



SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

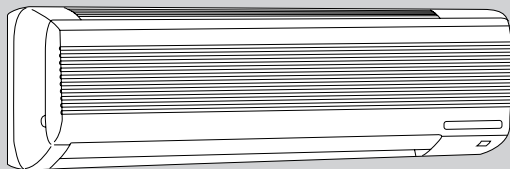
- Refer to the Service Manual OB185 REVISED EDITION C when MSH-18RV-**E1** is connected with MXZ-32NV-**E1** or MXZ-32NV-**E2** as multi system units.
- Refer to the Service Manual OB227 REVISED EDITION-B when MSH-18RV-**E1** is connected with MXZ-32RV-**E1** as multi system units.
- Refer to the Service Manual OB254 when MSH-18RV-**E1** is connected with MXZ-32SV-**E1** as multi system units.

No. OB272

# SERVICE MANUAL

Wireless type  
Models

- |                                  |   |                             |
|----------------------------------|---|-----------------------------|
| <b>MSH-18RV</b> - <b>E1</b> (WH) | ▪ | <b>MUH-18RV</b> - <b>E1</b> |
| <b>MSH-24RV</b> - <b>E1</b> (WH) | ▪ | <b>MUH-24RV</b> - <b>E1</b> |
| <b>MSH-30RV</b> - <b>E1</b> (WH) | ▪ | <b>MUH-30RV</b> - <b>E1</b> |



MSH-18RV - **E1**  
MSH-24RV - **E1**



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# 1

# TECHNICAL CHANGES

**MSH-18NV -[E4] → MSH-18RV -[E1]**

**MSH-24NV -[E2] → MSH-24RV -[E1]**

1. Remote controller has changed.

- SLEEP MODE function has removed.
- ECONO COOL operation has added.
- SWING button is removed, but SWING MODE function is available by VANE CONTROL button.

**MSH-30RV -[E1]**

New model

**MUH-18NV -[E4] → MUH-18RV -[E1]**

1. Outdoor model name has changed.

**MUH-24NV -[E2] → MUH-24RV -[E1]**

1. Outdoor deicer P.C. board has changed.
2. Ball valve has changed to stop valve.
3. Thermostat has changed to ambient temperature thermistor.

**MUH-30RV -[E1]**

New model

# 2

# PART NAMES AND FUNCTIONS

## INDOOR UNIT

**MSH-18RV -[E1]**

**MSH-24RV -[E1]**

Air cleaning filter (option)  
(White bellows type)

Deodorizing filter (option)  
(Gray sponge type)

Front panel

Air filter

Vertical vanes

Grille

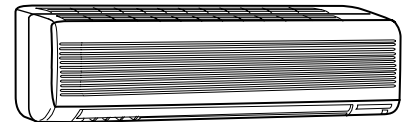
Air inlet

Remote control  
receiving section

Horizontal vane

Remote controller

**MSH-30RV -[E1]**

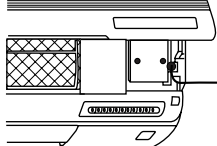


**Operation section**

(When the grille is open)

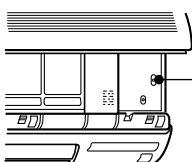
**MSH-18RV -[E1]**

**MSH-24RV -[E1]**



Emergency operation switch

**MSH-30RV -[E1]**



Emergency operation switch

**Display section**

**MSH-18RV -[E1]**

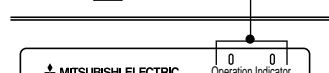
**MSH-24RV -[E1]**



Operation indicator lamp

Receiving section

**MSH-30RV -[E1]**

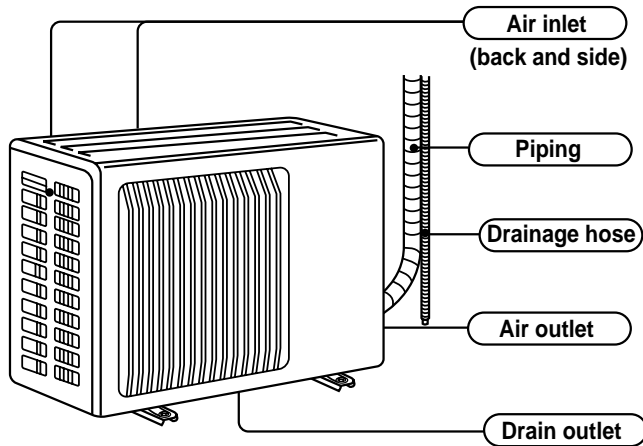


Operation indicator lamp

Receiving section

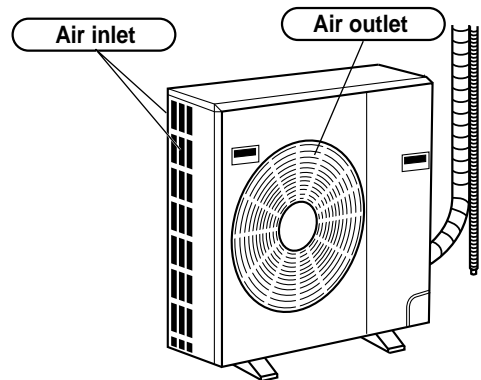
## OUTDOOR UNIT

MUH-18RV - E1



MUH-24RV - E1

MUH-30RV - E1



## ACCESSORIES

### Indoor unit

		MSH-18RV- E1 MSH-24RV- E1	MSH-30RV- E1
①	Installation plate	1	1
②	Installation plate fixing screw 4 × 25 mm	6	7
③	Remote controller mouting hardware	1	1
④	Fixing screw for ③ × 3.5 × 1.6 mm (Black)	2	2
⑤	Battery (AAA) for remote controller	2	2
⑥	Wireless remote controller	1	1
⑦	Felt tape (Used for left or left-rear piping)	1	1

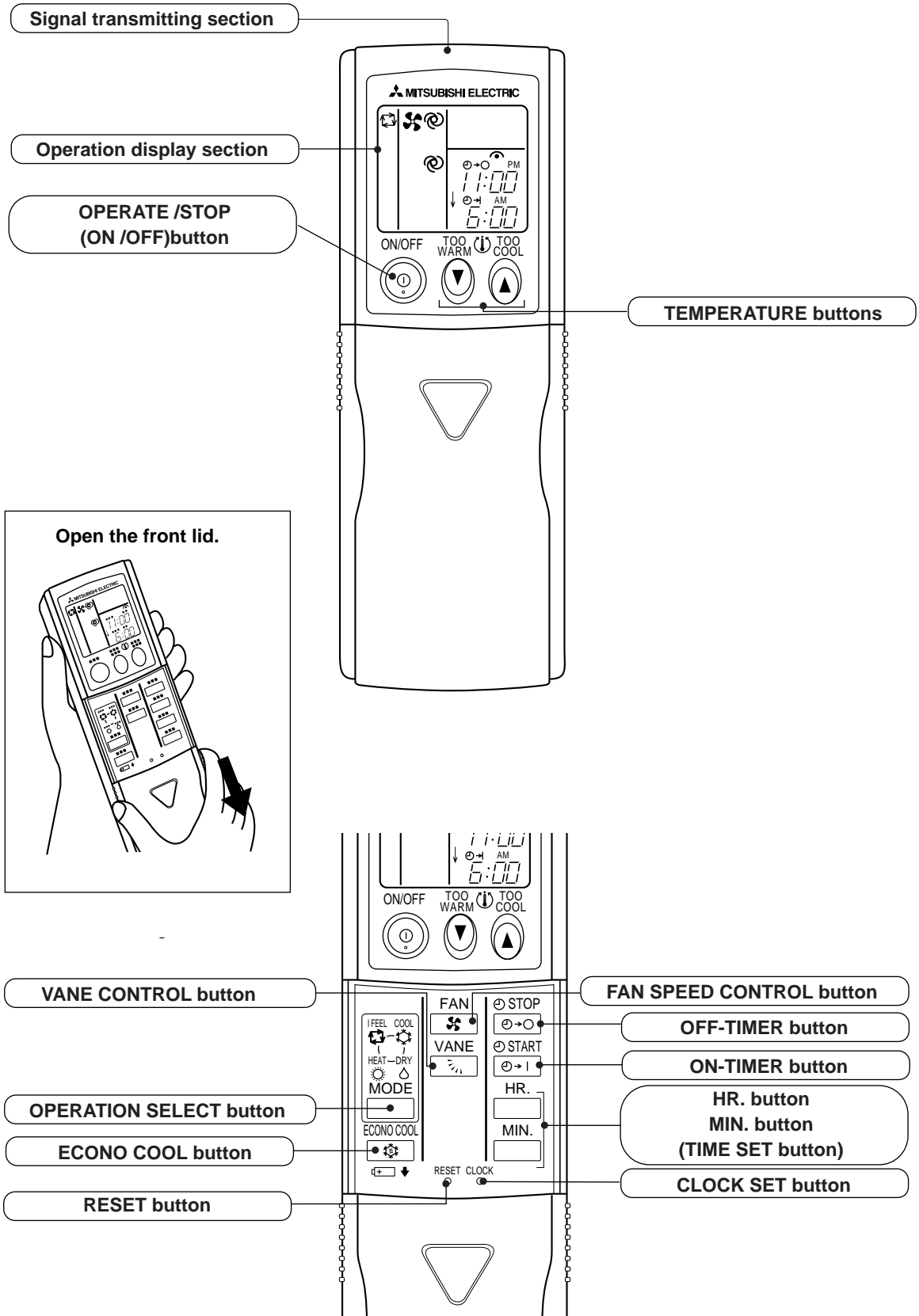
### Outdoor unit

		MUH-18RV- E1	MUH-24RV- E1 MUH-30RV- E1
⑧	Drain socket	1	1
⑨	Drain cap φ33	2	6
	Drain cap φ16	1	—

# REMOTE CONTROLLER

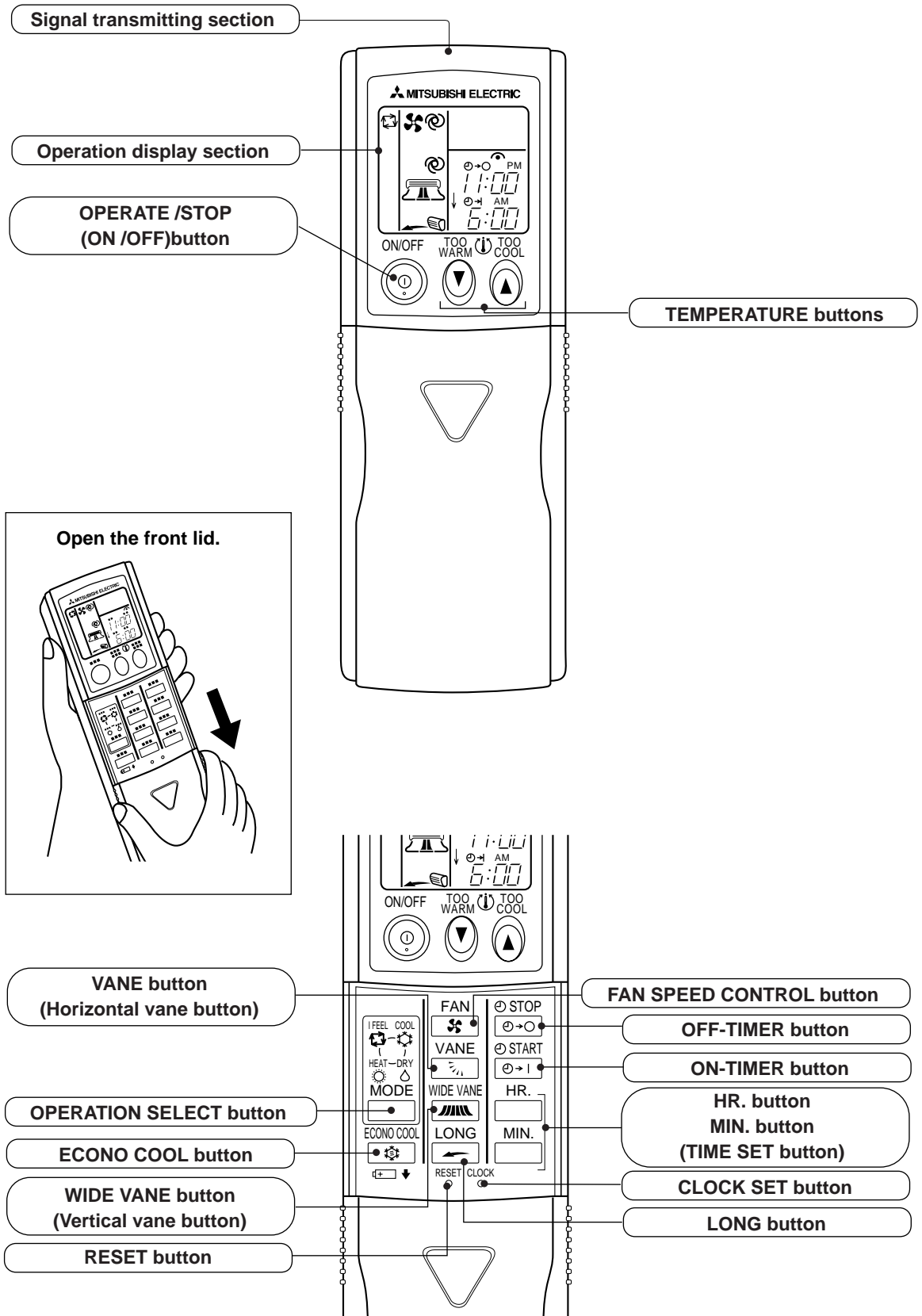
MSH-18RV -E1

MSH-24RV -E1



# REMOTE CONTROLLER

MSH-30RV - E1



## 3

## SPECIFICATION

\*Refer to the Service Manual OB185 REVISED EDITION C when MSH-18RV-<sup>[E1]</sup> is connected with MXZ-32NV-<sup>[E1]</sup> or MXZ-32NV-<sup>[E2]</sup> as multi system units.

Refer to the Service Manual OB227 REVISED EDITION-B when MSH-18RV-<sup>[E1]</sup> is connected with MXZ-32RV-<sup>[E1]</sup> as multi system units.

Refer to the Service Manual OB254 when MSH-18RV-<sup>[E1]</sup> is connected with MXZ-32SV-<sup>[E1]</sup> as multi system units.

Indoor model			MSH-18RV - <sup>[E1]</sup>		* MSH-18RV - <sup>[E1]</sup>		MSH-24RV - <sup>[E1]</sup>	
Function			Cooling	Heating	Cooling	Heating	Cooling	Heating
Power supply			Single phase 220-240V, 50Hz		Single phase 220-240V, 50Hz		Single phase 220-240V, 50Hz	
Capacity	Capacity	kW	5.1	5.4	—	—	6.0	6.2
	Dehumidification	ℓ /h	2.5	—	—	—	3.1	—
	Air flow(High)	m <sup>3</sup> /h	756		756	—	816	
Electrical data	Power outlet	A	15		10	—	25	
	Running current	A	9.4-9.2	9.2-9.0	0.28	—	12.6-11.7	11.5-11.0
	Power input	W	2,030-2,120	1,980-2,070	60	—	2,720-2,750	2,470-2,580
	Auxiliary heater	A(kW)	—		—	—	—	
	Power factor	%	98-96		97-89	—	98	
	Starting current	A	52-58		—	—	59	
	Fan motor current	A	0.25		0.25	—	0.29	
Coefficient of performance(C.O.P)			2.51-2.41	2.73-2.61	—	—	2.21-2.18	2.51-2.40
Fan motor	Model		RA4V27-EF		RA4V27-EF	—	RA4V27-EE	
	Winding resistance(at20°C)	Ω	WHT-BLK 183.8 BLK-RED 250.5		WHT-BLK 183.8 BLK-RED 250.5	—	WHT-BLK 183.3 BLK-RED 250.5	
	Dimensions W×H×D	mm	1,015×320×190		1,015×320×190	—	1,015×320×190	
	Weight	kg	14		14	—	14	
Special remarks	Air direction		5		5	—	5	
	Sound level (High)	dB	42		42	—	45	
	Fan speed (High)	rpm	1,180		1,180	—	1,260	
	Fan speed regulator		3		3	—	3	
	Thermistor RT11(at25°C)	kΩ	10		10	—	10	
	Thermistor RT12(at25°C)	kΩ	10		10	—	10	
Outdoor model			MUH-18RV - <sup>[E1]</sup>		MUH-18RV - <sup>[E1]</sup>		MUH-24RV - <sup>[E1]</sup>	
Capacity	Air flow	m <sup>3</sup> /h	2,142-2,244		—	—	2,640-2,760	
Electrical data	Compressor motor current	A	8.76-8.56	8.56-8.36	—	—	11.73-10.83	10.63-10.13
	Fan motor current	A	0.39		—	—	0.58	
Compressor	Model		PH-36VPET		—	—	NH-47VMDT	
	Output	W	1,600		—	—	2,200	
	Winding resistance(at20°C)	Ω	C-R 1.03 C-S 2.04		—	—	C-R 0.96 C-S 2.07	
Fan motor	Model		RA6V50-OG		—	—	RA6V85-AA	
	Winding resistance(at20°C)	Ω	WHT-BLK 116.4 BLK-RED 111.0		—	—	WHT-BLK 62.7 BLK-YLW 30.2 YLW-RED 62.9	
	Dimensions W×H×D	mm	850×605×290		—	—	870×850×295	
	Weight	kg	54		—	—	72	
Special remarks	Sound level (High)	dB	52		—	—	53	
	Fan speed (High)	rpm	810-845		—	—	720-750	
	Fan speed regulator		1		—	—	2	
	Refrigerant filling capacity(R22)	kg	1.65		—	—	2.40	
	Refrigerating oil (Model)	cc	900 (MS32N1)		—	—	1,200 (MS32N1)	
	Thermistor RT61(at0°C)	kΩ	33.18		—	—	33.18	
	Thermistor RT63(at0°C)	kΩ	—		—	—	33.18	

NOTE: Test conditions are based on JIS C 9612.

Cooling : Indoor DB 27°C / WB 19°C  
Outdoor DB 35°C / (WB 24°C)

Heating : Indoor DB 20°C / WB 15.5°C  
Outdoor DB 7°C / WB 6°C



Indoor model			<b>MSH-30RV - E1</b>		
Function			Cooling	Heating	
Power supply			Single phase 220-240V, 50Hz		
Capacity	Capacity	kW	8.3		9.6
	Dehumidification	ℓ /h	4.5		—
	Air flow(High)	m³ /h	960		960
Electrical data	Power outlet	A	25		
	Running current	A	15.3-15.5		16.3-15.8
	Power input	W	3,300-3,460		3,520-3,560
	Auxiliary heater	A(kW)	—		
	Power factor	%	98-93		98-94
	Starting current	A	82-84		
	Fan motor current	A	0.33-0.35		
Coefficient of performance(C.O.P)			2.52-2.40		2.73-2.70
Fan motor	Model		RC4V40-AA		
	Winding resistance(at20°C)	Ω	WHT-BLK 138.2		
			BLK-RED 159.0		
	Dimensions W×H×D	mm	1,100×325×227		
Weight	kg	16			
Special remarks	Air direction		5		
	Sound level (High)	dB	47		
	Fan speed (High)	rpm	1,280		
	Fan speed regulator		3		
	Thermistor RT11(at25°C)	kΩ	10		
	Thermistor RT12(at25°C)	kΩ	10		
	Thermistor RT13(at25°C)	kΩ	10		
Outdoor model			<b>MUH-30RV - E1</b>		
Capacity	Air flow	m³ /h	2,880-3,000		
Electrical data	Compressor motor current	A	14.41-14.57		15.41-14.87
	Fan motor current	A	0.56-0.58		
Compressor	Model		NH-56VNHT		
	Output	W	2,700		
	Winding resistance(at20°C)	Ω	C-R 0.66		
C-S 1.58					
Fan motor	Model		RA6V75-AA		
	Winding resistance(at20°C)	Ω	WHT-BLK 62.8		BLK-YLW 55.9
			YLW-RED 26.0		
Dimensions W×H×D	mm	870×850×295			
Weight	kg	79			
Special remarks	Sound level(High)		55		
	Fan speed(High)	rpm	790-820		
	Fan speed regulator		2		
	Refrigerant filling capacity(R22)	kg	2.30		
	Refrigerating oil (Model)	cc	1,200 (MS32N1)		
	Thermistor RT61(at0°C)	kΩ	33.18		
	Thermistor RT62(at25°C)	kΩ	231.44		
	Thermistor RT63(at0°C)	kΩ	33.18		

NOTE:Test conditions are based on JIS C 9612.

Cooling : Indoor DB 27°C / WB 19°C  
Outdoor DB 35°C / (WB 24°C)

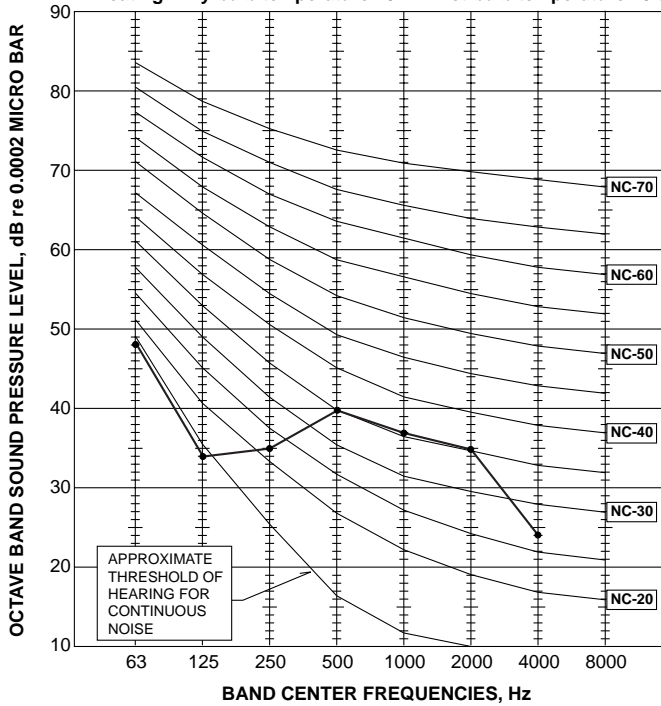
Heating : Indoor DB 20°C / WB 15.5°C  
Outdoor DB 7°C / WB 6°C

## MSH-18RV-E1

NOTCH	SPL(dB(A))	LINE
High	42	

Test conditions,

Cooling : Dry-bulb temperature 27°C Wet-bulb temperature 19°C  
 Heating : Dry-bulb temperature 20°C Wet-bulb temperature 15.5°C

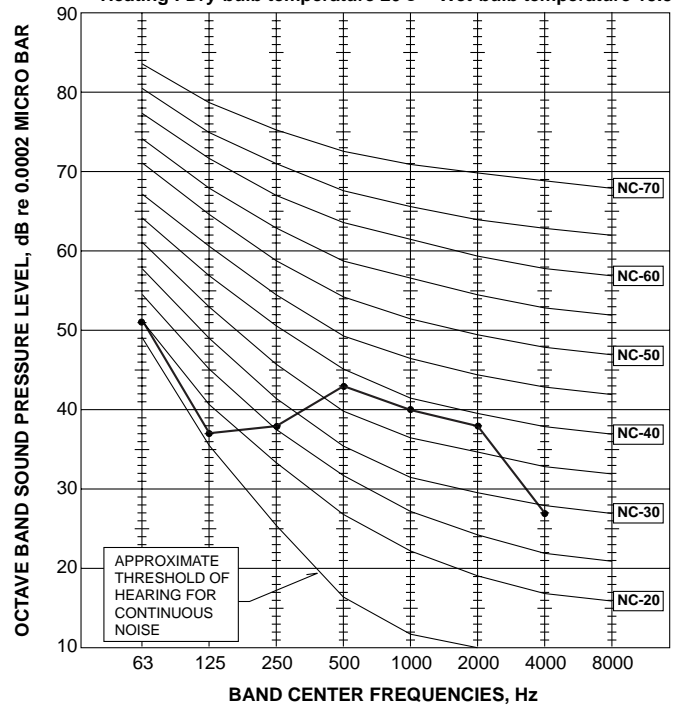


## MSH-24RV-E1

NOTCH	SPL(dB(A))	LINE
High	45	

Test conditions,

Cooling : Dry-bulb temperature 27°C Wet-bulb temperature 19°C  
 Heating : Dry-bulb temperature 20°C Wet-bulb temperature 15.5°C

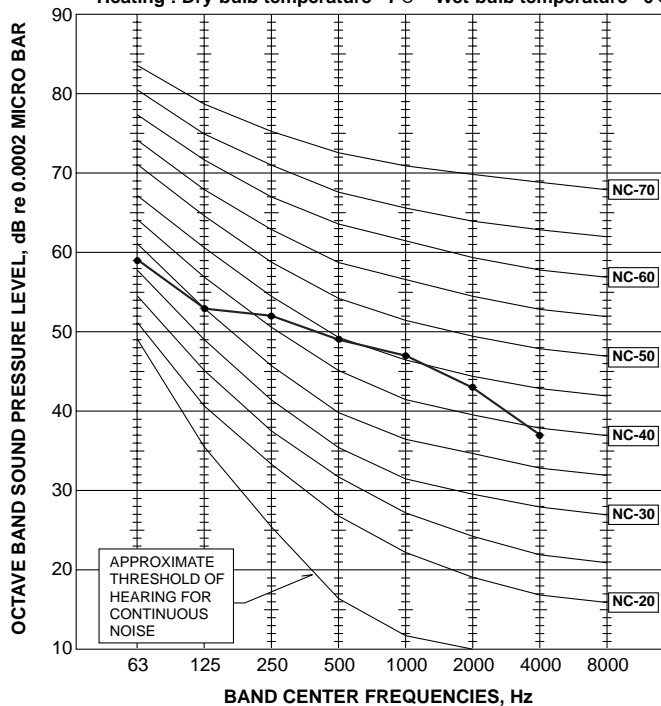


## MUH-18RV-E1

NOTCH	SPL(dB(A))	LINE
High	52	

Test conditions,

Cooling : Dry-bulb temperature 35°C Wet-bulb temperature 24°C  
 Heating : Dry-bulb temperature 7°C Wet-bulb temperature 6°C

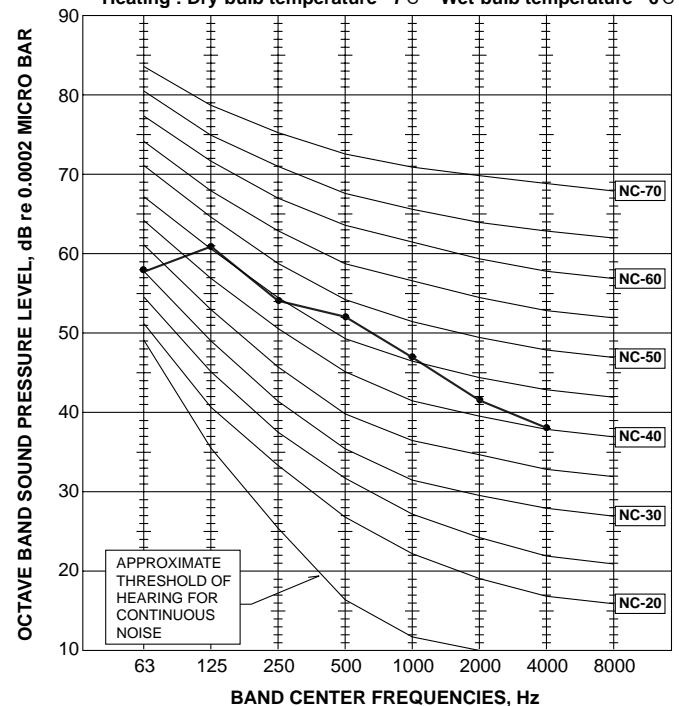


## MUH-24RV-E1

NOTCH	SPL(dB(A))	LINE
High	53	

Test conditions,

Cooling : Dry-bulb temperature 35°C Wet-bulb temperature 24°C  
 Heating : Dry-bulb temperature 7°C Wet-bulb temperature 6°C



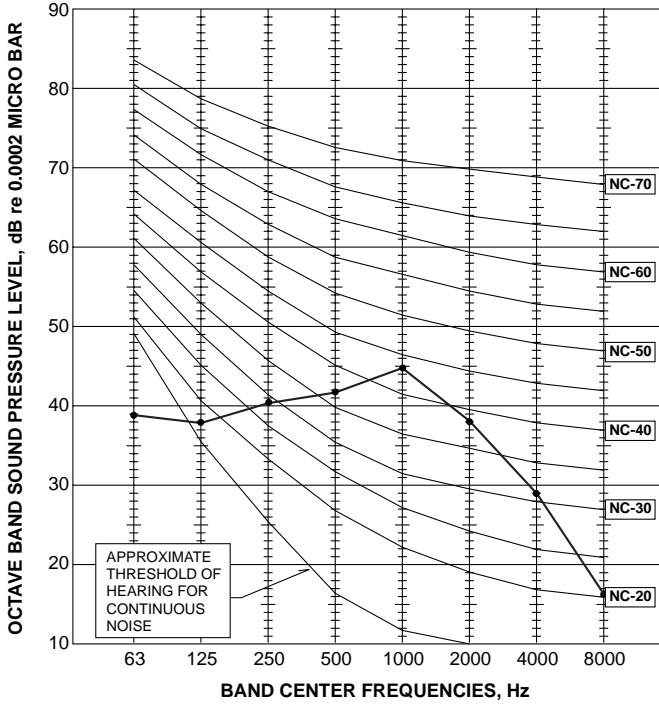


# MSH-30RV-<sup>E1</sup>

NOTCH	SPL(dB(A))	LINE
High	47	●—●

Test conditions,

Cooling : Dry-bulb temperature 27°C Wet-bulb temperature 19°C  
 Heating : Dry-bulb temperature 20°C Wet-bulb temperature 15.5°C

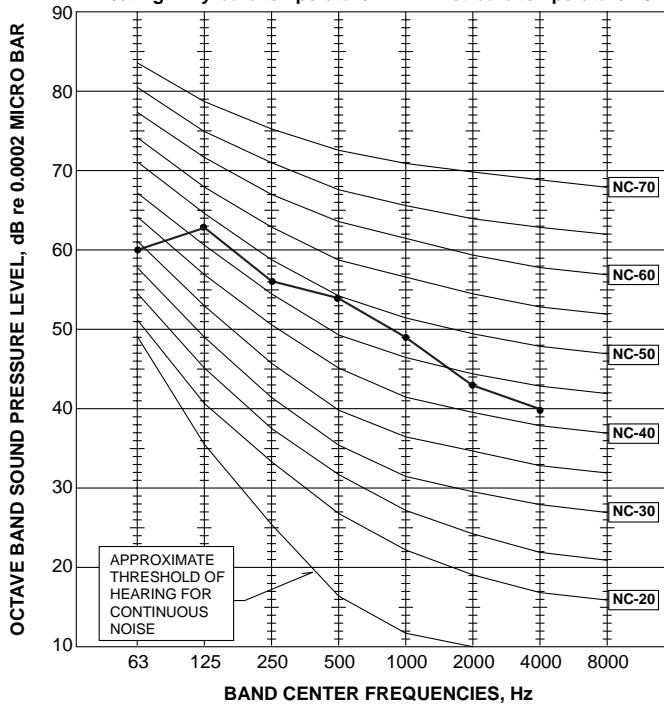


# MUH-30RV-<sup>E1</sup>

NOTCH	SPL(dB(A))	LINE
High	55	●—●

Test conditions,

Cooling : Dry-bulb temperature 35°C Wet-bulb temperature 24°C  
 Heating : Dry-bulb temperature 7°C Wet-bulb temperature 6°C



5

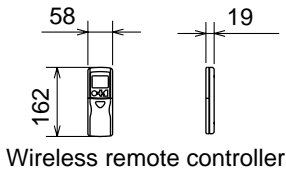
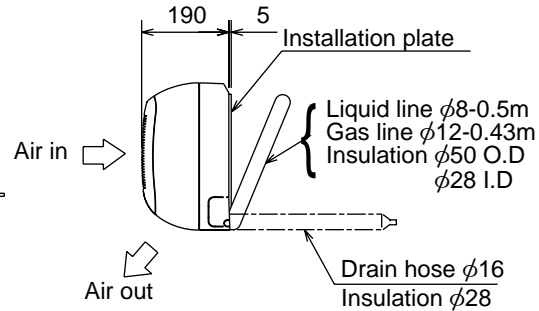
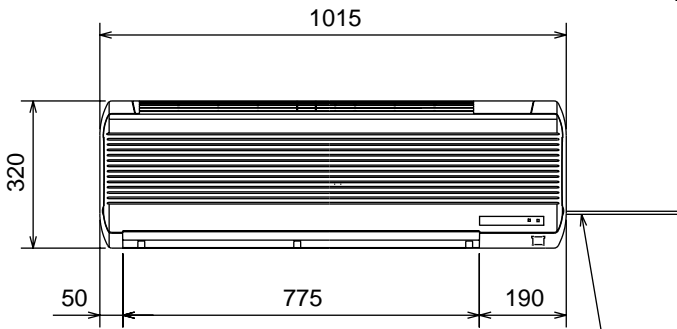
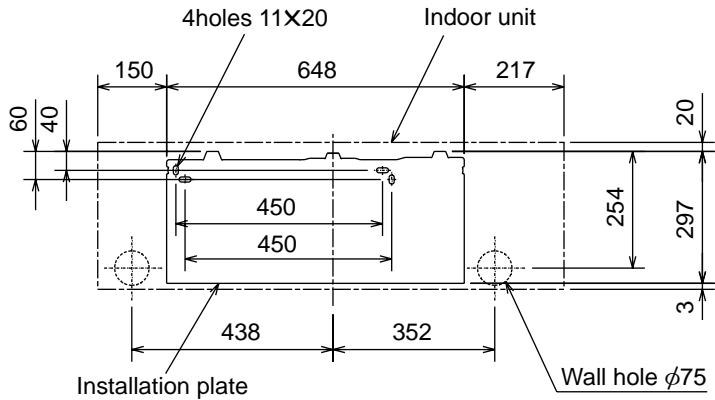
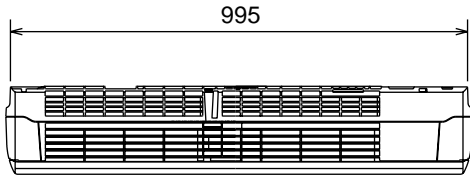
OUTLINES AND DIMENSIONS

Unit: mm

MSH-18RV -[E1]

MSH-24RV -[E1]

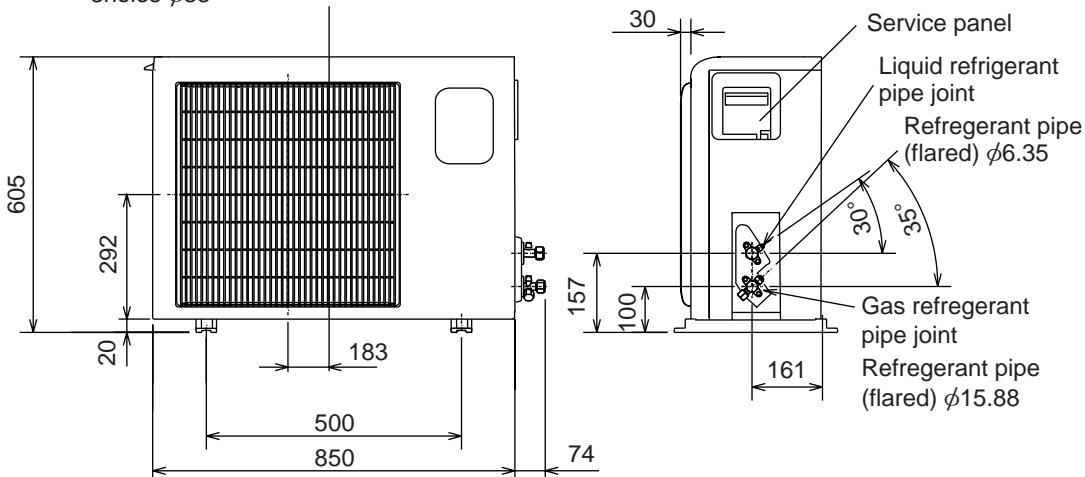
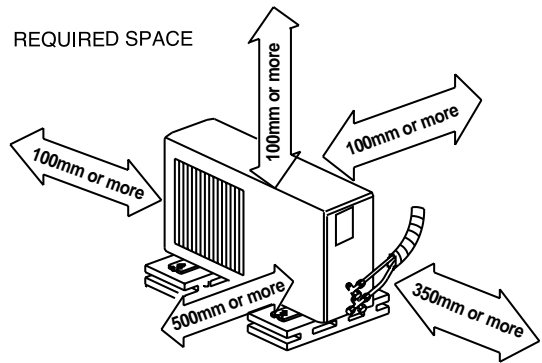
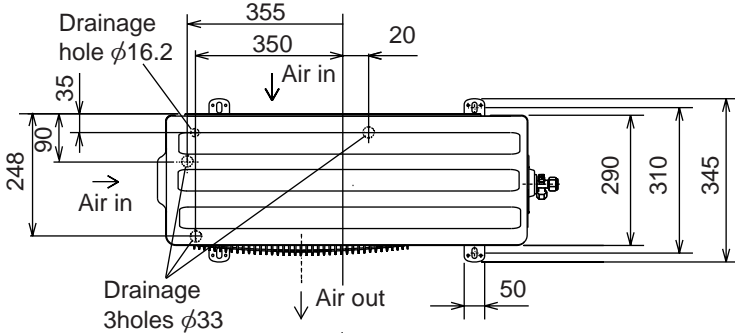
INDOOR UNIT



Power supply cord  
Lead to right 2m  
Lead to left 1m

MUH-18RV -[E1]

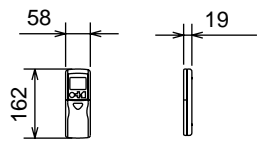
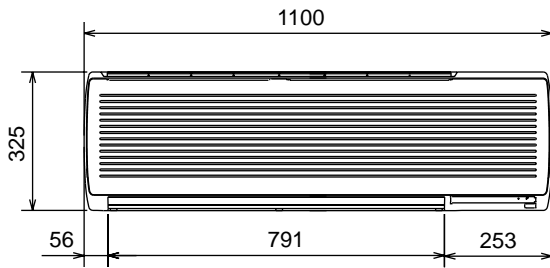
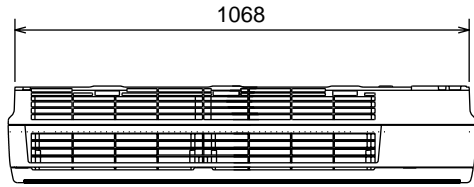
OUTDOOR UNIT



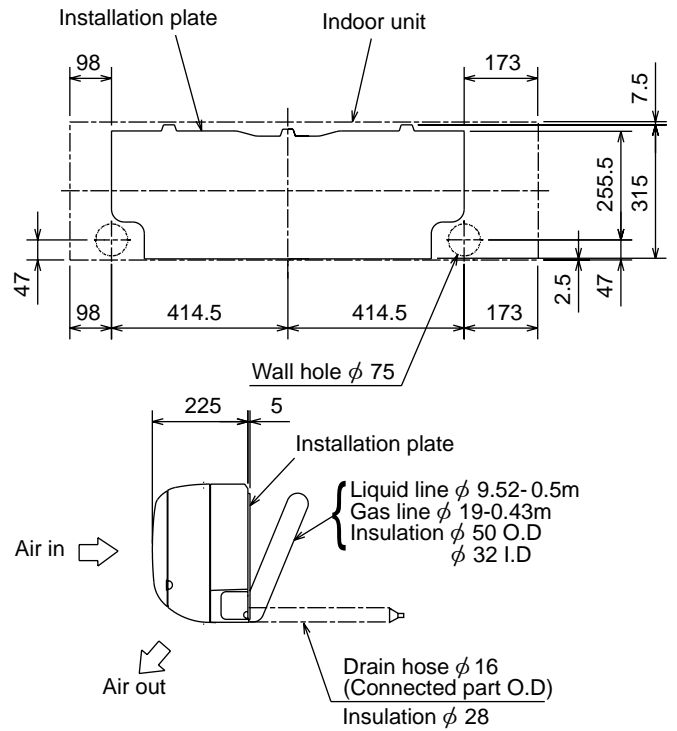
MSH-30RV -E1

Unit: mm

INDOOR UNIT



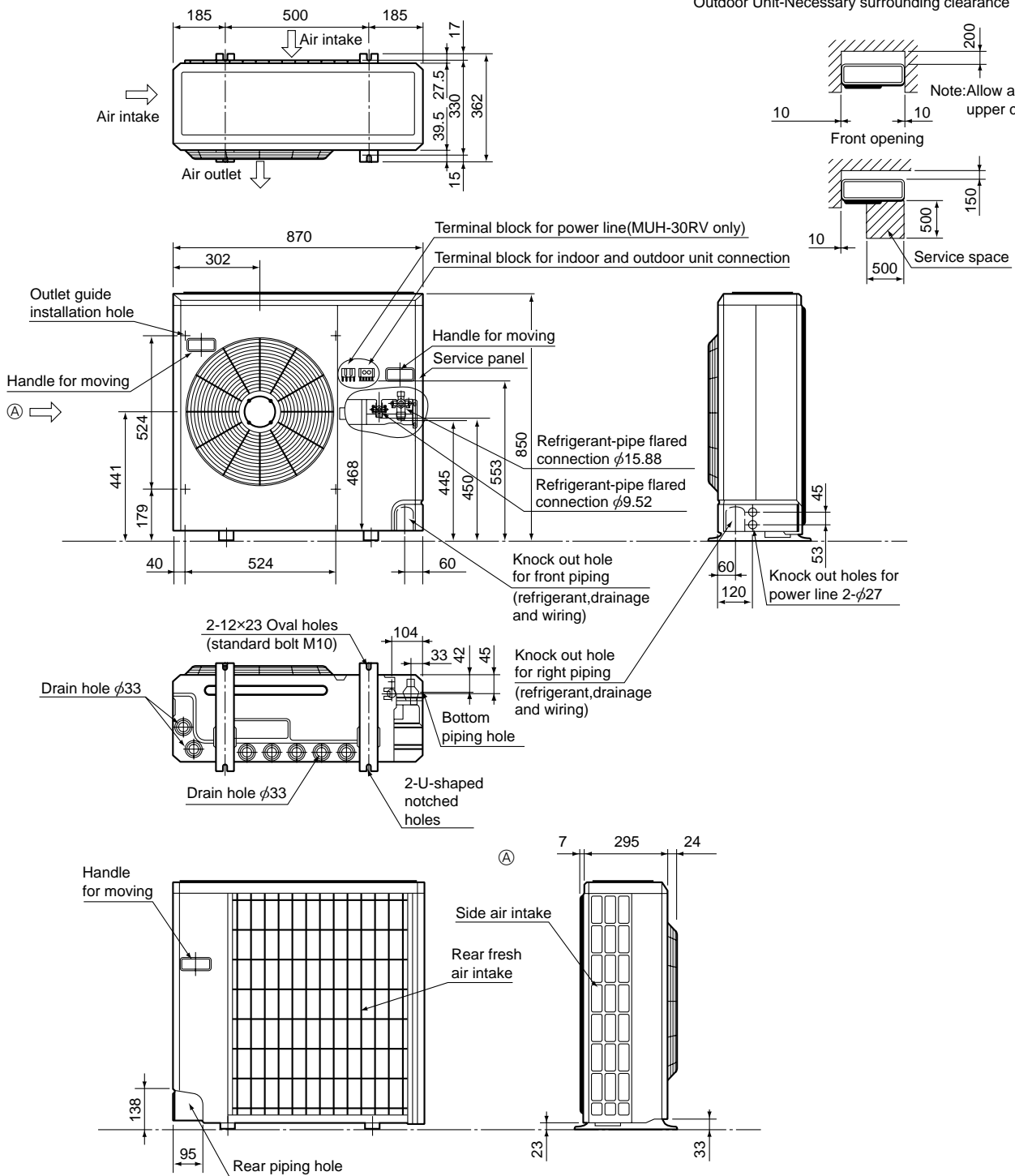
Wireless remote controller



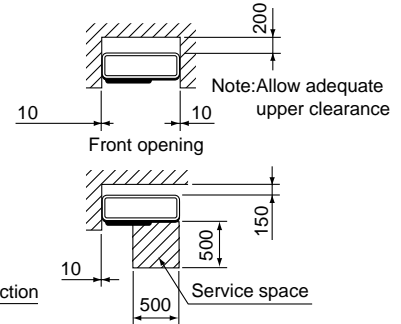
MUH-24RV-E1  
 MUH-30RV-E1

Unit: mm

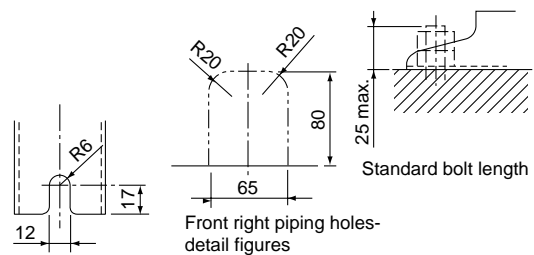
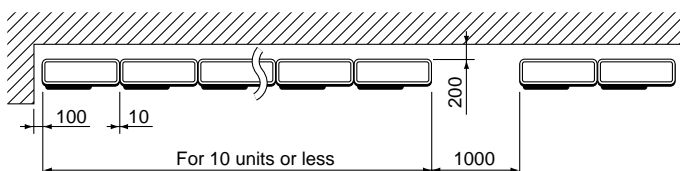
**OUTDOOR UNIT**



Outdoor Unit-Necessary surrounding clearance

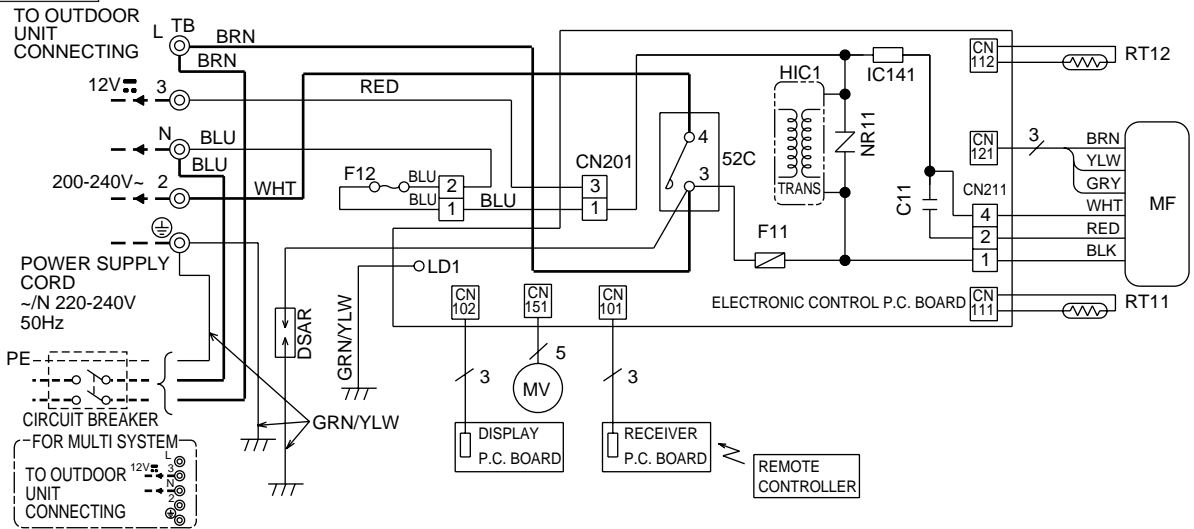


Outdoor Unit-Necessary surrounding clearance (Concentrated installation) The upper side must be open.



MSH-18RV -[E1] MODEL WIRING DIAGRAM

INDOOR UNIT



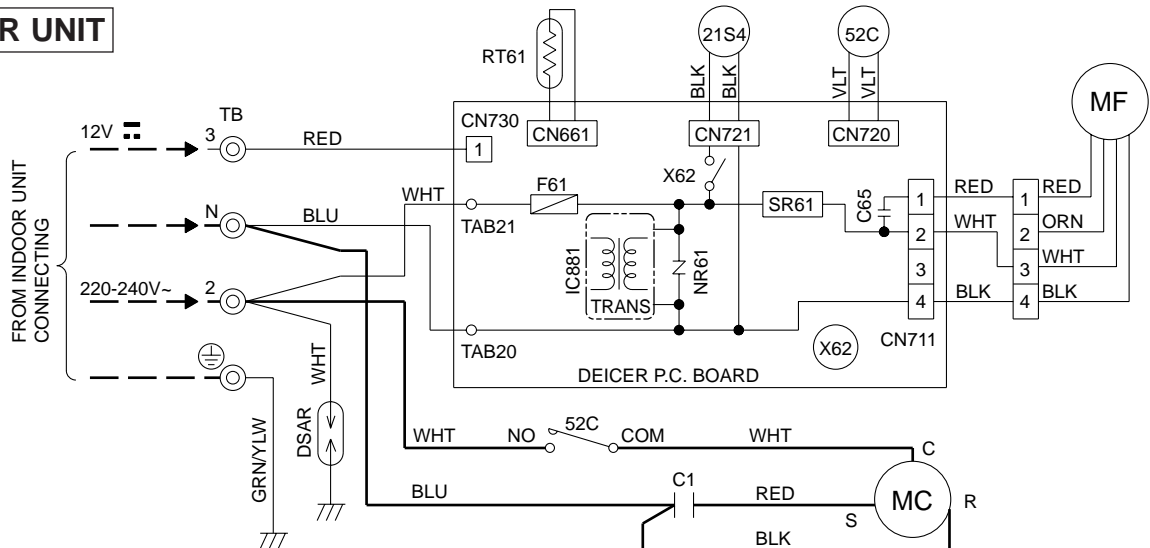
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C11	INDOOR FAN CAPACITOR	IC141	HYBRID IC	RT12	INDOOR COIL TEMPERATURE THERMISTOR
DSAR	SURGE ABSORBER	MF	INDOOR FAN MOTOR (INNER FUSE)	TB	TERMINAL BLOCK
F11	FUSE (3.15A)	MV	VANE MOTOR	52C	CONTACTOR
F12	THERMAL FUSE (93°C)	NR11	VARISTOR		
HIC1	DC/DC CONVERTER	RT11	ROOM TEMPERATURE THERMISTOR		

NOTES: 1.About the outdoor side electric wiring refer to the outdoor unit electric wiring diagram for servicing.  
 2.Use copper conductors only. (For field wiring)  
 3.Symbols below indicate.  
 ⊙ : Terminal block □ □ □ : Connector

VG79B021H01

MUH-18RV -[E1] MODEL WIRING DIAGRAM

OUTDOOR UNIT



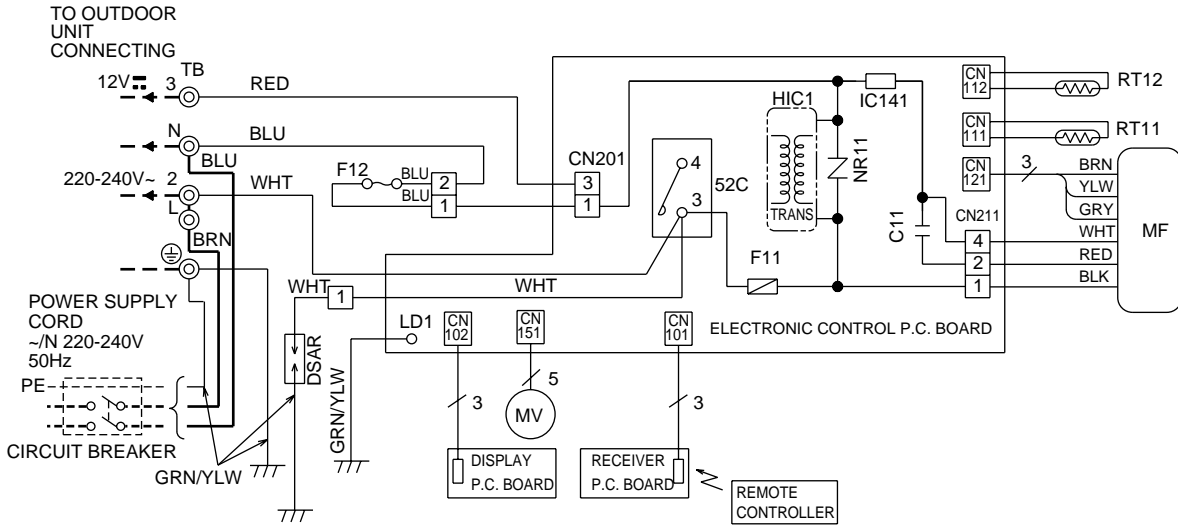
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C1	COMPRESSOR CAPACITOR	MC	COMPRESOR (INNER PROTECTOR)	TB	TERMINAL BLOCK
C65	OUTDOOR FAN CAPACITOR	MF	OUTDOOR FAN MOTOR (INNER PROTECTOR)	X62	R.V. COIL RELAY
DSAR	SURGE ABSORBER	NR61	VARISTOR	21S4	R.V. COIL
F61	FUSE (2A)	RT61	DEFROST THERMISTOR	52C	COMPRESSOR CONTACTOR
IC881	DC/DC CONVERTER	SR61	SOLID STATE RELAY		

NOTES: 1.About the indoor side electric wiring refer to the indoor unit electric wiring diagram for servicing.  
 2.Use copper conductors only. (For field wiring)  
 3.Symbols below indicate.  
 ⊙ : Terminal block □ □ □ : Connector

SG79J004H01

# MSH-24RV -[E1] MODEL WIRING DIAGRAM

## INDOOR UNIT



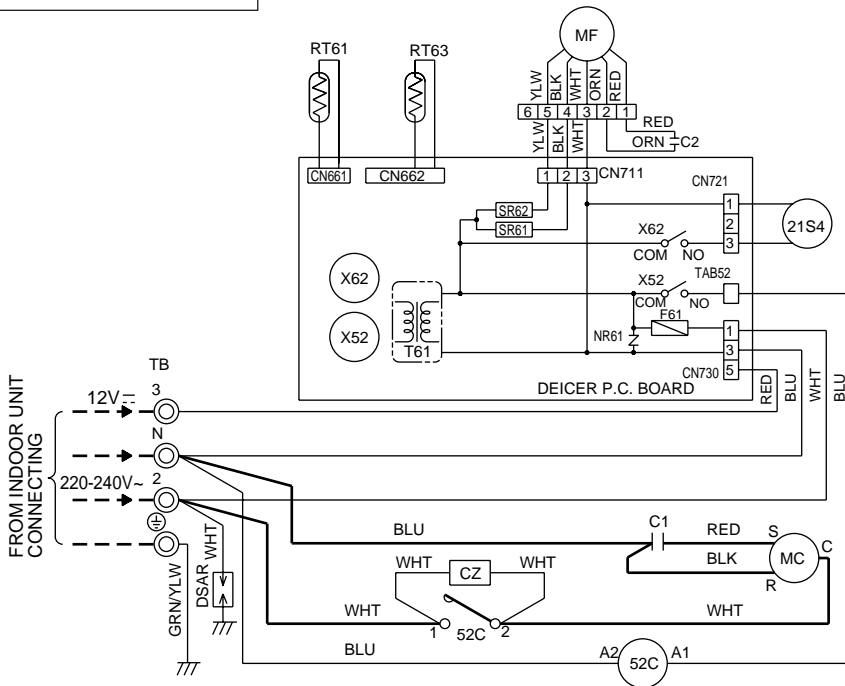
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C11	INDOOR FAN CAPACITOR	IC141	HYBRID IC	RT12	INDOOR COIL THERMISTOR
DSAR	SURGE ABSORBER	MF	INDOOR FAN MOTOR (INNER FUSE)	TB	TERMINAL BLOCK
F11	FUSE (3.15A)	MV	VANE MOTOR	52C	CONTACTOR
F12	THERMAL FUSE (93°C)	NR11	VARISTOR		
HIC1	DC/DC CONVERTER	RT11	ROOM TEMPERATURE THERMISTOR		

- NOTES: 1.About the outdoor side electric wiring refer to the outdoor unit electric wiring diagram for servicing.  
 2.Use copper conductors only. (For field wiring)  
 3.Symbols below indicate.  
 ⊙ : Terminal block □ : Connector

VG79B022H01

# MUH-24RV -[E1] MODEL WIRING DIAGRAM

## OUTDOOR UNIT



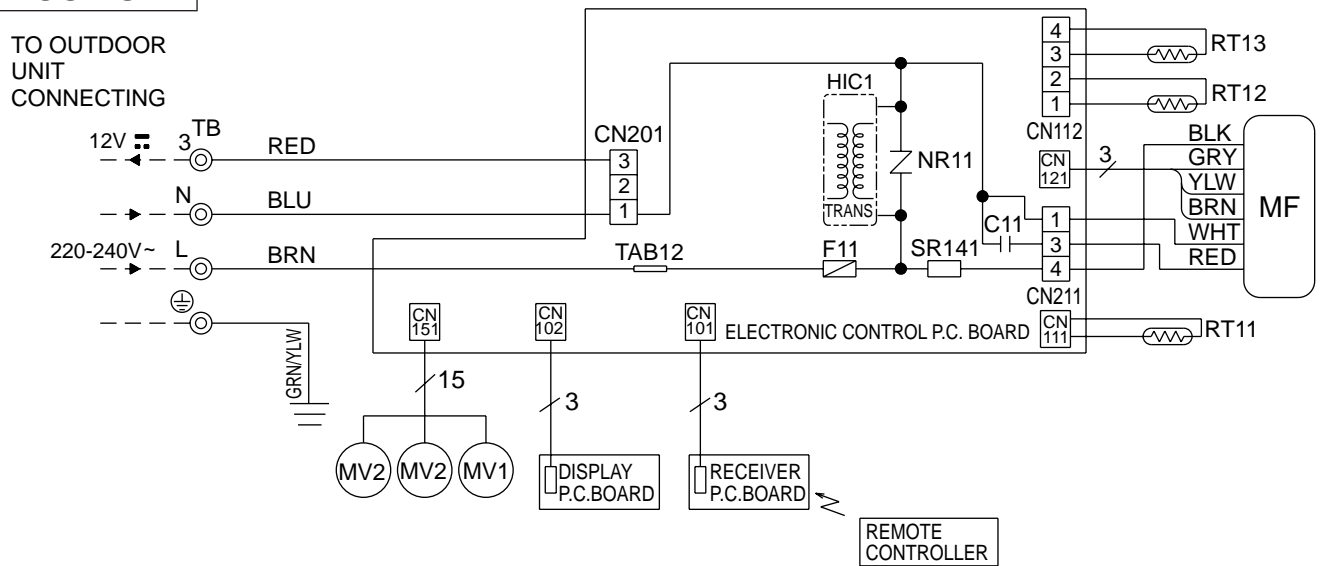
SYMBOL	NAME
CZ	CZ SURGE ABSORBER
C1	COMPRESSOR CAPACITOR
C2	OUTDOOR FAN CAPACITOR
DSAR	SURGE ABSORBER
F61	FUSE (3.15A)
MC	COMPRESSOR (INNER PROTECTOR)
MF	OUTDOOR FAN MOTOR (INNER PROTECTOR)
NR61	VARISTOR
RT61	DEFROST THERMISTOR
RT63	AMBIENT TEMPERATURE THERMISTOR
SR61	SOLID STATE RELAY
SR62	SOLID STATE RELAY
TB	TERMINAL BLOCK
T61	TRANSFORMER
X52	CONTACTOR
X62	R. V. COIL RELAY
21S4	R. V. COIL
52C	COMPRESSOR 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 (3,N,2).  
 3.Symbols below indicate.  
 ⊙:Terminal block, □:Connector

SG79J183H01

# MSH-30RV -E1 MODEL WIRING DIAGRAM

## INDOOR UNIT



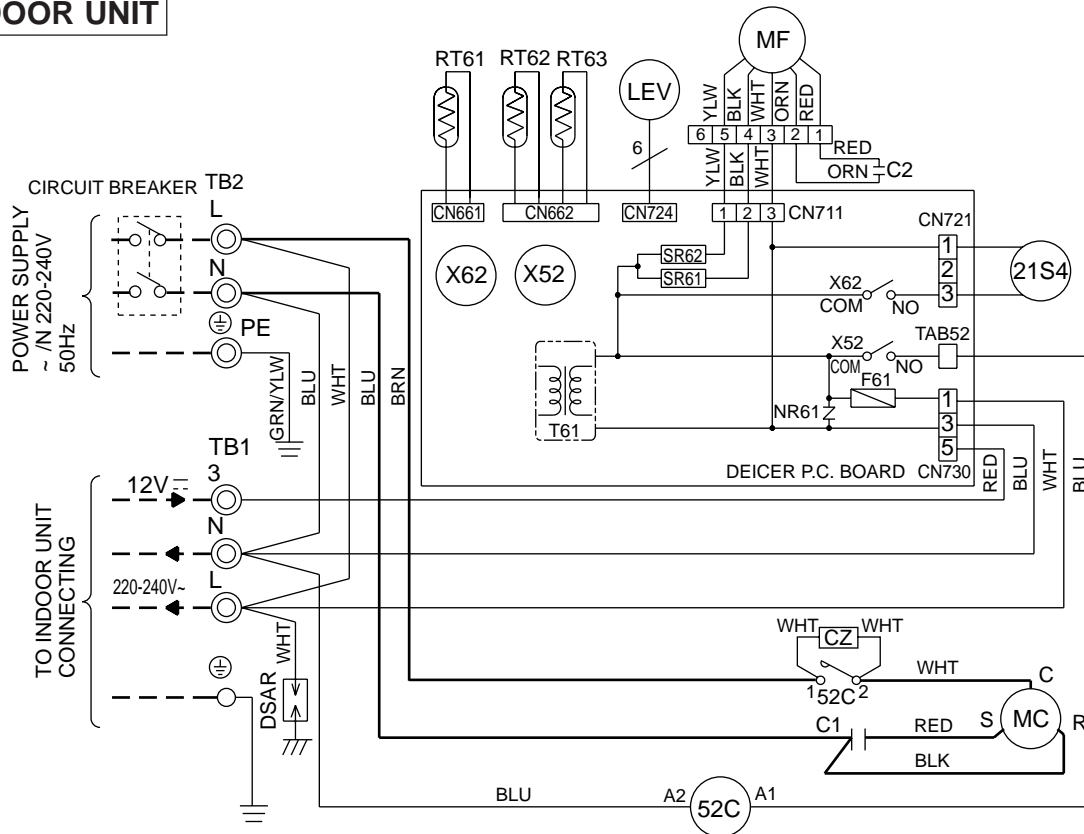
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C11	INDOOR FAN CAPACITOR	MV2	VANE MOTOR(VERTICAL)	SR141	SOLID STATE RELAY
F11	FUSE(3.15A)	NR11	VARISTOR	TB	TERMINAL BLOCK
HIC1	DC/DC CONVERTER	RT11	ROOM TEMPERATURE THERMISTOR		
MF	INDOOR FAN MOTOR(INNER PROTECTOR)	RT12	INDOOR COIL THERMISTOR (MAIN)		
MV1	VANE MOTOR(HORIZONTAL)	RT13	INDOOR COIL THERMISTOR (SUB)		

NOTE:1. About the outdoor side electric wiring refer to the outdoor unit electric wiring diagram for servicing.  
 2. Use copper conductors only. (For field wiring)  
 3. Symbols below indicate.  
 ○: Terminal block, □□□□: Connector

SG79J148H01

# MUH-30RV -E1 MODEL WIRING DIAGRAM

## OUTDOOR UNIT



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CZ	CZ SURGE ABSRBER	MF	OUTDOOR FAN MOTOR (INNER PROTECTOR)	TB1	TERMINAL BLOCK
C1	COMPRESSOR CAPACITOR	NR61	VARISTOR	TB2	TERMINAL BLOCK
C2	OUTDOOR FAN CAPACITOR	RT61	DEFROST THERMISTOR	T61	TRANSFORMER
DSAR	SURGE ABSORBER	RT62	DISCHARGE TEMPERATURE THERMISTOR	X52	CONTACTOR
F61	FUSE(3.15A)	RT63	AMBIENT TEMPERATURE THERMISTOR	X62	R.V. COIL RELAY
LEV	EXPANSION VALVE COIL	SR61	SOLID STATE RELAY	21S4	R.V. COIL
MC	COMPRESSOR (INNER PROTECTOR)	SR62	SOLID STATE RELAY	52C	COMPRESSOR CONTACTOR

NOTE 1. Use copper conductors only (For field wiring).

SG79J149H02

2. Since the indoor and outdoor unit connecting wires have polarity, connect them according to the numbers (3,N, L).

3. Symbols below indicate.

⊙: Terminal block, □□□□: Connector



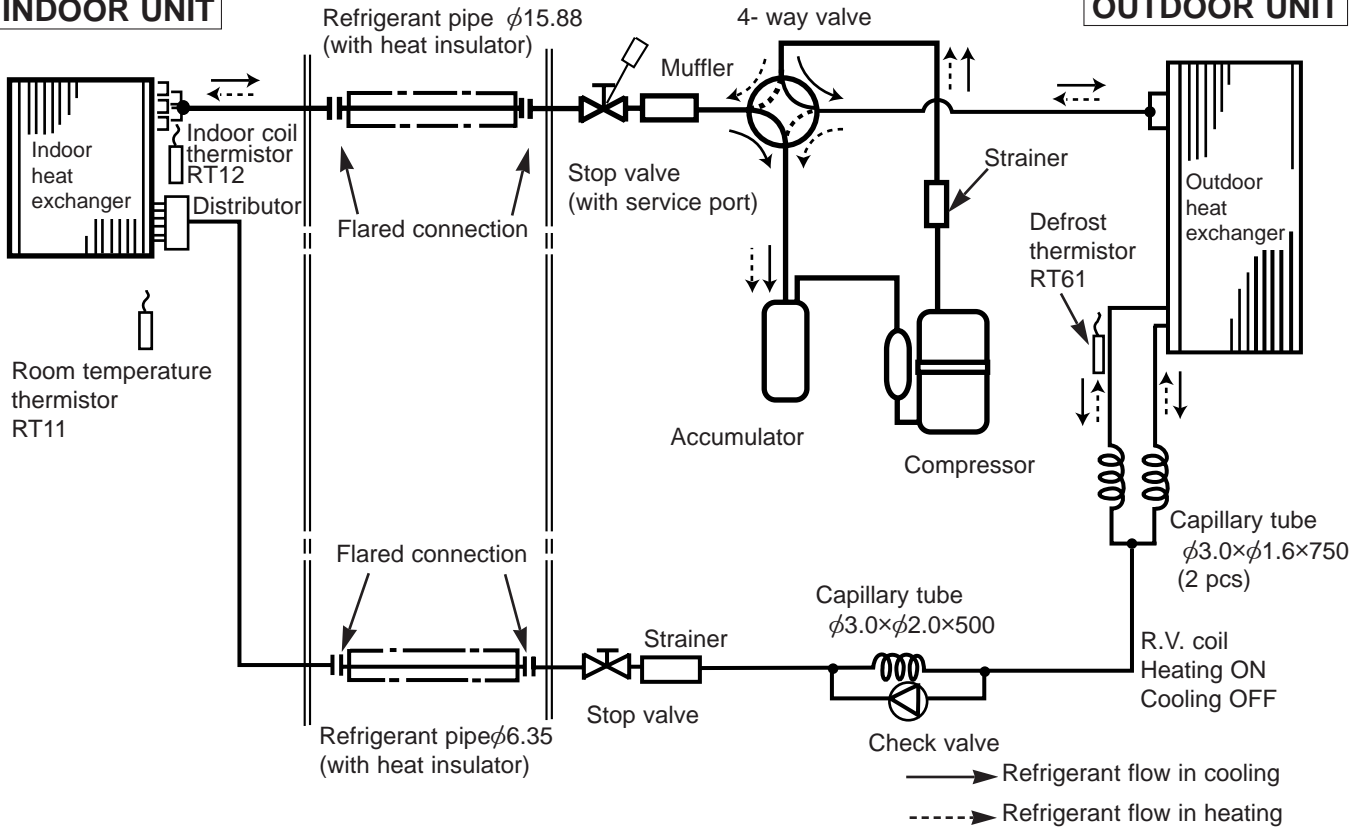
Unit:mm

MSH-18RV -[E1]

MUH-18RV -[E1]

INDOOR UNIT

OUTDOOR UNIT



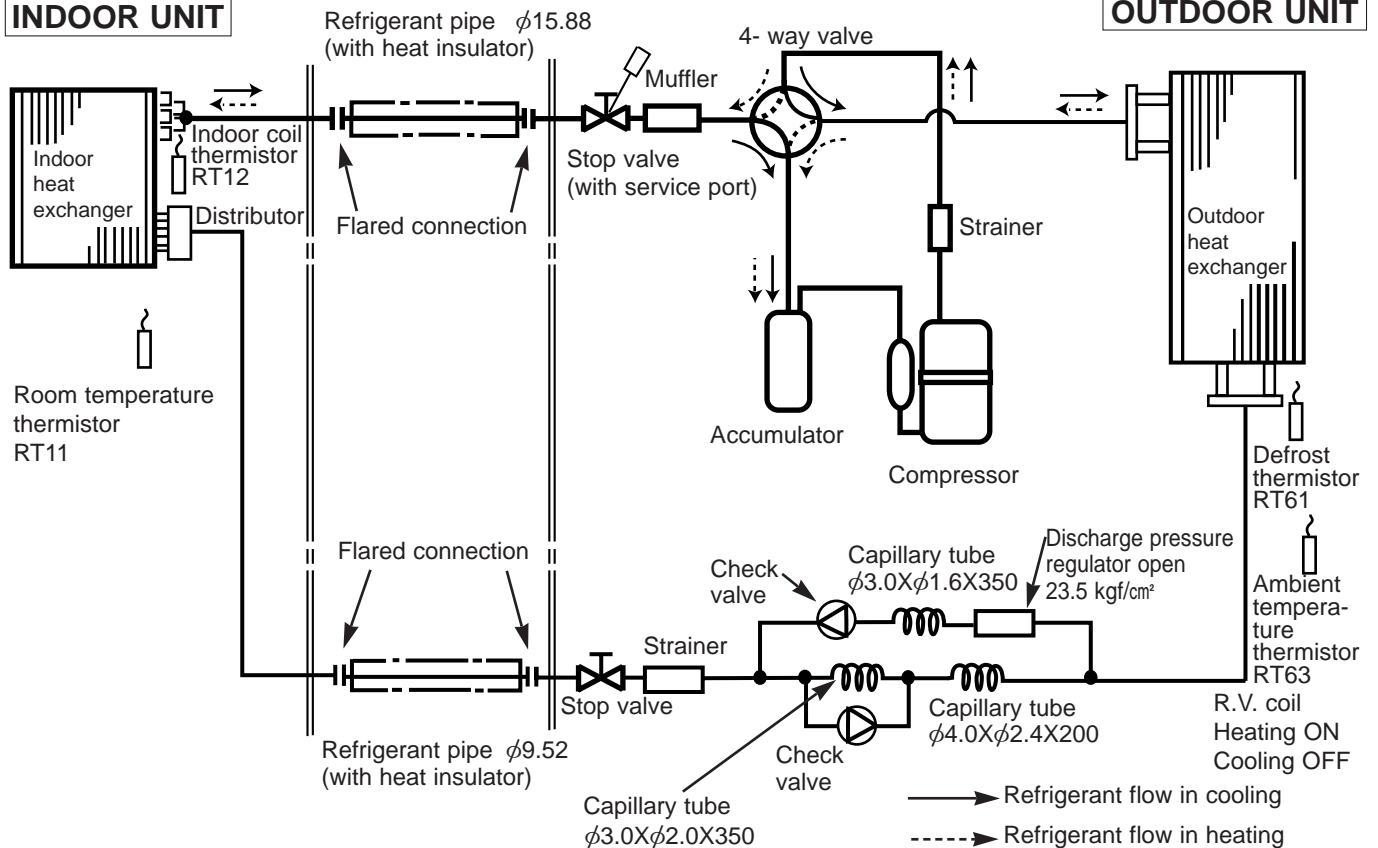
Unit:mm

MSH-24RV -[E1]

MUH-24RV -[E1]

INDOOR UNIT

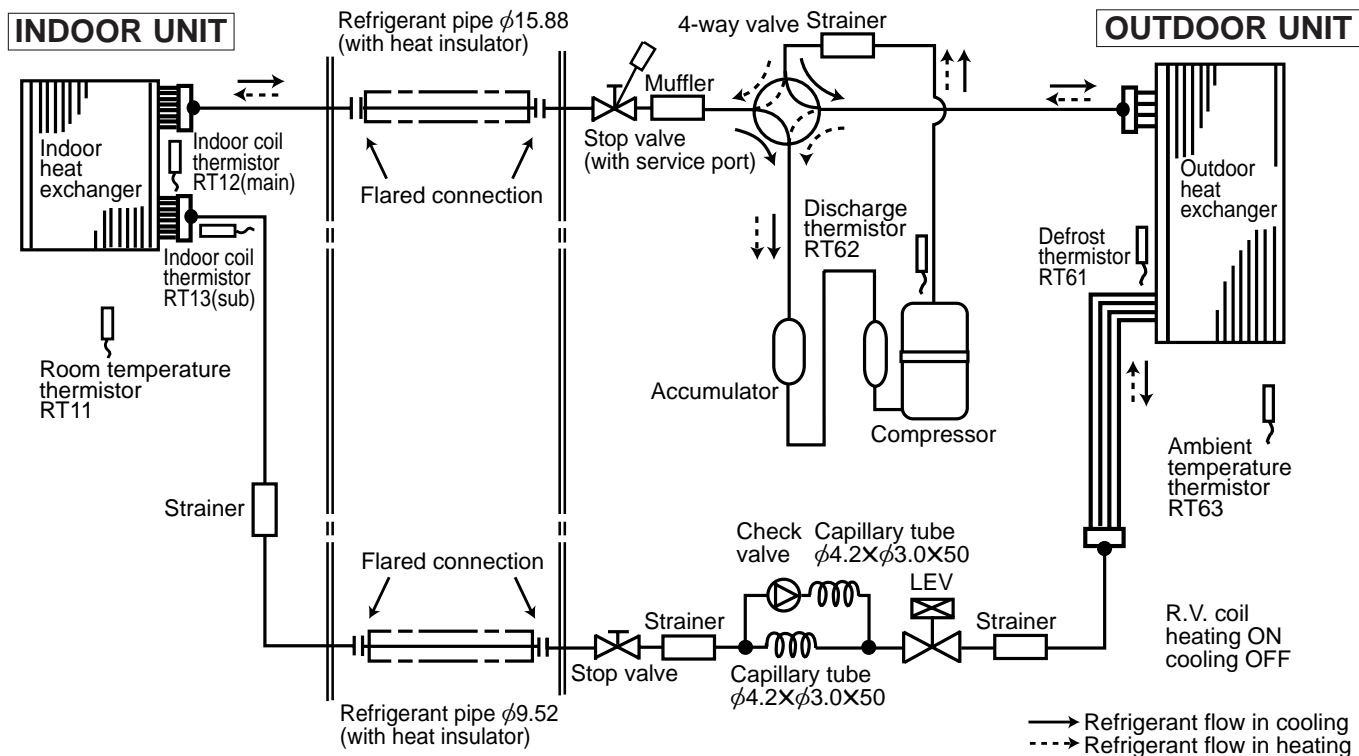
OUTDOOR UNIT



Unit:mm

MSH-30RV -E1

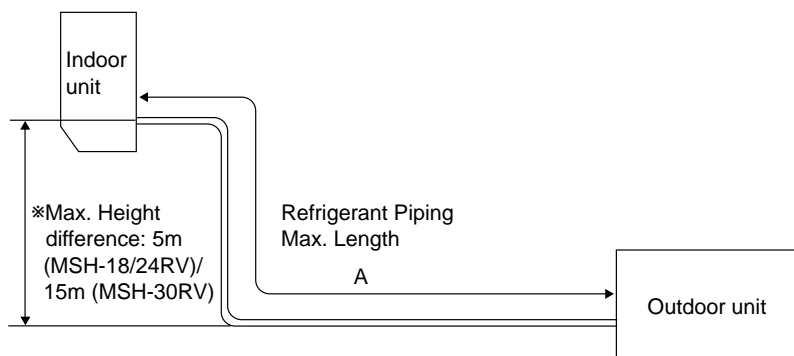
MUH-30RV -E1



### MAX. REFRIGERANT PIPING LENGTH

Model	Refrigerant piping Max. length : m A	Piping size O.D : mm		Length of connecting pipe : m	
		Gas	Liquid	Indoor unit	Outdoor unit
MSH-18RV - E1 MUH-18RV - E1	15	15.88	6.35	Gas 0.43 Liquid 0.5	Gas 0 Liquid 0
MSH-24RV - E1 MUH-24RV - E1			9.52		
MSH-30RV - E1 MUH-30RV - E1	30				

### MAX. HEIGHT DIFFERENCE



\* Height difference should be within 5m (MSH-18/24RV) / 15m (MSH-30RV) regardless of which unit, indoor or outdoor position is high.



### ADDITIONAL REFRIGERANT CHARGE(R22 : g)

Model	Outdoor unit precharged	Refrigerant piping length (one way)		
		7m	10m	15m
<b>MSH-18RV</b> - <input type="checkbox"/> E1 <b>MUH-18RV</b> - <input type="checkbox"/> E1	1,650	0	150	400

Calculation :  $Xg=50g/m \times (\text{Refrigerant piping length (m)}-7)$

Model	Outdoor unit precharged	Refrigerant piping length (one way)		
		7m	10m	15m
<b>MSH-24RV</b> - <input type="checkbox"/> E1 <b>MUH-24RV</b> - <input type="checkbox"/> E1	2,400	0	195	520

Calculation :  $Xg=65g/m \times (\text{Refrigerant piping length (m)}-7)$

Model	Outdoor unit precharged	Refrigerant piping length (one way)					
		7m	10m	15m	20m	25m	30m
<b>MSH-30RV</b> - <input type="checkbox"/> E1 <b>MUH-30RV</b> - <input type="checkbox"/> E1	2,300	0	195	520	845	1170	1495

Calculation :  $Xg=65g/m \times (\text{Refrigerant piping length(m)}-7)$

**MSH-18RV** -[E1]      **MUH-18RV** -[E1]  
**MSH-24RV** -[E1]      **MUH-24RV** -[E1]  
**MSH-30RV** -[E1]      **MUH-30RV** -[E1]

The standard data contained in these specifications apply only to the operation of the air conditioner under normal conditions, since operating conditions vary according to the areas where these units are installed. The following information has been provided to clarify the operating characteristics of the air conditioner under the conditions indicated by the performance curve.

**(1) GUARANTEED VOLTAGE**

198 ~ 264V, 50Hz

**(2) AIR FLOW**

Air flow should be set at MAX.

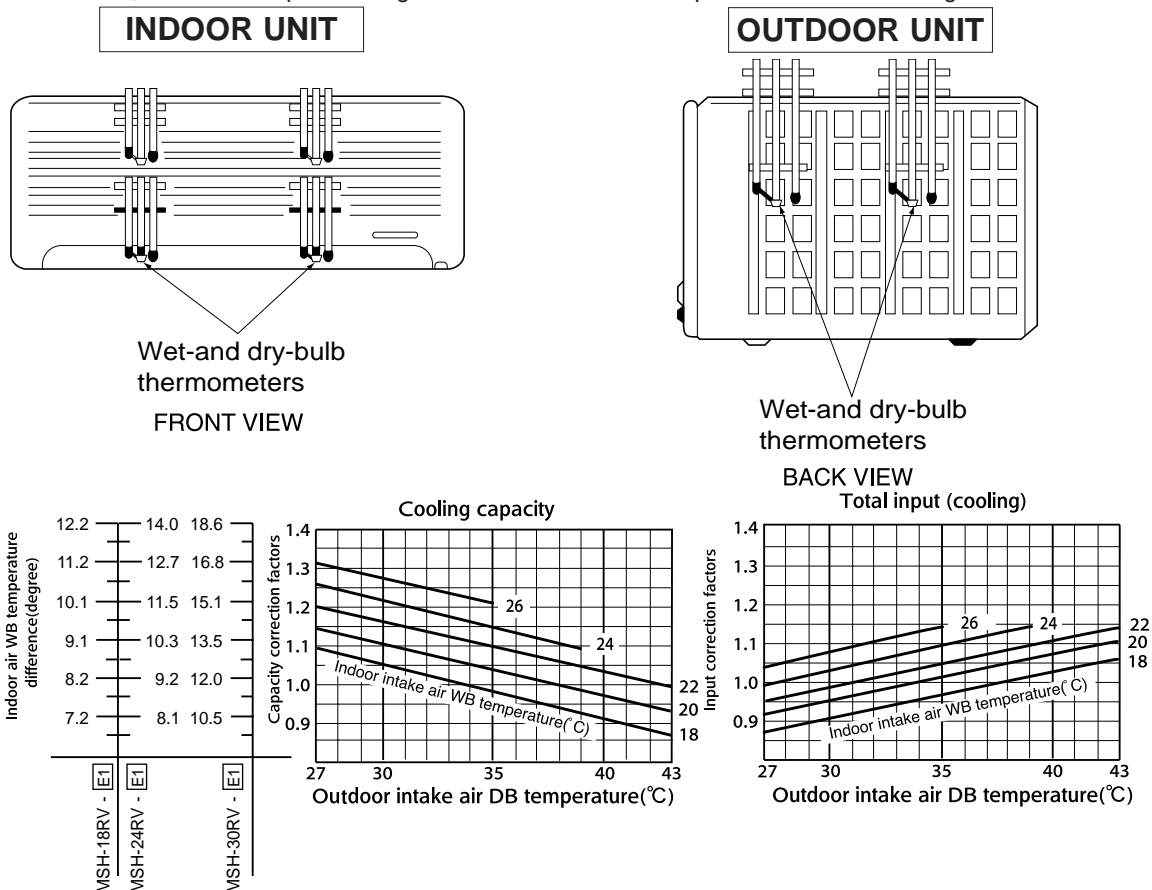
**(3) MAIN READINGS**

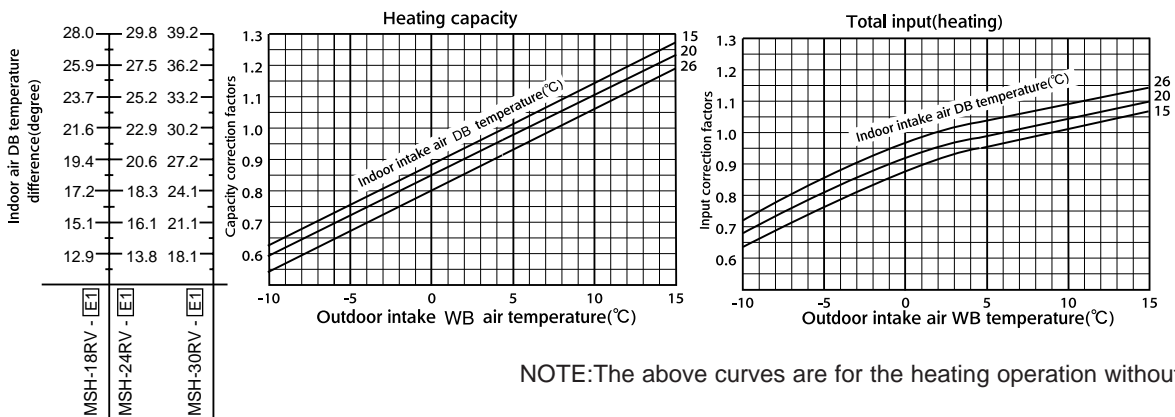
(1) Indoor intake air wet-bulb temperature :	°CWB	} Cooling
(2) Indoor outlet air wet-bulb temperature :	°CWB	
(3) Outdoor intake air dry-bulb temperature :	°CDB	
(4) Total input:	W	} Heating
(5) Indoor intake air dry-bulb temperature :	°CDB	
(6) Outdoor intake air wet-bulb temperature :	°CWB	
(7) Total input :	W	

Indoor air wet/dry-bulb temperature difference on the left side of the chart on this page and next page shows the difference between the indoor intake air wet/dry-bulb temperature and the indoor outlet air wet/dry-bulb temperature for your reference at service.

**How to measure the indoor air wet-bulb/dry-bulb temperature difference**

1. Attach at least 2 sets of wet-and dry-bulb thermometers to the indoor air intake as shown in the figure, and at least 2 sets of wet-and dry-bulb thermometers to the indoor air outlet. The thermometers must be attached to the position where air speed is high.
2. Attach at least 2 sets of wet-and dry-bulb thermometers to the outdoor air intake. Cover the thermometers to prevent direct rays of the sun.
3. Check that the air filter is cleaned.
4. Open windows and doors of room.
5. Press the EMERGENCY OPERATION switch once(twice) to start the EMERGENCY COOL(HEAT) MODE.
6. When system stabilizes after more than 15 minutes, measure temperature and take an average temperature.
7. 10 minutes later, measure temperature again and check that the temperature does not change.





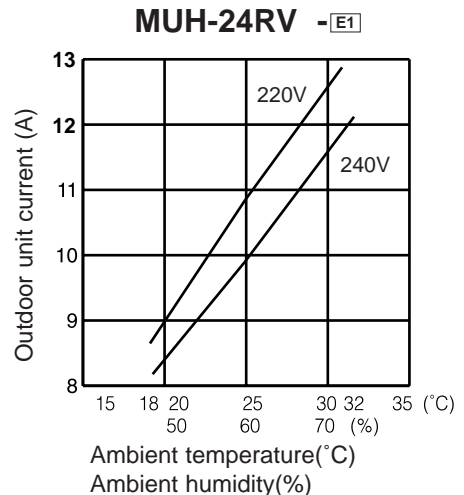
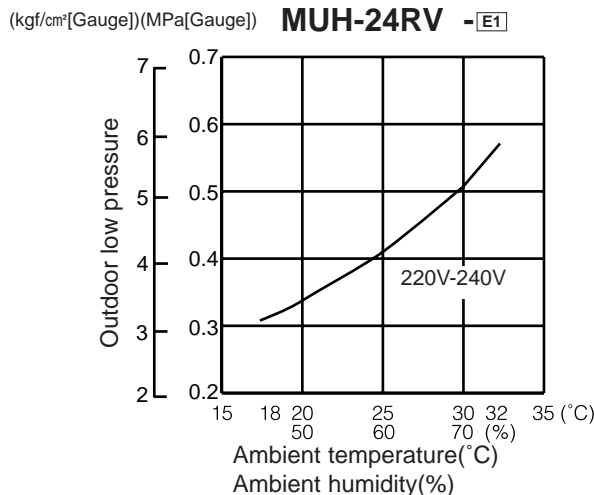
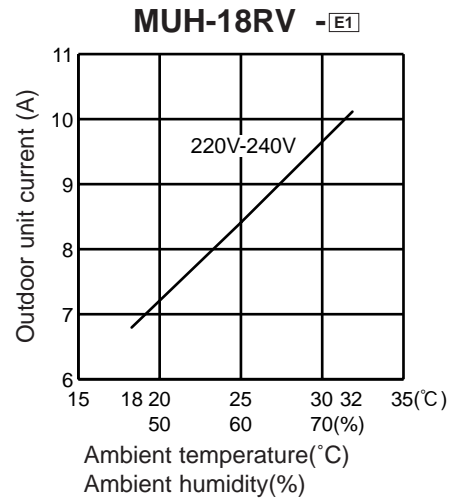
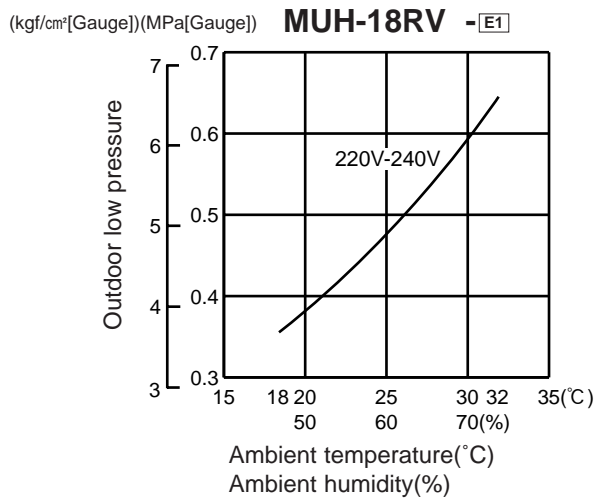
## OUTDOOR LOW PRESSURE AND OUTDOOR UNIT CURRENT COOL operation

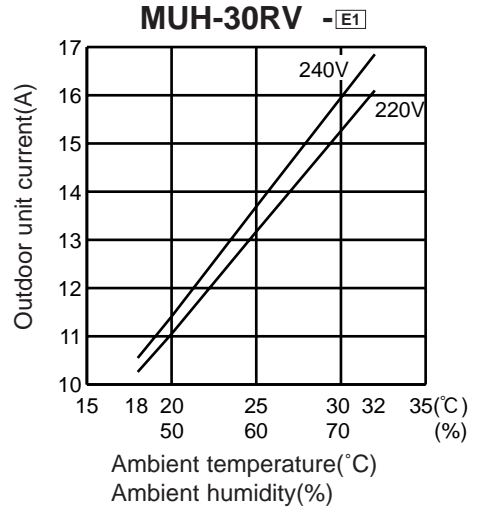
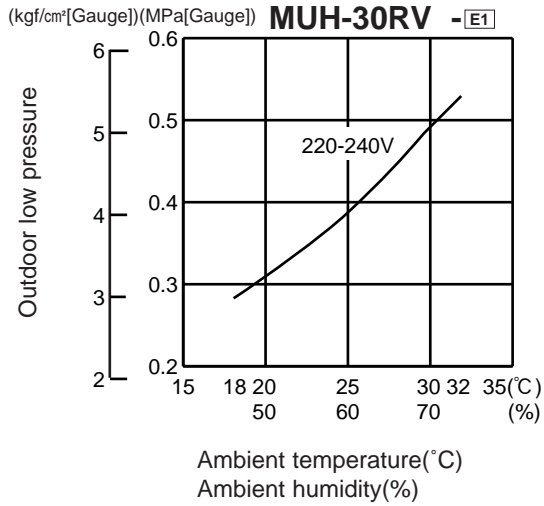
① Both indoor and outdoor unit are under the same temperature/humidity condition.

Dry-bulb temperature	Relative humidity(%)
20	50
25	60
30	70

② Air flow should be set at MAX.

③ The unit of pressure has been changed to MPa on the international system of units(SI unit system).  
The conversion factor is : **1(MPa [Gauge]) = 10.2(kgf/cm<sup>2</sup> [Gauge])**

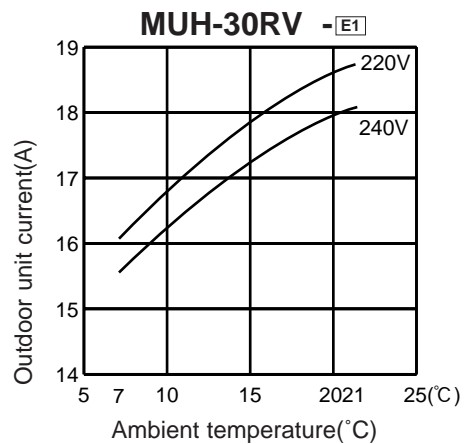
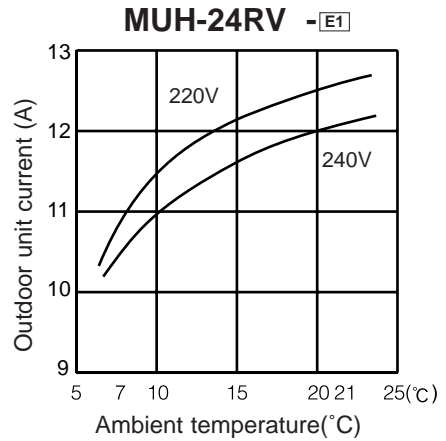
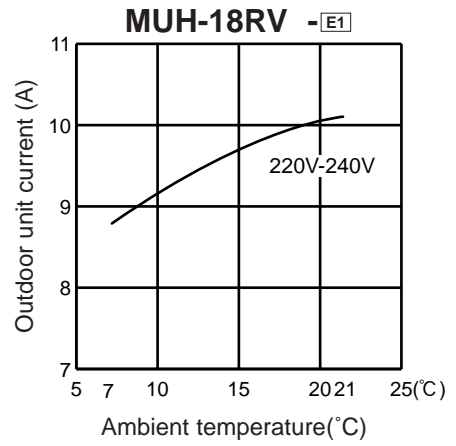




### HEAT operation

Condition indoor: Dry bulb temperature 20.0°C  
Wet bulb temperature 14.5°C

Outdoor: Dry bulb temperature 7, 15, 20°C  
Wet bulb temperature 6, 12, 14.5°C



**PERFORMANCE DATA COOL operation**  
**MSH-18RV -[E1] : MUH-18RV -[E1] (220V)**

CAPACITY : 5.1(KW) SHF : 0.66 INPUT : 2030(W)

INDOOR		OUTDOOR DB(°C)															
		21				25				27				30			
DB(°C)	WB(°C)	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	5.99	2.88	0.48	1624	5.74	2.75	0.48	1705	5.51	2.64	0.48	1786	5.30	2.55	0.48	1868
21	20	6.25	2.25	0.36	1705	5.99	2.16	0.36	1807	5.81	2.09	0.36	1847	5.61	2.02	0.36	1929
22	18	5.99	3.12	0.52	1624	5.74	2.98	0.52	1705	5.51	2.86	0.52	1786	5.30	2.76	0.52	1868
22	20	6.25	2.50	0.40	1705	5.99	2.40	0.40	1807	5.81	2.33	0.40	1847	5.61	2.24	0.40	1929
22	22	6.50	1.82	0.28	1766	6.27	1.76	0.28	1878	6.12	1.71	0.28	1929	5.87	1.64	0.28	2010
23	18	5.99	3.36	0.56	1624	5.74	3.21	0.56	1705	5.51	3.08	0.56	1786	5.30	2.97	0.56	1868
23	20	6.25	2.75	0.44	1705	5.99	2.64	0.44	1807	5.81	2.56	0.44	1847	5.61	2.47	0.44	1929
23	22	6.50	2.08	0.32	1766	6.27	2.01	0.32	1878	6.12	1.96	0.32	1929	5.87	1.88	0.32	2010
24	18	5.99	3.60	0.60	1624	5.74	3.44	0.60	1705	5.51	3.30	0.60	1786	5.30	3.18	0.60	1868
24	20	6.25	3.00	0.48	1705	5.99	2.88	0.48	1807	5.81	2.79	0.48	1847	5.61	2.69	0.48	1929
24	22	6.50	2.34	0.36	1766	6.27	2.26	0.36	1878	6.12	2.20	0.36	1929	5.87	2.11	0.36	2010
24	24	6.83	1.64	0.24	1847	6.58	1.58	0.24	1949	6.43	1.54	0.24	2010	6.22	1.49	0.24	2111
25	18	5.99	3.84	0.64	1624	5.74	3.67	0.64	1705	5.51	3.53	0.64	1786	5.30	3.39	0.64	1868
25	20	6.25	3.25	0.52	1705	5.99	3.12	0.52	1807	5.81	3.02	0.52	1847	5.61	2.92	0.52	1929
25	22	6.50	2.60	0.40	1766	6.27	2.51	0.40	1878	6.12	2.45	0.40	1929	5.87	2.35	0.40	2010
25	24	6.83	1.91	0.28	1847	6.58	1.84	0.28	1949	6.43	1.80	0.28	2010	6.22	1.74	0.28	2111
26	18	5.99	4.07	0.68	1624	5.74	3.90	0.68	1705	5.51	3.75	0.68	1786	5.30	3.61	0.68	1868
26	20	6.25	3.50	0.56	1705	5.99	3.36	0.56	1807	5.81	3.26	0.56	1847	5.61	3.14	0.56	1929
26	22	6.50	2.86	0.44	1766	6.27	2.76	0.44	1878	6.12	2.69	0.44	1929	5.87	2.58	0.44	2010
26	24	6.83	2.19	0.32	1847	6.58	2.11	0.32	1949	6.43	2.06	0.32	2010	6.22	1.99	0.32	2111
26	26	7.04	1.41	0.20	1949	6.83	1.37	0.20	2050	6.73	1.35	0.20	2111	6.53	1.31	0.20	2172
27	18	5.99	4.31	0.72	1624	5.74	4.13	0.72	1705	5.51	3.97	0.72	1786	5.30	3.82	0.72	1868
27	20	6.25	3.75	0.60	1705	5.99	3.60	0.60	1807	5.81	3.49	0.60	1847	5.61	3.37	0.60	1929
27	22	6.50	3.12	0.48	1766	6.27	3.01	0.48	1878	6.12	2.94	0.48	1929	5.87	2.82	0.48	2010
27	24	6.83	2.46	0.36	1847	6.58	2.37	0.36	1949	6.43	2.31	0.36	2010	6.22	2.24	0.36	2111
27	26	7.04	1.69	0.24	1949	6.83	1.64	0.24	2050	6.73	1.62	0.24	2111	6.53	1.57	0.24	2172
28	18	5.99	4.55	0.76	1624	5.74	4.36	0.76	1705	5.51	4.19	0.76	1786	5.30	4.03	0.76	1868
28	20	6.25	4.00	0.64	1705	5.99	3.84	0.64	1807	5.81	3.72	0.64	1847	5.61	3.59	0.64	1929
28	22	6.50	3.38	0.52	1766	6.27	3.26	0.52	1878	6.12	3.18	0.52	1929	5.87	3.05	0.52	2010
28	24	6.83	2.73	0.40	1847	6.58	2.63	0.40	1949	6.43	2.57	0.40	2010	6.22	2.49	0.40	2111
28	26	7.04	1.97	0.28	1949	6.83	1.91	0.28	2050	6.73	1.88	0.28	2111	6.53	1.83	0.28	2172
29	18	5.99	4.79	0.80	1624	5.74	4.59	0.80	1705	5.51	4.41	0.80	1786	5.30	4.24	0.80	1868
29	20	6.25	4.25	0.68	1705	5.99	4.07	0.68	1807	5.81	3.95	0.68	1847	5.61	3.81	0.68	1929
29	22	6.50	3.64	0.56	1766	6.27	3.51	0.56	1878	6.12	3.43	0.56	1929	5.87	3.28	0.56	2010
29	24	6.83	3.01	0.44	1847	6.58	2.89	0.44	1949	6.43	2.83	0.44	2010	6.22	2.74	0.44	2111
29	26	7.04	2.25	0.32	1949	6.83	2.19	0.32	2050	6.73	2.15	0.32	2111	6.53	2.09	0.32	2172
30	18	5.99	5.03	0.84	1624	5.74	4.82	0.84	1705	5.51	4.63	0.84	1786	5.30	4.46	0.84	1868
30	20	6.25	4.50	0.72	1705	5.99	4.31	0.72	1807	5.81	4.19	0.72	1847	5.61	4.04	0.72	1929
30	22	6.50	3.90	0.60	1766	6.27	3.76	0.60	1878	6.12	3.67	0.60	1929	5.87	3.52	0.60	2010
30	24	6.83	3.28	0.48	1847	6.58	3.16	0.48	1949	6.43	3.08	0.48	2010	6.22	2.99	0.48	2111
30	26	7.04	2.53	0.36	1949	6.83	2.46	0.36	2050	6.73	2.42	0.36	2111	6.53	2.35	0.36	2172
31	18	5.99	5.27	0.88	1624	5.74	5.05	0.88	1705	5.51	4.85	0.88	1786	5.30	4.67	0.88	1868
31	20	6.25	4.75	0.76	1705	5.99	4.55	0.76	1807	5.81	4.42	0.76	1847	5.61	4.26	0.76	1929
31	22	6.50	4.16	0.64	1766	6.27	4.01	0.64	1878	6.12	3.92	0.64	1929	5.87	3.75	0.64	2010
31	24	6.83	3.55	0.52	1847	6.58	3.42	0.52	1949	6.43	3.34	0.52	2010	6.22	3.24	0.52	2111
31	26	7.04	2.82	0.40	1949	6.83	2.73	0.40	2050	6.73	2.69	0.40	2111	6.53	2.61	0.40	2172
32	18	5.99	5.51	0.92	1624	5.74	5.28	0.92	1705	5.51	5.07	0.92	1786	5.30	4.88	0.92	1868
32	20	6.25	5.00	0.80	1705	5.99	4.79	0.80	1807	5.81	4.65	0.80	1847	5.61	4.49	0.80	1929
32	22	6.50	4.42	0.68	1766	6.27	4.27	0.68	1878	6.12	4.16	0.68	1929	5.87	3.99	0.68	2010
32	24	6.83	3.83	0.56	1847	6.58	3.68	0.56	1949	6.43	3.60	0.56	2010	6.22	3.48	0.56	2111
32	26	7.04	3.10	0.44	1949	6.83	3.01	0.44	2050	6.73	2.96	0.44	2111	6.53	2.87	0.44	2172

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA COOL operation**  
**MSH-18RV -E1 : MUH-18RV -E1 (220V)**

CAPACITY : 5.1(KW) SHF : 0.66 INPUT : 2030(W)

INDOOR		OUTDOOR DB(°C)															
		35				40				43				46			
		DB(°C)	WB(°C)	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC
21	18	5.00	2.40	0.48	1989	4.59	2.20	0.48	2111	4.41	2.12	0.48	2152	4.23	2.03	0.48	2192
21	20	5.25	1.89	0.36	2071	4.90	1.76	0.36	2172	4.72	1.70	0.36	2233	4.54	1.63	0.36	2294
22	18	5.00	2.60	0.52	1989	4.59	2.39	0.52	2111	4.41	2.29	0.52	2152	4.23	2.20	0.52	2192
22	20	5.25	2.10	0.40	2071	4.90	1.96	0.40	2172	4.72	1.89	0.40	2233	4.54	1.82	0.40	2294
22	22	5.56	1.56	0.28	2152	5.20	1.46	0.28	2274	5.02	1.41	0.28	2314	4.85	1.36	0.28	2355
23	18	5.00	2.80	0.56	1989	4.59	2.57	0.56	2111	4.41	2.47	0.56	2152	4.23	2.37	0.56	2192
23	20	5.25	2.31	0.44	2071	4.90	2.15	0.44	2172	4.72	2.08	0.44	2233	4.54	2.00	0.44	2294
23	22	5.56	1.78	0.32	2152	5.20	1.66	0.32	2274	5.02	1.61	0.32	2314	4.85	1.55	0.32	2355
24	18	5.00	3.00	0.60	1989	4.59	2.75	0.60	2111	4.41	2.65	0.60	2152	4.23	2.54	0.60	2192
24	20	5.25	2.52	0.48	2071	4.90	2.35	0.48	2172	4.72	2.26	0.48	2233	4.54	2.18	0.48	2294
24	22	5.56	2.00	0.36	2152	5.20	1.87	0.36	2274	5.02	1.81	0.36	2314	4.85	1.74	0.36	2355
24	24	5.87	1.41	0.24	2233	5.51	1.32	0.24	2335	5.36	1.29	0.24	2385	5.20	1.25	0.24	2436
25	18	5.00	3.20	0.64	1989	4.59	2.94	0.64	2111	4.41	2.82	0.64	2152	4.23	2.71	0.64	2192
25	20	5.25	2.73	0.52	2071	4.90	2.55	0.52	2172	4.72	2.45	0.52	2233	4.54	2.36	0.52	2294
25	22	5.56	2.22	0.40	2152	5.20	2.08	0.40	2274	5.02	2.01	0.40	2314	4.85	1.94	0.40	2355
25	24	5.87	1.64	0.28	2233	5.51	1.54	0.28	2335	5.36	1.50	0.28	2385	5.20	1.46	0.28	2436
26	18	5.00	3.40	0.68	1989	4.59	3.12	0.68	2111	4.41	3.00	0.68	2152	4.23	2.88	0.68	2192
26	20	5.25	2.94	0.56	2071	4.90	2.74	0.56	2172	4.72	2.64	0.56	2233	4.54	2.54	0.56	2294
26	22	5.56	2.45	0.44	2152	5.20	2.29	0.44	2274	5.02	2.21	0.44	2314	4.85	2.13	0.44	2355
26	24	5.87	1.88	0.32	2233	5.51	1.76	0.32	2335	5.36	1.71	0.32	2385	5.20	1.66	0.32	2436
26	26	6.17	1.23	0.20	2314	5.81	1.16	0.20	2416	5.64	1.13	0.20	2466	5.46	1.09	0.20	2517
27	18	5.00	3.60	0.72	1989	4.59	3.30	0.72	2111	4.41	3.18	0.72	2152	4.23	3.05	0.72	2192
27	20	5.25	3.15	0.60	2071	4.90	2.94	0.60	2172	4.72	2.83	0.60	2233	4.54	2.72	0.60	2294
27	22	5.56	2.67	0.48	2152	5.20	2.50	0.48	2274	5.02	2.41	0.48	2314	4.85	2.33	0.48	2355
27	24	5.87	2.11	0.36	2233	5.51	1.98	0.36	2335	5.36	1.93	0.36	2385	5.20	1.87	0.36	2436
27	26	6.17	1.48	0.24	2314	5.81	1.40	0.24	2416	5.64	1.35	0.24	2466	5.46	1.31	0.24	2517
28	18	5.00	3.80	0.76	1989	4.59	3.49	0.76	2111	4.41	3.35	0.76	2152	4.23	3.22	0.76	2192
28	20	5.25	3.36	0.64	2071	4.90	3.13	0.64	2172	4.72	3.02	0.64	2233	4.54	2.90	0.64	2294
28	22	5.56	2.89	0.52	2152	5.20	2.71	0.52	2274	5.02	2.61	0.52	2314	4.85	2.52	0.52	2355
28	24	5.87	2.35	0.40	2233	5.51	2.20	0.40	2335	5.36	2.14	0.40	2385	5.20	2.08	0.40	2436
28	26	6.17	1.73	0.28	2314	5.81	1.63	0.28	2416	5.64	1.58	0.28	2466	5.46	1.53	0.28	2517
29	18	5.00	4.00	0.80	1989	4.59	3.67	0.80	2111	4.41	3.53	0.80	2152	4.23	3.39	0.80	2192
29	20	5.25	3.57	0.68	2071	4.90	3.33	0.68	2172	4.72	3.21	0.68	2233	4.54	3.09	0.68	2294
29	22	5.56	3.11	0.56	2152	5.20	2.91	0.56	2274	5.02	2.81	0.56	2314	4.85	2.71	0.56	2355
29	24	5.87	2.58	0.44	2233	5.51	2.42	0.44	2335	5.36	2.36	0.44	2385	5.20	2.29	0.44	2436
29	26	6.17	1.97	0.32	2314	5.81	1.86	0.32	2416	5.64	1.80	0.32	2466	5.46	1.75	0.32	2517
30	18	5.00	4.20	0.84	1989	4.59	3.86	0.84	2111	4.41	3.71	0.84	2152	4.23	3.56	0.84	2192
30	20	5.25	3.78	0.72	2071	4.90	3.53	0.72	2172	4.72	3.40	0.72	2233	4.54	3.27	0.72	2294
30	22	5.56	3.34	0.60	2152	5.20	3.12	0.60	2274	5.02	3.01	0.60	2314	4.85	2.91	0.60	2355
30	24	5.87	2.82	0.48	2233	5.51	2.64	0.48	2335	5.36	2.57	0.48	2385	5.20	2.50	0.48	2436
30	26	6.17	2.22	0.36	2314	5.81	2.09	0.36	2416	5.64	2.03	0.36	2466	5.46	1.96	0.36	2517
31	18	5.00	4.40	0.88	1989	4.59	4.04	0.88	2111	4.41	3.88	0.88	2152	4.23	3.73	0.88	2192
31	20	5.25	3.99	0.76	2071	4.90	3.72	0.76	2172	4.72	3.59	0.76	2233	4.54	3.45	0.76	2294
31	22	5.56	3.56	0.64	2152	5.20	3.33	0.64	2274	5.02	3.22	0.64	2314	4.85	3.10	0.64	2355
31	24	5.87	3.05	0.52	2233	5.51	2.86	0.52	2335	5.36	2.78	0.52	2385	5.20	2.71	0.52	2436
31	26	6.17	2.47	0.40	2314	5.81	2.33	0.40	2416	5.64	2.25	0.40	2466	5.46	2.18	0.40	2517
32	18	5.00	4.60	0.92	1989	4.59	4.22	0.92	2111	4.41	4.06	0.92	2152	4.23	3.89	0.92	2192
32	20	5.25	4.20	0.80	2071	4.90	3.92	0.80	2172	4.72	3.77	0.80	2233	4.54	3.63	0.80	2294
32	22	5.56	3.78	0.68	2152	5.20	3.54	0.68	2274	5.02	3.42	0.68	2314	4.85	3.29	0.68	2355
32	24	5.87	3.28	0.56	2233	5.51	3.08	0.56	2335	5.36	3.00	0.56	2385	5.20	2.91	0.56	2436
32	26	6.17	2.72	0.44	2314	5.81	2.56	0.44	2416	5.64	2.48	0.44	2466	5.46	2.40	0.44	2517

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature



**PERFORMANCE DATA COOL operation**  
**MSH-18RV -[E1] : MUH-18RV -[E1] (240V)**

CAPACITY : 5.1(KW) SHF : 0.66 INPUT : 2120(W)

INDOOR		OUTDOOR DB(°C)															
		21				25				27				30			
DB(°C)	WB(°C)	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	5.99	2.88	0.48	1696	5.74	2.75	0.48	1781	5.51	2.64	0.48	1866	5.30	2.55	0.48	1950
21	20	6.25	2.25	0.36	1781	5.99	2.16	0.36	1887	5.81	2.09	0.36	1929	5.61	2.02	0.36	2014
22	18	5.99	3.12	0.52	1696	5.74	2.98	0.52	1781	5.51	2.86	0.52	1866	5.30	2.76	0.52	1950
22	20	6.25	2.50	0.40	1781	5.99	2.40	0.40	1887	5.81	2.33	0.40	1929	5.61	2.24	0.40	2014
22	22	6.50	1.82	0.28	1844	6.27	1.76	0.28	1961	6.12	1.71	0.28	2014	5.87	1.64	0.28	2099
23	18	5.99	3.36	0.56	1696	5.74	3.21	0.56	1781	5.51	3.08	0.56	1866	5.30	2.97	0.56	1950
23	20	6.25	2.75	0.44	1781	5.99	2.64	0.44	1887	5.81	2.56	0.44	1929	5.61	2.47	0.44	2014
23	22	6.50	2.08	0.32	1844	6.27	2.01	0.32	1961	6.12	1.96	0.32	2014	5.87	1.88	0.32	2099
24	18	5.99	3.60	0.60	1696	5.74	3.44	0.60	1781	5.51	3.30	0.60	1866	5.30	3.18	0.60	1950
24	20	6.25	3.00	0.48	1781	5.99	2.88	0.48	1887	5.81	2.79	0.48	1929	5.61	2.69	0.48	2014
24	22	6.50	2.34	0.36	1844	6.27	2.26	0.36	1961	6.12	2.20	0.36	2014	5.87	2.11	0.36	2099
24	24	6.83	1.64	0.24	1929	6.58	1.58	0.24	2035	6.43	1.54	0.24	2099	6.22	1.49	0.24	2205
25	18	5.99	3.84	0.64	1696	5.74	3.67	0.64	1781	5.51	3.53	0.64	1866	5.30	3.39	0.64	1950
25	20	6.25	3.25	0.52	1781	5.99	3.12	0.52	1887	5.81	3.02	0.52	1929	5.61	2.92	0.52	2014
25	22	6.50	2.60	0.40	1844	6.27	2.51	0.40	1961	6.12	2.45	0.40	2014	5.87	2.35	0.40	2099
25	24	6.83	1.91	0.28	1929	6.58	1.84	0.28	2035	6.43	1.80	0.28	2099	6.22	1.74	0.28	2205
26	18	5.99	4.07	0.68	1696	5.74	3.90	0.68	1781	5.51	3.75	0.68	1866	5.30	3.61	0.68	1950
26	20	6.25	3.50	0.56	1781	5.99	3.36	0.56	1887	5.81	3.26	0.56	1929	5.61	3.14	0.56	2014
26	22	6.50	2.86	0.44	1844	6.27	2.76	0.44	1961	6.12	2.69	0.44	2014	5.87	2.58	0.44	2099
26	24	6.83	2.19	0.32	1929	6.58	2.11	0.32	2035	6.43	2.06	0.32	2099	6.22	1.99	0.32	2205
26	26	7.04	1.41	0.20	2035	6.83	1.37	0.20	2141	6.73	1.35	0.20	2205	6.53	1.31	0.20	2268
27	18	5.99	4.31	0.72	1696	5.74	4.13	0.72	1781	5.51	3.97	0.72	1866	5.30	3.82	0.72	1950
27	20	6.25	3.75	0.60	1781	5.99	3.60	0.60	1887	5.81	3.49	0.60	1929	5.61	3.37	0.60	2014
27	22	6.50	3.12	0.48	1844	6.27	3.01	0.48	1961	6.12	2.94	0.48	2014	5.87	2.82	0.48	2099
27	24	6.83	2.46	0.36	1929	6.58	2.37	0.36	2035	6.43	2.31	0.36	2099	6.22	2.24	0.36	2205
27	26	7.04	1.69	0.24	2035	6.83	1.64	0.24	2141	6.73	1.62	0.24	2205	6.53	1.57	0.24	2268
28	18	5.99	4.55	0.76	1696	5.74	4.36	0.76	1781	5.51	4.19	0.76	1866	5.30	4.03	0.76	1950
28	20	6.25	4.00	0.64	1781	5.99	3.84	0.64	1887	5.81	3.72	0.64	1929	5.61	3.59	0.64	2014
28	22	6.50	3.38	0.52	1844	6.27	3.26	0.52	1961	6.12	3.18	0.52	2014	5.87	3.05	0.52	2099
28	24	6.83	2.73	0.40	1929	6.58	2.63	0.40	2035	6.43	2.57	0.40	2099	6.22	2.49	0.40	2205
28	26	7.04	1.97	0.28	2035	6.83	1.91	0.28	2141	6.73	1.88	0.28	2205	6.53	1.83	0.28	2268
29	18	5.99	4.79	0.80	1696	5.74	4.59	0.80	1781	5.51	4.41	0.80	1866	5.30	4.24	0.80	1950
29	20	6.25	4.25	0.68	1781	5.99	4.07	0.68	1887	5.81	3.95	0.68	1929	5.61	3.81	0.68	2014
29	22	6.50	3.64	0.56	1844	6.27	3.51	0.56	1961	6.12	3.43	0.56	2014	5.87	3.28	0.56	2099
29	24	6.83	3.01	0.44	1929	6.58	2.89	0.44	2035	6.43	2.83	0.44	2099	6.22	2.74	0.44	2205
29	26	7.04	2.25	0.32	2035	6.83	2.19	0.32	2141	6.73	2.15	0.32	2205	6.53	2.09	0.32	2268
30	18	5.99	5.03	0.84	1696	5.74	4.82	0.84	1781	5.51	4.63	0.84	1866	5.30	4.46	0.84	1950
30	20	6.25	4.50	0.72	1781	5.99	4.31	0.72	1887	5.81	4.19	0.72	1929	5.61	4.04	0.72	2014
30	22	6.50	3.90	0.60	1844	6.27	3.76	0.60	1961	6.12	3.67	0.60	2014	5.87	3.52	0.60	2099
30	24	6.83	3.28	0.48	1929	6.58	3.16	0.48	2035	6.43	3.08	0.48	2099	6.22	2.99	0.48	2205
30	26	7.04	2.53	0.36	2035	6.83	2.46	0.36	2141	6.73	2.42	0.36	2205	6.53	2.35	0.36	2268
31	18	5.99	5.27	0.88	1696	5.74	5.05	0.88	1781	5.51	4.85	0.88	1866	5.30	4.67	0.88	1950
31	20	6.25	4.75	0.76	1781	5.99	4.55	0.76	1887	5.81	4.42	0.76	1929	5.61	4.26	0.76	2014
31	22	6.50	4.16	0.64	1844	6.27	4.01	0.64	1961	6.12	3.92	0.64	2014	5.87	3.75	0.64	2099
31	24	6.83	3.55	0.52	1929	6.58	3.42	0.52	2035	6.43	3.34	0.52	2099	6.22	3.24	0.52	2205
31	26	7.04	2.82	0.40	2035	6.83	2.73	0.40	2141	6.73	2.69	0.40	2205	6.53	2.61	0.40	2268
32	18	5.99	5.51	0.92	1696	5.74	5.28	0.92	1781	5.51	5.07	0.92	1866	5.30	4.88	0.92	1950
32	20	6.25	5.00	0.80	1781	5.99	4.79	0.80	1887	5.81	4.65	0.80	1929	5.61	4.49	0.80	2014
32	22	6.50	4.42	0.68	1844	6.27	4.27	0.68	1961	6.12	4.16	0.68	2014	5.87	3.99	0.68	2099
32	24	6.83	3.83	0.56	1929	6.58	3.68	0.56	2035	6.43	3.60	0.56	2099	6.22	3.48	0.56	2205
32	26	7.04	3.10	0.44	2035	6.83	3.01	0.44	2141	6.73	2.96	0.44	2205	6.53	2.87	0.44	2268

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA COOL operation**  
**MSH-18RV -[E1] : MUH-18RV -[E1] (240V)**

CAPACITY : 5.1(KW) SHF : 0.66 INPUT : 2120(W)

		OUTDOOR DB(°C)															
INDOOR DB(°C)	INDOOR WB(°C)	35				40				43				46			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	5.00	2.40	0.48	2078	4.59	2.20	0.48	2205	4.41	2.12	0.48	2247	4.23	2.03	0.48	2290
21	20	5.25	1.89	0.36	2162	4.90	1.76	0.36	2268	4.72	1.70	0.36	2332	4.54	1.63	0.36	2396
22	18	5.00	2.60	0.52	2078	4.59	2.39	0.52	2205	4.41	2.29	0.52	2247	4.23	2.20	0.52	2290
22	20	5.25	2.10	0.40	2162	4.90	1.96	0.40	2268	4.72	1.89	0.40	2332	4.54	1.82	0.40	2396
22	22	5.56	1.56	0.28	2247	5.20	1.46	0.28	2374	5.02	1.41	0.28	2417	4.85	1.36	0.28	2459
23	18	5.00	2.80	0.56	2078	4.59	2.57	0.56	2205	4.41	2.47	0.56	2247	4.23	2.37	0.56	2290
23	20	5.25	2.31	0.44	2162	4.90	2.15	0.44	2268	4.72	2.08	0.44	2332	4.54	2.00	0.44	2396
23	22	5.56	1.78	0.32	2247	5.20	1.66	0.32	2374	5.02	1.61	0.32	2417	4.85	1.55	0.32	2459
24	18	5.00	3.00	0.60	2078	4.59	2.75	0.60	2205	4.41	2.65	0.60	2247	4.23	2.54	0.60	2290
24	20	5.25	2.52	0.48	2162	4.90	2.35	0.48	2268	4.72	2.26	0.48	2332	4.54	2.18	0.48	2396
24	22	5.56	2.00	0.36	2247	5.20	1.87	0.36	2374	5.02	1.81	0.36	2417	4.85	1.74	0.36	2459
24	24	5.87	1.41	0.24	2332	5.51	1.32	0.24	2438	5.36	1.29	0.24	2491	5.20	1.25	0.24	2544
25	18	5.00	3.20	0.64	2078	4.59	2.94	0.64	2205	4.41	2.82	0.64	2247	4.23	2.71	0.64	2290
25	20	5.25	2.73	0.52	2162	4.90	2.55	0.52	2268	4.72	2.45	0.52	2332	4.54	2.36	0.52	2396
25	22	5.56	2.22	0.40	2247	5.20	2.08	0.40	2374	5.02	2.01	0.40	2417	4.85	1.94	0.40	2459
25	24	5.87	1.64	0.28	2332	5.51	1.54	0.28	2438	5.36	1.50	0.28	2491	5.20	1.46	0.28	2544
26	18	5.00	3.40	0.68	2078	4.59	3.12	0.68	2205	4.41	3.00	0.68	2247	4.23	2.88	0.68	2290
26	20	5.25	2.94	0.56	2162	4.90	2.74	0.56	2268	4.72	2.64	0.56	2332	4.54	2.54	0.56	2396
26	22	5.56	2.45	0.44	2247	5.20	2.29	0.44	2374	5.02	2.21	0.44	2417	4.85	2.13	0.44	2459
26	24	5.87	1.88	0.32	2332	5.51	1.76	0.32	2438	5.36	1.71	0.32	2491	5.20	1.66	0.32	2544
26	26	6.17	1.23	0.20	2417	5.81	1.16	0.20	2523	5.64	1.13	0.20	2576	5.46	1.09	0.20	2629
27	18	5.00	3.60	0.72	2078	4.59	3.30	0.72	2205	4.41	3.18	0.72	2247	4.23	3.05	0.72	2290
27	20	5.25	3.15	0.60	2162	4.90	2.94	0.60	2268	4.72	2.83	0.60	2332	4.54	2.72	0.60	2396
27	22	5.56	2.67	0.48	2247	5.20	2.50	0.48	2374	5.02	2.41	0.48	2417	4.85	2.33	0.48	2459
27	24	5.87	2.11	0.36	2332	5.51	1.98	0.36	2438	5.36	1.93	0.36	2491	5.20	1.87	0.36	2544
27	26	6.17	1.48	0.24	2417	5.81	1.40	0.24	2523	5.64	1.35	0.24	2576	5.46	1.31	0.24	2629
28	18	5.00	3.80	0.76	2078	4.59	3.49	0.76	2205	4.41	3.35	0.76	2247	4.23	3.22	0.76	2290
28	20	5.25	3.36	0.64	2162	4.90	3.13	0.64	2268	4.72	3.02	0.64	2332	4.54	2.90	0.64	2396
28	22	5.56	2.89	0.52	2247	5.20	2.71	0.52	2374	5.02	2.61	0.52	2417	4.85	2.52	0.52	2459
28	24	5.87	2.35	0.40	2332	5.51	2.20	0.40	2438	5.36	2.14	0.40	2491	5.20	2.08	0.40	2544
28	26	6.17	1.73	0.28	2417	5.81	1.63	0.28	2523	5.64	1.58	0.28	2576	5.46	1.53	0.28	2629
29	18	5.00	4.00	0.80	2078	4.59	3.67	0.80	2205	4.41	3.53	0.80	2247	4.23	3.39	0.80	2290
29	20	5.25	3.57	0.68	2162	4.90	3.33	0.68	2268	4.72	3.21	0.68	2332	4.54	3.09	0.68	2396
29	22	5.56	3.11	0.56	2247	5.20	2.91	0.56	2374	5.02	2.81	0.56	2417	4.85	2.71	0.56	2459
29	24	5.87	2.58	0.44	2332	5.51	2.42	0.44	2438	5.36	2.36	0.44	2491	5.20	2.29	0.44	2544
29	26	6.17	1.97	0.32	2417	5.81	1.86	0.32	2523	5.64	1.80	0.32	2576	5.46	1.75	0.32	2629
30	18	5.00	4.20	0.84	2078	4.59	3.86	0.84	2205	4.41	3.71	0.84	2247	4.23	3.56	0.84	2290
30	20	5.25	3.78	0.72	2162	4.90	3.53	0.72	2268	4.72	3.40	0.72	2332	4.54	3.27	0.72	2396
30	22	5.56	3.34	0.60	2247	5.20	3.12	0.60	2374	5.02	3.01	0.60	2417	4.85	2.91	0.60	2459
30	24	5.87	2.82	0.48	2332	5.51	2.64	0.48	2438	5.36	2.57	0.48	2491	5.20	2.50	0.48	2544
30	26	6.17	2.22	0.36	2417	5.81	2.09	0.36	2523	5.64	2.03	0.36	2576	5.46	1.96	0.36	2629
31	18	5.00	4.40	0.88	2078	4.59	4.04	0.88	2205	4.41	3.88	0.88	2247	4.23	3.73	0.88	2290
31	20	5.25	3.99	0.76	2162	4.90	3.72	0.76	2268	4.72	3.59	0.76	2332	4.54	3.45	0.76	2396
31	22	5.56	3.56	0.64	2247	5.20	3.33	0.64	2374	5.02	3.22	0.64	2417	4.85	3.10	0.64	2459
31	24	5.87	3.05	0.52	2332	5.51	2.86	0.52	2438	5.36	2.78	0.52	2491	5.20	2.71	0.52	2544
31	26	6.17	2.47	0.40	2417	5.81	2.33	0.40	2523	5.64	2.25	0.40	2576	5.46	2.18	0.40	2629
32	18	5.00	4.60	0.92	2078	4.59	4.22	0.92	2205	4.41	4.06	0.92	2247	4.23	3.89	0.92	2290
32	20	5.25	4.20	0.80	2162	4.90	3.92	0.80	2268	4.72	3.77	0.80	2332	4.54	3.63	0.80	2396
32	22	5.56	3.78	0.68	2247	5.20	3.54	0.68	2374	5.02	3.42	0.68	2417	4.85	3.29	0.68	2459
32	24	5.87	3.28	0.56	2332	5.51	3.08	0.56	2438	5.36	3.00	0.56	2491	5.20	2.91	0.56	2544
32	26	6.17	2.72	0.44	2417	5.81	2.56	0.44	2523	5.64	2.48	0.44	2576	5.46	2.40	0.44	2629

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA COOL operation**  
**MSH-24RV -[E1] : MUH-24RV -[E1] (220V)**

CAPACITY : 6.0(KW) SHF : 0.65 INPUT : 2720(W)

		OUTDOOR DB(°C)															
INDOOR DB(°C)	INDOOR WB(°C)	21				25				27				30			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	7.05	3.31	0.47	2176	6.75	3.17	0.47	2285	6.48	3.05	0.47	2394	6.24	2.93	0.47	2502
21	20	7.35	2.57	0.35	2285	7.05	2.47	0.35	2421	6.84	2.39	0.35	2475	6.60	2.31	0.35	2584
22	18	7.05	3.60	0.51	2176	6.75	3.44	0.51	2285	6.48	3.30	0.51	2394	6.24	3.18	0.51	2502
22	20	7.35	2.87	0.39	2285	7.05	2.75	0.39	2421	6.84	2.67	0.39	2475	6.60	2.57	0.39	2584
22	22	7.65	2.07	0.27	2366	7.38	1.99	0.27	2516	7.20	1.94	0.27	2584	6.90	1.86	0.27	2693
23	18	7.05	3.88	0.55	2176	6.75	3.71	0.55	2285	6.48	3.56	0.55	2394	6.24	3.43	0.55	2502
23	20	7.35	3.16	0.43	2285	7.05	3.03	0.43	2421	6.84	2.94	0.43	2475	6.60	2.84	0.43	2584
23	22	7.65	2.37	0.31	2366	7.38	2.29	0.31	2516	7.20	2.23	0.31	2584	6.90	2.14	0.31	2693
24	18	7.05	4.16	0.59	2176	6.75	3.98	0.59	2285	6.48	3.82	0.59	2394	6.24	3.68	0.59	2502
24	20	7.35	3.45	0.47	2285	7.05	3.31	0.47	2421	6.84	3.21	0.47	2475	6.60	3.10	0.47	2584
24	22	7.65	2.68	0.35	2366	7.38	2.58	0.35	2516	7.20	2.52	0.35	2584	6.90	2.42	0.35	2693
24	24	8.04	1.85	0.23	2475	7.74	1.78	0.23	2611	7.56	1.74	0.23	2693	7.32	1.68	0.23	2829
25	18	7.05	4.44	0.63	2176	6.75	4.25	0.63	2285	6.48	4.08	0.63	2394	6.24	3.93	0.63	2502
25	20	7.35	3.75	0.51	2285	7.05	3.60	0.51	2421	6.84	3.49	0.51	2475	6.60	3.37	0.51	2584
25	22	7.65	2.98	0.39	2366	7.38	2.88	0.39	2516	7.20	2.81	0.39	2584	6.90	2.69	0.39	2693
25	24	8.04	2.17	0.27	2475	7.74	2.09	0.27	2611	7.56	2.04	0.27	2693	7.32	1.98	0.27	2829
26	18	7.05	4.72	0.67	2176	6.75	4.52	0.67	2285	6.48	4.34	0.67	2394	6.24	4.18	0.67	2502
26	20	7.35	4.04	0.55	2285	7.05	3.88	0.55	2421	6.84	3.76	0.55	2475	6.60	3.63	0.55	2584
26	22	7.65	3.29	0.43	2366	7.38	3.17	0.43	2516	7.20	3.10	0.43	2584	6.90	2.97	0.43	2693
26	24	8.04	2.49	0.31	2475	7.74	2.40	0.31	2611	7.56	2.34	0.31	2693	7.32	2.27	0.31	2829
26	26	8.28	1.57	0.19	2611	8.04	1.53	0.19	2747	7.92	1.50	0.19	2829	7.68	1.46	0.19	2910
27	18	7.05	5.01	0.71	2176	6.75	4.79	0.71	2285	6.48	4.60	0.71	2394	6.24	4.43	0.71	2502
27	20	7.35	4.34	0.59	2285	7.05	4.16	0.59	2421	6.84	4.04	0.59	2475	6.60	3.89	0.59	2584
27	22	7.65	3.60	0.47	2366	7.38	3.47	0.47	2516	7.20	3.38	0.47	2584	6.90	3.24	0.47	2693
27	24	8.04	2.81	0.35	2475	7.74	2.71	0.35	2611	7.56	2.65	0.35	2693	7.32	2.56	0.35	2829
27	26	8.28	1.90	0.23	2611	8.04	1.85	0.23	2747	7.92	1.82	0.23	2829	7.68	1.77	0.23	2910
28	18	7.05	5.29	0.75	2176	6.75	5.06	0.75	2285	6.48	4.86	0.75	2394	6.24	4.68	0.75	2502
28	20	7.35	4.63	0.63	2285	7.05	4.44	0.63	2421	6.84	4.31	0.63	2475	6.60	4.16	0.63	2584
28	22	7.65	3.90	0.51	2366	7.38	3.76	0.51	2516	7.20	3.67	0.51	2584	6.90	3.52	0.51	2693
28	24	8.04	3.14	0.39	2475	7.74	3.02	0.39	2611	7.56	2.95	0.39	2693	7.32	2.85	0.39	2829
28	26	8.28	2.24	0.27	2611	8.04	2.17	0.27	2747	7.92	2.14	0.27	2829	7.68	2.07	0.27	2910
29	18	7.05	5.57	0.79	2176	6.75	5.33	0.79	2285	6.48	5.12	0.79	2394	6.24	4.93	0.79	2502
29	20	7.35	4.92	0.67	2285	7.05	4.72	0.67	2421	6.84	4.58	0.67	2475	6.60	4.42	0.67	2584
29	22	7.65	4.21	0.55	2366	7.38	4.06	0.55	2516	7.20	3.96	0.55	2584	6.90	3.80	0.55	2693
29	24	8.04	3.46	0.43	2475	7.74	3.33	0.43	2611	7.56	3.25	0.43	2693	7.32	3.15	0.43	2829
29	26	8.28	2.57	0.31	2611	8.04	2.46	0.31	2747	7.92	2.46	0.31	2829	7.68	2.38	0.31	2910
30	18	7.05	5.85	0.83	2176	6.75	5.60	0.83	2285	6.48	5.38	0.83	2394	6.24	5.18	0.83	2502
30	20	7.35	5.22	0.71	2285	7.05	5.01	0.71	2421	6.84	4.86	0.71	2475	6.60	4.69	0.71	2584
30	22	7.65	4.51	0.59	2366	7.38	4.35	0.59	2516	7.20	4.25	0.59	2584	6.90	4.07	0.59	2693
30	24	8.04	3.78	0.47	2475	7.74	3.64	0.47	2611	7.56	3.55	0.47	2693	7.32	3.44	0.47	2829
30	26	8.28	2.90	0.35	2611	8.04	2.81	0.35	2747	7.92	2.77	0.35	2829	7.68	2.69	0.35	2910
31	18	7.05	6.13	0.87	2176	6.75	5.87	0.87	2285	6.48	5.64	0.87	2394	6.24	5.43	0.87	2502
31	20	7.35	5.51	0.75	2285	7.05	5.29	0.75	2421	6.84	5.13	0.75	2475	6.60	4.95	0.75	2584
31	22	7.65	4.82	0.63	2366	7.38	4.65	0.63	2516	7.20	4.54	0.63	2584	6.90	4.35	0.63	2693
31	24	8.04	4.10	0.51	2475	7.74	3.95	0.51	2611	7.56	3.86	0.51	2693	7.32	3.73	0.51	2829
31	26	8.28	3.23	0.39	2611	8.04	3.14	0.39	2747	7.92	3.09	0.39	2829	7.68	3.00	0.39	2910
32	18	7.05	6.42	0.91	2176	6.75	6.14	0.91	2285	6.48	5.90	0.91	2394	6.24	5.68	0.91	2502
32	20	7.35	5.81	0.79	2285	7.05	5.57	0.79	2421	6.84	5.40	0.79	2475	6.60	5.21	0.79	2584
32	22	7.65	5.13	0.67	2366	7.38	4.94	0.67	2516	7.20	4.82	0.67	2584	6.90	4.62	0.67	2693
32	24	8.04	4.42	0.55	2475	7.74	4.26	0.55	2611	7.56	4.16	0.55	2693	7.32	4.03	0.55	2829
32	26	8.28	3.56	0.43	2611	8.04	3.46	0.43	2747	7.92	3.41	0.43	2829	7.68	3.30	0.43	2910

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA COOL operation**  
**MSH-24RV -E1 : MUH-24RV -E1 (220V)**

CAPACITY : 6.0(KW) SHF : 0.65 INPUT : 2720(W)

		OUTDOOR DB(°C)															
INDOOR DB(°C)	INDOOR WB(°C)	35				40				43				46			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	5.88	2.76	0.47	2666	5.40	2.54	0.47	2829	5.19	2.44	0.47	2883	4.98	2.34	0.47	2938
21	20	6.18	2.16	0.35	2774	5.76	2.02	0.35	2910	5.55	1.94	0.35	2992	5.34	1.87	0.35	3074
22	18	5.88	3.00	0.51	2666	5.40	2.75	0.51	2829	5.19	2.65	0.51	2883	4.98	2.54	0.51	2938
22	20	6.18	2.41	0.39	2774	5.76	2.25	0.39	2910	5.55	2.16	0.39	2992	5.34	2.08	0.39	3074
22	22	6.54	1.77	0.27	2883	6.12	1.65	0.27	3046	5.91	1.60	0.27	3101	5.70	1.54	0.27	3155
23	18	5.88	3.23	0.55	2666	5.40	2.97	0.55	2829	5.19	2.85	0.55	2883	4.98	2.74	0.55	2938
23	20	6.18	2.66	0.43	2774	5.76	2.48	0.43	2910	5.55	2.39	0.43	2992	5.34	2.30	0.43	3074
23	22	6.54	2.03	0.31	2883	6.12	1.90	0.31	3046	5.91	1.83	0.31	3101	5.70	1.77	0.31	3155
24	18	5.88	3.47	0.59	2666	5.40	3.19	0.59	2829	5.19	3.06	0.59	2883	4.98	2.94	0.59	2938
24	20	6.18	2.90	0.47	2774	5.76	2.71	0.47	2910	5.55	2.61	0.47	2992	5.34	2.51	0.47	3074
24	22	6.54	2.29	0.35	2883	6.12	2.14	0.35	3046	5.91	2.07	0.35	3101	5.70	2.00	0.35	3155
24	24	6.90	1.59	0.23	2992	6.48	1.49	0.23	3128	6.30	1.45	0.23	3196	6.12	1.41	0.23	3264
25	18	5.88	3.70	0.63	2666	5.40	3.40	0.63	2829	5.19	3.27	0.63	2883	4.98	3.14	0.63	2938
25	20	6.18	3.15	0.51	2774	5.76	2.94	0.51	2910	5.55	2.83	0.51	2992	5.34	2.72	0.51	3074
25	22	6.54	2.55	0.39	2883	6.12	2.39	0.39	3046	5.91	2.30	0.39	3101	5.70	2.22	0.39	3155
25	24	6.90	1.86	0.27	2992	6.48	1.75	0.27	3128	6.30	1.70	0.27	3196	6.12	1.65	0.27	3264
26	18	5.88	3.94	0.67	2666	5.40	3.62	0.67	2829	5.19	3.48	0.67	2883	4.98	3.34	0.67	2938
26	20	6.18	3.40	0.55	2774	5.76	3.17	0.55	2910	5.55	3.05	0.55	2992	5.34	2.94	0.55	3074
26	22	6.54	2.81	0.43	2883	6.12	3.63	0.43	3046	5.91	2.54	0.43	3101	5.70	2.45	0.43	3155
26	24	6.90	2.14	0.31	2992	6.48	2.01	0.31	3128	6.30	1.95	0.31	3196	6.12	1.90	0.31	3264
26	26	7.26	1.38	0.19	3101	6.84	1.30	0.19	3327	6.63	1.26	0.19	3305	6.42	1.22	0.19	3373
27	18	5.88	4.17	0.71	2666	5.40	3.83	0.71	2829	5.19	3.68	0.71	2883	4.98	3.54	0.71	2938
27	20	6.18	3.65	0.59	2774	5.76	3.40	0.59	2910	5.55	3.27	0.59	2992	5.34	3.15	0.59	3074
27	22	6.54	3.07	0.47	2883	6.12	2.88	0.47	3046	5.91	2.78	0.47	3101	5.70	2.68	0.47	3155
27	24	6.90	2.42	0.35	2992	6.48	2.27	0.35	3128	6.30	2.21	0.35	3196	6.12	2.14	0.35	3264
27	26	7.26	1.67	0.23	3101	6.84	1.57	0.23	3327	6.63	1.52	0.23	3305	6.42	1.48	0.23	3373
28	18	5.88	4.41	0.75	2666	5.40	4.05	0.75	2829	5.19	3.89	0.75	2883	4.98	3.74	0.75	2938
28	20	6.18	3.89	0.63	2774	5.76	3.63	0.63	2910	5.55	3.50	0.63	2992	5.34	3.36	0.63	3074
28	22	6.54	3.34	0.51	2883	6.12	3.12	0.51	3046	5.91	3.01	0.51	3101	5.70	2.91	0.51	3155
28	24	6.90	2.69	0.39	2992	6.48	2.53	0.39	3128	6.30	2.46	0.39	3196	6.12	2.39	0.39	3264
28	26	7.26	1.96	0.27	3101	6.84	1.85	0.27	3327	6.63	1.79	0.27	3305	6.42	1.73	0.27	3373
29	18	5.88	4.65	0.79	2666	5.40	4.27	0.79	2829	5.19	4.10	0.79	2883	4.98	3.93	0.79	2938
29	20	6.18	4.14	0.67	2774	5.76	3.86	0.67	2910	5.55	3.72	0.67	2992	5.34	3.58	0.67	3074
29	22	6.54	3.60	0.55	2883	6.12	3.37	0.55	3046	5.91	3.25	0.55	3101	5.70	3.14	0.55	3155
29	24	6.90	2.97	0.43	2992	6.48	2.79	0.43	3128	6.30	2.71	0.43	3196	6.12	2.63	0.43	3264
29	26	7.26	2.25	0.31	3101	6.84	2.12	0.31	3327	6.63	2.06	0.31	3305	6.42	1.99	0.31	3373
30	18	5.88	4.88	0.83	2666	5.40	4.48	0.83	2829	5.19	4.31	0.83	2883	4.98	4.13	0.83	2938
30	20	6.18	4.39	0.71	2774	5.76	4.09	0.71	2910	5.55	3.94	0.71	2992	5.34	3.79	0.71	3074
30	22	6.54	3.86	0.59	2883	6.12	3.61	0.59	3046	5.91	3.49	0.59	3101	5.70	3.36	0.59	3155
30	24	6.90	3.24	0.47	2992	6.48	3.05	0.47	3128	6.30	2.96	0.47	3196	6.12	2.88	0.47	3264
30	26	7.26	2.54	0.35	3101	6.84	2.39	0.35	3327	6.63	2.32	0.35	3305	6.42	2.25	0.35	3373
31	18	5.88	5.12	0.87	2666	5.40	4.70	0.87	2829	5.19	4.52	0.87	2883	4.98	4.33	0.87	2938
31	20	6.18	4.64	0.75	2774	5.76	4.32	0.75	2910	5.55	4.16	0.75	2992	5.34	4.01	0.75	3074
31	22	6.54	4.12	0.63	2883	6.12	3.86	0.63	3046	5.91	3.72	0.63	3101	5.70	3.59	0.63	3155
31	24	6.90	3.52	0.51	2992	6.48	3.30	0.51	3128	6.30	3.21	0.51	3196	6.12	3.12	0.51	3264
31	26	7.26	2.83	0.39	3101	6.84	2.67	0.39	3327	6.63	2.59	0.39	3305	6.42	2.50	0.39	3373
32	18	5.88	5.35	0.91	2666	5.40	4.91	0.91	2829	5.19	4.72	0.91	2883	4.98	4.53	0.91	2938
32	20	6.18	4.88	0.79	2774	5.76	4.55	0.79	2910	5.55	4.38	0.79	2992	5.34	4.22	0.79	3074
32	22	6.54	4.38	0.67	2883	6.12	4.10	0.67	3046	5.91	3.96	0.67	3101	5.70	3.82	0.67	3155
32	24	6.90	3.80	0.55	2992	6.48	3.56	0.55	3128	6.30	3.47	0.55	3196	6.12	3.37	0.55	3264
32	26	7.26	3.12	0.43	3101	6.84	2.94	0.43	3327	6.63	2.85	0.43	3305	6.42	2.76	0.43	3373

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA COOL operation**  
**MSH-24RV -[E1] : MUH-24RV -[E1] (240V)**

CAPACITY : 6.0(KW) SHF : 0.65 INPUT : 2750(W)

INDOOR		OUTDOOR DB(°C)															
		21				25				27				30			
DB(°C)	WB(°C)	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	7.05	3.31	0.47	2200	6.75	3.17	0.47	2310	6.48	3.05	0.47	2420	6.24	2.93	0.47	2530
21	20	7.35	2.57	0.35	2310	7.05	2.47	0.35	2448	6.84	2.39	0.35	2503	6.60	2.31	0.35	2613
22	18	7.05	3.60	0.51	2200	6.75	3.44	0.51	2310	6.48	3.30	0.51	2420	6.24	3.18	0.51	2530
22	20	7.35	2.87	0.39	2310	7.05	2.75	0.39	2448	6.84	2.67	0.39	2503	6.60	2.57	0.39	2613
22	22	7.65	2.07	0.27	2393	7.38	1.99	0.27	2544	7.20	1.94	0.27	2613	6.90	1.86	0.27	2723
23	18	7.05	3.88	0.55	2200	6.75	3.71	0.55	2310	6.48	3.56	0.55	2420	6.24	3.43	0.55	2530
23	20	7.35	3.16	0.43	2310	7.05	3.03	0.43	2448	6.84	2.94	0.43	2503	6.60	2.84	0.43	2613
23	22	7.65	2.37	0.31	2393	7.38	2.29	0.31	2544	7.20	2.23	0.31	2613	6.90	2.14	0.31	2723
24	18	7.05	4.16	0.59	2200	6.75	3.98	0.59	2310	6.48	3.82	0.59	2420	6.24	3.68	0.59	2530
24	20	7.35	3.45	0.47	2310	7.05	3.31	0.47	2448	6.84	3.21	0.47	2503	6.60	3.10	0.47	2613
24	22	7.65	2.68	0.35	2393	7.38	2.58	0.35	2544	7.20	2.52	0.35	2613	6.90	2.42	0.35	2723
24	24	8.04	1.85	0.23	2503	7.74	1.78	0.23	2640	7.56	1.74	0.23	2723	7.32	1.68	0.23	2860
25	18	7.05	4.44	0.63	2200	6.75	4.25	0.63	2310	6.48	4.08	0.63	2420	6.24	3.93	0.63	2530
25	20	7.35	3.75	0.51	2310	7.05	3.60	0.51	2448	6.84	3.49	0.51	2503	6.60	3.37	0.51	2613
25	22	7.65	2.98	0.39	2393	7.38	2.88	0.39	2544	7.20	2.81	0.39	2613	6.90	2.69	0.39	2723
25	24	8.04	2.17	0.27	2503	7.74	2.09	0.27	2640	7.56	2.04	0.27	2723	7.32	1.98	0.27	2860
26	18	7.05	4.72	0.67	2200	6.75	4.52	0.67	2310	6.48	4.34	0.67	2420	6.24	4.18	0.67	2530
26	20	7.35	4.04	0.55	2310	7.05	3.88	0.55	2448	6.84	3.76	0.55	2503	6.60	3.63	0.55	2613
26	22	7.65	3.29	0.43	2393	7.38	3.17	0.43	2544	7.20	3.10	0.43	2613	6.90	2.97	0.43	2723
26	24	8.04	2.49	0.31	2503	7.74	2.40	0.31	2640	7.56	2.34	0.31	2723	7.32	2.27	0.31	2860
26	26	8.28	1.57	0.19	2640	8.04	1.53	0.19	2778	7.92	1.50	0.19	2860	7.68	1.46	0.19	2943
27	18	7.05	5.01	0.71	2200	6.75	4.79	0.71	2310	6.48	4.60	0.71	2420	6.24	4.43	0.71	2530
27	20	7.35	4.34	0.59	2310	7.05	4.16	0.59	2448	6.84	4.04	0.59	2503	6.60	3.89	0.59	2613
27	22	7.65	3.60	0.47	2393	7.38	3.47	0.47	2544	7.20	3.38	0.47	2613	6.90	3.24	0.47	2723
27	24	8.04	2.81	0.35	2503	7.74	2.71	0.35	2640	7.56	2.65	0.35	2723	7.32	2.56	0.35	2860
27	26	8.28	1.90	0.23	2640	8.04	1.85	0.23	2778	7.92	1.82	0.23	2860	7.68	1.77	0.23	2943
28	18	7.05	5.29	0.75	2200	6.75	5.06	0.75	2310	6.48	4.86	0.75	2420	6.24	4.68	0.75	2530
28	20	7.35	4.63	0.63	2310	7.05	4.44	0.63	2448	6.84	4.31	0.63	2503	6.60	4.16	0.63	2613
28	22	7.65	3.90	0.51	2393	7.38	3.76	0.51	2544	7.20	3.67	0.51	2613	6.90	3.52	0.51	2723
28	24	8.04	3.14	0.39	2503	7.74	3.02	0.39	2640	7.56	2.95	0.39	2723	7.32	2.85	0.39	2860
28	26	8.28	2.24	0.27	2640	8.04	2.17	0.27	2778	7.92	2.14	0.27	2860	7.68	2.07	0.27	2943
29	18	7.05	5.57	0.79	2200	6.75	5.33	0.79	2310	6.48	5.12	0.79	2420	6.24	4.93	0.79	2530
29	20	7.35	4.92	0.67	2310	7.05	4.72	0.67	2448	6.84	4.58	0.67	2503	6.60	4.42	0.67	2613
29	22	7.65	4.21	0.55	2393	7.38	4.06	0.55	2544	7.20	3.96	0.55	2613	6.90	3.80	0.55	2723
29	24	8.04	3.46	0.43	2503	7.74	3.33	0.43	2640	7.56	3.25	0.43	2723	7.32	3.15	0.43	2860
29	26	8.28	2.57	0.31	2640	8.04	2.46	0.31	2778	7.92	2.46	0.31	2860	7.68	2.38	0.31	2943
30	18	7.05	5.85	0.83	2200	6.75	5.60	0.83	2310	6.48	5.38	0.83	2420	6.24	5.18	0.83	2530
30	20	7.35	5.22	0.71	2310	7.05	5.01	0.71	2448	6.84	4.86	0.71	2503	6.60	4.69	0.71	2613
30	22	7.65	4.51	0.59	2393	7.38	4.35	0.59	2544	7.20	4.25	0.59	2613	6.90	4.07	0.59	2723
30	24	8.04	3.78	0.47	2503	7.74	3.64	0.47	2640	7.56	3.55	0.47	2723	7.32	3.44	0.47	2860
30	26	8.28	2.90	0.35	2640	8.04	2.81	0.35	2778	7.92	2.77	0.35	2860	7.68	2.69	0.35	2943
31	18	7.05	6.13	0.87	2200	6.75	5.87	0.87	2310	6.48	5.64	0.87	2420	6.24	5.43	0.87	2530
31	20	7.35	5.51	0.75	2310	7.05	5.29	0.75	2448	6.84	5.13	0.75	2503	6.60	4.95	0.75	2613
31	22	7.65	4.82	0.63	2393	7.38	4.65	0.63	2544	7.20	4.54	0.63	2613	6.90	4.35	0.63	2723
31	24	8.04	4.10	0.51	2503	7.74	3.95	0.51	2640	7.56	3.86	0.51	2723	7.32	3.73	0.51	2860
31	26	8.28	3.23	0.39	2640	8.04	3.14	0.39	2778	7.92	3.09	0.39	2860	7.68	3.00	0.39	2943
32	18	7.05	6.42	0.91	2200	6.75	6.14	0.91	2310	6.48	5.90	0.91	2420	6.24	5.68	0.91	2530
32	20	7.35	5.81	0.79	2310	7.05	5.57	0.79	2448	6.84	5.40	0.79	2503	6.60	5.21	0.79	2613
32	22	7.65	5.13	0.67	2393	7.38	4.94	0.67	2544	7.20	4.82	0.67	2613	6.90	4.62	0.67	2723
32	24	8.04	4.42	0.55	2503	7.74	4.26	0.55	2640	7.56	4.16	0.55	2723	7.32	4.03	0.55	2860
32	26	8.28	3.56	0.43	2640	8.04	3.46	0.43	2778	7.92	3.41	0.43	2860	7.68	3.30	0.43	2943

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature



**PERFORMANCE DATA COOL operation**  
**MSH-24RV -E1 : MUH-24RV -E1 (240V)**

CAPACITY : 6.0(KW) SHF : 0.65 INPUT : 2750(W)

INDOOR		OUTDOOR DB(°C)															
		35				40				43				46			
		DB(°C)	WB(°C)	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC
21	18	5.88	2.76	0.47	2695	5.40	2.54	0.47	2860	5.19	2.44	0.47	2915	4.98	2.34	0.47	2970
21	20	6.18	2.16	0.35	2805	5.76	2.02	0.35	2943	5.55	1.94	0.35	3025	5.34	1.87	0.35	3108
22	18	5.88	3.00	0.51	2695	5.40	2.75	0.51	2860	5.19	2.65	0.51	2915	4.98	2.54	0.51	2970
22	20	6.18	2.41	0.39	2805	5.76	2.25	0.39	2943	5.55	2.16	0.39	3025	5.34	2.08	0.39	3108
22	22	6.54	1.77	0.27	2915	6.12	1.65	0.27	3080	5.91	1.60	0.27	3135	5.70	1.54	0.27	3190
23	18	5.88	3.23	0.55	2695	5.40	2.97	0.55	2860	5.19	2.85	0.55	2915	4.98	2.74	0.55	2970
23	20	6.18	2.66	0.43	2805	5.76	2.48	0.43	2943	5.55	2.39	0.43	3025	5.34	2.30	0.43	3108
23	22	6.54	2.03	0.31	2915	6.12	1.90	0.31	3080	5.91	1.83	0.31	3135	5.70	1.77	0.31	3190
24	18	5.88	3.47	0.59	2695	5.40	3.19	0.59	2860	5.19	3.06	0.59	2915	4.98	2.94	0.59	2970
24	20	6.18	2.90	0.47	2805	5.76	2.71	0.47	2943	5.55	2.61	0.47	3025	5.34	2.51	0.47	3108
24	22	6.54	2.29	0.35	2915	6.12	2.14	0.35	3080	5.91	2.07	0.35	3135	5.70	2.00	0.35	3190
24	24	6.90	1.59	0.23	3025	6.48	1.49	0.23	3163	6.30	1.45	0.23	3231	6.12	1.41	0.23	3300
25	18	5.88	3.70	0.63	2695	5.40	3.40	0.63	2860	5.19	3.27	0.63	2915	4.98	3.14	0.63	2970
25	20	6.18	3.15	0.51	2805	5.76	2.94	0.51	2943	5.55	2.83	0.51	3025	5.34	2.72	0.51	3108
25	22	6.54	2.55	0.39	2915	6.12	2.39	0.39	3080	5.91	2.30	0.39	3135	5.70	2.22	0.39	3190
25	24	6.90	1.86	0.27	3025	6.48	1.75	0.27	3163	6.30	1.70	0.27	3231	6.12	1.65	0.27	3300
26	18	5.88	3.94	0.67	2695	5.40	3.62	0.67	2860	5.19	3.48	0.67	2915	4.98	3.34	0.67	2970
26	20	6.18	3.40	0.55	2805	5.76	3.17	0.55	2943	5.55	3.05	0.55	3025	5.34	2.94	0.55	3108
26	22	6.54	2.81	0.43	2915	6.12	3.63	0.43	3080	5.91	2.54	0.43	3135	5.70	2.45	0.43	3190
26	24	6.90	2.14	0.31	3025	6.48	2.01	0.31	3163	6.30	1.95	0.31	3231	6.12	1.90	0.31	3300
26	26	7.26	1.38	0.19	3135	6.84	1.30	0.19	3273	6.63	1.26	0.19	3341	6.42	1.22	0.19	3410
27	18	5.88	4.17	0.71	2695	5.40	3.83	0.71	2860	5.19	3.68	0.71	2915	4.98	3.54	0.71	2970
27	20	6.18	3.65	0.59	2805	5.76	3.40	0.59	2943	5.55	3.27	0.59	3025	5.34	3.15	0.59	3108
27	22	6.54	3.07	0.47	2915	6.12	2.88	0.47	3080	5.91	2.78	0.47	3135	5.70	2.68	0.47	3190
27	24	6.90	2.42	0.35	3025	6.48	2.27	0.35	3163	6.30	2.21	0.35	3231	6.12	2.14	0.35	3300
27	26	7.26	1.67	0.23	3135	6.84	1.57	0.23	3273	6.63	1.52	0.23	3341	6.42	1.48	0.23	3410
28	18	5.88	4.41	0.75	2695	5.40	4.05	0.75	2860	5.19	3.89	0.75	2915	4.98	3.74	0.75	2970
28	20	6.18	3.89	0.63	2805	5.76	3.63	0.63	2943	5.55	3.50	0.63	3025	5.34	3.36	0.63	3108
28	22	6.54	3.34	0.51	2915	6.12	3.12	0.51	3080	5.91	3.01	0.51	3135	5.70	2.91	0.51	3190
28	24	6.90	2.69	0.39	3025	6.48	2.53	0.39	3163	6.30	2.46	0.39	3231	6.12	2.39	0.39	3300
28	26	7.26	1.96	0.27	3135	6.84	1.85	0.27	3273	6.63	1.79	0.27	3341	6.42	1.73	0.27	3410
29	18	5.88	4.65	0.79	2695	5.40	4.27	0.79	2860	5.19	4.10	0.79	2915	4.98	3.93	0.79	2970
29	20	6.18	4.14	0.67	2805	5.76	3.86	0.67	2943	5.55	3.72	0.67	3025	5.34	3.58	0.67	3108
29	22	6.54	3.60	0.55	2915	6.12	3.37	0.55	3080	5.91	3.25	0.55	3135	5.70	3.14	0.55	3190
29	24	6.90	2.97	0.43	3025	6.48	2.79	0.43	3163	6.30	2.71	0.43	3231	6.12	2.63	0.43	3300
29	26	7.26	2.25	0.31	3135	6.84	2.12	0.31	3273	6.63	2.06	0.31	3341	6.42	1.99	0.31	3410
30	18	5.88	4.88	0.83	2695	5.40	4.48	0.83	2860	5.19	4.31	0.83	2915	4.98	4.13	0.83	2970
30	20	6.18	4.39	0.71	2805	5.76	4.09	0.71	2943	5.55	3.94	0.71	3025	5.34	3.79	0.71	3108
30	22	6.54	3.86	0.59	2915	6.12	3.61	0.59	3080	5.91	3.49	0.59	3135	5.70	3.36	0.59	3190
30	24	6.90	3.24	0.47	3025	6.48	3.05	0.47	3163	6.30	2.96	0.47	3231	6.12	2.88	0.47	3300
30	26	7.26	2.54	0.35	3135	6.84	2.39	0.35	3273	6.63	2.32	0.35	3341	6.42	2.25	0.35	3410
31	18	5.88	5.12	0.87	2695	5.40	4.70	0.87	2860	5.19	4.52	0.87	2915	4.98	4.33	0.87	2970
31	20	6.18	4.64	0.75	2805	5.76	4.32	0.75	2943	5.55	4.16	0.75	3025	5.34	4.01	0.75	3108
31	22	6.54	4.12	0.63	2915	6.12	3.86	0.63	3080	5.91	3.72	0.63	3135	5.70	3.59	0.63	3190
31	24	6.90	3.52	0.51	3025	6.48	3.30	0.51	3163	6.30	3.21	0.51	3231	6.12	3.12	0.51	3300
31	26	7.26	2.83	0.39	3135	6.84	2.67	0.39	3273	6.63	2.59	0.39	3341	6.42	2.50	0.39	3410
32	18	5.88	5.35	0.91	2695	5.40	4.91	0.91	2860	5.19	4.72	0.91	2915	4.98	4.53	0.91	2970
32	20	6.18	4.88	0.79	2805	5.76	4.55	0.79	2943	5.55	4.38	0.79	3025	5.34	4.22	0.79	3108
32	22	6.54	4.38	0.67	2915	6.12	4.10	0.67	3080	5.91	3.96	0.67	3135	5.70	3.82	0.67	3190
32	24	6.90	3.80	0.55	3025	6.48	3.56	0.55	3163	6.30	3.47	0.55	3231	6.12	3.37	0.55	3300
32	26	7.26	3.12	0.43	3135	6.84	2.94	0.43	3273	6.63	2.85	0.43	3341	6.42	2.76	0.43	3410

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA COOL operation**  
**MSH-30RV -E1 : MUH-30RV -E1 (220V)**

CAPACITY : 8.3(KW) SHF : 0.62 INPUT : 3300(W)

		OUTDOOR DB(°C)															
INDOOR DB(°C)	INDOOR WB(°C)	21				25				27				30			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	9.75	4.29	0.44	2640	9.34	4.11	0.44	2772	8.96	3.94	0.44	2904	8.63	3.80	0.44	3036
21	20	10.17	3.25	0.32	2772	9.75	3.12	0.32	2937	9.46	3.03	0.32	3003	9.13	2.92	0.32	3135
22	18	9.75	4.68	0.48	2640	9.34	4.48	0.48	2772	8.96	4.30	0.48	2904	8.63	4.14	0.48	3036
22	20	10.17	3.66	0.36	2772	9.75	3.51	0.36	2937	9.46	3.41	0.36	3003	9.13	3.29	0.36	3135
22	22	10.58	2.54	0.24	2871	10.21	2.45	0.24	3053	9.96	2.39	0.24	3135	9.55	2.29	0.24	3267
23	18	9.75	5.07	0.52	2640	9.34	4.86	0.52	2772	8.96	4.66	0.52	2904	8.63	4.49	0.52	3036
23	20	10.17	4.07	0.40	2772	9.75	3.90	0.40	2937	9.46	3.78	0.40	3003	9.13	3.65	0.40	3135
23	22	10.58	2.96	0.28	2871	10.21	2.86	0.28	3053	9.96	2.79	0.28	3135	9.55	2.67	0.28	3267
24	18	9.75	5.46	0.56	2640	9.34	5.23	0.56	2772	8.96	5.02	0.56	2904	8.63	4.83	0.56	3036
24	20	10.17	4.47	0.44	2772	9.75	4.29	0.44	2937	9.46	4.16	0.44	3003	9.13	4.02	0.44	3135
24	22	10.58	3.39	0.32	2871	10.21	3.27	0.32	3053	9.96	3.19	0.32	3135	9.55	3.05	0.32	3267
24	24	11.12	2.22	0.20	3003	10.71	2.14	0.20	3168	10.46	2.09	0.20	3267	10.13	2.03	0.20	3432
25	18	9.75	5.85	0.60	2640	9.34	5.60	0.60	2772	8.96	5.38	0.60	2904	8.63	5.18	0.60	3036
25	20	10.17	4.88	0.48	2772	9.75	4.68	0.48	2937	9.46	4.54	0.48	3003	9.13	4.38	0.48	3135
25	22	10.58	3.81	0.36	2871	10.21	3.68	0.36	3053	9.96	3.59	0.36	3135	9.55	3.44	0.36	3267
25	24	11.12	2.67	0.24	3003	10.71	2.57	0.24	3168	10.46	2.51	0.24	3267	10.13	2.43	0.24	3432
26	18	9.75	6.24	0.64	2640	9.34	5.98	0.64	2772	8.96	5.74	0.64	2904	8.63	5.52	0.64	3036
26	20	10.17	5.29	0.52	2772	9.75	5.07	0.52	2937	9.46	4.92	0.52	3003	9.13	4.75	0.52	3135
26	22	10.58	4.23	0.40	2871	10.21	4.08	0.40	3053	9.96	3.98	0.40	3135	9.55	3.82	0.40	3267
26	24	11.12	3.11	0.28	3003	10.71	3.00	0.28	3168	10.46	2.93	0.28	3267	10.13	2.84	0.28	3432
26	26	11.45	1.83	0.16	3168	11.12	1.78	0.16	3333	10.96	1.75	0.16	3432	10.62	1.70	0.16	3531
27	18	9.75	6.63	0.68	2640	9.34	6.35	0.68	2772	8.96	6.10	0.68	2904	8.63	5.87	0.68	3036
27	20	10.17	5.69	0.56	2772	9.75	5.46	0.56	2937	9.46	5.30	0.56	3003	9.13	5.11	0.56	3135
27	22	10.58	4.66	0.44	2871	10.21	4.49	0.44	3053	9.96	4.38	0.44	3135	9.55	4.20	0.44	3267
27	24	11.12	3.56	0.32	3003	10.71	3.43	0.32	3168	10.46	3.35	0.32	3267	10.13	3.24	0.32	3432
27	26	11.45	2.29	0.20	3168	11.12	2.22	0.20	3333	10.96	2.19	0.20	3432	10.62	2.12	0.20	3531
28	18	9.75	7.02	0.72	2640	9.34	6.72	0.72	2772	8.96	6.45	0.72	2904	8.63	6.22	0.72	3036
28	20	10.17	6.10	0.60	2772	9.75	5.85	0.60	2937	9.46	5.68	0.60	3003	9.13	5.48	0.60	3135
28	22	10.58	5.08	0.48	2871	10.21	4.90	0.48	3053	9.96	4.78	0.48	3135	9.55	4.58	0.48	3267
28	24	11.12	4.00	0.36	3003	10.71	3.85	0.36	3168	10.46	3.76	0.36	3267	10.13	3.65	0.36	3432
28	26	11.45	2.75	0.24	3168	11.12	2.67	0.24	3333	10.96	2.63	0.24	3432	10.62	2.55	0.24	3531
29	18	9.75	7.41	0.76	2640	9.34	7.10	0.76	2772	8.96	6.81	0.76	2904	8.63	6.56	0.76	3036
29	20	10.17	6.51	0.64	2772	9.75	6.24	0.64	2937	9.46	6.06	0.64	3003	9.13	5.84	0.64	3135
29	22	10.58	5.50	0.52	2871	10.21	5.31	0.52	3053	9.96	5.18	0.52	3135	9.55	4.96	0.52	3267
29	24	11.12	4.45	0.40	3003	10.71	4.28	0.40	3168	10.46	4.18	0.40	3267	10.13	4.05	0.40	3432
29	26	11.45	3.21	0.28	3168	11.12	3.11	0.28	3333	10.96	3.07	0.28	3432	10.62	2.97	0.28	3531
30	18	9.75	7.80	0.80	2640	9.34	7.47	0.80	2772	8.96	7.17	0.80	2904	8.63	6.91	0.80	3036
30	20	10.17	6.91	0.68	2772	9.75	6.63	0.68	2937	9.46	6.43	0.68	3003	9.13	6.21	0.68	3135
30	22	10.58	5.93	0.56	2871	10.21	5.72	0.56	3053	9.96	5.58	0.56	3135	9.55	5.35	0.56	3267
30	24	11.12	4.89	0.44	3003	10.71	4.71	0.44	3168	10.46	4.60	0.44	3267	10.13	4.46	0.44	3432
30	26	11.45	3.67	0.32	3168	11.12	3.56	0.32	3333	10.96	3.51	0.32	3432	10.62	3.40	0.32	3531
31	18	9.75	8.19	0.84	2640	9.34	7.84	0.84	2772	8.96	7.53	0.84	2904	8.63	7.25	0.84	3036
31	20	10.17	7.32	0.72	2772	9.75	7.02	0.72	2937	9.46	6.81	0.72	3003	9.13	6.57	0.72	3135
31	22	10.58	6.35	0.60	2871	10.21	6.13	0.60	3053	9.96	5.98	0.60	3135	9.55	5.73	0.60	3267
31	24	11.12	5.34	0.48	3003	10.71	5.14	0.48	3168	10.46	5.02	0.48	3267	10.13	4.86	0.48	3432
31	26	11.45	4.12	0.36	3168	11.12	4.00	0.36	3333	10.96	3.94	0.36	3432	10.62	3.82	0.36	3531
32	18	9.75	8.58	0.88	2640	9.34	8.22	0.88	2772	8.96	7.89	0.88	2904	8.63	7.60	0.88	3036
32	20	10.17	7.73	0.76	2772	9.75	7.41	0.76	2937	9.46	7.19	0.76	3003	9.13	6.94	0.76	3135
32	22	10.58	6.77	0.64	2871	10.21	6.53	0.64	3053	9.96	6.37	0.64	3135	9.55	6.11	0.64	3267
32	24	11.12	5.78	0.52	3003	10.71	5.57	0.52	3168	10.46	5.44	0.52	3267	10.13	5.27	0.52	3432
32	26	11.45	4.58	0.40	3168	11.12	4.45	0.40	3333	10.96	4.38	0.40	3432	10.62	4.25	0.40	3531

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA COOL operation**  
**MSH-30RV -[E1] : MUH-30RV -[E1] (220V)**

CAPACITY : 8.3(KW) SHF : 0.62 INPUT : 3300(W)

INDOOR		OUTDOOR DB(°C)															
		35				40				43				46			
		DB(°C)	WB(°C)	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC
21	18	8.13	3.58	0.44	3234	7.47	3.29	0.44	3432	7.18	3.16	0.44	3498	6.89	3.03	0.44	3564
21	20	8.55	2.74	0.32	3366	7.97	2.55	0.32	3531	7.68	2.46	0.32	3630	7.39	2.36	0.32	3729
22	18	8.13	3.90	0.48	3234	7.47	3.59	0.48	3432	7.18	3.45	0.48	3498	6.89	3.31	0.48	3564
22	20	8.55	3.08	0.36	3366	7.97	2.87	0.36	3531	7.68	2.76	0.36	3630	7.39	2.66	0.36	3729
22	22	9.05	2.17	0.24	3498	8.47	2.03	0.24	3696	8.18	1.96	0.24	3762	7.89	1.89	0.24	3828
23	18	8.13	4.23	0.52	3234	7.47	3.88	0.52	3432	7.18	3.73	0.52	3498	6.89	3.58	0.52	3564
23	20	8.55	3.42	0.40	3366	7.97	3.19	0.40	3531	7.68	3.07	0.40	3630	7.39	2.95	0.40	3729
23	22	9.05	2.53	0.28	3498	8.47	2.37	0.28	3696	8.18	2.29	0.28	3762	7.89	2.21	0.28	3828
24	18	8.13	4.56	0.56	3234	7.47	4.18	0.56	3432	7.18	4.02	0.56	3498	6.89	3.86	0.56	3564
24	20	8.55	3.76	0.44	3366	7.97	3.51	0.44	3531	7.68	3.38	0.44	3630	7.39	3.25	0.44	3729
24	22	9.05	2.90	0.32	3498	8.47	2.71	0.32	3696	8.18	2.62	0.32	3762	7.89	2.52	0.32	3828
24	24	9.55	1.91	0.20	3630	8.96	1.79	0.20	3795	8.72	1.74	0.20	3878	8.47	1.69	0.20	3960
25	18	8.13	4.88	0.60	3234	7.47	4.48	0.60	3432	7.18	4.31	0.60	3498	6.89	4.13	0.60	3564
25	20	8.55	4.10	0.48	3366	7.97	3.82	0.48	3531	7.68	3.69	0.48	3630	7.39	3.55	0.48	3729
25	22	9.05	3.26	0.36	3498	8.47	3.05	0.36	3696	8.18	2.94	0.36	3762	7.89	2.84	0.36	3828
25	24	9.55	2.29	0.24	3630	8.96	2.15	0.24	3795	8.72	2.09	0.24	3878	8.47	2.03	0.24	3960
26	18	8.13	5.21	0.64	3234	7.47	4.78	0.64	3432	7.18	4.59	0.64	3498	6.89	4.41	0.64	3564
26	20	8.55	4.45	0.52	3366	7.97	4.14	0.52	3531	7.68	3.99	0.52	3630	7.39	3.84	0.52	3729
26	22	9.05	3.62	0.40	3498	8.47	3.39	0.40	3696	8.18	3.27	0.40	3762	7.89	3.15	0.40	3828
26	24	9.55	2.67	0.28	3630	8.96	2.51	0.28	3795	8.72	2.44	0.28	3878	8.47	2.37	0.28	3960
26	26	10.04	1.61	0.16	3762	9.46	1.51	0.16	3927	9.17	1.47	0.16	4010	8.88	1.42	0.16	4092
27	18	8.13	5.53	0.68	3234	7.47	5.08	0.68	3432	7.18	4.88	0.68	3498	6.89	4.68	0.68	3564
27	20	8.55	4.79	0.56	3366	7.97	4.46	0.56	3531	7.68	4.30	0.56	3630	7.39	4.14	0.56	3729
27	22	9.05	3.98	0.44	3498	8.47	3.73	0.44	3696	8.18	3.60	0.44	3762	7.89	3.47	0.44	3828
27	24	9.55	3.05	0.32	3630	8.96	2.87	0.32	3795	8.72	2.79	0.32	3878	8.47	2.71	0.32	3960
27	26	10.04	2.01	0.20	3762	9.46	1.89	0.20	3927	9.17	1.83	0.20	4010	8.88	1.78	0.20	4092
28	18	8.13	5.86	0.72	3234	7.47	5.38	0.72	3432	7.18	5.17	0.72	3498	6.89	4.96	0.72	3564
28	20	8.55	5.13	0.60	3366	7.97	4.78	0.60	3531	7.68	4.61	0.60	3630	7.39	4.43	0.60	3729
28	22	9.05	4.34	0.48	3498	8.47	4.06	0.48	3696	8.18	3.92	0.48	3762	7.89	3.78	0.48	3828
28	24	9.55	3.44	0.36	3630	8.96	3.23	0.36	3795	8.72	3.14	0.36	3878	8.47	3.05	0.36	3960
28	26	10.04	2.41	0.24	3762	9.46	2.27	0.24	3927	9.17	2.20	0.24	4010	8.88	2.13	0.24	4092
29	18	8.13	6.18	0.76	3234	7.47	5.68	0.76	3432	7.18	5.46	0.76	3498	6.89	5.24	0.76	3564
29	20	8.55	5.47	0.64	3366	7.97	5.10	0.64	3531	7.68	4.91	0.64	3630	7.39	4.73	0.64	3729
29	22	9.05	4.70	0.52	3498	8.47	4.40	0.52	3696	8.18	4.25	0.52	3762	7.89	4.10	0.52	3828
29	24	9.55	3.82	0.40	3630	8.96	3.59	0.40	3795	8.72	3.49	0.40	3878	8.47	3.39	0.40	3960
29	26	10.04	2.81	0.28	3762	9.46	2.65	0.28	3927	9.17	2.57	0.28	4010	8.88	2.49	0.28	4092
30	18	8.13	6.51	0.80	3234	7.47	5.98	0.80	3432	7.18	5.74	0.80	3498	6.89	5.51	0.80	3564
30	20	8.55	5.81	0.68	3366	7.97	5.42	0.68	3531	7.68	5.22	0.68	3630	7.39	5.02	0.68	3729
30	22	9.05	5.07	0.56	3498	8.47	4.74	0.56	3696	8.18	4.58	0.56	3762	7.89	4.42	0.56	3828
30	24	9.55	4.20	0.44	3630	8.96	3.94	0.44	3795	8.72	3.83	0.44	3878	8.47	3.73	0.44	3960
30	26	10.04	3.21	0.32	3762	9.46	3.03	0.32	3927	9.17	2.93	0.32	4010	8.88	2.84	0.32	4092
31	18	8.13	6.83	0.84	3234	7.47	6.27	0.84	3432	7.18	6.03	0.84	3498	6.89	5.79	0.84	3564
31	20	8.55	6.16	0.72	3366	7.97	5.74	0.72	3531	7.68	5.53	0.72	3630	7.39	5.32	0.72	3729
31	22	9.05	5.43	0.60	3498	8.47	5.08	0.60	3696	8.18	4.91	0.60	3762	7.89	4.73	0.60	3828
31	24	9.55	4.58	0.48	3630	8.96	4.30	0.48	3795	8.72	4.18	0.48	3878	8.47	4.06	0.48	3960
31	26	10.04	3.62	0.36	3762	9.46	3.41	0.36	3927	9.17	3.30	0.36	4010	8.88	3.20	0.36	4092
32	18	8.13	7.16	0.88	3234	7.47	6.57	0.88	3432	7.18	6.32	0.88	3498	6.89	6.06	0.88	3564
32	20	8.55	6.50	0.76	3366	7.97	6.06	0.76	3531	7.68	5.83	0.76	3630	7.39	5.61	0.76	3729
32	22	9.05	5.79	0.64	3498	8.47	5.42	0.64	3696	8.18	5.23	0.64	3762	7.89	5.05	0.64	3828
32	24	9.55	4.96	0.52	3630	8.96	4.66	0.52	3795	8.72	4.53	0.52	3878	8.47	4.40	0.52	3960
32	26	10.04	4.02	0.40	3762	9.46	3.78	0.40	3927	9.17	3.67	0.40	4010	8.88	3.55	0.40	4092

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature



**PERFORMANCE DATA COOL operation**  
**MSH-30RV -E1 : MUH-30RV -E1 (240V)**

CAPACITY : 8.3(KW) SHF : 0.62 INPUT : 3460(W)

INDOOR		OUTDOOR DB(°C)															
		21				25				27				30			
DB(°C)	WB(°C)	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	9.75	4.29	0.44	2768	9.34	4.11	0.44	2906	8.96	3.94	0.44	3045	8.63	3.80	0.44	3183
21	20	10.17	3.25	0.32	2906	9.75	3.12	0.32	3079	9.46	3.03	0.32	3149	9.13	2.92	0.32	3287
22	18	9.75	4.68	0.48	2768	9.34	4.48	0.48	2906	8.96	4.30	0.48	3045	8.63	4.14	0.48	3183
22	20	10.17	3.66	0.36	2906	9.75	3.51	0.36	3079	9.46	3.41	0.36	3149	9.13	3.29	0.36	3287
22	22	10.58	2.54	0.24	3010	10.21	2.45	0.24	3201	9.96	2.39	0.24	3287	9.55	2.29	0.24	3425
23	18	9.75	5.07	0.52	2768	9.34	4.86	0.52	2906	8.96	4.66	0.52	3045	8.63	4.49	0.52	3183
23	20	10.17	4.07	0.40	2906	9.75	3.90	0.40	3079	9.46	3.78	0.40	3149	9.13	3.65	0.40	3287
23	22	10.58	2.96	0.28	3010	10.21	2.86	0.28	3201	9.96	2.79	0.28	3287	9.55	2.67	0.28	3425
24	18	9.75	5.46	0.56	2768	9.34	5.23	0.56	2906	8.96	5.02	0.56	3045	8.63	4.83	0.56	3183
24	20	10.17	4.47	0.44	2906	9.75	4.29	0.44	3079	9.46	4.16	0.44	3149	9.13	4.02	0.44	3287
24	22	10.58	3.39	0.32	3010	10.21	3.27	0.32	3201	9.96	3.19	0.32	3287	9.55	3.05	0.32	3425
24	24	11.12	2.22	0.20	3149	10.71	2.14	0.20	3322	10.46	2.09	0.20	3425	10.13	2.03	0.20	3598
25	18	9.75	5.85	0.60	2768	9.34	5.60	0.60	2906	8.96	5.38	0.60	3045	8.63	5.18	0.60	3183
25	20	10.17	4.88	0.48	2906	9.75	4.68	0.48	3079	9.46	4.54	0.48	3149	9.13	4.38	0.48	3287
25	22	10.58	3.81	0.36	3010	10.21	3.68	0.36	3201	9.96	3.59	0.36	3287	9.55	3.44	0.36	3425
25	24	11.12	2.67	0.24	3149	10.71	2.57	0.24	3322	10.46	2.51	0.24	3425	10.13	2.43	0.24	3598
26	18	9.75	6.24	0.64	2768	9.34	5.98	0.64	2906	8.96	5.74	0.64	3045	8.63	5.52	0.64	3183
26	20	10.17	5.29	0.52	2906	9.75	5.07	0.52	3079	9.46	4.92	0.52	3149	9.13	4.75	0.52	3287
26	22	10.58	4.23	0.40	3010	10.21	4.08	0.40	3201	9.96	3.98	0.40	3287	9.55	3.82	0.40	3425
26	24	11.12	3.11	0.28	3149	10.71	3.00	0.28	3322	10.46	2.93	0.28	3425	10.13	2.84	0.28	3598
26	26	11.45	1.83	0.16	3322	11.12	1.78	0.16	3495	10.96	1.75	0.16	3598	10.62	1.70	0.16	3702
27	18	9.75	6.63	0.68	2768	9.34	6.35	0.68	2906	8.96	6.10	0.68	3045	8.63	5.87	0.68	3183
27	20	10.17	5.69	0.56	2906	9.75	5.46	0.56	3079	9.46	5.30	0.56	3149	9.13	5.11	0.56	3287
27	22	10.58	4.66	0.44	3010	10.21	4.49	0.44	3201	9.96	4.38	0.44	3287	9.55	4.20	0.44	3425
27	24	11.12	3.56	0.32	3149	10.71	3.43	0.32	3322	10.46	3.35	0.32	3425	10.13	3.24	0.32	3598
27	26	11.45	2.29	0.20	3322	11.12	2.22	0.20	3495	10.96	2.19	0.20	3598	10.62	2.12	0.20	3702
28	18	9.75	7.02	0.72	2768	9.34	6.72	0.72	2906	8.96	6.45	0.72	3045	8.63	6.22	0.72	3183
28	20	10.17	6.10	0.60	2906	9.75	5.85	0.60	3079	9.46	5.68	0.60	3149	9.13	5.48	0.60	3287
28	22	10.58	5.08	0.48	3010	10.21	4.90	0.48	3201	9.96	4.78	0.48	3287	9.55	4.58	0.48	3425
28	24	11.12	4.00	0.36	3149	10.71	3.85	0.36	3322	10.46	3.76	0.36	3425	10.13	3.65	0.36	3598
28	26	11.45	2.75	0.24	3322	11.12	2.67	0.24	3495	10.96	2.63	0.24	3598	10.62	2.55	0.24	3702
29	18	9.75	7.41	0.76	2768	9.34	7.10	0.76	2906	8.96	6.81	0.76	3045	8.63	6.56	0.76	3183
29	20	10.17	6.51	0.64	2906	9.75	6.24	0.64	3079	9.46	6.06	0.64	3149	9.13	5.84	0.64	3287
29	22	10.58	5.50	0.52	3010	10.21	5.31	0.52	3201	9.96	5.18	0.52	3287	9.55	4.96	0.52	3425
29	24	11.12	4.45	0.40	3149	10.71	4.28	0.40	3322	10.46	4.18	0.40	3425	10.13	4.05	0.40	3598
29	26	11.45	3.21	0.28	3322	11.12	3.11	0.28	3495	10.96	3.07	0.28	3598	10.62	2.97	0.28	3702
30	18	9.75	7.80	0.80	2768	9.34	7.47	0.80	2906	8.96	7.17	0.80	3045	8.63	6.91	0.80	3183
30	20	10.17	6.91	0.68	2906	9.75	6.63	0.68	3079	9.46	6.43	0.68	3149	9.13	6.21	0.68	3287
30	22	10.58	5.93	0.56	3010	10.21	5.72	0.56	3201	9.96	5.58	0.56	3287	9.55	5.35	0.56	3425
30	24	11.12	4.89	0.44	3149	10.71	4.71	0.44	3322	10.46	4.60	0.44	3425	10.13	4.46	0.44	3598
30	26	11.45	3.67	0.32	3322	11.12	3.56	0.32	3495	10.96	3.51	0.32	3598	10.62	3.40	0.32	3702
31	18	9.75	8.19	0.84	2768	9.34	7.84	0.84	2906	8.96	7.53	0.84	3045	8.63	7.25	0.84	3183
31	20	10.17	7.32	0.72	2906	9.75	7.02	0.72	3079	9.46	6.81	0.72	3149	9.13	6.57	0.72	3287
31	22	10.58	6.35	0.60	3010	10.21	6.13	0.60	3201	9.96	5.98	0.60	3287	9.55	5.73	0.60	3425
31	24	11.12	5.34	0.48	3149	10.71	5.14	0.48	3322	10.46	5.02	0.48	3425	10.13	4.86	0.48	3598
31	26	11.45	4.12	0.36	3322	11.12	4.00	0.36	3495	10.96	3.94	0.36	3598	10.62	3.82	0.36	3702
32	18	9.75	8.58	0.88	2768	9.34	8.22	0.88	2906	8.96	7.89	0.88	3045	8.63	7.60	0.88	3183
32	20	10.17	7.73	0.76	2906	9.75	7.41	0.76	3079	9.46	7.19	0.76	3149	9.13	6.94	0.76	3287
32	22	10.58	6.77	0.64	3010	10.21	6.53	0.64	3201	9.96	6.37	0.64	3287	9.55	6.11	0.64	3425
32	24	11.12	5.78	0.52	3149	10.71	5.57	0.52	3322	10.46	5.44	0.52	3425	10.13	5.27	0.52	3598
32	26	11.45	4.58	0.40	3322	11.12	4.45	0.40	3495	10.96	4.38	0.40	3598	10.62	4.25	0.40	3702

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA COOL operation**  
**MSH-30RV -E1 : MUH-30RV -E1 (240V)**

CAPACITY : 8.3(KW) SHF : 0.62 INPUT : 3460(W)

		OUTDOOR DB(°C)															
INDOOR DB(°C)	INDOOR WB(°C)	35				40				43				46			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	8.13	3.58	0.44	3391	7.47	3.29	0.44	3598	7.18	3.16	0.44	3668	6.89	3.03	0.44	3737
21	20	8.55	2.74	0.32	3529	7.97	2.55	0.32	3702	7.68	2.46	0.32	3806	7.39	2.36	0.32	3910
22	18	8.13	3.90	0.48	3391	7.47	3.59	0.48	3598	7.18	3.45	0.48	3668	6.89	3.31	0.48	3737
22	20	8.55	3.08	0.36	3529	7.97	2.87	0.36	3702	7.68	2.76	0.36	3806	7.39	2.66	0.36	3910
22	22	9.05	2.17	0.24	3668	8.47	2.03	0.24	3875	8.18	1.96	0.24	3944	7.89	1.89	0.24	4014
23	18	8.13	4.23	0.52	3391	7.47	3.88	0.52	3598	7.18	3.73	0.52	3668	6.89	3.58	0.52	3737
23	20	8.55	3.42	0.40	3529	7.97	3.19	0.40	3702	7.68	3.07	0.40	3806	7.39	2.95	0.40	3910
23	22	9.05	2.53	0.28	3668	8.47	2.37	0.28	3875	8.18	2.29	0.28	3944	7.89	2.21	0.28	4014
24	18	8.13	4.56	0.56	3391	7.47	4.18	0.56	3598	7.18	4.02	0.56	3668	6.89	3.86	0.56	3737
24	20	8.55	3.76	0.44	3529	7.97	3.51	0.44	3702	7.68	3.38	0.44	3806	7.39	3.25	0.44	3910
24	22	9.05	2.90	0.32	3668	8.47	2.71	0.32	3875	8.18	2.62	0.32	3944	7.89	2.52	0.32	4014
24	24	9.55	1.91	0.20	3806	8.96	1.79	0.20	3979	8.72	1.74	0.20	4066	8.47	1.69	0.20	4152
25	18	8.13	4.88	0.60	3391	7.47	4.48	0.60	3598	7.18	4.31	0.60	3668	6.89	4.13	0.60	3737
25	20	8.55	4.10	0.48	3529	7.97	3.82	0.48	3702	7.68	3.69	0.48	3806	7.39	3.55	0.48	3910
25	22	9.05	3.26	0.36	3668	8.47	3.05	0.36	3875	8.18	2.94	0.36	3944	7.89	2.84	0.36	4014
25	24	9.55	2.29	0.24	3806	8.96	2.15	0.24	3979	8.72	2.09	0.24	4066	8.47	2.03	0.24	4152
26	18	8.13	5.21	0.64	3391	7.47	4.78	0.64	3598	7.18	4.59	0.64	3668	6.89	4.41	0.64	3737
26	20	8.55	4.45	0.52	3529	7.97	4.14	0.52	3702	7.68	3.99	0.52	3806	7.39	3.84	0.52	3910
26	22	9.05	3.62	0.40	3668	8.47	3.39	0.40	3875	8.18	3.27	0.40	3944	7.89	3.15	0.40	4014
26	24	9.55	2.67	0.28	3806	8.96	2.51	0.28	3979	8.72	2.44	0.28	4066	8.47	2.37	0.28	4152
26	26	10.04	1.61	0.16	3944	9.46	1.51	0.16	4117	9.17	1.47	0.16	4204	8.88	1.42	0.16	4290
27	18	8.13	5.53	0.68	3391	7.47	5.08	0.68	3598	7.18	4.88	0.68	3668	6.89	4.68	0.68	3737
27	20	8.55	4.79	0.56	3529	7.97	4.46	0.56	3702	7.68	4.30	0.56	3806	7.39	4.14	0.56	3910
27	22	9.05	3.98	0.44	3668	8.47	3.73	0.44	3875	8.18	3.60	0.44	3944	7.89	3.47	0.44	4014
27	24	9.55	3.05	0.32	3806	8.96	2.87	0.32	3979	8.72	2.79	0.32	4066	8.47	2.71	0.32	4152
27	26	10.04	2.01	0.20	3944	9.46	1.89	0.20	4117	9.17	1.83	0.20	4204	8.88	1.78	0.20	4290
28	18	8.13	5.86	0.72	3391	7.47	5.38	0.72	3598	7.18	5.17	0.72	3668	6.89	4.96	0.72	3737
28	20	8.55	5.13	0.60	3529	7.97	4.78	0.60	3702	7.68	4.61	0.60	3806	7.39	4.43	0.60	3910
28	22	9.05	4.34	0.48	3668	8.47	4.06	0.48	3875	8.18	3.92	0.48	3944	7.89	3.78	0.48	4014
28	24	9.55	3.44	0.36	3806	8.96	3.23	0.36	3979	8.72	3.14	0.36	4066	8.47	3.05	0.36	4152
28	26	10.04	2.41	0.24	3944	9.46	2.27	0.24	4117	9.17	2.20	0.24	4204	8.88	2.13	0.24	4290
29	18	8.13	6.18	0.76	3391	7.47	5.68	0.76	3598	7.18	5.46	0.76	3668	6.89	5.24	0.76	3737
29	20	8.55	5.47	0.64	3529	7.97	5.10	0.64	3702	7.68	4.91	0.64	3806	7.39	4.73	0.64	3910
29	22	9.05	4.70	0.52	3668	8.47	4.40	0.52	3875	8.18	4.25	0.52	3944	7.89	4.10	0.52	4014
29	24	9.55	3.82	0.40	3806	8.96	3.59	0.40	3979	8.72	3.49	0.40	4066	8.47	3.39	0.40	4152
29	26	10.04	2.81	0.28	3944	9.46	2.65	0.28	4117	9.17	2.57	0.28	4204	8.88	2.49	0.28	4290
30	18	8.13	6.51	0.80	3391	7.47	5.98	0.80	3598	7.18	5.74	0.80	3668	6.89	5.51	0.80	3737
30	20	8.55	5.81	0.68	3529	7.97	5.42	0.68	3702	7.68	5.22	0.68	3806	7.39	5.02	0.68	3910
30	22	9.05	5.07	0.56	3668	8.47	4.74	0.56	3875	8.18	4.58	0.56	3944	7.89	4.42	0.56	4014
30	24	9.55	4.20	0.44	3806	8.96	3.94	0.44	3979	8.72	3.83	0.44	4066	8.47	3.73	0.44	4152
30	26	10.04	3.21	0.32	3944	9.46	3.03	0.32	4117	9.17	2.93	0.32	4204	8.88	2.84	0.32	4290
31	18	8.13	6.83	0.84	3391	7.47	6.27	0.84	3598	7.18	6.03	0.84	3668	6.89	5.79	0.84	3737
31	20	8.55	6.16	0.72	3529	7.97	5.74	0.72	3702	7.68	5.53	0.72	3806	7.39	5.32	0.72	3910
31	22	9.05	5.43	0.60	3668	8.47	5.08	0.60	3875	8.18	4.91	0.60	3944	7.89	4.73	0.60	4014
31	24	9.55	4.58	0.48	3806	8.96	4.30	0.48	3979	8.72	4.18	0.48	4066	8.47	4.06	0.48	4152
31	26	10.04	3.62	0.36	3944	9.46	3.41	0.36	4117	9.17	3.30	0.36	4204	8.88	3.20	0.36	4290
32	18	8.13	7.16	0.88	3391	7.47	6.57	0.88	3598	7.18	6.32	0.88	3668	6.89	6.06	0.88	3737
32	20	8.55	6.50	0.76	3529	7.97	6.06	0.76	3702	7.68	5.83	0.76	3806	7.39	5.61	0.76	3910
32	22	9.05	5.79	0.64	3668	8.47	5.42	0.64	3875	8.18	5.23	0.64	3944	7.89	5.05	0.64	4014
32	24	9.55	4.96	0.52	3806	8.96	4.66	0.52	3979	8.72	4.53	0.52	4066	8.47	4.40	0.52	4152
32	26	10.04	4.02	0.40	3944	9.46	3.78	0.40	4117	9.17	3.67	0.40	4204	8.88	3.55	0.40	4290

**NOTE** Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature  
SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

**PERFORMANCE DATA HEAT operation**

**MSH-18RV -[E1] : MUH-18RV -[E1] (220V)**

CAPACITY : 5.4(KW) INPUT : 1980(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	3.40	1287	4.10	1544	4.81	1742	5.51	1881	6.21	2000	6.86	2059	7.56	2099
21	3.24	1386	3.89	1643	4.59	1822	5.24	1960	5.96	2059	6.59	2119	7.26	2198
26	2.92	1485	3.62	1742	4.27	1921	4.97	2059	5.67	2158	6.32	2218	7.02	2277

**NOTE** Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

**(240V)**

CAPACITY : 5.4(KW) INPUT : 2070(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	3.40	1346	4.10	1615	4.81	1822	5.51	1967	6.21	2091	6.86	2153	7.56	2194
21	3.24	1449	3.89	1718	4.59	1904	5.24	2049	5.94	2153	6.59	2215	7.26	2298
26	2.92	1553	3.62	1822	4.27	2008	4.97	2153	5.67	2256	6.32	2318	7.02	2381

**NOTE** Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

**MSH-24RV -[E1] : MUH-24RV -[E1] (220V)**

CAPACITY : 6.2(KW) INPUT : 2470(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	3.91	1606	4.71	1927	5.52	2174	6.32	2347	7.13	2495	7.87	2569	8.68	2618
21	3.72	1729	4.46	2050	5.27	2272	6.01	2445	6.82	2569	7.56	2643	8.34	2742
26	3.35	1853	4.15	2174	4.90	2396	5.70	2569	6.51	2692	7.25	2766	8.06	2841

**NOTE** Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

**(240V)**

CAPACITY : 6.2(KW) INPUT : 2580(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	3.91	1677	4.71	2012	5.52	2270	6.32	2451	7.13	2606	7.87	2683	8.68	2735
21	3.72	1806	4.46	2141	5.27	2374	6.01	2554	6.82	2683	7.56	2761	8.34	2864
26	3.35	1935	4.15	2270	4.90	2503	5.70	2683	6.51	2812	7.25	2890	8.06	2967

**NOTE** Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

**MSH-30RV -[E1] : MUH-30RV -[E1] (220V)**

CAPACITY : 9.6(KW) INPUT : 3520(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	6.05	2288	7.30	2746	8.54	3098	9.79	3344	11.04	3555	12.19	3661	13.44	3731
21	5.76	2464	6.91	2922	8.16	3238	9.31	3485	10.56	3661	11.71	3766	12.91	3907
26	5.18	2640	6.43	3098	7.58	3414	8.83	3661	10.08	3837	11.23	3942	12.48	4048

**NOTE** Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

**(240V)**

CAPACITY : 9.6(KW) INPUT : 3560(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	6.05	2314	7.30	2777	8.54	3133	9.79	3382	11.04	3596	12.19	3702	13.44	3774
21	5.76	2492	6.91	2955	8.16	3275	9.31	3524	10.56	3702	11.71	3809	12.91	3952
26	5.18	2670	6.43	3133	7.58	3453	8.83	3702	10.08	3880	11.23	3987	12.48	4094

**NOTE** Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

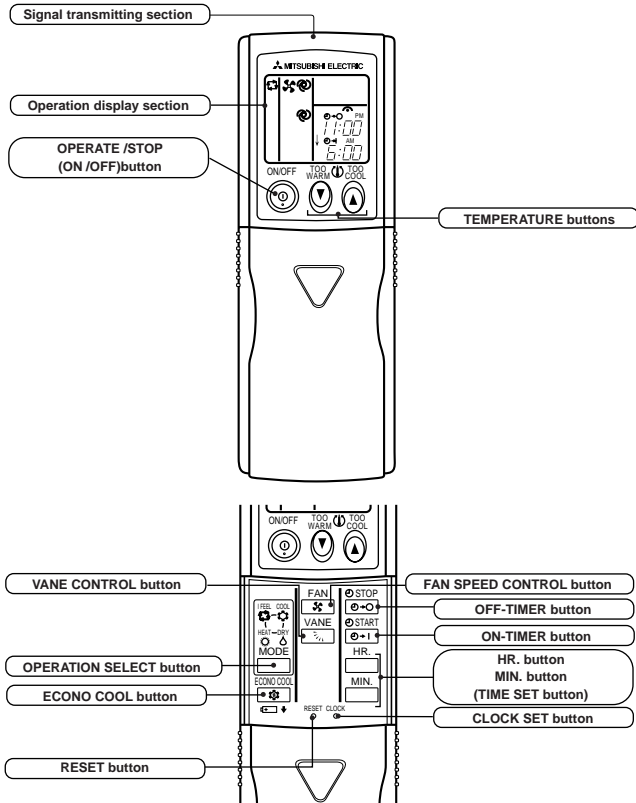
MSH-18RV -E1 MUH-18RV -E1

MSH-24RV -E1 MUH-24RV -E1

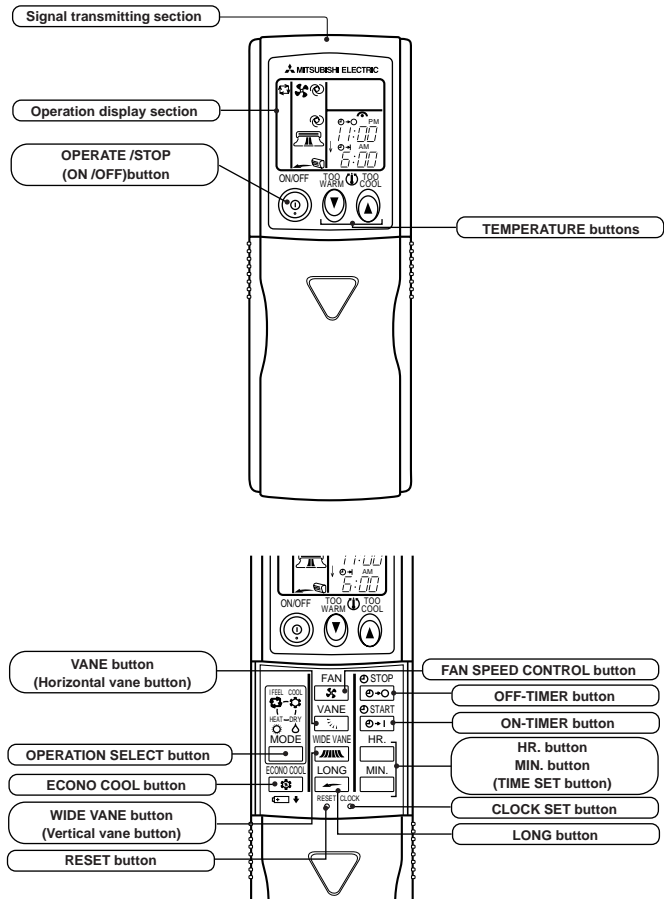
MSH-30RV -E1 MUH-30RV -E1

## WIRELESS REMOTE CONTROLLER

MSH-18RV -E1 MSH-24RV -E1



MSH-30RV -E1

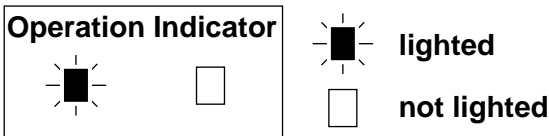


## INDOOR UNIT DISPLAY SECTION

### Operation Indicator lamp

The operation indicator at the right side of the indoor unit indicates the operation state.

- The following indication does not depend on the shape of lamp.



Once the operation mode are set, the same operation mode can be repeated by simply turning the OPERATE/STOP (ON/OFF) button ON.

Indoor unit receives the signal with a beep tone.

When the system turns off, 3-minute time delay will operate to protect system from overload and compressor will not restart for 3 minutes.

Indication	Operation state	Difference between target temperature and room temperature
	This shows that the air conditioner is operating to reach the target temperature. Please wait until the target temperature is obtained.	Approx. 2 °C or more
	This shows that the room temperature is approaching the target temperature.	Approx. 2 °C or less

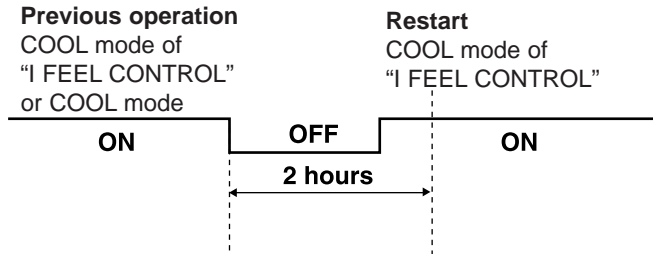
### 9-1. "I FEEL CONTROL" ( ) OPERATION

- Press OPERATE/STOP (ON/OFF) button on the remote controller. OPERATION INDICATOR lamp of the indoor unit turns on with a beep tone.
- Select "I FEEL CONTROL" mode with the OPERATION SELECT button.
- The operation mode is determined by the room temperature at start-up of the operation.

Initial room temperature	Mode
25°C or more	COOL mode of "I FEEL CONTROL"
23°C to 25°C	DRY mode of "I FEEL CONTROL"
less than 23°C	HEAT mode of "I FEEL CONTROL"

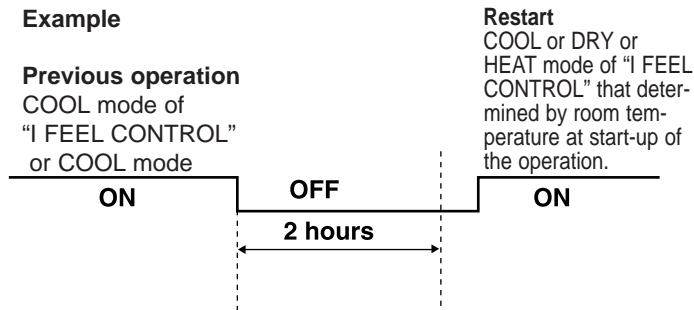
- Once the mode is fixed, the mode does not change by room temperature afterwards.
- Under the ON-TIMER (⊖→|) operation, mode is determined according to the room temperature at the set time the operation starts.
- When the system is stopped on the remote controller, and restarted within 2 hours in "I FEEL CONTROL" (□) mode, the system operates in previous mode automatically regardless of the room temperature.

**Example**



When the system is restarted after 2 hours and more, the operation mode is determined by the room temperature at start-up of the operation.

**Example**



(4) The initial set temperature is decided by the initial room temperature.

Model	Initial room temperature	Initial set temperature	
COOL mode of "I FEEL CONTROL"	26°C or more	24°C	*1
	25°C to 26°C	Initial room temperature minus 2°C	
DRY mode of "I FEEL CONTROL"	23°C to 25°C	Initial room temperature minus 2°C	
HEAT mode of "I FEEL CONTROL"	less than 23°C	26°C	

\*1 When the system is restarted with the remote controller, the system operates with the previous set temperature regardless of room temperature at restart.  
The set temperature is calculated by the previous set temperature.

(5) TEMPERATURE buttons


In "I FEEL CONTROL" (□) mode, set temperature is decided by the microprocessor based on the room temperature. In addition, set temperature can be controlled by TOO WARM or TOO COOL buttons when you feel too cool or too warm. Each time the TOO WARM or TOO COOL button is pressed, the indoor unit receives the signal and emits a beep tone.

• **Fuzzy control**

When the TOO COOL or TOO WARM button is pressed, the microprocessor changes the set temperature, considering the room temperature, the frequency of pressing TOO COOL or TOO WARM button and the user's preference to heat or cool. So this is called "Fuzzy control", and works only in "I FEEL CONTROL" mode.

In DRY mode of "I FEEL CONTROL", the set temperature doesn't change.

 ... To raise the set temperature 1~2 degrees(°C)

 ... To lower the set temperature 1~2 degrees(°C)

## 9-1-1. COOL mode of "I FEEL CONTROL"

### 1. Indoor fan speed control

Indoor fan operates at the set speed by FAN SPEED CONTROL button.  
In AUTO the fan speed is as follows.

Initial temperature difference	Fan Speed	Difference between room temperature and set temperature during operation
Room temperature minus set temperature : 3 degrees or more.....	High	
Room temperature minus set temperature : Between 1 and 1.7 degrees.....	Med.	
Room temperature minus set temperature : less than 1 degree.....	Low	

### 2. Coil frost prevention

#### ① Temperature control

When the indoor coil thermistor RT12 reads 3°C or below(MSH-18/24RV)/ RT12 or RT13 reads -1°C or below(MSH-30RV), the coil frost prevention mode starts immediately.

However, the coil frost prevention doesn't work for 5 minutes since the compressor has started.

The indoor fan operates at the set speed and the compressor stops for 5 minutes.

After that, if RT12 still reads below 3°C(MSH-18/24RV)/ RT12 or RT13 still reads below -1°C(MSH-30RV) this mode prolonged until the RT12 reads over 3°C(MSH-18/24RV)/ RT12 or RT13 still reads over -1°C(MSH-30RV) .

#### ② Time control

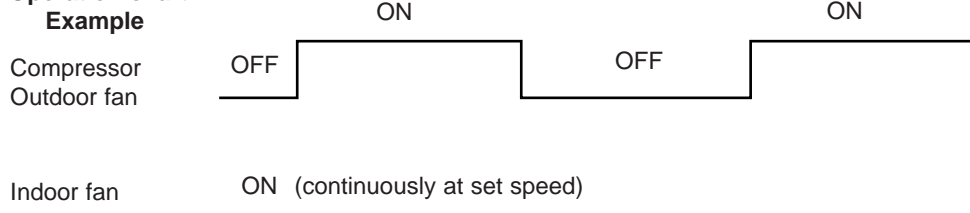
When the three conditions as follows have been satisfied for 1 hour and 45 minutes, compressor stops for 3 minutes.

- Compressor has been continuously operating.
- Indoor fan speed is Low or Med.
- Room temperature is below 26°C.

When compressor stops, the accumulated time is cancelled and when compressor restarts, time counting starts from the beginning.

Time counting also stops temporarily when the indoor fan speed becomes High or the room temperature exceeds 26°C. However, when two of the above conditions (b.and c.) are satisfied again. Time accumulation is resumed.

#### Operation chart



### 3. Outdoor fan speed control <MSH-24/30RV only>

Outdoor fan speed is controlled according to the temperature of ambient temperature thermistor RT63.

Outdoor fan Low operation : When the outside temperature decreases to 28°C(MSH-24RV)/ 23°C(MSH-30RV) or less. Until the outside temperature goes to 31°C(MSH-24RV)/ 27°C(MSH-30RV) or more.

Outdoor fan High operation : Until the outside temperature decreases to 28°C(MSH-24RV)/ 23°C(MSH-30RV) or less. When the outside temperature goes to 31°C(MSH-24RV)/ 27°C(MSH-30RV) or more.

Ambient temperature thermistor RT63 temperature	Outdoor fan speed
28°C (MSH-24RV) 23°C (MSH-30RV)	High
31°C (MSH-24RV) 27°C (MSH-30RV)	Low

**NOTE1.** : If the temperature of RT63 reads from 28°C to 31°C (MSH-24RV)/ from 23°C to 27°C (MSH-30RV) at the air conditioner starting outdoor fan speed is High.

#### **NOTE2.** : <MSH-30RV only>

When indoor fan speed is Low except HEAT operation mode and the outside temperature is 29°C or less, the outdoor fan operates at Low.

Outdoor fan Low operation is cancelled according to the following conditions(① or ②):

- When the operation is not changed and the outside temperature goes to 31°C or more.
- When the operation is changed. (Change to HEAT operation mode / Change of the indoor fan speed)

### 4. Discharge temperature protection <MSH-30RV only>

The compressor is controlled by the temperature of discharge temperature thermistor RT62 for excess rise protection of compressor discharge pressure.

#### • Compressor

When the temperature of discharge temperature thermistor RT62 goes to 120°C or more, the compressor is turned OFF.

After 3 minutes since the compressor has been turned OFF, if the temperature of discharge temperature thermistor RT62 becomes 100°C or less, the compressor is turned ON.

## 9-1-2. DRY mode of "I FEEL CONTROL"

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

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

By such controls, indoor flow amounts will be reduced in order to lower humidity without much room temperature decrease.



### 1. Indoor fan speed control

Indoor fan operates at the set speed by FAN SPEED CONTROL button. However, in AUTO fan operation, fan speed becomes Low.

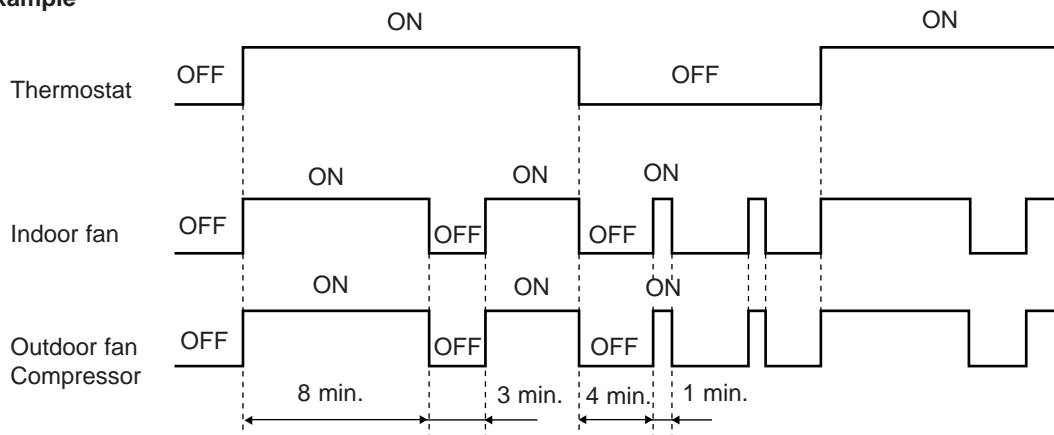
### 2. The operation of the compressor and indoor/ outdoor fan

Compressor operates by room temperature control and time control. Set temperature is controlled to fall 2°C from initial room temperature. Indoor fan and outdoor fan operate in the same cycle as the compressor.

- When the room temperature is 23°C or over:  
When the thermostat is ON, the compressor repeats 8 minutes ON and 3 minutes OFF.  
When the thermostat is OFF, the compressor repeats 4 minutes OFF and 1 minute ON.
- When the room temperature is under 23°C:  
When the thermostat is ON, the compressor repeats 2 minutes ON and 3 minutes OFF.  
When the thermostat is OFF, the compressor repeats 4 minutes OFF and 1 minute ON.

### Operation time chart

#### Example



### 3. Coil frost prevention

- The operation is as same as coil frost prevention during COOL mode of "I FEEL CONTROL".
- Indoor fan operates at the set speed and the compressor stops for 5 minutes, because protection(Coil frost prevention) has the priority. However, when coil frost prevention works while the compressor is not operating, it's speed becomes Low.

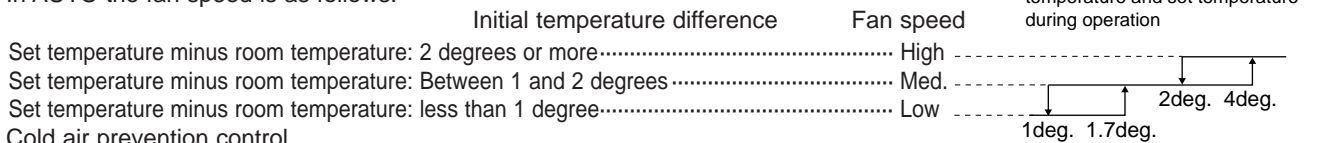
### 4. Outdoor fan control <MSH-24/30RV only>

Outdoor fan control is as same as one of COOL mode of "I FEEL CONTROL".

## 9-1-3. HEAT mode of "I FEEL CONTROL"

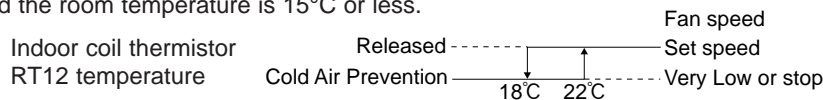
### 1. Indoor fan speed control

(1) In AUTO the fan speed is as follows.



(2) Cold air prevention control

The fan runs at set speed when the indoor coil thermistor RT12 temperature exceeds 22°C. The fan operates Low when the temperature of indoor coil thermistor RT12 is below 18°C. But the fan stops when the indoor fan operates at Very Low and the room temperature is 15°C or less.



**NOTE :** If the temperature of RT12 reads from 18°C to 22°C at the air conditioner starting and also after defrosting, this control works.

(3) Warm air control.

When compressor starts in heating operation or after defrosting, the fan changes the speed due to the indoor coil thermistor RT12 temperature to blow out warm air. After releasing of cold air prevention, when the indoor coil thermistor RT12 temperature is 37°C or above, the fan speed shifts to the set speed, and when the fan speed is changed by the remote controller, the fan speed is the set speed. When the indoor coil thermistor RT12 temperature is less than 37°C, the fan speed is controlled by time as below.

<Time condition>                    <Indoor fan speed>  
 less than 2 minutes.....Low  
 2 minutes to 4 minutes.....Med.  
 4 minutes or more.....High  
 The upper limit of the fan speed is the set speed.  
 If the thermostat turns off, this operation changes to flow soft control.

(4) Flow soft control

After the thermostat turns off, the indoor fan operates at Very Low.

**NOTE** : When the thermostat turns on, the fan operates at the set speed. Due to the cold air prevention control, the fan does not start at set speed until the indoor coil thermistor RT12 reads 22°C or more.

**2. Outdoor fan speed control <MSH-24/30RV only>**

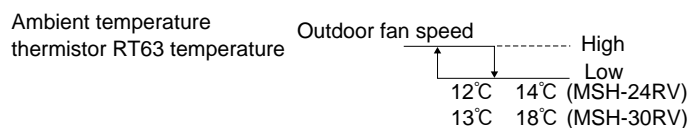
Outdoor fan speed is controlled according to the temperature of ambient temperature thermistor RT63.

Outdoor fan Low operation : Until the outside temperature decreases to 12°C(MSH-24RV)/ 13°C(MSH-30RV).

When the outside temperature goes to 14°C(MSH-24RV)/ 18°C(MSH-30RV) or more.

Outdoor fan High operation :When the outside temperature decreases to 12°C(MSH-24RV)/ 13°C(MSH-30RV) or less.

Until the outside temperature goes to 14°C(MSH-24RV)/ 18°C(MSH-30RV).



**3. High pressure protection <MSH-18/24RV>**

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

(MSH-18RV) Outdoor fan OFF : 60°C

Outdoor fan ON : 56°C

(MSH-24RV) Outdoor fan OFF : 52°C

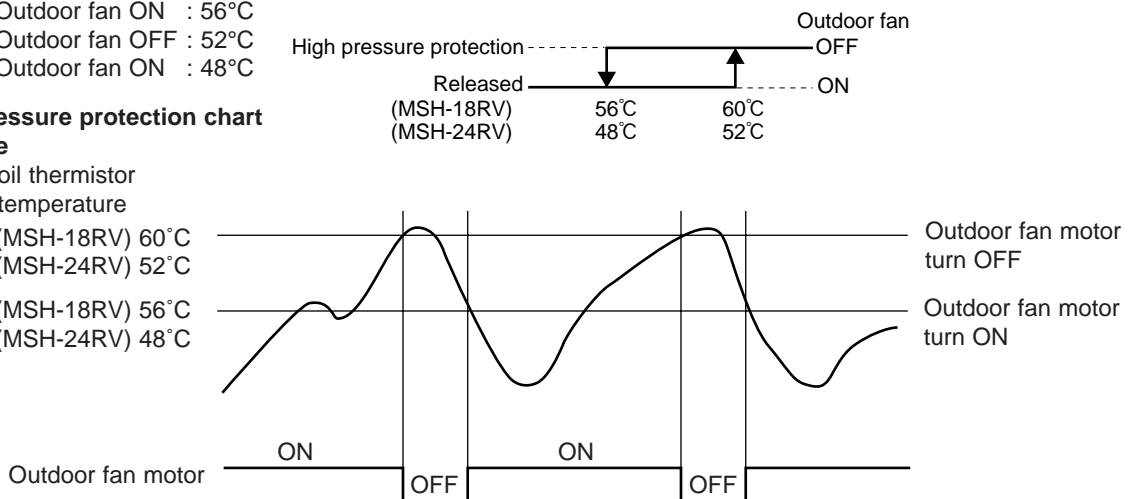
Outdoor fan ON : 48°C

**High pressure protection chart Example**

Indoor coil thermistor RT12 temperature

(MSH-18RV) 60°C  
 (MSH-24RV) 52°C

(MSH-18RV) 56°C  
 (MSH-24RV) 48°C



**NOTE 1** During high pressure protection and for 4 minutes and 15 seconds after high pressure protection, defrosting of outdoor heat exchanger is not detected by the defrost thermistor RT61.

**NOTE 2** When connected to MXZ-32NV- [E1], MXZ-32NV- [E2], MXZ-32RV- [E1] or MXZ-32SV- [E1] outdoor unit, the indoor unit send the data for the temperature to the outdoor unit according to the indoor coil thermistor RT12 temperature. For the further information, refer to the service manual No.OB185 REVISED EDITION C (Outdoor unit: MXZ-32NV- [E1] or MXZ-32NV- [E2]), No.OB227 REVISED EDITION-B(Outdoor unit: MXZ-32RV- [E1]) or No.OB254 (Outdoor unit: MXZ-32SV- [E1]) .

**<MSH-30RV>**

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

• Outdoor fan

When the temperature of indoor coil thermistor RT12 goes to 55°C or more, the outdoor fan is turned OFF.

When the temperature of indoor coil thermistor RT12 becomes to 52°C or less, the outdoor fan is turned ON.

• Compressor

When the temperature of indoor coil thermistor RT12 goes to 75°C or more, the compressor is turned OFF.

3 minutes after the compressor is turned OFF and if the temperature of indoor coil thermistor RT12 becomes 75°C or less, the compressor is turned ON.

**NOTE** : During the high pressure protection and for 10 seconds after high pressure protection, defrosting of outdoor heat exchanger is not detected by the defrost thermistor RT61.

**4. Discharge temperature protection <MSH-30RV only>**

Discharge temperature protection is as same as during COOL mode of "I FEEL CONTROL".



## 5. Defrosting

Defrosting of outdoor heat exchanger is controlled by deicer P.C. board, with detection by the defrost thermistor RT61.

### (1) Starting conditions of defrost

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

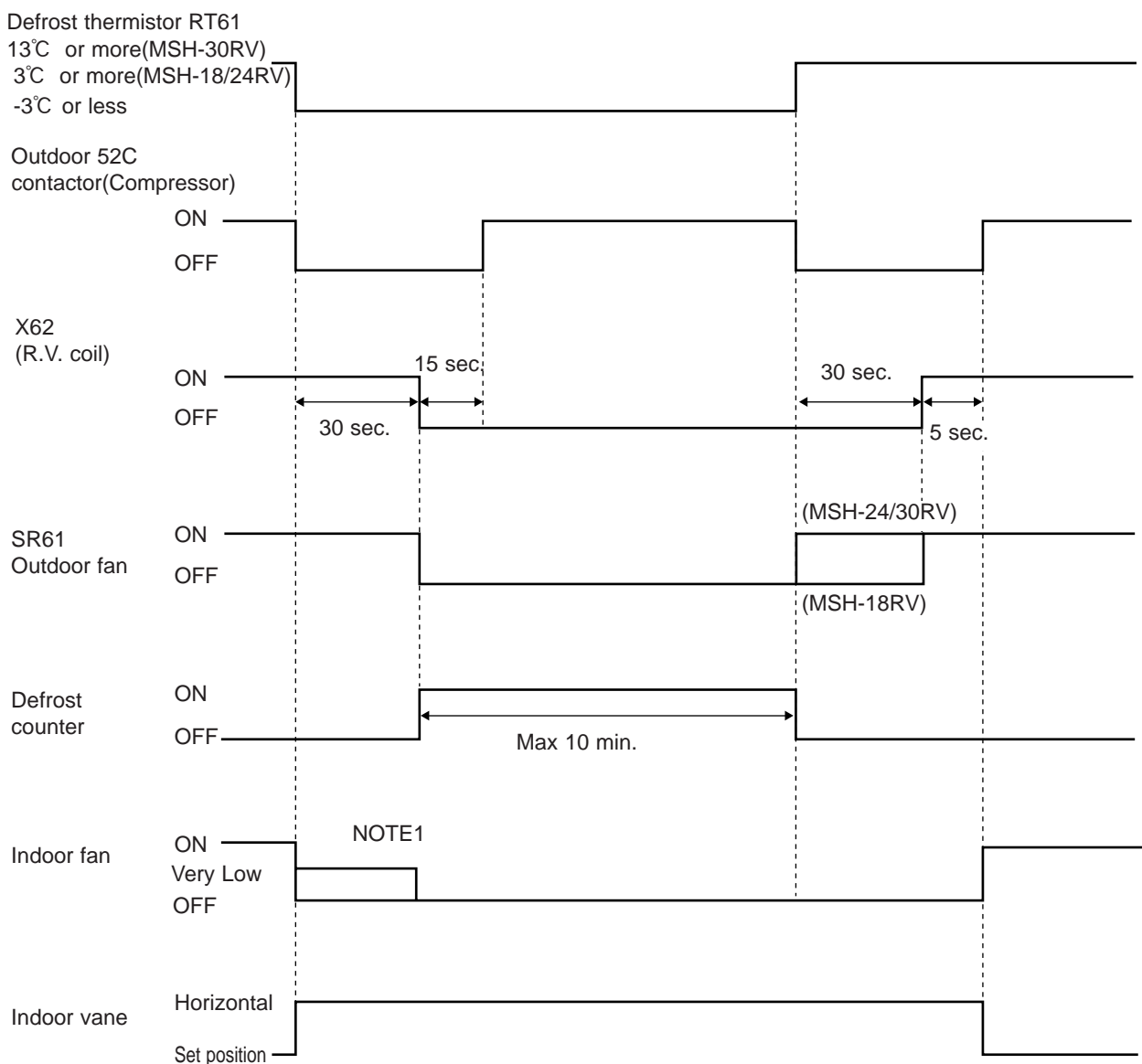
- Under the heat operation, the compressor cumulative operation time exceeds 40 minutes without the defrosting operation working.
- The defrost thermistor RT61 reads  $-3^{\circ}\text{C}$  or less.
- After releasing the high pressure protection 4 minutes and 15 seconds(MSH-18/24RV)/ 10 seconds(MSH-30RV) have elapsed.

### (2) Releasing conditions of defrost

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

- The defrost thermistor RT61 reads  $3^{\circ}\text{C}$ (MSH-18/24RV)/  $13^{\circ}\text{C}$ (MSH-30RV) or more.
- The defrosting time exceeds 10 minutes.

### (3) Defrosting time chart



- NOTE1**
- When the indoor coil thermistor RT12 reads above  $18^{\circ}\text{C}$ , indoor fan operates at Very Low for 30 seconds.
  - When the indoor coil thermistor RT12 reads  $18^{\circ}\text{C}$  or less, the indoor fan stops.

**NOTE2** • Refer to the Service Manual OB185 REVISED EDITION C when MSH-18RV-[E1] is connected with MXZ-32NV-[E1] or MXZ-32NV-[E2] as multi system units.

• Refer to the Service Manual OB227 REVISED EDITION-B when MSH-18RV-[E1] is connected with MXZ-32RV-[E1] as multi system units.

• Refer to the Service Manual OB254 when MSH-18RV-[E1] is connected with MXZ-32SV-[E1] as multi system units.

**6. R.V. coil control**

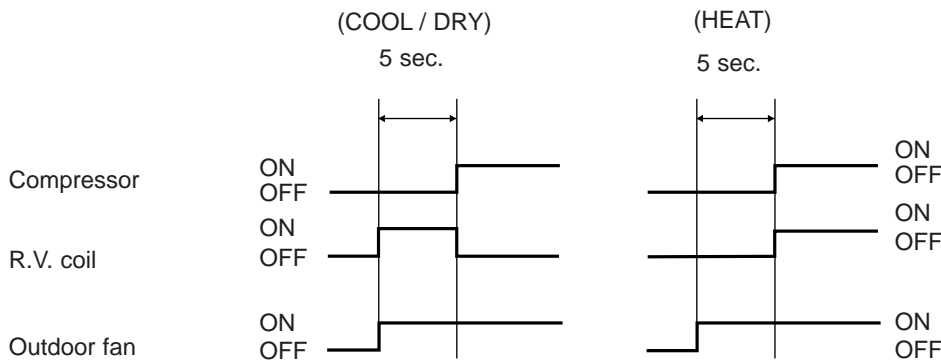
- Heating . . . . . ON
- Cooling . . . . . OFF
- Dry . . . . . OFF

**NOTE1** The 4-way valve reverses for 5 seconds right before start-up of the compressor.

**NOTE2** •Refer to the Service Manual OB185 REVISED EDITION C when MSH-18RV-E1 is connected with MXZ-32NV-E1 or MXZ-32NV-E2 as multi system units.

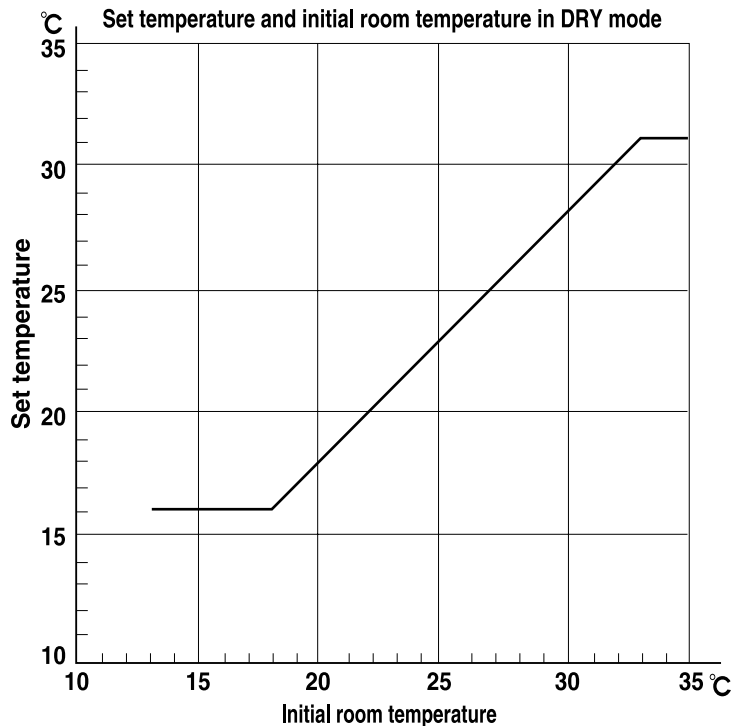
•Refer to the Service Manual OB227 REVISED EDITION-B when MSH-18RV-E1 is connected with MXZ-32RV-E1 as multi system units.

•Refer to the Service Manual OB254 when MSH-18RV-E1 is connected with MXZ-32SV-E1 as multi system units.



**9-2. COOL ( ❄ ) OPERATION**

- (1) Press OPERATE/STOP (ON/OFF) button. OPERATION INDICATOR lamp of the indoor unit turns on with a beep tone.
- (2) Select COOL mode with the OPERATION SELECT button.
- (3) Press the TEMPERATURE buttons. (TOO WARM or TOO COOL button) to select the desired temperature. The setting range is 16 ~ 31°C.
  - \* Indoor fan continues to operate regardless of thermostat's OFF-ON at set speed.
  - \* Coil frost prevention is as same as COOL mode of "I FEEL CONTROL".



**9-3. DRY ( ☹ ) OPERATION**

- (1) Press OPERATE/STOP (ON/OFF) button. OPERATION INDICATOR lamp of the indoor unit turns on with a beep tone.
- (2) Select DRY mode with the OPERATION SELECT button.
- (3) The microprocessor reads the room temperature and determines the set temperature. Set temperature is as shown on the right chart. Thermostat (SET TEMP.) does not work. The other operations are same as DRY mode of "I FEEL CONTROL".
- (4) DRY operation will not function when the room temperature is 13°C or below.

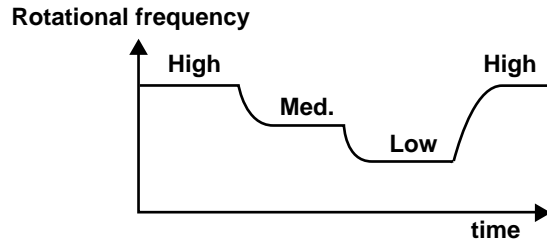
**9-4. HEAT ( ☀ ) OPERATION**

- (1) Press OPERATE/STOP (ON/OFF) button. OPERATION INDICATOR lamp of the indoor unit turns on with a beep tone.
- (2) Select HEAT mode with the OPERATION SELECT button.
- (3) Press TEMPERATURE buttons (TOO WARM or TOO COOL button) to select the desired temperature. The setting range is 16 ~ 31°C.
- (4) Indoor fan speed control, high pressure protection, defrosting, R.V. coil control are the same as HEAT mode of "I FEEL CONTROL".

## 9-5. INDOOR FAN MOTOR CONTROL

### (1) Rotational frequency feedback control

The indoor fan motor is equipped with a rotational frequency sensor, and outputs signal to the microprocessor to feed back the rotational frequency. Comparing the current rotational frequency with the target rotational frequency (High, Med., Low), the microprocessor controls IC141(MSH-18/24RV)/ SR141(MSH-30RV) and adjusts fan motor electric current to make the current rotational frequency close to the target rotational frequency. With this control, when the fan speed is switched, the rotational frequency changes smoothly.



### (2) Fan motor lock-up protection

When the rotational frequency feedback signal has not output for 12 seconds, (or when the microprocessor cannot detect the signal for 12 seconds) the fan motor is regarded locked-up. Then the electric current to the fan motor is shut off. 3 minutes later, the electric current is applied to the fan motor again. During the fan motor lock-up, the OPERATION INDICATOR lamp flashes on and off to show the fan motor abnormality. (Refer to page 55 or 56.)

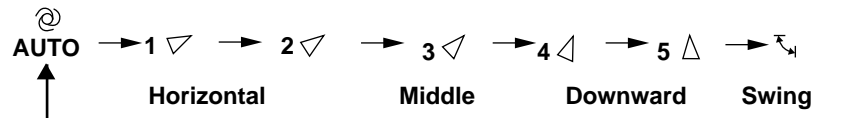
## 9-6. AUTO VANE OPERATION

### 1. Horizontal vane

#### (1) Vane motor drive

These models are equipped with a stepping motor for the horizontal vane. The rotating direction, speed, and angle of the motor are controlled by pulse signals (approx. 12V) transmitted from indoor microprocessor.

#### (2) The horizontal vane angle and mode changes as follows by pressing the VANE CONTROL button(MSH-18/24RV)/ VANE button(MSH-30RV).



#### (3) Positioning

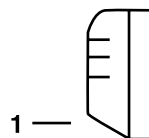
The vane is once pressed to the vane stopper below to confirm the standard position and then set to the desired angle. Confirming of standard position is performed in case of follows.

- When the OPERATE/STOP (ON/OFF) button is pressed.
- When the vane control is changed from AUTO to MANUAL.
- When the SWING is finished.
- When the test run starts.
- When the power supply turns ON.

#### (4) VANE AUTO (Ⓐ) mode

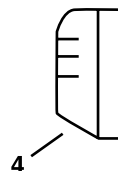
In VANE AUTO mode, the microprocessor automatically determines the vane angle and operation to make the optimum room-temperature distribution.

① In COOL and DRY operation



Vane angle is fixed to Angle 1.

② In HEAT operation



Vane angle is fixed to Angle 4.

(5) STOP (operation OFF) and ON-TIMER standby.


When the following cases occur, the horizontal vane returns to the closed position.

- (a) When the OPERATE/STOP (ON/OFF) button is pressed (POWER OFF).
- (b) When the operation is stopped by the emergency operation.
- (c) When the ON-TIMER is on standby.

(6) Dew prevention

During COOL or DRY operation at Vane Angle 4 or 5 when the cumulative operation time of compressor exceeds 1 hour, the vane angle automatically changes to Angle 1 for dew prevention.

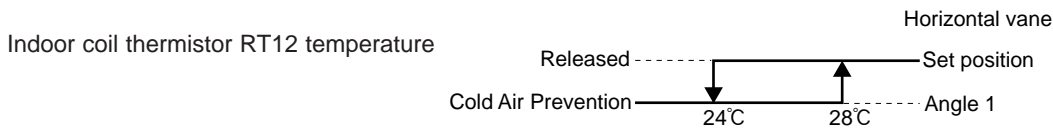
(7) SWING MODE (  )

By selecting SWING mode with the VANE CONTROL button (MSH-18/24RV) / VANE button (MSH-30RV), the horizontal vane swings vertically. The remote controller displays “  ”.

(8) Cold air prevention in HEAT operation

When any of the following conditions occurs in HEAT operation, the vane angle changes to Angle 1 automatically to prevent cold air blowing on users.

- ① Compressor is not operating.
- ② Defrosting is performed.
- ③ Indoor coil thermistor RT12 reads 24°C or below.
- ④ Indoor coil thermistor RT12 temperature is raising from 24°C or below, but it does not exceed 28°C.



**NOTE:** If the temperature of RT12 reads from 24°C to 28°C at the air conditioner starting, this control works.

(9) ECONO COOL (  ) operation (ECONOMical operation)

When the ECONO COOL button is pressed in COOL mode, set temperature is automatically set 2°C higher than that in COOL mode.

Also the horizontal vane swings in various cycle according to the temperature of indoor heat exchanger( $T_{p(*1)}$ ).

SWING operation makes you feel cooler than set temperature. So, even though the set temperature is higher than that in COOL mode, the air conditioner can keep comfort. As a result, energy can be saved.

ECONO COOL operation is cancelled when the ECONO COOL button is pressed once again or VANE CONTROL button(MSH-18/24RV)/ VANE button(MSH-30RV) is pressed or LONG button(MSH-30RV only) is pressed or change to other operation mode.

**NOTE :** ECONO COOL operation does not work in COOL mode of “I FEEL CONTROL”.

SWING operation

- \* 1  $T_p$  : • Value of RT12 (MSH-18/24RV)
- Minimum value of indoor coil thermistor (main) RT12 and indoor coil thermistor (sub) RT13 (MSH-30RV)

In swing operation of ECONO COOL operation air flow is initially blew out upward(levelly).

According to the temperature of indoor coil thermistor  $T_{p(*1)}$  at starting of this operation, next downward blow time is decided. Then when the downward blow has been finished, next upward blow time is decided.


For initial 10 minutes the swing operation is performed in table G~H for quick cooling(but G :  $T_{p(*1)}$  is 24°C or less).

Also, after 10 minutes when the difference of set temperature and room temperature is more than 2°C, the swing operation is performed in table D~H for more cooling(but D:  $T_{p(*1)}$  is 20°C or less).

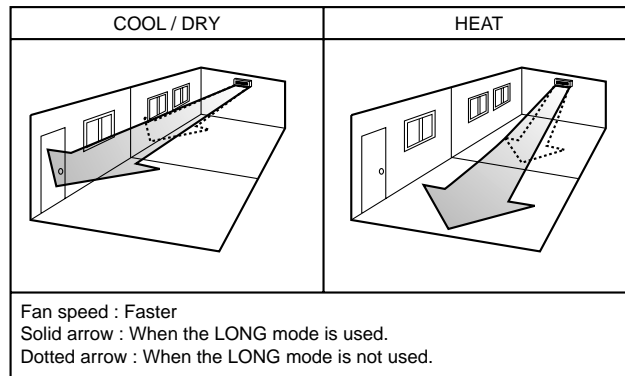
The air conditioner repeats the swing operation in various cycle as follows.

	Temperature of $T_{p(*1)}$	Downward blow time (sec.)	Upward(level) blow time (sec.)
A	15°C or less	2	23
B	15°C to 17°C	5	20
C	17°C to 18°C	8	17
D	18°C to 20°C	11	14
E	20°C to 21°C	14	11
F	21°C to 22°C	17	8
G	22°C to 24°C	20	5
H	more than 24°C	23	2

(10) LONG MODE (  ) <MSH-30RV only>

By pressing the LONG button fan speed becomes faster than setting fan speed on the remote controller, and the horizontal vane moves to the position for LONG mode. The remote controller displays “  ”. LONG mode is cancelled when the LONG button is pressed once again or the VANE button is pressed or ECONO COOL button is pressed in COOL mode.

- In the following example, the vertical vane is set to  (front.).

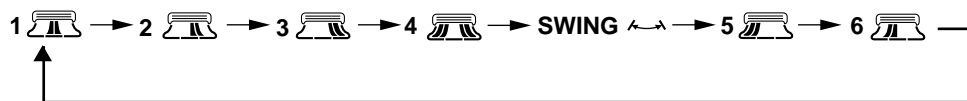


**2. Vertical vane <MSH-30RV only>**

(1) Vane motor drive

This model is equipped with a stepping motor for the vertical vane. The rotating direction, speed, and angle of the motor are controlled by pulse signals (approx. 12V) transmitted from microprocessor.

(2) The vertical vane angle and mode change as follows by pressing the WIDE VANE button.




(3) Positioning


The vane is once pressed to the vane stopper to confirm the standard position and then set to the desired angle. Confirming of standard position is performed in case of follows.

- When the OPERATE/STOP(ON/OFF) button is pressed (POWER ON/OFF).
- When the SWING is started or finished.
- When the power supply turns ON.



(4) SWING MODE (  )

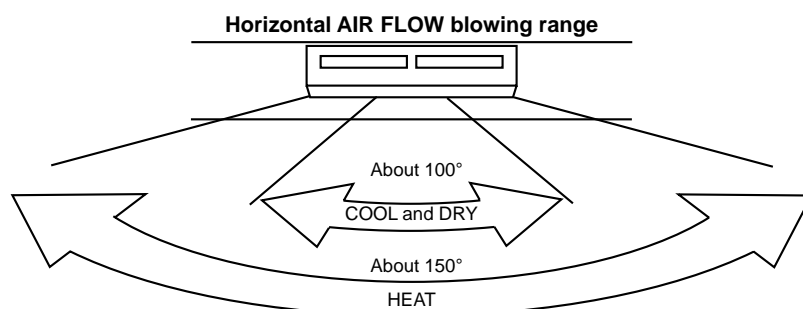
By selecting SWING mode with the WIDE VANE button, the vertical vane swings horizontally. The remote controller displays “  ”. The vane moves right and left in the width of Angle 4 repeatedly.

(5) WIDE MODE (  )

By selecting WIDE mode with the WIDE VANE button, indoor fan speed becomes faster than setting fan speed on the remote controller (\*). The remote controller displays “  ”.

**NOTE :** The position of vane angle 3, angle 4 and angle 5 are different in COOL operation and HEAT operation.

- \* Indoor fan speed becomes faster than setting fan speed on the remote controller even when  or  is selected.



## 9-7. TIMER OPERATION

### 1. How to set the timer

- (1) Press OPERATE/STOP (ON/OFF) button to start the air conditioner.
- (2) Check that the current time is set correctly.

**NOTE** : Timer operation will not work without setting the current time. Initially "AM0:00" blinks at the current time display of TIME MONITOR, so set the current time correctly with CLOCK SET button.

- (3) Press TIMER CONTROL button to select the operation.

"ON-TIMER" button... AUTO START operation (ON timer)

"OFF-TIMER" button... AUTO STOP operation (OFF timer)

- (4) Press HR. and MIN. button to set the timer. Time setting is 10-minute units.

HR. and MIN. button will work when "⊕→| " or "⊕→○" mark is flashing.

These marks disappear in 1 minute.

After setting the ON timer, check that OPERATION INDICATOR lamp of the indoor unit lights.

**NOTE1** : Be sure to place the remote controller at the position where its signal can reach the air conditioner even during TIMER operation, or the set time may deviate within the range of about 10 minutes.

**NOTE2** : Reset the timer in the following cases, or the set time may deviate and other malfunctions may occur.

- A power failure occurs.
- The circuit breaker functions.

### 2. Cancel

TIMER setting can be cancelled with the ON/OFF TIMER buttons.

To cancel the ON timer, press the "ON-TIMER" button.

To cancel the OFF timer, press the "OFF-TIMER" button.

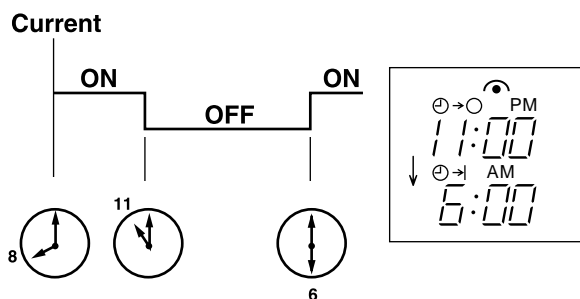
TIMER is cancelled and the display of set time disappears.

## PROGRAM TIMER

- The OFF timer and ON timer can be used in combination.
- "↑" and "↓" display shows the order of the OFF timer and ON timer operation.

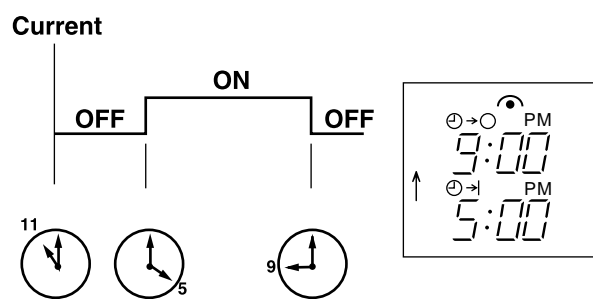
(Example 1) The current time is 8:00 PM.

The unit turns off at 11:00 PM, and on at 6:00 AM.



(Example 2) The current time is 11:00 AM.

The unit turns on at 5:00 PM, and off at 9:00 PM.



**NOTE** : TIMER setting will be cancelled by power failure or breaker functioning.

## 9-8. EMERGENCY-TEST OPERATION

In case of test run operation or emergency operation, use the EMERGENCY OPERATION switch on the front of the indoor unit. Emergency operation is available when the remote controller is missing, has failed or the batteries of remote controller run down. The unit will start and the OPERATION INDICATOR lamp will light.

The first 30 minutes of operation is the test run operation. This operation is for servicing. The indoor fan speed runs at High speed and the system is in continuous operation. (The thermostat is ON.)

After 30 minutes of test run operation the system shifts to EMERGENCY COOL / HEAT MODE with a set temperature of 24°C.

The fan speed shifts to Med. speed.

The coil frost prevention works even in emergency operation, and defrosting too.

In the test run or emergency operation, the horizontal vane operates in VANE AUTO ( @ ) mode.

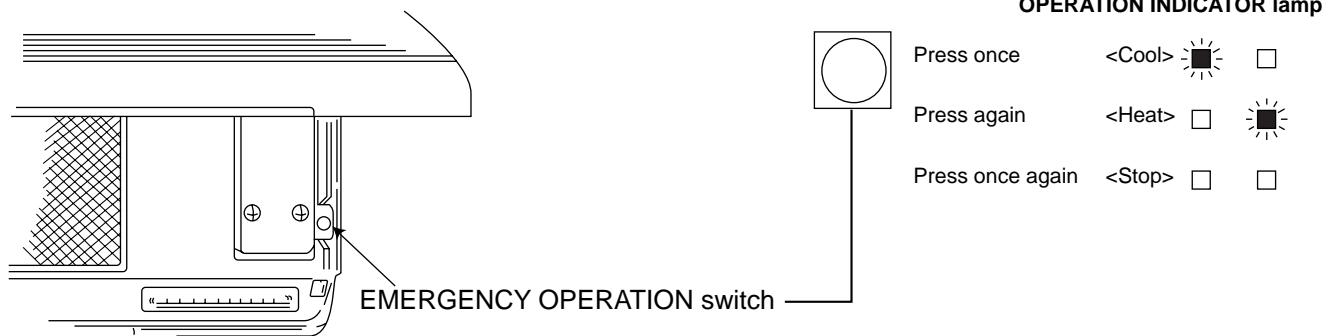
Emergency operation continues until the EMERGENCY OPERATION switch is pressed once or twice or the unit receives any signal from the remote controller. In case of latter normal operation will start.

**NOTE :** Do not press the EMERGENCY OPERATION switch during normal operation.

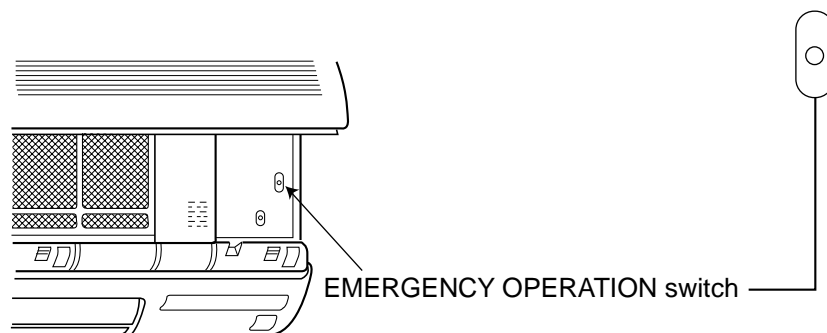
**MSH-18RV** -[E1]

**MSH-24RV** -[E1]

- The following indication does not depend on the shape of lamp.



**MSH-30RV** -[E1]





### 9-9. LEV control <MSH-30RV only>

LEV (Expansion valve) is controlled by "Thermostat ON" commands given from the unit.

Basic specification	Controlled range	Minimum : 54 pulse, Maximum : 500 pulse
	Drive speed	30 ~ 90 pulse / second
	Opening set	The setting is always in opening direction. (When closing LEV, open the LEV to adjust to set opening after closing the LEV at once.)
General operation	Stop of indoor unit	Opening in stop : 150 pulse → LEV opening is set to becomes 500 pulse after 3 minutes passed.
	Remote controller ON	LEV positioning (LEV is closed completely at once)
	Power ON (Breaker ON)	LEV is positioned. However, afterwards, LEV is not positioned at the first remote controller ON.
	Approximate for 2 minutes since compressor has started.	Opening is set by the initial opening. (Initial opening is set according to each operation modes and outer temperature conditions.)
	From approximate 2 minutes to approximate 13 minutes (for 11 minutes) since compressor has started.	Opening is set by standard opening. (Standard opening is set according to each operation modes and outer temperature conditions.)
	After 13 minutes passed since compressor has started.	LEV opening is corrected to be once every 2 minutes so that discharge temperature becomes the target discharge temperature. (When the discharge temperature is lower than target one : LEV is corrected in closed direction, when the discharge temperature is higher than target one : LEV is corrected in opening direction.)
	At thermostat OFF	Opening in stop : 150 pulse → LEV is set to the initial opening after about 3 minutes passed.
	At thermostat ON	Same as the starting of compressor operation
At remote controller OFF	Opening in stop : 150 pulse → LEV is set so that the opening is opened completely at the speed of 4 pulse every 5 seconds in opening after about 3 minutes passed.	

#### (1) LEV opening correction by discharge temperature

The LEV opening is corrected according to the temperature difference between target discharge temperature (Tb) and actual discharge temperature (Ta).

① The LEV correction is used properly for two kinds according to the LEV opening status at operation off.

Rank	Opening immediately before having stopped last time	
	100 pulse or less	100 pulse or more
Ta (°C)	Cooling / Heating	Cooling / Heating
more than Tb+10	5	20
Tb+5 to Tb+10	2	10
Tb+2 to Tb+5	1	2
Tb-2 to Tb+2	0	0
Tb-5 to Tb-2	-1	-2
Tb-10 to Tb-5	-2	-5
less than Tb-10	-5	-10

**NOTE** : Discharge temperature : Ta, Target discharge temperature : Tb

- ② When the temperature difference  $\Delta RT$  between indoor coil thermistor (main) RT12 and indoor coil thermistor (sub) RT13 in the indoor unit is 2°C or more for a fixed time at cool or dry operation, the target discharge temperature is changed. After the temperature is changed, when temperature difference  $\Delta RT$  is 3°C or more, the target temperature is changed again. The LEV opening is controlled based on the changed target discharge temperature and the temperature difference  $\Delta RT$ .

Ta (°C)	$\Delta RT$		
	less than 2°C	2°C or more and less than 3°C	3°C or more
more than Tb+10	20	60	60
Tb+5 to Tb+10	10	20	20
Tb+2 to Tb+5	2	2	2
Tb-2 to Tb+2	0	0	0
Tb-5 to Tb-2	-2	-2	-2
Tb-10 to Tb-5	-5	-5	-5
less than Tb-10	-10	-10	-10

**NOTE** : Discharge temperature : Ta, Target discharge temperature : Tb

The target discharge temperature (Tb) is set according to the operation mode or the unit status as follows.

Operation mode	Tb (°C)
HEAT	93
COOL (Normal)	93
COOL ( $\Delta RT$ is less than 2°C, or $\Delta RT$ is 2°C or more and less than 3°C.)	75
COOL ( $\Delta RT$ is 3°C or more.)	65

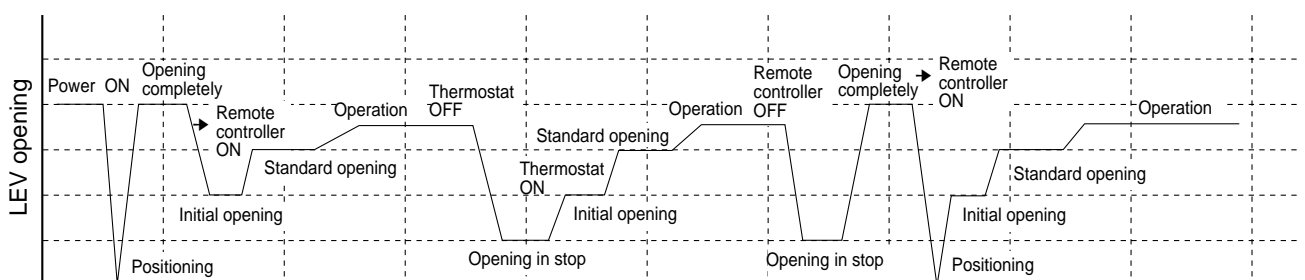
**NOTE** : Target discharge temperature : Tb

**NOTE** : When the discharge temperature (Ta) is 50°C or less on the cool operation, or is 49°C or less on heat operation, LEV opening is set in 54 pulse.

When this state continues for 20 minutes, the compressor is stopped and restarts in 3 minutes.

When the compressor is stopped, the indoor unit indicates the abnormality of refrigerant system and stops. (OPERATION INDICATOR lamp is 10-time flashing on and off.)

## (2) LEV time chart



**NOTE** : Opening increases and decreases to be in the target discharge temperature during operation.

**MSH-18RV -E1 MUH-18RV -E1**

**MSH-24RV -E1 MUH-24RV -E1**

**MSH-30RV -E1 MUH-30RV -E1**

### 10-1. COMPULSORY DEFROSTING MODE FOR SERVICE

By short circuit of the connector JP607 and R853(MSH-18RV)/ JPG1 and R871(MSH-24/30RV) on the outdoor deicer P.C. board, defrosting mode can be accomplished regardless of the defrost interval restriction. (Refer to page 69 or 70.)

Defrost thermistor RT61 must read below  $-3^{\circ}\text{C}$ .

### 10-2. CHANGE IN DEFROST SETTING

#### MUH-18RV

<JPC> When the JPC wire of the deicer P.C. board is cut, the defrost interval time will be changed.

<JPE> When the JPE wire of the deicer P.C. board is cut, the defrost temperature will be changed. (Refer to page 69.)

#### MUH-24/30RV

<JRF> When the JRF wire of the deicer P.C. board is cut, the defrost interval time will be changed.

<JRG> When the JRG wire of the deicer P.C. board is cut, the defrost temperature will be changed. (Refer to page 70.)

Model	Jumper wire	Change point
<b>MUH-18RV - E1</b>	JPC	Defrost interval time changes from 40 minutes to 15 minutes.
	JPE	Defrost start temperature changes from $-3^{\circ}\text{C}$ to $0^{\circ}\text{C}$ . Defrost finish temperature changes from $3^{\circ}\text{C}$ to $10^{\circ}\text{C}$ .

Model	Jumper wire	Change point
<b>MUH-24RV - E1</b>	JRF	Defrost interval time changes from 40 minutes to 15 minutes.
<b>MUH-30RV - E1</b>	JRG	Defrost start temperature does not change. ( $-3.0^{\circ}\text{C}$ ) Defrost finish temperature changes from $3^{\circ}\text{C}$ to $15^{\circ}\text{C}$ . (MSH-24RV) Defrost finish temperature changes from $13^{\circ}\text{C}$ to $15^{\circ}\text{C}$ . (NSH-30RV)

### 10-3. TIMER SHORT MODE

For service, set time can be shortened by short circuit of JPG and JPS the electronic control P.C. board.

The time will be shortened as follows.

Set time : 1 minute  $\rightarrow$  1-second

Set time : 3 minute  $\rightarrow$  3-second (It takes 3 minutes for the compressor to start operation. However, the starting time is shortened by short circuit of JPG and JPS.)

### 10-4. P.C. BOARD MODIFICATION FOR INDIVIDUAL OPERATION

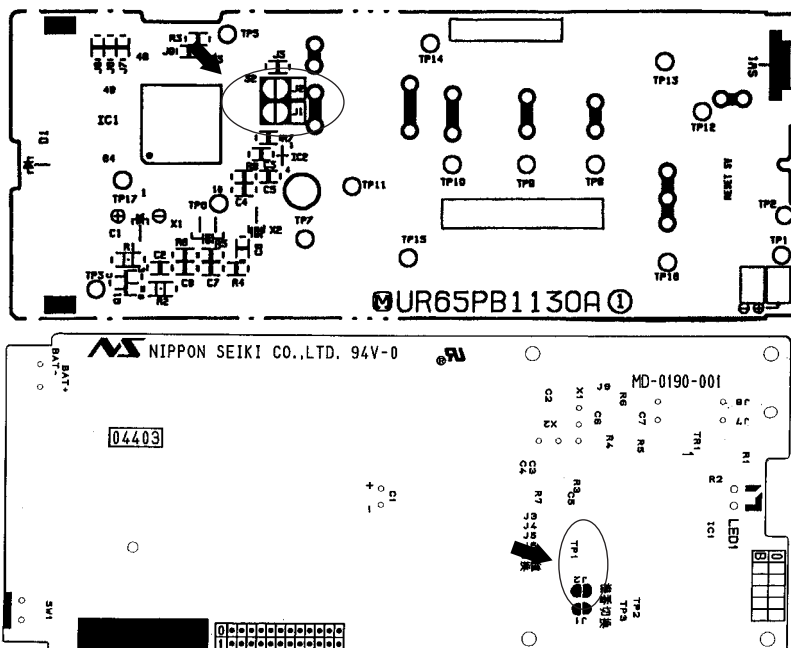
A maximum of 4 indoor units with wireless remote controllers can be used in a room.

In this case, to operate each indoor unit individually by each remote controller, P.C. boards of remote controller must be modified according to the number of the indoor unit.

#### How to modify the remote controller P.C. board

Remove batteries before modification.

The board has a print as shown below :



**NOTE :** For remodelling, take out the batteries and push the OPERATE/STOP(ON/OFF)button twice or 3 times at first. After finish remodelling, put back the batteries then push the RESET button.

The P.C. board has the print "J1" and "J2". Solder "J1" and "J2" according to the number of indoor unit as shown in Table 1. After modification, push the RESET button.

**Table 1**

	1 unit operation	2 units operation	3 units operation	4 units operation
No. 1 unit	No modification	Same as at left	Same as at left	Same as at left
No. 2 unit	–	Solder J1	Same as at left	Same as at left
No. 3 unit	–	–	Solder J2	Same as at left
No. 4 unit	–	–	–	Solder both J1 and J2

**NOTE :** At power supply failure or installation, indoor unit deletes the memory about remote controller. When the power supply is turned on and indoor unit receives the first signals from the remote controller, the remote controller number is designated as the indoor unit number. Therefore at and after the second time indoor unit accepts the remote controller of the initial setting number.

At setting - error, turn the power supply off to cancel the individual operation and then turn the power supply on to restart the setting.

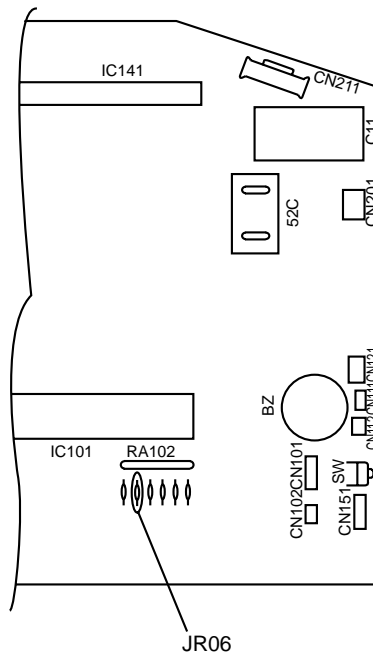
**10-5. AUTO RESTART FUNCTION**

When the indoor unit is controlled with the remote controller, the operation mode, set temperature, and the fan speed are memorized by the indoor electronic control P.C.board. The “AUTO RESTART FUNCTION” sets to work the moment power has restored after power failure. Then, the unit will restart automatically. However if the unit is 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 room temperature.

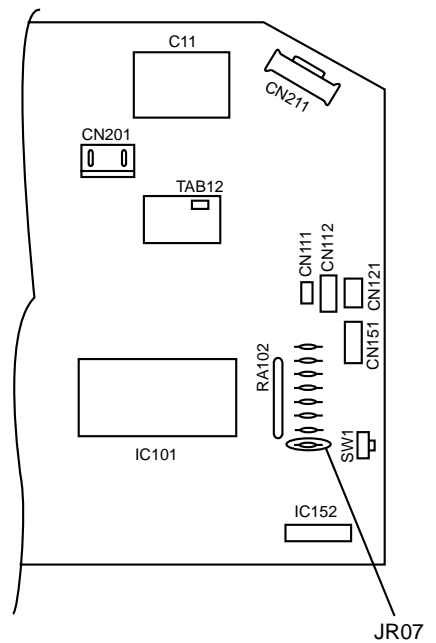
**How to set “AUTO RESTART FUNCTION”**

- ① Turn off the main power for the unit.
- ② Pull out the electronic control P.C. board and the display P.C. board. (Refer to page 71 or 73.)
- ③ Cut the RESISTOR JR06 (MSH-18/24RV) / JR07 (MSH-30RV) on the indoor electronic control P.C. board. (Refer to page 67 or 68.)

**MSH-18/24RV**



**MSH-30RV**



**Operation**

- ① If the main power (220-240V AC) has been cut, the operation settings remain.
- ② After the power is restored, the unit restarts automatically according to the memory. (However, it takes at least 3 minutes for the compressor to start running.)

**NOTE**

- The operation settings are memorized when 10 seconds have passed after the remote controller was operated with the remote controller.
- If main power is turned off or a power failure occurs while AUTO START/STOP timer is active, the timer setting is cancelled.
- If the unit has been off with the remote controller before power failure, the auto restart function does not work as the power button of the remote controller is off.
- To prevent breaker off due to the rush of starting current, systematize other home appliances not to turn on at the same time.
- When some air conditioners are connected to the same supply system, if they are operated before power failure, the starting current of all the compressors may flow simultaneously at restart. Therefore, the special counter-measures are required to prevent the main voltage-drop or the rush of the starting current by adding to the system that allows the units to start one by one.

**MSH-18RV** -E1      **MUH-18RV** -E1

**MSH-24RV** -E1      **MUH-24RV** -E1

**MSH-30RV** -E1      **MUH-30RV** -E1

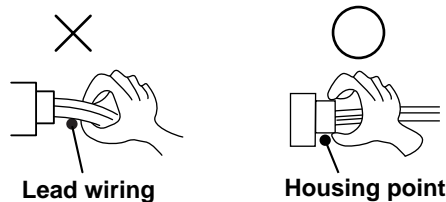
### 11-1. Cautions on troubleshooting

#### 1. Before troubleshooting, check the following:

- (1) Check the power supply voltage.
- (2) Check the indoor/outdoor connecting wire for mis-wiring.

#### 2. Take care the following during servicing.

- (1) Before servicing the air conditioner, be sure to first turn off the remote controller to stop the main unit, and then after confirming the horizontal vane is closed, turn off the breaker and / or disconnect the power plug.
- (2) Be sure to turn OFF the power supply before removing the front panel, the cabinet, the top panel, and the electronic control P.C. board.
- (3) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.
- (4) When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.



### 3. Troubleshooting procedure

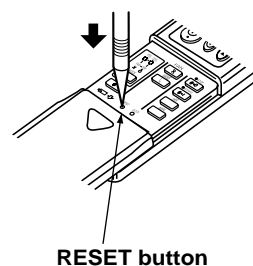
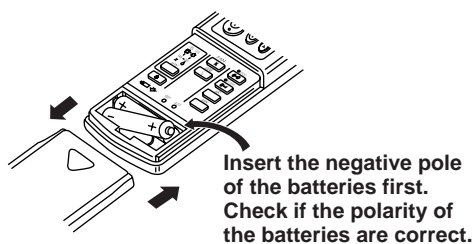
- (1) First, check if the OPERATION INDICATOR lamp on the indoor unit is flashing on and off to indicate an abnormality. To make sure, check how many times the abnormality indication is flashing on and off before starting service work.
- (2) Before servicing check that the connector and terminal are connected properly.
- (3) If the electronic control P.C. board is supposed to be defective, check the copper foil pattern for disconnection and the components for bursting and discoloration.
- (4) When troubleshooting, refer to the flow chart on page 53 or 54 and the check table on page 55 or 56.

### 4. How to replace batteries

Weak batteries may cause the remote controller malfunction.

In this case, replace the batteries to operate the remote controller normally.

- ① Remove the front lid and insert batteries. Then reattach the front lid.
- ② Press the RESET button with tip end of ball point pen or the like, and then use the remote controller.



**NOTE1.** : 1. If the RESET button is not pressed, the remote controller may not operate correctly.

2. In these illustrations remote controller of MSH-18/24RV-E1.

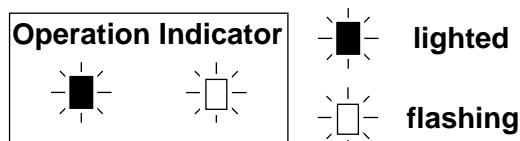
### **NOTE2.** : INFORMATION FOR MULTI SYSTEM AIR CONDITIONER

(OUTDOOR UNIT : MXZ-32NV-E1 MXZ-32NV-E2 MXZ-32RV-E1 MXZ-32SV-E1 )

Multi system air conditioner (Outdoor unit MXZ-32NV-E1 MXZ-32NV-E2 MXZ-32RV-E1 MXZ-32SV-E1) can connect two or more indoor units with one outdoor unit.

According to the capacity, two or more units can operate simultaneously.

- When you try to operate two or more indoor units with one outdoor unit simultaneously, one for the cooling and the other for heating, the operation mode of the indoor unit that operates earlier is selected. The other indoor units that will start the operation later cannot operate, indicating as shown in the figure below. In this case, please set all the indoor units to the same operation mode.

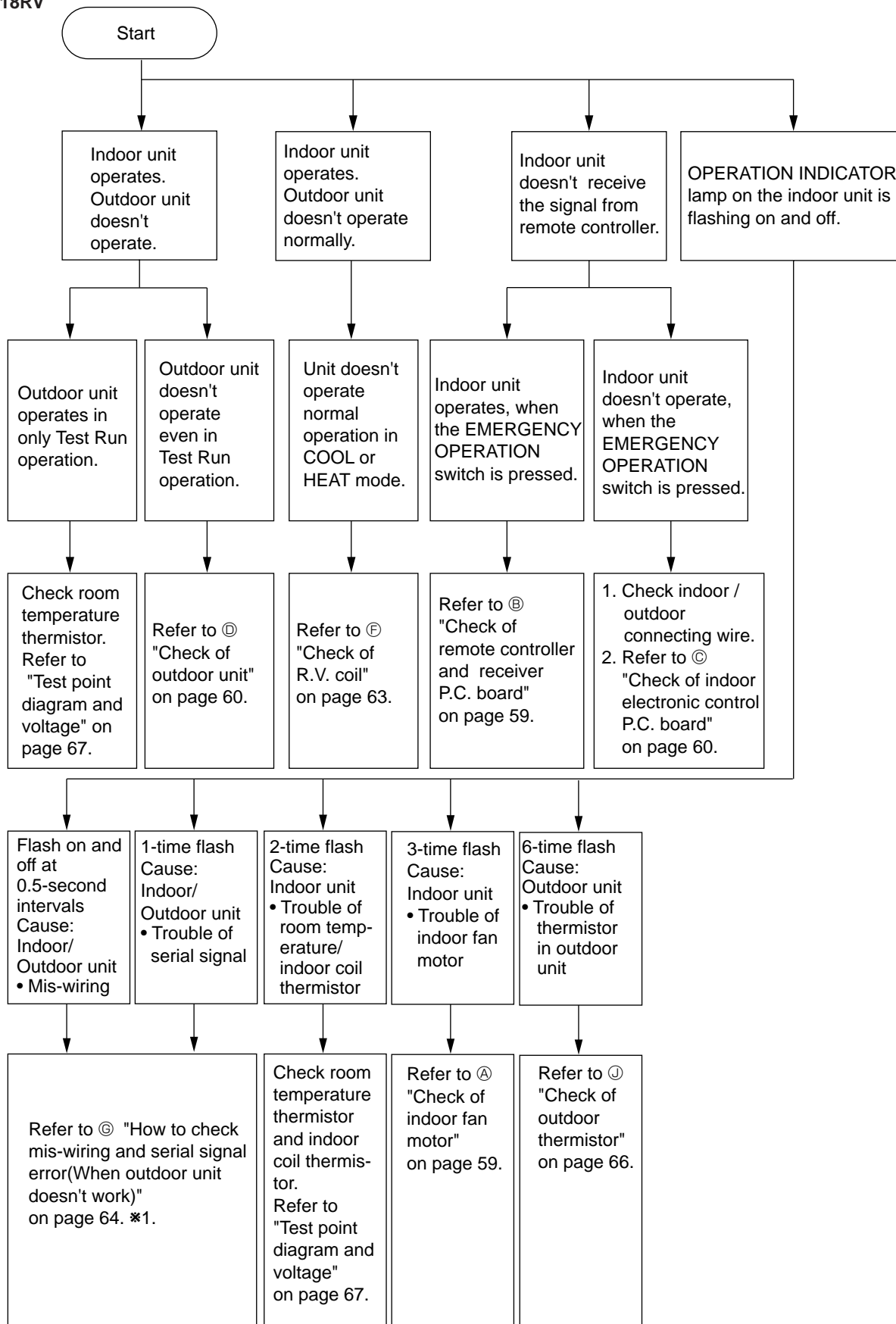


- When indoor units starts the operation while the defrosting of outdoor unit is being done, it takes a few minutes (max. 10 minutes) to blow out the warm air.

- In the heating operation, though indoor unit that does not operate may get warm or the sound of refrigerant flowing may be heard, they are not malfunction. The reason is that the refrigerant continuously flows into it.

## 11-2. Instruction of troubleshooting

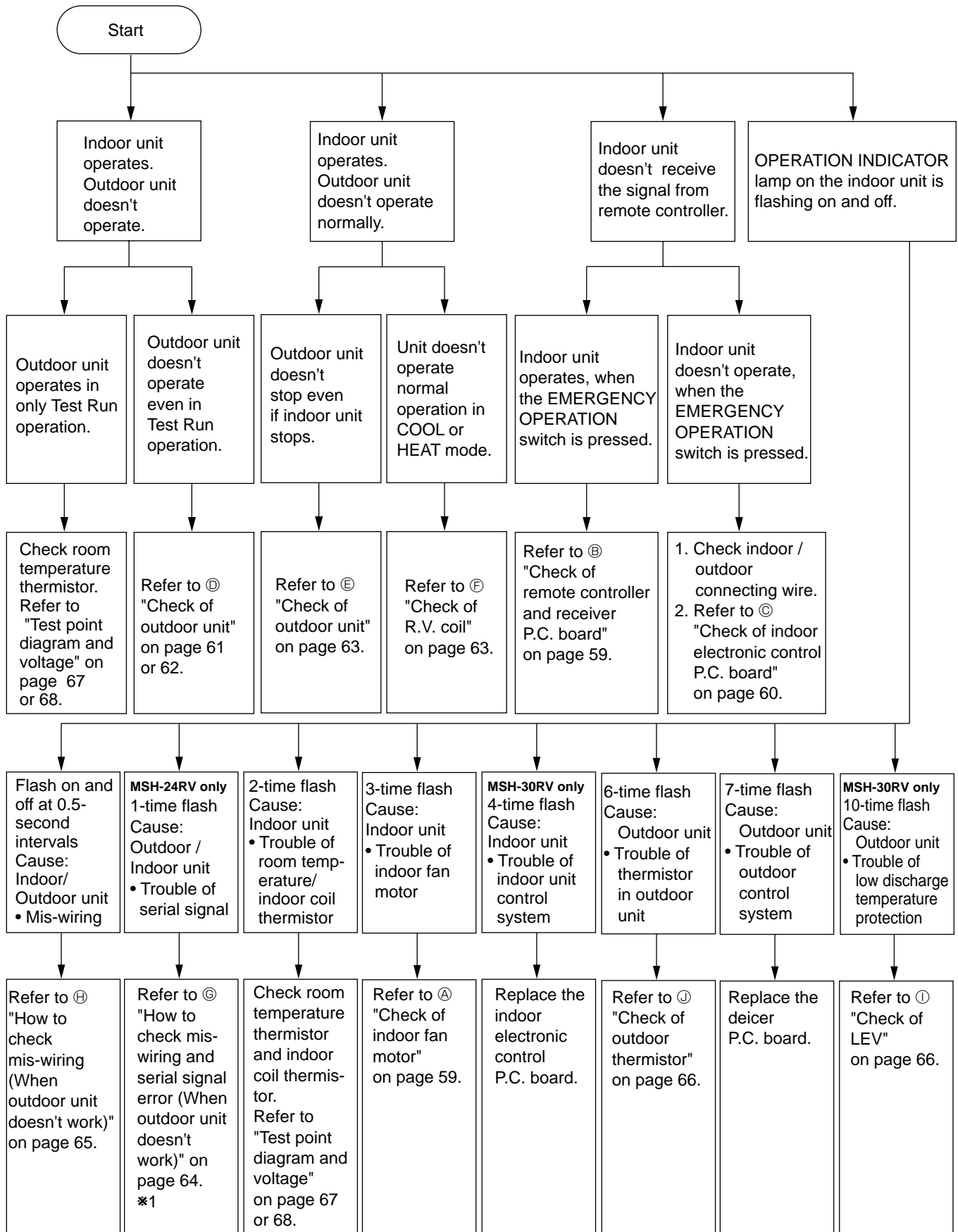
### MSH-18RV



\*1.<The case of the trouble of the serial signal>

When the power is turned off and then turned on again, the indication shows "the trouble of mis-wiring".

MSH-24/30RV



\*1.<The case of the trouble of the serial signal>

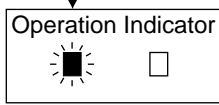
When the power is turned off and then turned on again, the indication shows "the trouble of mis-wiring".



# 1. Troubleshooting check table

## MSH-18RV






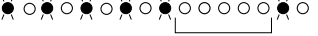


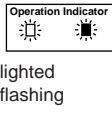

- The following indication does not depend on the shape of lamp.  
flashing



- Flashing of the OPERATION INDICATOR lamp (on the left-hand side) indicates possible abnormalities.
- The OPERATION INDICATOR lamp (on the left-hand side) is lighting during normal operation.

Before taking measures, make sure that the symptom reappears, for accurate troubleshooting.

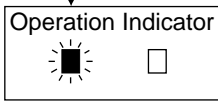
### Self check table

NO.	Abnormal point	Indication	Symptom	Detect method	Check point
1	Mis-wiring	0.5-second ON  0.5-second OFF	Outdoor unit does not run.	When serial signal stops for 4 to 5 seconds after 1st on of 52C relay by POWER turning on.	<ul style="list-style-type: none"> <li>● Check wiring (visual check and conductivity check).</li> <li>● Check indoor electronic control P.C.board.</li> <li>● Check outdoor DEICER P.C. board.</li> <li>● Check electrical parts.</li> </ul>
	Serial signal	1-time flash  2.5-second OFF		When serial signal from outdoor unit stops for 4 to 5 seconds.	
2	Indoor coil thermistor	2-time flash  2.5-second OFF	Outdoor unit does not run.	Detect Indoor coil/room temperature thermistor short or open circuit every 8 seconds during operation.	<ul style="list-style-type: none"> <li>● Check resistance of thermistor.</li> <li>● Re-connect connector.</li> <li>● Check indoor electronic control P.C.board.</li> </ul>
	Room temperature thermistor				
3	Indoor fan motor	3-time flash  2.5-second OFF	Indoor fan motor repeats 12 seconds ON and 3 minutes OFF. When the indoor fan breaks, the fan motor keeps stopping.	When rotational frequency feedback signal is not emitted during 12-second indoor fan operation.	<ul style="list-style-type: none"> <li>● Disconnect connector CN211 and then check connector CN121②-③ to make sure rotational frequency feedback signal of 1.5V or over exists.</li> <li>● Check indoor electronic control P.C. board.</li> <li>● Check indoor fan motor.</li> <li>● Re-connect connector.</li> </ul>
4	Defrost thermistor	6-time flash  2.5-second OFF	Outdoor unit does not run	When the defrost thermistor shorts or opens after the compressor start-up.	<ul style="list-style-type: none"> <li>● Check outdoor DEICER P.C. board.</li> <li>● Check resistance of thermistor.</li> <li>● Re-connect connector.</li> </ul>
5	Outdoor power system	5-time flash  2.5-second OFF	Outdoor unit does not run	When the compressor operation is continuously three times interrupted by over current protection within 1 minute after start-up, it stops operation.	<ul style="list-style-type: none"> <li>● Check the inverter output.</li> <li>● Check the compressor.</li> </ul>
6	Outdoor control P.C. board	7-time flash  2.5-second OFF	Outdoor unit does not run	When it cannot properly read data in the nonvolatile memory of the outdoor control P.C.board.	<ul style="list-style-type: none"> <li>● Check the outdoor control P.C.board.</li> </ul>
7	Outdoor refrigerant system error MXZ-32NV MXZ-32RV only	10-time flash  2.5-second OFF	Outdoor unit does not run	When the compressor operation has been interrupted by LEV protection continuously 5 minutes, the compressor stops operation.	<ul style="list-style-type: none"> <li>● Amount of gas.</li> <li>● Check the outdoor control P.C. board.</li> <li>● Contact of LEV board connectors.</li> </ul>
8	Outdoor control P.C. board	 lighted flashing  2.5-second OFF	Outdoor unit runs but the indoor unit does not run.	When the operation mode of each indoor unit is differently set to COOL (includes DRY) and HEAT at same time, the operation mode of indoor unit that has operated at first has the priority.	<ul style="list-style-type: none"> <li>● Unify the operation mode.</li> </ul>

\*The indication is shown only when the indoor unit connects with the outdoor unit MXZ-32NV-**E1**, **E2**, MXZ-32RV-**E1** and MXZ-32SV-**E1**

**MSH-24/30RV**

- The following indication does not depend on the shape of lamp.  
flashing



- Flashing of the OPERATION INDICATOR lamp (on the left-hand side) indicates possible abnormalities.
- The OPERATION INDICATOR lamp (on the left-hand side) is lighting during normal operation.

Before taking measures, make sure that the symptom reappears, for accurate troubleshooting.  
Self check table

No.	Abnormal point	Operation indicator lamp	Symptom	Detection method	Checkpoint
1	Mis-Wiring	0.5-second ON  0.5-second OFF	Outdoor unit does not operate.	3 minutes after power supply turns ON, when serial signal is not received.	• Refer to ㊦ "How to check mis-wiring " on page 65.
	Serial signal <b>MSH-24RV only</b>	1-time flash  2.5-second OFF		When serial signal from outdoor unit stops for 4 to 5 seconds.	• Refer to ㊦ "How to check mis-wiring and serial signal error" on page 64.
2	Indoor coil thermistor	2-time flash  2.5-second OFF	Outdoor unit does not operate.	Detect Indoor coil/room temperature thermistor short or open circuit every 8 seconds during operation.	• Refer to the characteristics of main indoor coil thermistor, sub indoor coil thermistor, and room temperature thermistor on page 67 or 68.
	Room temperature thermistor				
3	Indoor fan motor	3-time flash  2.5-second OFF	Indoor fan repeats 12 seconds ON and 3 minutes OFF. When the indoor fan breaks, the fan keeps stopping.	When rotational frequency feedback signal is not emitting during 12-second indoor fan operation.	• Refer to ㊦ "Check of indoor fan motor" on page 59.
4	Indoor control system <b>MSH-30RV only</b>	4-time flash  2.5-second OFF	Outdoor unit does not operate.	When it cannot properly read data in the nonvolatile memory of the indoor electronic control P.C. board.	• Replace the indoor electronic control P.C. board.
5	Outdoor thermistor	6-time flash  2.5-second OFF	Outdoor unit does not operate.	<Thermistor short> Thermistors are abnormal when they short after compressor start-up. <Thermistor open> Thermistors are abnormal when they open after compressor start-up. However, discharge temperature thermistor is abnormal when open circuit is detected more than 10 minutes after compressor start-up.	• Shortage of refrigerant • Replace the deicer P.C. board. Refer to ㊦ "Check of outdoor thermistor" on page 66.
6	Outdoor control system	7-time flash  2.5-second OFF	Outdoor unit does not operate.	When it cannot properly read data in the nonvolatile memory of the deicer P.C. board, outdoor unit stops [and restarts 3 minutes later( <b>MSH-24RV only</b> ).]	• Replace the deicer P.C. board.
7	Low discharge temperature protection <b>MSH-30RV only</b>	10-time flash  2.5-second OFF	Outdoor unit does not operate.	When discharge temperature has been 50°C or less on cool operation, or has been 49°C or less on heat operation for 20 minutes.	• Refer to ㊦ "Check of LEV" on page 66. • Check refrigerant circuit and refrigerant amount.

**NOTE :** When the indoor unit has started operation and the above detection method has detected an abnormality (the first detection after the power ON), the indoor electronic control P.C. board turns OFF the indoor fan motor with the OPERATION INDICATOR lamp flashing.

2. Trouble criterion of main parts

**MSH-18RV** -[E1]      **MUH-18RV** -[E1]  
**MSH-24RV** -[E1]      **MUH-24RV** -[E1]

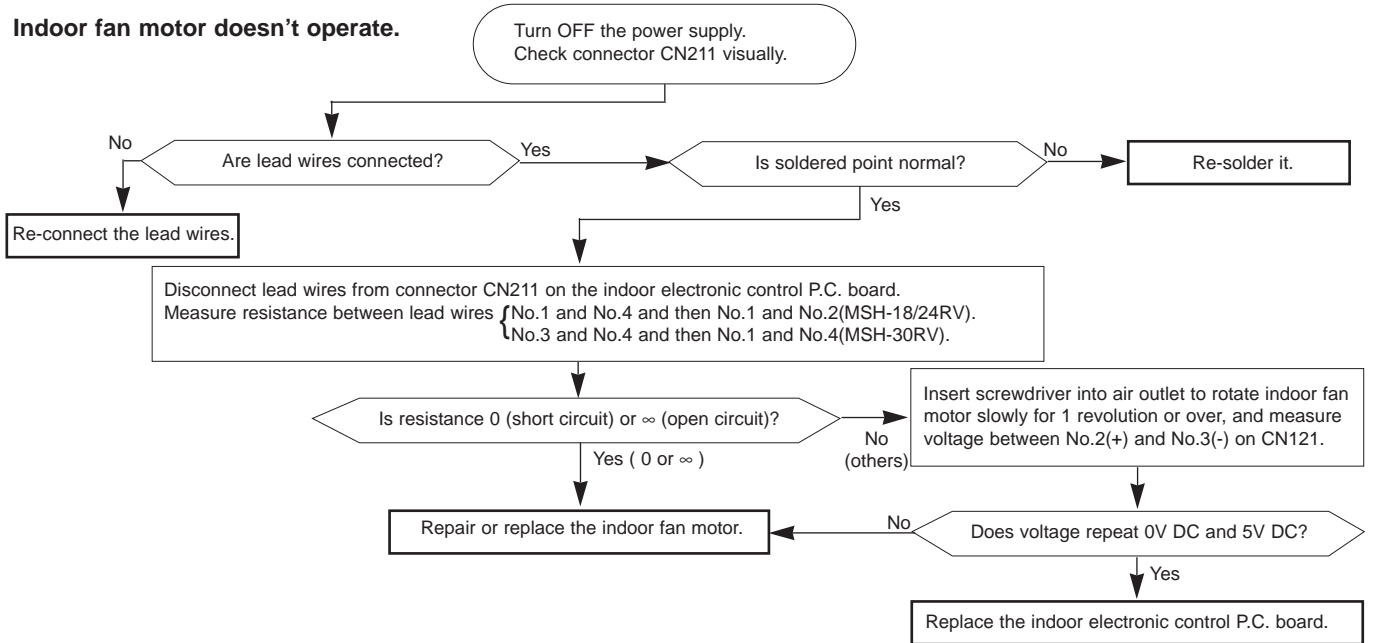
Part name	Check method and criterion		Figure																			
Room temperature thermistor (RT11) Indoor coil thermistor (RT12)	Measure the resistance with a tester. (Part temperature 10°C ~ 30°C) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Normal</td> <td>Abnormal</td> </tr> <tr> <td>8kΩ ~ 20kΩ</td> <td>Open or short-circuit</td> </tr> </table>		Normal	Abnormal	8kΩ ~ 20kΩ	Open or short-circuit																
Normal	Abnormal																					
8kΩ ~ 20kΩ	Open or short-circuit																					
Defrost thermistor (RT61)	Measure the resistance with a tester. (Part temperature -10°C ~ 40°C) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Normal</td> <td>Abnormal</td> </tr> <tr> <td>5kΩ ~ 60kΩ</td> <td>Open or short-circuit</td> </tr> </table>		Normal	Abnormal	5kΩ ~ 60kΩ	Open or short-circuit																
Normal	Abnormal																					
5kΩ ~ 60kΩ	Open or short-circuit																					
Ambient temperature thermistor (RT63) <b>MSH-24RV only</b>	Measure the resistance with a tester. (Part temperature -10°C ~ 40°C) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Normal</td> <td>Abnormal</td> </tr> <tr> <td>5kΩ ~ 60kΩ</td> <td>Open or short-circuit</td> </tr> </table>		Normal	Abnormal	5kΩ ~ 60kΩ	Open or short-circuit																
Normal	Abnormal																					
5kΩ ~ 60kΩ	Open or short-circuit																					
Compressor (MC)	Measure the resistance between the terminals with a tester. (Part temperature -10°C ~ 40°C) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td colspan="2">Normal</td> <td rowspan="2">Abnormal</td> </tr> <tr> <td></td> <td>MSH-18RV</td> <td>MSH-24RV</td> </tr> <tr> <td>C-R</td> <td>0.90Ω ~ 1.12Ω</td> <td>0.84Ω ~ 1.04Ω</td> <td rowspan="2">Open or short-circuit</td> </tr> <tr> <td>C-S</td> <td>1.79Ω ~ 2.21Ω</td> <td>1.82Ω ~ 2.24Ω</td> </tr> </table>			Normal		Abnormal		MSH-18RV	MSH-24RV	C-R	0.90Ω ~ 1.12Ω	0.84Ω ~ 1.04Ω	Open or short-circuit	C-S	1.79Ω ~ 2.21Ω	1.82Ω ~ 2.24Ω						
	Normal		Abnormal																			
	MSH-18RV	MSH-24RV																				
C-R	0.90Ω ~ 1.12Ω	0.84Ω ~ 1.04Ω	Open or short-circuit																			
C-S	1.79Ω ~ 2.21Ω	1.82Ω ~ 2.24Ω																				
Indoor fan motor (MF)	Motor part	Measure the resistance between the terminals with a tester. (Part temperature 10°C ~ 30°C) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td colspan="2">Normal</td> <td rowspan="2">Abnormal</td> </tr> <tr> <td>WHT-BLK</td> <td colspan="2">176Ω ~ 192Ω</td> </tr> <tr> <td>BLK-RED</td> <td colspan="2">240Ω ~ 261Ω</td> <td rowspan="2">Open or short-circuit</td> </tr> </table>			Normal		Abnormal	WHT-BLK	176Ω ~ 192Ω		BLK-RED	240Ω ~ 261Ω		Open or short-circuit								
		Normal		Abnormal																		
WHT-BLK	176Ω ~ 192Ω																					
BLK-RED	240Ω ~ 261Ω		Open or short-circuit																			
Sensor part	Measure the voltage Power ON. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>Normal</td> <td rowspan="2">Abnormal</td> </tr> <tr> <td>BRN-YLW</td> <td>4.5 ~ 5.5V</td> </tr> <tr> <td>YLW-GRY</td> <td>(When fan revolved one time) 0V → 5V → 0V (Approx.)</td> <td rowspan="2">Remain 0V or 5V</td> </tr> </table>				Normal	Abnormal	BRN-YLW	4.5 ~ 5.5V	YLW-GRY	(When fan revolved one time) 0V → 5V → 0V (Approx.)	Remain 0V or 5V											
	Normal	Abnormal																				
BRN-YLW	4.5 ~ 5.5V																					
YLW-GRY	(When fan revolved one time) 0V → 5V → 0V (Approx.)	Remain 0V or 5V																				
Outdoor fan motor (MF)	Measure the resistance between the terminals with a tester. (Part temperature -10°C ~ 40°C) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td colspan="2">Normal</td> <td rowspan="5">Abnormal</td> </tr> <tr> <td></td> <td>MSH-18RV</td> <td>MSH-24RV</td> </tr> <tr> <td>WHT-BLK</td> <td>102Ω ~ 126Ω</td> <td>55Ω ~ 68Ω</td> </tr> <tr> <td>BLK-RED</td> <td>97Ω ~ 120Ω</td> <td>—</td> </tr> <tr> <td>BLK-YLW</td> <td>—</td> <td>26Ω ~ 33Ω</td> </tr> <tr> <td>YLW-RED</td> <td>—</td> <td>55Ω ~ 68Ω</td> </tr> </table>			Normal		Abnormal		MSH-18RV	MSH-24RV	WHT-BLK	102Ω ~ 126Ω	55Ω ~ 68Ω	BLK-RED	97Ω ~ 120Ω	—	BLK-YLW	—	26Ω ~ 33Ω	YLW-RED	—	55Ω ~ 68Ω	
	Normal		Abnormal																			
	MSH-18RV	MSH-24RV																				
WHT-BLK	102Ω ~ 126Ω	55Ω ~ 68Ω																				
BLK-RED	97Ω ~ 120Ω	—																				
BLK-YLW	—	26Ω ~ 33Ω																				
YLW-RED	—	55Ω ~ 68Ω																				
Vane motor (MV)	Measure the resistance between the terminals with a tester. (Part temperature 10°C ~ 30°C) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Normal</td> <td>Abnormal</td> </tr> <tr> <td>358 ~ 388Ω</td> <td>Open or short-circuit</td> </tr> </table>		Normal	Abnormal	358 ~ 388Ω	Open or short-circuit																
Normal	Abnormal																					
358 ~ 388Ω	Open or short-circuit																					

**MSH-30RV -[E1] MUH-30RV -[E1]**

Part name	Check method and criterion		Figure	
Room temperature thermistor(RT11)	Measure the resistance with a tester. (Part temperature 10°C ~ 30°C)			
Indoor coil thermistor (RT12(main), RT13(sub))	Normal 8 kΩ ~ 20 kΩ	Abnormal Open or short-circuit		
Defrost thermistor (RT61)	Measure the resistance with a tester. (Part temperature -10°C ~ 40°C)			
	Normal 5 kΩ ~ 60 kΩ	Abnormal Open or short-circuit		
Discharge temperature thermistor(RT62)	Measure the resistance with a tester. Before measurement, hold the thermistor with your hands to warm it up. (Part temperature 0°C ~ 40°C)			
	Normal 120 kΩ ~ 800kΩ	Abnormal Open or short-circuit		
Ambient temperature thermistor(RT63)	Measure the resistance with a tester. (Part temperature -10°C ~ 40°C)			
	Normal 5 kΩ ~ 60 kΩ	Abnormal Open or short-circuit		
Compressor(MC)	Measure the resistance between the terminals with a tester. (Part temperature -10°C ~ 40°C)			
	Terminal	Normal C - R: 0.58 Ω ~ 0.71 Ω C - S: 1.39 Ω ~ 1.70 Ω		Abnormal Open or short-circuit
Indoor fan motor(MF)	Motor part	Measure the resistance between the terminals with a tester. (Part temperature 10°C ~ 30°C)		
		Color of lead wire	Normal WHT - BLK: 133 Ω ~ 144 Ω BLK - RED: 153 Ω ~ 165 Ω	Abnormal Open or short-circuit
	Sensor part	Measure the voltage power ON.		
		Color of lead wire	Normal BRN - YLW: 4.5 ~ 5.5V YLW - GRY: (When fan revolved one time) 0V→5V→0V (Approx.)	Abnormal Remain 0V or 5V
Outdoor fan moter(MF)	Measure the resistance between the terminals with a tester. (Part temperature -10°C ~ 40°C)			
	Color of lead wire	Normal WHT - BLK: 55.4 Ω ~ 67.7 Ω BLK - YLW: 49.3 Ω ~ 60.3 Ω YLW - RED: 22.9 Ω ~ 28.0 Ω		Abnormal Open or short-circuit
Horizontal vane motor(MV1) Vertical vane motor(MV2)	Measure the resistance between the terminal with a tester. (Part temperature 10°C ~ 30°C)			
	Normal 282Ω ~ 306 Ω	Abnormal Open or short-circuit		
R.V. coil(21S4)	Measure the resistance between the terminals with a tester. (Part temperature -10°C ~ 40°C)			
	Normal 2.673 kΩ ~ 3.268 kΩ	Abnormal Open or short-circuit		
LEV(Expansion valve)	Measure the resistance with a tester. (Part temperature : -10°C ~ 40°C)			
	Color of lead wire	Normal WHT - RED: 30.3 Ω ~ 37.0 Ω RED - ORN YLW - BRN BRN - BLU		Abnormal Open or short-circuit

## Ⓐ Check of indoor fan motor

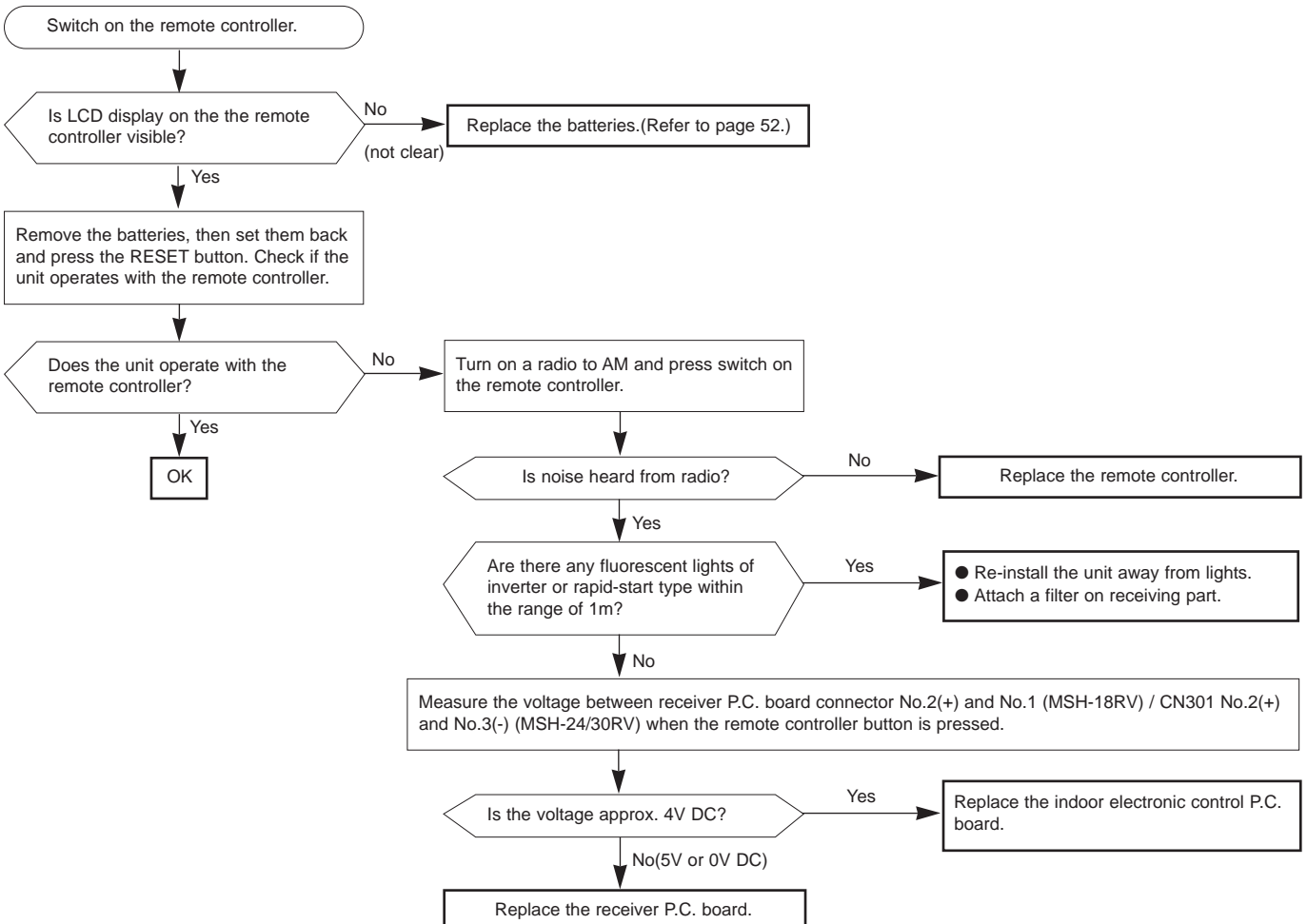
Indoor fan motor doesn't operate.



## Ⓑ Check of remote controller and receiver P.C. board

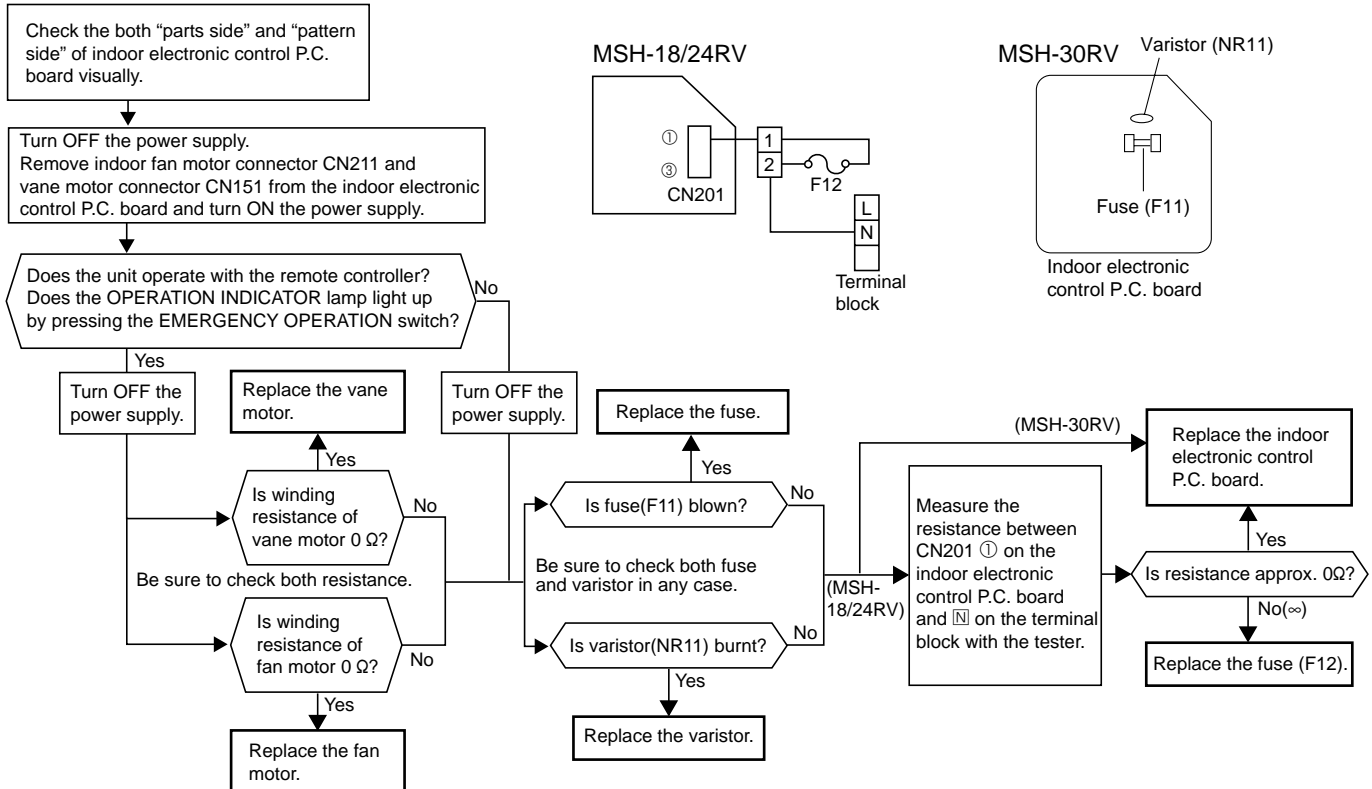
Indoor unit operates by pressing the EMERGENCY OPERATION switch, but doesn't operate with the remote controller.

\* Check if the remote controller is exclusive for this air conditioner.



## © Check of indoor electronic control P.C. board

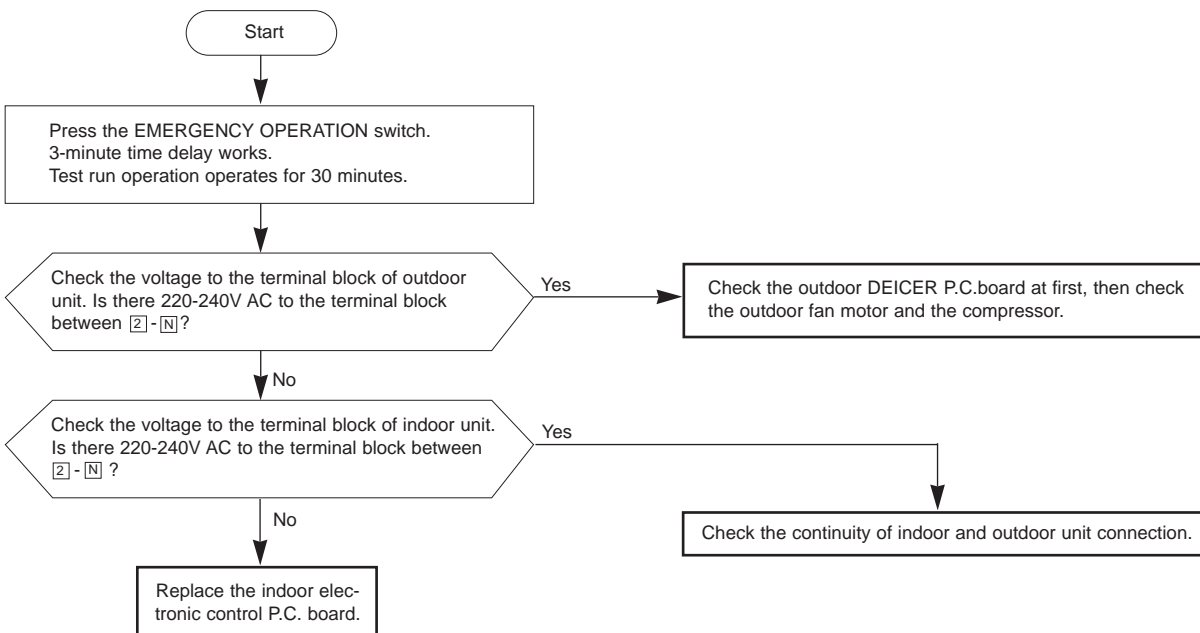
The unit doesn't operate with the remote controller. Also, the OPERATION INDICATOR lamp doesn't light up by pressing the EMERGENCY OPERATION switch.



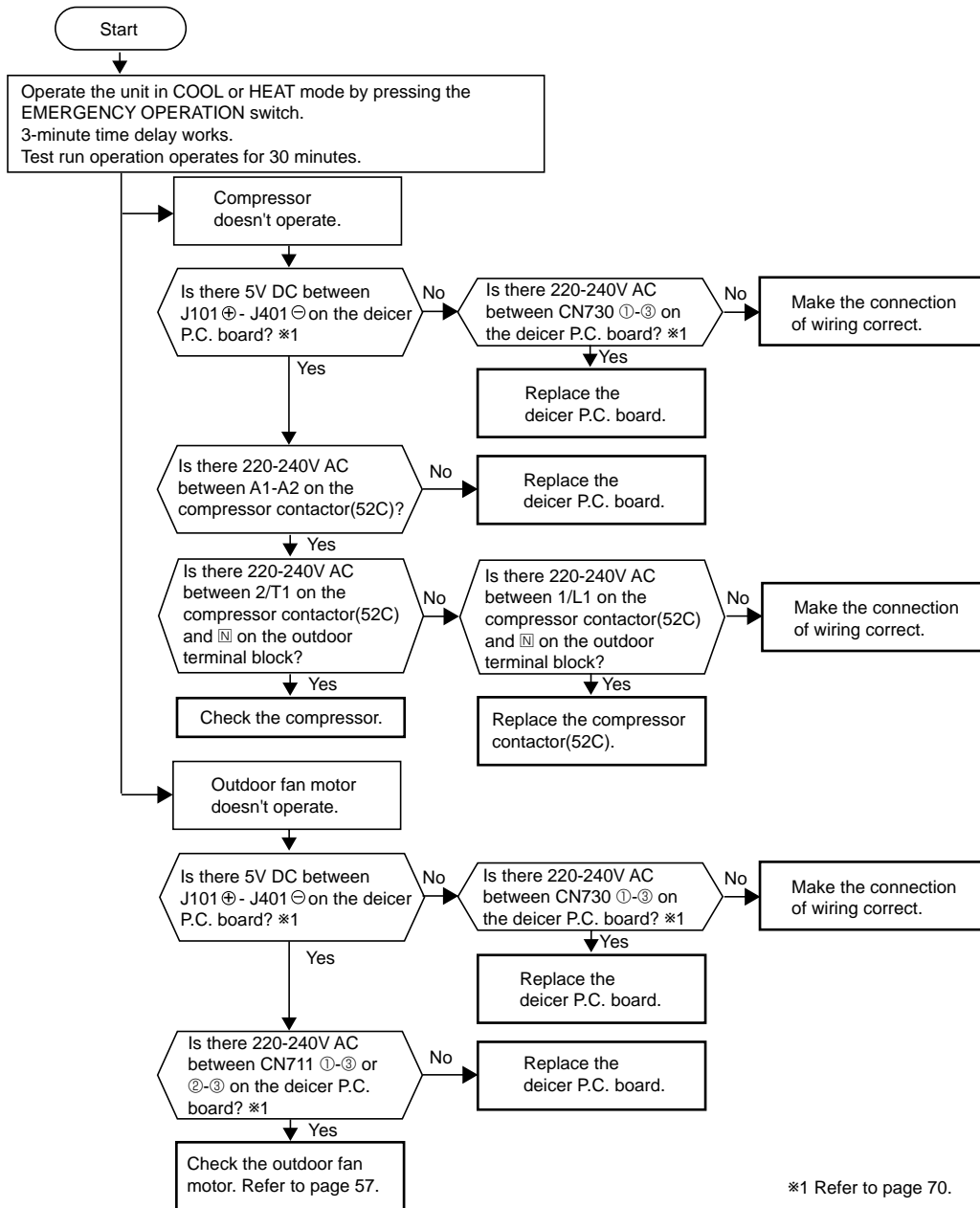
## ④ Check of outdoor unit

Compressor and or outdoor fan motor doesn't operate.

MSH-18RV

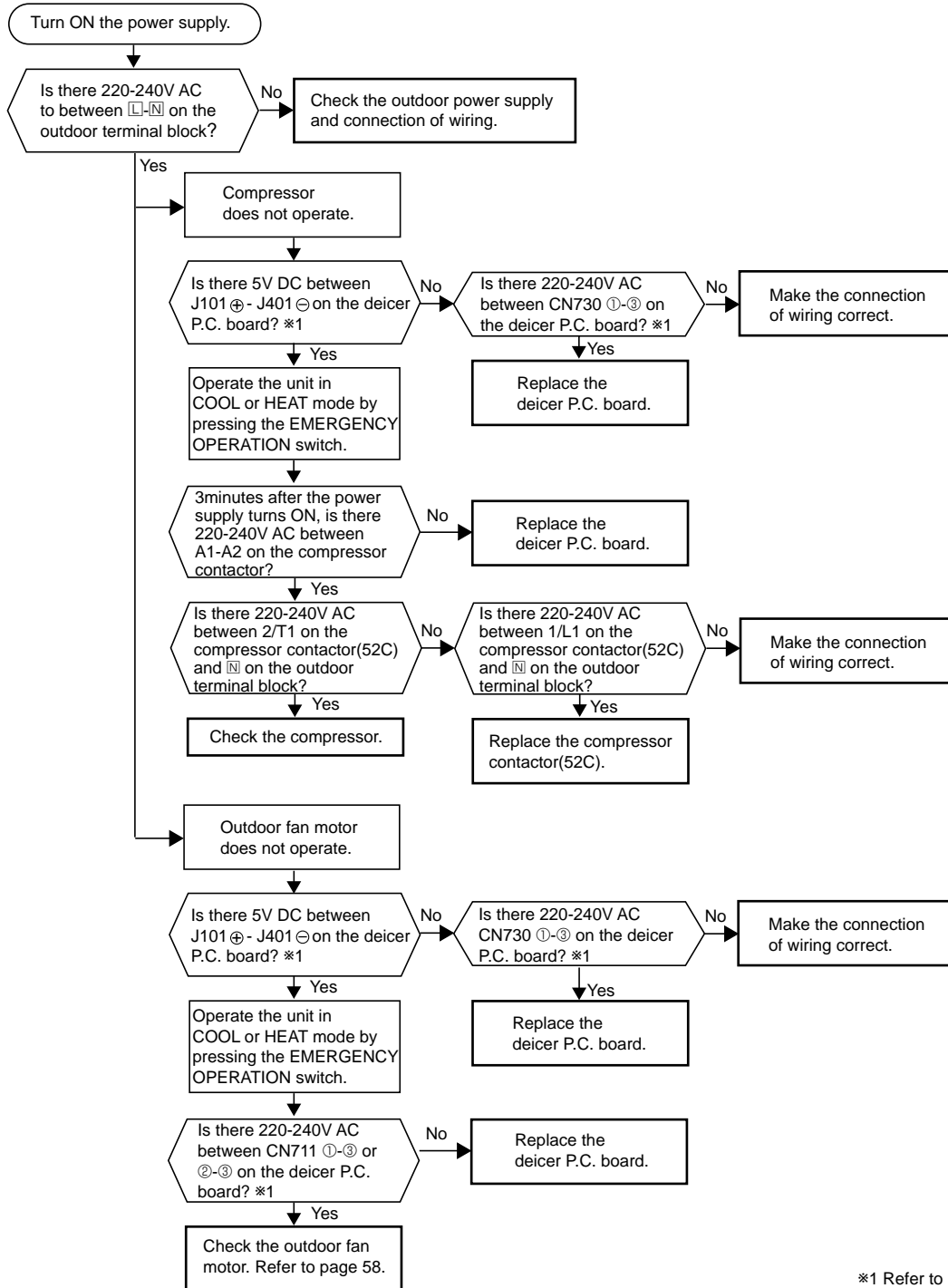


MSH-24RV





**MSH-30RV**



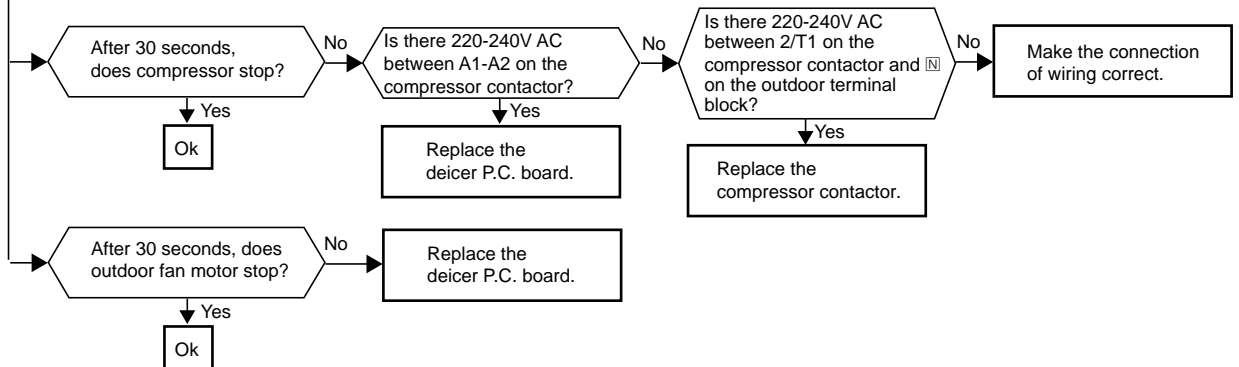
\*1 Refer to page 70.

## Ⓔ Check of outdoor unit

<MSH-24/30RV only>

**Compressor and / or outdoor fan motor doesn't stop.**

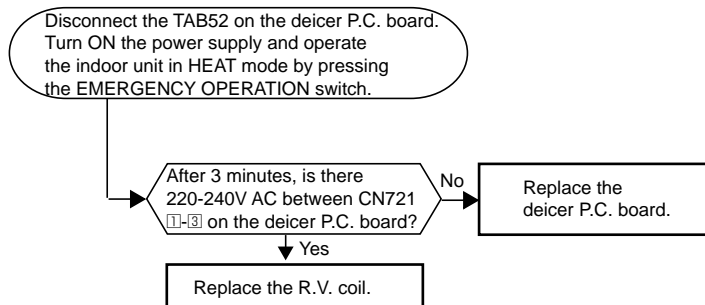
- ① Turn OFF the power supply.
- ② After 30 seconds, turn ON the power supply again.
- ③ Operate the unit in COOL or HEAT mode by pressing the EMERGENCY OPERATION switch.
- ④ Operate the unit for 1 minute or more and stop it by pressing the EMERGENCY OPERATION switch again.



## Ⓕ Check of R.V. coil

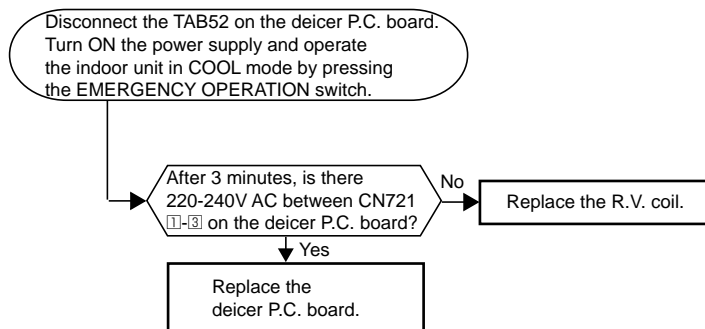
**Unit operates COOL mode even if it is set to HEAT mode.**

\* First, measure the resistance of R.V. coil to confirm it is disconnected or is not short-circuit.



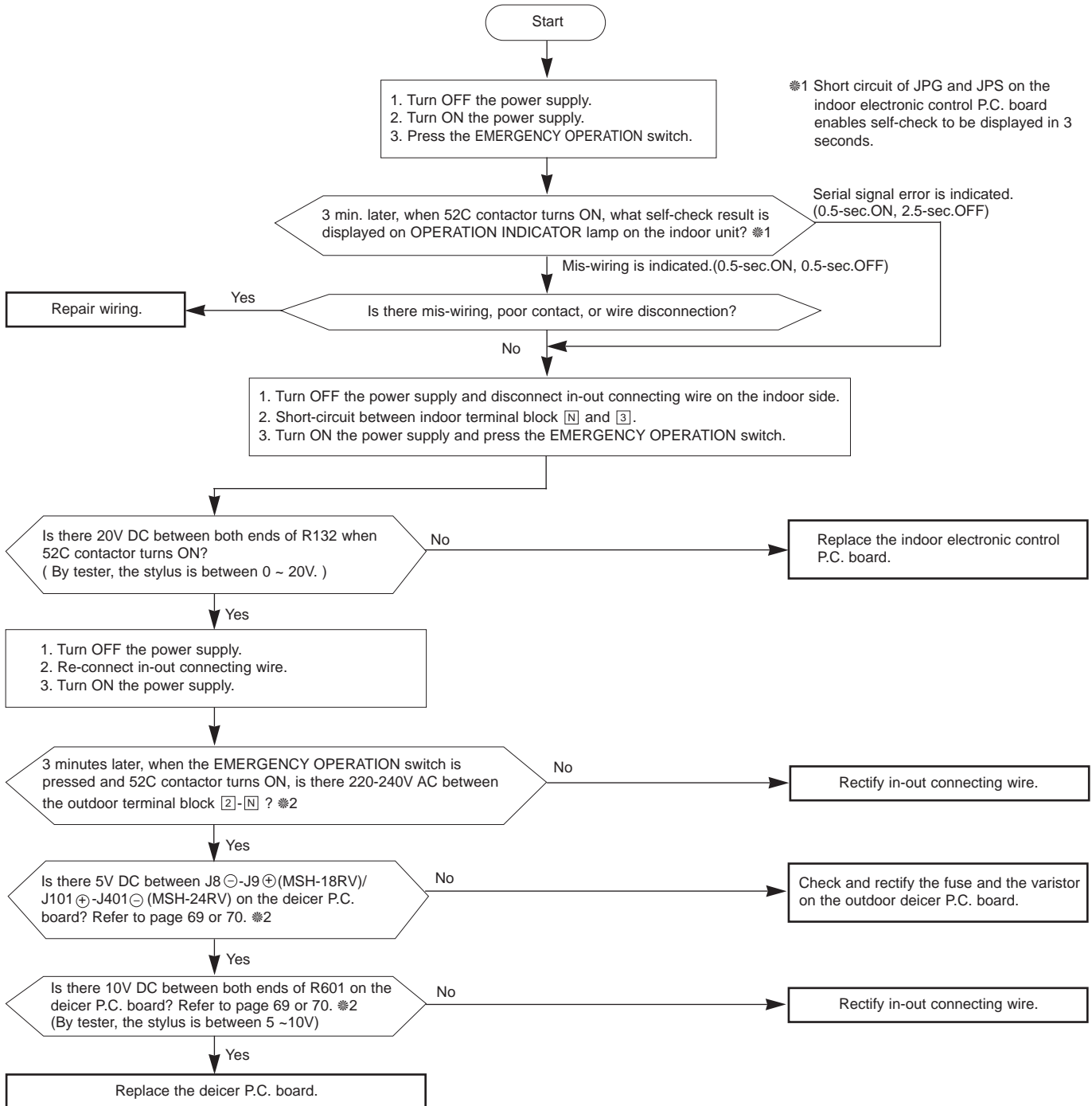
**Unit operates HEAT mode even if it is set to COOL mode.**

\* First, measure the resistance of R.V. coil to confirm it is disconnected or is not short-circuit.



## Ⓒ How to check mis-wiring and serial signal error <MSH-18/24RV only>

Outdoor unit doesn't operate.



\*1 Short circuit of JPG and JPS on the indoor electronic control P.C. board enables self-check to be displayed in 3 seconds.

Serial signal error is indicated. (0.5-sec.ON, 2.5-sec.OFF)

Mis-wiring is indicated. (0.5-sec.ON, 0.5-sec.OFF)

Replace the indoor electronic control P.C. board.

Rectify in-out connecting wire.

Check and rectify the fuse and the varistor on the outdoor deicer P.C. board.

Rectify in-out connecting wire.

Replace the deicer P.C. board.

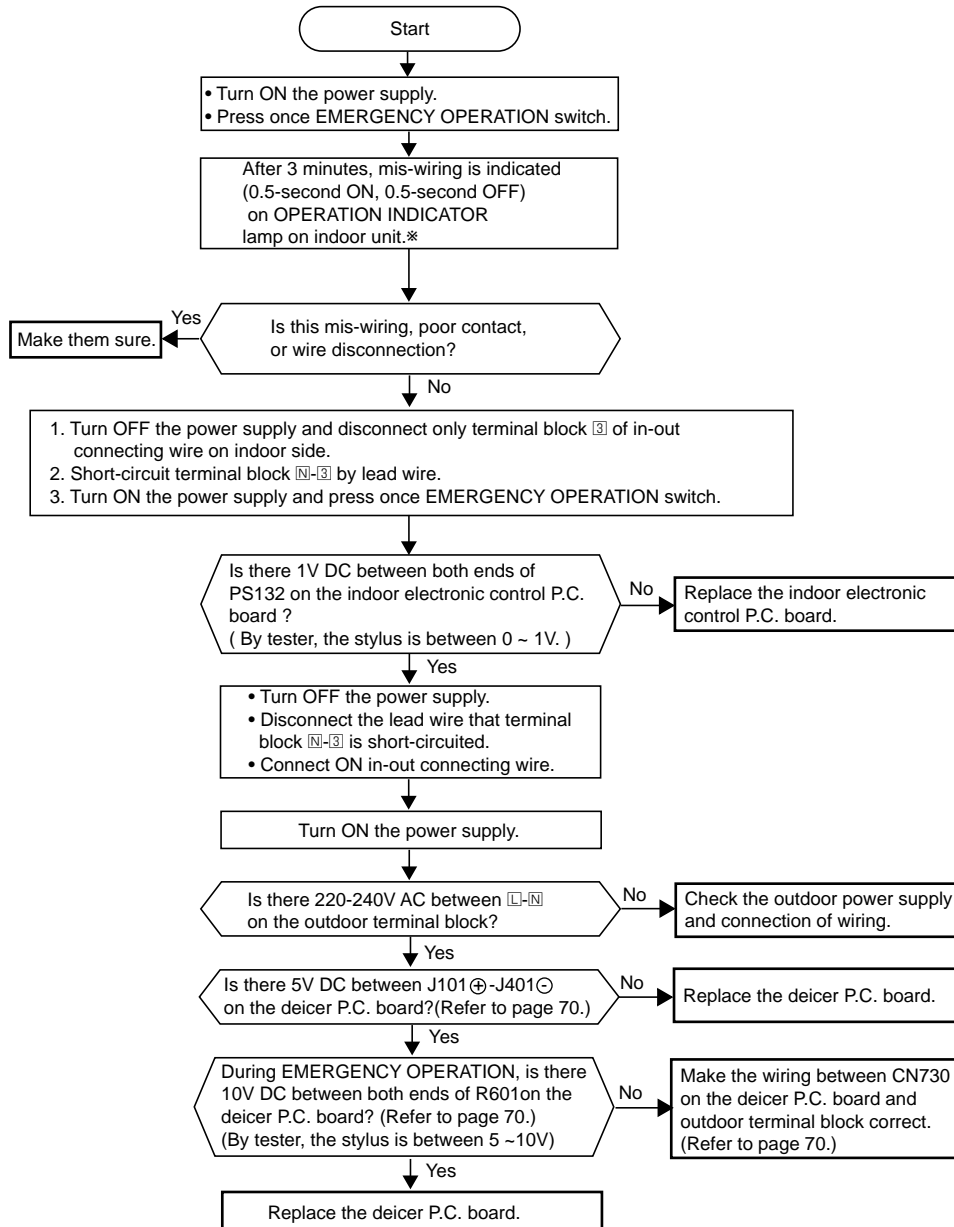
\*2 While the serial signal error is indicated, 52C contactor alternates ON for about 10 seconds and OFF for 3 minutes. Measure the voltage when 52C contactor is ON.

## Ⓜ How to check mis-wiring

<MSH-30RV only>

Outdoor unit doesn't operate.

\* Short circuit of JPG and JPS on the indoor electronic control P.C. board enables self-check to be displayed in 3 seconds.



## I Check of LEV (Expansion valve)

<MSH-30RV only>

Heating/ Cooling doesn't operate.

- ① During pressing OPERATION SELECT button on remote controller, press RESET button.
- ② First, release RESET button.  
(Confirm all displays of remote controller.)
- ③ Then release OPERATION SELECT button.

With remote controller set toward the indoor unit, press OPERATE/ STOP(ON/ OFF) button and confirm one beep tone.

LEV operates in full-opening direction.

Do you hear LEV "click, click....." ?  
Do you touch LEV and feel it vibrate?

Yes → Ok

No

Is LEV coil properly fixed to the body?

No

Properly fix LEV coil to the body.

Yes

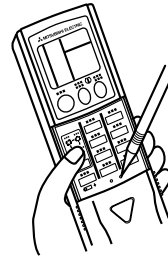
Does the resistance of LEV coil have the characteristics?

Yes

Replace the deicer P.C. board.

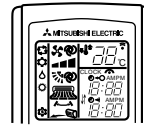
No

Replace the LEV coil.



- ① During pressing OPERATION SELECT button on remote controller, press RESET button.
- ② First, release RESET button.

- ③ Then release OPERATION SELECT button.



- (Confirm all displays of remote controller.)
- ③ Then release OPERATION SELECT button.

Characteristics of LEV coil

LEV (CN724)	Resistance
WHT-RED	30.3 Ω ~ 37.0 Ω
RED-ORN	
YLW-BRN	
BRN-BLU	

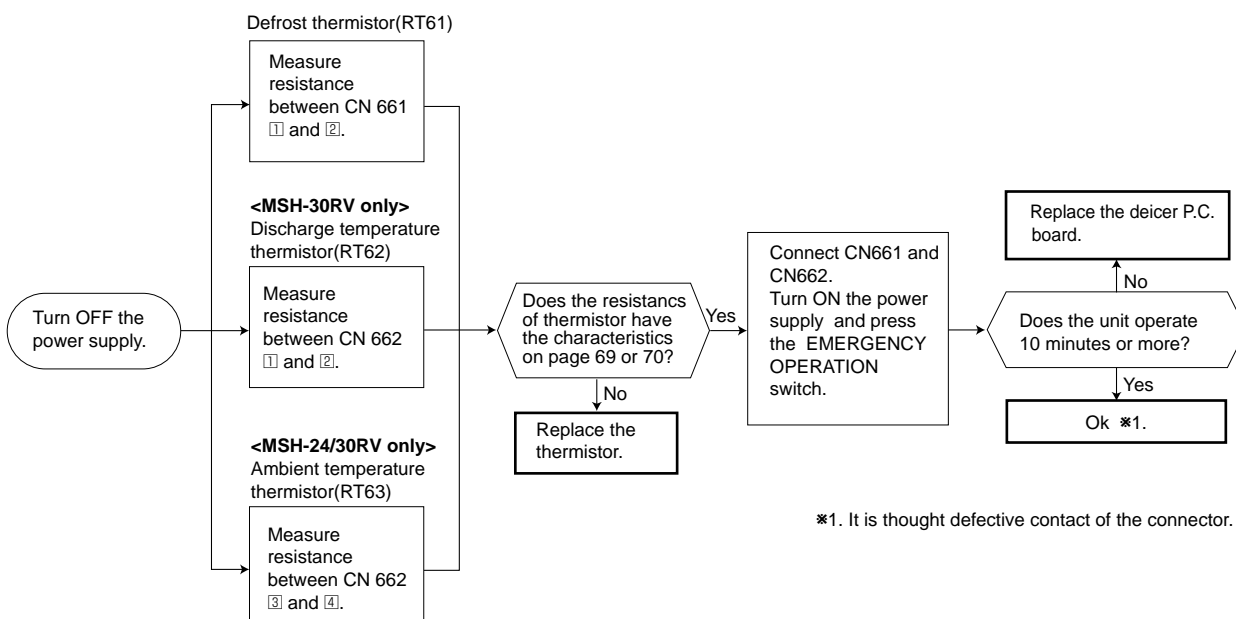
NOTE : After check of LEV, do the undermentioned operations.

1. Turn OFF the power supply of the unit and turn ON again.
2. Press the RESET button on the remote controller.

## J Check of outdoor thermistor

Thermistors in the outdoor unit are abnormal.

- \* Disconnect the connectors CN661 and/ or CN662 from the deicer P.C. board.  
(Check the characteristics of each thermistor.)

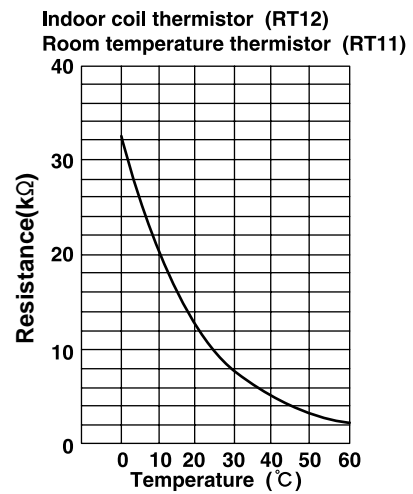
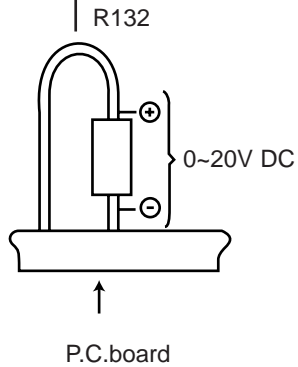
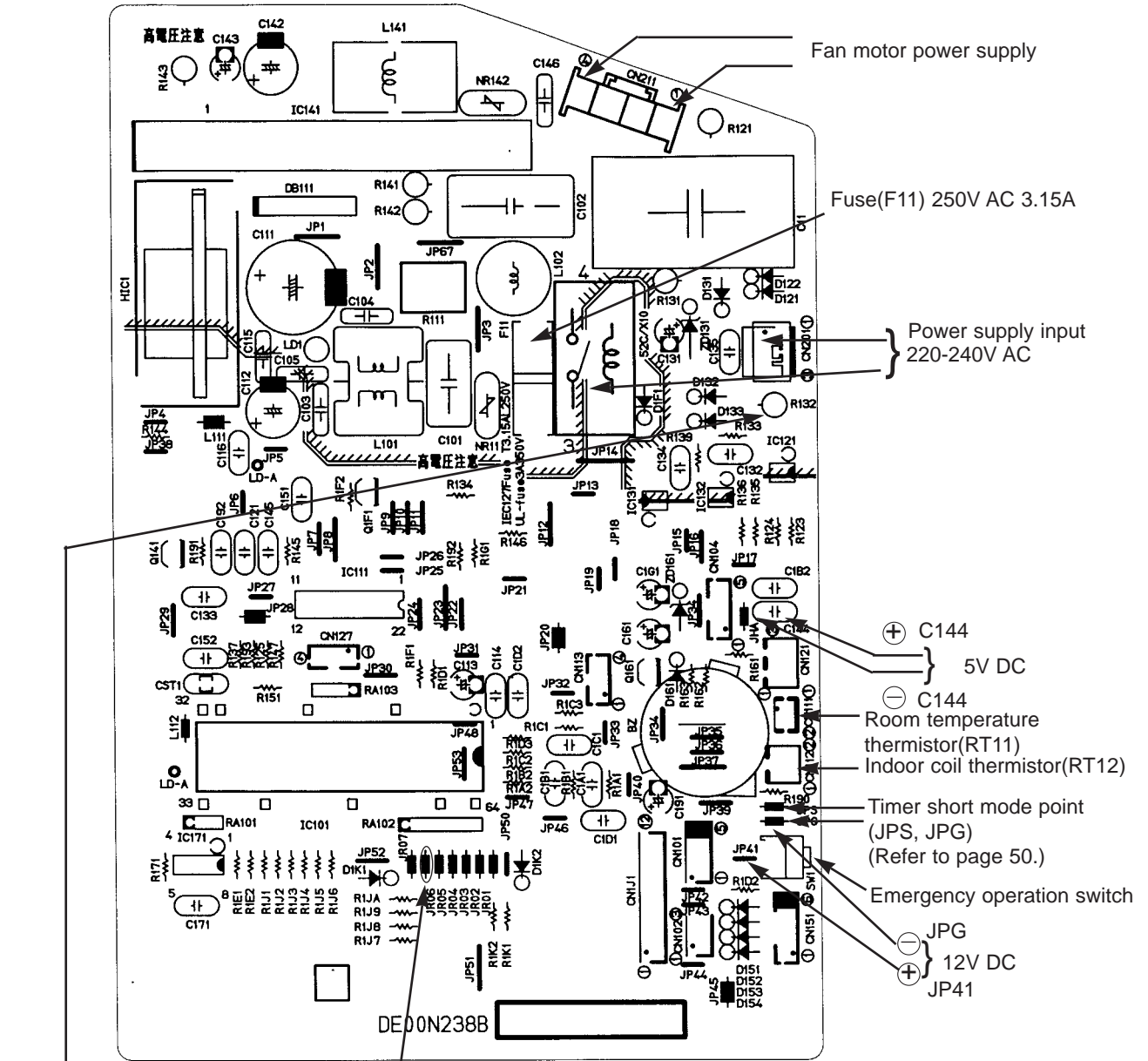


# TEST POINT DIAGRAM AND VOLTAGE

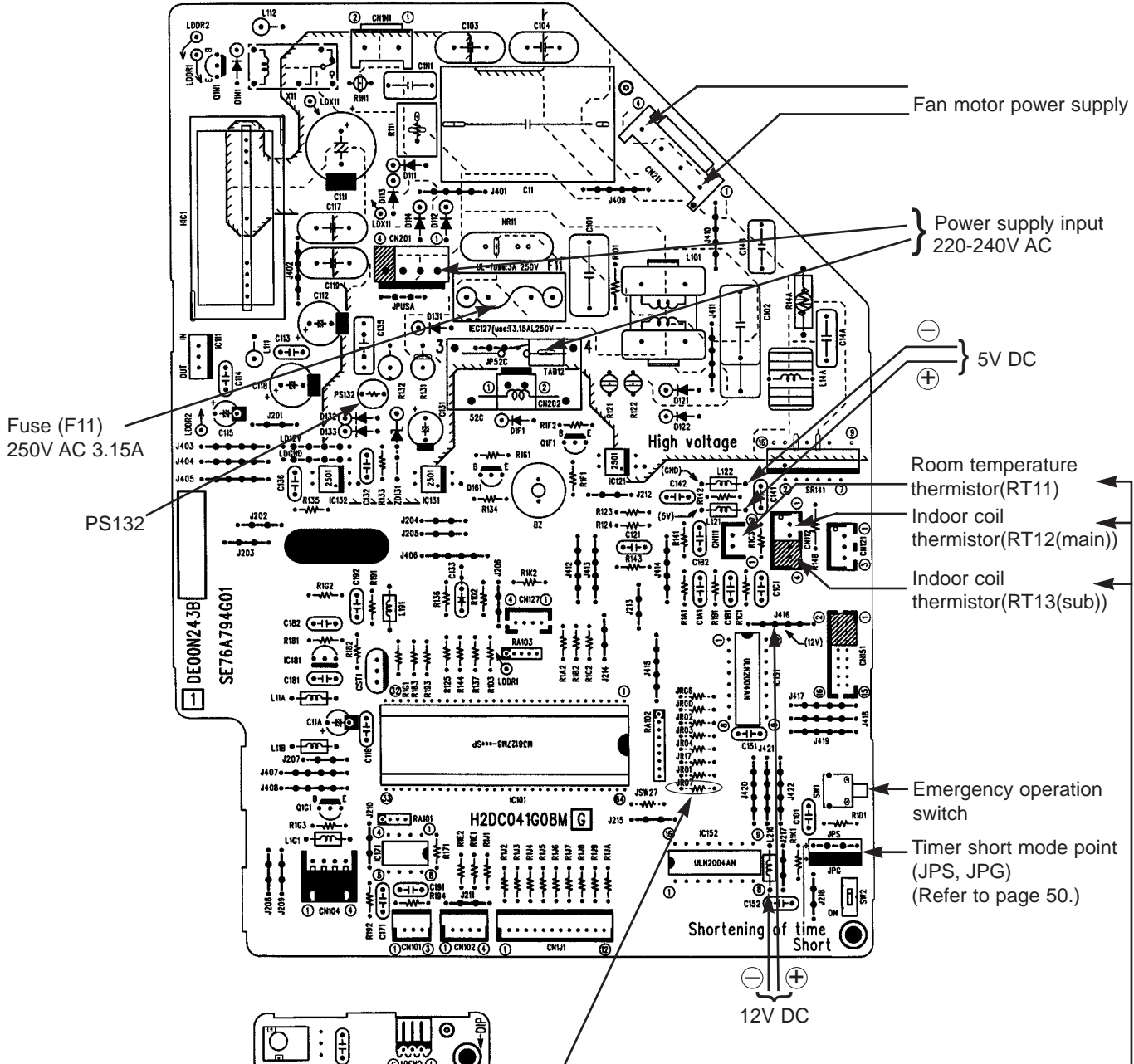
MSH-18RV -E1

MSH-24RV -E1

## Indoor electronic control P.C. board



**TEST POINT DIAGRAM AND VOLTAGE**  
**MSH-30RV -E1**  
**Indoor electronic control P.C. board**



Fuse (F11)  
250V AC 3.15A

PS132

Fan motor power supply

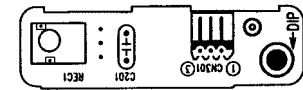
Power supply input  
220-240V AC

5V DC

Room temperature thermistor (RT11)  
 Indoor coil thermistor (RT12(main))  
 Indoor coil thermistor (RT13(sub))

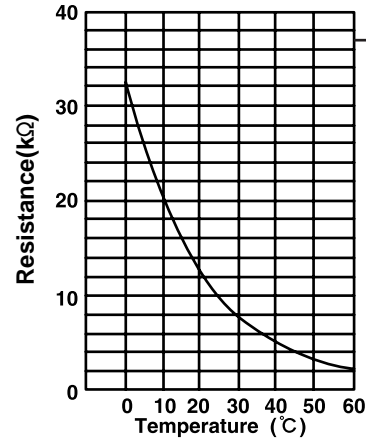
Emergency operation switch  
 Timer short mode point (JPS, JPG)  
(Refer to page 50.)

12V DC



How to set "Auto restart function"  
 Cut the Resistor JR07.  
 (Refer to page 51.)

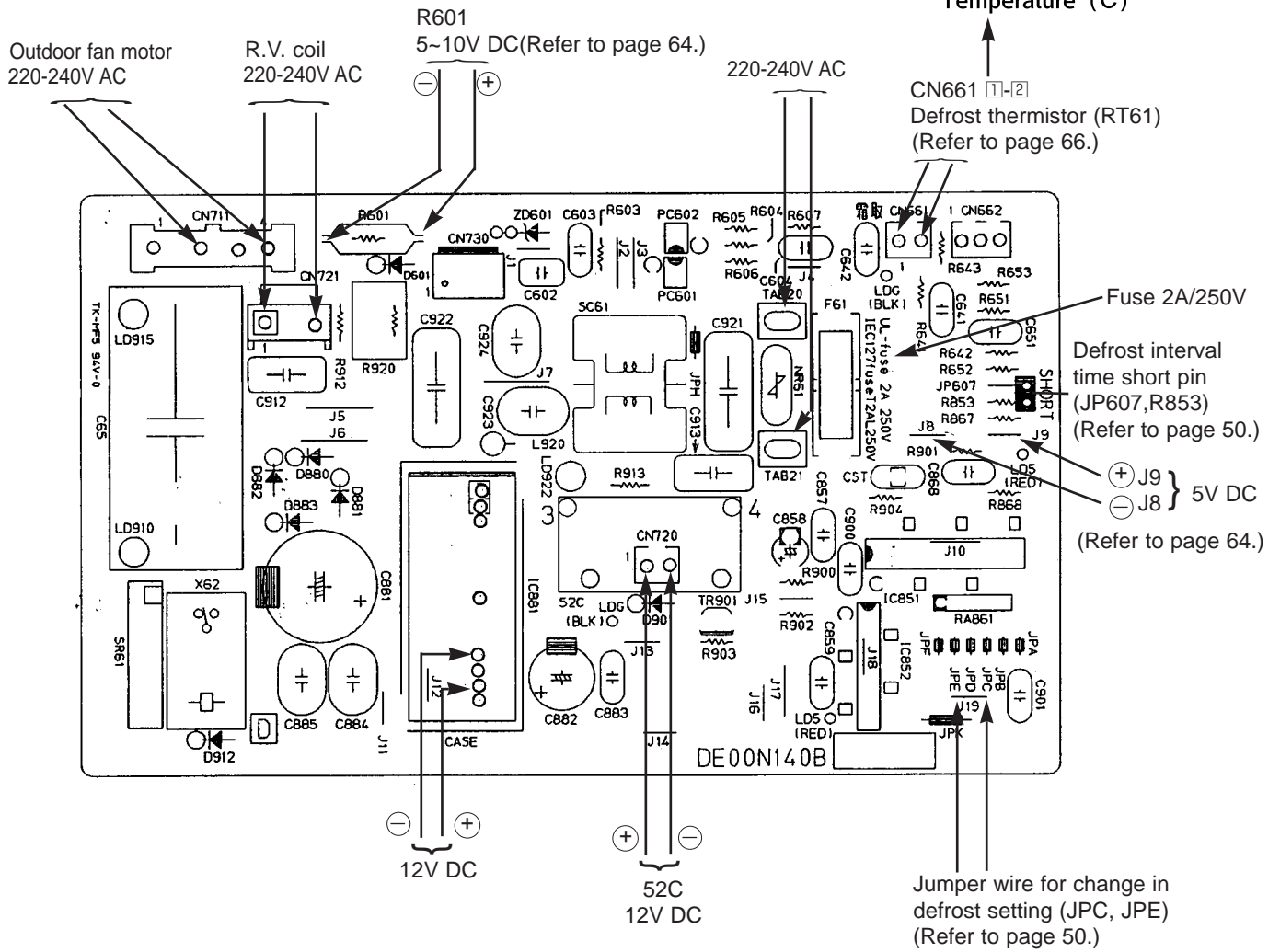
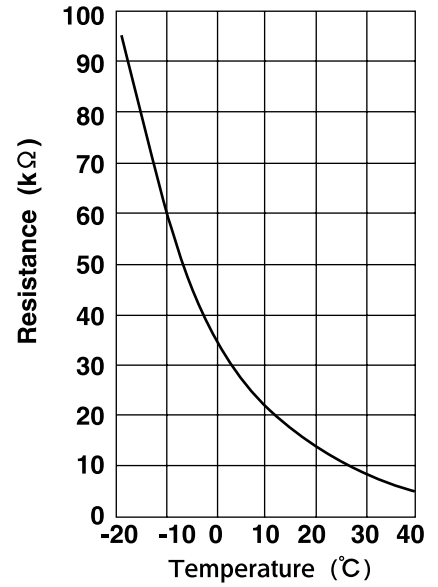
Indoor coil thermistor (RT12(main), RT13(sub))  
 Room temperature thermistor (RT11)





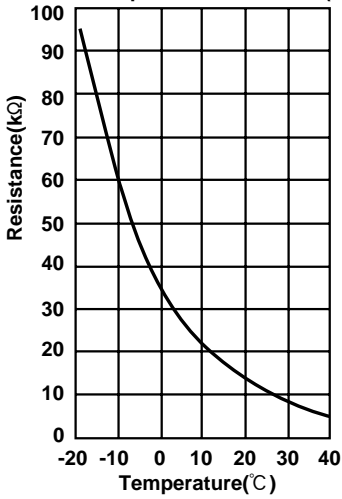
**MUH-18RV -E1**  
**Outdoor deicer P.C. board**

**Defrost thermistor (RT61)**

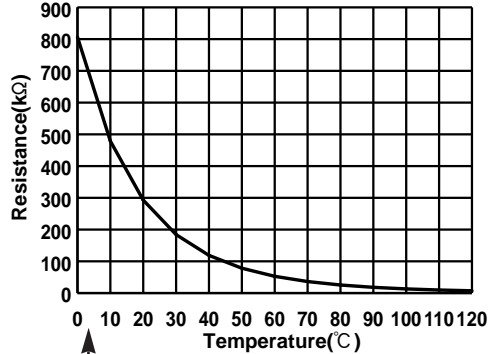


**MUH-24RV -E1**  
**MUH-30RV -E1**  
**Outdoor deicer P.C. board**

Defrost thermistor (RT61)  
 Ambient temperature thermistor (RT63)



Discharge temperature thermistor (RT62)



- CN661 ①-② <MSH-30RV only> Defrost thermistor (RT61) (Refer to page 66.)
- CN662 ①-② Discharge temperature thermistor (RT62) (Refer to page 66.)
- CN662 ③-④ Ambient temperature thermistor (RT63) (Refer to page 66.)
- LEV connector (CN724)
- Fan motor connector (CN711)
- Varistor (NR62)

Defrost interval time short pin (JPG1, R871) (Refer to page 50.)

J101 (+) 5V DC  
 J401 (-) (Refer to page 61, 62 or 65.)

Jumper wire for change in defrost setting (JRF, JRG) (Refer to page 50.)

R.V. coil (CN721)

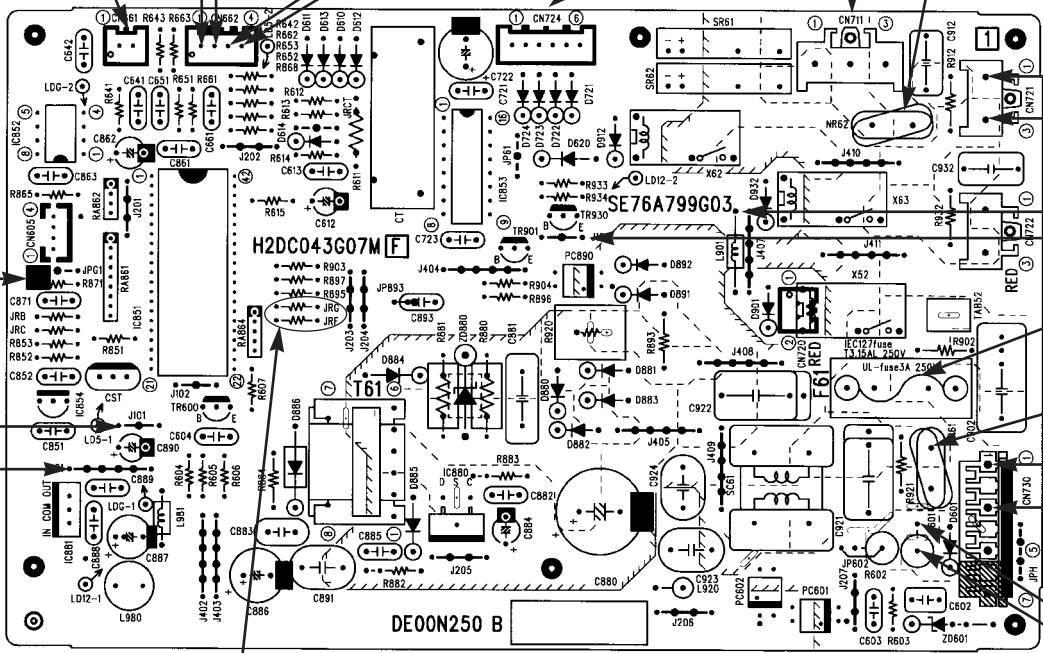
12V DC

Fuse 3.15A / 250V

Varistor (NR61)

CN730 ①-③ 220-240V AC (Refer to page 61 or 62.)

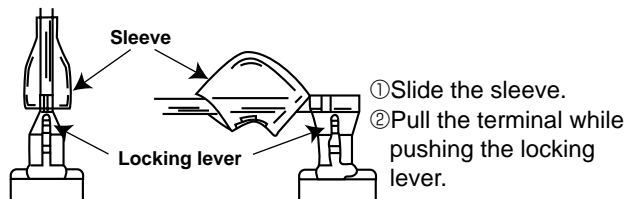
R601 10V DC (Refer to page 64 or 65.)



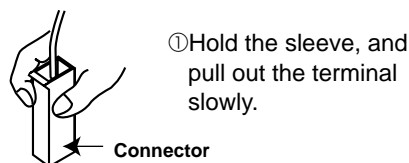
## &lt;"Terminal with lock mechanism" Detaching points&gt;

In case of terminal with lock mechanism, detach the terminal as shown below.  
There are two types ( Refer to (1) and (2)) of the terminal with lock mechanism.  
The terminal with no lock mechanism can be removed by pulling it out.  
Check the shape of the terminal and work.

(1) Slide the sleeve and check if there is a locking lever or not.



(2) The terminal with this connector is a terminal with lock mechanism



### 12-1. MSH-18RV -[E1] MSH-24RV -[E1] INDOOR UNIT

OPERATING PROCEDURE	PHOTOS
<p><b>1. Removing the front panel</b></p> <ol style="list-style-type: none"> <li>(1) Remove the screw caps at the down of the front panel. Remove the screws.</li> <li>(2) Pull the panel down to your side slightly and unhook the catches at the top.</li> </ol>	<p><b>Photo 1</b></p>
<p><b>2. Removing the electronic control P.C. board, the receiver P.C. board and the display P.C. board</b></p> <ol style="list-style-type: none"> <li>(1) Remove the front panel. (Refer to 1)</li> <li>(2) Remove the electrical cover.</li> <li>(3) Remove the screw of the terminal cover.</li> <li>(4) Remove the screw of the terminal block.</li> <li>(5) Unhook the catch of the lamp holder.</li> <li>(6) Remove the receiver holder and the receiver P.C. board.</li> <li>(7) Remove the screw of the ground wire.</li> <li>(8) Disconnect all the connectors and all the lead wires on the electronic control P.C. board.</li> <li>(9) Remove the electronic control P.C. board and display P.C. board.</li> </ol>	<p><b>Photo 2</b></p>

## OPERATING PROCEDURE

### 3. Removing the electrical box

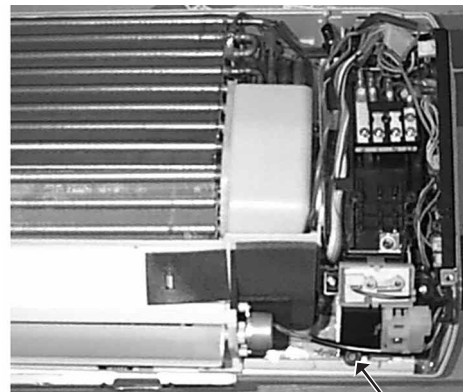
- (1) Remove the front panel. (Refer to 1)
- (2) Remove the electrical cover.
- (3) Disconnect the connector of the indoor coil thermistor.
- (4) Disconnect the motor connector (CN211 and CN121) and the vane motor connector (CN151) on the electronic control P.C. board.
- (5) Remove the screw of the electrical box, remove the electrical box.

### 4. Removing the indoor fan motor and the line flow fan

- (1) Remove the front panel.
- (2) Remove the electrical box.
- (3) Unhook the catches on the both sides of the nozzle assembly.
- (4) Remove the nozzle assembly.
- (5) Remove the screws of the bearing support.
- (6) Remove the screw of the heat exchanger unhook the catch.
- (7) Lifting the heat exchanger, remove the bearing support.
- (8) Loose the screw fixing the line flow fan, remove the line flow fan.
- (9) Remove the screws of the motor band, remove the fan motor.

## PHOTOS

Photo 3



Screw of the electrical box

Photo 4

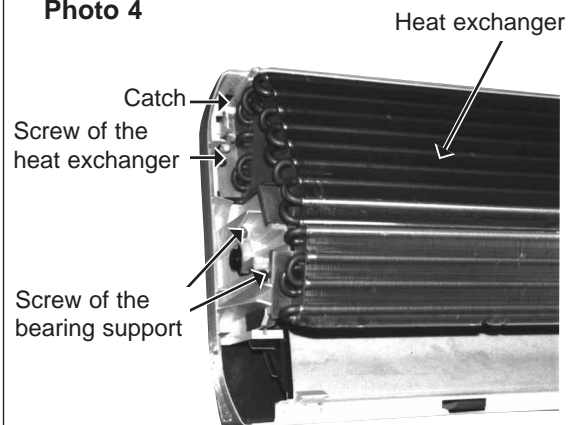
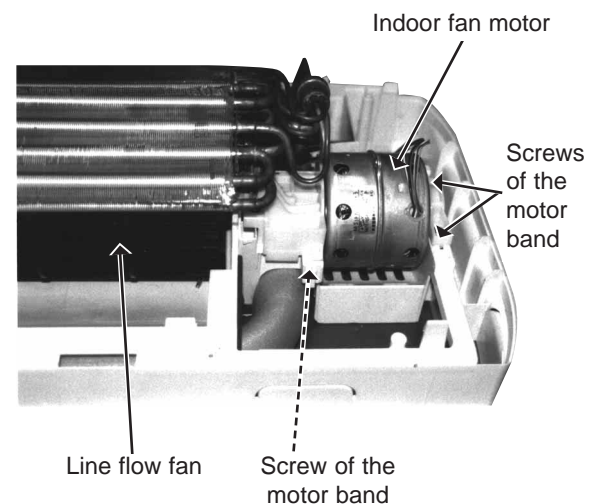
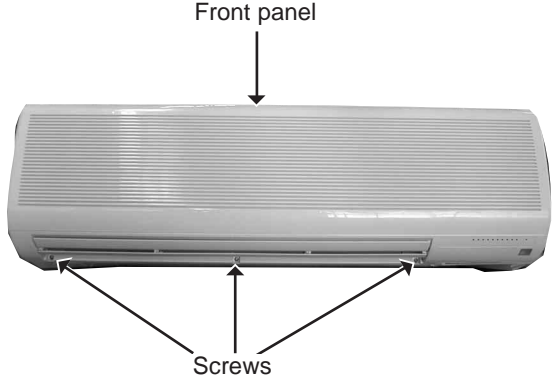
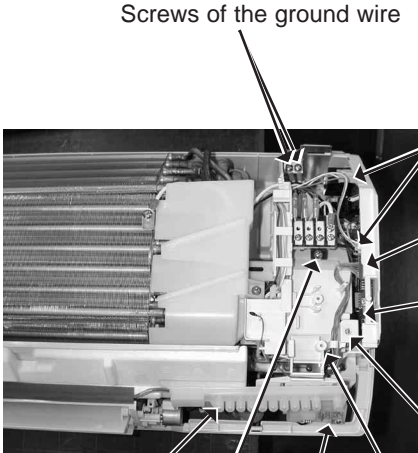


Photo 5



## 12-2. MSH-30RV -E1 INDOOR UNIT

OPERATING PROCEDURE	PHOTOS
<p><b>1. Removing the front panel</b></p> <ol style="list-style-type: none"> <li>(1) Remove the screws caps of the front panel. Remove the screws.</li> <li>(2) Pull the panel down to your side slightly and unhook the catches at the top.</li> </ol>	<p><b>Photo 1</b></p>  <p>Front panel</p> <p>Screws</p>
<p><b>2. Removing the electronic control P.C. board, the receiver P.C. board and the display P.C. board</b></p> <ol style="list-style-type: none"> <li>(1) Remove the front panel. (Refer to 1)</li> <li>(2) Remove the screw of the electrical cover. Remove the electrical cover.</li> <li>(3) Remove the screw of the V.A. clamp. Remove the V.A. clamp.</li> <li>(4) Remove the screw of the terminal block.</li> <li>(5) Remove the screw of the ground wire.</li> <li>(6) Disconnect all the connectors and all the lead wires on the electronic control P.C. board.</li> <li>(7) Remove the R.L holder.</li> <li>(8) Remove the electronic control P.C. board.</li> <li>(9) Open the R.L holder, remove the receiver P.C. board and the display P.C. board.</li> </ol>	<p><b>Photo 2</b></p>  <p>Screws of the ground wire</p> <p>Fan motor connectors</p> <p>Vane motor connector</p> <p>Indoor electronic control P.C.board</p> <p>Screw of the electrical cover</p> <p>R.L holder</p> <p>Screw of the terminal block</p> <p>Receiver P.C. board</p> <p>Screw of the V.A. clamp</p>



## OPERATING PROCEDURE

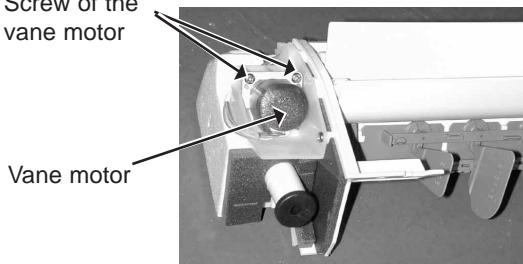
### 3. Removing the electrical box

- (1) Remove the front panel. (Refer to 1)
- (2) Remove the electrical cover. (Refer to 2)
- (3) Disconnect the connector of the indoor coil thermistor.
- (4) Disconnect the motor connector (CN211 and CN121) and the vane motor connector (CN151) on the electronic control P.C. board.
- (5) Remove the screw of ground wire.
- (6) Remove the fan motor lead wire and indoor coil thermistor from the electrical box.
- (7) Remove the lead wire of vane motor from the bottom of electrical box.
- (8) Remove the screw fixing the electrical box, remove the electrical box.

### 4. Removing the vane motor

- (1) Remove the front panel. (Refer to 1)
- (2) Remove the electrical cover. (Refer to 2)
- (3) Remove the lead wire of vane motor.(Refer to 3)
- (4) Remove the R.L. holder.
- (5) Pull out the drain hose from the nozzle assembly, remove the nozzle assembly.
- (6) Remove the screws of the vane motor, disconnect the connector.
- (7) Remove the vane motor.

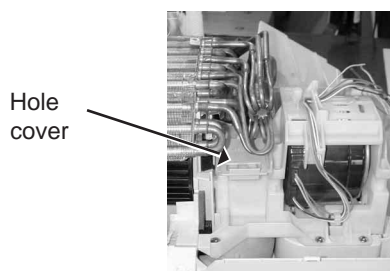
**Photo 5** Screw of the vane motor



### 5. Removing the line flow fan and the indoor fan motor

- (1) Remove the front panel. (Refer to 1)
- (2) Remove the electrical box. (Refer to 3)
- (3) Pull out the drain hose from the nozzle assembly, remove the nozzle assembly.
- (4) Remove the water cut.
- (5) Slide the hole cover, remove the hole cover.
- (6) Remove the hexagon socket set screw from the line flow fan.
- (7) Remove the screws fixing the fan motor, remove the fan motor. (Be careful not to drop the fan motor because it is heavy.)
- (8) Remove the screws fixing the left side of the heat exchanger.
- (9) Lifting the left side of the heat exchanger.
- (10) Remove the line flow fan.

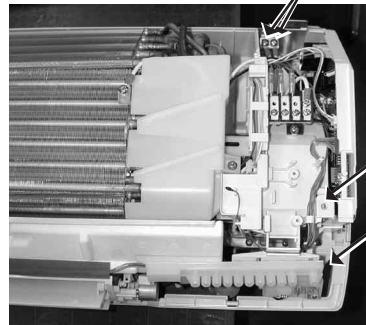
**Photo 8**



## PHOTOS

**Photo 3**

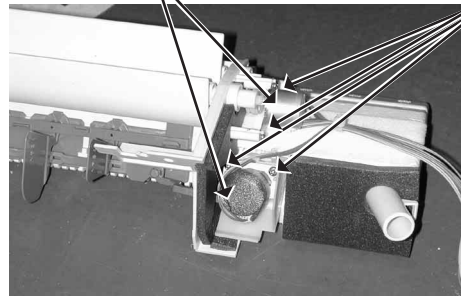
Screws of the ground wire



Screw of the electrical cover  
Screw of the electrical box

**Photo 4**

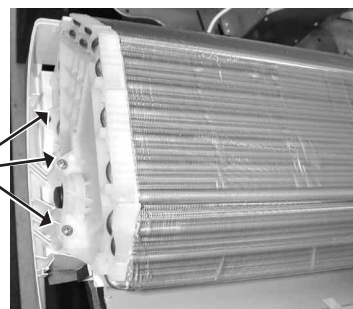
Vane motors



Screws of the vane motor

**Photo 6**

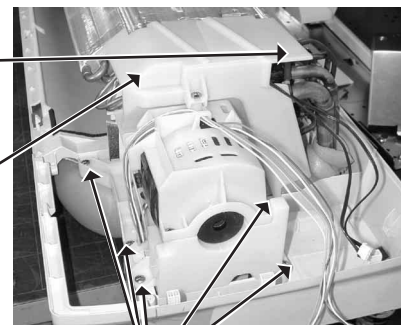
Screws fixing the left side of the heat exchanger



**Photo 7**

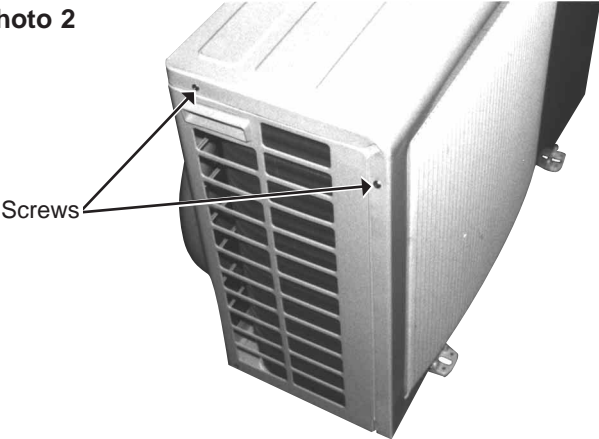
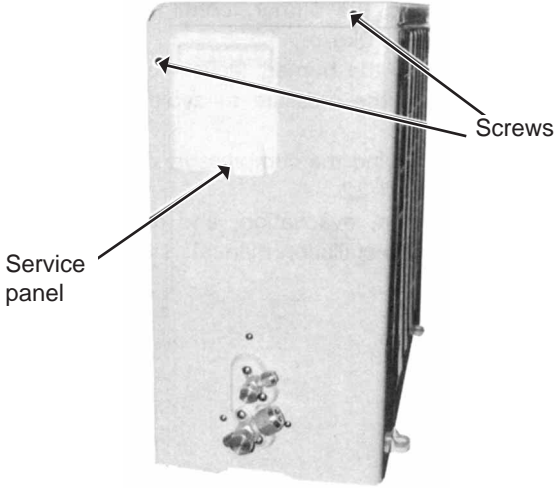
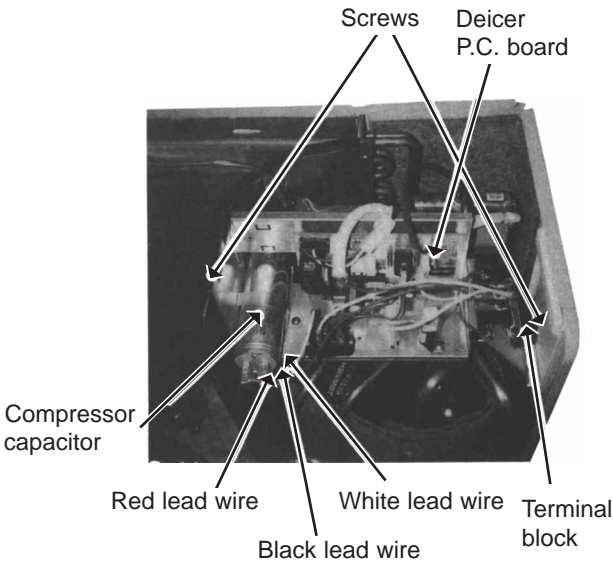
Indoor coil thermistor

Water cut



Screws fixing the fan motor

**12-3. MUH-18RV -E1**  
**OUTDOOR UNIT**

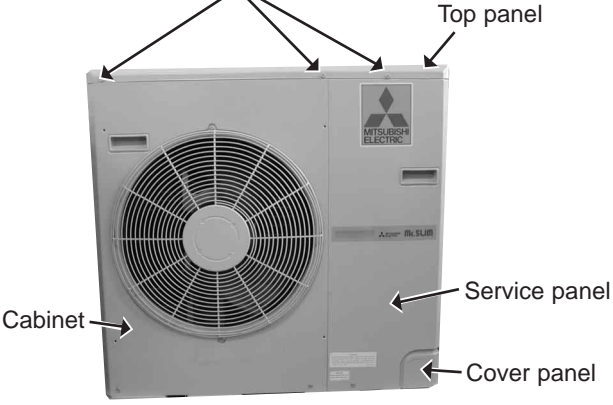
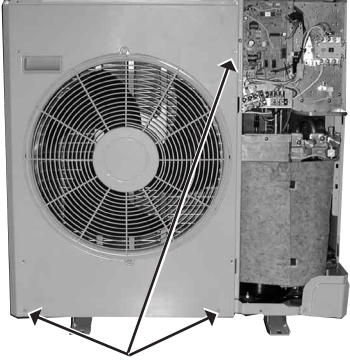
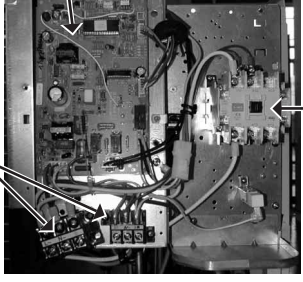
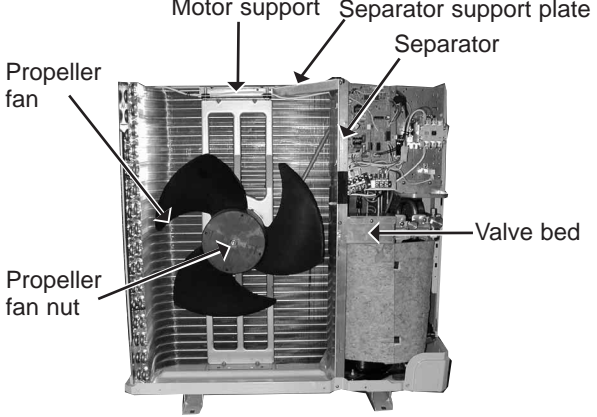
OPERATING PROCEDURE	PHOTOS
<p><b>1. Removing the cabinet</b></p> <p>(1) Remove the screws of the cabinet.            (2) Hold the down of the cabinet on the both side to remove the cabinet.</p> <p><b>Photo 2</b></p>  <p>Screws</p>	<p><b>Photo 1</b></p>  <p>Service panel</p> <p>Screws</p>
<p><b>2. Removing the deicer P.C. board</b></p> <p>(1) Remove the service panel and the cabinet.            (2) Disconnect all the connectors and the terminals on the deicer P.C. board.            (3) Remove the deicer P.C. board.</p>	<p><b>Photo 3</b></p>  <p>Screws</p> <p>Deicer P.C. board</p> <p>Compressor capacitor</p> <p>Red lead wire</p> <p>Black lead wire</p> <p>White lead wire</p> <p>Terminal block</p>





**12-4. MUH-24RV -[E1] MUH-30RV -[E1]  
OUTDOOR UNIT**

NOTE: These photos use MUH-30RV -[E1].  
MUH-24RV -[E1] is almost the same as MUH-30RV -[E1].

OPERATING PROCEDURE	PHOTOS
<p><b>1. Removing the cabinet</b></p> <ol style="list-style-type: none"> <li>(1) Remove the screws of the top panel and the top panel.</li> <li>(2) Remove the screw of the service panel. To remove the service panel, pull it down toward you and unhook the catches on the both sides.</li> <li>(3) Remove the screw of the cover panel. To remove the cover panel.</li> <li>(4) Remove the screws of the cabinet. Open the cabinet to a 45-degree angle. Then lift it and unhook the catches to remove.</li> </ol>	<p><b>Photo 1</b> Screws of the top panel</p>  <p><b>Photo 2</b></p>  <p>Screws of the cabinet</p>
<p><b>2. Removing the deicer P.C. board</b></p> <ol style="list-style-type: none"> <li>(1) Remove the top panel, the service panel and the cover panel.</li> <li>(2) Disconnect all the connectors and the terminals on the deicer P.C. board.</li> <li>(3) Remove the deicer P.C. board.</li> </ol>	<p><b>Photo 3</b> Deicer P.C. board</p>  <p>Terminal blocks</p> <p>Compressor contactor</p>
<p><b>3. Removing the propeller fan and the outdoor fan motor</b></p> <ol style="list-style-type: none"> <li>(1) Remove the cabinet. (Refer to 1)</li> <li>(2) Remove the propeller fan nut and the propeller fan. <b>NOTE:</b>Loose the propeller fan in the rotating direction for removal. When attaching the propeller fan, align the mark on the propeller fan and the motor shaft cut section. Set the propeller fan in position by using the cut on the shaft and the mark on the propeller fan.</li> <li>(3) Remove the screws and the outdoor fan motor and the connectors. Remove the outdoor fan motor.</li> </ol>	<p><b>Photo 4</b></p>  <p>Propeller fan</p> <p>Propeller fan nut</p> <p>Motor support</p> <p>Separator support plate</p> <p>Separator</p> <p>Valve bed</p>

## OPERATING PROCEDURE

### 4. Removing the heat exchanger and compressor

- (1) Remove the screws of the rear panel. Remove the screws of the valve bed and the valve bed. (The valve bed is fixed by the catches on the right and left sides. Lift it to remove.)

Open the rear panel to the rear to remove.

#### NOTE :

All panels are fixed by catches, and must be removed by up and down.

- (2) Remove the screws of the side panel and the side panel.
- (3) Remove the screws of the rear guard and the rear guard.
- (4) Remove the screws of the separator support plate and the separator support plate.
- (5) Remove the screws of the motor support and the motor support.
- (6) Remove the relay panel.  
Disconnect the fan motor lead wires.
- (7) Remove the soundproof felt.
- (8) Remove the screws of the separator and the separator.
- (9) Recover gas from the refrigerant circuit.
- (10) Remove the screws of the heat exchanger and the heat exchanger.  
Detach the welded part of pipe.
- (11) Remove the nuts of the compressor and the compressor.  
Detach the welded part of the suction pipe and the discharge pipe.

## PHOTOS

Photo 5

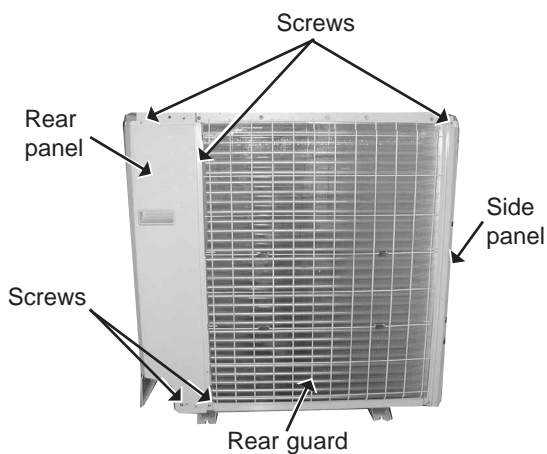


Photo 6

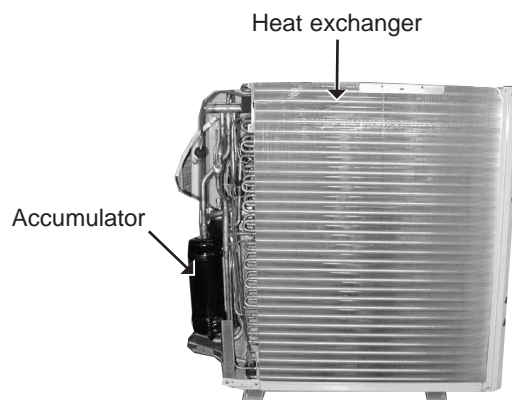
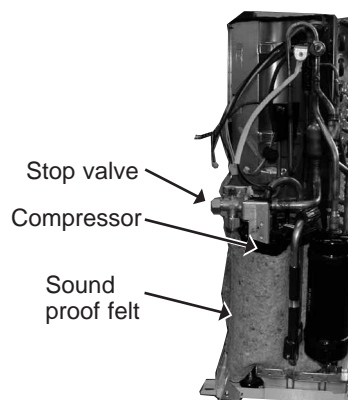
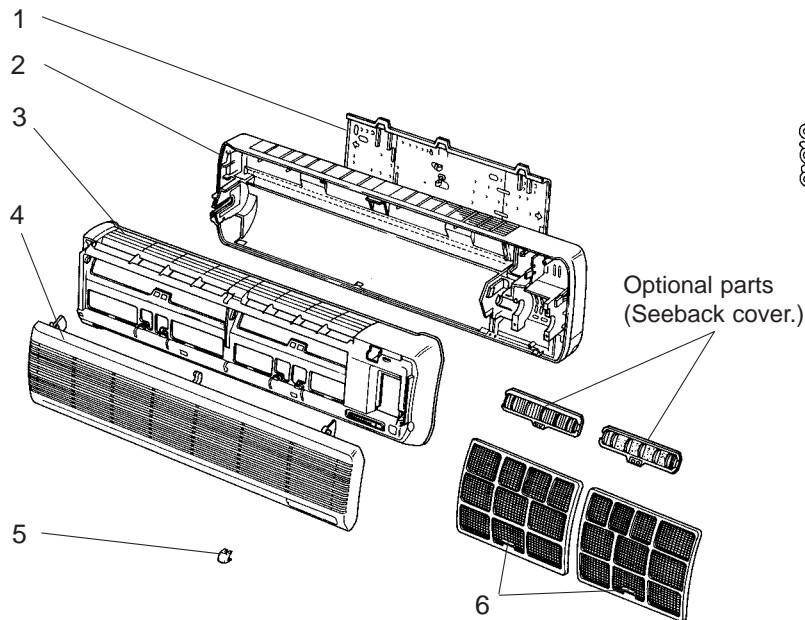
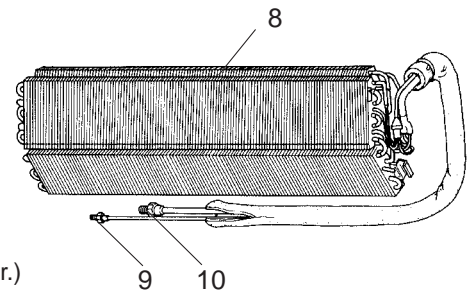


Photo 7



MSH-18RV -E1 (WH)

MSH-24RV -E1 (WH)

13-1. INDOOR UNIT  
STRUCTURAL PARTS13-2. INDOOR UNIT  
HEAT EXCHANGER

## 13-1. INDOOR UNIT STRUCTURAL PARTS

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

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit		Remarks
				MSH-18RV- <sup>E1</sup> (WH)	MSH-24RV- <sup>E1</sup> (WH)	
1	E02 141 970	INSTALLATION PLATE		1	1	
2	E02 143 234	BOX(WH)		1	1	
3	E02 138 000	FRONT PANEL ASSEMBLY(WH)		1	1	Including 4,5
4	E02 138 010	GRILLE(WH)		1	1	
5	E02 143 067	SCREW CAP(WH)		3	3	3PCS/SET
6	E02 141 100	AIR FILTER		2	2	
⑦	E02 516 007	LAMP PANEL(WH)		1	1	

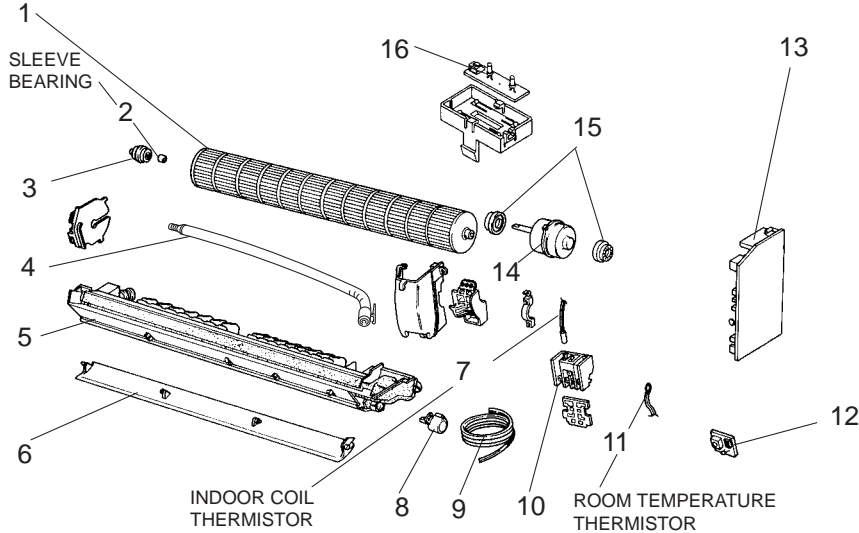
## 13-2. INDOOR UNIT HEAT EXCHANGER

8	E02 141 620	INDOOR HEAT EXCHANGER		1	1	
9	E02 138 667	UNION(LIQUID)		1		φ6.35
	E02 176 667	UNION(LIQUID)			1	φ9.52
10	E02 138 666	UNION(GAS)		1	1	φ15.88

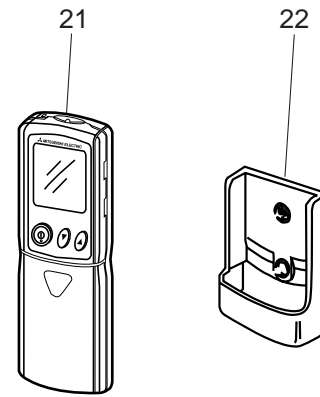
MSH-18RV -E1 (WH)

MSH-24RV -E1 (WH)

**13-3. INDOOR UNIT  
FUNCTIONAL PARTS  
AND ELECTRICAL PARTS**



**13-4. ACCESSORY AND REMOTE  
CONTROLLER PART**



**13-3. INDOOR UNIT FUNCTIONAL PARTS AND ELECTRICAL PARTS**

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

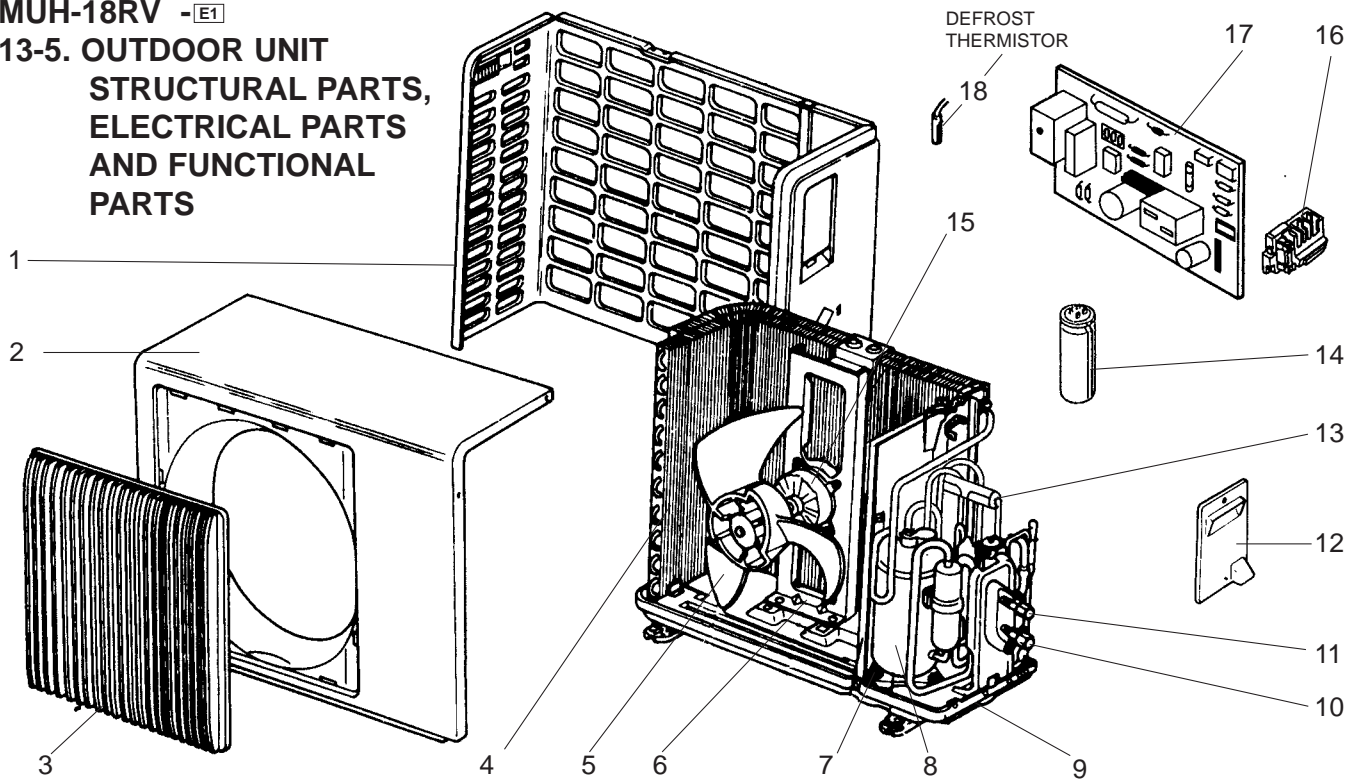
NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit		Remarks
				MSH-18RV- (WH)	MSH-24RV- (WH)	
1	E02 141 302	LINE FLOW FAN		1	1	
2	E02 001 504	SLEEVE BEARING		1	1	
3	E02 141 509	BEARING MOUNT		1	1	
4	E02 408 702	DRAIN HOSE		1	1	
5	E02 143 235	NOZZLE(WH)		1	1	
6	E02 143 040	VANE(WH)		1	1	
7	E02 138 307	INDOOR COIL THERMISTOR	RT12	1	1	
8	E02 141 303	VANE MOTOR	MV	1	1	
9	E02 138 395	POWER SUPPLY CORD		1		
	E02 320 395	POWER SUPPLY CORD			1	
10	E02 581 375	TERMINAL BLOCK	TB	1		
	E02 540 375	TERMINAL BLOCK	TB		1	
11	E02 138 308	ROOM TEMPERATURE THERMISTOR	RT11	1	1	
12	E02 141 468	RECEIVER P. C. BOARD		1	1	
13	E02 581 452	ELECTRONIC CONTROL P.C. BOARD		1		AUTO RESTART
	E02 582 452	ELECTRONIC CONTROL P.C. BOARD			1	AUTO RESTART
14	E02 141 300	INDOOR FAN MOTOR	MF	1		RA4V27 -□□
	E02 213 300	INDOOR FAN MOTOR	MF		1	RA4V27 -□□
15	E02 001 505	FAN MOTOR RUBBER MOUNT		2	2	2PCS/SET
16	E02 138 329	DISPLAY P.C. BOARD		1	1	
17	E02 336 385	VARISTOR	NR11	1	1	
18	E02 127 382	FUSE	F11	1	1	3.15A
19	E02 205 381	THERMAL FUSE	F12	1		93°C
	E02 209 381	THERMAL FUSE	F12		1	93°C
20	E02 138 383	SURGE ABSORBER	DSAR	1		
	E02 147 383	SURGE ABSORBER	DSAR		1	

**13-4. ACCESSORY AND REMOTE CONTROLLER PART**

21	E02 581 426	REMOTE CONTROLLER		1	1	
22	E02 527 083	REMOTE CONTROLLER HOLDER		1	1	

**MUH-18RV -E1**

**13-5. OUTDOOR UNIT  
STRUCTURAL PARTS,  
ELECTRICAL PARTS  
AND FUNCTIONAL  
PARTS**



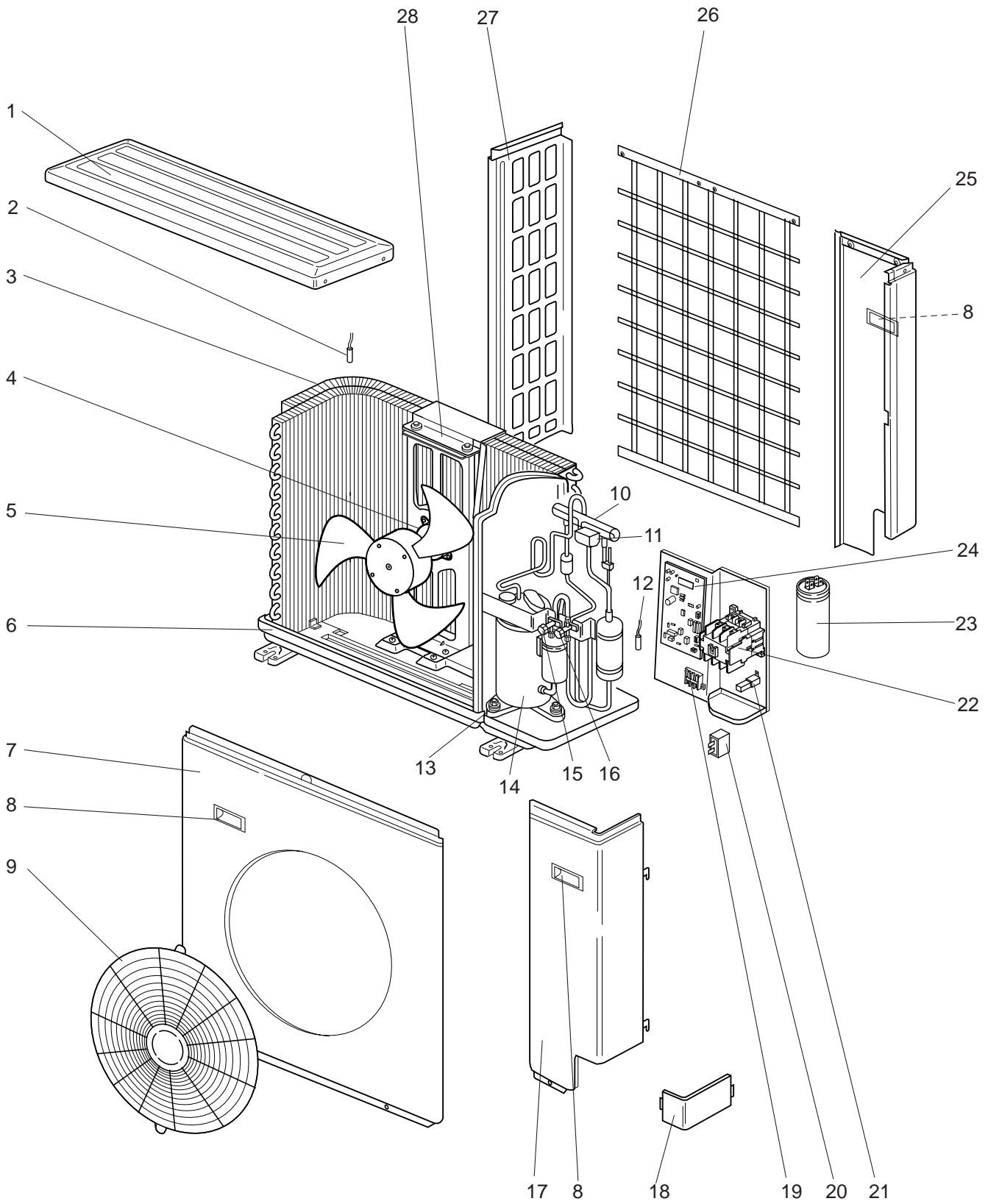
Part numbers that are circled are not shown in the illustration.

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUH-18RV-E1	
1	E02 140 233	BACK PANEL		1	
2	E02 141 232	CABINET		1	
3	E02 141 521	GRILLE		1	
4	E02 139 630	OUTDOOR HEAT EXCHANGER		1	
5	E02 141 501	PROPELLER FAN		1	
6	E02 139 515	MOTOR SUPPORT		1	
7	E02 138 506	COMPRESSOR RUBBER SET		4	4RUBBERS/SET
8	E02 277 900	COMPRESSOR	MC	1	PH-36VPET
9	E02 277 290	BASE		1	
10	E02 150 661	STOP VALVE(GAS)		1	φ15.88
11	E02 139 662	STOP VALVE(LIQUID)		1	φ 6.35
12	E02 141 245	SERVICE PANEL		1	
13	E02 444 961	4-WAY VALVE		1	
14	E02 277 353	COMPRESSOR CAPACITOR	C1	1	55μF/420V AC
15	E02 144 301	OUTDOOR FAN MOTOR	MF	1	RA6V50 - □□
16	E02 540 374	TERMINAL BLOCK	TB	1	4P
17	E02 444 451	DEICER P.C. BOARD		1	
18	E02 440 310	DEFROST THERMISTOR	RT61	1	
19	E02 004 340	COMPRESSOR CONTACTOR	52C	1	
20	E02 139 936	CAPILLARY TUBE		2	φ3.0Xφ1.6X750
20	E02 064 936	CAPILLARY TUBE		1	φ3.0Xφ2.0X500
21	E02 095 382	FUSE	F61	1	250V / 2A
22	E02 139 490	R.V. COIL	21S4	1	
23	E02 128 383	SURGE ABSORBER	DSAR	1	
24	E02 214 642	CHECK VALVE		1	



MUH-24RV -E1

13-6. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS  
AND FUNCTIONAL PARTS





**MUH-24RV -<sup>[E1]</sup>**

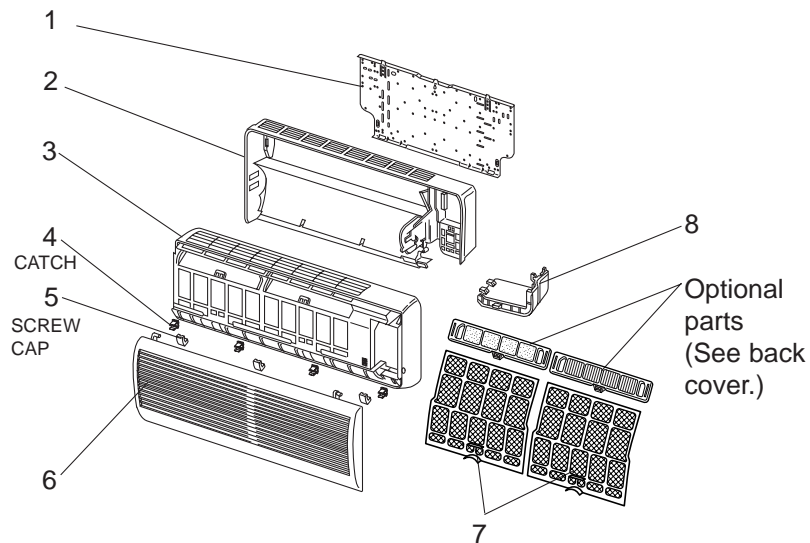
**13-6. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS  
AND FUNCTIONAL PARTS**

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

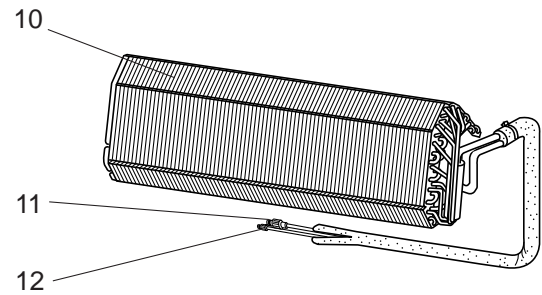
NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUH-24RV - <sup>[E1]</sup>	
1	E02 214 297	TOP PANEL		1	
2	E02 578 309	AMBIENT TEMPERATURE THERMISTOR	RT63	1	
3	E02 214 630	OUTDOOR HEAT EXCHANGER		1	
4	E02 214 301	OUTDOOR FAN MOTOR	MF	1	RA6V85- □□
5	E02 214 501	PROPELLER FAN		1	
6	E02 214 290	BASE		1	
7	E02 214 232	CABINET		1	
8	E07 001 009	HANDLE		3	
9	E02 527 521	FAN GUARD		1	
10	E02 444 961	4-WAY VALVE		1	
11	E02 529 490	R.V. COIL	21S4	1	
12	E02 529 310	DEFROST THERMISTOR	RT61	1	
13	E02 138 506	COMPRESSOR RUBBER SET		4	4RUBBERS/SET
14	E02 047 900	COMPRESSOR	MC	1	NH-47VMDT
15	E02 527 662	STOP VALVE(LIQUID)		1	φ9.52
16	E02 527 661	STOP VALVE(GAS)		1	φ15.88
17	E02 214 245	SERVICE PANEL		1	
18	E07 001 006	COVER PANEL		1	
19	E02 540 374	TERMINAL BLOCK	TB	1	4P
20	E02 138 351	OUTDOOR FAN CAPACITOR	C2	1	3.0μF/440V AC
21	E02 128 383	SURGE ABSORBER	DSAR	1	
22	E02 010 342	COMPRESSOR CONTACTOR	52C	1	
23	E02 082 353	COMPRESSOR CAPACITOR	C1	1	50μF/440V AC
24	E02 578 451	DEICER P.C. BOARD		1	
25	E02 214 522	REAR PANEL		1	
26	E02 605 523	REAR GUARD		1	
27	E02 214 249	SIDE PANEL		1	
28	E02 527 515	MOTOR SUPPORT		1	
29	E02 127 382	FUSE	F61	1	250V/3.15A
30	E02 214 642	CHECK VALVE		1	
31	E02 214 384	CZ SURGE ABSORBER	CZ	1	
32	E02 176 936	CAPILLARY TUBE		1	φ3.0×φ1.6×350
	E02 256 936	CAPILLARY TUBE		1	φ3.0×φ2.0×350
	E02 262 936	CAPILLARY TUBE		1	φ4.0×φ2.4×200
33	E02 214 644	DISCHARGE PRESSURE REGULATOR		1	

## MSH-30RV -E1 (WH)

### 13-7. INDOOR UNIT STRUCTURAL PARTS



### 13-8. INDOOR UNIT HEAT EXCHANGER



### 13-7. INDOOR UNIT STRUCTURAL PARTS

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

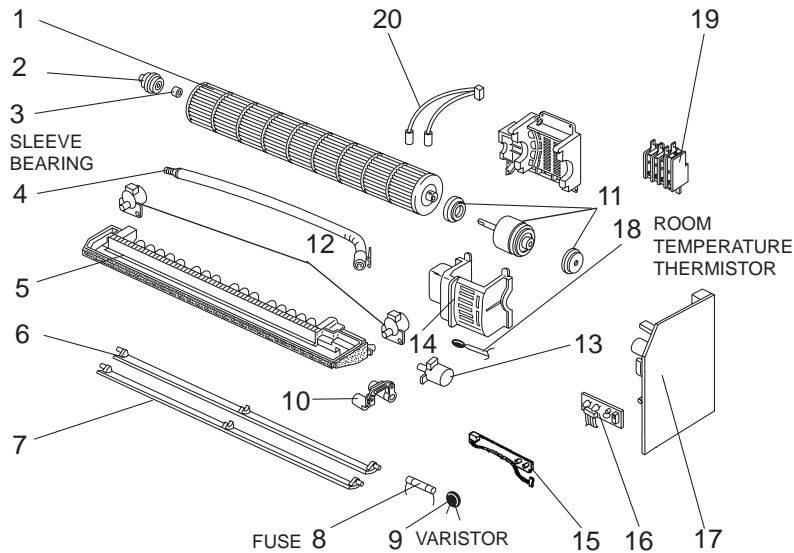
NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit		Remarks
				MSH-30RV -E1 (WH)		
1	E02 527 970	INSTALLATION PLATE		1		
2	E02 527 234	BOX (WH)		1		
3	E02 527 000	FRONT PANEL ASSEMBLY(WH)		1		Including No.4,5,6
4	E02 408 142	CATCH		4		4PCS/ SET
5	E02 527 067	SCREW CAP (WH)		3		3PCS/ SET
6	E02 527 010	GRILLE (WH)		1		
7	E02 527 100	AIR FILTER		2		
8	E02 527 975	CORNER BOX RIGHT		1		
⑨	E02 528 007	LAMP PANEL		1		

### 13-8. INDOOR UNIT HEAT EXCHANGER

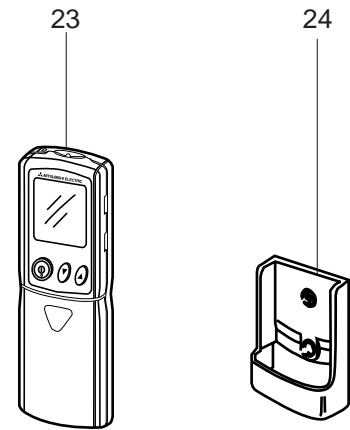
10	E02 527 620	INDOOR HEAT EXCHANGER		1		
11	E02 527 666	UNION (GAS)		1		φ15.88
12	E02 527 667	UNION (LIQUID)		1		φ9.52

## MSH-30RV -E1 (WH)

### 13-9. INDOOR UNIT FUNCTIONAL PARTS AND ELECTRICAL PARTS



### 13-10. ACCESSORY AND REMOTE CONTROLLER PART



### 13-9. INDOOR UNIT FUNCTIONAL PARTS AND ELECTRICAL PARTS

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

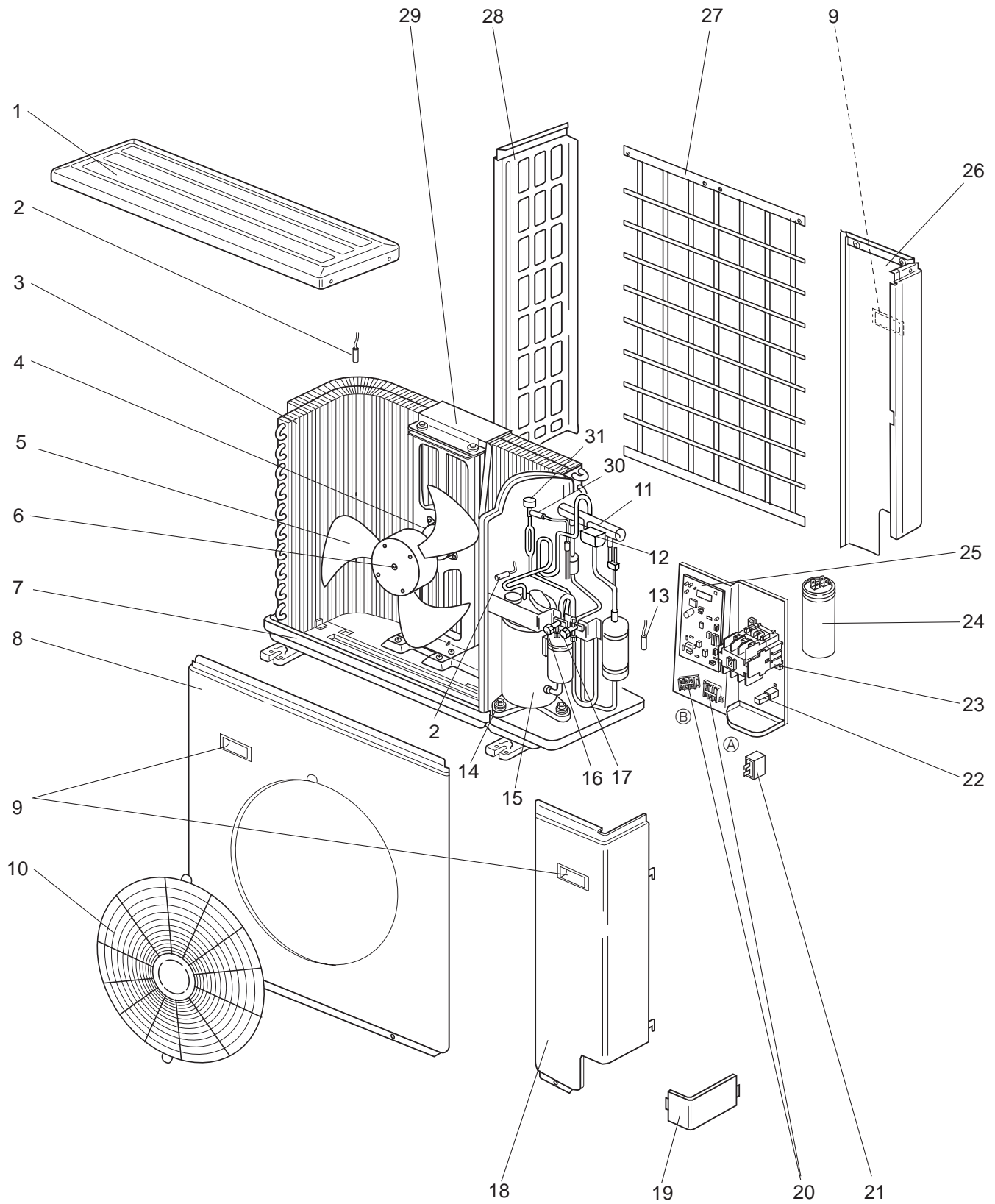
NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MSH-30RV -E1 (WH)	
1	E02 527 302	LINE FLOW FAN		1	
2	E02 408 509	BEARING MOUNT		1	
3	E02 001 504	SLEEVE BEARING		1	
4	E02 408 702	DRAIN HOSE		1	
5	E02 527 235	NOZZLE (WH)		1	
6	E02 527 040	VANE UPPER (WH)		1	
7	E02 527 041	VANE LOWER (WH)		1	
8	E02 127 382	FUSE	F11	1	3.15A
9	E02 336 385	VARISTOR	NR11	1	
10	E02 527 034	VANE CRANK SET		1	
11	E02 527 300	INDOOR FAN MOTOR ASSEMBLY	MF	1	RC4V40 - □□ Including RUBBER MOUNT
12	E02 448 303	VANE MOTOR (VERTICAL)	MV2	2	RIGHT & LEFT
13	E02 408 303	VANE MOTOR (HORIZONTAL)	MV1	1	UP & DOWN
14	E02 527 333	MOTOR BAND		1	
15	E02 528 329	DISPLAY P.C. BOARD		1	
16	E02 527 468	RECEIVER P.C. BOARD		1	
17	E02 640 452	ELECTRONIC CONTROL P.C. BOARD		1	AUTO RESTART Including No.16
18	E02 527 308	ROOM TEMPERATURE THERMISTOR	RT11	1	
19	E02 639 375	TERMINAL BLOCK	TB	1	
20	E02 527 307	INDOOR COIL THERMISTOR	RT12, RT13	1	
21	E02 528 034	VANE MOTOR SUPPORT SET(RIGHT)		1	
22	E02 529 034	VANE MOTOR SUPPORT SET(LEFT)		1	

### 13-10. ACCESSORY AND REMOTE CONTROLLER PART

23	E02 529 426	REMOTE CONTROLLER		1	
24	E02 527 083	REMOTE CONTROLLER HOLDER		1	

MUH-30RV - E1

13-11. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS  
AND FUNCTIONAL PARTS



**MUH-30RV -<sup>Ⓔ</sup>**

**13-11. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS**

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

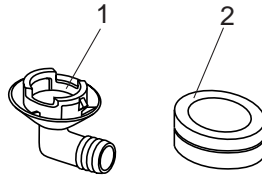
NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUH-30RV - <sup>Ⓔ</sup>	
1	E02 214 297	TOP PANEL		1	
2	E02 528 309	THERMISTOR	RT62, RT63	1	DISCHARGE, AMBIENT
3	E02 529 630	OUTDOOR HEAT EXCHANGER		1	
4	E02 527 301	OUTDOOR FAN MOTOR	MF	1	RA6V75- □□
5	E07 001 501	PROPELLER FAN		1	
6	E07 070 508	PROPELLER FAN NUT		1	
7	E02 214 290	BASE		1	
8	E02 214 232	CABINET		1	
9	E07 001 009	HANDLE		3	
10	E02 527 521	FAN GUARD		1	
11	E02 444 961	4-WAY VALVE		1	
12	E02 529 490	R.V. COIL	21S4	1	
13	E02 529 310	DEFROST THERMISTOR	RT61	1	
14	E02 527 506	COMPRESSOR RUBBER SET		4	4RUBBERS/SET
15	E02 527 900	COMPRESSOR	MC	1	NH-56VNHT
16	E02 527 662	STOP VALVE(LIQUID)		1	φ9.52
17	E02 527 661	STOP VALVE(GAS)		1	φ15.88
18	E02 214 245	SERVICE PANEL		1	
19	E07 001 006	COVER PANEL		1	
20	E02 639 374	TERMINAL BLOCK	TB1	1	3P FIGURE <sup>Ⓐ</sup>
	E02 528 374	TERMINAL BLOCK	TB2	1	3P FIGURE <sup>Ⓑ</sup>
21	E02 064 351	OUTDOOR FAN CAPACITOR	C2	1	4.0μF/440V AC
22	E02 128 383	SURGE ABSORBER	DSAR	1	
23	E02 010 342	COMPRESSOR CONTACTOR	52C	1	
24	E02 177 353	COMPRESSOR CAPACITOR	C1	1	60μF/420V AC
25	E02 640 451	DEICER P.C. BOARD		1	
26	E02 214 522	REAR PANEL		1	
27	E07 003 523	REAR GUARD		1	
28	E02 527 249	SIDE PANEL		1	
29	E02 527 515	MOTOR SUPPORT		1	
30	E02 527 640	EXPANSION VALVE		1	
31	E02 528 493	EXPANSION VALVE COIL	LEV	1	250V/3.15A
<sup>Ⓒ</sup> 32	E02 127 382	FUSE	F61	1	
<sup>Ⓓ</sup> 33	E02 336 385	VARISTOR	NR61	1	
<sup>Ⓔ</sup> 34	E02 096 642	CHECK VALVE		1	
<sup>Ⓕ</sup> 35	E02 214 384	CZ SURGE ABSORBER	CZ	1	

MUH-18RV -E1

MUH-24RV -E1

MUH-30RV -E1

### 13-12. ACCESSORY PARTS



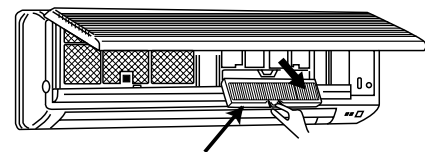
NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit			Remarks
				MUH-18RV-E1	MUH-24RV-E1	MUH-30RV-E1	
1	E02 444 704	DRAIN SOCKET		1			
	E02 329 704	DRAIN SOCKET			1	1	
2	E02 444 705	DRAIN CAP		2	6	6	φ33
	E02 444 706	DRAIN CAP		1			φ16

## 14 OPTIONAL PARTS

### 14-1. AIR CLEANING FILTER

- AIR CLEANING FILTER removes fine dust of 0.01 micron from air by means of static electricity.
- Normal life of AIR CLEANING FILTER is 4 months. However, when it becomes dirty, replace it as soon as possible.
- Clogged AIR CLEANING FILTER may reduce the air conditioner capacity or cause frost on the air outlet.
- DO NOT reuse AIR CLEANING FILTER even if it is washed.
- DO NOT remove or attach AIR CLEANING FILTER during unit operation.

Model	Part No.
MSH-18RV-E1 MSH-24RV-E1	MAC-1100FT
MSH-30RV-E1	MAC-1700FT

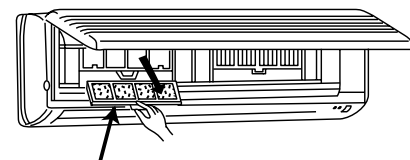


Air cleanig filter (White bellows type)

### 14-2. DEODORIZING FILTER

- DEODORIZING FILTER removes ammonia and hydrogen sulphide emitted from tobacco, and odor of pets.
  - Clean DEODORIZING FILTER every two weeks. If the filter is particularly dirty, clean the filter more often.
  - For cleaning, soak the filter in warm water for a while, and then wash and rinse it. Dry the filter in the shade thoroughly.
  - When the filter color is still dark even after cleaning, replace the filter with a new one.
- Replace the filter at least once a year.

Model	Part No.
MSH-18RV-E1 MSH-24RV-E1	MAC-1600DF
MSH-30RV-E1	MAC-2200DF



Deodorizing filter (Gray sponge type)

- DEODORIZING FILTER and AIR CLEANING FILTER can be attached on either side.

# MITSUBISHI ELECTRIC CORPORATION

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