Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

No. OC291

CITY MULTI Indoor Unit
TECHNICAL & SERVICE MANUAL

CITY MULTI Series Wall Mounted Type

[Models] PKFY-08NAMU-A
PKFY-12NGMU-A
PKFY-20NFMU-A
PKFY-32NFMU-A

CITY MULTI Series Ceiling Cassettes Type

[Models] PLFY-12NAMU-A
PLFY-20NAMU-A
PLFY-24NAMU-A
PLFY-32NAMU-A
PLFY-40NAMU-A

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1. PKFY-•MU-A Type ·····OC292-1
2. PLFY-•NAMU-A Type ·····OC290-1

• Connected outdoor unit is **PURY-80TMU** or **PURY-100TMU**.

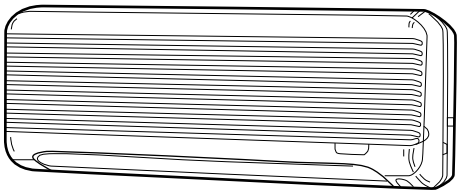
CITY MULTI

PKFY-08NAMU-A
PKFY-12NGMU-A
PKFY-20NFMU-A
PKFY-32NFMU-A

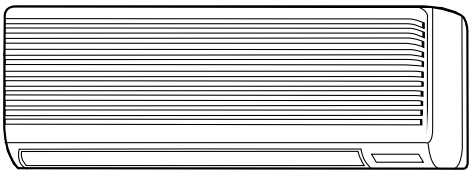
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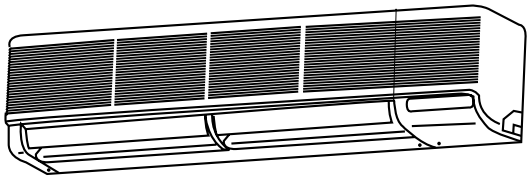
1 DIFFERENCES



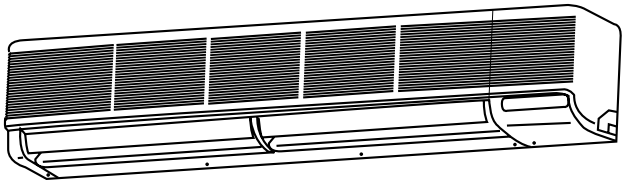
PKFY-08NAMU-A
Indoor Unit



PKFY-12NGMU-A
Indoor Unit



PKFY-20NFMU-A
Indoor Unit



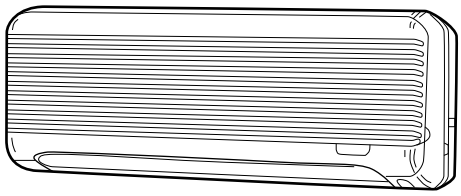
PKFY-32NFMU-A
Indoor Unit

Differences among the models of PKFY series.

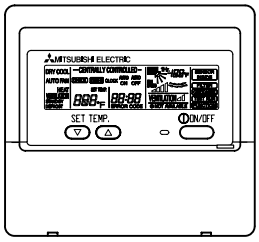
Item			Model	PKFY-											
				08NAMU-A			12NGMU-A			20NFMU-A			32NFMU-A		
Fan			—	Lineflow fan × 1			Lineflow fan × 1			Lineflow fan × 2					
Fan speed			—	4 speeds type			4 speeds type			2 speeds type			2 speeds type		
Air flow	High		CFM	DRY	210	WET 190	DRY	410	WET 370	DRY	640	WET 570	DRY	990	WET 890
	Medium 1		CFM	DRY	200	WET 180	DRY	370	WET 330	DRY	—	WET —	DRY	—	WET —
	Medium 2		CFM	DRY	180	WET 170	DRY	340	WET 300	DRY	—	WET —	DRY	—	WET —
	Low		CFM	DRY	170	WET 160	DRY	280	WET 250	DRY	490	WET 440	DRY	780	WET 700
Noise level	High		dB	36			42			45			49		
	Medium 1		dB	35			40			—			—		
	Medium 2		dB	33			36			—			—		
	Low		dB	32			32			39			46		
Out dimension	Height		in.	11-5/8			13-3/8			13-3/8					
	Width		in.	32-3/32			39			55-1/8			66-1/8		
	Depth		in.	6-7/32			9-1/4			9-1/4					
Controller board	SW2	1	—	OFF			OFF			OFF			OFF		
		2	—	OFF			ON			ON			OFF		
		3	—	ON			ON			OFF			OFF		
		4	—	OFF			OFF			ON			OFF		
		5	—	—			OFF			OFF			ON		
		6	—	—			OFF			OFF			OFF		
Pipe dimension	Gas side		in.	1/2"			1/2"			5/8"					
	Liquid side		in.	1/4"			1/4"			3/8"					
	Drain(unit side)		in.	O.D. 5/8"			O.D. 13/16"			O.D. 13/16"					

2 FEATURES

PKFY-08NAMU-A



Indoor Unit



Microprocessor Remote controller

Model	**Cooling capacity / Heating capacity**
PKFY-08NAMU-A	8,000/9,000 Btu/h

2-1. New Compact Design

- Compact 11-5/8 inch (29.5cm) high body fits snugly in even limited spaces.
- Light weight 19lbs (8.5kg) unit easy to transport and install.

2-2. Auto-flap shutter Enhances good Looks

With a simple flick of the OFF switch the air outlet can be closed off with a shutter. The shutter also functions as a flap during operation to adjust the air flow angle, with “Auto Angle” securing a comfortable air flow.

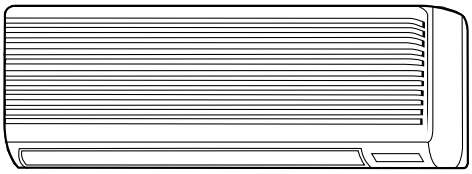
2-3. Front power supply box for easier wiring even after installation

The front power supply box allows electrical wiring work to be done after the indoor unit has been installed. For easier installation, all the screws required for securing the indoor unit to the wall are accessible from the front of the unit.

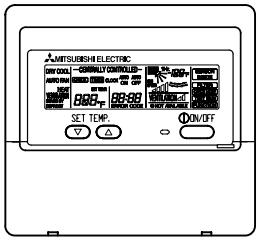
2-4. 4-way piping provides more flexibility in selecting installation sites

All piping including drainage can be connected from the rear, right, base, and left of the unit, providing much greater flexibility out piping and selecting installation site.

PKFY-12NGMU-A



Indoor Unit



Microprocessor
Remote controller

Model	Cooling capacity / Heating capacity
PKFY-12NGMU-A	12,000 / 12,500 Btu/h

2-1. New Compact Design

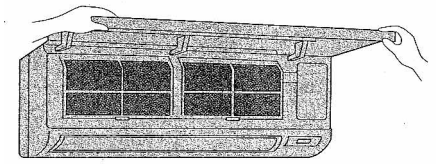
Units have now been downsized to require minimal wall space.
A 20% reduction in width 38-31/32 inch (990mm) compared to previous models means that installation is possible in very narrow spaces.

2-2. Auto-flap shutter Enhances Good Looks

With a simple flick of the OFF switch the air outlet can be closed off with a with a shutter. The shutter also functions as a flap during operation to adjust the air flow angle, with “Auto Angle” securing a comfortable air flow.

2-3. The Intake Grille Filter Can be Completely Removed Allowing Easy Cleaning (Can be washed in water)

• Front grille opens out



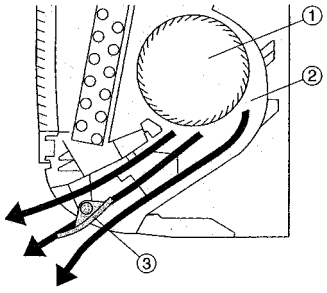
2-4. Quiet Operation

•Airflow passage configuration that assures quiet operation

① The unit incorporates a randompitch cycling fan.
By changing fan intervals, quiet operation is achieved without reduction in airflow. Optimal design of the airflow passage gives a shortened fan diameter and allows a highly compact installation.

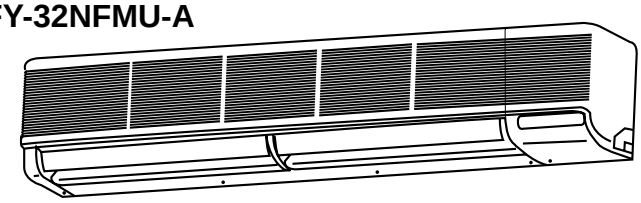
② Thanks to a highly practical casing configuration, airflow generated by the fan is distributed uniformly.

③ Due to careful positioning of the vertical vane axis, air is blown evenly from the outlet. This prevents mixing with secondary air and also suppresses condensation.

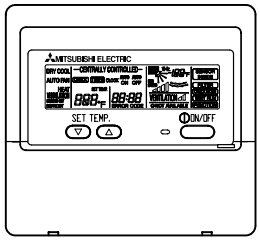


2-5. 4-way Piping Provides more Flexibility in Selecting Installation Sites

PKFY-20NFMU-A
PKFY-32NFMU-A



Indoor Unit



Microprocessor
Remote controller

Models	**Cooling capacity / Heating capacity**
PKFY-20NFMU-A	20,000 / 22,500 Btu/h
PKFY-32NFMU-A	32,000 / 35,500 Btu/h

2-1. COMPACT DESIGN

The PKFY series models have been downsized and now require such minimal wall space that they can even be installed above windows. For the PKFY series models, 14-9/16 inch (37 cm) of wall space between the ceiling and the window allows “above window” installation.

2-2. A FURTHER REFINEMENT OF COMFORT WITH NISE SUPPRESSION

Remarkably tow-noise operation has been achieved through the development of a “near -silent” fan and the design which minimises air flow resistance.

2-3. AUTO FLAP SHUTTER

With a simple flick of the OFF switch the air outlet can be closed off with a shutter. The shutter also functions as a flap during operation to adjust the air flow angle, with “Auto Angle” securing a comfortable air flow.

2-4. INSTALLATION : FAST AND ENDLESSLY ADAPTABLE

(1) Multi-directional piping

Multi directional drain and refrigerant piping radically improves flexibility in selecting installation layouts.
PKFY- • NFMU-A models boast refrigerant piping in 4 directions and drain piping 2 directions.

(2) Back plate installation guide

The back plate installation guide gives clear instructions on installation positions. The enlarged back plate secures the unit firmly to the wall, while the support piece which lifts the unit makes left side piping work much easier.

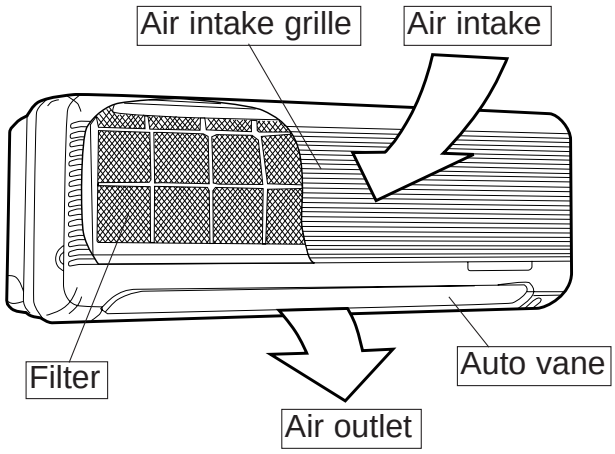
(3) Easily removable filter

The presence of thumbscrews on the filters means that the filters can be quickly and smoothly removed.

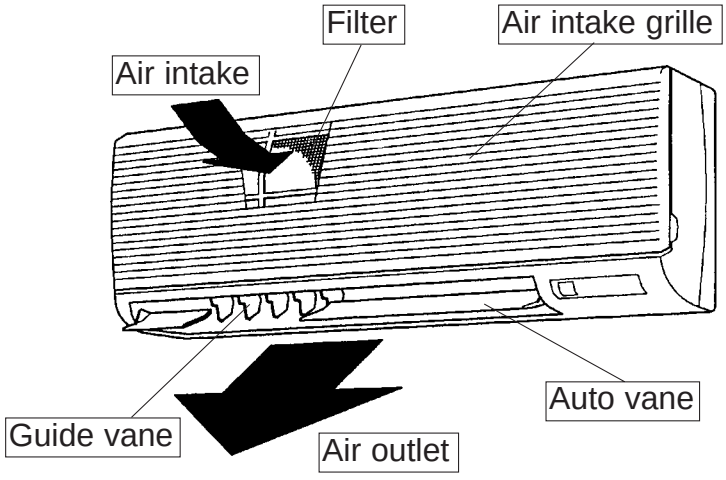
3 PART NAMES AND FUNCTIONS

● **Indoor Unit**

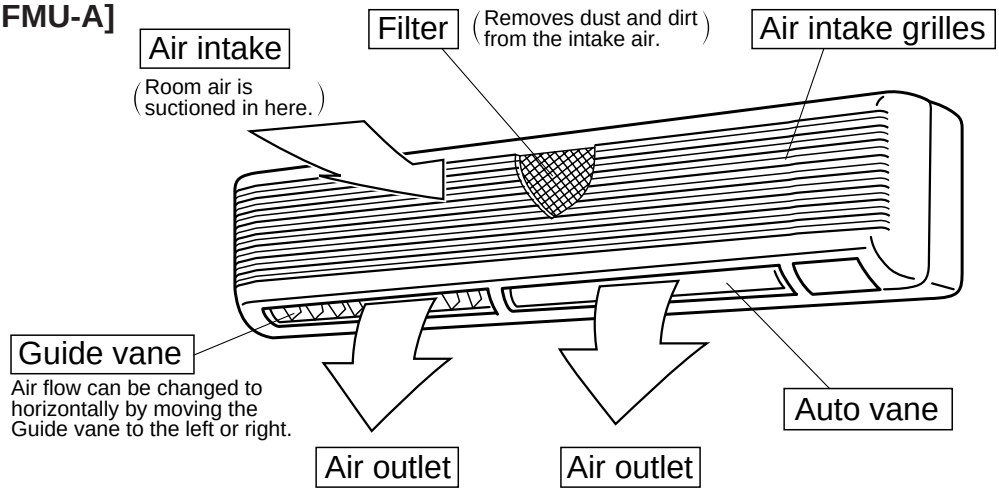
[PKFY-08NAMU-A]



[PKFY-12NGMU-A]



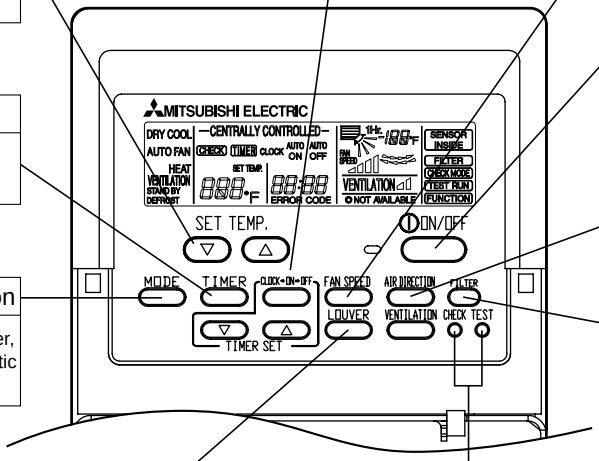
[PKFY-20NFMU-A]
[PKFY-32NFMU-A]



● Remote controller

● Once the operation of the unit is set, subsequent operations can only be performed by pressing the ON/OFF button repeatedly.

● Operation buttons



TEMP. ADJUSTMENT button

This sets the room temperature. The temperature setting can be performed in 2°F units

Setting range

Cooler 67°F to 87°F

Heater 63°F to 83°F

TIME SETTING button

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

AIR SPEED button

This sets the ventilation fan speed.

ON/OFF button

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

TIMER button

This switches between continuous operation and the timer operation.

AIR DIRECTION button

This adjusts the vertical angle of the ventilation.

OPERATION SWITCH button

Press this button to switch the cooler, electronic dry (dehumidify), automatic and heater modes.

FILTER button

This resets the filter service indication display

LOUVER button

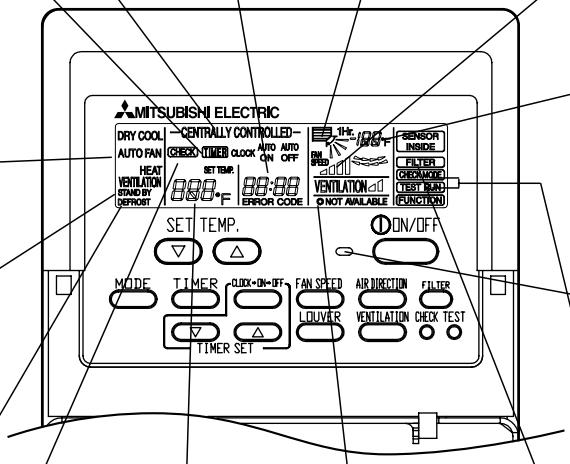
This switch the horizontal fan motion ON and OFF.

(Not available for this model.)

CHECK-TEST RUN button

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

● Display



CENTRALLY CONTROLLED display

This indicates when the unit is controlled by optional features such as central control type remote controller.

CLOCK display

The current time , start time and stop time can be displayed in ten second intervals by pressing the time switch button. The start time or stop time is always displayed during the timer operation.

In this display example on the bottom left, a condition where all display lamps light is shown for explanation purposes although this differs from actual operation.

AIR DIRECTION display

This displays the air direction.

TIMER display

This indicates when the continuous operation and time operation modes are set.
It also display the time for the timer operation at the same time as when it is set.

AIR SPEED display

The selected fan speed is displayed.

ROOM TEMPERATURE display

The temperature of the return air is displayed during operation. The display range is 46°F to 102°F. The display flashes 46°F when the actual temperature is less than 46°F and flashes 102°F when the actual temperature is greater than 102°F.

OPERATION MODE display

This indicates the operation mode.

STANDBY display

The [STANDBY] symbol is only displayed from the time the heating operation starts unit the heated air begins to blow.

Operation lamp

This lamp lights during operation, goes off when the unit stops and flashes when a malfunction occurs.

CHECK MODE / TEST RUN display

This display lights in the check mode or when a test operation is performed.

DEFROST display

This indicates when the defrost operation is performed.

FILTER display

This lamp lights when the filter need to be cleaned.

CHECK display

This indicates when a malfunction has occurred in the unit which should be checked.

SET TEMPERATURE display

This displays the selected set temperature.

POWER display

This lamp lights when electricity is supplied to the unit.

Caution

- Only the Power display lights when the unit is stopped and power supplied to the unit.
- When the central control remote control unit, which is sold separately, is used the ON-OFF button, operation switch button and TEMP. adjustment button do not operate.
- “NOT AVAILABLE” is displayed when the Air speed button is pressed. This indicates that this room unit is not equipped with the fan direction adjustment function and the louver function.
- When power is turned ON for the first time, it is normal that “H0” is displayed on the room temperature indication (For max. 2minutes). Please wait until this “H0” indication disappear then start the operation.

4 SPECIFICATIONS

4-1. Specifications
PKFY-08NAMU-A

Item			Unit	PKFY-08NAMU-A
Power			ϕ,V,Hz	Single phase, 208/230V, 60Hz
Cooling capacity			Btu/h	8,000
Heating capacity			Btu/h	9,000
Electric characteristic	Power Supply	Cooling	kW	0.03
		Heating	kW	0.03
	Starting Current	Cooling	A	0.15
		Heating	A	0.15
Exterior <munsell symbol>			—	Plastic munsell : <2.60Y 8.66/0.69>
Out dimensions		Height	in.	11-5/8
		Width	in.	32-3/32
		Depth	in.	6-7/32
Heat exchanger			—	Cross fin
Fan	Fan × No.		—	Lineflow fan × 1
	Air flow ※2	DRY	CFM	170-180-200-210
		WET	CFM	160-170-180-190
	External static pressure		Pa	0
	Fan motor output		kW	0.008
Insulator			—	Polyethylene sheet
Air filter			—	PP honey comb
Pipe dimensions		Gas side	in.	1/2"
		Liquid side	in.	1/4"
Unit drain pipe size			in.	PVC pipe with O.D. 5/8"
Noise level ※2			dB	32-33-35-36
Product weight			lbs	19

Note 1. Rating conditions

Cooling : Indoor D.B. 80˚F W.B. 67˚F
Outdoor D.B. 95˚F W.B. 75˚F
Heating : Indoor D.B. 70˚F
Outdoor D.B. 47˚F W.B. 43˚F

※ 2. Air flow and the noise level are indicated as Low - Medium2 - Medium1 - High.

• Connected outdoor unit is PURY-80TMU or PURY-100TMU.

PKFY-12NGMU-A

Item			Unit	PKFY-12NGMU-A
Power			ϕ,V,Hz	Single phase, 208/230V, 60Hz
Cooling capacity			Btu/h	12,000
Heating capacity			Btu/h	12,500
Electric characteristic	Input	Cooling	kW	0.07
		Heating	kW	0.07
	Current	Cooling	A	0.34
		Heating	A	0.34
Exterior <munsell symbol>			—	Plastic , white : <0.70Y 8.59/0.97>
Out dimensions		Height	in.	13-3/8
		Width	in.	39
		Depth	in.	9-1/4
Heat exchanger			—	Cross fin (Aluminum plate fin and copper tube)
Fan	Fan × No.		—	Lineflow fan × 1
	Air flow ※2	DRY	CFM	280-340-370-410
		WET	CFM	250-300-330-370
	External static pressure		Pa	0
	Fan motor output		kW	0.03
Insulator			—	Polyethylene sheet
Air filter			—	PP honey comb
Pipe dimensions		Gas side	in.	1/2"
		Liquid side	in.	1/4"
Unit drain pipe size			in.	PVC pipe with O.D. 13/16"
Noise level ※2			dB	32-36-40-42
Product weight			lbs	35

Note 1. Rating conditions
Cooling : Indoor : D.B. 80°F W.B. 67°F
outdoor : D.B. 95°F W.B. 75°F
Heating : Indoor : D.B. 70°F
outdoor : D.B. 47°F W.B. 43°F

※2. Air flow and the noise level are indicated as Low - Medium2 - Medium1 - High.

• Connected outdoor unit is PURY-80TMU or PURY-100TMU.

PKFY-20NFMU-A
PKFY-30NFMU-A

Item			Unit	PKFY-20NFMU-A	PKFY-32NFMU-A
Power source			ϕ,V,Hz	Single phase, 208V-220V, 60Hz	
Cooling capacity			Btu/h	20,000	32,000
Heating capacity			Btu/h	22,500	35,500
Electric characteristic	Input	Cooling	kW	0.09	0.12
		Heating	kW	0.09	0.12
	Current	Cooling	A	0.44	0.58
		Heating	A	0.44	0.58
Exterior <munsell symbol>			—	Plastic , white : <3.4Y 7.7/0.8>	
Dimensions		Height	in.	13-3/8	
		Width	in.	55-1/8	66-1/8
		Depth	in.	9-1/4	
Heat exchanger			—	Cross fin(Aluminum plate fin and copper tube)	
Fan	Type × No.		—	Lineflow fan × 2	
	Air flow Low - High	DRY	CFM	490 - 640	780 - 990
		WET	CFM	440 - 570	700 - 890
	External static pressure		Pa	0	
	Fan motor output		kW	0.045	0.070
Insulator			—	Polyethylene sheet	
Air filter			—	PP Honeycomb fabric	
Pipe dimensions		Gas side	in.	5/8"	
		Liquid side	in.	3/8"	
Unit drain pipe dimension			in.	PVC pipe with O.D. 13/16"	
Noise level Low - High			dB	39 - 45	46 - 49
Product weight			lbs	53	62

Note 1. Rating conditions

Cooling : Indoor : D.B. 80°F W.B. 67°F
outdoor : D.B. 95°F W.B. 75°F
Heating : Indoor : D.B. 70°F
outdoor : D.B. 47°F W.B. 43°F

• Connected outdoor unit is PURY-80TMU or PURY-100TMU.

4-2. Electrical parts specifications
PKFY-08NAMU-A

Model / Parts name	Symbol	PKFY-08NAMU-A
Room temperature thermistor	TH21	Resistance 30˚F/15.8kΩ, 50˚F/9.6kΩ, 70˚F/6.0kΩ, 80˚F/4.8kΩ, 90˚F/3.9kΩ, 100˚F/3.2kΩ
Liquid pipe thermistor	TH22	Resistance 30˚F/15.8kΩ, 50˚F/9.6kΩ, 70˚F/6.0kΩ, 80˚F/4.8kΩ, 90˚F/3.9kΩ, 100˚F/3.2kΩ
Gas pipe thermistor	TH23	Resistance 30˚F/15.8kΩ, 50˚F/9.6kΩ, 70˚F/6.0kΩ, 80˚F/4.8kΩ, 90˚F/3.9kΩ, 100˚F/3.2kΩ
Fuse (Indoor power board)	FUSE	250V 6A
Fan motor (with thermal fuse)	MF	4-Pole Output 8W / PS4N8
Fan motor capacitor	C	1.2μF × 440V
Vane motor (with limit switch)	MV	MSFBC20A03 DC12V
Linear expansion valve	LEV	DC12V Stepping motor drive Port ϕ3.2 (0~2000pulse) EDM-402ME
Power supply terminal block	TB2	(L1, L2,GR) 250V 20A
Transmission terminal block	TB5	(M1, M2) 250V 10A

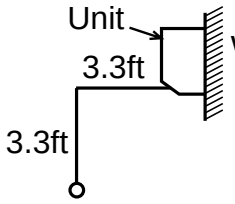
PKFY-12NGMU-A

Parts name \ Model	Symbol	PKFY-12NGMU-A
Room temperature thermistor	TH21	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ
Liquid pipe temperature thermistor	TH22	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ
Gas pipe temperature thermistor	TH23	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ
Fuse (Indoor controller board)	FUSE	250V 6A
Fan motor (with inner-thermostat)	MF	PM4N30-KA 208V/230V 60Hz 4 pole Output 30W
		Inner-thermostat: OPEN 257±9°F
Fan motor capacitor	C	2.0μF 440V
Vane motor	MV	MP 35 EA DC12V
Linear expansion valve	LEV	DC12V Stepping motor drive Port dimension ϕ3.2 (0 ~ 2000pulse)
Power supply terminal block	TB2	(L1, L2, GR) 330V 30A
Transmission terminal block	TB5	(M1, M2, S) 250V 20A
MA remote controller terminal block	TB15	(1,2) 250V 10A

PKFY-20NFMU-A
PKFY-30NFMU-A

Parts name \ Model	Symbol	PKFY-20NFMU-A	PKFY-32NFMU-A
Room temperature thermistor	TH21	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ	
Liquid pipe temperature thermistor	TH22	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ	
Gas pipe temperature thermistor	TH23	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ	
Fuse (Indoor controller board)	FUSE	250V 6A	
Fan motor (with inner-thermostat)	MF	D094P45MS 208-230V 60Hz 4pole Output 45w	D10B4P70MS 208-230V 60Hz 4pole Output 70w
		Inner-thermostat OPEN 266±9°F	
Fan motor capacitor	C	2.5μF 440V	
Vane motor	MV	MP 35 EA DC12V	
Linear expansion valve	LEV	DC12V Stepping motor drive Port dimension φ3.2 (0 ~ 2,000pulse)	DC12V Stepping motor drive Port dimension φ5.2 (0 ~ 2,000pulse)
Power supply terminal block	TB2	(L1, L2, GR) 330V 30A	
Transmission terminal block	TB5	(M1, M2, S) 250V 20A	
MA remote controller terminal block	TB15	(1,2) 250V 10A	

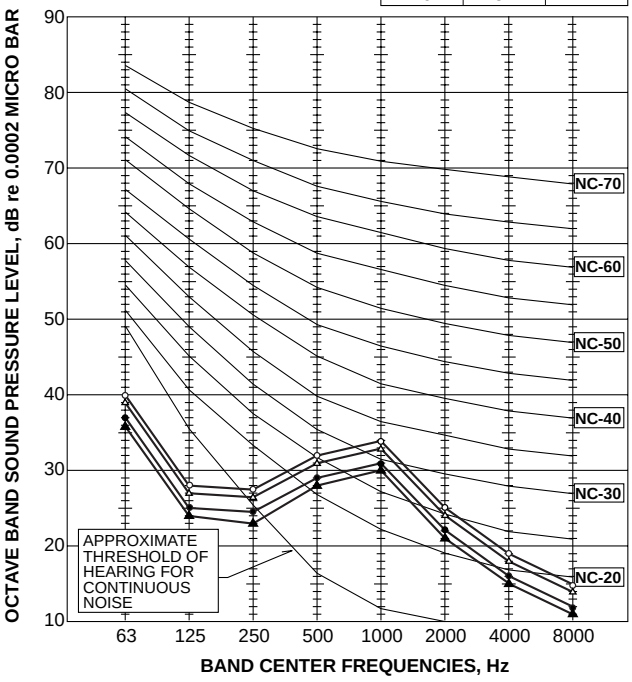
4-3. Noise criterion curves



Ambient temperature 80˚F
Test conditions are based on JIS Z8731

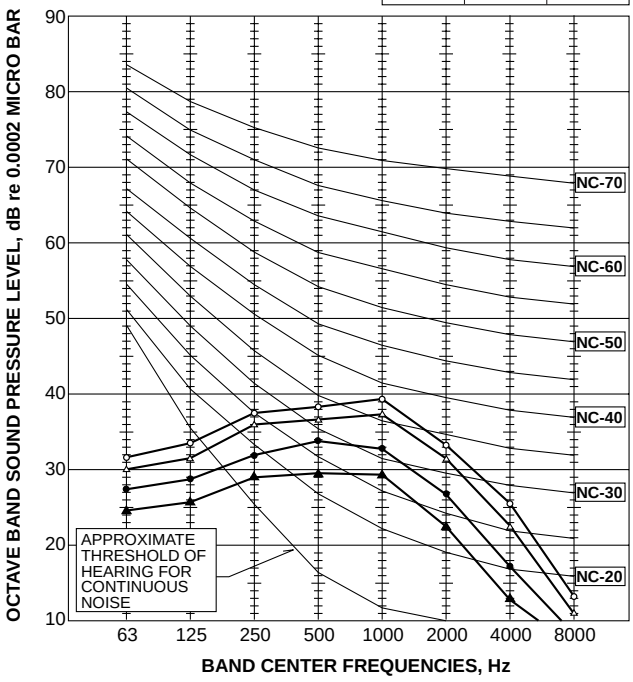
PKFY-08NAMU-A

NOTCH	SPL(dB)	LINE
Hi	36	
Med1	35	
Med2	33	
Lo	32	



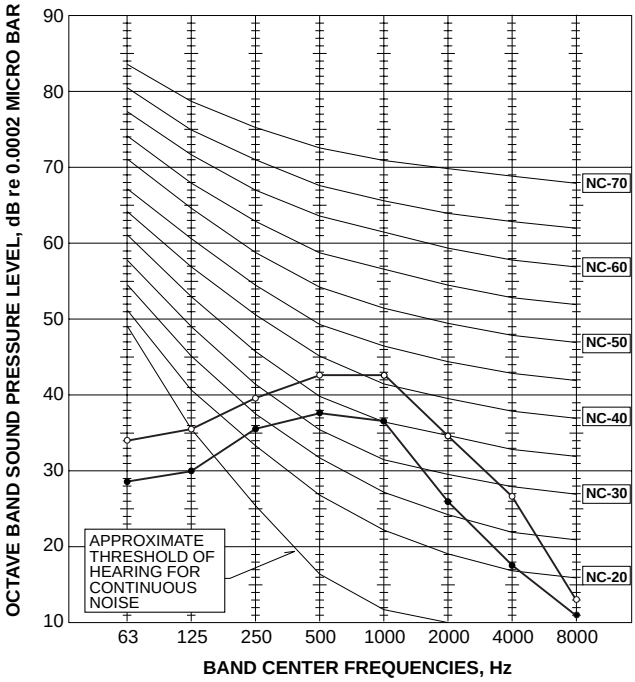
PKFY-12NGMU-A

NOTCH	SPL(dB)	LINE
Hi	42	
Med1	40	
Med2	36	
Lo	32	



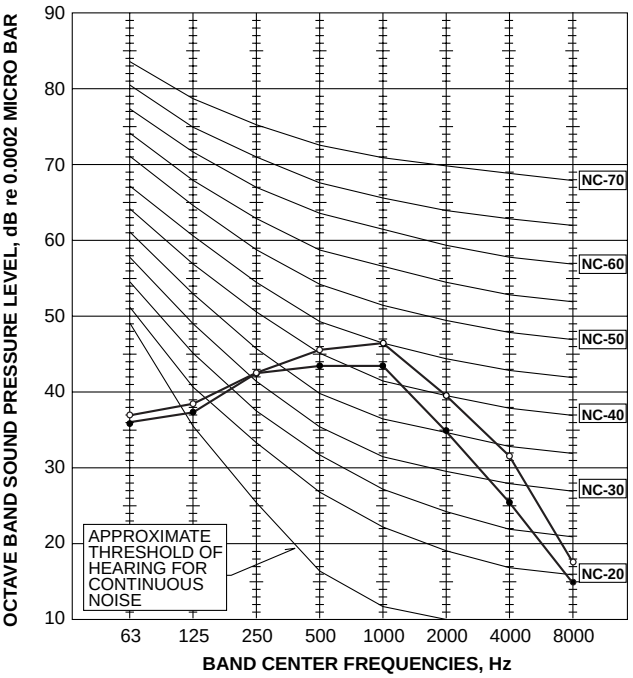
PKFY-20NFMU-A

NOTCH	SPL(dB)	LINE
Hi	45	
Lo	39	



PKFY-32NFMU-A

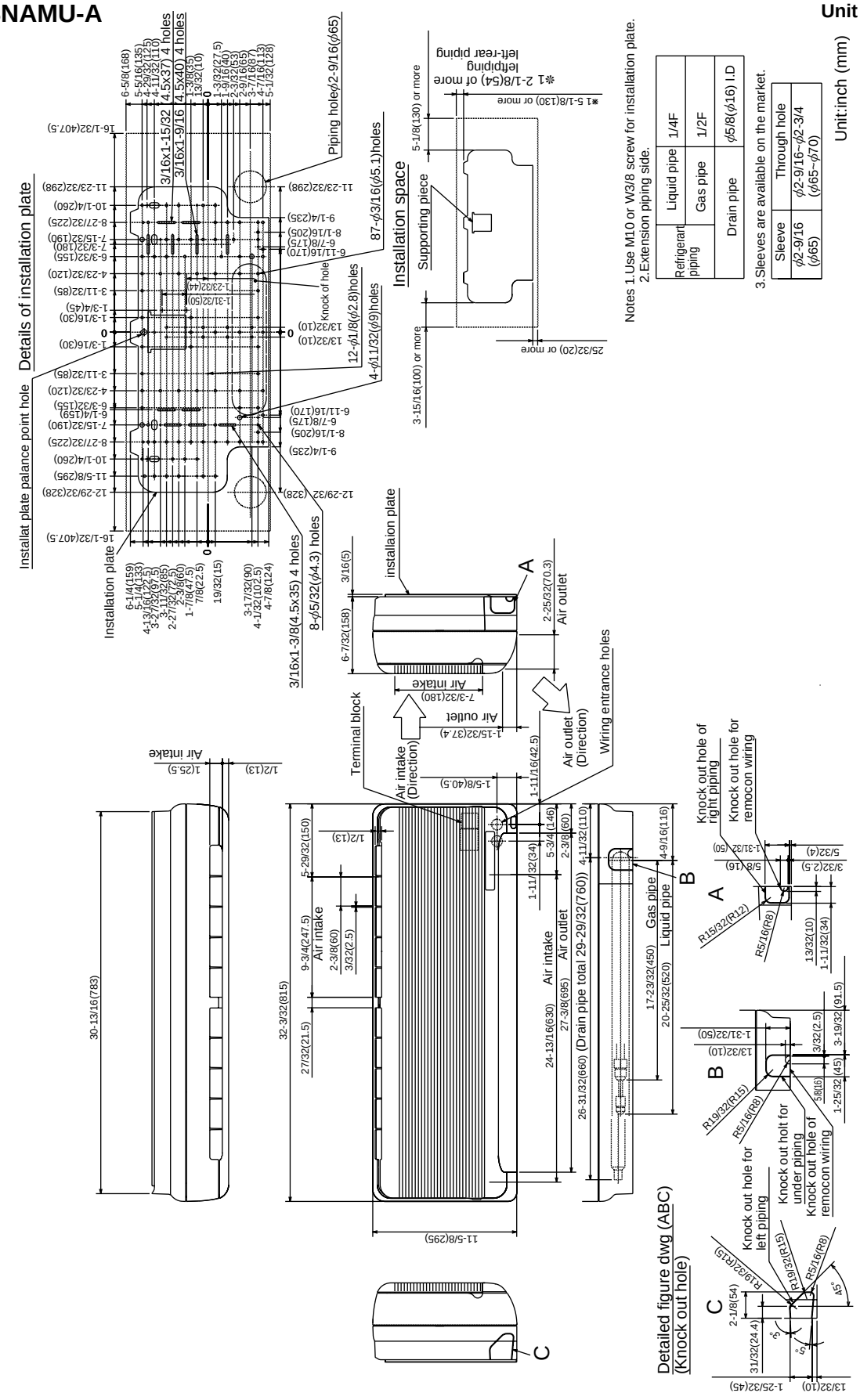
NOTCH	SPL(dB)	LINE
Hi	49	
Lo	46	



5 OUTLINES AND DIMENSIONS

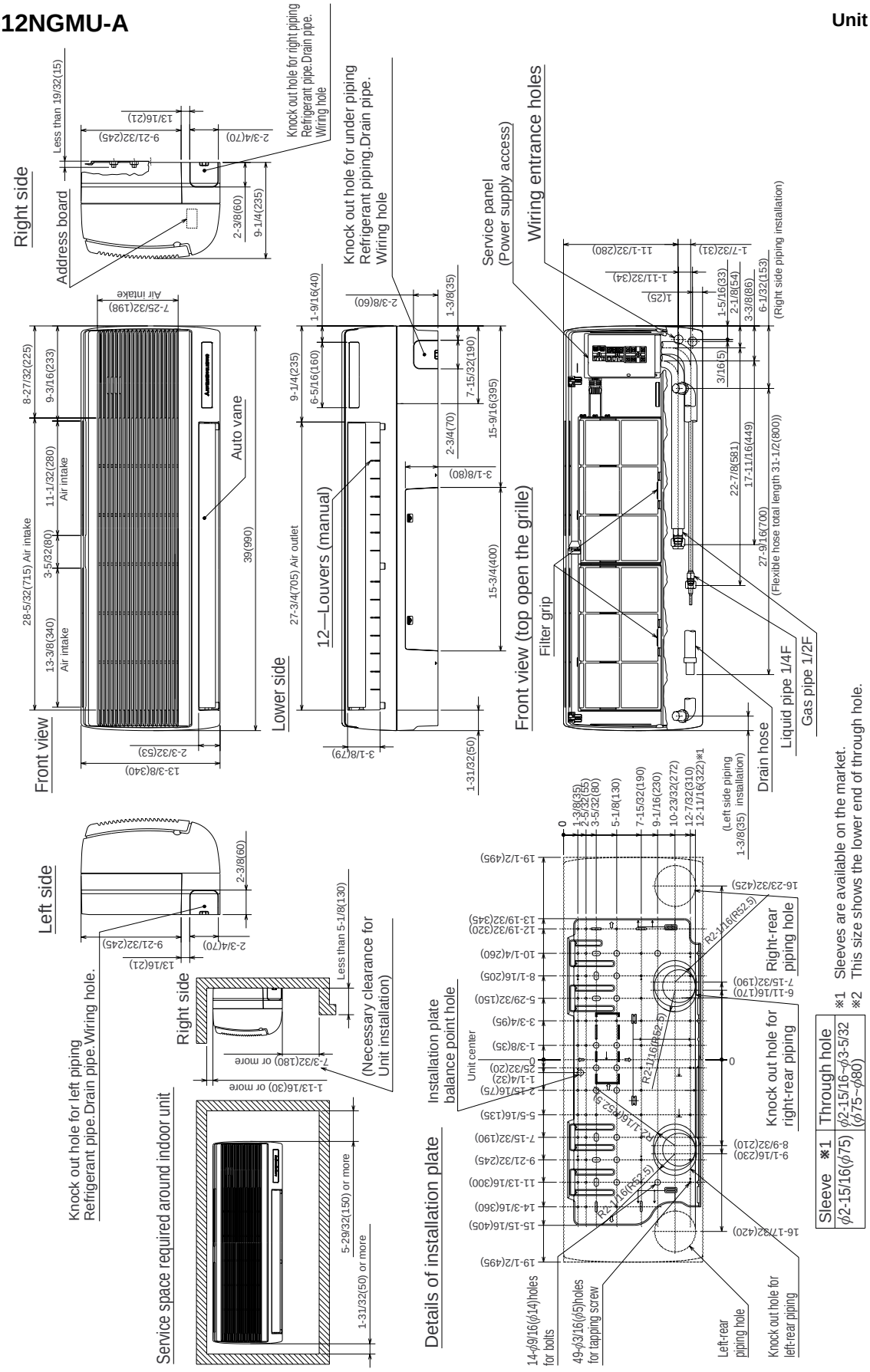
PKFY-08NAMU-A

Unit : inch(mm)



PKFY-12NGMU-A

Unit : inch(mm)

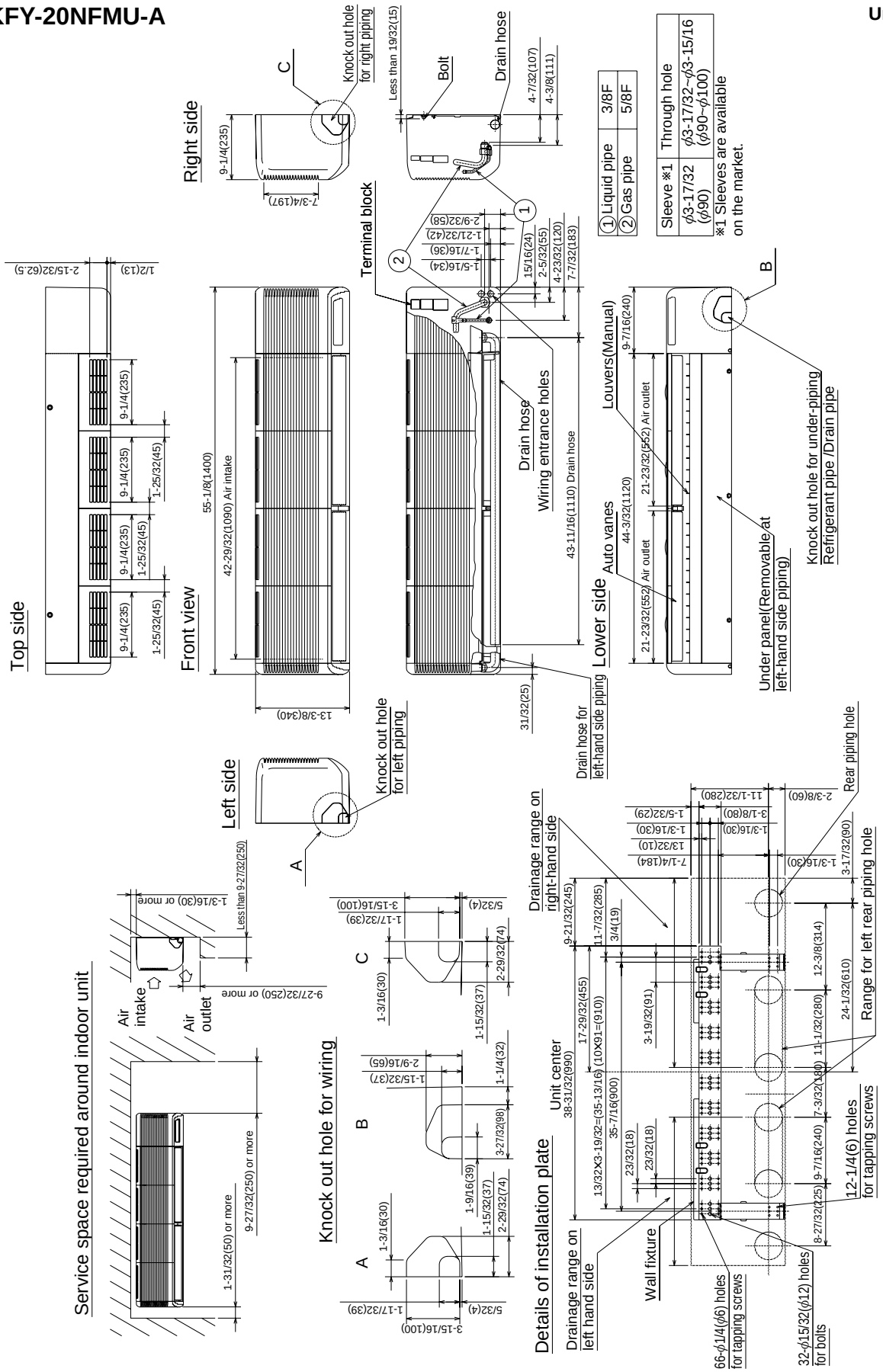


Sleeve ※1	Through hole
φ2-15/16(φ75)	φ2-15/16~φ3-5/32 (φ75~φ80)

※1 Sleeves are available on the market.
※2 This size shows the lower end of through hole.

PKFY-20NFMU-A

Unit : inch(mm)



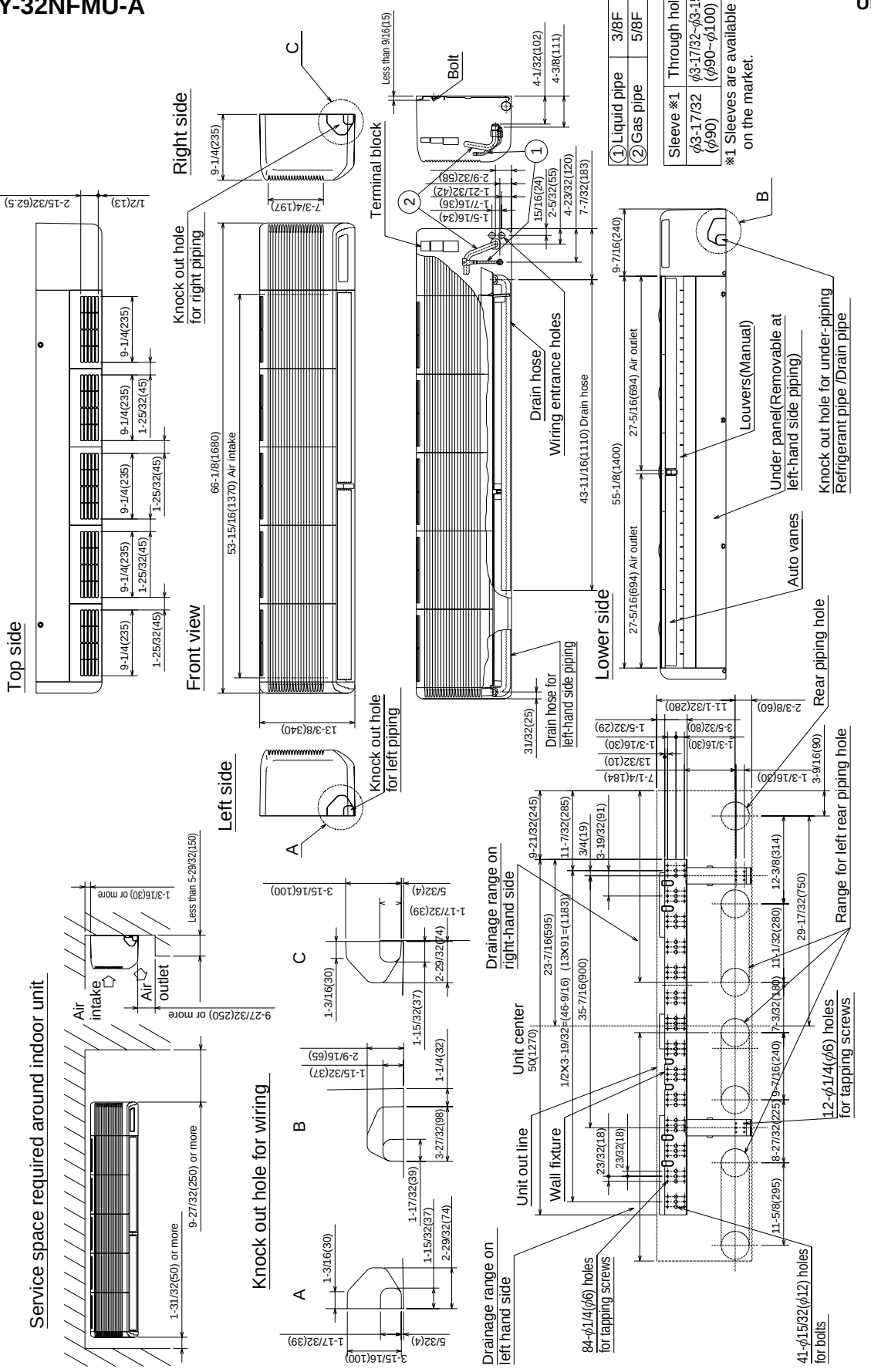
①Liquid pipe	3/8F
②Gas pipe	5/8F

Sleeve ※1	Through hole
φ3-17/32 (φ90)	φ3-17/32~φ3-15/16 (φ90~φ100)

※1 Sleeves are available on the market.

PKFY-32NFMU-A

Unit : inch(mm)

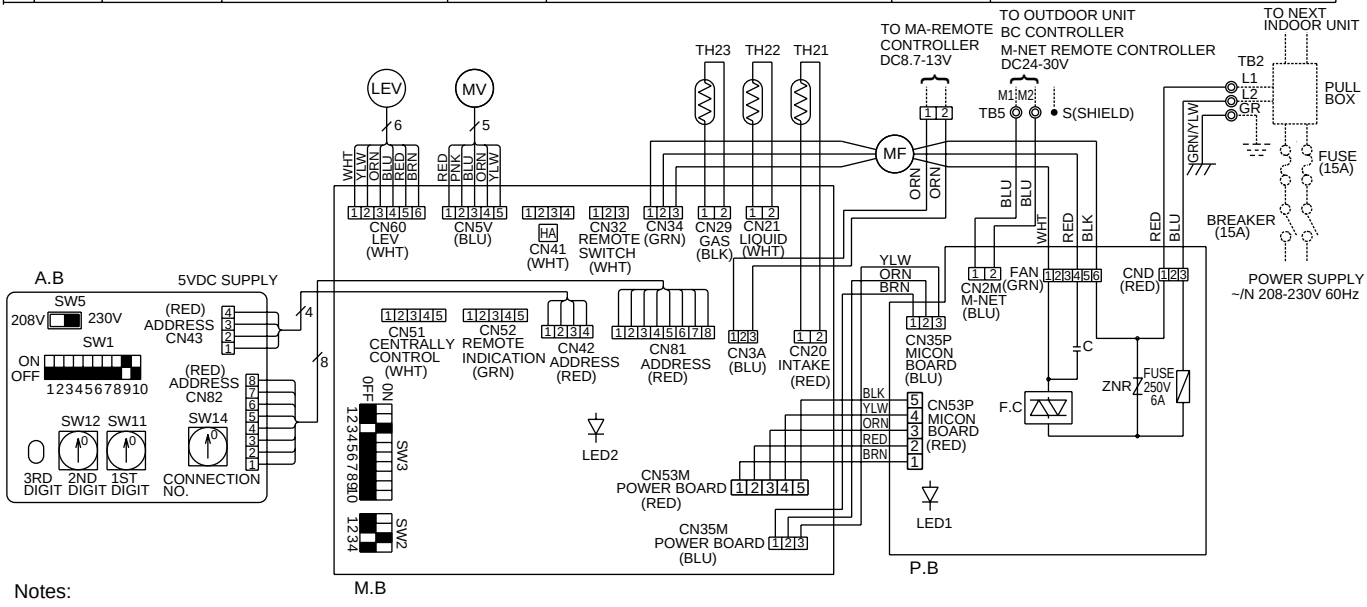


6 WIRING DIAGRAM

PKFY-08NAMU-A

[LEGEND]

SYMBOL	NAME		SYMBOL	NAME	SYMBOL	NAME	
A.B	CIRCUIT BOARD (ADDRESS)		P.B	INDOOR POWER BOARD	LEV	LINEAR EXPANSION VALVE	
SW1	SWITCH	MODE SELECTION	C	CAPACITOR (FAN MOTOR)	MF	FAN MOTOR	
SW5		VOLTAGE SELECTION	F.C	FAN PHASE CONTROL	MV	VANE MOTOR	
SW11		ADDRESS SETTING 1ST DIGIT	FUSE	FUSE (6A/250V)	TB2	TERMINAL BLOCK	POWER SUPPLY
SW12		ADDRESS SETTING 2ND DIGIT	ZNR	VARISTOR	TB5		TRANSMISSION
SW14		CONNECTION No.			TH21	THERMISTOR	ROOM TEMPERATURE DETECTION (32°F/15kΩ,77°F/5.4kΩ)
M.B	INDOOR CONTROLLER BOARD				TH22		PIPE TEMPERATURE DETECTION /LIQUID (32°F/15kΩ,77°F/5.4kΩ)
CN32	CONNECTOR	REMOTE SWITCH			TH23		PIPE TEMPERATURE DETECTION /GAS (32°F/15kΩ,77°F/5.4kΩ)
CN41		HA TERMINAL-A					
CN51		CENTRALLY CONTROL					
CN52		REMOTE INDICATION					
SW2	SWITCH	CAPACITY CODE					
SW3		MODE SELECTION					



Notes:

1. At servicing for outdoor unit,always follow the wiring diagram of outdoor unit.
2. In case of connecting MA-Remote controller,please connect MA remote controller cable in an accessorie to the connector 1 2 .(Remote controller wire is non-polar.)
3. In case of using M-NET,please connect to TB5.(Transmission line is non-polar.)
4. Symbols used in wiring diagram above are, ◎:terminal block, □□□:connecter, ●:direct wire connection.
5. Please set the switch SW5 according to the power supply voltage.
   Set SW5 to 230V side when the power supply is 230 volts.
   When the power supply is 208 volts,set SW5 to 208V side.

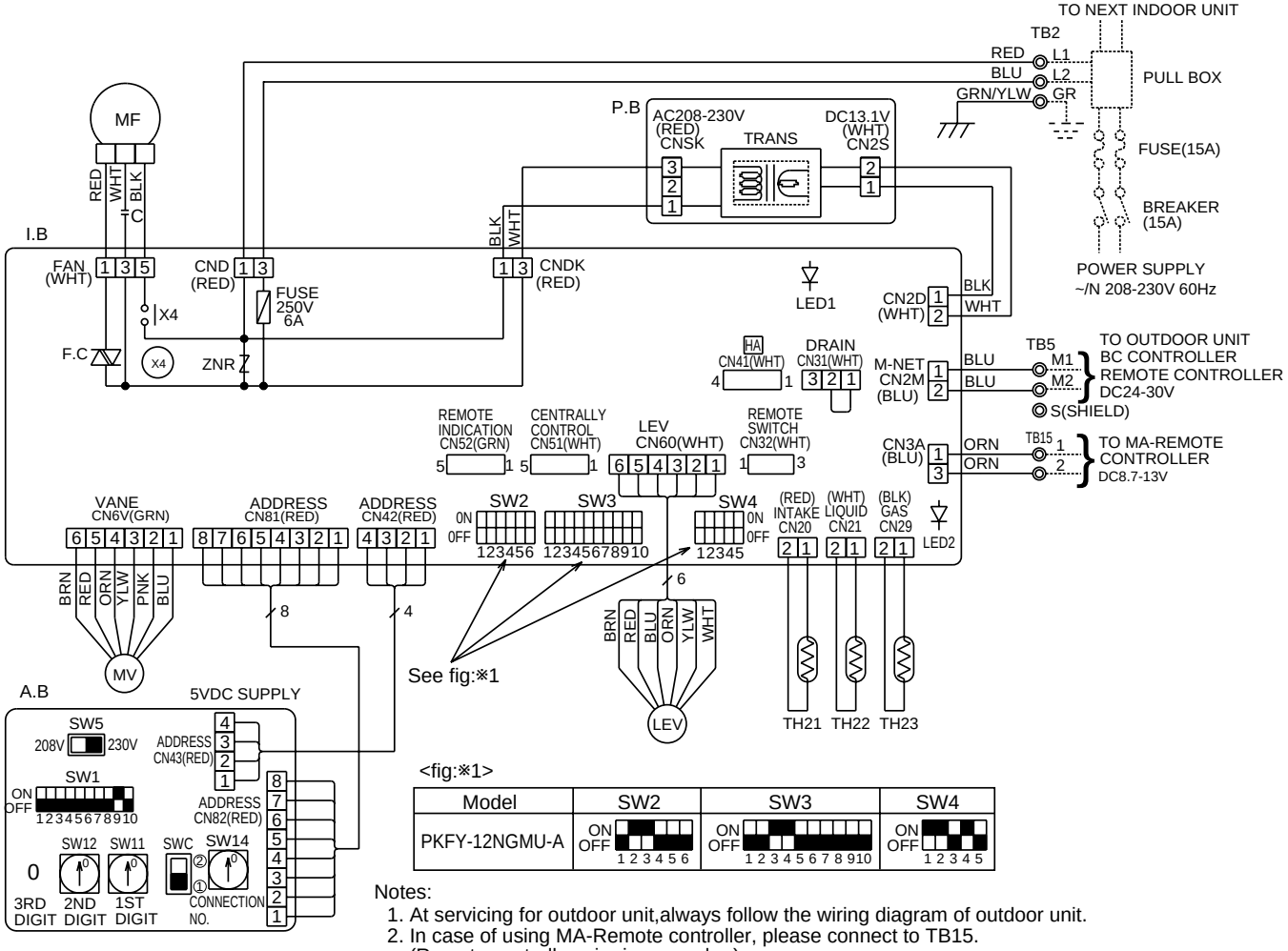
LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply(Indoor unit:208-230V) power on → lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on → lamp is lit

PKFY-12NGMU-A

[LEGEND]

SYMBOL	NAME		SYMBOL	NAME		SYMBOL	NAME	
I.B	INDOOR CONTROLLER BOARD		C	CAPACITOR (FAN MOTOR)		TH23	THERMISTOR	PIPE TEMPERATURE DETECTION/GAS (32°F/15kΩ,77°F/5.4kΩ)
CN32	CONNECTOR	REMOTE SWITCH	LEV	LINEAR EXPANSION VALVE				
CN41		HA TERMINAL-A	MF	FAN MOTOR(WITH INNER THERMOSTAT)		A.B	CIRCUIT BOARD (ADDRESS)	
CN51		CENTRALLY CONTROL	MV	VANE MOTOR		SW1	SWITCH	MODE SELECTION
CN52		REMOTE INDICATION	P.B	INDOOR POWER BOARD		SW5		VOLTAGE SELECTION
F.C	FAN PHASE CONTROL		TB2	TERMINAL BLOCK	POWER SUPPLY	SW11		ADDRESS SETTING 1ST DIGIT
FUSE	FUSE (6A/250V)		TB5		TRANSMISSION	SW12		ADDRESS SETTING 2ND DIGIT
SW2	SWITCH	CAPACITY CODE	TB15		MA-REMOTE CONTROLLER	SW14		CONNECTION No.
SW3		MODE SELECTION	TH21	THERMISTOR	ROOM TEMPERATURE DETECTION (32°F/15kΩ,77°F/5.4kΩ)	SWC		OPTION SELECTOR
SW4		MODEL SELECTION						
X4	AUX. RELAY (FAN MOTOR)		TH22		PIPE TEMPERATURE DETECTION/LIQUID (32°F/15kΩ,77°F/5.4kΩ)			
ZNR	VARISTOR							



<fig:※1>

Model	SW2	SW3	SW4
PKFY-12NGMU-A	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10	ON OFF 1 2 3 4 5

Notes:

1. At servicing for outdoor unit,always follow the wiring diagram of outdoor unit.
2. In case of using MA-Remote controller, please connect to TB15.
   (Remote controller wire is non-polar.)
3. In case of using M-NET, please connect to TB5.
   (Transmisson line is non-polar.)
4. Symbol[S] of TB5 is the shield wire connection.
5. Symbols used in wiring diagram above are, ◎:terminal block, □□□:connecter.
6. The setting of the SW2/SW3/SW4 dip switches differs in the capacity for the detail, refer to the fig:※1.
7. Please set the switch SW5 according to the power supply voltage.
   Set SW5 to 230V side when the power supply is 230 volts.
   When the power supply is 208 volts, set SW5 to 208V side.

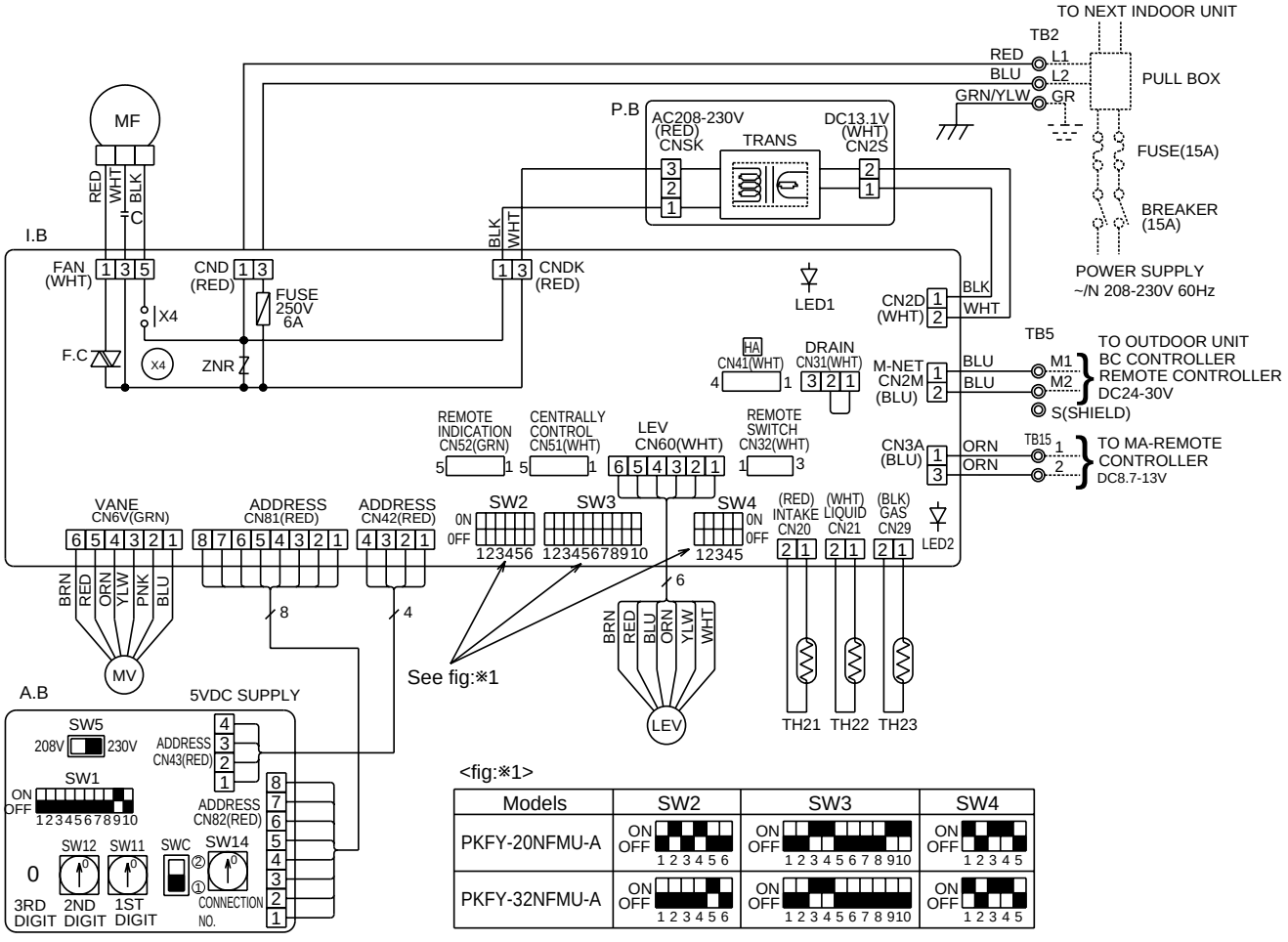
LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply(Indoor unit:208-230V) power on →lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on →lamp is lit

PKFY-20NFMU-A PKFY-32NFMU-A

[LEGEND]

SYMBOL	NAME		SYMBOL	NAME		SYMBOL	NAME	
I.B	INDOOR CONTROLLER BOARD		C	CAPACITOR (FAN MOTOR)		TH23	THERMISTOR	PIPE TEMPERATURE DETECTION/GAS (32°F/15kΩ,77°F/5.4kΩ)
CN32	CONNECTOR	REMOTE SWITCH	LEV	LINEAR EXPANSION VALVE				
CN41		HA TERMINAL-A	MF	FAN MOTOR(WITH INNER THERMOSTAT)		A.B	CIRCUIT BOARD (ADDRESS)	
CN51		CENTRALLY CONTROL	MV	VANE MOTOR		SW1	SWITCH	MODE SELECTION
CN52		REMOTE INDICATION	P.B	INDOOR POWER BOARD		SW5		VOLTAGE SELECTION
F.C	FAN PHASE CONTROL		TB2	TERMINAL BLOCK	POWER SUPPLY	SW11		ADDRESS SETTING 1ST DIGIT
FUSE	FUSE (6A/250V)		TB5		TRANSMISSION	SW12		ADDRESS SETTING 2ND DIGIT
SW2	SWITCH	CAPACITY CODE	TB15		MA-REMOTE CONTROLLER	SW14		CONNECTION No.
SW3		MODE SELECTION	TH21	THERMISTOR	ROOM TEMPERATURE DETECTION (32°F/15kΩ,77°F/5.4kΩ)	SWC		OPTION SELECTOR
SW4		MODEL SELECTION						
X4	AUX. RELAY (FAN MOTOR)		TH22		PIPE TEMPERATURE DETECTION/LIQUID (32°F/15kΩ,77°F/5.4kΩ)			
ZNR	VARISTOR							



<fig:※1>

Models	SW2	SW3	SW4
PKFY-20NFMU-A	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10	ON OFF 1 2 3 4 5
PKFY-32NFMU-A	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10	ON OFF 1 2 3 4 5

Notes:

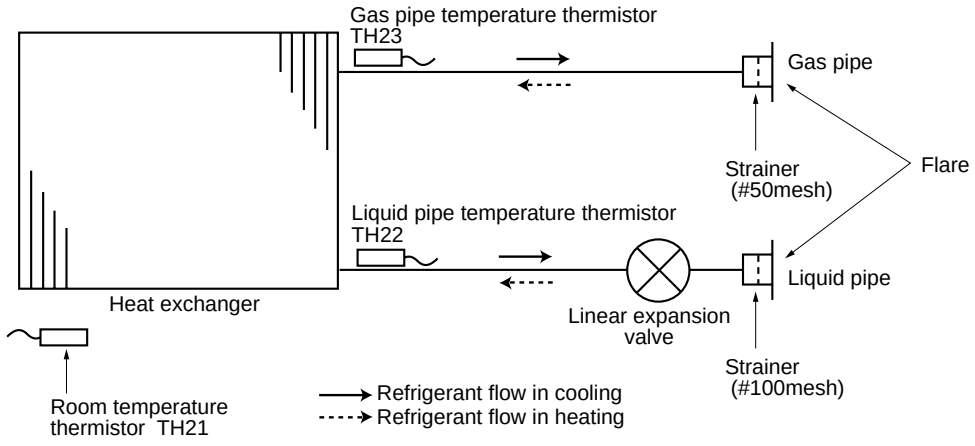
1. At servicing for outdoor unit,always follow the wiring diagram of outdoor unit.
2. In case of using MA-Remote controller, please connect to TB15.
   (Remote controller wire is non-polar.)
3. In case of using M-NET, please connect to TB5.
   (Transmisson line is non-polar.)
4. Symbol[S] of TB5 is the shield wire connection.
5. Symbols used in wiring diagram above are, ◎:terminal block, □□□ :connecter.
6. The setting of the SW2 / SW3 / SW4 dip switches differs in the capacity for the detail,refer to the fig:※1.
7. Please set the switch SW5 according to the power supply voltage.
   Set SW5 to 230V side when the power supply is 230 volts.
   When the power supply is 208 volts,set SW5 to 208V side.

LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply(Indoor unit:208-230V) power on ⟶lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on ⟶lamp is lit

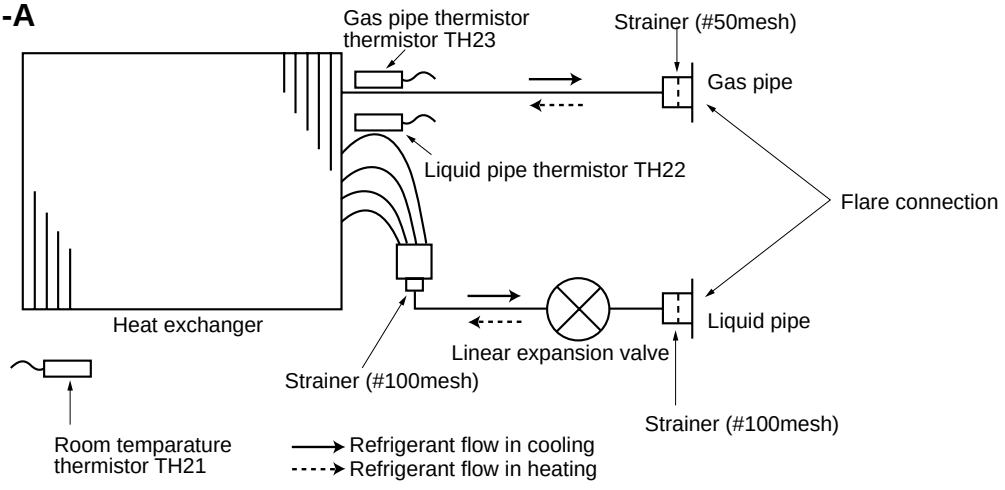
7 REFRIGERANT SYSTEM DIAGRAM

PKFY-08NAMU-A



Item \ Service Ref.	PKFY-08NAMU-A
Gas pipe	1/2"
Liquid pipe	1/4"

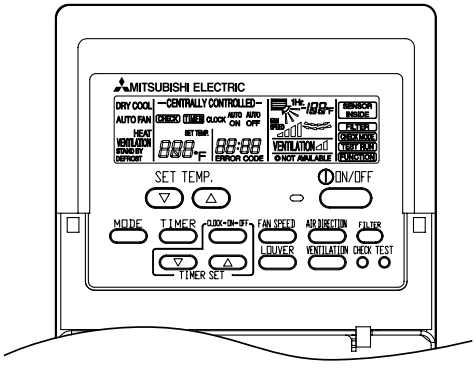
PKFY-12NGMU-A
PKFY-20NFMU-A
PKFY-32NFMU-A



Item \ Service Ref.	PKFY-12NGMU-A	PKFY-20NFMU-A PKFY-32NFMU-A
Gas pipe	1/2"	5/8"
Liquid pipe	1/4"	3/8"

8 MICROPROCESSOR CONTROL

INDOOR UNIT CONTROL
8-1. COOL operation



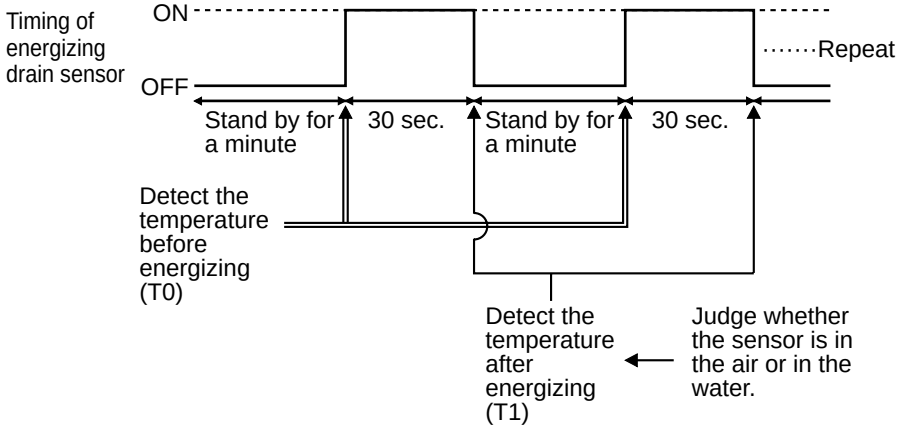
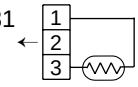
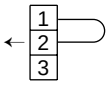
<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display COOL.
③ Press the SET TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time Cooling 67 to 87°F.

Control modes	Control details	Remarks
1. Thermoregulating function	1-1. Thermoregulating function (Function to prevent restarting for 3 minutes) • Room temperature ≧ desired temperature + 2°F ⋯Thermo ON • Room temperature ≦ desired temperature ⋯Thermo OFF	
	1-2. Anti-freezing control Detected condition : When the liquid pipe temp. (TH22) is 36°F or less in 16 minutes from compressors start up, anti-freezing control starts and the thermo OFF. Released condition : The timer which prevents reactivating is set for 3 minutes, and anti- freezing control is cancelled when any one of the following conditions is satisfied. ① Liquid pipe temp. (TH22) turn 50°F or above. ② The condition of the thermo OFF has become complete by thermoregulating, etc. ③ The operation modes became mode other than COOL. ④ The operation stopped.	
2. Fan	By the remote controller setting (switch of 4 speeds or 2 speeds)	

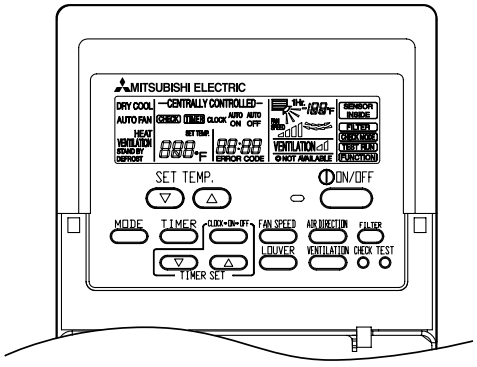
Type	Fan speed notch
4 speeds type	[Low], [Med2], [Med1], [High]
2 speeds type	[Low], [High]

To be continued on the next page.

From the preceding page.

Control modes	Control details	Remarks
3. Drain pump **Except for PKFY-08NAMU-A.**	3-1. Drain pump control •Always drain pump ON during the COOL and DRY mode operation. (Regardless of the thermo ON/ OFF) •When the operation mode has changed from the COOL or DRY to the others (including Stop), OFF the control after the drain pump ON for 3 minutes.	
	Drain sensor function • Energize drain sensor at a fixed voltage for a fixed duration. After energizing, compare the drain sensor's temperature to the one before energizing, and judge whether the sensor is in the air or in the water. **Basic control system** • While drain pump is turned on, repeat the following control system and judge whether the sensor is in the air or in the water.  •Drain sensor temperature rise (Δt) •Temperature of drain sensor before current is applied (T_0) •Temperature of drain sensor after current is applied (T_1) [$\Delta t = T_1 - T_0$]	※1 Drain sensor Indoor control p.c. board CN31  ※2 If the unit is without the drain sensor, install the jumper connector. Indoor control p.c. board CN31  When installing the jumper connector, determine to detect compulsorily in the air.
4. Vane (up/ down vane change)	(1) Initial setting : Start at COOL mode and horizontal vane. (2)Vane position : Horizontal →Downward A →Downward B →Downward C→Swing PKFY-08NAMU-A is not equipped with the swing function. : Horizontal →Downward A →Downward B →Downward C (3) In case of PKFY-08NAMU-A and PKFY-12NGMU-A : Restriction of the downward vane setting When setting the downward vane A, B or C in [Med1], [Med2] or [Low] of the fan speed notch, the vane changes to horizontal position after 1 hour have passed. In case of PKFY-20NFMU-A and PKFY-32NFMU-A : Restriction of the downward vane setting When setting the downward vane A, B or C in [Low] of the fan speed notch, the vane changes to horizontal position after 1 hour have passed.	※1 "SET FOR 1 HOUR" appears on the wired remote controller.

8-2. DRY operation



<How to operate>

① Press POWER ON/OFF button.

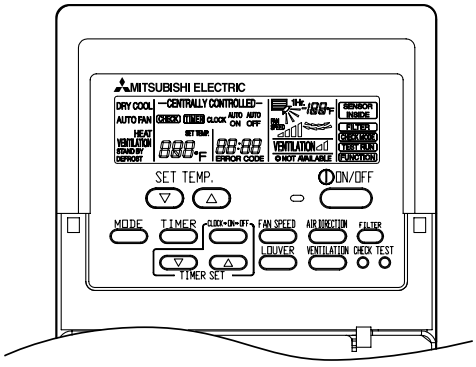
② Press the operation MODE button to display DRY.

③ Press the SET TEMP. button to set the desired temperature.

NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Dry 67 to 87°F.

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Thermoregulating function</td><td>1-1. Thermoregulating function (Function to prevent restarting for 3 minutes)
Setting the Dry thermo by the thermoregulating signal and the room temperature (TH1).
Dry thermo ON Room temperature ≧ desired temperature + 2°F
Dry thermo OFF Room temperature ≦ desired temperature
<table>
<tr><th rowspan="2">Room temperature</th><th colspan="2">3 min. passed since starting operation</th><th rowspan="2">Dry thermo ON time (min)</th><th rowspan="2">Dry thermo OFF time (min)</th></tr>
<tr><th>Thermoregulating signal</th><th>Room temperature (T1)</th></tr>
<tr><td rowspan="5">Over 64°F</td><td rowspan="4">ON</td><td>T1 ≧ 82°F</td><td>9</td><td>3</td></tr>
<tr><td>82°F > T1 ≧ 79°F</td><td>7</td><td>3</td></tr>
<tr><td>79°F > T1 ≧ 75°F</td><td>5</td><td>3</td></tr>
<tr><td>75°F > T1</td><td>3</td><td>3</td></tr>
<tr><td>OFF</td><td>Unconditional</td><td>3</td><td>10</td></tr>
<tr><td>Less than 64°F</td><td colspan="4">Dry thermo OFF</td></tr>
</table>
1-2. Frozen prevention control
No control function</td><td></td></tr>
<tr><td>2. Fan</td><td>Indoor fan operation controlled depends on the compressor conditions.
<table>
<tr><th>Dry thermo</th><th>Fan speed notch</th></tr>
<tr><td>ON</td><td>[Low]</td></tr>
<tr><td>OFF</td><td>Stop</td></tr>
</table>
Note: Remote controller setting is not acceptable.</td><td></td></tr>
<tr><td>3. Drain pump
Except for PKFY-08NAMU-A.</td><td>Same control as COOL operation</td><td></td></tr>
<tr><td>4. Vane
(up/ down vane change)</td><td>Same control as COOL operation</td><td></td></tr>
</table>

8-3. FAN operation



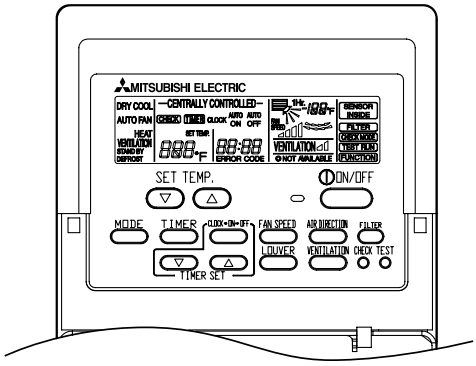
<How to operate>

① Press POWER ON/OFF button.

② Press the operation MODE button to display FAN.

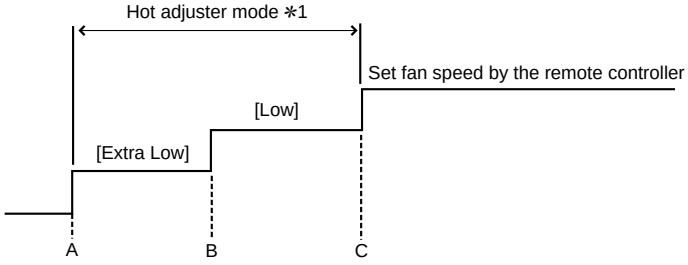
Control modes	Control details	Remarks
1. Fan	Set by remote controller. Type: 4 speeds type — Fan speed notches: [Low], [Med2], [Med1], [High] Type: 2 speeds type — Fan speed notches: [Low], [High]	
2. Vane (up/ down vane change)	Same as the control performed during the COOL operation, but with no restriction on the vane's downward blow setting.	

8-4. HEAT operation



<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display HEAT.
③ Press the SET TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Heating 63 to 83°F.

<Display in HEAT operation>
[DEFROST]
The [DEFROST] symbol is only displayed during the defrost operation.
[STANDBY]
The [STANDBY] symbol is only displayed from the time the heating operation starts unit the heated air begins to blow.

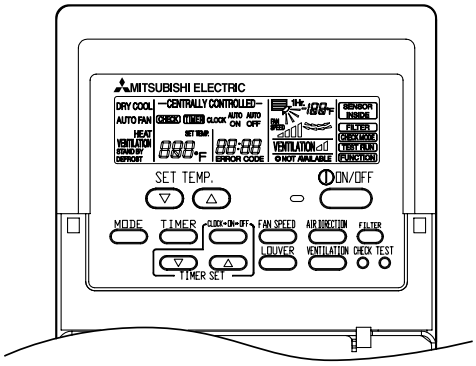
Control modes	Control details	Remarks
1. Thermoregulating function	1-1. Thermoregulating function (Function to prevent restarting for 3 minutes) •Room temp. ≦ desired temp.30°F ⋯Thermo ON •Room temp. ≧ desired temp. ⋯Thermo OFF	
2. Fan	Controlled by the remote controller (4-speed) Give priority to under-mentioned controlled mode 2-1. Hot adjuster mode 2-2. Preheating exclusion mode 2-3. Thermo OFF mode (When the compressor off by the thermoregulating) 2-4. Cool air prevention mode (Defrosting mode) 2-5. Capacity increasing mode	∗1 Fan speed change notch Refer to the model function table
	2-1. Hot adjuster mode The fan controller becomes the hot adjuster mode for the following conditions. ① When starting the HEAT operation ② When starting the compressor by the thermoregulating ③ When release the HEAT defrosting operation  A: HOT adjuster mode start B: 5 min have passed since the condition A or the indoor Condenser/ Evaporator temp. turned 65°F or more C: 2 min have passed since the condition A (Terminating the hot adjuster mode)	∗1 "STAND BY" will be displayed during the hot adjuster mode.

To be continued on the next page.

From the preceding page.

Control modes	Control details	Remarks
2. Fan	2-2. Preheating exclusion mode When the condition changes the auxiliary heater ON to OFF (thermoregulating or operation stop, etc), the indoor fan operates in [Low] mode for 1 minute.	✻1 This control is same for the model without auxiliary heater.
	2-3. Thermo OFF mode When the thermoregulating function changes to OFF, the indoor fan operates in [Extra low].	
	2-4. Heat defrosting mode The indoor fan stops.	
3. Vane control (Up/ down vane change)	(1) Initial setting : OFF → HEAT⋯[last setting] When changing the mode from exception of HEAT to HEAT operation. ⋯[Downward C] (2) Vane position : Horizontal →Downward A →Downward B →Downward C→Swing PKFY-08NAMU-A is not equipped with the swing function. Horizontal →Downward A →Downward B →Downward C (3) Restriction of vane position ① The vane is horizontally fixed for the following modes. (The control by the remote controller is temporally invalidated and control by the unit.) •Thermo OFF •Hot adjuster [Extra low] mode •Heat defrost mode	

8-5. AUTO operation [Automatic COOL/HEAT change over operation]

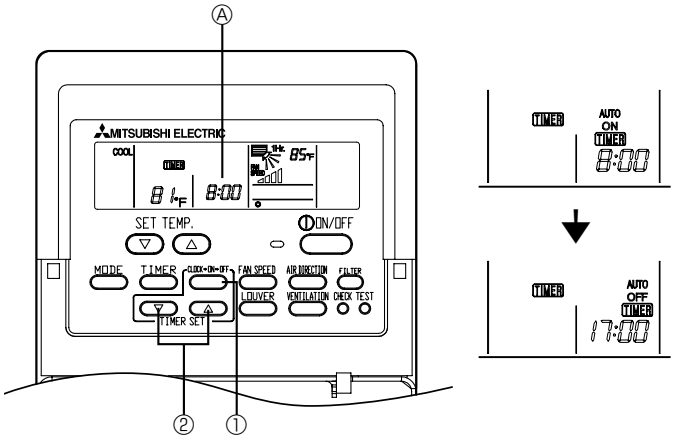


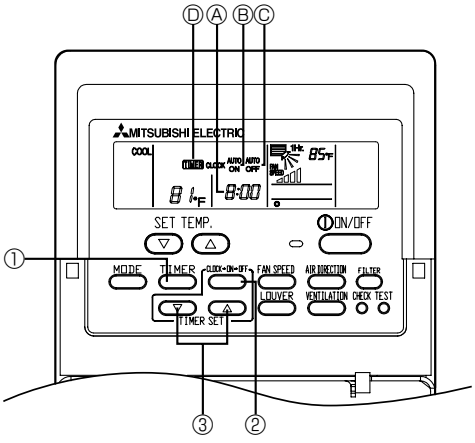
<How to operate>

① Press POWER ON/OFF button.
② Press the operation MODE button to display AUTO.
③ Press the SET TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Automatic 67 to 83°F.
"AUTO" works to change by itself the operation mode either to cooling or heating to the room temperature.

Control modes	Control details	Remarks
1. Initial value of operation mode	HEAT mode for room temperature < Desired temperature COOL mode for room temperature ≧ Desired temperature	
2. Mode change	(1) HEAT mode → COOL mode Room temperature ≧ Desired temperature + 4°F. or 15 min. has passed (2) COOL mode → HEAT mode Room temperature ≦ Desired temperature - 4°F. or 15 min. has passed	
3. COOL mode	Same control as cool operation	
4. HEAT mode	Same control as heat operation	

8-6. TIMER operation





1) Set the current time

① Press CLOCK-ON-OFF button to display the “current time” Ⓐ.

Remote controller display Ⓐ	CLOCK ("current time") → TIMER ("timer start time") → TIMER ("timer end time") → No display

② Each time you press ▽ button, the time increases in increments of one minute. Each time you press △ button, the time decreases in increments of one minute.

- Press and hold the button to rapidly change the time.
- The time changes in increments of one minute ➔ ten minutes ➔ in units of hour; in this order.
- Approximately ten seconds after pressing the button, the display on the remote controller will turn off.

The example shows a timer set for operation start at 8:00 and end at 17:00.

2) set the mode to continuous as follows

① Press TIMER button to display TIMER Ⓓ.

3) Set the time to start the unit as follows

② Press CLOCK-ON-OFF button to display Ⓑ ON.

③ Press ▽ △ (TIMER SET) button to set the time that you want the unit to start. The start time is displayed at Ⓐ.

4) Set the time to stop the unit as follows

② Press CLOCK-ON-OFF button to display Ⓒ OFF.

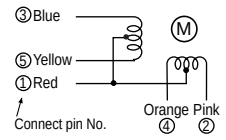
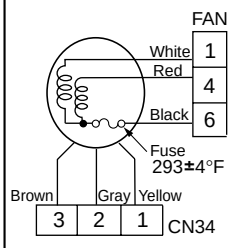
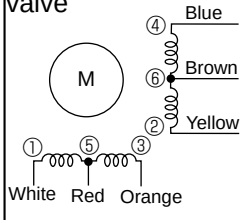
③ Press ▽ △ (TIMER SET) button to set the time that you want the unit to stop. The stop time is displayed at Ⓐ.

5) Set the mode to timer as follows

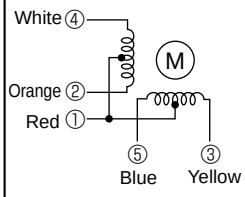
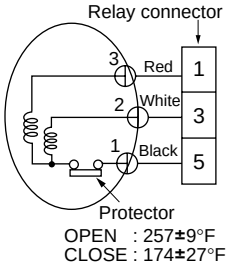
① Press TIMER button to display TIMER Ⓓ.

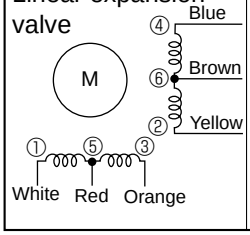
9 TROUBLESHOOTING

9-1. How to check
PKFY-08NAMU-A

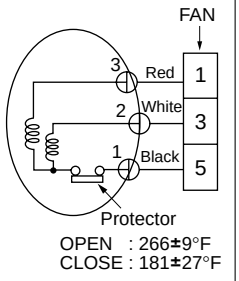
<table>
<tr><th>Part Name</th><th>Check points</th></tr>
<tr><td>Room temperature thermistor(TH21)
Liquid pipe temperature thermistor(TH22)
Gas pipe temperature thermistor(TH23)</td><td>Disconnect the connector, then measure the resistance using a tester.
(Surrounding temperature 50˚F~86˚F)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3kΩ~9.6kΩ</td><td>Open or short</td></tr></table>(Refer to page OC292-36 for details.)</td></tr>
<tr><td>Vane motor

</td><td>①Measure the resistance between the terminals using a tester.(Surrounding temperature 77˚F.)
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>①-②
Red-Pink</td><td>①-③
Red-Blue</td><td>①-④
Red-Orange</td><td>①-⑤
Red-Yellow</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">400Ω ± 7%</td></tr></table></td></tr>
<tr><td>Fan motor

</td><td>①Measure the resistance between the terminals using a tester.(Surrounding temperature 68˚F.)
<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>White-Black</td><td>195Ω</td><td rowspan="2">Open or short</td></tr><tr><td>Red-Black</td><td>200Ω</td></tr></table>②Without disassembling the parts, measure the electrical pressure of the gray wire(Signal line) and brown wire (GND) while the power is on.
<table><tr><td>Normal</td><td>⑴At first, check if the electrical pressure is 12V between the brown wire(GND) and yellow wire(VCC).
⑵Slowly start running the fan. It is normal if while the fan rotate once, the electrical pressure change from 0V to12V then go back to 0V.</td></tr><tr><td>Abnormal</td><td>If the electrical pressure stay at around 0V or 10V, it means the fan motor has the defects.</td></tr></table></td></tr>
<tr><td>Linear expansion valve

</td><td>Disconnect the connector then measure the resistance valve using a tester.
(Coil temperature 68˚F)
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>①-⑤
White-Red</td><td>②-⑥
Yellow-Brown</td><td>③-⑤
Orange-Red</td><td>④-⑥
Blue-Brown</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">150Ω ±10%</td></tr></table>(Refer to page OC292-36 for details.)</td></tr>
</table>

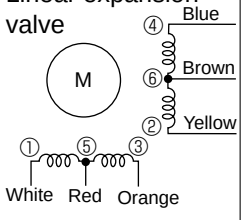
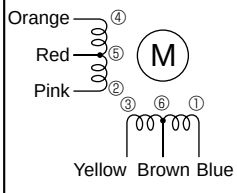
PKFY-12NGMU-A

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temperature thermistor (TH21)
Liquid pipe thermistor thermistor (TH22)
Gas pipe thermistor thermistor (TH23)</td><td>Disconnect the connector then measure the resistance using a tester.
(Surrounding temperature 50°F~86°F)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3kΩ~9.6kΩ</td><td>Open or short</td></tr></table>(Refer to page OC292-36 for details.)</td></tr>
<tr><td>Vane motor

</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 68°F~86°F)
<table><tr><th>Connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Red — Yellow</td><td rowspan="4">186Ω~214Ω</td><td rowspan="4">Open or short</td></tr><tr><td>Red — Blue</td></tr><tr><td>Red — Orange</td></tr><tr><td>Red — White</td></tr></table></td></tr>
<tr><td>Fan motor


OPEN : 257±9°F
CLOSE : 174±27°F</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 68°F)
<table><tr><th>Motor terminal
or
Relay connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Red-Black</td><td>141.2Ω</td><td rowspan="2">Open or short</td></tr><tr><td>White-Black</td><td>131.5Ω</td></tr></table></td></tr>
<tr><td>Linear expansion valve

</td><td>Disconnect the connector then measure the resistance with the tester.
(Surrounding temperature 68°F)
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>① - ⑤
White-Red</td><td>② - ⑥
Yellow-Brown</td><td>③ - ⑤
Orange-Red</td><td>④ - ⑥
Blue-Brown</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">150Ω ±10%</td></tr></table>(Refer to page OC292-36 for details.)</td></tr>
</table>

PKFY-20NFMU-A
PKFY-32NFMU-A

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temperature thermistor (TH21)
Liquid pipe temperature thermistor (TH22)
Gas pipe temperature thermistor (TH23)</td><td>Disconnect the connector then measure the resistance using a tester.
(Surrounding temperature 50°F~86°F)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3kΩ~9.6kΩ</td><td>Open or short</td></tr></table>(Refer to page OC292-36 for details.)</td></tr>
<tr><td>Fan motor


OPEN : 266±9°F
CLOSE : 181±27°F</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 68°F)
<table><tr><th rowspan="2">Motor terminal or Relay connector</th><th colspan="2">Normal</th><th rowspan="2">Abnormal</th></tr><tr><th>PKFY-20NFMU-A</th><th>PKFY-32NFMU-A</th></tr><tr><td>Red-Black</td><td>99.5Ω ±10%</td><td>62.6Ω ±10%</td><td rowspan="2">Open or short</td></tr><tr><td>White-Black</td><td>103.5Ω ±10%</td><td>74.0Ω ±10%</td></tr></table></td></tr>
<tr><td>Linear expansion valve

</td><td>Disconnect the connector then measure the resistance valve using a tester.
(Surrounding temperature 68°F)
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>① - ⑤
White-Red</td><td>② - ⑥
Yellow-Brown</td><td>③ - ⑤
Orange-Red</td><td>④ - ⑥
Blue-Brown</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">150Ω ±10%</td></tr></table>(Refer to page OC292-36 for details.)</td></tr>
<tr><td>Vane motor

</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 68°F~86°F)
<table><tr><th>Connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Brown — Yellow</td><td rowspan="4">186~214Ω</td><td rowspan="4">Open or short</td></tr><tr><td>Brown — Blue</td></tr><tr><td>Red — Orange</td></tr><tr><td>Red — Pink</td></tr></table></td></tr>
</table>

<Thermistor characteristic graph>

Thermistor for lower temperature

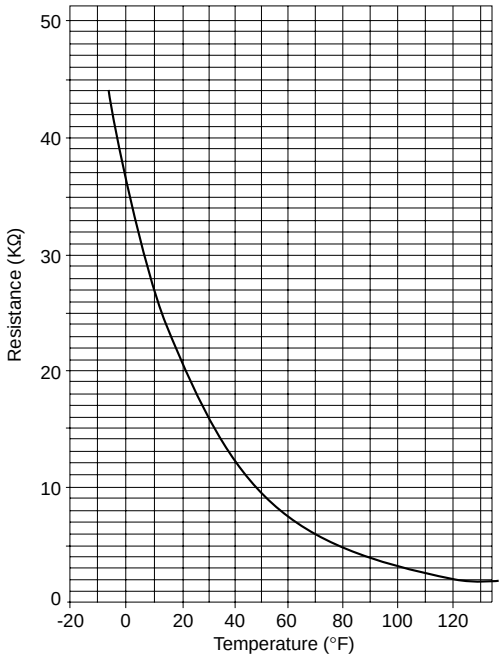
Room temperature thermistor(TH21)
Liquid pipe temperature thermistor(TH22)
Gas pipe temperature thermistor(TH23)

Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480kΩ ± 2%

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

30°F	15.8kΩ
50°F	9.6kΩ
70°F	6.0kΩ
80°F	4.8kΩ
90°F	3.9kΩ
100°F	3.2kΩ

< Thermistor for lower temperature >

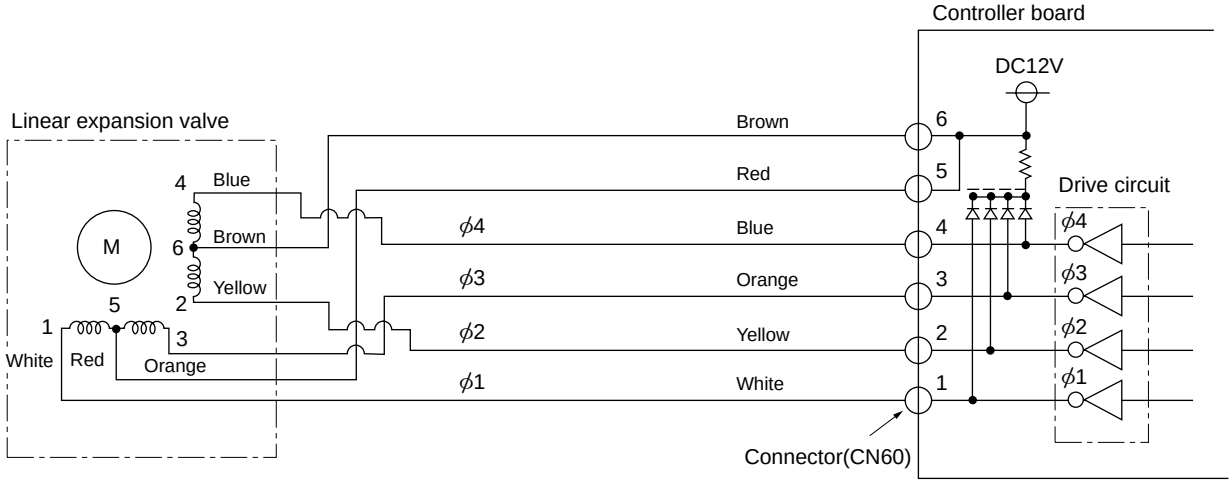


Linear expansion valve

① **Operation summary of the linear expansion valve.**

• Linear expansion valve open/close through stepping motor after receiving the pulse signal from the indoor controller board.
• Valve position can be changed in proportion to the number of pulse signal.

<Connection between the indoor controller board and the linear expansion valve>



Note : Since the number of the connector at the controller board side and the relay connector are different, follow the color of the lead wire.

<Output pulse signal and the valve operation>

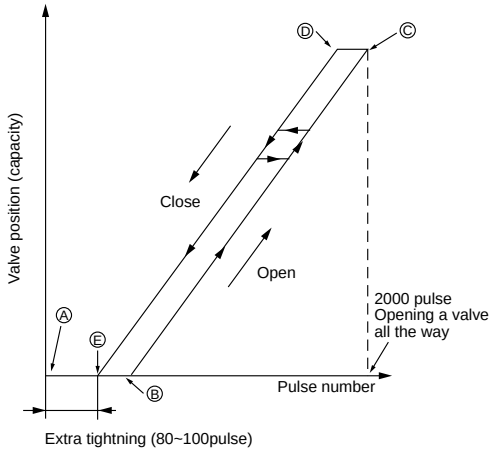
Output (Phase)	Output			
	1	2	3	4
ϕ1	ON	OFF	OFF	ON
ϕ2	ON	ON	OFF	OFF
ϕ3	OFF	ON	ON	OFF
ϕ4	OFF	OFF	ON	ON

Closing a valve : 1 → 2 → 3 → 4 → 1
Opening a valve : 4 → 3 → 2 → 1 → 4

The output pulse shifts in above order.

❋ 1. When linear expansion valve operation stops, all output phase become OFF.
2. At phase interruption or when phase does not shift in order, motor does not rotate smoothly and motor will lock and vibrates.

② Linear expansion valve operation

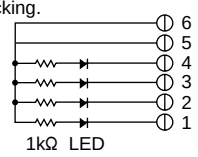
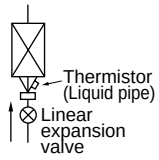


❋ When the switch is turned on, 2200 pulse closing valve signal will be send till it goes to Ⓐ point in order to define the valve position.

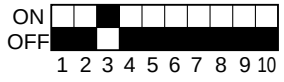
When the valve moves smoothly, there is no noise or vibration occurring from the linear expansion valve : however, when the pulse number moves from Ⓔ to Ⓐ or when the valve is locked, more noise can be heard than normal situation.

❋ Noise can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

③ Trouble shooting

Symptom	Check points	Countermeasures
Operation circuit failure of the micro processor.	Disconnect the connector on the controller board, then connect LED for checking.  Pulse signal will be sent out for 10 seconds as soon as the main switch is turn on. If there is LED with lights on or lights off, it means the operation circuit is abnormal.	Exchange the indoor controller board at drive circuit failure.
Linear expansion valve mechanism is locked.	Motor will idle and make ticking noise when motor is operated while the linear expansion valve is locked. This ticking sound is the sign of the abnormality.	Exchange the linear expansion vale.
Short or breakage of the motor coil of the linear expansion valve.	Measure the resistance between the each coil (red-white, red-orange, brown-yellow, brown-blue) using a tester. It is normal if the resistance is in the range of 150Ω ± 10%.	Exchange the linear expansion valve.
Valve doesn't close completely (thermistor leaking).	To check the linear expansion valve, operate the indoor unit in fan mode and at the same time operate other indoor units in cooling mode, then check the pipe temperature <liquid pipe temperature> of the indoor unit by the outdoor multi controller board operation monitor. During fan operation, linear expansion valve is closed completely and if there are some leaking, detecting temperature of the thermistor will go lower. If the detected temperature is much lower than the temperature indicated in the remote controller, it means the valve is not closed all the way. It is not necessary to exchange the linear expansion valve, if the leakage is small and not making any trouble.  	If large amount of thermistor is leaked, exchange the linear expansion valve.
Wrong connection of the connector or contact failure.	Check the color of lead wire and missing terminal of the connector.	Disconnect the connector at the controller board, then check the continuity.

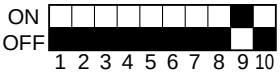
9-2. FUNCTION OF DIP SWITCH
PKFY-08NAMU-A

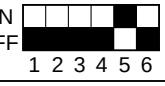
Switch	Pole	Function	Operation by switch		Remarks
			ON	OFF	
SW1 Mode Selection	1	Thermistor <intake temperature detection> position	Built-in remote controller	Indoor unit	Address board <At delivery>  (Note 1) SW1-7=OFF, SW1-8=ON →Setting air flow. SW1-7=OFF, SW1-8=ON →Indoor fan stop. (Note 2) It is impossible to intake the fresh air.
	2	Filter clogging detection	Provided	Not provided	
	3	Filter sign indication	2,500hr	100hr	
	4	Air intake (Note 2)	Not effective	Not effective	
	5	Remote indication switching	Thermostat ON signal indication	Fan output indication	
	6	Humidifier control	Fan operation at Heating mode	Heat thermostat ON is operating	
	7	Air flow set in case of Heat thermostat OFF	Low (Note 1)	Extra low (Note 1)	
	8		Setting air flow (Note 1)	Reset to SW1-7	
	9	Auto restart function	Effective	Not effective	
	10	Power ON/OFF	Effective	Not effective	
SW2 Capacity code setting	1~4	MODELS: PKFY-08NAMU-A; SW 2: 			Indoor controller board Set while the unit is off. <At delivery> Set for each capacity.
SW3 Function Selection	1	Heat pump / Cooling only	Cooling only	Heat pump	Indoor controller board Set while the unit is off. <At delivery>  (Note 3) At cooling mode, each angle can be used only1 hour.
	2	Capacity save	Available	Not available	
	3	Vane	Available	Not available	
	4	Reading change of LEV opening on reversion of after defrosting	Not available	Available	
	5	Vane horizontal angle	Second setting	First setting	
	6	Vane cooling limit angle setting (Note 3)	Horizontal angle	Down B, C	
	7	Indoor linear expansion valve opening	Effective	Not effective	
	8	Heat 4degrees up	Not effective	Effective	
	9	Target superheat setting temperature	5 degrees	2 degrees	
	10	Target sub cool setting temperature	15 degrees	10 degrees	

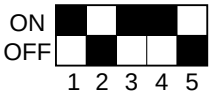
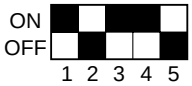
PKFY-12NGMU-A

Switch	Pole	Function	Operation by switch		Remarks
			ON	OFF	
SW1 Mode Selection	1	Thermistor <intake temperature detection> position	Built-in remote controller	Indoor unit	Address board <At delivery> ON OFF 1 2 3 4 5 6 7 8 9 10 Note : ※1 At Heating mode, fan operating. ※2 At Heating mode, operating heat thermostat ON. ※3 SW 1-7=OFF, SW 1-8=ON → Setting air flow. SW 1-7=ON, SW 1-8=ON → Indoor fan stop.
	2	Filter clogging detection	Provided	Not provided	
	3	Filter cleaning	2,500hr	100hr	
	4	Fresh air intake	Effective	Not effective	
	5	Remote indication switching	Thermostat ON signal indication	Fan output indication	
	6	Humidifier control	Always operated while the heating mode ※1	Operated depends on the condition ※2	
	7	Air flow set in case of Heat thermostat OFF	Fix to Low ※3	Fix to Extra low ※3	
	8		Depends on setting remote controller ※3	Depends on SW1-7	
	9	Auto restart function	Effective	Not effective	
	10	Power ON/OFF	Effective	Not effective	
SW2 Capacity code setting	1~6	MODELS: PKFY-12NGMU-A / SW 2: ON OFF 1 2 3 4 5 6			Indoor controller board Set while the unit is off. <At delivery> Set for each capacity.
SW3 Function Selection	1	Heat pump / Cooling only	Cooling only	Heat pump	Indoor controller board Set while the unit is off. <At delivery> ON OFF 1 2 3 4 5 6 7 8 9 10 Note : ※4 At cooling mode, each angle can be used only1 hour.
	2	Louver	Available	Not available	
	3	Vane	Available	Not available	
	4	Vane swing function	Available	Not available	
	5	Vane horizontal angle	Second setting	First setting	
	6	Vane cooling limit angle setting ※4	Horizontal angle	Down B, C	
	7	Indoor linear expansion valve opening	Effective	Not effective	
	8	Heat 4degrees up	Not effective	Effective	
	9	Superheat setting temperature	5 degrees	2 degrees	
	10	Sub cool setting temperature	15 degrees	10 degrees	
SW4 Unit Selection	1~5	ON OFF 1 2 3 4 5			Indoor controller board Set while the unit is off. <At delivery> ON OFF 1 2 3 4 5

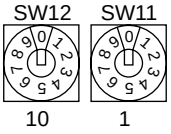
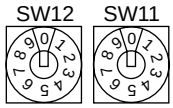
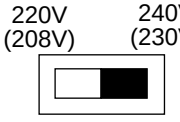
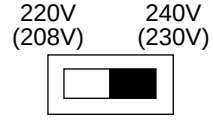
PKFY-20NFMU-A
PKFY-32NFMU-A

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<tr><th rowspan="2">Switch</th><th rowspan="2">Pole</th><th rowspan="2">Function</th><th colspan="2">Operation by switch</th><th rowspan="2">Remarks</th></tr>
<tr><th>ON</th><th>OFF</th></tr>
<tr><td rowspan="10">SW1
Mode
Selection</td><td>1</td><td>Thermistor <intake temperature detection> position</td><td>Built-in remote controller</td><td>Indoor unit</td><td rowspan="10">Address board
<At delivery>


Note :
※1 At Heating mode, fan operating.
※2 At Heating mode, operating heat thermostat ON.
※3 SW 1-7=OFF, SW 1-8=ON → Setting air flow.
SW 1-7=ON, SW 1-8=ON → Indoor fan stop.</td></tr>
<tr><td>2</td><td>Filter clogging detection</td><td>Provided</td><td>Not provided</td></tr>
<tr><td>3</td><td>Filter cleaning</td><td>2,500hr</td><td>100hr</td></tr>
<tr><td>4</td><td>Fresh air intake</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>5</td><td>Remote indication switching</td><td>Thermostat ON signal indication</td><td>Fan output indication</td></tr>
<tr><td>6</td><td>Humidifier control</td><td>Always operated while the heating mode ※1</td><td>Operated depends on the condition ※2</td></tr>
<tr><td>7</td><td rowspan="2">Air flow set in case of Heat thermostat OFF</td><td>Fix to Low ※3</td><td>Fix to Extra low ※3</td></tr>
<tr><td>8</td><td>Depends on setting remote controller ※3</td><td>Depends on SW1-7</td></tr>
<tr><td>9</td><td>Auto restart function</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>10</td><td>Power ON/OFF</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>SW2
Capacity code setting</td><td>1~6</td><td colspan="3"><table><tr><th>MODEL</th><th>SW 2</th><th>MODEL</th><th>SW 2</th></tr><tr><td>PKFY-20NFMU-A</td><td></td><td>PKFY-32NFMU-A</td><td></td></tr></table></td><td>Indoor controller board
Set while the unit is off.
<At delivery>
Set for each capacity.</td></tr>
<tr><td rowspan="10">SW3
Function Selection</td><td>1</td><td>Heat pump / Cooling only</td><td>Cooling only</td><td>Heat pump</td><td rowspan="10">Indoor controller board
Set while the unit is off.
<At delivery>


Note :
※4 At cooling mode, each angle can be used only1 hour.
※5 SW 3-9, 3-10 setting
PKFY-20NFMU-A = ON
PKFY-32NFMU-A = OFF</td></tr>
<tr><td>2</td><td>Louver</td><td>Available</td><td>Not available</td></tr>
<tr><td>3</td><td>Vane</td><td>Available</td><td>Not available</td></tr>
<tr><td>4</td><td>Vane swing function</td><td>Available</td><td>Not available</td></tr>
<tr><td>5</td><td>Vane horizontal angle</td><td>Second setting</td><td>First setting</td></tr>
<tr><td>6</td><td>Vane cooling limit angle setting ※4</td><td>Horizontal angle</td><td>Down B, C</td></tr>
<tr><td>7</td><td>Indoor linear expansion valve opening</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>8</td><td>Heat 4degrees up</td><td>Not effective</td><td>Effective</td></tr>
<tr><td>9</td><td>Superheat setting temperature</td><td>5 degrees</td><td>2 degrees</td></tr>
<tr><td>10</td><td>Sub cool setting temperature</td><td>15 degrees</td><td>10 degrees</td></tr>
<tr><td>SW4
Unit Selection</td><td>1~5</td><td colspan="3"></td><td>Indoor controller board
Set while the unit is off.
<At delivery>
</td></tr>
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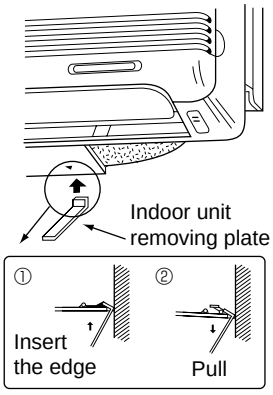
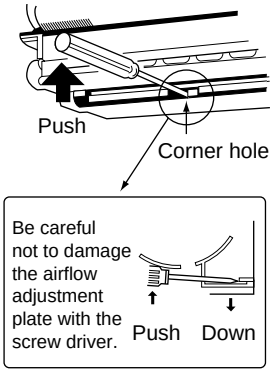
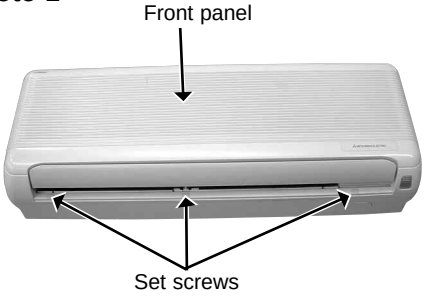
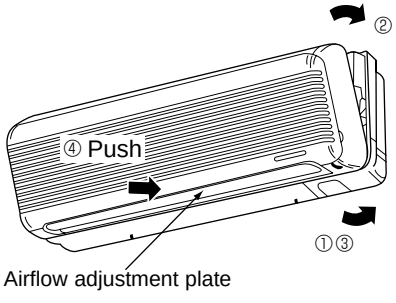
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PKFY-12NGMU-A
PKFY-20NFMU-A
PKFY-32NFMU-A

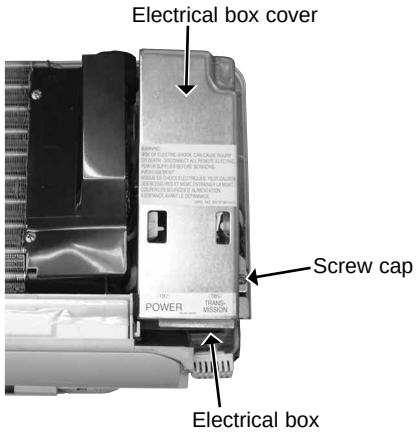
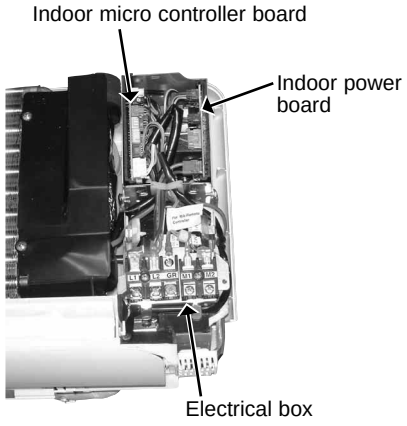
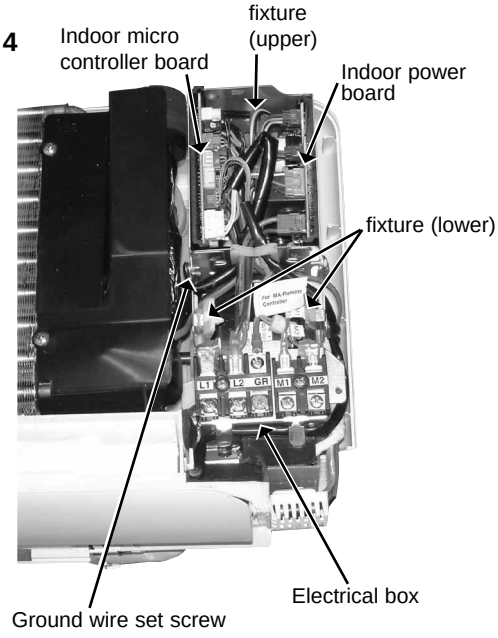
Switch	Pole	Operation by switch	Remarks
SW11 1st digit address setting SW12 2nd digit address setting	Rotary switch	 Address setting should be done when M-NET Remote controller is being used.	Address board Address can be set while the unit is stopped. <At delivery> 
SW14 Connection No. setting	Rotary switch	 This is the switch to be used when the indoor unit is operated with R2 series outdoor unit as a set.	Address board <At delivery> 
SW5 Voltage Selection	2	 If the unit is used at the 230V area, set the voltage to 230V. If the unit is used at the 208V, set the voltage to 208V.	Address board <At delivery> 

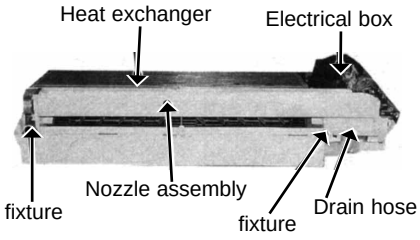
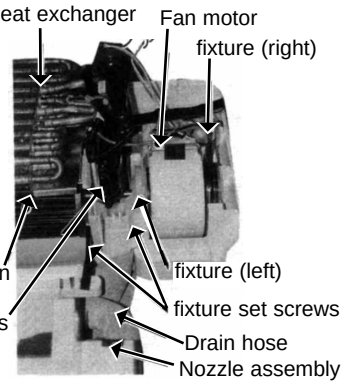
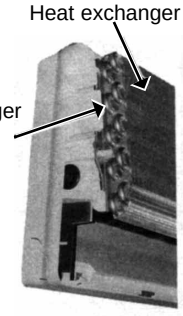
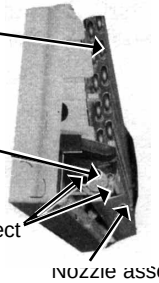
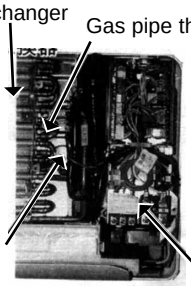
10 DISASSEMBLY PROCEDURE

PKFY-08NAMU-A

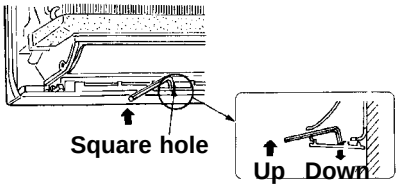
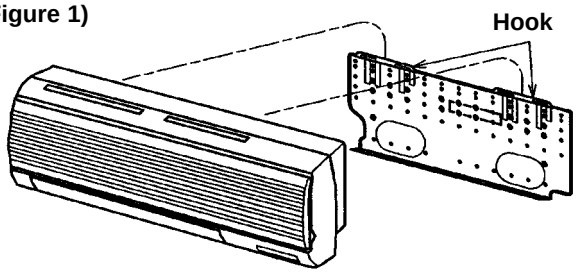
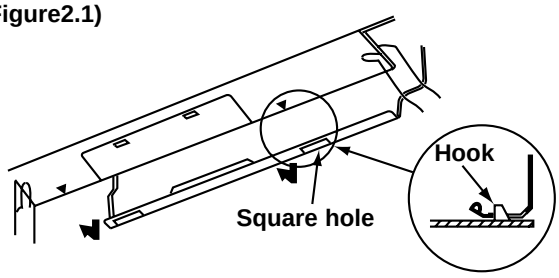
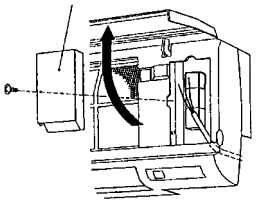
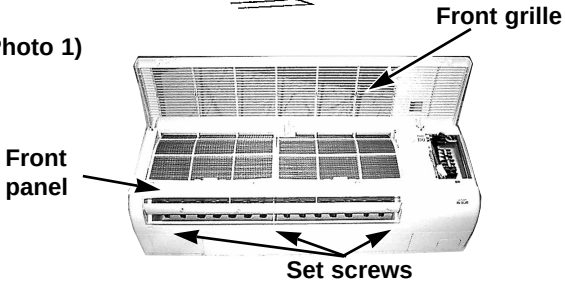
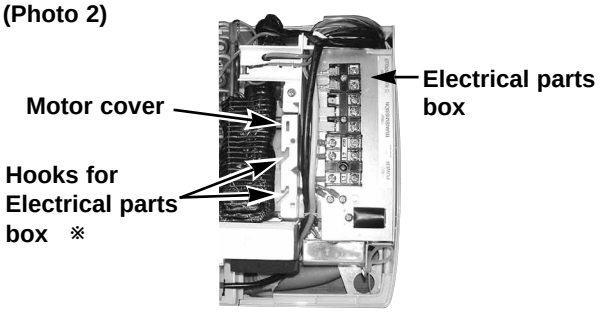
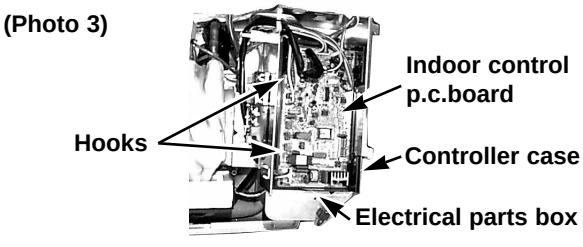
Be careful on removing heavy parts.

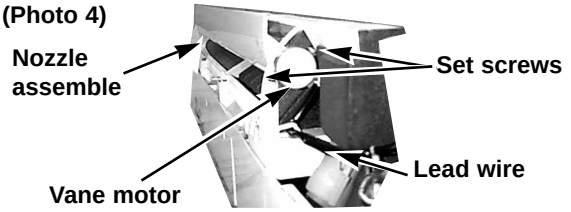
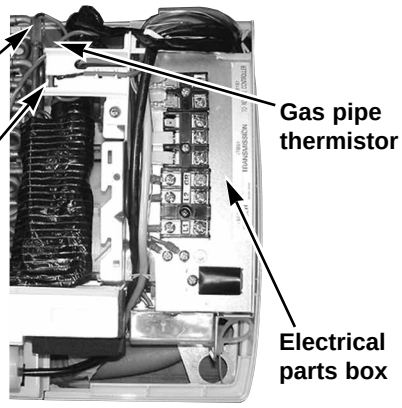
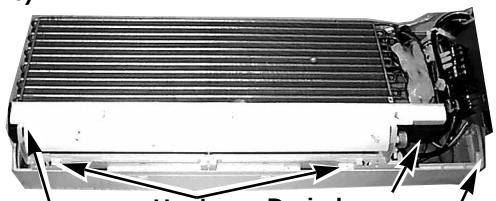
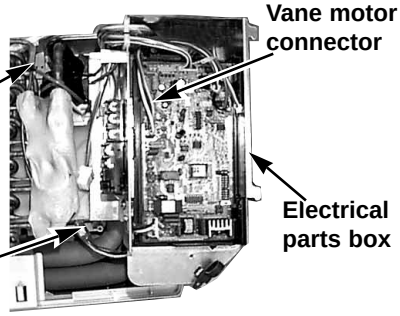
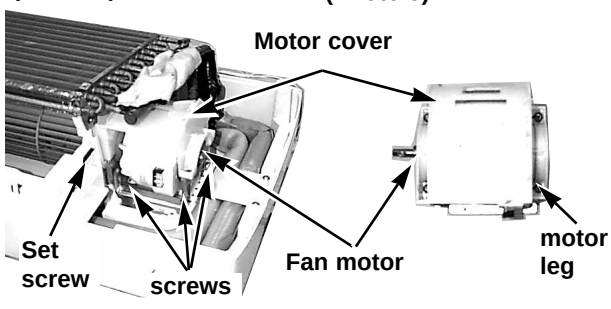
OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
1. REMOVING THE LOWER SIDE OF THE INDOOR UNIT FROM THE INSTALLATION PLATE When there is removing plate (1) Remove the corner box at right lower side of the indoor unit. (2) Insert the removing plate at the back side of the corner box to remove the indoor unit. (3) Remove the hook by pulling the lower side of the indoor unit down as shown in the figure **1**. When there is no removing plate or it can not be used for some reason. (1) Remove the front panel. (2) Insert the screw driver to the corner hole at both left and right side as shown in the figure **2**. (3) Push it up then, pull down the lower side of indoor unit and remove the hook.	**Figure 1**  **Figure 2** 
2. REMOVING THE FRONT PANEL ❋ Before removing the front panel, leave the open space at upper side of air flow adjustment plate approximately 2 to 3 cm. (1) Remove the screw caps then remove the set screws. (Refer to the photo **1**) (2) Remove the left side of the front panel, then right side. (3) After removing the lower side of the front panel a little, remove it as pulling the upper side toward you. ❋ Please pay attention to the nozzle assemble. INSTALLING THE FRONT PANEL (1) Insert the lower side of the front panel under the air adjustment plate. (2) Set the upper side of the front panel. (3) Set the lower side of the front panel then fix it with the screws. (4) Press the area indicated as arrow sign and set it to the air conditioner unit.	**Photo 1**  **Figure 3** 

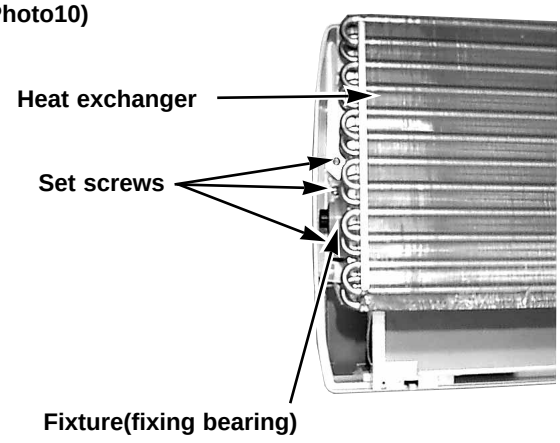
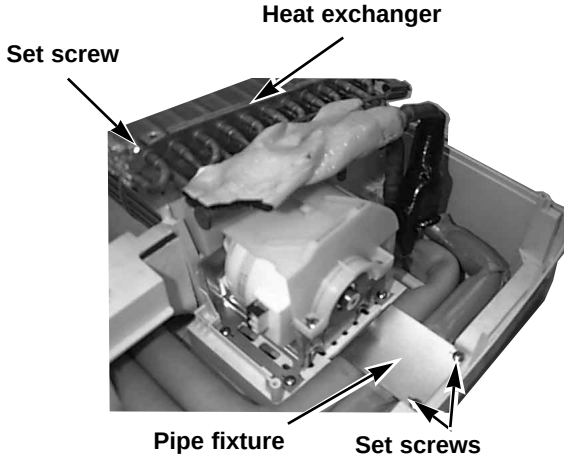
OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
3. REMOVING THE INDOOR MICRO CONTROLLER BOARD AND INDOOR POWER BOARD (1) Remove the front panel. (Refer to **2**) (2) Remove the electrical box cover (screw 4 X 10). (Refer to the photo **2**) INDOOR MICRO CONTROLLER BOARD (1) Disconnect the following connectors on the indoor micro controller board. (connector in front of) ● CN60, CN5V, CN34, CN29, CN21 ● CN42, CN81, CN3A, CN20 (2) Pull out the indoor micro controller board toward you, then disconnect the rest of connectors. ● CN53M, CN35M (See the photo **3**) INDOOR POWER BOARD (1) Disconnect the following connectors on the indoor power board. ● FAN, CN53P, CN35P, CN2M, CND (2) Remove the screws of the indoor power board, then pull out the indoor power board toward you. (See the photo **3**)	**Photo 2**  **Photo 3** 
4. REMOVING THE ELECTRICAL BOX (1) Remove the front panel. (Refer to **2**) (2) Remove the electrical box cover. (3) Pull the nozzle assembly toward you as opening the catch of the nozzle assembly. (4) Disconnect the indoor/outdoor connector. (5) Disconnect the following connector on the indoor micro controller board. (See the photo **4**) ● CN60, CN5V, CN34, CN29, CN21, CN20, CN3A (6) Disconnect the following connector on the indoor power board. (See the photo **4**) ● FAN, CN2M, CND (7) Disconnect the ground wire. (8) Pull the disconnected lead wire out from the electrical box. (9) Push up the upper fixture catch to remove the box, then pull the lower fixture and remove it from the box fixture.	**Photo 4** 

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
5. REMOVING THE NOZZLE ASSEMBLY (1) Remove the front panel (Refer to **2**). (2) Remove the electrical box cover. (3) Disconnect the connector (CN5V) on the indoor micro con troller board. (4) After unhook the right side of the corner box, press the upper left side and remove the corner box. (5) Remove the nozzle assemble from the fixture. (See the photo **5**) (6) Remove the drain hose.	**Photo 5** 
6. REMOVING THE LINE FLOW FAN AND THE FAN MOTOR (1) Remove the front panel. (Refer to **2**) (2) Remove the nozzle assembly. (Refer to **5**) (3) Remove the electrical parts box. (4) Remove the fixture while pressing the right side of motor fixture catch. (See the photo **6**) (5) Remove the left side of the motor fixture. (6) Loosen the screw which fixes the line flow fan to the fan motor, then remove the fan motor by sliding it to the right side. (See the photo **6**) (7) Pull the left-hand side of the heat exchanger toward you. (See the photo **7**) (8) Remove the line flow fan.	**Photo 6**  **Photo 7** 
7. REMOVING THE VANE MOTOR (1) Remove the front panel. (2) Remove the screw of the electrical parts box cover, and remove the cover. (3) Remove the screw of the vane motor, and remove the motor from the shaft. (4) Disconnect the vane motor connector (CN5V) on the indoor controller board.	**Photo 8** 
8. REMOVING THE LIQUID PIPE THERMISTOR AND GAS PIPE THERMISTOR (1) Remove the front panel. (Refer to **2**) (2) Remove the electrical box cover. (3) Remove the pipe cover. (4) Cut the wiring fixed band. (5) Remove the liquid pipe thermistor and gas pipe thermistor. (See the photo **9**) (6) Disconnect the connector (CN29) (CN21) on the indoor micro controller board.	**Photo 9** 

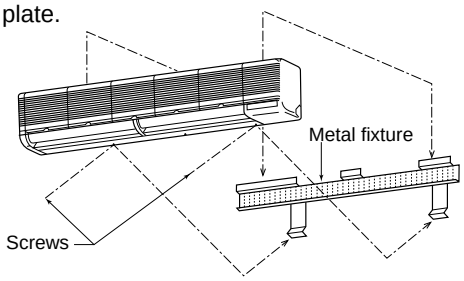
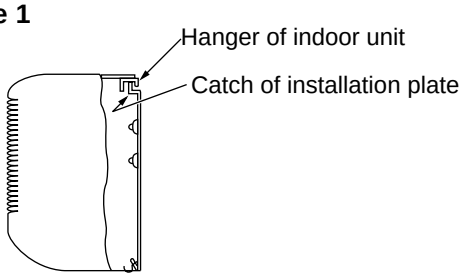
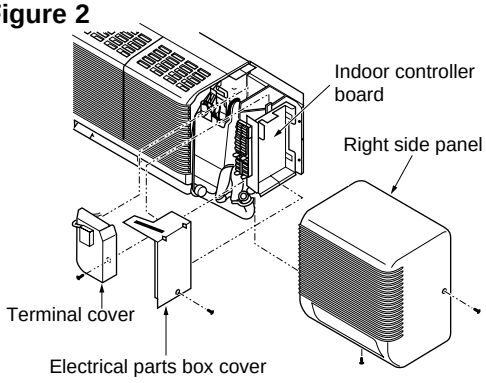
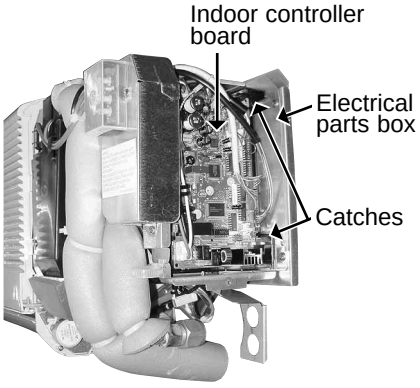
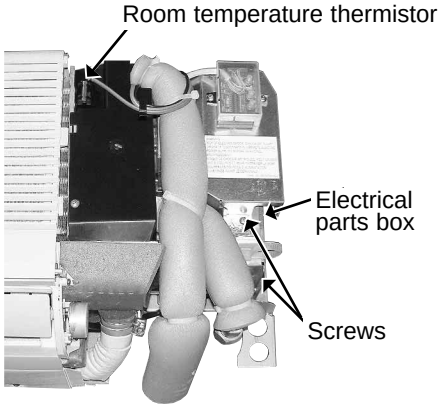
PKFY-12NGMU-A

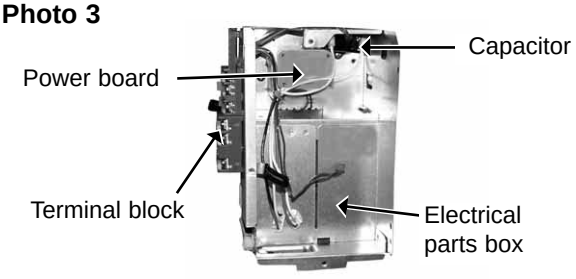
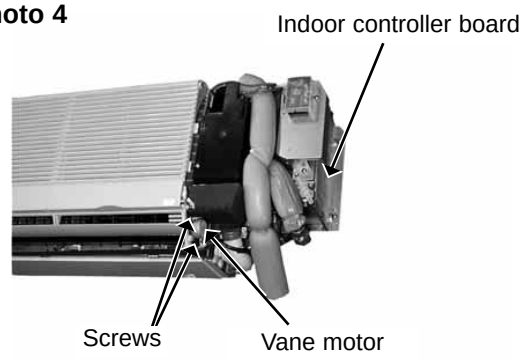
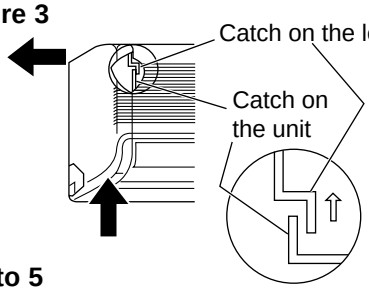
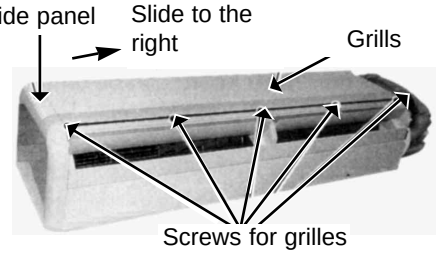
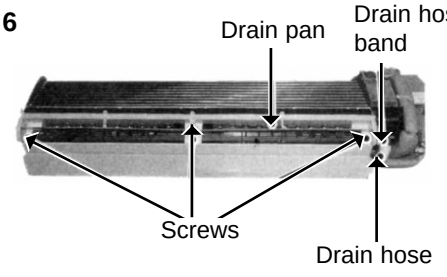
OPERATION PROCEDURE	PHOTOS & ILLUSTRATION
1. REMOVE THE LOWER SIDE OF THE INDOOR UNIT FROM THE INSTALLATION PLATE (1) Remove the left / right corner box of the indoor unit. (2) Hold and pull down the lower and both ends of the indoor unit, and remove the ▼ section from the square hole. (Refer to the figure 2.1) Or remove the front panel and push the ▼ section down by using allen wrench ,etc. from the front side. (Refer to the figure 2.2). (3) Unhook the top of the indoor unit from the back plate catch. **(Figure 2.2)** 	**(Figure 1)**  **(Figure2.1)** 
2. REMOVING THE FRONT PANEL (1) Open the front grille. (2) Remove the terminal block cover with a screw. (3) Remove the screw 3caps then remove the set 3screws. (4) After removing the lower side of the front panel a little, remove it as pulling toward upper.	**(Figure 3)**  **(Photo 1)** 
3. REMOVING THE INDOOR CONTROLLER BOARD (1) Remove the terminal block cover. (2) Remove the front panel. (see the photo 1) (3) Remove the electrical parts box(2screws). (4) Remove the electrical parts box cover(1screw). (5) Disconnect the connector on the indoor controller board and remove the controller board by Pulling up the hook of the controller case. ※ To smooth work, hang the side hooks of the electrical parts box on the hook of the motor cover. (see the photo 3)	**(Photo 2)**  **(Photo 3)** 

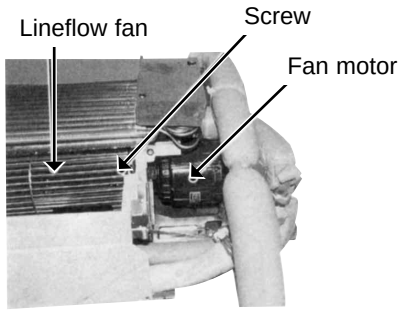
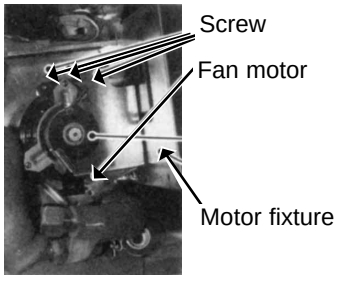
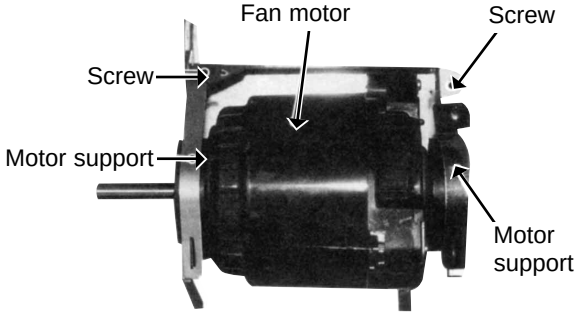
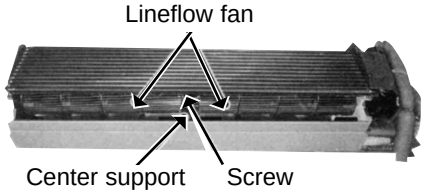
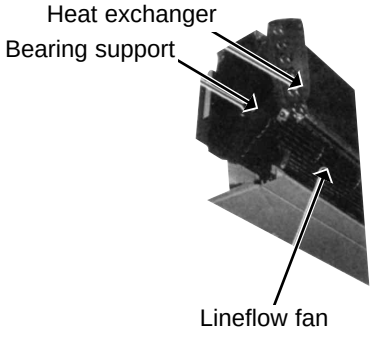
OPERATION PROCEDURE	PHOTOS & ILLUSTRATION
4. REMOVING THE VANE MOTOR (1) Disconnect the connector CN6V on the indoor controller board. (2) Remove the 2screws of the vane motor, disconnect the lead wire and remove the vane motor from the shaft.	(Photo 4) 
5. REMOVING THE THERMISTOR (1) Removing the room thermistor TH21. ①Disconnect the connector CN20<red> on the indoor controller board. ②Remove the room thermistor from the holder. (2) Removing the liquid pipe thermistor TH22. ①Disconnect the connector CN21<white> on indoor controller board. ②Remove the liquid pipe thermistor with set to the pipe. (3) Removing the gas pipe thermistor TH23. ①Disconnect the connector CN29<black> on indoor controller board. ②Remove the gas pipe thermistor with set to the pipe.	(Photo 5) 
6. REMOVING THE NOZZLE ASSEMBLE (1) Disconnect the connector CN6V on the indoor controller .board. (2) Disconnect the lead wire of the vane motor. (3) Remove the corner cover. (4) Pull the drain hose out from the nozzle assembly. (5) Unhook the hook of the lower nozzle assembly and pull the nozzle assembly toward you,then remove the nozzle assemble by sliding it down.	(Photo 6) 
7. REMOVING THE ELECTRICAL PARTS BOX (1) Remove the terminal block cover. (2) Remove the front panel.(see the photo 1) (3) Disconnect the vane motor connector. (4) Disconnect the fan motor connector from the fan motor. (5) Remove the liquid / gas pipe thermistor.(see the photo 5) (6) Disconnect the linear expansion valve connector. (7) Remove the electrical parts box (2screws).	(Photo 7) 
8. REMOVING THE FAN MOTOR (1) Remove the terminal block cover. (2) Remove the front panel.(see the photo 1) (3) Remove the electrical parts box.(see the photo 7) (4) Remove the nozzle assembly.(see the photo 6) (5) Remove the fan motor leg fixing 3screws. (6) Unscrew the set screws using by allen wrench and remove it by sliding the fan motor to right. (7) Remove the 4screws and remove the motor cover from the fan motor leg.	(Photo 8) (Photo 9) 

OPERATION PROCEDURE	PHOTOS & ILLUSTRATION
9. REMOVING THE LINE FLOW FAN (1) Remove the terminal block cover. (2) Remove the front panel.(see the photo 1) (3) Remove the electrical parts box.(see the photo 7) (4) Remove the nozzle assembly.(see the photo 6) (5) Remove the fan motor.(see the photo 8) (6) Remove the pipe fixture with 2screws.(see the photo11) (7) Remove the left / right screws of the heat exchanger and pull the left-hand side up. (8) Remove the 2screws by sliding it toward you remove the fixture(fixing bearing). ※ The fan motor is removable first , when the fan removing is hard. ※ When resetting the fan to the fan motor. Locate and fix the shaft after installing the fan.	**(Photo10)** 
10. REMOVING THE HEAT EXCHANGER (1) Remove the terminal block cover. (2) Remove the front panel.(see the photo 1) (3) Remove the electrical parts box.(see the photo 7) (4) Remove the corner box. (5) Remove the nozzle assemble.(see the photo 6) (6) Remove the 2screws and the pipe fixture. (7) Remove the 2screws and heat exchanger.	**(Photo 11)** 

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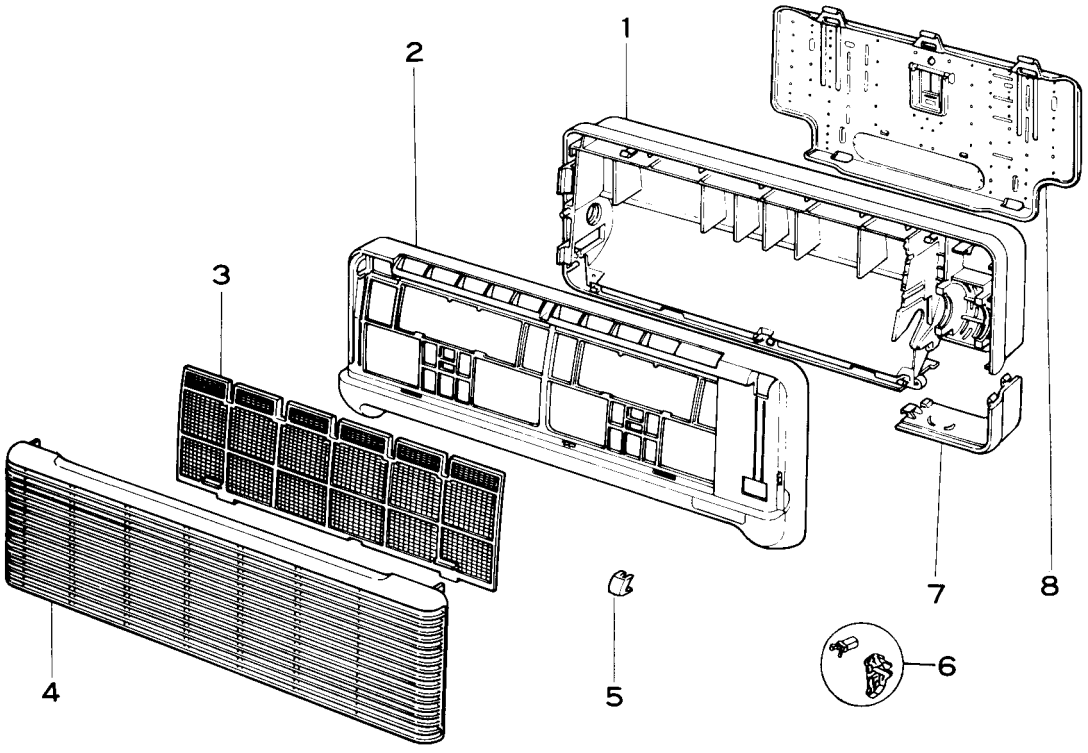
OPERATING PROCEDURE	PHOTOS & ILLUSTRATION
1. Removing the lower side of the indoor unit from the installation plate (1) Remove the 2 screws. Hang the indoor unit hangers to the catches on the installation plate. 	**Figure 1** 
2. Removing the right side panel (1) Remove the 2 screws of the right side panel:one on the bottom and the other on the upper right-hand side. (2) Sliding the right side panel to the right, pull it out toward you.	**Figure 2** 
3. Removing the indoor controller board (1) Remove the right side panel. (2) Remove the screw of the electrical parts box cover, and remove the cover. (3) Disconnect the connectors on the indoor controller board. (4) To unhook the catches on the right-hand side of the indoor controller board, pull the left-hand side toward you and lift up the cover to the right. Then the indoor controller board can be removed.	**Photo 1** 
4. Removing the electrical parts box (1) Remove the right side panel. (2) Remove the screw of the electrical parts box cover and controller cover, and remove each the cover. (3) Disconnect the vane motor, the linear expansion valve, the room temperature thermistor, the liquid pipe temperature thermistor and the gas pipe temperature thermistor connector on the indoor controller board. (4) Remove the 2 screws of the electrical parts box. (5) Disconnect the connector of the fan motor lead wire.(Fan motor side) (6) Remove the electrical parts box.	**Photo 2** 

OPERATING PROCEDURE	PHOTOS & ILLUSTRATION
(7) Remove the indoor controller board case. Then the Power board and the capacitor can be serviced.	**Photo 3** 
5. Removing the vane motor (1) Remove the right side panel. (2) Remove the screw of the electrical parts box cover, and remove the terminal cover. (3) Remove the 2 screws of the vane motor, and remove the motor from the shaft. (4) Disconnect the vane motor connector on the indoor controller board.	**Photo 4** 
6. Removing the intake grilles (1) Remove the right side panel. (2) To remove the left side panel, remove the screw on the bottom and the screw on the upper left-hand side. (See Figure 3.) 1. Press up this side of the left side panel to unhook the catch on the panel from the catch on the unit. 2. Slide the left side panel to the left to remove the panel. Note: Fix the unit to the metal fixture securely (3) Remove the air filters. (4) Hold and press the center cover to remove. (5) Remove the screws of the grilles. (6) Pull the lower side of the grille toward you and slide the upper to the right to remove the grilles.	**Figure 3**  **Photo 5** 
7. Removing the drain pan (1) Remove the left and right side panels. (2) Remove the grilles. (3) Remove the electrical parts box cover. (4) Loosen the drain hose band to remove. (5) Remove the 3 screws of the drain pan, and slide the drain pan toward you to remove.	**Photo 6** 

OPERATING PROCEDURE	PHOTOS
8. Removing the lineflow fan and the fan motor (1) Remove the left and right side panels. (2) Remove the grilles. (3) Remove the electrical parts box. (4) Remove the drain pan. (5) Loosen the screw that fixes the lineflow fan to the fan motor. (See Photo 7.) (6) Remove the 4 screws of the motor fixture, and remove the fan motor and the motor fixture at a time (See Photo 8.) (7) Remove the screws of the left and right motor supports, and remove the motor supports and the fan motor. (See Photo 9.) (8) Remove the screw of the center support, and remove the support. (See Photo 10.) (9) Remove the 2 screws on the left and right sides of the heat exchanger, and pull the bearing support toward you. (See Photo 11.) (10) Pull the left-hand side of the heat exchanger toward you, and remove the lineflow fan.	**Photo 7**  **Photo 8**  **Photo 9**  **Photo 10** 
Photo 11  	

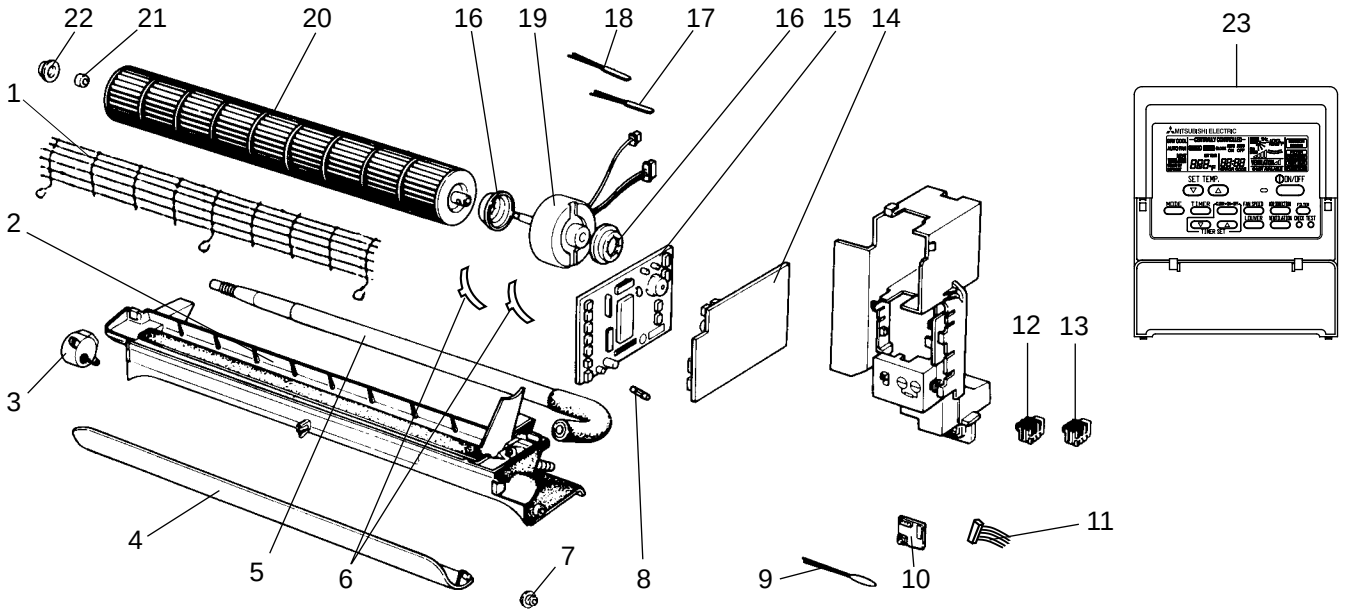
11 PARTS LIST

PANEL PARTS
PKFY-08NAMU-A



No.	Parts No.	Parts Name	Specifications	Q'ty / set	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKFY-08NAMU-A				Unit	Amount
1	R01 22A 635	BOX		1					
2	R01 22A 651	FRONT PANEL		1					
3	R01 22A 500	AIR FILTER		1					
4	R01 22A 691	INTAKE GRILLE		1					
5	R01 22A 096	SCREW CAP		1	3PCS/SET				
6	R01 22A 054	GRILLE CATCH		1					
7	T7W A00 658	CORNER BOX		1					
8	R01 22A 808	BACK PLATE		1					

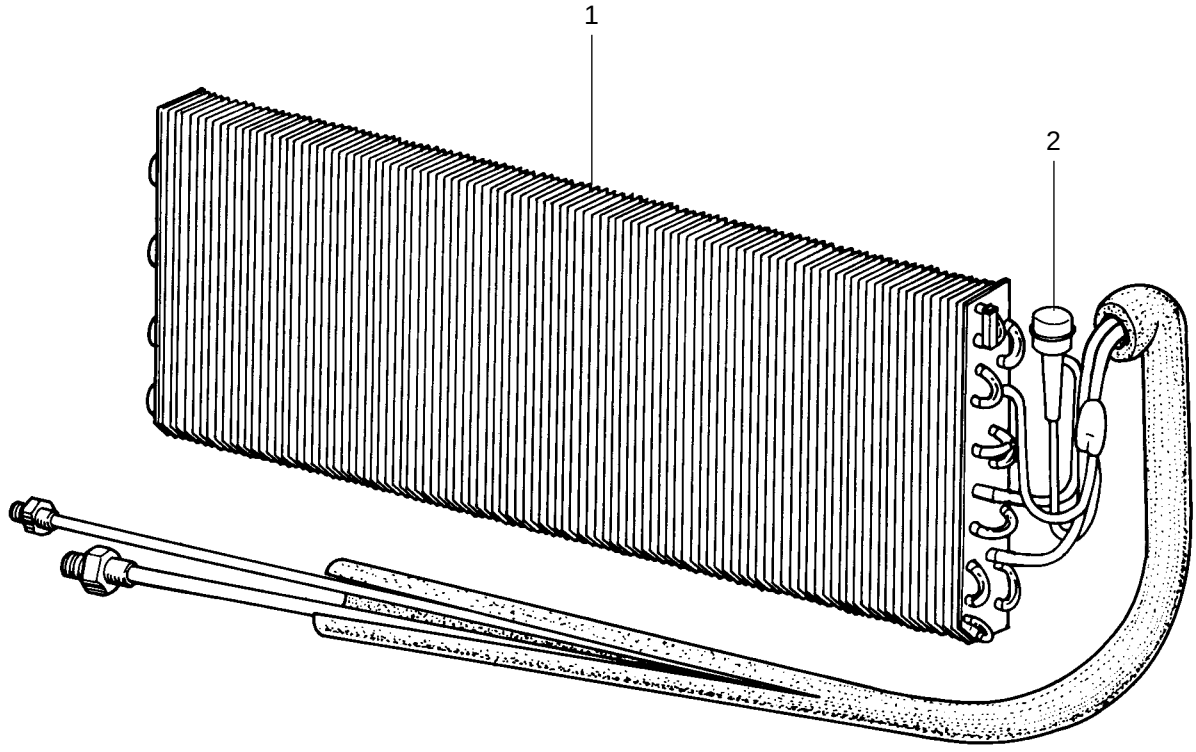
ELECTRICAL PARTS
PKFY-08NAMU-A



No.	Parts No.	Parts Name	Specifications	Q'ty / set	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKFY-08NAMU-A				Unit	Amount
1	T7W B00 675	FAN GUARD		1					
2	R01 22A 530	NOZZLE		1					
3	R01 22A 223	VANE MOTOR		1		MV			
4	R01 22A 002	AUTO VANE		1					
5	R01 22A 527	DRAIN HOSE		1					
6	R01 22A 126	MOTOR BAND	SET (LEFT, RIGHT)	1					
7	R01 07Y 092	VANE SLEEVE		1					
8	T7W 410 239	FUSE	250V 6A	1		FUSE			
9	T7W E12 202	ROOM TEMPERATURE THERMISTOR		1		TH21			
10	T7W E00 294	ADDRESS BOARD		1		A.B			
11	T7W E00 304	ADDRESS CABLE		1					
12	T7W E18 716	TERMINAL BLOCK	3P (L1, L2, GR)	1		TB2			
13	T7W E19 716	TERMINAL BLOCK	2P (M1, M2)	1		TB5			
14	T7W E05 313	POWER BOARD		1		P.B			
15	T7W E29 310	INDOOR CONTROLLER BOARD		1		M.B			
16	R01 22A 105	RUBBER MOUNT		2					
17	R01 E38 202	PIPE TEMPERATURE THERMISTOR	GAS	1		TH23			
18	T7W E06 202	PIPE TEMPERATURE THERMISTOR	LIQUID	1		TH22			
19	T7W E18 762	FAN MOTOR	PS4N8-KA	1		MF			
20	R01 22A 114	LINE FLOW FAN		1					
21	R01 005 103	SLEEVE BEARING		1					
22	R01 22A 102	BEARING MOUNT		1					
23	—	REMOTE CONTROLLER	PAR-20MAU	1		R.B			

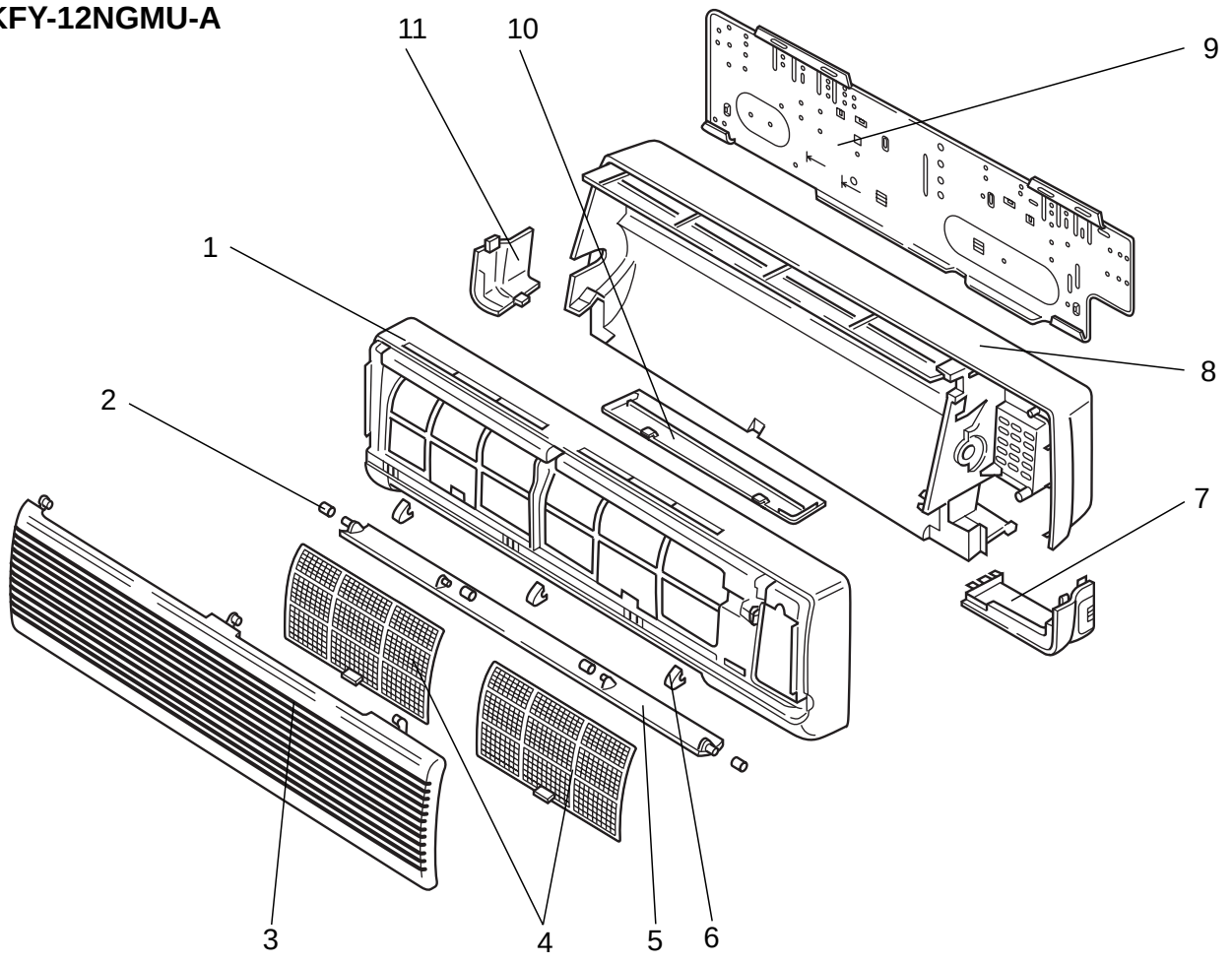
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HEAT EXCHANGER PARTS
PKFY-08NAMU-A



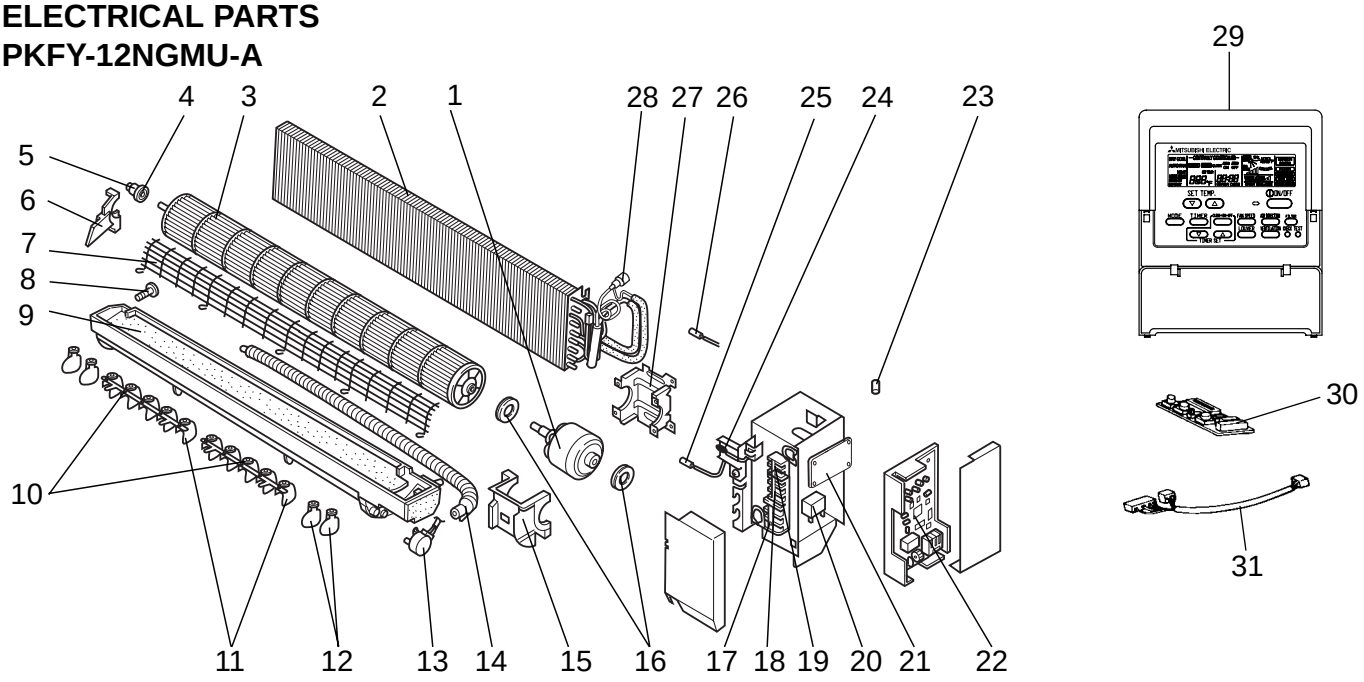
No.	Parts No.	Parts Name	Specifications	Q'ty / set	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKFY-08NAMU-A				Unit	Amount
1	T7W E84 480	HEAT EXCHANGER	With connection pipe	1					
2	R01 E27 401	LINEAR EXPANSION VALVE		1		LEV			

STRUCTURAL PARTS
PKFY-12NGMU-A



No.	Parts No.	Parts Name	Specifications	PKFY-12NGMU-A	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
								Unit	Amount
1	R01 07Y 651	FRONT PANEL		1					
2	R01 07Y 092	VANE SLEEVE		1					
3	R01 07Y 691	FRONT GRILLE		1					
4	R01 A16 500	AIR FILTER		2					
5	R01 07Y 002	AUTO VANE		1					
6	R01 07Y 096	SCREW CAP		3					
7	R01 09Y 658	CORNER COVER		1					
8	R01 07Y 635	BOX ASSEMBLY		1					
9	R01 07Y 808	BACK PLATE		1					
10	R01 07Y 623	UNDER COVER		1					
11	R01 07Y 658	CORNER COVER		1					

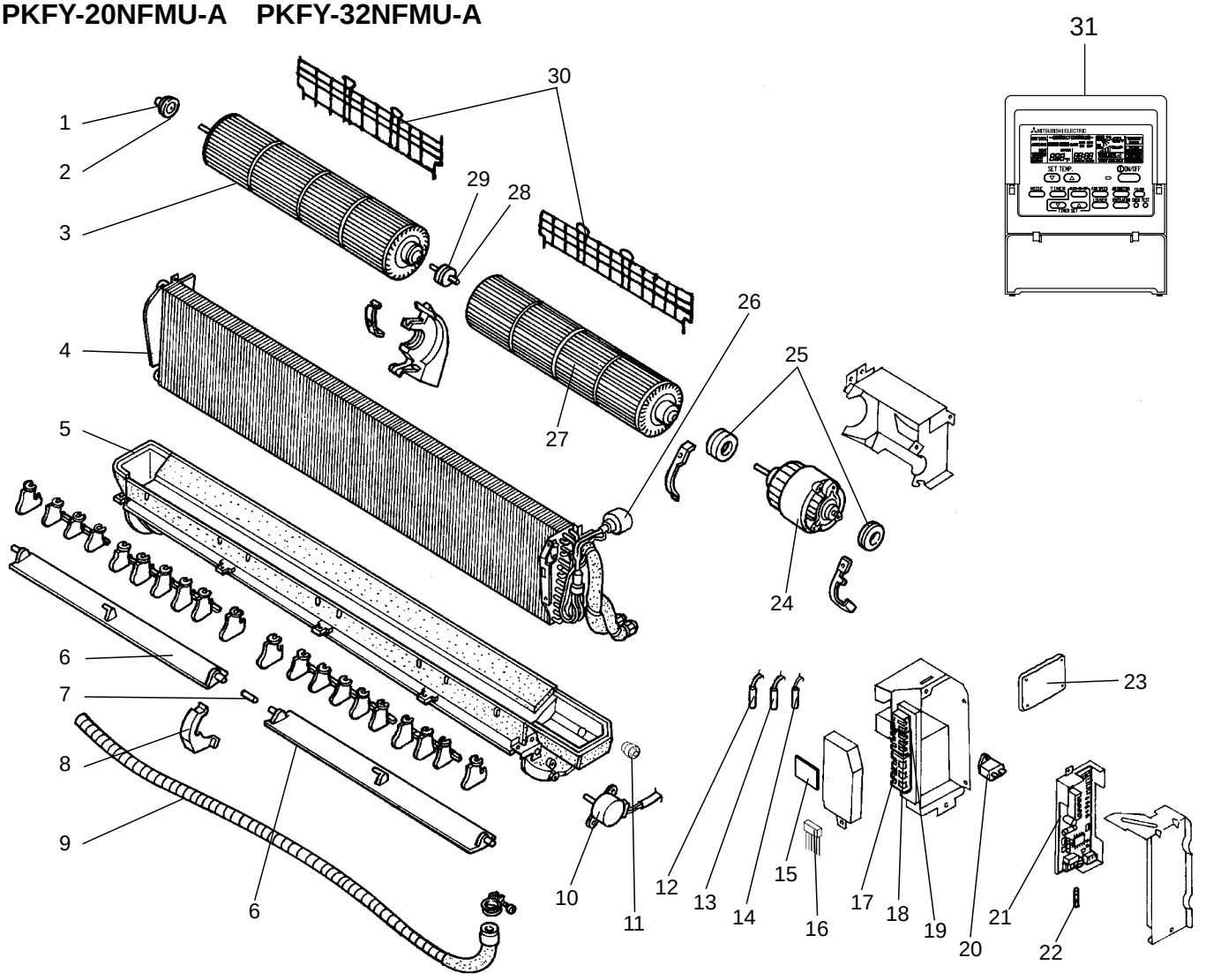
ELECTRICAL PARTS
PKFY-12NGMU-A



No.	Parts No.	Parts Name	Specifications	PKFY-	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				12NGMU-A				Unit	Amount
1	T7W E19 762	FAN MOTOR	PM4N30-KA	1		MF			
2	R01 E25 480	HEAT EXCHANGER		1					
3	R01 07Y 114	LINE FLOW FAN		1					
4	R01 005 103	SLEEVE BEARING		1					
5	R01 07Y 102	BEARING MOUNT		1					
6	R01 07Y 106	BEARING SUPPORT		1					
7	T7W A00 675	FAN GUARD		1					
8	R01 07Y 524	DRAIN PLUG		1					
9	R01 07Y 530	NOZZLE ASSY		1					
10	R01 07Y 059	ARM		2					
11	R01 07Y 038	GUIDE VANE		10					
12	R01 09Y 038	GUIDE VANE		4					
13	T7W E04 223	VANE MOTOR		1		MV			
14	R01 07Y 527	DRAIN HOSE		1					
15	R01 07Y 135	MOTOR COVER		1					
16	R01 07Y 105	RUBBER MOUNT		2					
17	T7W E11 716	TERMINAL BLOCK	3P(L1, L2, GR)	1		TB2			
18	T7W E17 716	TERMINAL BLOCK	3P(M1,M2,S)	1		TB5			
19	R01 556 246	TERMINAL BLOCK	2P(1,2)	1		TB15			
20	T7W E11 255	RUN CAPACITOR	2.0μF 440V	1		C			
21	R01 E02 313	POWER BOARD		1		P.B			
22	T7W E28 310	CONTROLLER BOARD		1		I.B			
23	T7W 410 239	FUSE	250V 6A	1		FUSE			
24	R01 E26 202	ROOM THERMISTOR		1		TH21			
25	R01 E28 202	LIQUID PIPE THERMISTOR		1		TH22			
26	T7W E25 202	GAS PIPE THERMISTOR		1		TH23			
27	R01 07Y 130	MOTOR SUPPORT		1					
28	R01 E27 401	LINEAR EXPANSION VALVE		1		LEV			
29	—	REMOTE CONTROLLER	PAR-20MAU	1					
30	T7W E00 294	ADDRESS BOARD		1		A.B			
31	R01 85Y 304	ADDRESS CABLE		1					

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ELECTRICAL PARTS
PKFY-20NFMU-A PKFY-32NFMU-A

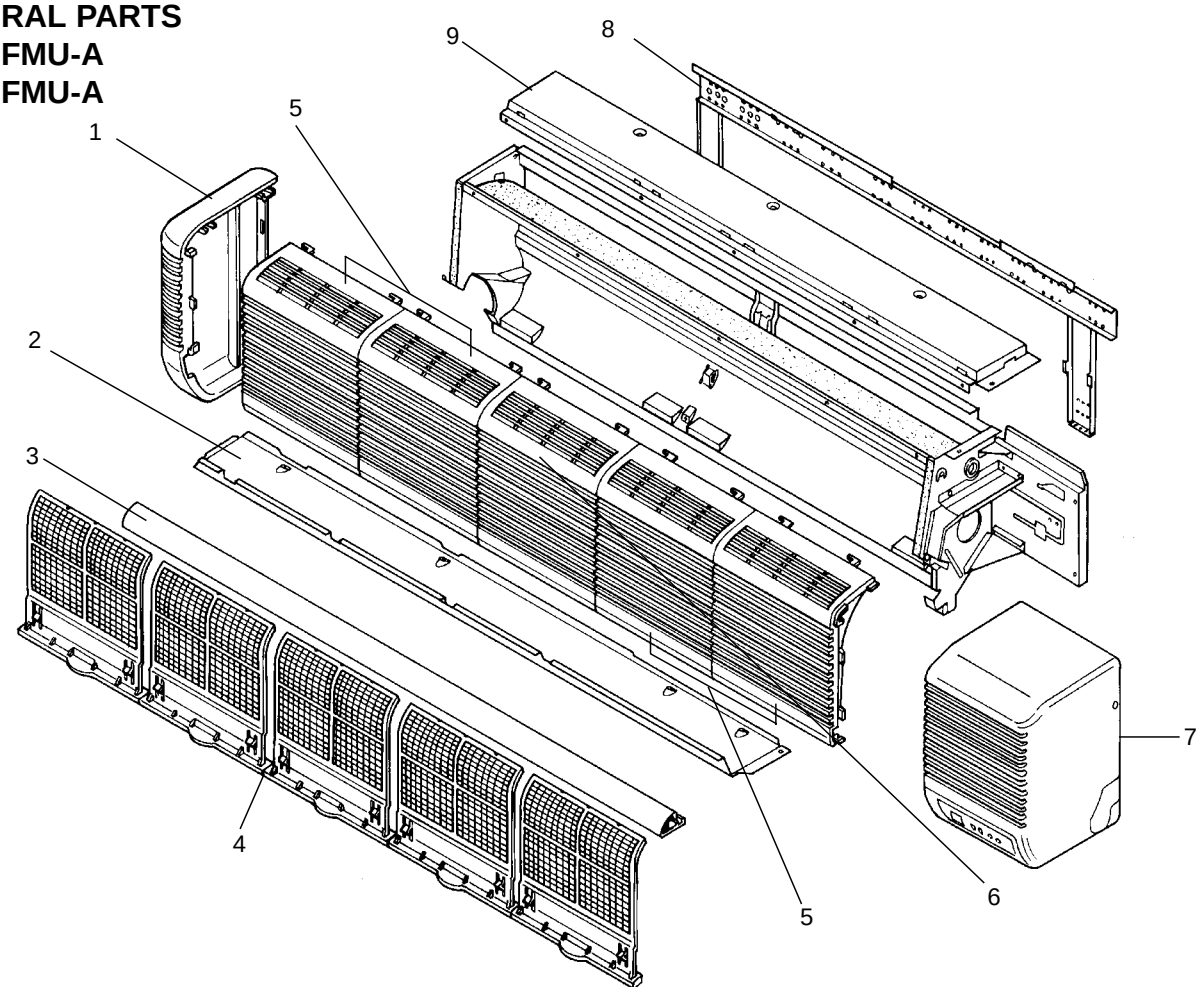


No.	Part No.	Part Name	Specification	Q'ty / set		Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKFY-					Unit	Amount
				20NFMU-A	32NFMU-A					
1	R01 Z61 102	BEARING MOUNT		1	1					
2	R01 12G 103	SLEEVE BEARING		1	1					
3	R01 13G 114	LEFT LINEFLOW FAN		1						
	R01 16G 114	LEFT LINEFLOW FAN			1					
4	T7W E97 480	HEAT EXCHANGER		1						
	T7W E98 480	HEAT EXCHANGER			1					
5	T7W E13 529	DRAIN PAN		1						
	T7W E14 529	DRAIN PAN			1					
6	R01 12G 002	AUTO VANE		2						
	R01 16G 002	AUTO VANE			2					
7	R01 12G 063	JOINT SHAFT		1	1					

No.	Part No.	Part Name	Specification	Q'ty / set		Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKFY-					Unit	Amount
				20NFMU-A	32NFMU-A					
8	R01 12G 621	CENTER COVER		1	1					
9	R01 KV5 527	DRAIN HOSE		1	1					
10	T7W E03 223	VANE MOTOR		1	1		MV			
11	R01 12G 523	DRAIN SOCKET		1	1					
12	R01 E58 202	GAS PIPE THERMISTOR		1	1		TH23			
13	T7W E12 202	ROOM TEMPERATURE THERMISTOR		1	1		TH21			
14	R01 E02 202	LIQUID PIPE THERMISTOR		1	1		TH22			
15	T7W E00 294	ADDRESS BOARD		1	1		A.B			
16	R01 05A 304	ADDRESS CABLE		1	1					
17	T7W E11 716	TERMINAL BLOCK	3P(L1,L2,GR)	1	1		TB2			
18	T7W E17 716	TERMINAL BLOCK	3P(M1,M2,S)	1	1		TB5			
19	R01 556 246	TERMINAL BLOCK	2P(1,2)	1	1		TB15			
20	T7W E03 255	FAN MOTOR CAPACITOR	2.5μF 440V	1	1		C			
21	T7W E28 310	INDOOR CONTROLLER BOARD		1	1		I.B			
22	T7W 410 239	FUSE	250V 6A	1	1		FUSE			
23	R01 E02 313	POWER BOARD		1	1		P.B			
24	T7W B00 762	FAN MOTOR	PN4N45-K	1			MF			
	T7W B01 762	FAN MOTOR	PN4N70-K		1		MF			
25	R01 13G 105	RUBBER MOUNT		2						
	R01 16G 105	RUBBER MOUNT			2					
26	R01 E27 401	LINEAR EXPANSION VALVE		1			LEV			
	T7W E09 401	LINEAR EXPANSION VALVE			1		LEV			
27	R01 13G 115	RIGHT LINE FLOW FAN		1						
	R01 16G 115	RIGHT LINE FLOW FAN			1					
28	R01 005 103	SLEEVE BEARING		1	1					
29	R01 KV5 102	BEARING MOUNT		1	1					
30	T7W B02 675	FAN GUARD		2						
	T7W B03 675	FAN GUARD			2					
31	—	REMOTE CONTROLLER	PAR-20MAU	1	1		R.B			

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STRUCTURAL PARTS
PKFY-20NFMU-A
PKFY-32NFMU-A



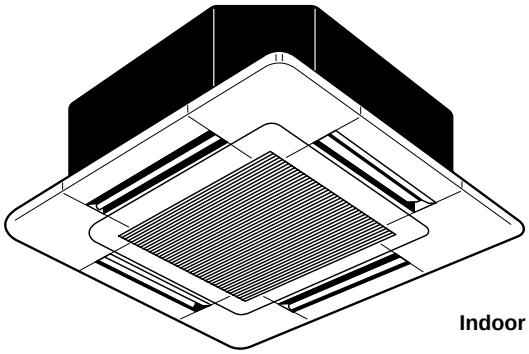
No.	Part No.	Part Name	Specification	Q'ty / set		Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKFY-					Unit	Amount
				20NFMU-A	32NFMU-A					
1	R01 12G 662	LEFT SIDE PANEL		1	1					
2	R01 E01 812	UNDER PLATE		1						
	R01 E00 812	UNDER PLATE			1					
3	R01 E00 811	NOSE		1						
	R01 E01 811	NOSE			1					
4	R01 A17 500	AIR FILTER		4	5					
5	R01 12G 691	INTAKE GRILLE		2	2					
6	R01 16G 692	INTAKE GRILLE			1					
7	R01 12G 661	RIGHT SIDE PANEL		1	1					
8	R01 12G 808	BACK PLATE		1						
	R01 16G 808	BACK PLATE			1					
9	R01 E01 641	TOP PLATE		1						
	R01 E00 641	TOP PLATE			1					

PLFY-12NAMU-A
PLFY-20NAMU-A
PLFY-24NAMU-A
PLFY-32NAMU-A
PLFY-40NAMU-A

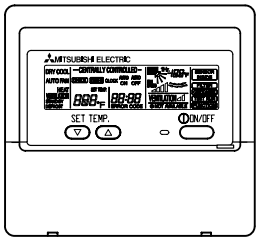
CONTENTS

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1 FEATURES



Indoor Unit



Microprocessor
Remote controller

Models	Cooling capacity / Heating capacity
PLFY-12NAMU-A	12,000 / 13,000 Btu/h
PLFY-20NAMU-A	20,000 / 22,500 Btu/h
PLFY-24NAMU-A	24,000 / 26,500 Btu/h
PLFY-32NAMU-A	32,000 / 36,000 Btu/h
PLFY-40NAMU-A	40,000 / 39,000 Btu/h

1. SPACE-SAVING CENTRALLY LOCATED CEILING RECESSED INSTALLATION

2. 4-WAY AIR FLOW SYSTEM

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

3. 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 memorised 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.

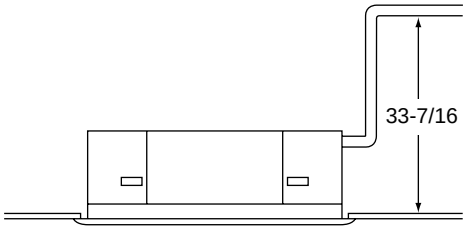
(3) Automatic Cooling/Heating Changeover Operation

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

Once the desired temperature is set, unit operation is switched automatically between cooling and heating, in accordance with the room temperature.

4. 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.



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

6. HIGH RELIABILITY AND EASY SERVICING.

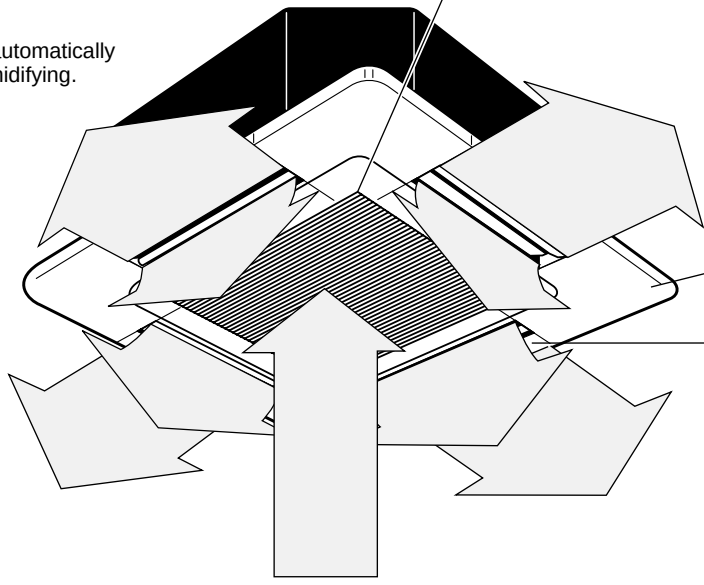
In addition to the self-diagnostic function, units are also equipped with a 3-minute time delay mechanism (cooling), an auto restart function, an emergency operation function, a test run switch, etc., to assure high reliability and easy servicing.

7. NITROGEN GAS IS CHARGED TO INDOOR UNIT.

Indoor unit and refrigerant pipes are charged with nitrogen gas (N_2) instead of (R22) before shipment from the factory.

2 PART NAMES AND FUNCTIONS

● Indoor (Main) Unit



Filter
Remove dust and pollutants from return air

Horizontal Air Outlet
Sets airflow horizontal automatically during cooling or dehumidifying.

Grille

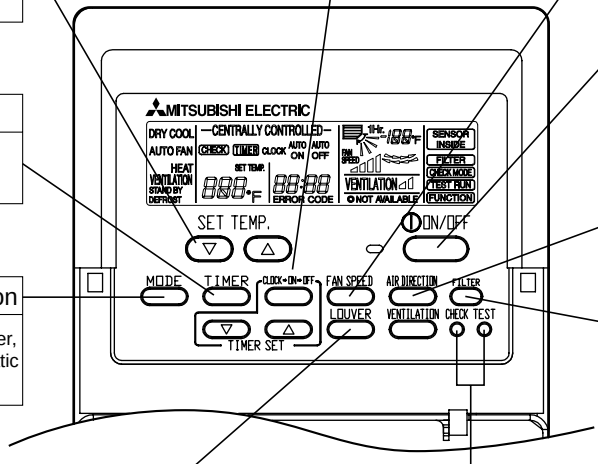
Auto Air Swing Vane
Disperses airflow up and down and adjusts the angle of airflow direction.

Air Intake
Returns air from room.

● Remote controller

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

● Operation buttons



TEMP. ADJUSTMENT button

This sets the room temperature. The temperature setting can be performed in 2°F units
Setting range
Cooler 67°F to 87°F
Heater 63°F to 83°F

TIME SETTING button

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

AIR SPEED button

This sets the ventilation fan speed.

ON/OFF button

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

TIMER button

This switches between continuous operation and the timer operation.

AIR DIRECTION button

This adjusts the vertical angle of the ventilation.

OPERATION SWITCH button

Press this button to switch the cooler, electronic dry (dehumidify), automatic and heater modes.

FILTER button

This resets the filter service indication display

LOUVER button

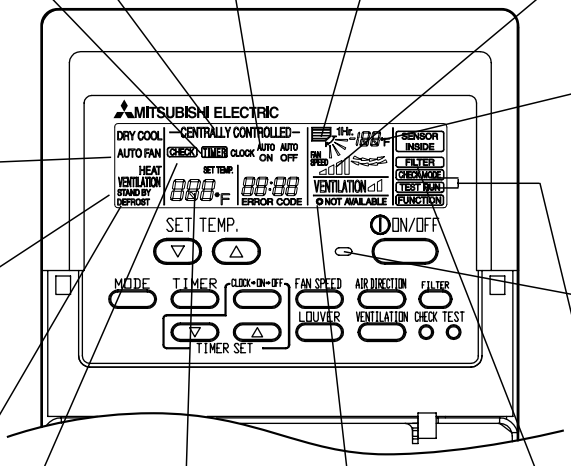
This switch the horizontal fan motion ON and OFF.

(Not available for this model.)

CHECK-TEST RUN button

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

● Display



CENTRALLY CONTROLLED display

This indicates when the unit is controlled by optional features such as central control type remote controller.

CLOCK display

The current time , start time and stop time can be displayed in ten second intervals by pressing the time switch button. The start time or stop time is always displayed during the timer operation.

In this display example on the bottom left, a condition where all display lamps light is shown for explanation purposes although this differs from actual operation.

AIR DIRECTION display

This displays the air direction.

TIMER display

This indicates when the continuous operation and time operation modes are set.
It also display the time for the timer operation at the same time as when it is set.

AIR SPEED display

The selected fan speed is displayed.

ROOM TEMPERATURE display

The temperature of the return air is displayed during operation. The display range is 46°F to 102°F. The display flashes 46°F when the actual temperature is less than 46°F and flashes 102°F when the actual temperature is greater than 102°F.

OPERATION MODE display

This indicates the operation mode.

STANDBY display

The [STANDBY] symbol is only displayed from the time the heating operation starts unit the heated air begins to blow.

Operation lamp

This lamp lights during operation, goes off when the unit stops and flashes when a malfunction occurs.

CHECK MODE / TEST RUN display

This display lights in the check mode or when a test operation is performed.

DEFROST display

This indicates when the defrost operation is performed.

FILTER display

This lamp lights when the filter need to be cleaned.

CHECK display

This indicates when a malfunction has occurred in the unit which should be checked.

SET TEMPERATURE display

This displays the selected set temperature.

POWER display

This lamp lights when electricity is supplied to the unit.

Caution

- Only the Power display lights when the unit is stopped and power supplied to the unit.
- When the central control remote control unit, which is sold separately, is used the ON-OFF button, operation switch button and TEMP. adjustment button do not operate.
- “NOT AVAILABLE” is displayed when the Air speed button is pressed. This indicates that this room unit is not equipped with the fan direction adjustment function and the louver function.
- When power is turned ON for the first time, it is normal that “H0” is displayed on the room temperature indication (For max. 2minutes). Please wait until this “H0” indication disappear then start the operation.

3 SPECIFICATIONS

3-1. Specifications

Item				PLFY-12NAMU-A	PLFY-20NAMU-A	PLFY-24NAMU-A	PLFY-32NAMU-A	PLFY-40NAMU-A
Power			V･Hz	Single phase 208/230V 60Hz				
Cooling capacity			Btu/h	12,000	20,000	24,000	32,000	40,000
Heating capacity			Btu/h	13,000	22,500	26,500	36,000	39,000
Electric characteristic	Input	Cooling	kW	0.14	0.14	0.14	0.27	0.27
		Heating	kW	0.14	0.14	0.14	0.27	0.27
	Current	Cooling	A	0.68	0.68	0.68	1.30	1.30
		Heating	A	0.68	0.68	0.68	1.30	1.30
Exterior (munsell symbol)			—	Unit : Galvanized sheets with gray heat insulation Grills : ABS resin Munsell<0.70Y 8.59/0.97>				
Dimensions		Height	in	10-3/16<1-3/16>			11-3/4<1-3/16>	
		Width	in	33-1/16<37-3/8>				
		Depth	in	33-1/16<37-3/8>				
Heat exchanger			—	Cross fin				
Fan	Fan × No		—	Turbo fan × 1				
	Air flow ※3	DRY	CFM	390-420-460-490	490-530-570-640	530-570-640-710	710-810-920-990	780-880-990-1060
		WET	CFM	350-380-410-440	470-500-530-600	500-530-600-670	670-770-870-930	730-830-930-1000
	External static pressure		Pa	0				
	Fan motor output		kW	0.070			0.110	
Insulator			—	Polyethylene sheet				
Air filter			—	PP honey comb fabric				
Pipe dimensions		Gas side	in	1/2"	5/8"			3/4"
		Liquid side	in	1/4"	3/8"			
Unit drain pipe size			in	PVC with O.D.1-1/4"				
Noise level ※3			dB	24-27-28-30	27-28-31-33	28-30-33-34	34-36-40-41	37-40-43-44
Product weight			lb	49<11>	53<11>		66<11>	

Note 1. Rating conditions
Cooling : Indoor : D.B. 80°F W.B. 67°F
outdoor : D.B. 95°F W.B. 75°F
Heating : Indoor : D.B. 70°F
outdoor : D.B. 47°F W.B. 43°F

Note 2. The number indicated in < > is just for the grille.

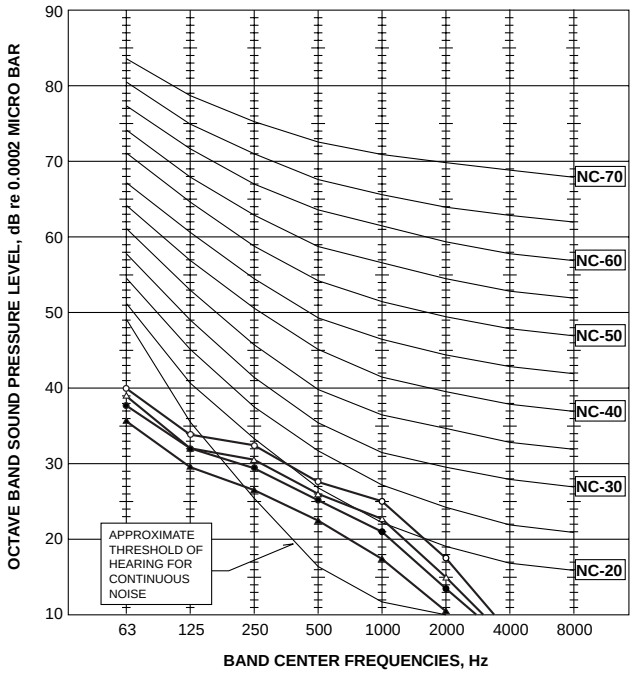
※ 3. Air flow and the noise level are indicated as Low - Medium2 - Medium1 - High.

• Connected outdoor unit is PURY-80TMU or PURY-100TMU.

3-2. NOISE CRITERION CURVES

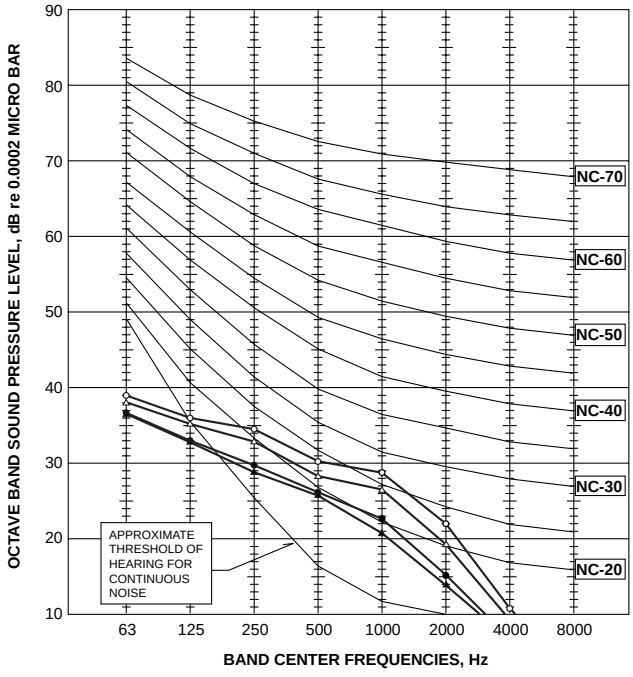
PLFY-12NAMU-A

NOTCH	SPL(dB)	LINE
Hi	30	○—○
Med1	28	△—△
Med2	27	●—●
Lo	24	▲—▲



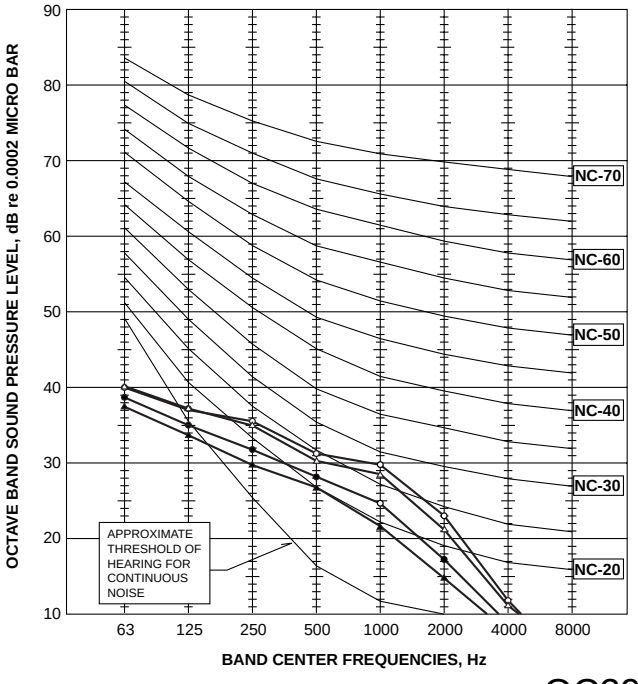
PLFY-20NAMU-A

NOTCH	SPL(dB)	LINE
Hi	33	○—○
Med1	31	△—△
Med2	28	●—●
Lo	27	▲—▲



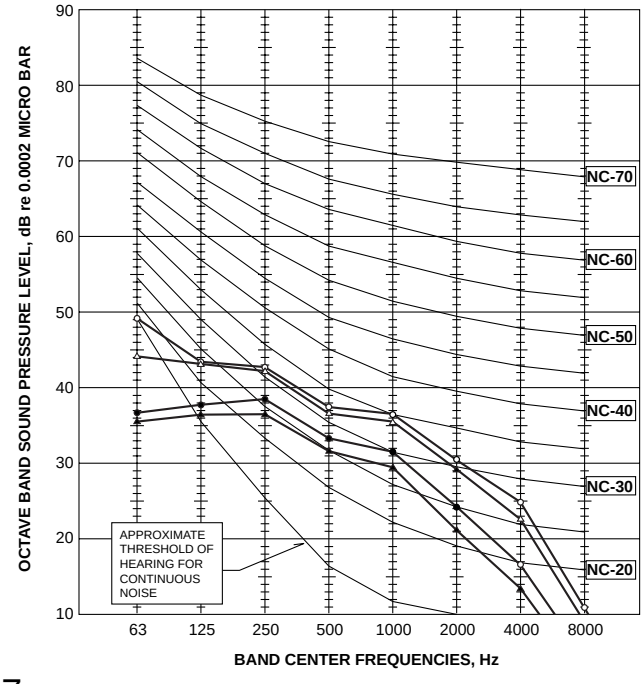
PLFY-24NAMU-A

NOTCH	SPL(dB)	LINE
Hi	34	○—○
Med1	33	△—△
Med2	30	●—●
Lo	28	▲—▲



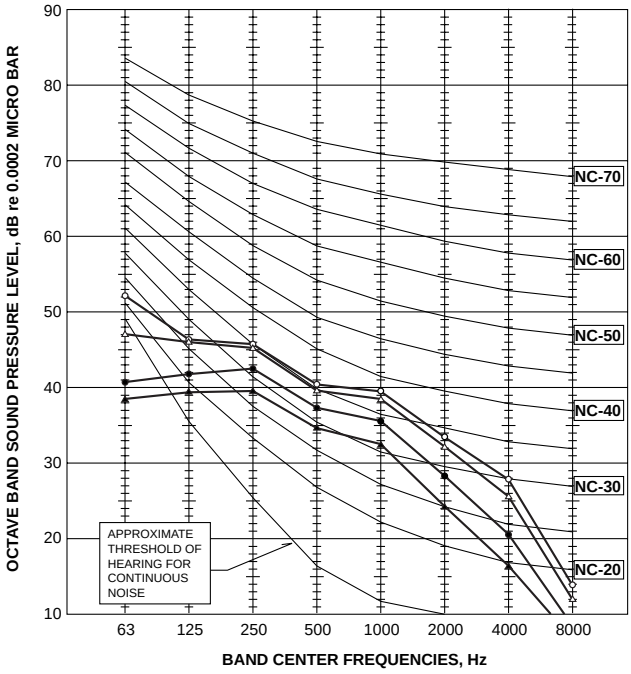
PLFY-32NAMU-A

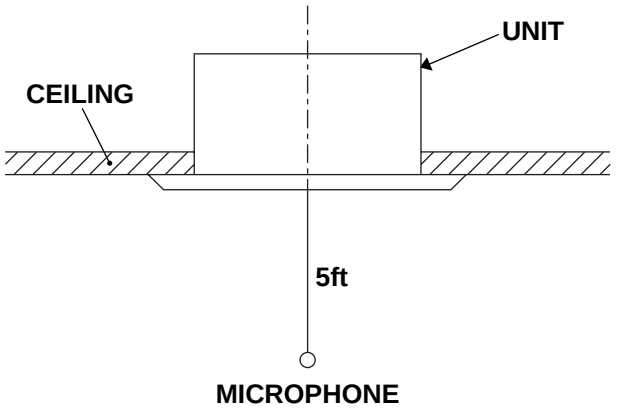
NOTCH	SPL(dB)	LINE
Hi	41	○—○
Med1	40	△—△
Med2	36	●—●
Lo	34	▲—▲



PLFY-40NAMU-A

NOTCH	SPL(dB)	LINE
Hi	44	
Med1	43	
Med2	40	
Lo	37	





Ambient temperature 80˚F

Test conditions are based on JIS Z8731

3-3. Electrical parts specifications

Model / Parts name	Symbol	PLFY-12NAMU-A	PLFY-20NAMU-A	PLFY-24NAMU-A	PLFY-32NAMU-A	PLFY-40NAMU-A
Room temperature thermistor	TH21	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ				
Liquid pipe thermistor	TH22	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ				
Gas pipe thermistor	TH23	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ				
Fuse (Indoor controller board)	FUSE	250V 6A				
Fan motor (with inner-thermostat)	MF	6-pole OUTPUT 70W D17D6P70MS			6-pole OUTPUT 110W D176P110MS	
		Inner-thermostat OPEN 266°F ± 9°F				
Fan motor capacitor	C	3.0μF × 440V			7.0μF × 440V	
Vane motor	MV	MSBPC20M13 DC12V 300Ω/phase				
Drain-up mechanism	DP	PLD-12220ME-2 INPUT 12/10.8W 24 ℓ /Hr				
Drain sensor	DS	Thermistor resistance 30°F/6.3kΩ, 50°F/3.9kΩ, 70°F/2.5kΩ, 80°F/2.0kΩ, 90°F/1.6kΩ, 100°F/1.3kΩ				
Linear expansion valve	LEV	DC12V Stepping motor drive port dimension 3.2Ω (0~2000pulse) EDM-40YHME			DC12V Stepping motor drive port dimension 5.2Ω (0~2000pulse) EDM-80YHME	
Electric heater (Condensation proof)	H2	240V 21.8W				
Power supply terminal block	TB2	(L1, L2, GR) 330V 30A				
Transmission terminal block	TB5	(M1, M2, S) 250V 20A				
MA remote controller terminal block	TB15	(1, 2) 250V 10A				

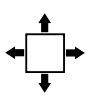
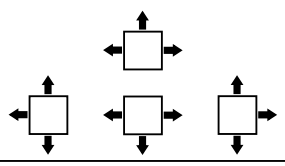
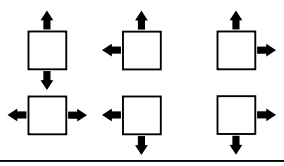
4 4-WAY AIR FLOW SYSTEM

4-1. Placement of the air outlets

• For this grille, the blowout direction comes in 11 patterns.
Also, by setting the dip switches (SWA and SWB) on the address 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.

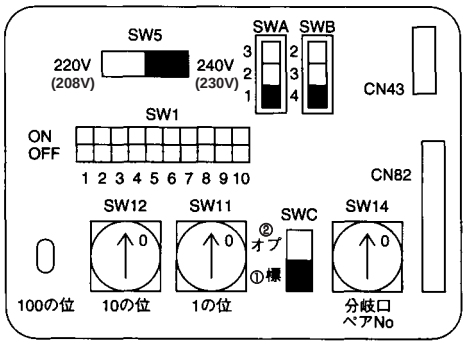
1) Decide on the pattern of the airflow direction.

<Table 1>

Blowout direction pattern	4-direction	3-direction	2-direction
	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 (SWA, SWB) on the indoor board to the appropriate setting.
• Correspondence of ceiling heights to numbers of air outlets.



PLFY-12, 20NAMU-A (Unit : feet)

SWB \ SWA	① Standard	② High ceiling ①	③ High ceiling ②
4 4 direction	8.9	9.8	11.5
3 3 direction	9.8	10.8	11.5
2 2 direction	10.8	11.5	—

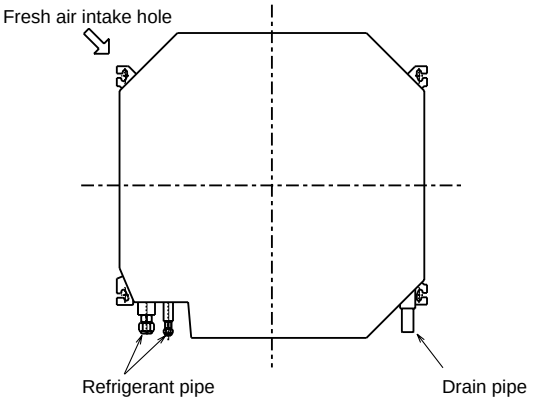
PLFY-24, 32, 40NAMU-A (Unit : feet)

SWB \ SWA	① Standard	② High ceiling ①	③ High ceiling ②
4 4 direction	10.5	11.8	13.8
3 3 direction	11.8	13.1	13.8
2 2 direction	13.1	13.8	—

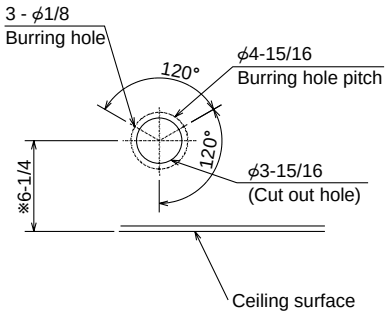
4-2. Fresh air intake (Installation of site)

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

Note :
Be sure to add5-5/16inch to the dimensions in the diagram that are marked with a "※" if installing a multi function casement (Option)

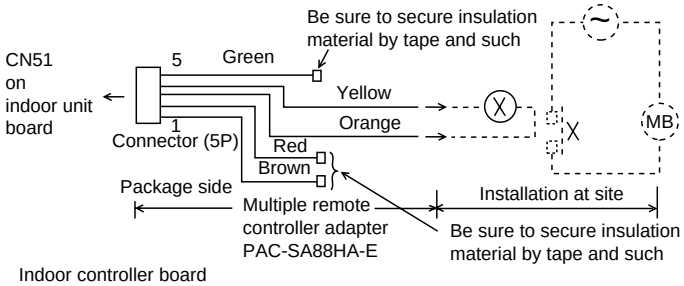


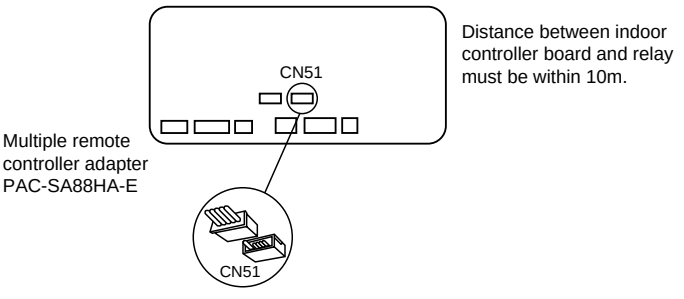
Fresh air intake hole diagram (Unit : inch)



4-3. Interlocking operation method with duct fan (Booster fan)

• Whenever the indoor unit is operating, the duct fun 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)

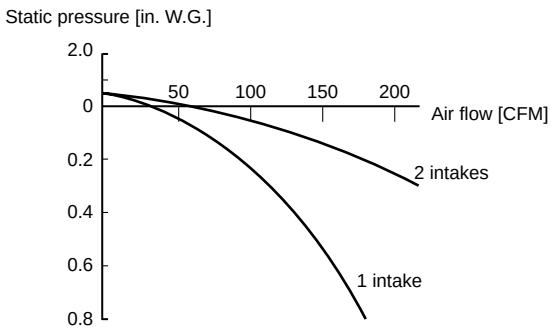




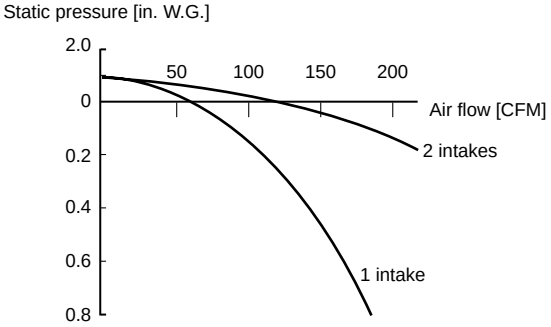
4-4. Fresh air intake amount & static pressure characteristics

1 PLFY-12, 20, 24NAMU-A

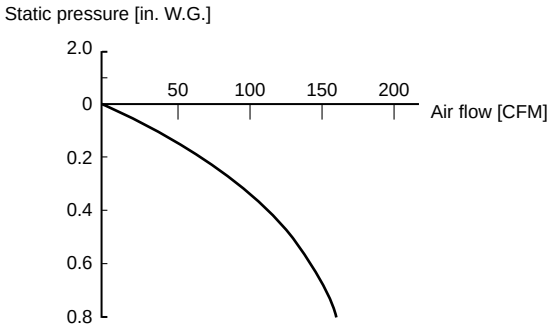
Multifunction casement + Standard filter



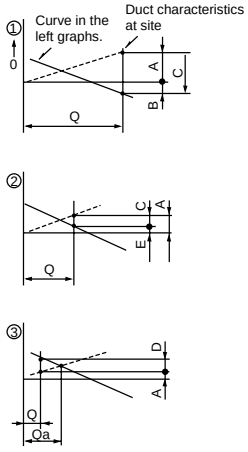
Multifunction casement + High efficiency filter



Taking air into the unit



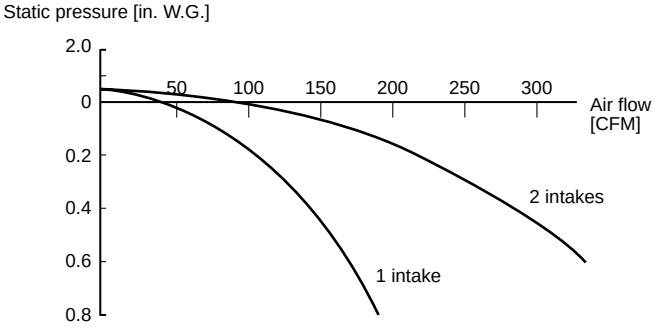
How to read curves



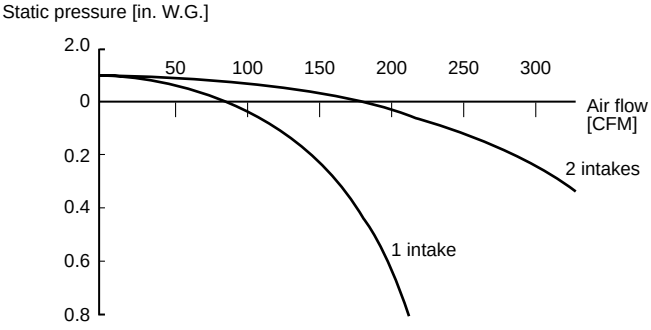
Q···Planned amount of fresh air intake <CFM>
A···Static pressure loss of fresh air intake duct system with air flow amount Q <in.W.G.>
B···Forced static pressure at air conditioner inlet with air flow amount Q <in.W.G.>
C···Static pressure of booster fan with air flow amount Q <in.W.G.>
D···Static pressure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

2 PLFY-32, 40NAMU-A

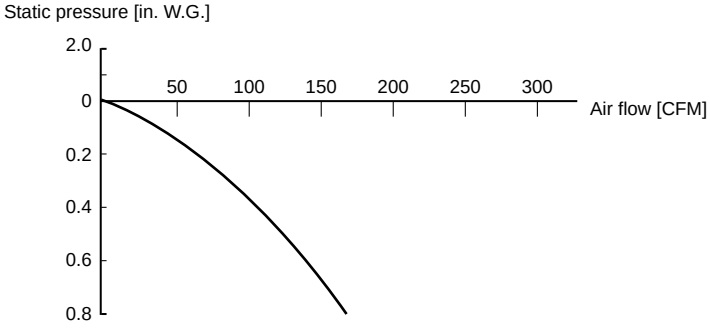
Multifunction casement + Standard filter



Multifunction casement + High efficiency filter



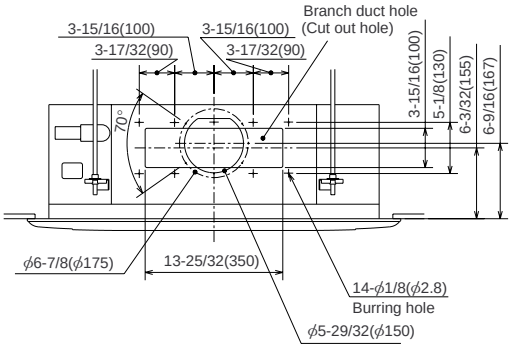
Taking air into the unit

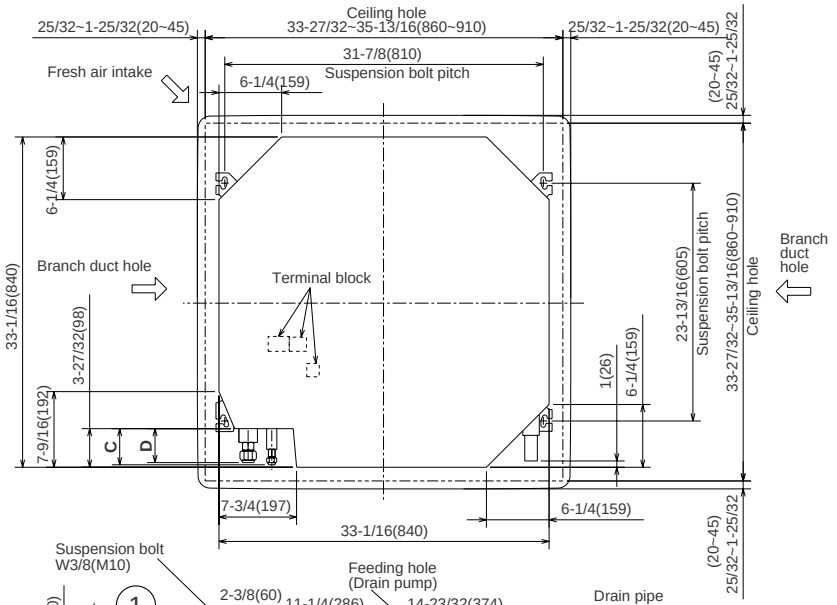


5 OUTLINES AND DIMENSIONS

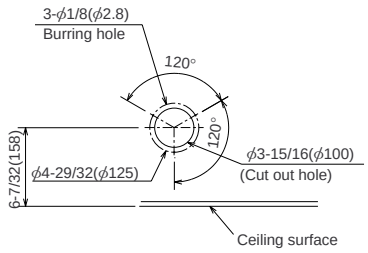
PLFY-12NAMU-A PLFY-32NAMU-A
PLFY-20NAMU-A PLFY-40NAMU-A
PLFY-24NAMU-A

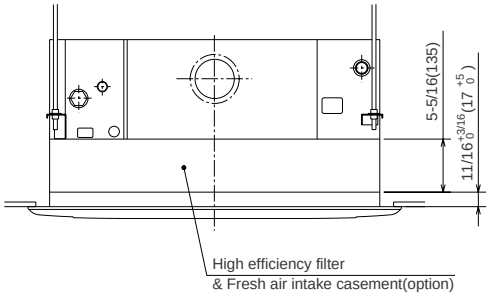
Unit : in(mm)

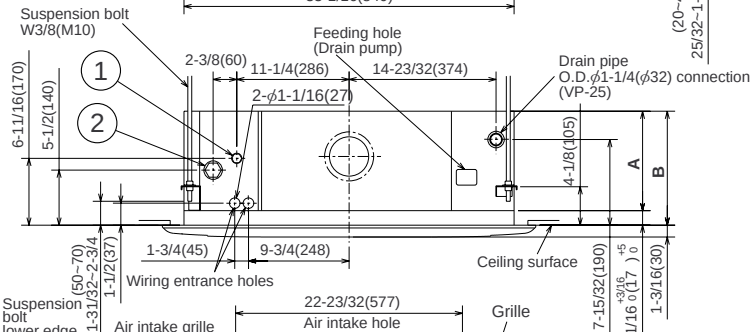


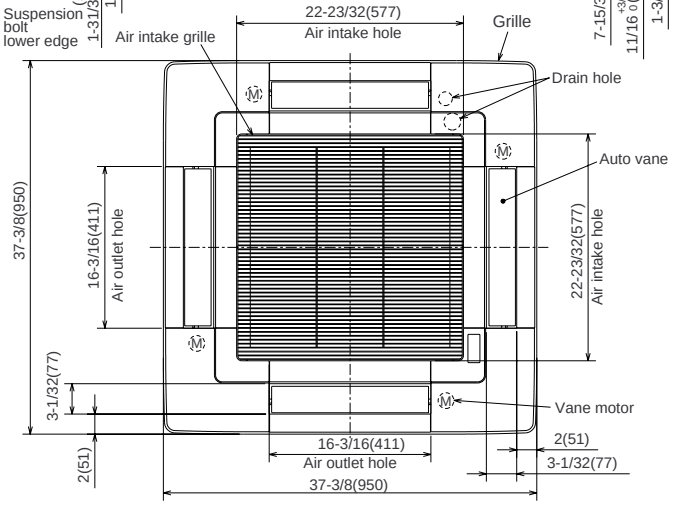


Detail drawing of fresh air intake







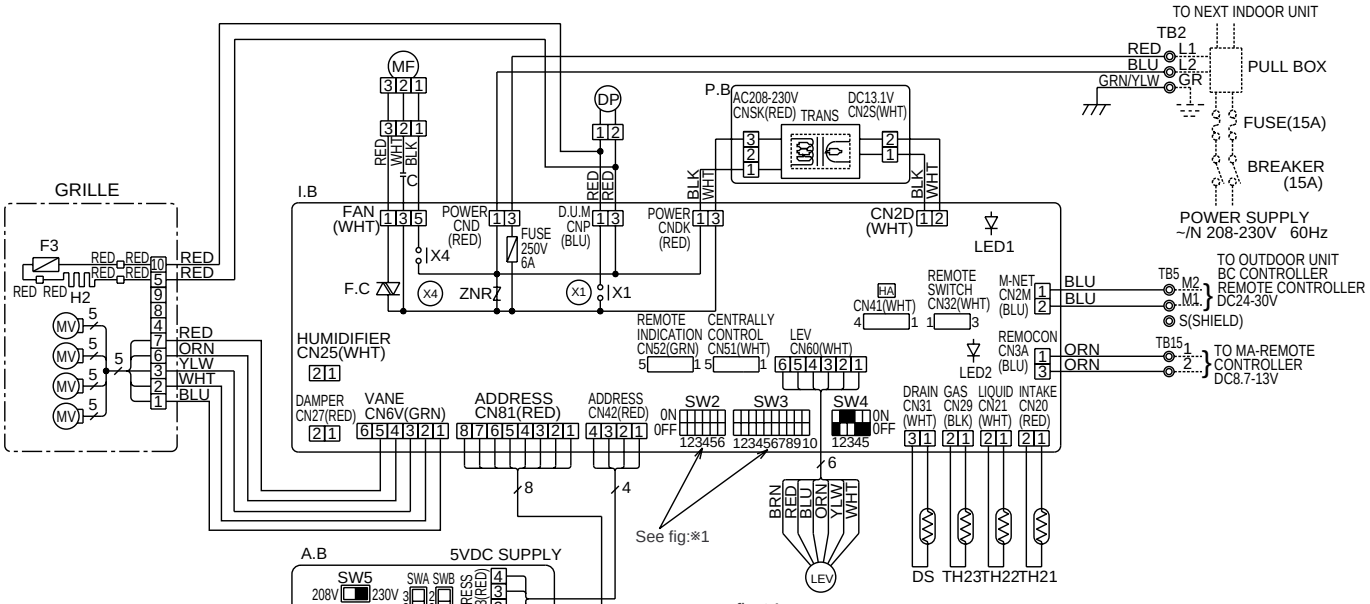


Unit : inch (mm)

Models	①	②	A	B	C	D
PLFY-12NAMU-A	Refrigerant pipe O.D.ϕ1/4(ϕ6.35) flared connection 1/4F	Refrigerant pipe O.D.ϕ1/2(ϕ12.7) flared connection 1/2F	9-1/2 (241)	10-3/16 (258)	3-11/32 (85)	3 (76)
PLFY-20,24NAMU-A	Refrigerant pipe O.D.ϕ3/8(ϕ9.52) flared connection 3/8F	Refrigerant pipe O.D.ϕ5/8(ϕ15.88) flared connection 5/8F			3-1/2 (89)	3-5/32 (80)
PLFY-32NAMU-A			11-1/16 (281)	11-3/4 (298)		
PLFY-40NAMU-A		Refrigerant pipe O.D.ϕ3/4(ϕ19.05) flared connection 3/4F				3-5/16 (84)

6 WIRING DIAGRAM

PLFY-12NAMU-A PLFY-32NAMU-A
PLFY-20NAMU-A PLFY-40NAMU-A
PLFY-24NAMU-A



<fig:※1>

MODELS	SW2	SW3
PLFY-12NAMU-A	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10
PLFY-20NAMU-A	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10
PLFY-24NAMU-A	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10
PLFY-32NAMU-A	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10
PLFY-40NAMU-A	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10

Notes:

1. At servicing for outdoor unit,always follow the wiring diagram of outdoor unit.
2. In case of using MA-Remote controller, please connect to TB15. (Remote controller wire is non-polar.)
3. In case of using M-NET, please connect to TB5. (Transmisson line is non-polar.)
4. Symbol [S] of TB5 is the shield wire connection.
5. Symbols used in wiring diagram above are, ◎:terminal block, □□□:connecter.
6. The setting of the SW2 dip switches differs in the capacity for the detail,refer to the fig:※1.
7. Please set the switch SW5 according to the power supply voltage. Set SW5 to 230V side when the power supply is 230 volts. When the power supply is 208 volts,set SW5 to 208V side.

LED on indoor board for service

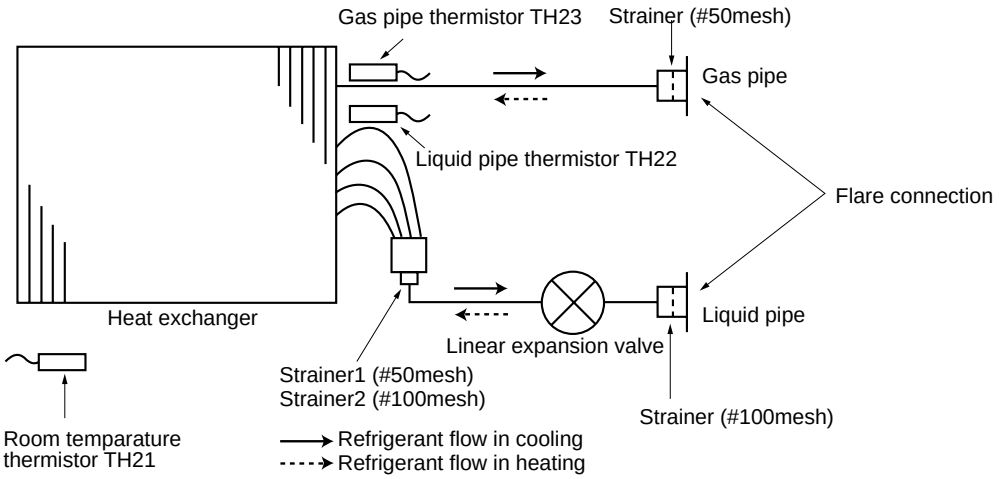
Mark	Meaning	Function
LED1	Main power supply	Main power supply(Indoor unit:208-230V) power on ⟶ lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on ⟶ lamp is lit

[LEGEND]

SYMBOL	NAME		SYMBOL	NAME	
A.B	CIRCUIT BOARD(ADDRESS)		C	CAPACITOR (FAN MOTOR)	
SW1	SWITCH	MODE SELECTION	DP	DRAIN WATER LIFTING-UP MACHINE	
SW5		VOLTAGE SELECTION	DS	DRAIN SENSER	
SW11		ADDRESS SETTING 1ST DIGIT	F3	FUSE(0.16A/250V)	
SW12		ADDRESS SETTING 2ND DIGIT	H2	DEW PREVENTION HEATER	
SW14		CONNECTION No.	LEV	LINEAR EXPANSION VALVE	
SWA		CEILING HEIGHT SELECTOR	MF	FAN MOTOR (WITH INNER THERMOSTAT)	
SWB		DISCHARGE OUTLET NUMBER SELECTOR	MV	VANE MOTOR	
SWC		OPTION SELECTOR	TB2	TERMINAL BLOCK	POWER SUPPLY
I.B	INDOOR CONTROLLER BOARD		TB5		TRANSMISSION
CN25	CONNECTOR	HUMIDIFIER	TB15		MA-REMOTE CONTROLLER
CN27		DAMPER	TH21	THERMISTOR	ROOM TEMP. DETECTION (32°F/15kΩ, 77°F/5.4kΩ)
CN32		REMOTE SWITCH			
CN41		HA TERMINAL-A	TH22		PIPE TEMP. DETECTION/LIQUID (32°F/15kΩ, 77°F/5.4kΩ)
CN51		CENTRALLY CONTROL			
CN52		REMOTE INDICATION	TH23		PIPE TEMP. DETECTION/GAS (32°F/15kΩ, 77°F/5.4kΩ)
F.C	FAN PHASE CONTROL				
FUSE	FUSE (6A/250V)				
SW2	SWITCH	CAPACITY CODE			
SW3		MODE SELECTION			
SW4		MODEL SELECTION			
X1	AUX. RELAY	DRAIN PUMP			
X4		FAN MOTOR			
ZNR	VARISTOR				
P.B	INDOOR POWER BOARD				

7 REFRIGERANT SYSTEM DIAGRAM

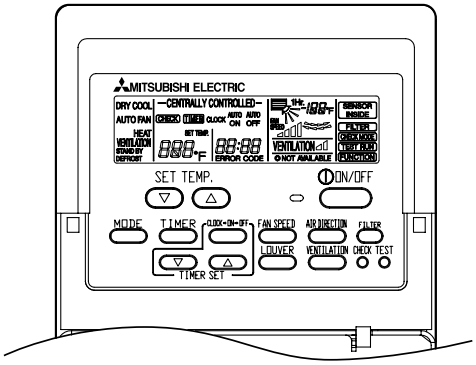
PLFY-12NAMU-A PLFY-32NAMU-A
PLFY-20NAMU-A PLFY-40NAMU-A
PLFY-24NAMU-A



Item \ Service Ref.	PLFY-12NAMU-A	PLFY-20, 24, 32NAMU-A	PLFY-40NAMU-A
Gas pipe	1/2"	5/8"	3/4"
Liquid pipe	1/4"	3/8"	3/8"

8 MICROPROCESSOR CONTROL

INDOOR UNIT CONTROL
8-1. COOL operation



<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display COOL.
③ Press the SET TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time Cooling 67 to 87°F.

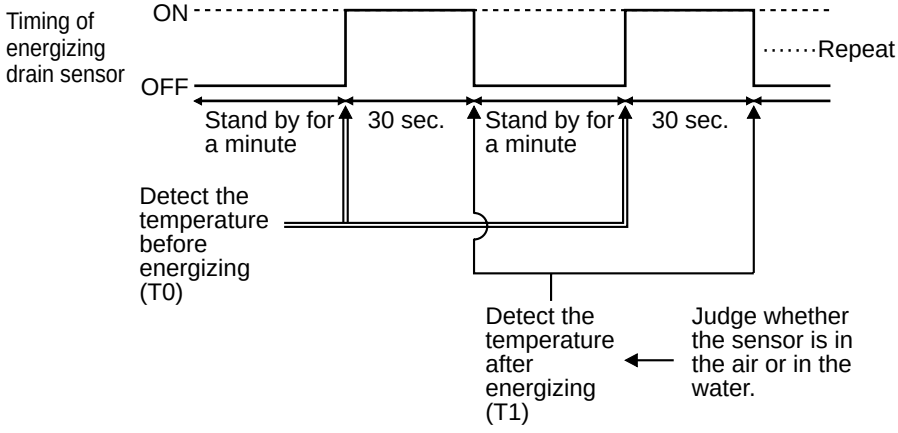
Control modes	Control details	Remarks
1. Thermoregulating function	1-1. Thermoregulating function (Function to prevent restarting for 3 minutes) • Room temperature ≧ desired temperature + 2°F ⋯Thermo ON • Room temperature ≦ desired temperature ⋯Thermo OFF	
	1-2. Anti-freezing control Detected condition : When the liquid pipe temp. (TH22) is 36°F or less in 16 minutes from compressors start up, anti-freezing control starts and the thermo OFF. Released condition : The timer which prevents reactivating is set for 3 minutes, and anti- freezing control is cancelled when any one of the following conditions is satisfied. ① Liquid pipe temp. (TH22) turn 50°F or above. ② The condition of the thermo OFF has become complete by thermoregulating, etc. ③ The operation modes became mode other than COOL. ④ The operation stopped.	
2. Fan	By the remote controller setting (switch of 4 speeds)	

Type	Fan speed notch
4 speeds type	[Low], [Med2], [Med1], [High]

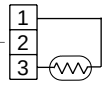
To be continued on the next page.

From the preceding page.

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>3. Drain pump</td><td>3-1. Drain pump control
•Always drain pump ON during the COOL and DRY mode operation.
(Regardless of the thermo ON/ OFF)
•When the operation mode has changed from the COOL or DRY to the others (including Stop), OFF the control after the drain pump ON for 3 minutes.</td><td></td></tr>
<tr><td></td><td>Drain sensor function
• Energize drain sensor at a fixed voltage for a fixed duration. After energizing, compare the drain sensor's temperature to the one before energizing, and judge whether the sensor is in the air or in the water.

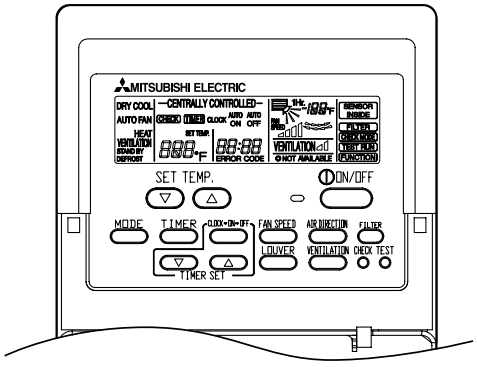
Basic control system
• While drain pump is turned on, repeat the following control system and judge whether the sensor is in the air or in the water.


•Drain sensor temperature rise (Δt)
•Temperature of drain sensor before current is applied (T_0)
•Temperature of drain sensor after current is applied (T_1)

[$\Delta t = T_1 - T_0$]</td><td>∗1 Drain sensor
Indoor control p.c. board
CN31

</td></tr>
<tr><td>4. Vane
(up/ down vane change)</td><td>(1) Initial setting : Start at COOL mode and horizontal vane.
(2) Vane position : Horizontal →Downward A →Downward B →Downward C→Swing

(3) Restriction of the downward vane setting
When setting the downward vane A, B or C in [Med1], [Med2] or [Low] of the fan speed notch, the vane changes to horizontal position after 1 hour have passed.</td><td>∗1 "SET FOR 1 HOUR" appears on the wired remote controller.</td></tr>
</table>

8-2. DRY operation

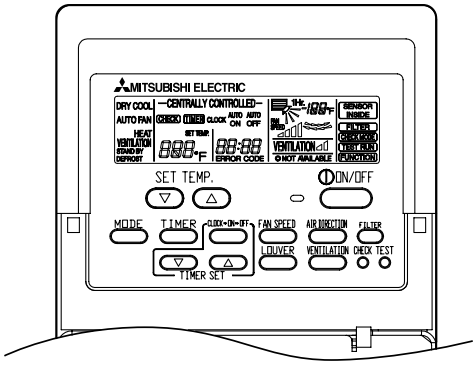


<How to operate>

① Press POWER ON/OFF button.
② Press the operation 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 ▽ or △ button is pressed one time. Dry 67 to 87°F.

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Thermoregulating function</td><td>1-1. Thermoregulating function (Function to prevent restarting for 3 minutes)
Setting the Dry thermo by the thermoregulating signal and the room temperature (TH1).
Dry thermo ON Room temperature ≧ desired temperature + 2°F
Dry thermo OFF Room temperature ≦ desired temperature
<table>
<tr><th rowspan="2">Room temperature</th><th colspan="2">3 min. passed since starting operation</th><th rowspan="2">Dry thermo ON time (min)</th><th rowspan="2">Dry thermo OFF time (min)</th></tr>
<tr><th>Thermoregulating signal</th><th>Room temperature (T1)</th></tr>
<tr><td rowspan="5">Over 64°F</td><td rowspan="4">ON</td><td>T1 ≧ 82°F</td><td>9</td><td>3</td></tr>
<tr><td>82°F > T1 ≧ 79°F</td><td>7</td><td>3</td></tr>
<tr><td>79°F > T1 ≧ 75°F</td><td>5</td><td>3</td></tr>
<tr><td>75°F > T1</td><td>3</td><td>3</td></tr>
<tr><td>OFF</td><td>Unconditional</td><td>3</td><td>10</td></tr>
<tr><td>Less than 64°F</td><td colspan="4">Dry thermo OFF</td></tr>
</table>
1-2. Frozen prevention control
No control function</td><td></td></tr>
<tr><td>2. Fan</td><td>Indoor fan operation controlled depends on the compressor conditions.
<table>
<tr><th>Dry thermo</th><th>Fan speed notch</th></tr>
<tr><td>ON</td><td>[Low]</td></tr>
<tr><td>OFF</td><td>Stop</td></tr>
</table>
Note: Remote controller setting is not acceptable.</td><td></td></tr>
<tr><td>3. Drain pump</td><td>Same control as COOL operation</td><td></td></tr>
<tr><td>4. Vane
(up/ down vane change)</td><td>Same control as COOL operation</td><td></td></tr>
</table>

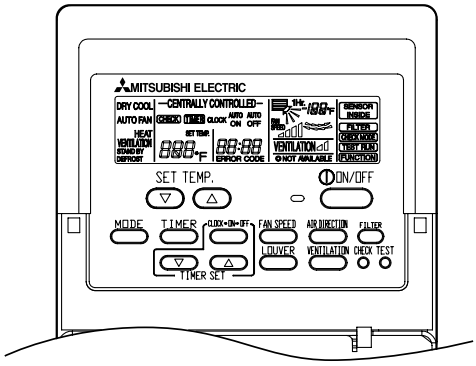
8-3. FAN operation



<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display FAN.

Control modes	Control details	Remarks
1. Fan	Set by remote controller. Type: 4 speeds type — Fan speed notch: [Low], [Med2], [Med1], [High]	
2. Drain pump	2-1. Drain pump control The drain pump turns ON for the specified amount of time when any of the following conditions is met: ① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (FAN). ② ON for 6 minutes after the drain sensor is determined to be submerged using the liquid level detection method given below. ③ ON for 6 minutes after indoor piping (liquid piping) temperature – indoor intake temperature ≦ -18°F, AND the drain sensor input is at the short or open level. (If condition ② or ③ is still being met after the drain pump has been turned ON for 6 minutes, the drain pump is kept ON for a further 6 minutes.)	
	2-2. Liquid level detection method The liquid level is detected by determining whether or not the drain sensor is submerged, based on the amount the temperature rises after self-heating the sensor. This process is performed if any of the following conditions is met: ① Drain pump is ON. ② Indoor piping (liquid piping) temperature – indoor intake temperature ≦ -18°F ③ Indoor piping (liquid piping) temperature or indoor intake temperature is at the short or open level temperature. ④ Every hour after the drain pump has been switched from ON to OFF.	
3. Vane (up/ down vane change)	Same as the control performed during the COOL operation, but with no restriction on the vane's downward blow setting.	

8-4. HEAT operation



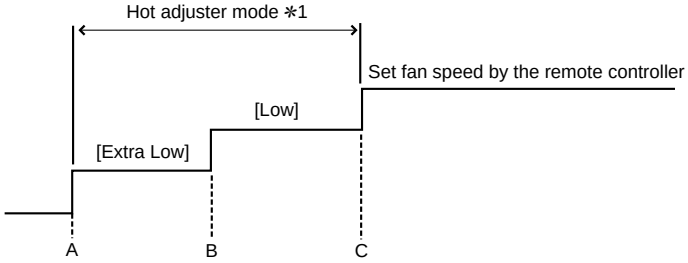
<How to operate>

① Press POWER ON/OFF button.
② Press the operation MODE button to display HEAT.
③ Press the SET TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Heatling 63 to 83°F.

<Display in HEAT operation>

[DEFROST]
The [DEFROST] symbol is only displayed during the defrost operation.

[STANDBY]
The [STANDBY] symbol is only displayed from the time the heating operation starts unit the heated air begins to blow.

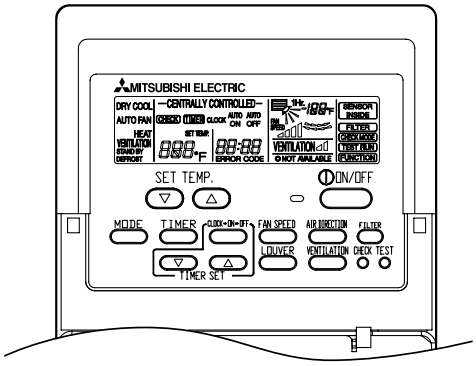
Control modes	Control details	Remarks
1. Thermoregulating function	1-1. Thermoregulating function (Function to prevent restarting for 3 minutes) • Room temperature ≦ desired temperature -2°F ⋯Thermo ON • Room temperature ≧ desired temperature ⋯Thermo OFF	
2. Fan	Controlled by the remote controller (4-speed) Give priority to under-mentioned controlled mode 2-1. Hot adjuster mode 2-2. Preheating exclusion mode 2-3. Thermo OFF mode (When the compressor off by the thermoregulating) 2-4. Cool air prevention mode (Defrosting mode) 2-5. Capacity increasing mode	
	2-1. Hot adjuster mode The fan controller becomes the hot adjuster mode for the following conditions. ① When starting the HEAT operation ② When the thermoregulating function changes from OFF to ON. ③ When release the HEAT defrosting operation  A: HOT adjuster mode start B: 5 min have passed since the condition A or the indoor liquid pipe temperature turned 65°F or more C: 2 min have passed since the condition A (Terminating the hot adjuster mode)	∗1 "STAND BY" will be displayed during the hot adjuster mode.
	2-2. Preheating exclusion mode When the condition changes the auxiliary heater ON to OFF (thermoregulating or operation stop, etc), the indoor fan operates in [Low] mode for 1 minute.	∗1 This control is same for the model without auxiliary heater.

To be continued on the next page.

From the preceding page.

Control modes	Control details	Remarks
2. Fan	2-3. Thermo OFF mode When the thermoregulating function changes to OFF, the indoor fan operates in [Extra low].	
	2-4. Heat defrosting mode The indoor fan stops.	
3. Drain pump	No drain pump operation However, when the control changes from COOL or DRY operation, the drain pump operates for 3 minutes.	
4. Vane control (Up/ down vane change)	(1) Initial setting : OFF → HEAT⋯[last setting] When changing the mode from exception of HEAT to HEAT operation. ⋯[Downward C] (2) Vane position : Horizontal →Downward A →Downward B →Downward C→Swing (3) Restriction of vane position ① The vane is horizontally fixed for the following modes. (The control by the remote controller is temporally invalidated and control by the unit.) •Thermo OFF •Hot adjuster [Extra low] mode •Heat defrost mode	

8-5. AUTO operation [Automatic COOL/HEAT change over operation]



<How to operate>

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

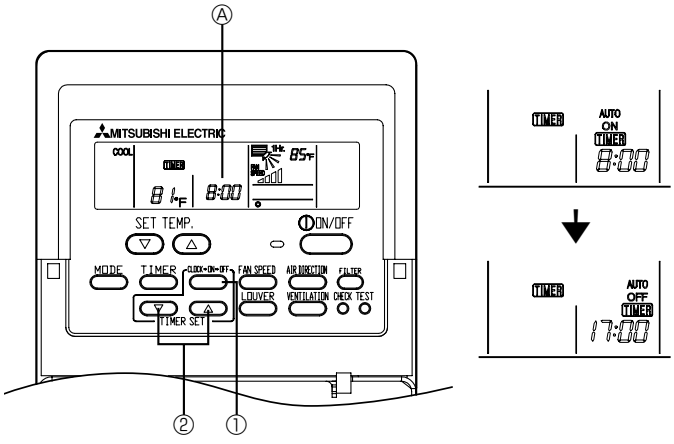
NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Automatic 67 to 83°F.
"AUTO" works to change by itself the operation mode either to cooling or heating to the room temperature.

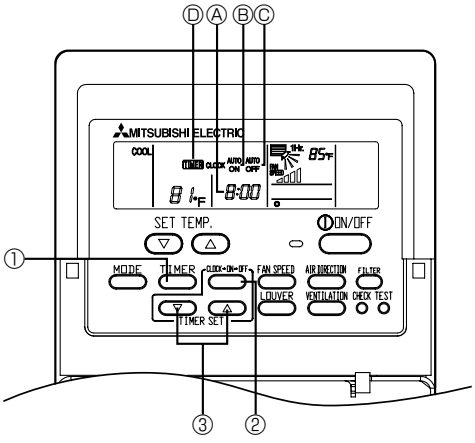
Control modes	Control details	Remarks
1. Initial value of operation mode	HEAT mode for room temperature < Desired temperature COOL mode for room temperature ≧ Desired temperature	
2. Mode change	(1) HEAT mode → COOL mode Room temperature ≧ Desired temperature + 4°F. or 15 min. has passed (2) COOL mode → HEAT mode Room temperature ≦ Desired temperature - 4°F. or 15 min. has passed	
3. COOL mode	Same control as cool operation	
4. HEAT mode	Same control as heat operation	

8-6. When unit is stopped Control mode

Control modes	Control details	Remarks
1. Drain pump	1-1. Drain pump control The drain pump turns ON for the specified amount of time when any of the following conditions is met (regardless of whether the compressor is ON or OFF) ① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (HEAT mode). ② ON for 6 minutes after the drain sensor is determined to be submerged using the liquid level detection method given below. ③ ON for 6 minutes after indoor piping (liquid piping) temperature – indoor intake temperature ≦ -18°F, AND the drain sensor input is at the short or open level. (If condition ② or ③ is still being met after the drain pump has been turned ON for 6 minutes, the drain pump is kept ON for a further 6 minutes.)	
	1-2. Liquid level detection method The liquid level is detected by determining whether or not the drain sensor is submerged, based on the amount the temperature rises after self-heating the sensor. This process is performed if any of the following conditions is met: ① Drain pump is ON. ② Indoor piping (liquid piping) temperature – indoor intake temperature ≦ -18°F (except during defrosting) ③ Indoor piping (liquid piping) temperature or indoor intake temperature is at the short or open level temperature. ④ Every hour after the drain pump has been switched from ON to OFF.	

8-7. TIMER operation





1) Set the current time

① Press CLOCK-ON-OFF button to display the “current time” Ⓐ.

Remote controller display Ⓐ	CLOCK ("current time") → TIMER ("timer start time") → TIMER ("timer end time") → No display

② Each time you press ▽ button, the time increases in increments of one minute. Each time you press △ button, the time decreases in increments of one minute.

- Press and hold the button to rapidly change the time.
- The time changes in increments of one minute ➔ ten minutes ➔ in units of hour; in this order.
- Approximately ten seconds after pressing the button, the display on the remote controller will turn off.

The example shows a timer set for operation start at 8:00 and end at 17:00.

2) set the mode to continuous as follows

① Press TIMER button to display TIMER Ⓓ.

3) Set the time to start the unit as follows

② Press CLOCK-ON-OFF button to display Ⓑ ON.

③ Press ▽ △ (TIMER SET) button to set the time that you want the unit to start. The start time is displayed at Ⓐ.

4) Set the time to stop the unit as follows

② Press CLOCK-ON-OFF button to display Ⓒ OFF.

③ Press ▽ △ (TIMER SET) button to set the time that you want the unit to stop. The stop time is displayed at Ⓐ.

5) Set the mode to timer as follows

① Press TIMER button to display TIMER Ⓓ.

9 TROUBLE SHOOTING

9-1. How to check the parts PLFY-12, 20, 24, 32, 40NAMU-A

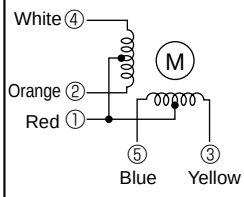
Room temperature thermistor (TH21) / Liquid pipe thermistor (TH22) / Gas pipe thermistor (TH23)

Disconnect the connector then measure the resistance using a tester.
(Surrounding temperature 50°F~86°F)

Normal	Abnormal
4.3kΩ~9.6kΩ	Open or short

(Refer to the next page for a detail.)

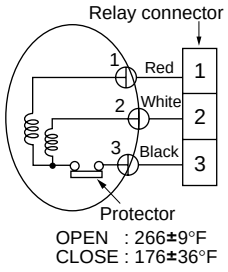
Vane motor



Measure the resistance between the terminals using a tester.
(Surrounding temperature 68°F~86°F)

Connector	Normal	Abnormal
Red — Yellow	300Ω	Open or short
Red — Blue		
Red — Orange		
Red — White		

Fan motor

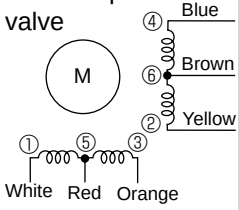


OPEN : 266±9°F
CLOSE : 176±36°F

Measure the resistance between the terminals using a tester.

Motor terminal or Relay connector	Normal		Abnormal
	PLFY-NAMU-A		
	12, 20, 24	32, 40	
Red-Black	87.2Ω	32.6Ω	Open or short
White-Black	104.1Ω	40.7Ω	

Linear expansion valve

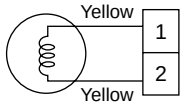


Disconnect the connector then measure the resistance valve using a tester.

Normal				Abnormal
① - ⑤ White-Red	② - ⑥ Yellow-Brown	③ - ⑤ Orange-Red	④ - ⑥ Blue-Brown	Open or short
150Ω ±10%				

(Refer to the next page for a detail.)

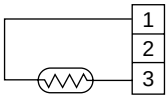
Drain pump



Measure the resistance between the terminals using a tester.
(Surrounding temperature 68°F~86°F)

Normal	Abnormal
319Ω	Open or short

Drain sensor



Measure the resistance after 3 minutes have passed since the power supply was intercepted.
(Surrounding temperature 50°F~140°F)

Normal	Abnormal
0.6kΩ~6.0kΩ	Open or short

(Refer to the next page for a detail.)

<Thermistor characteristic graph>

Thermistor for lower temperature

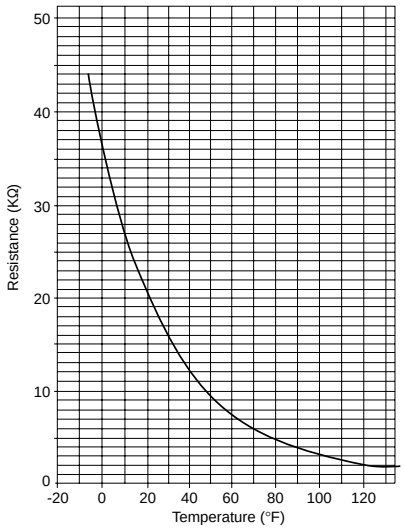
Room temperature thermistor(TH21)
Liquid pipe temperature thermistor(TH22)
Gas pipe temperature thermistor(TH23)

Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480kΩ ± 2%

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

30°F 15.8kΩ
50°F 9.6kΩ
70°F 6.0kΩ
80°F 4.8kΩ
90°F 3.9kΩ
100°F 3.2kΩ

< Thermistor for lower temperature >



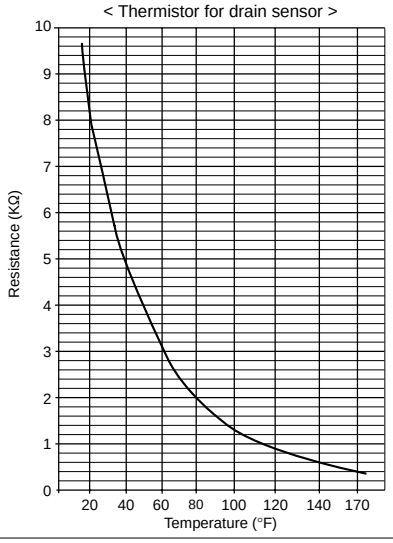
Thermistor for drain sensor

Thermistor R_0=6.0kΩ ±5%
Fixed number of B=3390kΩ ±2%

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

30°F 6.3kΩ
50°F 3.9kΩ
70°F 2.5kΩ
80°F 2.0kΩ
90°F 1.6kΩ
100°F 1.3kΩ

< Thermistor for drain sensor >

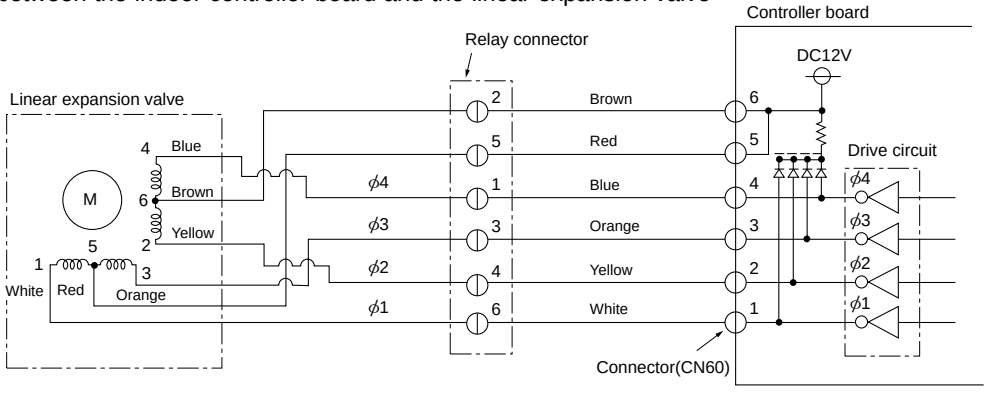


Linear expansion valve

① **Operation summary of the linear expansion valve.**

• Linear expansion valve open/close through stepping motor after receiving the pulse signal from the indoor controller board.
• Valve position can be changed in proportion to the number of pulse signal.

<Connection between the indoor controller board and the linear expansion valve>



Note : Since the number of the connector at the controller board side and the relay connector are different, follow the color of the lead wire.

<Output pulse signal and the valve operation>

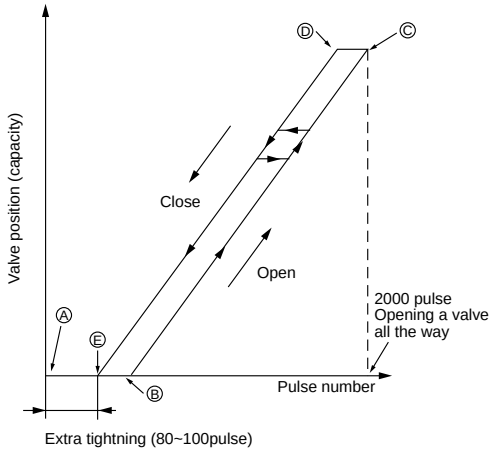
Output (Phase)	Output			
	1	2	3	4
ϕ1	ON	OFF	OFF	ON
ϕ2	ON	ON	OFF	OFF
ϕ3	OFF	ON	ON	OFF
ϕ4	OFF	OFF	ON	ON

Closing a valve : 1 → 2 → 3 → 4 → 1
Opening a valve : 4 → 3 → 2 → 1 → 4

The output pulse shifts in above order.

❋ 1. When linear expansion valve operation stops, all output phase become OFF.
2. At phase interruption or when phase does not shift in order, motor does not rotate smoothly and motor will lock and vibrates.

② Linear expansion valve operation

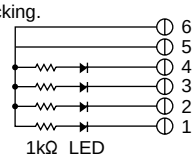
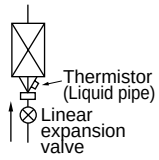


❋ When the switch is turned on, 2200 pulse closing valve signal will be send till it goes to Ⓐ point in order to define the valve position.

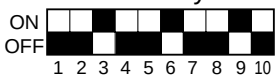
When the valve moves smoothly, there is no noise or vibration occurring from the linear expansion valve : however, when the pulse number moves from Ⓔ to Ⓐ or when the valve is locked, more noise can be heard than normal situation.

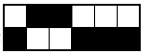
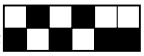
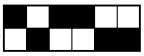
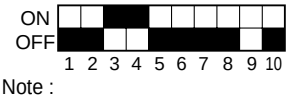
❋ Noise can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

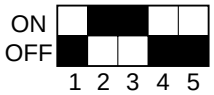
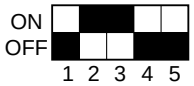
③ Trouble shooting

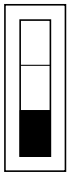
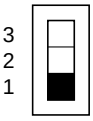
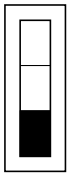
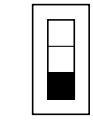
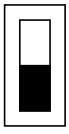
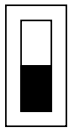
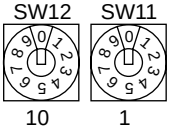
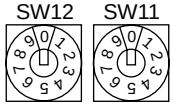
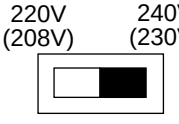
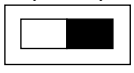
Symptom	Check points	Countermeasures
Operation circuit failure of the micro processor.	Disconnect the connector on the controller board, then connect LED for checking.  Pulse signal will be sent out for 10 seconds as soon as the main switch is turn on. If there is LED with lights on or lights off, it means the operation circuit is abnormal.	Exchange the indoor controller board at drive circuit failure.
Linear expansion valve mechanism is locked.	Motor will idle and make ticking noise when motor is operated while the linear expansion valve is locked. This ticking sound is the sign of the abnormality.	Exchange the linear expansion vale.
Short or breakage of the motor coil of the linear expansion valve.	Measure the resistance between the each coil (red-white, red-orange, brown-yellow, brown-blue) using a tester. It is normal if the resistance is in the range of 150Ω ± 10%.	Exchange the linear expansion valve.
Valve doesn't close completely (thermistor leaking).	To check the linear expansion valve, operate the indoor unit in fan mode and at the same time operate other indoor units in cooling mode, then check the pipe temperature <liquid pipe temperature> of the indoor unit by the outdoor multi controller board operation monitor. During fan operation, linear expansion valve is closed completely and if there are some leaking, detecting temperature of the thermistor will go lower. If the detected temperature is much lower than the temperature indicated in the remote controller, it means the valve is not closed all the way. It is not necessary to exchange the linear expansion valve, if the leakage is small and not making any trouble.  	If large amount of thermistor is leaked, exchange the linear expansion valve.
Wrong connection of the connector or contact failure.	Check the color of lead wire and missing terminal of the connector.	Disconnect the connector at the controller board, then check the continuity.

9-2. FUNCTION OF DIP SWITCH

<table>
<tr><th rowspan="2">Switch</th><th rowspan="2">Pole</th><th rowspan="2">Function</th><th colspan="2">Operation by switch</th><th rowspan="2">Remarks</th></tr>
<tr><th>ON</th><th>OFF</th></tr>
<tr><td rowspan="10">SW1
Mode
Selection</td><td>1</td><td>Thermistor <intake temperature detection> position</td><td>Built-in remote controller</td><td>Indoor unit</td><td rowspan="10">Address board
<At delivery>


Note :
※1 Fan operation at Heating mode.
※2 Heater thermo ON is operating.
※3 SW 1-7=OFF, SW 1-8=ON → Setting air flow.
SW 1-7=ON, SW 1-8=ON → Indoor fan stop.</td></tr>
<tr><td>2</td><td>Filter clogging detection</td><td>Provided</td><td>Not provided</td></tr>
<tr><td>3</td><td>Filter cleaning</td><td>2,500hr</td><td>100hr</td></tr>
<tr><td>4</td><td>Fresh air intake</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>5</td><td>Remote indication switching</td><td>Thermostat ON signal indication</td><td>Fan output indication</td></tr>
<tr><td>6</td><td>Humidifier control</td><td>Always operated while the heat in ON ※1</td><td>Operated depends on the condition ※2</td></tr>
<tr><td>7</td><td rowspan="2">Air flow set in case of Heat thermostat OFF</td><td>Low ※3</td><td>Extra low ※3</td></tr>
<tr><td>8</td><td>Setting air flow ※3</td><td>Depends on SW1-7</td></tr>
<tr><td>9</td><td>Auto restart function</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>10</td><td>Power ON/OFF</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>SW2
Capacity code setting</td><td>1~6</td><td colspan="3"><table><tr><th>MODELS</th><th>SW 2</th><th>MODELS</th><th>SW 2</th></tr><tr><td>PLFY-12NAMU-A</td><td></td><td>PLFY-32NAMU-A</td><td></td></tr><tr><td>PLFY-20NAMU-A</td><td></td><td>PLFY-40NAMU-A</td><td></td></tr><tr><td>PLFY-24NAMU-A</td><td></td><td></td><td></td></tr></table></td><td>Indoor controller board
Set while the unit is off.
<At delivery>
Set for each capacity.</td></tr>
<tr><td rowspan="10">SW3
Function
Selection</td><td>1</td><td>Heat pump / Cooling only</td><td>Cooling only</td><td>Heat pump</td><td rowspan="10">Indoor controller board
Set while the unit is off.
<At delivery>


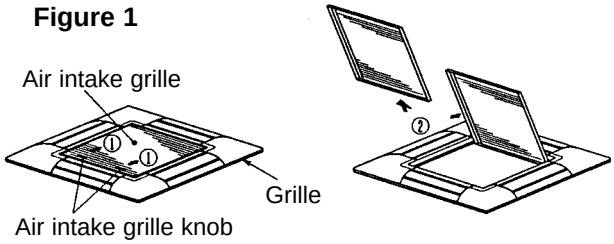
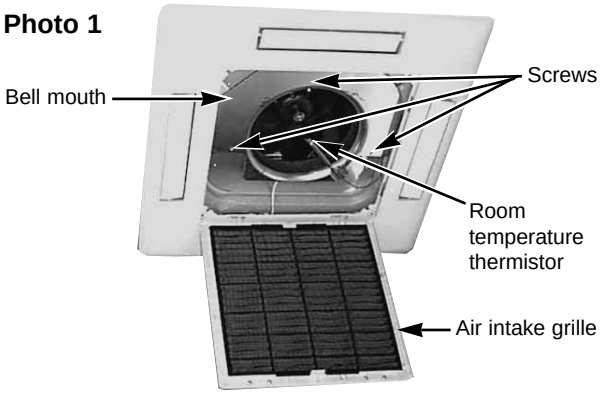
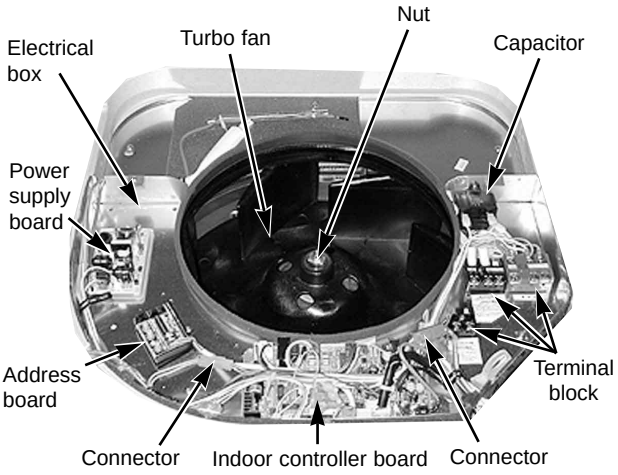
Note :
※4 At cooling mode, each angle can be used only1 hour.
※5 SW3-2 setting
Only for PLFY-NAM, SW is used to change whether the humidifier functions or not. (Fixed the louver function less.)
※6 SW3-9 setting
PLFY-12NAMU-A = ON
20NAMU-A = ON
24NAMU-A = OFF
32NAMU-A = ON
40NAMU-A = OFF</td></tr>
<tr><td>2</td><td>Louver / humidifier ※5</td><td>Available</td><td>Not available</td></tr>
<tr><td>3</td><td>Vane</td><td>Available</td><td>Not available</td></tr>
<tr><td>4</td><td>Vane swing function</td><td>Available</td><td>Not available</td></tr>
<tr><td>5</td><td>Vane horizontal angle</td><td>Second setting</td><td>First setting</td></tr>
<tr><td>6</td><td>Vane cooling limit angle setting ※4</td><td>Horizontal angle</td><td>Down B, C</td></tr>
<tr><td>7</td><td>Indoor linear expansion valve opening</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>8</td><td>Heat 4degrees up</td><td>Not effective</td><td>Effective</td></tr>
<tr><td>9</td><td>Superheat setting temperature ※6</td><td>5degrees</td><td>2degrees</td></tr>
<tr><td>10</td><td>Sub cool setting temperature</td><td>15degrees</td><td>10degrees</td></tr>
<tr><td>SW4
Unit
Selection</td><td>1~5</td><td colspan="3"></td><td>Indoor controller board
Set while the unit is off.
<At delivery>
</td></tr>
</table>

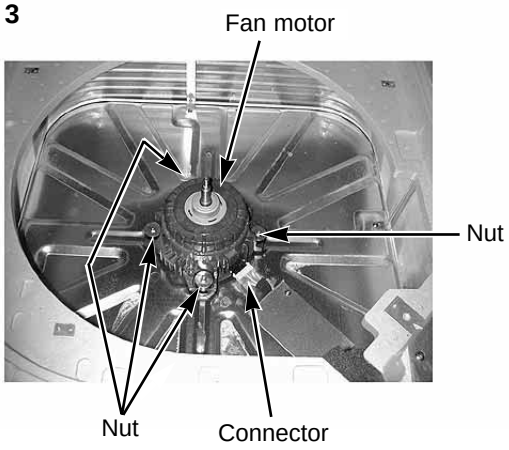
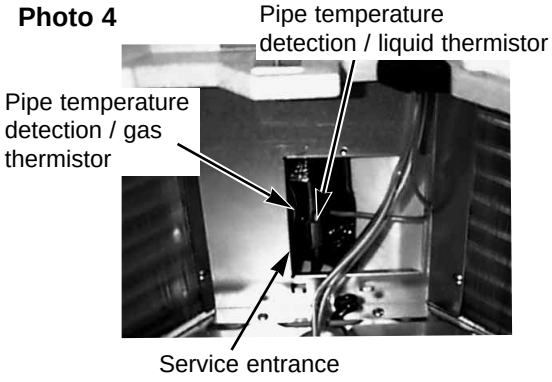
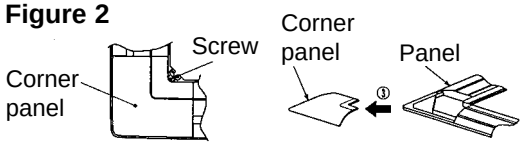
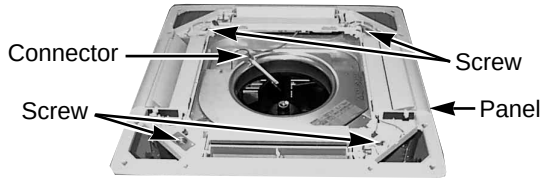
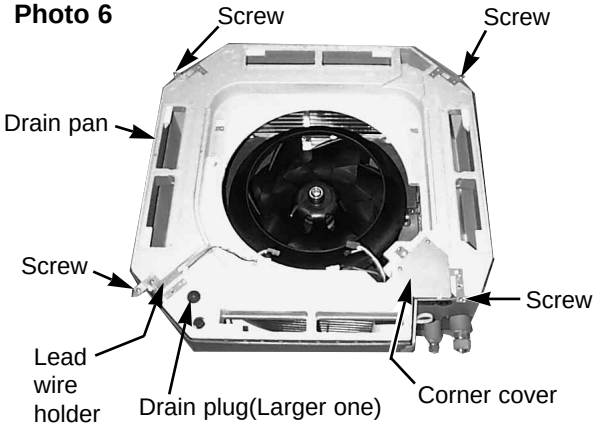
<table>
<tr><th>Switch</th><th>Pole</th><th>Operation by switch</th><th>Remarks</th></tr>
<tr><td>SWA
Ceiling height selector</td><td>1~3</td><td>(High ceiling②) 3
(High ceiling①) 2
(Standard) 1

✻ Ceiling height can be changed depends on SWB setting.
PLFY-12, 20, 24NAMU-A (Unit : feet)<table><tr><th>SWB \ SWA</th><th>1
Standard</th><th>2
High ceiling①</th><th>3
High ceiling②</th></tr><tr><td>4 4 direction</td><td>8.9</td><td>9.8</td><td>11.5</td></tr><tr><td>3 3 direction</td><td>9.8</td><td>10.8</td><td>11.5</td></tr><tr><td>2 2 direction</td><td>10.8</td><td>11.5</td><td>—</td></tr></table></td><td>Address board
<At delivery>
</td></tr>
<tr><td>SWB
Discharge outlet number selector</td><td>3</td><td>(2 direction) 2
(3 direction) 3
(4 direction) 4

PLFY-32, 40NAMU-A (Unit : feet)<table><tr><th>SWB \ SWA</th><th>1
Standard</th><th>2
High ceiling①</th><th>3
High ceiling②</th></tr><tr><td>4 4 direction</td><td>10.5</td><td>11.8</td><td>13.8</td></tr><tr><td>3 3 direction</td><td>11.8</td><td>13.1</td><td>13.8</td></tr><tr><td>2 2 direction</td><td>13.1</td><td>13.8</td><td>—</td></tr></table></td><td>Address board
<At delivery>
</td></tr>
<tr><td>SWC
Option selector</td><td>2</td><td>Option
Standard

When attach the optional high performance filter elements (multi function casement) to the unit, be sure to attach it to the option side in order to prevent the airflow reducing.</td><td>Address board
<At delivery>
</td></tr>
<tr><td>SW11
1st digit address setting
SW12
2nd digit address setting</td><td>Rotary switch</td><td>
Address setting should be done when M-NET Remote controller is being used.</td><td>Address board
Address can be set while the unit is stopped.
<At delivery>
</td></tr>
<tr><td>SW14
Connection No. setting</td><td>Rotary switch</td><td>
This is the switch to be used when the indoor unit is operated with R2 series outdoor unit as a set.</td><td>Address board
<At delivery>
</td></tr>
<tr><td>SW5
Voltage Selection</td><td>2</td><td>
If the unit is used at the 230V area, set the voltage to 230V.
If the unit is used at the 208V, set the voltage to 208V.</td><td>Address board
<At delivery>
220V (208V) 240V (230V)
</td></tr>
</table>

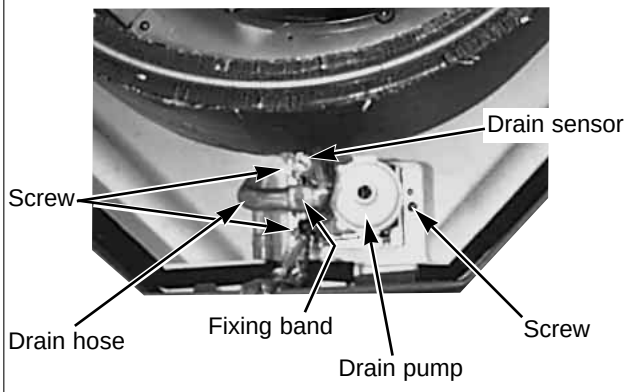
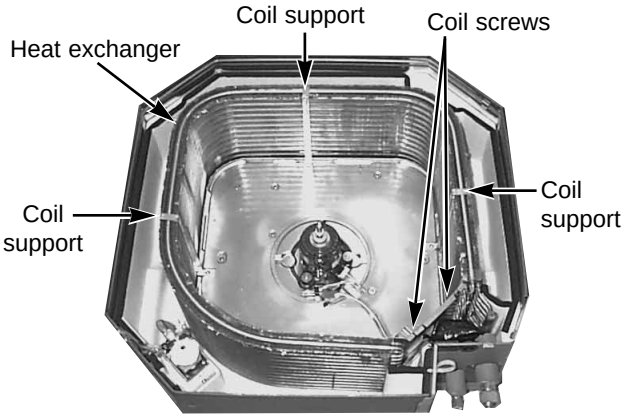
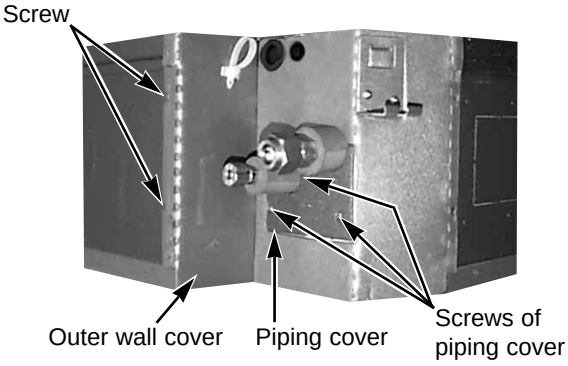
10 DISASSEMBLY PROCEDURE

PLFY-20NAMU-A

Be careful on removing heavy parts.

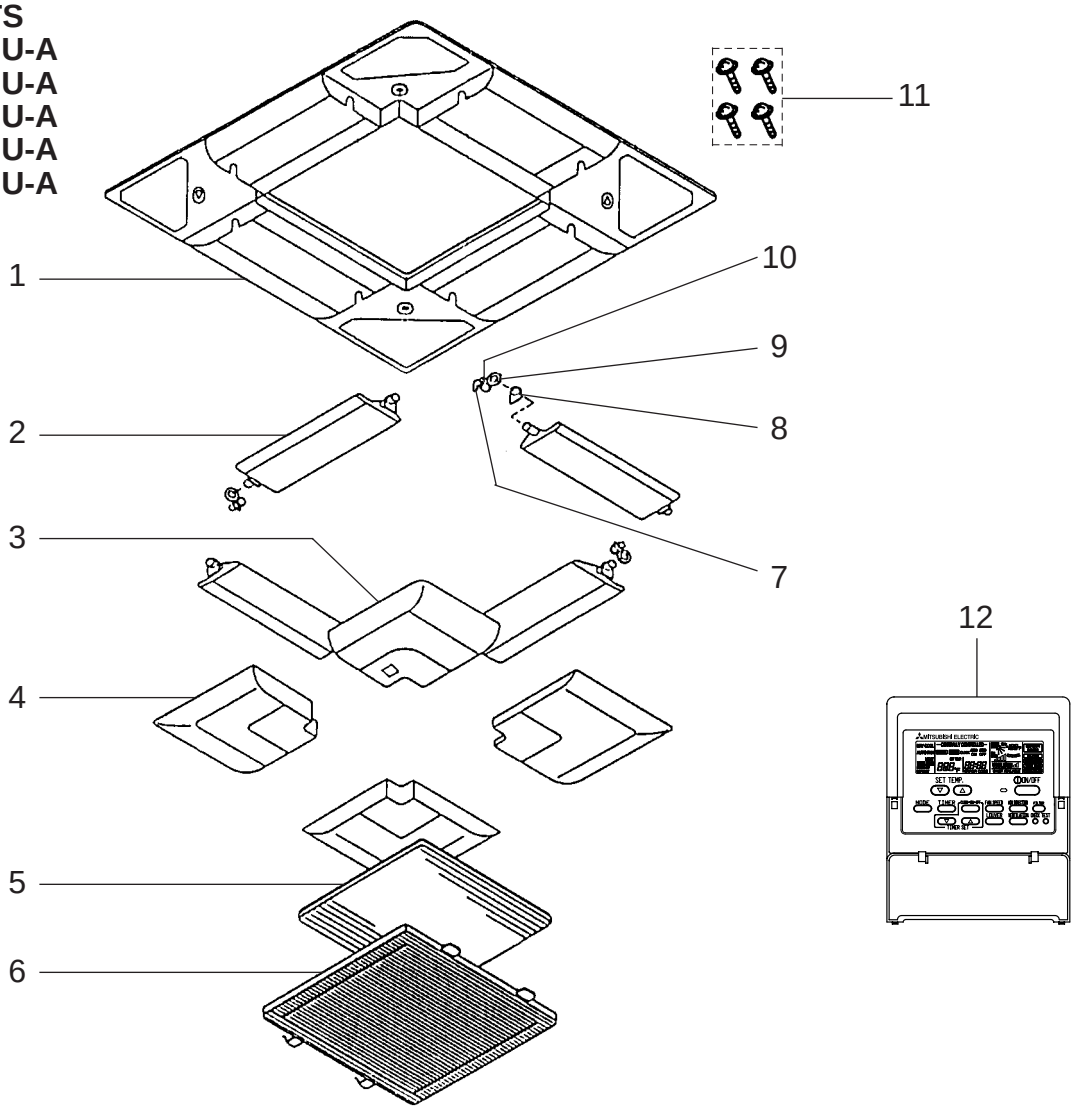
OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
1. Removing the air intake grille (1) Slide the knob of air intake grille to the direction of the arrow ① to open the air intake grille. (2) Remove the string hook from the panel to prevent the grille from dropping. (3) Slide the shaft in the hinge to the direction of the arrow② and remove the air intake grille.	**Figure 1** 
2. Removing the room temperature thermistor (1) Remove the screw(×1) 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 power supply White (2P) for pipe temperature detection / liquid thermistor Black (2P) for pipe temperature detection / gas 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 (Power supply) Terminal block (Transmission) Terminal block (MA remote controller) Capacitor Address board	**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, washer and radiation cap(P100, P125). (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 detection / liquid thermistor and the pipe temperature detection / gas 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 detection / liquid thermistor and the pipe temperature detection / gas thermistor which is inserted into the holder installed to the thin copper pipe. (7) Disconnect the each 2-pin white(liquid) and black(gas) 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 6)** (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** 

11 PARTS LIST

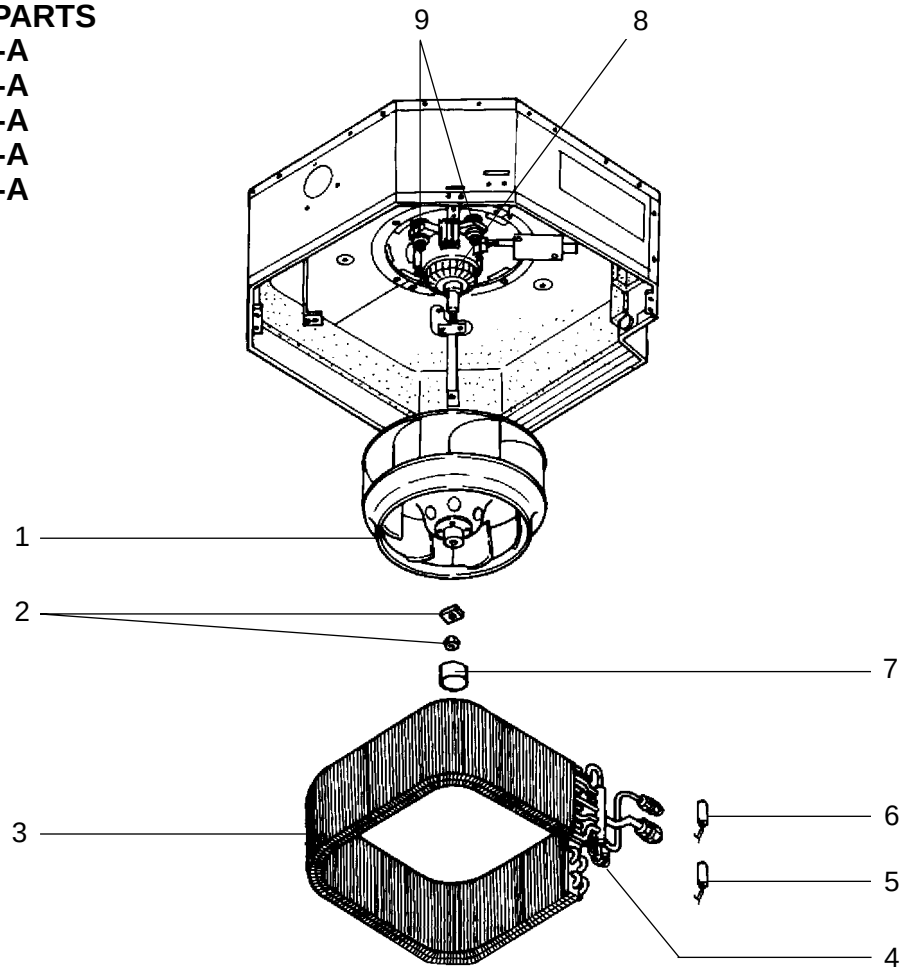
PANEL PARTS
PLFY-12NAMU-A
PLFY-20NAMU-A
PLFY-24NAMU-A
PLFY-32NAMU-A
PLFY-40NAMU-A



No.	Part No.	Part Name	Specification	Q'ty/set PLFY- 12, 20, 24, 32, 40 NAMU-A	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price Unit	Price Amount
1	T7W E12 003	AIR OUTLET GRILLE	PLP-40AAU	1					
2	T7W E05 002	AUTO VANE		4					
3	T7W E01 638	CORNER PANEL		1					
4	R01 E00 638	CORNER PANEL		3					
5	R01 E00 500	AIR 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 (MOTOR)		4					
11	T7W E00 673	SCREW ASSY		1					
12	—	REMOTE CONTROLLER	PAR-20MAU	1		R.B			

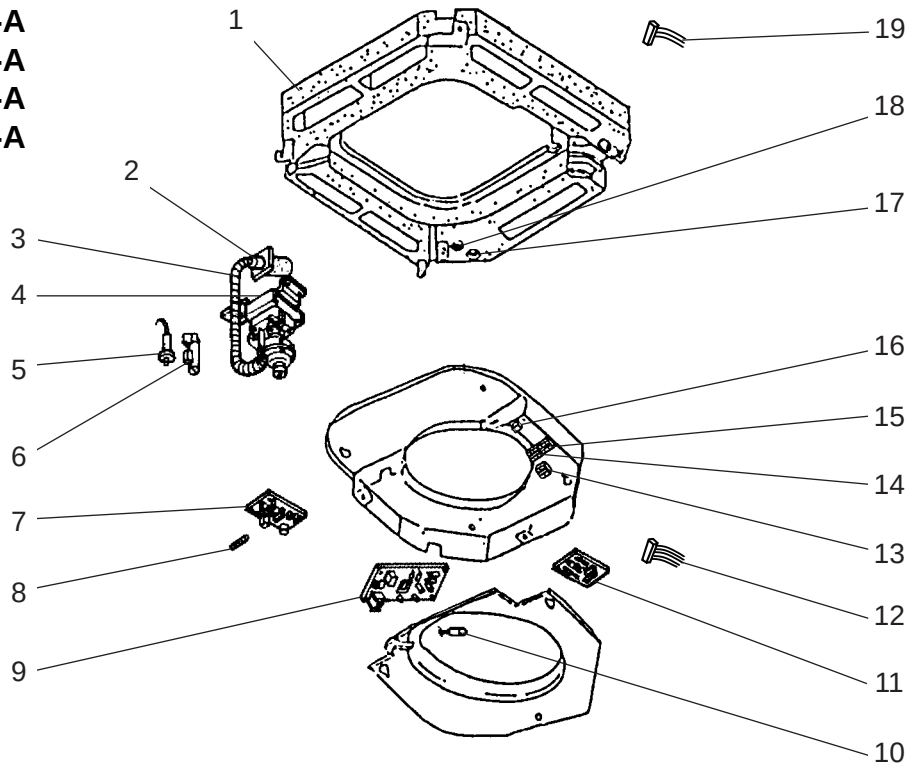
This REMOTE CONTROLLER is made by AIR-CONDITIONING & REFRIGERATION SYSTEMS WORKS,. MITSUBISHI ELECTRIC CORPORATION.

FUNCTIONAL PARTS
PLFY-12NAMU-A
PLFY-20NAMU-A
PLFY-24NAMU-A
PLFY-32NAMU-A
PLFY-40NAMU-A



No.	Part No.	Part Name	Specification	Q'ty/set PLFY-·NAMU-A					Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				12	20	24	32	40				Unit	Amount
1	R01 E10 114	TURBO FAN		1	1	1							
	R01 E11 114	TURBO FAN					1	1					
2	R01 08K 097	SPL WASHER		1	1	1	1	1					
3	T7W E92 480	HEAT EXCHANGER		1									
	T7W E93 480	HEAT EXCHANGER			1								
	T7W E94 480	HEAT EXCHANGER				1							
	T7W E95 480	HEAT EXCHANGER					1						
	T7W E96 480	HEAT EXCHANGER						1					
4	T7W E11 401	LINEAR EXPANSION VALVE		1	1	1				LEV			
	R01 E32 401	LINEAR EXPANSION VALVE					1	1		LEV			
5	T7W E06 202	PIPE TEMPERATURE THERMISTOR	GAS	1	1	1	1	1		TH23			
6	R01 E00 202	PIPE TEMPERATURE THERMISTOR	LIQUID	1	1	1	1	1		TH22			
7	R01 E00 122	MOTOR CAP					1	1					
8	T7W E12 762	FAN MOTOR	(D17D6P70MS)	1	1	1				MF			
	T7W E08 762	FAN MOTOR	(D176P110MS)				1	1		MF			
9	R01 A41 105	MOTOR MOUNT		4	4	4	4	4					

FUNCTIONAL PARTS
PLFY-12NAMU-A
PLFY-20NAMU-A
PLFY-24NAMU-A
PLFY-32NAMU-A
PLFY-40NAMU-A



No.	Part No.	Part Name	Specification	Q'ty/set PLFY-·NAMU-A					Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				12	20	24	32	40				Unit	Amount
1	T7W E09 529	DRAIN PAN		1									
	T7W E06 529	DRAIN PAN			1	1							
	T7W E07 529	DRAIN PAN					1	1					
2	R01 29H 523	DRAIN SOCKET		1	1	1	1	1					
3	T7W E00 527	DRAIN HOSE		1	1	1	1	1					
4	T7W E06 355	DRAIN PUMP		1	1	1	1	1		DP			
5	R01 E00 266	DRAIN SENSOR		1	1	1	1	1		DS			
6	R01 31K 241	SENSOR HOLDER		1	1	1	1	1					
7	R01 E02 313	POWER BOARD		1	1	1	1	1		P.B			
8	T7W 410 239	FUSE	250V 6A	1	1	1	1	1		FUSE			
9	T7W E28 310	CONTROLLER BOARD		1	1	1	1	1		I.B			
10	R01 E58 202	ROOM TEMPERATURE THERMISTOR		1	1	1	1	1		TH21			
11	T7W E00 294	ADDRESS BOARD		1	1	1	1	1		A.B			
12	T7W E00 304	ADDRESS CABLE		1	1	1	1	1					
13	R01 556 716	TERMINAL BLOCK	2P(1,2)	1	1	1	1	1		TB15			
14	T7W E17 716	TERMINAL BLOCK	3P(M1,M2,S)	1	1	1	1	1		TB5			
15	T7W E11 716	TERMINAL BLOCK	3P(L1,L2,GR)	1	1	1	1	1		TB2			
16	T7W E10 255	CAPACITOR	3.0μF 440V	1	1	1				C			
	T7W E02 255	CAPACITOR	7.0μF 440V				1	1		C			
17	R01 A41 524	DRAIN PLUG		1	1	1	1	1					
18	R01 A48 524	DRAIN PLUG		1	1	1	1	1					
19	T7W E01 304	LEAD ASSY (F/M)		1	1	1	1	1					

12 OPTIONAL PARTS

12-1. Multi function casement

Part No.	PAC-SG03TM-E

12-2. Air outlet shutter plate (20 sets)

Part No.	PAC-SG06SP-E

12-3. High efficiency filter (PAC-SG03TM-E is required in using this optional part.)

Part No.	PAC-SG01KF

CITY MULTI

MITSUBISHI ELECTRIC CORPORATION

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