



DUCTLESS SPLIT-TYPE HEAT PUMPS AND AIR CONDITIONERS

No. SP-001

SERVICE & PARTS MANUAL

Wireless type

Models

INDOOR UNIT

MSH09EW
MSH12EN
MSH15EN

OUTDOOR UNIT

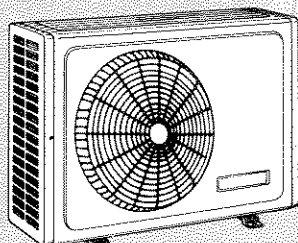
MUH09EW
MUH12EN
MUH15EN



MSH12EN
INDOOR UNIT



LCD wireless
remote controller



MUH12EN
OUTDOOR UNIT

CONTENTS

1. CHANGE POINTS	1
2. FEATURES	2
3. PART NAMES AND FUNCTIONS	4
4. SPECIFICATIONS	8
5. DATA	10
6. OUTLINES AND DIMENSIONS	19
7. WIRING DIAGRAM	21
8. REFRIGERANT SYSTEM DIAGRAM	25
9. MICROPROCESSOR CONTROL	26
10. SERVICE FUNCTION	35
11. TROUBLESHOOTING	36
12. OPTIONAL PARTS	49
13. STANDARD PARTS	50

NOTE: For DISASSEMBLY INSTRUCTIONS, refer to
OB-038.



The Slim Line.
From Mitsubishi Electric.



Mr. SLIM



1**CHANGE POINTS****MSH-09DW → MSH09EW**

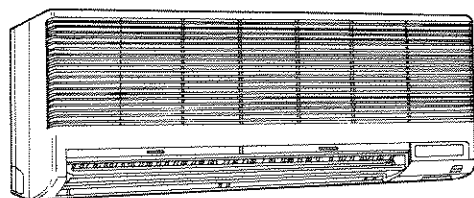
1. Indoor and outdoor units changed.
2. Extension pipe length changed from 33ft to 49ft.
3. Compressor changed from RHS-135WAE (with injection circuit) to RH-140WJK (without the circuit)
4. New model has AUTO RESTART function. Cut jumper wire to work AUTO RESTART function.
5. Temperature and time of defrost control changed.
6. Indoor fan can operate at set speed when thermostat is off in HEAT mode by cutting jumper wire.

MSH12/15DN → MSH12/15EN

1. Indoor front panel changed.
2. Outer diameter of extension pipe changed; gas pipe became thicker.
3. Compressor changed as follows:
(MSH12) RH-189NAB → RH-185NFL
(MSH15) RH-281NAB → RH-207NFL
4. New model has AUTO RESTART function. Cut jumper wire to work AUTO RESTART function.
5. Temperature and time of defrost control changed.
6. Indoor fan can operate at set speed when thermostat is off in HEAT mode by cutting jumper wire.

2

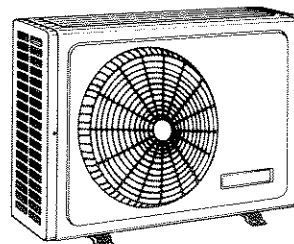
FEATURES



MSH12EN



LCD wireless
remote controller



MUH12EN

Models	Cooling Capacity	Heating Capacity	SEER	HSPF
MSH09EW	8,800 Btu/h	10,300 Btu/h	10.0	6.8
MSH12EN	12,500 Btu/h	12,500 Btu/h	10.0	6.8
MSH15EN	14,200 Btu/h	14,500 Btu/h	10.0	6.8

1. NEW "I FEEL CONTROL" IN OUR LCD WIRELESS REMOTE CONTROLLER

Mitsubishi Electric's new wireless remote controller incorporates a number of advanced features that provide even greater control and ease-of-use. It has a liquid crystal display which indicates such information as mode, fan speed and temperature selected as well as the timer setting and time remaining. It is also equipped with "I Feel Control", a unique Mitsubishi Electric feature that allows the user to adjust the temperature to exactly the level he or she wants simply by tapping the button that describes present conditions: "Too Cool", "Too Warm", or "Okay". The optimum temperature set this way is then memorized for immediate recall whenever the air conditioner is used again. And what's more, the new controller has been made more compact and easy to handle than even before.

2. A VARIETY OF MICROPROCESSOR-CONTROLLED FUNCTIONS

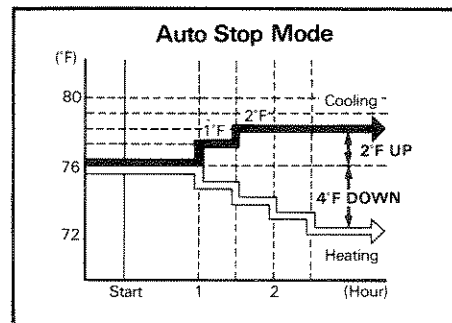
Automatic ON/OFF Timer

Convenient timer function includes Auto Start, Auto Stop, both can be set 1~12 hours.

Auto Stop (Night Setback) Mode

In heating, this mode lowers the temperature setting by 1°F every half hour. When 2-1/2 hours have passed, the air conditioner is running at a setting that is 4°F lower, thus preventing excessive heating.

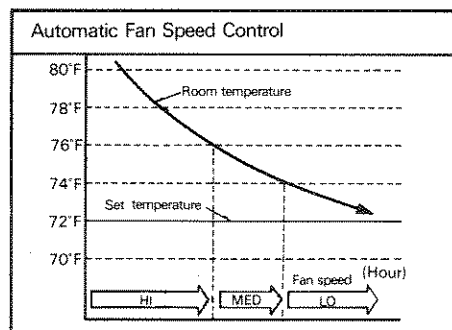
In cooling, the set temperature rises 1°F after one hour and another 1°F the next half hour. When 1-1/2 hours have passed, the air conditioner is running at a setting that is 2°F higher, thus preventing excess cooling.



Automatic Fan Speed Control

When there's a large difference between the set temperature and existing room temperature, the fan speed automatically adjusts to HI to either cool or heat the room quickly.

As the temperature difference decreases, the Fan Control shifts down automatically to MED and LO. Operation is almost whisper quiet.



Hot Start System

Heating always begins comfortably with warm air, since the Hot Start System prevents cold air from blowing out at the start of heating and during defrosting.

Booster Heater for Fast Warm-up

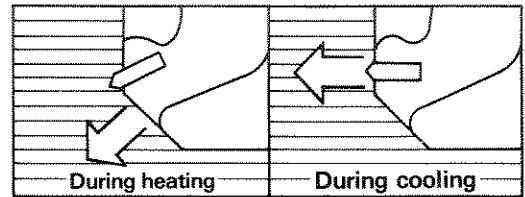
Microprocessor controlled-Booster Heater automatically speeds the heating process to quickly warm up a room, and thereby eliminates unnecessary energy use that occurs during prolonged heating.

Automatic Change Vane System

The Automatic Change Vane System will automatically set the vane in a horizontal position for cooling. During heating, when the hot air is blowing strongly enough, it will automatically adjust downward. The angle of the vane can be adjusted with the Remote Controller. (MSH12/15EN)

Adjustable Change Vane System

Choose the air direction that suits your needs. To achieve uniform airflow for heating, adjust the louver downward. For cooling, keep it in a horizontal position. (MSH09EW)

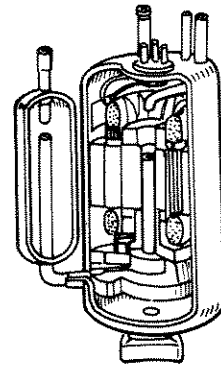


AUTO RESTART Function

The restart function restarts the equipment when power is restored following an outage. Operation resumes in the mode in which the equipment was running immediately before outage.

High Performance Rotary Compressor

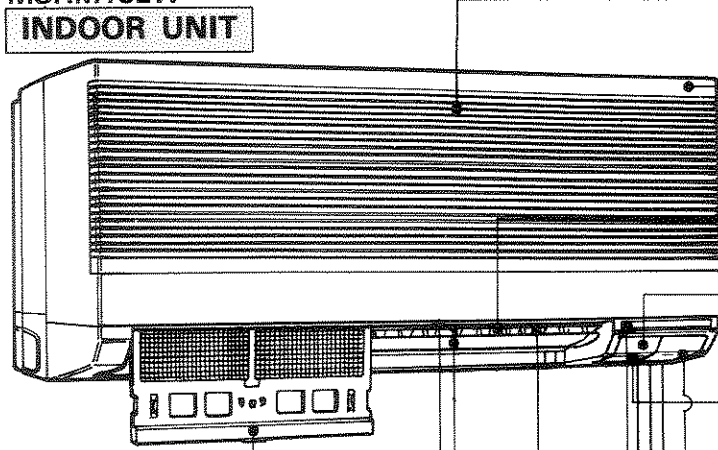
The advanced design of Mitsubishi Electric's powerful and energy-efficient rotary compressor results in lower operating costs and a longer service life.



3

PART NAMES AND FUNCTIONS

MSH09EW
MSHM18EW
INDOOR UNIT



AIR INTAKE

FRONT PANEL

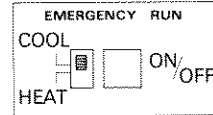
AIR OUTLET

RECEIVING SECTION

Receives signal from the wireless remote controller.

ROOM TEMPERATURE SENSOR

INDOOR UNIT OPERATION SECTION



Use only for TEST RUN at installation or when the WIRELESS REMOTE CONTROLLER malfunctions. Do not press this button during normal operation, or the operation stops.

AIR FILTERS

CHANGE VANE

GUIDE VANE

I FEEL MONITOR

||||| POWER ||||| DEFROST
▶ ▶ ● I FEEL MONITOR

Shows the room temperature for I FEEL CONTROL operation.

- ▶ ▶ ● Shows that the unit is in operation for the set temperature (when 3°F or more difference exists between set temperature and room temperature).
- ▷ ▶ ● Shows that the room temperature is approaching the set temperature (difference from set temperature is 2 to 3°F)
- ▷ ▷ ● Shows that the room temperature has almost reached the set temperature (difference from set temperature is 2°F or less).

POWER lamp : Lights by turning POWER SWITCH on.

Indoor unit display section

||||| POWER ||||| DEFROST

OPERATION lamp
Lights when POWER is turned ON.

DEFROST lamp
This lamp lights at start of heating and while defrosting. While defrosting, the indoor fan may stop for a while.

WIRELESS REMOTE CONTROLLER

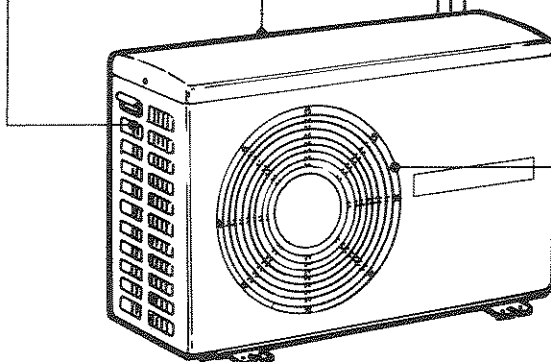
DRAINAGE HOSE

Removes water produced during cooling.

CONNECTING WIRING

CONNECTING PIPES

OUTDOOR UNIT



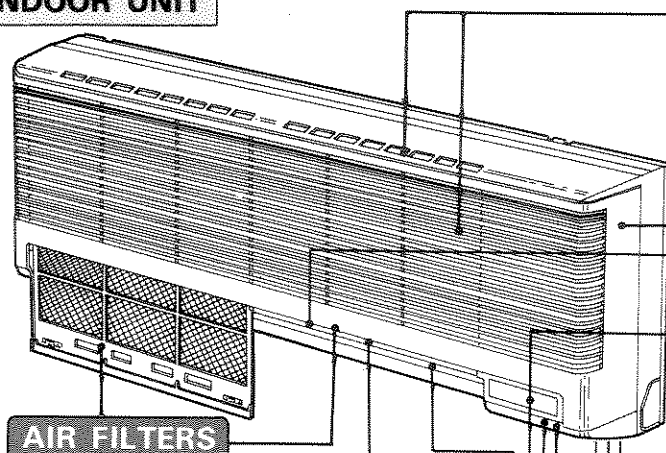
AIR INTAKE

Located on the back and side.

AIR OUTLET

MSH12/15EN

INDOOR UNIT



AIR FILTERS

GUIDE VANE

AUTO VANE

● I FEEL MONITOR

POWER DEFROST
I FEEL MONITOR
▶ ▶ ●

Shows the room temperature for I FEEL CONTROL operation.

- ▶ ▶ ● Shows that the unit is in operation for the set temperature (when 3°F or more difference exists between set temperature and room temperature).
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● Indoor unit display section

POWER

DEFROST

POWER lamp
Lights when POWER is turned ON.

DEFROST lamp
This lamp lights at start of heating and while defrosting. While defrosting, the indoor fan may stop for a while.

AIR INTAKE

Provided on the front and top.

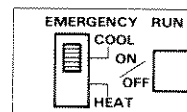
FRONT PANEL

AIR OUTLET

INDOOR UNIT DISPLAY SECTION

THERMAL SENSOR

INDOOR UNIT OPERATION SECTION



Use only for TEST RUN at installation or when the WIRELESS REMOTE CONTROLLER malfunctions. Do not press this button during normal operation, or the operation stops.

WIRELESS REMOTE CONTROLLER

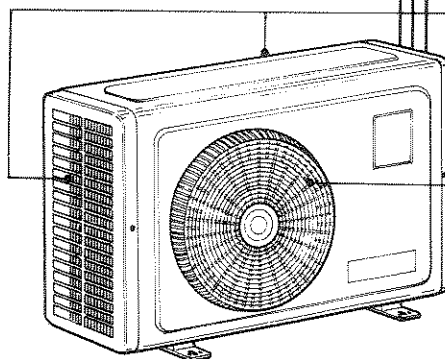
DRAINAGE HOSE

Removes water produced during cooling.

CONNECTING WIRING

CONNECTING PIPES

OUTDOOR UNIT



AIR INTAKE

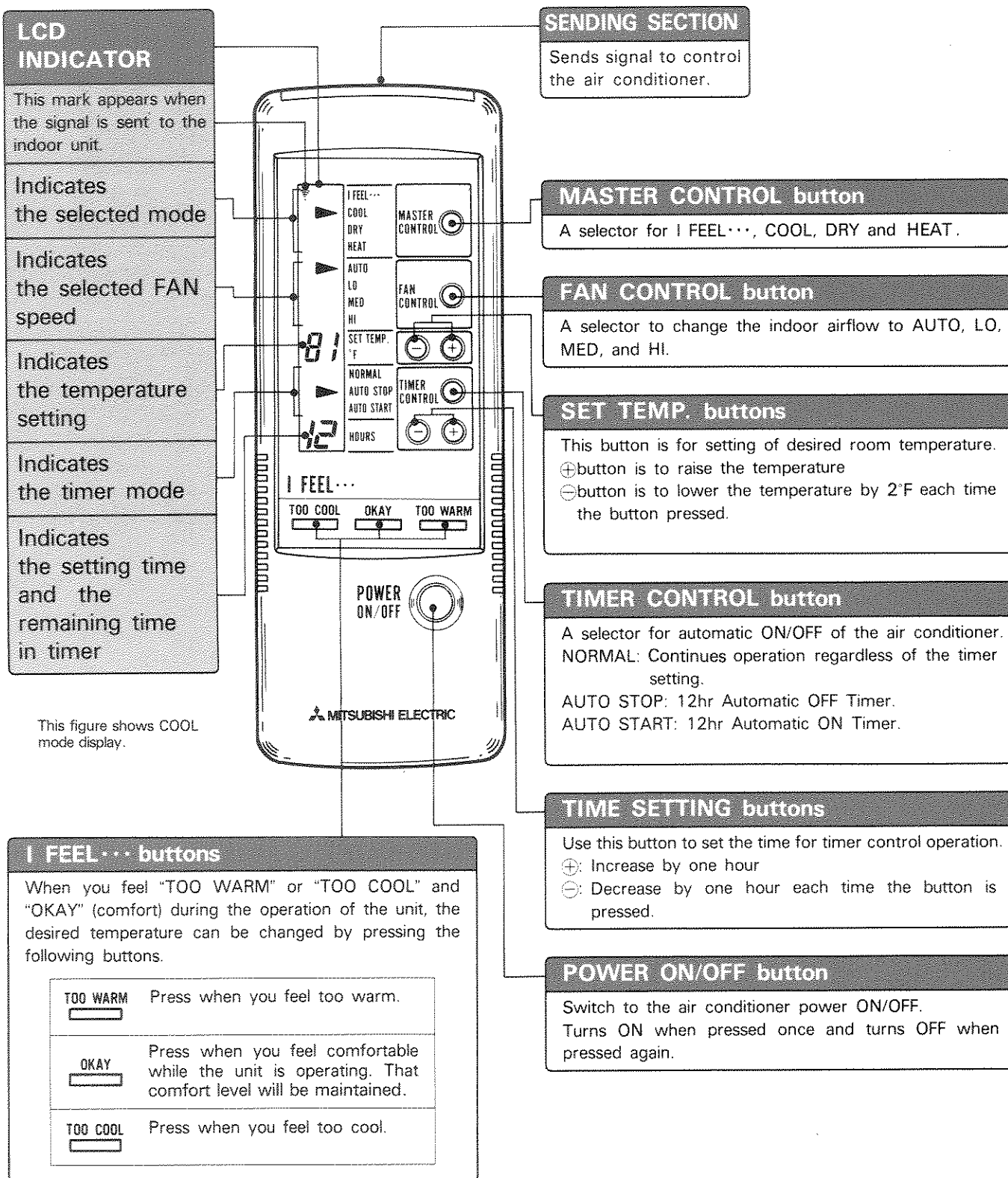
Located on the back and side.

AIR OUTLET

MSH09EW

WIRELESS REMOTE CONTROLLER

Once the controls are set, the same operation mode can be repeated by simply turning the POWER switch ON. When batteries are replaced all of the controls memorized will be cancelled, and "I FEEL ..." mode is automatically selected.

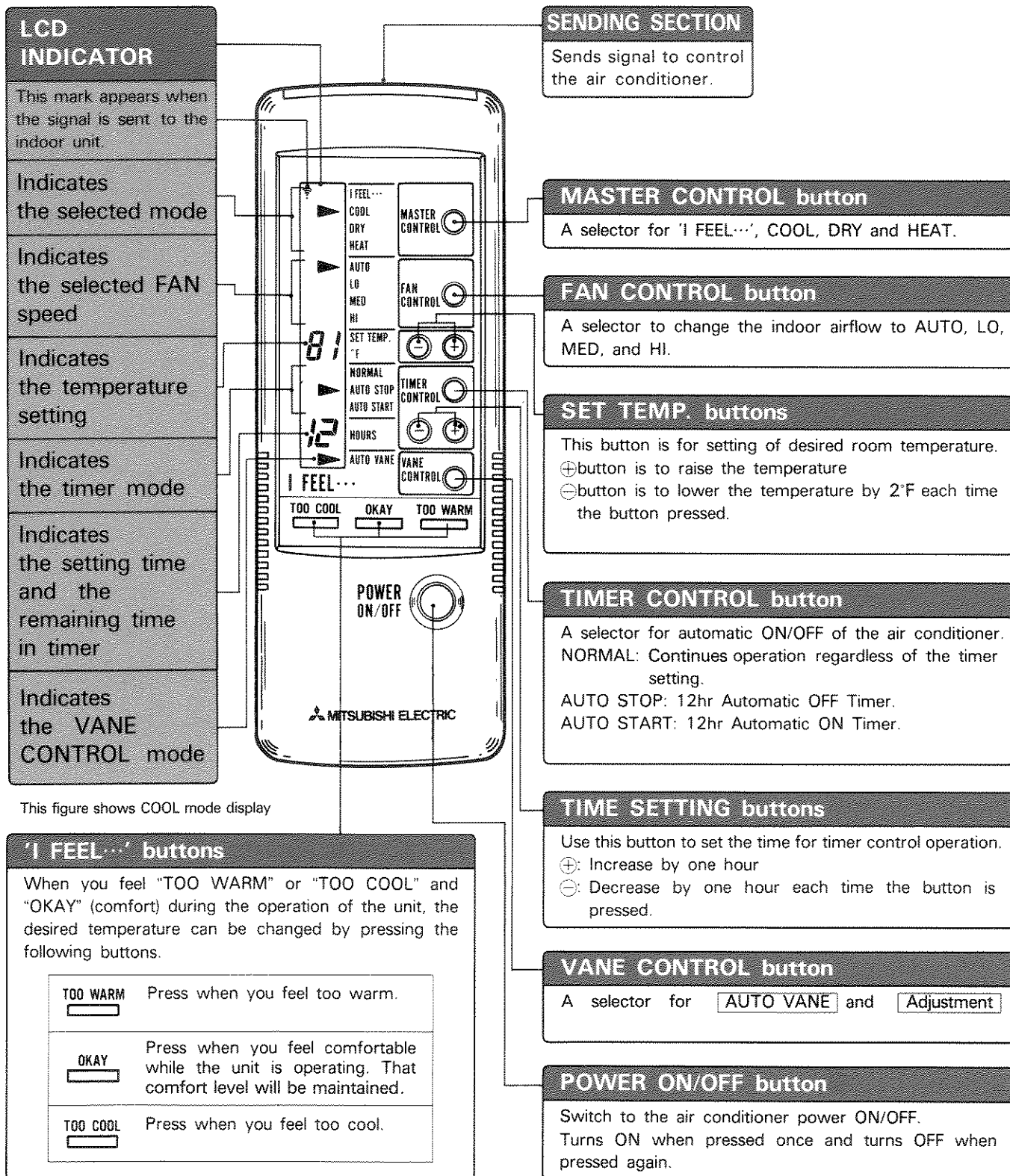


MSH12/15EN

WIRELESS REMOTE CONTROLLER

Once the controls are set, the same operation mode can be repeated by simply turning the POWER switch ON.

When batteries are replaced all of the controls memories will be cancelled, and "I FEEL ..." mode is automatically selected.



ITEM		MODEL	MSH09EW
Capacity	Cooling *1	Btu/h	8,800
	Heating 47° *1	Btu/h	10,300 (13,700)
	Heating 17° *2	Btu/h	5,200 (8,600)
Power consumption	Cooling *1	W	890
	Heating 47° *1	W	920 (1,920)
	Heating 17° *2		840 (1,840)
EER *1 (SEER)			9.9 (10.0)
HSPF			6.8
COP		47° *1 (17°) *2	3.3 (1.8)
INDOOR UNIT			MSH09EW
External finish			White
Power supply		V, Hz, ϕ	115, 60, 1
Max. fuse size (time delay)		A	15
Min. ampacity		F.L.A.	12
Fan motor			0.3
Auxiliary heater		A(kW)	8.7 (1.0)
Airflow Lo-Med-Hi	Dry	CFM	173-201-261
	Wet	CFM	152-177-229
Moisture removal		Pints/h	2.9
Sound level		bB(A)	43
Cond. drain conn. OD		in.	5/8
Dimensions	W	in.	31-1/8
	D	in.	5-3/8
	H	in.	14-3/16
Weight		lb.	28
OUTDOOR UNIT			MUH09EW
External finish			Munsell 5Y 6.5/1
Power supply		V, Hz, ϕ	115, 60, 1
Max. fuse size (time delay)		A	20
Min. ampacity			16
Fan motor		F.L.A.	0.7
Compressor	Model		RH-140WJK
	Winding resistance (at 68°F)	Ω	C-R 0.83 C-S 1.49
		R.L.A.	12
		L.R.A.	42
Refrigerant control			Capillary tube
Defrost method			Reverse cycle
Dimensions	W	in.	30-11/16
	D	in.	10-1/16
	H	in.	21-1/4
Weight		lb.	80
REMOTE CONTROLLER			Wireless type
Control voltage (by built in transformer)			12V DC (peak voltage)
REFRIGERANT PIPING			Not supplied (optional parts)
Pipe size	Liquid	in.	1/4
	Gas	in.	3/8
Connection method	Indoors		Flared
	Outdoors		Flared
Between the indoor & outdoor units	Height difference	ft	Max. 25
	Piping length	ft	Max. 49

Notes *1. Rating conditions (cooling) — Indoor : 80°FDB, 67° FWB, Outdoor : 95°FDB, 75°FWB

(heating) — Indoor : 70°FDB, 60° FWB, Outdoor : 47°FDB, 43°FWB

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

*3. Heating capacity and power consumption in () include auxiliary electric heater operation at 115V.

Operating Range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	90°FDB, 71°FWB	115°FDB
	Minimum	67°FDB, 57°FWB	67°FDB
Heating	Maximum	80°FDB, 67°FWB	75°FDB, 65°FWB
	Minimum	70°FDB, 60°FWB	17°FDB, 15°FWB

ITEM		MODEL	MSH12EN	MSH15EN
Capacity	Cooling *1	Btu/h	12,000/12,500	13,700/14,200
	Heating 47° *1	Btu/h	12,000/12,500 (17,100/17,600)*3	14,000/14,500 (19,100/19,600)*3
	Heating 17° *2	Btu/h	6,240/6,500 (11,340/11,600)*3	8,400/8,700 (13,500/13,800)*3
Power consumption	Cooling *1	W	1,210/1,260	1,380/1,430
	Heating 47° *1	W	1,110/1,150 (2,610/2,650)	1,280/1,340 (2,780/2,840)*3
	Heating 17° *2		1,020/1,060 (2,520/5,560)	1,230/1,270 (2,730/2,770)*3
EER *1 (SEER)			9.9/9.9 (10.0/10.0)	9.9/9.9 (10.0/10.0)
HSPF			6.8	6.8
COP		47° *1 (17°) *2	3.2/3.2 (1.8/1.8)	3.2/3.2 (2.0/2.0)
INDOOR UNIT			MSH12EN	MSH15EN
External finish			White	
Power supply		V, Hz, ϕ	115, 60, 1	
Max. fuse size (time delay)		A	20	
Min. ampacity		F.L.A.	17	
Fan motor		F.L.A.	0.5	
Auxiliary heater		A(kW)	13 (1.5)	
Airflow Lo-Me-Hi	Dry	CFM	279-374-427	
	Wet	CFM	265-357-406	
Moisture removal		Pists/h	3.4	
Sound level		dB(A)	48	
Cond. drain conn. OD		in.	5/8	
Dimensions	W	in.	39-3/8	
	D	in.	7	
	H	in.	14-3/16	
Weight		lb	37.5	
OUTDOOR UNIT			MUH12EN	MUH15EN
External finish			Munsell 5Y 6.5/1	
Power supply		V, Hz, ϕ	208/230, 60, 1	
Max. fuse size (time delay)		A	15	
Min. ampacity			12	
Fan motor		F.L.A.	0.5	
Compressor	Model		RH-185NFL	
	Winding resistance (at 68°F)	Ω	C-R 2.10 C-S 3.08	
	R.L.A.		8	
	L.R.A.		30	
Refrigerant control			Capillary tube	
Defrost method			Reverse cycle	
Dimensions	W	in.	33-1/2	
	D	in.	11-7/16	
	H	in.	23-7/8	
Weight		lb	106	
REMOTE CONTROLLER			Wireless type	
Control voltage (by built in transformer)			12V DC (peak voltage)	
REFRIGERANT PIPING			Not supplied (optional parts)	
Pipe size	Liquid	in.	1/4	
	Gas	in.	5/8	
Connection method	Indoors		Flared	
	Outdoors		Flared	
Between the indoor & outdoor units	Height difference	ft	Max. 25	
	Piping length	ft	Max. 49	

Notes *1. Rating conditions (cooling) — Indoor : 80°FDB, 67° FWB, Outdoor : 95°FDB, 75°FWB
(heating) — Indoor : 70°FDB, 60° FWB, Outdoor : 47°FDB, 43°FWB

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

*3. Includes auxiliary electric heater operation 115V.

Operating Range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	90°FDB, 71°FWB	115°FDB
	Minimum	67°FDB, 57°FWB	67°FDB
Heating	Maximum	80°FDB, 67°FWB	75°FDB, 65°FWB
	Minimum	70°FDB, 60°FWB	17°FDB, 15°FWB

1. PERFORMANCE CURVE

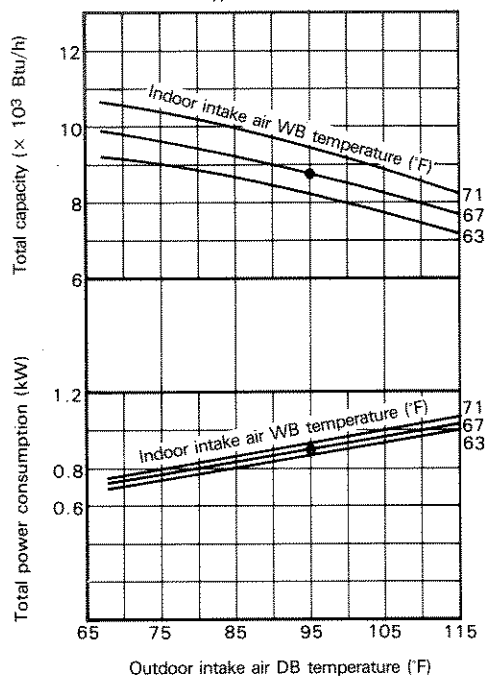
NOTE: A point on the curve shows the reference point.

MSH09EW

MUH09EW

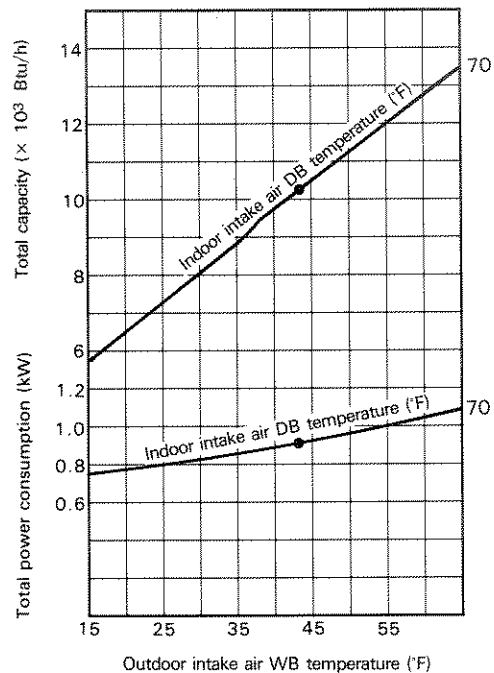
Cooling capacity

SHF at rating condition = 0.67
Airflow = 229CFM
Bypass Factor = 0.12



Heating capacity

Airflow = 261CFM

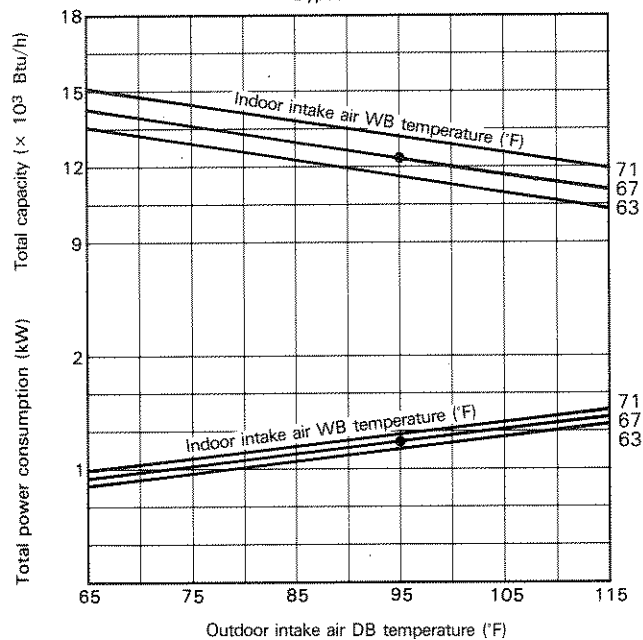


MSH12EN

MUH12EN

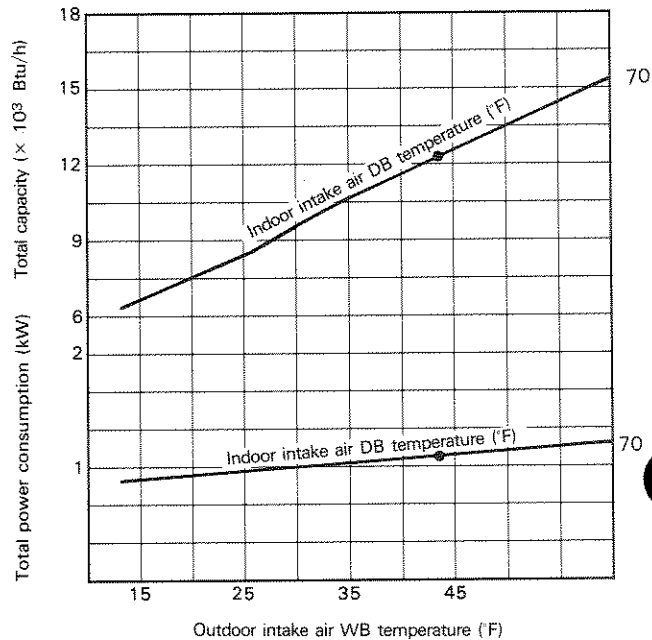
Cooling capacity

SHF at rating condition = 0.73
Airflow = 406CFM
Bypass Factor = 0.12



Heating capacity

Airflow = 427CFM

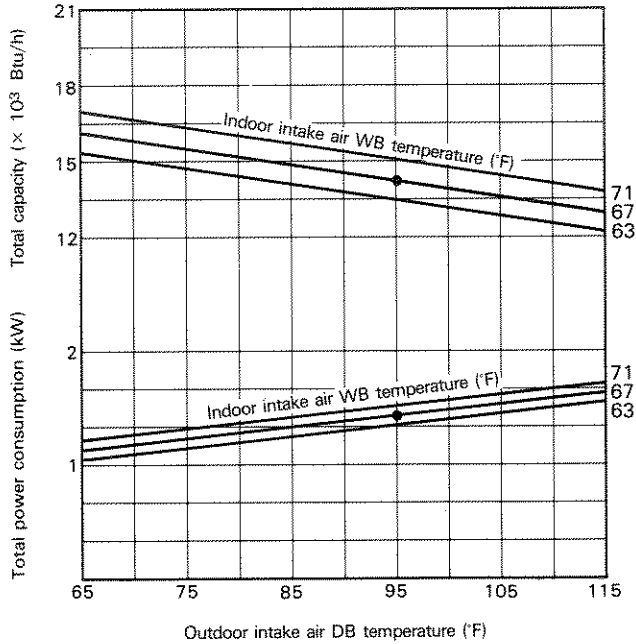


NOTE: A point on the curve shows the reference point.

MSH15EN
MUH15EN

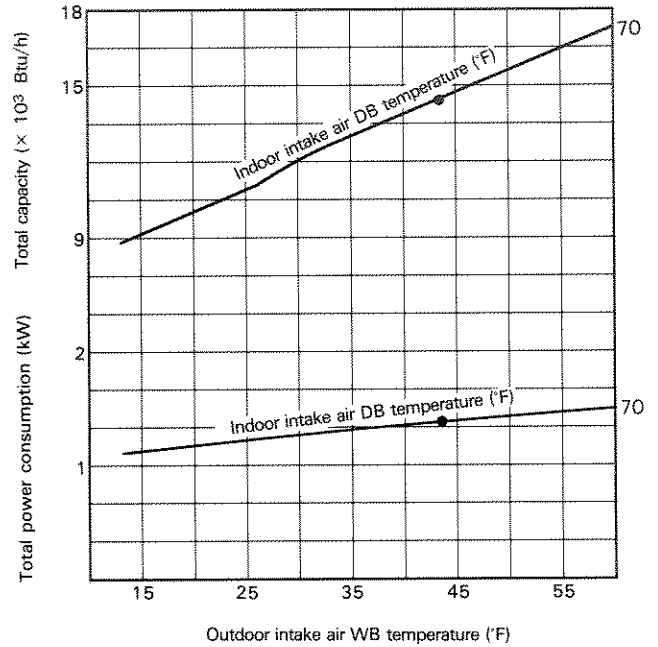
Cooling capacity

SHF at rating condition = 0.69
Airflow = 406 CFM
Bypass Factor = 0.13



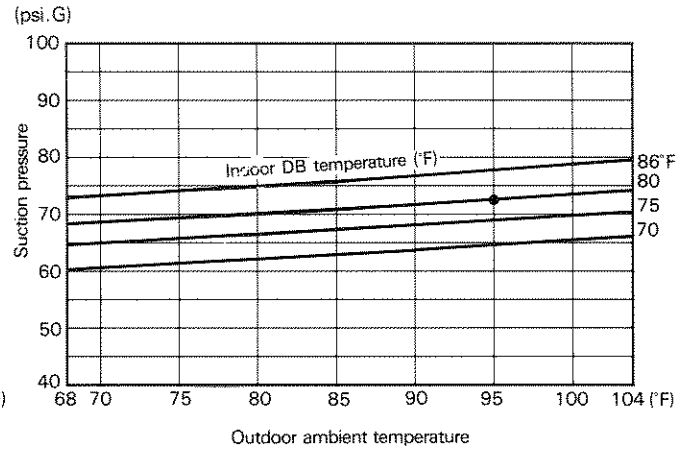
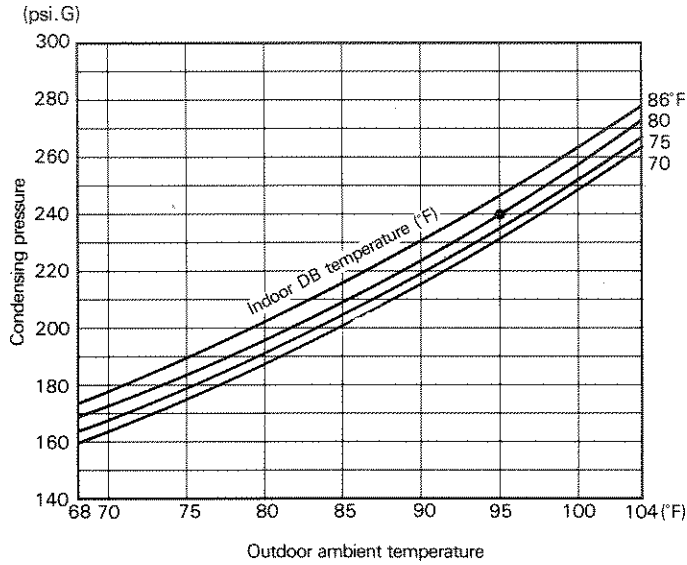
Heating capacity

Airflow = 427 CFM



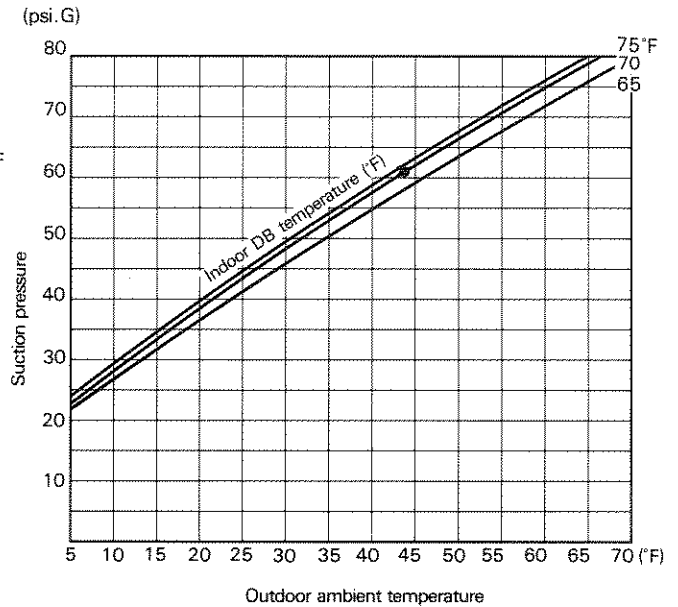
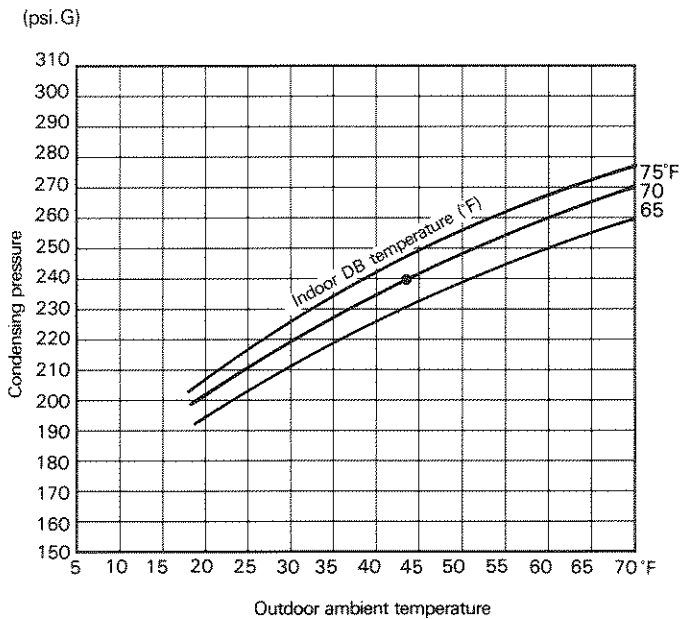
Condensing pressure
MSH09EW (Cooling)

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



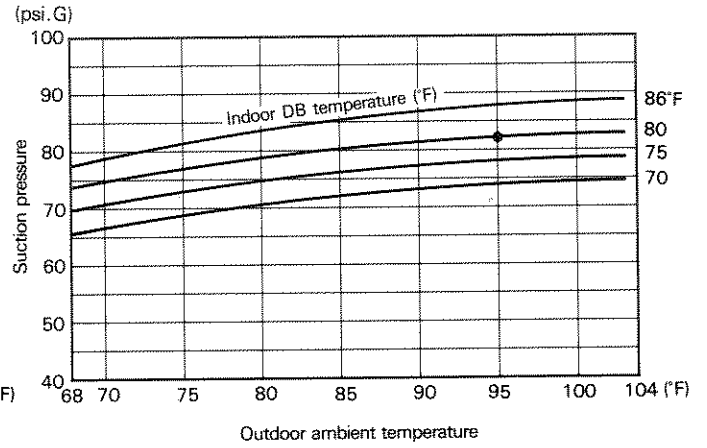
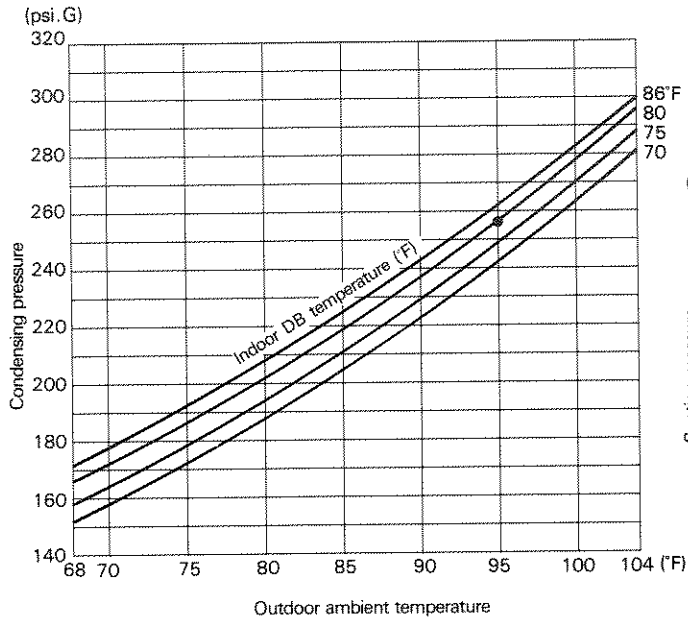
MSH09EN (Heating)

Data is based on the condition of outdoor humidity 75%
Air flow should be set at HI.
A point on the curve shows the reference point.



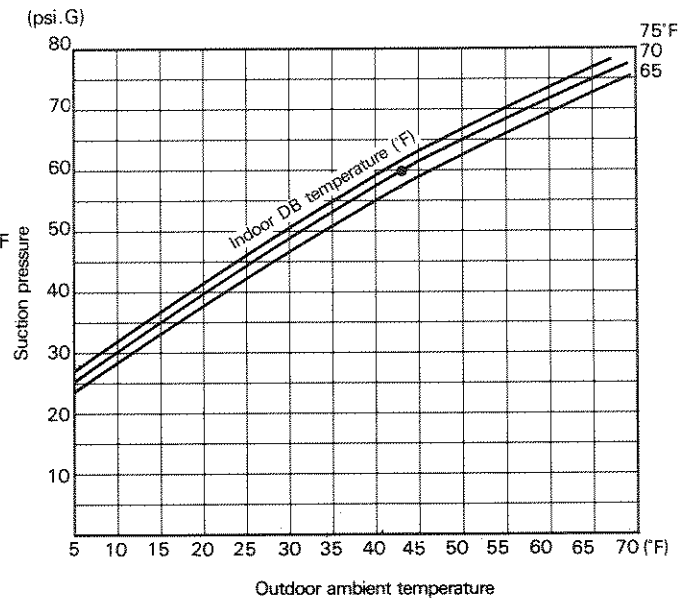
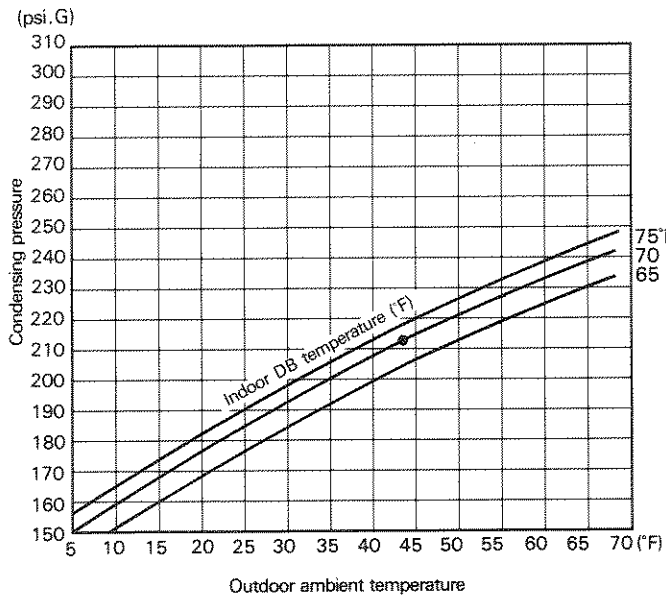
MSH12EN (Cooling)

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



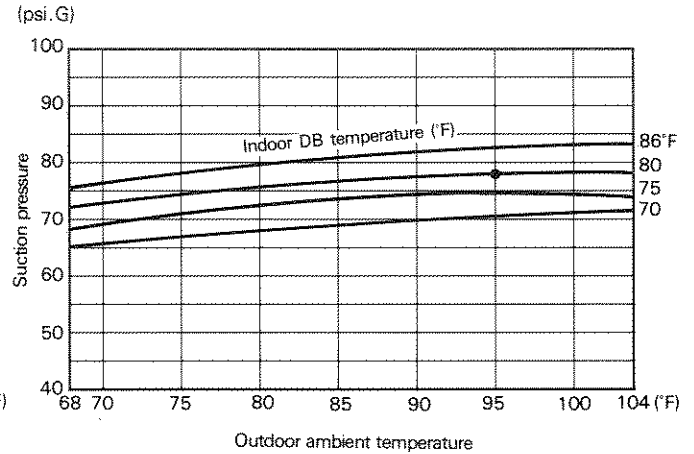
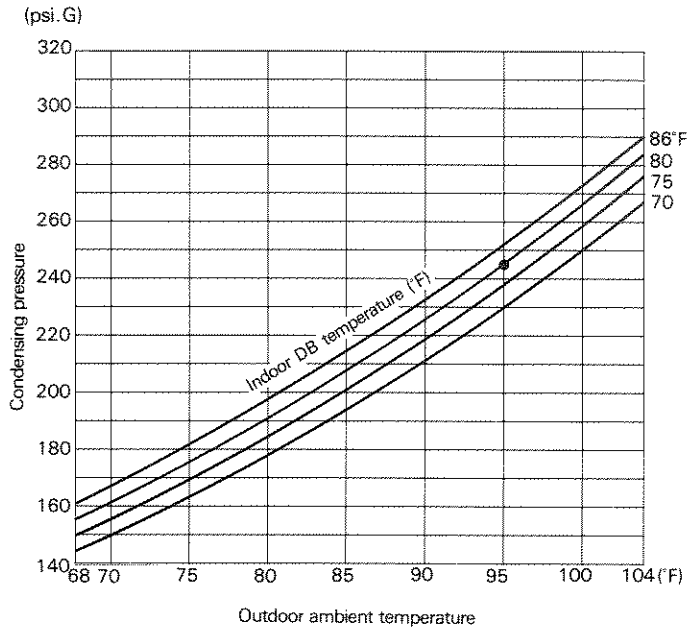
MSH12EN (Heating)

Data is based on the condition of outdoor humidity 75%
Air flow should be set at HI.
A point on the curve shows the reference point.



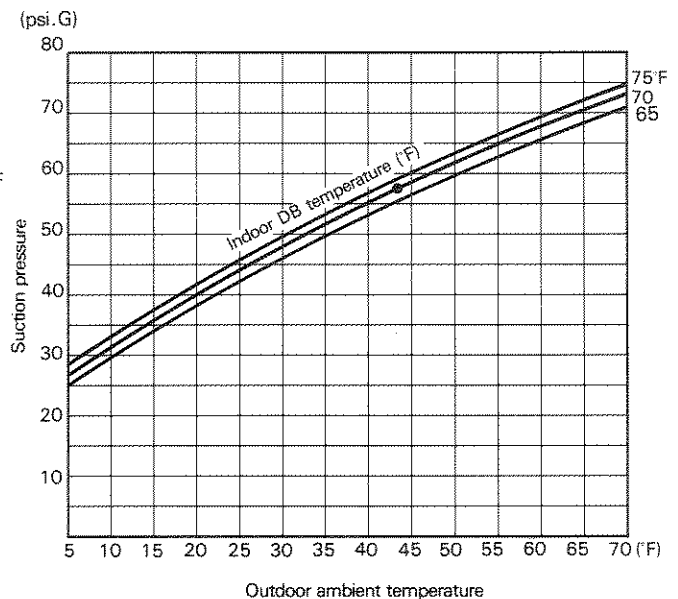
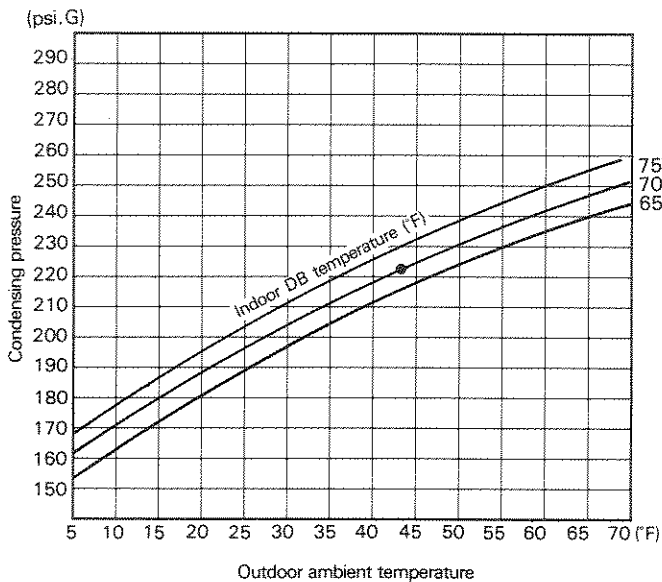
MSH15EN (Cooling)

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



MSH15EN (Heating)

Data is based on the condition of outdoor humidity 75%
Air flow should be set at HI.
A point on the curve shows the reference point.



2. OPERATING RANGE

(1) POWER SUPPLY

	Models	Rating	Guaranteed voltage
Indoor unit	MSH09EW MSH12EN MSH15EN	115V 60Hz 1 ϕ	Min. 103V — Max. 127V
Outdoor unit	MUH09EW	115V 60Hz 1 ϕ	Min. 103V — Max. 127V
	MUH12EN MUH15EN	208/230V 60Hz 1 ϕ	Min. 198V — Max. 253V

(2) OPERATION

Function	Intake air temperature Condition	MSH09EW MSH12EN	MSH15EN	MUH09EW MUH12EN	MUH15EN
		DB (°F)	WB (°F)	DB (°F)	WB (°F)
Cooling	Standard temperature	80	67	95	—
	Maximum temperature	95	71	115	—
	Minimum temperature	67	57	67	—
Heating	Standard temperature	70	60	47	43
	Maximum temperature	80	—	75	65
	Minimum temperature	70	60	17	15

3. OUTLET AIR SPEED AND COVERAGE RANGE

Model	Function	Airflow (CFM)	Air speed (ft/sec)	Coverage range (ft)
MSH09EW	Dry	261	12.3	18.5
	Wet	229	10.8	16.3
MSH12EN	Dry	427	14.3	25.3
	Wet	406	13.6	24.1
MSH15EN	Dry	427	14.3	25.3
	Wet	406	13.6	24.1

- The air coverage range is the value up to the position where the air speed is 1 ft/sec. when air is blown out horizontally from the unit properly at the High speed position.

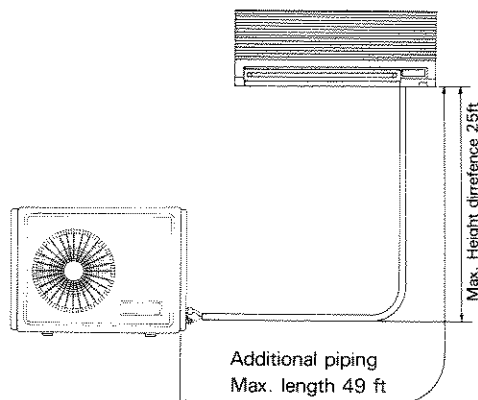
The coverage range should be used only as a general guideline since it varies according to the size of the room and furniture installed inside the room.

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

Model	Outdoor unit precharged (up to 25ft)	Refrigerant piping length (one way)					
		25 ft	30 ft	35 ft	40 ft	45 ft	49 ft
MSH09EW MUH09EW	2 lbs 7 oz	0	3	5	8	11	13
MSH12EN MUH12EN	3 lbs 1 oz						
MSH15EN MUH15EN	3 lbs 3 oz						

5. MAX. REFRIGERANT PIPING LENGTH & MAX. HEIGHT DIFFERENCE

MSH09EW
MSH12EN
MSH15EN

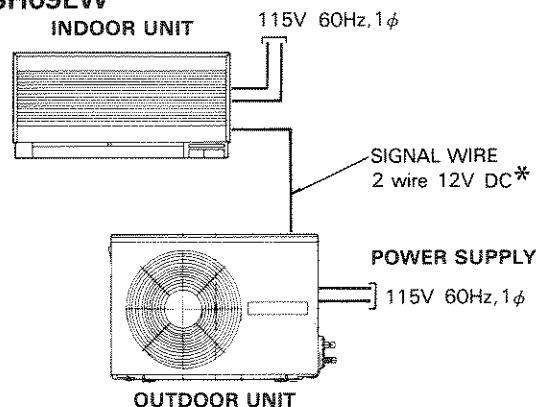


6. STANDARD OPERATION DATA

Model			MSH09EW	
	Item	Unit	Cooling	Heating
Total	Capacity	Btu/h	8,800	10,300
	SHF	—	0.67	—
	Input	kW	0.89	0.92(1.92)
Electrical circuit	Indoor unit		MSH09EW	
	Power supply (V,Hz,φ)		115,60,1	115,60,1
	Input	kW	0.03	0.03(1.03)
	Fan current	A	0.3	0.3
	Aux. heater current	A	—	8.7
	Outdoor unit		MUH09EW	
	Power supply (V,Hz,φ)		115·60·1	
	Input	kW	0.78	0.81
	Comp. current	A	6.90	7.25
	Fan current	A	0.7	0.7
Refrigerant circuit	Condensing pressure	psi.G	239	242
	Suction pressure	psi.G	73	64
	Discharge temperature	°F	179	161
	Condensing temperature	°F	111	110
	Suction temperature	°F	53	35
	Comp. shell bottom temp.	°F	164	146
	Refrigerant pipe length	ft	25	
	Refrigerant charge	—	2 lbs 7 oz	
Indoor side	Intake air temperature	DB °F	80	70
		WB °F	67	60
	Discharge air temperature	DB °F	55	108
		WB °F	54	—
	Fan speed	rpm	1,430	1,430
Outdoor side	Intake air temperature	DB °F	95	47
		WB °F	—	43
	Fan speed	rpm	850	850
	Airflow (Hi)	CFM	229	261
	Airflow	CFM	1,059	1,059

POWER SUPPLY

MSH09EW



* Control voltage

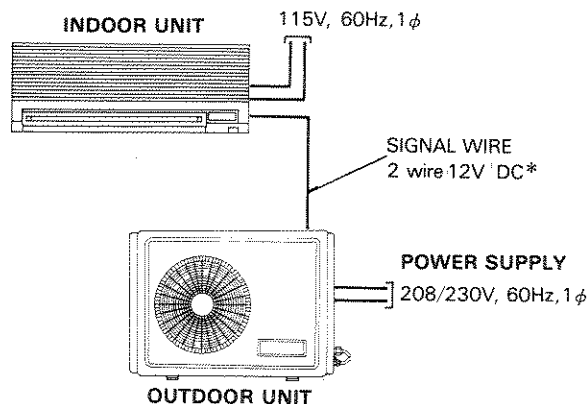
MSH09EW/MUH09EW

Power supply voltage to serial signal circuit is 24V DC.

Between ① and ② on in-out terminal block will be 12V DC peak voltage.

Model			MSH12EN		MSH15EN	
Item		Unit	Cooling	Heating	Cooling	Heating
Total	Capacity	Btu/h	12,000/12,500	12,000/12,500 (17,100/17,600)	13,700/14,200	14,000/14,500 (19,100/19,600)
	SHF	—	0.73	—	0.69	—
	Input	kW	1.21/1.26	1.11/1.15 (2.61/2.65)	1.38/1.40	1.28/1.34 (2.78/2.84)
Electrical circuit	Indoor unit		MSH12EN		MSH15EN	
	Power supply (V, Hz, ϕ)		115·60·1		115·60·1	
	Input	kW	0.05	0.05(1.55)	0.05	0.05(1.55)
	Fan current	A	0.5	0.5	0.5	0.5
	Aux. heater current	A	—	13.0	—	13.0
	Outdoor unit		MUH12EN		MUH15EN	
	Power supply (V, Hz, ϕ)		208/230·60·1		208/230·60·1	
	Input	kW	1.16/1.21	1.06/1.10	1.33/1.35	1.23/1.29
	Comp. current	A	5.3/5.0	4.8/4.6	6.0/5.6	5.7/5.3
	Fan current	A	0.5	0.5	0.5	0.5
Refrigerant circuit	Condensing pressure	psi.G	255	216	243	228
	Suction pressure	psi.G	82	62	78	59
	Discharge temperature	°F	164	127	180	143
	Condensing temperature	°F	113	102	113	108
	Suction temperature	°F	46	32	51	30
	Comp. shell bottom temp.	°F	159	121	169	133
	Refrigerant pipe length	ft	25		25	
	Refrigerant charge	—	3lbs 1oz		3lbs 3oz	
Indoor side	Intake air temperature	DB	°F	80	70	80
		WB	°F	67	60	67
	Discharge air temperature	DB	°F	58	96	57
		WB	°F	57	69	55
	Fan speed	rpm	1,530	1,530	1,530	1,530
	Airflow (Hi)	CFM	406	427	406	427
Outdoor side	Intake air temperature	DB	°F	95	47	95
		WB	°F	—	43	—
	Fan speed	rpm	910	910	910	910
	Airflow	CFM	1,270	1,270	1,270	1,270

POWER SUPPLY **MSH12EN** **MSH15EN**



* **Control voltage.**

MSH12EN MUH12EN
MSH15EN MUH15EN

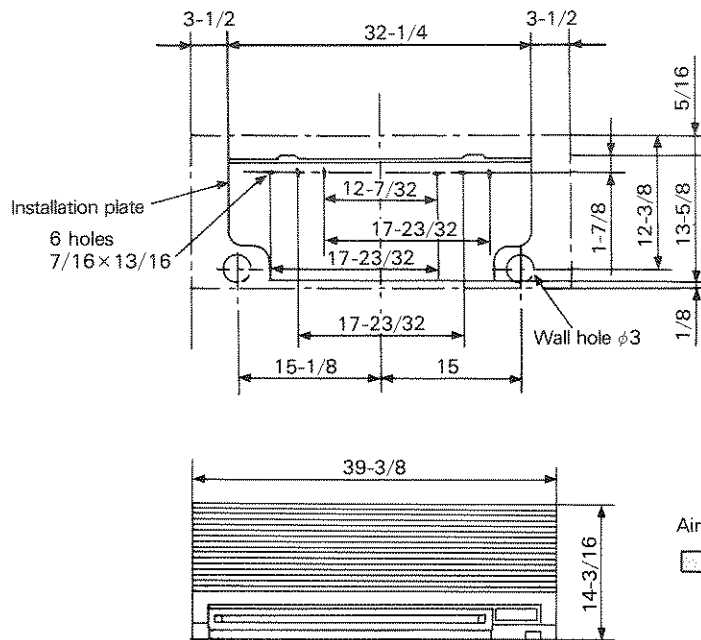
Power supply voltage to serial signal circuit is 24V DC.

Between ① and ② on in-out terminal block will be 12V DC peak voltage.

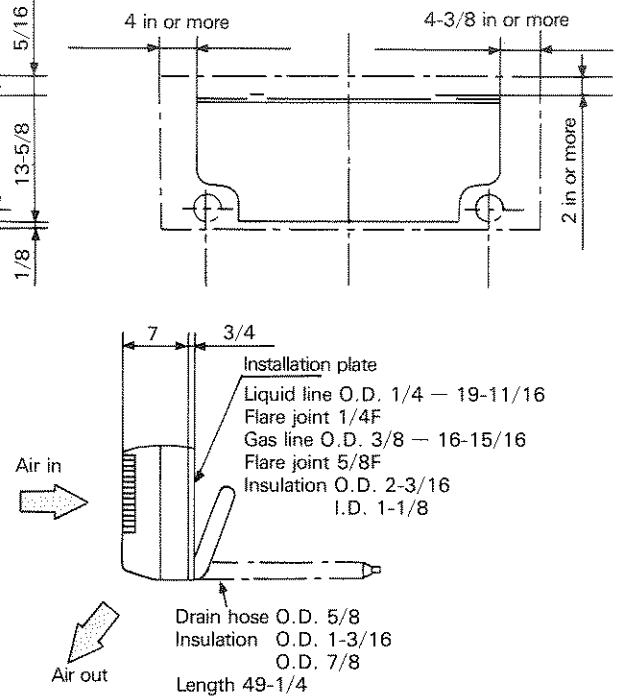
MODELS MSH12EN MSH15EN

Unit : inch

INDOOR UNIT

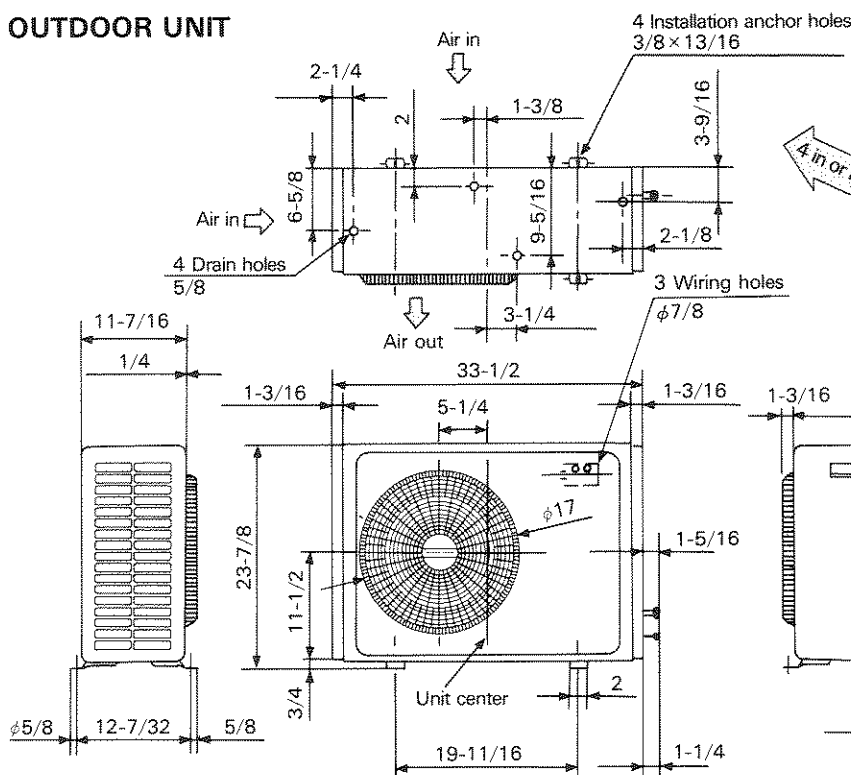


INDOOR UNIT REQUIRED SPACE

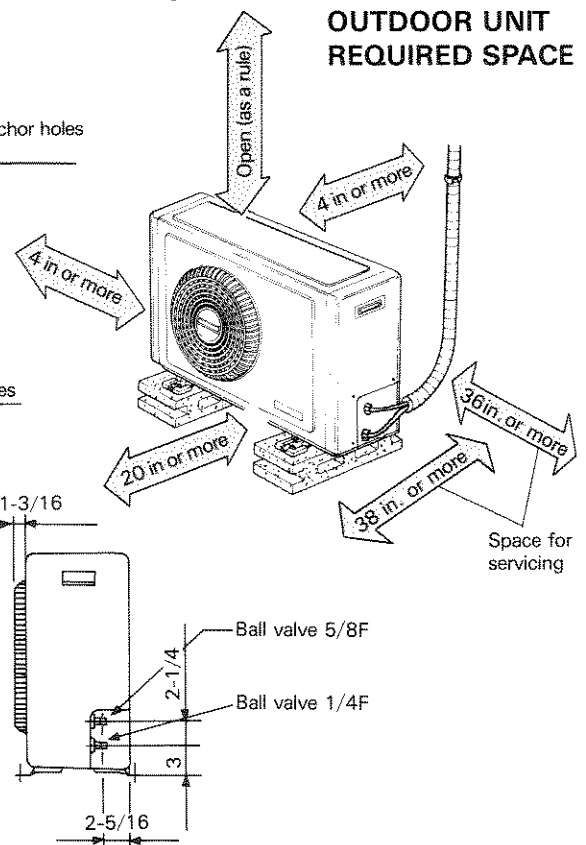


MODELS MUH12EN MUH15EN

OUTDOOR UNIT



OUTDOOR UNIT REQUIRED SPACE



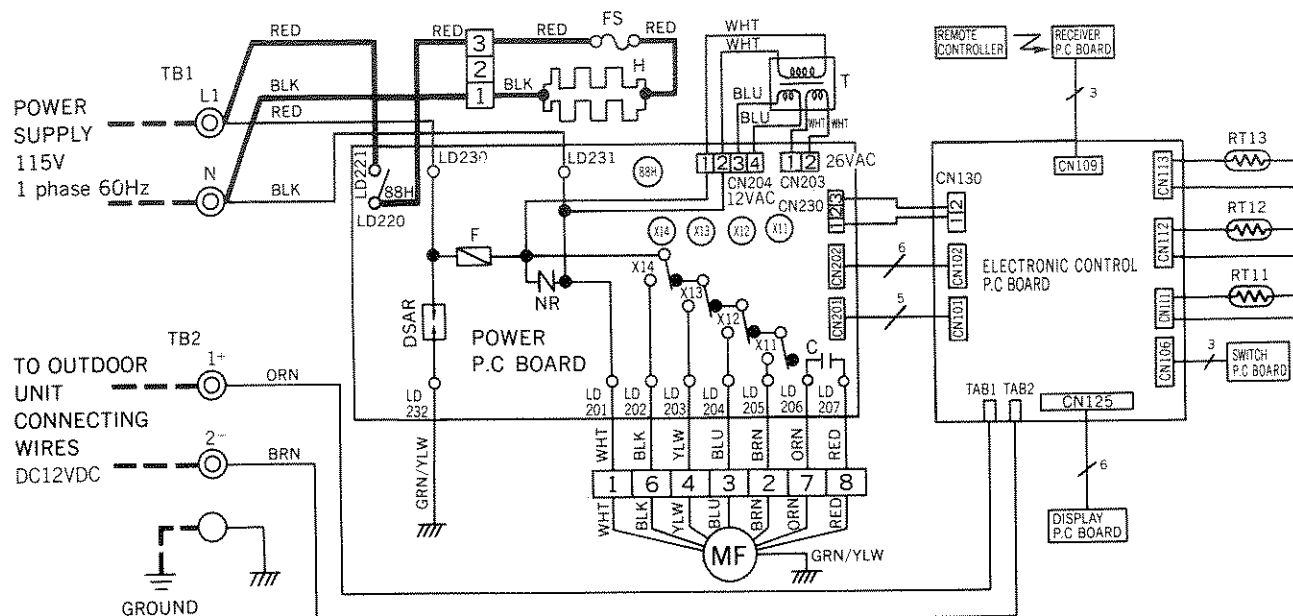
Note : The symbol ϕ indicates diameter

7

WIRING DIAGRAM

INDOOR

MODEL MSH09EW WIRING DIAGRAM



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C	INDOOR FAN CAPACITOR	MF	INDOOR FAN MOTOR (INNER THERMOSTAT)	T	TRANSFORMER
DSAR	SURGE ABSORBER	NR	VARISTOR	TB1,2	INDOOR TERMINAL BLOCK
F	FUSE (2A)	RT11	ROOM TEMPERATURE THERMISTOR	X11~14	INDOOR FAN MOTOR RELAY
FS	THERMAL FUSE [336°F (169°C), 10A]	RT12	INDOOR COIL THERMISTOR	88H	HEATER CONTACTOR
H	HEATER	RT13	HEATER CONTROL THERMISTOR		

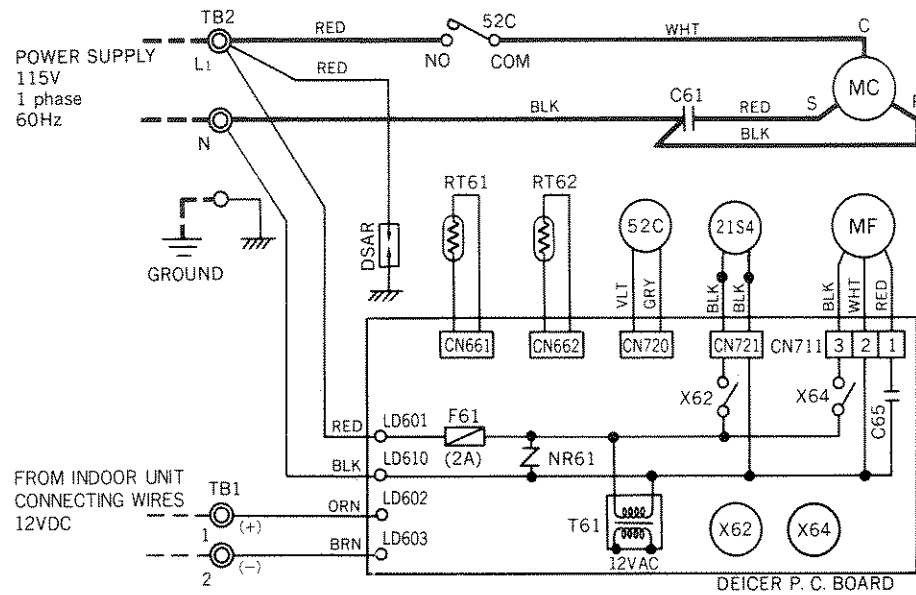
NOTES :

1. For the outdoor electric wiring refer to the outdoor unit electric wiring diagram.
2. Use copper conductors only. (For field wiring)
3. Symbols below indicate.

⊙ : Terminal block, □ : Connector.

OUTDOOR

MODEL MUH09EW WIRING DIAGRAM



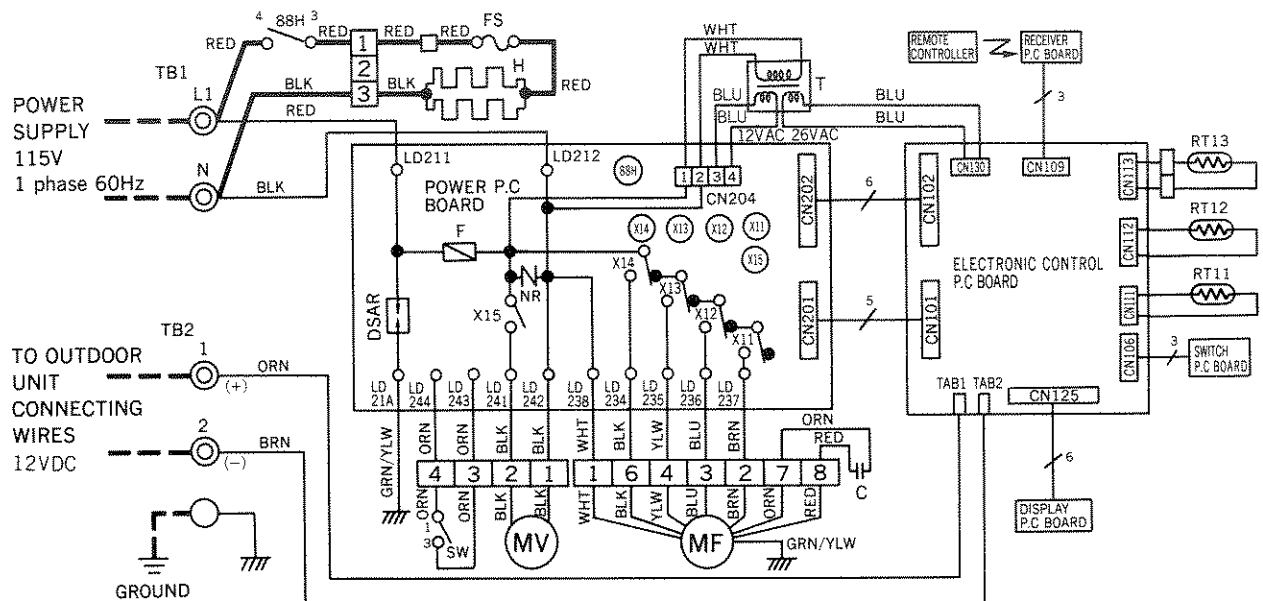
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C61	COMPRESSOR CAPACITOR	MF	FAN MOTOR (INNER THERMOSTAT)	T61	TRANSFORMER
C65	OUTDOOR FAN CAPACITOR	NR61	VARISTOR	X62	R.V. COIL RELAY
DSAR	SURGE ABSORBER	RT61	DEFROST THERMISTOR	X64	FAN MOTOR RELAY
F61	FUSE (2A)	RT62	DISCHARGE TEMPERATURE THERMISTOR	21S4	R.V. COIL
MC	COMPRESSOR (INNER THERMOSTAT)	TB1,2	TERMINAL BLOCK	52C	CONTACTOR

NOTES:

1. Use copper conductors only (For field wiring).
2. Since the indoor and outdoor unit connecting wires have polarity connect them according to the numbers (1 and 2).
3. Symbol below indicate

⊙ : Terminal block, □ : Connector

MODELS MSH12EN MSH15EN WIRING DIAGRAM



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C	INDOOR FAN CAPACITOR	MV	VANE MOTOR	T	TRANSFORMER
DSAR	SURGE ABSORBER	NR	VARISTOR	TB1,2	INDOOR TERMINAL BLOCK
F	FUSE (2A)	RT11	ROOM TEMPERATURE THERMISTOR	X11~14	INDOOR FAN MOTOR RELAY
FS	THERMAL FUSE (378°F, 15A)	RT12	INDOOR COIL THERMISTOR	X15	VANE MOTOR RELAY
H	HEATER	RT13	HEATER CONTROL THERMISTOR	88H	HEATER CONTACTOR
MF	INDOOR FAN MOTOR (INNER FUSE 275°F or INNER PROTECTOR)	SW	VANE MOTOR SWITCH		

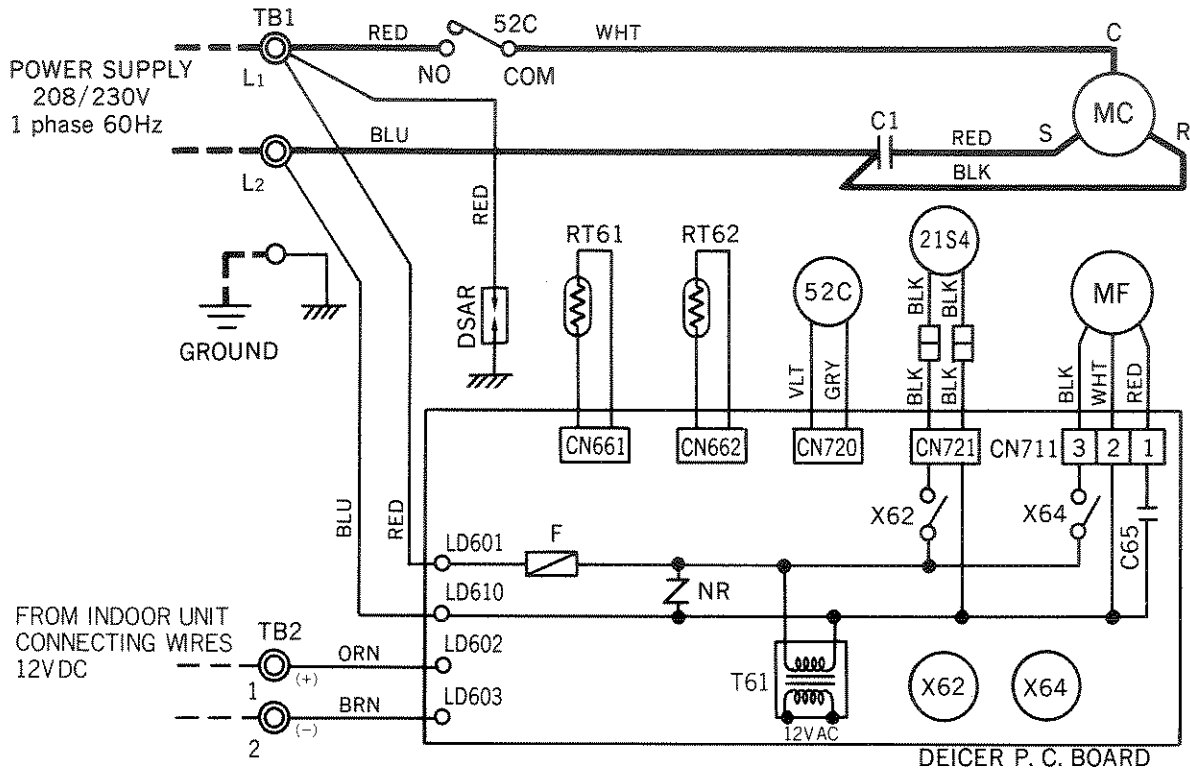
NOTES :

1. For the outdoor electric wiring refer to the outdoor unit electric wiring diagram.
2. Use copper conductors only. (For field wiring)
3. Symbols below indicate.

⊙ : Terminal block, : Connector.

OUTDOOR

MODELS MUH12EN MUH15EN WIRING DIAGRAM



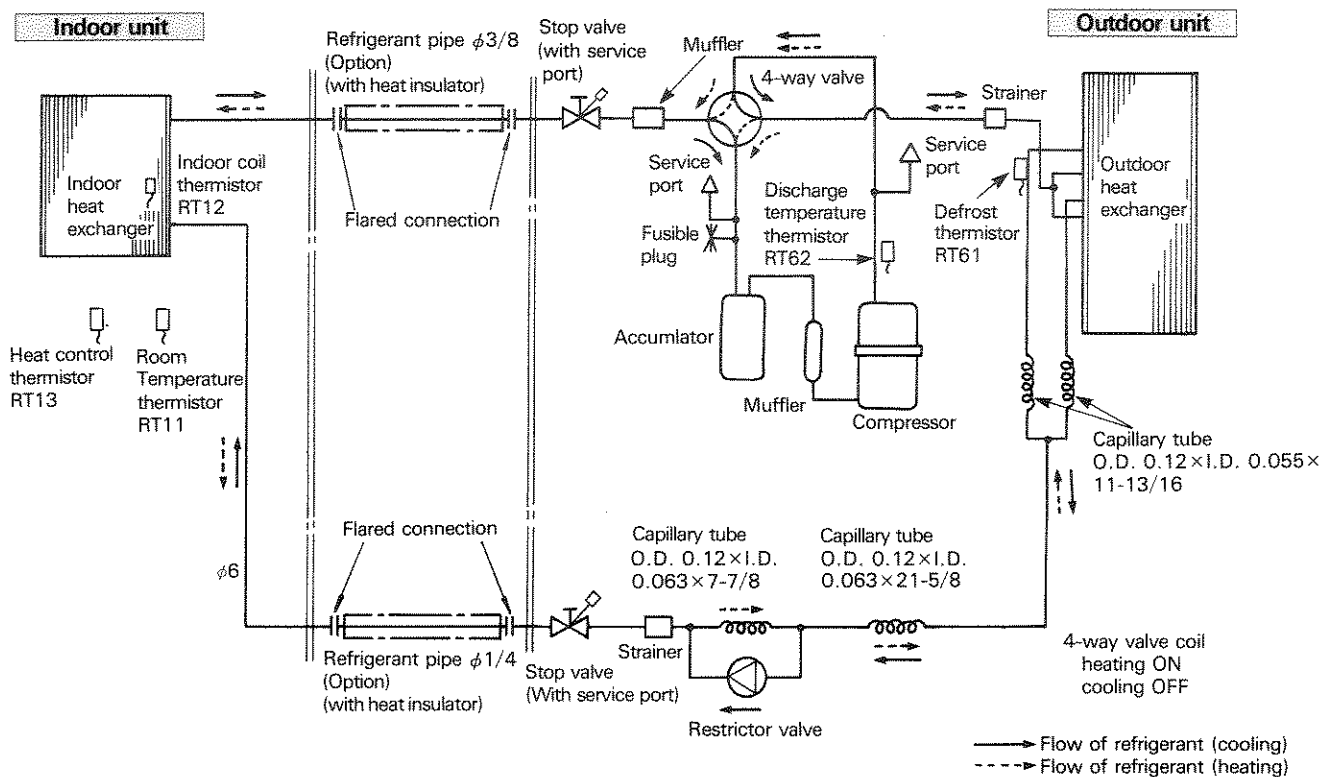
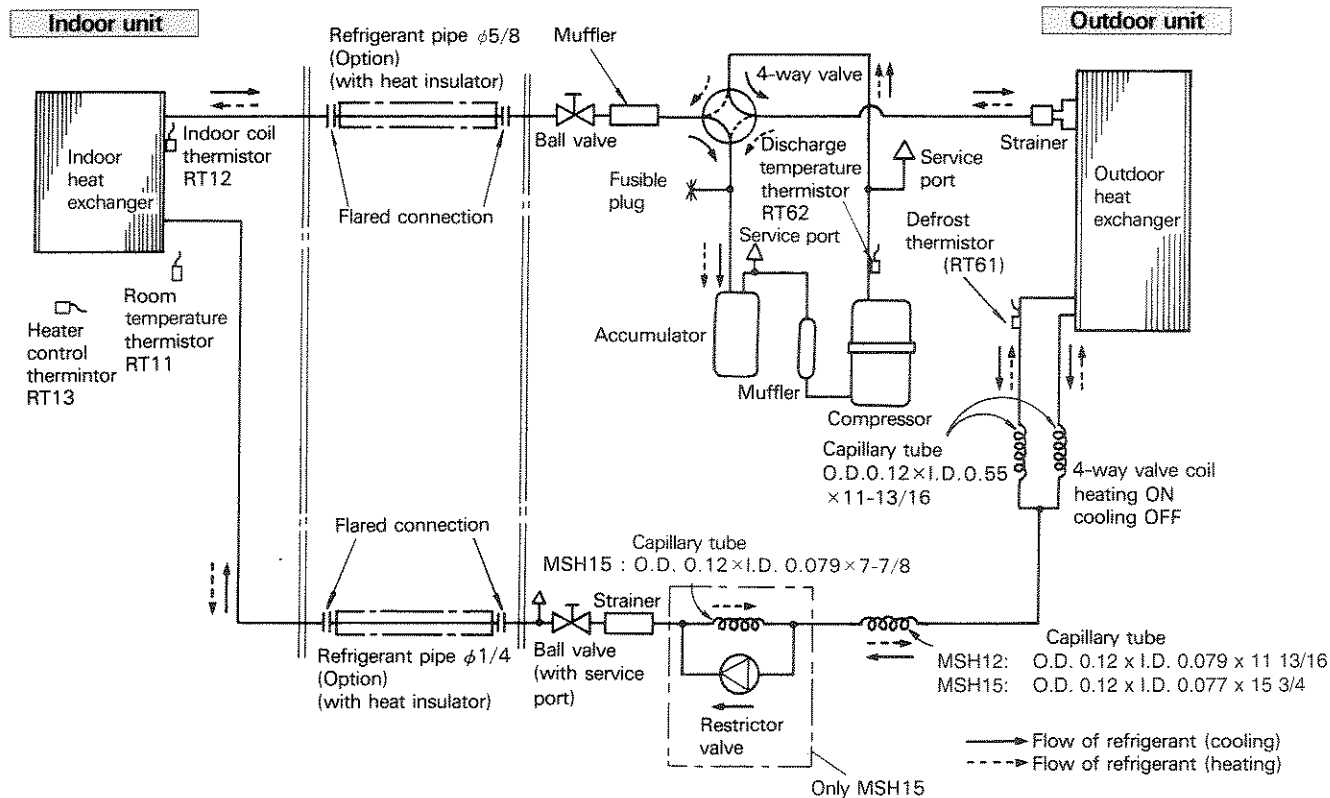
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C61	COMPRESSOR CAPACITOR	MF	OUTDOOR FAN MOTOR (INNER FUSE (275°F) or INNER PROTECTOR)	T61	TRANSFORMER
C65	OUTDOOR FAN CAPACITOR	NR61	VARISTOR	X62	R.V RELAY
DSAR61	SURGE ABSORBER	RT61	DEFROST THERMISTOR	X64	FAN MOTOR RELAY
F61	FUSE (2A)	RT62	DISCHARGE TEMPERATURE THERMISTOR	21S4	R.V COIL
MC	COMPRESSOR INNER THERMOSTAT	TB1,2	OUTDOOR TERMINAL BLOCK	52C	CONTACTOR

NOTES :

1. Use copper conductors only (For field wiring).
2. Since the indoor and outdoor unit connecting wires have polarity connect them according to the numbers (1 and 2).
3. Symbols below indicate.

⊙ : Terminal block, □ : Connector.

MSH09EW

MSH12EN
MSH15EN

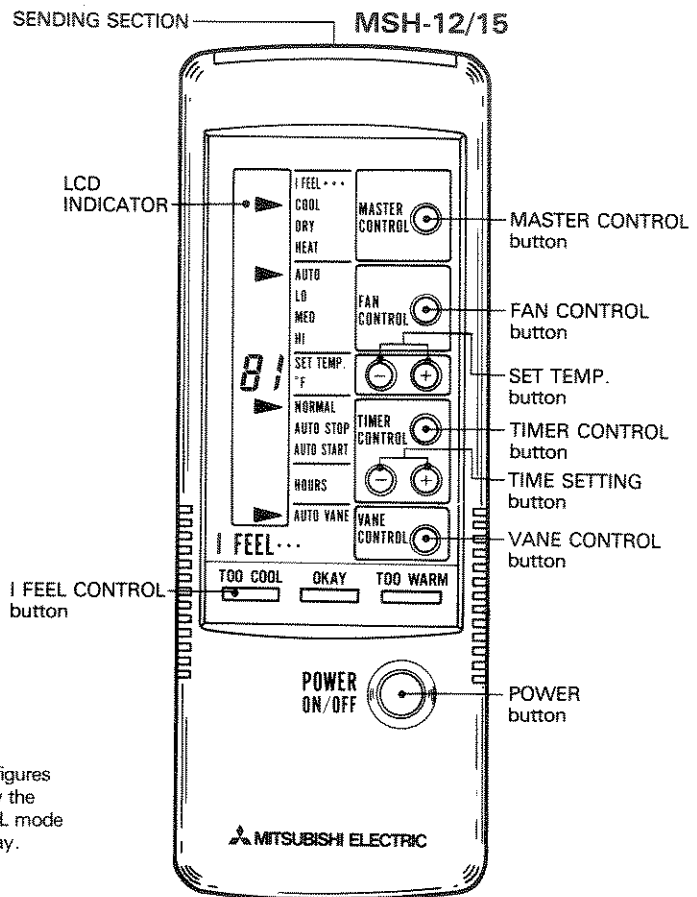
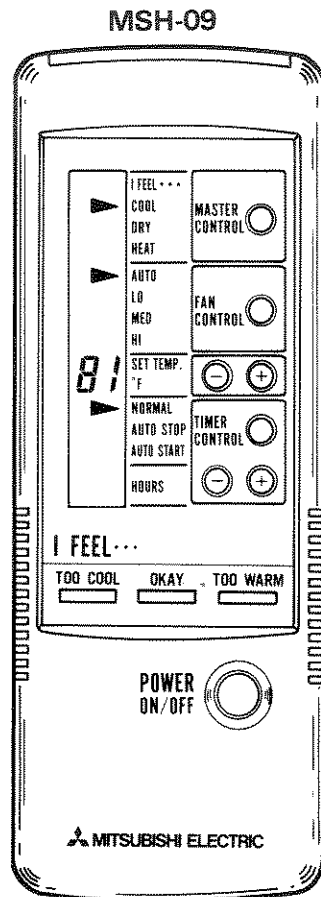
Wireless Remote Controller

Once the controls are set, the same operation mode can be repeated by simply turning the POWER switch ON.

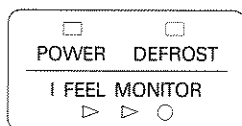
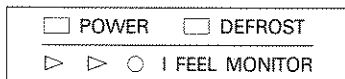
Indoor unit receives the signal with a beep tone.

When the system turns off, "3 min. time-delay function" will operate to protect system from over load and compressor does not restart for 3 minutes.

MSH09EW, MSH12/15EN, MSHM18EN



The figures show the COOL mode display.

INDOOR UNIT DISPLAY SECTION**1. "I FEEL CONTROL" operation**

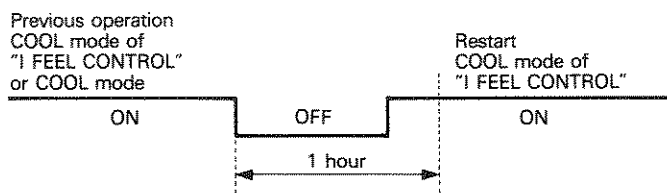
- (1) Press POWER button on the remote controller. Power lamp of the indoor unit will turn on with a beep tone.
- (2) Select the MASTER CONTROL button to "I FEEL CONTROL". And I FEEL MONITOR lamp lights with a beep tone.
- (3) The operation mode is decided by the initial room temp. at start of operation.

Initial Room Temp.	Mode
more than 76°F	COOL mode of "I FEEL CONTROL"
73°F to 76°F	DRY mode of "I FEEL CONTROL"
less than 73°F	HEAT mode of "I FEEL CONTROL"

- Once the mode is fixed, the mode will not change by room temp. afterwards.
- Under the AUTO START timer operation, the mode is determined according to the room temperature 1 hour before the set time.
- When the system is stopped with the POWER button on the remote controller, and restarted within 1 hour in "I FEEL CONTROL" mode, the system operates in previous mode automatically regardless of the room temp.

When the system is restarted after 1 hour, the operation mode is decided by the initial room temp. at starting up the operation.

Example



(4) The initial set temperature is decided by the initial room temperature for the first 2 minutes after start-up of the system.

Mode	Initial room temperature	Initial set temperature	
COOL mode of "I FEEL CONTROL"	More than 88°F	81°F	※1
	84°F to 88°F	79°F	
	81°F to 84°F	77°F	
	76°F to 81°F	75°F	
DRY mode of "I FEEL CONTROL"	73°F to 76°F	Initial room temp. minus 2°F	
HEAT mode of "I FEEL CONTROL"	Less than 73°F	79°F	※2

※1 After the system restarts by the remote controller, the system operates with the previous set temperature. regardless of the initial set temperature.

※2 By room temperature compensation of 4 °F, room temperature of a living space is 75°F.

(5) I FEEL CONTROL buttons

In "I FEEL CONTROL" mode, set temperature is decided by the microprocessor based on the room temperature. In addition, set temperature is controlled by I FEEL CONTROL buttons when you feel too cool or too warm, and when you feel comfortable the OKAY button sets that comfort level.

When the I FEEL CONTROL button is pressed, I FEEL MONITOR lamp on the indoor unit flickers for a second with beeps.

● Variable control

When the TOO COOL or TOO WARM button is pressed, the set temperature is changed based on the room temperature. As the set temperature range is variable, this is called "Variable control". The variable control operates only in "I FEEL CONTROL" mode.

In DRY mode of "I FEEL CONTROL", the set temperature range is fixed ± 2 deg. (°F).

TOO COOL ... To raise the set temperature by 2 ~ 3°F.

OKAY ... To fix and memorize the comfortable present temperature

TOO WARM ... To lower the set temperature by 2 ~ 3°F.

NOTE : When all three LED are lit, the set temperature does not change.
When one or two LED are lit, the set temperature can change.

— I FEEL MONITOR lamp on the indoor unit —

When I FEEL CONTROL button is pressed, I FEEL MONITOR lamp on the indoor unit flickers with beeps and shows the temperature control condition.

I FEEL MONITOR lamp

- ▶▶▶ Shows that difference between Set temperature and Room temperature is more than 3°F
During this condition, I FEEL button is not available.
Wait for about 15 min.
- ▷▶▶ Shows that difference between Set temperature and Room temperature is 2°F to 3°F
The buttons are available.
- ▷▷▶ Shows Room temperature has almost reached Set temperature. The difference is less than 2°F
The buttons are available.

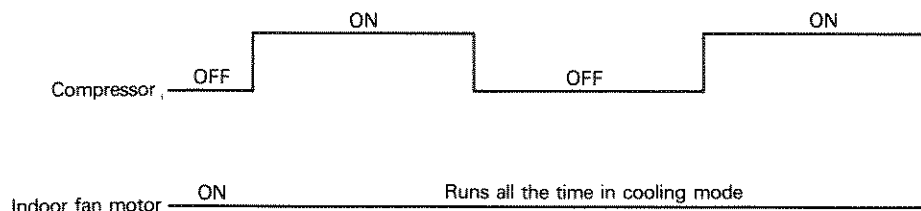
NOTE ●During "I FEEL CONTROL" operation, thermostat (SET TEMP.) is not available. Use "I FEEL CONTROL" buttons to set temp.

●Once the set temperature is set, the microprocessor memorizes the temperature and the system restarts at the same set temperature.

●The set temperature range is 61 to 88°F in COOL • DRY • HEAT mode of "I FEEL CONTROL".

●When the main power is turned off, the settings are canceled. Set temperature will be decided by the room temperature. See page 27.

— COOL mode of "I FEEL CONTROL" —



NOTE Coil frost prevention during COOL mode of "I FEEL CONTROL"

<MSH09EW>

When the indoor coil thermistor RT12 reads 39°F or below for 5 minutes, the coil frost prevention mode starts. The compressor stops and the indoor fan operates at set speed for 5 minutes.

After that, if RT12 still reads 39°F or below, this mode is prolonged until RT12 reads above 39°F.

<MSH12/15EN>

When the indoor coil thermistor RT12 reads 27°F or below for 5 minutes, the coil frost prevention mode starts. The compressor stops and the indoor fan operates at set speed for 5 minutes.

After that, if RT12 still reads 27°F or below, this mode is prolonged until RT12 reads above 27°F.

●Indoor fan operates at the set speed by FAN CONTROL switch.

Followings are the fan speed in AUTO.

	Temperature difference	Fan speed
Room temperature minus Set temperature : 4 to 7°F or over		HI
Room temperature minus Set temperature : 2 to 7°F		MED
Room temperature minus Set temperature : 2 to 3°F or below		LO

2 deg. 3 deg. 4 deg. 7 deg.

— DRY mode of "I FEEL CONTROL" —

The system uses the same refrigerant circuit as the cooling circuit for dry operation.

The compressor and the indoor fan are controlled by temperature and by the microprocessor.

By such controls, indoor flow amounts will be reduced in order to lower humidity without much room temperature decrease. The operation of the comp. and indoor fan is as follows.

- When the thermostat is off, the compressor repeats 4 min. OFF/1 min. ON cycle operation.**

Time Chart

Thermostat

Indoor fan VLO speed

Outdoor fan compressor

2 min. 8 min. 3 min. 4 min. 1 min.

● In DRY mode of "I FEEL CONTROL", FAN CONTROL switch is not available.

	Temperature difference	Fan speed
Room temperature minus Set temperature : 4 to 7°F or over		HI
Room temperature minus Set temperature : 2 to 7°F		MED
Room temperature minus Set temperature : 2 to 3°F or below		LO

Cold air prevention control

- (5) If power is turned off during heat operation, the indoor fan operates for 30 sec. in LO speed to eliminate remaining heat.

2. High pressure protection

During heating operation the outdoor fan motor is controlled by the temperature of the indoor coil thermistor RT12 for excess rise protection of compressor discharge pressure.

This high pressure protection control is as below.

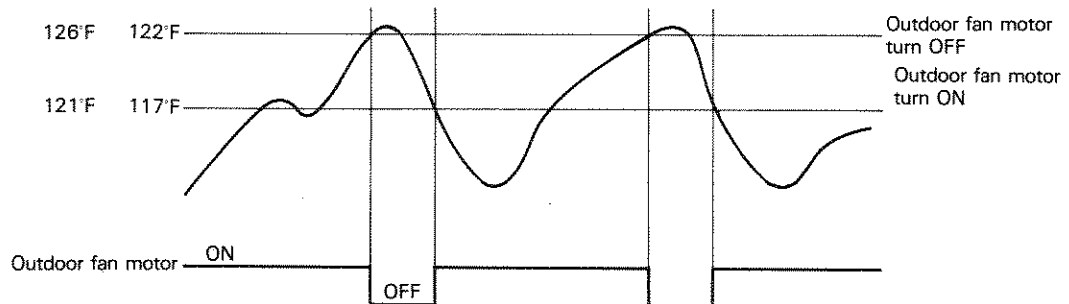
Outdoor fan		Model
ON	OFF	
121°F	126°F	MSH09EW
117°F	122°F	MSH12EN
		MSH15EN

High pressure protection time chart

Indoor coil thermistor

RT12

<MSH09/MSH12/MSH15>



NOTE : When the outdoor fan is off, the heating defrost is not detected by the defrost thermistor RT61.

3. Defrosting

Outdoor unit defrosting is controlled by outdoor P.C. board, with detection by the defrost thermistor RT61.

Defrost starting conditions

When all conditions of a) ~ d) are satisfied, the defrosting operation starts.

- Under heat mode of "I FEEL CONTROL" and heat operation, the compressor cumulative time exceeds the defrost interval.
- The defrost thermistor RT61 is below 32°F.
- After releasing the high pressure protection of the outdoor fan operation, 4 min. and 16 sec. have elapsed.
- The compressor operates for 1 min. or more.

Defrost stopping conditions

When the condition e) or f) is satisfied, the defrosting operation stops.

- The defrost thermistor RT61 reads above 50°F
- The defrosting time exceeds 15 min.

The defrosting operation stops by 15-minute timer.

Defrost interval

The defrost interval depends on the defrosting time.

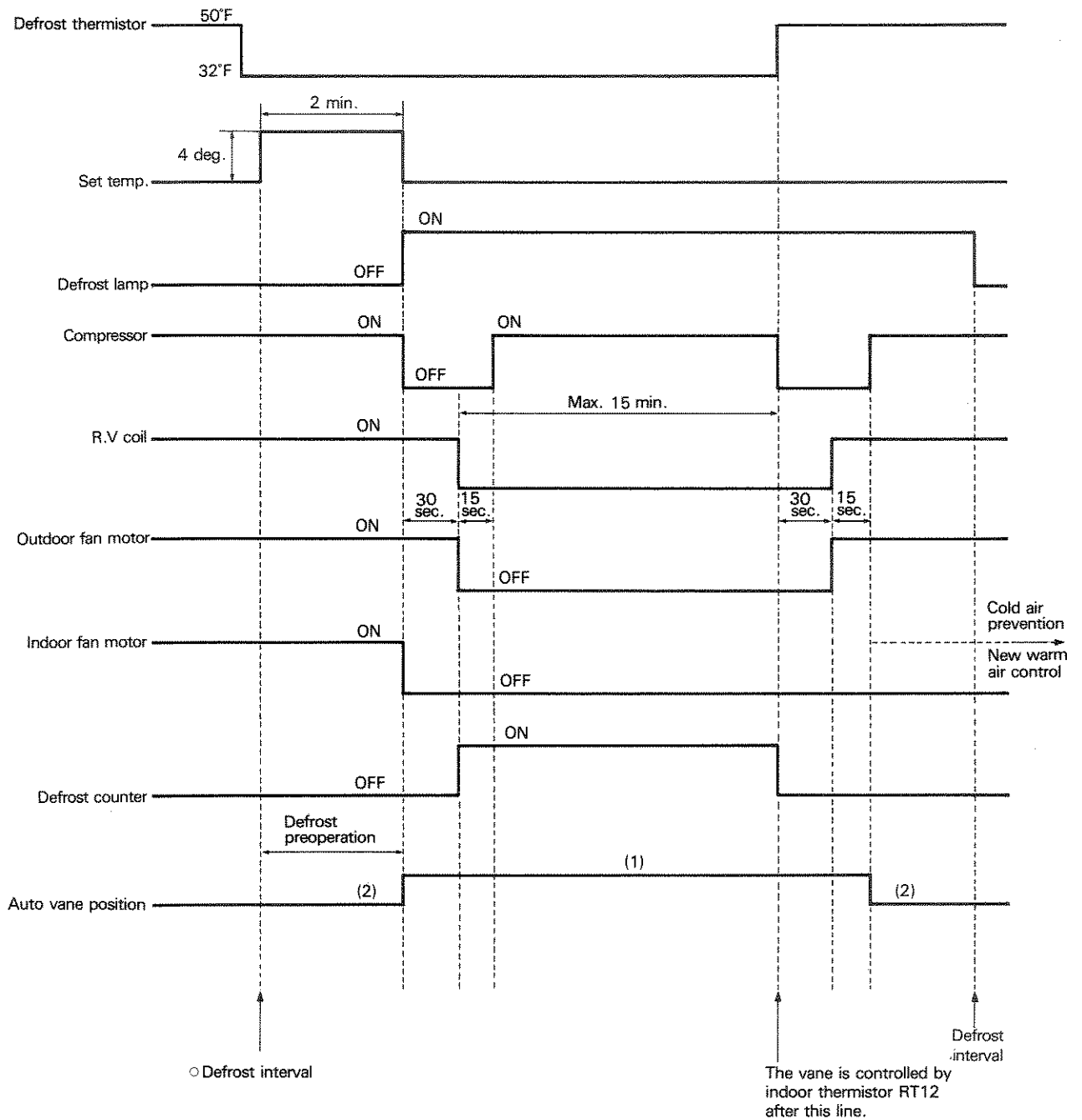
- After starting of heating operation, the first and second defrost interval are fixed to 30 min.
- From the third interval, it is calculated so as that defrost time is 2 min.

Defrost Time	Defrost Interval
under 2 min.	Previous interval plus 10 min.
2 ~ 3 min.	Same as previous
3 ~ 4 min.	Previous interval minus 10 min.
over 4 min.	Previous interval minus 15 min.

3. Max. and Min. of Defrost Interval

Mode	Max.	Min.
MSH09EW MSH12EN MSH15EN	40 min.	15min.

Defrost time chart



4. Heater control

(1) When all listed conditions are satisfied and 30 sec. have elapsed, power is supplied to the heater.

- ① In heating mode
- ② Indoor fan speed is faster than LO.
- ③ Room temperature thermostat is on.
- ④ By temperature of Heater control thermistor RT13

	ON	OFF (Heater ON/OFF)
MSH09EW	131°F	140°F
MSH1215EN	142°F	151°F
- ⑤ By difference between set temperature and room temperature.
5 deg. (°F) : ON, below 4 deg. (°F) : OFF
- ⑥ Not in heating defrost mode

(2) If one of above conditions is not satisfied, the heater turns off.

- When system is stopped by pressing the power button, the indoor fan operates for 30 sec. in SET speed to eliminate the remaining heat.
 - When the room temperature thermostat is off, the indoor fan operates at VLO (Very LO) speed.
- (3) Power is not supplied to the heater under following condition even if all above conditions are satisfied.
- When RT13 is under -4°F, heater does not turn on as RT13 is considered to be disconnected.

5. Discharge Protection

When the discharge temperature is too high because of unit gas leakage or other reasons, the discharge temperature thermistor RT62 stops compressor in order to protect compressor from burning.

Models	ON	OFF
MSH09EW	185°F	248°F
MSH12EN		
MSH15EN		

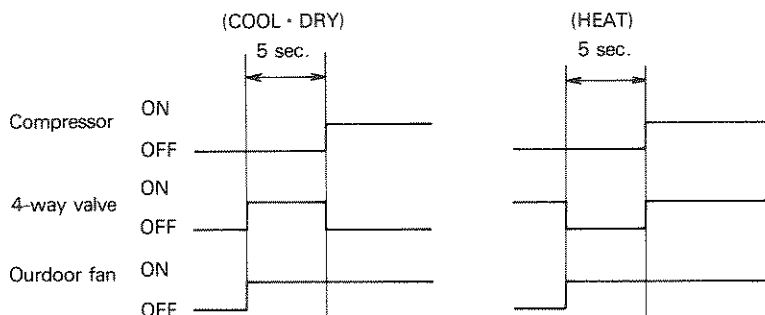
NOTE : When the discharge protection works, the compressor will not start for 3 minutes by 3-minute time delay function.

Discharge protection operates in "I FEEL CONTROL", COOL, DRY, and HEAT mode.

6. 4-way valve control

Heating ON
Cooling OFF
Dry OFF

NOTE : The 4-way valve reverses for 5 sec. right before start-up of the compressor.



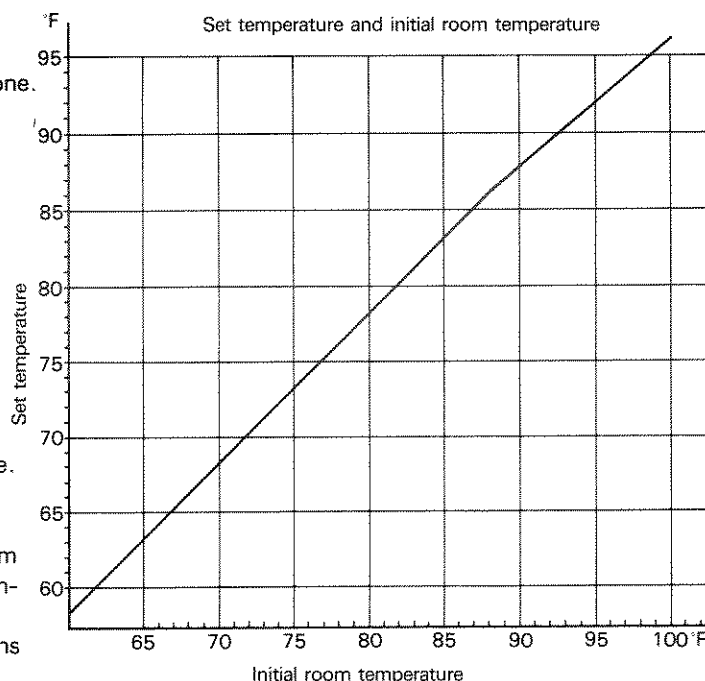
2. COOL operation

- (1) Press POWER button.
Power lamp of the indoor unit turns on with a beep tone.
- (2) Select COOL mode.
- (3) Set the SET TEMP. button.
The setting range is 59 to 89°F.
* "I FEEL CONTROL" buttons are not available.
Indoor fan continues to operate regardless of thermostat's OFF-ON.
Coil frost prevention is the same as COOL mode of "I FEEL CONTROL".

3. DRY operation

- (1) Press POWER ON/OFF button.
Power lamp of the indoor unit turns on with a beep tone.
- (2) Select DRY mode.
- (3) Indoor fan operates at VLO speed.
- (4) Two minutes later the microprocessor reads the room temperature and decides the set temperature. Set temperature will be as shown in this chart.

Thermostat (SET TEMP.) is not available. The other operations are the same as DRY mode of "I FEEL CONTROL".



4. HEAT operation

- (1) Press POWER button.
POWER lamp on the indoor unit turns on with a beep tone.
- (2) Select HEAT mode.
DEFROST lamp on the unit lights during the cold air prevention control.
- (3) Press SET TEMP. button to select the desired temperature.
The setting range is 59 to 89°F.
"I FEEL CONTROL" buttons are not available.
- (4) Indoor fan speed control, high pressure protection, defrosting, heater control are the same as HEAT mode of "I FEEL CONTROL".

5. TIMER

1. AUTO STOP operation

AUTO STOP mode has "SOFT SLEEP" circuit which provides comfortable temperature control for sleeping.

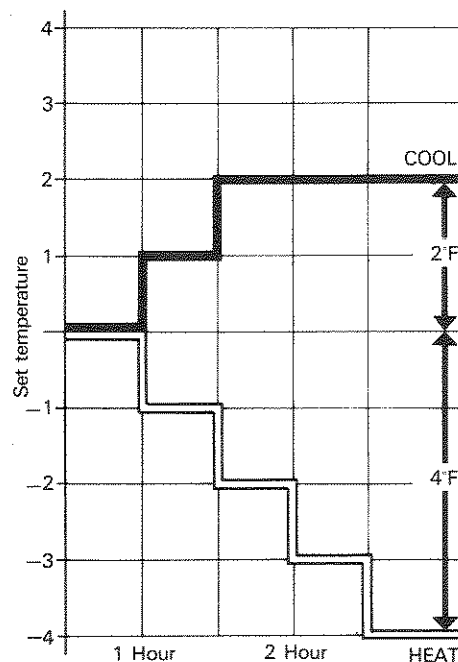
- (1) Set the TIMER CONTROL to AUTO STOP.
- (2) Set the time. Time setting is in 1 hour units for up to 12 hours.
- (3) "SOFT SLEEP" circuit operates in COOL and HEAT mode. By this circuit, system operates at the set temperature for the first 1 hour. Then in COOL mode the set temperature rises by 1°F half-hourly to 2°F range and in heat mode the set temperature falls by 1°F half-hourly to 4°F range.

In "I FEEL CONTROL" and DRY mode, the circuit does not operate.

2. AUTO START operation

- (1) Set the TIMER CONTROL button to AUTO START.
- (2) Set the time. Time setting is in 1 hour units for up to 12 hours.
- (3) In HEAT mode, warming up circuit operates.

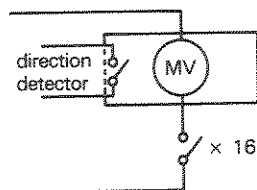
NOTE TIMER setting will be canceled by power failure or breaker functioning.



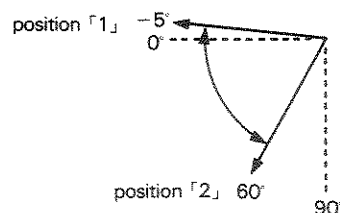
MSH09/12/15

6. AUTO VANE adjustment MSH12EN MSH15EN

(1) The vane circuit / Auto vane direction



The vane motor circuit



Auto vane direction

(2) Vane control

1 Automatic control (Auto vane lamp is on.)

● During COOL operation

The vane is at position 「1」 initially → power ON → moves to position 「2」 returns to 「1」 → fixes on 「1」

● During HEAT operation

Power ON → the vane moves to position 「2」 → moves to 「1」

○ Until the temperature of Indoor coil thermistor RT12 rises to 97°F : position 「1」
(on the indoor heat exchanger)

○ When the thermistor reads 97°F : change position 「1」 → 「2」

○ Until the temperature of Indoor coil thermistor RT12 falls to 86°F : position 「2」
(on the indoor heat exchanger)

○ When the thermistor reads below 86°F : change position 「2」 → 「1」

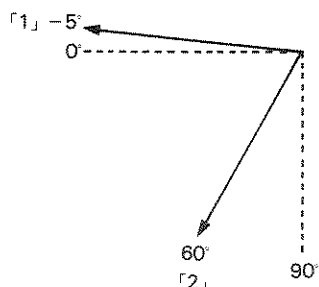
When contactor (52C) is off : position 「1」

● During defrosting : the vane is forced to return to position 「1」

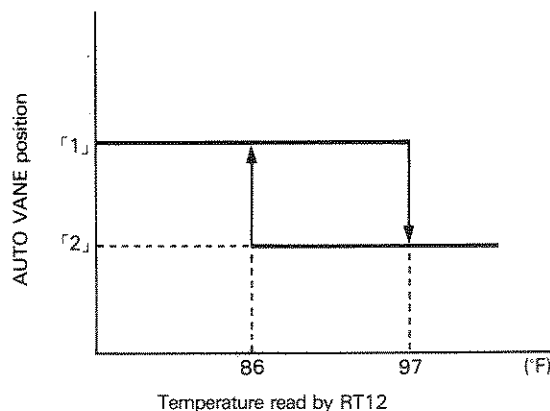
The indoor fan speed is VLO while the vane is working.

When thermistor (RT12) reads 86°F or below

Contactor (52C) is off.



When Thermistor (RT12) reads 97°F or above.



7. EMERGENCY-TEST operation

When the remote controller is missing, has failed or the batteries run down, set the emergency run selector switch on the front of the indoor unit to heat or cool and press the emergency run on/off switch. The unit will start and the operation lamp will light.

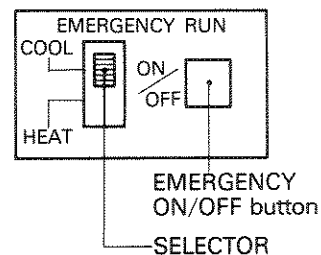
The first 30 min. of operation will be the test run operation. This operation is for servicing. The indoor fan runs at high speed and the system is in continuous operation. The thermostat does not operate and the timer is reset to normal.

After 30 min. of test run operation the system shifts to emergency run operation with a set temperature of 75°F in heating or cooling. The fan shifts to MED speed.

This operation continues until the emergency run on/off button is pressed or a button on the remote control is pressed, then normal operation will start.

The coil frost prevention circuit operates in this mode.

Defrost of outdoor unit works in emergency heating.



1. COMPULSORY DEFROSTING MODE FOR SERVICE

Defrosting mode can be accomplished regardless of the defrost interval restriction by short-circuiting the connector (CN606 for MUH09,12,15) on the outdoor P.C. board which is located in outdoor unit.

RT61 must be below 50°F.

2. When frost is not eliminated by defrost mode for some reason such as coldness, cut the jumper wire of the outdoor P.C. board.

Model	Jumper wire		Change point
		Test point	
MUH09EW	JPF	P 51	Defrost finish temperature changes from 50°F to 54°F.
MUH12EN			
MUM15EN		P 54	

3. AUTO RESTART FUNCTION

When the indoor unit is controlled by the remote controller; the operation mode, set temperature, and the fan speed are memorized by the indoor electronic control P.C. board. After power failure, the unit operates automatically when power is restored. If the unit operated in "I FEEL CONTROL" mode before power failure, the operation is not memorized. In "I FEEL CONTROL" mode, the operation is decided by the initial temperature. Refer to page 27.

How to set "AUTO RESTART FUNCTION"

Cut the jumper wire JR84 on the indoor electronic control P.C. board.

Operation

- If main power (AC115V) is cut, the operation settings remain.
- When power is restored, the unit restarts in previous mode 3 minutes later without remote controller.
- Even if power is cut for about 0.5 seconds, auto restart works.

Note

- If main power is cut while AUTO START/STOP timer is set, the timer setting is cancelled when auto restart function works.
- If the unit was off by the remote controller before power failure, auto restart function does not work as the power button of the remote controller is off.
- To prevent breaker off due to starting current rush systematize other home appliance not to turn on at the same time.

4. Fan speed during Flow Soft control

Normally, after a compressor turns off by the thermostat, the indoor fan operates at a lower speed than LO.

This speed is called Very Low (VLO) in this manual. When the compressor runs, the fan operates at the setting speed. Due to the cold air prevention control, the fan does not start until the indoor coil thermistor RT12 reads above 72°F.

To operate fan at set speed when thermostat off, cut jumper wire JR81 on the board.

MSH09EW
MSH12EN
MSH15EN

Self check function

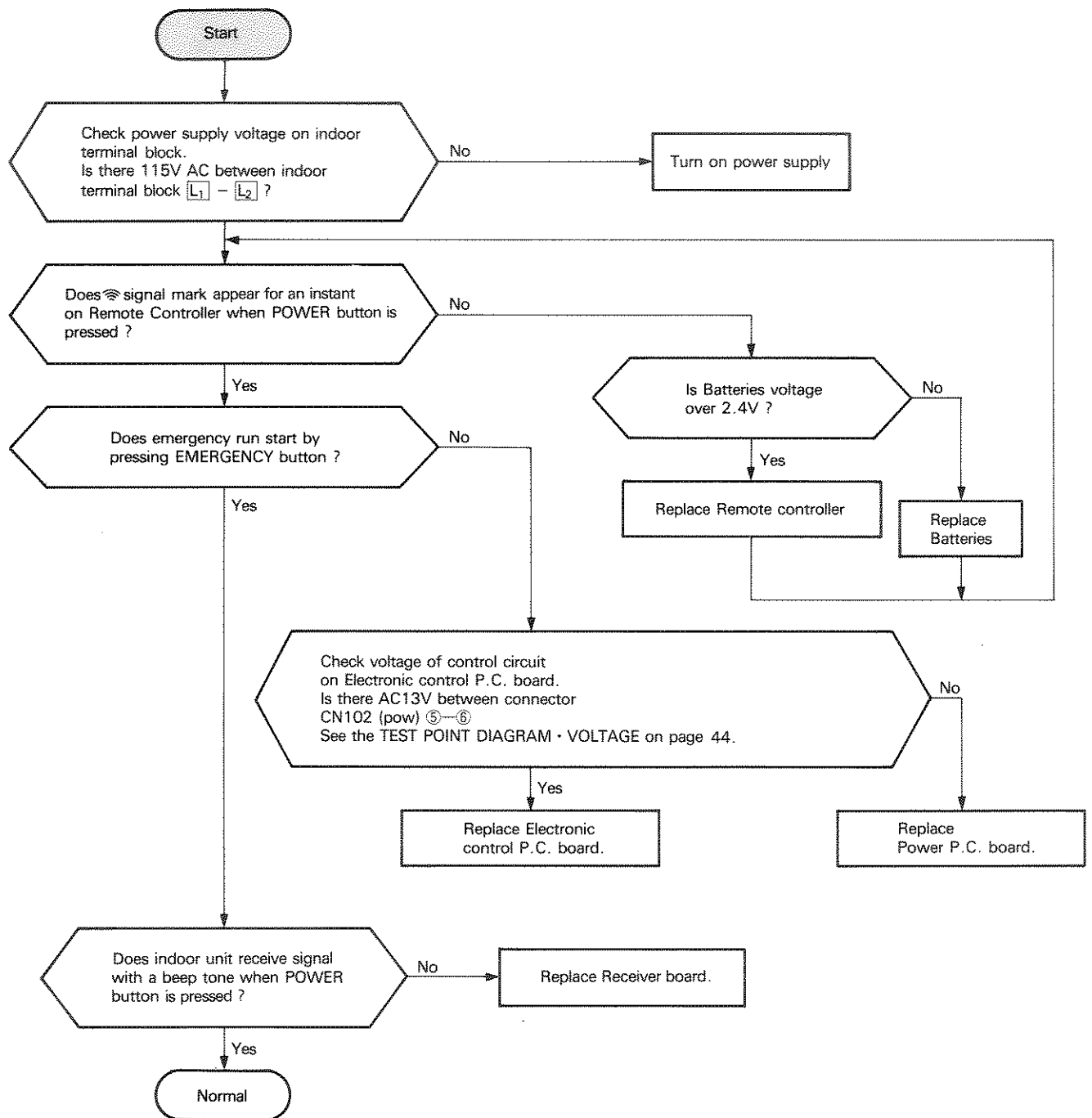
This function is to show defective point by lighting or flashing of the indoor unit power lamp, defrost lamp, or "I FEEL" monitor lamp (monitor LED). If troubles written in the below table occur during operation, the self check result is indicated. The abnormal point indication disappears by pressing the power on/off button of the remote controller and when the unit is on.

* Before taking measures make sure that the symptom reappears, for accurate troubleshooting
Self Check Table

No.	Abnormal point	Indication	Symptom	Detect method	Cause	Measures
1	Serial signal	POWER DEFROST    I FEEL MONITOR   	Outdoor unit does not run.	1. When serial signal from outdoor unit stops for 4 to 5 sec. When serial signal stops for 4 to 5 sec. after 1st on of 52C relay by POWER turning on.	- Indoor Outdoor connection mis-wiring - Indoor Outdoor connection disconnecting - Connector misconnecting - Indoor electronic control P.C. board defect - Outdoor P.C. board defect - Electrical parts defect - Outdoor power supply off	- Check wiring (Visual check and conductivity check) - Check indoor board - Check outdoor board - Check electrical parts
	Mis-wiring	     	Indoor unit power turns off.	2. Detects Indoor coil thermistor short or open circuit every 2 sec. during operation.	- Thermistor defect - Connector disconnecting - Connector misconnecting - Indoor control P.C. board defect	- Check thermistor character - Reconnect connector - Check indoor board
3	Discharge temperature thermistor	     	- Compressor is not operating. - Indoor unit power turns off.	3. Detects Discharge thermistor open : more than 10 min. from compressor start up. Detects Discharge thermistor short : During Compressor operation.	- Thermistor defect - Connector misconnecting - Outdoor P.C. board defect	- Check thermistor character - Reconnect connector - Check outdoor board

1. (1) Operation does not start .

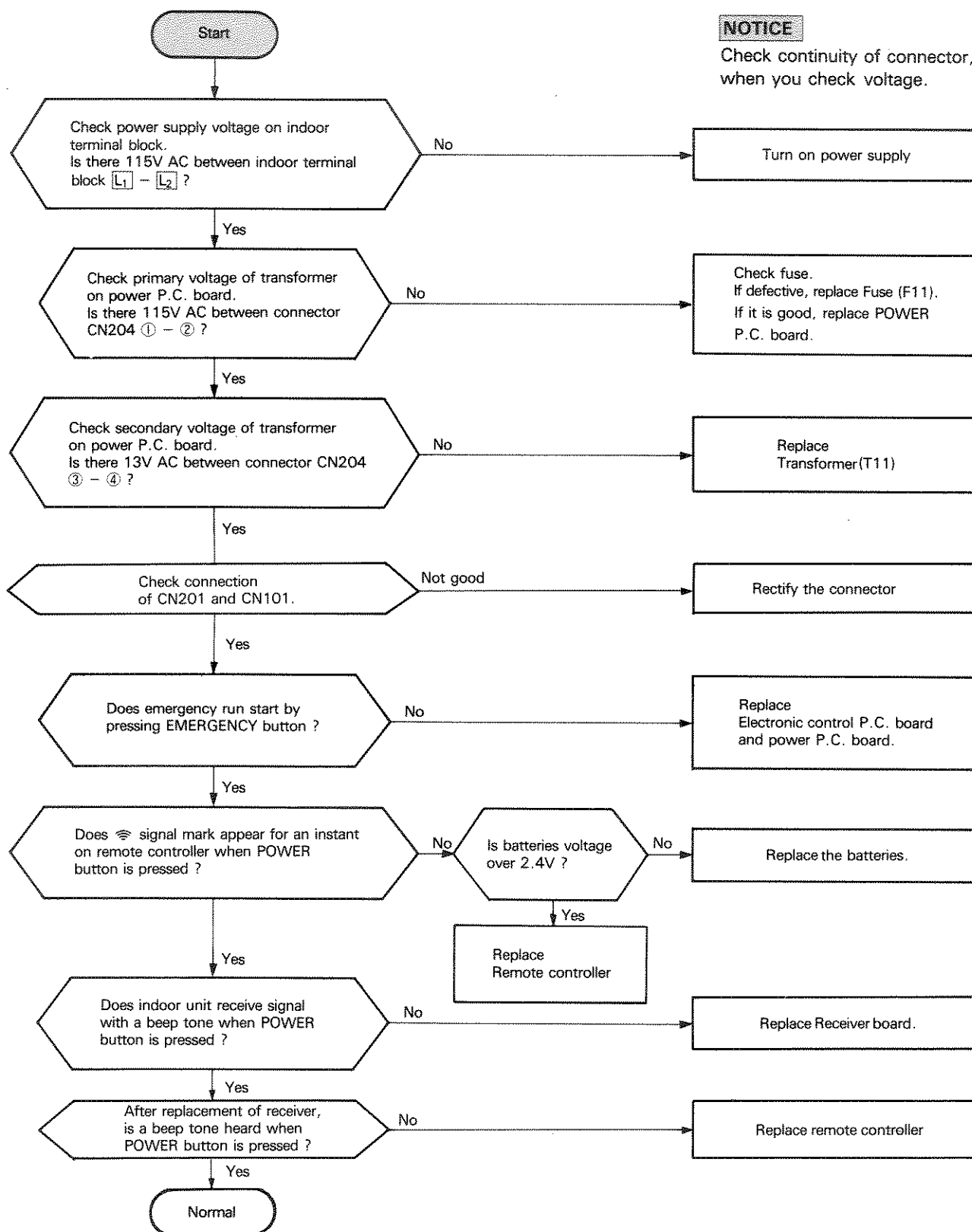
MSH09EW



(2) Operation does not start.

MSH12EN

MSH15EN



2. Outdoor fan does not operate. (compressor operates)

MSH09EW

MSH12EN

MSH15EN

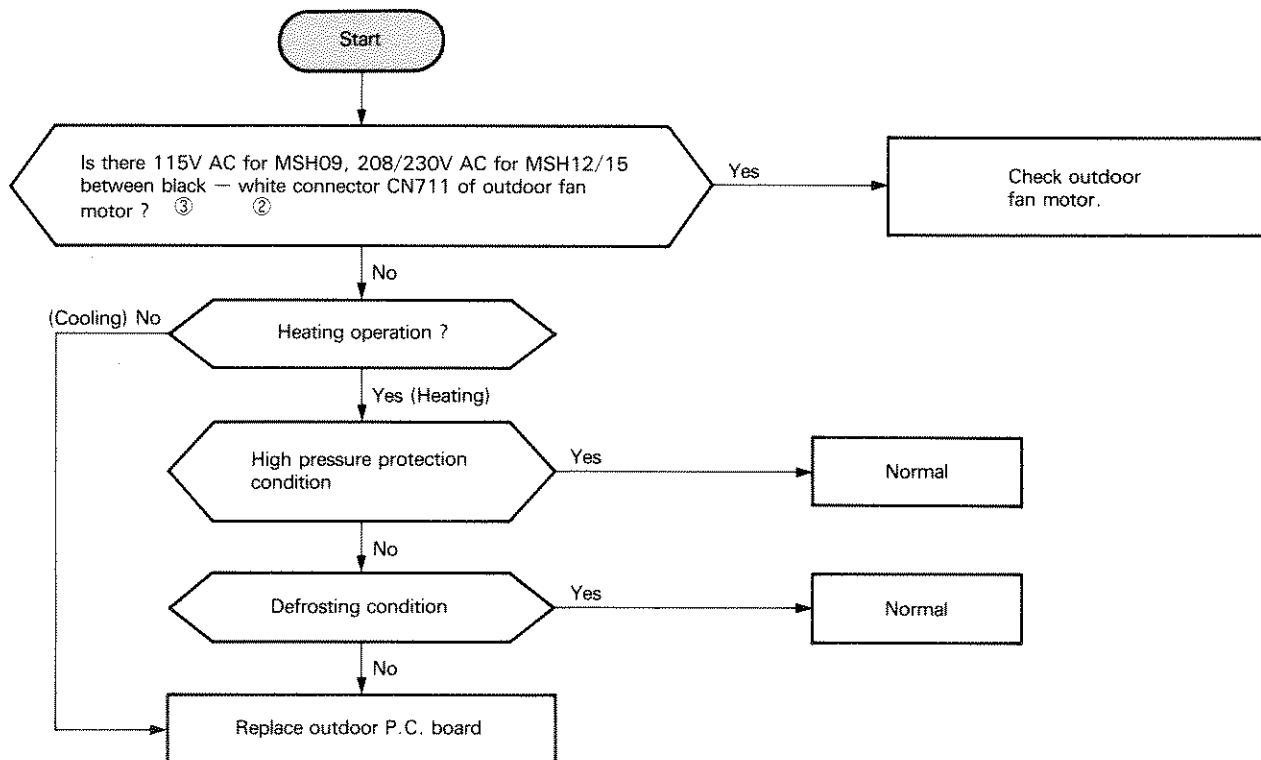
Below listed are not troubles:

1. Heating defrost

During heating defrost operation, the outdoor fan stops. Refer to defrost time chart on page 31.

2. High pressure protection

During heating operation, when high pressure protection works the outdoor fan stops. Refer to high pressure protection time chart on page 30.

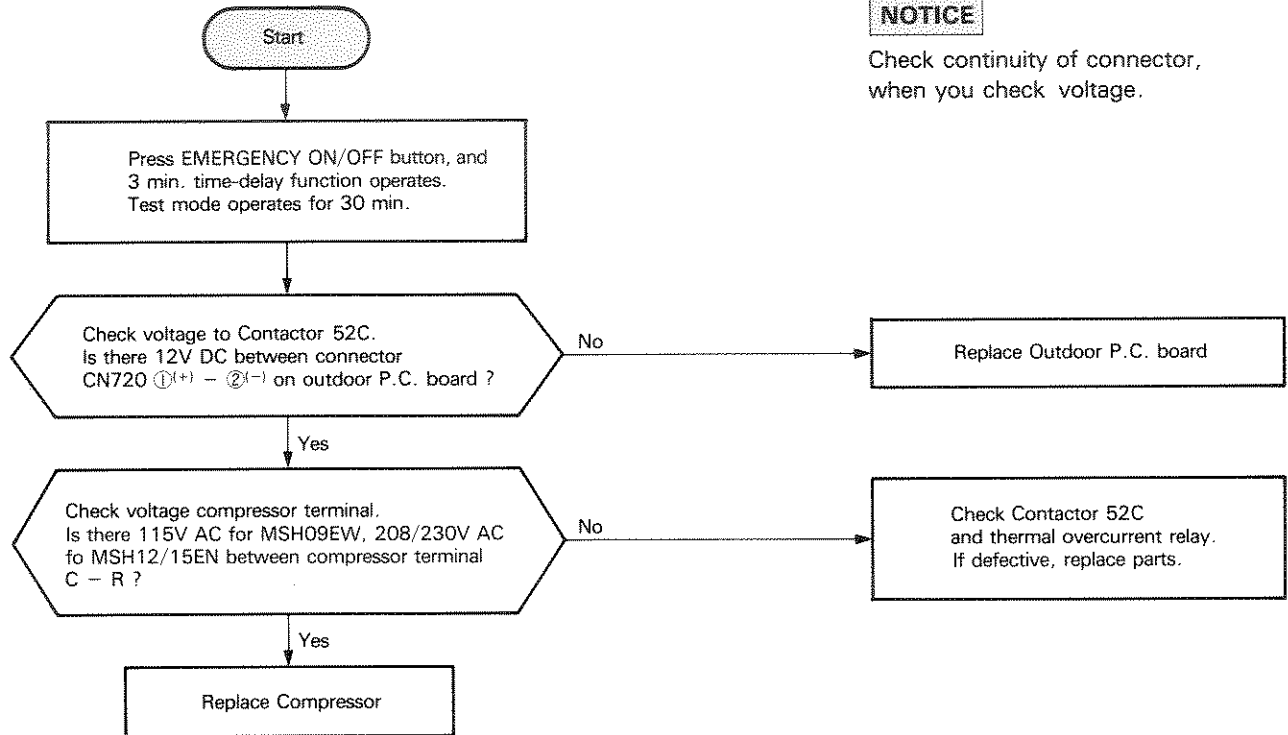


3. Compressor does not operate. (Indoor and outdoor fan operate.)

MSH09EW

MSH12EN

MSH15EN

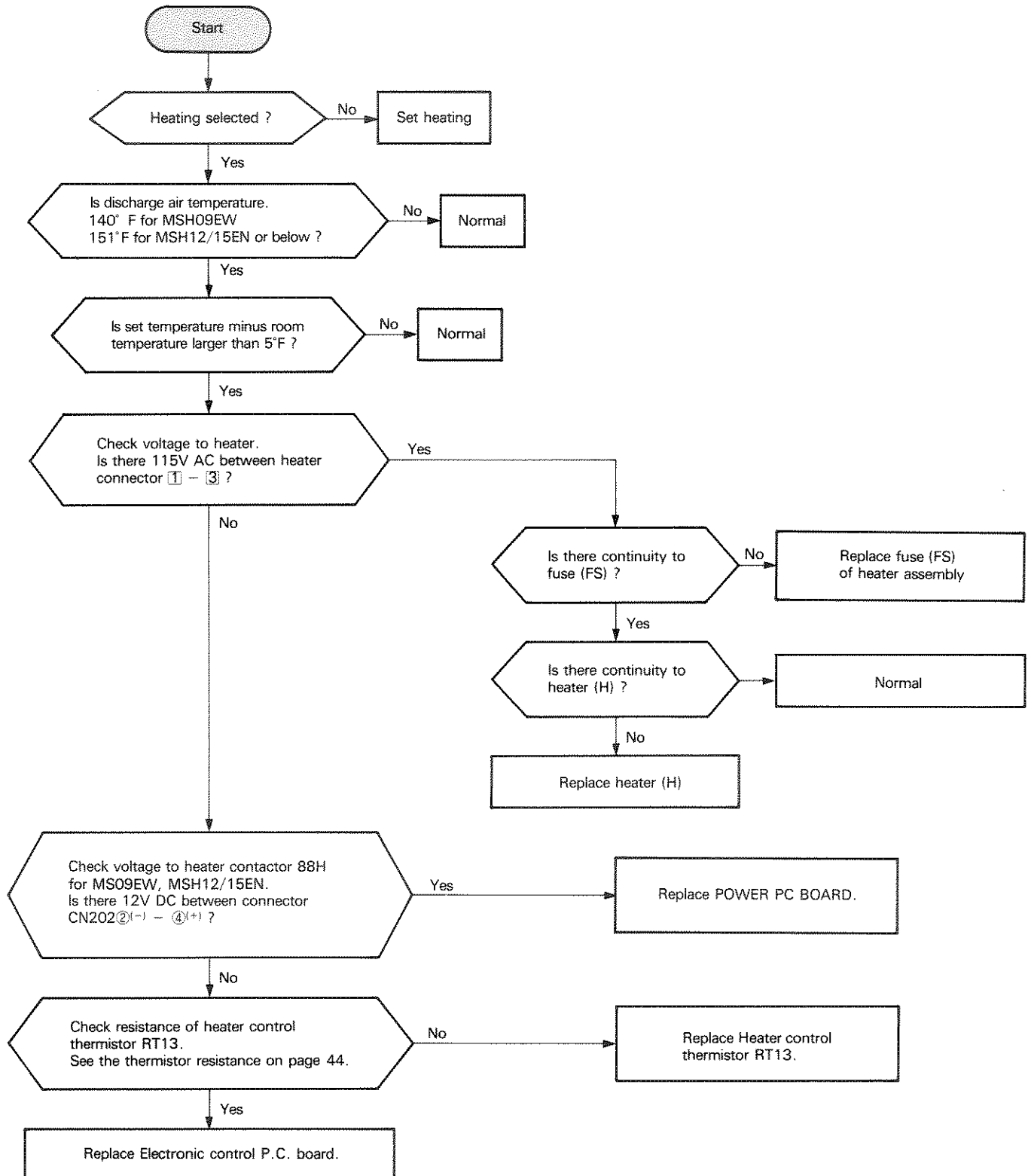


4. Heater does not work. (compressor and fan operate)

MSH09EW

MSH12EN

MSH15EN

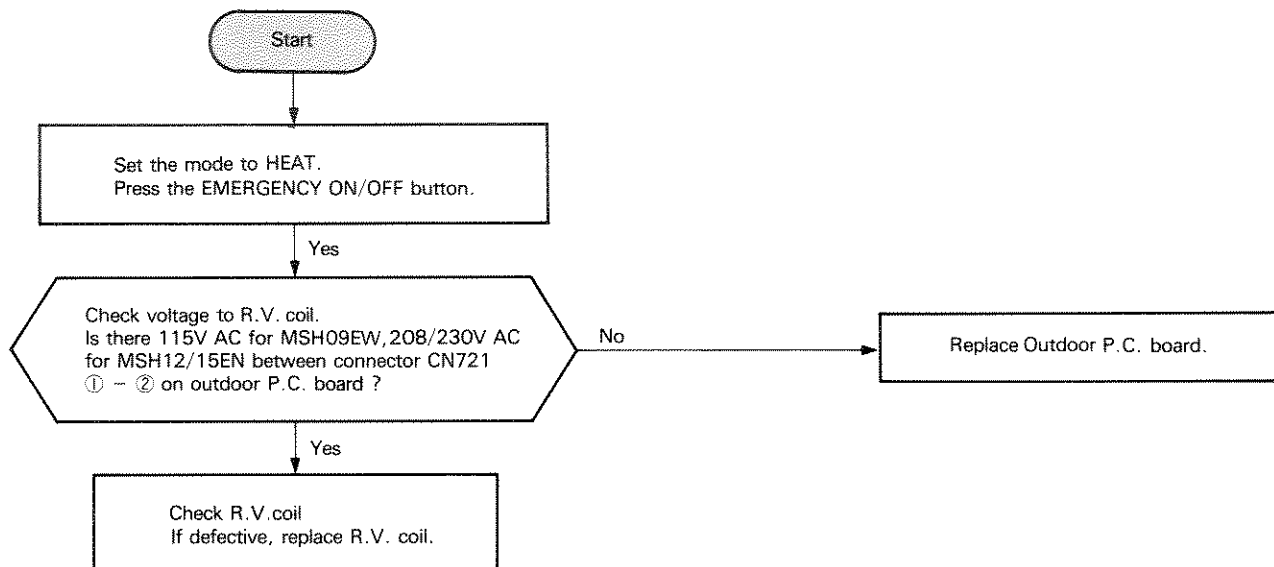


5. Heating operation does not work. (Cooling operation works)

MSH09EW

MSH12EN

MSH15EN



How to reconstruct for individual operation

A maximum of 4 units with wireless remote controllers can be used in a room. In this case, reconstruction of P.C. boards is needed to operate each unit individually by each remote controller.

The transmission code is changed by the reconstruction.

1. Reconstruction of the remote controller P.C. board

Remove batteries before reconstruction.

機番 J10 - & 機番 J20 -
1 J11 - 2 J21 - are printed on the board.

Originally, chip parts are fitted on J10/J20 side and there is no chip parts on the other side.

Remove the chip parts of J10/J20 side and connect Jumper wire to J11/J21 side according to the number of the individual control.

Either J10 or J11/J20 or J21 should be attached for normal operation.

Standard reconstruction table

	1 unit operation	2 units operation	3 units operation	4 units operation
No.1 unit	No construction	Same as left	Same as left	Same as left
No.2 unit	—	Remove J20 Connect to J21	Same as left	Same as left
No.3 unit	—	—	Remove J10 Connect to J11	Same as left
No.4 unit	—	—	—	Remove J10, J20 Connect to J11, J21

2. Reconstruction of the indoor electronic control P.C. board.

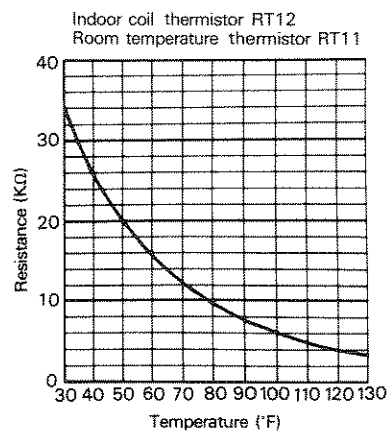
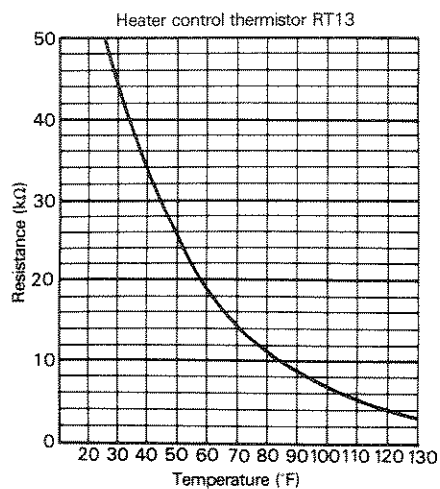
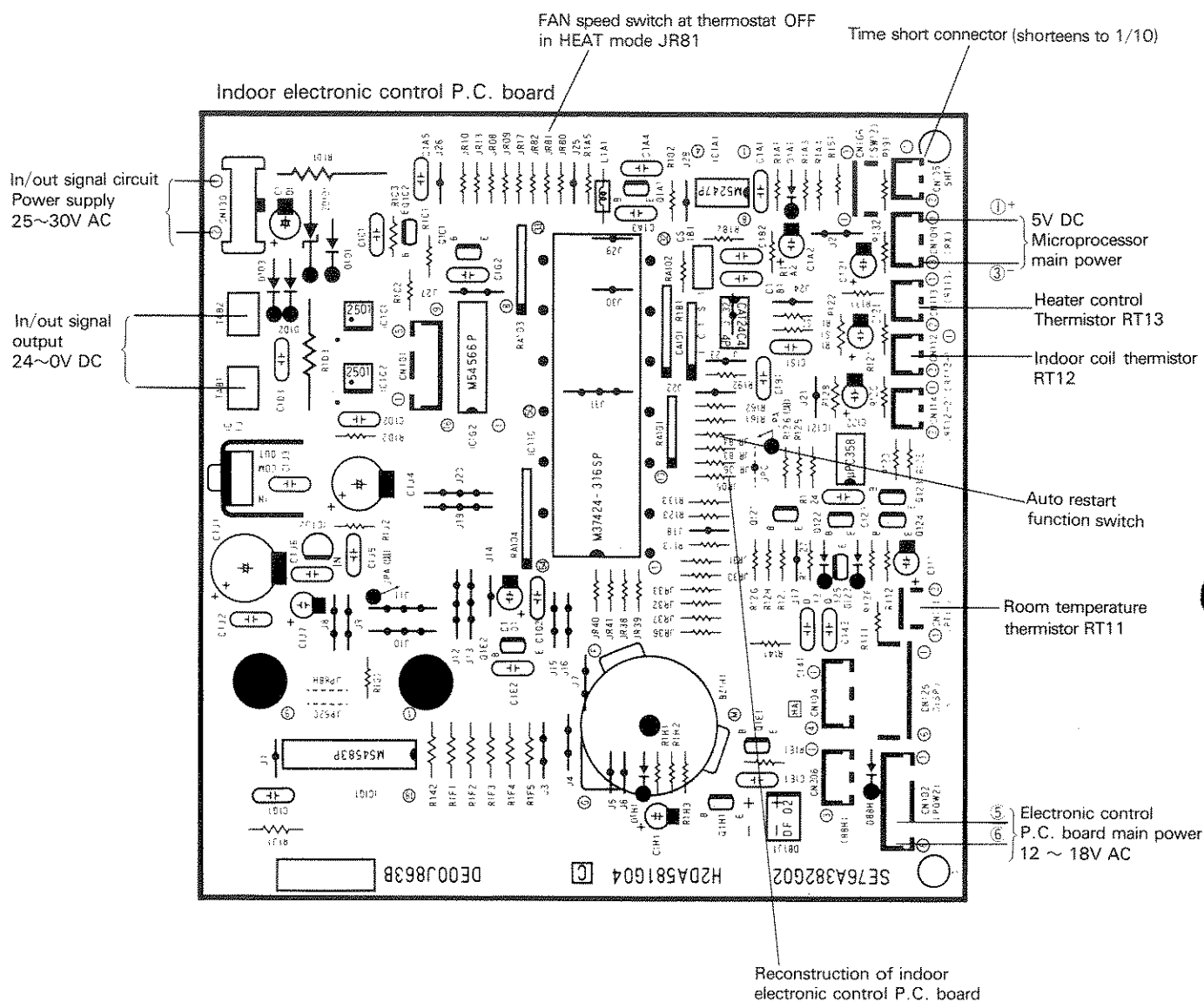
JR05
JR06 is printed on the board. Refer to TEST POINT VOLTAGE in the manual for the print point.

Jumper wire are fitted to JR05 and JR06.

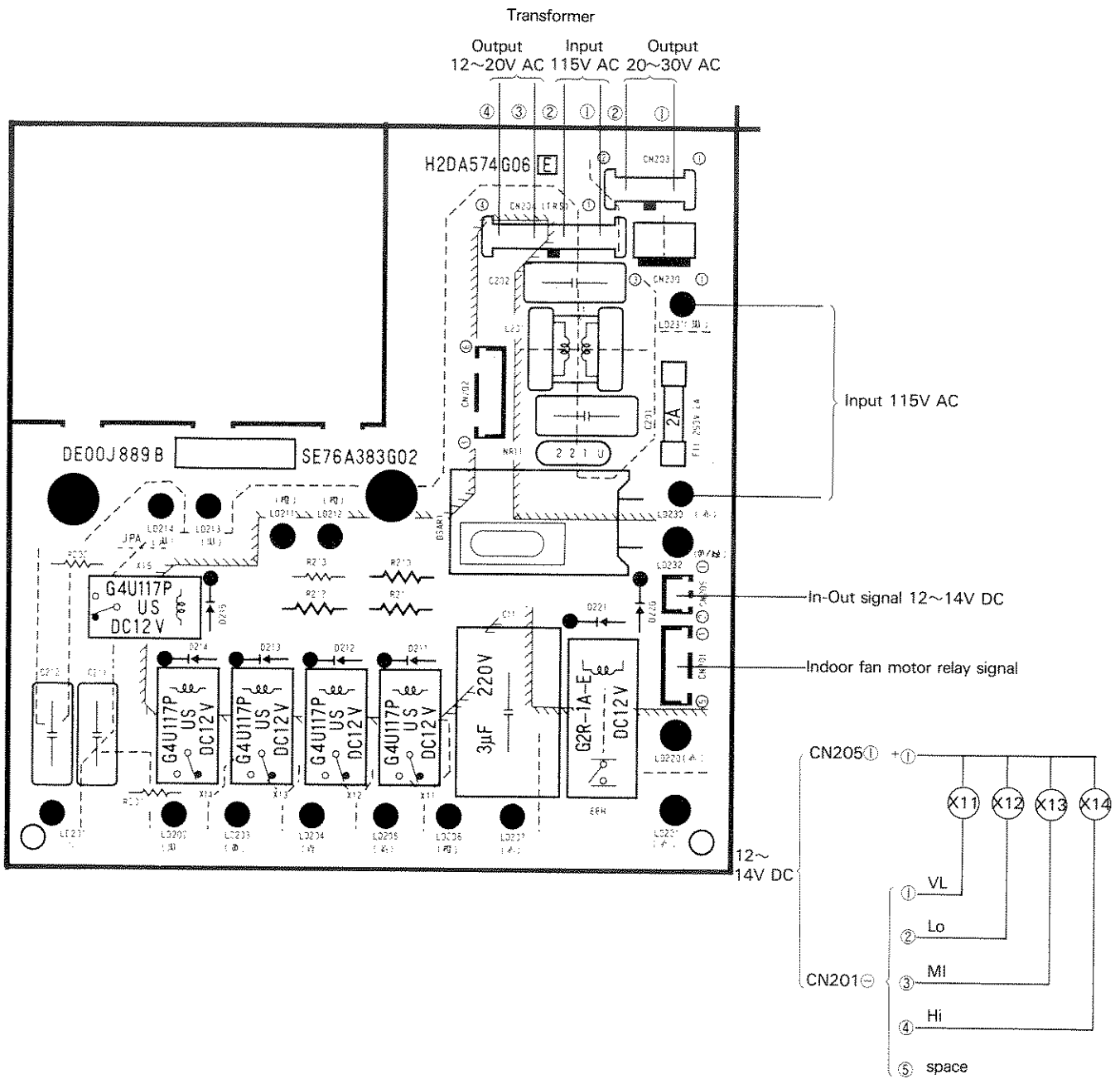
Reconstruct JR05 and JR06 to correspond to the remote controller board.

	1 unit operation	2 units operation	3 units operation	4 units operation
No.1 unit	No construction	Same as left	Same as left	Same as left
No.2 unit	—	Remove JR05	Same as left	Same as left
No.3 unit	—	—	Remove JR06	Same as left
No.4 unit	—	—	—	Remove JR05, JR06

TEST POINT DIAGRAM AND VOLTAGE
MSH09EW
MSH12/15EN



MSH09EW POWER P.C. board



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RELAY OPERATION

MSH09EW

MSH12EN

MSH15EN

MODE	THERMOSTAT	52C CONTACTOR	INDOOR FAN RELAY
COOL & COOL mode of I FEEL CONTROL	ON	ON	AUTO or set speed
	OFF	OFF	
DRY & DRY mode of I FEEL CON- TROL	ON	OFF for 2 min. after system start. Repeats 8 min. ON/. 3 min. OFF operation or 2 min. ON/3 min. OFF operation	VLO speed.
	OFF	Repeats 4 min. OFF/1 min. ON operation	VLO links with 52C contactor.
HEAT & HEAT mode of I FEEL CONTROL	ON	ON	AUTO or set speed.
	OFF	OFF	VLO speed

NOTE : When the compressor is OFF, "3-minute time delay circuit" operates.

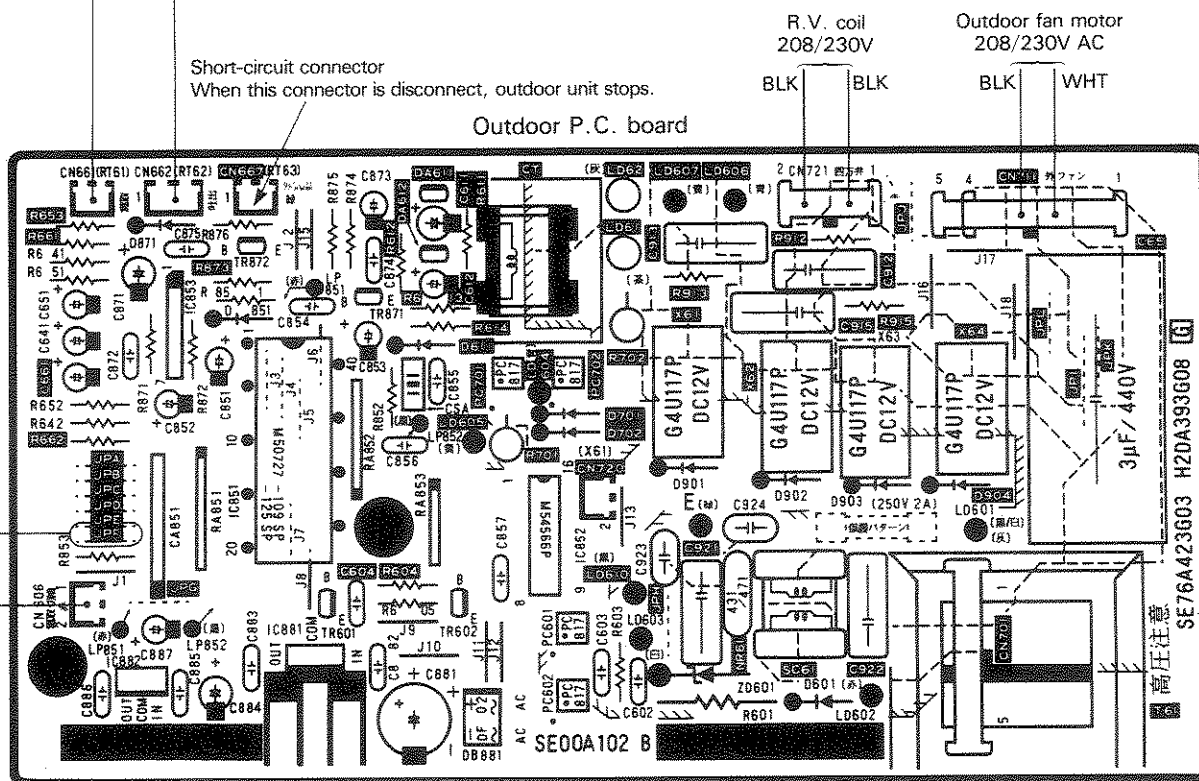
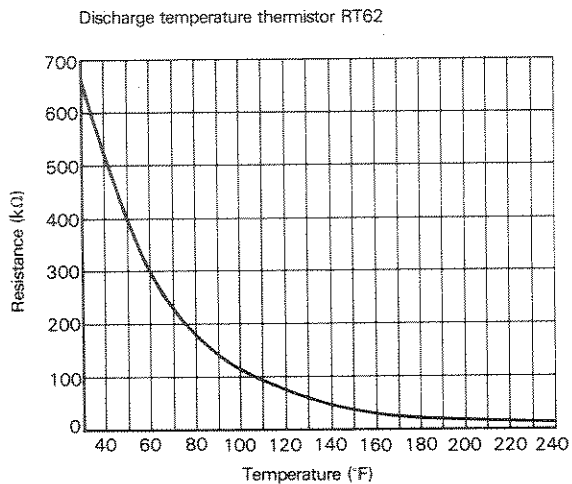
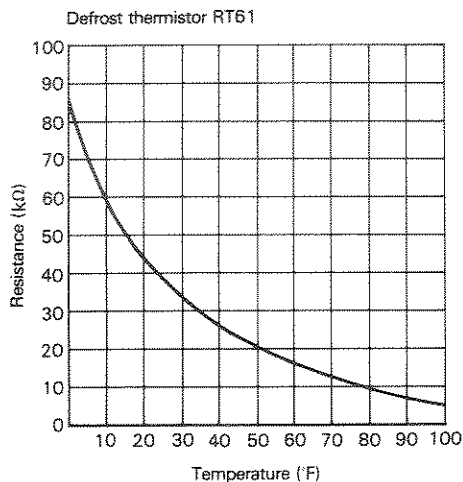
COIL FROST PREVENTION mode are as follows

MODE	THERMOSTAT	52C CONTACTOR	INDOOR FAN RELAY
COOL & COOL mode of I FEEL CONTROL	ON	Off for 5 min. After that, OFF is prolonged until indoor coil thermis- tor reads termination temperature.	Auto or set speed
DRY & DRY mode of I FEEL CONTROL			VLO speed

Indoor fan relay mode

Indoor fan speed	Relay turning ON
HI	X14
MED	X13
LO	X12
VLO	X11
OFF	All fan relays are off

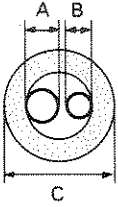
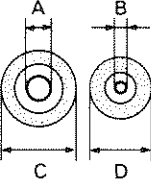
MUH09EW
MUH12EN
MUH15EN



- Compulsory defrost terminal
CN606 (red) RT61 must be lower than 50°F
- Defrost temperature alteration

1. REFRIGERANT PIPES

The air conditioner has flared connections in its indoor and outdoor sides.
Please use the optional extension pipe as follows.

Applicable models	Parts No.	Pipe length	Pipe Size O.D				Additional refrigerant charge R-22 (OZ)
			Cross-section	A. Gas (in.)	B. Liquid (in.)	Insulation (in.)	
MSH09EW	MAC645PI	10 ft		3/8	1/4	3 1-3/8	0
	MAC646PI	16 ft					
	MAC647PI	23 ft					5
	MAC648PI	33 ft					13
	MAC649PI	49 ft					
MSH12EN MSH15EN	MAC725PI	10 ft		5/8	1/4	C 1-7/32 D 1-1/16	0
	MAC726PI	16 ft					
	MAC727PI	23 ft					5
	MAC728PI	33 ft					13
	MAC729PI	49 ft					