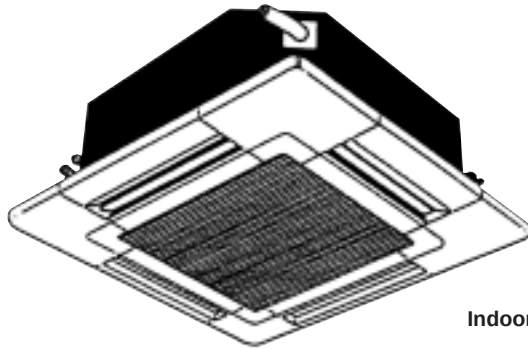


PL12AK
PL18AK
PL24AK
PL30AK
PL36AK
PL42AK

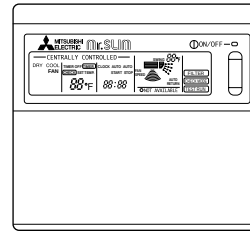
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1

FEATURES



Indoor Unit



Remote controller

Models	Cooling capacity	SEER
PL12AK	12,500 Btu/h	10.1
PL18AK	18,400 Btu/h	10.2
PL24AK	24,000 Btu/h	10.0
PL30AK	31,000 Btu/h	10.6
PL36AK	36,500 Btu/h	10.5
PL42AK	42,500 Btu/h	10.8

1. SPACE-SAVING CENTRALLY LOCATED CEILING RECESSED INSTALLATION

2. 4-WAY AIR FLOW SYSTEM

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

3. STABLE COOLING EVEN AT OUTDOOR TEMPERATURES AS LOW AS 0°F MAKES YEARROUND AIR-CONDITIONING POSSIBLE. WIND BAFFLE REQUIRED.

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

4. ADVANCED MICROPROCESSOR CONTROL

(1) Easy to use Microprocessor (remote controller)

1) Ultra-Thin Remote Controller

The streamlined, wide 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, 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 or off automatically at the 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.

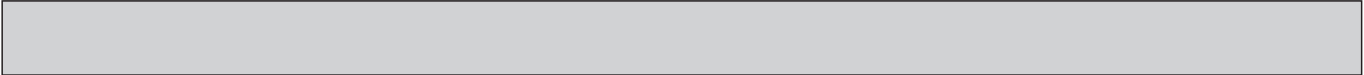
If the check switch is pressed twice, the unit stops operating and the check mode is initiated. The cause of the most recent problem stored in the memory is displayed on the LCD. This is extremely useful for maintenance purposes.

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 trouble-free. Remote controller wire can be extended up to 550 yards.



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

This mechanism, with its capacity to raise drain water 33-7/16 inch above the ceiling line, is convenient for removing water and avoiding piping contact with beams, etc.

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

7. REDI-CHARGED REFRIGERANT SYSTEM

The industry's first redi-charge refrigerant system.

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

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

8. 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.

9. NITROGEN GAS IS CHARGED TO INDOOR UNIT.

Indoor unit and refrigerant pipes are charged with nitrogen gas (N₂) instead of (R22) before shipment from the factory.

● Indoor (Main) Unit

Horizontal Air Outlet

Sets airflow horizontal automatically during cooling or dehumidifying.

Filter

Remove dust and pollutants from return air

Grille

Auto Air Swing Vane

Disperses airflow up and down and adjusts the angle of airflow direction.

Air Intake

Returns air from room.

● Remote controller

On the controls are set, the same operation mode can be repeated by simply pressing the ON/OFF button.

● Operation buttons

TIMER ON/OFF button

This switches between continuous operation and the timer operation.

CLOCK/TIMER button

This sets or switches the current time, start time and stop time.

FAN SPEED button

This sets the ventilation fan speed.

OPERATION MODE button

Press this button to switch the cooling, electronic dry (Dehumidify), fan modes.

ON/OFF button

This switches between the operation and stop modes each time it is press. The lamp on this button lights during operation.

SET TEMPERATURE button

This sets the room temperature. The temperature setting can be performed in 2°F units.
Setting range :
Cooling 65°F to 87°F

AIR DISCHARGE button

This adjusts the vertical angle of the vane.

FILTER button

This resets the filter service indication display.

AIR SWEEP button

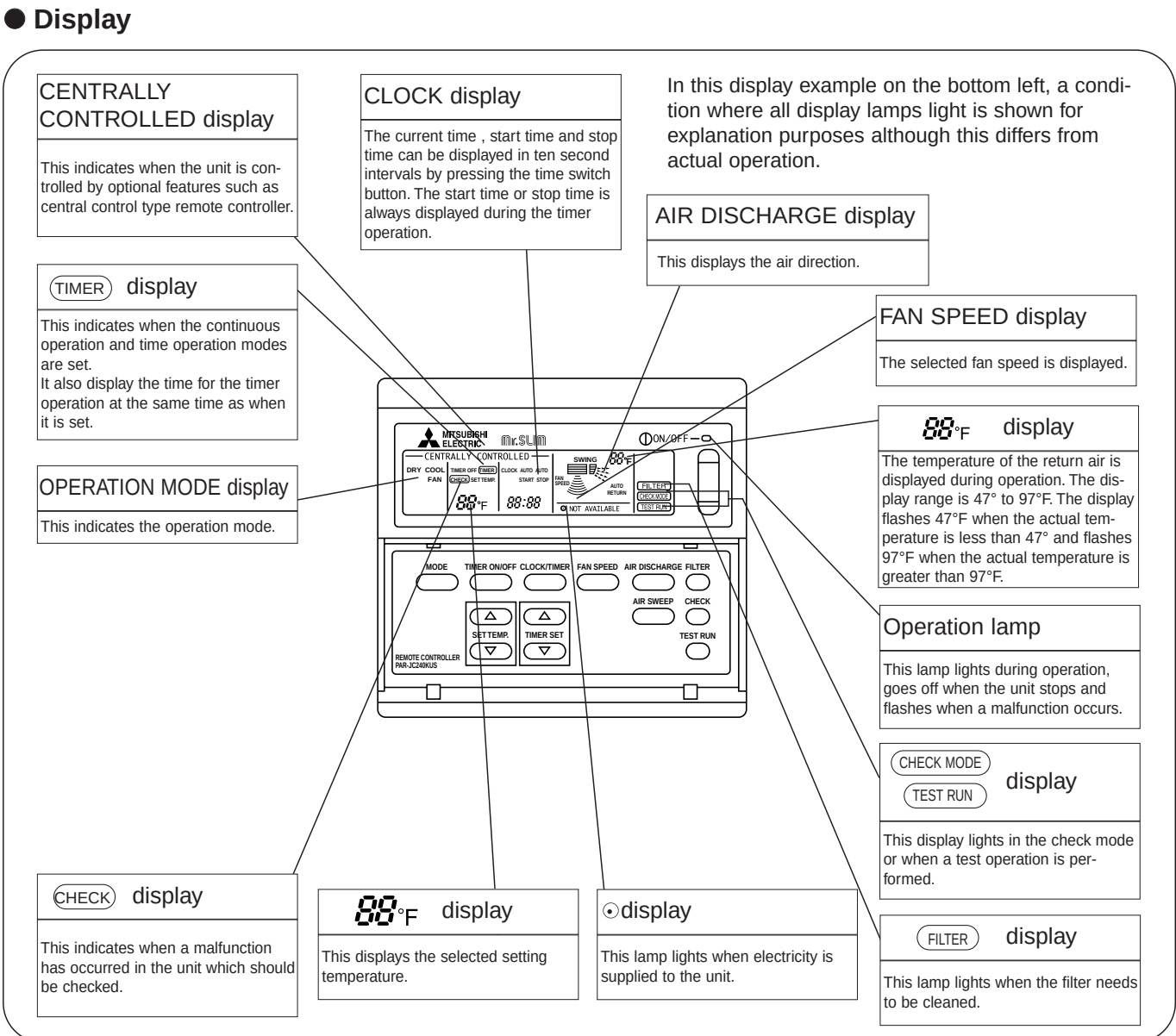
This switches the horizontal louver motion ON and OFF.

CHECK-TEST RUN button

Press twice this button to perform an inspection check or test operation. Do not use it for normal operation.

(Not available for this model.)

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Caution

- Only the  display lights when the unit is stopped and power supplied to the unit.
- When power is turned ON for the first time the (CENTRAL CTRL) display appears to go on momentarily but this is not a malfunction.
- When the central control remote control unit, which is sold separately, is used the ON-OFF button, OPERATION MODE button and SET TEMP button do not operate.
- “NOT AVAILABLE” is displayed when the AIR SWEEP button are pressed.
(AIR SWEEP function is not provided for PL series.)

MODELS : PL12/18/24/30/36/42AK

Model			PL12AK	PL18AK	PL24AK	PL30AK	PL36AK	PL42AK
Item								
Capacity	*1	Btu/h	12,500	18,400	24,000	31,00	36,500	42,500
Moisture removal		Pints/h	3.8	5.3	7.2	9.6	11.1	12.6
Power Consumption	*1	kW	1.26	1.85	2.65	3.17	3.64	4.08
EER	*1		9.9	9.9	9.1	9.8	10.0	10.4
SEER			10.1	10.2	10.0	10.6	10.5	10.8
INDOOR UNIT MODELS			PL12AK	PL18AK	PL24AK	PL30AK	PL36AK	PL42AK
External finish			Galvanized sheets with gray heat insulation					
Power supply			V,phase,Hz 115 , 1 , 60					
Max.fuse size (time delay)			A 15					
Min.ampacity			A 2.0			A 3.0		
Fan motor			F.L.A. 1.2			F.L.A. 2.6		
Airflow Hi-Lo	Dry	CFM	560-420	710-530	990-710	1060-780		
	Wet	CFM	530-390	670-490	950-670	1020-740		
Sound level Hi-Lo			dB	32-27	37-31	41-33	43-45	45-37
Unit drain pipe O.D.			in. 1-1/4					
Dimensions	W	in.	33-1/16					
	D	in.	33-1/16					
	H	in.	10-3/16			11-3/4		
Weight			lb	49	53	66	71	
External finish(GRILLE)			Munsell 0.7Y 8.59/0.97					
Dimensions (GRILLE)	W	in.	37-3/8					
	D	in.	37-3/8					
	H	in.	1-3/16					
Weight(GRILLE)			lb	11				
OUTDOOR UNIT MODELS			PU12EK	PU18EK ₁	PU24EK ₁	PU30EK ₁	PU36EK ₁	PU42EK ₇

NOTES : *1.Rating conditions (cooling)-indoor : 80°FDB,67°F WB outdoor : 95°FDB,75°F WB.

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95°FDB,71°F WB	115°FDB
	Minimum	67°FDB,57°F WB	0°FDB*

★ In case of the wind baffle is installed.
(In case of the wind baffle is not installed, the minimum temperature will be 23°FDB.)

MODELS : PL18/24/30/36/42AK

1. PERFORMANCE DATA
COOLING CAPACITY

Models	Indoor air		Outdoor intake air DB temperature(°F)																	
	Airflow (CFM) B.F.	IWB (°F)	65			75			85			95			105			115		
			TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC
PL12AK	$\frac{530}{0.23}$	71	14.9	10.1	1.05	14.5	9.9	1.10	14.1	9.6	1.18	13.5	9.2	1.29	12.8	8.7	1.41	12.2	8.3	1.51
		67	13.9	11.4	1.02	13.6	11.1	1.07	13.1	10.7	1.15	12.5	10.3	1.26	11.9	9.7	1.37	11.3	9.3	1.46
		63	13.0	12.4	1.00	12.7	12.1	1.05	12.2	11.6	1.13	11.6	11.1	1.23	11.0	10.5	1.33	10.5	10.0	1.41
	DB 75°F (50%RH)	62.5	12.9	11.1	1.00	12.5	10.8	1.05	12.1	10.4	1.12	11.5	9.9	1.22	10.9	9.4	1.32	10.4	8.9	1.41
	DB 72°F (50%RH)	60	12.4	10.7	0.99	12.0	10.4	1.03	11.6	10.0	1.11	11.1	9.5	1.20	10.5	9.0	1.30	9.9	8.5	1.38
	DB 70°F (50%RH)	59	12.2	10.4	0.98	11.8	10.1	1.03	11.4	9.8	1.10	10.8	9.3	1.20	10.2	8.8	1.29	9.7	8.3	1.37
PL18AK	$\frac{670}{0.12}$	71	21.9	14.7	1.54	21.4	14.4	1.61	20.7	13.9	1.74	19.8	13.3	1.90	18.8	12.7	2.07	18.0	12.1	2.22
		67	20.5	16.6	1.50	20.0	16.2	1.58	19.3	15.6	1.69	18.4	14.9	1.85	17.5	14.1	2.01	16.6	13.5	2.14
		63	19.2	18.1	1.47	18.6	17.6	1.54	18.0	16.9	1.66	17.1	16.1	1.80	16.2	15.3	1.95	15.4	14.5	2.07
	DB 75°F (50%RH)	62.5	19.0	16.2	1.47	18.5	15.7	1.54	17.8	15.2	1.65	17.0	14.5	1.80	16.1	13.7	1.94	15.3	13.0	2.06
	DB 72°F (50%RH)	60	18.3	15.5	1.45	17.7	15.1	1.52	17.1	14.5	1.63	16.3	13.8	1.77	15.4	13.1	1.91	14.6	12.4	2.03
	DB 70°F (50%RH)	59	18.0	15.2	1.44	17.4	14.7	1.51	16.8	14.2	1.62	16.0	13.5	1.75	15.1	12.8	1.89	14.3	12.1	2.01
PL24AK	$\frac{950}{0.08}$	71	28.5	19.2	2.20	27.9	18.8	2.31	27.0	18.2	2.49	25.8	17.4	2.72	24.6	16.5	2.97	23.5	15.8	3.18
		67	26.8	21.7	2.16	26.0	21.1	2.26	25.2	20.4	2.43	24.0	19.4	2.65	22.8	18.5	2.87	21.7	17.6	3.06
		63	25.1	23.6	2.11	24.3	22.9	2.21	23.5	22.1	2.37	22.4	21.1	2.58	21.2	19.9	2.79	20.1	19.0	2.97
	DB 75°F (50%RH)	62.5	24.8	21.1	2.10	24.1	20.5	2.20	23.2	19.8	2.36	22.1	18.9	2.57	21.0	17.9	2.78	19.9	17.0	2.96
	DB 72°F (50%RH)	60	23.8	20.3	2.08	23.1	19.6	2.18	22.3	19.0	2.33	21.2	18.0	2.53	20.1	17.1	2.74	19.1	16.2	2.91
	DB 70°F (50%RH)	59	23.4	19.8	2.07	22.7	19.2	2.16	21.9	18.5	2.31	20.8	17.6	2.51	19.7	16.6	2.71	18.7	15.8	2.88
PL30AK	$\frac{1020}{0.10}$	71	36.9	23.7	2.63	36.1	23.2	2.76	34.9	22.4	2.97	33.4	21.4	3.26	31.7	20.4	3.55	30.3	19.5	3.81
		67	34.6	27.0	2.58	33.6	26.2	2.70	32.5	25.3	2.90	31.0	24.2	3.17	29.4	23.0	3.44	28.0	21.9	3.66
		63	32.4	29.5	2.53	31.4	28.6	2.64	30.3	27.6	2.84	28.9	26.3	3.09	27.3	24.9	3.34	26.0	23.7	3.55
	DB 75°F (50%RH)	62.5	32.1	26.4	2.52	31.3	25.6	2.64	30.0	24.7	2.83	28.6	23.5	3.08	27.1	22.3	3.33	25.7	21.2	3.54
	DB 72°F (50%RH)	60	30.8	25.3	2.49	29.9	24.5	2.60	28.8	23.6	2.79	27.4	22.5	3.03	25.9	21.3	3.27	24.6	20.2	3.48
	DB 70°F (50%RH)	59	30.3	24.7	2.47	29.3	23.9	2.59	28.3	23.1	2.77	26.9	21.9	3.01	25.4	20.7	3.25	24.1	19.7	3.44
PL36AK	$\frac{1020}{0.10}$	71	43.4	25.3	3.02	42.5	24.7	3.17	41.1	23.9	3.41	39.3	22.9	3.74	37.4	21.7	4.08	35.7	20.8	4.37
		67	40.7	29.3	2.96	39.6	28.5	3.10	38.3	27.6	3.33	36.5	26.3	3.64	34.6	24.9	3.95	33.0	23.8	4.21
		63	38.1	32.5	2.90	37.0	31.5	3.04	35.7	30.4	3.26	34.0	29.0	3.55	32.2	27.4	3.84	30.6	26.1	4.08
	DB 75°F (50%RH)	62.5	37.7	28.8	2.89	36.6	27.9	3.03	35.3	26.9	3.25	33.7	25.7	3.53	31.9	24.3	3.82	30.3	23.1	4.06
	DB 72°F (50%RH)	60	36.3	27.6	2.85	35.2	26.7	2.99	33.9	25.8	3.20	32.3	24.5	3.48	30.5	23.2	3.76	29.0	22.0	3.99
	DB 70°F (50%RH)	59	35.6	26.9	2.84	34.5	26.1	2.97	33.3	25.2	3.18	31.7	23.9	3.45	29.9	22.6	3.73	28.4	21.5	3.96
PL42AK	$\frac{1020}{0.06}$	71	50.5	27.9	3.39	49.4	27.3	3.56	47.9	26.4	3.83	45.7	25.2	4.19	43.5	24.0	4.57	41.6	22.9	4.90
		67	47.4	32.7	3.32	46.1	31.8	3.48	44.6	30.7	3.74	42.5	29.3	4.08	40.3	27.8	4.43	38.5	26.5	4.72
		63	44.4	36.5	3.25	43.1	35.4	3.40	41.6	34.2	3.65	39.6	32.5	3.97	37.5	30.8	4.30	35.7	29.3	4.57
	DB 75°F (50%RH)	62.5	43.9	32.2	3.24	42.7	31.2	3.39	41.2	30.1	3.64	39.2	28.7	3.96	37.1	27.2	4.28	35.3	25.8	4.55
	DB 72°F (50%RH)	60	42.2	30.8	3.20	40.9	29.9	3.35	39.5	28.8	3.59	37.6	27.4	3.90	35.5	25.9	4.21	33.7	24.6	4.47
	DB 70°F (50%RH)	59	41.5	30.1	3.18	40.2	29.2	3.33	38.7	28.1	3.56	36.9	26.8	3.87	34.8	25.3	4.18	33.1	24.0	4.43

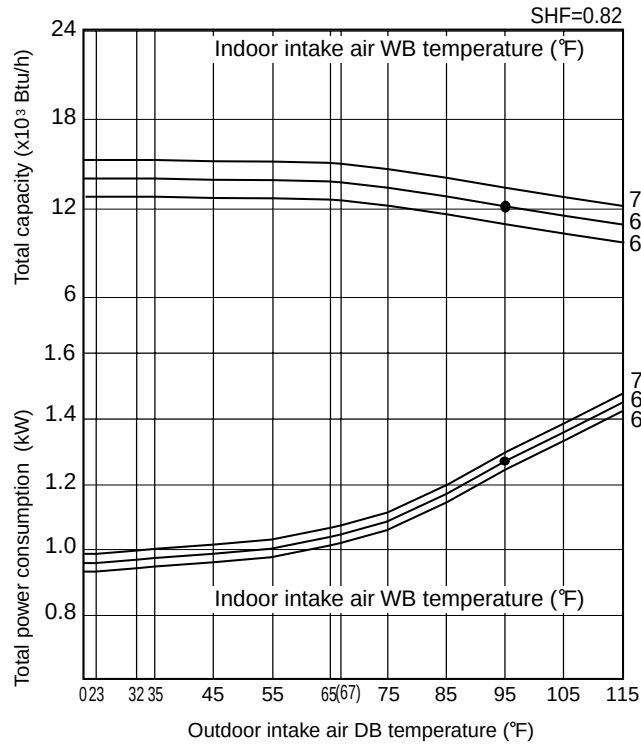
Notes 1. B.F. : Bypass Factor, IWB : Intake air wet-bulb temperature
 TC : Total Capacity (x10³ Btu/h), SHC : Sensible Heat Capacity (x10³ Btu/h)
 TPC : Total Power Consumption (kW)
 2. SHC is based on 80°FDB of indoor intake air temperature.

MODEL	Refrigerant piping length (one way)									
	25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PL12AK	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PL18AK	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PL24AK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PL30AK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PL36AK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PL42AK	1.0	0.975	0.955	0.935	0.918	0.900	0.884	0.869	0.855	0.840

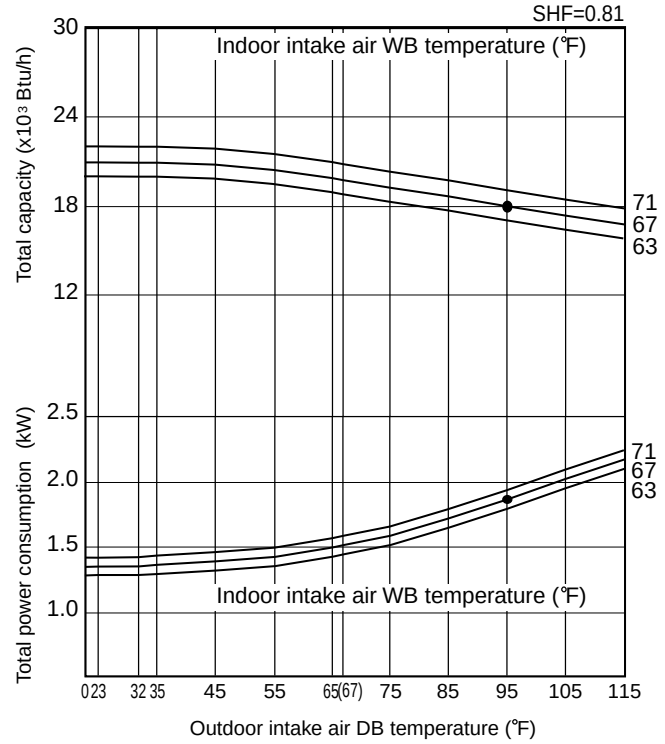
2. PERFORMANCE CURVE

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

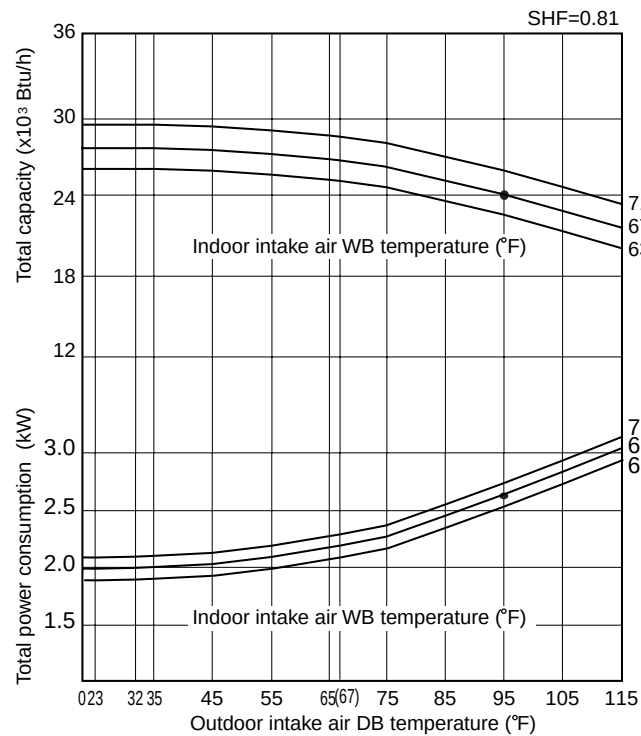
PL12AK COOLING CAPACITY



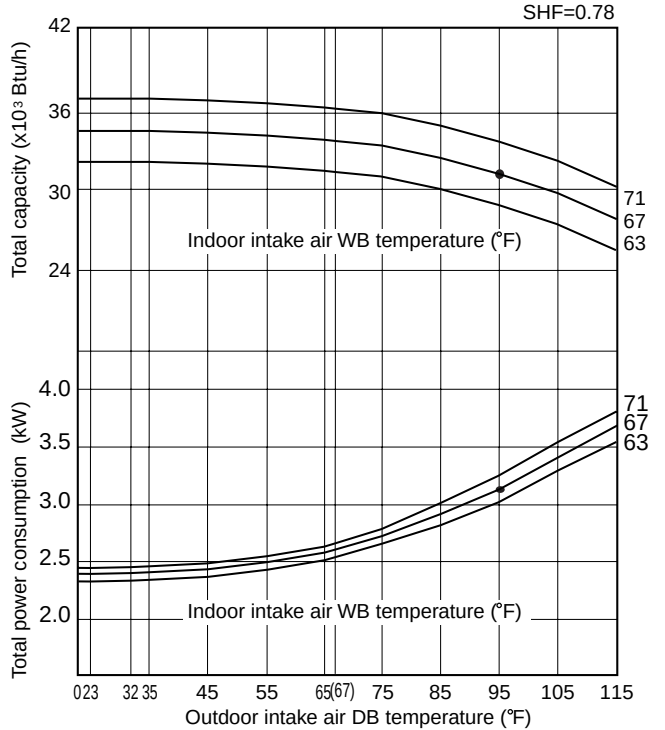
PL18AK COOLING CAPACITY



PL24AK COOLING CAPACITY

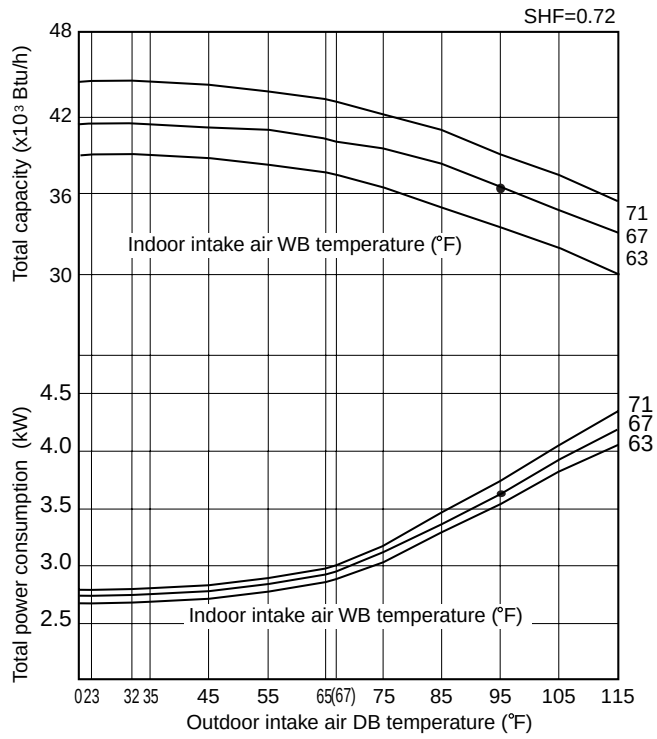


PL30AK COOLING CAPACITY

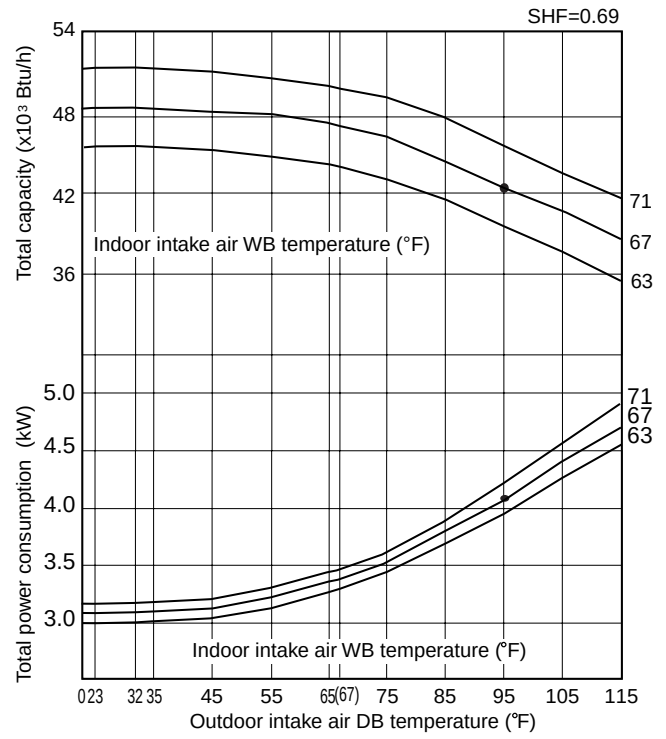


NOTES : A point on the curve shows the reference point.

PL36AK COOLING CAPACITY



PL42AK COOLING CAPACITY



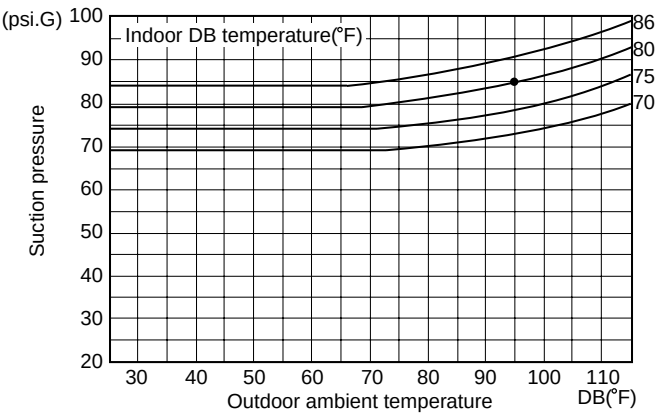
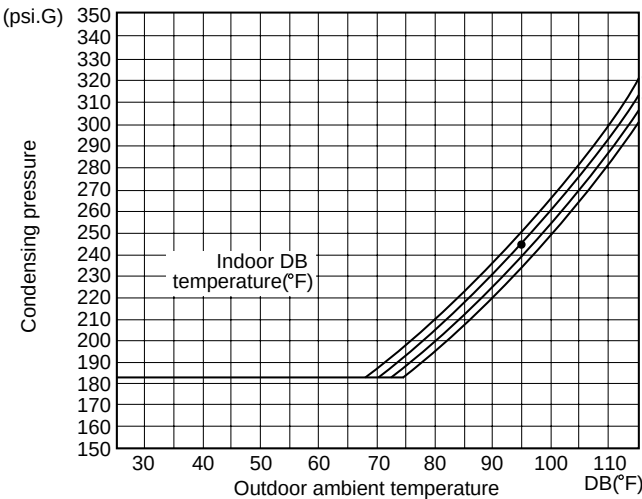


3. CONDENSING PRESSURE AND SUCTION PRESSURE

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.

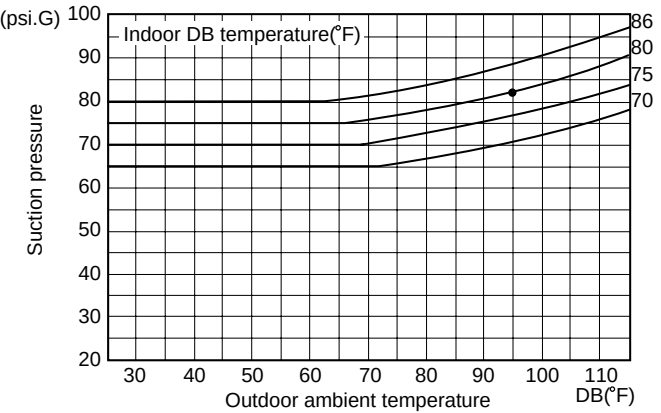
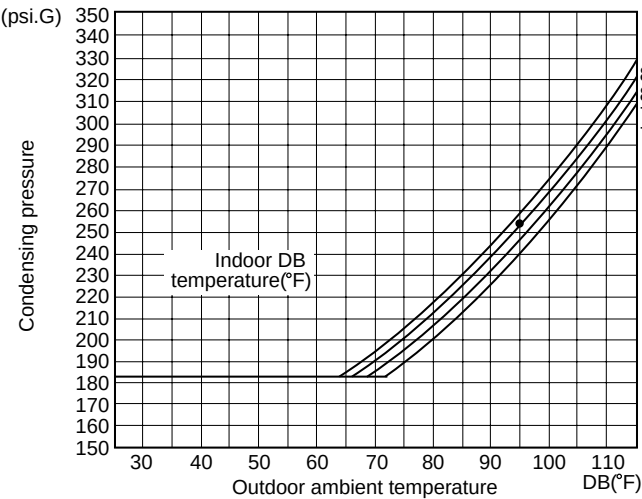
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COOLING MODE



<PL18AK>

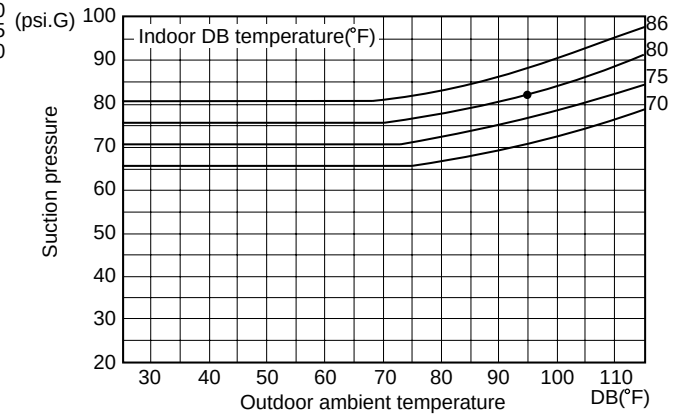
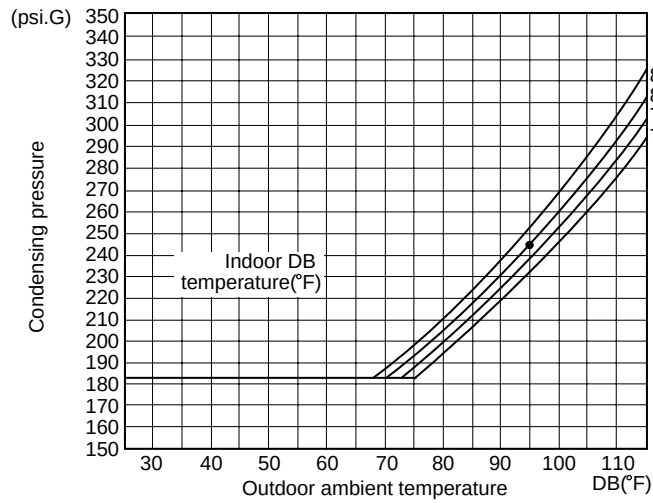
COOLING MODE



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

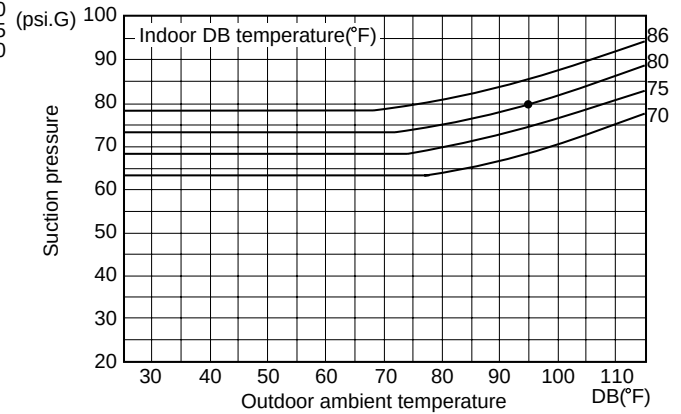
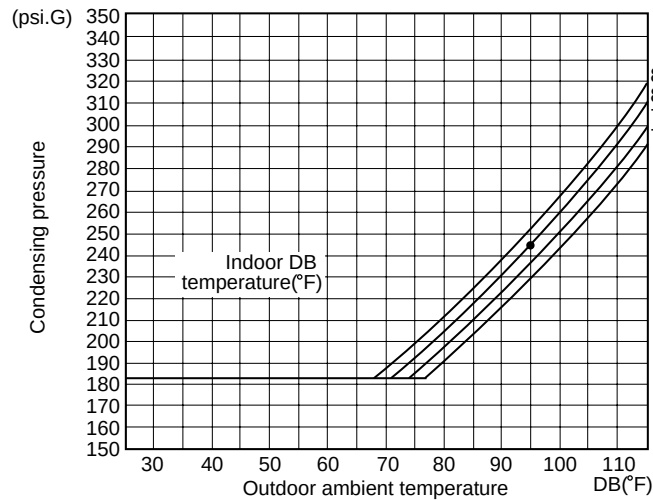
<PL24AK>

COOLING MODE



<PL30AK >

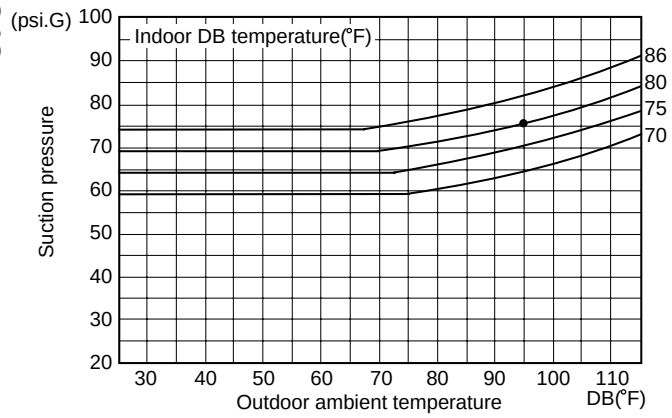
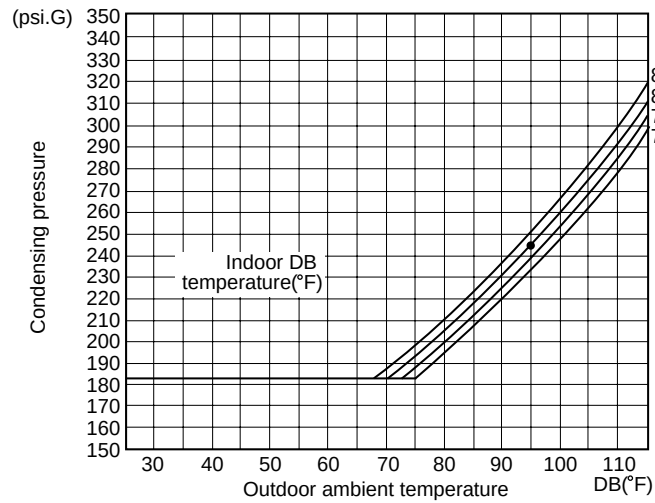
COOLING MODE



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

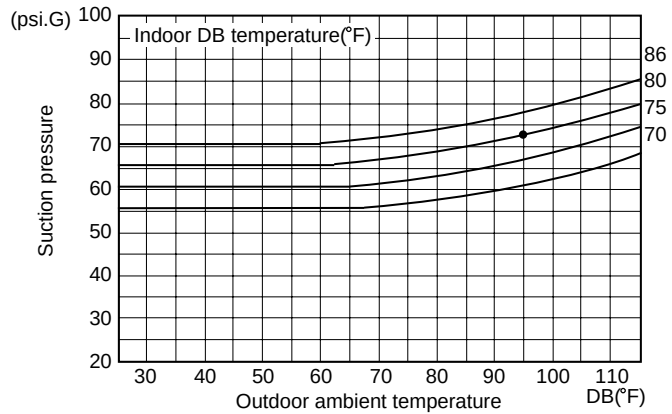
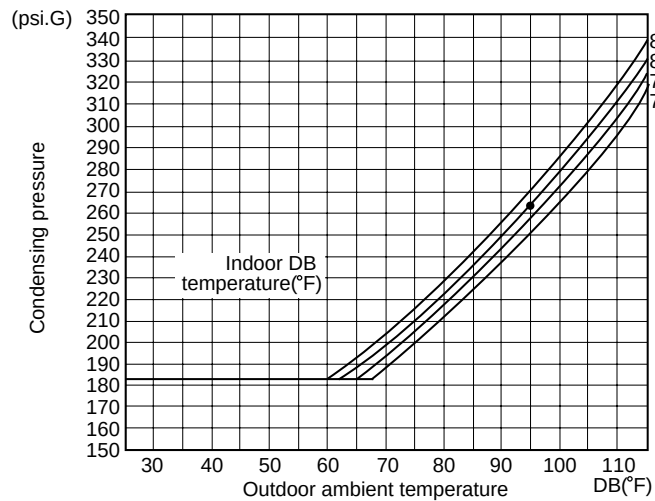
<PL36AK >

COOLING MODE



<PL42AK >

COOLING MODE





4. STANDARD OPERATION DATA

Model			PL12AK	PL18AK	PL24AK	PL30AK	PL36AK	PL42AK				
Item		Unit	Cooling	Cooling	Cooling	Cooling	Cooling	Cooling				
Total	Capacity	Btu / t	12,500	18,500	24,000	31,000	36,500	42,500				
	SHF	—	0.82	0.81	0.81	0.78	0.72	0.69				
	Input	kW	1.26	1.85	2.65	3.17	3.64	4.08				
Electrical circuit	INDOOR UNIT MODEL		PL12AK	PL18AK	PL24AK	PL30AK	PL36AK	PL42AK				
	Power supply (V, phase, Hz)		115, 1, 60	115, 1, 60	115, 1, 60	115, 1, 60	115, 1, 60	115, 1, 60				
	Input	kW	0.15	0.15	0.3	0.3	0.3	0.3				
	Fan current	A	1.2	1.2	2.6	2.6	2.6	2.6				
	OUTDOOR UNIT MODEL		PU12EK	PU18EK1	PU24EK1	PU30EK1	PU36EK1	PU42EK7				
	Power supply (V, phase, Hz)		208/230, 1, 60	208/230, 1, 60	208/230, 1, 60	208/230, 1, 60	208/230, 1, 60	208/230, 1, 60				
	Input	kW	1.11	1.70	2.35	2.87	3.34	3.78				
	Comp. current	A	8.9	12.0	11.5	14.0	15.9	20.4				
	Fan current	A	0.65	0.75	0.65+0.65	0.65+0.65	0.75+0.75	0.8+0.8				
Refrigerant circuit	Condensing pressure		psi-G	246	255	247	245	245	264			
	Suction pressure		psi-G	85	83	83	80	76	73			
	Discharge temp.		°F	150	168	163	161	167	161			
	Condensing temp.		°F	116	118	116	115	116	120			
	Suction temp.		°F	51	50	50	48	48	43			
	Ref. pipe length		ft	25	25	25	25	25	25			
	Refrigerant charge		—	4 lbs 14oz	5 lbs 8 oz	9 lbs 15 oz	10 lbs 2 oz	10 lbs 9 oz	11 lbs 0 oz			
Indoor side	Intake air temperature		DB	°F	80	80	80	80	80			
			WB	°F	67	67	67	67	67			
	Discharge air temperature		DB	°F	63	60	59	59	57	54		
			WB	°F	60	58	58	58	56	54		
	Fan speed (High)		rpm	420	530	640	690	790	790			
	Airflow (High)		CFM	560	710	990	1,060	1,060	1,060			
Outdoor side	Intake air temperature		DB	°F	95	95	95	95	95			
			WB	°F	—	—	—	—	—	—		
	Fan speed upper / lower		rpm	790	790	750	750	750	760	760	840	840
	Airflow		CFM	1,590	1,590	3,170	3,170	3,350	3,530			

5. OPERATING RANGE

1) POWER SUPPLY

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

2) OPERATION

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



6.OUTLET AIR SPEED AND COVERAGE RANGE

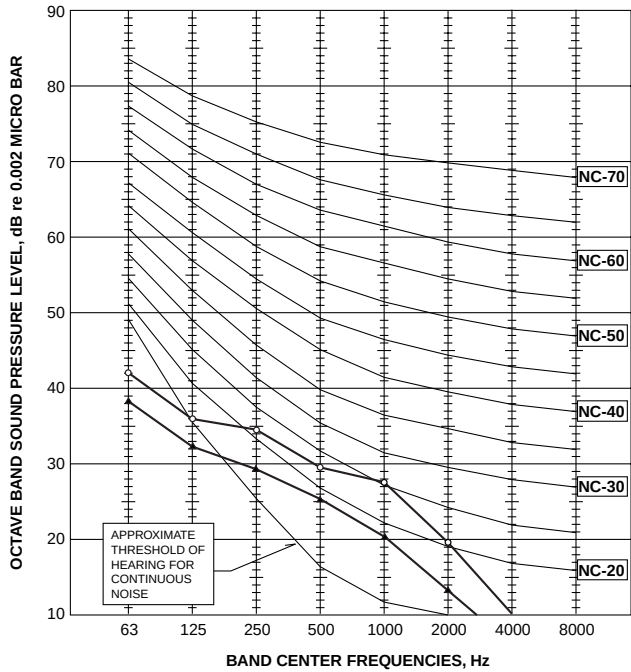
		PL12AK	PL18AK	PL24AK	PL30AK	PL36AK	PL42AK
Standard height	Airflow (CFM)	560	710	990	1,060	1,060	1,060
	Air speed (ft / sec.)	12.5	13.1	16.1	17.1	21.7	21.7
	Coverage range (ft)	16	19	24	26	29	29

•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. NOISE CRITERION CURVES

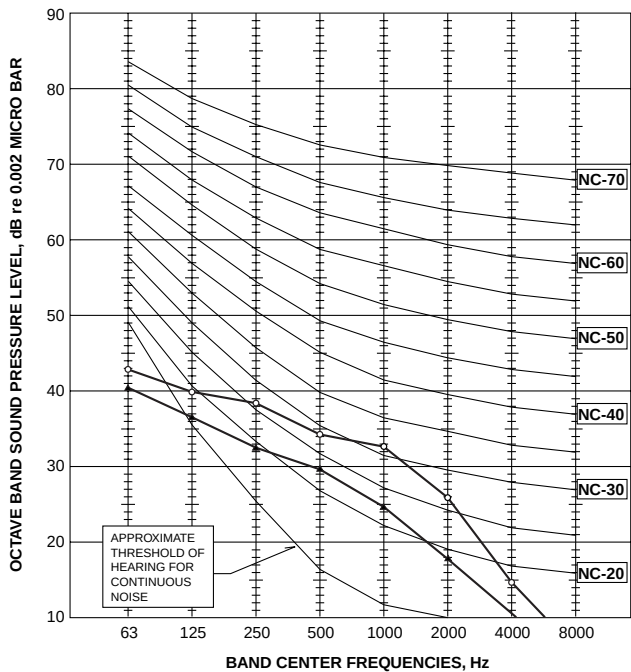
PL12AK

NOTCH	SPL(dB)	LINE
Hi	32	○—○
Lo	27	▲—▲



PL18AK

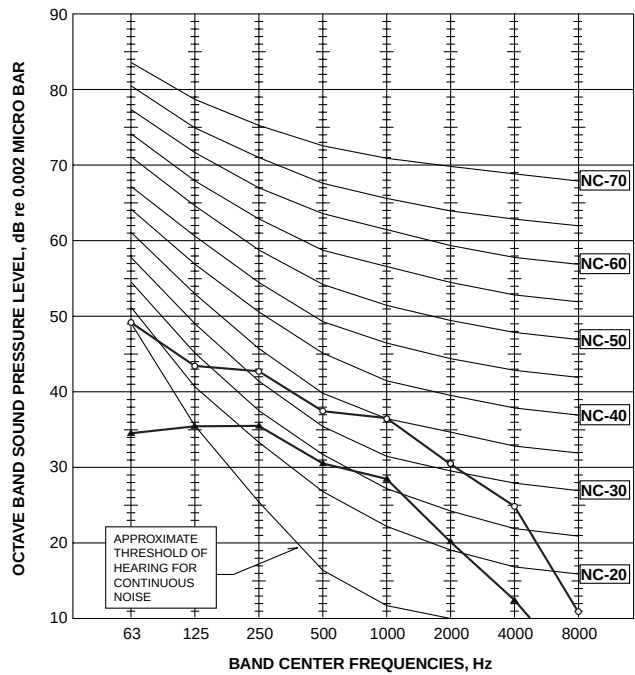
NOTCH	SPL(dB)	LINE
Hi	37	○—○
Lo	31	▲—▲





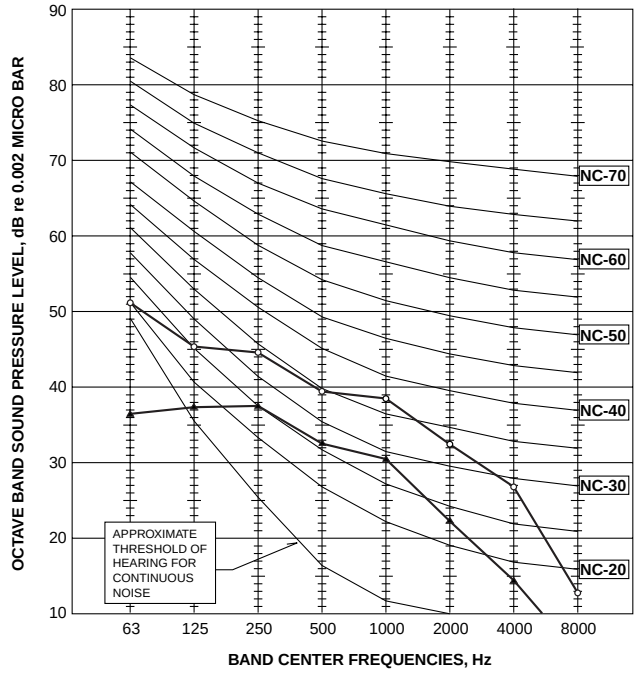
PL24AK

NOTCH	SPL(dB)	LINE
Hi	41	○—○
Lo	33	▲—▲



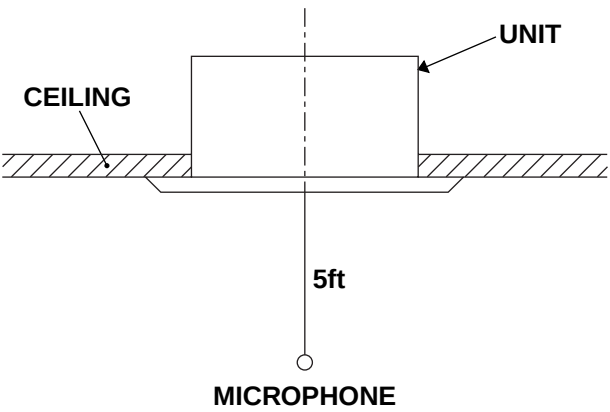
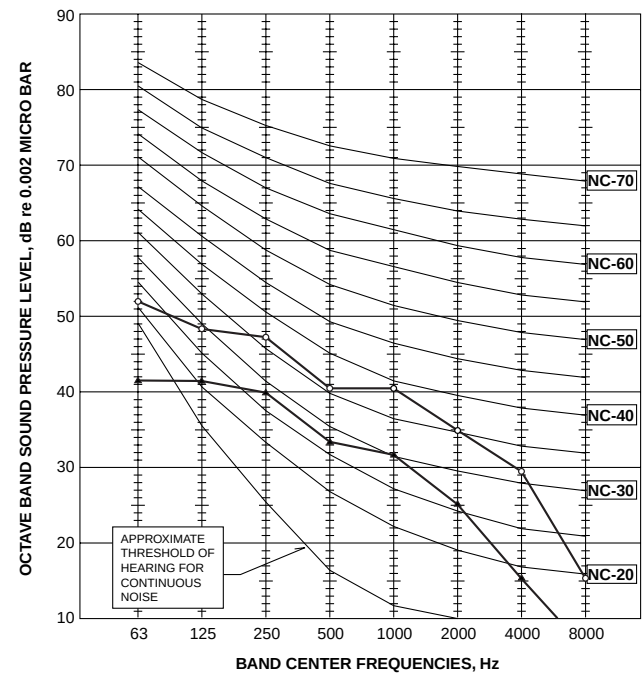
PL30AK

NOTCH	SPL(dB)	LINE
Hi	43	○—○
Lo	35	▲—▲



PL36,42AK

NOTCH	SPL(dB)	LINE
Hi	45	○—○
Lo	37	▲—▲



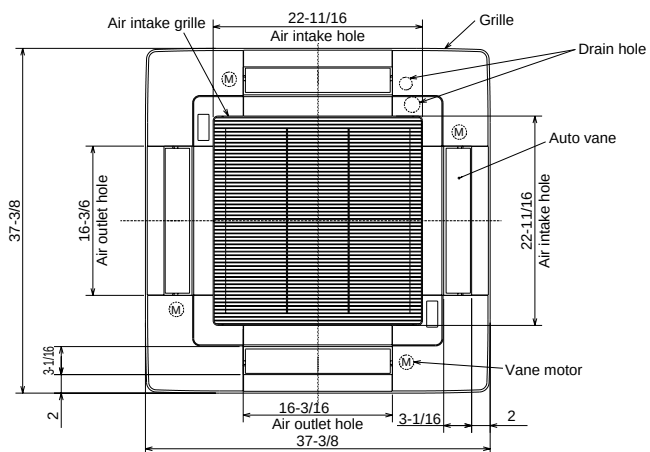
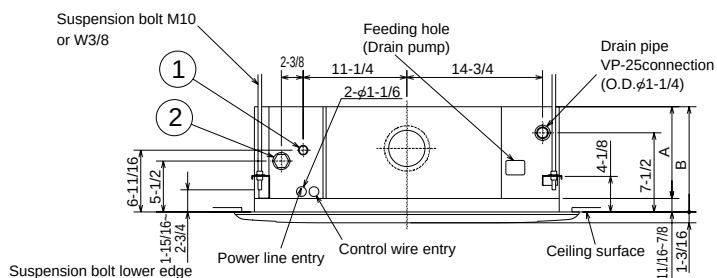
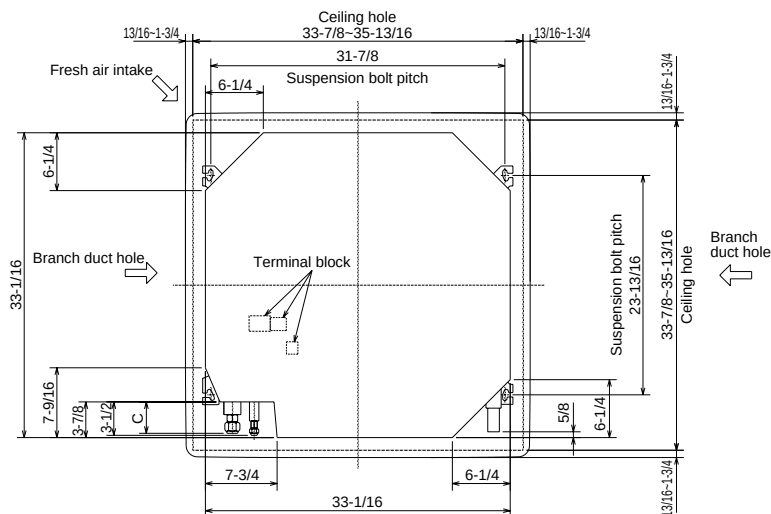
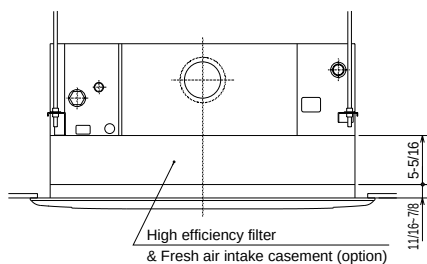
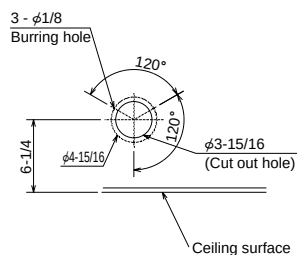
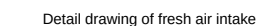
Ambient temperature 80°F

Test conditions are based on JIS Z8731

OUTLINES AND DIMENSIONS

Unit : inch

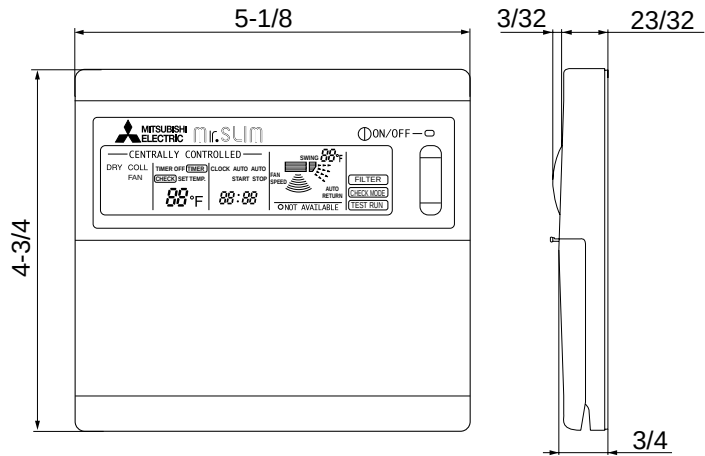
PL12AK , PL18AK , PL24AK , PL30AK , PL36AK , PL42AK



Models	①	②	A	B	C
PL12AK	Refrigerant pipe flared connection 3/8F	Refrigerant pipe flared connection 5/8F	9-1/2	10-3/16	3-1/16
PL18AK					3-1/8
PL24AK					3-1/4
PL30AK PL36AK PL42AK	Refrigerant pipe flared connection 1/2F	Refrigerant pipe flared connection 3/4F	11-1/16	11-3/4	3-5/16

2.Remote controller

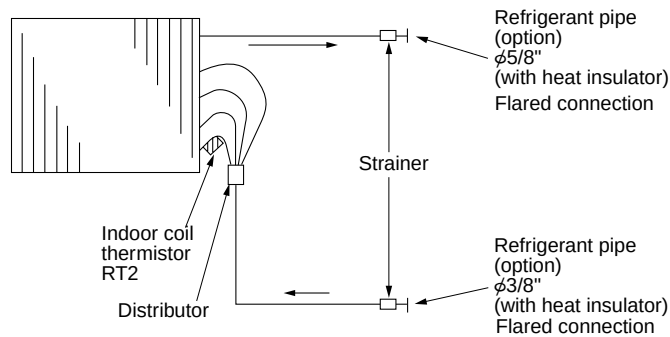
Unit : inch



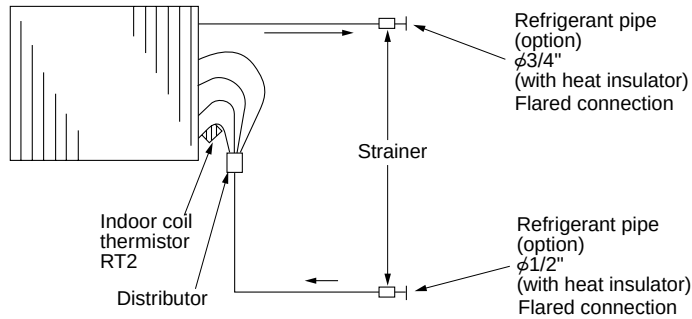
6 REFRIGERANT SYSTEM DIAGRAM

PL12/18/24AK

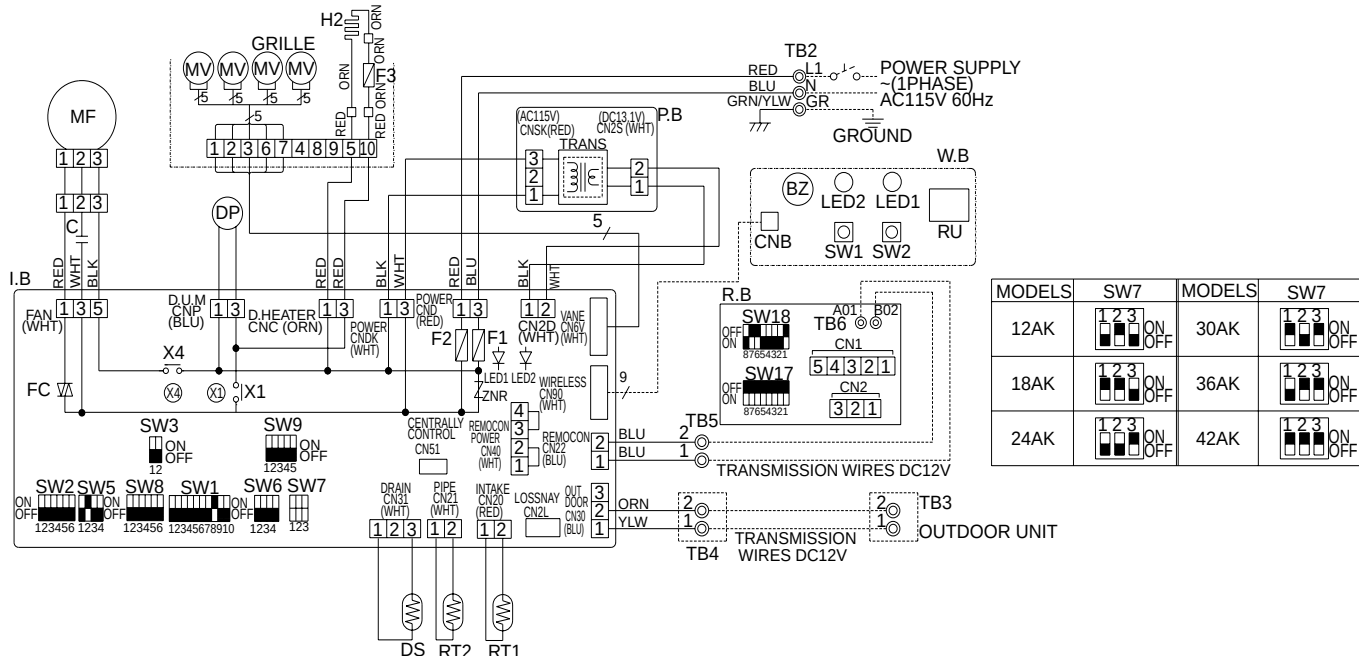
Unit : inch



PL30/36/42AK



MODELS: PL12/18/24/30/36/42AK WIRING DIAGRAM



LEGEND

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
P.B	INDOOR POWER BOARD	ZNR	VARISTOR	R.B	REMOTE CONTROLLER BOARD
I.B	INDOOR CONTROLLER BOARD	LED1	LED(DC12V POWER)	CN1	CONNECTOR(PROGRAM TIMER)
CN2L	CONNECTOR(LOSSNAY)	LED2	LED(DC5V POWER)	CN2	CONNECTOR(REMOTE SWITCH)
CN51	CONNECTOR(CENTRALLY CONTROL)	C	CAPACITOR(FAN MOTOR)	SW17	SWITCH(ADDRESS SELECTOR)
FC	FAN PHASE CONTROL	MF	FAN MOTOR	SW18	SWITCH(FUNCTION SELECTOR)
SW1	SWITCH(FUNCTION SELECTOR)	MV	VANE MOTOR	W.B	WIRELESS REMOTE CONTROLLER BOARD
SW2	SWITCH(ADDRESS SELECTOR)	DP	DRAIN-UP MACHINE	RU	RECEIVING UNIT
SW3	SWITCH(EMERGENCY OPERATION)	DS	DRAIN SENSOR	BZ	BUZZER
SW5	SWITCH(MODEL SELECTOR)	F3	FUSE(0.3A/250V)	LED1	LED(RUN INDICATOR)
SW6	SWITCH(TWIN/TRIPLE SELECTOR)	H2	DEW PREVENTION HEATER	SW2	SWITCH(COOLING ON/OFF)
SW7	SWITCH(MODEL SELECTOR)	TB2-TB6	TERMINAL BLOCK		
SW8	SWITCH(OPTION)	RT1	ROOM TEMPERATURE THERMISTOR (32°F/15kΩ, 77°F/5.4kΩ DETECT)		
SW9	SWITCH(MODEL SELECTOR)	RT2	PIPE TEMPERATURE THERMISTOR/LIQUID (32°F/15kΩ, 77°F/5.4kΩ DETECT)		
X1	RELAY(DRAIN PUMP)				
X4	RELAY(FAN MOTOR)				
F1,F2	FUSE(6A/250V)				

NOTE If the drain water lift-up mechanism is identified to be defective with the microcomputer doctor during cooling, do not use emergency operation (It causes drain overflow).

NOTES:

- 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 matching terminal numbers.
- Symbols used in wiring diagram above are, :Connector, :Terminal block.
- Emergency operation
If remote controller or microcomputer fails but there is no other trouble, emergency operation is possible by setting dip switch(SW3<I.B>) on the indoor controller board.

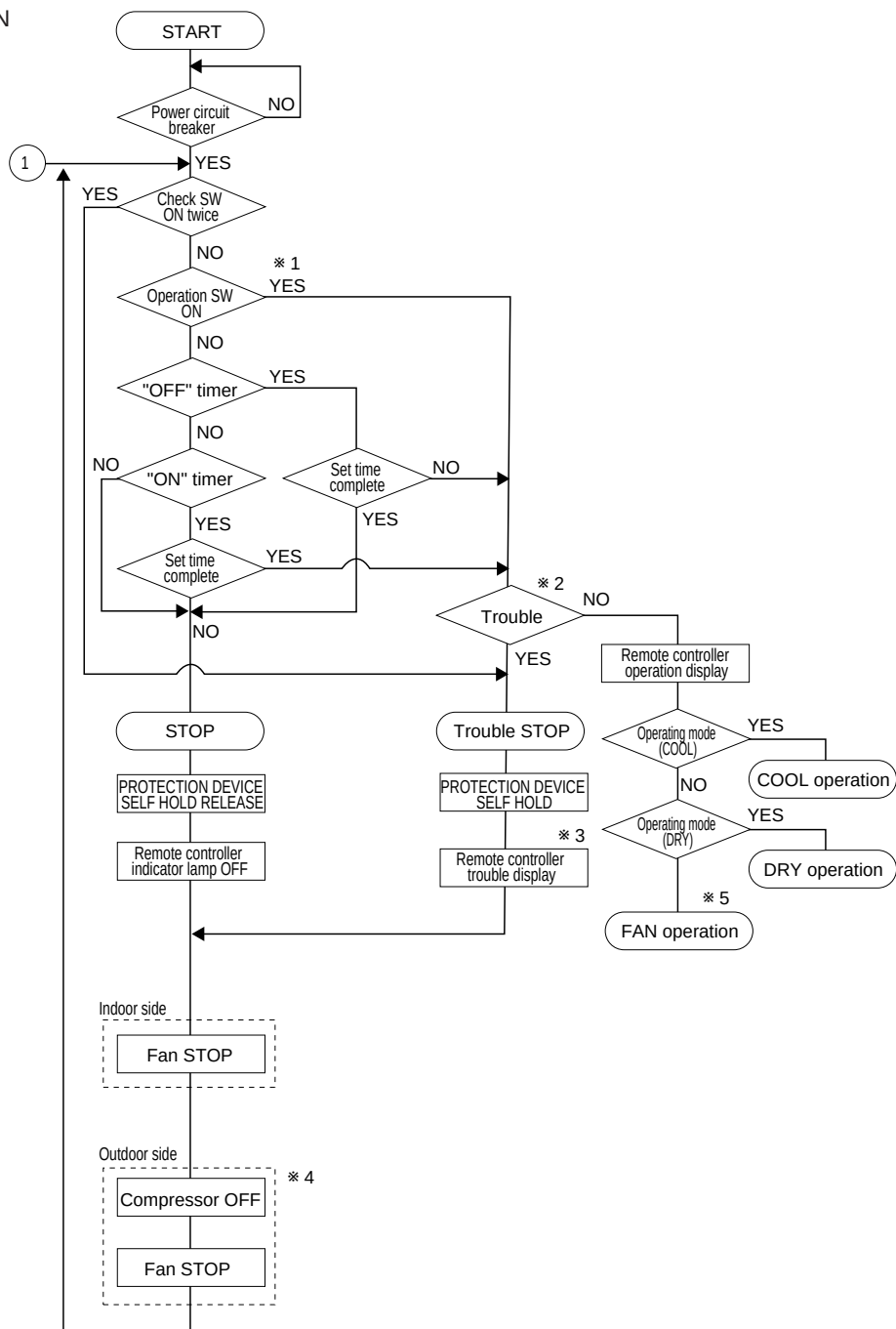
[Check items]

- Make sure that no other trouble exist the outdoor unit. Trouble with the outdoor unit prevents emergency operation.
(If any trouble exists the outdoor unit error code "P8" will be displayed on the remote controller and the trouble position will be shown on the outdoor controller board LED. See electric wiring diagram of the outdoor unit for details.)
- Make sure that there is no trouble with the indoor fan.
Emergency operation will be continuous run with the power ON/OFF (ON/OFF with the remote controller is not possible).

[Emergency operation procedure]

- Set the dip switch(SW3<I.B>) on the indoor controller board to ① on and ② off for cooling.
- Turn on are outdoor unit side circuit breaker, then indoor unit side circuit breaker.
- During emergency operation indoor fan runs at high speed but auto-vane does not work.
- Thermostat will not function.
- Emergency cooling should be limited to 10 hours maximum
(the indoor unit heat exchanger may freeze).
- After every emergency operation, set all dip switches(SW3<I.B>) to OFF.
- Movement of the vanes does not work in emergency operation, therefore you have to slowly set them manually to the appropriate position.

MAIN OPERATION



※1 In addition, the centralized control and remote control can be operated.

※2 The modes which indicate the sources of trouble are listed below.

- EO-Signal transmitting/receiving error
- P1-Room temperature thermistor malfunction
- P2-Indoor coil thermistor malfunction
- P4-Drain sensor malfunction
- P5-Drain overflow
- P6-Coil frost/overheat protection
- P7-System error
- P8-Outdoor unit trouble

※3 The CHECK switch will show if an error has occurred in the past.

※4 The 3-minute time-delay functions after compressor stops.

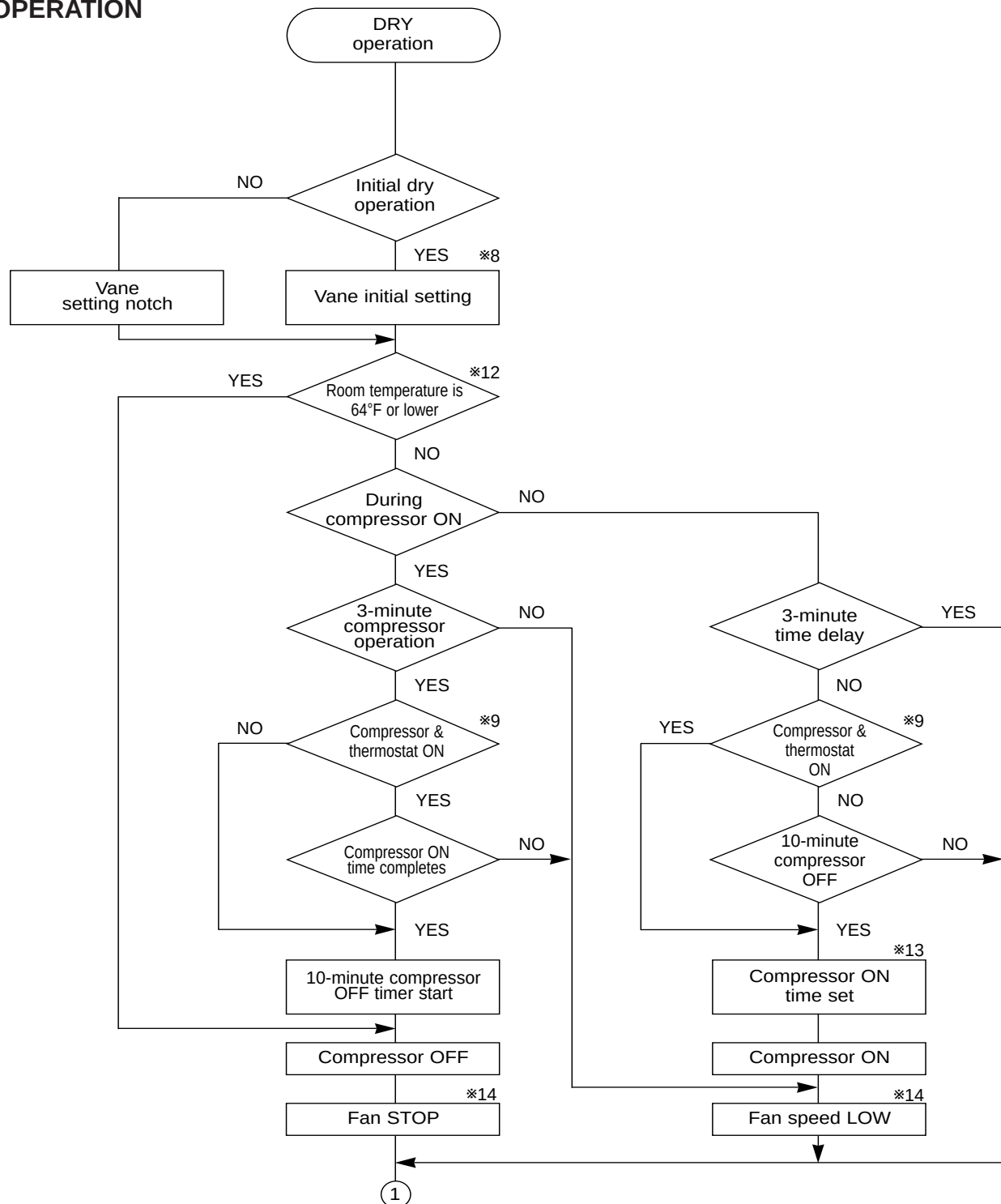
※5 In FAN mode, fan speed and vane operation depend on the remote controller setting. (Compressor is OFF.)

--



- *8 When operation stops or changes to cooling or dry mode, the auto vane turns to a horizontal angle. If operation changes during auto vane SWING, the auto vane will continue to swing.
- *9 When operating TEST RUN, the thermostat will be continuously ON.
- *10 After 3 minute compressor operation, if the indoor coil thermistor reads 5°F or below for 3 minutes, the compressor will stop for 6 minutes.
- *11 Heating area : Indoor coil temperature is more than 9 degrees above the room temperature.
Cooling area : Indoor coil temperature is more than 9 degrees below the room temperature.
FAN area : Indoor coil temperature is within 9 degrees either way of the room temperature.

DRY OPERATION



*8—9 Refer to page OC246-20.

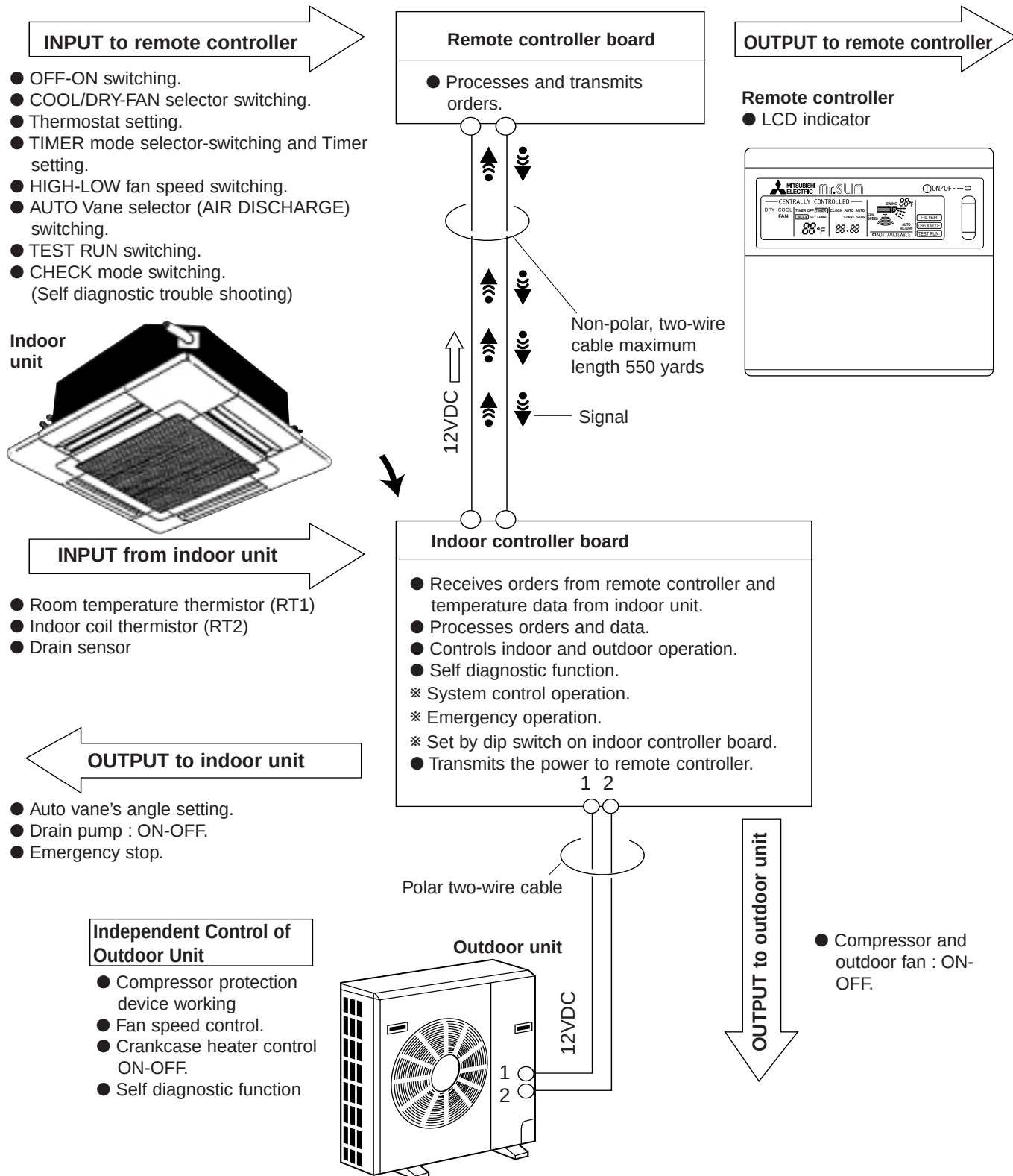
*12 When room temperature is 64°F or below, the compressor cannot operate.
When room temperature rises over 64°F the compressor starts after a 3-minute time delay.

*13 Compressor ON time is decided by room temperature. Refer to page OC246-26~27.

*14 In dry operation, compressor ON makes the fan speed LOW. Also, when the compressor OFF and the pipe temperature is 79°F or less, the fan stops, or when the compressor OFF and the pipe temperature is below 43°F the fan speed changes to LOW mode.

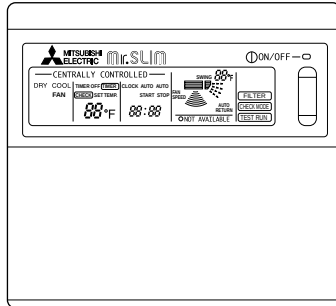
It is not possible to set the fan speed with the remote controller

1. OUTLINE OF MICROPROCESSOR CONTROL



2. INDOOR UNIT CONTROL

2-1 COOL operation

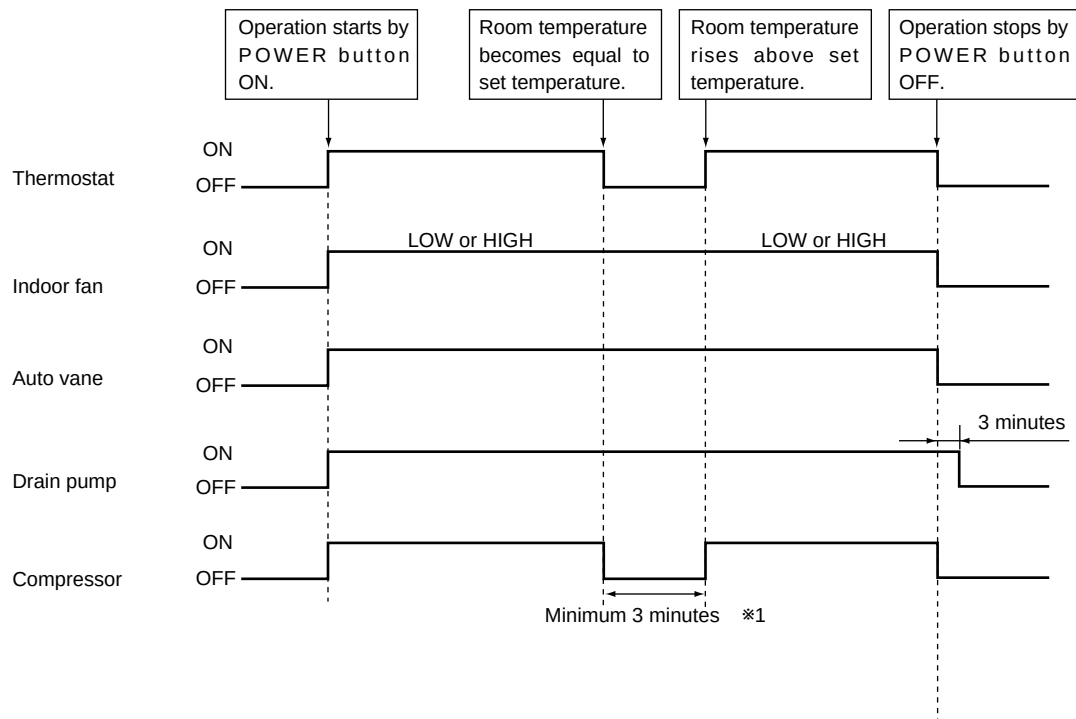


<How to operate>

- ① Press POWER ON/OFF button.
- ② Press the MODE button to display COOL.
- ③ Press the SET TEMP. button to set the desired temperature.

NOTE: Set temperature changes 2°F when the SET TEMP. button is pressed one time.
Cooling 65 to 87°F.

<COOL operation time chart>



※1 Even if the room temperature rise above the set temperature during this period, the compressor will not start until this period has ended.

(1) Compressor control

① 3-minute time delay

To prevent overload, the compressor will not start within 3 minutes after stop.

② The compressor runs when room temperature is higher than set temperature.

The compressor stops when room temperature is equal to or lower than the set temperature.

The compressor maintains the previous state when the room temperature minus the set temperature is 0 degrees or more, or lower than 2 degrees.

③ The compressor stops in check mode or during protective functions.

④ Coil frost prevention

To prevent indoor coil frost, the compressor will stop when the indoor coil thermistor (RT2) reads 34°F or below after the compressor has been continuously operated for at least 16 minutes or more. When the indoor coil temperature rises to 50°F or above, the compressor will start in a 3-minute(※2) time delay.

※2 When the indoor coil temperature is 30°F or less, the compressor starts in 6 minutes.

NOTE : By turning OFF the dip switch SW1-3 on indoor controller board, the start temperature of coil frost prevention changes from 34°F to 36°F.

⑤ Coil frost protection

When indoor coil temperature becomes 5°F or below,coil frost protection will proceed as follows.

<Start condition>

After the compressor has been continuously operated for 3 minutes or more,and the indoor coil temperature has been 5°F or below for 3 minutes,the coil frost protection will start.

<Coil frost protection>

Compressor stops for 6 minutes,and then restarts.

If the start condition is satisfied again during the first 10 minutes of compressor operation,both the indoor and outdoor units stop,displaying a check code of“P6”on the remote controller.

<Termination conditions>

Coil frost protection is released when the start condition is not satisfied again during the allowance, or when the COOL mode stops or changes to another mode.

(2) Indoor fan control

Indoor fan speed LOW/HIGH depends on the remote controller setting.

However, if an outdoor unit abnormality is detected, the indoor fan speed will be LOW, regardless of the remote controller setting.

(i) Fan speed LOW/HIGH depends on the remote controller setting regardless of the thermostat ON/OFF.

(ii) Fan speed will remain on LOW if an abnormality in outdoor unit is detected. (5 minutes)

NOTE : Fan stops immediately if the unit stops or the check mode is started.

(3) Auto vane control

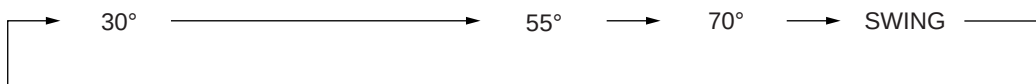
Auto vane position is set to 30degrees airflow at the start-up of COOL operation.

(a) Vane position set mode & swing mode.

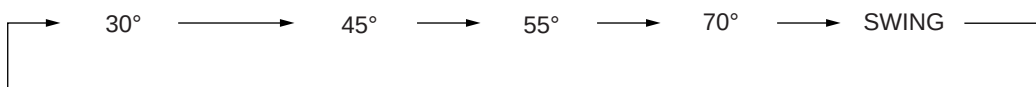
(i) Every time AIR DISCHARGE button is pressed, setting will be changed .

(ii) Airflow direction can be changed with AIR DISCHARGE button.

① Fan speed : LOW

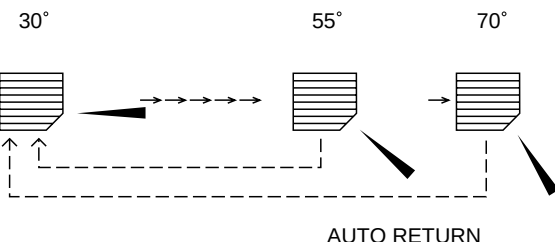


② Fan speed : HIGH

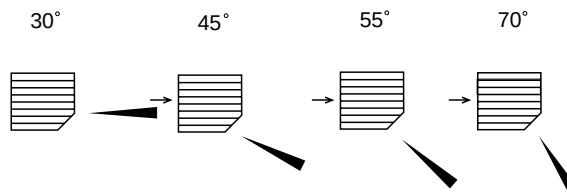


<VANE POSITION>

① Fan speed : LOW



② Fan speed : HIGH



When 55 degrees or 70 degrees airflow is selected with the LOW fan speed in COOL operation, “AUTO RETURN” will appear right side of the air direction display. One hour later, the airflow direction returns to 30 degrees automatically and “AUTO RETURN” will disappear. If the airflow direction is set to 30 degrees during “AUTO RETURN” indication, the time counting for AUTO RETURN is cancelled.



(4) Detecting abnormalities in the outdoor unit

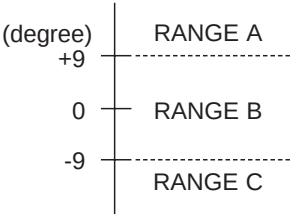
After the compressor has been continuously operated for 3 minutes, if the difference between the indoor coil temperature and room temperature is out of RANGE C for 1 minute, the indoor fan speed will turn to LOW. Five minutes later, if the difference is still out of RANGE C, the outdoor unit is functioning abnormally. Thus, the compressor stops and check code "P8" appears on remote controller.

RANGE A : Indoor coil temperature is more than 9 degrees above room temperature.

RANGE B : Indoor coil temperature is within 9 degrees either way of room temperature.

RANGE C : Indoor coil temperature is more than 9 degrees below room temperature.

Indoor coil temperature
minus room temperature



(5) Drain pump control

The drain pump works in COOL or DRY operation.

The drain pump does not work in check mode.

<Drain sensor>

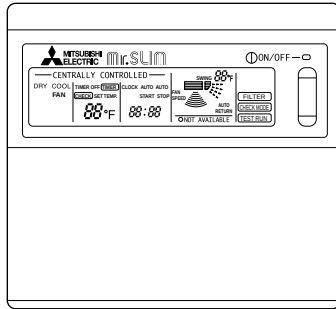
When both the drain pump and unit are operating, the drain sensor detects the temperature. This temperature tells whether the drain water level is above or under the drain sensor. If the drain water level rises above the drain sensor due to a drain pump malfunction, the unit will stop operating in order to prevent drain from overflowing. The check code "P5" on the remote controller will display this occurrence.

(6) Dew prevention heater

To prevent dew from accumulating on the grille, the dew prevention heater is continuously ON during COOL operation.

It is independent of the thermostat ON/OFF.

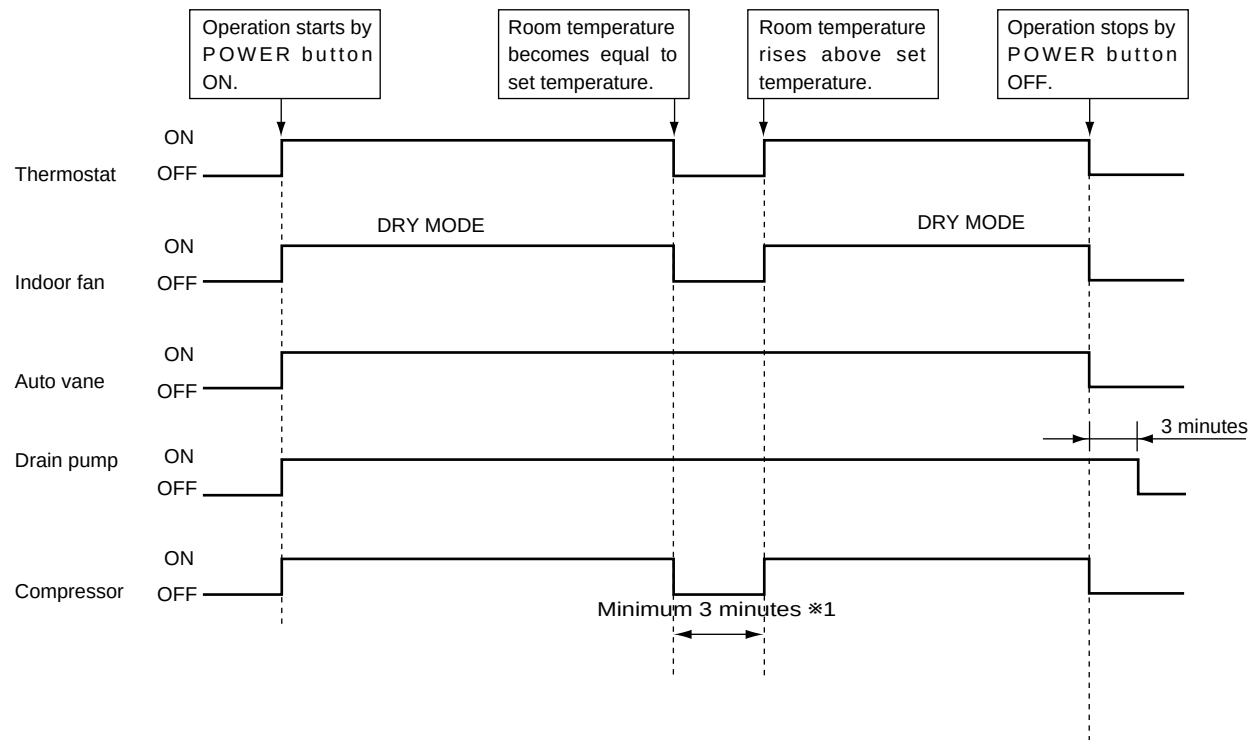
2-2 DRY operation



<How to operate>

- ① Press POWER ON/OFF button.
 - ② Press the MODE button to display "DRY"
 - ③ Press the SET TEMP. button to set the desired temperature.
- NOTE:** The set temperature changes 2°F when the SET TEMP. button is pressed one time.
Dry 65 to 87°F

<DRY operation time chart>



*1 Even if the room temperature rises above the set temperature during this period, the compressor will not start until this period has ended.

(1) Compressor control

- ① 3-minute time delay
To prevent overload, the compressor will not start within 3 minutes after stop.
- ② The compressor runs when room temperature is higher than set temperature.
The compressor stops when room temperature is equal to or lower than the set temperature.
The compressor maintains the previous state when the room temperature minus the set temperature is 0°F or more, or lower than 2°F.
- ③ The compressor stops in check mode or during protective functions.

④The compressor will not start when the room temperature is 64°F or below.

The compressor starts intermittent operation when the power is turned ON with room temperature above 64°F. The compressor ON/OFF time depends on the thermostat ON/OFF and the following room temperatures. After 3-minute compressor operation,

- If the room temperature thermistor reads above 82°F with thermostat ON, the compressor will operate for 6 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads 79°F~82°F with thermostat ON, the compressor will operate for 4 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads 75°F~79°F with thermostat ON, the compressor will operate for 2 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads below 75°F with thermostat ON, the compressor will stop for 3 minutes.
- If the thermostat is OFF regardless of room temperature, the compressor will stop for 10 minutes.

⑤Coil frost protection

Coil frost protection in DRY operation is the same as in COOL operation. (Refer to "2-1 COOL operation".)

⑥Coil frost prevention

Coil frost prevention does not operate in DRY operation.

(2) Indoor fan control

The indoor fan runs on LOW speed during compressor operation. The fan speed cannot be changed with the remote controller. Also, the fan runs on LOW speed when the pipe temperature is 43°F or more, or the compressor is OFF and the pipe temperature is below 43°F.

(a) During compressor OFF

- When the indoor coil temperature is 43°F or above, the indoor fan will stop.
- When the indoor coil temperature is below 43°F, the indoor fan will run on LOW speed.

(b) During compressor ON

- The indoor fan runs on LOW speed.

<Dry mode>

The fan notch is controlled by the indoor coil temperature every 30 seconds.

Fan control in DRY operation.

	Pipe temp.	Fan
Compressor OFF	43°F or more	STOP
	Below 43°F	LOW
Compressor ON	All	LOW

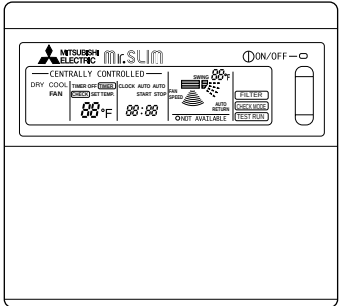
(3) Auto vane & drain pump controls

Same as in COOL operation

(4) Detecting abnormalities in the outdoor unit

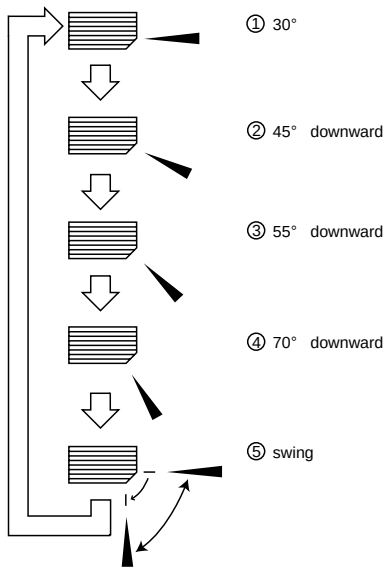
An abnormality in the outdoor unit can not be detected in DRY operation.

2-3 Auto vane control



<How to operate>
To change the air flow direction, press AIR DISCHARGE button.

①	②	③	④	⑤
30°	45°	55°	70°	SWING



Changes by pressing
the AIR DISCHARGE
button.

Available in COOL operation with fan speed on HIGH.
Unavailable in DRY operation.
If fan speed changes from HIGH to LOW during 45°
downward airflow in COOL mode, the direction automati-
cally changes to 30°.

COOL/DRY operation

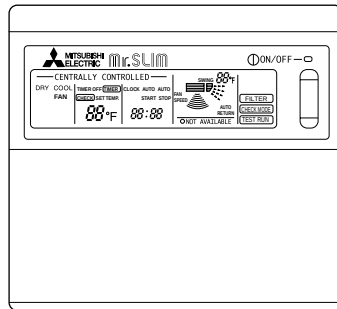
At the start-up of COOL or DRY operation, the airflow direction is automatically set to 30°. After, it can be changed to another direction with AIR DISCHARGE button on the remote controller.

<Auto return>

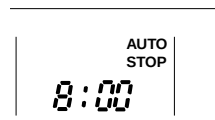
When 55° or 70° airflow is set with fan speed in LOW, “AUTO RETURN” appears right side of the air direction. One hour later the direction changes to 30 degrees, automatically and “AUTO RETURN” disappears.

2-4 TIMER operation

WIRED REMOTE CONTROLLER



<Timer setting example>



<Timer function>

AUTO STOP The air conditioner stops after the set time lapses.

AUTO START The air conditioner starts after the set time lapses.

AUTO OFF Timer is not active.

<How to operate>

1. Press POWER ON/OFF button.
2. Press "TIMER ON/OFF" button to select AUTO STOP or AUTO START.
3. Press "CLOCK/TIMER" button to set desired time.
Time setting is in 1 hour units for up to 24 hours.
Each time TIMER SET button is pressed, set time increases by 1 hour. When TIMER SET button is pressed and held, the set time increases by 1 hour every 0.5 seconds.
4. To cancel the timer operation, press POWER ON/OFF button.

This setting will stop the operation in 8hours.

With the lapse of time, time display changes in 1hour units, showing remaining time.

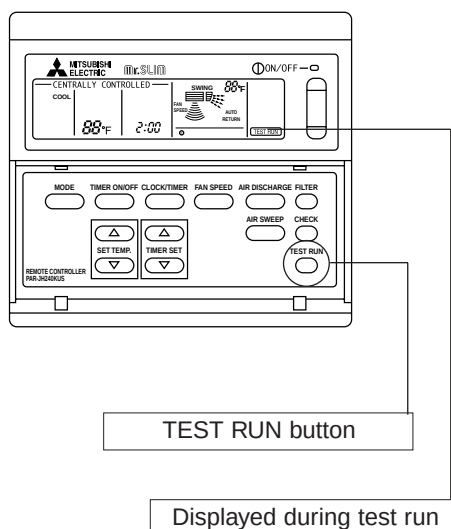
2-5Test run

<Before test run>

- After installing, wiring, and piping the indoor and outdoor units, check for refrigerant leakage, looseness in power supply or control wiring, and mistaken polarity.
- Use a 500-volt measure to check the resistance between the power supply terminal block and ground to make sure that it is at least 1.0MΩ.

Attention:

Do not use the air conditioner if resistance is less than 1.0MΩ.



<How to operate>

1. Turn ON main breaker.
2. Press TEST RUN button twice. "TEST RUN" is displayed on remote controller.
3. Select "COOL" with MODE button to check that cool air is being discharge.
4. Select LOW/HIGH with FAN SPEED button to check that the fan speed changes properly.
5. Press AIR DISCHARGE button to check auto vane operation.
6. Check outdoor fan operation.
7. Check compressor operation referring to the indoor coil temperature code displayed on the remote controller.
8. After checking, press the ON/OFF button.

·The test run works for 2 hours and stops automatically.

To cancel the test run, press ON / OFF button or TIMER ON / OFF button.

(1) Indoor coil temperature code

During the test run, the indoor coil temperature code from 1 to 15 is displayed on the remote controller instead of room temperature. The code should fall with the lapse of time in normal COOL operation.

Code	1	2	3	4	5	6	7	8
Indoor coil temperature	~34(36)°F	36(37)°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	~191°F	Thermistor abnormality	

(2) Trouble during test run

- If the unit malfunctions during the test run, refer to section 10 in this manual entitled “TROUBLESHOOTING.”
- When the optional program timer is connected to the conditioner, refer to its operating instructions.

2-6 Emergency operation

When the remote controller or microprocessor malfunctions but all other parts are normal, emergency operation is started by setting the dip switch SW3 on the indoor controller board.

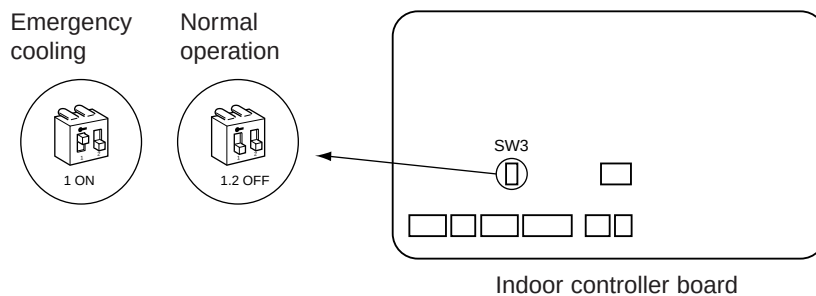
<Before emergency operation>

1. Make sure the compressor and the indoor fan are operating normally.
2. Locate the defect with the self-diagnostic function. When the self-diagnostic function indicates “protective function is working”, release the protective function before starting the emergency operation.

CAUTION: When the self-diagnostic function indicates a check code of “P5” (drain pump malfunction), DO NOT start the emergency operation because the drain may overflow.

<How to operate>

1. For emergency cooling, set the dip switch SW3-1 to ON and SW3-2 to OFF.



2. Turn ON the outdoor unit breaker and then ON the indoor unit breaker.
Emergency operation will now start.
3. During emergency operation, the indoor fan operates on high speed, the auto vanes do not operate.
4. To stop emergency operation, turn OFF the indoor unit breaker.
5. Movements of the vanes do not work in emergency operation, therefore you have to slowly set them manually to the appropriate position.

NOTE: The remote controller POWER ON/OFF button can not start/stop emergency operations.

CAUTION: Do not use emergency cooling for more than 10 hours, as the indoor coil may freeze.

2-7 Dip switch functions

Each figure shows the initial factory setting.

1. On remote controller board

(1) SW17(Address selector)

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

SW17-1~6) For address setting

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

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

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

SW17-8) Switch for system back-up.

OFF:Without back-up

ON:With back-up

(2) SW18(Function selector)

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

SW18-1) Switch for timer

OFF:Single day ON:timer every day

SW18-2) Switch for filter sign

OFF:filter sign absent

ON:filter sign present

SW18-3) Switch for filter sign time setting.

OFF:100Hr ON:2500Hr

SW18-4~8) Not yet used.

2. On indoor controller board

(1) SW1 (Mode selector)

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

SW1-1) Switch that changes between FAN mode and AUTO mode

OFF:Not available

ON:Not available

SW1-2) Not yet used.

SW1-3) Switch to change the temperature to start coil frost prevention

OFF:34°F

ON:36°F

SW1-4) Not yet used.

SW1-5) Not yet used.

SW1-6) Not yet used.

SW1-7) Switch for detecting abnormalities in the outdoor unit abnormality detection

OFF:When an abnormality occurs,it is detected.

ON:Even if an abnormality occurs,it can not be detected.

SW1-8) Switch for auto restart function

OFF:This function does not work

ON:This function works.

SW1-9, 10) Not yet used.

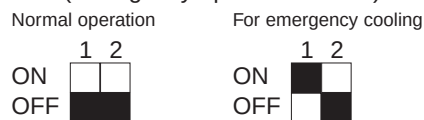
(2) SW2 (Address selector)

	1	2	3	4	5	6
ON	☐	☐	☐	☐	☐	☐
OFF	☒	☒	☒	☒	☒	☒

Used in setting the unit-address for group control.

For further information,refer to page 46.

(3) SW3 (Emergency operation switch)



(4) SW5 (Model selector)



SW5-1) Not yet used

SW5-2) Leave this switch as it is.

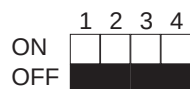
SW5-3) OFF: Auto vane angle 30°→45°→55°→70°

ON: Auto vane angle 25°→40°→55°→70°

SW5-4) Fresh air intake OFF: Fresh air in not taken in

ON: Fresh air is taken in

(5) SW6 (Address selector)



This switch is not available for series PL.

(6) SW7 (Model selector)

Switch to set the output of phase-controlled indoor fan motor.

Address setting is available at any time.

The initial factory setting by is based on each capacity.

Model	PL12AK	PL18AK	PL24AK	PL30AK	PL36AK	PL42AK
SW7	ON OFF 1 2 3	ON OFF 1 2 3	ON OFF 1 2 3	ON OFF 1 2 3	ON OFF 1 2 3	ON OFF 1 2 3

(7) SW8



SW8-1~2) Ceiling high type switch

SW8-3~4) Discharge direction selector } See page 39.

SW8-5) Option selector

OFF: Standard

ON: When mounting the optional high efficiency filter.

SW8-6) Not yet used

2-8. INDOOR FAN CONTROL

Fan motor max. rotational frequency

Model	Voltage [V]	100% rotational frequency(rpm)
		60Hz
PL12/18AK	115	630
PL24/30/36/42AK	115	800

1.TROUBLES IN TEST RUN

Symptom	Cause	Check points																				
The display “CENTRALLY CONTROLLED” on remote controller does not disappear.	1) Wrong address setting of remote controller/indoor controller board. 2) Timer 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) Make sure the timer adapter is used correctly. 3) ① Turn another remote controller's DIP SW17-7 ON to make it sub controller. ② Connect the sub controller to the unit, and turn circuit breaker ON. ● If the display “centrally controlled” disappears, replace the original remote controller. ● If the display remains the same, replace the indoor controller board.																				
When remote controller POWER button is turned ON, the check code “E0”appears.	1) Signal transmission error between indoor unit and remote controller	1) ① Connect a sub remote controller. ② Turn circuit breaker ON. If the display “centrally controlled” remains, replace the indoor controller board. ③ If the display disappears, turn the remote controller POWER button 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>E0 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>E0 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	E0 Display	Malfunction of indoor Unit	2	Operating Display	Operating Display	Malfunction of Remote controller	3	No Display	E0 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	E0 Display	Malfunction of indoor Unit																			
2	Operating Display	Operating Display	Malfunction of Remote controller																			
3	No Display	E0 Display	Malfunction of indoor Unit and Remote Controller																			
4	No Display	Operating Display	Malfunction of Remote controller																			
When remote controller POWER button is turned ON, operating display appears, but disappears soon.	1) Short circuit of indoor/outdoor connecting wire 2) Short circuit of transmission wire. 3) Wrong operation of remote controller due to noise wave emitted by other appliances.	1), 2) Check the wire 3) 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 button 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 power board. 6) Bad contact of CN2D. 7) Blown 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 it is not defective, replace the indoor controller board.																				

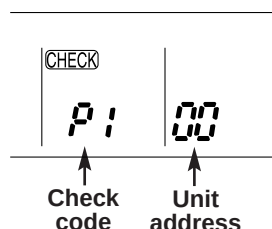
2. SELF DIAGNOSTIC FUNCTION WITH REMOTE CONTROLLER (WIRED REMOTE CONTROLLER)

2-1 When malfunction occurs during operation

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

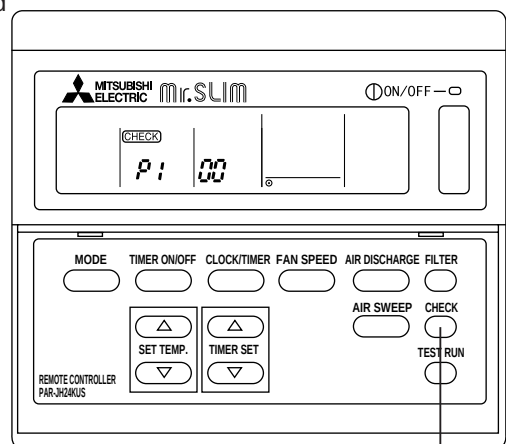
- (1) ON the set temperature display part, "CHECK" appears, and the unit address and the check code are displayed alternately at one-second intervals. (Check mode)

Example



- (2) When one remote controller controls several units in the group control, the LCD shows the unit address and check code of the first malfunctioning unit.
- (3) To cancel the check mode, press the Ⓢ ON/OFF button. In remote ON/OFF control, press the remote Ⓢ ON/OFF switch. In centralized control, turn OFF the Ⓢ ON/OFF button of centralized controller.

CHECK mode



Check button

NOTE: The latest check code is memorized, even if the check mode is cancelled by the way mentioned above. It takes 60 seconds maximum to display the memorized check code.

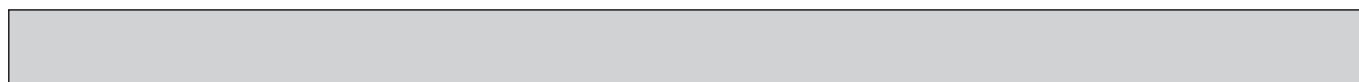
2-2 How to use the self diagnostic function for service

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 MODE" 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 page 35.)

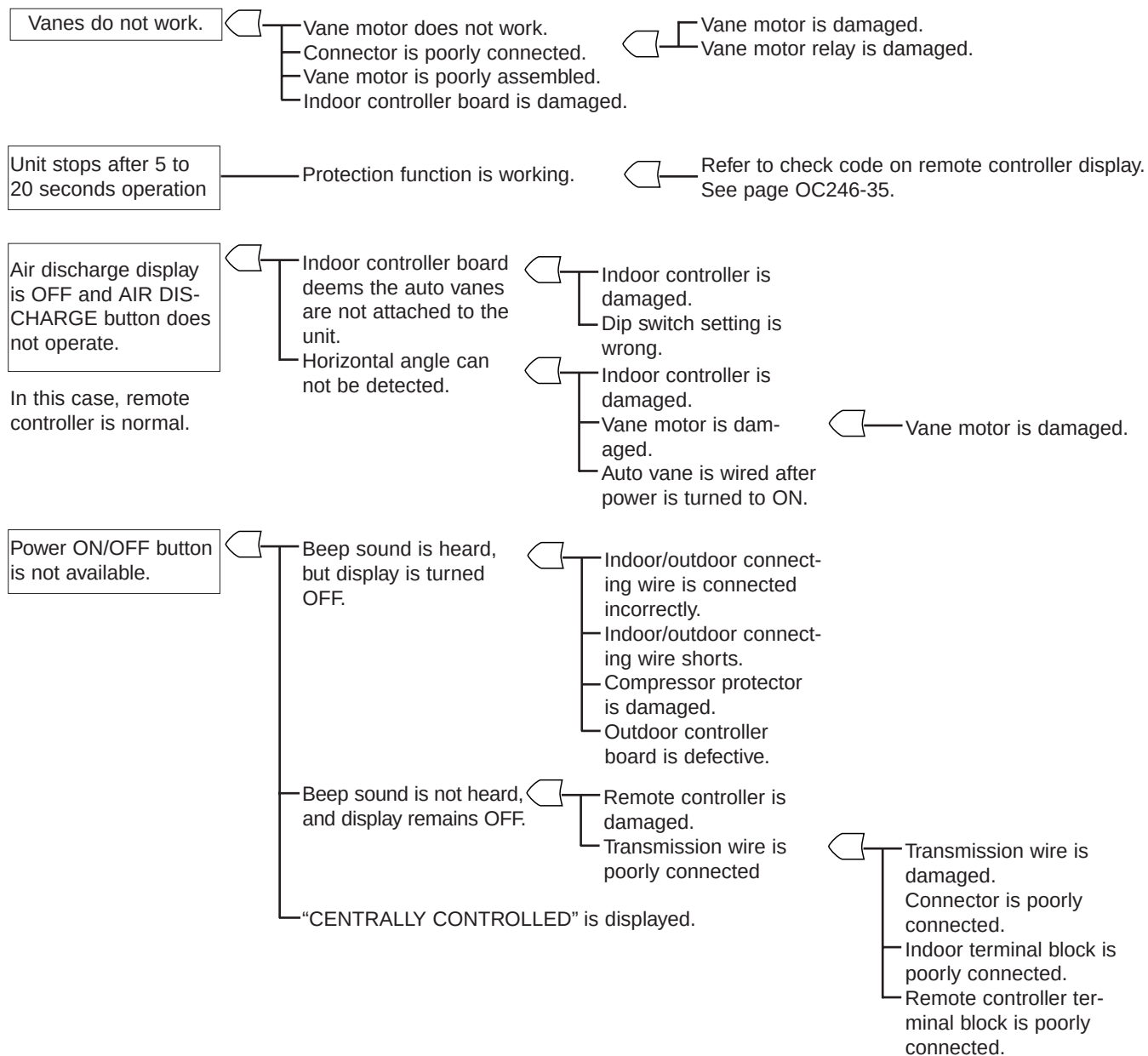
B. For group control using one remote controller

- (1) Pressing the CHECK button on the remote controller twice starts the self diagnostic function.
- (2) Press the SET TEMP. button or SET TEMP. button on the remote controller to advance or go back to the unit address. Each time SET TEMP. button is pressed, the unit address advances by one. Each time SET TEMP. button is pressed, the unit address goes back by one. The check code and the unit address, appear alternately.
- (3) The check code "U8" means no malfunction has occurred 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.
- (4) Check and repair the unit according to the check code. (Refer to page 35.)

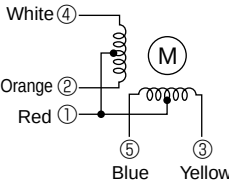
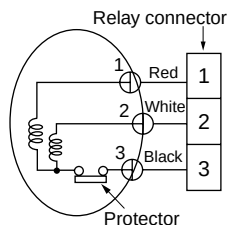
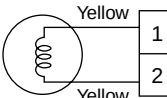
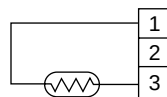


Check code	Diagnosis of malfunction	Cause	Check points
E0	Signal transmitting/receiving error (Indoor controller does not respond to remote controller signal.)	During individual unit control 1) Bad contact of transmission wire 2) Signal transmitting/receiving circuit is abnormal.	1) Check the transmission wire. 2) Check with another remote controller. If "E0" is still indicated, replace the indoor controller board. If other check code appears, replace the original 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. Normal resistance should be as follows. 32°F...15kΩ 86°F ...4.3kΩ 50°F...9.6kΩ 104°F ...3.0kΩ 68°F...6.3kΩ If the resistance is 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 noise wave emitted by 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 original 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 ① - ③. 32°F ...6kΩ 59°F...3.2kΩ 86°F...1.8kΩ 41°F ...4.8kΩ 68°F...2.6kΩ 95°F...1.5kΩ 50°F ...3.9kΩ 77°F...2.2kΩ 104°F...1.3kΩ If the resistance is normal, replace the indoor controller board.
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 drop of water is on.) If the resistance is normal, replace the indoor controller board.
P6	Freezing protection/overheating protection is working.	1) Short cycle of air cycle 2) Dirty air filter 3) Damaged fan 4) Abnormal refrigerant	1) Clear obstructions 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 original remote controller. 3) Check SW6 setting.
P8	Abnormality in outdoor unit	1) Wrong wiring of indoor/outdoor connecting wire 2) Reversed phase 3) Protection device is working 4) Damaged outdoor coil thermistor	1) Check the indoor/outdoor connecting wire. 2) Change the connection of electric wiring. 3) Check the protection device. 4) Measure the resistance of the outdoor coil thermistor. If the resistance is normal, replace the outdoor controller board.

3. OTHER TROUBLES AND CAUSES



4. How to check the parts PL12AK/PL18AK/PL24AK/PL30AK/PL36AK/PL42AK

Parts name	Check points																	
Room temperature thermistor (RT1)	Disconnect the connector then measure the resistance using a tester. (Surrounding temperature 50°F~86°F)																	
Liquid pipe thermistor (RT2)	<table><tr><td>Normal</td><td>Abnormal</td></tr><tr><td>4.3kΩ~9.6kΩ</td><td>Open or short</td></tr></table>	Normal	Abnormal	4.3kΩ~9.6kΩ	Open or short	(Refer to the thermistor)												
Normal	Abnormal																	
4.3kΩ~9.6kΩ	Open or short																	
Vane motor	Measure the resistance between the terminals using a tester. (Surrounding temperature 68°F~86°F)																	
	<table><tr><td>Connector</td><td>Normal</td><td>Abnormal</td></tr><tr><td>Red Ñ Yellow</td><td rowspan="4">300Ω</td><td rowspan="4">Open or short</td></tr><tr><td>Red Ñ Blue</td></tr><tr><td>Red Ñ Orange</td></tr><tr><td>Red Ñ White</td></tr></table>	Connector	Normal	Abnormal	Red Ñ Yellow	300Ω	Open or short	Red Ñ Blue	Red Ñ Orange	Red Ñ White								
Connector	Normal	Abnormal																
Red Ñ Yellow	300Ω	Open or short																
Red Ñ Blue																		
Red Ñ Orange																		
Red Ñ White																		
Fan motor	Measure the resistance between the terminals using a tester.																	
	<table><tr><td rowspan="3">Motor terminal or Relay connector</td><td colspan="2">Normal</td><td rowspan="3">Abnormal</td></tr><tr><td colspan="2">PL</td></tr><tr><td>12/18AK</td><td>24/36/42AK</td></tr><tr><td>Red-Black</td><td>21.7Ω</td><td>8.5Ω</td><td rowspan="2">Open or short</td></tr><tr><td>White-Black</td><td>26.5Ω</td><td>12.2Ω</td></tr></table>	Motor terminal or Relay connector	Normal		Abnormal	PL		12/18AK	24/36/42AK	Red-Black	21.7Ω	8.5Ω	Open or short	White-Black	26.5Ω	12.2Ω		
Motor terminal or Relay connector	Normal		Abnormal															
	PL																	
	12/18AK	24/36/42AK																
Red-Black	21.7Ω	8.5Ω	Open or short															
White-Black	26.5Ω	12.2Ω																
Drain pump	Measure the resistance between the terminals using a tester. (Surrounding temperature 68°F~86°F)																	
	<table><tr><td>Normal</td><td>Abnormal</td></tr><tr><td>101Ω</td><td>Open or short</td></tr></table>	Normal	Abnormal	101Ω	Open or short													
Normal	Abnormal																	
101Ω	Open or short																	
Drain sensor	Measure the resistance between the terminals using a tester. (Surrounding temperature 50°F~86°F)																	
	<table><tr><td>Normal</td><td>Abnormal</td></tr><tr><td>0.6kΩ~6.0kΩ</td><td>Open or short</td></tr></table>	Normal	Abnormal	0.6kΩ~6.0kΩ	Open or short	(Refer to the thermistor)												
Normal	Abnormal																	
0.6kΩ~6.0kΩ	Open or short																	

<Thermistor Characteristic graph>

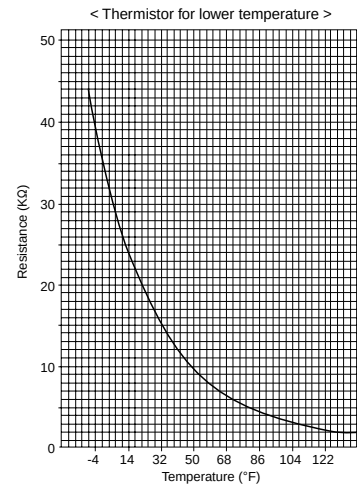
Thermistor for
lower temperature

Room temperature thermistor(RT1)
Liquid pipe thermistor(RT2)

Thermistor $R_0=15k\Omega \pm 3\%$
Fixed number of $B=3480k\Omega \pm 2\%$

$$R_t = 15 \exp \left\{ 3480 \left(\frac{1}{273 + \{(t-32)/1.8\}} - \frac{1}{273} \right) \right\}$$

32°F	15kΩ
50°F	9.6kΩ
68°F	6.3kΩ
77°F	5.2kΩ
86°F	4.3kΩ
104°F	3.0kΩ

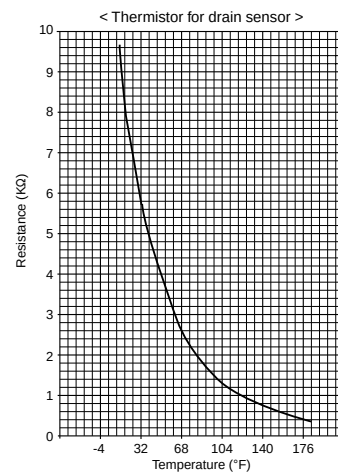


Thermistor for
drain sensor

Thermistor $R_0=6.0k\Omega \pm 5\%$
Fixed number of $B=3390k\Omega \pm 2\%$

$$R_t = 6 \exp \left\{ 3390 \left(\frac{1}{273 + \{(t-32)/1.8\}} - \frac{1}{273} \right) \right\}$$

32°F	6.0kΩ
50°F	3.9kΩ
68°F	2.6kΩ
77°F	2.2kΩ
86°F	1.8kΩ
104°F	1.3kΩ

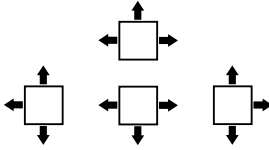
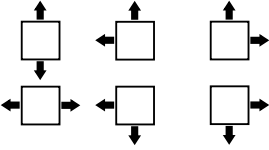


1. Placement of the air outlets

- For this grille, the blowout direction comes in 11 patterns.
- Also, by setting the dip switches (SW8-3, SW8-4) on the indoor board to the appropriate settings, you can adjust the air flow and speed. Select the settings from Table according to the location in which you want to install the unit.

1) Decide on the pattern of the airflow direction.

<Table 1>

	4-direction	3-direction	2-direction
Blowout direction pattern	Pattern 1 Factory setting 	Pattern 4 One air outlet fully closed 	Pattern 6 Two air outlet fully closed 

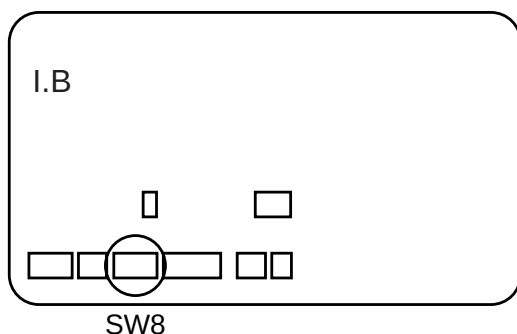
Note1.
For 3 and 2-directional, please use the air outlet shutter plate (option).

2) According to the number of air outlets and height of the ceiling to install the unit, be sure to set the up switches (SW8-3, SW8-4) on the indoor board to the appropriate setting.

- Correspondence of ceiling heights to numbers of air outlets.

Ceiling height & discharge direction

(Unit : feet)



PL12 / 18AK		Standard	High ceiling ①	High ceiling ②
SW8-3,4		SW8-1 OFF SW8-2 OFF	SW8-1 ON SW8-2 OFF	SW8-1 ON SW8-2 ON
4 direction	SW8-3 OFF SW8-4 OFF	8.9	9.8	11.5
3 direction	SW8-3 ON SW8-4 OFF	9.8	10.8	11.5
2 direction	SW8-3 ON SW8-4 ON	10.8	11.5	—

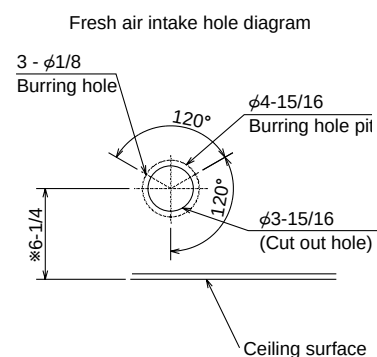
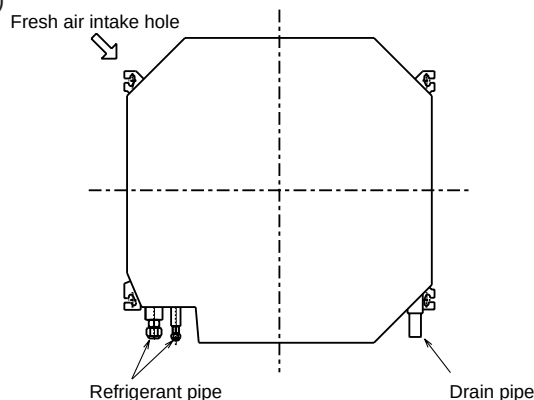
PL24 / 30 / 36 / 42AK		Standard	High ceiling ①	High ceiling ②
SW8-3,4		SW8-1 OFF SW8-2 OFF	SW8-1 ON SW8-2 OFF	SW8-1 ON SW8-2 ON
4 direction	SW8-3 OFF SW8-4 OFF	10.5	11.8	13.8
3 direction	SW8-3 ON SW8-4 OFF	11.8	13.1	13.8
2 direction	SW8-3 ON SW8-4 ON	13.1	13.8	—

2. Fresh air intake (Installation of site)

- At the time of installation, use the duct holes (cut out) located at the positions shown in following diagram, as and when required.

Note :

Be sure to add 5-5/16inch to the dimensions in the diagram that are marked with a "*" if installing a multi function casement (Option)

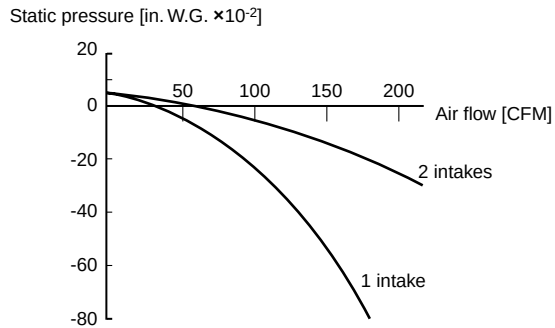


(Unit : inch)

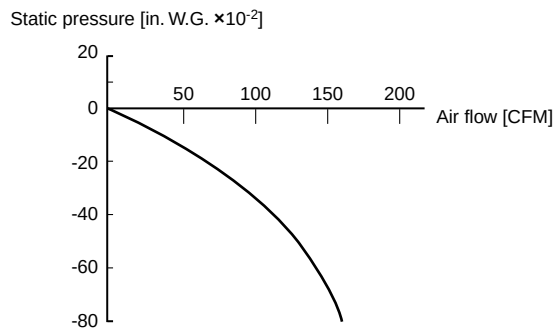
3. Fresh air intake amount & static pressure characteristics

1 PL12 / 18AK

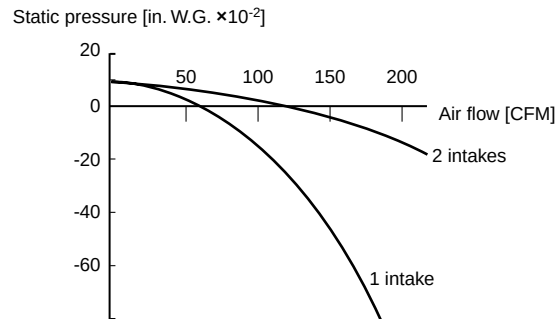
Multifunction casement + Standard filter



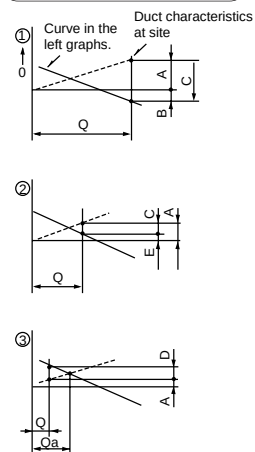
Taking air into the unit



Multifunction casement + High efficiency filter



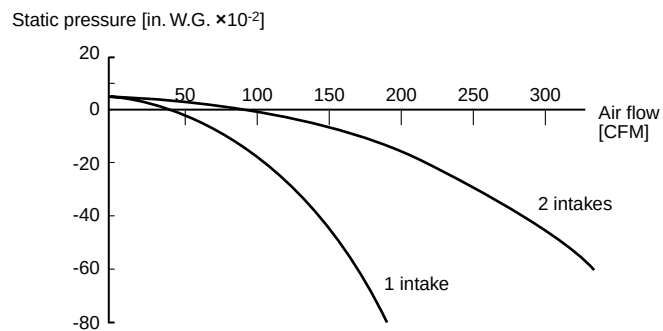
How to read curves



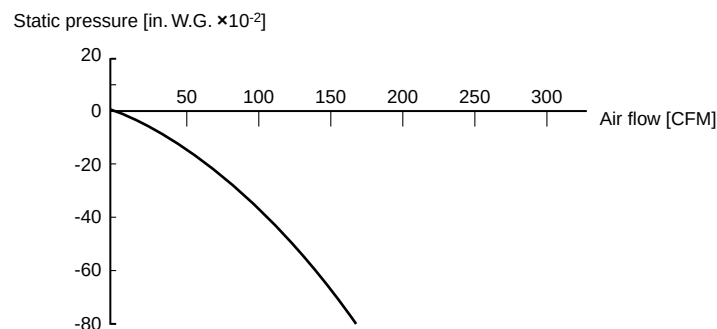
- Q...Planned amount of fresh air intake <CFM>
- A...Static pressure loss of fresh air intake duct system with air flow amount Q <in.W.G.×10⁻²>
- B...Forced static pressure at air conditioner inlet with air flow amount Q <in.W.G.×10⁻²>
- C...Static pressure of booster fan with air flow amount Q <in.W.G.×10⁻²>
- D...Static pressure loss increase amount of fresh air intake duct system for air flow amount Q <in.W.G.×10⁻²>
- E...Static pressure of indoor unit with air flow amount Q <in.W.G.×10⁻²>
- Qa...Estimated amount of fresh air intake with out D <CFM>

2 PL24/30/36/42AK

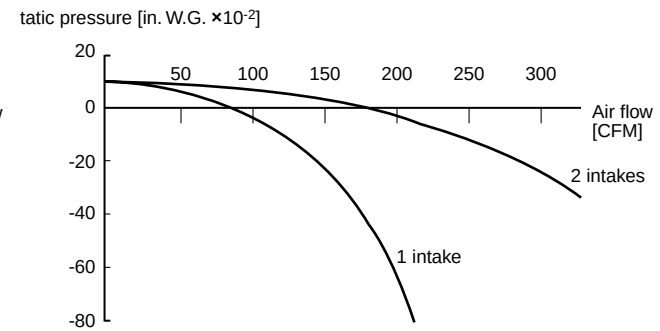
Multifunction casement + Standard filter



Taking air into the unit



Multifunction casement + High efficiency filter



4. Interlocking operation method with duct fan (Booster fan)

●Whenever the indoor unit is operating the duct fan also operates.

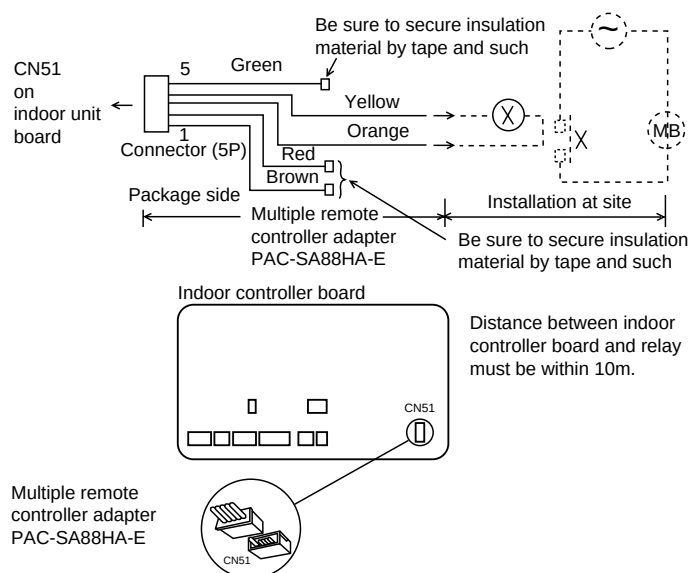
(1)Connect the optional multiple remote controller adapter(PAC-SA88HA-E)to the connector CN51 on the indoor controller board.

(2)Drive the relay after connecting the 12V DC relay between the Yellow and Orange connector lines.

Use a relay under 1W.

MB: Electromagnetic switch power relay for duct fan.

X: Auxiliary relay (12V DC LY-1F)



5. BRANCH DUCT(Installation at site)

Discharge by branch duct becomes possible by installing a branch duct at site. Knockout holes on the wall panel of the indoor unit must be removed.

Branch Duct Installation Procedure

At the time of installation, use the duct holes (cut out) located at the positions shown in following diagram, as and when required.

Note :

The figure marked with * in the drawing represent the dimensions of the main unit excluding those of the optional multi function casement.

When installing the optional multi function casement, add 5-5/16 inch to the dimensions marked on the figure.

When installing the branch ducts, be sure to insulate adequately. Otherwise condensation and dripping may occur.

Figure 1. Branch duct mounting position

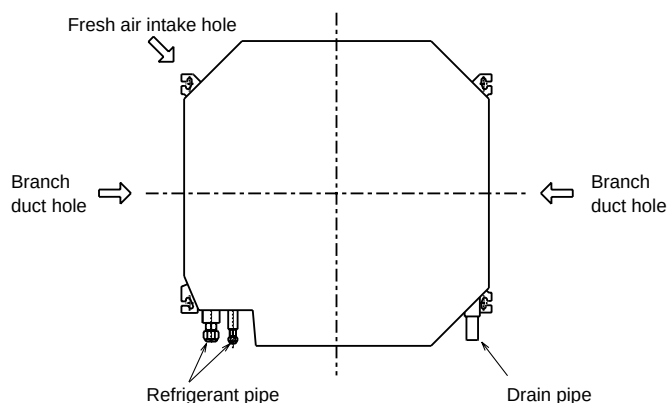
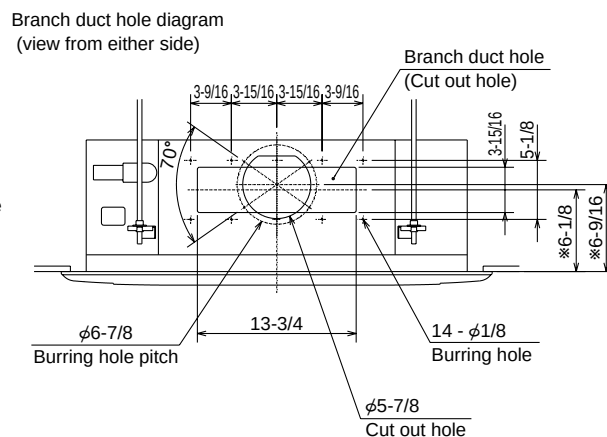


Figure 2. Branch duct connection details



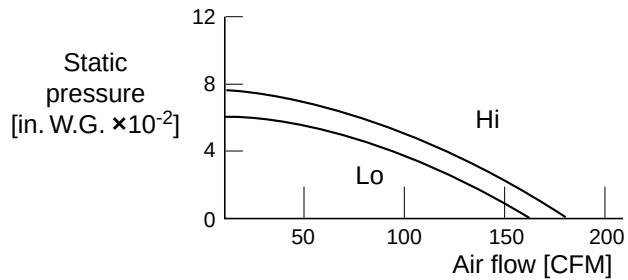
Unit : (inch)

6. Air flow & Static pressure characteristics of Branch Duct (with SWA at “Standard”)

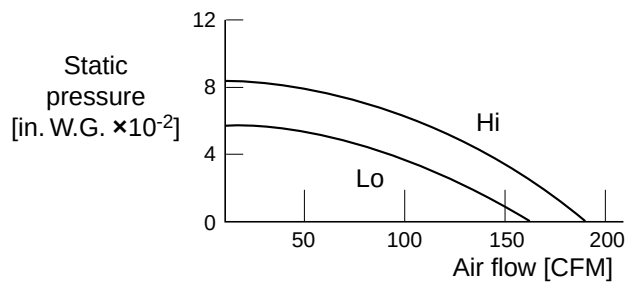
(1) 4 direction airflow (Horizontal vane)

Angled duct

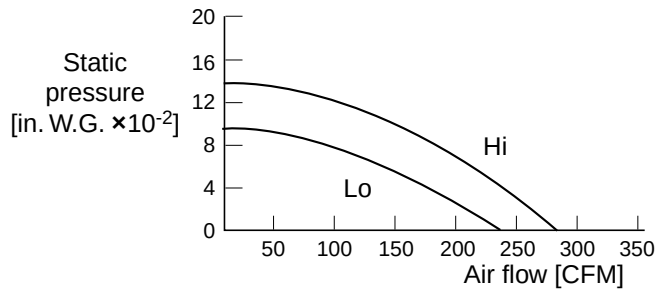
PL12AK



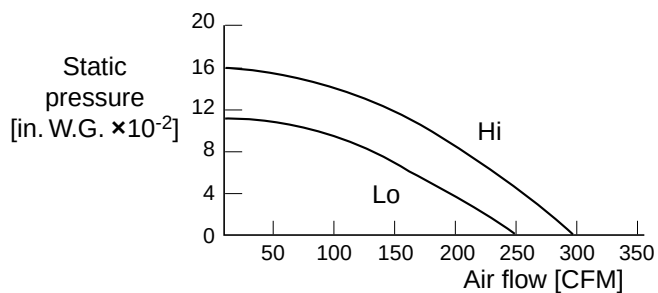
PL18AK



PL24AK

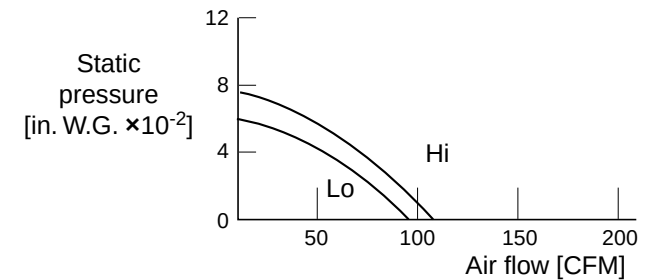


PL30/36/42AK

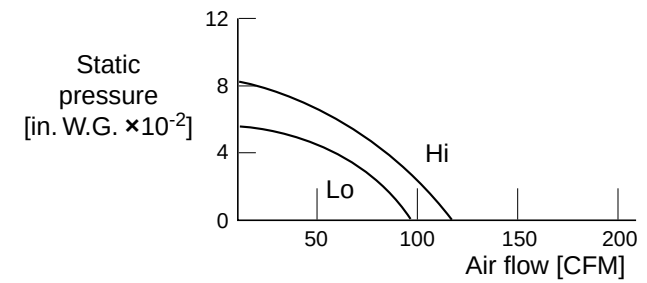


Rounded duct

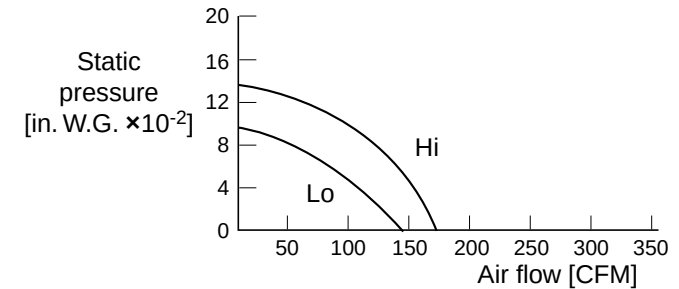
PL12AK



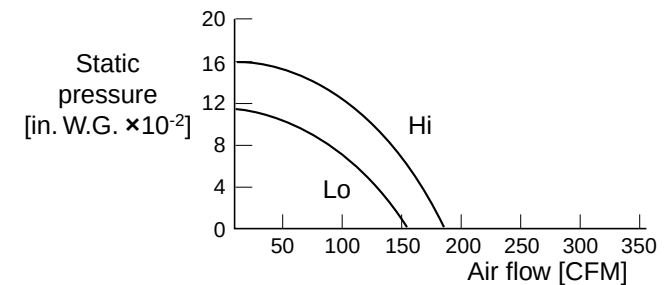
PL18AK



PL24AK



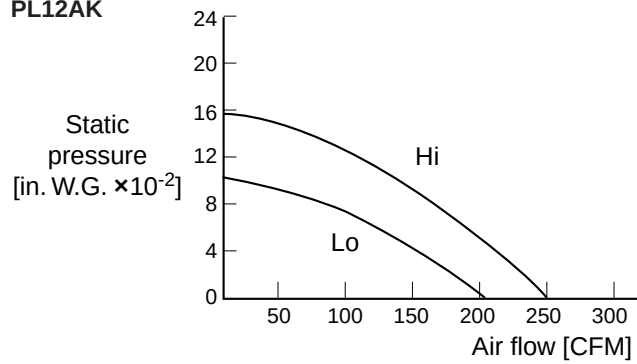
PL30/36/42AK



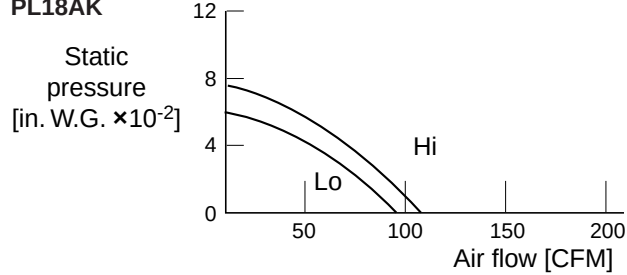
(2) 3 direction airflow (Horizontal vane)

Angle duct

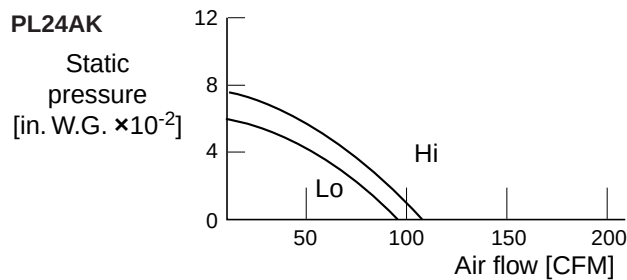
PL12AK



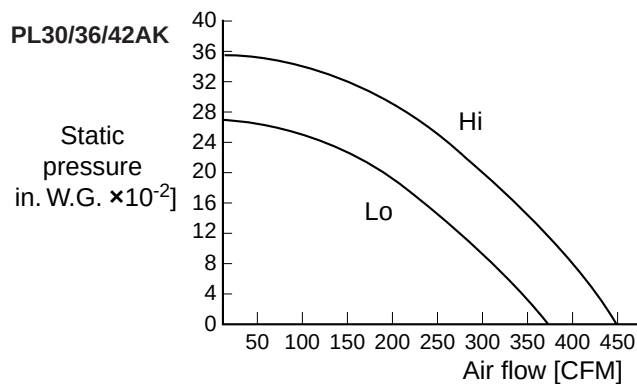
PL18AK



PL24AK

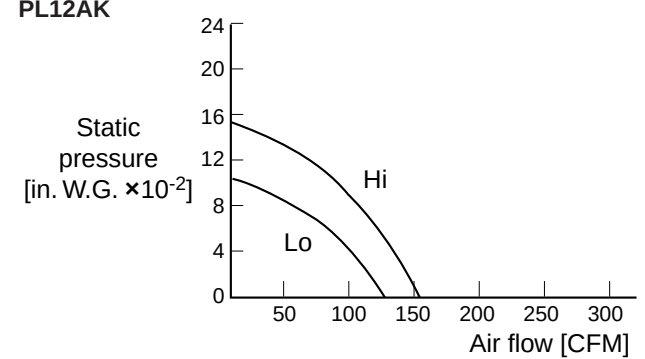


PL30/36/42AK

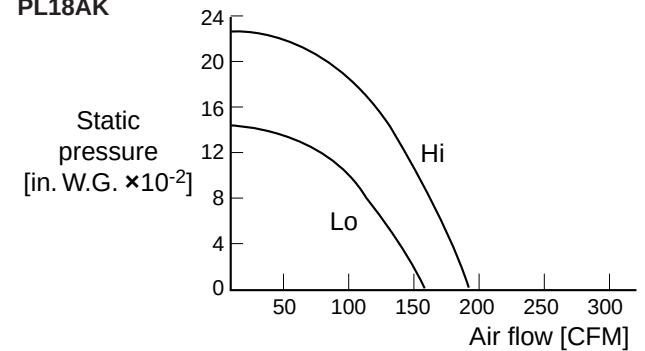


Rounded duct

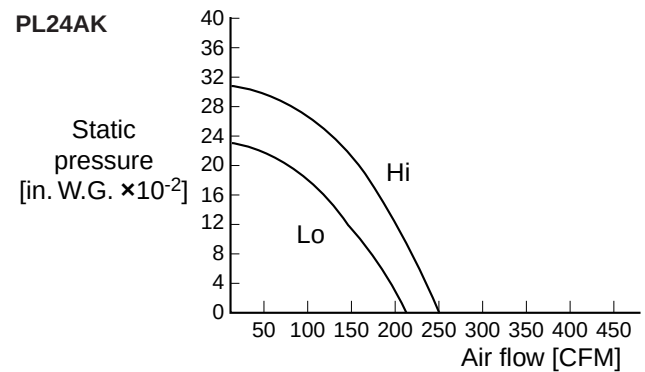
PL12AK



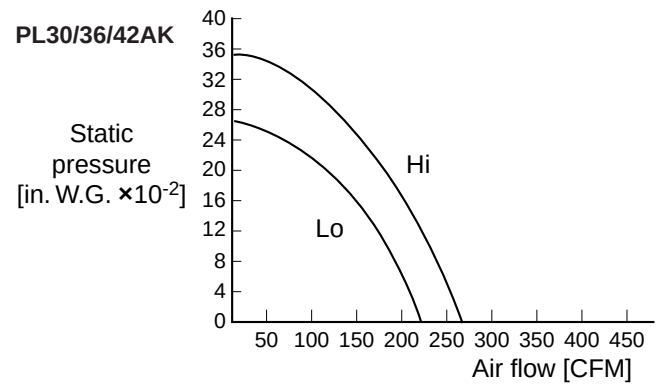
PL18AK



PL24AK



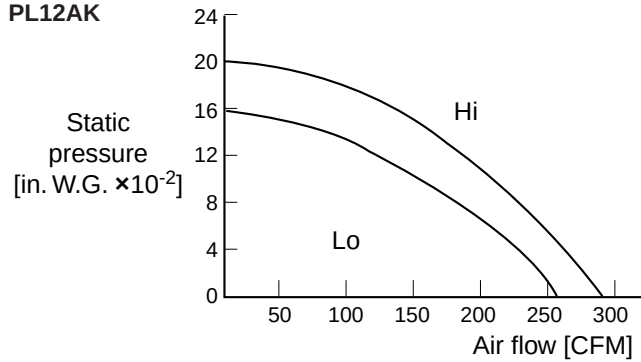
PL30/36/42AK



(3) 2 direction airflow (Horizontal vane)

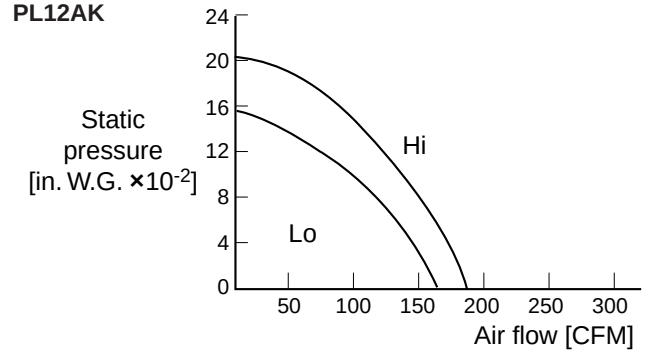
Angle duct

PL12AK

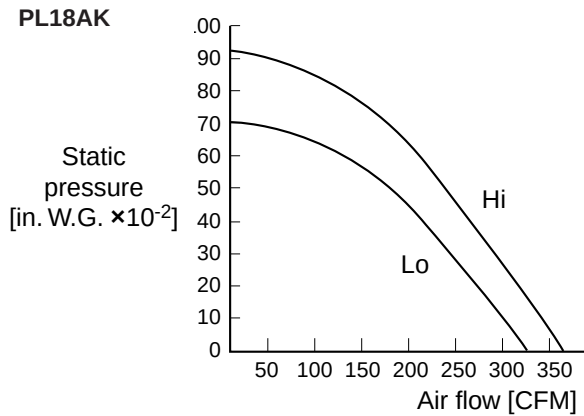


Rounded duct

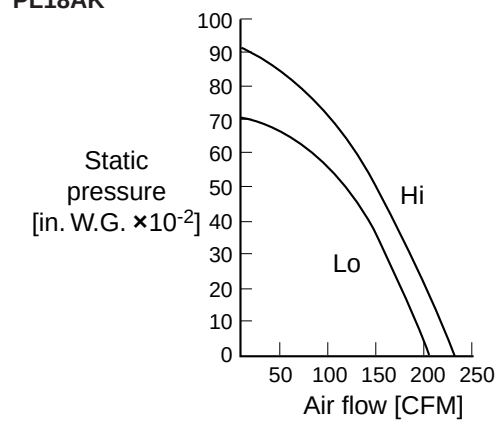
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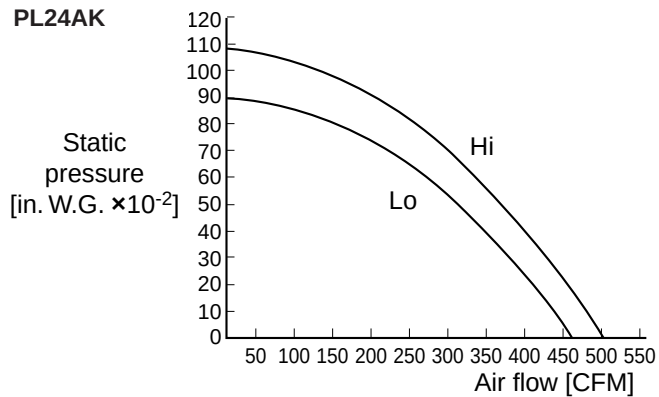
PL18AK



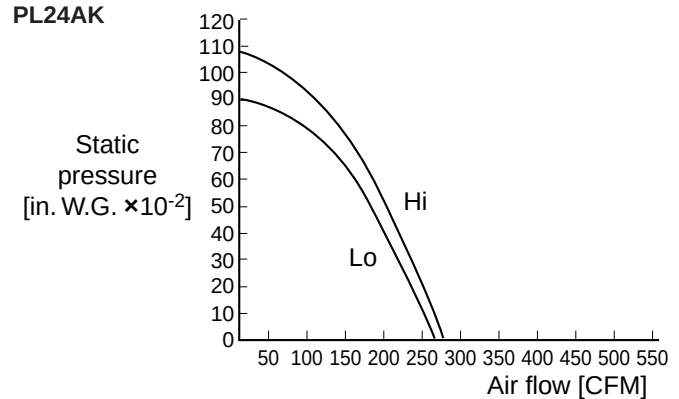
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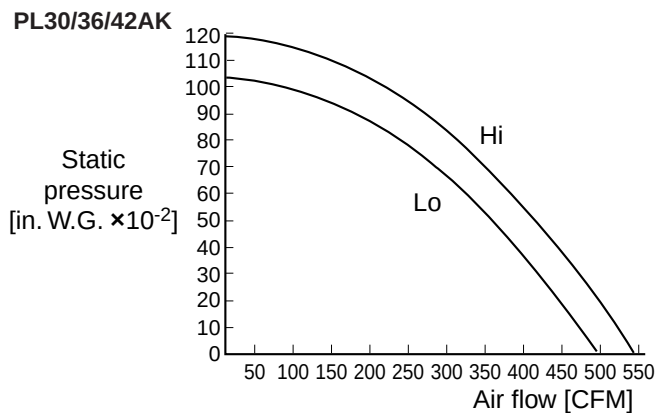
PL24AK



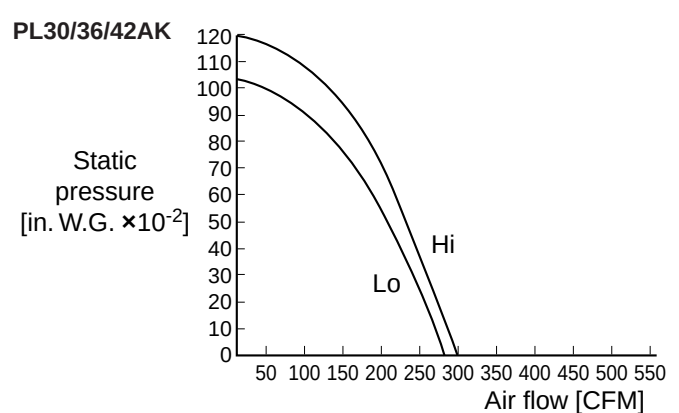
PL24AK



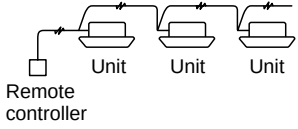
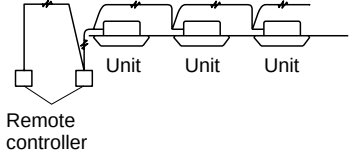
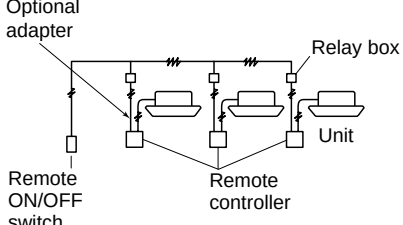
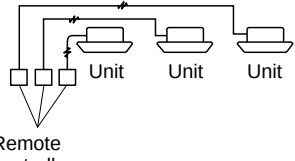
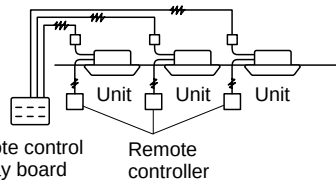
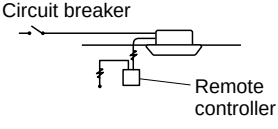
PL30/36/42AK



PL30/36/42AK



1. VARIETY OF SYSTEM CONTROL FUNCTIONS

① Group control with a single remote controller (See page OC246-46.)	 Remote controller	Many units, installed at different locations, can be started and controlled with a single remote controller. The remote controller can be mounted in a different location using a non-polar two-wire cable, which can be extended up to 500m. A maximum of 50 units can be controlled with a single remote controller. All units operate in the same mode.
② Control using two remote controllers (See page OC246-47.)	 Remote controller	Two remote controllers can be used to control either one unit or a group of units. Units can then be controlled from a distance or at close range. Units operate according to the latest command from either remote controller.
③ Both remote ON/OFF and individual controls (See page OC246-47.) * Timer adapter (PAC-SA89TA-E) is needed.	 Optional adapter Relay box Remote ON/OFF switch Remote controller	All units can be turned on or off simultaneously using a remote ON-OFF switch. Also, each unit can be controlled individually by each remote controller. During remote ON-OFF control, a message of "CENTRALLY CONTROLLED" is displayed on the LCD of the remote controller. This is available for both one unit control and several units control.
④ Individual control by grouping remote controllers (See page OC246-48.)	 Remote controller	By grouping the remote controllers in one place, several units installed at different locations can be controlled individually, and operation conditions of all units are visible without a special control board. The control method is the same as that of the single unit with a single remote controller.
⑤ Multiple remote control display (See page OC246-49.) * Multiple display adapter (PAC-SA88HA-E) is needed.	 Remote control display board Remote controller	Several units can be controlled with a remote control display board. Operation conditions of all the units are visible with the remote control display board. Individual control by each remote controller is also possible.
⑥ Auto restart function (See page OC246-49.)	 Circuit breaker Remote controller	A unit can be started or stopped with the circuit breaker on or off. Remote controller is also available. With this function, when the power is restored after power failure, the unit will restart automatically. (However, when the remote controller POWER ON/OFF button is OFF, the unit will not start.)

2. GROUP CONTROL WITH A SINGLE REMOTE CONTROLLER

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

2-1 How to wire

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

2-2 How to set unit-address

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

- (1) Each lever of SW2 shows the number as follows.

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

Figure 1

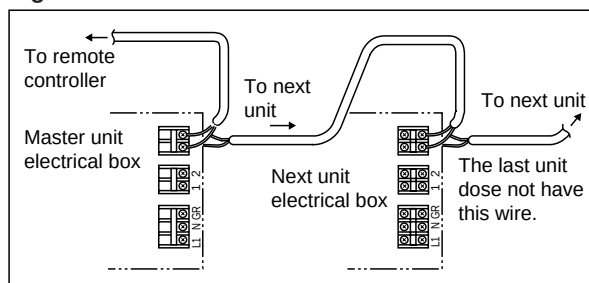


Figure 2

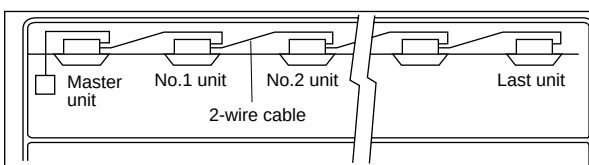
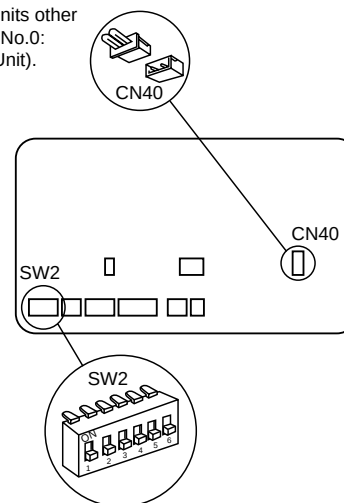


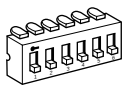
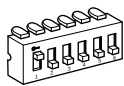
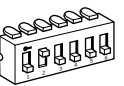
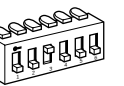
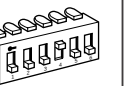
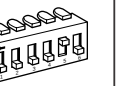
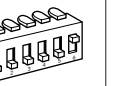
Figure 3

Indoor controller board ▼

Should be removed from all units other than unit No.0: (Master Unit).



Setting examples

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

2-3 Unit control

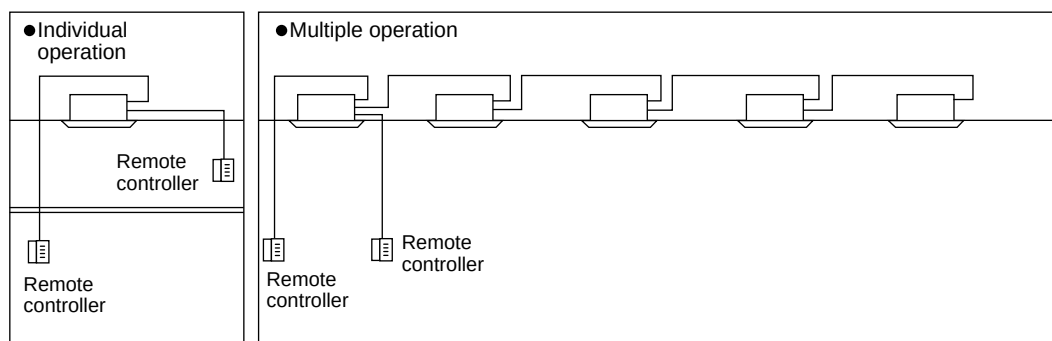
The remote controller can control all units ON/OFF, temperature, air flow, and swing louver. However, the thermostat in each unit turns ON or OFF individually to adjust to the room temperature.

3. CONTROL USING TWO REMOTE CONTROLLERS

Two remote controllers can be used to control either one unit or a group of units. Units operate according to the latest command from either of the two remote controllers.

Before operation, be sure to set one remote controller as the “main controller” and the other as the “sub controller”, using dip switch SW17-7 of the remote controller.

Figure 4



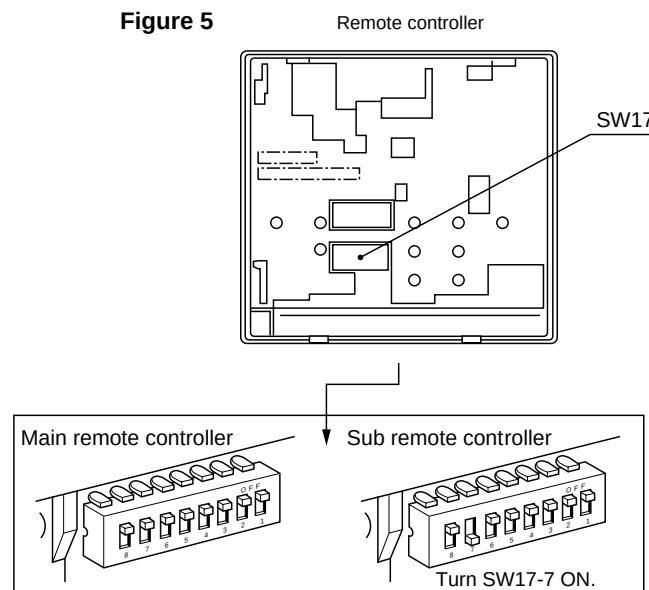
3-1 How to set SW17-7 (See Figure 5.)

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

3-2 Remote controller LCD indication

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

Figure 5



4. REMOTE ON-OFF AND INDIVIDUAL REMOTE CONTROLS

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

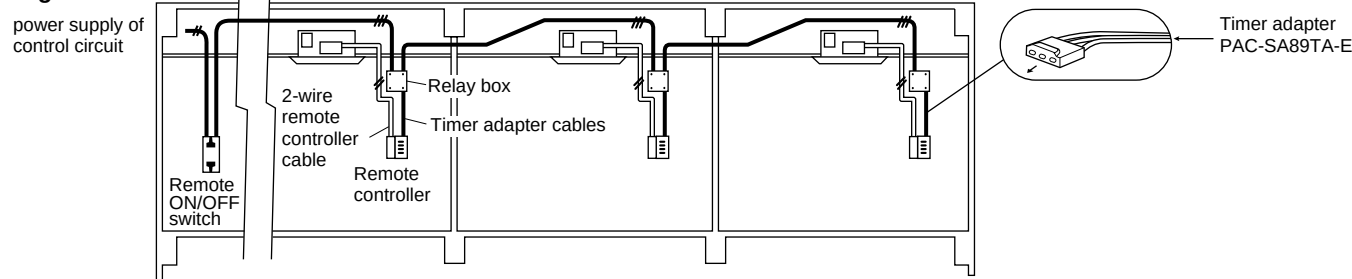
The following operations are available by connecting a relay, a timer adapter (PAC-SA89TA-E), and a remote ON/OFF switch to the system. Timer adapter is an optional part. Other parts are available on the market.

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

4-1 System

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

Figure 6



NOTE1 : Install the relay box where you can be serviced it easily.

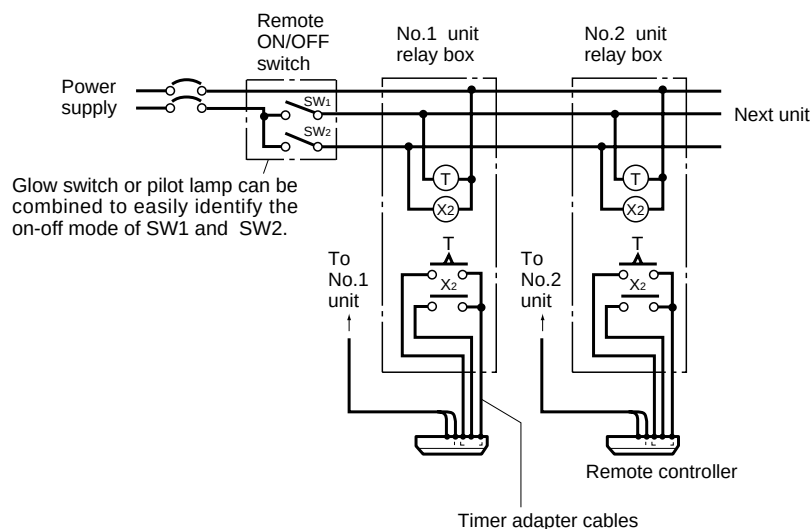
NOTE2 : For control circuit wiring, use a wire of No. 14 AWG or a control cable according to the power supply of control circuit.

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

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

4-2 Basic wiring

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



4-3 Switch function of remote ON-OFF switch

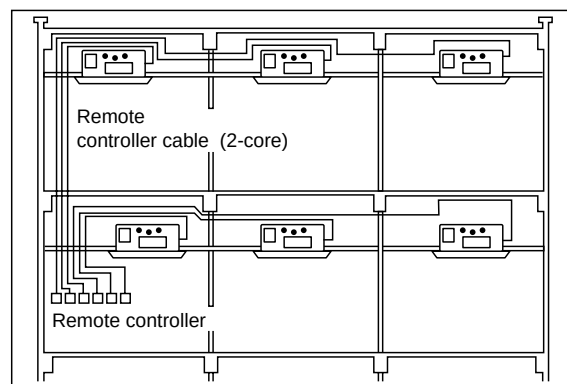
		SW2 (Switches between remote ON-OFF and individual control)	
		ON (Remote ON-OFF control)	OFF (Individual control)
SW1 (Switches between remote ON and OFF.)	ON (Start)	All units start together. ※1 Individual control is not available.	Each unit can be controlled by each remote controller. Remote ON-OFF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

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

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

5. INDIVIDUAL CONTROL BY GROUPING THE REMOTE CONTROLLERS

- Grouping the remote controllers allows individual control and centralized monitoring of units installed in different places without a special control board.
- Remote control cables are extendible up to 550 yards When the cable length exceeds 33ft, use the double-insulated two-core cable such as Belden 9407. Also, the cable thickness must be No. 22 AWG or above.
- When gathering the power ON/OFF switches of air conditioners near the remote controllers, you should also install the power ON/OFF switch near each unit to prevent electric trouble during servicing.

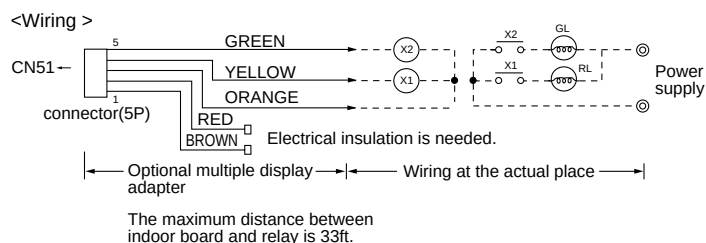


6. MULTIPLE REMOTE CONTROL DISPLAY

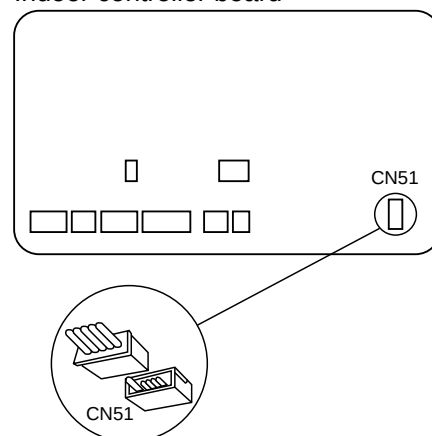
You can control several units with a multiple remote control display, by wiring an optional multiple display adapter (PAC-SA88HA-E) with relays and lamps on the market.

How to wire

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



Indoor controller board



[Notes on Signs]

X1:Relay (for operation lamp)

X2:Relay (for check lamp)

RL:Operation Lamp

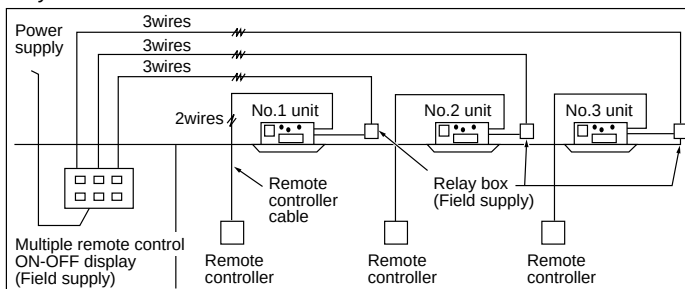
GL:Check Lamp

[Field supplied parts]

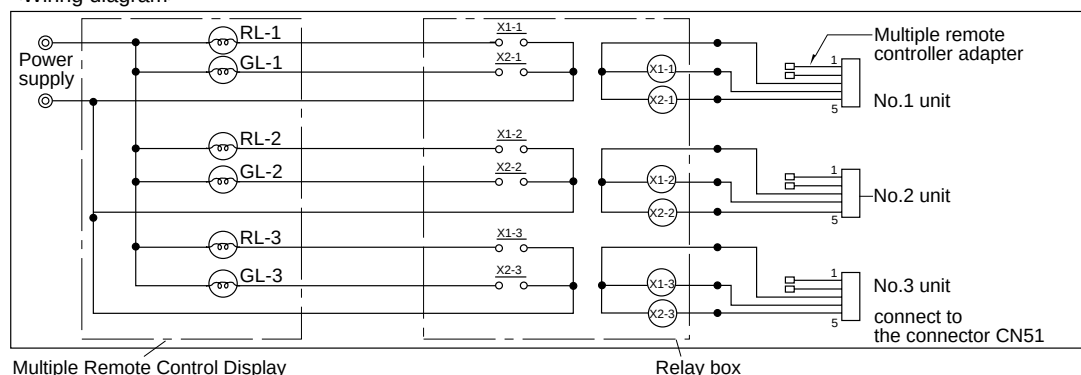
Relays:12V DC with rated coil power consumption below 0.9W.

Lamps:Matching to power supply voltage.

<System>



<Wiring diagram>



7. AUTO RESTART FUNCTION

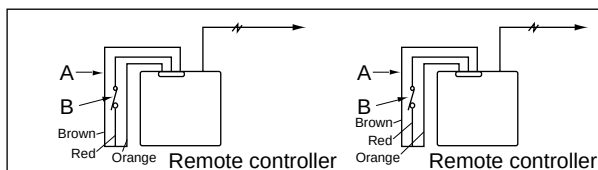
By setting the dip switch SW1-8 to ON, the air conditioner can be started/stopped by power supply ON/OFF.

If the air conditioner is OFF before the power failure, it will not start operation by power restore.

•This function is mainly to emergency performance when the power supply stops temporarily. Therefore, since the protection function (for example, crank case heater and prevention from restarting in 3 minutes, etc.) of the device is not operated, this function should not be used mostly.

8. TIMER OPERATION OR THE OPERATION BY AN EXTERNAL SIGNAL

<Wiring>



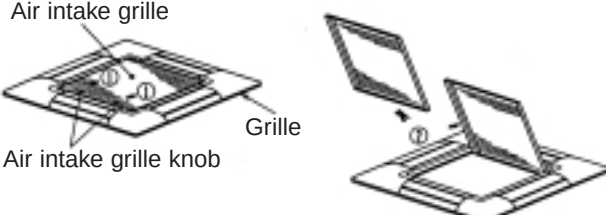
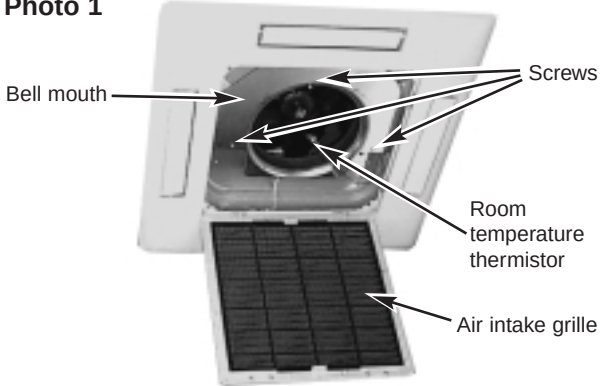
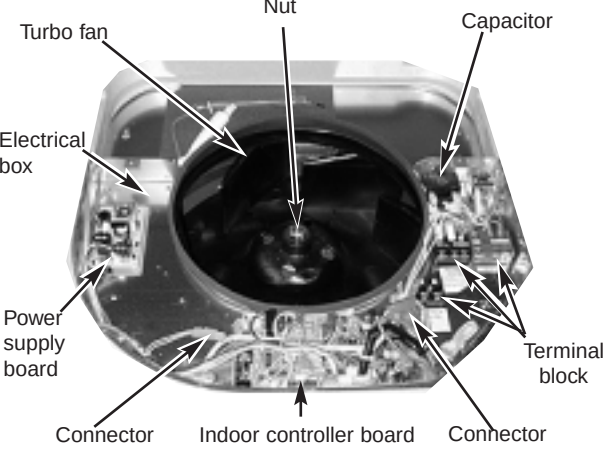
A : an optional timer adapter

B : a single-throw switch

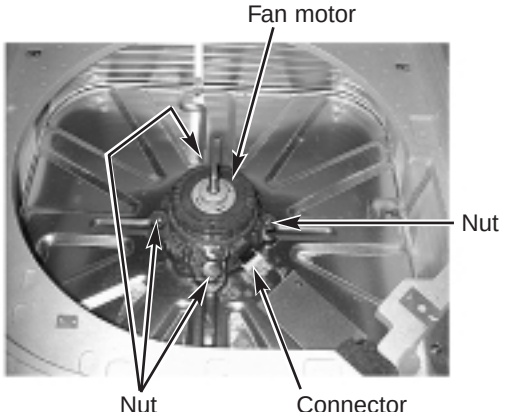
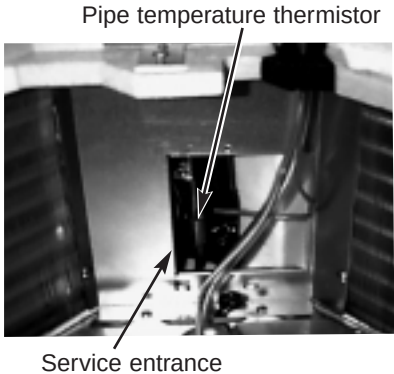
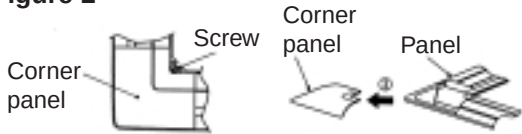
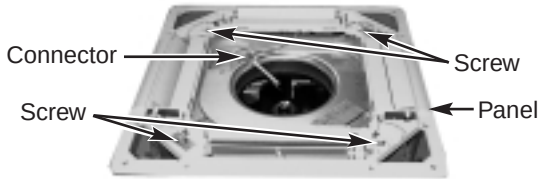
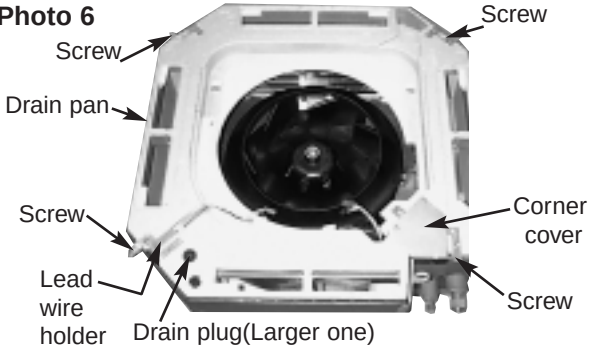
For remote control, connect the optional timer adapter (PAC-SA89TA-E)

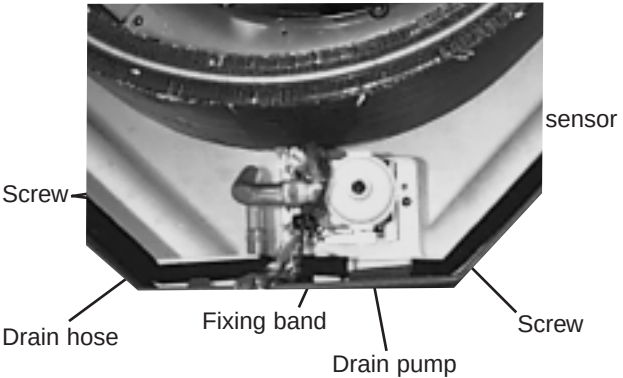
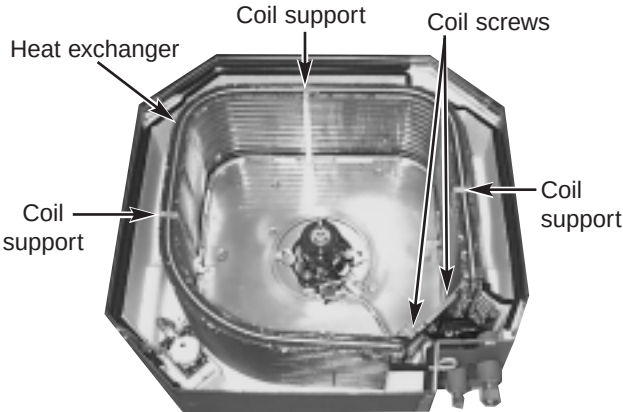
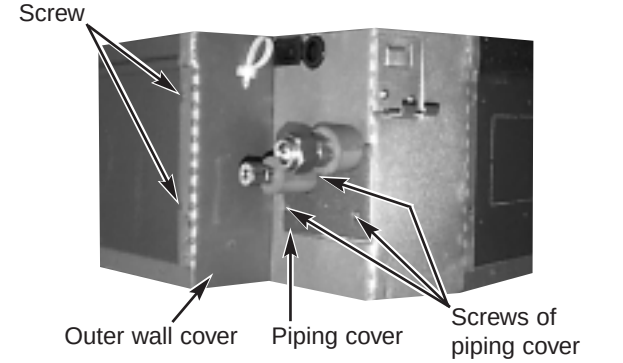
PL18AK

Be careful on removing heavy parts.

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
1. Removing the air intake grille (1) Slide the knob of air intake grille to the direction of the arrow ① to open the air intake grille. (2) Remove the string hook from the panel to pretend the grille from dropping. (3) Slide the shaft in the hinge to the direction of the arrow ② and remove the air intake grille.	Figure 1 
2. Removing the room temperature thermistor (1) Remove the screw(X1) in the room temperature thermistor holder to remove the holder and the room temperature thermistor. (2) Remove the 1 screw from the bell mouth, and unscrew the another 2 screws (fixed to the oval hole which has different diameter) to remove the bell mouth. (3) Hold the holder claw, and remove the room temperature thermistor and holder. (4) Disconnect the connector (red) in the indoor control board.	Photo 1 
3. Removing the electrical box (1) Disconnect the lead wire of the vane motor from the clamp, and disconnect the white connector (10P). (2) Remove the room temperature thermistor with the holder. (3) Remove the bell mouth.(See photo 1) (4) Disconnect the relay connector in the electrical box. Red (3P) for fan motor White (2P) for pipe temperature detecting thermistor Blue (2P) for drain pump White (3P) for drain sensor (5) Remove the 3 screws from the electrical box, loosen another 2 screws to remove the box. <Electrical parts in the electrical box> Indoor controller board Power supply board Terminal block Capacitor	Photo 2 



OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
4. Remove the fan motor (1) Remove the bell mouth.(See photo 1) (2) Remove the electrical box.(See photo 2) (3) Remove the turbo fan nut. (4) Pull out the turbo fan. (5) Disconnect the connector of the fan motor lead wire. (6) Remove the 4 nuts of the fan motor.	Photo 3 
5. Removing the pipe temperature thermistor (1) Remove the bell mouth.(See photo 1) (2) Remove the electrical box.(See photo 2) (3) Remove the turbo fan. (4) Remove the screw of the service panel. (5) Remove the service panel. (6) Remove the pipe temperature thermistor which is inserted into the holder installed to the thin copper pipe. (7) Disconnect the 2-pin white connector.	Photo 4 
6. Removing the panel (1) Remove the air intake grille.(See figure 1) Corner panel (See figure 2) (1) Remove the screw of the corner. (2) Slide the corner panel to the direction of the arrow③, and remove the corner panel. Panel (See photo 5) (1) Disconnect the connector that connects with the unit. (2) Remove the 2 screws from the panel and loose another 2 screws, which fixed to the oval hole, have different diameter. (3) Rotate the panel a little to remove the screws.(Slide the panel so that the screw comes to a large diameter of the oval hole, which has two different diameters.)	Figure 2  Photo 5 
7. Removing the drain pan (1) Remove the panel. (See photo 5) (2) Remove the drain plug (Larger one), drain the remaining water in the drain pan. (3) Remove the corner cover. (2 screws) (4) Remove the bell mouth (See photo 1) (5) Remove the electrical box. (See photo 2) (6) Remove the lead wire holder. (1 screw) (7) Remove the 4 screws and pull out the drain pan. ※ Pull out the left and right of the pan gradually. Be careful not to crack or damage the pan.	Photo 6 

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
8. Removing the drain pump and drain sensor (1) Remove the panel. (See photo 5) (2) Remove the bell mouth. (See photo 1) (3) Remove the electrical box. (See photo 2) (4) Remove the drain pan. (See photo 6) (5) Remove the 3 screws of the drain pump. (6) Cut the drain hose band, pull out the drain hose from the drain pump. (7) Pull out the drain pump. (8) Remove the drain sensor and the holder.	Photo 7 
9. Removing the heat exchanger (1) Remove the panel. (See photo 5) (2) Remove the bell mouth. (See photo 1) (3) Remove the electrical box. (See photo 2) (4) Remove the drain pan. (See photo 6) (5) Remove the turbo fan. (See photo 3) (6) Remove the 3 screws of the piping cover, and pull out piping cover. (7) Remove the 4 screws of the outer wall cover, and pull out the outer wall cover. (8) Remove the screw of the coil support. (9) Remove the 2 screws of the coil. (10) Pull out the heat exchanger.	Photo 8  Photo 9 

PANEL PARTS

PL12AK

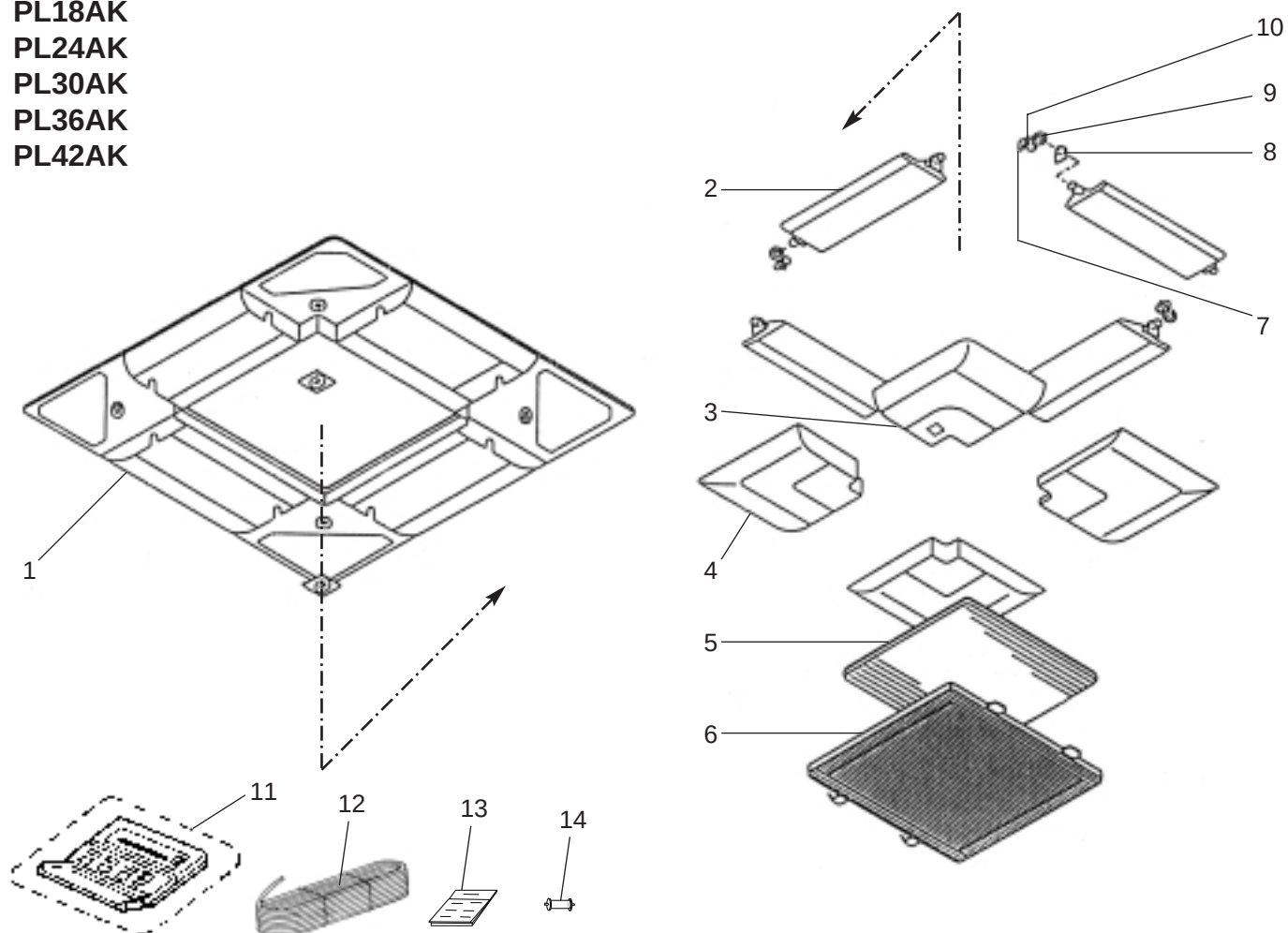
PL18AK

PL24AK

PL30AK

PL36AK

PL42AK



No.	Parts No.	Parts Name	Specification	Q'ty / set	Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty	Price	
				PL 12, 18, 24, 30, 36, 42 AK				Unit	Amount
1	T7W E13 003	AIR OUTLET GRILLE		1					
2	T7W E05 002	VANE ASSY		4					
3	R01 E01 638	CORNER PANEL		1					
4	R01 E00 638	CORNER PANEL		3					
5	R01 E00 500	L.L. FILTER		1					
6	R01 E00 691	GRILLE ASSY		1					
7	R01 E00 223	VANE MOTOR		4		MV			
8	R01 E00 063	VANE BUSH		8					
9	R01 E00 040	GEAR (VANE)		4					
10	R01 E01 040	GEAR		4					
11	T7W E05 713	REMOTE CONTROLLER BOARD		1		R.B			
12	T7W A00 305	CABLE ASSY	35ft	1					
13	T7W E00 673	SCREW ASSY		1					
14	T7W E03 239	FUSE	250V 0.3A	1		F3			

FUNCTIONAL PARTS

PL12AK

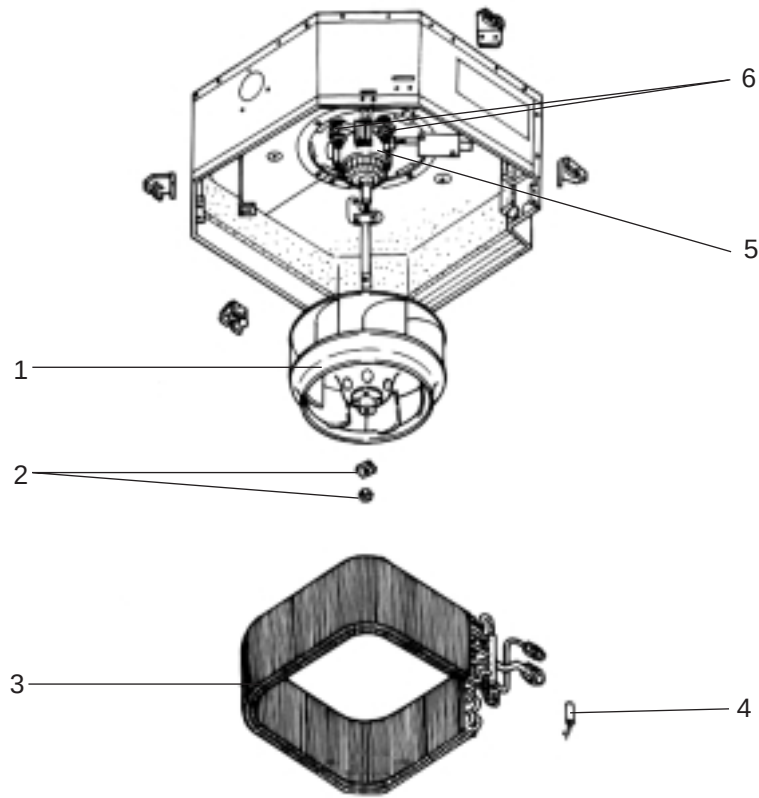
PL18AK

PL24AK

PL30AK

PL36AK

PL42AK



No.	Parts No.	Parts Name	Specification	Q'ty / set						Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty	Price	
				12 AK	18 AK	24 AK	30 AK	36 AK	42 AK				Unit	Amount
1	R01 E00 114	TURBO FAN		1	1									
	R01 E01 114	TURBO FAN				1	1	1	1					
2	R01 08K 097	SPL WASHER		1	1	1	1	1	1					
3	T7W E76 480	HEAT EXCHANGER		1										
	T7W E77 480	HEAT EXCHANGER			1									
	T7W E78 480	HEAT EXCHANGER				1								
	T7W E79 480	HEAT EXCHANGER					1							
	T7W E80 480	HEAT EXCHANGER						1	1					
4	T7W E06 202	PIPE TEMPERATURE THERMISTOR		1	1	1	1	1	1		RT2			
5	T7W E09 762	FAN MOTOR	PN6W70-L	1	1						MF			
	T7W E10 762	FAN MOTOR	PN6W120-L			1	1	1	1		MF			
6	R01 A41 105	RUBBER MOUNT		4	4	4	4	4	4					

FUNCTIONAL PARTS

PL12AK

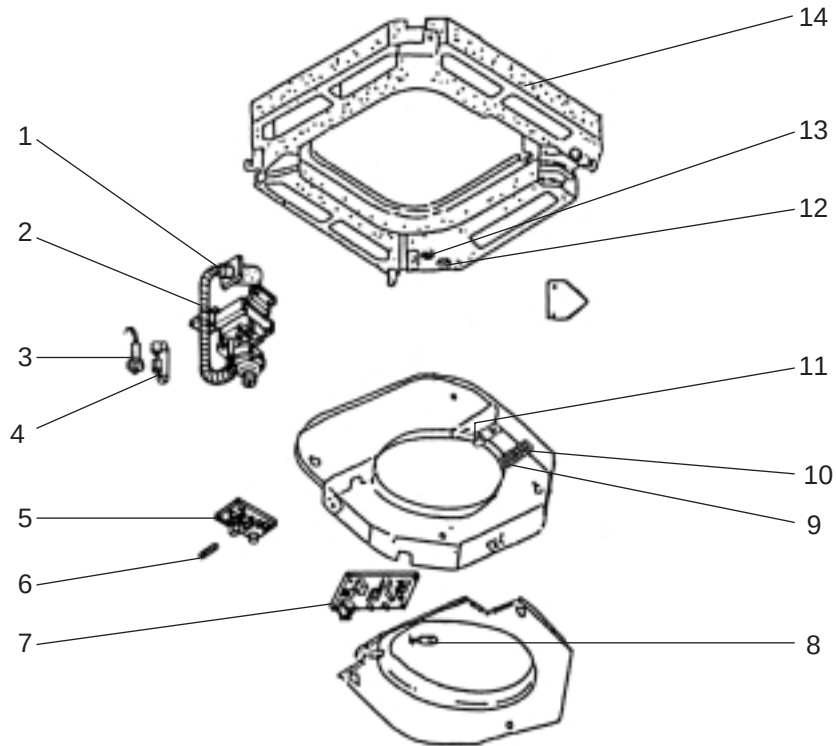
PL18AK

PL24AK

PL30AK

PL36AK

PL42AK



No.	Parts No.	Parts Name	Specification	Q'ty / set						Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty	Price	
				12 AK	18 AK	24 AK	30 AK	36 AK	42 AK				Unit	Amount
1	T7W E00 527	DRAIN HOSE		1	1	1	1	1	1					
2	T7W E04 355	DRAIN PUMP		1	1	1	1	1	1		DP			
3	R01 E00 266	DRAIN SENSOR		1	1	1	1	1	1		DS			
4	R01 31K 241	SENSOR HOLDER		1	1	1	1	1	1					
5	R01 E02 313	POWER BOARD		1	1	1	1	1	1		P.B			
6	T7W 410 239	FUSE	250V , 6A	2	2	2	2	2	2		F1,F2			
7	T7W E15 310	CONTROLLER BOARD		1	1	1	1	1	1		I.B			
8	R01 E00 202	ROOM TEMPERATURE THERMISTOR		1	1	1	1	1	1		RT1			
9	R01 556 246	TERMINAL BLOCK	2P (1, 2)	2	2	2	2	2	2		TB4,TB5			
10	T7W E12 716	TERMINAL BLOCK	3P (L1, N, GR)	1	1	1	1	1	1		TB2			
11	T7W E05 255	CAPACITOR	12 μ F 230V	1	1						C			
	T7W E04 255	CAPACITOR	25 μ F 230V			1	1	1	1		C			
12	R01 A41 524	DRAIN PLUG		1	1	1	1	1	1					
13	R01 A48 524	DRAIN PLUG		1	1	1	1	1	1					
14	T7W E09 529	DRAIN PAN		1										
	T7W E06 529	DRAIN PAN			1									
	T7W E07 529	DRAIN PAN				1	1							
	T7W E08 529	DRAIN PAN						1	1					

1. REFRIGERANT PIPES

Service Ref. : PL12/18/24AK

Part No.	PACSK03FS	PACSK05FS	PACSK07FS	PACSK10FS	PACSK15FS
Pipe length (ft.)	10	16	23	33	49
Pipe size O.D.(in.) (in.)	Liquid: $\phi 3/8$ Gas: $\phi 5/8$				
Connection method	Indoor unit: Flared Outdoor unit: Flared				

Service Ref. : PL30/36/42AK

Part No.	PACSK03FF	PACSK05FF	PACSK07FF	PACSK10FF	PACSK15FF
Pipe length (ft.)	10	16	23	33	49
Pipe size O.D.(in.) (in.)	Liquid: $\phi 1/2$ Gas: $\phi 3/4$				
Connection method	Indoor unit: Flared Outdoor unit: Flared				

Note 1. The refrigerant pipes and the indoor unit contain a nitrogen holding charge which must be removed by evacuation.

<Piping connection procedures>

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

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

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

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

2. TIMER

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

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

2-1 Program timer specifications

Parts name	Program timer
Parts No.	PAC-SC32PTA
Exterior dimensions (inch)	5-4/32x4-23/32x23/32 (130x120x18mm)
Installation	Wall mount
Type of clock	Quartz
Clock accuracy	±50 second / month at 77°F
Display-Time	Liquid crystal display
-Week	Liquid crystal display
-Timer setting unit	Liquid crystal display
Program cycle	24 hours
Timer setting unit	30 minutes
No. of set points	48 / day
Power rating	5V DC ±5% (Supplied by Remote Controller)

2-2 Feature of program timer

(1) Daily timer function

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

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

(2) Setback operation (PAC-SC32PT)

Set back operation is useful for reducing running costs

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

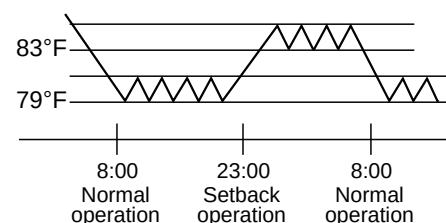
8:00~23:00 Cooling operation with set temperature at 79°F

23:00~8:00 Setback operation with 4 degrees of setback

As shown in the chart on the right, the set temperature rises 4 degrees automatically during the setback operation. When the setback operation ends, normal operation will begin.

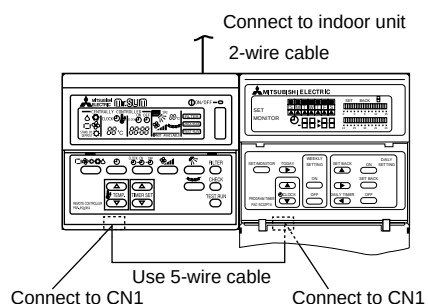
(3) Weekly timer function

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



2-3. How to connect program timer

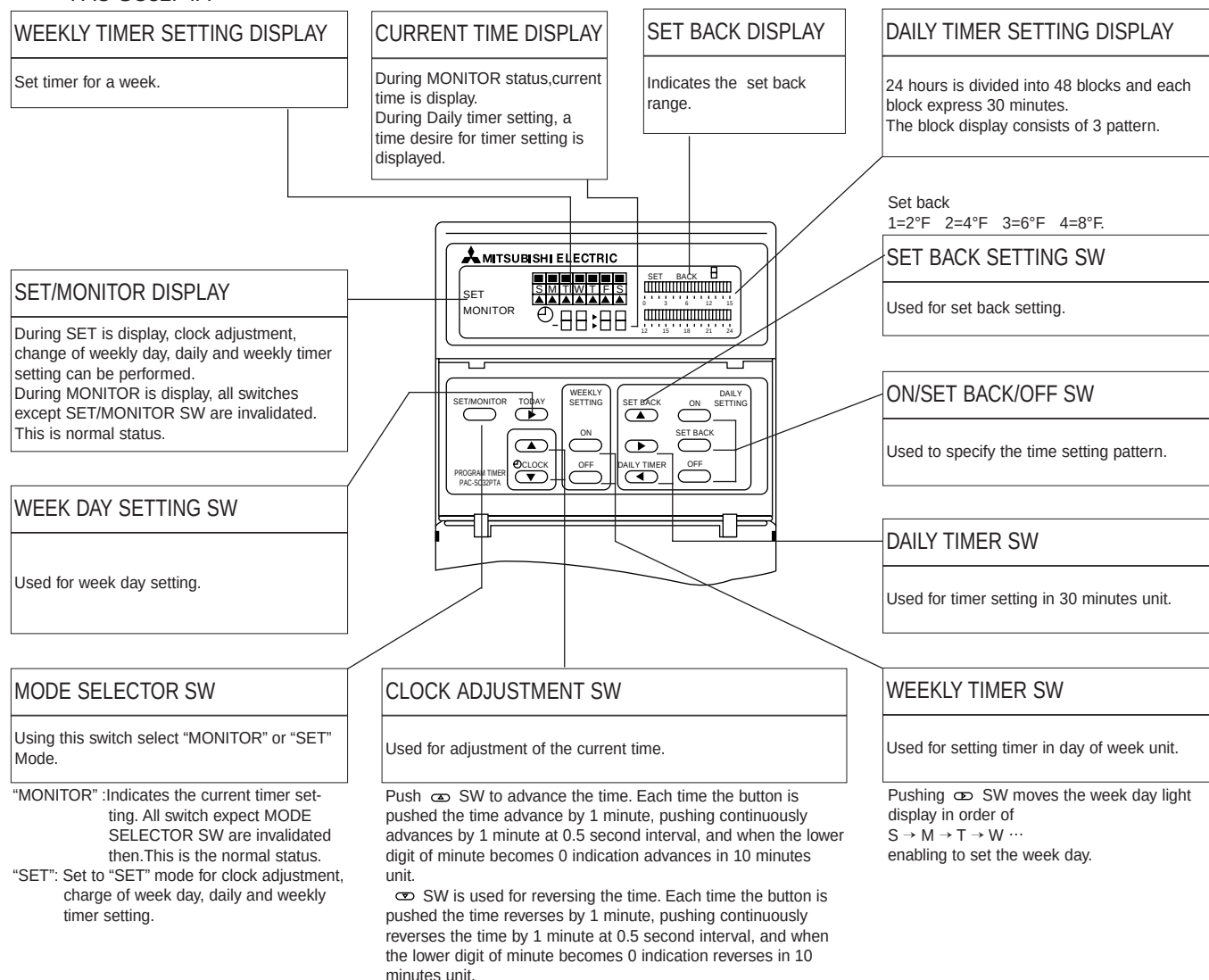
- (1) Install the program timer next to the remote controller the same way as the remote controller is installed.
- (2) Connect the program timer and the remote controller with a 5-wire cable as shown in the figure below



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

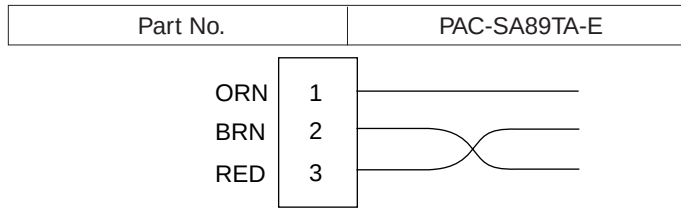
2-4. Names and functions

<PAC-SC32PTA>



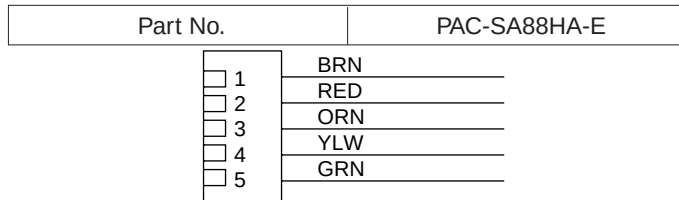
3. TIMER ADAPTER

This adapter is needed for system control and for operation via external contacts. Adapter connection is described on page 49.



4. MULTIPLE REMOTE CONTROLLER ADAPTER

This adapter is needed for remote indication (operation/check). Adapter connection is described on page 49.



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

Part No.	PAC-SG03TM-E
Applicable Model	PL12/18/24/30/36/42AK

6. HIGH EFFICIENCY FILTER ELEMENT

Part No.	PAC-SG01KF
Applicable Model	PL12/18/24/30/36/42AK

7. AIR OUTLET SHUTTER PLATE

Part No.	PAC-SG06SP-E
Applicable Model	PL12/18/24/30/36/42AK

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