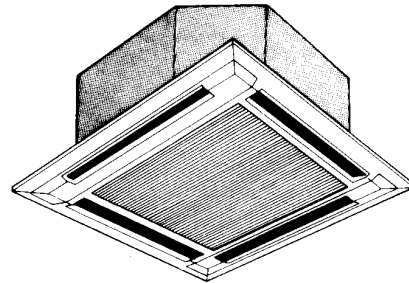

**MITSUBISHI
ELECTRIC**
DUCTLESS SPLIT-TYPE AIR CONDITIONERS AND HEAT PUMPS No. SP-005

SERVICE & PARTS MANUAL

Series PLH Ceiling Cassettes

Models **PLH18FK/PUH18EK**
PLH24FK/PUH24EK
PLH30FK/PUH30EK
PLH36FK/PUH36EK
PLH42FK/PUH42EK

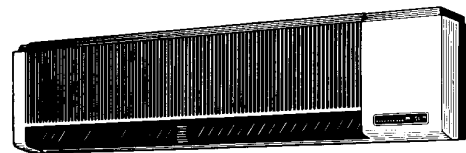
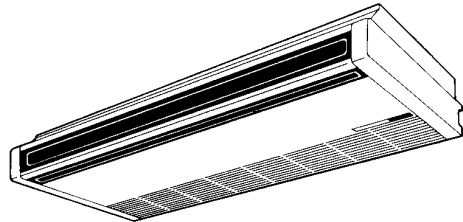


Series PCH Ceiling Suspended

Models **PCH24EK/PUH24EK**
PCH30EK/PUH30EK
PCH36EK/PUH36EK
PCH42EK/PUH42EK

Series PKH Wall Mounted

Models **PKH18EK/PUH18EK**
PKH24EK/PUH24EK
PKH30EK/PUH30EK



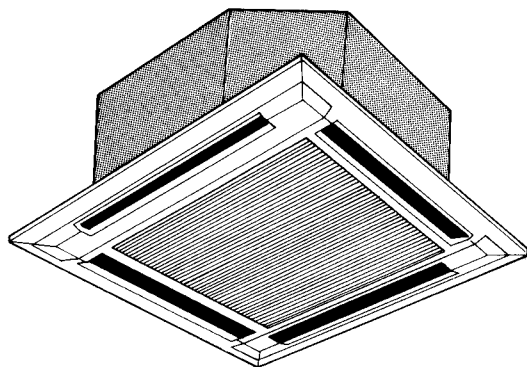
**The Slim Line.
From Mitsubishi Electric.**

Mr. SLIM™

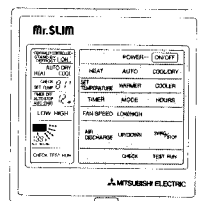
CONTENTS

1	FEATURES	1
	PLH series	1
	PCH series	5
	PKH series	7
2	SPECIFICATIONS	9
	PLH series	9
	PCH series	11
	PKH series	12
3	DATA	13
	PLH series	13
	PCH series	26
	PKH series	36
4	OUTLINES AND DIMENSIONS	45
	Indoor unit	45
	Remote controller	50
	Outdoor unit	53
5	REFRIGERANT SYSTEM DIAGRAM	56
6	WIRING DIAGRAM	57
7	OPERATION FLOW-CHART	64
8	MICROPROCESSOR CONTROL	68
9	TROUBLE SHOOTING	86
10	SYSTEM CONTROL	95
11	TIMER OPERATION WITH OPTIONAL PARTS	100
12	4-WAY AIR FLOW SYSTEM (PLH series)	102
13	DISASSEMBLY PROCEDURE	109
14	OPTIONAL PARTS	123
15	STANDARD PARTS	124

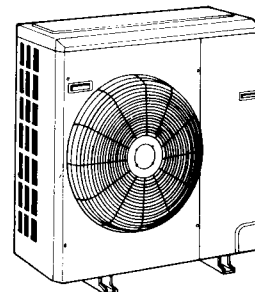
Series PLH Ceiling Cassettes



Indoor unit
PLH18FK



Remote controller



Outdoor unit
PUH18EK

Models	Cooling capacity/Heating capacity	SEER
PLH18FK	17,300/18,000(24,500)Btu/h	10.3
PLH24FK	23,100/25,000(31,500)Btu/h	10.3
PLH30FK	30,000/33,000(41,200)Btu/h	10.0
PLH36FK	35,400/38,000(47,600)Btu/h	10.4
PLH42FK	42,000/44,300(53,900)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/heating efficiency in a neat and unobstructive installation.

3. STABLE COOLING EVEN AT OUTDOOR TEMPERATURES AS LOW AS 23°F MAKES YEARROUND 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 23°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.

4. ADVANCED MICROPROCESSOR

(1) Easy to Use Microprocessor

1) Ultra-Thin Remote Controller

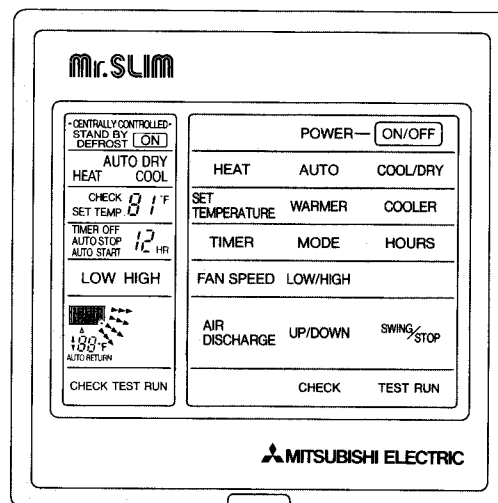
The streamlined, square controller is designed to blend with any kind of interior and the adoption of a sophisticated microprocessor allows you to carry out a wide range of operations easily.

2) Attractive Liquid Crystal Display (LCD)

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

3) Convenient 24-Hour ON-OFF Timer

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

(3) Automatic Cooling/Heating Changeover Operation

An automatic cooling and heating changeover operation system is provided to ensure easy control and year-round air conditioning.

Once the desired temperature is set, unit operation is switched automatically between cooling and heating, in accordance with the room temperature. In addition, the use of outdoor unit fan speed controller enables cooling operation at outdoor temperatures as low as 23°F.

5. INNOVATIVE SYSTEM CONTROL BY MICROPROCESSORS

The most significant feature of the series PLH-FK 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 PLH-FK 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.

(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 units can be centrally controlled using a single remote controller. The remote controller controls Power ON-OFF, set temperature, fan speed, swing louver, 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 the 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

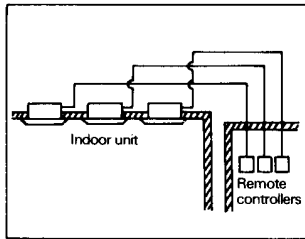
Two remote controllers can be used to control either one unit or several units in group control. This makes it possible to control units with ease either from a distance or at close range. Units operate according to the latest commands from either remote controller.

(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.

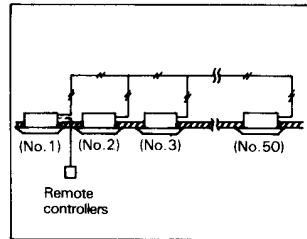
This system is well suited to buildings having a large number of rooms. In offices, for example, all units can be started together to cool or heat the premises before workers arrive, operated as necessary by individual remote controllers during the day, and stopped together at the end of business.

① Individual Control by Gathering Remote Controllers.



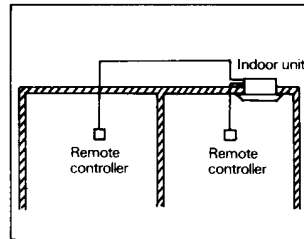
A built-in thermistor in each indoor unit controls its cooling and heating operation to maintain desired room temperature. Non-polar, two wire connection cables can be extended up to 550 yards.

② Group Control by a Single Remote Controller.



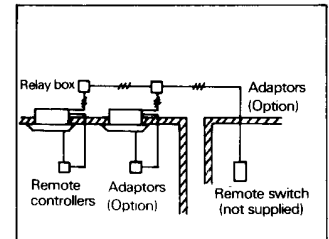
Each unit starts in sequence at one second intervals, and a built-in thermistor in each indoor unit controls its cooling operation to maintain desired room temperature.

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 units 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 possible.

6. DRAIN PUMP FOR EASY PIPE CONNECTION (DRAIN LIFT-UP MECHANISM)

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

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

8. REDI-CHARGED REFRIGERANT SYSTEM

PRE-CHARGE REFRIGERANT REQUIRED FOR MAXIMUM PIPING LENGTH AT SHIPMENT. PREVENTING TROUBLES DUE TO SHORTAGE OF REFRIGERANT.

The unique refrigerant circuit and a large accumulator always controls the refrigerant to its optimum condition regardless of the length of 164ft maximum. The additional refrigerant charging work at the field which often caused uncertain problems heretofore is completely eliminated. This unique system serves to improve the quality of work and reliability, and also helps to speed up the installation work.

Fig.1 Normal Refrigerant Circulation System.

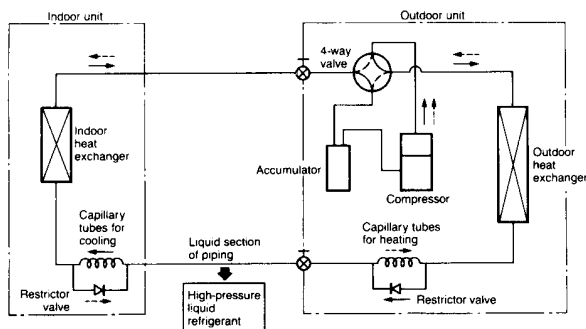
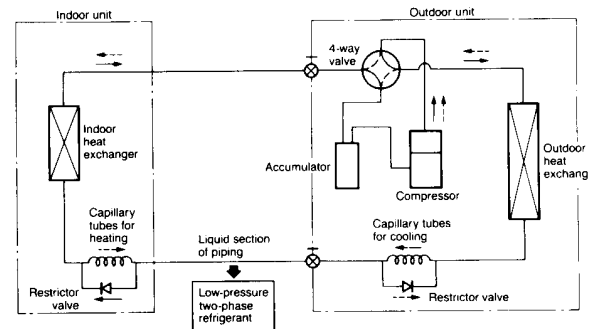


Fig.2 New Refrigerant Circulation System.



With normal circulation systems, a high-pressure refrigerant, condensed for cooling by the outdoor heat exchanger, is reduced in pressure by capillary tubes in the indoor unit after passing through the restrictor valve in the outdoor unit (see Figure 1). With the new circulation system, the direction of the restrictor valve is reversed as shown in Figure 2, and the condensed high pressure refrigerant is reduced in pressure by the capillary tubes in the outdoor unit. This results in a "two-phase refrigerant" of reduced pressure in the liquid section of the piping. The density of this two-phase refrigerant is 1/3~1/2 of that of the high pressure liquid refrigerant, and thus is required in smaller amounts (see Figures 1 and 2). As a result, the length of the piping can be extended further, and the effects of height differences are reduced. These new circulation systems are also equipped with a large accumulator which allows the refrigerant required for the 100ft piping length to be enclosed in the outdoor unit. The result is an air conditioner that requires no charging unless piping is extended beyond 100ft.

—→ Direction of flow during cooling

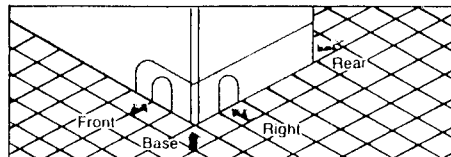
- - - → Direction of flow during heating

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.

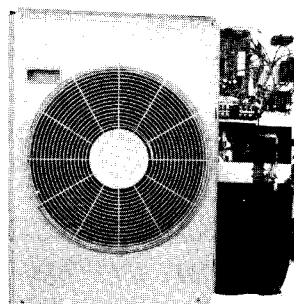
10. FOUR-WAY PIPING ACCESS MAKES INSTALLATION LAYOUT EASY

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

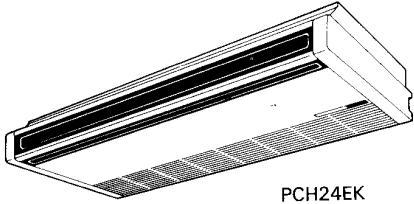
The outdoor unit has been designed with a front access service panel that allows easy access to all maintenance point, regardless of the installation layout. What's more, this front panel may be removed by loosening only two screws. It all adds up to greatly simplified maintenance work.



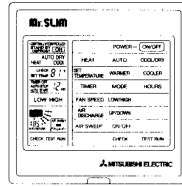
12. NITROGEN GAS IS CHARGED TO INDOOR UNIT

Indoor unit and refrigerant pipes are charged with nitrogen gas (N_2) instead of R-22 before shipment from the factory.

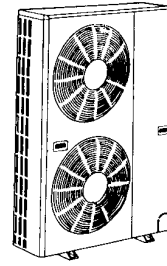
Series PCH Ceiling Suspended



PCH24EK
Indoor Unit



Microprocessor
Remote controller



PUH24EK
Outdoor Unit

Models	Cooling capacity/Heating capacity	SEER
PCH24EK	24,000/27,000(33,500)Btu/h	10.3
PCH30EK	30,000/33,000(41,500)Btu/h	10.0
PCH36EK	35,400/38,000(47,600)Btu/h	10.4
PCH42EK	42,000/45,000(54,600)Btu/h	10.0

1. ADVANCED MICROPROCESSOR CONTROL (Please refer to page 1 ~ 2 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
- (3) Automatic Cooling/Heating Changeover Operation

2. INNOVATIVE SYSTEM CONTROL BY MICROPROCESSORS (Please refer to page 2 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) Auto-Angle Airflow for Comfortable Air Conditioning

PCH units offer a choice of airflow outlets, a horizontal one and a downward-pointing one, and they incorporate auto-angle vanes which can be used independently by means of microprocessor control. This has led to the development of a new auto-angle airflow function and has made it possible to obtain the most comfortable forms of heating and cooling to suit the requirements of all kinds of rooms.

When operating in the heating mode the vanes automatically set the downward direction of the hot air at an angle of 70°. When cooling, they are set at 0° so that 100% horizontal airflow is achieved. Altogether, four* directions of airflow can be selected by remote control: 100% downward airflow, 80% downward airflow (plus 20% horizontal airflow), 60% downward airflow (plus 40% horizontal airflow) and 100% horizontal airflow.

*When the fan speed is on low during cooling, only three types are available: 100% and 80% downward airflow and 100% horizontal airflow.

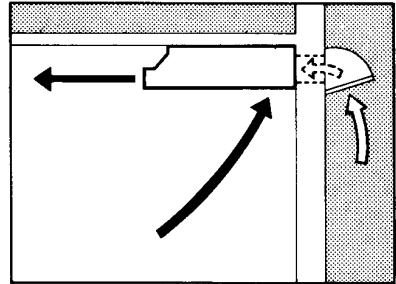
(2) Swing Flow Louvers

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



(3) Fresh-Air Intake

The PCH-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 23°F MAKES YEAR-ROUND AIR-CONDITIONING POSSIBLE

(Please refer to page 1 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 PCH-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 10-1/8" high and 50-7/16" wide (PCH24/30EK).

The outdoor units are also slim line, with a depth dimension of only 11-5/8" (PUH24EK).

(2) Flush-To-The-Wall Installation

Since the units in the PCH-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.

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 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.)

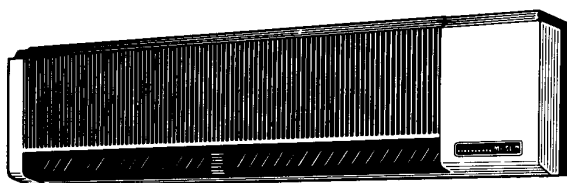
12. ECONOMICAL AND EFFICIENT OPERATION

- 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 PCH models feature highly precise compressors with large-capacity heat exchangers for efficient operation.

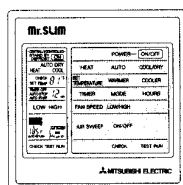
13. NITROGEN GAS IS CHARGED TO INDOOR UNIT.

(Please refer to page 4 for the detail.)

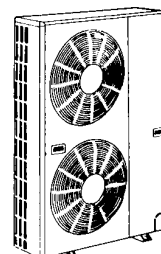
Series PKH Wall Mounted



PKH24EK
Indoor unit



Microprocessor
remote controller



PUH24EK
Outdoor unit

Models	Cooling capacity/Heating capacity	SEER
PKH18EK	18,000/18,600(25,100)Btu/h	10.0
PKH24EK	24,000/25,000(31,500)Btu/h	10.9
PKH30EK	28,500/31,000(37,500)Btu/h	10.0

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

- (1) Ultra-Thin, Multifunction LCD Remote Controller
- (2) Non-polar Two-Wire Remote Controller Cables
- (3) Automatic Cooling/Heating Changeover operation

2. INNOVATIVE SYSTEM CONTROL BY MICROPROCESSORS (Please refer to page 2~3 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

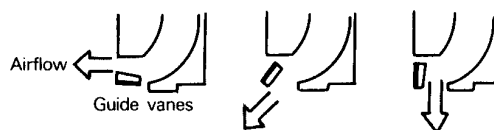
Swing Flow Louvers automatically change the airflow direction for uniform air distribution.

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 23°F MAKES YEAR-ROUND AIR-CONDITIONING POSSIBLE

(Please refer to page 1 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 (PUH24EK).

8. EASY INSTALLATION

Installation is simple, thanks to the easy-connection refrigerant lines.

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. ECONIMICAL 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 PKH models feature highly precise compressors with large-capacity heat exchangers for efficient operation.

2

SPECIFICATIONS

MODELS: PLH18/24/30FK

Model			PLH18FK	PLH24FK	PLH30FK
Capacity	Cooling	* 1 Btu/h	17,300	23,100	30,000
	Heating	* 1 Btu/h	18,000[23,500/24,500]	25,000[30,500/31,500]	33,000[39,500/41,200]
	Heating	* 2 Btu/h	11,500[17,000/18,000]	16,000[21,500/22,500]	20,800[27,300/29,000]
Moisture removal		Pints/h	5.3	7.0	9.1
Power consumption	Cooling	* 1 kW	1.77	2.42	3.20
	Heating	* 1 kW	1.6[3.2/3.5]	2.48[4.08/4.38]	2.97[4.87/5.37]
	Heating	* 2 kW	1.4[3.0/3.3]	2.0[3.6/3.9]	2.6[4.5/5.0]
		* 1	9.8	9.5	9.4
SEER			10.3	10.3	10.0
HSPF			7.0	7.1	7.1
COP		* 1	3.3	3.0	3.3
		* 2	2.4	2.3	2.3
INDOOR UNIT MODELS			PLH18FK	PLH24FK	PLH30FK
External finish			Galvanized sheets with gray heat insulation		
Power supply		V,phase,HZ	208/230,1,60		
Max.fuse size (time delay)		A	20	20	25
Min.ampacity		A	15	15	17
Fan motor		F.L.A.	0.55	0.6	0.5+0.5
Booster heater		A(kW)	7.6/8.4<1.6/1.9>	7.6/8.4<1.6/1.9>	8.4/11.0<1.9/2.4>
Airflow Hi-Lo	Dry	CFM	600-390	640-420	1,060-670
	Wet	CFM	540-350	580-380	950-600
Sound level Hi-Lo		dB(A)	45-38	47-39	49-41
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	66		104
INDOOR GRILLE	External finish		Munsell 0.70Y 8.59/0.97		
	Dimensions	W	in.	36-5/8	57-1/8
		D	in.	36-5/8	
		H	in.	2-3/8	
	Weight		lb	22	35
OUTDOOR UNIT MODELS			PUH18EK	PUH24EK	PUH30EK
External finish			Munsell 5Y 7/1		
Power supply		V,phase,HZ	208/230,1,60		
Max.fuse size (time delay)		A	20	20	30
Min.ampacity		A	16	16	20
Fan motor		F.L.A.	0.75	0.65+0.65	0.75+0.75
Compressor	Model (type)		RH247NAB	NH33NBD	NH41NAD
	R.L.A.		12	11.5	14.0
	L.R.A.		37	54	73
Crankcase heater		A(W)	0.11/0.12<23/28>	0.16/0.17<33/39>	0.16/0.17<33/39>
Refrigerant control			Capillary tube		
Defrost method			Reverse cycle		
Sound level		dB(A)	53	55	55
Dimensions	W	in.	34-1/4		38-3/16
	D	in.	11-5/8		13-9/16
	H	in.	33-1/2	49-9/16	
Weight		lb	131	202	245
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		1/2
	Gas	in.	5/8		3/4
Connection method	Indoors		Flared		
	Outdoors		Flared		
Between the indoor & outdoor units	Height difference	ft	130	164	
	Piping length	ft	130	164	

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

(heating) — indoor : 70°FDB, 60°FWB outdoor : 47°FDB, 43°FWB.

*2.Rating conditions (heating) — indoor : 70°FDB, 60°FWB outdoor : 17°FDB, 15°FWB.

*3.Heating capacity and power consumption () includes booster heater operation at 208/230V.

Operating range

		Indoor intake air temperature		Outdoor intake air temperature	
Cooling	Maximum	95°FDB, 71°FWB		115°FDB	
	Minimum	67°FDB, 57°FWB		23°FDB	
Heating	Maximum	80°FDB, 67°FWB		75°FDB, 65°FWB	
	Minimum	70°FDB, 68°FWB		17°FDB, 15°FWB	

MODELS: PLH36/42FK

Item			Model	PLH36FK	PLH42FK
Capacity	Cooling	* 1 Btu/h		35,400	42,000
	Heating	* 1 Btu/h		38,000(45,900/47,600)	44,300(52,200/53,900)
	Heating	* 2 Btu/h		19,600(27,500/29,200)	28,300(36,200/37,900)
Moisture removal		Pints/h		10.9	12.3
Power consumption	Cooling	* 1 kW		3.53	4.27
	Heating	* 1 kW		3.40(5.7/6.2)	4.38(6.68/7.18)
	Heating	* 2 kW		2.70(5.0/5.5)	3.4(5.7/6.2)
EER		* 1		10.0	9.8
SEER				10.4	10.0
HSPF				7.4	7.3
COP		* 1		3.3	3.0
		* 2		2.1	2.4
INDOOR UNIT MODELS			PLH36FK	PLH42FK	
External finish			Galvanized sheets with gray heat insulation		
Power supply		V,phase,Hz	208/230,1,60		
Max.fuse size (time delay)		A	25	25	
Min.ampacity		A	17	17	
Fan motor		F.L.A.	0.5+0.5	0.6+0.6	
Booster heater		A(kW)	10.8/12.0<2.3/2.8>	10.8/12.0<2.3/2.8>	
Airflow Hi-Lo	Dry	CFM	1,060-670	1,090-780	
	Wet	CFM	950-600	980-700	
Sound level Hi-Lo		dB(A)	49-41	49-42	
Cond. drain connection OD		in.	1-1/4	1-1/4	
Dimensions	W	in.	52-3/4		
	D	in.	32-1/4		
	H	in.	10-1/8		
Weight		lb	104		
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		lb	35	
OUTDOOR UNIT MODELS			PUH36EK	PUH42EK	
External finish			Munsell 5Y 7/1		
Power supply		V,phase,Hz	208/230,1,60		
Max.fuse size (time delay)		A	30	40	
Min.ampacity		A	22	27	
Fan motor		F.L.A.	0.75+0.75	0.8+0.8	
Compressor	Model (type)		NH47NAD	NH569NXA	
			R.L.A.	17.5	
			L.R.A.	87	
Crankcase heater		A(W)	0.16/0.17<33/39>	0.16/0.17<33/39>	
Refrigerant control			Capillary tube		
Defrost method			Reverse cycle		
Sound level		dB(A)	55	56	
Dimensions	W	in.	38-3/16		
	D	in.	13-9/16		
	H	in.	49-9/16		
Weight		lb	246	268	
REMOTE CONTROLLER			With indoor unit		
Control voltage(by built-in transformer)			Indoor unit-remote controller:DC12V. Indoor unit-outdoor unit:DC12V		
REFREGERANT PIPING			Not supplied(optional parts)		
Pipe size	Liquid	in.	1/2		
	Gas	in.	3/4	7/8	
Connection method	Indoors		Flared		
	Outdoors		Flared		
Between the indoor & outdoor units	Height difference		164		
	Piping length		164		

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

(heating) — indoor : 70°FDB, 60°FWB outdoor : 47°FDB, 43°FWB.

* 2. Rating conditions (heating) — indoor : 70°FDB, 60°FWB outdoor : 17°FDB, 15°FWB.

* 3. Heating capacity and power consumption in [] includes booster heater operation at 208/230V.

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95°FDB, 71°FWB	115°FDB
	Minimum	67°FDB, 57°FWB	23°FDB
Heating	Maximum	80°FDB, 67°FWB	75°FDB, 65°FWB
	Minimum	70°FDB, 68°FWB	17°FDB, 15°FWB

MODELS: PCH24/30/36/42EK

Item			Model	PCH24EK	PCH30EK	PCH36EK	PCH42EK
Capacity	Cooling	* 1	Btu/h	24,000	30,000	35,400	42,000
	Heating	* 1	Btu/h	27,000(32,500/33,500)	33,000(39,800/41,500)	38,000(45,900/47,600)	45,000(52,900/54,600)
	Heating	* 2	Btu/h	18,400(23,900/24,900)	18,000(24,800/26,500)	19,600(27,500/29,200)	24,800(32,700/34,400)
Moisture removal			Pints/h	7.0	9.1	10.9	12.3
Power consumption	Cooling	* 1	kW	2.46	3.06	3.53	4.37
	Heating	* 1	kW	2.42(4.02/4.32)	3.13(5.13/5.63)	3.4(5.7/6.2)	4.3(6.6/7.1)
	Heating	* 2	kW	2.1(3.7/4.0)	2.6(4.6/5.1)	2.7(5.0/5.5)	3.2(5.5/6.0)
EER			* 1	9.8	9.8	10.0	9.6
SEER				10.3	10.0	10.4	10.0
HSPF				7.1	7.1	7.4	7.3
COP		* 1		3.3	3.1	3.3	3.1
		* 2		2.6	2.4	2.1	2.3
INDOOR UNIT MODELS				PCH24EK	PCH30EK	PCH36EK	PCH42EK
External finish				Munsell 2.5Y 8/0.3 & N2			
Power supply				V,phase,Hz 208/230,1,60			
Max.fuse size (time delay)				A 20	25	25	25
Min.ampacity				A 12	15	15	17
Fan motor				F.L.A. 0.7	0.7	1.3	1.3
Booster heater				A(kW) 7.6/8.4<1.6/1.9>	9.8/10.8<2.0/2.5>	10.8/12.0<2.3/2.8>	10.8/12.0<2.3/2.8>
Airflow Hi-Lo	Dry		CFM 920-740	920-740	1,270-990	1,270-990	
	Wet		CFM 830-670	830-670	1,100-860	1,100-860	
Sound level Hi-Lo			dB(A) 50-43	50-43	51-45	51-45	
Cond. drain connection OD			in. 1	1	1	1	
Dimensions	W		in. 50-7/16	62-1/4			
	D		in. 26-13/16				
	H		in. 10-1/8				
Weight			lb 101	119			
OUTDOOR UNIT MODELS				PUH24EK	PUH30EK	PUH36EK	PUH42EK
External finish				Munsell 5Y 7/1			
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	0.75+0.75	0.75+0.75	0.8+0.8
Compressor	Model (type)		NH33NBD	NH41NAD	NH47NAD	NH569NXA	
			R.L.A. 11.5	14.0	17.5	20.0	
			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			
Defrost method				Reverse cycle			
Sound level			dB(A) 55	55	55	56	
Dimensions	W		in. 34-1/4	38-3/16			
	D		in. 11-5/8	13-9/16			
	H		in. 49-9/16	49-9/16			
Weight			lb 202	245	246	268	
REMOTE CONTROLLER				With indoor unit			
Control voltage (by built-in transformer)				Indoor unit-remote controller:DC12V. Indoor unit-outdoor unit:DC12V			
REFREGERANT PIPING				Not supplied(optional parts)			
Pipe size	Liquid		in. 3/8	1/2			
	Gas		in. 5/8	3/4		7/8	
Connection method	Indoors		Flared				
	Outdoors		Flared				
Between the indoor & outdoor units	Height difference		ft 164				
	Piping length		ft 164				

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

(heating) — indoor : 70°FDB, 60°FWB outdoor : 47°FDB, 43°FWB.

* 2. Rating conditions (heating) — indoor : 70°FDB, 60°FWB outdoor : 17°FDB, 15°FWB.

* 3. Heating capacity and power consumption in () includes booster heater operation at 208/230V.

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95°FDB, 71°FWB	115°FDB
	Minimum	67°FDB, 57°FWB	23°FDB
Heating	Maximum	80°FDB, 67°FWB	75°FDB, 65°FWB
	Minimum	70°FDB, 68°FWB	17°FDB, 15°FWB

MODELS:PKH18/24/30EK

Item		Model	PKH18EK	PKH24EK	PKH30EK
Capacity	Cooling	* 1 Btu/h	18,000	24,000	28,500
	Heating	* 1 Btu/h	18,600[24,100/25,100]	25,000[30,500/31,500]	31,000[36,500/37,500]
	Heating	* 2 Btu/h	11,300[16,800/17,800]	16,000[21,500/22,500]	19,000[24,500/25,500]
Moisture removal		Pints/h	5.3	7.2	8.5
Power consumption	Cooling	* 1 kW	1.81	2.30	2.97
	Heating	* 1 kW	1.58[3.18/3.48]	2.40[4.0/4.3]	3.29[4.89/5.19]
	Heating	* 2 kW	1.4[3.0/3.3]	2.0[3.6/3.9]	2.7[4.3/4.6]
EER		* 1	9.9	10.4	9.6
SEER			10.0	10.9	10.0
HSPF			7.2	7.1	6.9
COP		* 1	3.4	3.1	2.8
		* 2	2.4	2.3	2.1
INDOOR UNIT MODELS			PKH18EK	PKH24EK	PKH30EK
External finish			Munsell 2.5Y 8/0.3		
Power supply		V,phase,Hz	208/230,1,60		
Max.fuse size (time delay)		A	15	15	15
Min.ampacity		A	12	12	12
Fan motor		F.L.A.	0.5	0.5	0.5
Booster heater		A(kW)	7.6/8.4<1.6/1.9>	7.6/8.4<1.6/1.9>	7.6/8.4<1.6/1.9>
Airflow Hi-Lo	Dry	CFM	700-560	700-560	700-560
	Wet	CFM	630-510	630-510	630-510
Sound level Hi-Lo		dB(A)	49-43	50-44	50-44
Cond. drain connection OD		in.	1	1	1
Dimensions	W	in.	60-1/4		
	D	in.	8-11/16		
	H	in.	14-3/16		
Weight		lb	70	82	
OUTDOOR UNIT MODELS			PUH18EK	PUH24EK	PUH30EK
External finish			Munsell 5Y 7/1		
Power supply		V,phase,Hz	208/230,1,60		
Max.fuse size (time delay)		A	20	20	30
Min.ampacity		A	16	16	20
Fan motor		F.L.A.	0.75	0.65+0.65	0.75+0.75
Compressor	Model (type)		RH247NAB	NH33NBD	NH41NAD
		R.L.A.	12	11.5	14.0
		L.R.A.	37	54	73
Crankcase heater		A(W)	0.11/0.12<23/28>	0.16/0.17<33/39>	0.16/0.17<33/39>
Refrigerant control			Capillary tube		
Defrost method			Reverse cycle		
Sound level		dB(A)	53	55	55
Dimensions	W	in.	34-1/4		38-3/16
	D	in.	11-5/8		13-9/16
	H	in.	33-1/2	49-9/16	
Weight		lb	131	202	245
REMOTE CONTROLLER			With indoor unit		
Control voltage (by built-in transformer)			Indoor unit-remote controller:DC12V. Indoor unit-outdoor unit:DC12V		
REFREGERANT 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 difference	ft	130	164	
	Piping length	ft	130	164	

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

(heating) — indoor : 70°FDB,60°FWB outdoor : 47°FDB,43°FWB.

* 2.Rating conditions (heating) — indoor : 70°FDB,60°FWB outdoor : 17°FDB,15°FWB.

* 3.Heating capacity and power consumption in () includes booster heater operation at 208/230V.

Operating range

		Indoor intake air temperature		Outdoor intake air temperature	
Cooling	Maximum	95°FDB,71°FWB		115°FDB	
	Minimum	67°FDB,57°FWB		23°FDB	
Heating	Maximum	80°FDB,67°FWB		75°FDB,65°FWB	
	Minimum	70°FDB,68°FWB		17°FDB,15°FWB	

3

DATA

MODELS: PLH18/24/30/36/42FK

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
PLH18FK	540 0.11	71	19.8	10.4	1.55	19.2	10.2	1.68	18.5	10.0	1.82	17.4	9.7	1.95	16.7	9.6	2.08
		67	18.7	12.3	1.52	18.1	12.1	1.63	17.3	11.8	1.77	16.5	11.4	1.91	15.7	11.1	2.03
		63	17.3	13.7	1.48	16.7	13.4	1.60	16.1	13.1	1.73	15.3	12.6	1.88	14.5	12.2	1.98
PLH24FK	580 0.13	71	27.4	12.8	2.10	26.2	12.5	2.28	24.8	12.0	2.49	23.3	11.6	2.68	22.0	11.3	2.85
		67	25.4	15.4	2.03	24.2	14.9	2.20	23.1	14.4	2.42	21.7	13.8	2.58	20.4	13.3	2.75
		63	23.6	17.4	1.95	22.6	16.9	2.13	21.4	16.2	2.30	20.2	15.5	2.50	19.1	14.9	2.67
PLH30FK	950 0.10	71	35.1	18.4	2.80	33.9	18.2	3.03	32.5	17.9	3.28	31.0	17.4	3.55	29.8	17.1	3.80
		67	32.7	21.7	2.73	31.4	21.1	2.94	30.0	20.6	3.20	28.7	20.1	3.46	27.6	19.7	3.70
		63	30.4	24.1	2.65	29.3	23.6	2.85	28.0	22.9	3.12	26.8	22.3	3.38	25.6	21.7	3.61
PLH36FK	950 0.10	71	41.1	20.1	3.00	39.7	19.7	3.28	37.9	19.1	3.59	34.1	18.7	3.93	34.7	18.3	4.22
		67	38.1	23.9	2.95	36.7	23.3	3.23	35.4	22.8	3.53	33.7	22.1	3.84	32.3	21.5	4.12
		63	35.6	27.1	2.85	34.3	26.3	3.13	32.9	25.5	3.43	31.4	24.7	3.73	30.0	23.9	4.00
PLH42FK	950 0.19	71	48.8	22.0	3.95	47.2	21.4	4.20	45.0	20.7	4.45	42.9	20.0	4.75	41.1	19.6	5.00
		67	45.6	26.8	3.85	44.0	26.1	4.08	42.0	25.1	4.27	40.0	24.2	4.55	37.9	23.3	4.80
		63	42.5	30.6	3.75	40.9	29.6	3.95	38.9	28.4	4.15	36.9	27.2	4.40	34.9	26.1	4.55

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.

3. Cooling capacity correction factors and Refrigerant piping length (one way) range.

MODEL	Refrigerant piping length (one way)									
	25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PLH18FK	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PLH24FK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PLH30FK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PLH36FK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PLH42FK	1.0	0.975	0.955	0.935	0.918	0.900	0.884	0.869	0.855	0.840

2) HEATING CAPACITY

Models	Indoor air		Outdoor intake air WB temperature (°F)												Auxiliary heater (208V 230V)	
	Airflow (CFM)	IDB (°F)	15		25		35		45		55		65			
			CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC
PLH18FK	540	75	12.3	1.20	14.1	1.38	16.1	1.55	18.5	1.75	20.6	1.95	23.0	2.15	5.5	1.6
		70	12.5	1.13	14.5	1.30	16.5	1.45	18.8	1.64	21.0	1.83	23.6	2.00		
		65	12.7	1.08	14.7	1.23	17.1	1.38	19.4	1.53	21.8	1.70	24.6	1.88	6.5	1.9
PLH24FK	580	75	17.5	2.28	19.2	2.36	21.8	2.50	25.0	2.68	28.6	2.88	32.9	3.03	5.5	1.6
		70	17.9	2.15	19.8	2.23	22.6	2.35	25.8	2.50	29.6	2.73	33.9	2.95		
		65	18.1	2.08	20.2	2.14	23.0	2.25	26.2	2.43	30.2	2.63	34.5	2.85	6.5	1.9
PLH30FK	950	75	22.2	2.40	25.8	2.65	29.4	2.90	32.9	3.20	37.3	3.50	41.7	3.85	6.5	1.9
		70	22.6	2.30	26.2	2.55	29.8	2.78	33.7	3.05	37.9	3.33	42.5	3.63		
		65	23.0	2.25	26.6	2.48	30.6	2.70	34.9	2.95	39.3	3.20	44.0	3.50	8.2	2.4
PLH36FK	950	75	25.8	2.85	29.8	3.05	33.7	3.35	38.1	3.65	42.9	4.00	48.0	4.40	7.9	2.3
		70	26.2	2.75	30.4	2.90	34.5	3.15	39.3	3.45	44.0	3.80	49.2	4.15		
		65	26.6	2.55	31.0	2.80	35.3	3.05	40.3	3.35	45.2	3.65	50.8	3.95	9.6	2.8
PLH42FK	980	75	26.4	3.60	32.1	3.85	38.5	4.15	45.2	4.60	52.6	5.10	60.3	5.65	7.9	2.3
		70	26.8	3.50	32.5	3.70	38.9	4.05	46.0	4.45	53.6	4.90	61.5	5.45		
		65	27.4	3.45	33.3	3.60	40.1	3.95	47.2	4.35	55.2	4.80	63.5	5.35	9.6	2.8

Notes 1. IDB: Intake air dry-bulb temperature

CA: Capacity ($\times 10^3$ Btu/h), PC: Power Consumption (kW)

2. When booster heater is "on", total capacity and total power consumption should be added the figures described in booster heater column.

● Booster heater ON : When the set temperature is higher than the room temperature by more than 5.4 deg.

● Booster heater OFF : When the set temperature is higher than the room temperature by less than 3.6 deg.

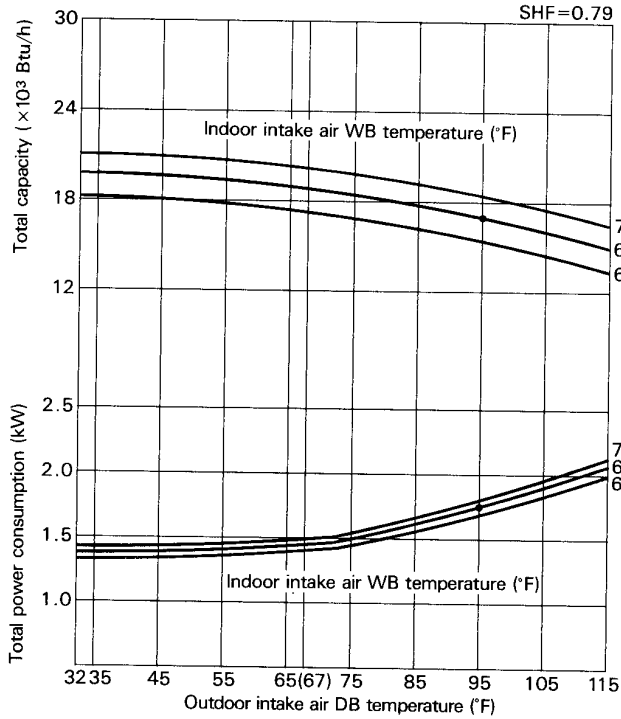
3. Heating capacity correction factors.

Models	Refrigerant piping length (one way)		
	Less than 100ft	100~130ft	130~164ft
PLH18FK	1.00	0.995	0.990
PLH24FK	1.00	0.995	0.990
PLH30FK	1.00	0.995	0.990
PLH36FK	1.00	0.995	0.990
PLH42FK	1.00	0.995	0.990

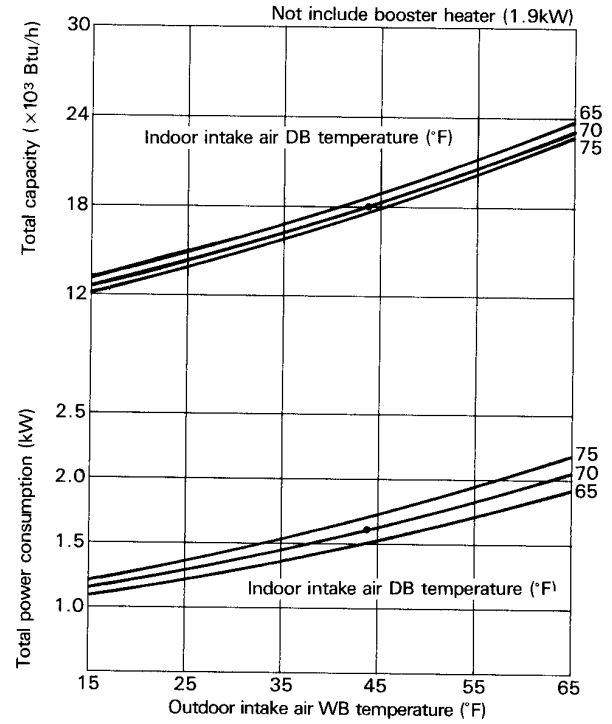
2. PERFORMANCE CURVE

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

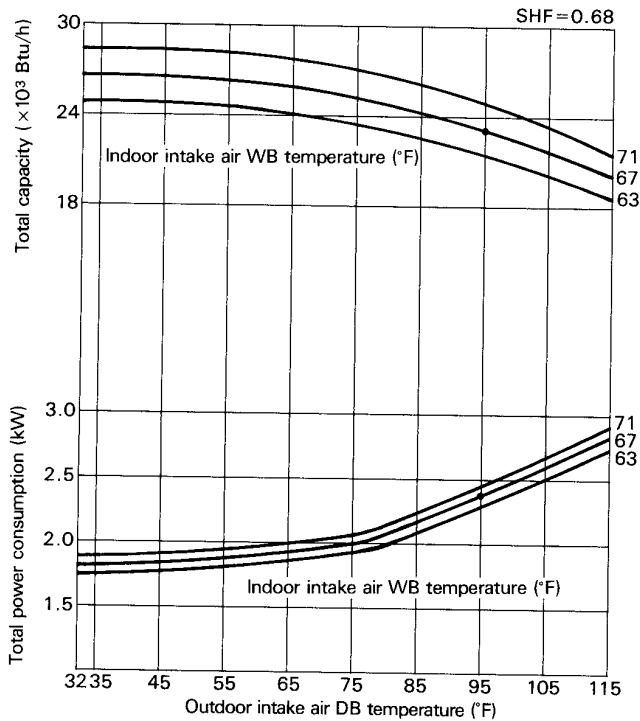
PLH18FK COOLING CAPACITY



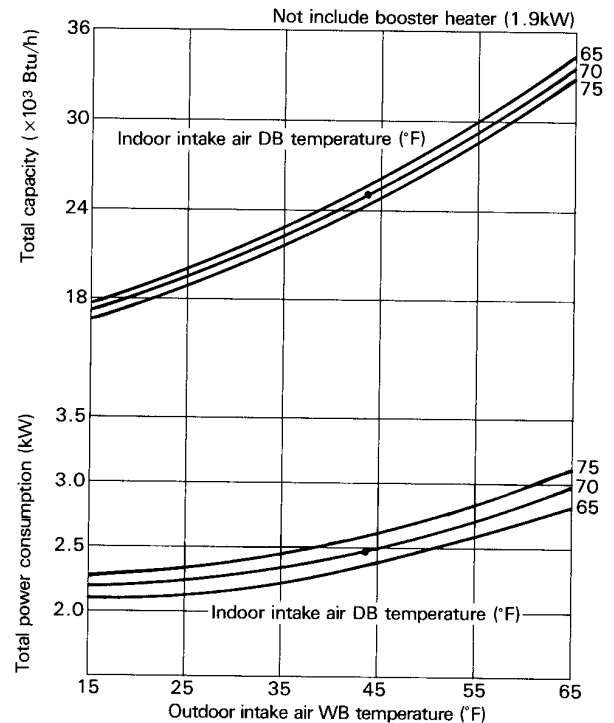
PLH18FK HEATING CAPACITY



PLH24FK COOLING CAPACITY

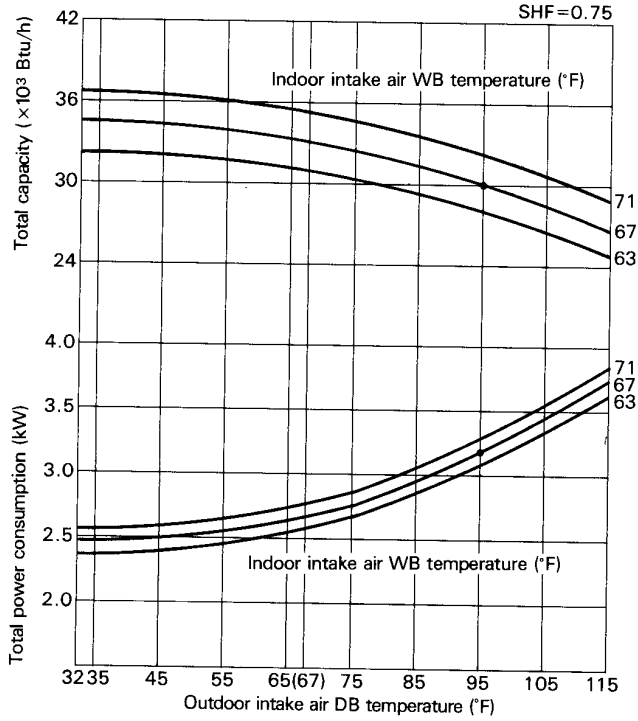


PLH24FK HEATING CAPACITY

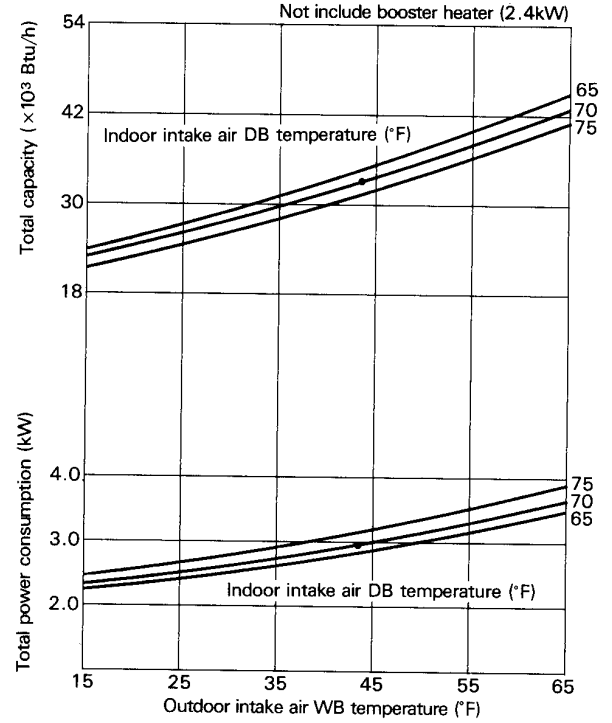


NOTE: A point on the curve shows the reference point.

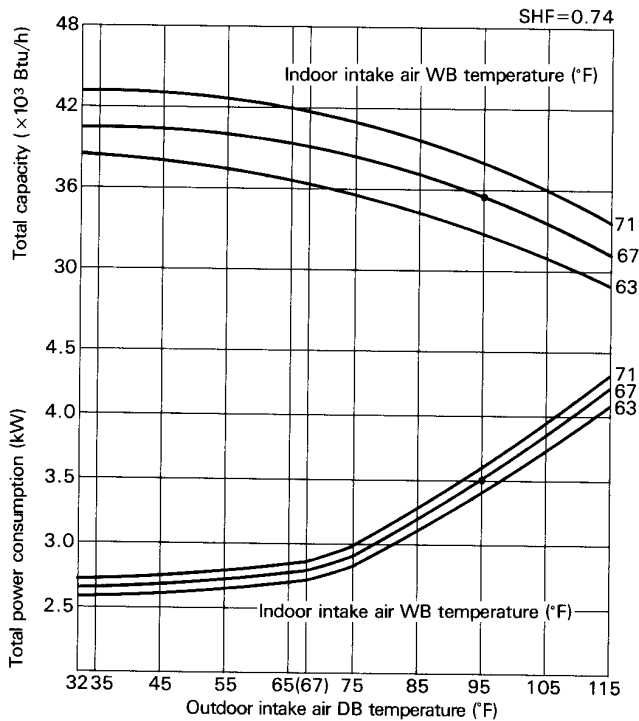
PLH30FK COOLING CAPACITY



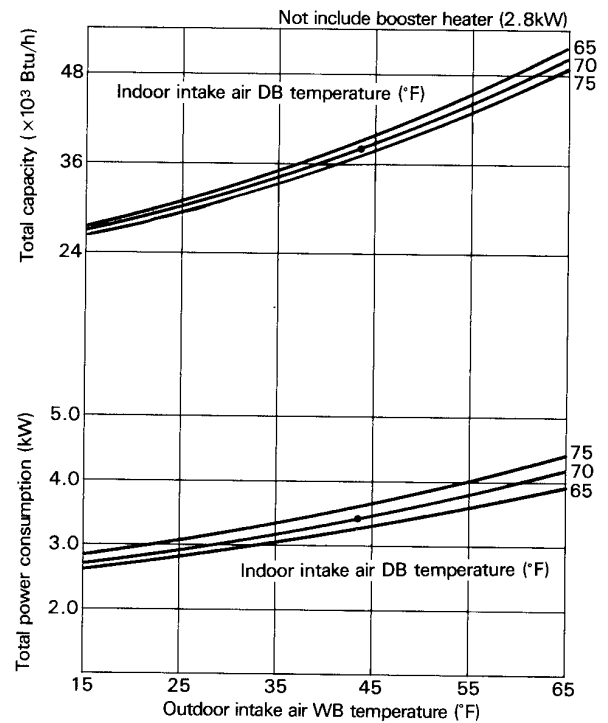
PLH30FK HEATING CAPACITY



PLH36FK COOLING CAPACITY



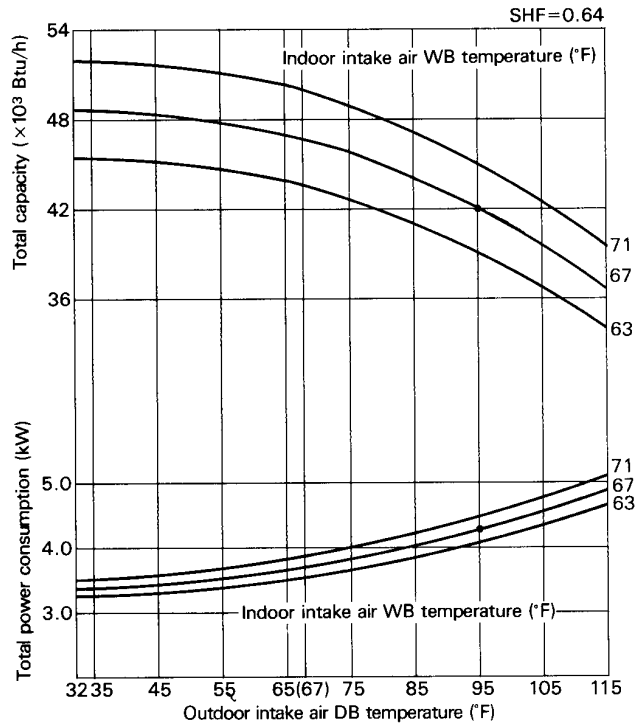
PLH36FK HEATING CAPACITY



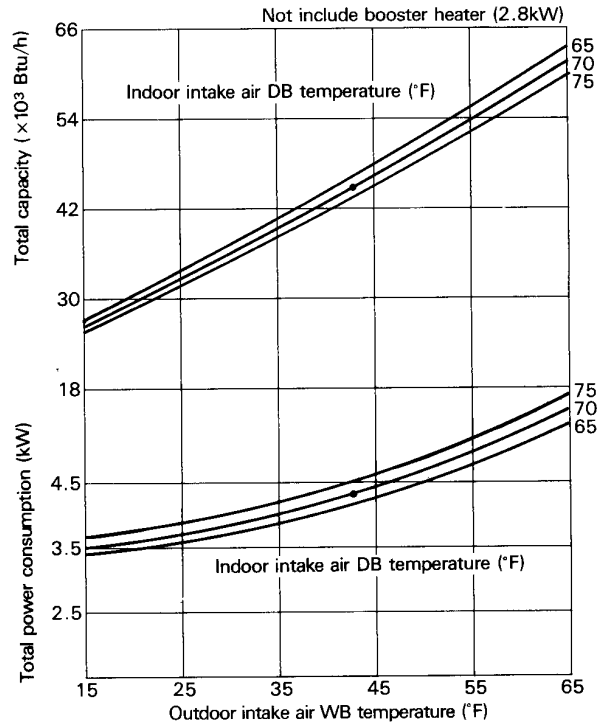
3. CONDENSING PRESSURE AND SUCTION PRESSURE CURVE

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

PLH42FK COOLING CAPACITY



PLH42FK HEATING CAPACITY



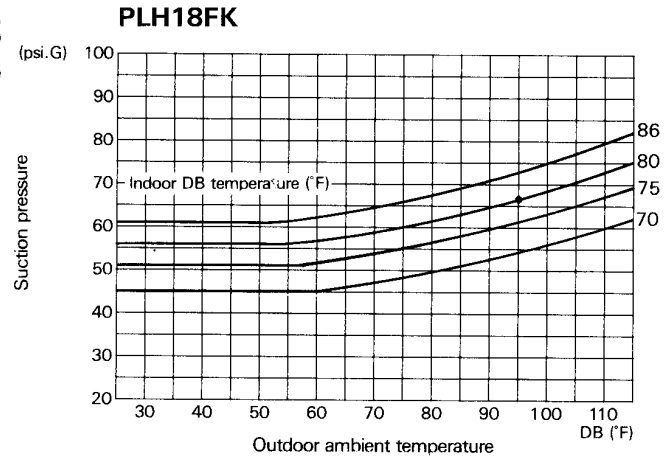
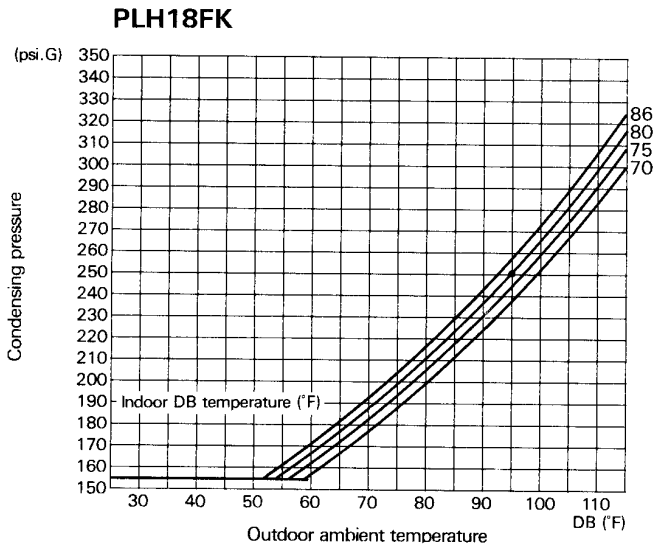
3. CONDENSING PRESSURE AND SUCTION PRESSURE

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.

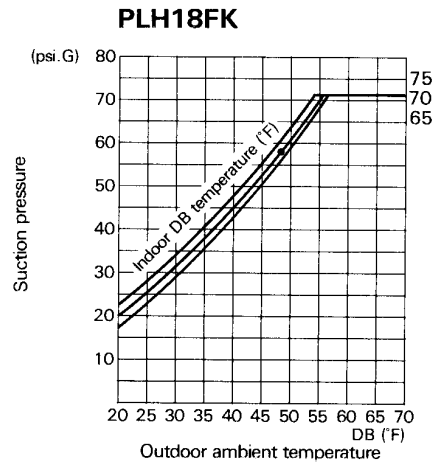
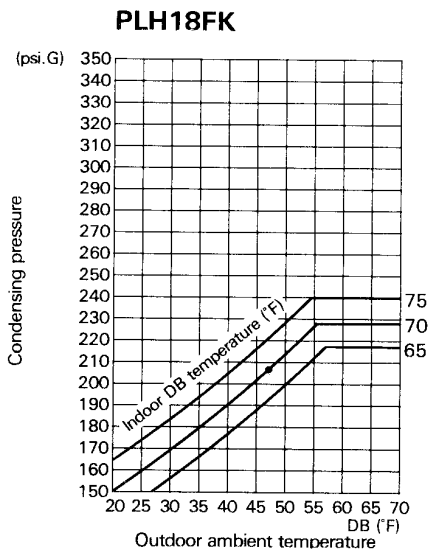
<Cooling mode>



Data is based on the condition of outdoor humidity 75%.

A point on the curve shows the reference point.

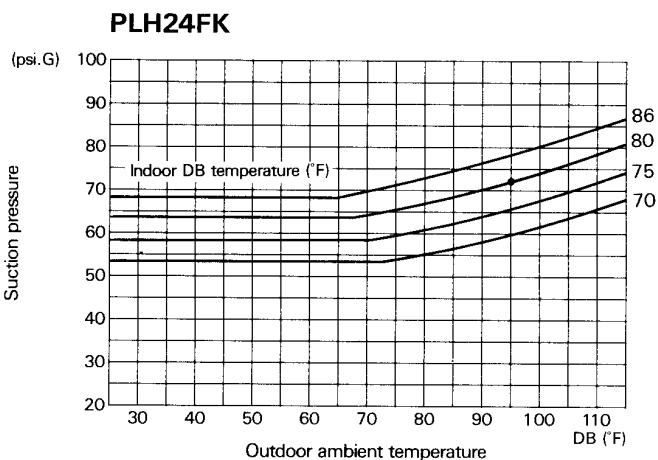
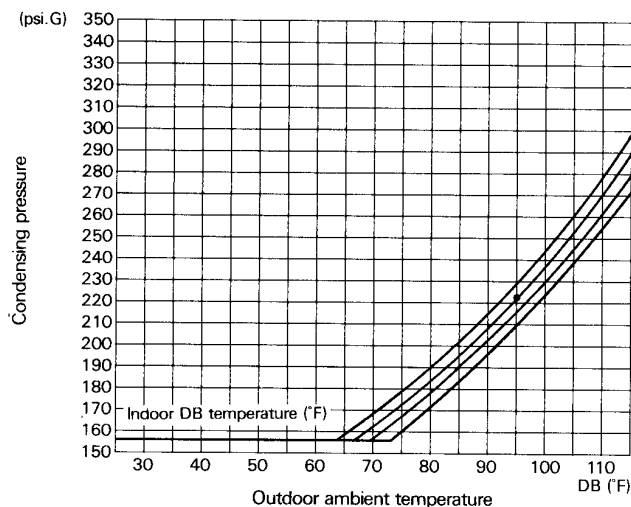
<Heating mode>



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

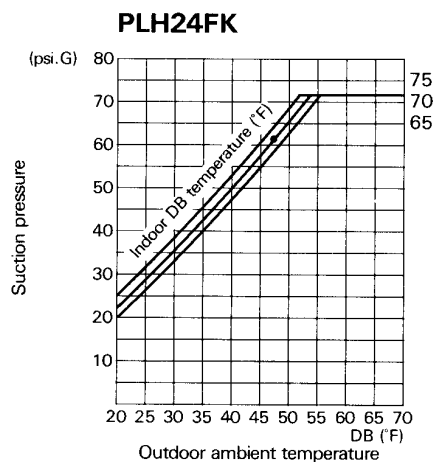
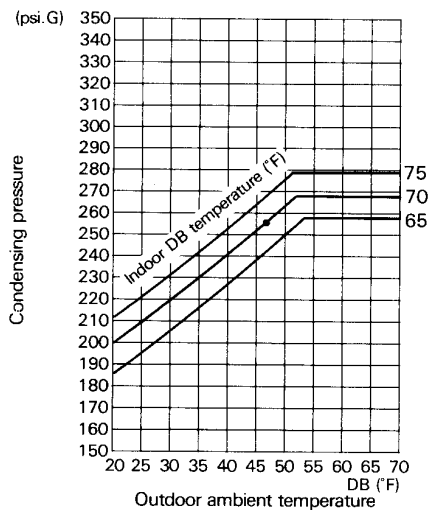
Air flow should be set at HI.

A point on the curve shows the reference point.



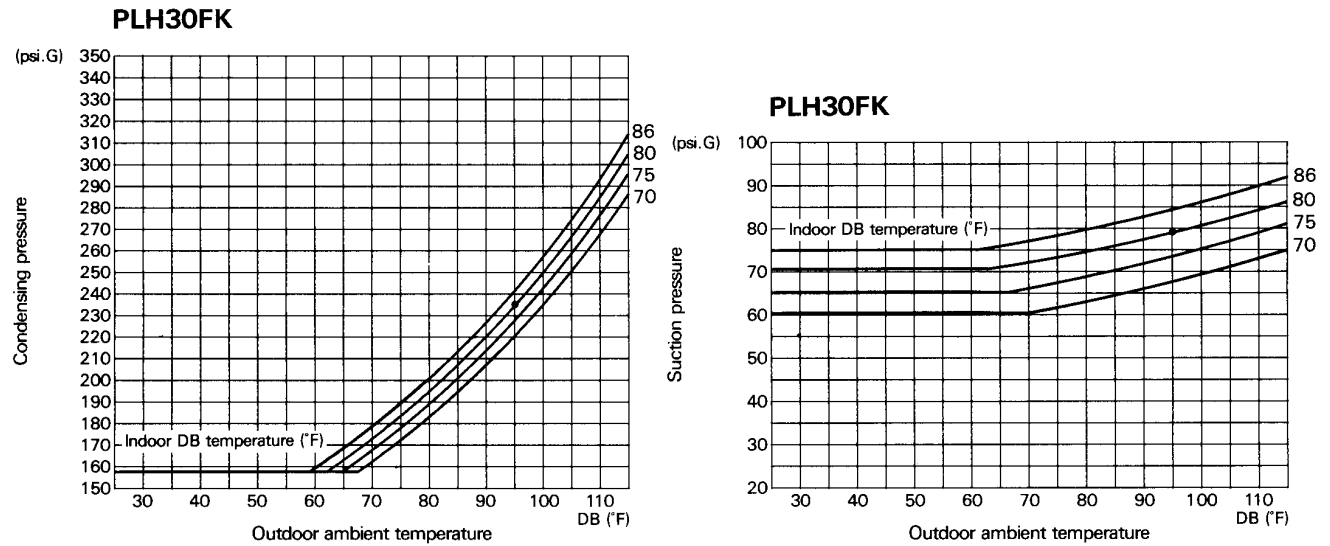
Data is based on the condition of outdoor humidity 75%.

A point on the curve shows the reference point.



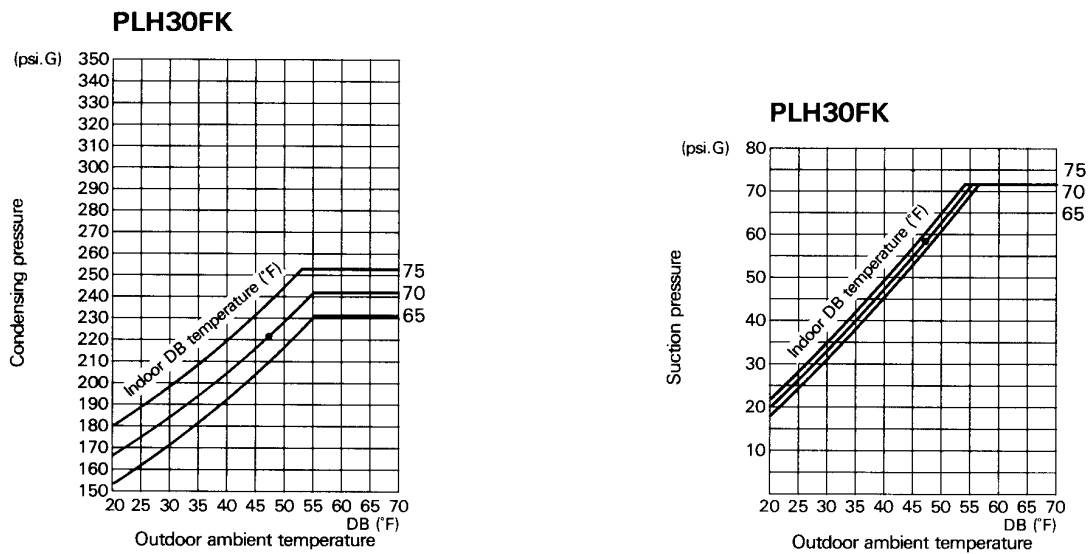
Data is based on the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.

<Cooling mode>



Data is based on the condition of outdoor humidity 75%.
 A point on the curve shows the reference point.

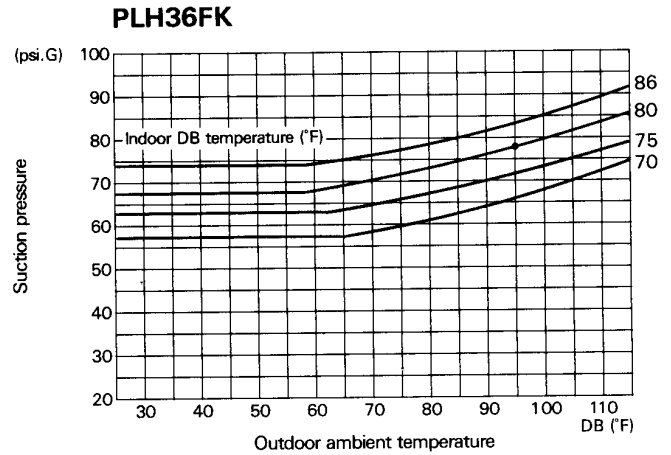
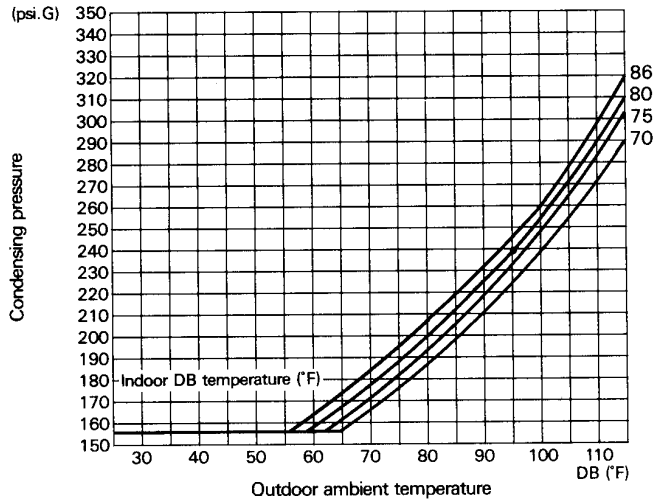
<Heating mode>



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.

<Cooling mode>

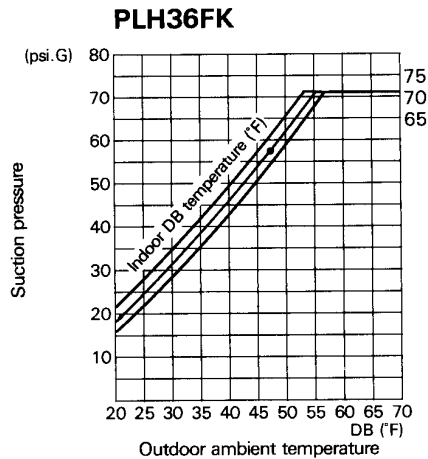
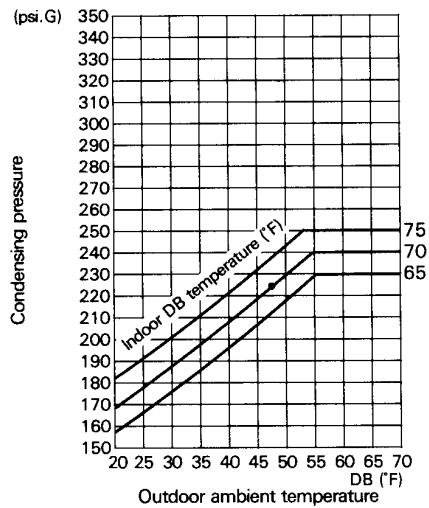
PLH36FK



Data is based on the condition of outdoor humidity 75%.
 A point on the curve shows the reference point.

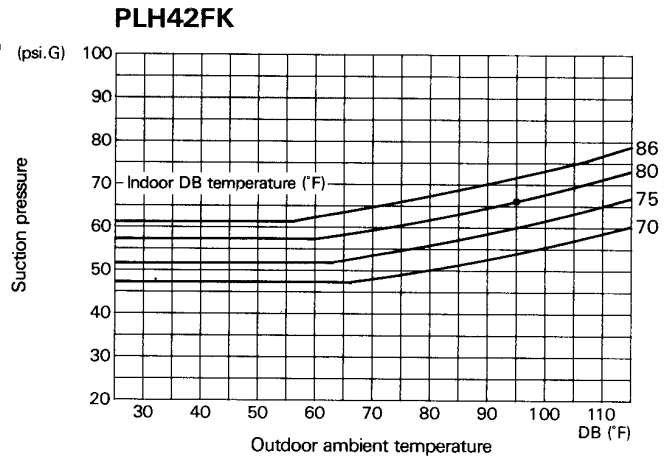
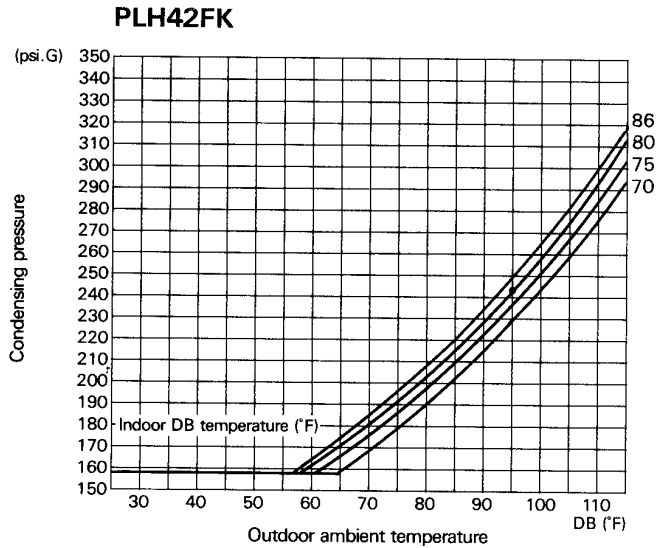
<Heating mode>

PLH36FK



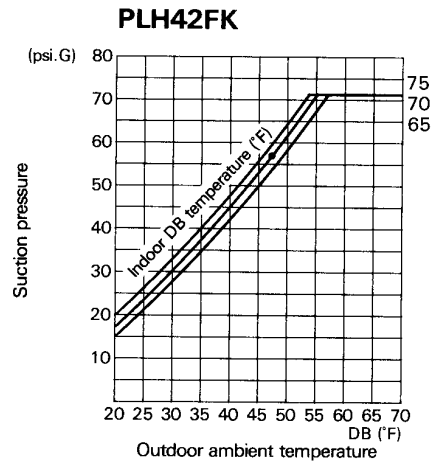
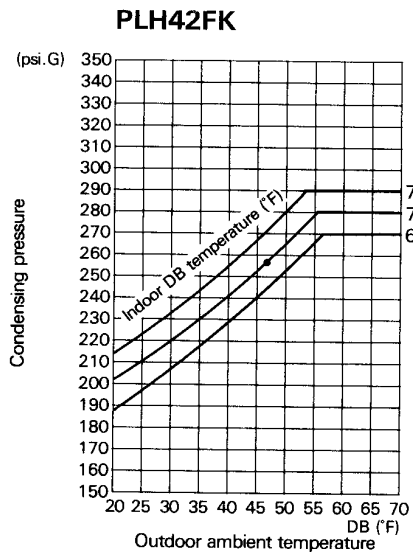
Data is based no the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.

<Cooling mode>



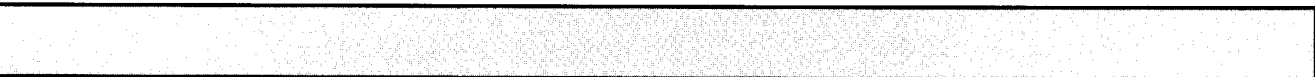
Data is based on the condition of outdoor humidity 75%.
 A point on the curve shows the reference point.

<Heating mode>



4. STANDARD OPERATION DATA

Models			PLH18FK		PLH24FK		PLH30FK		
Item		Unit	Cooling	Heating	Cooling	Heating	Cooling	Heating	
Electrical circuit	Voltage	V	208/230	208/230	208/230	208/230	208/230	208/230	
	Frequency	Hz	60		60		60		
	Total input	kW	1.77	1.60	2.42	2.48	3.20	2.97	
	Indoor fan current	A	0.55	0.55	0.6	0.6	0.5+0.5	0.5+0.5	
	Booster heater current	A	—	7.6/8.4	—	7.6/8.4	—	8.4/11.0	
	Outdoor fan current	A	0.75	0.75	0.65+0.65	0.65+0.65	0.75+0.75	0.75+0.75	
	Comp. current	A	8.0/7.6	7.0/6.8	10.4/9.7	11.5/10.5	14.0/13.4	13.6/12.8	
Refrigerant circuit	Condensing pressure	psi.G	245	206	225	253	235	220	
	Suction pressure	psi.G	77	58	73	61	80	58	
	Discharge temperature	°F	181	138	157	170	157	153	
	Condensing temperature	°F	116	103	110	118	113	108	
	Suction temperature	°F	57	35	44	36	50	35	
	Comp.shell bottom temperature	°F	173	131	150	161	147	141	
	Ref. pipe length	ft	25		25		25		
	Refrigerant charge	—	5 lbs 8 oz		9 lbs 15 oz		10 lbs 2 oz		
Indoor side	Intake air temperature	DB	°F	80	70	80	70	80	70
		WB	°F	67	60	67	60	67	60
	Discharge air temperature	DB	°F	60	96	56	106	58	99
		WB	°F	58	—	55	—	57	—
	Fan speed	r.p.m.	690		720		670+670		
	Airflow (High)	CFM	600		640		1,060		
Outdoor side	Intake air temperature	DB	°F	95	47	95	47	95	47
		WB	°F	—	43	—	43	—	43
	Fan speed upper/lower	r.p.m.	790		750/750		760/760		
	Airflow	CFM	1,590		3,170		3,350		
Capacity		Btu/h	17,300	18,000	23,100	25,000	30,000	33,000	
SHF		—	0.79	—	0.68	—	0.75	—	



Models				PLH36FK				PLH42FK				
Item				Unit	Cooling		Heating		Cooling		Heating	
Electrical circuit	Voltage			V	208/230		208/230		208/230		208/230	
	Frequency			Hz	60				60			
	Total input			kW	3.53		3.4		4.27		4.38	
	Indoor fan current			A	0.5+0.5		0.5+0.5		0.6+0.6		0.6+0.6	
	Booster heater current			A	—		10.8/12.0		—		10.8/12.0	
	Outdoor fan current			A	0.75+0.75		0.75+0.75		0.8+0.8		0.8+0.8	
	Comp. current			A	15.7/14.7		15.0/14.1		20.0/18.4		20.5/19.0	
Refrigerant circuit	Condensing pressure			psi.G	236		222		239		257	
	Suction pressure			psi.G	78		58		67		56	
	Discharge temperature			°F	162		160		198		178	
	Condensing temperature			°F	113		109		114		119	
	Suction temperature			°F	48		35		66		31	
	Comp.shell bottom temperature			°F	150		144		186		164	
	Ref. pipe length			ft	25				25			
	Refrigerant charge			—	10 lbs 9 oz				12 lbs 9 oz			
Indoor side	Intake air temperature		DB	°F	80		70		80		70	
			WB	°F	67		60		67		60	
	Discharge air temperature		DB	°F	58		100		56		107	
			WB	°F	57		—		54		—	
	Fan speed			r.p.m.	670+670				720+720			
	Airflow (High)			CFM	1,060				1,090			
Outdoor side	Intake air temperature		DB	°F	95		47		95		47	
			WB	°F	—		43		—		43	
	Fan speed upper/lower			r.p.m.	760/760				840/840			
	Airflow			CFM	3,350				3,530			
Capacity				Btu/h	35,400		38,000		42,000		44,300	
SHF				—	0.74		—		0.64		—	

5. OPERATING RANGE

1) POWER SUPPLY

	Min.			Max.
1 Phase 60Hz 208/230V	198V	208V	230V	253V
Guaranteed voltage range	-----			-----

2) OPERATION

Function	Air intake temperature Condition	Indoor		Outdoor	
		DB(°F)	WB(°F)	DB(°F)	WB(°F)
Cooling	Standard temperature	80	67	95	75
	Maximum temperature	95	71	115	—
	Minimum temperature	67	57	23	—
	Maximum humidity	80	75	80	75
Heating	Standard temperature	70	60	47	43
	Maximum temperature	70	60	17	15
	Minimum temperature	80	67	75	65

6. OUTLET AIR SPEED AND COVERAGE RANGE

		PLH18FK	PLH24FK	PLH30FK	PLH36FK	PLH42FK
Standard (8.2ft)	Airflow (CFM)	600	640	1,060	1,060	1,090
	Air speed (ft/sec.)	10.5	11.4	9.8	9.8	10.7
	Coverage range (ft)	19	22	25	25	27
High ceiling (9.8ft)	Airflow (CFM)	600	640	1,060	1,060	1,090
	Air speed (ft/sec.)	14.6	16.4	14.2	14.2	15.8
	Coverage range (ft)	22	25	30	30	31
	Total width discharge outlets (ft)	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.

7. 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
PLH18FK	5 lbs 8 oz	0	0	0	0	0	0	2	4	—	—
PLH24FK	9 lbs 15 oz	0	0	0	0	0	0	2	4	7	9
PLH30FK	10 lbs 2 oz	0	0	0	0	0	0	5	10	16	20
PLH36FK	10 lbs 9 oz	0	0	0	0	0	0	5	10	16	20
PLH42FK	12 lbs 9 oz	0	0	0	0	0	0	5	10	16	20

MODELS:PCH24/30/36/42EK

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
PCH24EK	900 0.13	71	28.4	16.1	2.15	27.1	15.8	2.34	25.7	15.4	2.53	24.3	15.1	2.74	22.7	14.8	2.95
		67	26.3	18.6	2.10	25.1	18.2	2.29	24.0	17.8	2.46	22.7	17.3	2.67	21.0	16.6	2.87
		63	24.5	20.5	2.00	24.5	20.1	2.18	22.2	19.4	2.38	21.0	18.8	2.56	19.8	18.3	2.76
PCH30EK	900 0.10	71	34.7	17.8	2.69	33.5	17.5	2.91	32.1	17.1	3.17	30.8	16.8	3.46	29.2	16.3	3.73
		67	32.5	21.2	2.62	31.4	20.7	2.84	30.0	20.2	3.06	28.8	19.7	3.36	27.4	19.1	3.63
		63	30.2	23.6	2.55	29.2	23.1	2.76	28.0	22.4	3.02	26.8	21.8	3.28	25.4	21.1	3.54
PCH36EK	1,100 0.13	71	40.9	21.1	3.02	39.7	20.8	3.28	38.1	20.3	3.60	36.3	19.9	3.95	34.5	19.4	4.30
		67	38.1	24.9	2.95	36.7	24.3	3.23	35.4	23.8	3.53	33.7	23.1	3.85	32.1	22.5	4.18
		63	35.7	28.0	2.88	34.5	27.4	3.15	33.1	26.6	3.43	31.6	25.8	3.74	30.2	25.1	4.05
PCH42EK	1,100 0.11	71	49.6	23.8	3.99	47.6	23.1	4.24	45.4	22.6	4.54	43.1	21.9	4.84	40.7	21.3	5.20
		67	46.0	28.4	3.86	44.2	27.6	4.09	42.0	26.7	4.37	39.9	25.8	4.64	37.7	24.9	4.95
		63	42.9	32.1	3.73	41.1	31.1	3.94	39.3	30.1	4.19	37.1	28.9	4.44	34.7	27.5	4.74

- 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°FDB of indoor intake air temperature.
 3. Cooling capacity correction factors and Refrigerant piping length (one way) range.

MODEL	Refrigerant piping length (one way)									
	25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PCH24EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PCH30EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PCH36EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PCH42EK	1.0	0.975	0.955	0.935	0.918	0.900	0.884	0.869	0.855	0.840

2) HEATING CAPACITY

Models	Indoor air		Outdoor intake air WB temperature (°F)												Auxiliary heater (^{208V} ^{230V})	
	Airflow (CFM)	IDB (°F)	15		25		35		45		55		65			
			CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC
PCH24EK	900	75	18.7	2.19	21.1	2.29	23.9	2.42	27.5	2.60	31.2	2.81	36.3	3.03	5.5	1.6
		70	19.1	2.09	21.3	2.19	24.3	2.29	27.9	2.45	32.1	2.68	36.9	2.91	-----	-----
		65	19.5	1.98	21.6	2.03	24.7	2.16	28.6	2.31	33.0	2.54	37.6	2.79	6.5	1.9
PCH30EK	900	75	22.2	2.54	25.4	2.70	29.0	3.03	32.9	3.37	37.3	3.75	41.3	4.08	6.8	2.0
		70	22.6	2.37	26.2	2.59	29.8	2.87	33.7	3.20	38.1	3.53	42.1	3.86	-----	-----
		65	23.0	2.26	26.6	2.48	30.4	2.76	34.5	3.03	38.9	3.37	43.5	3.69	8.5	2.5
PCH36EK	1,100	75	25.8	2.75	29.6	3.05	33.7	3.35	38.3	3.65	43.3	4.00	47.8	4.35	7.9	2.3
		70	26.2	2.63	30.4	2.90	34.5	3.15	39.1	3.45	44.0	3.78	48.8	4.15	-----	-----
		65	26.8	2.48	31.0	2.75	35.3	3.05	40.5	3.35	45.2	3.63	50.6	3.93	9.6	2.8
PCH42EK	1,100	75	26.6	3.41	32.5	3.67	39.1	4.03	45.6	4.45	53.2	4.98	60.9	5.55	7.9	2.3
		70	26.8	3.38	32.9	3.62	39.7	3.96	46.4	4.38	54.0	4.87	61.9	5.45	-----	-----
		65	27.0	3.33	33.3	3.56	40.1	3.88	47.2	4.30	55.2	4.80	63.5	5.34	9.6	2.8

Notes 1. IDB : Indoor air dry-bulb temperature

CA : Capacity ($\times 10^3$ Btu/h), PC : Power Consumption (kW)

2. When booster heater is "on", total capacity and total power consumption should be added the figures described in heater column.

●Booster heater ON : When the set temperature is higher than the room temperature by more than 5.4 deg.

●Booster heater OFF : When the set temperature is higher than the room temperature by less than 3.6 deg.

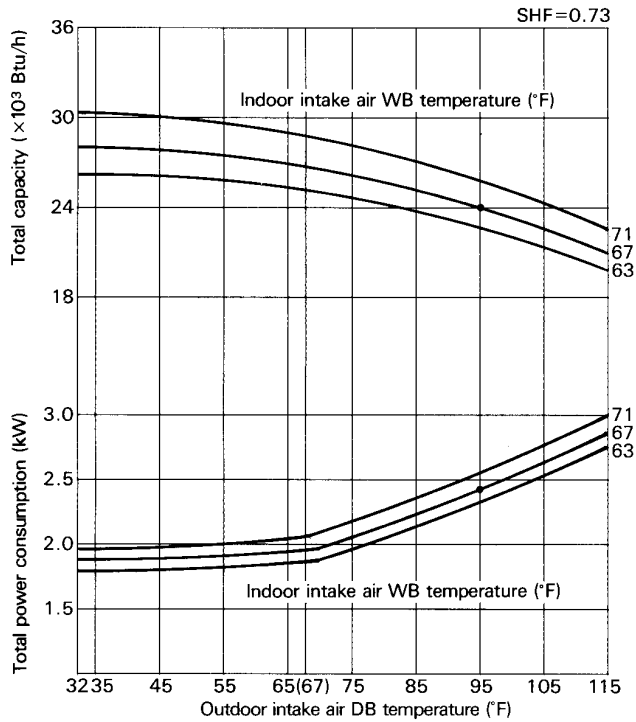
3. Heating capacity correction factors.

Models	Refrigerant piping length (one way)		
	Less than 100ft	100~130ft	130~164ft
PCH24EK	1.00	0.995	0.990
PCH30EK	1.00	0.995	0.990
PCH36EK	1.00	0.995	0.990
PCH42EK	1.00	0.995	0.990

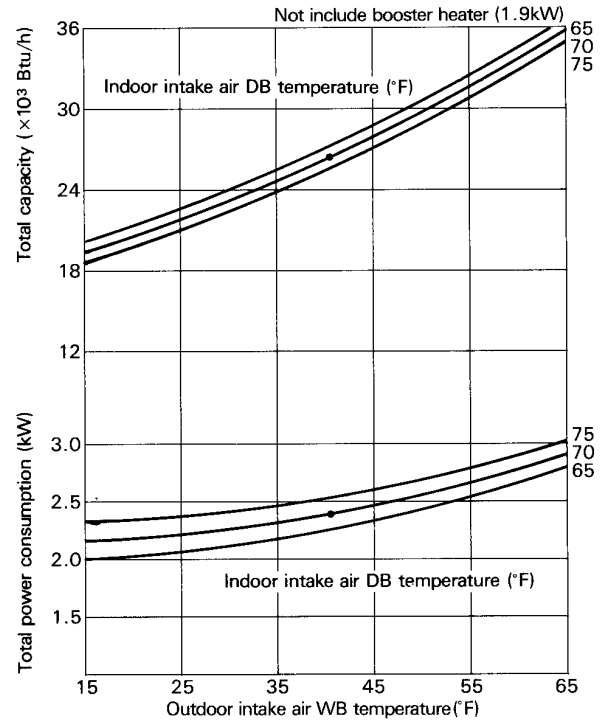
2. PERFORMANCE CURVE

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

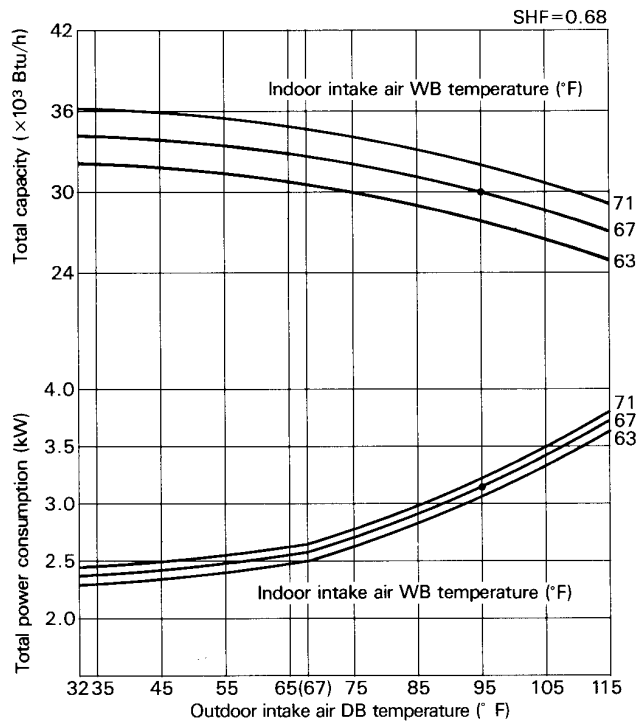
PCH24EK COOLING CAPACITY



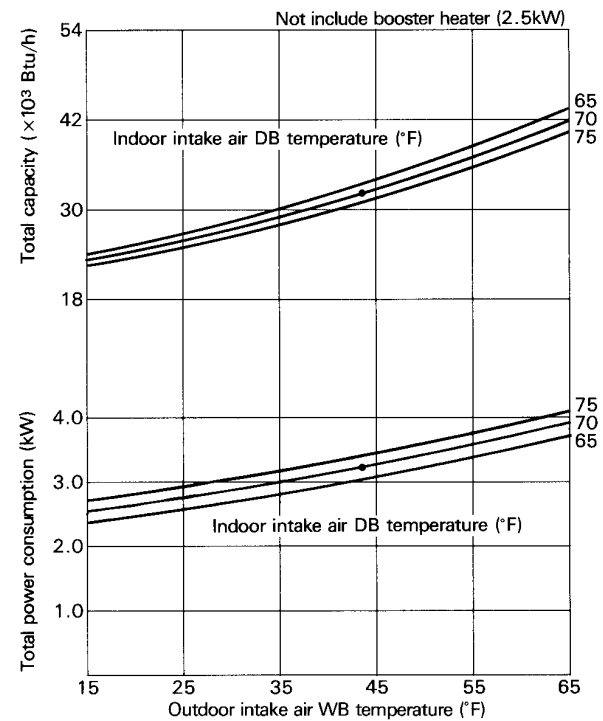
PCH24EK HEATING CAPACITY



PCH30EK COOLING CAPACITY

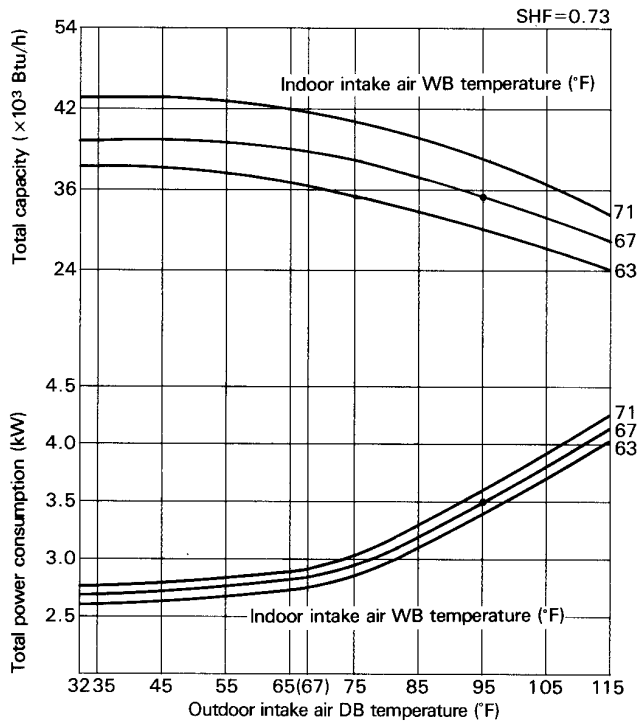


PCH30EK HEATING CAPACITY

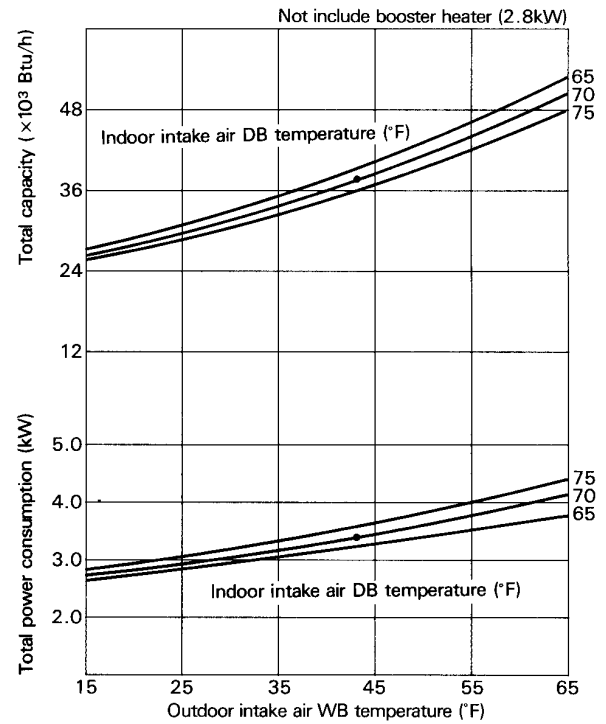


NOTE: A point on the curve shows the reference point.

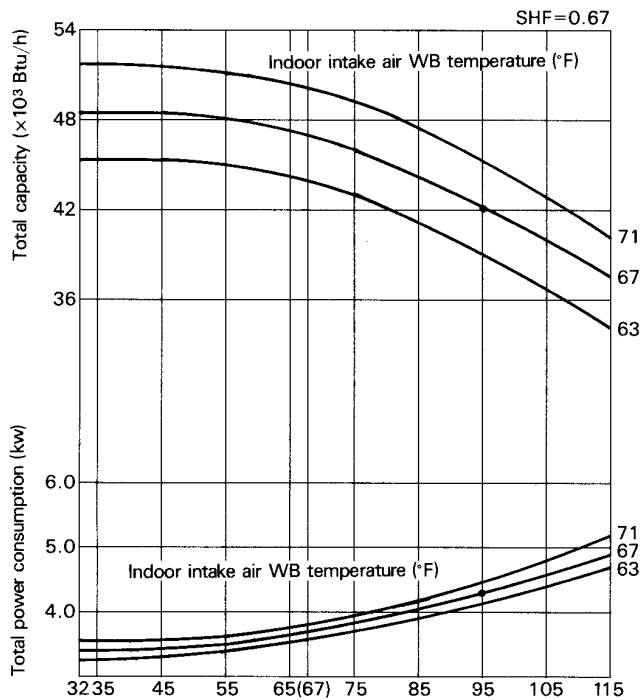
PCH36EK COOLING CAPACITY



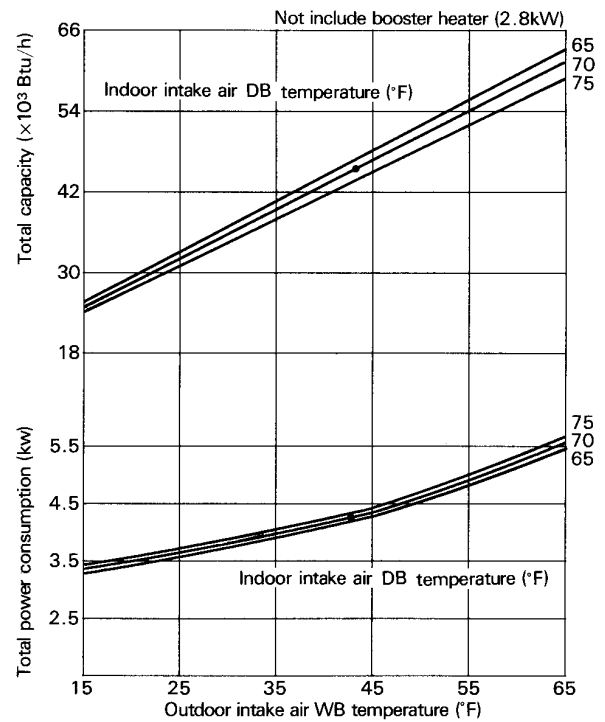
PCH36EK HEATING CAPACITY



PCH42EK COOLING CAPACITY



PCH42EK HEATING CAPACITY



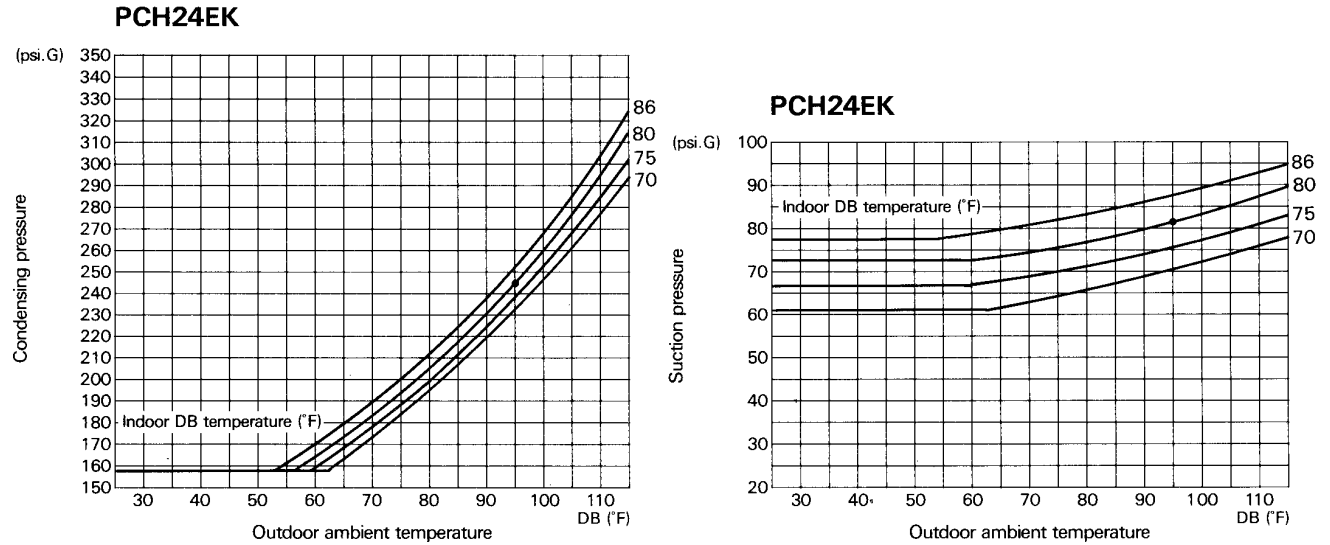
3. CONDENSING PRESSURE AND SUCTION PRESSURE

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.

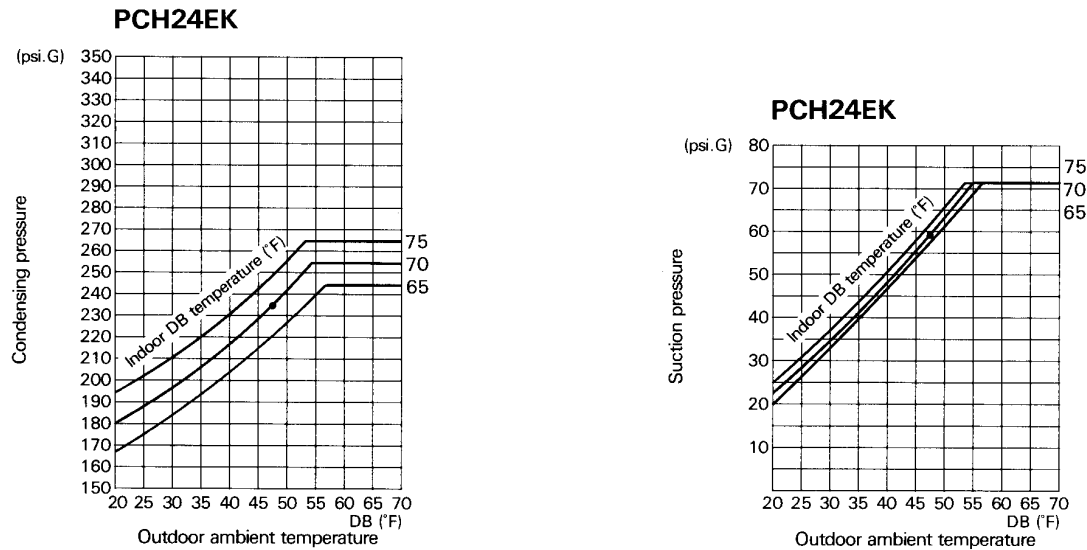
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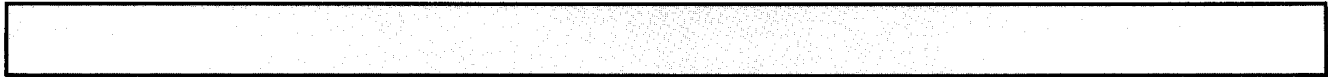


Data is based on the condition of outdoor humidity 75%.

A point on the curve shows the reference point.

<Heating mode>

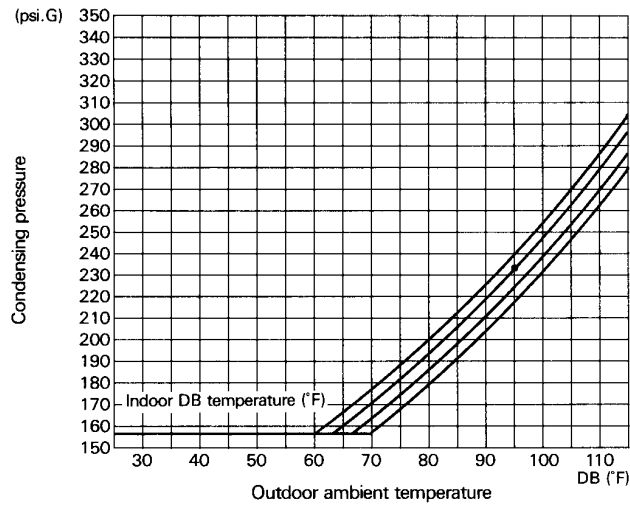




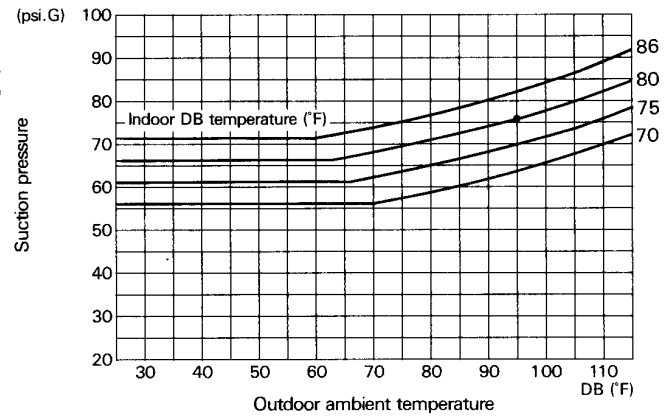
Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

<Cooling mode>

PCH30EK



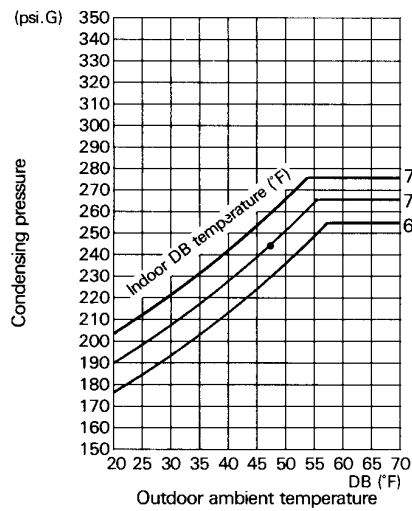
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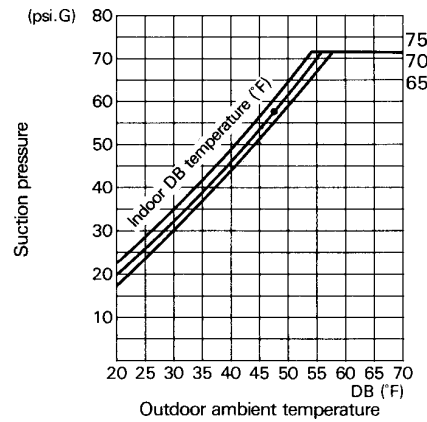
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A point on the curve shows the reference point.

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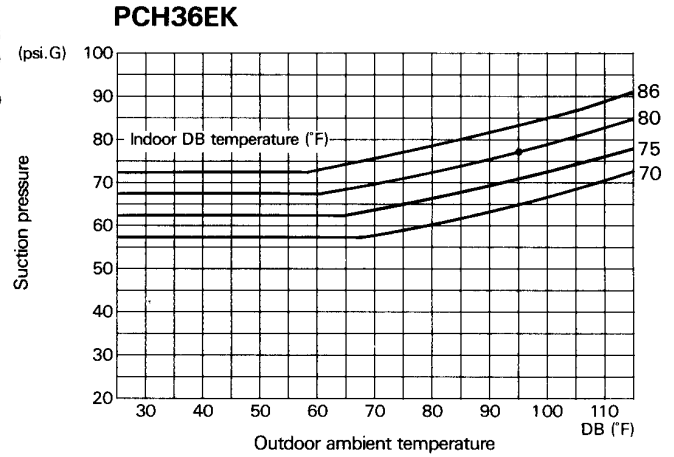
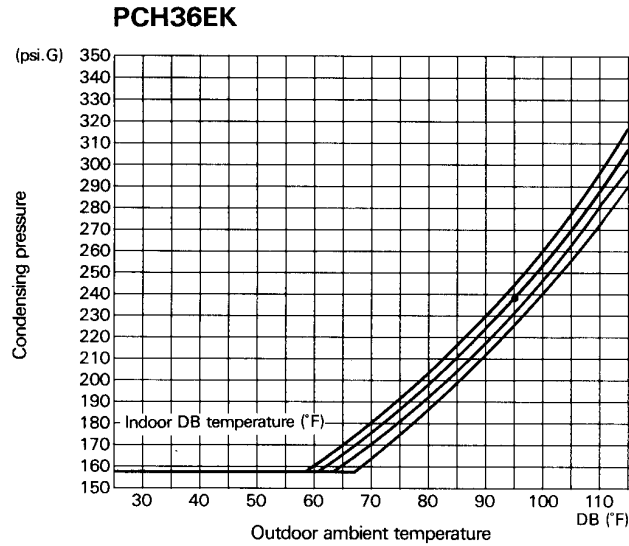


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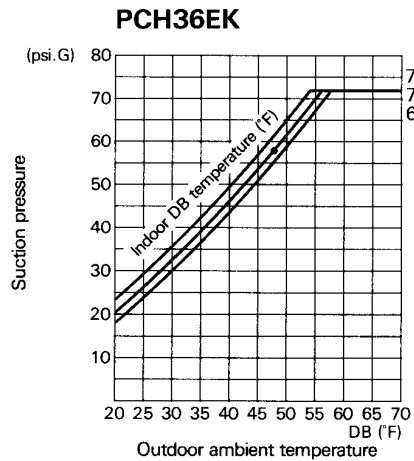
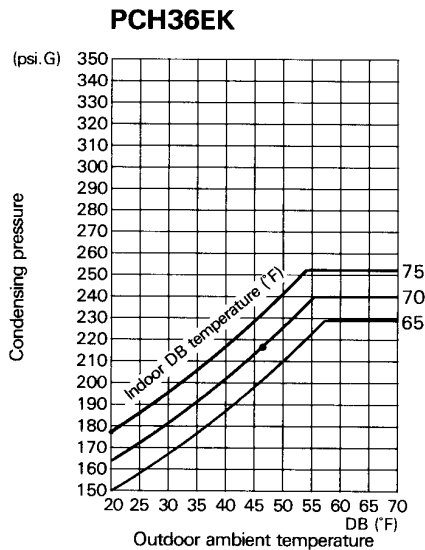
Data is based on the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.

<Cooling mode>



Data is based on the condition of outdoor humidity 75%.
 A point on the curve shows the reference point.

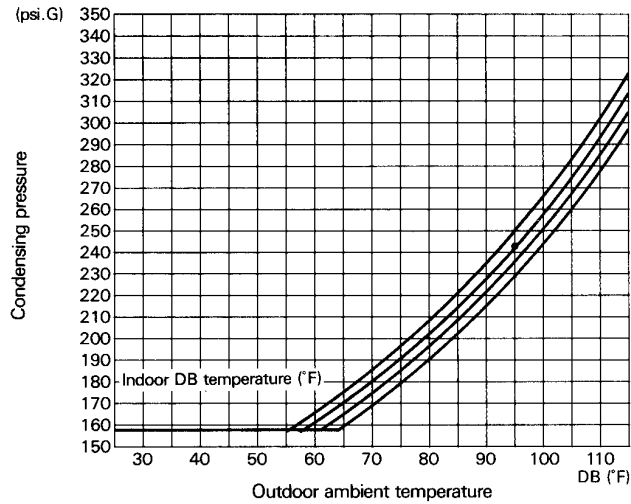
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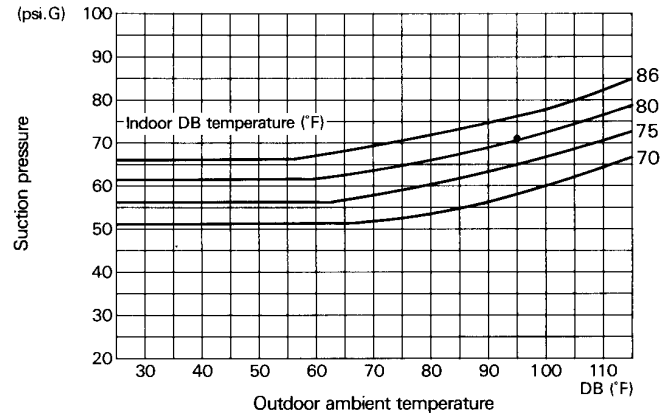
Data is based on the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.

<Cooling mode>

PCH42EK



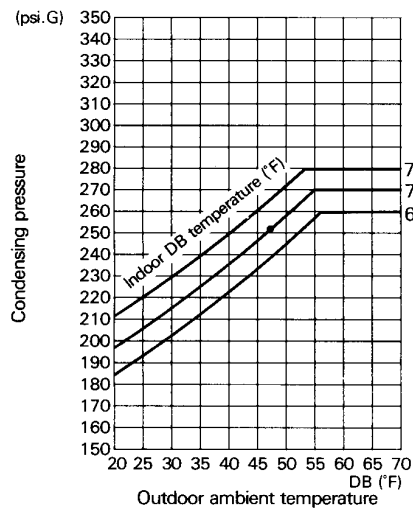
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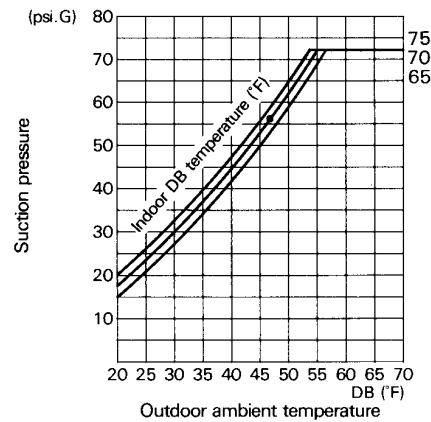
Data is based on the condition of outdoor humidity 75%.
 A point on the curve shows the reference point.

<Heating mode>

PCH42EK



PCH42EK



4. STANDARD OPERATION DATA

Models			PCH24EK		PCH30EK		PCH36EK		PCH42EK		
Item		Unit	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	
Electrical circuit	Voltage	V	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	
	Frequency	Hz	60		60		60		60		
	Total input	kW	2.46	2.42	3.06	3.13	3.53	3.4	4.37	4.3	
	Indoor fan current	A	0.7	0.7	0.7	0.7	1.3	1.3	1.3	1.3	
	Booster heater current	A	—	7.6/8.4	—	9.8/10.8	—	10.8/12.0	—	10.8/12.0	
	Outdoor fan current	A	0.65+0.65	0.65+0.65	0.75+0.75	0.75+0.75	0.75+0.75	0.75+0.75	0.8+0.8	0.8+0.8	
	Comp. current	A	11.3/10.4	10.9/10.2	14.0/13.3	14.3/13.5	16.1/14.3	14.7/14.0	21.0/19.1	19.5/18.7	
Refrigerant circuit	Condensing pressure		psi.G	245	236	232	243	235	216	240	252
	Suction pressure		psi.G	81	60	76	58	77	58	71	56
	Discharge temperature		°F	176	168	158	168	164	160	181	175
	Condensing temperature		°F	116	113	112	115	113	107	114	118
	Suction temperature		°F	58	35	48	35	48	34	51	33
	Comp.shell bottom temperature		°F	165	153	149	156	154	149	171	160
	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	70	80	70	80	70	80	70
		WB	°F	67	60	67	60	67	60	67	60
	Discharge air temperature	DB	°F	59	98	55	105	58	100	55	106
		WB	°F	57	—	54	—	57	—	54	—
	Fan speed		r.p.m.	1,485	1,470	1,485	1,470	1,505	1,480	1,505	1,480
	Airflow (High)		CFM	830	920	830	920	1,100	1,270	1,100	1,270
Outdoor side	Intake air temperature	DB	°F	95	47	95	47	95	47	95	47
		WB	°F	—	43	—	43	—	43	—	43
	Fan speed upper/lower		r.p.m.	750/750		760/760		760/760		840/840	
	Airflow		CFM	3,170		3,350		3,350		3,530	
Capacity		Btu/h	24,000	27,000	30,000	33,000	35,400	38,000	42,000	45,000	
SHF		—	0.73	—	0.68	—	0.73	—	0.67	—	

5. OPERATING RANGE

1) POWER SUPPLY

	Min.			Max.
1 Phase 60Hz 208/230V	198V	208V	230V	253V
Guaranteed voltage range	----- ----- ----- ----- -----			

2) OPERATION

Function	Air intake temperature Condition	Indoor		Outdoor	
		DB(°F)	WB(°F)	DB(°F)	WB(°F)
Cooling	Standard temperature	80	67	95	75
	Maximum temperature	95	71	115	—
	Minimum temperature	67	57	23	—
	Maximum humidity	80	75	80	75
Heating	Standard temperature	70	60	47	43
	Maximum temperature	80	67	75	65
	Minimum temperature	70	60	17	15

6. OUTLET AIR SPEED AND COVERAGE RANGE

Model	Airflow (CFM)	Air speed (ft/sec)	Coverage range (ft)
PCH24EK	920	15.0	38
PCH30EK	920	15.0	38
PCH36EK	1,270	16.5	48
PCH42EK	1,270	16.5	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 notch position. 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.

7. 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
PCH24EK	9 lbs 15 oz	0	0	0	0	0	0	2	4	7	9
PCH30EK	10 lbs 2 oz	0	0	0	0	0	0	5	10	16	20
PCH36EK	10 lbs 9 oz	0	0	0	0	0	0	5	10	16	20
PCH42EK	12 lbs 9 oz	0	0	0	0	0	0	5	10	16	20

MODELS: PKH18/24/30EK

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
PKH18EK	630 0.15	71	21.2	11.4	1.59	20.4	11.2	1.73	19.6	11.1	1.85	18.9	10.8	2.00	17.9	10.5	2.15
		67	19.6	13.3	1.54	19.1	13.0	1.67	18.0	12.6	1.81	17.5	12.4	1.95	16.7	12.1	2.10
		63	18.5	14.9	1.49	17.9	14.6	1.63	17.1	14.2	1.75	16.4	13.8	1.90	15.5	13.3	2.03
PKH24EK	630 0.11	71	28.2	13.5	2.04	27.0	13.1	2.18	25.8	12.8	2.38	24.4	12.4	2.55	23.2	12.2	2.75
		67	26.4	16.3	1.98	25.4	15.9	2.13	24.0	15.3	2.30	23.0	14.9	2.48	21.6	14.3	2.68
		63	24.6	18.4	1.90	23.6	17.9	2.08	22.6	17.4	2.23	21.4	16.7	2.40	20.2	16.1	2.60
PKH30EK	630 0.12	71	33.1	15.0	2.53	31.9	14.6	2.75	30.6	14.2	3.00	29.2	13.7	3.28	27.6	13.3	3.55
		67	31.0	18.3	2.48	29.8	17.7	2.70	28.5	17.2	2.97	27.4	16.7	3.20	25.8	16.0	3.47
		63	28.8	20.8	2.42	27.6	20.1	2.63	26.6	19.5	2.86	25.4	18.8	3.10	23.8	17.9	3.38

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 DB of indoor intake air temperature.

3. Cooling capacity correction factors and Refrigerant piping length (one way) range.

MODEL	Refrigerant piping length (one way)									
	25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PKH18EK	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PKH24EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PKH30EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874

2) HEATING CAPACITY

Models	Indoor air		Outdoor intake air WB temperature (°F)												Auxiliary heater (208V (230V))	
	Airflow (CFM)	IDB (°F)	15		25		35		45		55		65			
			CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC
PKH18EK	700	75	12.7	1.22	14.5	1.35	16.6	1.52	18.8	1.68	21.0	1.84	23.4	2.00	5.5	1.6
		70	12.9	1.18	14.8	1.30	16.9	1.45	19.1	1.62	21.4	1.78	23.8	1.95	-----	-----
		65	13.1	1.10	15.1	1.23	17.3	1.38	19.8	1.53	22.2	1.68	25.0	1.84	6.5	1.9
PKH24EK	700	75	17.3	2.23	19.4	2.32	22.1	2.45	25.4	2.60	29.3	2.80	33.7	3.00	5.5	1.6
		70	17.7	2.15	19.8	2.22	22.6	2.33	25.9	2.48	29.9	2.68	34.3	2.88	-----	-----
		65	18.0	2.04	20.0	2.10	23.0	2.20	26.2	2.37	30.2	2.55	34.7	2.78	6.5	1.9
PKH30EK	700	75	21.0	2.70	24.2	2.95	27.4	3.25	31.0	3.58	34.9	3.90	38.9	4.30	5.5	1.6
		70	21.8	2.60	24.6	2.80	28.2	3.08	32.1	3.38	35.7	3.70	40.1	4.08	-----	-----
		65	22.2	2.45	25.0	2.70	29.0	2.95	32.9	3.20	36.9	3.50	41.3	3.80	6.5	1.9

Notes 1. IDB: Intake air dry-bulb temperature

CA: Capacity ($\times 10^3$ Btu/h), PC: Power Consumption (kW)

2. When booster heater is "on", total capacity and total power consumption should be added the figures described in booster heater column.

● Booster heater ON : When the set temperature is higher than the room temperature by more than 5.4 deg.

● Booster heater OFF : When the set temperature is higher than the room temperature by less than 3.6 deg.

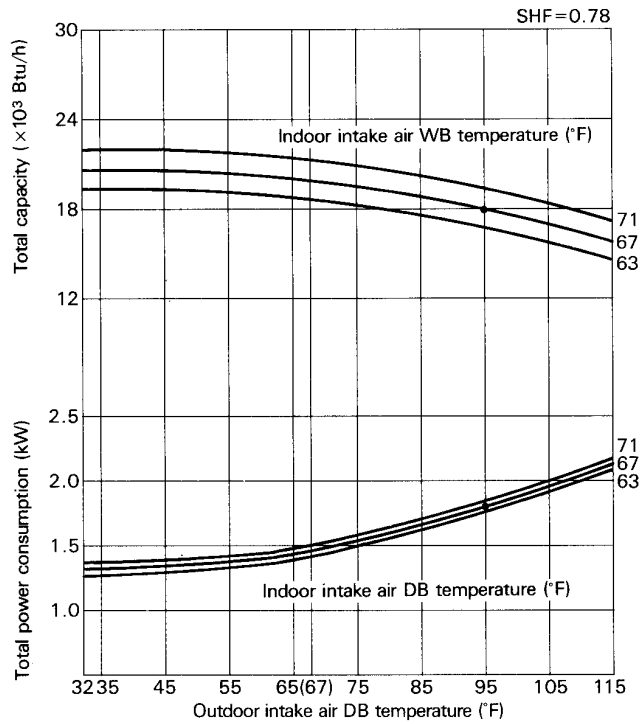
3. Heating capacity correction factors.

Models	Refrigerant piping length (one way)		
	Less than 100ft	100~130ft	130~164ft
PKH18EK	1.00	0.995	0.990
PKH24EK	1.00	0.995	0.990
PKH30EK	1.00	0.995	0.990

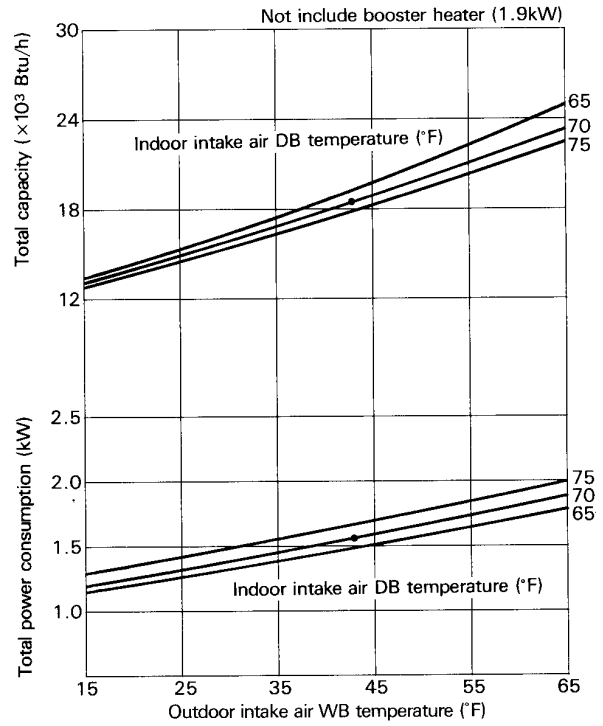
2. PERFORMANCE CURVE

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

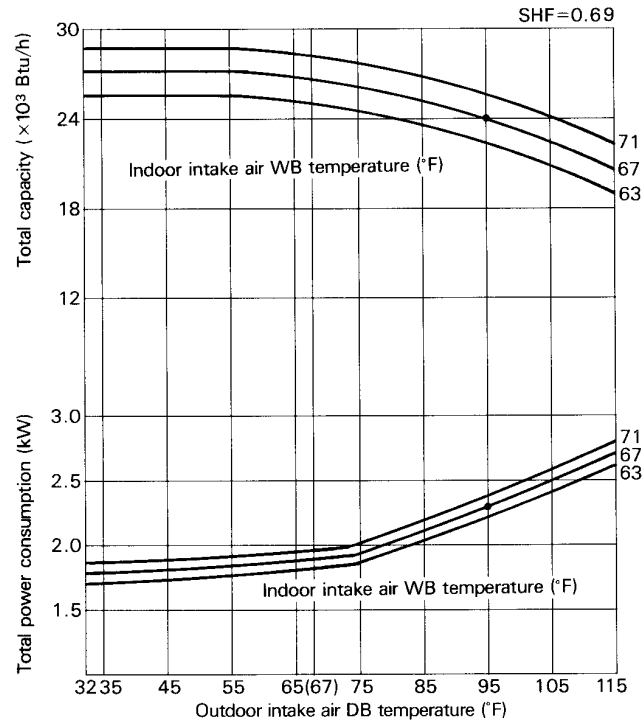
PKH18EK COOLING CAPACITY



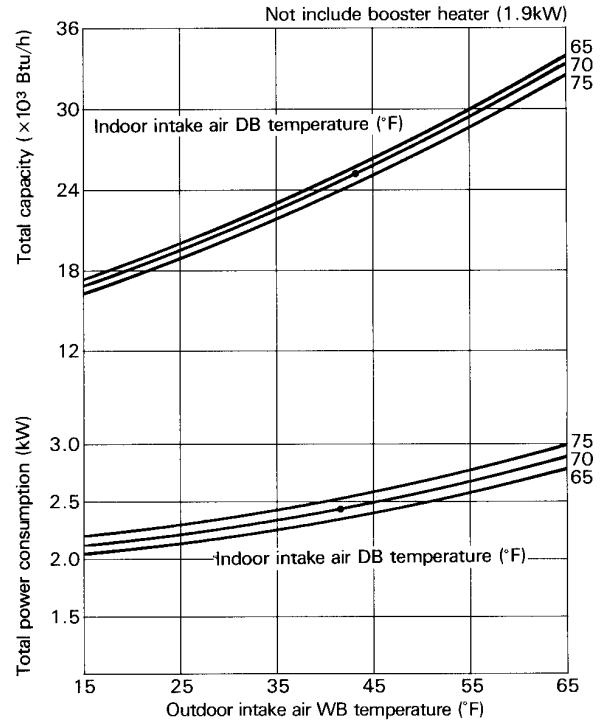
PKH18EK HEATING CAPACITY



PKH24EK COOLING CAPACITY

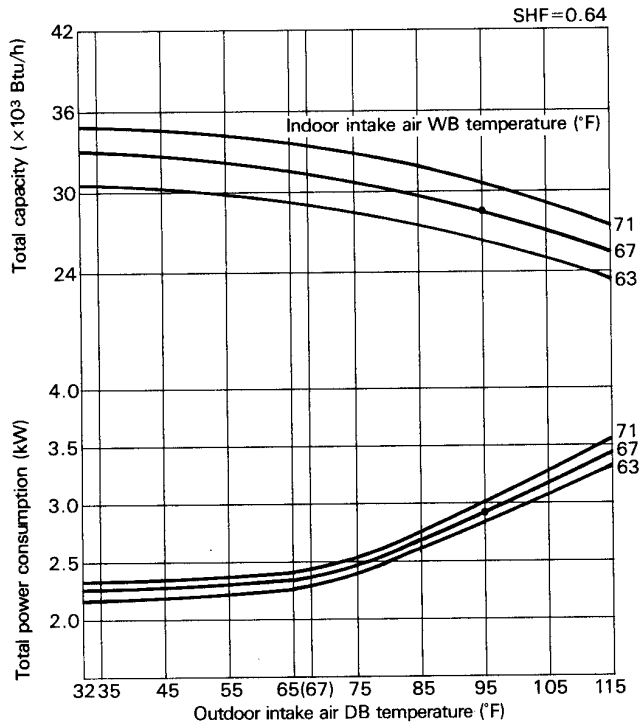


PKH24EK HEATING CAPACITY

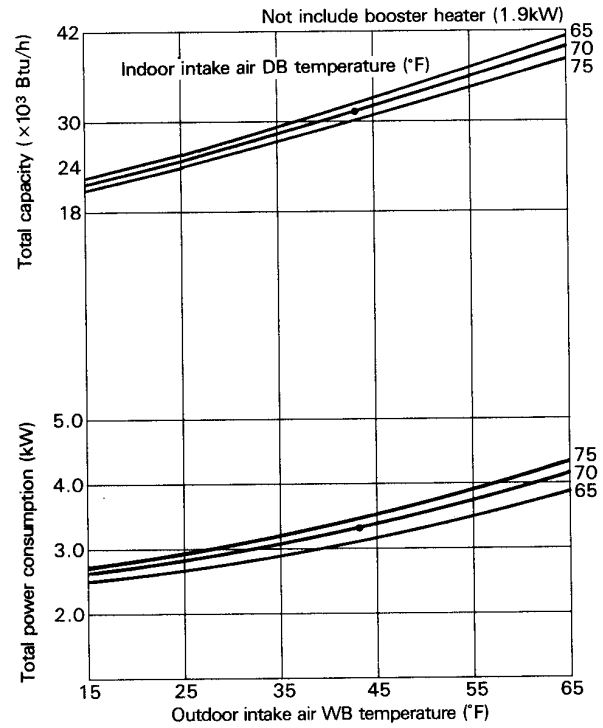


NOTE: A point on the curve shows the reference point.

PKH30EK COOLING CAPACITY



PKH30EK HEATING CAPACITY



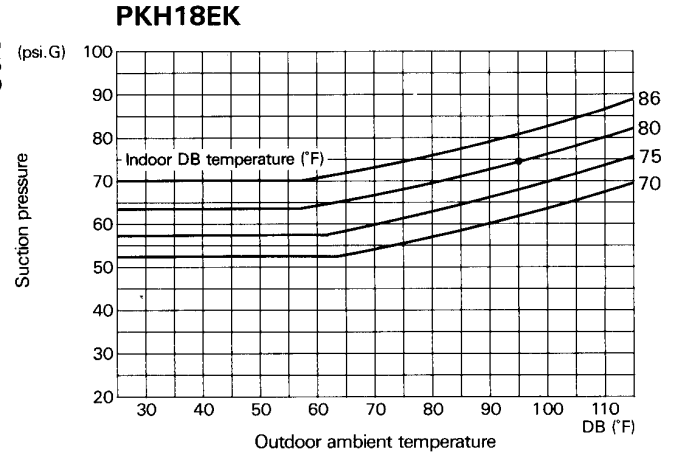
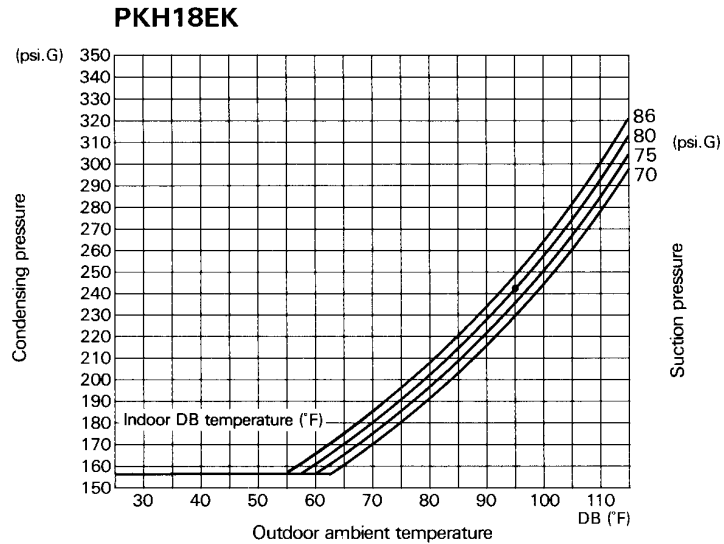
3. CONDENSING PRESSURE AND SUCTION PRESSURE

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.

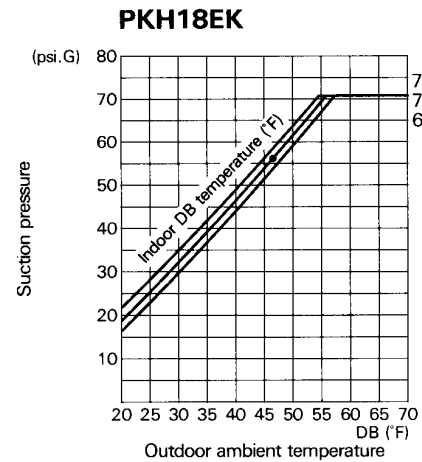
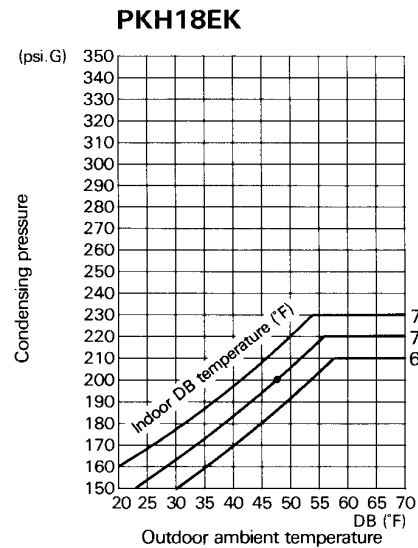
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Data is based on the condition of outdoor humidity 75%.

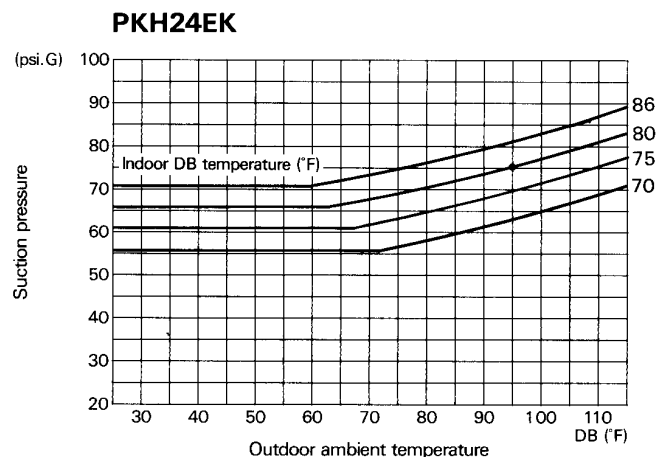
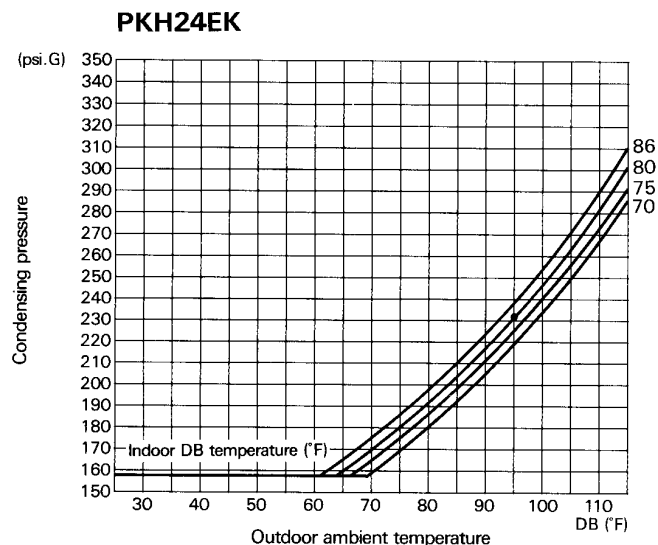
A point on the curve shows the reference point.

<Heating mode>



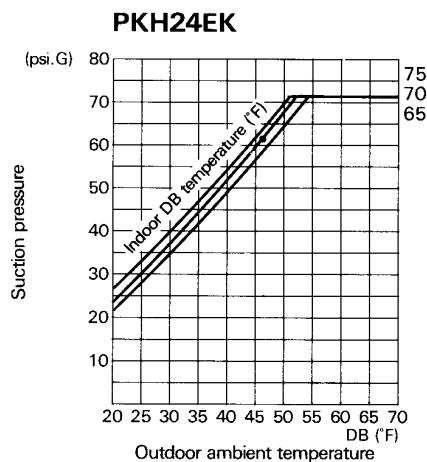
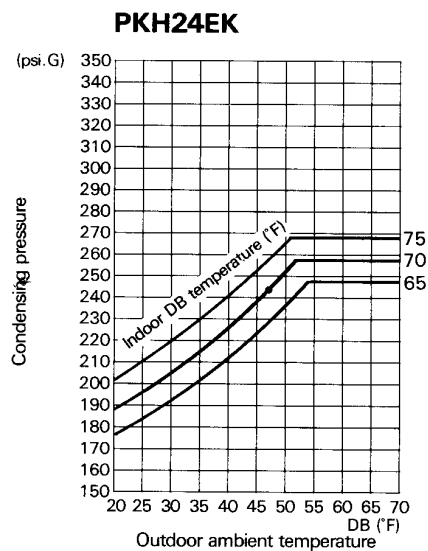
Data is based on the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.

<Cooling mode>



Data is based on the condition of outdoor humidity 75%.
 A point on the curve shows the reference point.

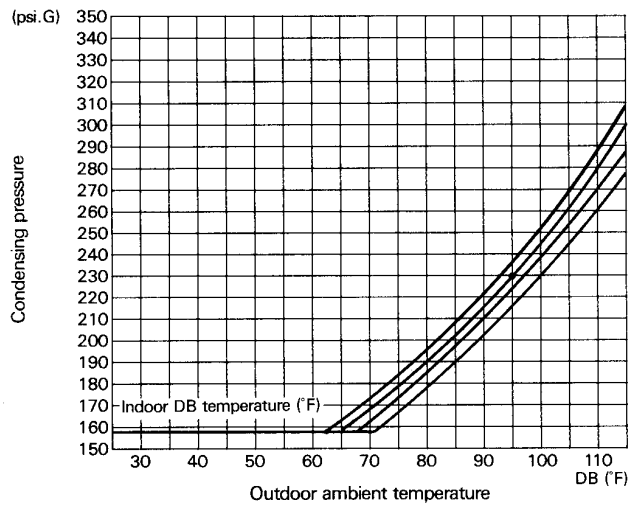
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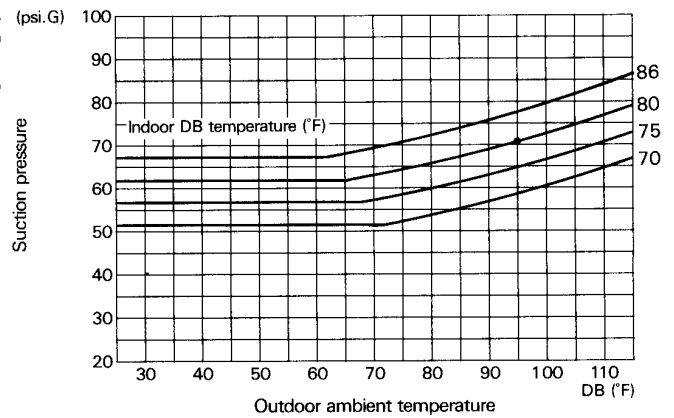
Data is based on the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.

<Cooling mode>

PKH30EK



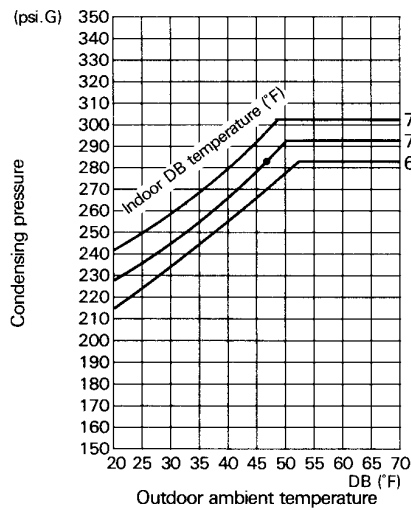
PKH30EK



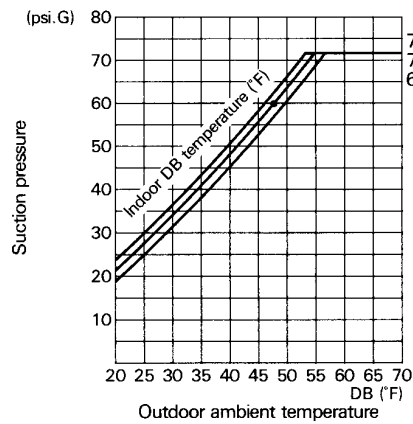
Data is based on the condition of outdoor humidity 75%.
 A point on the curve shows the reference point.

<Heating mode>

PKH30EK



PKH30EK



4. STANDARD OPERATION DATA

Models			PKH18EK		PKH24EK		PKH30EK		
Item		Unit	Cooling	Heating	Cooling	Heating	Cooling	Heating	
Electrical circuit	Voltage	V	208/230	208/230	208/230	208/230	208/230	208/230	
	Frequency	Hz	60		60		60		
	Total input	kW	1.81	1.58	2.30	2.40	2.97	3.29	
	Indoor fan current	A	0.5	0.5	0.5	0.5	0.5	0.5	
	Booster heater current	A	—	7.6/8.4	—	7.6/8.4	—	7.6/8.4	
	Outdoor fan current	A	0.75	0.75	0.65+0.65	0.65+0.65	0.75+0.75	0.75+0.75	
	Comp. current	A	7.9/7.5	6.9/6.7	10.5/9.8	10.8/10.4	13.9/13.2	15.5/14.7	
Refrigerant circuit	Condensing pressure	psi.G	242	203	232	242	230	283	
	Suction pressure	psi.G	75	58	76	61	71	60	
	Discharge temperature	°F	172	139	160	164	160	184	
	Condensing temperature	°F	115	103	112	115	111	126	
	Suction temperature	°F	47	34	48	36	44	36	
	Comp.shell bottom temperature	°F	165	132	154	155	149	169	
	Ref. pipe length	ft	25		25		25		
	Refrigerant charge	—	5 lbs 8 oz		9 lbs 15 oz		10 lbs 2 oz		
Indoor side	Intake air temperature	DB	°F	80	70	80	70	80	70
		WB	°F	67	60	67	60	67	60
	Discharge air temperature	DB	°F	60	94	56	109	52	119
		WB	°F	59	—	55	—	51	—
	Fan speed	r.p.m.	1,490		1,490		1,490		
	Airflow (High)	CFM	700		740		700		
Outdoor side	Intake air temperature	DB	°F	95	47	95	47	95	47
		WB	°F	—	43	—	43	—	43
	Fan speed upper/lower	r.p.m.	790		750/750		760/760		
	Airflow	CFM	1,590		3,170		3,350		
Capacity		Btu/h	18,000	18,600	24,000	25,000	28,500	31,000	
SHF		—	0.78	—	0.69	—	0.64	—	

5. OPERATING RANGE

1) POWER SUPPLY

	Min.			Max.
1 Phase 60Hz 208/230V	198V	208V	230V	253V
Guaranteed voltage range				

2) OPERATION

Function	Air intake temperature Condition	Indoor		Outdoor	
		DB(°F)	WB(°F)	DB(°F)	WB(°F)
Cooling	Standard temperature	80	67	95	75
	Maximum temperature	95	71	115	—
	Minimum temperature	67	57	23	—
	Maximum humidity	80	75	80	75
Heating	Standard temperature	70	60	47	43
	Maximum temperature	80	67	75	65
	Minimum temperature	70	60	17	15

6. OUTLET AIR SPEED AND COVERAGE RANGE

Model	Airflow (CFM)	Air speed (ft/sec)	Coverage range (ft)
PKH18EK	700	15.0	34
PKH24EK	700	15.0	34
PKH30EK	700	15.0	34

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 notch position. 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.

7. ADDITIONAL REFRIGERANT CHARGE (R-22(oz))

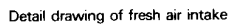
Model	Outdoor unit precharged (up to 100ft)	Refrigerant piping length (one way)									
		25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PKH18EK	5 lbs 8 oz	0	0	0	0	0	0	2	4	—	—
PKH24EK	9 lbs 15 oz	0	0	0	0	0	0	2	4	7	9
PKH30EK	10 lbs 2 oz	0	0	0	0	0	0	5	10	16	20

4

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.

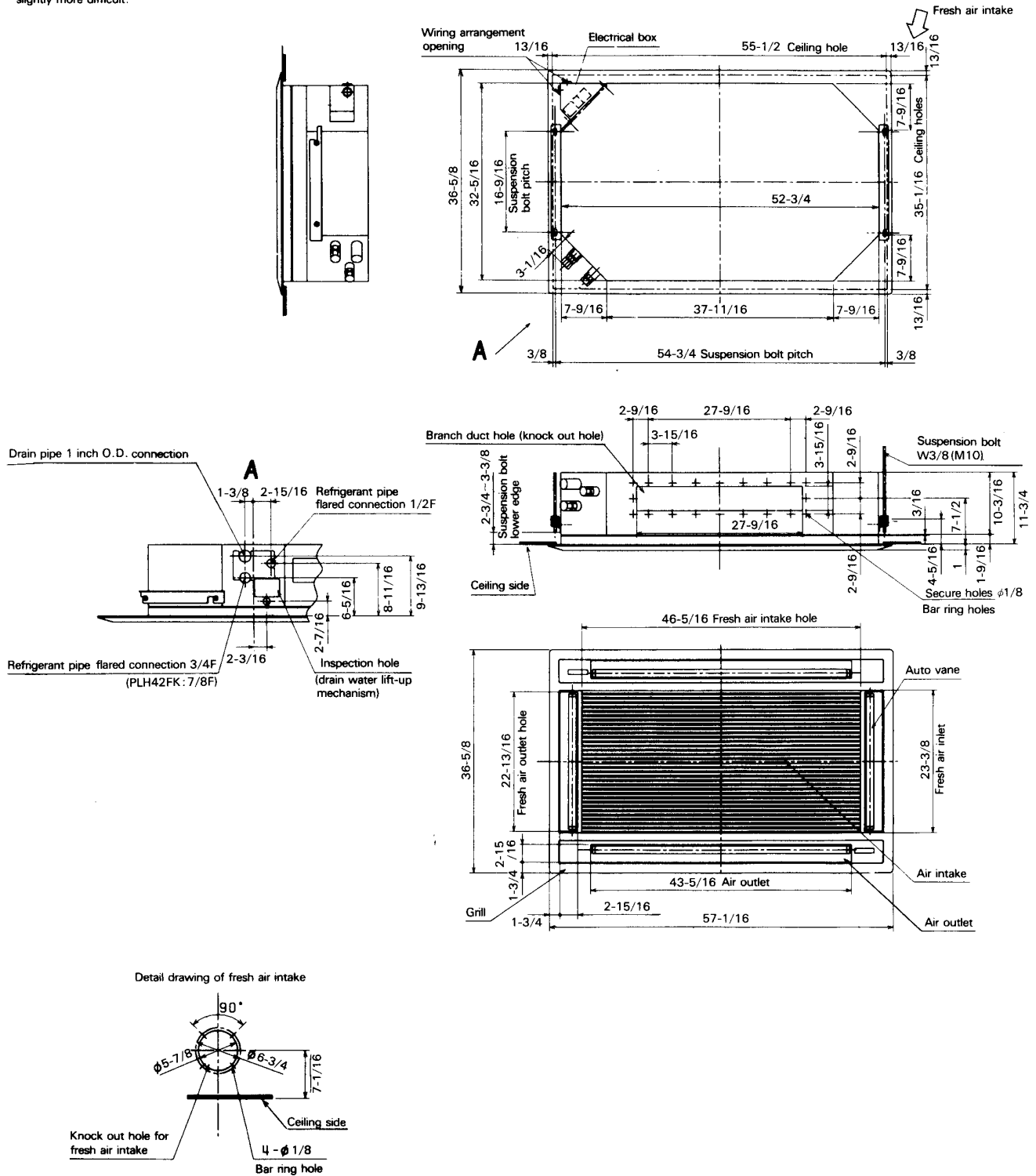


Indoor unit PLH30/36/42FK

Unit : inch

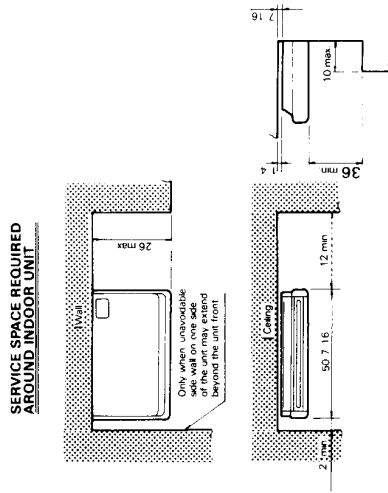
Note

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 * 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.

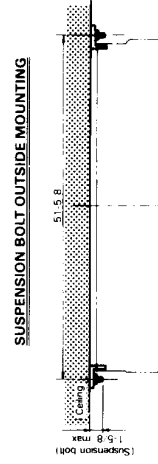
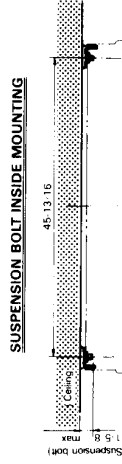


Indoor unit PCH24/30EK

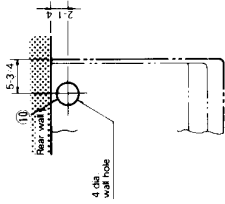
UNIT:inch



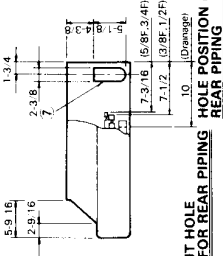
For workability and safety of suspension work, leave as much space as possible between one side of the unit and wall. Space required for bottom and right hand side for piping and wiring maintenance are shown above.



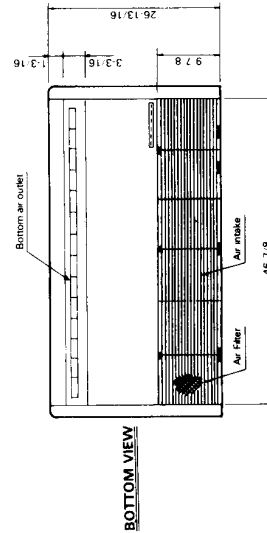
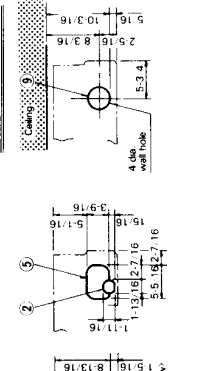
UPPER PIPING ARRANGEMENT POSITION



RIGHT SIDE VIEW



KNOCK OUT HOLE POSITION FOR REAR PIPING



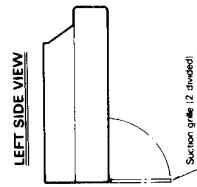
- 1 Drainage pipe connection (1 inch dia. I.D.)
- 2 Knock out hole for rear drainage piping arrangement
- 3 Refrigerant-pipe flared connection 5/8F (PCH24EK), 3/4F (PCH30EK)
- 4 Refrigerant-pipe flared connection 3/8F (PCH24EK), 1/2F (PCH30EK)
- 5 Knock out hole for rear refrigerant-piping arrangement
- 6 Knock out hole for upper refrigerant-piping arrangement
- 7 Knock out hole for right piping (refrigerant, drainage and wiring)
- 8 Wall hole for wiring arrangement
- 9 Wall hole for piping arrangement
- 10 Ceiling hole for power line
- 11 Terminal bed for indoor and outdoor units connection
- 12 Terminal bed for remote controller
- 13 Knock out hole for fresh air intake

- NOTES:
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.

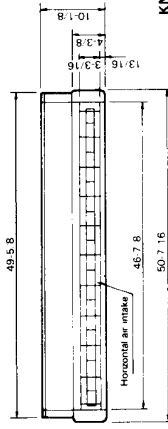
TOP VIEW

Unit:inch

LEFT SIDE VIEW



FRONT VIEW



- _____

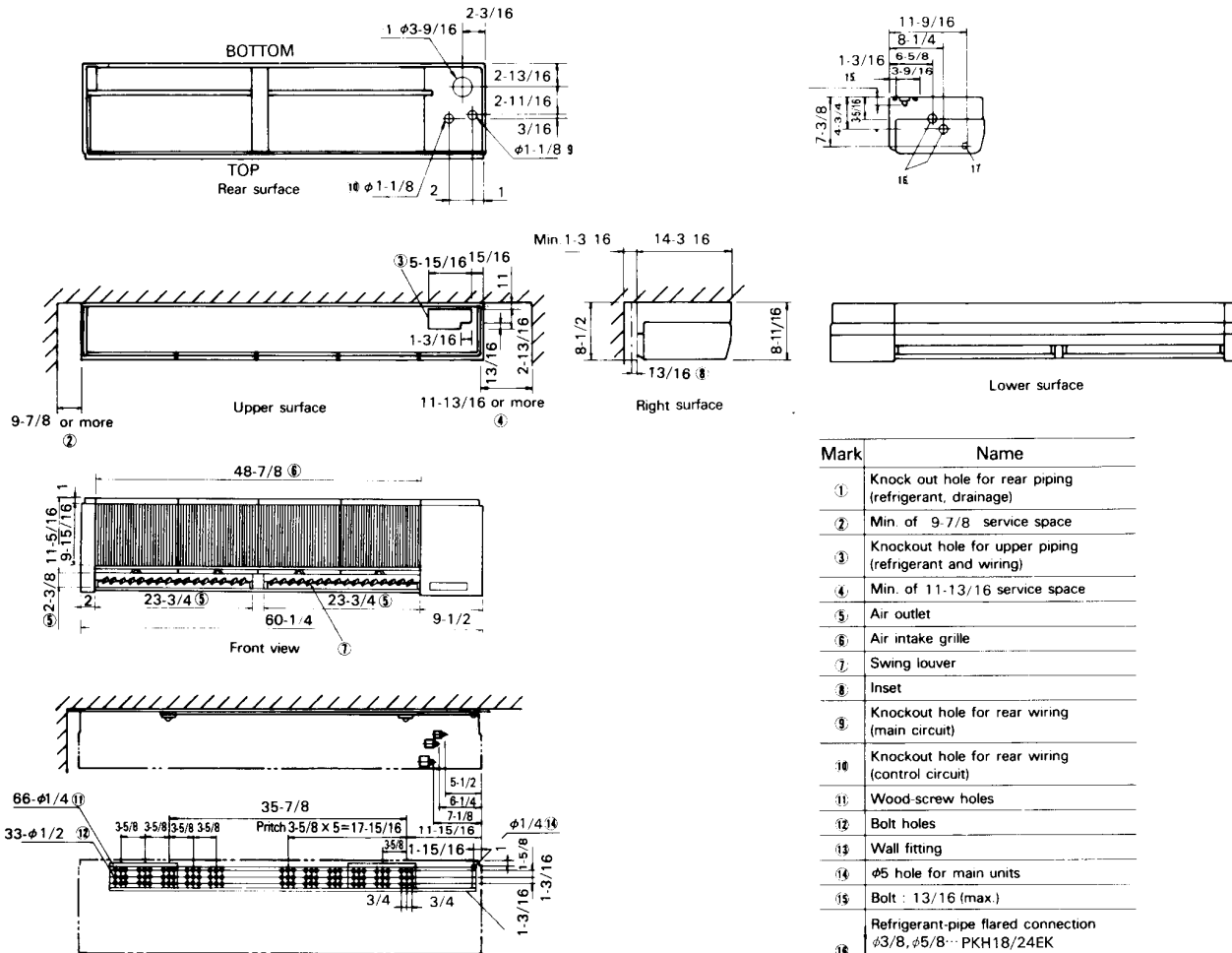




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Indoor unit PKH18/24/30EK

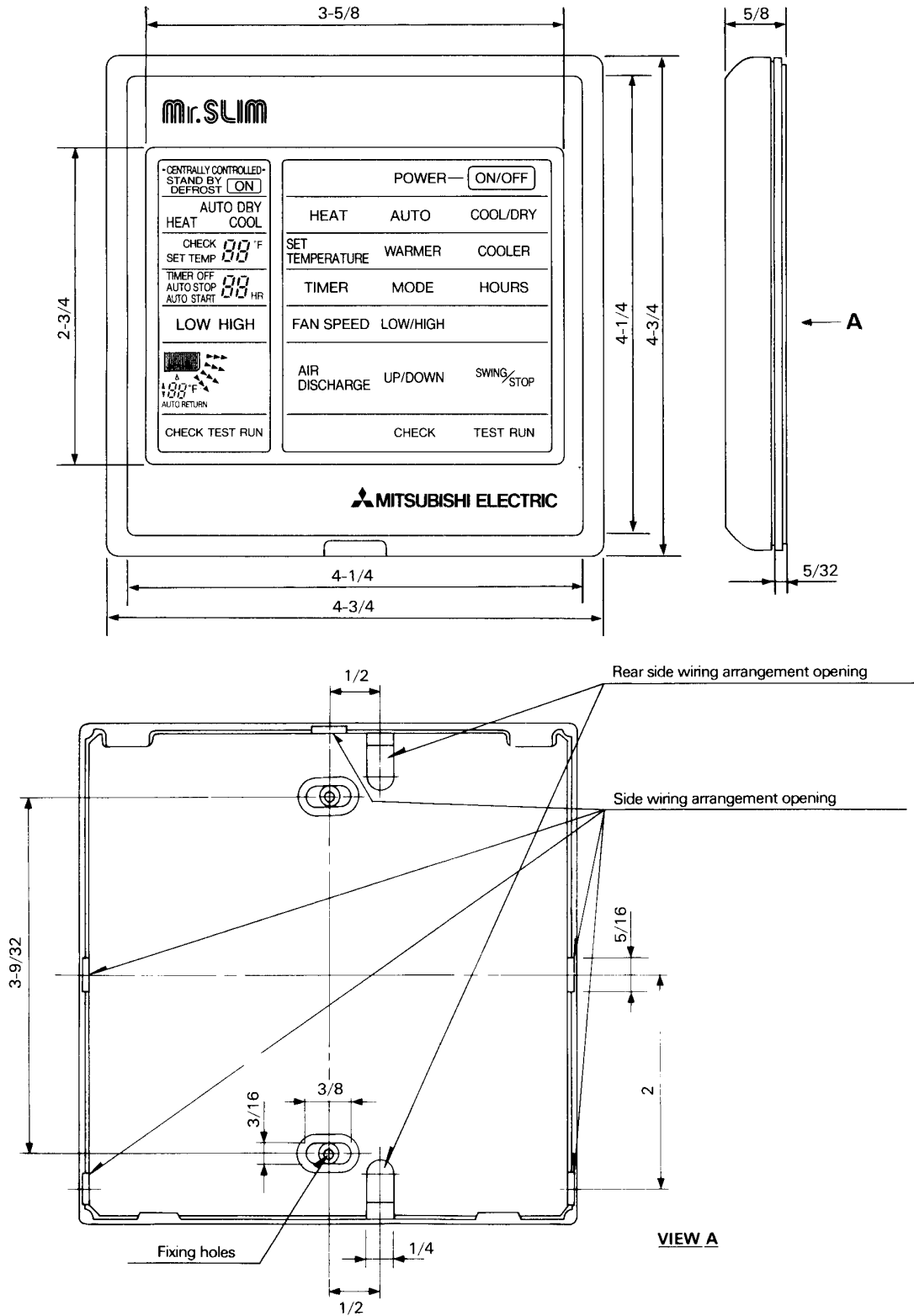
Unit: inch



Mark	Name
①	Knock out hole for rear piping (refrigerant, drainage)
②	Min. of 9-7/8 service space
③	Knockout hole for upper piping (refrigerant and wiring)
④	Min. of 11-13/16 service space
⑤	Air outlet
⑥	Air intake grille
⑦	Swing louver
⑧	Inset
⑨	Knockout hole for rear wiring (main circuit)
⑩	Knockout hole for rear wiring (control circuit)
⑪	Wood-screw holes
⑫	Bolt holes
⑬	Wall fitting
⑭	φ5 hole for main units
⑮	Bolt : 13/16 (max.)
⑯	Refrigerant-pipe flared connection φ3/8, φ5/8... PKH18/24EK φ1/2, φ3/4... PKH30EK
⑰	Drainage connection φ1

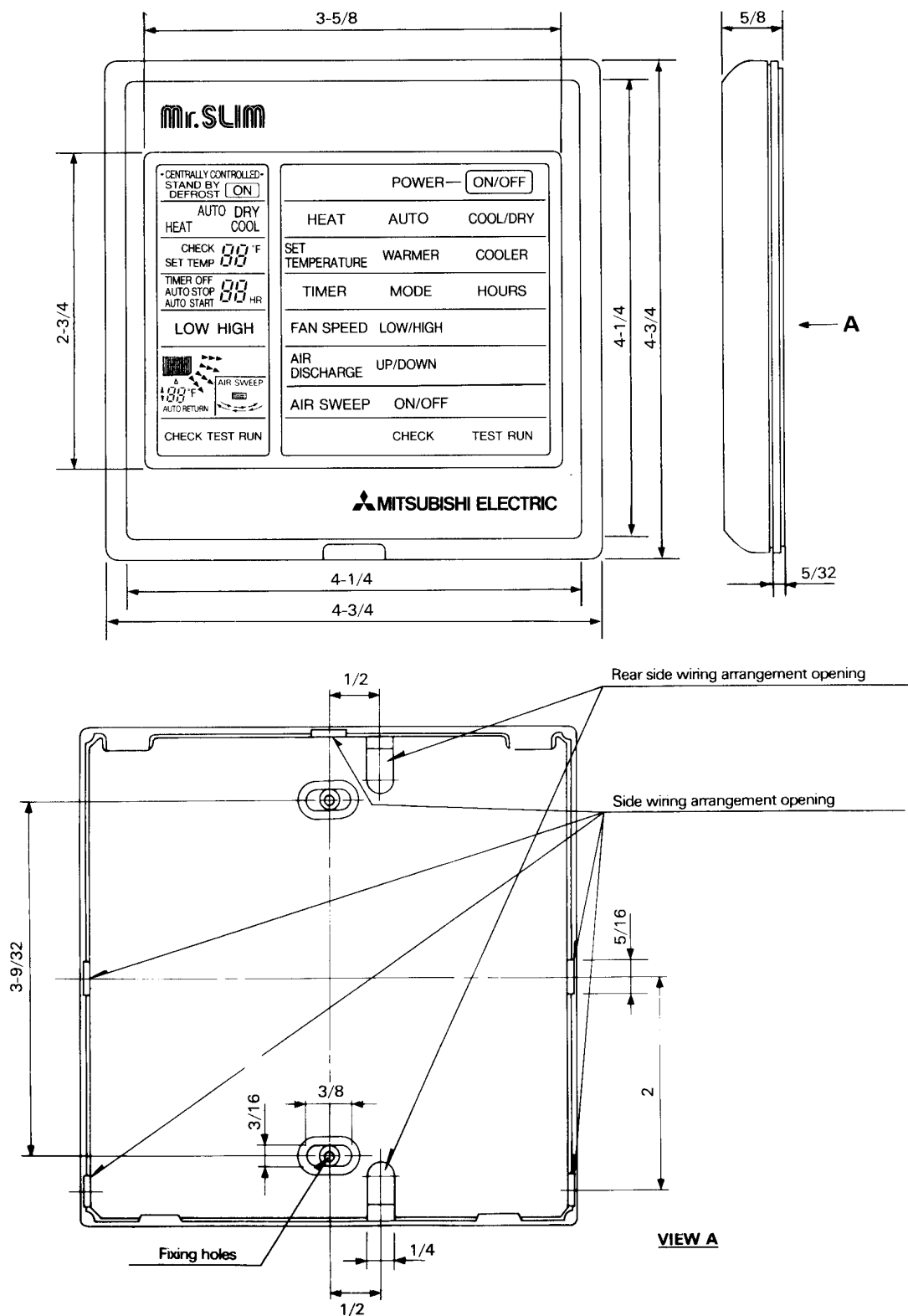
4.2 Remote controller (PLH series)

Unit : inch



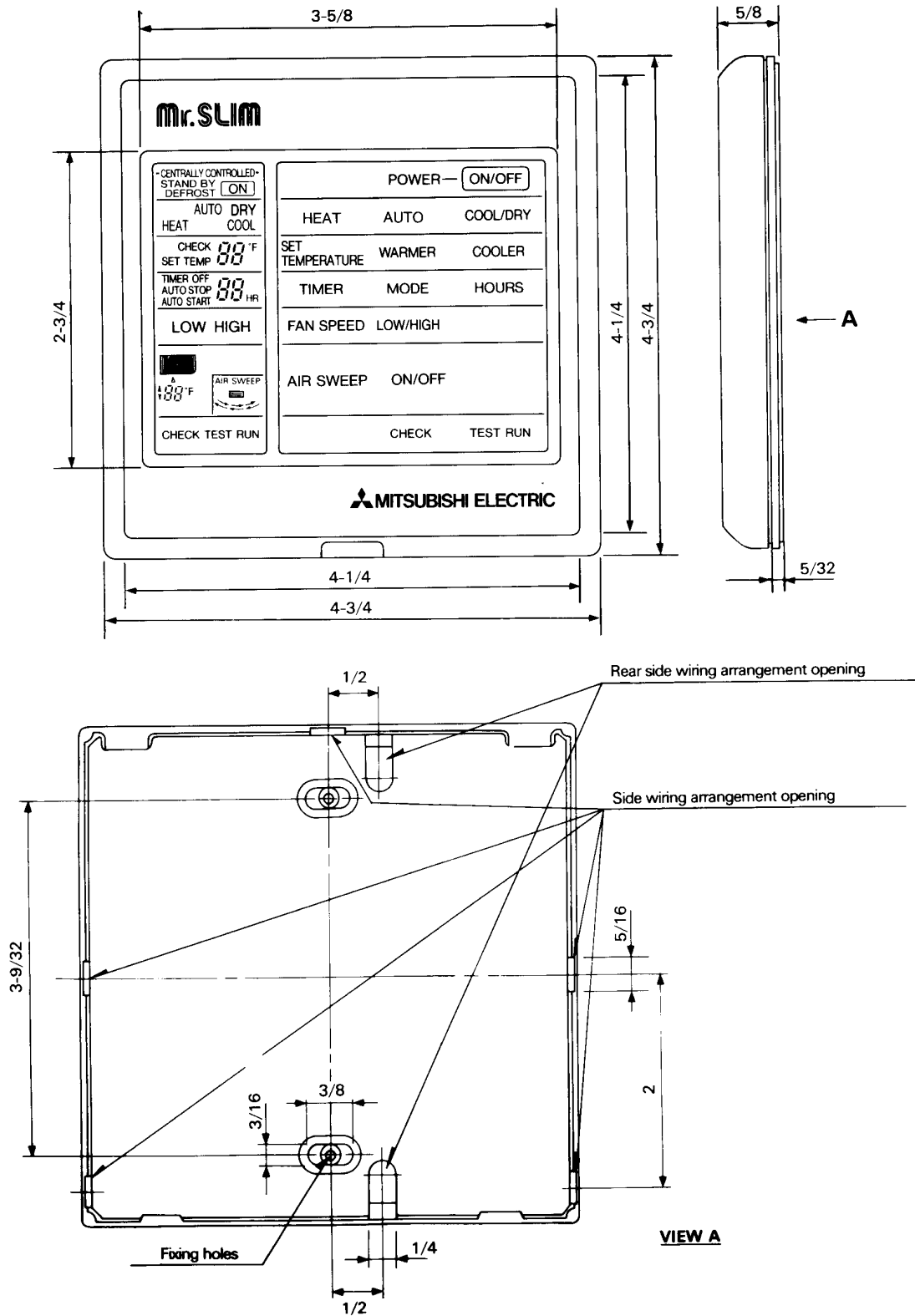
Remote controller (PCH series)

Unit : inch



Remote controller (PKH series)

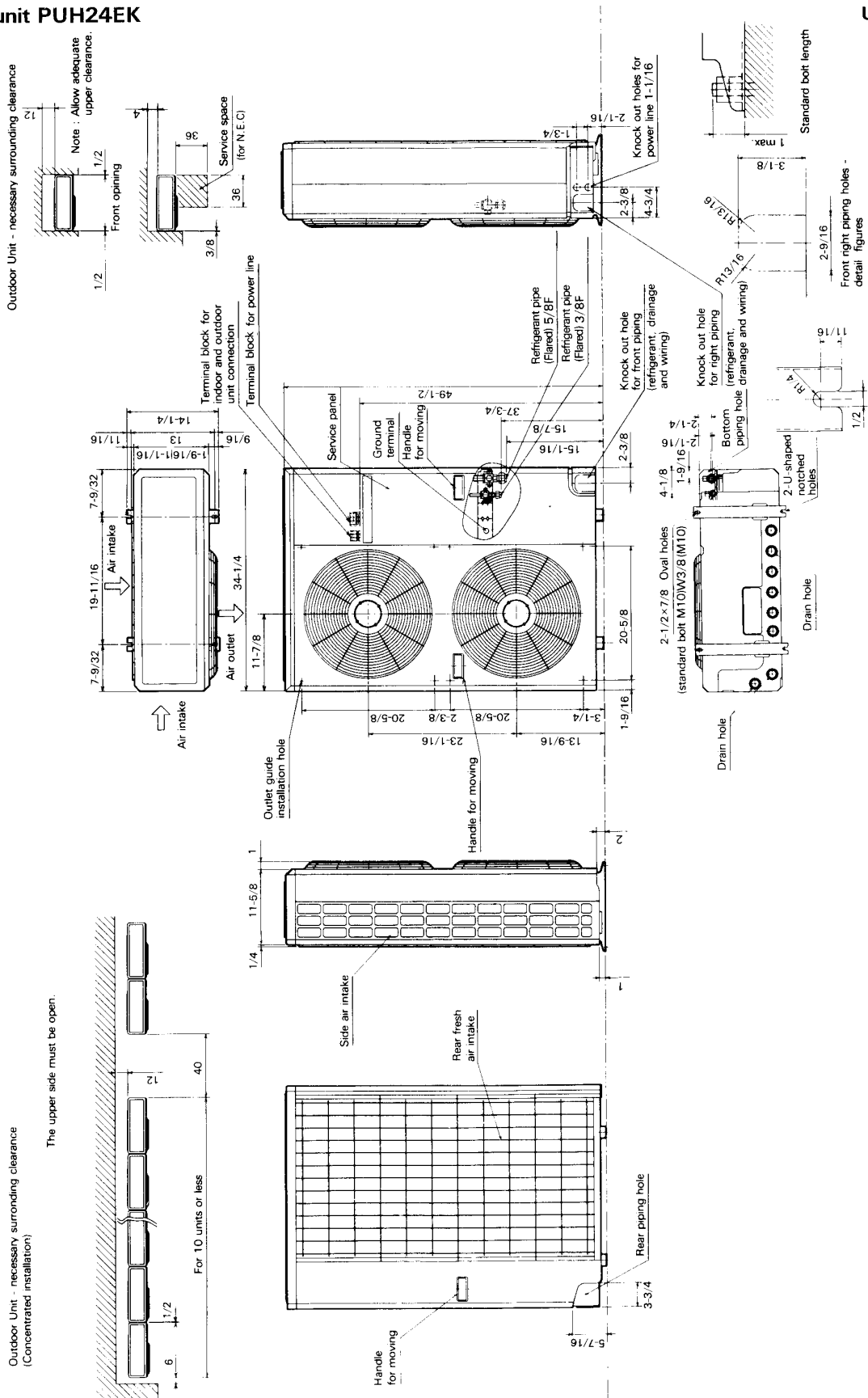
Unit : inch





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Unit : inch

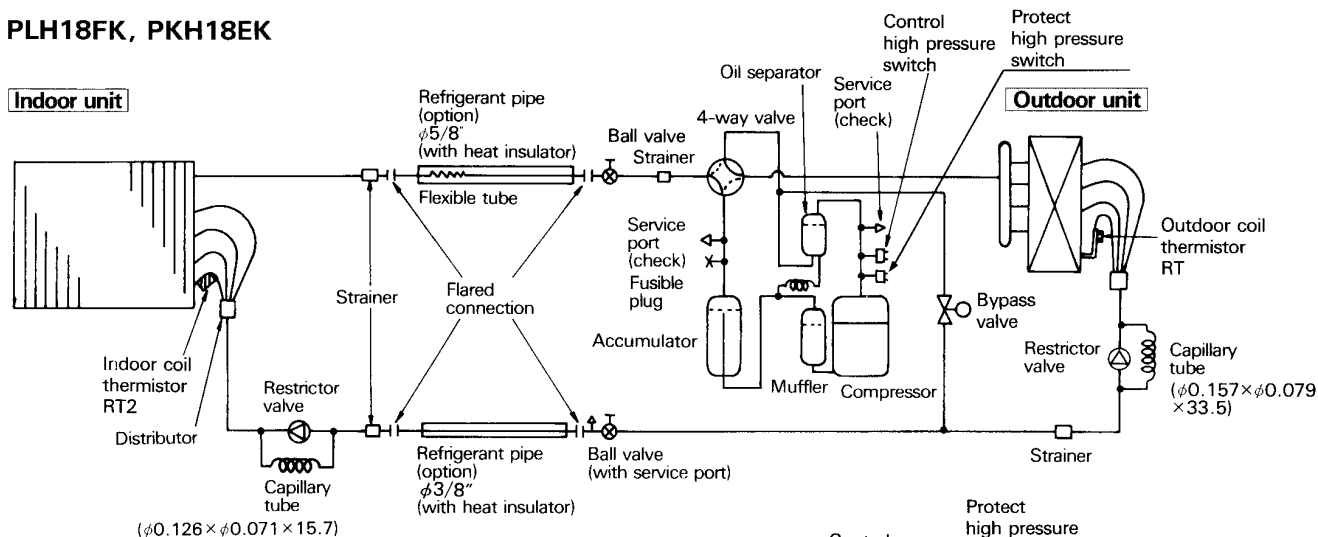




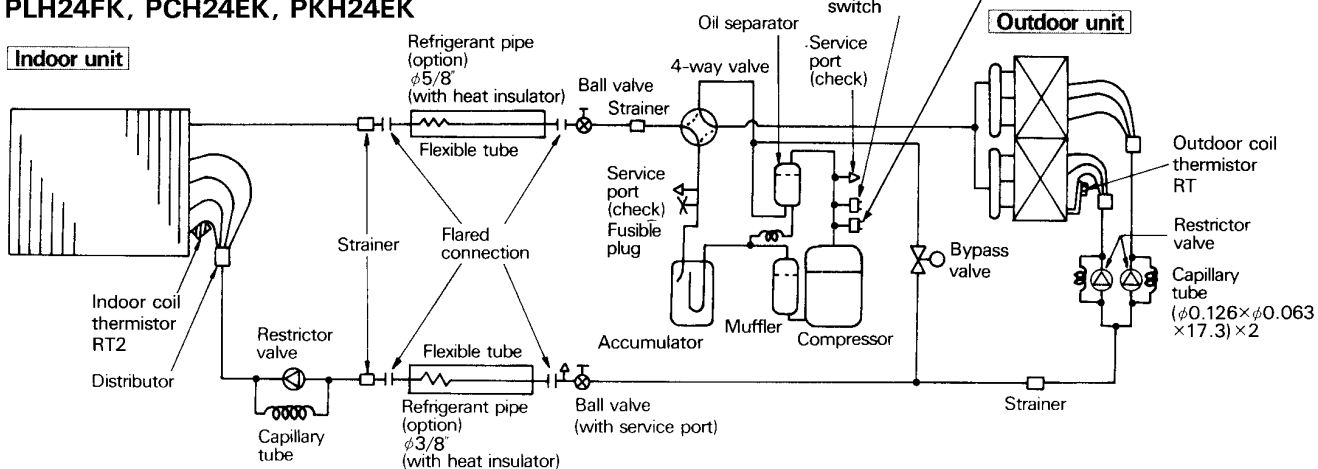
5

REFRIGERANT SYSTEM DIAGRAM

PLH18FK, PKH18EK

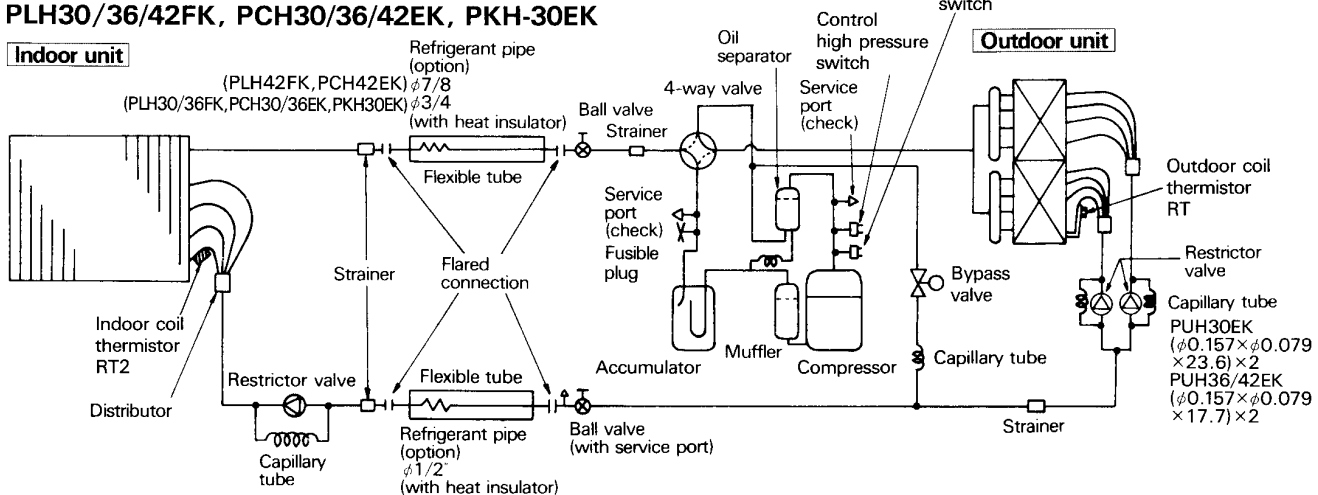


PLH24FK, PCH24EK, PKH24EK



PLH24FK, PCH24EK ($\phi 0.126 \times \phi 0.071 \times 15.7$)
 PKH24EK ($\phi 0.126 \times \phi 0.071 \times 9.8$)

PLH30/36/42FK, PCH30/36/42EK, PKH-30EK



PLH30FK ($\phi 0.157 \times \phi 0.079 \times 10.6$)
 PLH36FK, PCH36EK ($\phi 0.157 \times \phi 0.094 \times 21.7$)
 PLH42FK ($\phi 0.157 \times \phi 0.079 \times 8.7$)
 PCH30EK ($\phi 0.157 \times \phi 0.079 \times 15.7$)
 PCH42EK ($\phi 0.157 \times \phi 0.094 \times 25.6$)
 PKH30EK ($\phi 0.157 \times \phi 0.079 \times 11.4$)

* Capillary tube size: (OD $\times$ ID $\times$ Length)
 The symbol ϕ indicates diameter.

6

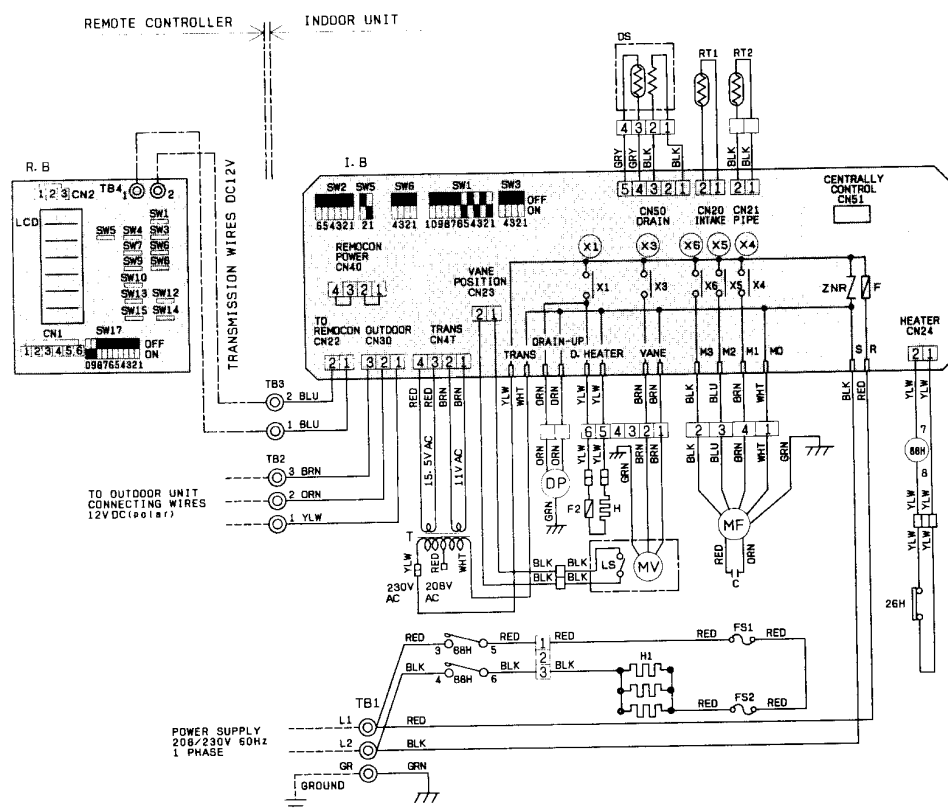
WIRING DIAGRAM

MODELS PLH18/24FK WIRING DIAGRAM

C 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 <0.3A>
 FS1 THERMAL FUSE <180°F, 10A>
 FS2 THERMAL FUSE <180°F, 10A>
 H DEW PREVENTION HEATER
 H1 BOOSTER HEATER
 I.B INDOOR CONTROLLER BOARD
 LCD LIQUID CRYSTAL DISPLAY
 LS LIMIT SWITCH
 MF FAN MOTOR <INNER THERMOSTAT>
 MV VANE MOTOR
 R.B REMOTE CONTROLLER BOARD

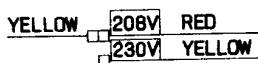
RT1 ROOM TEMPERATURE THERMISTOR
 <32°F/15kΩ, 77°F/5.4kΩ>
 RT2 INDOOR COIL THERMISTOR
 <32°F/15kΩ, 77°F/5.4kΩ>
 SW1 <I.B> MODE SELECTOR
 SW2 <I.B> ADDRESS SELECTOR
 SW3 <I.B> EMERGENCY SWITCH
 SW5 <I.B> MODEL SELECTOR
 SW6 <I.B> MODEL SELECTOR
 SW1 <R.B> ON/OFF SWITCH
 SW3 <R.B> COOLING/DRY OPERATION MODE SWITCH
 SW4 <R.B> AUTOMATIC OPERATION MODE SWITCH
 SW5 <R.B> HEATING OPERATION 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 SWITCH
 SW13 <R.B> AIR FLOW UP/DOWN DIRECTION
 SELECTOR SWITCH
 SW14 <R.B> TEST RUN SWITCH
 SW15 <R.B> INSPECTION SWITCH
 SW17 <R.B> ADDRESS SELECTOR
 T TRANSFORMER
 TB1~4 TERMINAL BLOCK
 X1 <I.B> DRAIN PUMP
 DEW PREVENTION HEATER RELAY
 X3 <I.B> VANE RELAY
 X4 <I.B> FAN RELAY
 X5 <I.B> FAN RELAY
 X6 <I.B> FAN RELAY
 ZNR VARISTOR
 26H HEATER THERMAL SWITCH
 88H HEATER CONTACTOR



NOTES :

- The indoor transformer (T) is connected with 230V power. If 208V power is used change the wiring connection in the following procedure.
 Indoor side transformer (T) for 208V



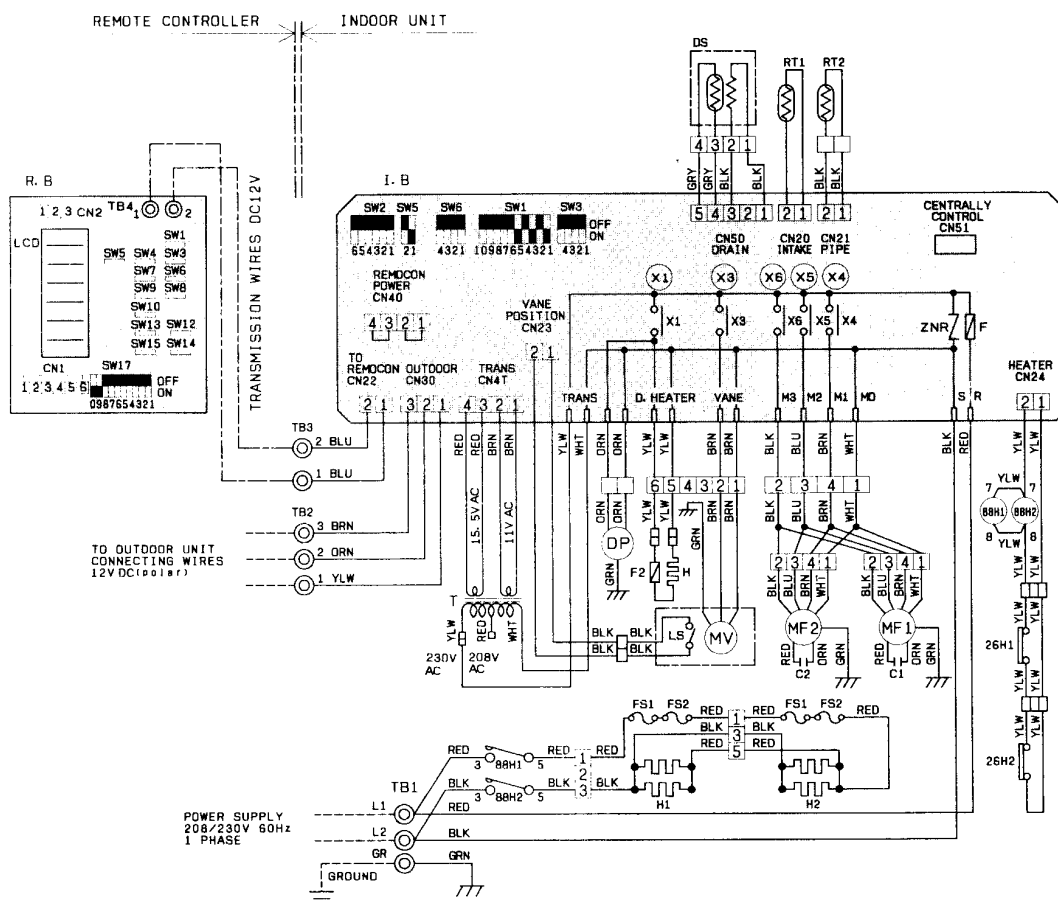
- Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
- Indoor and outdoor connecting wires are made with polarities make wiring to matching terminal.
- Symbols used in wiring diagram above are ○ : Terminal block, □ : connector, □ : PC board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

MODELS PLH30/36/42FK 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
 F <I.B> FUSE <6A>
 F2 FUSE <0.4A>
 FS1 THERMAL FUSE <192°F, 15A>
 FS2 THERMAL FUSE <192°F, 15A>
 H DEW PREVENTION HEATER
 H1,2 BOOSTER HEATER
 I.B INDOOR CONTROLLER BOARD
 LCD LIQUID CRYSTAL DISPLAY
 LS LIMIT SWITCH
 MF1,2 FAN MOTOR <INNER THERMOSTAT>
 MV VANE MOTOR
 R.B REMOTE CONTROLLER BOARD

RT1 ROOM TEMPERATURE THERMISTOR
 <32°F/15kΩ, 77°F/5.4kΩ>
 RT2 INDOOR COIL THERMISTOR
 <32°F/15kΩ, 77°F/5.4kΩ>
 SW1 <I.B> MODE SELECTOR
 SW2 <I.B> ADDRESS SELECTOR
 SW3 <I.B> EMERGENCY OPERATION SWITCH
 SW5 <I.B> MODEL SELECTOR
 SW6 <I.B> MODEL SELECTOR
 SW1 <R.B> ON/OFF SWITCH
 SW3 <R.B> COOLING/DRY OPERATION MODE SWITCH
 SW4 <R.B> AUTOMATIC OPERATION MODE SWITCH
 SW5 <R.B> HEATING OPERATION 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

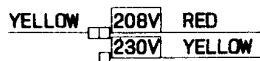
SW12 <R.B> LOUVER SWING/STOP SELECTOR
 SW13 <R.B> AIR FLOW UP/DOWN DIRECTION SELECTOR
 SW14 <R.B> TEST RUN SWITCH
 SW15 <R.B> INSPECTION SWITCH
 SW17 <R.B> ADDRESS SELECTOR
 T TRANSFORMER
 TB1~4 TERMINAL BLOCK
 X1 <I.B> DRAIN PUMP
 X3 <I.B> VANE RELAY
 X4 <I.B> FAN RELAY
 X5 <I.B> FAN RELAY
 X6 <I.B> FAN RELAY
 ZNR VARISTOR
 26H1,2 HEATER THERMAL SWITCH
 88H1,2 HEATER CONTACTOR



NOTES :

1. The indoor transformer (T) is connected with 230V power. If 208V power is used change the wiring connection in the following procedure.

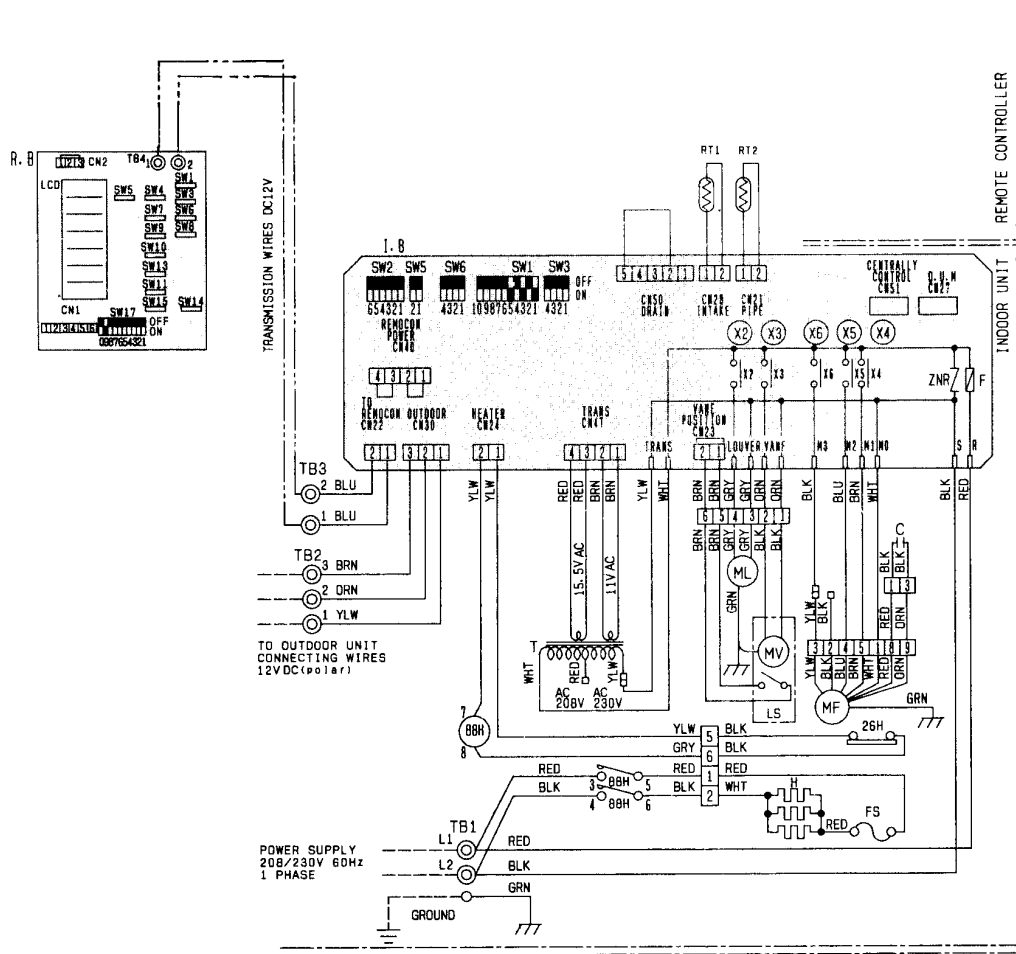
Indoor side transformer (T) for 208V



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

MODELS PCH24EK WIRING DIAGRAM

C	FAN CAPACITOR	RT1	ROOM TEMPERATURE THERMISTOR	SW9 <R.B>	TIMER, CONTINUOUS AND ON/OFF SWITCH
CN1 <R.B>	PROGRAM TIMER CONNECTOR	RT2	INDOOR COIL THERMISTOR	SW10 <R.B>	FAN SPEED HIGH/LOW SELECTOR
CN2 <R.B>	REMOTE SWITCH CONNECTOR			SW11 <R.B>	LOUVER ON/OFF SWITCH
CN27 <I.B>	DRAIN PUMP CONNECTOR	SW1 <I.B>	MODE SELECTOR	SW14 <R.B>	TEST RUN SWITCH
CN51 <I.B>	CENTRALLY CONTROL CONNECTOR	SW2 <I.B>	ADDRESS SELECTOR	SW15 <R.B>	INSPECTION SWITCH
F <I.B>	FUSE <6A>	SW3 <I.B>	EMERGENCY OPERATION SWITCH	SW17 <R.B>	ADDRESS SELECTOR
FS	THERMAL FUSE <196°F 15A>	SW5 <I.B>	MODE SELECTOR	T	TRANSFORMER
H	BOOSTER HEATER	SW6 <I.B>	MODEL SELECTOR	TB1~4	TERMINAL BLOCK
I.B	INDOOR CONTROLLER BOARD	SW1 <R.B>	ON/OFF SWITCH	X2 <I.B>	LOUVER RELAY
LCD	LIQUID CRYSTAL DISPLAY	SW3 <R.B>	COOLING/DRY OPERATION MODE SWITCH	X3 <I.B>	VANE RELAY
LS	LIMIT SWITCH	SW4 <R.B>	FAN OPERATION MODE SWITCH	X4 <I.B>	FAN RELAY
MF	FAN MOTOR <INNER THERMOSTAT>	SW5 <R.B>	HEATING OPERATION MODE SWITCH	X5 <I.B>	FAN RELAY
ML	LOUVER MOTOR	SW6 <R.B>	SET TEMPERATURE UP SWITCH	X6 <I.B>	FAN RELAY
MV	VANE MOTOR	SW7 <R.B>	SET TEMPERATURE DOWN SWITCH	ZNR	VARIATOR
R.B	REMOTE CONTROLLER BOARD	SW8 <R.B>	TIMER TIME SWITCH	26H	HEATER THERMAL SWITCH
				88H	HEATER CONTACTOR



NOTES :

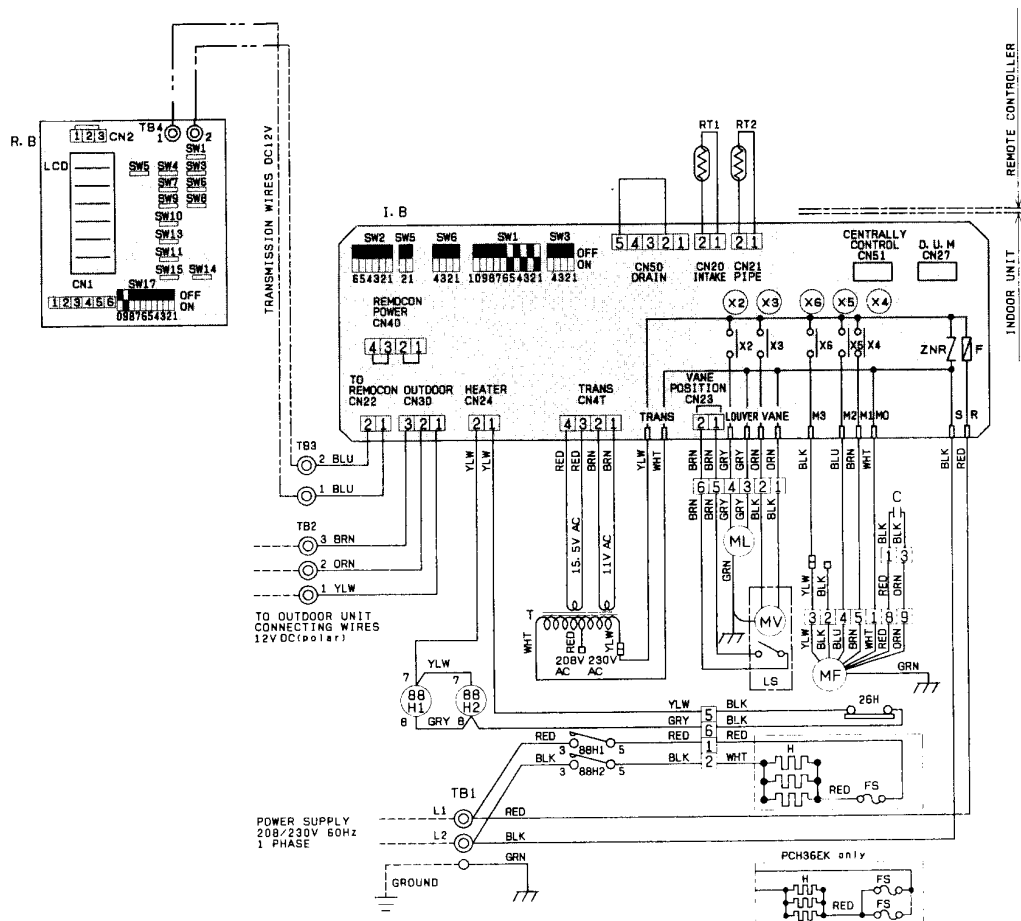
1. The indoor transformer (T) is connected with 230V power. If 208V power is used change the wiring connection in the following procedure.

Indoor side transformer (T) for 208V	YELLOW	208V	RED
		230V	YELLOW
Indoor fan (MF) for 208V	BLACK	208V	BLACK
		230V	YELLOW

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

MODELS PCH30/36/42EK WIRING DIAGRAM

C	FAN CAPACITOR	RT1	ROOM TEMPERATURE THERMISTOR	SW10 <R.B>	FAN SPEED HIGH/LOW SELECTOR SWITCH
CN1 <R.B>	PROGRAM TIMER CONNECTOR	RT2	INDOOR COIL THERMISTOR	SW11 <R.B>	LOUVER ON/OFF SWITCH
CN2 <R.B>	REMOTE SWITCH CONNECTOR		<32°F/15kΩ, 77°F/5.4kΩ>	SW13 <R.B>	AIR FLOW UP/DOWN DIRECTION SELECTOR
CN27 <I.B>	DRAIN PUMP CONNECTOR	SW1 <I.B>	MODE SELECTOR	SW14 <R.B>	TEST RUN SWITCH
CN51 <I.B>	CENTRALLY CONTROL CONNECTOR	SW2 <I.B>	ADDRESS SELECTOR	SW15 <R.B>	INSPECTION SWITCH
F <I.B>	FUSE <6A>	SW3 <I.B>	EMERGENCY OPERATION SWITCH	SW17 <R.B>	ADDRESS SELECTOR
FS	THERMAL FUSE <217°F, 10A> (PCH36EK)	SW5 <I.B>	MODEL SELECTOR	T	TRANSFORMER
FS	THERMAL FUSE <228°F, 15A> (PCH42EK)	SW6 <I.B>	MODEL SELECTOR	TB1~4	TERMINAL BLOCK
H	BOOSTER HEATER	SW1 <R.B>	ON/OFF SWITCH	X2 <I.B>	LOUVER MOTOR RELAY
I.B	INDOOR CONTROLLER BOARD	SW3 <R.B>	COOLING/DRY OPERATION MODE SWITCH	X3 <I.B>	VANE RELAY
LCD	LIQUID CRYSTAL DISPLAY	SW4 <R.B>	AUTOMATIC OPERATION MODE SWITCH	X4 <I.B>	FAN RELAY
LS	LIMIT SWITCH	SW5 <R.B>	HEATING OPERATION MODE SWITCH	X5 <I.B>	FAN RELAY
MF	FAN MOTOR <INNER THERMOSTAT>	SW6 <R.B>	SET TEMPERATURE UP SWITCH	X6 <I.B>	FAN RELAY
ML	LOUVER MOTOR	SW7 <R.B>	SET TEMPERATURE DOWN SWITCH	ZNR	VARISTOR
MV	VANE MOTOR	SW8 <R.B>	TIMER TIME SWITCH	26H	HEATER THERMAL SWITCH
R.B	REMOTE CONTROLLER BOARD	SW9 <R.B>	TIMER CONTINUOUS AND ON/OFF SWITCH	88H1,2	HEATER CONTACTOR



NOTES :

1. The indoor transformer (T) is connected with 230V power. If 208V power is used change the wiring connection in the following procedure.

Indoor side transformer (T) for 208V

YELLOW	208V	RED
BLACK	230V	YELLOW
	208V	BLACK
	230V	YELLOW

Indoor fan (MF) for 208V

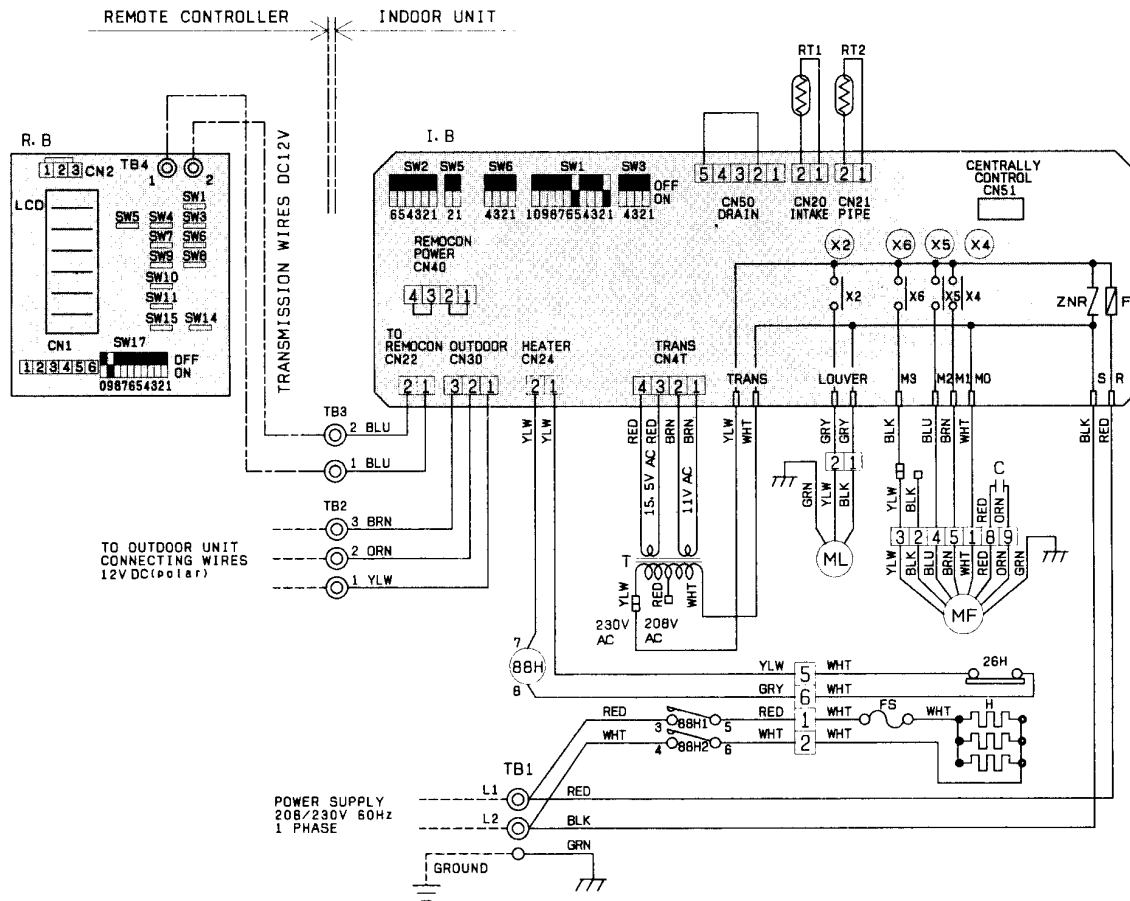
2. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
3. Indoor and outdoor connecting wires are made with polarities make wiring to matching terminal.
4. Symbols used in wiring diagram above are : Terminal block, : connector, : PC board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

MODELS PKH18/24/30EK WIRING DIAGRAM

C FAN CAPACITOR
CN1 <R.B> PROGRAM TIMER CONNECTOR
CN2 <R.B> REMOTE SWITCH CONNECTOR
CN51 <I.B> CENTRALLY CONTROL CONNECTOR
F <I.B> FUSE <6A>
FS THERMAL FUSE <239°F, 10A>
H BOOSTER HEATER
I.B INDOOR CONTROLLER BOARD
LCD LIQUID CRYSTAL DISPLAY
MF FAN MOTOR <INNER THERMOSTAT>
ML LOUVER MOTOR
R.B REMOTE CONTROLLER BOARD
RT1 ROOM TEMPERATURE THERMISTOR
<32°F/15kΩ, 77°F/5.4kΩ>

RT2 INDOOR COIL THERMISTOR
<32°F/15kΩ, 77°F/5.4kΩ>
SW1 <I.B> MODE SELECTOR
SW2 <I.B> ADDRESS SELECTOR
SW3 <I.B> EMERGENCY OPERATION SWITCH
SW5 <I.B> MODEL SELECTOR
SW6 <I.B> MODEL SELECTOR
SW1 <R.B> ON/OFF SWITCH
SW3 <R.B> COOLING/DRY OPERATION MODE SWITCH
SW4 <R.B> AUTOMATIC OPERATION MODE SWITCH
SW5 <R.B> HEATING OPERATION 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
SW11 <R.B> LOUVER ON/OFF SWITCH
SW14 <R.B> TEST RUN SWITCH
SW15 <R.B> INSPECTION SWITCH
SW17 <R.B> ADDRESS SELECTOR
T TRANSFORMER
TB1~4 TERMINAL BLOCK
X2 <I.B> LOUVER RELAY
X4 <I.B> FAN RELAY
X5 <I.B> FAN RELAY
X6 <I.B> FAN RELAY
ZNR VARISTOR
26H HEATER THERMAL SWITCH
88H HEATER CONTACTOR



NOTES :

1. The indoor transformer (T) is connected with 230V power. If 208V power is used change the wiring connection in the following procedure.

Indoor side transformer (T) for 208V

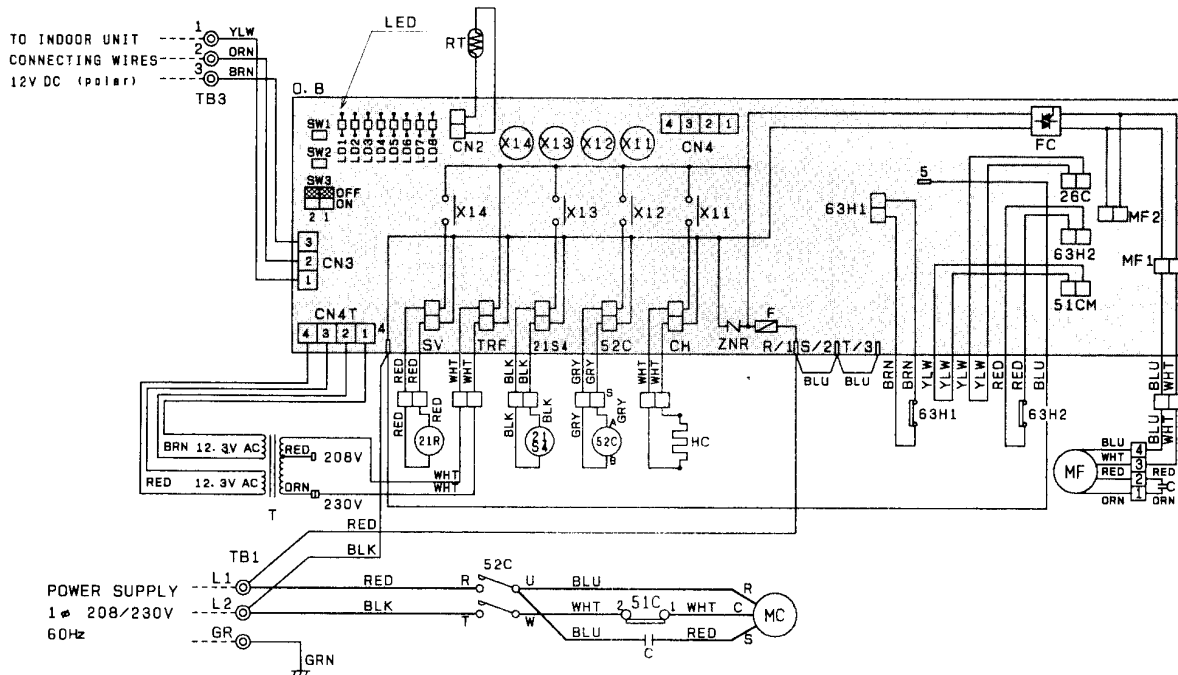
YELLOW	208V	RED
	230V	YELLOW
BLACK	208V	BLACK
	230V	YELLOW

Indoor fan (MF) for 208V

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

MODELS PUH18EK WIRING DIAGRAM

C	COMPRESSOR CAPACITOR	RT	OUTDOOR COIL THERMISTOR	X14 <O.B>	BYPASS VALVE RELAY
C1	FAN CAPACITOR		<32°F/15kΩ, 77°F/5.4kΩ>	ZNR <O.B>	VARIATOR
F <O.B>	FUSE <6A>	SW1-2-3<O.B>	SELECTOR <CHECK, SERVICE>	21R	BYPASS VALVE COIL
FC <O.B>	FAN CONTROLLER	T	TRANSFORMER	21S4	R.V. COIL
HC	CRANKCASE HEATER	TB1,3	TERMINAL BLOCK	51C	OVERCURRENT RELAY
LD1~LD8	LED <CHECK, SERVICE>	X11 <O.B>	CRANKCASE HEATER RELAY	52C	CONTACTOR
MC	COMPRESSOR	X12 <O.B>	COMPRESSOR RELAY	63H1	CONTROL HIGH PRESSURE SWITCH
MF	FAN MOTOR <INNER THERMOSTAT>	X13 <O.B>	R.V. RELAY	63H2	PROTECT HIGH PRESSURE SWITCH
O.B	OUTDOOR CONTROLLER BOARD				



Main function of LED (when both Nos.1 and 2 of **SW3** are "OFF")

LED NO.	Output display (light)	Check display (flash)
LD1	Compressor indoor command	---
LD2	Heating indoor command	---
LD3	63H1 ON	RT short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	---
LD6	R.V. coil ON	---
LD7	Bypass valve ON	RT overheat protection
LD8	Crankcase heater ON	Defective input

NOTES : 1. If the operation stops to function of the protection device, the check display flashes.

2. Symbols used in wiring diagram above are. : Terminal block, : Connector, : PC board insertion tab.

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.

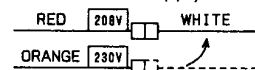
White connector



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 as shown in the right figure.

※ When Power Supply is 208V

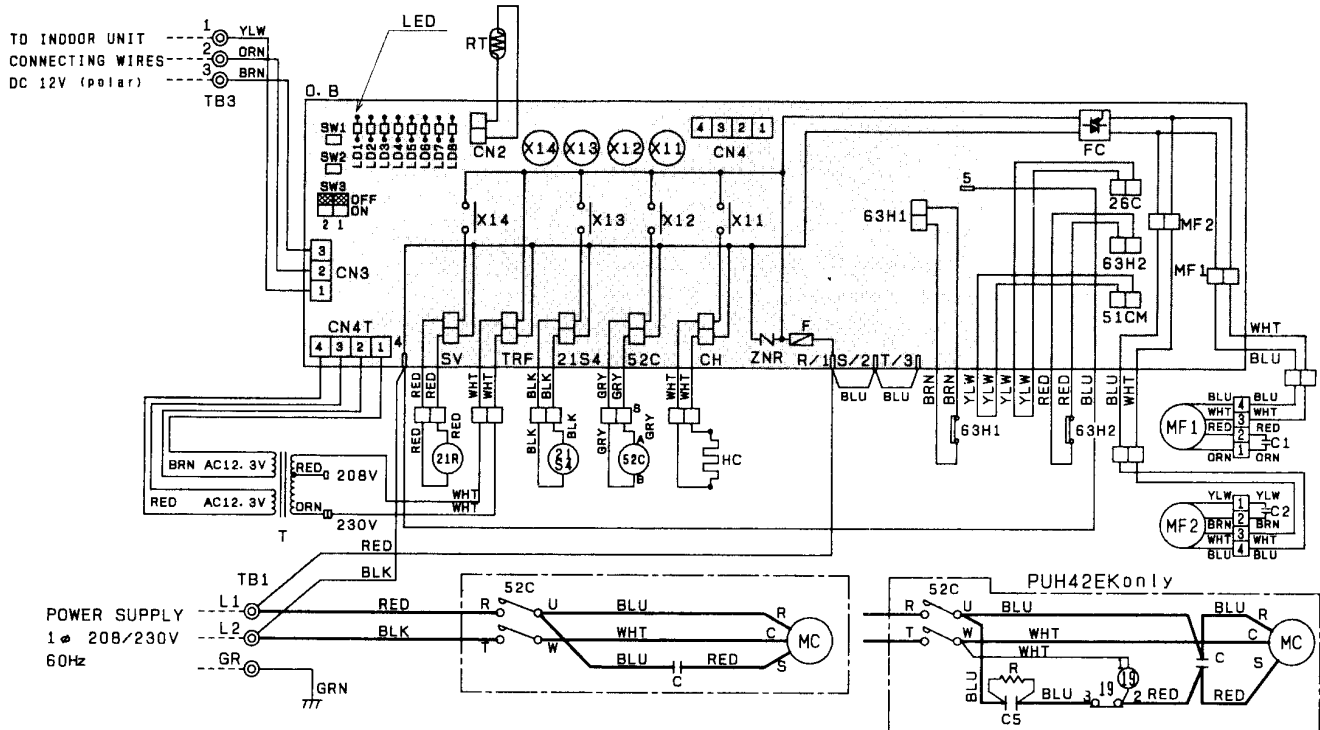


CAUTION FOR INDOOR AND OUTDOOR CONNECTING WIRES

- Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1,2,3) for indoor and outdoor units.

MODELS PUH24/30/36/42EK WIRING DIAGRAM

C	COMPRESSOR CAPACITOR	O.B	OUTDOOR CONTROLLER BOARD	X13 <O.B>	R.V RELAY
C1,2	FAN CAPACITOR	R	RESISTOR	X14 <O.B>	BYPASS VALVE RELAY
C5	COMPRESSOR START CAPACITOR	RT	OUTDOOR COIL THERMISTOR	ZNR <O.B>	VARIATOR
F <O.B>	FUSE <6A>	SW1-2-3<O.B>	SELECTOR <CHECK, SERVICE>	19	COMPRESSOR START RELAY
FC <O.B>	FAN CONTROLLER	T	TRANSFORMER	21R	BYPASS VALVE COIL
HC	CRANKCASE HEATER	TB1,3	TERMINAL BLOCK	21S4	R.V COIL
LD1~LD8	LED <CHECK, SERVICE>	X11 <O.B>	CRANKCASE HEATER RELAY	52C	CONTACTOR
MC	COMPRESSOR <INNER THERMOSTAT>	X12 <O.B>	COMPRESSOR RELAY	63H1	CONTROL HIGH PRESSURE SWITCH
MF1,2	FAN MOTOR <INNER THERMOSTAT>			63H2	PROTECT HIGH PRESSURE SWITCH



NOTES : 1. Symbols used in wiring diagram above are. : Terminal block, : Connector, : PC board insertion tab.

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.

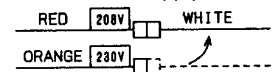
White connector



CAUTIONS FOR POWER SUPPLY WIRING

- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- ※ The indoor transformer (T) is connected with 230V power. If 208V power is used, change the wiring connection as shown in the right figure.

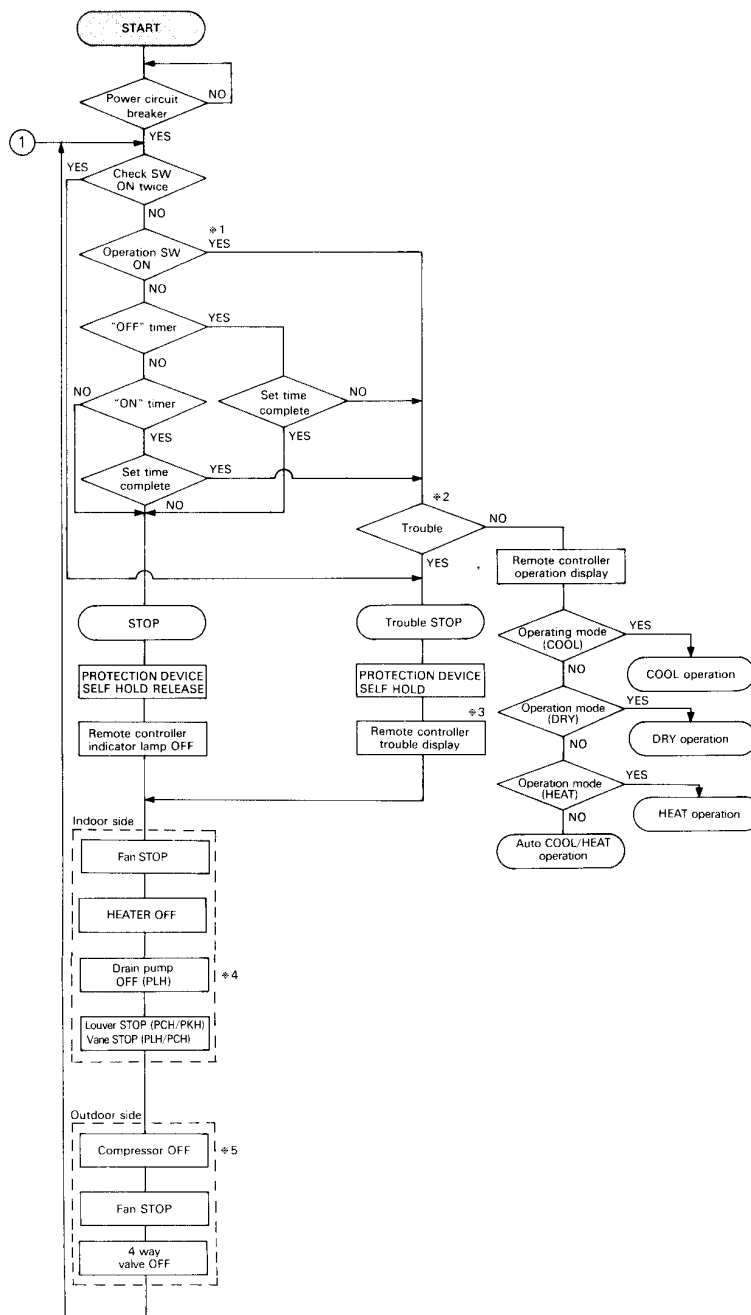
※ When Power Supply is 208V



CAUTION FOR INDOOR AND OUTDOOR CONNECTING WIRES

- Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1,2,3) for indoor and outdoor units.

MAIN OPERATION



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

※2 Causes for check mode are listed below :

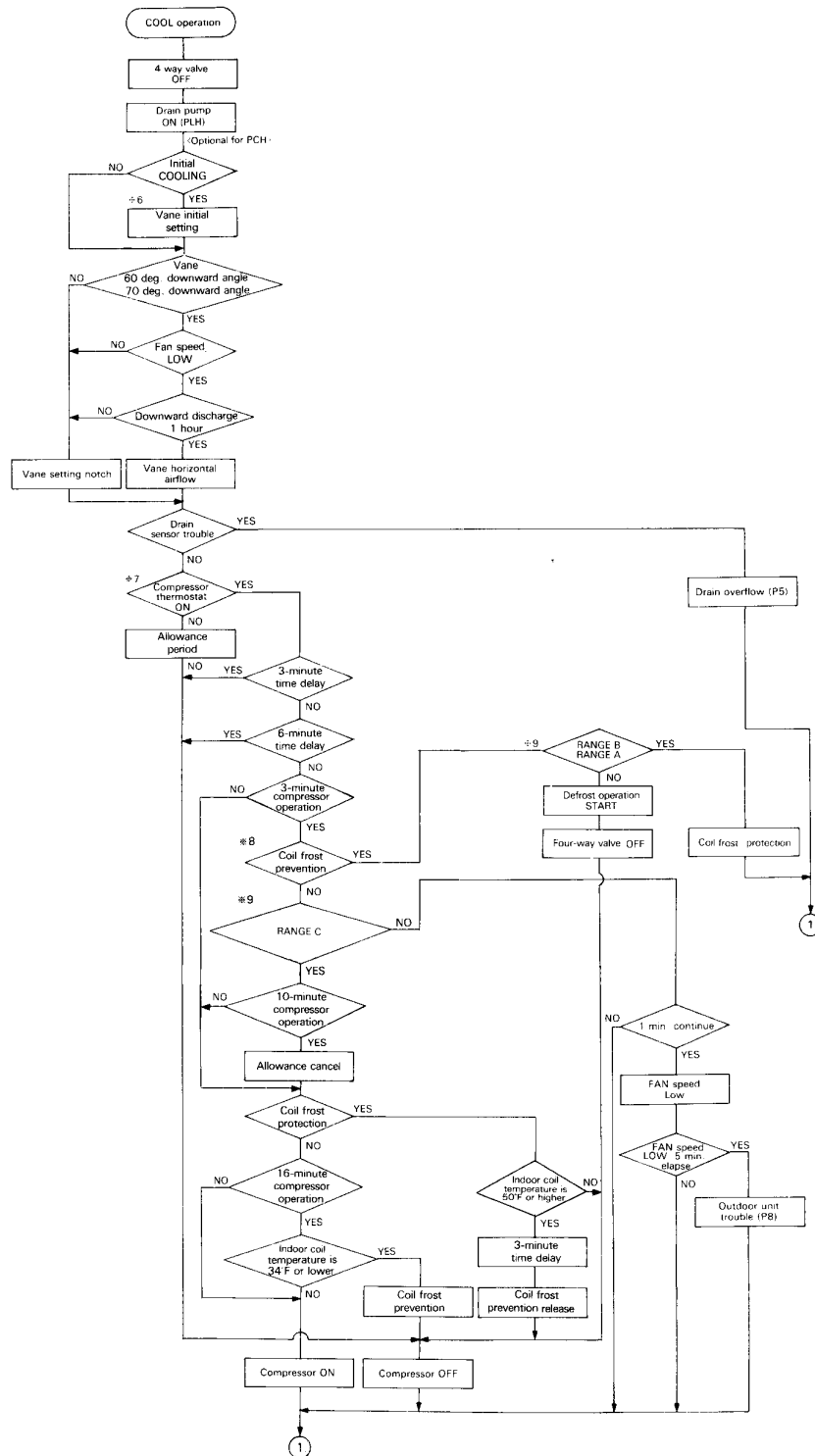
- E0 — Signal transmitting/receiving error
- P1 — Abnormality of room temperature thermistor
- P2 — Abnormality of indoor coil thermistor
- P3 — Signal transmitting/receiving error
- P4 — Abnormality of drain sensor
- P5 — Abnormality of drain pump
- P6 — Coil frost protection
- P7 — System error
- P8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

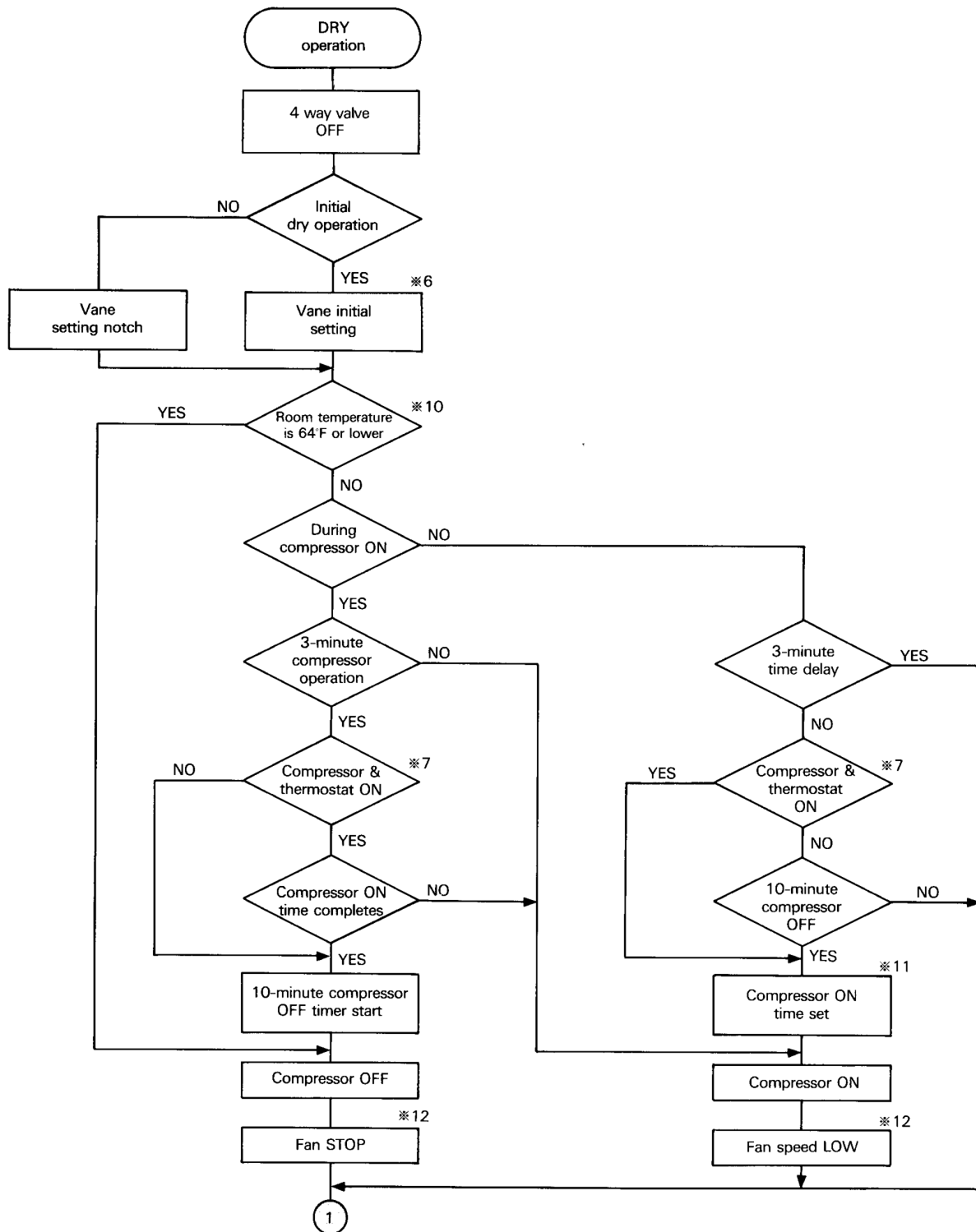
※5 The 3 minutes time-delay mechanism functions after compressor stops. Four-way valve turns to OFF 10 minutes after the compressor stops.

COOLING OPERATION



- ※6 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.
- ※7 For TEST RUN the thermostat function will be ignored resulting in continuous thermostat ON.
- ※8 After 3 minute compressor operation, if the indoor coil thermistor reads 5°F or below for 3 minutes, the compressor stops for 6 minutes.
- ※9 RANGE C area : Room temperature minus indoor coil temperature is more than 9 deg.
 RANGE B : Difference between room temperature and indoor coil temperature is 9 deg. or less.
 RANGE A : Indoor coil temperature minus room temperature is more than 9 deg.

DRY OPERATION



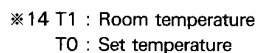
※6~7 Refer to page 65.

※10 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.

※11 Compressor ON time is decided by room temperature. Refer to page 70.

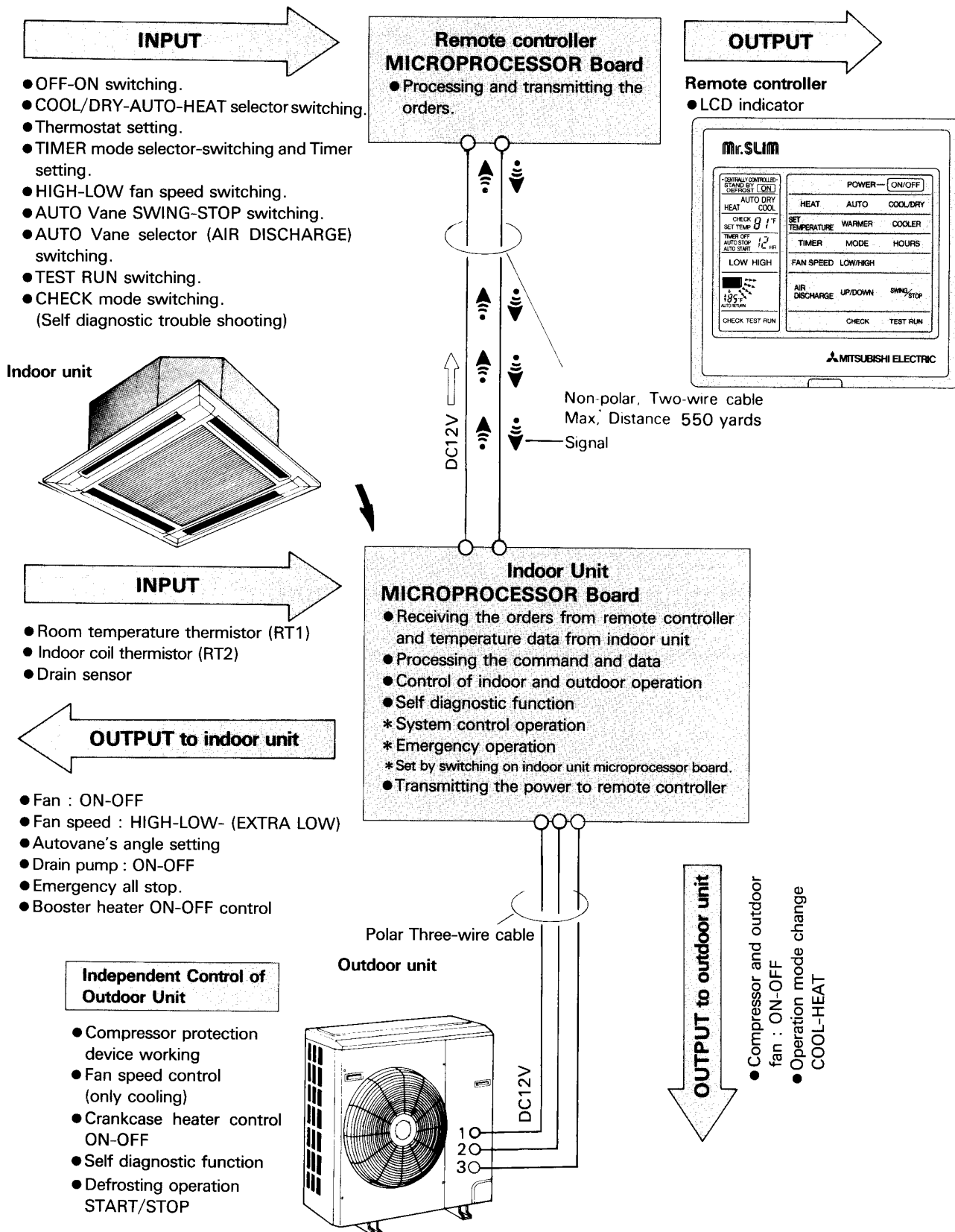
※12 In dry operation, compressor ON makes the fan speed LOW and compressor OFF stops the fan.
Fan speed setting by remote controller is not available.



8

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 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 temperature thermistor (RT2) 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 thermistor reads 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 condition as ① is satisfied again 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 condition 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 drain 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 turned to 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 drain 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.

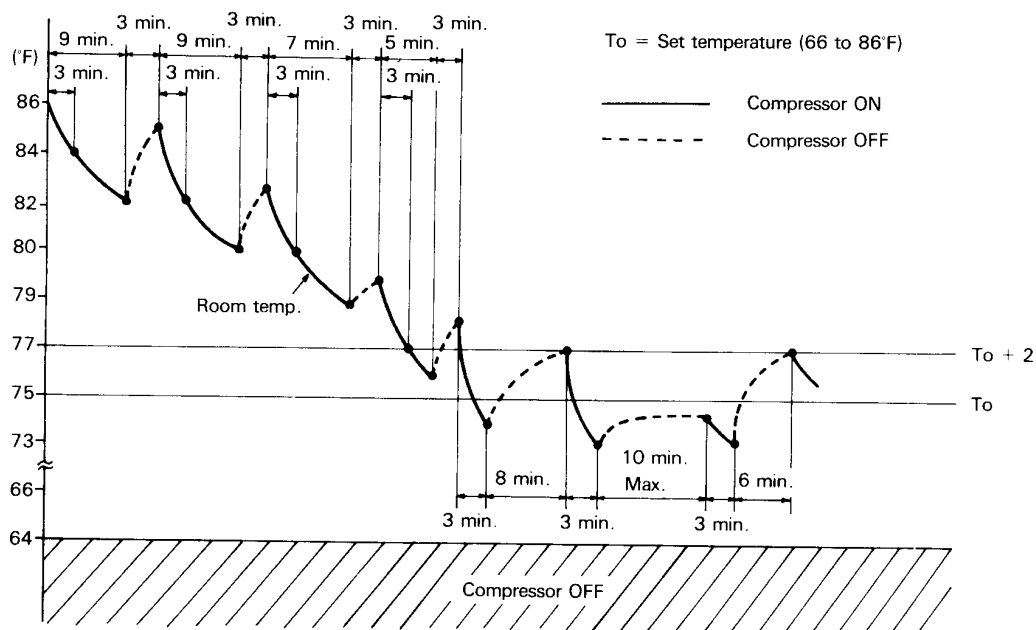
(b) Three minutes after the compressor stops :

- 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. AUTOMATIC COOLING/HEATING CHANGEOVER OPERATION

An automatic cooling and heating changeover operation system is equipped to ensure easy control and year-round air conditioning.

Once the desired temperature is set, unit operation is switched automatically between cooling and heating, in accordance with the room temperature. In addition, the use of outdoor unit fan speed controller enables cooling operation at outdoor temperatures as low as 23°F.

(1) Initial mode

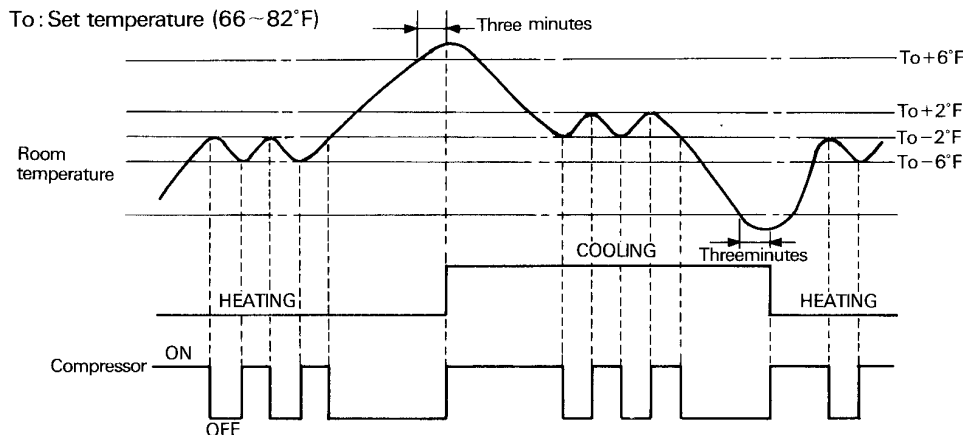
At the start-up of the AUTOMATIC COOLING/HEATING CHANGEOVER OPERATION:

- If room temperature is lower than or equal to set temperature, operation starts in heating mode.
- If room temperature is higher than set temperature, operation starts in cooling mode.

However, if the AUTOMATIC COOLING/HEATING CHANGEOVER OPERATION is selected during cooling or normal mode, the previous mode continues.

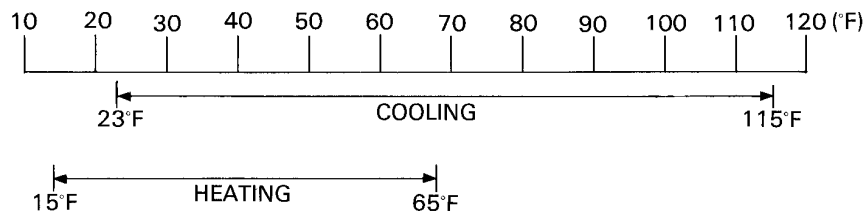
(2) Mode change

- In heating mode, if room temperature becomes 6 degrees higher than set temperature, the mode changes to cooling.
 - In cooling mode, if room temperature becomes 6 degrees lower than set temperature, the mode changes to heating.
- However, mode cannot be changed for the first 3 minutes after the compressor stops.



(3) Temperature range

AUTOMATIC COOLING/HEATING CHANGEOVER OPERATION is available under the ambient temperature as follows.

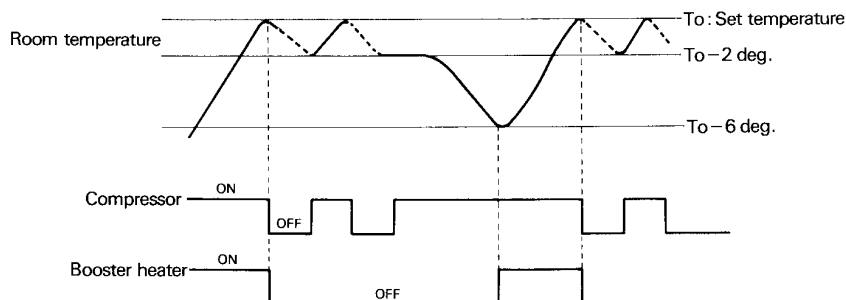


5. HEATING OPERATION

(1) Thermostat function

During heating operation, desired temperature can be set in the range from 63°F to 82°F. When room temperature rises to the set temperature, the thermostat turns to OFF.

After that, when the room temperature falls to 2 degrees lower than the set temperature, the thermostat turns to ON.



(2) Hot adjustment

I) Hot adjustment is a warm-up for heating operation, and starts under either of the below conditions.

- Heating mode starts.
- Thermostat turns to ON in heating mode.
- Defrosting operation has finished in heating mode.

When the hot adjustment starts, indoor fan operates at EXTRA LOW speed.

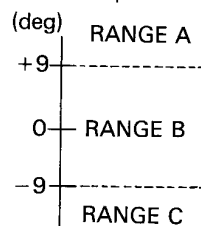
After that, when five minutes have passed or the indoor coil temperature exceeds 95°F, the indoor fan speed turns to LOW. Two minutes later, the hot adjustment ends and the indoor fan operates at the speed set by the remote controller, that is, normal heating operation starts.

During the hot adjustment, the thermostat ON/OFF is disregarded.

II) Defrosting operation during hot adjustment

- ① If the temperature difference between the indoor coil temperature and the room temperature enters the RANGE C, as shown in the right Figure 1, during the first two minutes of the hot adjustment; the indoor fan stops. The hot adjustment, however, continues.
- ② When two minutes have passed since the hot adjustment started,
 - If the temperature difference is in the RANGE C, the defrosting operation starts.
 - If the temperature difference is in the RANGE A or B, the hot adjustment continues normally. The fan operates at EXTRA LOW or LOW speed.

Fig. 1 Indoor coil temperature minus room temperature



(3) Cold air prevention

While the thermostat is OFF,

- If the temperature difference is in the RANGE A or B, the indoor fan runs at EXTRA LOW speed. By turning ON dipswitch SW1-7 on the indoor controller board, the fan speed becomes LOW.
- If the temperature difference is in the RANGE C, the indoor fan stops.

(4) Remaining heat elimination

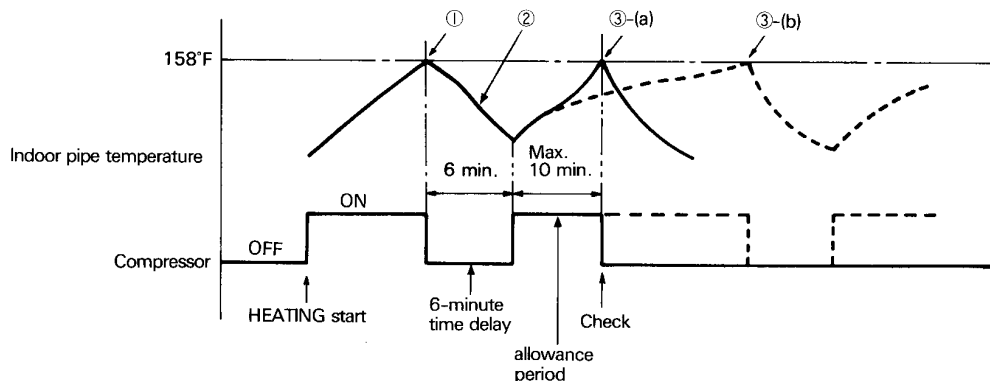
For the first one minute after the booster heater turns to OFF, the indoor fan operates at LOW speed to eliminate remaining heat.

(5) Overheat prevention

When the indoor coil temperature rises to 140°F or above, the booster heater stops. When the indoor coil temperature falls to 131°F, the booster heater starts.

(6) Overheat protection

- ① When the indoor coil temperature rises to 158°F or above, the overheat protection starts.
- ② The compressor stops and restarts 6 minutes later. (6-minute time delay)
- ③ The first 10 minutes after the compressor restarts is the allowance period.
 - a) If the indoor coil temperature rises to 158°F or above again in the allowance period, both indoor and outdoor units stop and the check code "P6" appears on LCD of the remote controller.
 - b) If the indoor coil temperature rises to 158°F or above after the allowance period, 6-minute time delay functions and the allowance period starts again.
- ④ If the heating mode stops or changes to other mode during 6-minute time delay or the allowance period, the overheat protection mode is canceled.



(7) Outdoor unit abnormality detection

If the outdoor unit is judged as abnormal by the below causes, the compressor stops and the check code "P8" appears on the remote controller display.

I) During the compressor ON after the hot adjustment

① When the temperature difference between the indoor coil temperature and the room temperature enters the RANGE B, the indoor fan stops. (See Fig. 1 on page 72.)

② When 10 seconds to 20 minutes have passed after that,

- a) If the temperature difference returns to the RANGE A, the hot adjustment starts.
- b) If the temperature difference remains in the RANGE B, the outdoor unit is judged as abnormal.
- c) If the temperature difference enters the RANGE C, defrosting operation starts.
 - If the temperature does not return to the RANGE B until 20 minutes passes, the outdoor unit is judged as abnormal.
 - If the temperature difference returns to the RANGE B within 20 minutes, the next 20 minutes is an allowance. If the temperature difference enters the RANGE A during the allowance, the defrosting mode ends and the hot adjustment starts. If the temperature difference does not return to the RANGE A during the allowance, the outdoor unit is judged as abnormal.

II) During the compressor ON in the hot adjustment

When 20 minutes have passed since the defrosting operation started during the hot adjustment, if the temperature difference is still in the RANGE C, the outdoor unit is judged as abnormal.

III) During compressor OFF

After 20 minutes of the thermostat OFF, if the indoor coil temperature thermistor reads -13°F or below, the outdoor unit is judged as abnormal.

(8) Booster heater control

When the room temperature becomes 6 degrees lower than the set temperature, the booster heater turns ON.

When the room temperature rises to the set temperature, the booster heater turns OFF before the thermostat turns OFF. However, the booster heater does not turn ON during the hot adjustment.

(9) Defrosting operation

After the outdoor unit starts the defrosting operation, when the temperature difference between the indoor coil temperature and the room temperature gets out of the RANGE A to the RANGE B, the indoor unit starts the defrosting mode. After the outdoor unit stops the defrosting operation, when the temperature difference returns to the RANGE A, the indoor unit stops the defrosting mode. While the indoor unit is in the defrosting mode, the indoor fan and the booster heater stops.

For further information on the defrosting operation, see the page 82~83.

(10) Indoor coil thermistor abnormality detection

The abnormality can be detected during the compressor ON, excepting the cases as follows:

- For the first 20 minutes after the temperature difference between the indoor coil temperature and the room temperature enters the RANGE C. (See Fig. 1 on page 72.)
- From the temperature difference enters the RANGE C till it moves to the RANGE B.

6. AUTO VANE CONROL (For series PLH/PCH)

(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.

PLH ①20-degree discharge

②45-degree downward discharge (only with the fan speed at HIGH)

③60-degree downward discharge

④70-degree downward discharge

PCH ①100%-horizontal discharge

②60%-downward and 40%-horizontal discharge

③80%-downward and 20%-horizontal discharge

④100%-downward discharge

NOTE: Discharge ② is available only when the fan speed is HIGH.

〈AUTO RETURN〉

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

NOTE1: After that, the discharge "③" or "④" is available by setting with the remote controller, and it continues for 1 hour.

NOTE2: 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.

NOTE3: If the discharge direction changes from "③" (or "④") to the horizontal discharge, the 1-hour timer to return the horizontal discharge is canceled at that time.

(3) During heating operation

When the heating operation starts, the same discharge direction as was set last time is choosed automatically. However, the desired discharge can be selected from among four modes above-mentioned with the remote controller.

However, in the following cases, the discharge direction turns to the horizontal discharge despite the setting with the remote controller.

- When the thermostat turns to OFF
- During defrosting operation with the indoor fan stopped
- While the indoor fan operates at EXTRA LOW speed in the hot adjustment

(4) During FAN operation (For series PLH)

When the FAN operation starts, the horizontal discharge is set automatically.

However, the desired discharge can be selected from among four modes with the remote controller.

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

(6) Automatic swing mechanism (For series PLH)

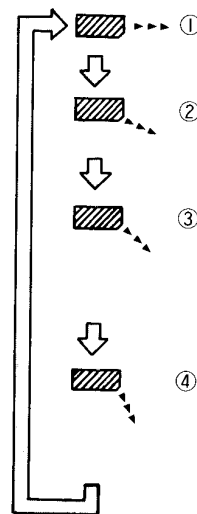
To enable the automatic swing mechanism, turn ON SW17-10 of the remote controller and SW5-1 of the indoor controller board.

Swinging air-flow or fixed air-flow can be selected by the AIRDISCHARGE 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.

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

〈Remote controller display〉

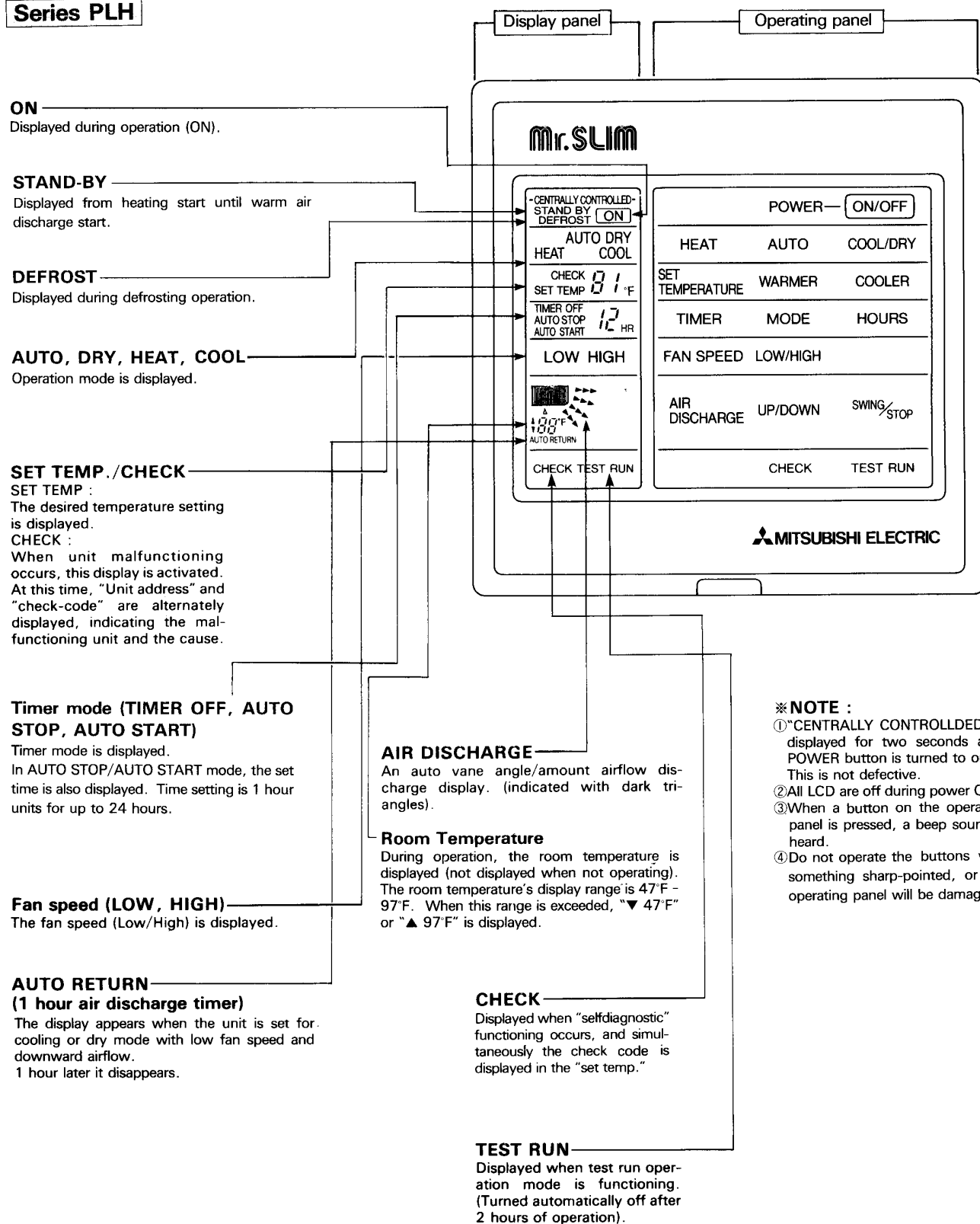


Changes by pushing the
AIR DISCHARGE
UP/DOWN button:

7. REMOTE CONTROLLER DISPLAY

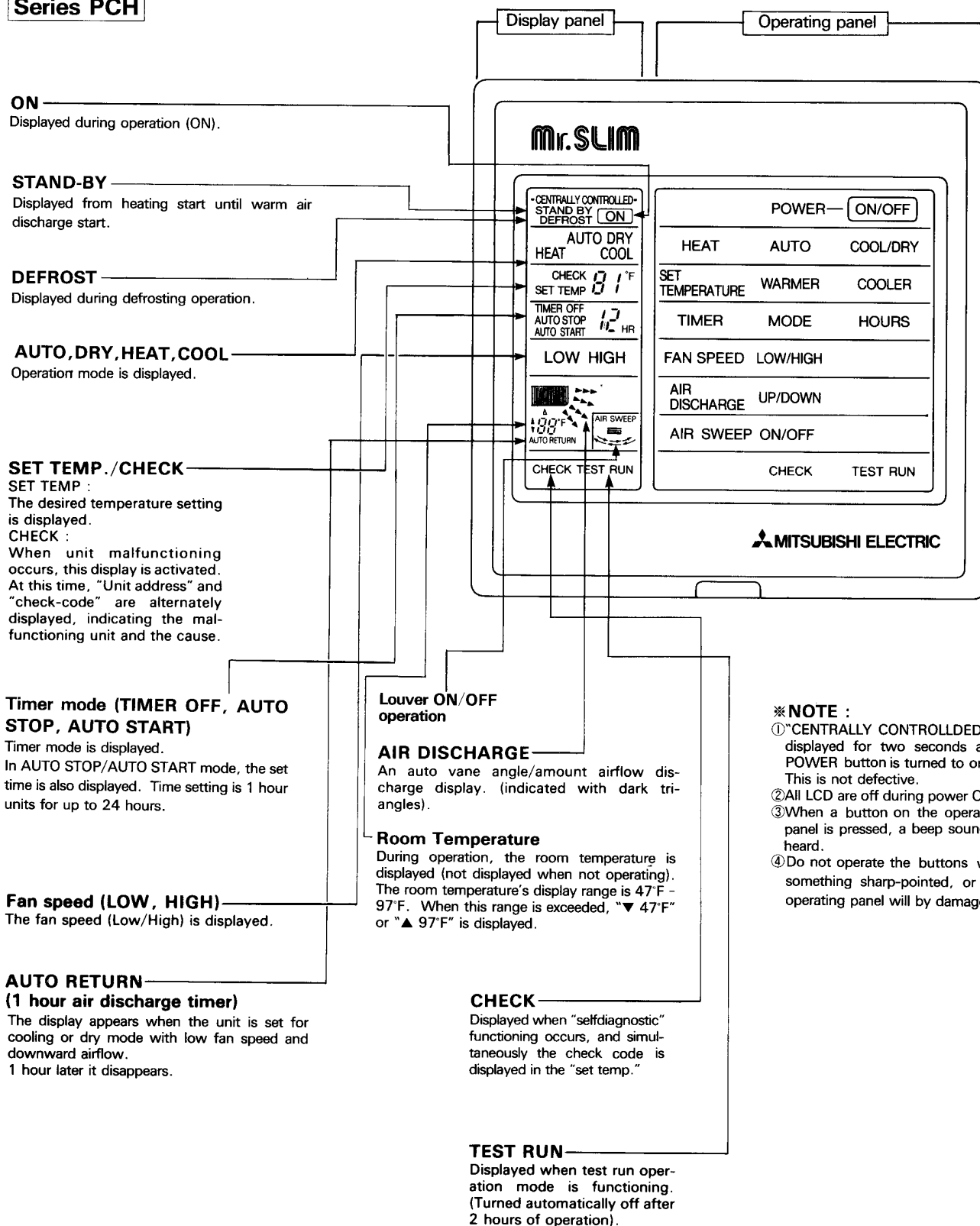
All LCD are indicated for your reference.

Series PLH



All LCD are indicated for your reference.

Series PCH



All LCD are indicated for your reference.

Series PKH

ON

Displayed during operation (ON).

STAND-BY

Displayed from heating start until warm air discharge start.

DEFROST

Displayed during defrosting operation.

AUTO, DRY, HEAT, COOL

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 mode (TIMER OFF, AUTO STOP, AUTO START)

Timer mode is displayed.

In AUTO STOP/AUTO START mode, the set time is also displayed. Time setting is 1 hour units for up to 24 hours.

Fan speed (LOW, HIGH)

The fan speed (Low/High) is displayed.

Louver ON/OFF operation

Room Temperature

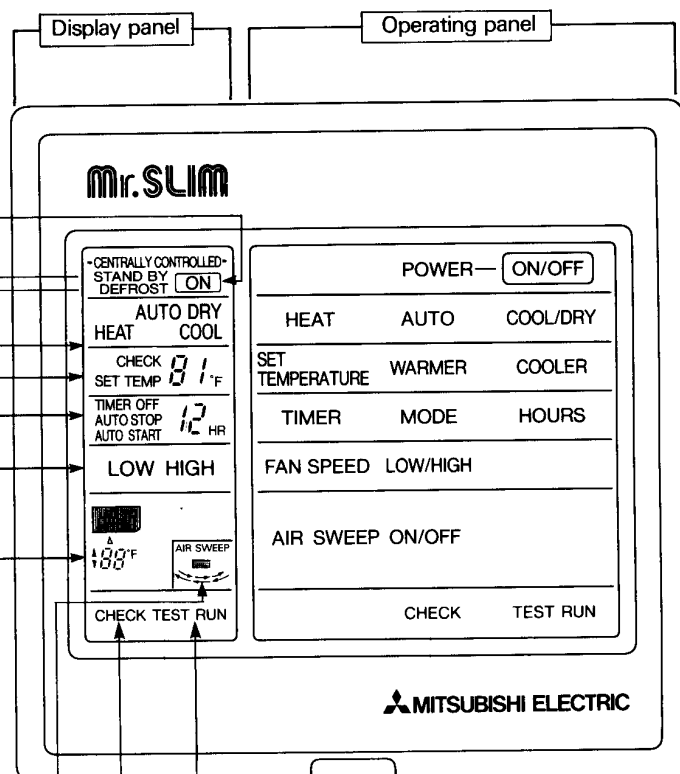
During operation, the room temperature is displayed (not displayed when not operating). The room temperature's display range is 47°F - 97°F. When this range is exceeded, "▼ 47°F" or "▲ 97°F" is displayed.

CHECK

Displayed when "selfdiagnostic" functioning occurs, and simultaneously the check code is displayed in the "set temp."

TEST RUN

Displayed when test run operation mode is functioning. (Turned automatically off after 2 hours of operation).



※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.

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: **HEAT**, **AUTO**, **COOL**, and **DRY**

During the automatic heating/cooling changeover operation, the display shows "AUTO" and the operating mode ("COOL" or "HEAT") at that time is also displayed.

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 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.

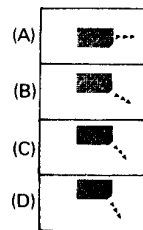
5) Fan speed

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 series PLH/PCH)

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

Air discharge display	
PLH (A) 20-deg. discharge	PCH (A) 100%-horizontal discharge
(B) 45-deg. downward discharge	(B) 60%-downward and 40%-horizontal discharge
(C) 60-deg. downward discharge	(C) 80%-downward and 20%-horizontal discharge
(D) 70-deg. downward discharge	(D) 100%-downward



○ In cooling mode, the discharge (B) is available only while the fan speed is high.

7) Louver operation (For series PCH/PKH)

Press the "AIR SWEEP" **ON/OFF** button to turn the louver ON/OFF.

During "AIR SWEEP", 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 on the set temperature display.

9) "Test run" mode

Press the **TEST RUN** button twice and the test run mode will be activated. the test run is 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 independantly 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 breaker 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 **AUTO**, **COOL/DRY** or **HEAT** button and check if the cool or warm 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 from 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 down as time passes.

Code	1	2	3	4	5	6	7	8
Indoor coil temperature	-40~34°F	~50°F	~59°F	~68°F	~77°F	~86°F	~95°F	~104°F
Code	9	10	11	12	13	14	15	
Indoor coil temperature	~113°F	~122°F	~131°F	~140°F	~158°F	~194°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 87 to 92.)

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.

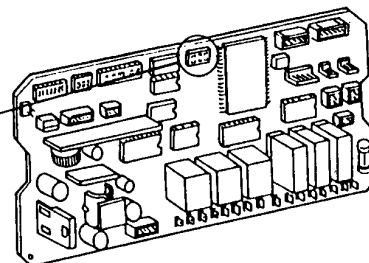
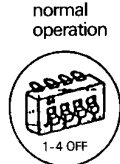
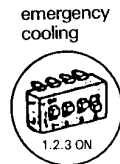
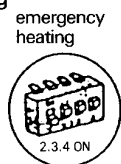
CAUTION: If the SELF-DIAGNOSTIC FUNCTION indicates "condensate pump malfunction" in the cooling mode, DO NOT use the EMERGENCY OPERATION. Otherwise drain overflow may occur.

6-2 HOW TO WORK EMERGENCY OPERATION

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

For emergency cooling, turn the SW3 levers 1, 2, and 3 ON.

SW3 setting



microprocessor board

- (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 switch is not available to start/stop the EMERGENCY OPERATION.

CAUTION1: Do not use the emergency cooling for more than 10 hours, or the indoor coil may frost.

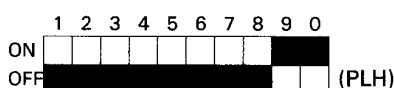
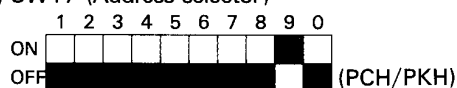
CAUTION2: Do not use the emergency heating for a long time, or the unit discharges cold air during defrosting operation due to the thermostat not working in the EMERGENCY OPERATION.

7. DIP SWITCH FUNCTIONS

Each figure shows the initial setting by factory.

1 On remote controller board

- (1) SW17 (Address selector)



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 PLH/PCH/PKH.

SW17-9) Switch for temperature unit

OFF: °C(Celsius)

ON: °F(Fahrenheit)

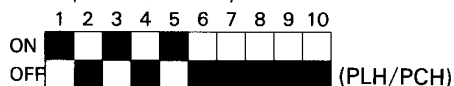
SW17-0) Switch for louvers

OFF: Unit with louvers (For PCH/PKH)

ON: Unit without louvers (PLH)

2 On indoor controller board

- (1) SW1 (Mode selector)



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

OFF: Fan mode for cooling-only models.

ON: AUTOMATIC COOLING-HEATING CHANGE OVER mode for heat pump models including PLH/PCH/PKH.

SW1-2) Switch to change over louver display

OFF: Swing

ON: Rotary

SW1-3) Switch for auto vane

OFF: Unit without auto vane (For PKH)

ON: Unit with auto vane (For PLH/PCH)

SW1-4) Switch for drain pump

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

During heating operation, warm air collects near ceiling. When indoor unit is installed near ceiling, temperature read by room temperature thermistor and temperature near floor differ by about 4 deg. Therefore, set temperature of the indoor unit must be adjusted 4 deg. higher than set temperature of remote controller.

OFF: 4 deg. higher adjustment

ON: No adjustment

SW1-7) Switch for fan speed during cold air prevention

OFF: Extra low

ON: Low

SW1-8) Switch for fan speed during thermostat OFF in heating mode

OFF: Extra low

ON: Low

SW1-9) Switch for outdoor unit abnormality detection

OFF: When abnormality occurs, it is detected.

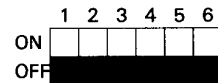
ON: Even if abnormality occurs, it is not detected.

SW1-10) Switch for AUTO RESTART FUNCTION

OFF: This function does not work.

ON: This function works.

(2) SW2 (Address selector)

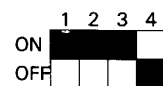


Use SW2 to set unit-address for group control.

For further information, refer to page 96.

(3) SW3 (Emergency operation switch)

For emergency cooling



Normal operation
(initial setting)



For emergency heating



(4) SW5 (Model selector)



(PLH)



(PCH/PKH)

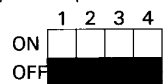
SW5-1) OFF: For models without automatic swing mechanism (PCH/PKH)

ON: For models with automatic swing mechanism (PLH)

SW5-2) OFF: For models with heating mode and cooling mode including series PLH/PCH/PKH

ON: For models with only cooling mode

(5) SW6 (Model selector¹⁾)



SW6 is set on site for twin/triple control. This switch is not available for series PLH/PCH/PKH.

8. OUTDOOR MICROPROCESSOR CONTROL

8-1 Protection function

- 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.
- 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.
- 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 pipe temperature 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

Fan rotational frequency is controlled so that outdoor coil temperature keeps $86^{\circ}\text{F} \pm 4^{\circ}\text{F}$ when the bypass valve is OFF, and $77^{\circ}\text{F} \pm 4^{\circ}\text{F}$ when the bypass valve is ON.

8-3 Unit operation control

The compressor and the 4-way valve receive 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 (output voltage 0 to 208/230V) and is controlled every 30 seconds.

<Cooling mode>

(1) Initial setting (For the first 2 minutes after the compressor start-up)

- 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. 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 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.
- (4) When the thermostat turns to OFF in cooling mode, the total time of compressor ON/OFF is cleared.

<Heating mode>

(1) Initial setting (For the first 2 minutes after the compressor start-up)

- A. When the outdoor coil thermistor reads above 46°F, the fan output step becomes 70. When the outdoor coil thermistor reads 46°F or below, 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. 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.
- (3) When the defrosting operation of two minutes or less ends, the fan output step becomes 130. When the defrosting operation of more than two minutes ends, the fan output step becomes 255.
- NOTE: When the forced defrosting operation ends, the fan output step is the same as that before the defrosting operation.
- (4) After seven minutes of compressor operation, if the outdoor coil thermistor reads 23°F or below, the fan output step becomes 255.
- (5) For the first one minute after the heating operation starts with the outdoor coil temperature at 23°F or below, the 4-way valve and the fan are OFF, that is, the fan output step is 0. After that, the 4-way valve turns to ON, and the fan output step is the same as described in (1).
- (6) The 4-way valve is always ON during the heating mode independent of the thermistor ON/OFF, excepting the case described in (5).
- (7) When the unit stops during the heating mode independent of the thermistor ON/OFF, the total time of compressor ON/OFF is not cleared.

8-5 Defrosting operation

(1) Start conditions

- A. When all of the following conditions are satisfied, the defrosting operation starts.
 - a) More than seven minutes have been passed since the compressor started.
 - b) The outdoor coil thermistor reads 23°F or below.
 - c) The fan output step is 225.
 - d) Total time of compressor operation exceeds 30 minutes, and the outdoor coil temperature has fallen by 16 deg. or more in comparison with the temperature as of 10 minutes after the compressor start-up.

NOTE: The outdoor coil temperature as of 10 minutes after the compressor start up is memorized until the defrosting operation finishes.

- B. When all of the following conditions are satisfied, the defrosting operation starts.
 - a)~c) The same as above A
 - d) Total time of compressor operation exceeds "defrost interval".

Further information on the defrost interval will be described in (3) on page 83.

- C. After the total time of compressor operation exceeds the defrost interval, the thermostat repeats ON/OFF three times. Two minutes after the fourth "ON" of the thermistor, if the outdoor coil temperature thermistor reads 23°F or below and the fan output step is 255, the defrosting operation starts.

NOTE: The count of the thermistor ON/OFF is cleared by the compressor-OFF command or the defrosting operation start-up.

(2) During defrosting operation

- Even if the thermostat turns to OFF, the defrosting operation continues.
- The fan is OFF.
- The bypass solenoid valve is OFF.

(3) Defrost interval

The defrost interval time is decided as follows.

- Initial defrost interval is 50 min.
- The defrost interval after defrosting operation depends on the preceding defrosting operation time. See Table 1.

Table 1

Defrosting operation time	Defrost interval
3 minutes or below	120 minutes
3 to 7 minutes	80 minutes
7 to 10 minutes	60 minutes
10 to 15 minutes	40 minutes
15 minutes (Maximum)	30 minutes

NOTE1: If the unit stops during defrosting operation, the next defrost interval will be 50 minutes.

NOTE2: If a protection function works for the first time during the defrosting operation, the compressor stops. After 3-minute time delay, the defrosting operation restarts. In this case, 3-minute time delay is included to the defrosting operation time.

If the protection function works for the second time, the operation stops and the check code is displayed. The next defrost interval will be 30 min.

NOTE3: When the bypass valve turns to OFF in heating mode, the defrosting operation does not work for the first 10 minutes.

(4) Termination conditions

The defrosting operation finishes when either of the following conditions is satisfied.

- ① Defrosting operation has continued for 15 minutes.
- ② Outdoor coil temperature thermistor reads 72°F or above for the first 75 seconds after the defrosting operation starts.
- ③ Outdoor coil temperature thermistor reads 46°F or above after 75 seconds of defrosting operation.

NOTE: When the defrosting operation finishes, the total time of the compressor ON/OFF is cleared.

8-6 Forced defrosting

(1) When all of the following conditions are satisfied, pushing SW2 starts the forced defrosting operation.

- During heating mode
- The compressor is ON.
- The outdoor coil temperature is being displayed by LED.
- The outdoor coil temperature thermistor reads 46°F or below.

(2) The operation state and the termination conditions of the forced defrosting are the same as those of the normal defrosting operation. As an exception, the defrost interval after the defrosting completed is 50 minutes.

8-7 Bypass valve control

<Cooling mode>

- (1) When the unit stops due to the coil frost prevention, the bypass valve turns to ON. When one hour has passed since the compressor stopped, the bypass valve returns to OFF.
- (2) When the compressor operates with the bypass valve at ON for more than 30 min., the bypass valve turns to OFF.
- (3) When the compressor stops with the bypass valve at OFF, the bypass valve turns to ON and continue to be ON for three minutes. For three phase model, however, the bypass valve does not turn to ON.

<Heating mode>

- (1) When the unit starts for the first time after the circuit breaker turned to ON or starts after the compressor OFF of 30 minutes or more, if the outdoor coil thermistor reads 54°F or more, the bypass valve turns to ON.
- (2) When the high pressure switch (63H1) works, the bypass valve turns to ON.
- (3) When the bypass valve has been at ON for 30 minutes:
 - If the high pressure switch has already returned, the bypass valve turns to OFF.
 - If not, the fan output step keeps 70 for three minutes. Meanwhile, if the high pressure switch returns, the bypass valve turns to OFF. Otherwise the normal fan control starts.
- (4) When the operation mode changes or stops, the bypass valve turns to ON and continues for three minutes.

<Defrosting operation>

- (1) The bypass valve is OFF.

8-8 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.

8-9 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.

8-10 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 90.

8-11 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	Bypass valve ON/OFF control	For series PLH/PCH/PKH	Not applied.
J3	Crankcase heater control	Refer to 8-8 (1) above	Refer to 8-8 (2) above.
J4	Target temperature of outdoor coil	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 EEPROM 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 micro processor 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.

8-12 100% 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 normal fan control to start.

8-13 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) Max. time of defrosting operation : 15 min. → 15 sec.
- 4) Defrost interval : 30~120 min. → 3~12 sec.
- 5) Compressor ON/OFF time for bypass valve ON/OFF : 30 min. → 3 sec.
- 6) Compressor ON time to start other functions : x min. → x sec.

9

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. ②Connect 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><td></td><td>Remote controller</td><td>Sub remote controller</td><td>Malfunction</td></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

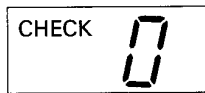
2-1 When malfunction occurs during operation

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

Alternately
displayed



Unit address

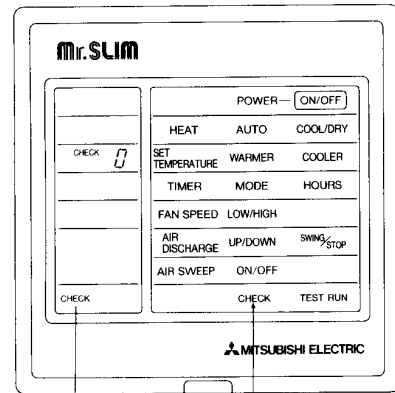


Check code

- (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, push the remote ON/OFF switch or turn the centralized controller power switch OFF.

NOTE: The latest check code is memorized, even if the check code is 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 is 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 (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 indoor coil thermistor (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 changed to output state indication.

NOTE : SW1 is usually available independant 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.

When SW2 is turned ot ON with SW3-1 at ON and SW3-2 at OFF, the defrosting operation starts forcibly.

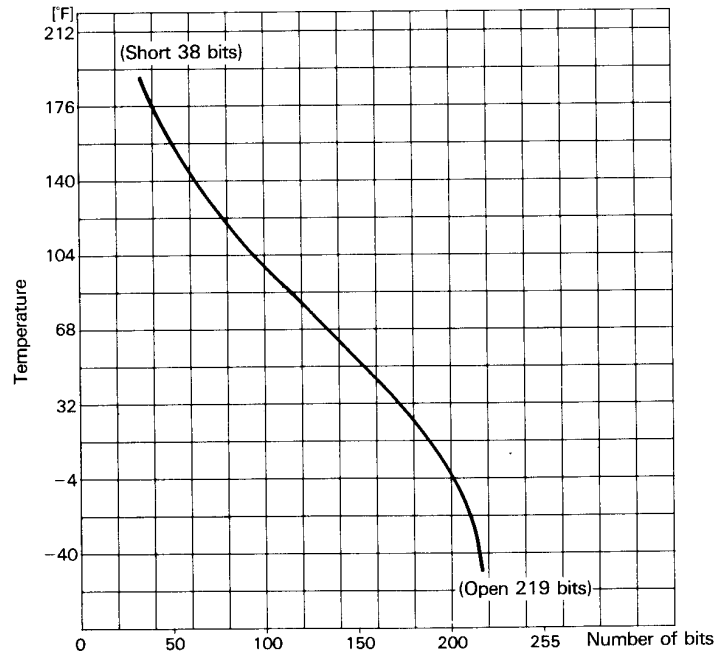
SW3 : Output state indication items depend on combination of SW3-1 ON/OFF and SW3-2 ON/OFF.

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.	4-way 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

3-1 Pipe temperature

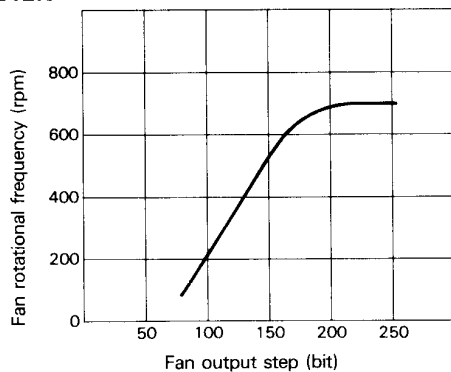
To obtain data of outdoor coil temperature, and the number of bits of lighting LEDs, and see the graph below. Then you can get the temperature.



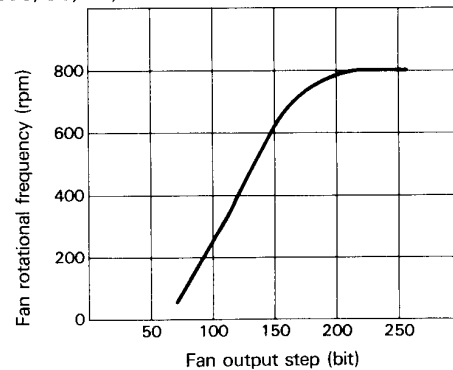
3-2 Fan output step

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.

①PUH24EK



②PUH18/30/36/42EK



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.)	● Outdoor coil 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.

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.