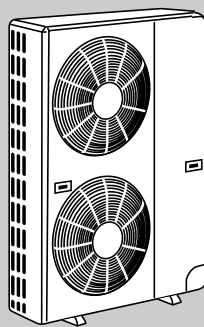


TECHNICAL & SERVICE MANUAL

<Outdoor unit>

Models

PUH18EK		
PUH24EK	PUH24EK₁	
PUH30EK	PUH30EK₁	PUH30EK₂
PUH36EK	PUH36EK₁	PUH36EK₂
PUH42EK	PUH42EK₁	
PUH42EK7	PUH42EK7₁	



Outdoor unit

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2. TECHNICAL CHANGE	3
3. COMBINATION OF INDOOR AND OUTDOOR UNITS	4
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- The contents of LD6 in Main functions of LED (page 13) have been revised.
- The contents of LD5 and LD6 in TROUBLESHOOTING ACCORDING TO CHECK CODE (page 22) have been revised.
- Refer to other manual as for Indoor Units.
- Please void OC247 REVISED EDITION-B.



Mr. SLIM™

1. REDI-CHARGED REFRIGERANT SYSTEM

The industry's first redi-charged refrigerant system.

There is no need to adjust the amount of refrigerant to match the piping length on-site unless lines exceed 100ft.

You will see a major reduction in installation time and labor costs.

The unique refrigerant circuit and a large accumulator always control the refrigerant to its optimum condition unless the pipe length exceeds 100ft. The additional refrigerant charging work in 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.

Figure 1. Normal Refrigerant Circulation System

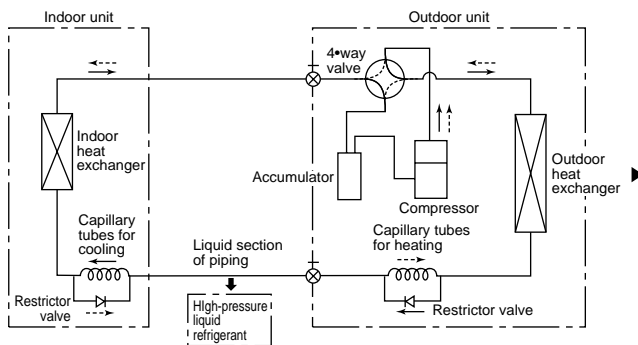
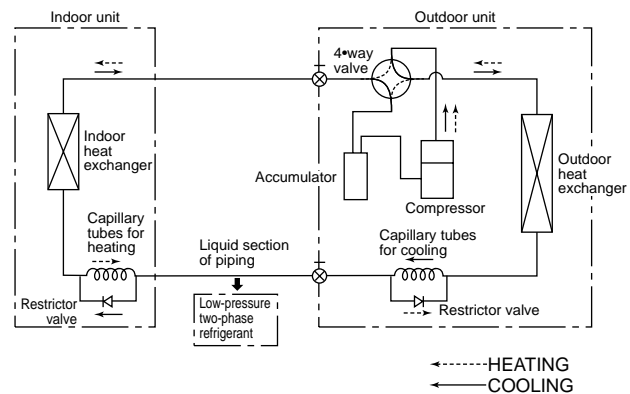


Figure 2. New Refrigerant Circulation System



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.

2. 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.

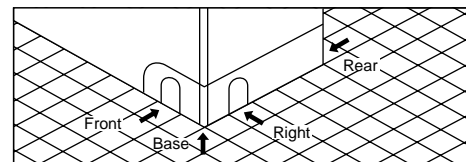
3. FOUR-WAY PIPING ACCESS MAKES INSTALLATION LAYOUT EASY

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.

4. 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.



(OC245 REVISED EDITION-A)

Change of the service parts.

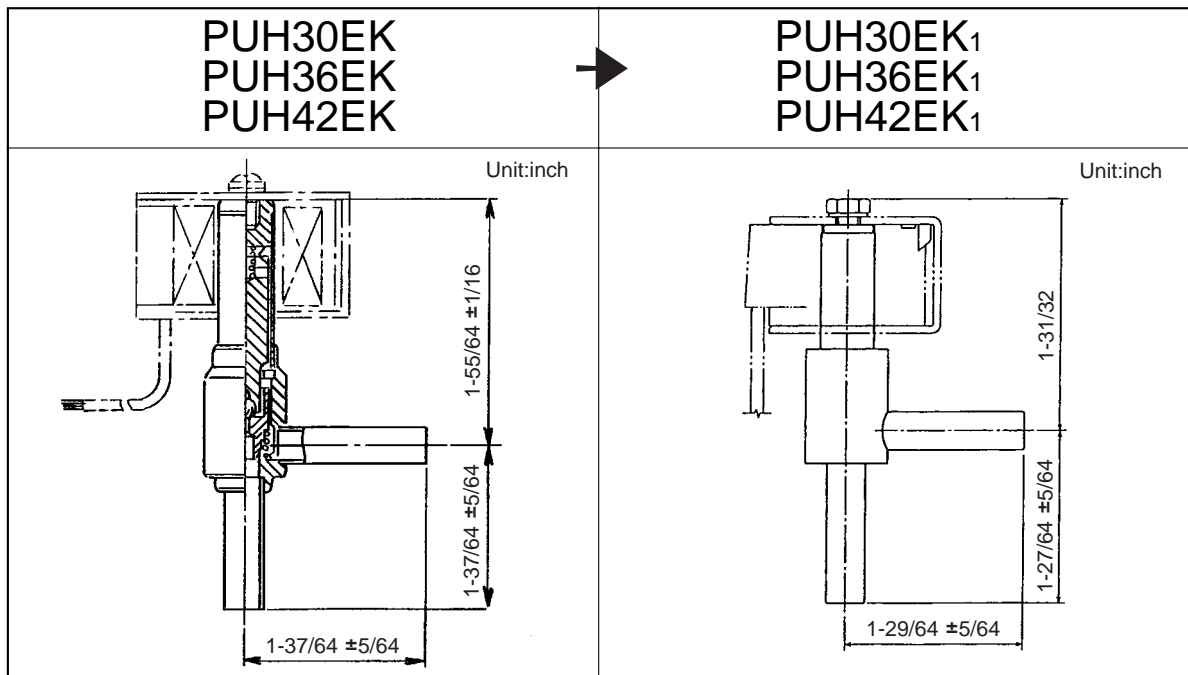
Refer to 13.PARTS LIST for the details.

[Change points]

BYPASS VALVE and BYPASS VALVE SOLENOID COIL has been changed to externals.

It has not been functionally changed.

Therefore, the piping connected with the BYPASS VALVE has been changed.

**(OC245 REVISED EDITION-B)**

PUH24EK → PUH24EK₁

PUH30EK₁ → PUH30EK₂

PUH36EK₁ → PUH36EK₂

[Change points]

COMPRESSOR has been changed.

(PUH24EK model) NH33NBD → NH33NBDT

(PUH30EK model) NH41NAD → NH41NAHT

(PUH36EK model) NH47NAD → NH47NAHT

Refer to 5.SPECIFICATIONS, 6.DATA and 13.PARTS LIST for details.

PUH42EK7 → PUH42EK7₁

[Change points]

1. COMPRESSOR CONTACTOR has been changed to the one equipped THERMAL RELAY.

Refer to 8.WIRING DIAGRAM and 13.PARTS LIST for details.

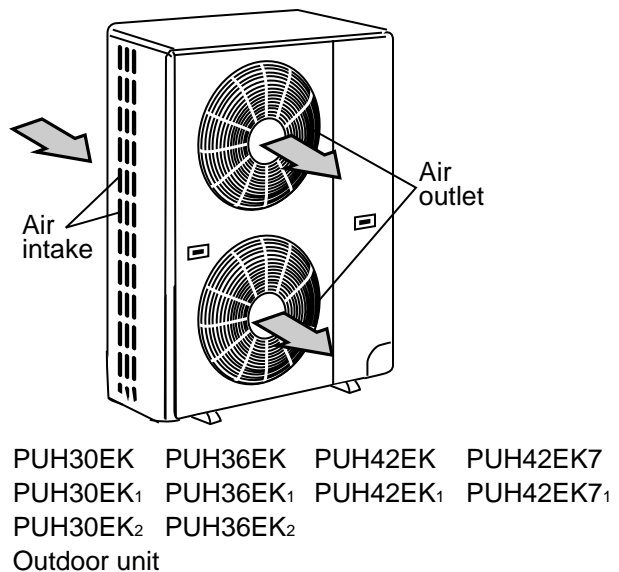
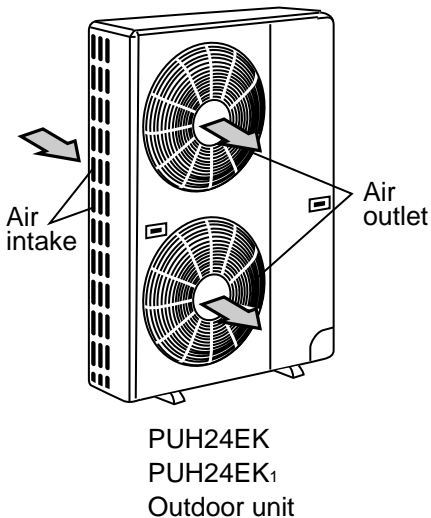
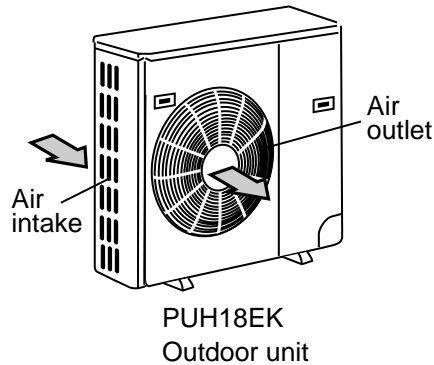
2. OUTDOOR CONTROLLER BOARD has been changed.

Refer to 13.PARTS LIST for details.

3 COMBINATION OF INDOOR AND OUTDOOR UNITS

Indoor unit		Outdoor unit								
		PUH								
Models	Service manual No.	18	24	30		36		42		
		EK	EK EK ₁	EK	EK ₁ EK ₂	EK	EK ₁ EK ₂	EK	EK ₁	EK ₇ EK ₇ ₁
PLH•AK	OC244	○	○	—	○	—	○	—	—	○
PLH•FK	OC002, OC004 OC195	○	○	○	○	○	○	○	○	—
PCH•EK	OC002, OC004 OC193	—	○	○	○	○	○	○	○	—
PKH•EK	OC002, OC004	○	○	○	—	—	—	—	—	—
PKH•FK(3)	OC120, OC197A OC273	○	○	○	○	○	○	—	—	—
PKH•FL	OC276	○	○	—	○	—	○	—	—	—
PCH•GK	OC277	—	○	—	○	—	○	—	—	○

4 PART NAMES AND FUNCTIONS



5

SPECIFICATIONS

**MODELS : PUH18EK PUH24EK PUH30EK PUH36EK PUH42EK PUH42EK7
PUH24EK₁ PUH30EK₁ PUH36EK₁ PUH42EK₁ PUH42EK₇₁
PUH30EK₂ PUH36EK₂**

Model		PUH18EK	PUH24EK		PUH30EK		PUH36EK		PUH42EK	PUH42EK7		
Item		PUH18EK	PUH24EK	PUH24EK ₁	PUH30EK	PUH30EK ₁	PUH36EK	PUH36EK ₁	PUH36EK ₂	PUH42EK	PUH42EK7	
OUTDOOR UNIT MODELS		PUH18EK	PUH24EK	PUH24EK₁	PUH30EK	PUH30EK₁	PUH36EK	PUH36EK₁	PUH36EK₂	PUH42EK	PUH42EK7	
External finish		Munsell 5Y 7/1										
Power supply V, phase, Hz		208/230, 1, 60										
Max.fuse size (time delay) A		20			30				40			
Min.ampacity A		16			20		22		27		28	
Fan motor F.L.A.		0.75	0.65+0.65		0.75+0.75				0.8+0.8			
Compressor	Model (type)	RH247NAB	NH33NBD	NH33NBDT	NH41NAD	NH41NAHT	NH47NAD	NH47NAHT	NH569NXA	ZR42K3PFV		
	R.L.A.	12	11.5	10.8	14.0	12.9	17.5	15.1	20.0		20.4	
	L.R.A.	37	54	57	73	75	87	81	105		109	
Crankcase heater A(W)		0.11/0.12(23/28)			0.16/0.17(33/39)							
Refrigerant control		Capillary tube										
Defrost method		Reverse cycle										
Sound level dB		53		55					56			
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	247	246	248	268		246	
Control voltage (by built-in transformer)		Indoor unit-outdoor unit:DC12V										
REFRIGERANT	Name	R22										
	Charge	5 lbs 8 oz		9 lbs 15 oz		10 lbs 2 oz		10 lbs 9 oz		12 lbs 9 oz		11 lbs 0 oz
	Oil<Model> OZ	16<MS-56>		37<MS32(N-1)>		40<MS32(N-1)>			49<MS32(N-1)>		42<SONTEX 200LT>	
REFRIGERANT 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	Max. 130				Max. 164						
	Piping length ft	Max. 130				Max. 164						

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	D.B. 95°F, W.B. 71°F	D.B. 115°F
	Minimum	D.B. 67°F, W.B. 57°F	D.B. 0°F *
Heating	Maximum	D.B. 80°F, W.B. 67°F	D.B. 75°F, W.B. 65°F
	Minimum	D.B. 70°F, W.B. 68°F	D.B. 17°F, W.B. 15°F

* In case of the wind baffle installed.

(In case of the wind baffle is not installed , the minimum temperature is D.B. 23°F)

1. ADDITIONAL REFRIGERANT CHARGE (R22 : oz)

Service Ref.	Piping length (one way)						Factory charged
	100 ft	115 ft	130 ft	145 ft	160 ft	164 ft	
PUH18EK	0	2	4	—	—	—	5 lbs 8 oz
PUH24EK PUH24EK ₁	0	2	4	6	8	9	9 lbs 15 oz
PUH30EK PUH30EK ₁ PUH30EK ₂	0	5	10	14	19	20	10 lbs 2 oz
PUH36EK PUH36EK ₁ PUH36EK ₂	0	5	10	14	19	20	10 lbs 9 oz
PUH42EK PUH42EK ₁	0	5	10	14	19	20	12 lbs 9 oz
PUH42EK7 PUH42EK7 ₁	0	5	10	14	19	20	11 lbs 0 oz

2. COMPRESSOR TECHNICAL DATA

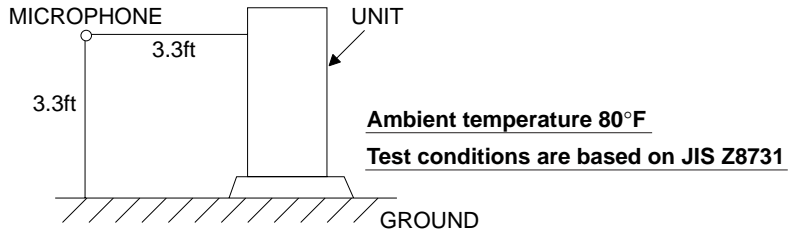
at 68°F(Only PUH42EK7 PUH42EK7₁ : at 77°F)

Unit		PUH18EK	PUH24EK	PUH24EK ₁	PUH30EK PUH30EK ₁	PUH30EK ₂
Compressor model		RH247NAB	NH33NBD	NH33NBDT	NH41NAD	NH41NAHT
Winding Resistance (Ω)	R-C	1.59	0.92	0.92	0.63	0.62
	S-C	3.22	1.93	1.93	1.37	1.51

at 68°F(Only PUH42EK7 PUH42EK7₁ : at 77°F)

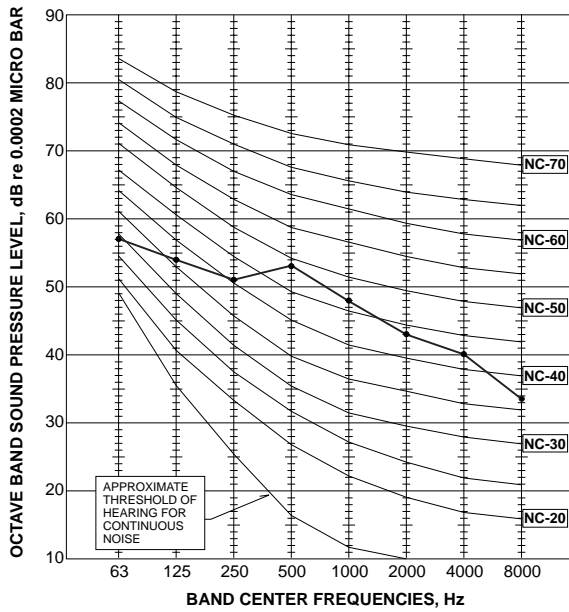
Unit		PUH36EK PUH36EK ₁	PUH36EK ₂	PUH42EK PUH42EK ₁	PUH42EK7 PUH42EK7 ₁
Compressor model		NH47NAD	NH47NAHT	NH569NXA	ZR42K3PFV
Winding Resistance (Ω)	R-C	0.55	0.52	0.55	0.54
	S-C	1.24	1.28	1.24	1.28

3. NOISE CRITERION CURVES



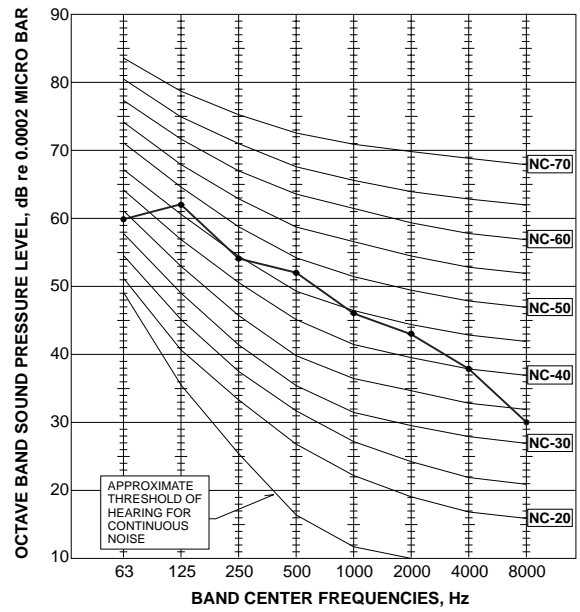
PUH18EK

SPL(dB)	LINE
53	●—●



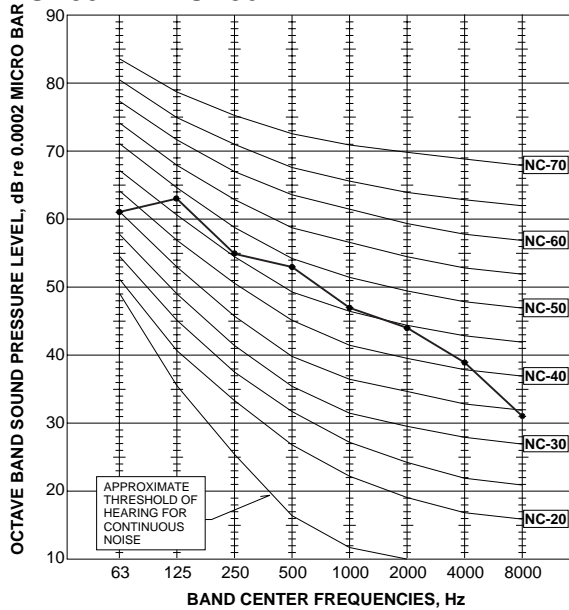
**PUH24EK
PUH24EK₁**

SPL(dB)	LINE
55	●—●



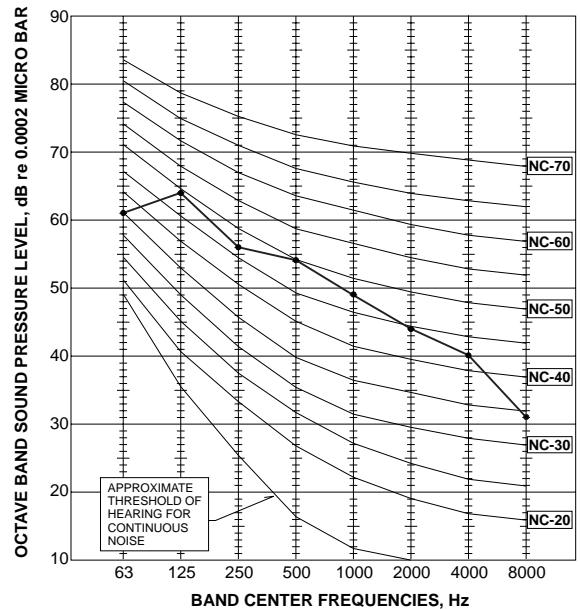
**PUH30EK PUH36EK
PUH30EK₁ PUH36EK₁
PUH30EK₂ PUH36EK₂**

SPL(dB)	LINE
55	●—●



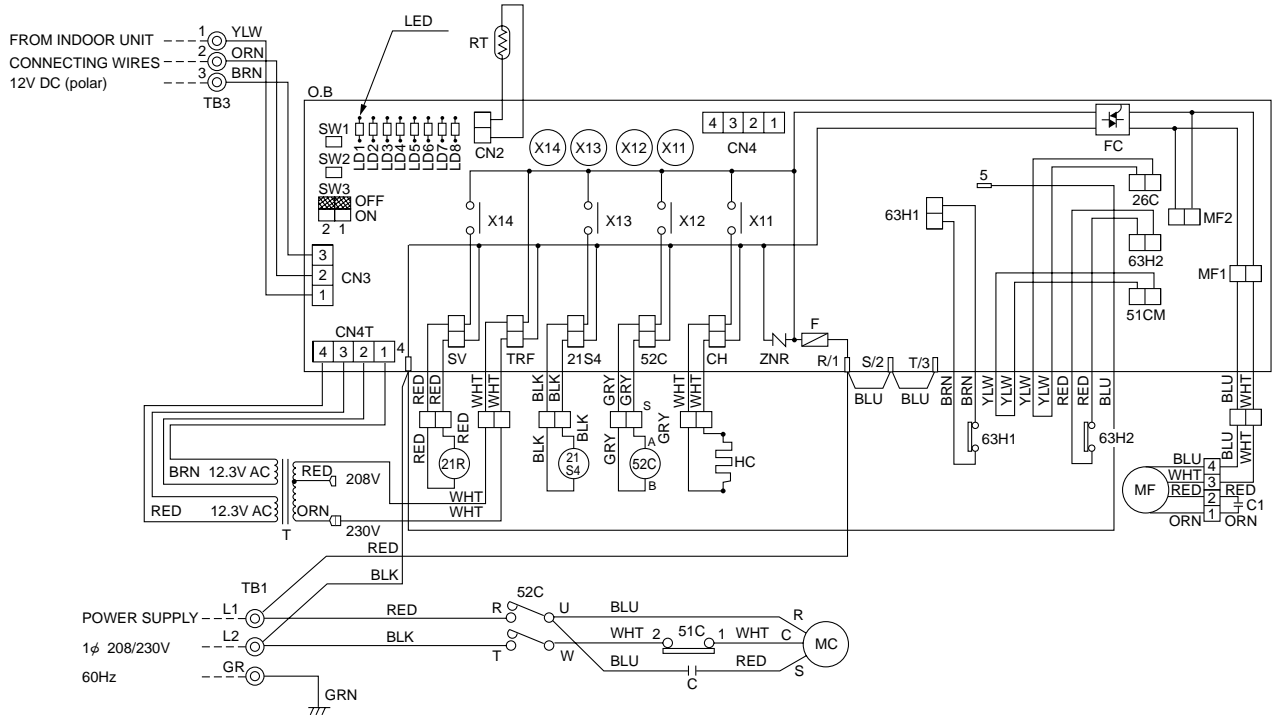
**PUH42EK PUH42EK₇
PUH42EK₁ PUH42EK₇₁**

SPL(dB)	LINE
56	●—●



MODEL : PUH18EK

C	COMPRESSOR CAPACITOR	RT	OUTDOOR COIL THERMISTOR	X14<O.B>	21R 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 SOLENOID COIL
FC<O.B>	FAN CONTROLLER	T	TRANSFORMER	21S4	4-WAY VALVE SOLENOID 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>	21S4 RELAY	63H2	PROTECT HIGH PRESSURE SWITCH
O.B	OUTDOOR CONTROLLER BOARD				



Main function of LED(when both No.1 and 2 of SW3 are "OFF")

LED NO.	Output display (light)	Check display (flush)
LD1	Compressor indoor command	—
LD2	Heating indoor command	—
LD3	63H1 ON	RT short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	—
LD6	4-way valve ON	—
LD7	Bypass valve ON	RT overheat protection
LD8	Crankcase heater ON	Defective input

How to use SW1 and 2

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

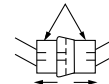
NOTES : 1. If the operation stops to function of the protection device, the check display flashes.

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.

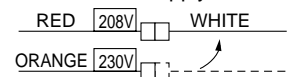
White connector



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

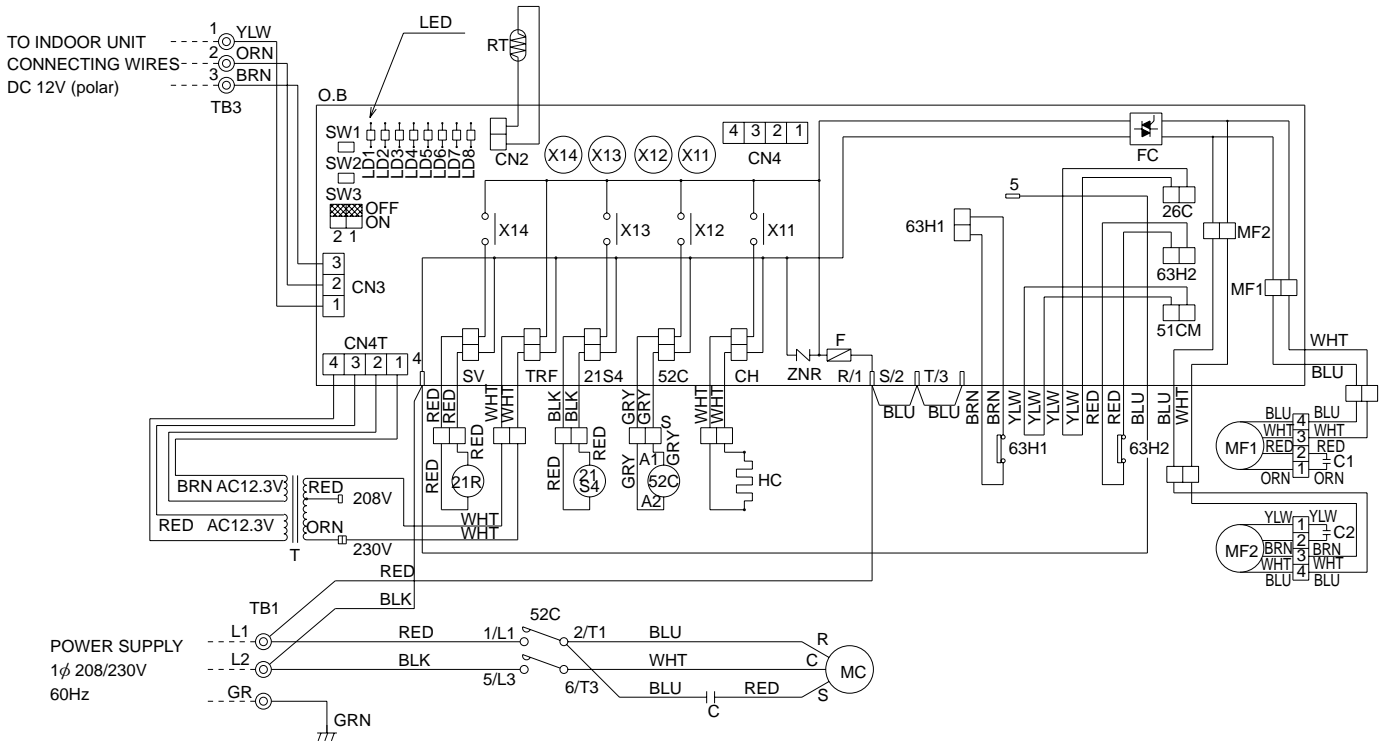


CAUTION FOR INDOOR AND OUTDOOR CONNECTING WIRES

- 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 : PUH24EK PUH24EK₁ PUH30EK PUH30EK₁ PUH30EK₂

HC	CRANKCASE HEATER	MC	COMPRESSOR MOTOR(INNER THERMOSTAT)	X12(O.B)	COMPRESSOR RELAY
C1,2	FAN MOTOR CAPACITOR	MF1,2	FAN MOTOR(INNER THERMOSTAT)	X13(O.B)	21S4 RELAY
C	COMPRESSOR CAPACITOR	O.B	OUTDOOR CONTROLLER BOARD	X14(O.B)	21R RELAY
FC(O.B)	FAN CONTROLLER	SW1*2*3(O.B)	SELECT SWITCH(CHECK,SERVICE)	ZNR(O.B)	VARISTOR
F(O.B)	FUSE(6A)	T	TRANSFORMER	52C	COMPRESSOR CONTACTOR
21S4	4-WAY VALVE SOLENOID COIL	TB1,3	TERMINAL BLOCK	63H1	CONTROL HIGH PRESSURE SWITCH
21R	BYPASS VALVE SOLENOID COIL	RT	OUTDOOR COIL THERMISTOR (32°F/15KΩ, 77°F/5.4KΩ)	63H2	PROTECT HIGH PRESSURE SWITCH
LD1-LD8	LED(CHECK,SERVICE)	X11(O.B)	HC RELAY		



Main functions of LED (when both No.1 and 2 of SW3 are "OFF")


LED NO.	Output display(light)	Check display(flush)
LD1	Compressor indoor command	---
LD2	Heating indoor command	---
LD3	63H1 ON	Pipe temp.sensor short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	---
LD6	4-Way valve 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 flushes.
2. Symbols used in wiring diagram above are. (○):Terminal block (□):Connector (□):PC board insertion tab.

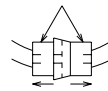
How to use SW1 and 2

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

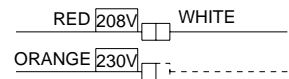
CAUTION FOR SERVICING

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

White connector



* When Power Supply is 208V



CAUTIONS FOR POWER SUPPLY WIRING

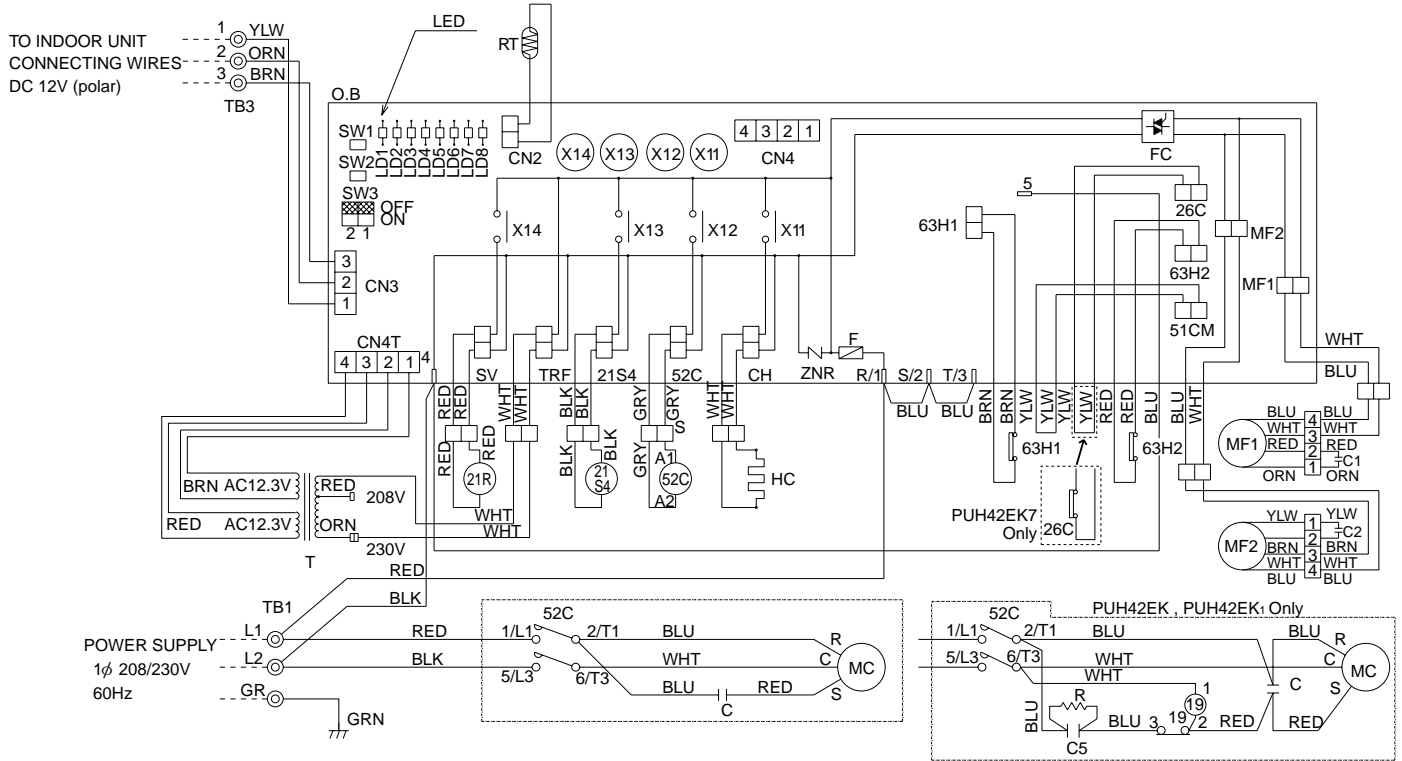
- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- * Since the indoor transformer (T) is connected with 230V power, if 208V power is used, change the wiring connection in the following Procedure.

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 : PUH36EK PUH36EK₁ PUH36EK₂
PUH42EK PUH42EK₁
PUH42EK₇**

HC	CRANKCASE HEATER	MC	COMPRESSOR MOTOR(INNER THERMOSTAT)	X13(O.B)	21S4 RELAY
C1,2	FAN MOTOR CAPACITOR	MF1,2	FAN MOTOR(INNER THERMOSTAT)	X14(O.B)	21R RELAY
C	COMPRESSOR CAPACITOR	O.B	OUTDOOR CONTROLLER BOARD	ZNR(O.B)	VARISTOR
C5	COMPRESSOR START CAPACITOR	SW1*2*3(O.B)	SELECT SWITCH(CHECK,SERVICE)	52C	COMPRESSOR CONTACTOR
FC(O.B)	FAN CONTROLLER	T	TRANSFORMER	63H1	CONTROL HIGH PRESSURE SWITCH
F(O.B)	FUSE(6A)	TB1,3	TERMINAL BLOCK	63H2	PROTECT HIGH PRESSURE SWITCH
21S4	4-WAY VALVE SOLENOID COIL	RT	OUTDOOR COIL THERMISTOR (32°F/15KΩ, 77°F/5.4KΩ)	19	COMPRESSOR START RELAY
21R	BYPASS VALVE SOLENOID COIL	X11(O.B)	HC RELAY	R	RESISTOR
LD1-LD8	LED(CHECK,SERVICE)	X12(O.B)	COMPRESSOR RELAY	26C	DISCHARGE THERMAL SWITCH



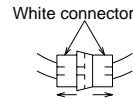
Main functions of LED (when both No.1 and 2 of SW3 are "OFF")

LED NO.	Output display(light)	Check display(flush)
LD1	Compressor indoor command	---
LD2	Heating indoor command	---
LD3	63H1 ON	Pipe temp.sensor short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	---
LD6	4-Way valve ON	26C functions (PUH42EK7)
LD7	Bypass valve ON	RT overhear protection
LD8	Crankcase heater ON	Defective input

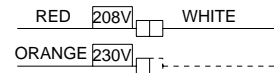
NOTES : 1. If the operation stops to function of the protection device,the check display flushes.
2. Symbols used in wiring diagram above are. ⊙:Terminal block □:Connector ▭:PC board insertion tab.

CAUTION FOR SERVICING

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



※ When Power Supply is 208V



CAUTIONS FOR POWER SUPPLY WIRING

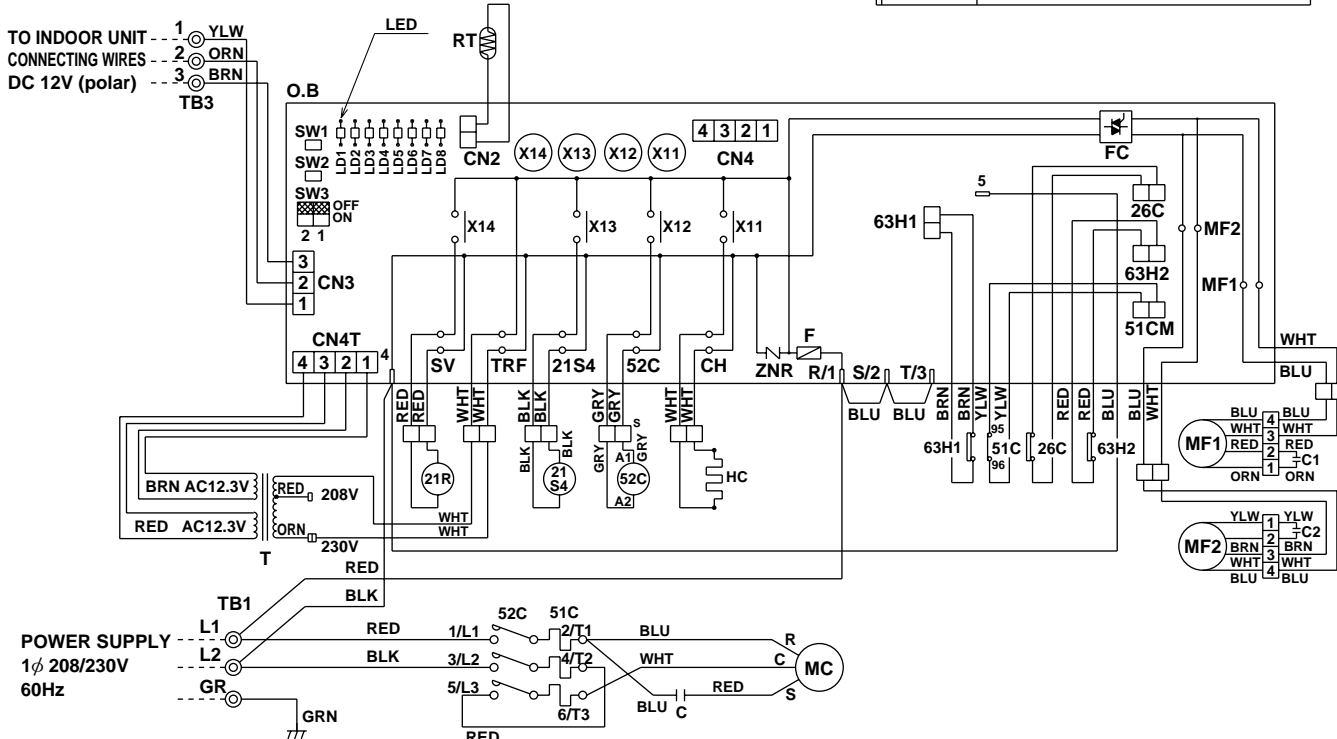
- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- ※ Since the indoor transformer(T) is connected with 230V power, if 208V power is used, change the wiring connection in the following Procedure.

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.

MODEL : PUH42EK7₁

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
HC	CRANKCASE HEATER	MC	COMPRESSOR MOTOR(INNER THERMOSTAT)	X12(O.B)	COMPRESSOR RELAY
C1, 2	FAN MOTOR CAPACITOR	MF1,2	FAN MOTOR(INNER THERMOSTAT)	X13(O.B)	21S4 RELAY
C	COMPRESSOR CAPACITOR	O.B	OUTDOOR CONTROLLER BOARD	X14(O.B)	21R RELAY
FC(O.B)	FAN CONTROLLER	SW1,2,3(O.B)	SELECT SWITCH(CHECK,SERVICE)	ZNR(O.B)	VARISTOR
F(O.B)	FUSE(6A/250V)	T	TRANSFORMER	51C	THERMAL RELAY
21S4	4-WAY VALVE SOLENOID COIL	TB1, 3	TERMINAL BLOCK	52C	COMPRESSOR CONTACTOR
21R	BYPASS VALVE SOLENOID COIL	RT	PIPE TEMPERATURE THERMISTOR (32°F/15kΩ, 77°F/5.4kΩ)	63H1	CONTROL HIGH PRESSURE SWITCH
LD1-LD8	LED(CHECK, SERVICE)	X11(O.B)	HC RELAY	63H2	PROTECT HIGH PRESSURE SWITCH
				26C	DISCHARGE THERMAL SWITCH




Main functions of LED (When both No.1 and 2 of [SW3] are "OFF")

LED NO.	Output display(light)	Check display(flush)
LD1	Compressor indoor command	—
LD2	Heating indoor command	—
LD3	63H1 ON	Pipe temperature sensor short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	51C functions
LD6	4-Way valve ON	26C functions
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 flushes.

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

CAUTION FOR SERVICING

- The connector marked  for 52C is to turn the compressor ON-OFF during servicing. The compressor stops by disconnecting the white connector as shown at the right.

CAUTIONS FOR POWER SUPPLY WIRING

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

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.

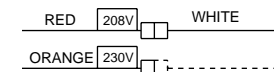
How to use SW1 and 2

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

White connector

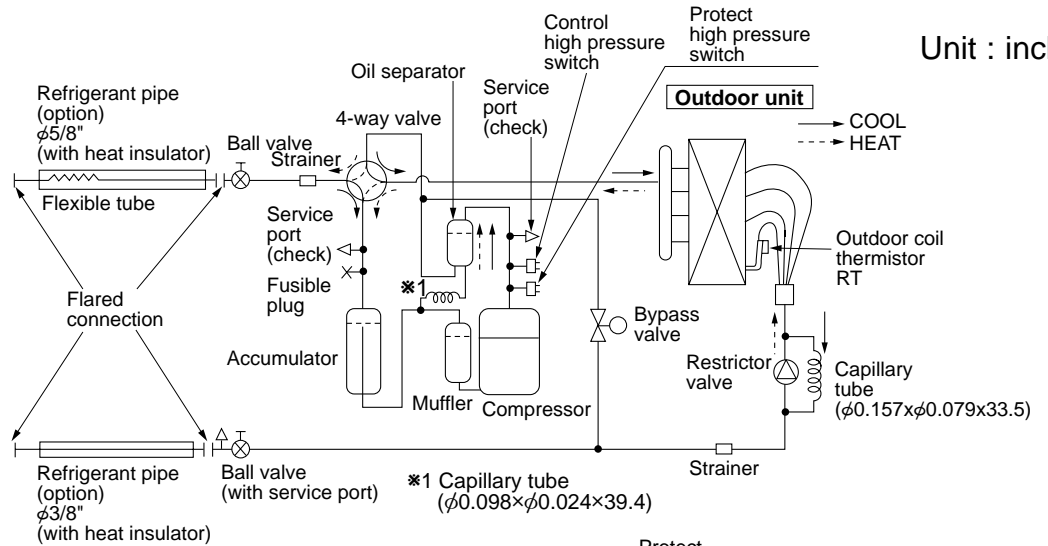


* When Power Supply is 208V

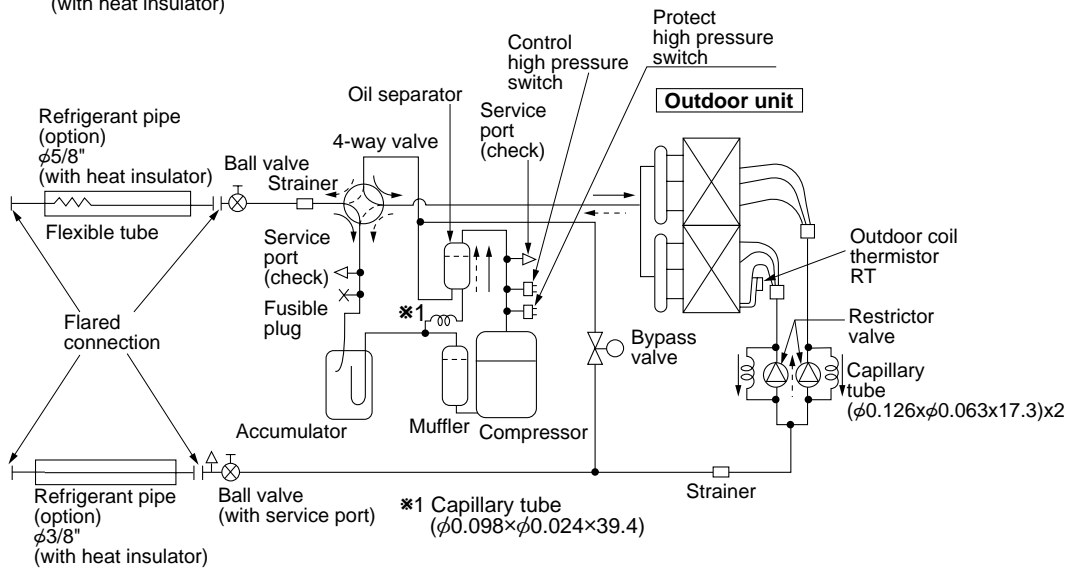


PUH18EK

Unit : inch



PUH24EK
PUH24EK₁

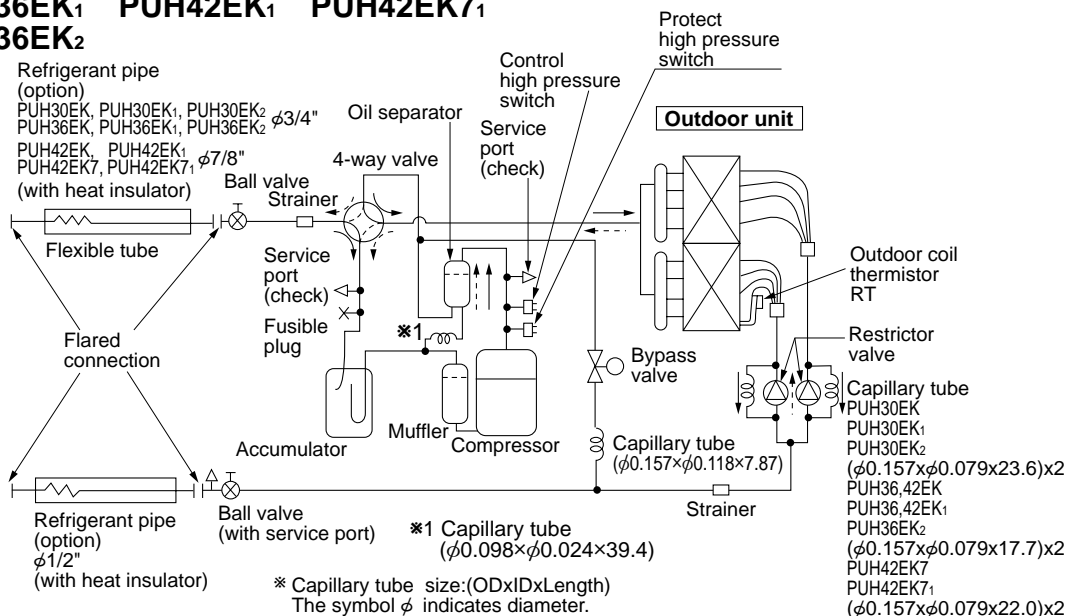


PUH30EK
PUH30EK₁
PUH30EK₂

PUH36EK
PUH36EK₁
PUH36EK₂

PUH42EK
PUH42EK₁

PUH42EK₇
PUH42EK₇₁



1. OUTDOOR UNIT CONTROL

1 Outdoor fan control

The rotational frequency of outdoor fan is phase-controlled according to the outdoor coil temperature. This control allows the cooling operation even with the low outside-air temperature and the heating operation even with the high outside-air temperature.

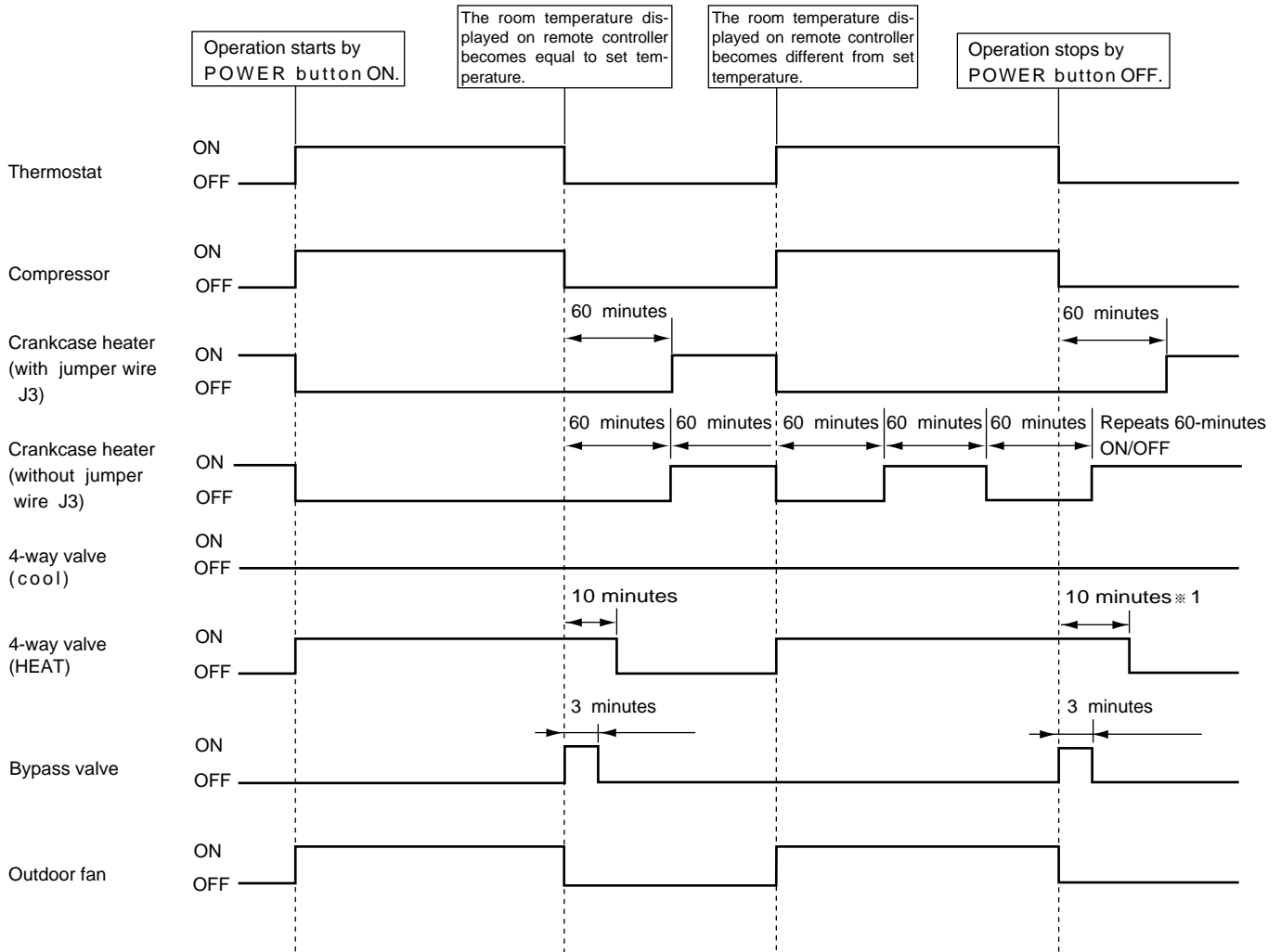
2 Outdoor unit control

The outdoor unit turns ON/OFF the cooling/heating operation according to orders given from the indoor unit.

3 Protective functions

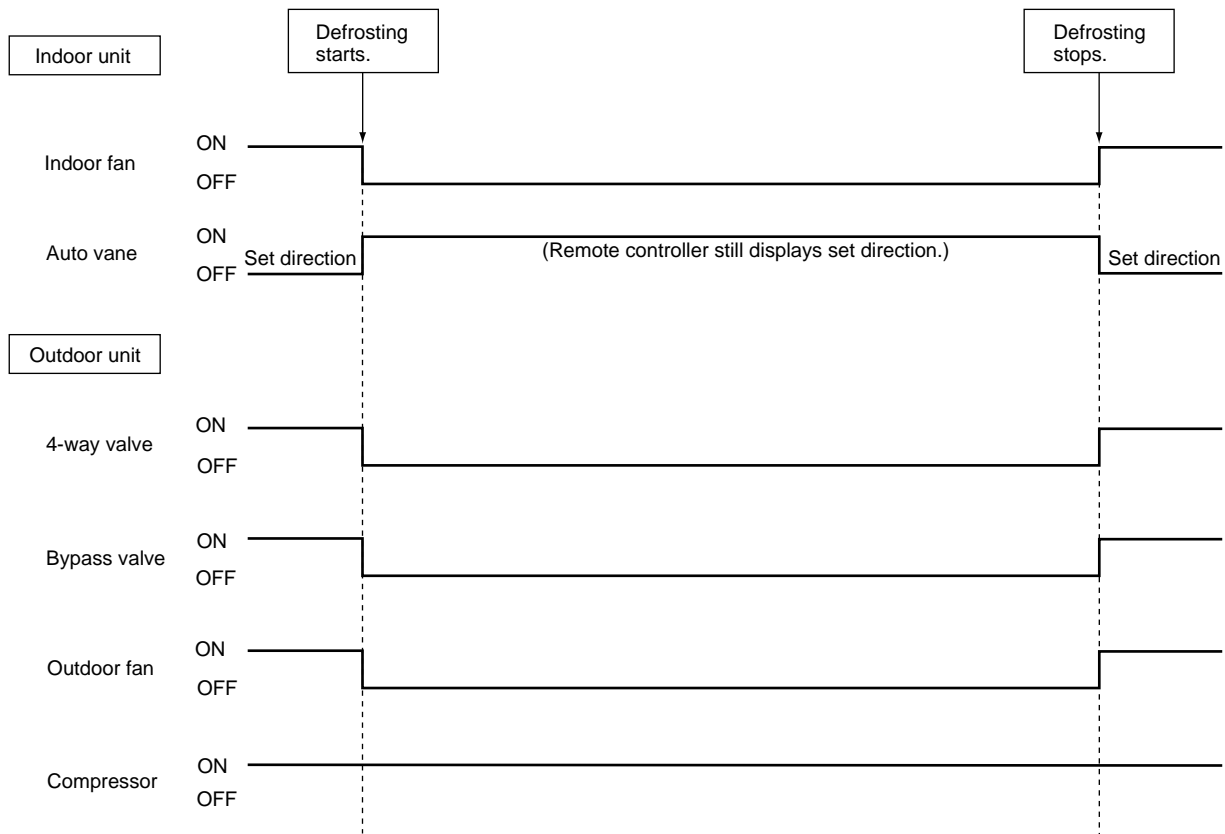
- ① If a reversed-phase, an open phase, or an indoor controller abnormality is detected, the outdoor unit will stop operation and the check mode will start. (For the check mode details, see the indoor unit TECHNICAL & SERVICE MANUAL.)
- ② If a protective function works, the compressor will stop running. Three minutes later, the compressor will restart. If the protective function works again, the compressor will stop running and the check mode will start.
- ③ The protective function is memorized.
- ④ The memory is cleared when the POWER ON/OFF button on the remote controller is turned OFF. However, the check mode display continues until the outdoor unit receives the "operation ON" command from the indoor unit.

4 COOL/HEAT operation time chart



*1 If compressor restarts within 10 minutes, 4-way valve remains ON.

5 Defrosting in HEAT mode <Defrosting time chart>



(1) Start conditions

- A. When all of the following conditions are satisfied, defrosting will start. However, when the bypass valve turns OFF, defrosting starts 10 minutes later.
- More than seven minutes have passed since the compressor start-up.
 - The outdoor coil thermistor reads 23°F or below.
 - The outdoor fan motor output step is 100%
 - Total time of compressor operation exceeds 30 minutes, and the outdoor coil temperature has fallen by 14 degrees or more in comparison with that of 10 minutes after the compressor start-up.

NOTE: The outdoor coil temperature 10 minutes after the compressor start-up is memorized until the defrosting operation has ended.

- B. When all of the following conditions are satisfied, defrosting will start.

- The same as above (a) ~ (c) in item A
- Total time of compressor operation exceeds "defrost interval".

Further information on the defrost interval is described in **(3)**.

- 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 thermostat, if the outdoor coil thermistor reads 23°F or below and the fan output is 100%, defrosting will start.

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

(2) During defrosting

- Even if the thermostat turns OFF, defrosting continues.
- The 4-way valve, bypass valve, outdoor fan, and indoor fan are OFF.

(3) Defrost interval

The defrost interval time is determined as follows.

- Initial defrost interval is 50 minutes.
- The defrost interval after defrosting depends on the preceding defrosting time as shown below.

Defrosting operation time	Next 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, the next defrost interval will be 50 minutes.

NOTE2:If a protection function works for the first time during defrosting, the compressor will stop.

After a 3-minute time delay, defrosting will restart. In this case, a 3-minute time delay is included with the defrosting time.

If the protection function works for the second time, the unit stops operation and displays the check code.

The next defrost interval will be 30 minutes.

NOTE3:When the defrosting has ended, the total time of the compressor operation is cleared.

(4) Termination conditions

Defrosting finishes when any of the following conditions are satisfied.

- ① Defrosting has continued for 15 minutes.
- ② Outdoor coil thermistor reads 72°F or above for the first 75 seconds after defrosting start-up.
- ③ Outdoor coil thermistor reads 46°F or above after the 75-second defrosting.
- ④ Power ON/OFF button is turned OFF during defrosting.

6 Actuators

(1) Bypass valve control

<Cooling mode>

- ① When the unit stops due to the coil frost prevention, the bypass valve turns 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 minutes, the bypass valve turns OFF.
- ③ When the compressor stops with the bypass valve at OFF, the bypass valve turns ON and remains ON for three minutes.

<Heating mode>

- ① When the unit starts for the first time after the circuit breaker has been turned ON, or when it starts after the compressor OFF of 30 minutes or more, if the outdoor coil thermistor reads 54°F or more, the bypass valve turns ON.
- ② When the high pressure switch (63H1) works, the bypass valve turns ON.
- ③ When the bypass has been 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 OFF. Otherwise the normal fan control starts.
- ④ When the operation mode changes or stops, the bypass valve turns ON and remains ON for three minutes.

<Defrosting operation>

- ① The bypass valve is OFF.

(2) Crankcase heater control

① With jumper wire J3

The crankcase heater is ON from when the power is turned ON until the compressor starts, and then turns ON one hour after the compressor stops.

② Without jumper wire J3

The crankcase heater is ON from when the power is turned ON until the compressor starts, and repeats 1-hour ON and 1-hour OFF.

7 Service functions

(1) Compulsory defrosting

- ① When all of the following conditions are satisfied, pressing SW2 starts the compulsory defrosting.
 - During HEAT mode
 - The compressor is ON.
 - The outdoor coil temperature is being displayed by LED.
(Outdoor controller board dip switch SW3-1 : OFF, SW3-2 : ON)
 - The outdoor coil thermistor reads 46°F or below.
- ② The operation state and the termination conditions of the compulsory defrosting are the same as those of the normal defrosting. As an exception, the defrost interval after the defrosting completion is 50 minutes.

(2) Fixed fan-output

While the compressor is operating (except during defrosting) and the fan output step is indicated by LED, pressing SW2 fixes the fan output. The fixed fan-output can be released when any of the following conditions are satisfied.

- ① SW2 is pressed again.
- ② SW3 setting is changed.
- ③ The compressor stops.
- ④ Defrosting operation starts.

(3) 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, refer to page 20.

(4) 100% fan output

Fan output is fixed to 100% by shorting the connector CN22. However, the fan stops during compressor OFF or defrosting. Open-circuit of CN22 restarts the normal fan control.

(5) Time shortening

Short circuit of the connector CN21 shortens the time as follows

- ① Fan control period: 30 seconds → 3 seconds
- ② Three-minutes time delay function : 3 minutes → 3 seconds
- ③ Max. time of defrosting : 15 minutes → 15 seconds
- ④ Defrost interval : 30 ~ 120 minutes → 3 ~ 12 seconds
- ⑤ Compressor ON/OFF time for bypass valve ON/OFF : 30 minutes → 3 seconds
- ⑥ Compressor ON time to start other functions : x minutes → x seconds
- ⑦ Crankcase heater operation : 1 hour → 6 seconds

1. SERVICE DATA INDICATION BY SWITCHES 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 ON while the check code is blinking , the indication changes to output state indication.

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

SW2 : SW2 is turned ON by pressing, and OFF by releasing.

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

When SW2 is turned On with SW3-1 OFF and SW3-2 ON, the compulsory defrosting starts.

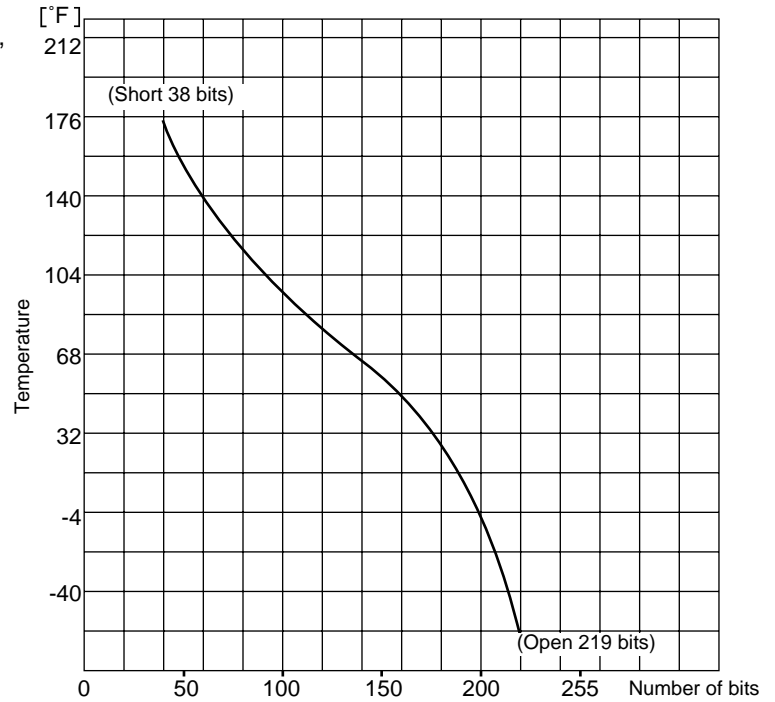
SW3 : Output state indication items depend on the combination of SW3-1 ON/OFF and SW3-2 ON/OFF.

Changed alternately by pressing 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	Compressor ON command from indoor controller	1	1	256
LD2	Open phase	Heating operation command from indoor controller	2	2	512
LD3	Outdoor coil thermistor is abnormal.	During 63H1 function	4	4	1024
LD4	63H2 function	Compressor ON	8	8	2048
LD5	51C function	Outdoor fan ON	16	16	4096
LD6	26C function	4-way valve ON	32	32	8192
LD7	Overheat protection	Bypass valve ON	64	64	16384
LD8	Input circuit on controller board is abnormal	Crankcase heater ON	128	128	32768

1-1 Outdoor coil temperature

To obtain data on the outdoor coil temperature, add the number of bits of lighting LEDs, and see the graph to find the temperature.

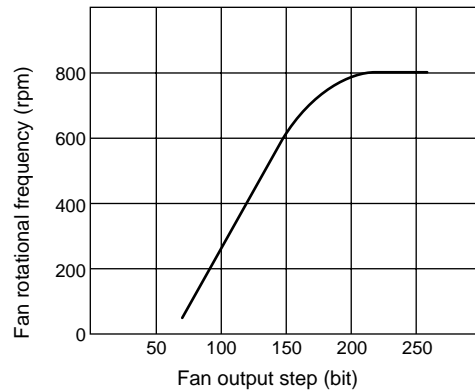
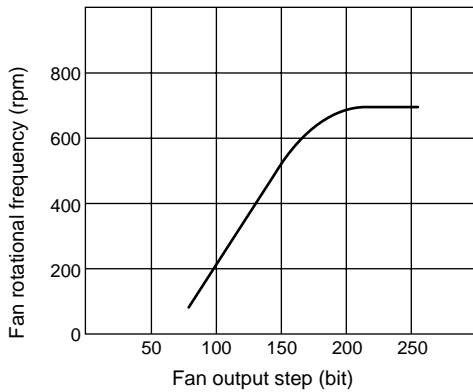


1-2 Fan output step

To obtain data on the fan output step, add the number of bits of lighting LEDs, and see the graph below to find the fan rotational frequency.

① PUH18EK PUH24EK
PUH24EK₁

② PUH30EK PUH36EK PUH42EK PUH42EK₇
PUH30EK₁ PUH36EK₁ PUH42EK₁ PUH42EK₇
PUH30EK₂ PUH36EK₂



1-3 Total time of compressor operation

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

1-4 Check code indication

- When a protection function works for the first time during operation, the operation stops and restarts after the 3-minutes time delay mode. When the protection function works again, the operation stops. (Check mode) When both SW3-1 and SW3-2 are OFF, the check code is indicated.
- If the outdoor controller board receives the compressor ON command from the indoor controller board during check mode the indication changes to output state indication.
- By pressing SW2 during normal operation. operation will continue.
- The latest check code is indicated.

2. TROUBLESHOOTING ACCORDING TO CHECK CODE

Blinking LED	Diagnosis of malfunction	Cause	Check point
LD1	Reversed phase	This model does not have this function.	No need to be checked.
LD2	Open phase	This model does not have this function.	No need to be checked.
LD3	Outdoor coil thermistor is abnormal. (Open circuit or short circuit)	<ul style="list-style-type: none"> ● Outdoor coil thermistor is broken. ● Thermistor was connected incorrectly. 	<ul style="list-style-type: none"> ● Measure the resistance of the thermistor. ● Check the thermistor. If normal, replace the outdoor controller board.
LD4	High pressure switch (63H2) function	<ul style="list-style-type: none"> ● 63H2 was badly connected. ● 63H2 was working. 	<ul style="list-style-type: none"> ● Check 63H2 and the outdoor fan motor. ● Check if refrigerant supply is low. ● Check if air cycle is short-cycled.
LD5	Thermal relay function (PUH42EK7)	<ul style="list-style-type: none"> ● 51C is working. 	<ul style="list-style-type: none"> ● Check 51C.
LD6	Thermal switch (26C) function (PUH42EK7) (PUH42EK7)	<ul style="list-style-type: none"> ● 26C was connected incorrectly. ● 26C is working. 	<ul style="list-style-type: none"> ● Check 26C. ● Check if refrigerant supply is low. ● Check if the capillary tube is clogged.
LD7	Over heat protection	<ul style="list-style-type: none"> ● The thermistor is broken. ● Coil temperature is over 153°F. 	<ul style="list-style-type: none"> ● 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.	<ul style="list-style-type: none"> ● Pulse input is abnormal. 	<ul style="list-style-type: none"> ● Replace the outdoor controller board.

3. WHEN OUTDOOR UNIT DOES NOT WORK

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

4. WRONG WIRING ON SITE

4-1 Between remote controller and indoor unit

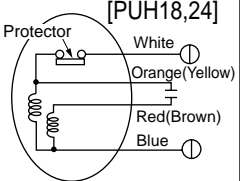
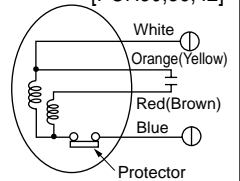
If the wire is disconnected between the remote controller and the indoor unit, nothing is displayed on the remote controller when the POWER button is pressed. The beep sound will also not be heard.

4-2 Phenomenon due to wrong wiring between indoor and outdoor units

Wrong wiring	Mode	Thermostat	Phenomenon
	COOL	OFF	Operation stops.
		ON	4-Way valve turns ON. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Cooling operation. Several minutes later, check code "P8" appears on remote controller display.
		ON	Normal operation.
	COOL	OFF	Outdoor unit stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops.
		ON	Operation stops. 27 minutes later, check code "P8" appears on remote controller display.
	COOL	OFF	Outdoor unit stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops.
		ON	Operation stops. 27 minutes later, check code "P8" appears on remote controller display.
	COOL	OFF	Outdoor unit stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops.
		ON	Operation stops, 27 minutes later, check code "P8" appears on remote controller display.
	COOL	OFF	Outdoor unit stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops.
		ON	Operation stops. 27 minutes later, check code "P8" appears on remote controller display.
Disconnection between 1 and 1 or 2 and 2.	COOL	OFF	Operation stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops. 4-way valve turns OFF.
		ON	27 minutes later, check code "P8" appears on remote controller display.
Disconnection between 3 and 3.	COOL	—	Normal operation.
	HEAT	OFF	Operation stops. 4-way valve turns ON.
		ON	Operation stops. 27 minutes later, check code "P8" appears on remote controller display.

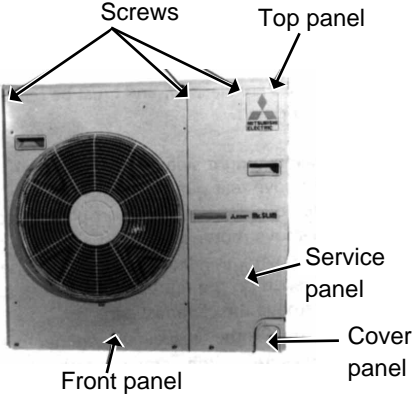
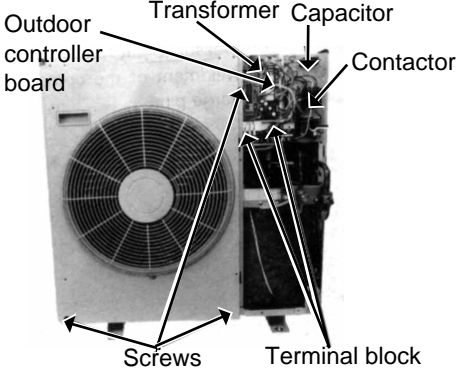
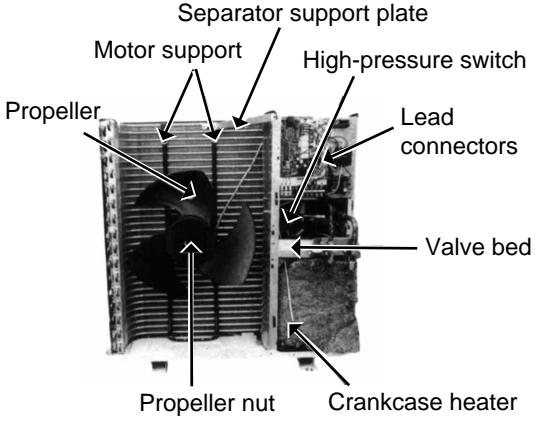
5. HOW TO CHECK THE PARTS

PUH18EK PUH24EK PUH30EK PUH36EK PUH42EK PUH42EK7
PUH24EK₁ PUH30EK₁ PUH36EK₁ PUH42EK₁ PUH42EK7₁
PUH30EK₂ PUH36EK₂

Parts name	Check points																					
OUTDOOR COIL THERMISTOR (RT)	Disconnect the connector then measure the resistance using a tester. (Surrounding temperature 50°F~86°F) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>4.3kΩ~9.6kΩ</td> <td>Open or short</td> </tr> </tbody> </table>	Normal	Abnormal	4.3kΩ~9.6kΩ	Open or short																	
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4.3kΩ~9.6kΩ	Open or short																					
FAN MOTOR(MF,1,2,3,4) [PUH18,24]  [PUH30,36,42] 	Measure the resistance between the terminals using a tester. (Surrounding temperature 68°F) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">Motor terminal or Relay connector</th> <th colspan="4">Normal</th> <th rowspan="2">Abnormal</th> </tr> <tr> <th>PUH18</th> <th>PUH24</th> <th>PUH30,36</th> <th>PUH42</th> </tr> </thead> <tbody> <tr> <td>White — Blue</td> <td>77.3Ω</td> <td>100.2Ω</td> <td>73.9Ω</td> <td>61.5Ω</td> <td rowspan="2">Open or short</td> </tr> <tr> <td>Blue — Red (Brown)</td> <td>134.6Ω</td> <td>83.8Ω</td> <td>118.7Ω</td> <td>79.8Ω</td> </tr> </tbody> </table> <p> Protector OPEN : 275±9°F CLOSE : 187±27°F </p>	Motor terminal or Relay connector	Normal				Abnormal	PUH18	PUH24	PUH30,36	PUH42	White — Blue	77.3Ω	100.2Ω	73.9Ω	61.5Ω	Open or short	Blue — Red (Brown)	134.6Ω	83.8Ω	118.7Ω	79.8Ω
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4-WAY VALVE SOLENOID COIL (21S4)	Measure the resistance between the terminals using a tester. (Surrounding temperature 68°F) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>PUH18,36,42</td> <td>PUH24,30</td> <td rowspan="2">Open or short</td> </tr> <tr> <td>1440Ω</td> <td>1190Ω</td> </tr> </tbody> </table>	Normal		Abnormal	PUH18,36,42	PUH24,30	Open or short	1440Ω	1190Ω													
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PUH18,36,42	PUH24,30	Open or short																				
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BYPASS VALVE SOLENOID COIL (21R)	Measure the resistance between the terminals using a tester. (Surrounding temperature 68°F) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>PUH18,24</td> <td>PUH30,36,42</td> <td rowspan="2">Open or short</td> </tr> <tr> <td>1500Ω</td> <td>1197Ω</td> </tr> </tbody> </table>	Normal		Abnormal	PUH18,24	PUH30,36,42	Open or short	1500Ω	1197Ω													
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PUH18,24	PUH30,36,42	Open or short																				
1500Ω	1197Ω																					
CRANKCASE HEATER (HC)	Measure the resistance between the terminals using a tester. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>PUH18</td> <td>PUH24,30,36,42</td> <td rowspan="2">Open or short</td> </tr> <tr> <td>1920Ω</td> <td>1340Ω</td> </tr> </tbody> </table>	Normal		Abnormal	PUH18	PUH24,30,36,42	Open or short	1920Ω	1340Ω													
Normal		Abnormal																				
PUH18	PUH24,30,36,42	Open or short																				
1920Ω	1340Ω																					

Outdoor unit (PUH18EK)

NOTE : All panels are clasped, and should be removed by shifting up and down.

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

OPERATING PROCEDURE

3. Heat Exchanger, Compressor

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

NOTE :

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

(2) Remove right side panel (4 screws).

(3) Remove rear guard (3 screws).

(4) Remove separator support plate (4 screws).

(5) Remove motor support (2 screws).

(6) Remove valve bed (5 screws). The valve bed is clasped on the right and left sides. Lift to remove.

(7) Remove the electrical parts box.

Remove the respective connector from high pressure switch, crank case heater, shell thermo, and fan motor lead.

(8) Remove separator (2 screws).

(9) Remove heat exchanger (2 screws).

Disconnect the welded section of pipe.

(10) Remove compressor (3 set nuts).

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

PHOTOS

Photo 4

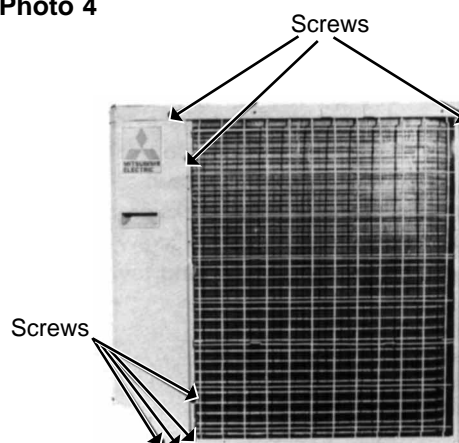


Photo 5

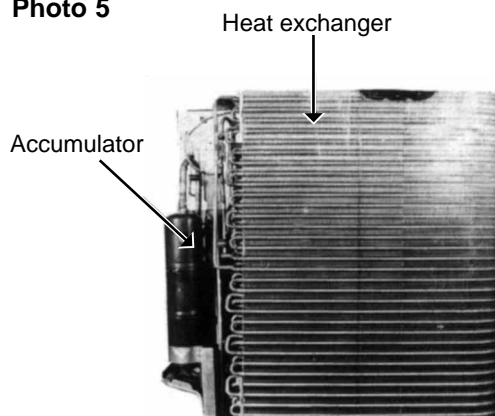
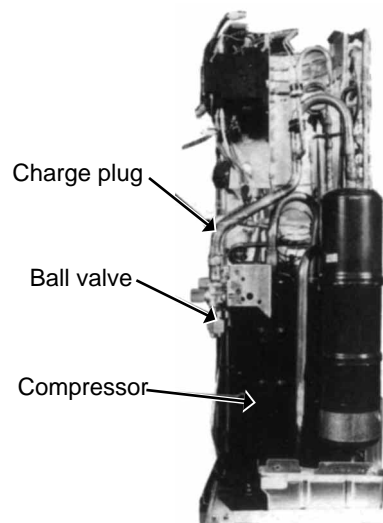


Photo 6



Outdoor unit (PUH24EK)

NOTE : All panels are clasped, and should be removed by shifting up and down.

OPERATING PROCEDURE

1. Electrical parts

- (1) Remove top panel (3 screws in front, 2 screws in rear)
- (2) Remove cover panel (1 screw).
The panel is anchored by clicks to the side panel.
Remove by pulling towards you.
- (3) Remove cover panel (1 screw).
The panel is clasped on the right and left sides. After removing the screw, pull the panel down and remove it by pulling towards you.

2. Fan motor

- (1) Remove front panel (3 screws).
Open the panel to a 45 degree angle and lift to remove. The panel is clasped at three points on the left side.
- (2) Remove propeller (1 set nut).
- (3) Remove fan motor (3 screws).
Remove lead connector.

PHOTOS

Photo 1

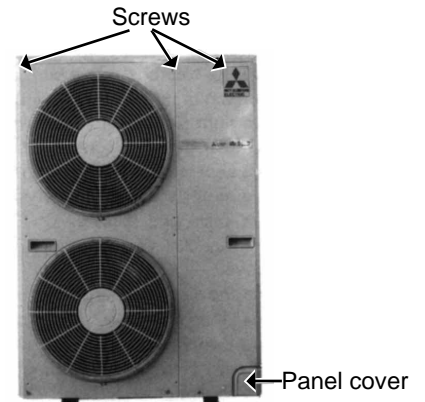


Photo 2

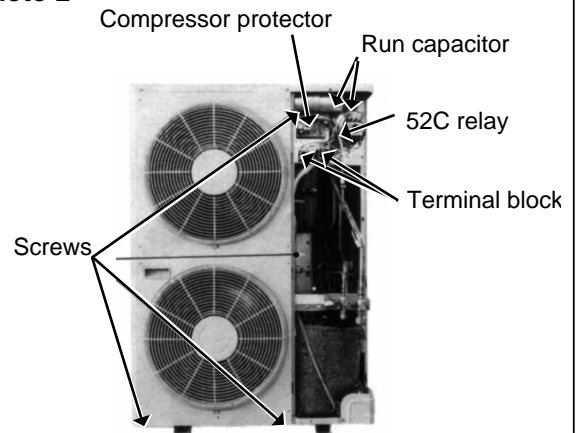
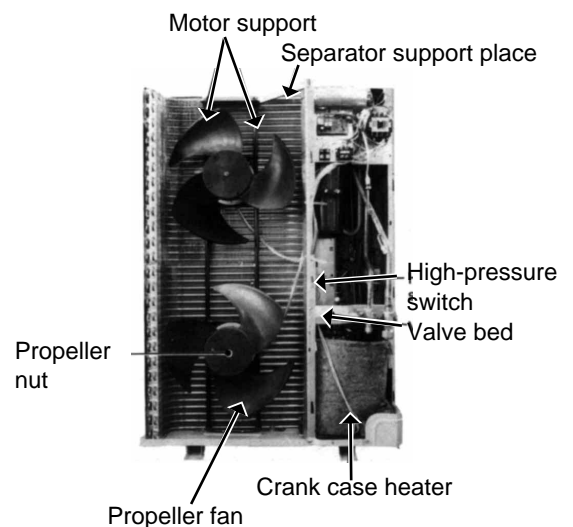


Photo 3



OPERATING PROCEDURE

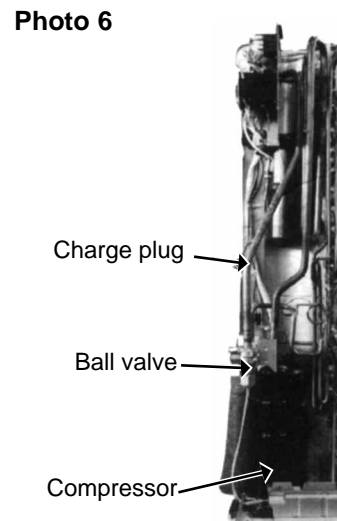
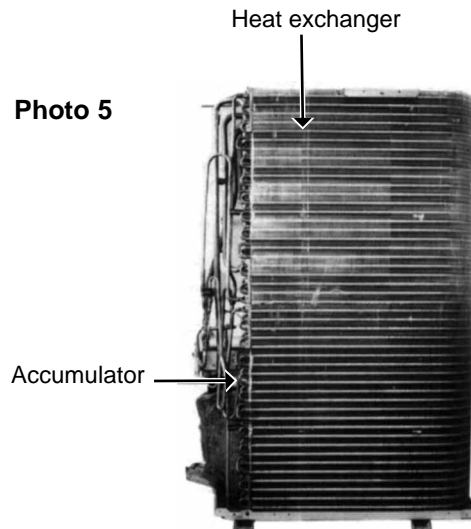
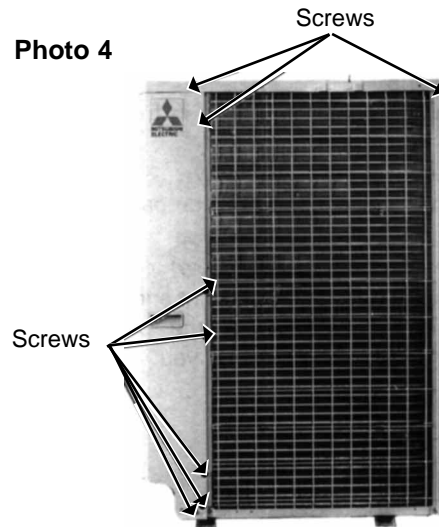
3. Heat Exchanger, Compressor

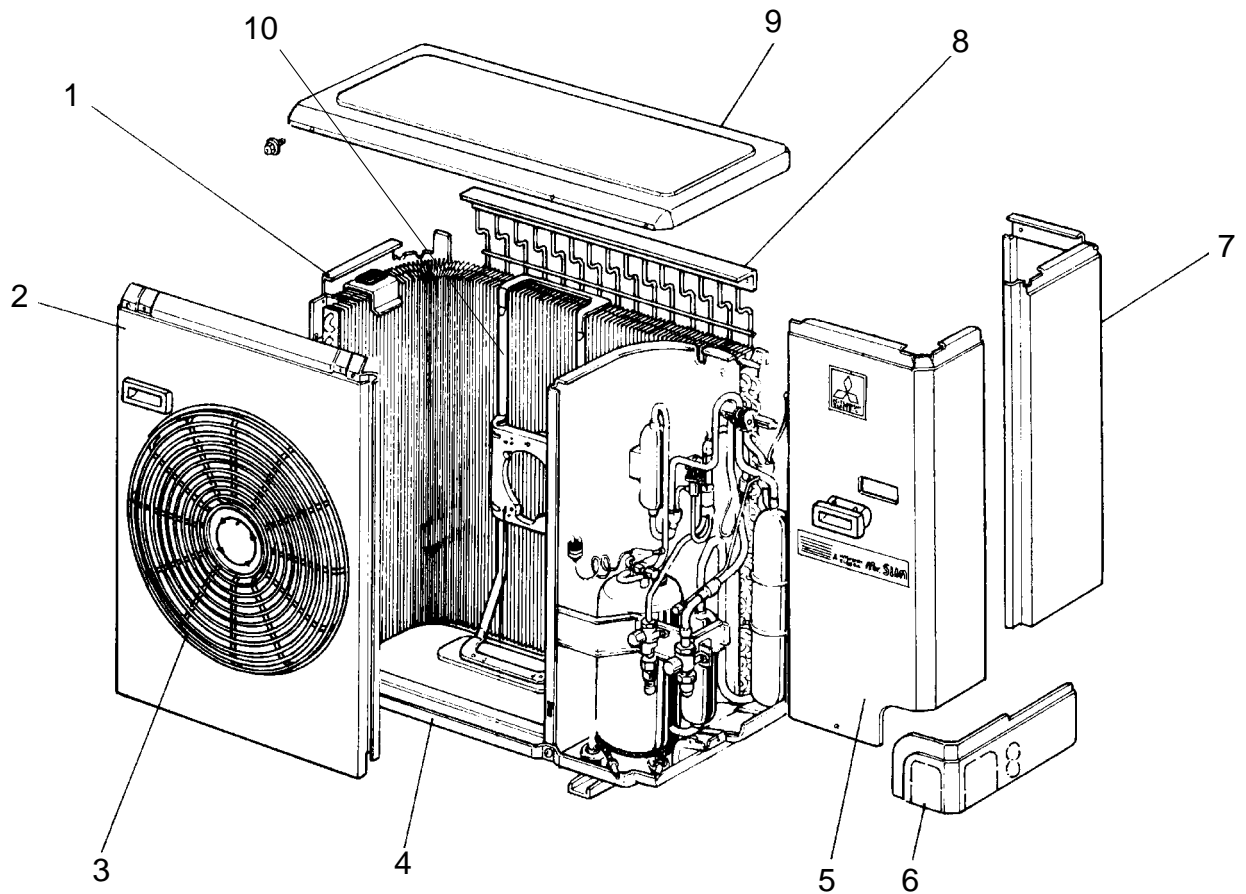
- (1) Remove the rear / right side panel (2 screws in front, 1 screw on the side, 3 screws in the rear).
Remove the electrical box, valve bed, and open to the rear to remove (anchors attached).
- (2) Remove right side panel (4 screws).
- (3) Remove rear guard (3 screws).
- (4) Remove separator support plate (4 screws).
- (5) Remove motor support (2 screws).
- (6) Remove valve bed (5 screws). The valve bed is clasped on the right and left sides. Lift to remove.
- (7) Remove the electrical parts box.
Remove the respective connector from high pressure switch, Low-pressure switch, crank case heater, shell thermo, and fan motor lead.
- (8) Remove separator (2 screws).
- (9) Remove heat exchanger (2 screws).
Remove piping weld zone.
- (10) Remove compressor (3 set nuts).
Remove the weldment of the compressor suction pipe and discharge pipe.

NOTE :

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

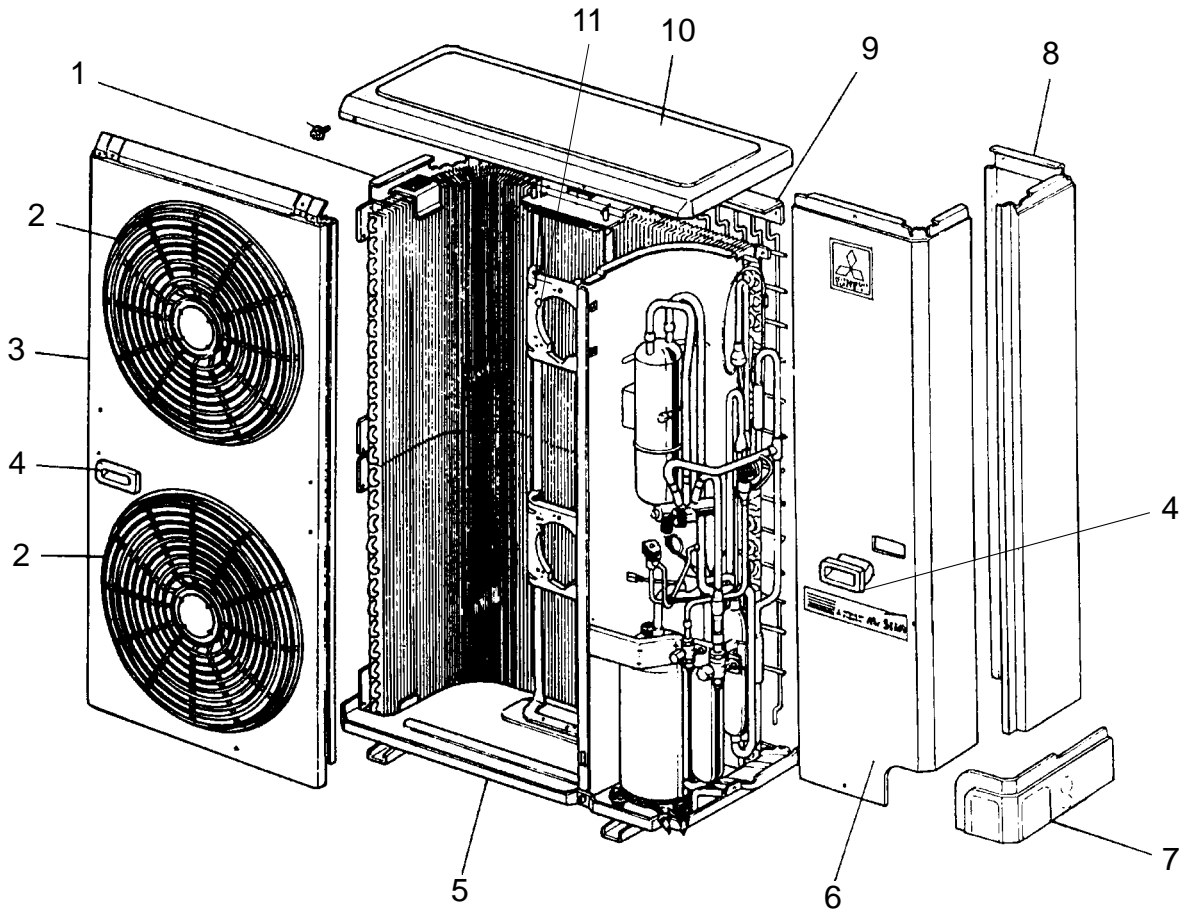
PHOTOS



**STRUCTURAL PARTS
PUH18EK**


No.	Parts No.	Parts Name	Specifications	Q'ty / set		Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH	18EK		
1	R01 A08 662	SIDE PANEL		1			
2	R01 A08 668	FRONT PANEL		1			
3	R01 A00 675	FAN GUARD		1			
4	R01 A00 686	BASE ASSEMBLY		1			
5	R01 A08 661	SERVICE PANEL		1			
6	R01 A00 658	PANEL COVER		1			
7	R01 A08 682	REAR PANEL		1			
8	R01 A08 698	REAR GUARD		1			
9	R01 A00 641	TOP PANEL		1			
10	T7W E03 130	MOTOR SUPPORT		1			

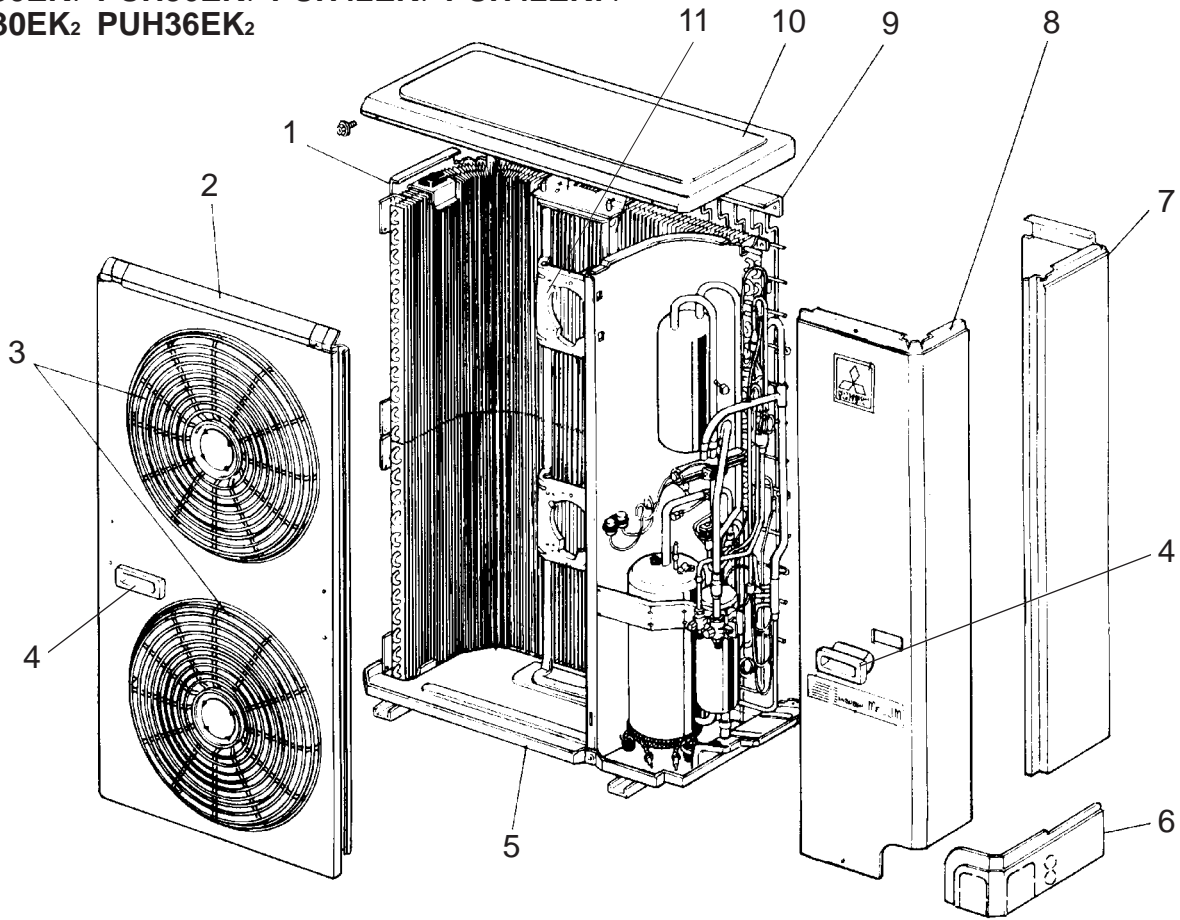
STRUCTURAL PARTS
PUH24EK
PUH24EK₁



No.	Parts No.	Parts Name	Specifications	Q'ty / set		Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH			
				24EK	24EK ₁		
1	R01 A11 662	SIDE PANEL		1	1		
2	R01 A00 675	FAN GUARD		2	2		
3	R01 A11 668	FRONT PANEL		1	1		
4	R01 A00 655	PANEL HANDLE		3	3		
5	R01 A10 686	BASE ASSEMBLY		1	1		
6	R01 A11 661	SERVICE PANEL		1	1		
7	R01 A00 658	PANEL COVER		1	1		
8	R01 A11 682	REAR PANEL		1	1		
9	T7W E04 698	REAR GUARD		1	1		
10	T7W E02 641	TOP PANEL		1	1		
11	T7W E04 130	MOTOR SUPPORT		1	1		

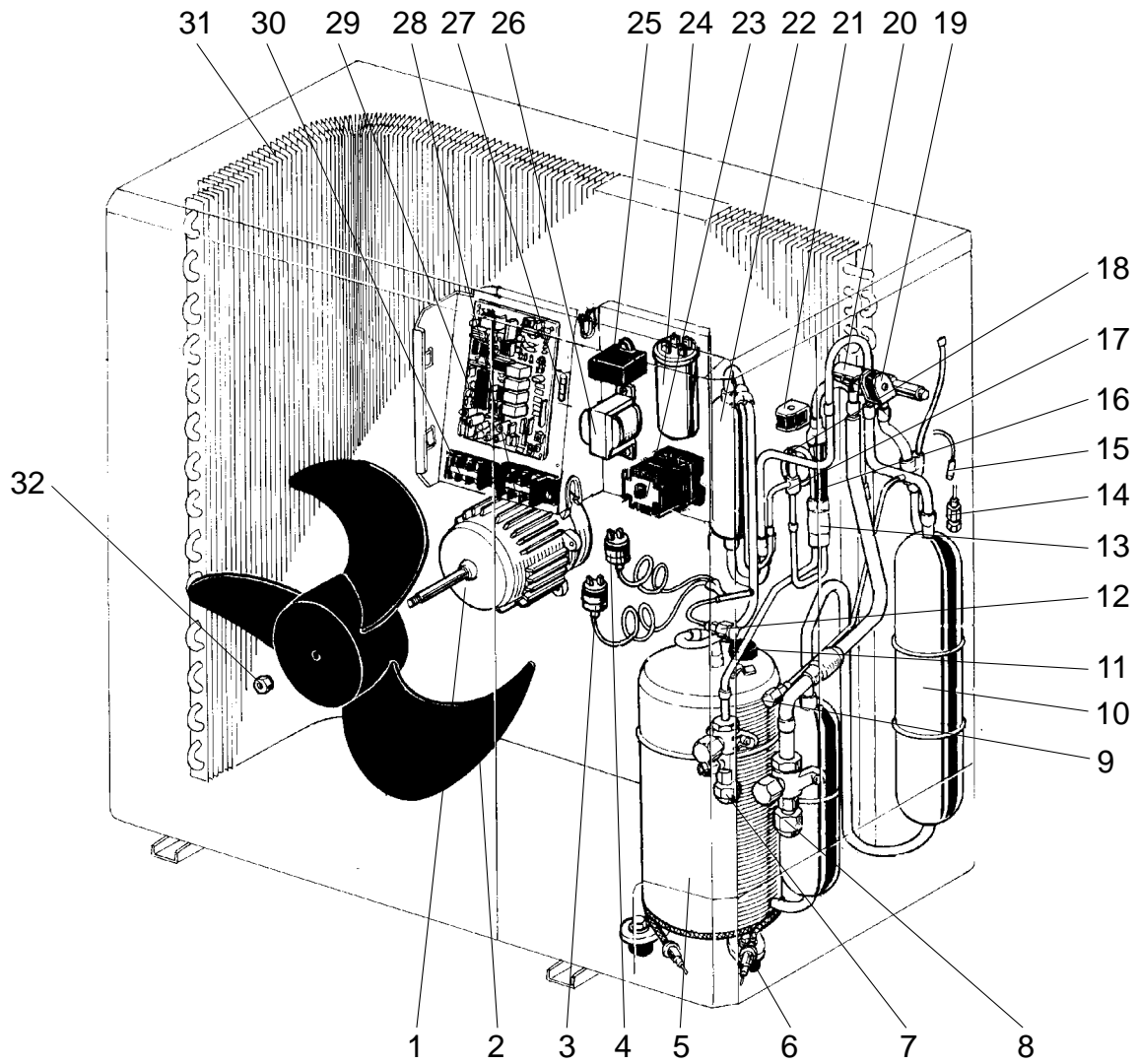
STRUCTURAL PARTS

PUH30EK PUH36EK PUH42EK PUH42EK7
 PUH30EK₁ PUH36EK₁ PUH42EK₁ PUH42EK7₁
 PUH30EK₂ PUH36EK₂



No.	Parts No.	Parts Name	Specifications	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH					
				30,36EK 30,36EK ₁	30,36EK ₂	42EK 42EK ₁	42EK7 42EK7 ₁		
1	R01 A14 662	SIDE PANEL		1	1	1	1		
2	R01 A14 668	FRONT PANEL		1	1	1	1		
3	R01 A00 675	FAN GUARD		2	2	2	2		
4	R01 A00 655	PANEL HANDLE		3	3	3	3		
5	R01 A14 686	BASE ASSEMBLY		1	1	1			
	R01 AK6 686	BASE ASSEMBLY					1		
6	R01 A14 658	PANEL COVER		1	1	1	1		
7	R01 A14 682	REAR PANEL		1	1	1	1		
8	R01 A14 661	SERVICE PANEL		1	1	1	1		
9	T7W E03 698	REAR GUARD		1	1	1	1		
10	R01 A14 641	TOP PANEL		1	1	1	1		
11	R01 85H 130	MOTOR SUPPORT		1	1				
	T7W E02 130	MOTOR SUPPORT				1	1		

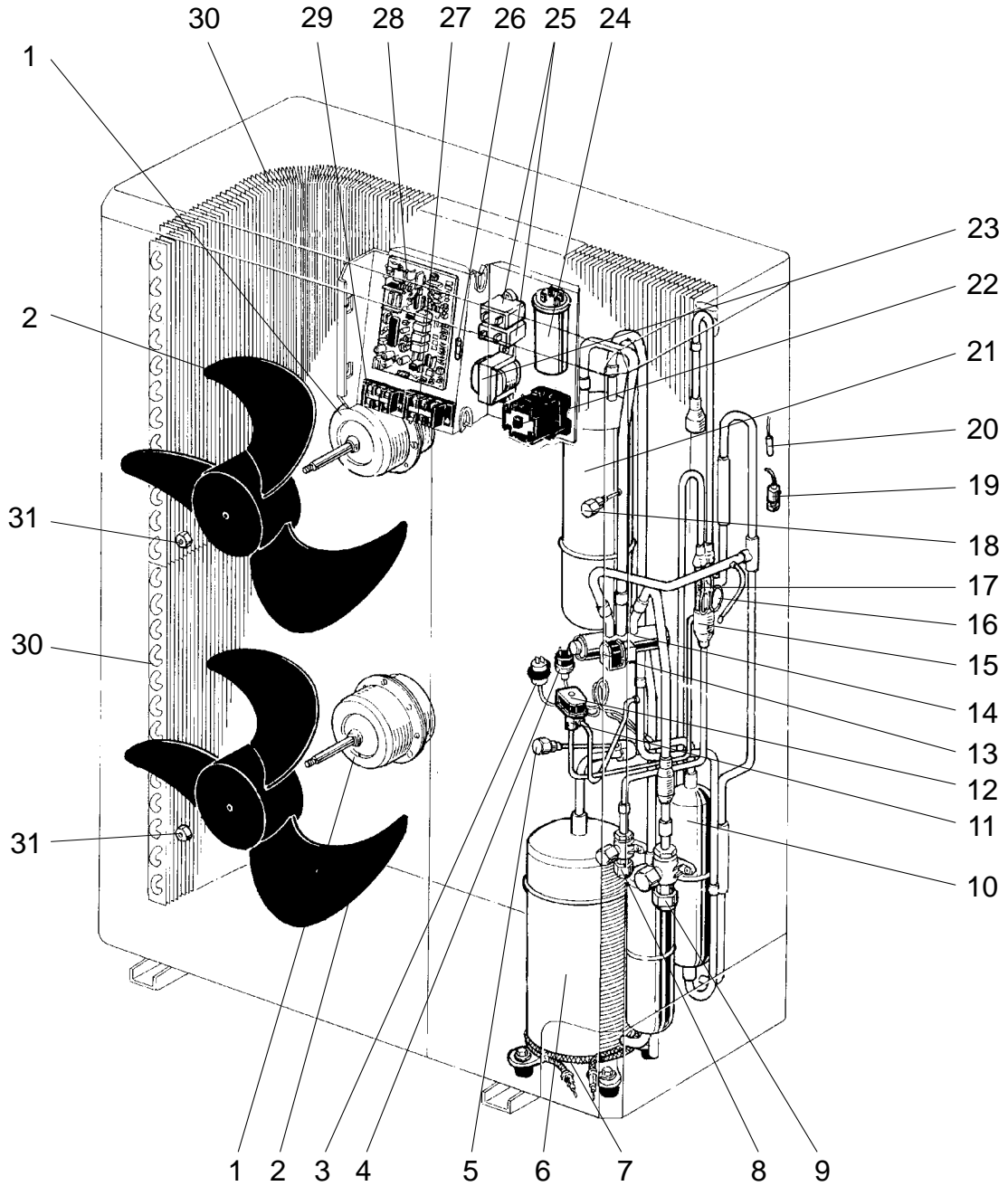
FUNCTIONAL PARTS
PUH18EK



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

No.	Parts No.	Parts Name	Specifications	Q'ty / set		Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH	18EK		
1	T7W 850 763	FAN MOTOR	S6V-85FPH	1			MF
2	R01 A00 115	PROPELLER FAN		1			
3	R01 A00 208	CONTROL HIGH PRESSURE SWITCH	OPEN psiG 363	1			63H1
4	T7W A30 208	PROTECT HIGH PRESSURE SWITCH	OPEN psiG 469	1			63H2
5	T97 665 600	COMPRESSOR	RH247NAB	1			MC
6	T7W 850 236	CRANKCASE HEATER	240V 30W	1			HC
7	R01 943 410	BALL VALVE	3/8	1			
8	R01 951 411	BALL VALVE	5/8	1			
9	R01 943 413	CHARGE PLUG		1			
10	R01 A08 440	ACCUMULATOR		1			
11	T7W 969 238	OVERCURRENT RELAY	MRA98881-90	1			51C
12	R01 590 413	CHARGE PLUG		1			
13	R01 A04 450	STRAINER		1			
14	T7W 973 507	FUSIBLE PLUG		1			
15	R01 J01 202	OUTDOOR COIL THERMISTOR		1			RT
16	R01 L11 418	RESTRICTOR VALVE		1			
17	R01 272 428	BYPASS VALVE		1			
18	T7W 851 425	CAPILLARY TUBE	0.157×0.079×33.5	1			
19	T7W 875 242	4-WAY VALVE SOLENOID COIL		1			21S4
20	T7W 875 403	4-WAY VALVE		1			
21	T7W 869 242	BYPASS VALVE SOLENOID COIL		1			21R
22	R01 V39 490	OIL SEPARATOR		1			
23	T7W A30 708	CONTACTOR	S-U12 208/230V	1			52C
24	T7W 969 723	COMPRESSOR CAPACITOR	30μF 370V	1			C
25	R01 576 255	FAN MOTOR CAPACITOR	3μF 440V	1			C1
26	T7W A30 799	TRANSFORMER	RED:12.3VAC, 0.06A BRN:12.3VAC, 0.06A	1			T
27	T7W 410 239	FUSE	250V 6A	1			F<O.B>
28	T7W 850 716	TERMINAL BLOCK	3P(L1, L2, GR)	1			TB1
29	T7W E08 315	OUTDOOR CONTROLLER BOARD		1			O.B
30	R01 377 246	TERMINAL BLOCK	3P(1, 2, 3)	1			TB3
31	R01 A10 408	OUTDOOR HEAT EXCHANGER		1			
32	R01 30L 097	NUT		1			
33	R01 A00 425	CAPILLARY TUBE	0.098×0.024×39.4	1			

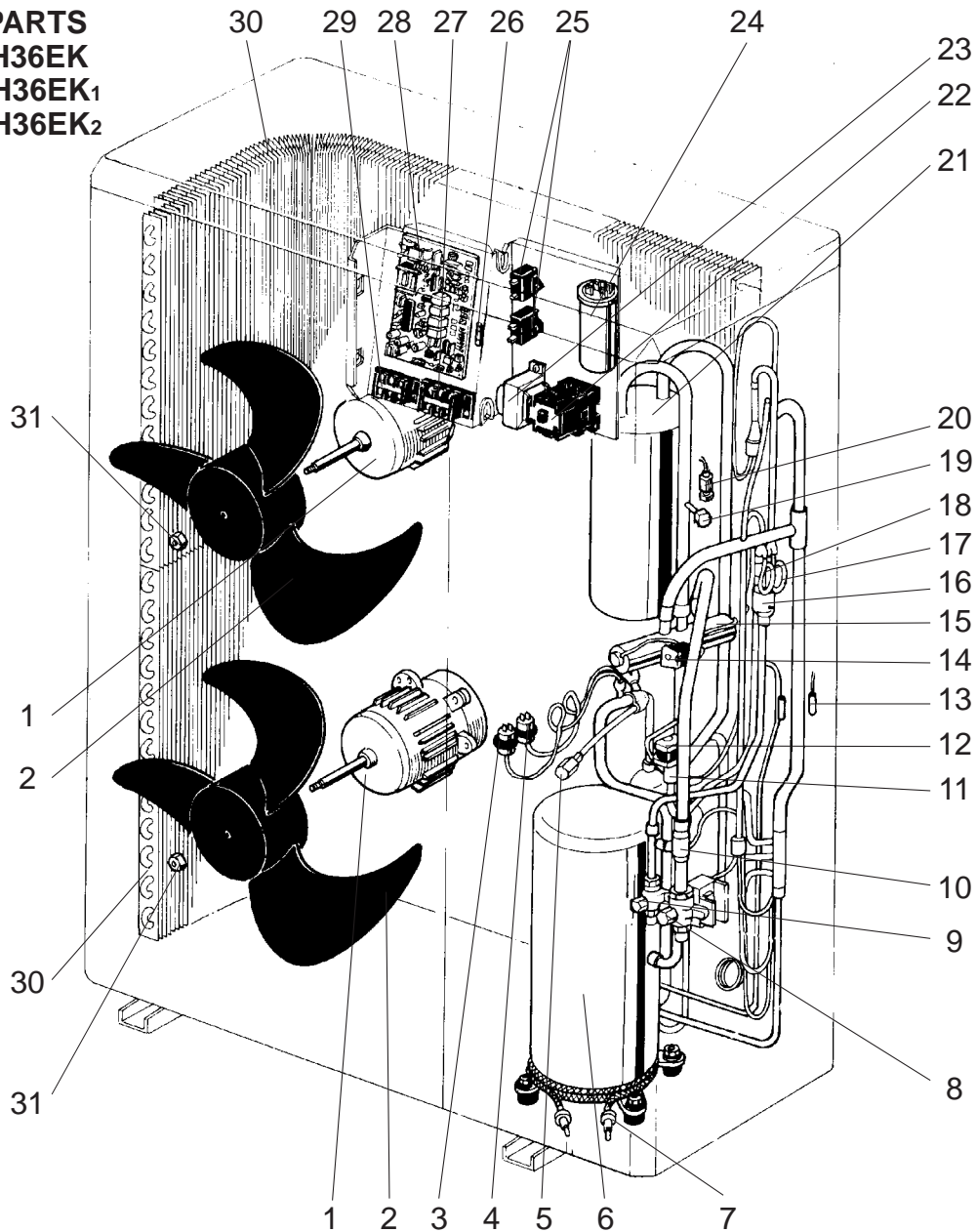
FUNCTIONAL PARTS
PUH24EK
PUH24EK₁



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

No.	Parts No.	Parts Name	Specifications	Q'ty / set		Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH			
				24EK	24EK ₁		
1	T7W 851 763	FAN MOTOR	S6V-60FPP	2	2		MF1, 2
2	R01 A00 115	PROPELLER FAN		2	2		
3	T7W A30 208	PROTECT HIGH PRESSURE SWITCH	OPEN psiG 469	1	1		63H2
4	R01 A00 208	CONTROL HIGH PRESSURE SWITCH	OPEN psiG 363	1	1		63H1
5	T7W A01 413	CHARGE PLUG		1	1		
6	T97 517 300	COMPRESSOR	NH33NBD	1			MC
	T97 501 400	COMPRESSOR	NH33NBDT		1		MC
7	T7W 851 236	CRANKCASE HEATER	240V 43W	1	1		HC
8	R01 943 410	BALL VALVE	3/8	1	1		
9	R01 951 411	BALL VALVE	5/8	1	1		
10	R01 A14 490	OIL SEPARATOR		1	1		
11	R01 272 428	BYPASS VALVE		1	1		
12	T7W 869 242	BYPASS VALVE SOLENOID COIL		1	1		21R
13	T7W A31 242	4-WAY VALVE SOLENOID COIL		1	1		21S4
14	T7W 260 403	4-WAY VALVE		1	1		
15	R01 A11 450	STRAINER		1	1		
16	T7W E14 425	CAPILLARY TUBE	0.126×0.063×17.3	2	2		
17	R01 993 418	RESTRICTOR VALVE		1	1		
18	R01 943 413	CHARGE PLUG		1	1		
19	T7W 973 507	FUSIBLE PLUG		1	1		
20	R01 J01 202	OUTDOOR COIL THERMISTOR		1	1		RT
21	R01 A12 440	ACCUMULATOR		1	1		
22	T7W A13 708	CONTACTOR	S-N25EX	1	1		52C
23	T7W E05 799	TRANSFORMER	RED:12.3VAC, 0.06A BRN:12.3VAC, 0.06A	1	1		T
24	T7W 973 723	COMPRESSOR CAPACITOR	40μF 400V	1	1		C
25	R01 653 255	FAN MOTOR CAPACITOR	4μF 440V	2	2		C1, 2
26	T7W 410 239	FUSE	250V 6A	1	1		F<O.B>
27	T7W 850 716	TERMINAL BLOCK	3P(L1, L2, GR)	1	1		TB1
28	T7W E08 315	OUTDOOR CONTROLLER BOARD		1	1		O.B
29	R01 377 246	TERMINAL BLOCK	3P(1, 2, 3)	1	1		TB3
30	T7W A31 408	OUTDOOR HEAT EXCHANGER		2	2		
31	R01 30L 097	NUT		2	2		
③2	R01 A00 425	CAPILLARY TUBE	0.098×0.024×39.4	1	1		

FUNCTIONAL PARTS
PUH30EK PUH36EK
PUH30EK₁ PUH36EK₁
PUH30EK₂ PUH36EK₂



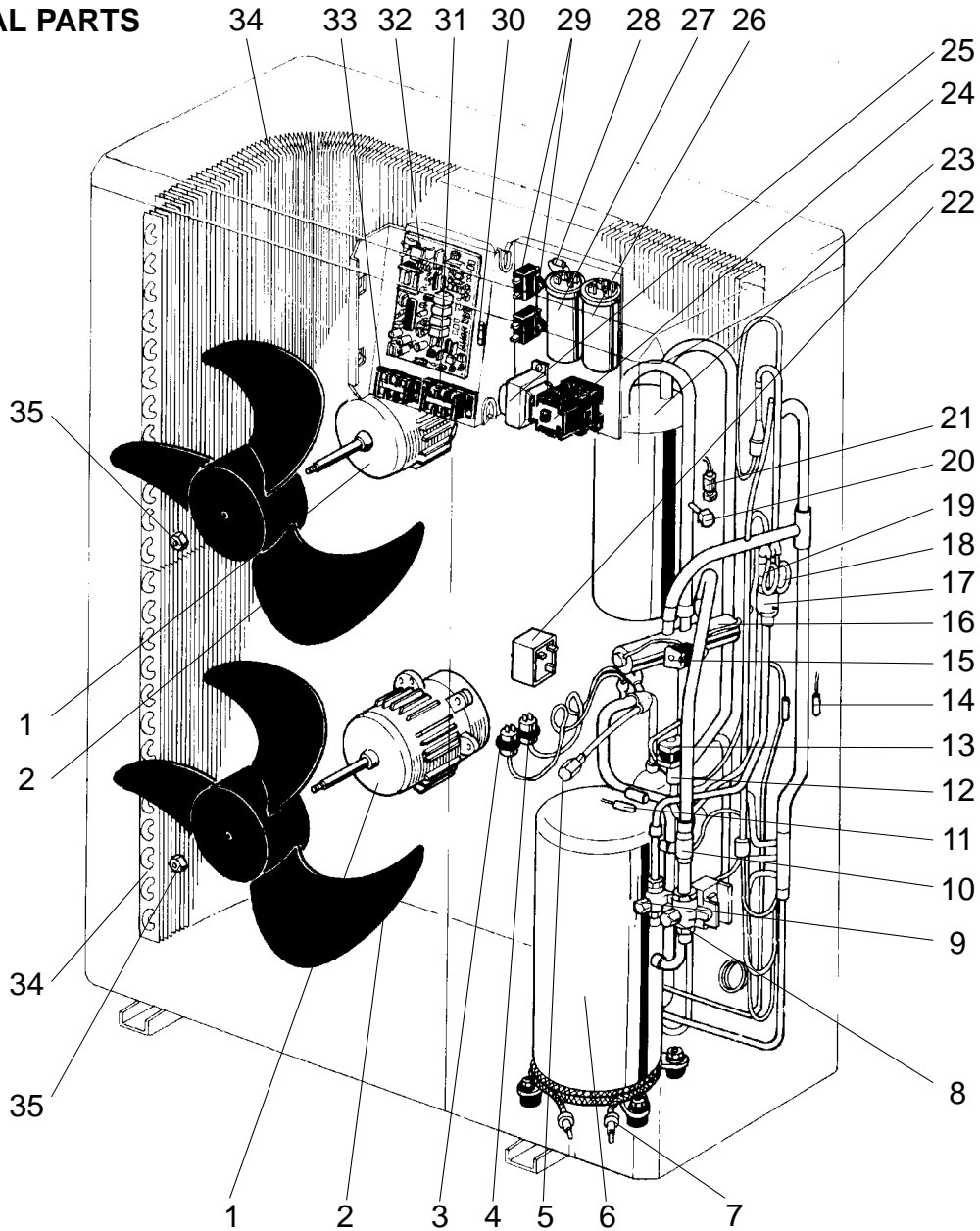
No.	Parts No.	Parts Name	Specifications	Q'ty / set						Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH							
				30EK	30EK ₁	30EK ₂	36EK	36EK ₁	36EK ₂		
1	T7W 852 763	FAN MOTOR	VC086DC	2	2	2	2	2	2		MF1, 2
2	R01 A00 115	PROPELLER FAN		2	2	2	2	2	2		
3	T7W A30 208	PROTECT HIGH PRESSURE SWITCH	OPEN psiG 469	1	1	1	1	1	1		63H2
4	R01 A00 208	CONTROL HIGH PRESSURE SWITCH	OPEN psiG 363	1	1	1	1	1	1		63H1
5	T7W E05 413	CHARGE PLUG		1	1	1	1	1	1		
6	T97 511 300	COMPRESSOR	NH41NAD	1	1						MC
	T97 502 400	COMPRESSOR	NH41NAHT			1					MC
	T97 518 300	COMPRESSOR	NH47NAD				1	1			MC
	T97 503 400	COMPRESSOR	NH47NAHT						1		MC

Part numbers that are circled are not shown in the illustration.

No.	Parts No.	Parts Name	Specifications	Q'ty / set						Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH							
				30EK	30EK ₁	30EK ₂	36EK	36EK ₁	36EK ₂		
7	T7W 851 236	CRANKCASE HEATER	240V 43W	1	1	1	1	1	1		HC
8	R01 670 411	BALL VALVE	3/4	1	1	1	1	1	1		
9	R01 47L 410	BALL VALVE	1/2	1	1	1	1	1	1		
10	R01 42L 450	STRAINER		1	1	1	1	1	1		
11	R01 A14 428	BYPASS VALVE		1			1				
	T7W E02 428	BYPASS VALVE			1	1		1	1		
12	T7W 869 242	BYPASS VALVE SOLENOID COIL		1			1				21R
	T7W E01 242	BYPASS VALVE SOLENOID COIL			1	1		1	1		21R
13	T7W E24 202	OUTDOOR COIL THERMISTOR		1	1	1	1	1	1		RT
14	T7W A31 242	4-WAY VALVE SOLENOID COIL		1	1	1					21S4
	T7W 875 242	4-WAY VALVE SOLENOID COIL					1	1	1		21S4
15	T7W 261 403	4-WAY VALVE		1	1	1					
	T7W 258 403	4-WAY VALVE					1	1	1		
16	R01 A14 450	STRAINER		1	1	1	1	1	1		
17	T7W E15 425	CAPILLARY TUBE	0.157×0.079×23.6	2	2	2					
	T7W E16 425	CAPILLARY TUBE	0.157×0.079×17.7				2	2	2		
18	R01 993 418	RESTRICTOR VALVE		2	2	2	2	2	2		
19	R01 943 413	CHARGE PLUG		1	1	1	1	1	1		
20	T7W 973 507	FUSIBLE PLUG		1	1	1	1	1	1		
21	T7W E01 440	ACCUMULATOR		1	1	1	1	1	1		
22	T7W 867 708	CONTACTOR	S-K25UR	1			1				52C
	T7W A13 708	CONTACTOR	S-N25EX		1	1		1	1		52C
23	T7W E05 799	TRANSFORMER	RED:12.3VAC, 0.06A BRN:12.3VAC, 0.06A	1	1	1	1	1	1		T
24	T7W 867 723	COMPRESSOR CAPACITOR	50μF 400V	1	1	1					C
	T7W 975 723	COMPRESSOR CAPACITOR	60μF 360V				1	1	1		C
25	R01 653 255	FAN MOTOR CAPACITOR	4μF 440V	2	2	2					C1, 2
	R01 576 255	FAN MOTOR CAPACITOR	3μF 440V				2	2	2		C1, 2
26	T7W 410 239	FUSE	250V 6A	1	1	1	1	1	1		F<O.B>
27	T7W 850 716	TERMINAL BLOCK	3P(L1, L2, GR)	1	1	1	1	1	1		TB1
28	T7W E08 315	OUTDOOR CONTROLLER BOARD		1	1	1	1	1	1		O.B
29	R01 377 246	TERMINAL BLOCK	3P(1, 2, 3)	1	1	1	1	1	1		TB3
30	T7W E22 408	OUTDOOR HEAT EXCHANGER		2	2	2					
	T7W E23 408	OUTDOOR HEAT EXCHANGER					2	2	2		
31	R01 30L 097	NUT		2	2	2	2	2	2		
32	R01 A14 490	OIL SEPARATOR		1	1	1	1	1	1		
33	R01 A00 425	CAPILLARY TUBE	0.098×0.024×39.4	1	1	1	1	1	1		
34	T7W A10 425	CAPILLARY TUBE	0.157×0.118×7.87	1	1	1	1	1	1		

FUNCTIONAL PARTS

PUH42EK
 PUH42EK₁
 PUH42EK7
 PUH42EK7₁



No.	Parts No.	Parts Name	Specifications	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH					
				42EK	42EK ₁	42EK7	42EK7 ₁		
1	T7W 853 763	FAN MOTOR	PA6N100UG	2	2	2	2		MF1, 2
2	R01 A00 115	PROPELLER FAN		2	2	2	2		
3	T7W A30 208	PROTECT HIGH PRESSURE SWITCH	OPEN psiG 469	1	1	1	1		63H2
4	R01 A00 208	CONTROL HIGH PRESSURE SWITCH	OPEN psiG 363	1	1	1	1		63H1
5	R01 02L 413	CHARGE PLUG		1	1	1	1		
6	T97 513 300	COMPRESSOR	NH569NXA	1	1				MC
	T97 513 500	COMPRESSOR	ZR42K3PFV			1	1		MC
7	T7W 851 236	CRANKCASE HEATER	240V 43W	1	1	1	1		HC
8	R01 670 411	BALL VALVE	3/4	1	1	1	1		

Part numbers that are circled are not shown in the illustration.

No.	Parts No.	Parts Name	Specifications	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol
				PUH					
				42EK	42EK ₁	42EK ₇	42EK ₇ ₁		
9	R01 47L 410	BALL VALVE	1/2	1	1	1	1		
10	R01 42L 450	STRAINER		1	1	1	1		
11	R01 86H 201	DISCHARGE THERMAL SWITCH				1	1		26C
12	R01 A14 428	BYPASS VALVE		1					
	T7W E02 428	BYPASS VALVE			1	1	1		
13	T7W 869 242	BYPASS VALVE SOLENOID COIL		1					21R
	T7W E01 242	BYPASS VALVE SOLENOID COIL			1	1	1		21R
14	T7W E24 202	OUTDOOR COIL THERMISTOR		1	1	1	1		RT
15	T7W 875 242	4-WAY VALVE SOLENOID COIL		1	1	1	1		21S4
16	T7W 258 403	4-WAY VALVE		1	1	1	1		
17	R01 A14 450	STRAINER		1	1	1	1		
18	R01 591 425	CAPILLARY TUBE	0.157×0.079×17.7	2	2				
	T7W E11 425	CAPILLARY TUBE	0.157×0.079×22.0			2	2		
19	R01 993 418	RESTRICTOR VALVE		2	2	2	2		
20	R01 943 413	CHARGE PLUG		1	1	1	1		
21	T7W 973 507	FUSIBLE PLUG		1	1	1	1		
22	T7W A34 704	COMPRESSOR START RELAY	AMVL320B	1	1				19
23	T7W E01 440	ACCUMULATOR		1	1	1	1		
24	T7W 868 708	CONTACTOR	S-K35UR	1					52C
	T7W A14 708	CONTACTOR	S-N35EX		1	1			52C
	T7W E07 708	CONTACTOR	MSO-N25KF				1		51C, 52C
25	T7W E05 799	TRANSFORMER	RED:12.3VAC, 0.06A BRN:12.3VAC, 0.06A	1	1	1	1		T
26	T7W A34 723	COMPRESSOR CAPACITOR	65μF 400V	1	1				C
	T7W E02 723	COMPRESSOR CAPACITOR	60μF 380V			1	1		C
27	T7W 853 723	COMPRESSOR START CAPACITOR	65μF 400V	1	1				C5
28	T7W A34 234	RESISTOR	15K 4W	1	1				R
29	R01 653 255	FAN MOTOR CAPACITOR	4μF 440V	2	2	2	2		C1, 2
30	T7W 410 239	FUSE	250V 6A	1	1	1	1		F<O.B>
31	T7W 850 716	TERMINAL BLOCK	3P(L1, L2, GR)	1	1	1	1		TB1
32	T7W E08 315	OUTDOOR CONTROLLER BOARD		1	1	1			O.B
	T7W E15 315	OUTDOOR CONTROLLER BOARD					1		O.B
33	R01 377 246	TERMINAL BLOCK	3P(1, 2, 3)	1	1	1	1		TB3
34	R01 V29 408	OUTDOOR HEAT EXCHANGER		2	2				
	T7W E08 408	OUTDOOR HEAT EXCHANGER				2	2		
35	R01 30L 097	NUT		2	2	2	2		
36	R01 A14 490	OIL SEPARATOR		1	1	1	1		
37	R01 A00 425	CAPILLARY TUBE	0.098×0.024×39.4	1	1	1	1		
38	T7W A10 425	CAPILLARY TUBE	0.157×0.118×7.87	1	1	1	1		

Mr. SLIM™

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Distributed in Dec. 2002 No.OC245 REVISED EDITION-C 17
Distributed in Dec. 2002 No.OC245 REVISED EDITION-B 17
Distributed in May 2001 No.OC245 REVISED EDITION-A 25
Distributed in Mar. 2001 No.OC245 20
Made in Japan.

New publication, effective Dec. 2002
Specifications subject to change without notice.