Changes for the Better

MITSUBISHI ELECTRIC

FLOOR AND CEILING TYPE AIR CONDITIONERS

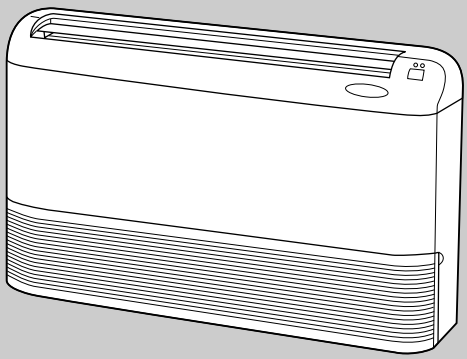
No. OB286

SERVICE MANUAL

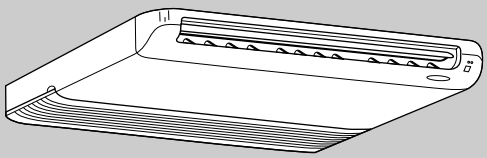
Wireless type
Models

MCFH-18TN-S1(WH) ·**MUCFH-18TN-S1**
MCFH-24TN-S1(WH) ·**MUCFH-24TN-S1**

(When installed on the floor)



(When installed on the ceiling)



CONTENTS

Mr.SLIM™

1 PART NAMES AND FUNCTIONS

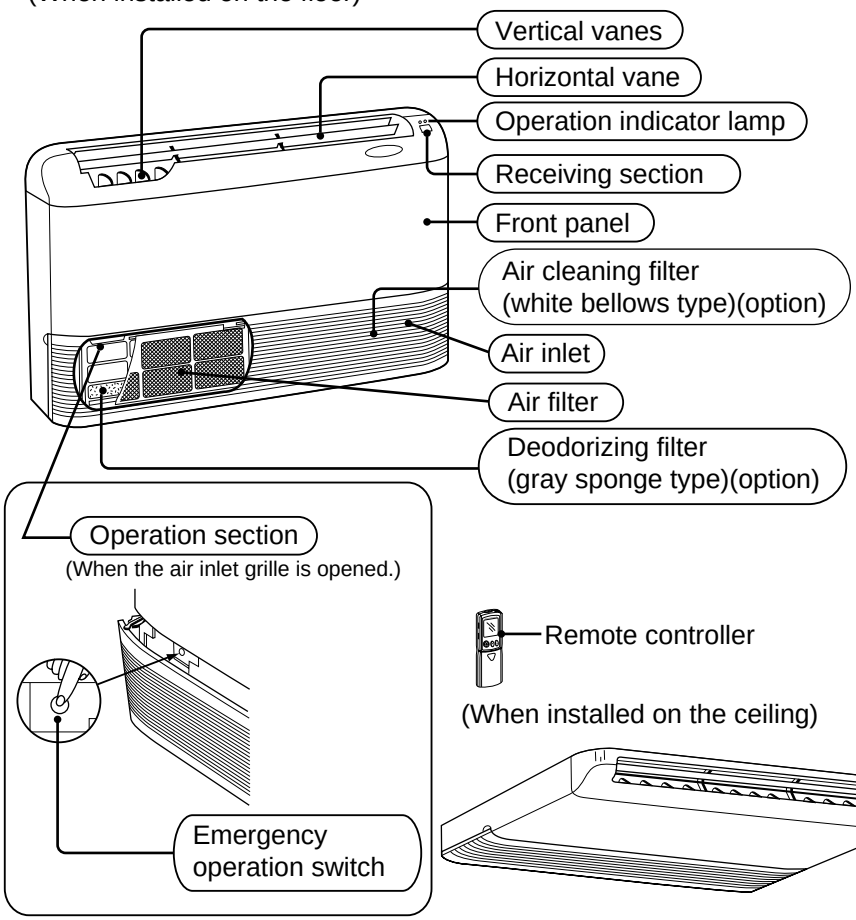
MCFH-18TN -S1 MCFH-24TN -S1

INDOOR UNIT

ACCESSORIES

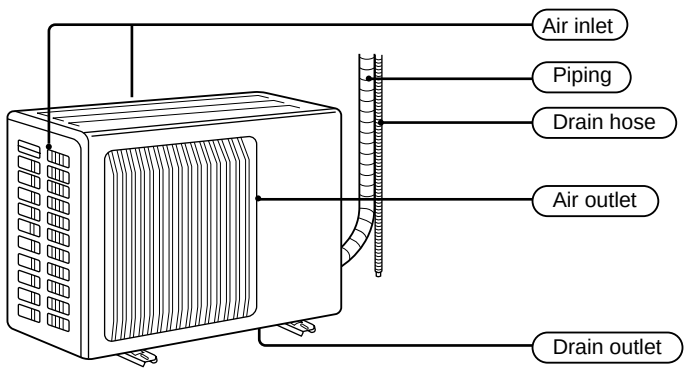
		MCFH-18TN-S1 MCFH-24TN-S1
①	Installation plate	2
②	Unit fixing screw 5 × 12mm	2
③	Wireless remote controller	1
④	Remote controller mounting hardware	1
⑤	Fixing screw for ④ 3.5 × 16mm (Black)	2
⑥	Battery (AAA) for remote controller	2
⑦	Drain hose	1
⑧	Drain pipe cover	1
⑨	Knockout cover	1
⑩	Screw for ⑨ 4 × 10mm	2

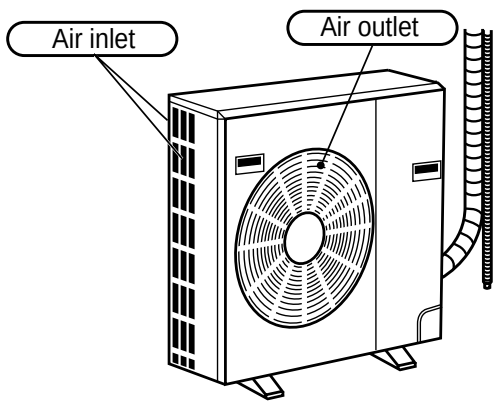
(When installed on the floor)



MUCFH-18TN -S1 **MUCFH-24TN -S1**

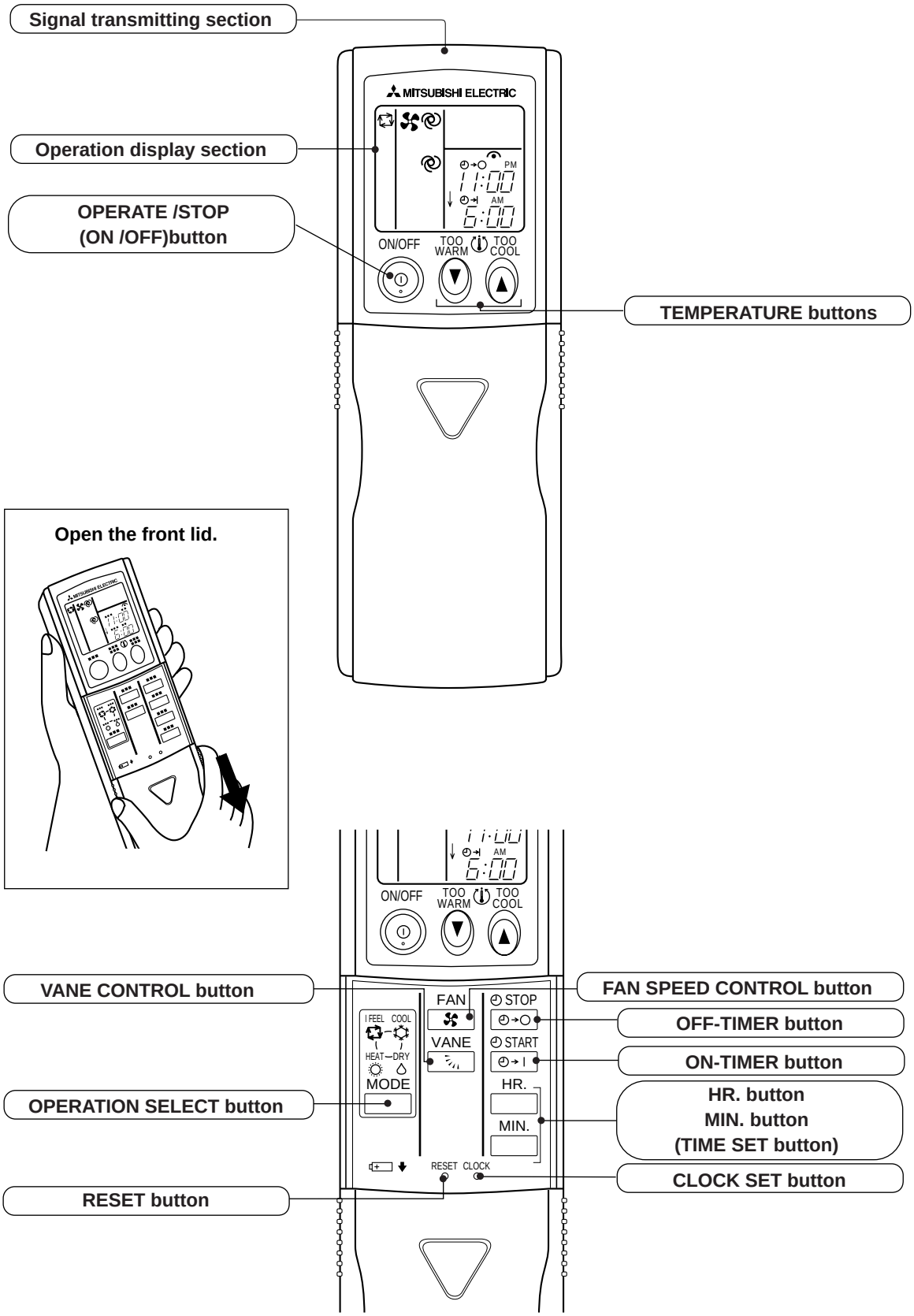
OUTDOOR UNIT





MCFH-18TN -S1 MCFH-24TN -S1

REMOTE CONTROLLER



2 SPECIFICATION

Model	MCFH-18TN - S1	
Function	Cooling	Heating
Power supply	Single phase, 220V, 60Hz	

SSA 385/386 ※1

Capacity		kW	4.3	5.5
		kcal/h	3,700	4,800
Electrical data	Current	A	12.1	9.7
	Input	W	2,500	2,100

JIS C 9612 (ISO 5151)

Capacity	Capacity	kW	5.1	5.5
	Dehumidification	ℓ /h	2.3	—
	Air flow※2 (High/Med./Low)	m³ /h	840/696/570	
Electrical data	Current	A	10.5	9.7
	Input	W	2,100	
	Power factor	%	98	
	Starting current	A	55	
	Compressor motor current	A	9.59	8.79
	Indoor fan motor current	A	0.42	
	Outdoor fan motor current	A	0.49	
Coefficient of performance (COP)			2.43	2.62

Fan motor	Model	Indoor unit	—	RB4N37-AA
		Outdoor unit	—	RA6V50-OG
	Winding resistance (at 20℃)	Indoor unit	Ω	WHT-BLK 100 YLW-BLU 33 BRN-RED 91 BLK-YLW 56 BLU-BRN 31
		Outdoor unit	Ω	WHT-BLK 116.4 BLK-RED 111.0
Compressor	Model		—	NH-30NCDT
	Output		W	1,300
	Winding resistance (at 20℃)		Ω	C-R 0.94 C-S 1.94
Dimensions	Indoor unit	Width	mm(in.)	1,100(43-5/16)
		Height	mm(in.)	650(25-5/8)
		Depth	mm(in.)	165(6-1/2)
	Outdoor unit	Width	mm(in.)	850(33-7/16)
		Height	mm(in.)	605(23-13/16)
		Depth	mm(in.)	290(11-7/16)
Weight	Indoor unit		kg(lb.)	26(58)
	Outdoor unit		kg(lb.)	58(128)
Special remarks	Air direction	Indoor unit	—	5
	Sound level (High)	Indoor unit	dB	48
		Outdoor unit	dB	52
	Fan speed(High/Med./Low)	Indoor unit	rpm	1,340/1,140/970
	Fan speed	Outdoor unit	rpm	865
	Fan speed regulator	Indoor unit	—	3
		Outdoor unit	—	1
	Thermistor RT11(at25℃)		kΩ	10
	Thermistor RT12(at25℃)		kΩ	10
	Thermistor RT61(at0℃)		kΩ	35
	Refrigerant filling capacity (R22)		kg(lb.)	1.70(3.75)
	Refrigerating oil (Model)		cc	850(MS32N1)

NOTE: 1. The values of Electrical data and Sound level indicated on the specification are based on the high speed operation of the fan.

2. Rating conditions : SSA 385/386 Cooling -Indoor DB29℃ WB19℃, Outdoor DB46℃ WB24℃
Heating -Indoor DB21℃ WB—— , Outdoor DB 7℃ WB 6℃
JIS C 9612 Cooling -Indoor DB27℃ WB19℃, Outdoor DB35℃ WB(24℃)
Heating -Indoor DB20℃ WB—— , Outdoor DB 7℃ WB 6℃

※1 SSA 385/386 can be applied only to Saudi Arabia.
Indoor-Outdoor piping length 7.5m

3. ※2 When fan speed or air flow is measured, set direction of vertical vane to front and set horizontal vane to position of 3.(As for position of vane, refer to 7-5. AUTO VANE OPERATION.)

Model			MCFH-24TN - S1	
Function			Cooling	Heating
Power supply			Single phase, 220V, 60Hz	

SSA 385/386 ※1

Capacity		kW	5.3	6.7
		kcal/h	4,550	5,780
Electrical data	Current	A	15.0	13.1
	Input	W	3,150	2,850

JIS C 9612 (ISO 5151)

Capacity	Capacity	kW	6.2	6.7
	Dehumidification	ℓ /h	3.4	—
	Air flow※2 (High/Med./Low)	m³ /h	840/696/570	
Electrical data	Current	A	12.7	13.1
	Input	W	2,650	2,850
	Power factor	%	95	99
	Starting current	A	56	
	Compressor motor current	A	11.64	12.04
	Indoor fan motor current	A	0.42	
	Outdoor fan motor current	A	0.64	
Coefficient of performance (COP)			2.34	2.35

Fan motor	Model	Indoor unit	—	RB4N37-AA
		Outdoor unit	—	RA6V85-AA
	Winding resistance (at 20℃)	Indoor unit	Ω	WHT-BLK 100 YLW-BLU 33 BRN-RED 91 BLK-YLW 56 BLU-BRN 31
		Outdoor unit	Ω	WHT-BLK 62.7 YLW-RED 62.9 BLK-RED 30.2
Compressor	Model		—	NH-38NBDT
	Output		W	1,700
	Winding resistance (at 20℃)		Ω	C-R 0.83 C-S 1.83
Dimensions	Indoor unit	Width	mm(in.)	1,100(43-5/16)
		Height	mm(in.)	650(25-5/8)
		Depth	mm(in.)	165(6-1/2)
	Outdoor unit	Width	mm(in.)	870(34/1/4)
		Height	mm(in.)	850(33-1/2)
		Depth	mm(in.)	295(11/5/8)
Weight	Indoor unit		kg(lb.)	26(58)
	Outdoor unit		kg(lb.)	72(159)
Special remarks	Air direction	Indoor unit	—	5
	Sound level (High)	Indoor unit	dB	48
		Outdoor unit	dB	54
	Fan speed(High/Med./Low)	Indoor unit	rpm	1,340/1,140/970
	Fan speed(High/Low)	Outdoor unit	rpm	740/560
	Fan speed regulator	Indoor unit	—	3
		Outdoor unit	—	2
	Thermistor RT11(at25℃)		kΩ	10
	Thermistor RT12(at25℃)		kΩ	10
	Thermistor RT61(at0℃)		kΩ	35
	Thermistor RT63(at0℃)		kΩ	35
	Refrigerant filling capacity (R22)		kg(lb.)	2.80(6.17)
	Refrigerating oil (Model)		cc	1,200(MS32N1)

NOTE: 1. The values of Electrical data and Sound level indicated on the specification are based on the high speed operation of the fan.

2. Rating conditions : SSA 385/386 Cooling -Indoor DB29℃ WB19℃, Outdoor DB46℃ WB24℃
Heating -Indoor DB21℃ WB—— , Outdoor DB 7℃ WB 6℃
JIS C 9612 Cooling -Indoor DB27℃ WB19℃, Outdoor DB35℃ WB(24℃)
Heating -Indoor DB20℃ WB—— , Outdoor DB 7℃ WB 6℃

※1 SSA 385/386 can be applied only to Saudi Arabia.
Indoor-Outdoor piping length 7.5m

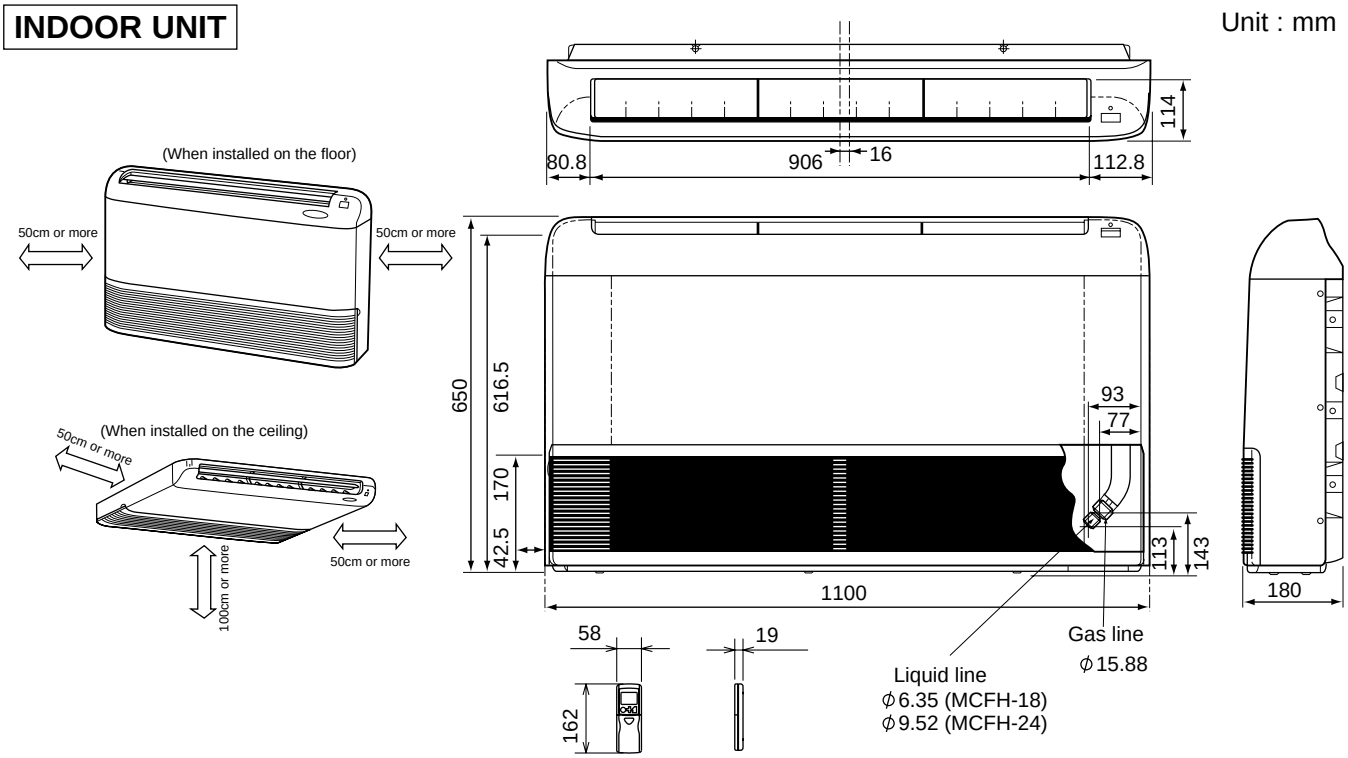
3. ※2 When fan speed or air flow is measured, set direction of vertical vane to front and set horizontal vane to position of 3.(As for position of vane, refer to 7-5. AUTO VANE OPERATION.)

3 OUTLINES AND DIMENSIONS

MCFH-18TN -S1 MCFH-24TN -S1

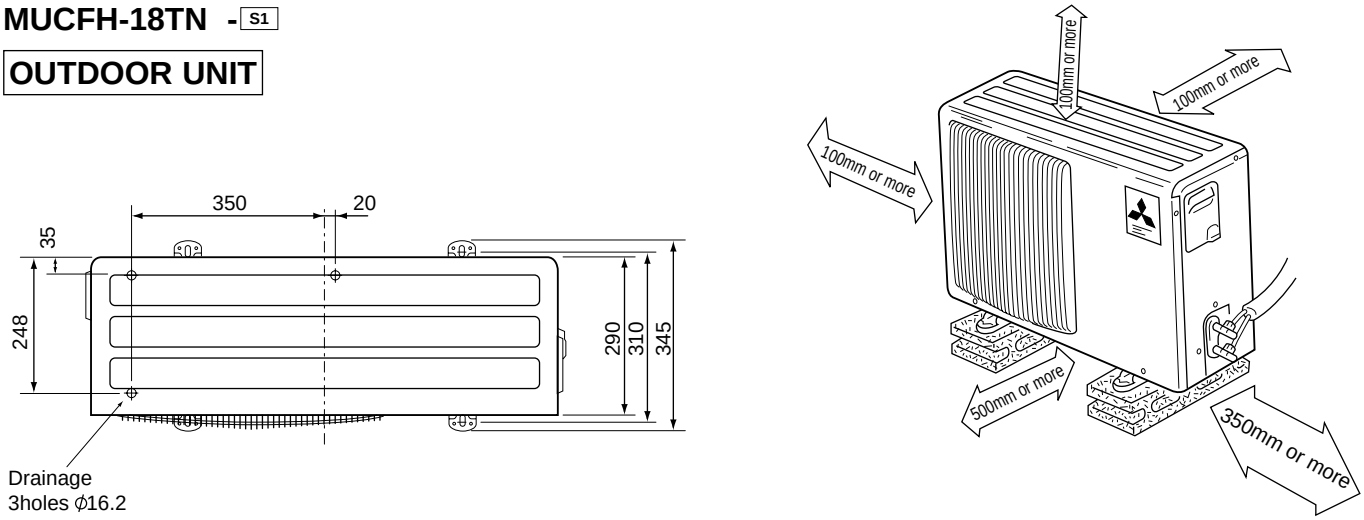
INDOOR UNIT

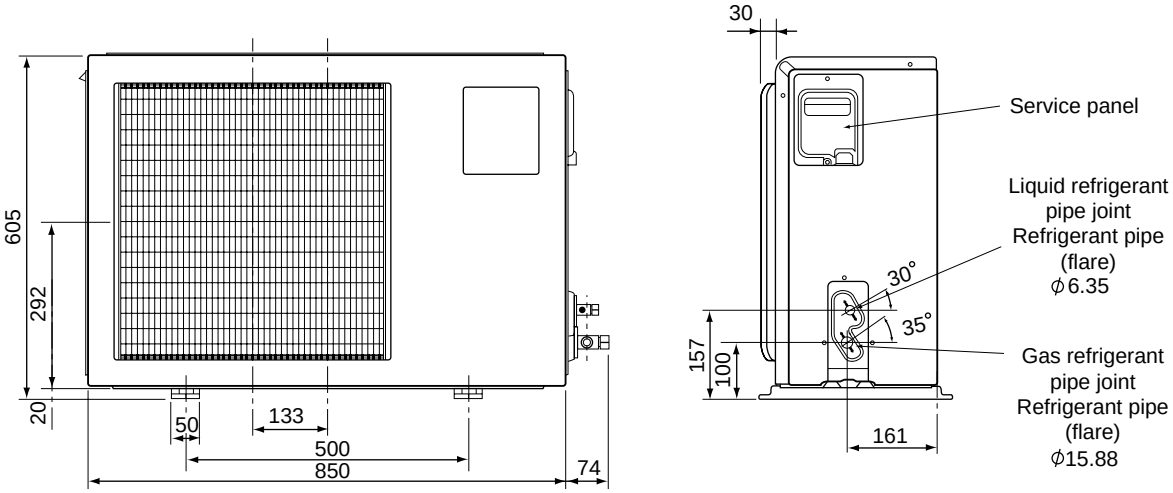
Unit : mm



MUCFH-18TN -S1

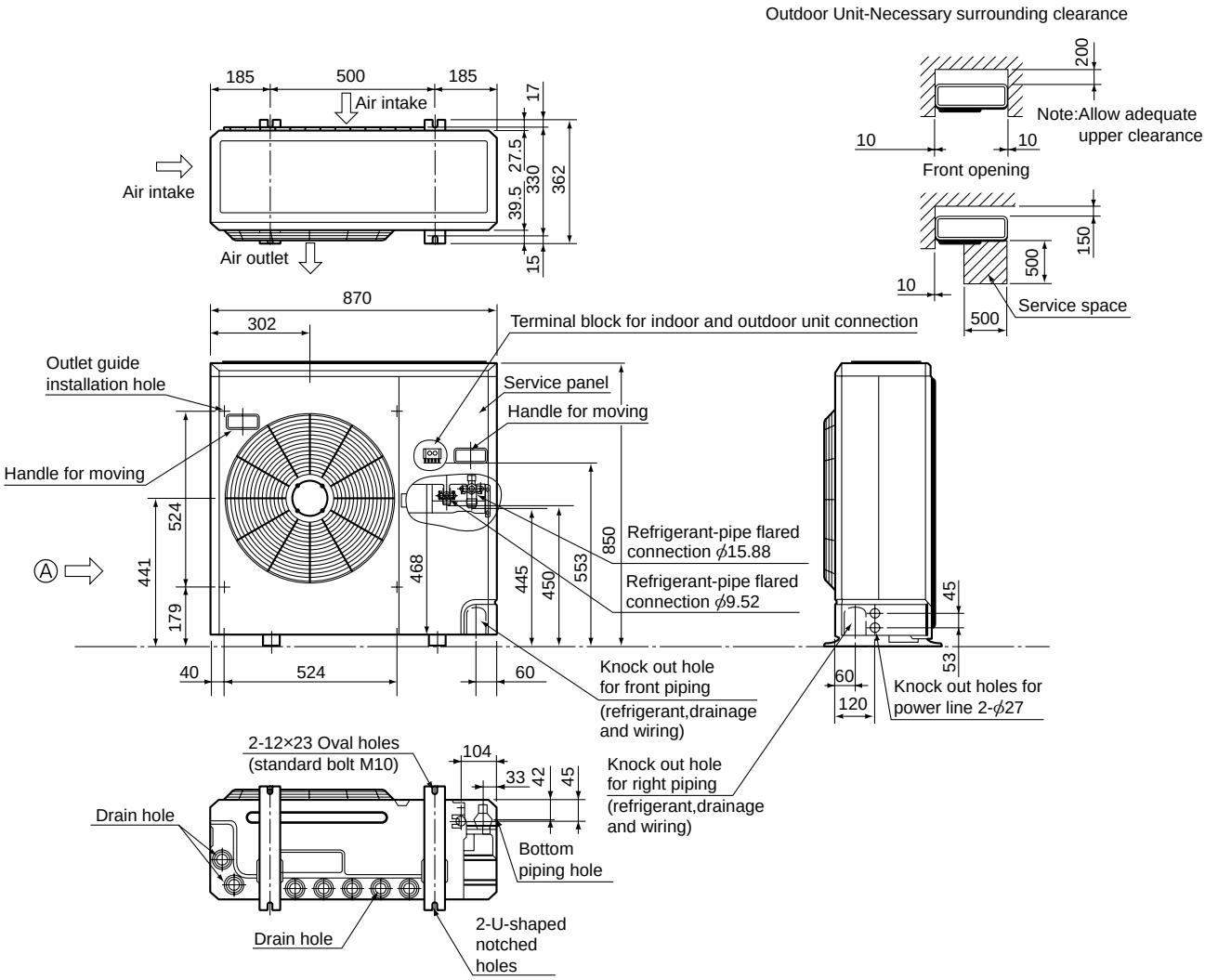
OUTDOOR UNIT





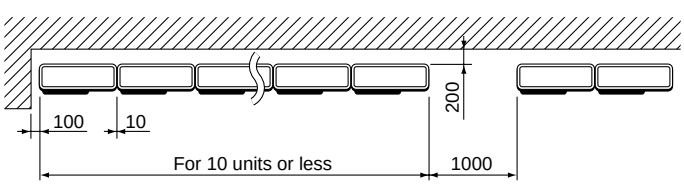
MUCFH-24TN - S1

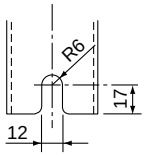
Unit : mm

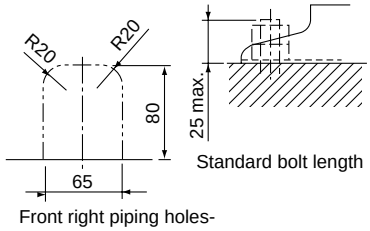


Outdoor Unit-Necessary surrounding clearance
(Concentrated installation)

The upper side must be open.





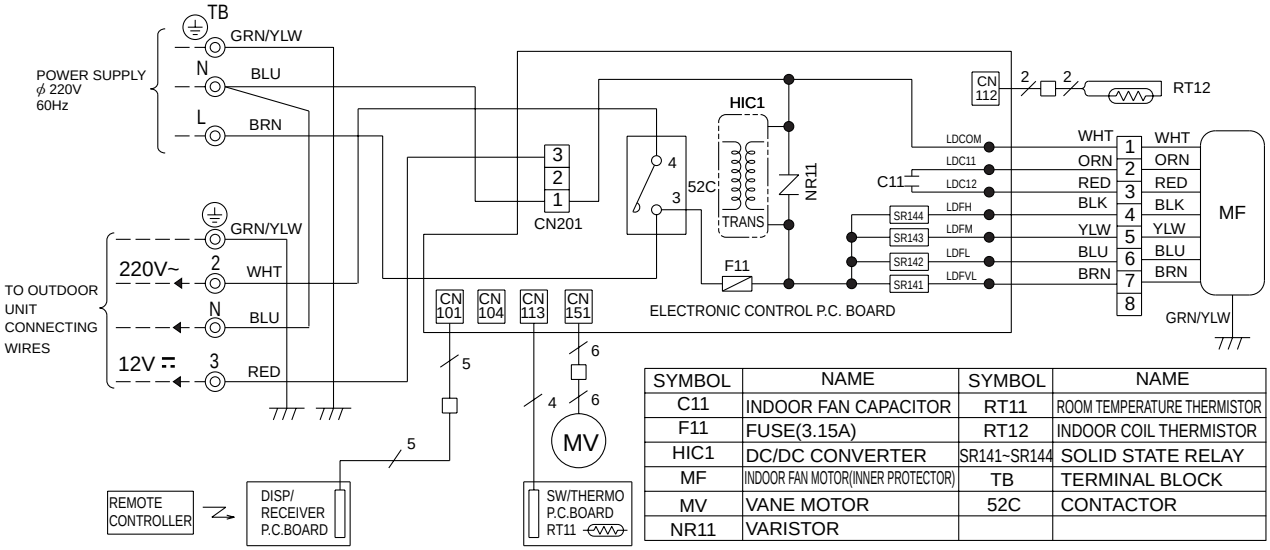


Front right piping holes-detail figures

4 WIRING DIAGRAM

MCFH-18TN -S1 MODEL WIRING DIAGRAM

INDOOR UNIT

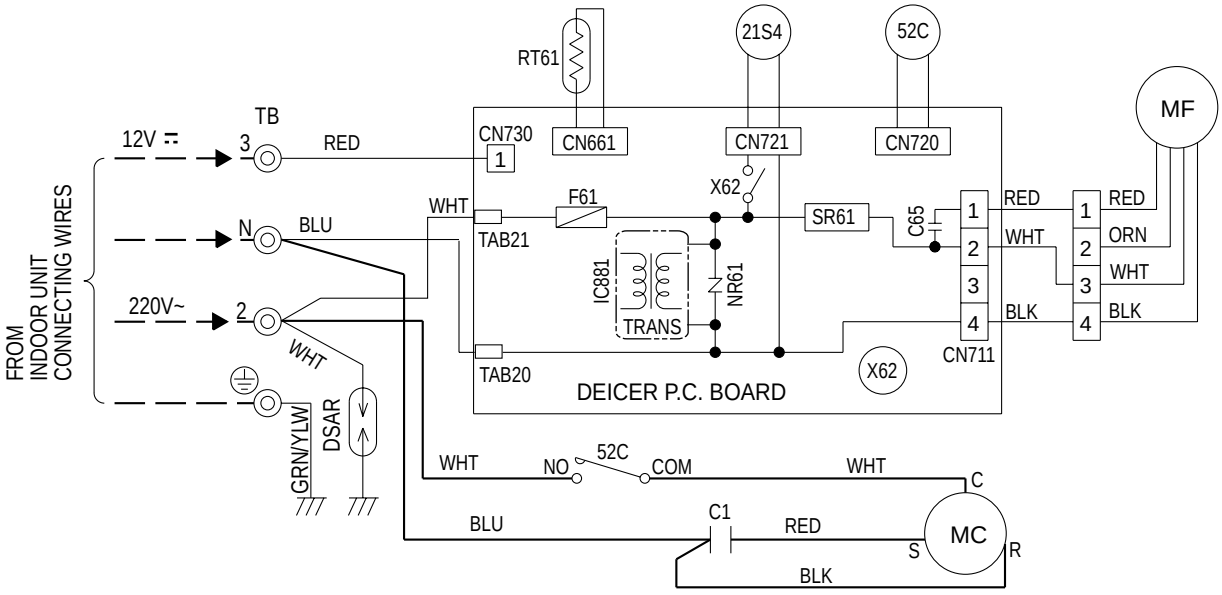


SYMBOL	NAME	SYMBOL	NAME
C11	INDOOR FAN CAPACITOR	RT11	ROOM TEMPERATURE THERMISTOR
F11	FUSE(3.15A)	RT12	INDOOR COIL THERMISTOR
HIC1	DC/DC CONVERTER	SR141~SR144	SOLID STATE RELAY
MF	INDOOR FAN MOTOR(INNER PROTECTOR)	TB	TERMINAL BLOCK
MV	VANE MOTOR	52C	CONTACTOR
NR11	VARISTOR		

NOTES: 1.About the outdoor side electric wiring refer to the outdoor unit electric wiring diagram for servicing. VG79B061H01
2.Use copper conductors only. (For field wiring)
3.Symbols below indicate.
◎ : Terminal block ⊏⊐⊏⊐ : Connector

MUCFH-18TN -S1 MODEL WIRING DIAGRAM

OUTDOOR UNIT

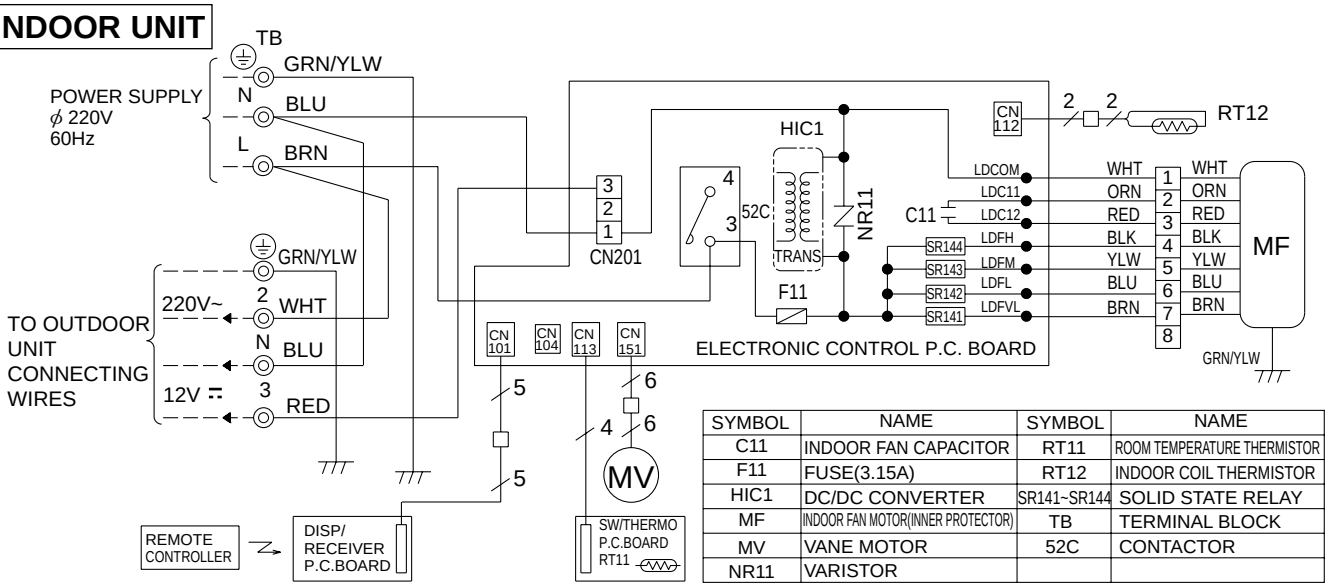


SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C1	COMPRESSOR CAPACITOR	MC	COMPRESSOR (INNER PROTECTOR)	TB	TERMINAL BLOCK
C65	OUTDOOR FAN CAPACITOR	MF	OUTDOOR FAN MOTOR (INNER PROTECTOR)	X62	R. V. COIL RELAY
DSAR	SURGE ABSORBER	NR61	VARISTOR	21S4	R. V. COIL
F61	FUSE (2A)	RT61	DEFROST THERMISTOR	52C	COMPRESSOR CONTACTOR
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. VG79B133H01
2.Use copper conductors only(For field wiring).
3.Symbols below indicate.
◎ : Terminal block ⊏⊐⊏⊐ : Connector

MCFH-24TN -S1 MODEL WIRING DIAGRAM

INDOOR UNIT



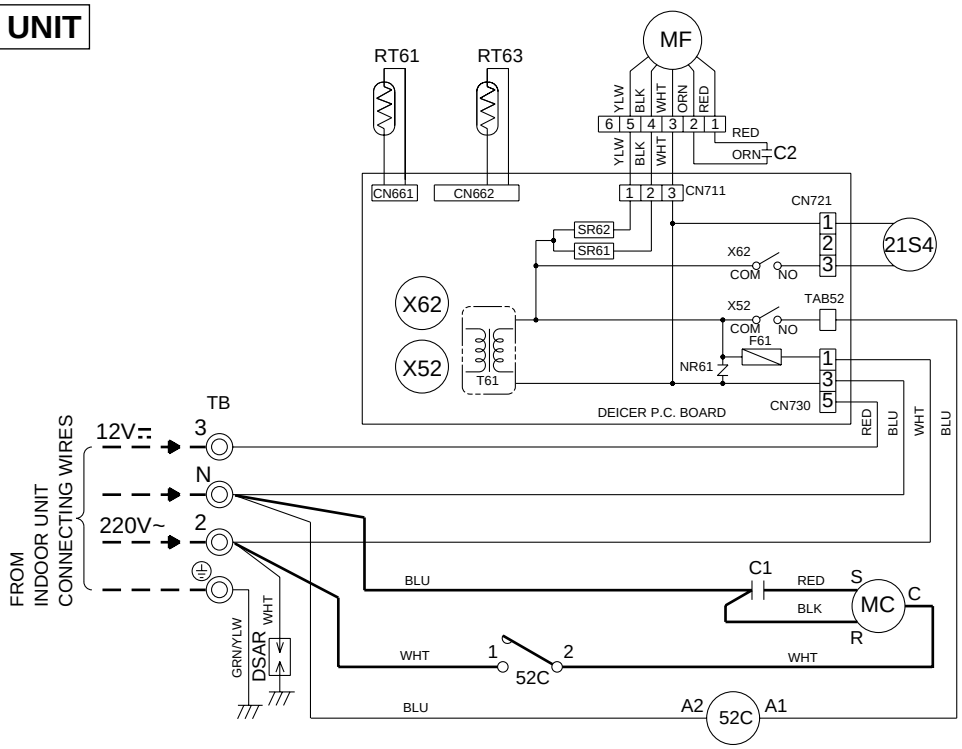
SYMBOL	NAME	SYMBOL	NAME
C11	INDOOR FAN CAPACITOR	RT11	ROOM TEMPERATURE THERMISTOR
F11	FUSE(3.15A)	RT12	INDOOR COIL THERMISTOR
HIC1	DC/DC CONVERTER	SR141~SR144	SOLID STATE RELAY
MF	INDOOR FAN MOTOR(INNER PROTECTOR)	TB	TERMINAL BLOCK
MV	VANE MOTOR	52C	CONTACTOR
NR11	VARISTOR		

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

VG79B062H01

MUCFH-24TN -S1 MODEL WIRING DIAGRAM

OUTDOOR UNIT



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

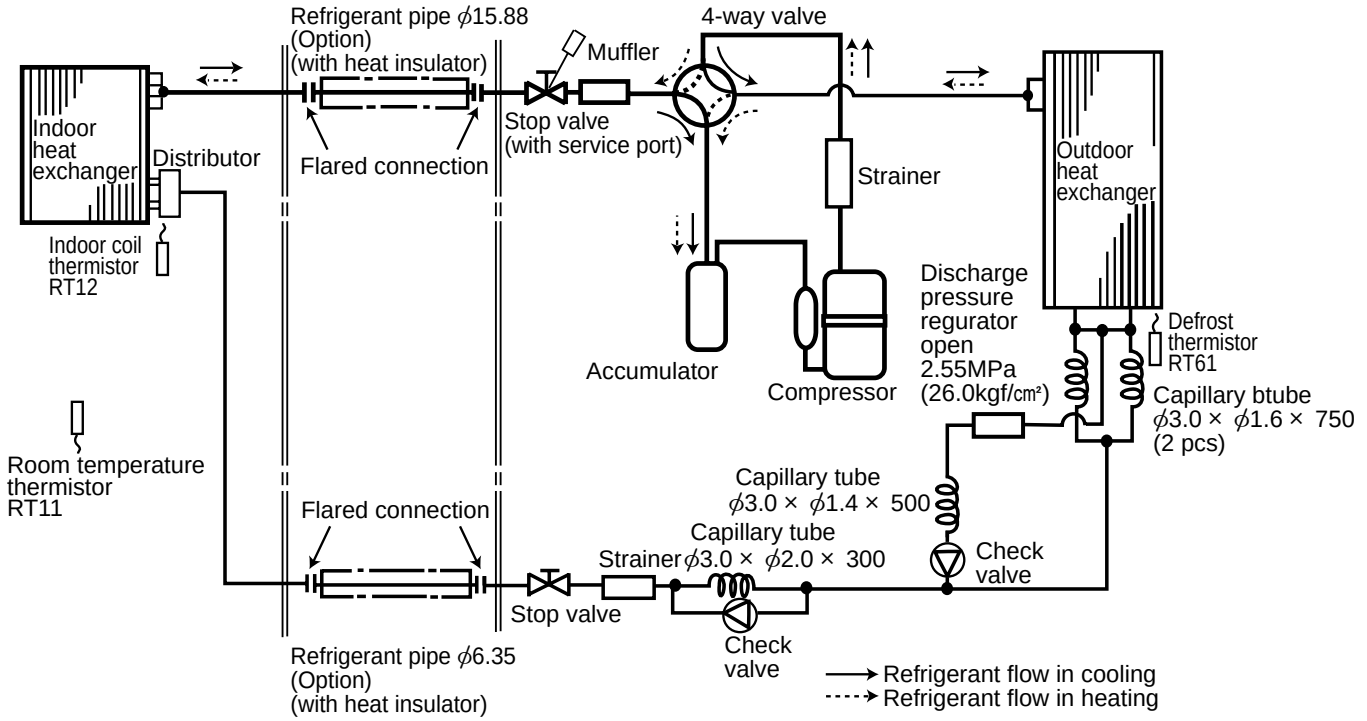
SG79B981H02

5 REFRIGERANT SYSTEM DIAGRAM

Unit:mm

MCFH-18TN -S1 **MUCFH-18TN -S1**

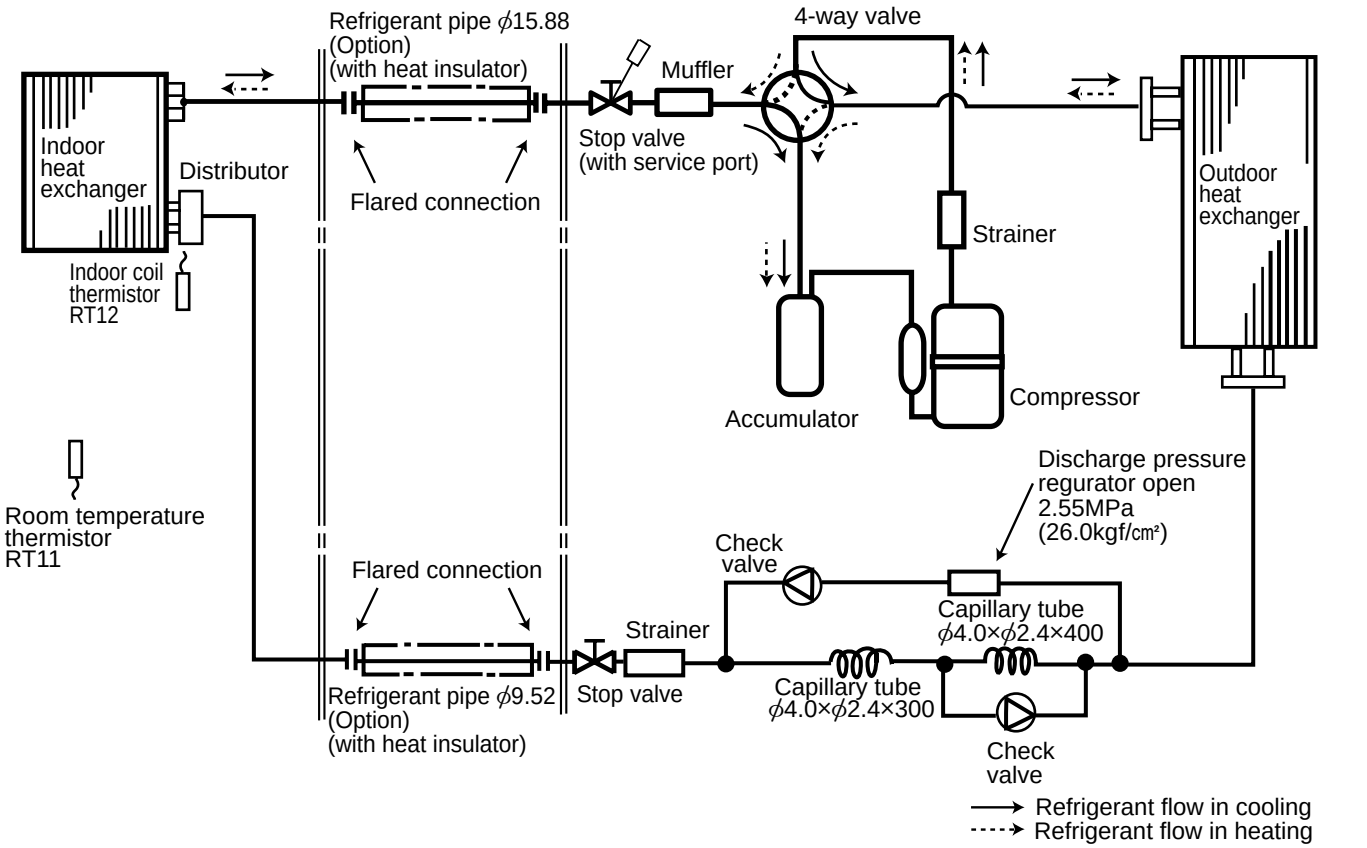
INDOOR UNIT **OUTDOOR UNIT**



Unit:mm

MCFH-24TN -S1 **MUCFH-24TN -S1**

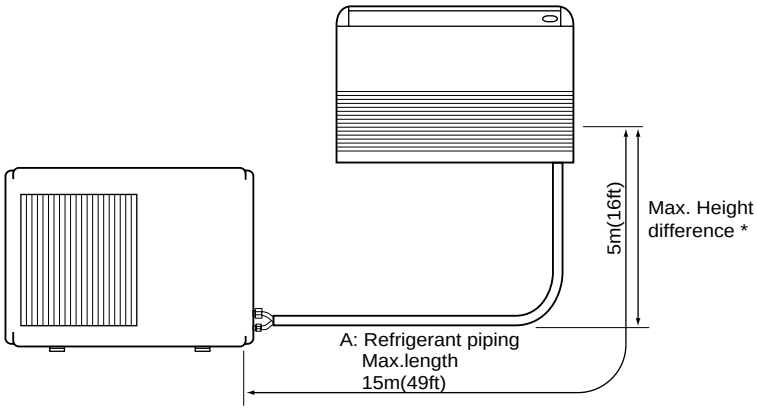
INDOOR UNIT **OUTDOOR UNIT**



MAX. REFRIGERANT PIPING LENGTH & MAX. HEIGHT DIFFERENCE

Model	Length : m(ft.) A	Piping size O.D. : mm (in.)	
		Gas	Liquid
MCFH-18TN - S1 **MUCFH-18TN -** S1	15(49)	ϕ15.88(5/8)	ϕ6.35(1/4)
MCFH-24TN - S1 **MUCFH-24TN -** S1			ϕ9.52(3/8)

※ It does not matter which unit is higher.



ADDITIONAL REFRIGERANT CHARGE (R22 : g)

If pipe length exceeds 7m, additional refrigerant (Freon 22) charge is required

Model	Outdoor unit:precharged	Refrigerant piping length (one way)								
		7m	8m	9m	10m	11m	12m	13m	14m	15m
MCFH-18TN - S1 **MUCFH-18TN -** S1	1,700	0	50	100	150	200	250	300	350	400
MCFH-24TN - S1 **MUCFH-24TN -** S1	2,800		65	130	195	260	325	390	455	520

Calculation : (MCFH-18TN)Xg=50g/m×(Refrigerant piping length (m)- 7)
(MCFH-24TN)Xg=65g/m×(Refrigerant piping length (m)- 7)

6 PERFORMANCE CURVES

MCFH-18TN - S1 **MUCFH-18TN -** S1
MCFH-24TN - S1 **MUCFH-24TN -** S1

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

198~242V, 60Hz

(2) AIR FLOW

Air flow should be set at MAX.

(3) MAIN READINGS

COOLING
(1) Indoor intake air wet-bulb temperature : ˚CWB
(2) Indoor outlet air wet-bulb temperature : ˚CWB
(3) Outdoor intake air dry-bulb temperature : ˚CDB
(4) Total input : W

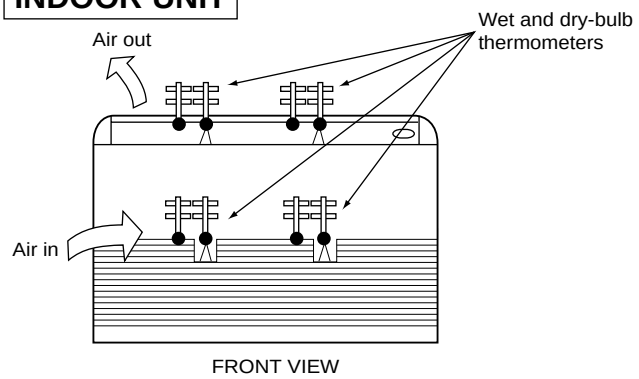
HEATING
(1) Indoor intake air dry-bulb temperature : ˚CDB
(2) Indoor outlet air dry-bulb temperature : ˚CDB
(3) Outdoor intake air wet-bulb temperature : ˚CWB
(4) Total input : W

Indoor air wet/dry-bulb temperature difference on the left side of the chart on page 12 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.

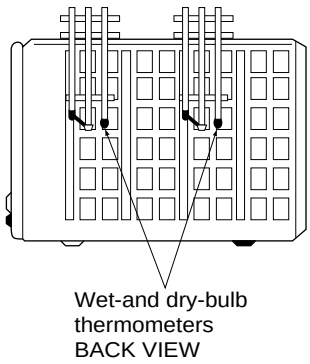
How to measure the indoor air wet-bulb/dry-bulb temperature difference

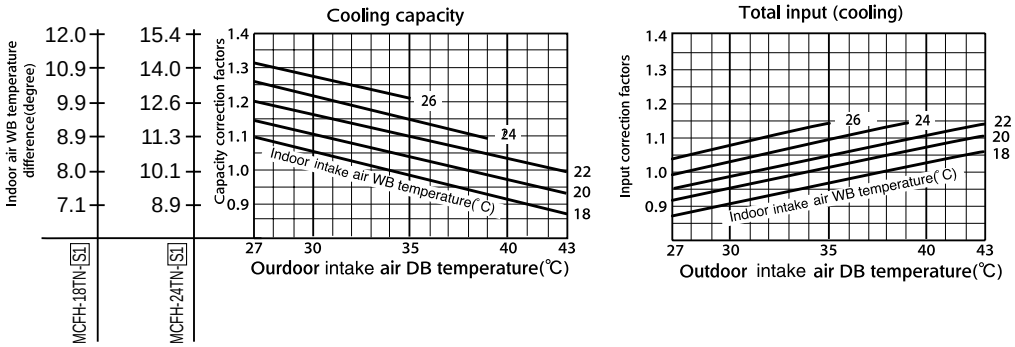
1. Attach at least 2 sets of wet and-dry-bulb thermometers to the indoor air inlet as shown in the figure, and at least 2 sets of wet and-dry-bulb thermometers to the indoor air outlet. The thermometers must be attached to the position where air speed is high.
2. Attach at least 2 sets of wet and-dry-bulb 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 the 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.

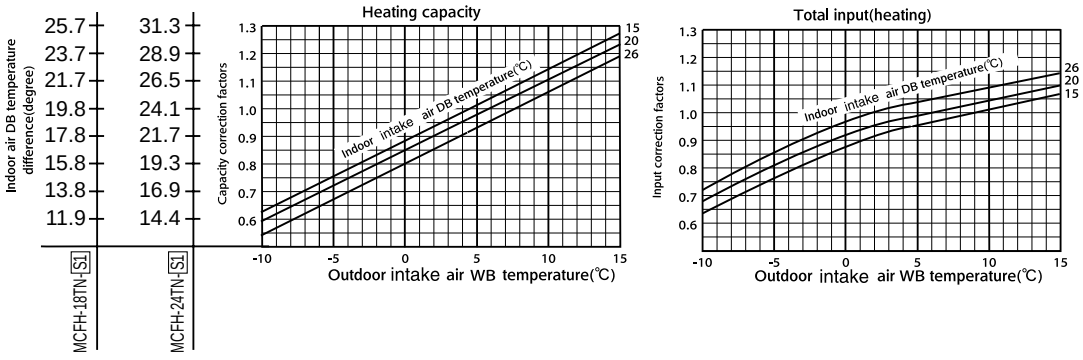
INDOOR UNIT



OUTDOOR UNIT







OUTDOOR LOW PRESSURE AND OUTDOOR UNIT CURRENT

COOL operation

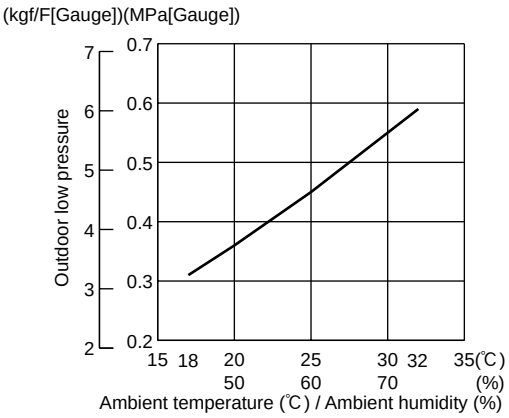
① Both indoor and outdoor units are under the same temperature/humidity condition.

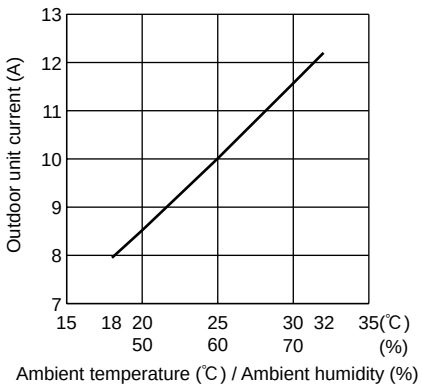
Dry Bulb temperature (˚C)	Relative humidity (%)
20	50
25	60
30	70

② Air flow should be set at MAX.

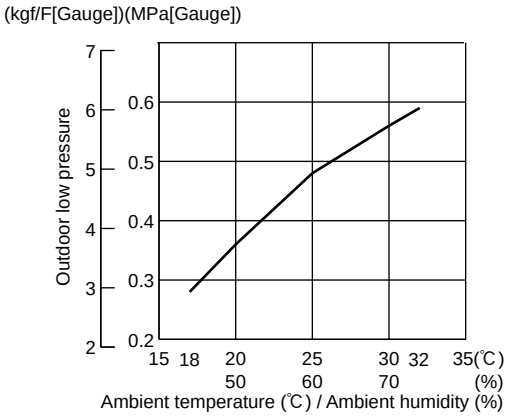
③ The unit of pressure has been changed to MPa on the international system of units(SI unit system).
The conversion factor is : **1(MPa [Gauge]) =10.2(kgf/㎠ [Gauge])**

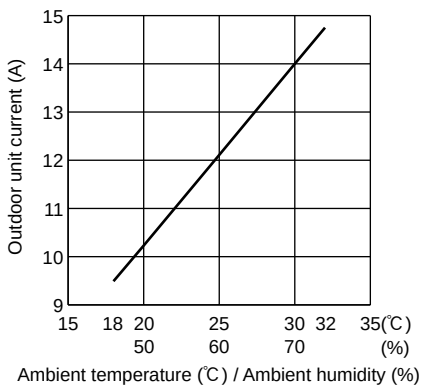
MUCFH-18TN- S1





MUCFH-24TN- S1



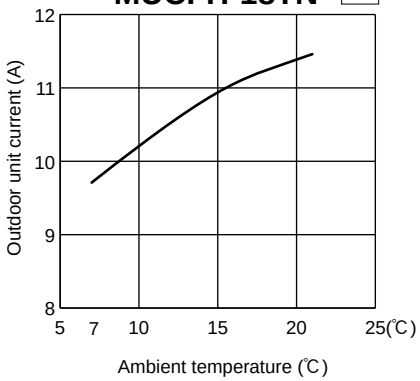


HEAT operation

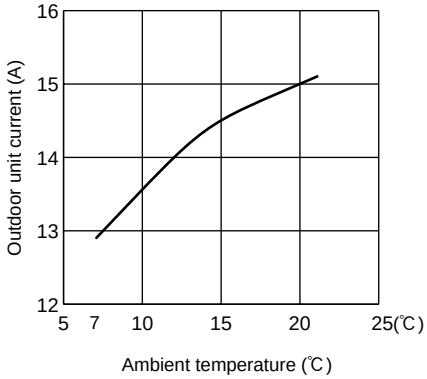
Condition Indoor : Dry bulb temerature 20.0℃
Wet bulb temerature 14.5℃

Outdoor : Dry bulb temerature 7,15,21℃
Wet bulb temerature 6,13,15.3℃

MUCFH-18TN- S1



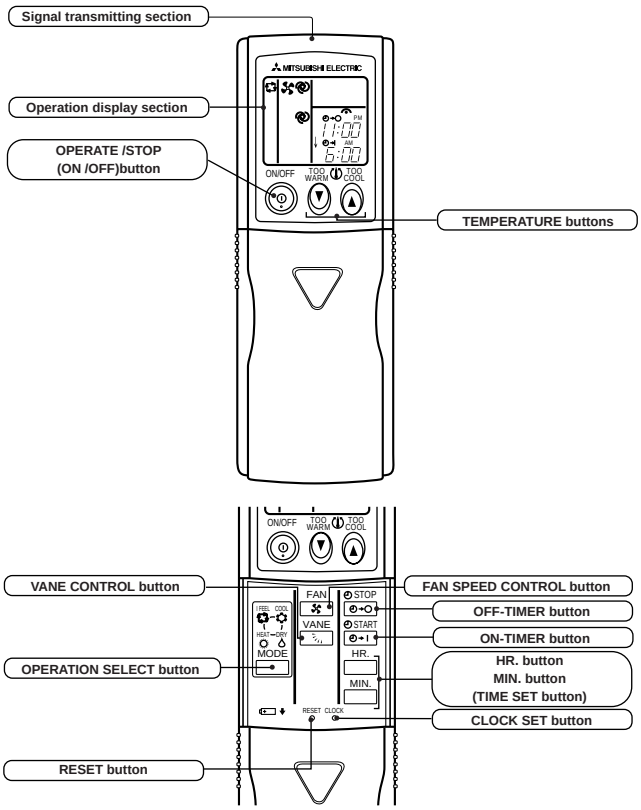
MUCFH-24TN- S1



7 MICROPROCESSOR CONTROL

MCFH-18TN -S1 MUCFH-18TN -S1
MCFH-24TN -S1 MUCFH-24TN -S1

WIRELESS REMOTE CONTROLLER



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 applies regardless of shape of the indicator.

Operation Indicator

lighted

not lighted

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 ℃ or more
☀ □	This shows that the room temperature is approaching the target temperature.	Approx. 2 ℃ or less

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.

7-1. "I FEEL CONTROL" OPERATION

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

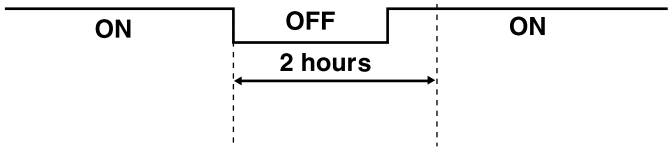
Initial room temperature	mode
25°C or more	COOL mode of "I FEEL CONTROL"
23°C to 25°C	DRY mode of "I FEEL CONTROL"
less than 23°C	HEAT mode of "I FEEL CONTROL"

- 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

Previous operation
COOL mode of
"I FEEL CONTROL"
or COOL mode

Restart
COOL mode of
"I FEEL CONTROL"

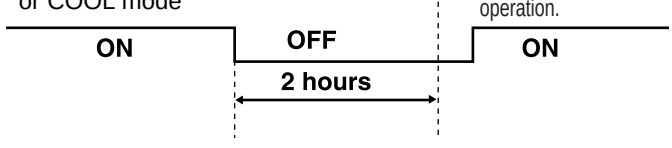


● When the system is restarted after 2 hours and more, the operation mode is determined by the room temperature at start-up of the operation.

Example

Previous operation
COOL mode of
"I FEEL CONTROL"
or COOL mode

Restart
COOL or DRY or HEAT mode of "I FEEL CONTROL" that is determined by room temperature at start-up of the operation.



(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 cold. 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.

TOO COOL ··· To raise the set temperature 1~2 degrees(°C)

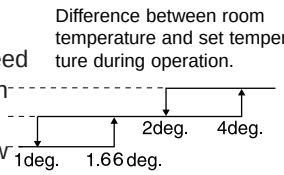
TOO WARM ··· To lower the set temperature 1~2 degrees(°C)

7-1-1. COOL mode of "I FEEL CONTROL"

1. Indoor fan speed control

Indoor fan operates continuously at the set speed by FAN SPEED CONTROL button regardless of the thermostat's OFF-ON.
In AUTO the fan speed is as follows.

Initial temperature difference	Fan Speed
Room temperature minus set temperature : 2 degrees or more	High
Room temperature minus set temperature : Between 1 and 2 degrees	Med.
Room temperature minus set temperature : less than 1 degree	Low



2. Coil frost prevention

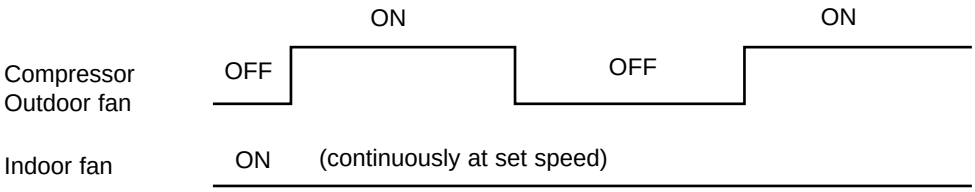
① Temperature control

When the indoor coil thermistor RT12 reads -1°C or below, 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 -1°C this mode prolonged until the RT12 reads over -1°C.

② Time control

When the three conditions as follows have been satisfied for 1 hour and 45 minutes, compressor stops for 3 minutes.
a. Compressor has been continuously operating.
b. Indoor fan speed is Low or Med..
c. 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
Example

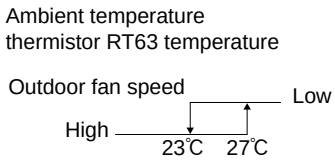


3. Outdoor fan control <MUCFH-24TN -S1 only>

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

Outdoor fan Low operation : When the outside temperature decreases to 23°C or less.
Until when the outside temperature goes to 27°C or more.

Outdoor fan High operation : Until when the outside temperature decreases to 23°C or less.
When the outside temperature goes to 27°C or more.



NOTE : When indoor fan Low operation and the outside temperature is 29℃ or less, the outdoor fan operates in Low.
Outdoor fan Low operation is cancelled according to the following conditions(① or ②):
① When the operation is not changed, and the outside temperature goes to 31℃ or more.
② When the operation is changed. (Change to other mode / Change of the indoor FAN speed)

7-1-2. 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.

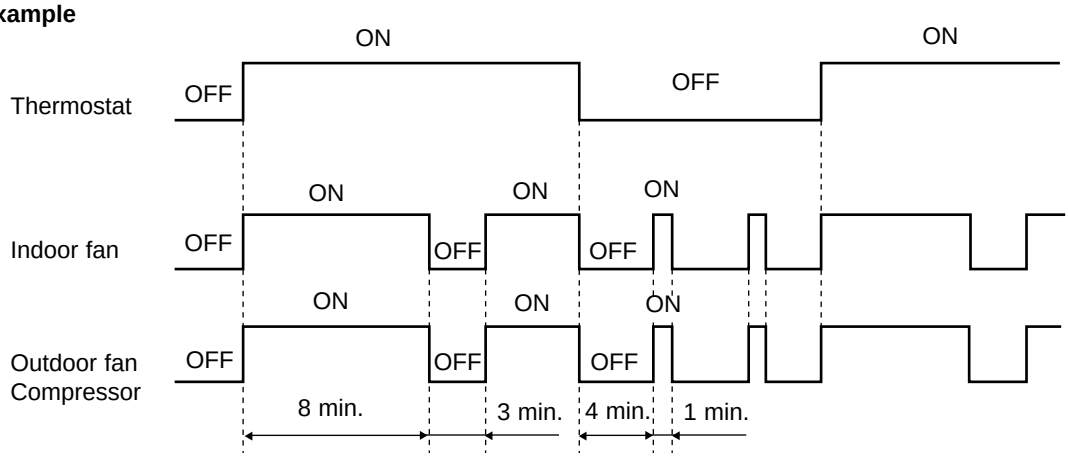
2. The operation of the compressor and indoor / outdoor fan

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

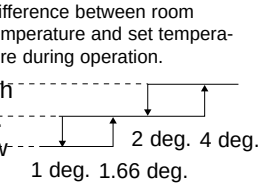


7-1-3. HEAT mode of "I FEEL CONTROL"

1. Indoor fan speed control

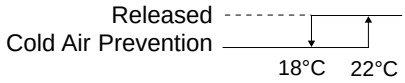
(1) In AUTO the fan speed is as follows.

Initial temperature difference	Fan speed
Room temperature minus set temperature: 2 degrees or more	High
Room temperature minus set temperature: Between 1 and 2 degrees	Med.
Room temperature minus set temperature: less than 1 degree	Low



(2) Cold air prevention control

The fan runs at set speed when the indoor coil thermistor RT12 temperature exceeds 22°C. The fan operates at Very Low when the temperature is below 18°C. But the fan stops when the indoor fan operates at Very Low and the 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) New 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.

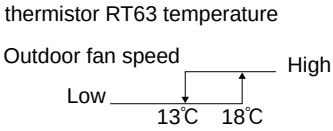
NOTE : When the thermostat turns on, the fan operates at the set speed. Due to the cold air prevention control, the fan does not start until the indoor coil thermistor RT12 reads 22°C or more.

2. Outdoor fan control <MUCFH-24TN -S1 only>

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

Outdoor fan Low operation : Until when the outside temperature decreases to 13°C or less.
When the outside temperature goes to 18°C or more.

Outdoor fan High operation : When the outside temperature decreases to 13°C or less.
Until when the outside temperature goes to 18°C or more.

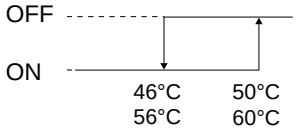


3. High pressure protection

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

Outdoor fan OFF : 50°C(MCFH-18TN)
60°C(MCFH-24TN)

Outdoor fan ON : 46°C(MCFH-TN)
56°C(MCFH-24TN)

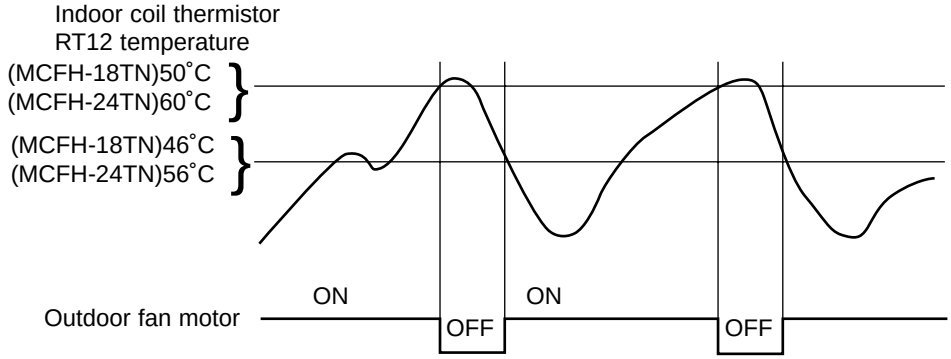


Outdoor fan motor turn OFF

Outdoor fan motor turn ON

High pressure protection time chart

Example



NOTE : When the outdoor fan is OFF in heating, defrosting of outdoor heat exchanger is not detected by the defrost thermistor RT61.

4. Defrosting

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

(1) Defrost starting conditions

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

a) Under the heat operation, the compressor cumulative operation time exceeds 40 minutes without the defrosting operation working.

b) The defrost thermistor RT61 reads - 3°C or less.

c) After releasing the high pressure protection, 4 minutes and 15 seconds have elapsed.

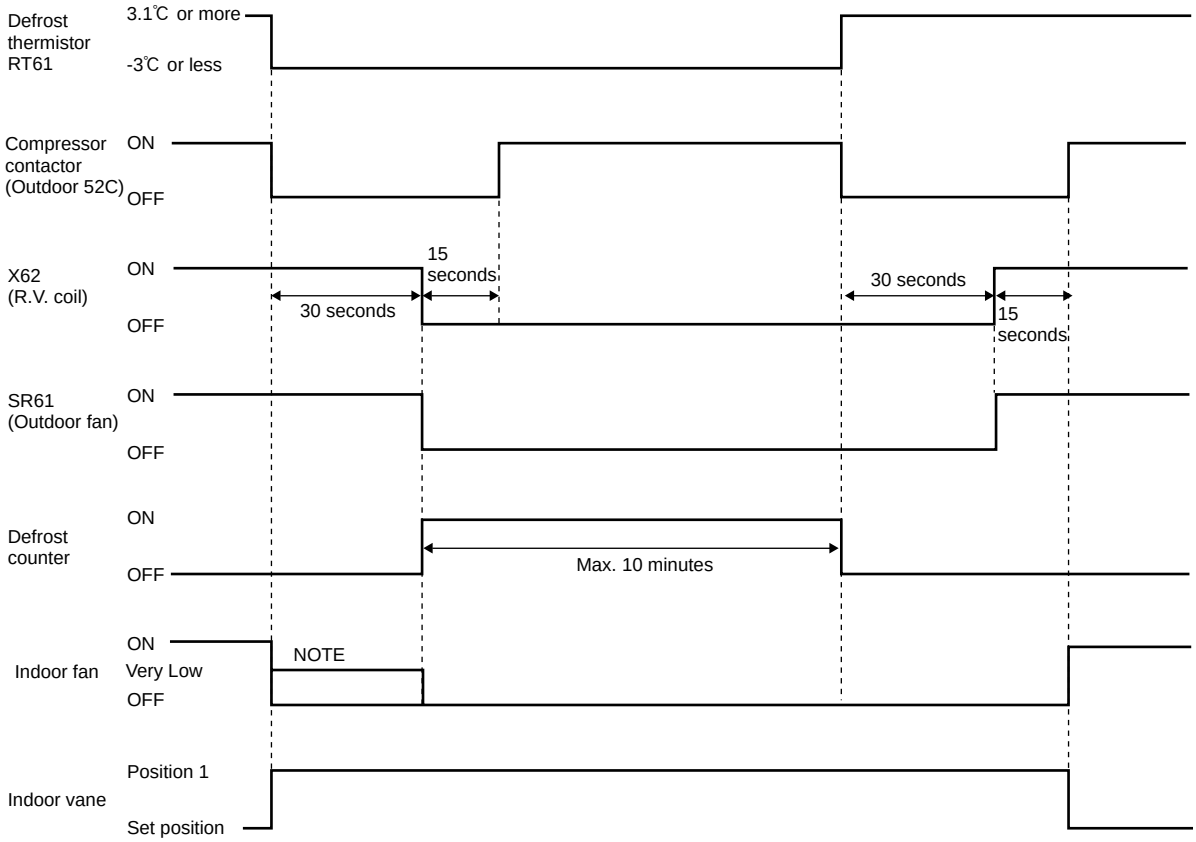
(2) Releasing conditions of defrost

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

d) The defrost thermistor RT61 reads 3.1°C or more.

e) The defrosting time exceeds 10 minutes.

(3) Defrosting time chart



NOTE ● When the indoor coil thermistor reads above 18°C, indoor fan operates at Very Low for 30 seconds.

● When the indoor coil thermistor reads 18°C or less, the indoor fan stops.

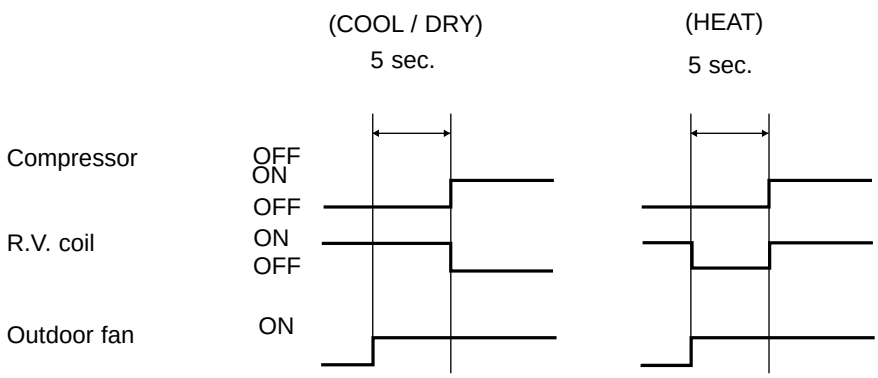
5. R.V. coil control

Heating · · · · · ON

Cooling · · · · · OFF

Dry · · · · · · · · · OFF

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

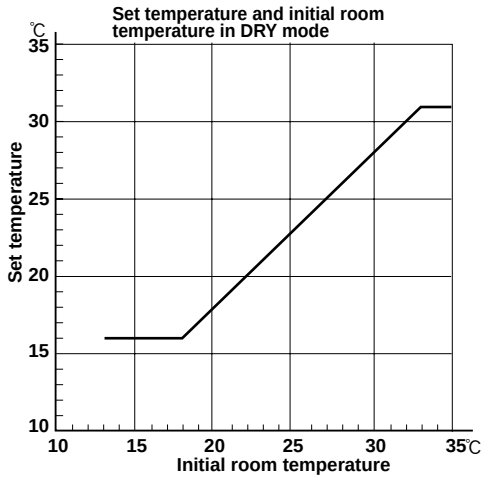


7-2. COOL OPERATION

(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)
The setting range is 16 ~ 31°C
※ Indoor fan continues to operate regardless of thermostat's OFF-ON
※ Coil frost prevention is as same as COOL mode of "I FEEL CONTROL"

7-3. 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.
(5) When DRY operation works, the fan speed is lower than cool operation.

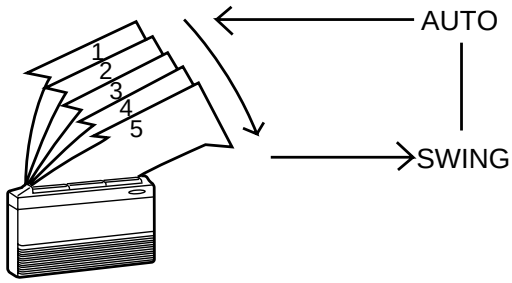


7-4. HEAT OPERATION

(1) Press OPERATE/STOP (ON/OFF) button.
OPERATION INDICATOR lamp on 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 same as HEAT mode of "I FEEL CONTROL".

7-5. AUTO VANE OPERATION

(1) Vane motor drive
This series is equipped with a stepping motor for the vane. The rotating direction, speed, and angle of the motor are controlled by pulse signals (approx. 12V, transmitted from indoor microprocessor.)
(2) Each time the VANE CONTROL button is pressed, angle of horizontal vane is changed in sequence, from 1, 2, 3, 4, 5, SWING to AUTO.

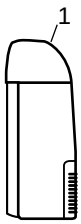


(3) Positioning
The vane is once pressed to the vane stopper to confirm the standard position and then set to the desired angle.
Confirming of standard position is performed in case of follows.
(a) When the OPERATE/STOP (ON/OFF) button is pressed (POWER ON/OFF).
(b) When the vane control is changed from AUTO to MANUAL.
(c) When the SWING is finished.
(d) When the test run starts.
(e) When the power supply turns ON.

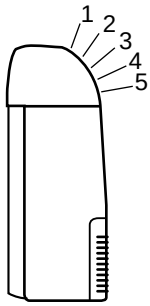
(4) VANE AUTO ( ) mode

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

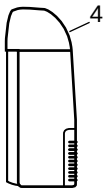
1.In COOL and DRY operation



Vane angle is fixed to position 1.



2.In HEAT operation



Vane angle is fixed to position 4.

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

When the following cases occur, the 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 position 4 or 5 when the compressor cumulative operation time exceeds 1 hour, the angle of horizontal vane automatically changes to Position 1 for dew prevention.

(7) SWING MODE ( )

By selecting SWING mode with the VANE CONTROL button, the horizontal vane swings vertically between Position 1 and 5 in COOL and DRY operation, between Position 2 and 4 in HEAT operation. The remote controller displays " ".

(8) Cold air prevention in HEAT operation.

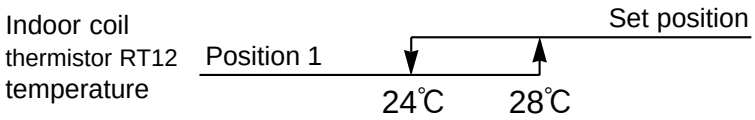
When either of the following conditions occurs in HEAT operation, the angle of horizontal vane automatically changes to Position 1 to prevent cold air blowing on users.

① Compressor is not operating.

② Defrosting is performed.

③ Indoor coil thermistor RT12 reads 24℃ or below.

④ Indoor coil thermistor RT12 temperature is raising from 24℃ or below, but it does not exceed 28℃.



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

7-6. 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.

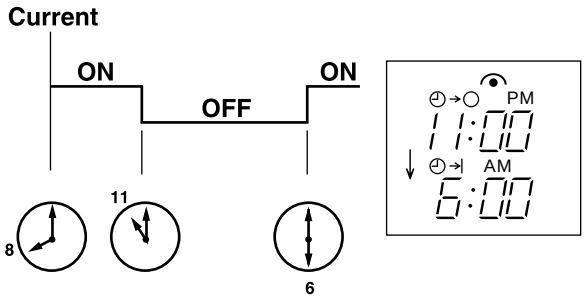
To cancel the OFF timer, press the “OFF-TIMER” button.

TIMER is cancelled and the display of set time disappears.

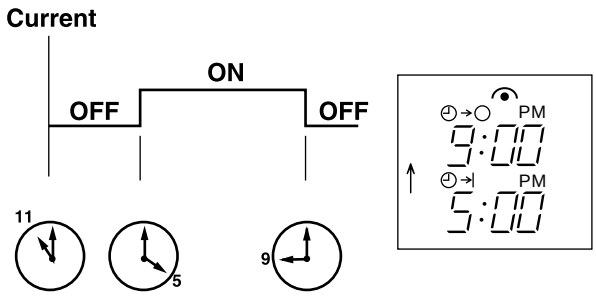
PROGRAM TIMER

- 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.



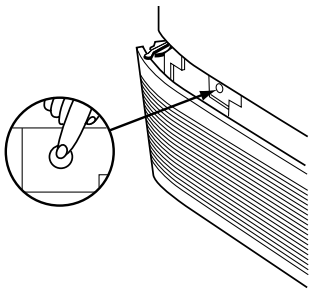
NOTE : TIMER setting will be cancelled by power failure or breaker functioning.

7-7. 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.

EMERGENCY OPERATION switch



• The following indication applies regardless of shape of the indicator.

OPERATION INDICATOR lamp

Press once	<Cool>	□
Press again	<Heat>	□
Press once again	<Stop>	□ □

8 SERVICE FUNCTIONS

MCFH-18TN -S1 MUCFH-18TN -S1
MCFH-24TN -S1 MUCFH-24TN -S1

8-1. COMPULSORY DEFROSTING MODE FOR SERVICE

By short circuit of the connector JP607 and R853(MUCFH-18TN)/ JPG1 and R871(MUCFH-24TN) on the outdoor deicer P.C. board, defrosting mode can be accomplished regardless of the defrost interval restriction. (Refer to page 33 or 34.)
Defrost thermistor RT61 must read below -3°C.

8-2. CHANGE IN DEFROST SETTING

MUCFH-18TN

<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 33.)

MUCFH-24TN

<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 34.)

Model	Jumper wire	Change point
MUCFH-18TN -S1	JPC	Defrost interval time changes from 40 minutes to 15 minutes.
	JPE	Defrost start temperature changes from -3℃ to 0℃. Defrost finish temperature changes from 3℃ to 10℃.

Model	Jumper wire	Change point
MUCFH-24TN -S1	JRF	Defrost interval time changes from 40 minutes to 15 minutes.
	JRG	Defrost start temperature does not change.(-3.0℃) Defrost finish temperature changes from 3℃ to 15℃.

8-3. TIMER SHORT MODE

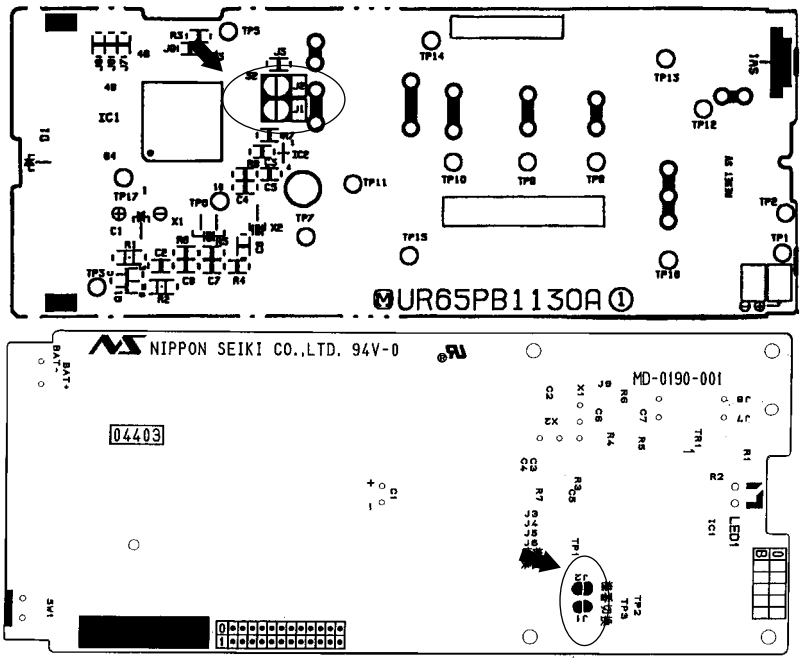
For service, set time can be shortened by short circuit of JPG and JPS the electronic control P.C. board.
The time will be shortened as follows.
Set time : 1 minute → 1-second
Set time : 3 minute → 3-second (It takes 3 minutes for the compressor to start operation. However, the starting time is shortened by short circuit of JPG and JPS.)

8-4. 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 press the OPERATE/STOP(ON/OFF)button twice or 3 times at first.
After finish remodelling, put back the batteries then press 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, press 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

How to set the remote controller exclusively for particular indoor unit

After you turn the breaker ON, the first remote controller that sends the signal to the indoor unit will be regarded as the remote controller for the indoor unit.
The indoor unit will only accepts the signal from the remote controller that has been assigned to the indoor unit once they are set.
The setting will be cancelled if the breaker has turned off, or the power supply has shut down.
Please conduct the above setting once again after the power has restored.

9 TROUBLESHOOTING

MCFH-18TN -S1 MUCFH-18TN -S1
MCFH-24TN -S1 MUCFH-24TN -S1

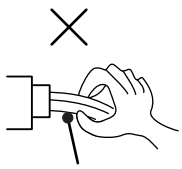
9-1. Cautions on troubleshooting

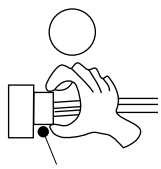
1. Before troubleshooting, check the following:

(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 has completely closed, turn off the breaker.
(2) Be sure to unplug the power cord before removing the air inlet grille, the front panel, the cabinet, the top panel and the electronic control P.C. boards.
(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.


Lead wiring


Housing point

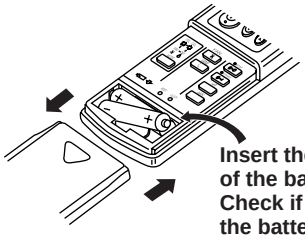
3. Troubleshooting procedure

(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) 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.
(3) When troubleshooting, refer to the flow chart and the check table on page 25.

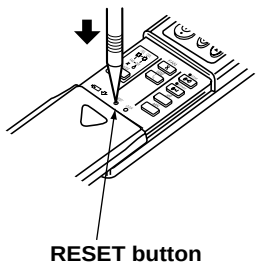
4. How to replace batteries

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 re-attach the front lid.

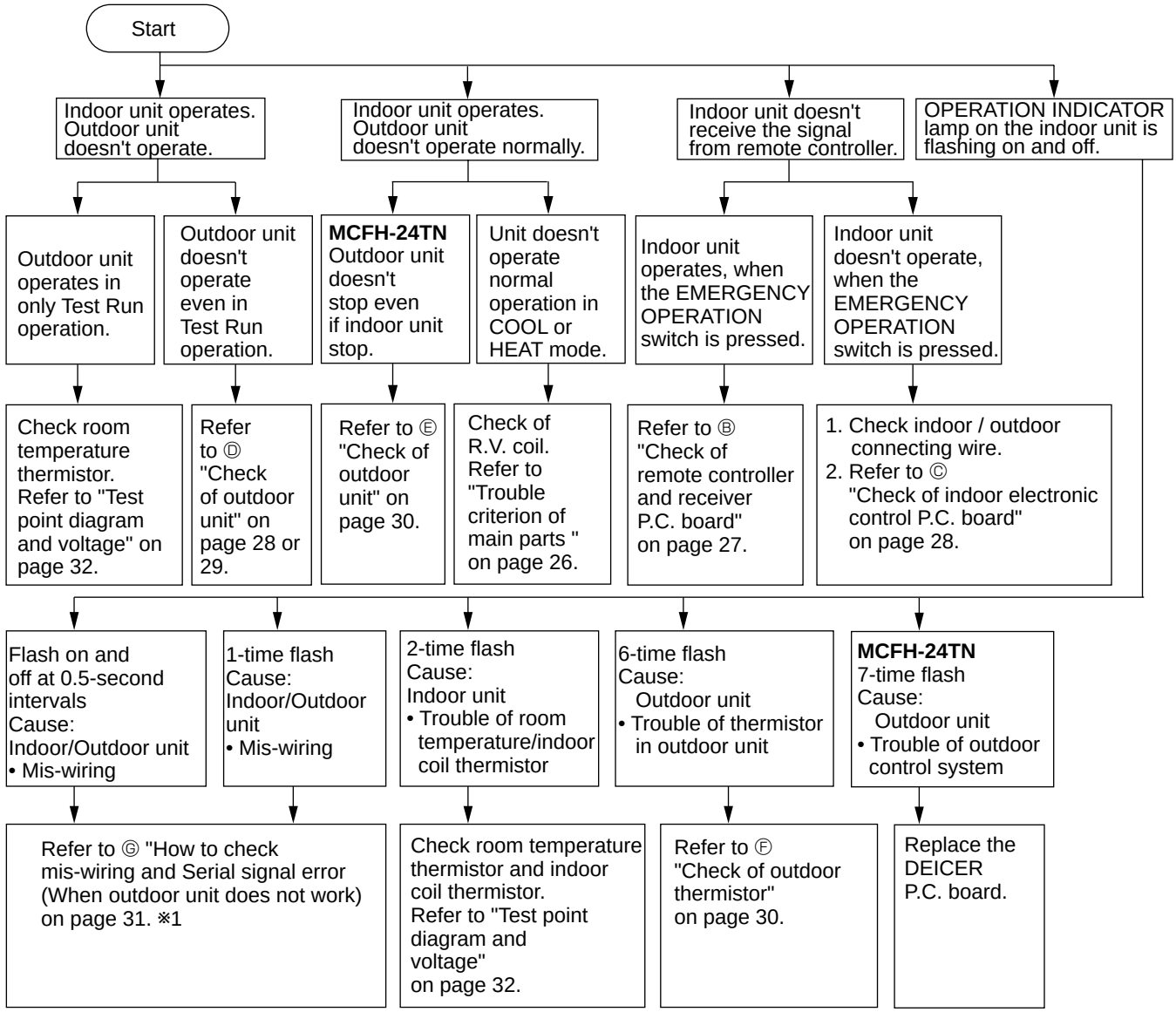

Insert the negative pole of the batteries first. Check if the polarity of the batteries are correct.

② Press the RESET button with tip end of ball point pen or the like, and then use the remote controller.


RESET button

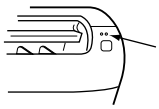
NOTE : If the RESET button is not pressed, the remote controller may not operate correctly.

9-2. Instruction of troubleshooting



※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



OPERATION INDICATOR lamp

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

Self check table

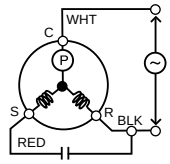
No.	Abnormal point	Indication	Symptom	Detect method	Check point
1	Mis-wiring	0.5-second ON ○●○●○●○●○ 0.5-second OFF	Outdoor unit does not run.	When serial signal stops for 4 to 5 seconds after 1st on of 52C contactor by POWER turning on.	• Check wiring. (visual check and conductivity check) • Check indoor electronic control P.C.board. • Check outdoor DEICER P.C. board. • Check electrical parts.
	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 Room temperature thermistor	2-time flash ●○●○○○○○○●○●○○○○○○●○ 2.5-second OFF	Outdoor unit does not run.	Detect Indoor coil/room temperature thermistor short or open circuit every 2 seconds during operation.	• Check resistance of thermistor. • Re-connect connector. • Check indoor electronic control P.C. board.
3	Outdoor thermistor	6-time flash ●○●○●○●○●○●○○○○○●○ 2.5-second OFF	Outdoor unit does not run.	When the outdoor thermistor short or open after the compressor start-up.	• Check resistance of thermistor. • Reconnect connector. • Check outdoor DEICER P.C. board.
4	Outdoor control system error	7-time flash ●○●○●○●○●○●○●○○○○○●○ 2.5-second OFF	Outdoor unit does not run.	When it cannot properly read data in the nonvolatile memory of the deicer P.C.board, outdoor unit stops and restarts 3 minutes later.	• Check outdoor DEICER P.C. board.

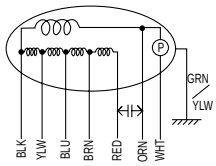
2. Trouble criterion of main parts

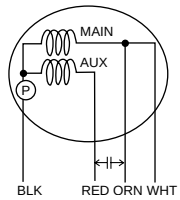
MCFH-18TN -S1 MUCFH-18TN -S1

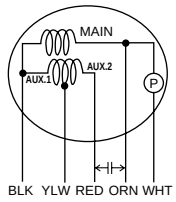
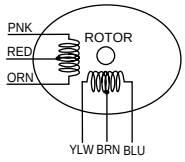
MCFH-24TN -S1 MUCFH-24TN -S1

<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Room temperature thermistor (RT11)
Indoor coil thermistor (RT12)</td><td>Measure the resistance with a tester.
(Part temperature 10°C ~ 30°C)<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>8kΩ ~ 20kΩ</td><td>Opened or short-circuit</td></tr></table></td><td></td></tr>
<tr><td>Defrost thermistor (RT61)
Ambient temperature thermistor (RT63)</td><td>Measure the resistance with a tester.
(Part temperature -10°C ~ 40°C)<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>5kΩ ~ 60kΩ</td><td>Open or short-circuit</td></tr></table></td><td></td></tr>
<tr><td>Compressor (MC)

INNER PROTECTOR
165± 8℃ ON
102±15℃ OFF</td><td>Measure the resistance between the terminals with a tester.
(Part temperature -10°C ~ 40°C)<table><tr><th rowspan="2">Color of lead wire</th><th colspan="2">Normal</th><th rowspan="2">Abnormal</th></tr><tr><th>MUCFH-18TN</th><th>MUCFH-24TN</th></tr><tr><td>C-R</td><td>0.82~1.02Ω</td><td>0.73~0.90Ω</td><td rowspan="2">Open or short-circuit</td></tr><tr><td>C-S</td><td>1.71~2.10Ω</td><td>1.61~1.98Ω</td></tr></table></td><td> 
</td></tr>
<tr><td>Indoor fan motor (MF)

INNER PROTECTOR
120±15℃ ON
77±15℃ OFF</td><td>Measure the resistance between the terminals with a tester.
(Part temperature10°C ~ 30°C)<table><tr><th>Color of lead wire</th><th>Normal</th><th>Abnormal</th></tr><tr><td>WHT-BLK</td><td>96~104Ω</td><td rowspan="5">Open or short-circuit</td></tr><tr><td>BLK-YLW</td><td>53~59Ω</td></tr><tr><td>YLW-BLU</td><td>31~35Ω</td></tr><tr><td>BLU-BRN</td><td>29~33Ω</td></tr><tr><td>BRN-RED</td><td>87~95Ω</td></tr></table></td><td> 
</td></tr>
<tr><td>Outdoor fan motor (MF)

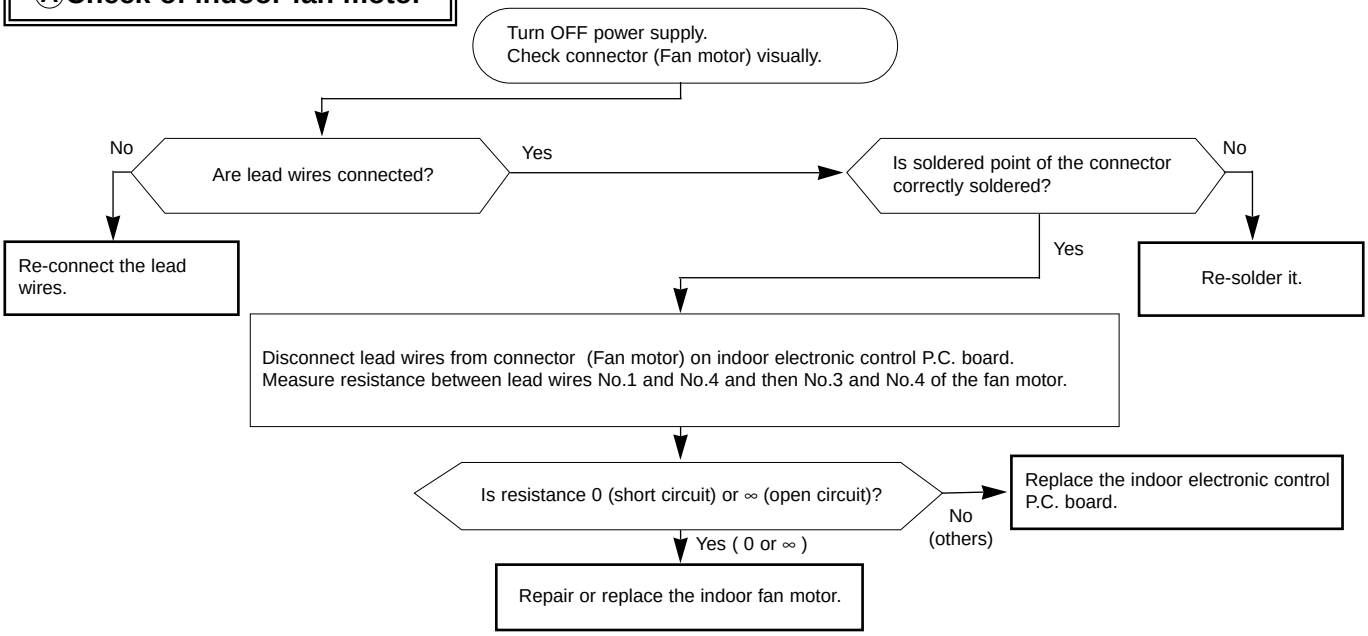
INNER PROTECTOR
145± 8℃ ON
About 88℃ OFF</td><td>Measure the resistance between the terminals with a tester.
(Part temperature -10°C ~ 40°C)<table><tr><th rowspan="2">Color of lead wire</th><th colspan="2">Normal</th><th rowspan="2">Abnormal</th></tr><tr><th>MUCFH-18TN</th><th>MUCFH-24TN</th></tr><tr><td>WHT-BLK</td><td>102 ~ 126Ω</td><td>55 ~ 68Ω</td><td rowspan="3">Open or short-circuit</td></tr><tr><td>BLK-RED</td><td>97 ~ 120Ω</td><td>26 ~ 33Ω</td></tr><tr><td>YLW-RED</td><td>——</td><td>55 ~ 68Ω</td></tr></table></td><td>MUCFH-18TN
 

MUCFH-24TN
 
</td></tr>
<tr><td>Vane motor (MV)</td><td>Measure the resistance between the terminals with a tester.
(Part temperature10°C ~ 30°C)<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>Resistance per phase</td><td>329~357Ω</td><td>Open or short-circuit</td></tr></table></td><td> 
</td></tr>
<tr><td>R.V. coil (21S4)</td><td>Measure the resistance using a tester.(Part temperature -10°C ~ 40°C)<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>2.673kΩ ~ 3.268kΩ</td><td>Open or short-circuit</td></tr></table></td><td></td></tr>
</table>

ⓟ : INNER PROTECTOR

Indoor fan motor does not operate.

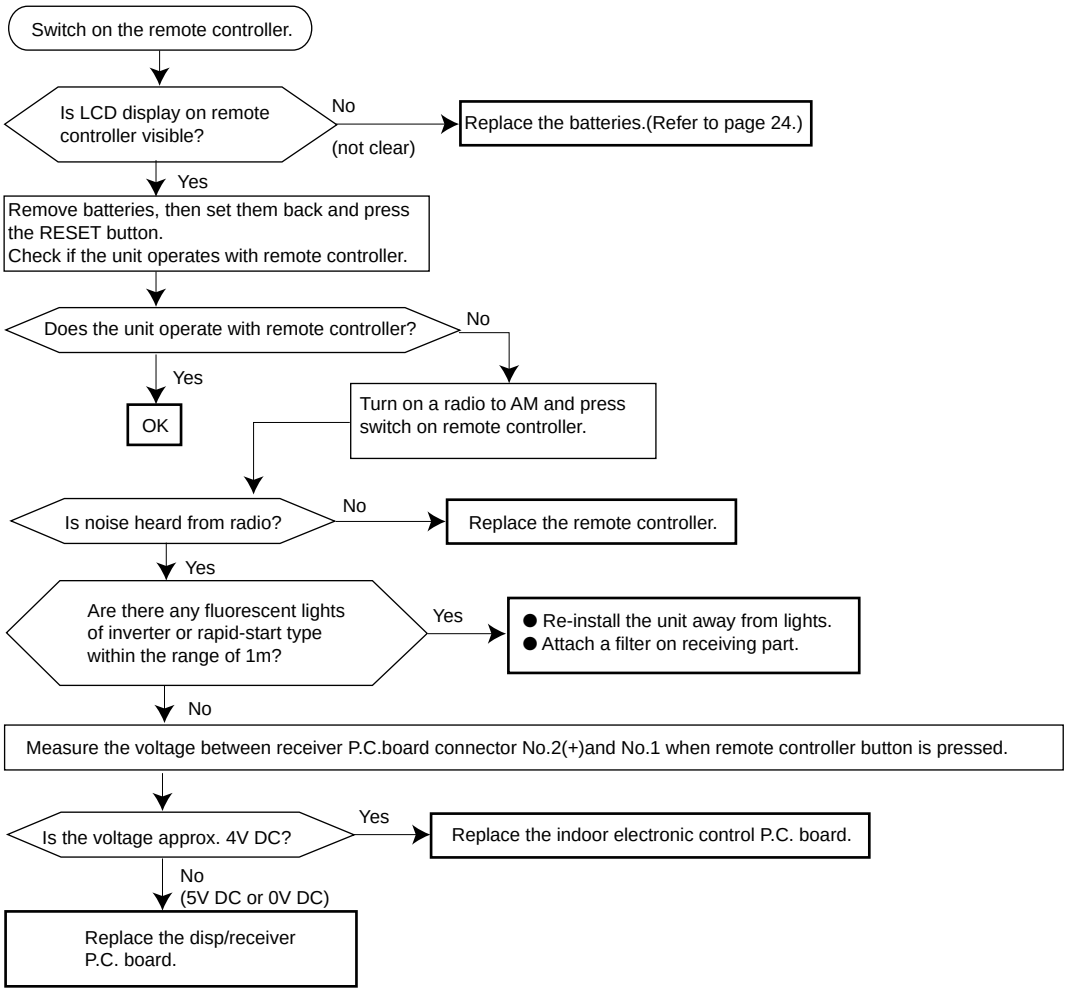
Ⓐ Check of indoor fan motor



Indoor unit operates by pressing the EMERGENCY OPERATION switch, but does not operate with the remote controller.

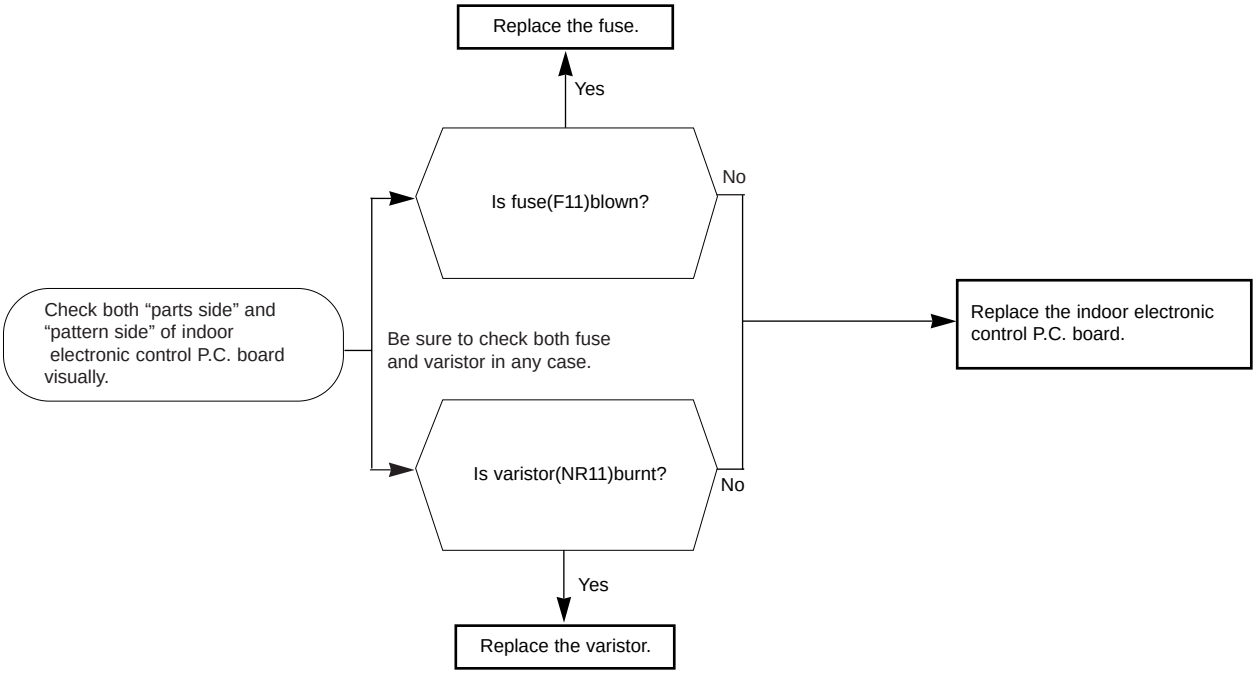
Ⓑ Check of remote controller and receiver P.C. board

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



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

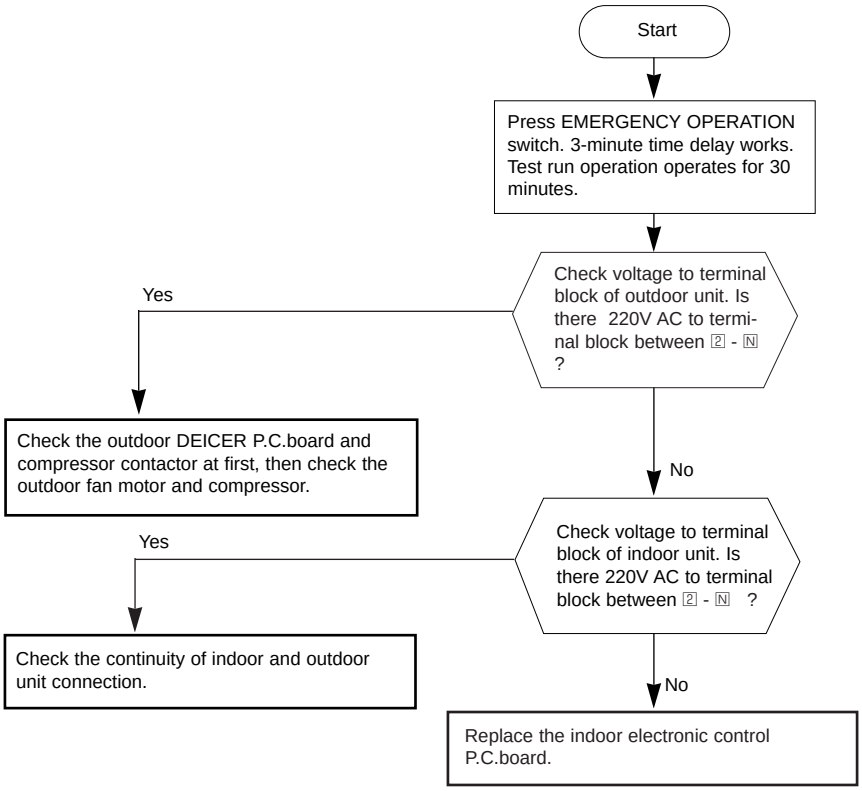
ⓒCheck of indoor electronic control P.C. board



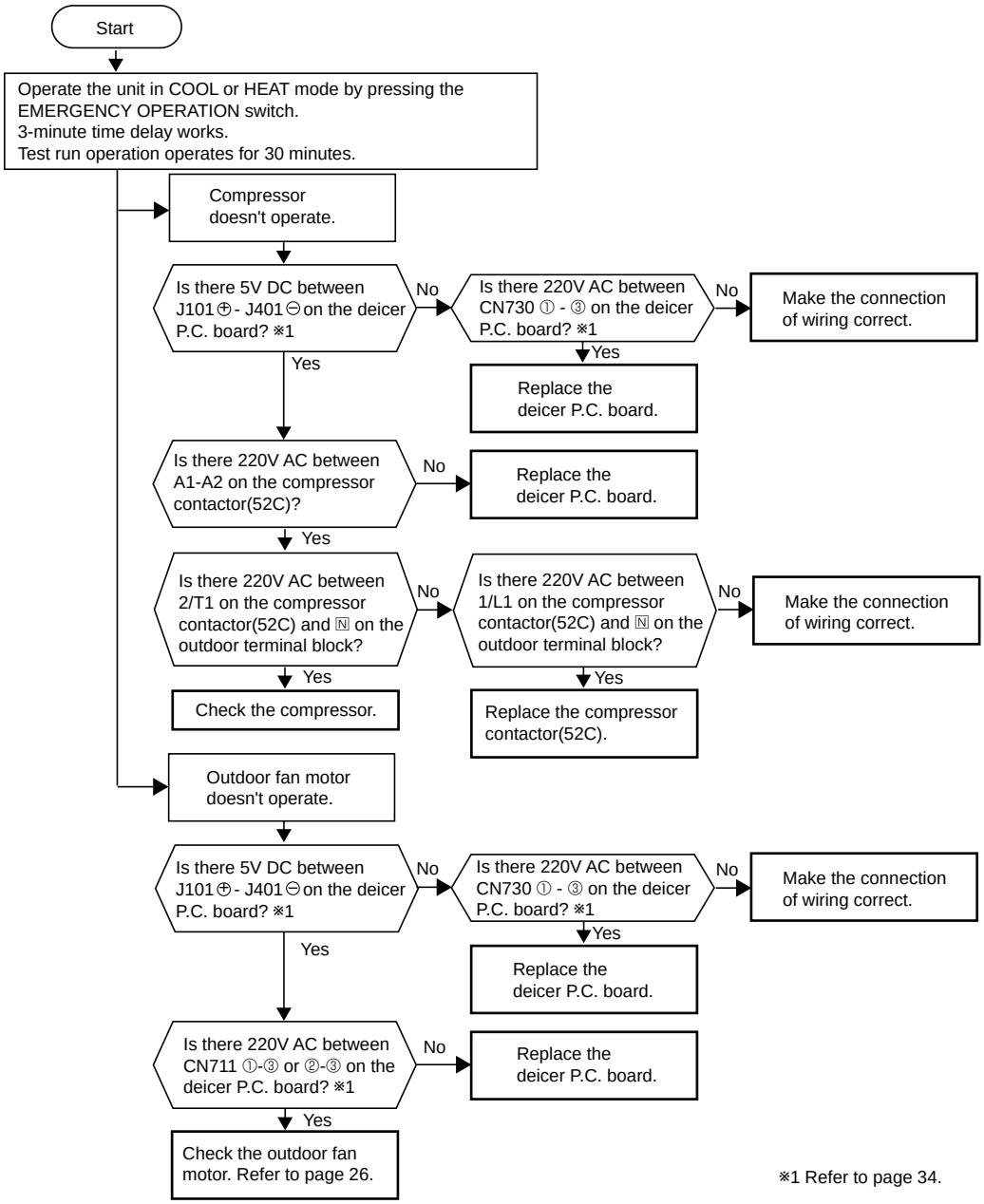
Compressor and / or outdoor fan motor does not operate.

ⓓCheck of outdoor unit

<MUCFH-18TN -S1>



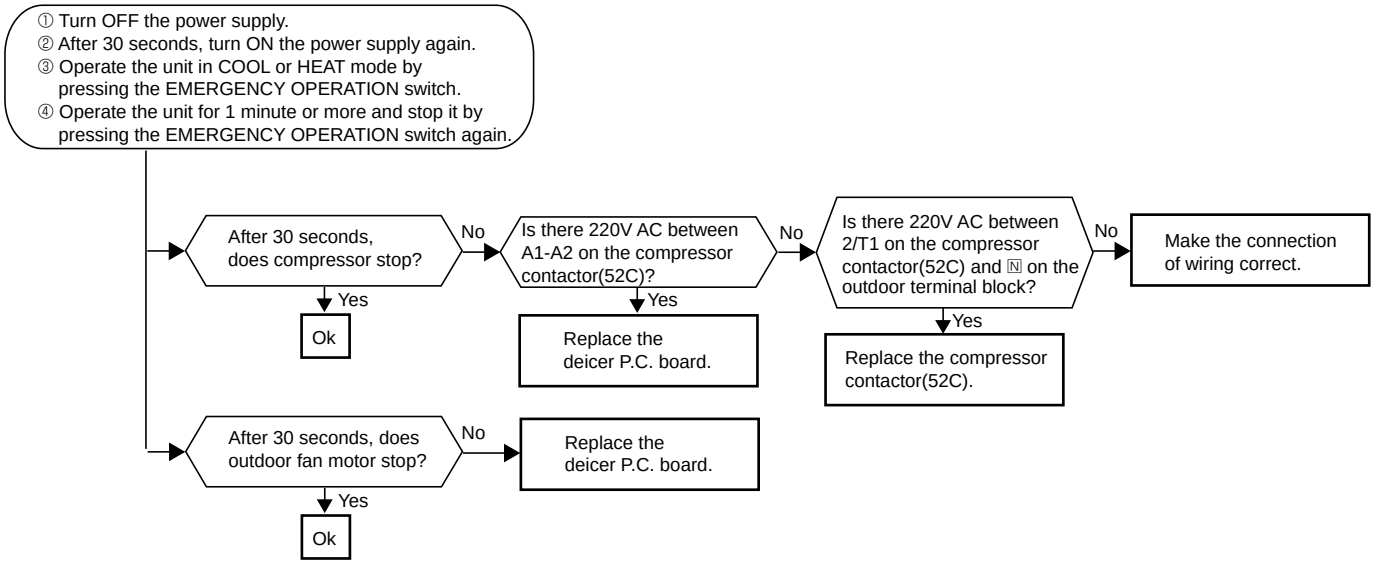
<MUCFH-24TN -S1>



※1 Refer to page 34.

Compressor and / or outdoor fan motor does not stop.

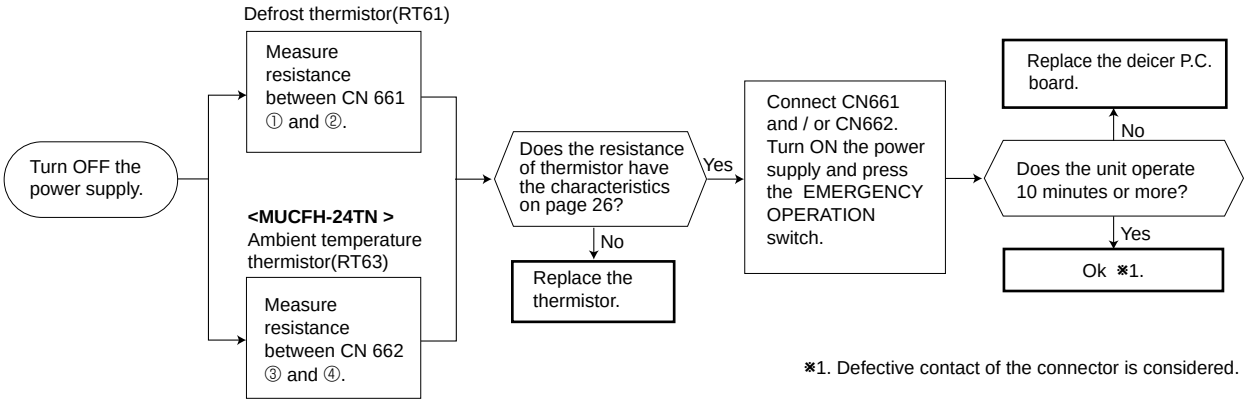
Ⓔ Check of outdoor unit <MUCFH-24TN -S1>



When OPERATION INDICATOR lamp flashes 6-time.
Thermistors in the outdoor unit are abnormal.

Ⓕ Check of outdoor thermistor

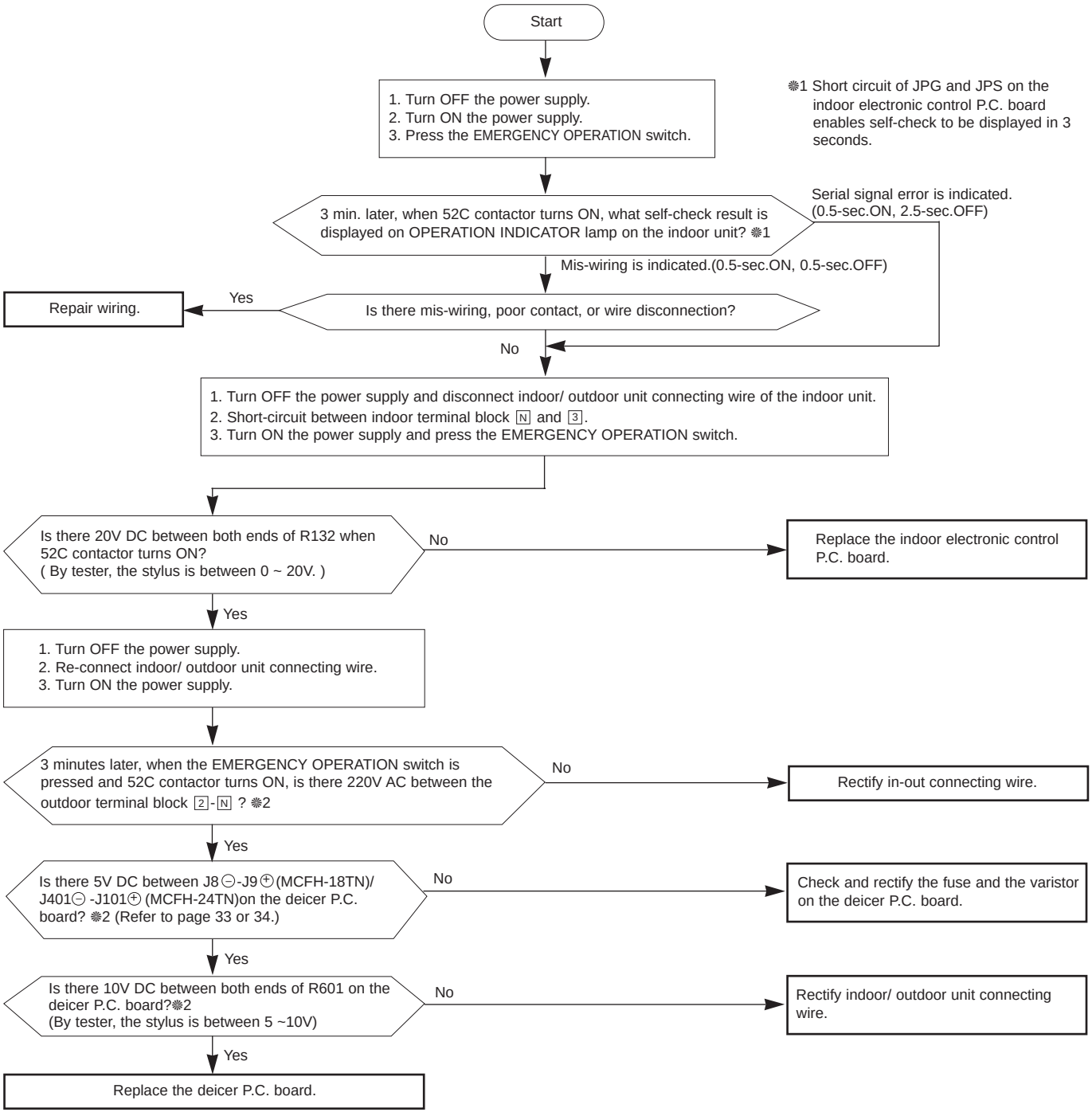
※ Disconnect the connectors CN661 and CN662 from the DEICER P.C. board.
(Check the characteristics of each thermistor.)



※1. Defective contact of the connector is considered.

When OPERATION INDICATOR lamp flashes ON and OFF in every 0.5-second or flashes once.
Outdoor unit doesn't operate.

Ⓖ How to check mis-wiring and serial signal error (when outdoor unit does not work)



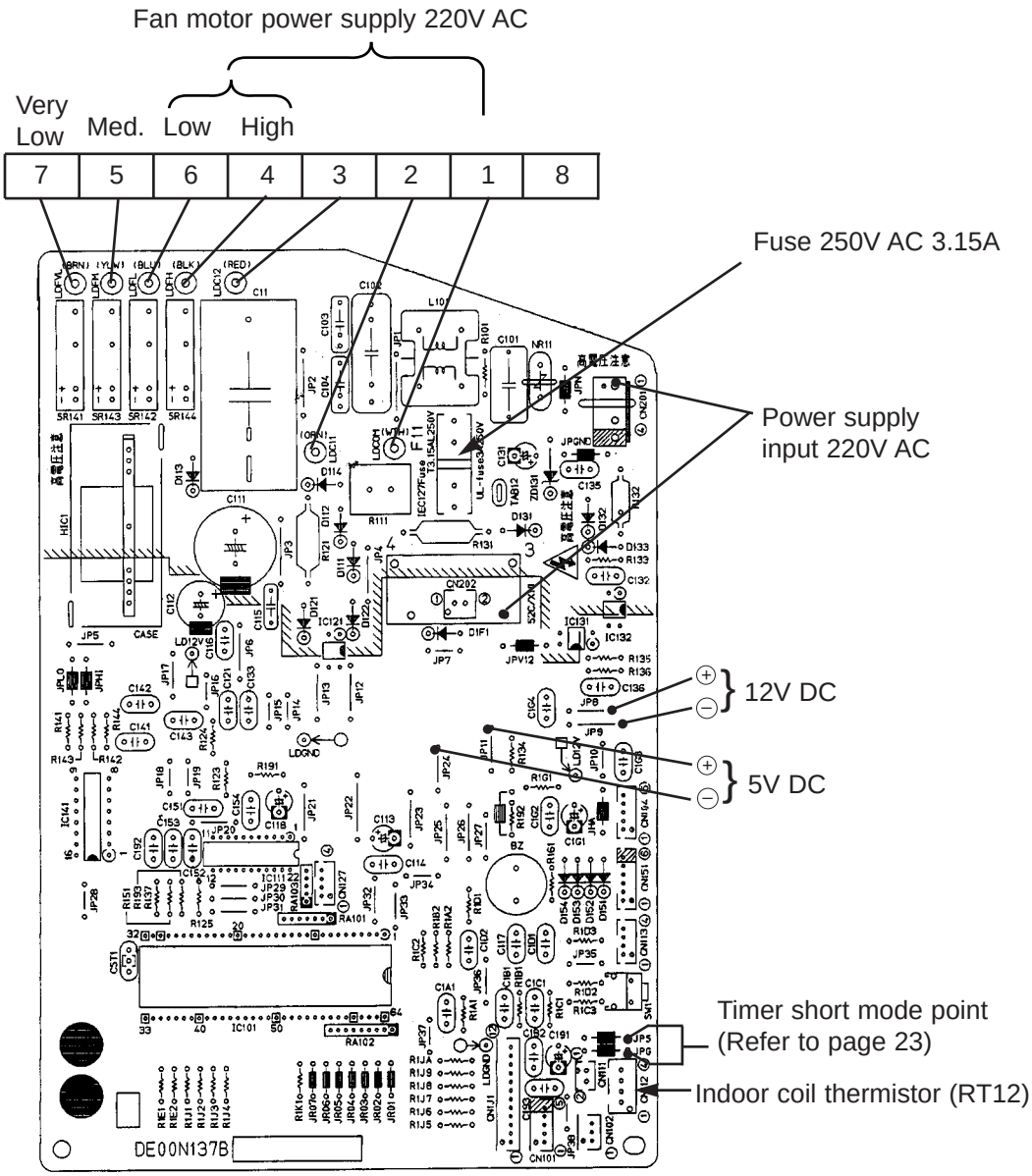
✵2 While the serial signal error is indicated, 52C contactor alternates ON for about 10 seconds and OFF for 3 minutes. Measure the voltage when 52C contactor is ON.

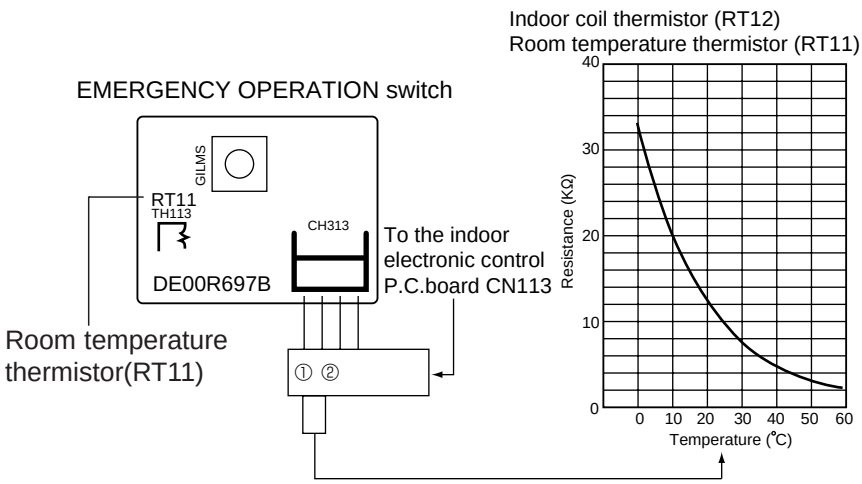
TEST POINT DIAGRAM AND VOLTAGE

MCFH-18TN - S1

MCFH-24TN - S1

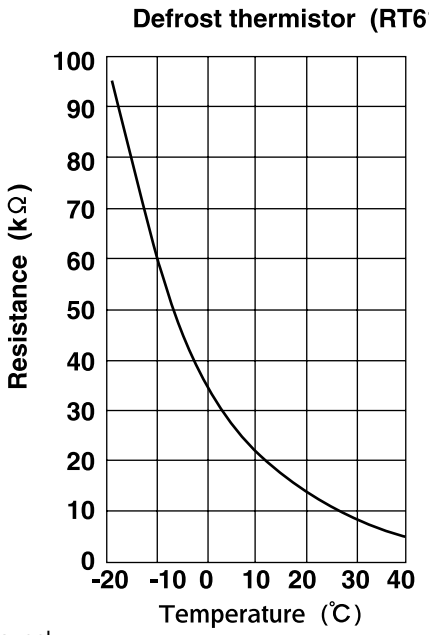
Indoor electronic control P.C. board

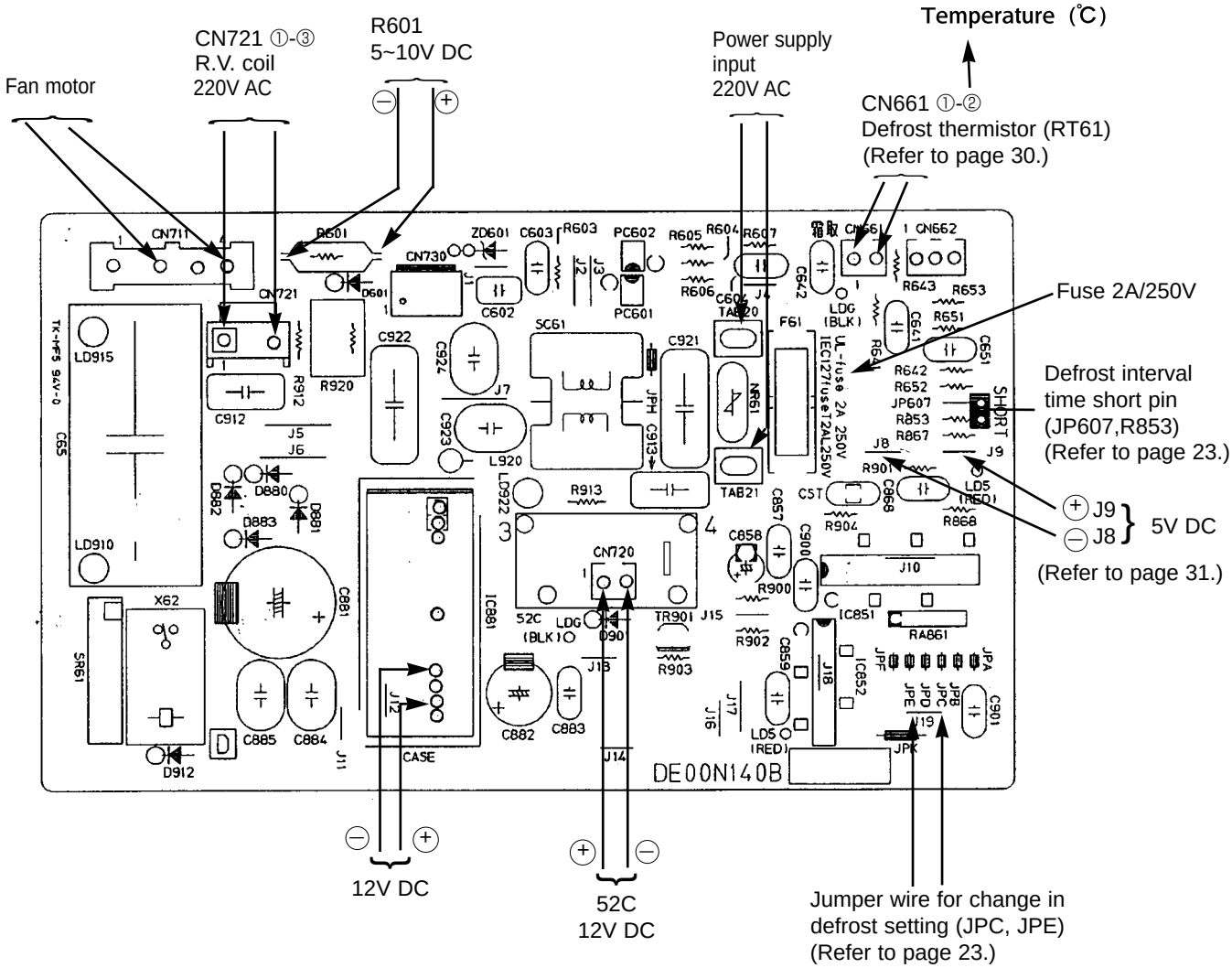




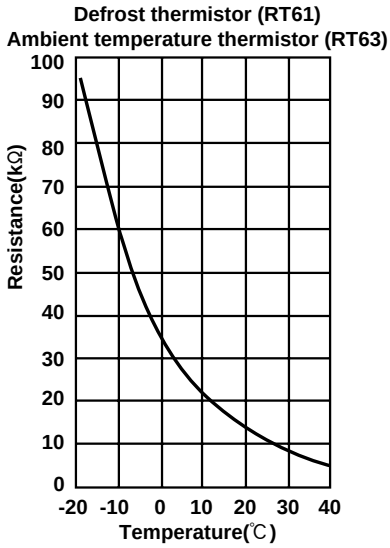
MUCFH-18TN -S1

Outdoor deicer P.C. board





MUCFH-24TN -S1
Outdoor deicer P.C. board

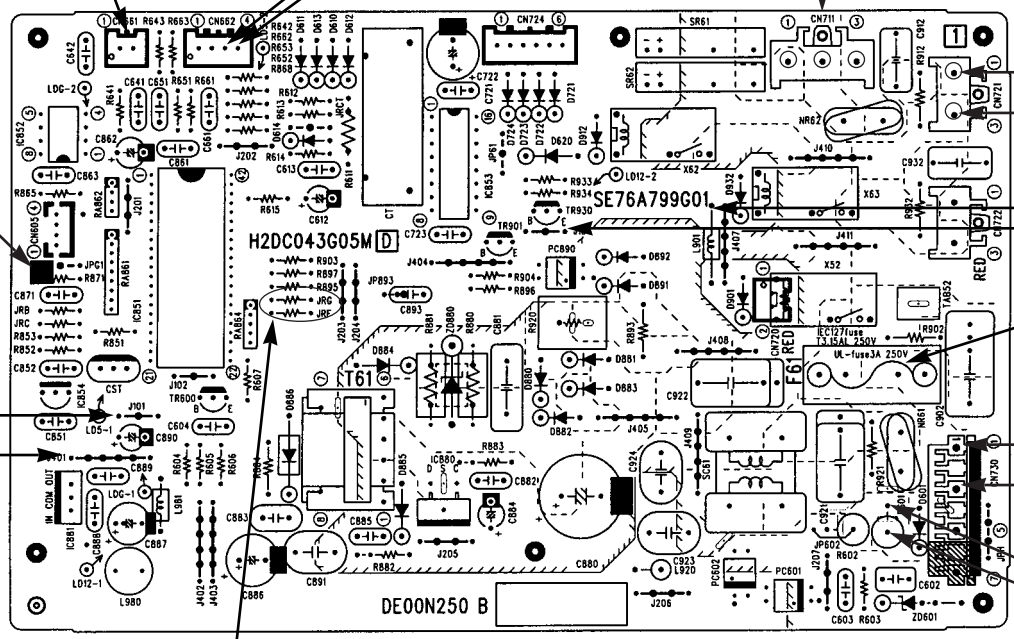


Defrost interval time short pin (JPG1,R871) (Refer to page 23.)

CN661 ①-② Defrost temperature thermistor (RT61) (Refer to page 30.)

CN662 ③-④ Ambient temperature thermistor (RT63) (Refer to page 30.)

Fan motor



CN721 ①-③ R.V. coil 220V AC

12V DC

Fuse 3.15A / 250V

J101 ⊕ 5V DC J401 ⊖ (Refer to page 29 or 31.)

Power supply input CN730①-③ 220V AC (Refer to page 29.)

R601 10V DC (Refer to page 31.)

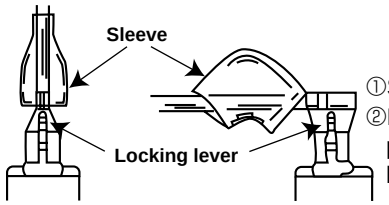
Jumper wire for change in defrost setting (JRF, JRG) (Refer to page 23.)

10 DISASSEMBLY INSTRUCTIONS

<"Terminal with lock mechanism" Detaching points>

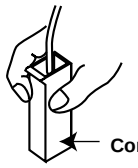
In case of terminal with lock mechanism, detach the terminal as shown below.
There are two types (Refer to (1) and (2)) of the terminal with lock mechanism.
The terminal with no lock mechanism can be removed by pulling it out.
Check the shape of the terminal and work.

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



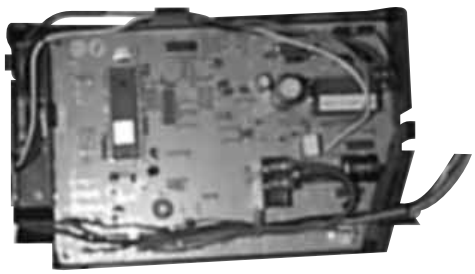
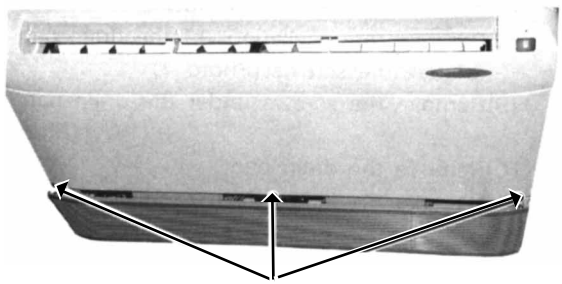
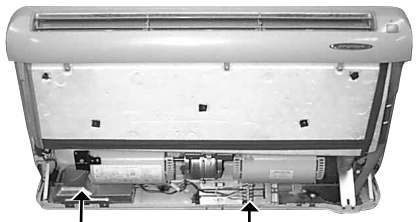
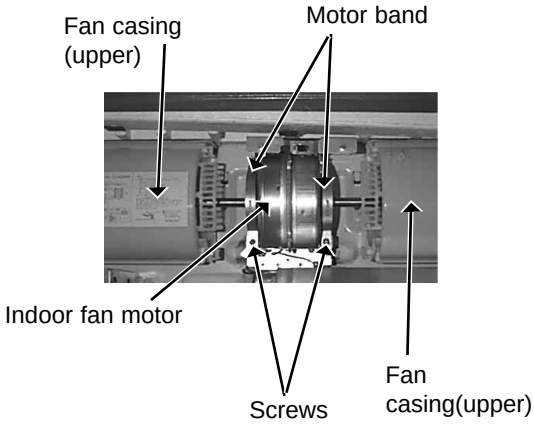
①Slide the sleeve.
②Pull the terminal while pushing the locking lever.

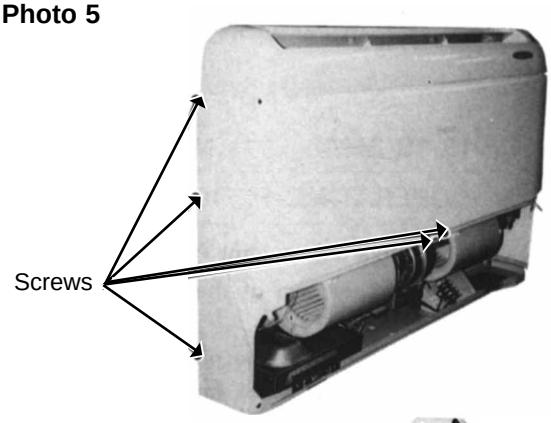
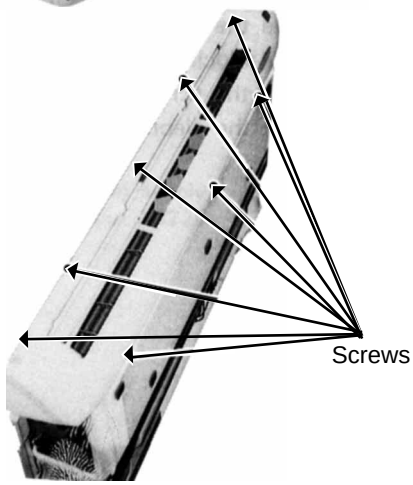
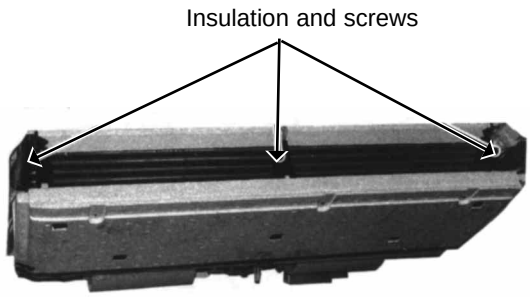
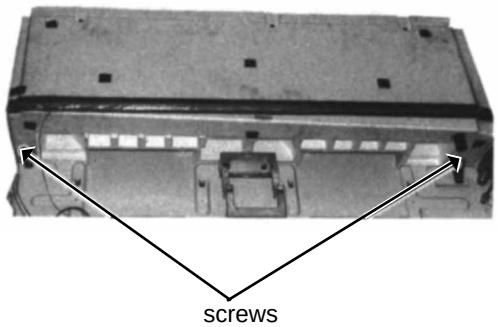
(2) The terminal with this connector is a terminal with lock mechanism



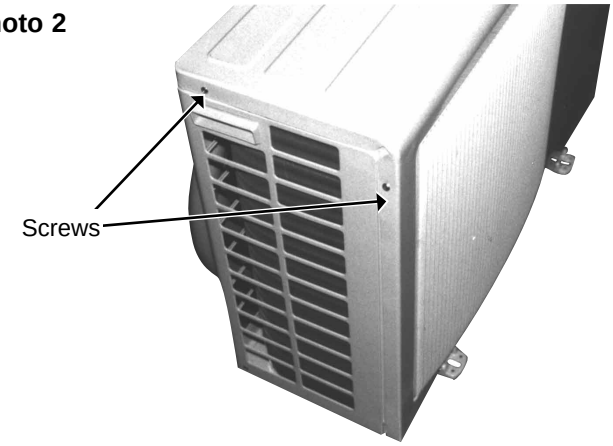
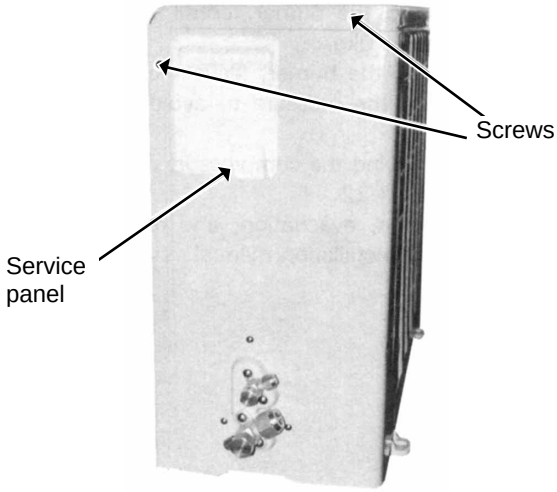
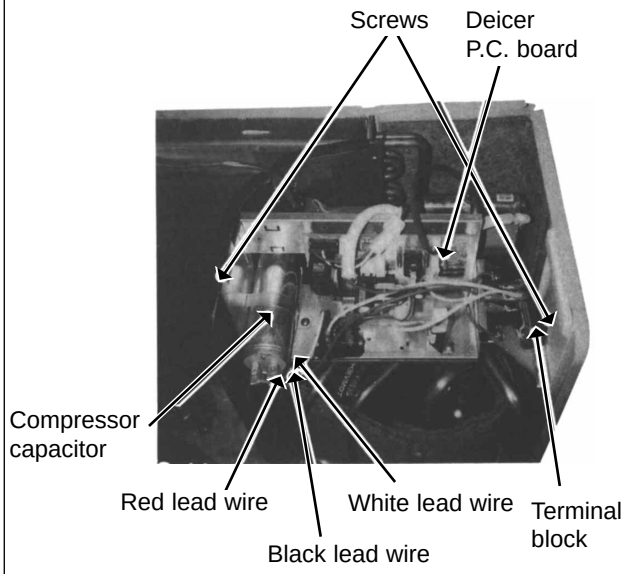
①Hold the sleeve, and pull out the terminal slowly.

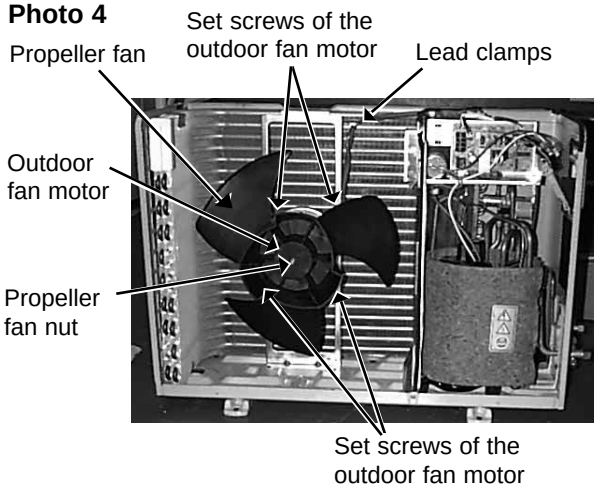
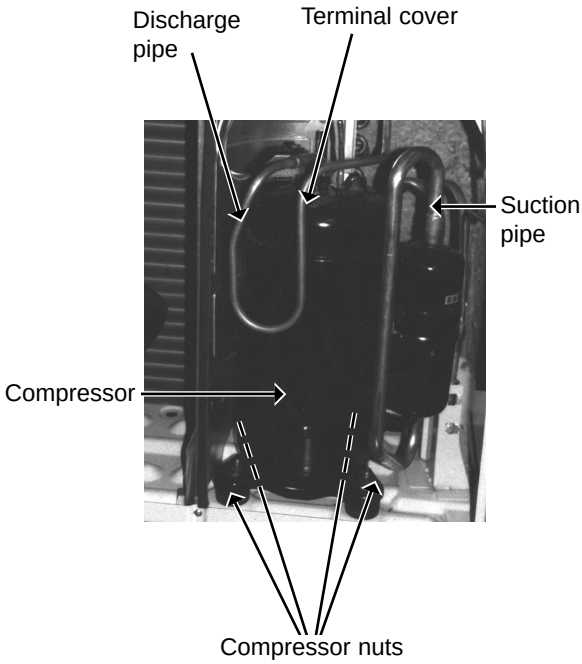
10-1. MCFH-18TN -S1 MCFH-24TN -S1 INDOOR UNIT

OPERATING PROCEDURE	PHOTOS
1. Removing the electronic control P.C. board. (1) Pull out the upper part of the grille. (Photo 1) (2) Remove the screws of the grille. (3) Remove screws of terminal block cover. Remove the terminal block cover and remove the terminal block. (4) Remove the screws of the electronic box cover. (5) Pull out the electronic control P.C. board. **Photo 3**  Electronic control P.C. board	**Photo 1**  Screws **Photo 2**  Electronic box Terminal block
2. Removing the indoor fan motor (1) Remove the grille. (Refer to 1(1) (2)) (2) Remove the screws of the pipe support assembly. (3) Remove the fan casing.(upper). (4) Disconnect the connector of the indoor fan motor. (5) Disconnect the ground wire of the fan motor. (6) Remove the screws of the motor band and remove the catch. (7) Take out the sirocco fan and the indoor fan motor.	**Photo 4**  Fan casing (upper) Motor band Indoor fan motor Screws Fan casing(upper)

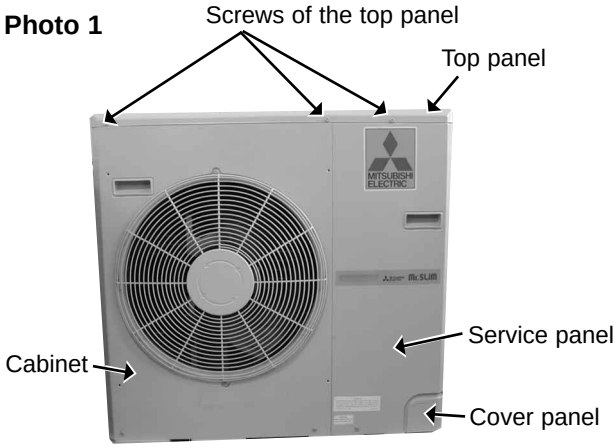
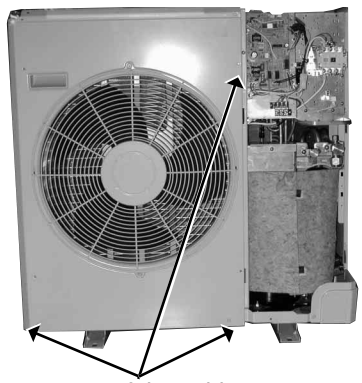
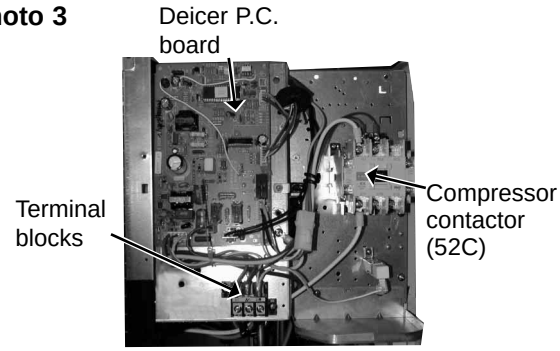
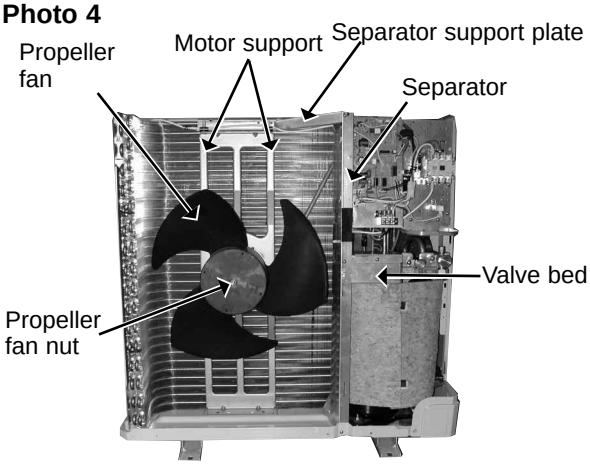
OPERATING PROCEDURE	PHOTOS
3. Removing the indoor heat exchanger. (1) Remove the grille. (Refer to 1(1) (2)) (2) Remove the screws on both side and in front of the front panel. (Photo 5) (3) Remove the screws of the nozzle assembly. (Photo 6) (4) Remove the electronic box. (Refer to 1) (5) Remove the indoor fan motor. (Refer to 2) (6) Remove the screws of the motor support. (7) Remove the fan casing. (lower) (8) Remove the insulation of the drain pan and remove the screws. (Photo 7) (9) Remove the screws under the drain pan.(Photo 8) (10) Remove the drain pan. (11) Remove the indoor heat exchanger.	**Photo 5**  **Photo 6**  **Photo 7**  **Photo 8** 

10-2. MUCFH-18TN - S1
OUTDOOR UNIT

OPERATING PROCEDURE	PHOTOS
1. Removing the cabinet (1) Remove the screws of the cabinet. (2) Hold the down of the cabinet on the both side to remove the cabinet. **Photo 2**  	**Photo 1** 
2. Removing the deicer P.C. board (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.	**Photo 3** 

OPERATING PROCEDURE	PHOTOS
3. Removing the outdoor fan motor (1) Remove the cabinet. (Refer to 1) (2) Disconnect the connector remove the clamp of fan motor lead wire. (3) Remove the propeller fun nut and remove the propeller fan. (4) Remove screws fixing the fan motor.	**Photo 4** 
4. Removing the compressor (1) Remove the cabinet. (Refer to 1) (2) Remove the soundproof felt. (3) Remove the terminal cover on the compressor (4) Remove the electrical assembly. (Refer to 2) (5) Recover gas from the refrigerant circuit. (6) Disconnect the welded part of the discharge pipe (7) Disconnect the welded part of the suction pipe. (8) Remove nuts fixing the compressor. (9) Remove the compressor.	**Photo 5** 

10-3. MUCFH-24TN - S1
OUTDOOR UNIT

OPERATING PROCEDURE	PHOTOS
1. Removing the cabinet (1) Remove the screws of the top panel and the top panel. (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. (3) Remove the screw of the cover panel. To remove the cover panel. (4) Remove the screws of the cabinet. Open the cabinet to a 45-degree angle. Then lift it and unhook the catches to remove.	**Photo 1**  **Photo 2** 
2. Removing the deicer P.C. board (1) Remove the top panel, the service panel and the cover panel. (2) Disconnect all the connectors and the terminals on the deicer P.C. board. (3) Remove the deicer P.C. board.	**Photo 3** 
3. Removing the propeller fan and the outdoor fan motor (1) Remove the cabinet. (Refer to 1) (2) Remove the propeller fan nut and the propeller fan. **NOTE**: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. (3) Remove the screws and the outdoor fan motor and the connectors. Remove the outdoor fan motor.	**Photo 4** 

OPERATING PROCEDURE	PHOTOS

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.

NOTE

- Before using a burner, reclaim gas from the pipes until the pressure gauge shows 0 kg/㎠(MPa).
- Use the burner under the condition that gas can be recovered even when the inner pressure rises by heat.

Photo 5

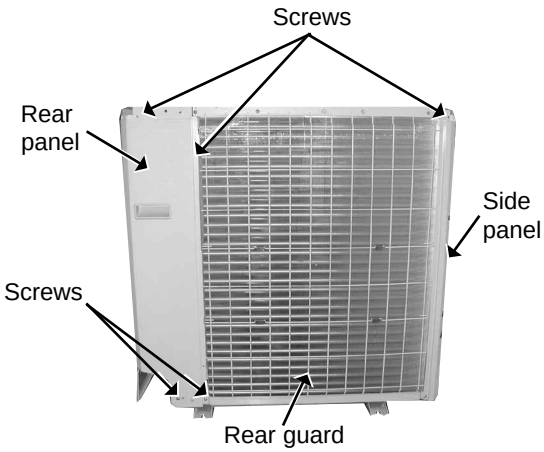


Photo 6

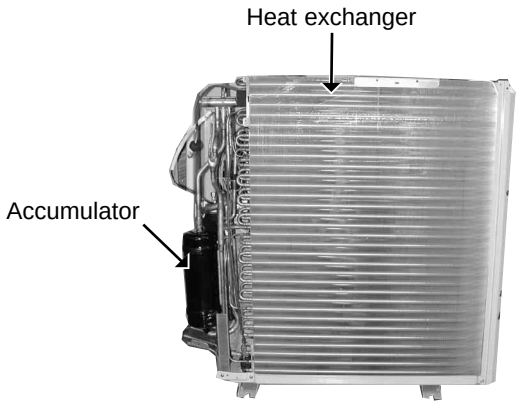
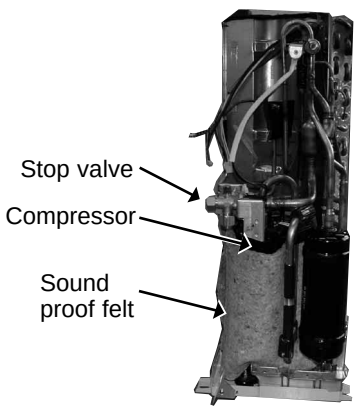


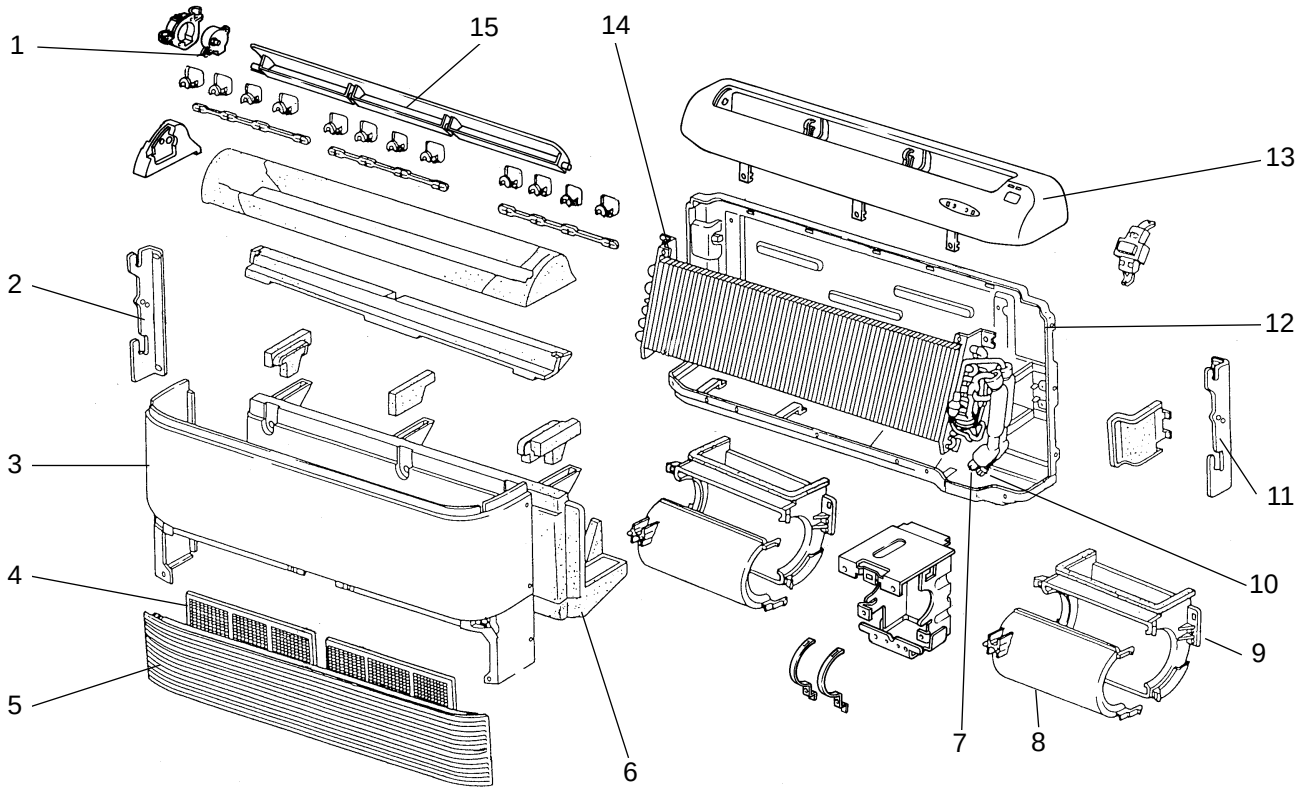
Photo 7



11 PARTS LIST

MCFH-18TN -S1 (WH)
MCFH-24TN -S1 (WH)

11-1. INDOOR UNIT
STRUCTURAL PARTS



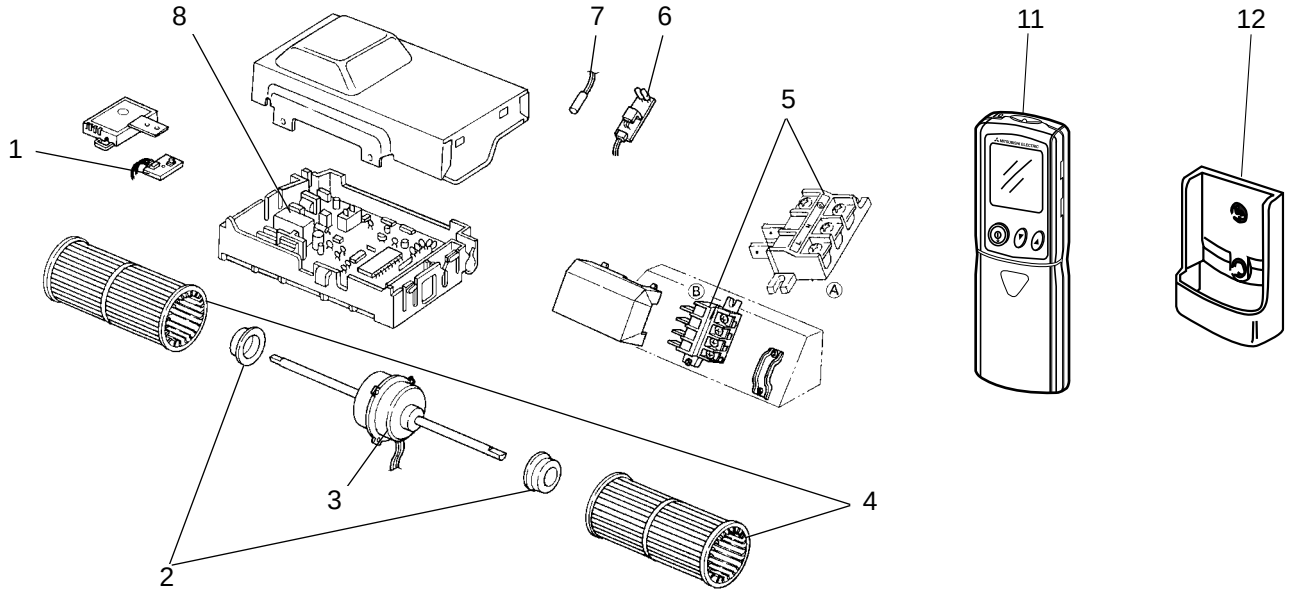
Part number that is circled is not shown in the illustration.

No.	Part No.	Part name	Symbol in Wiring Diagram	Q'ty/unit		Remarks
				MCFH-18TN- S1 (WH)	MCFH-24TN- S1 (WH)	
1	E02 227 303	VANE MOTOR	MV	1	1	
2	E02 179 971	INSTALLATION METAL L		1	1	
3	E02 179 000	FRONT PANEL		1	1	
4	E02 179 100	AIR FILTER		2	2	
5	E02 179 010	GRILLE(WH)		1	1	
6	E02 215 700	DRAIN PAN		1	1	
7	E02 138 666	UNION(GAS)		1	1	ϕ15.88
8	E02 179 237	FAN CASING(UPPER)		2	2	
9	E02 179 238	FAN CASING(LOWER)		2	2	
10	E02 138 667	UNION(LIQUID)		1		ϕ6.35
	E02 176 667	UNION(LIQUID)			1	ϕ9.52
11	E02 179 972	INSTALLATION METAL R		1	1	
12	E02 179 231	BACK PANEL		1	1	
13	E02 227 235	NOZZLE		1	1	
14	E02 179 620	INDOOR HEAT EXCHANGER		1	1	
15	E02 227 040	VANE		1	1	
(16)	E02 179 142	GRILLE CATCH		3	3	3PCS/SET

MCFH-18TN -S1 (WH)
MCFH-24TN -S1 (WH)

11-2. INDOOR UNIT ELECTRICAL PARTS

11-3. ACCESSORY PARTS AND REMOTE CONTROLLER



11-2. INDOOR UNIT 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
				MCFH-18TN- S1 (WH)	MCFH-24TN- S1 (WH)	
1	E02 215 328	SWITCH BOARD		1	1	
2	E02 179 505	FAN MOTOR RUBBER MOUNT		2	2	2PCS/SET
3	E02 587 300	INDOOR FAN MOTOR	MF	1	1	RB4N37-□□
4	E02 179 500	SIROCCO FAN		2	2	
5	E02 573 375	TERMINAL BLOCK	TB	1	1	Figure A 3P
	E02 588 375	TERMINAL BLOCK	TB	1	1	Figure B 4P
6	E02 227 468	RECEIVER P.C. BOARD		1	1	
7	E02 327 307	INDOOR-COIL THERMISTOR	RT12	1	1	
8	E02 588 450	ELECTRONIC CONTROL P.C. BOARD		1		
	E02 660 450	ELECTRONIC CONTROL P.C. BOARD			1	
⑨	E02 127 382	FUSE	F11	1	1	3.15A
⑩	E02 336 385	VARISTOR	NR11	1	1	

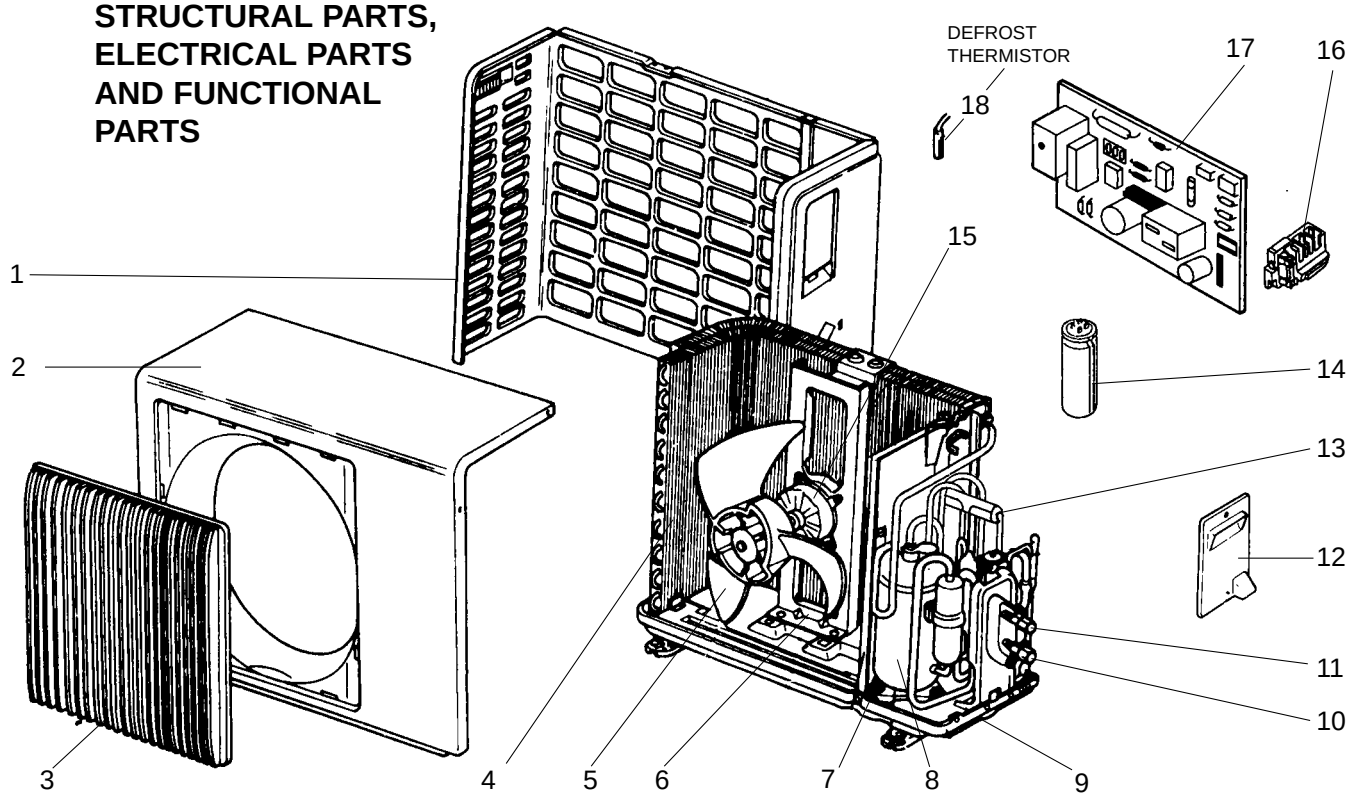
11-3. ACCESSORY PARTS AND REMOTE CONTROLLER

11	E02 576 426	REMOTE CONTROLLER		1	1	
12	E02 527 083	REMOTE CONTROLLER HOLDER		1	1	

MUCFH-18TN -S1

11-4. OUTDOOR UNIT

STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

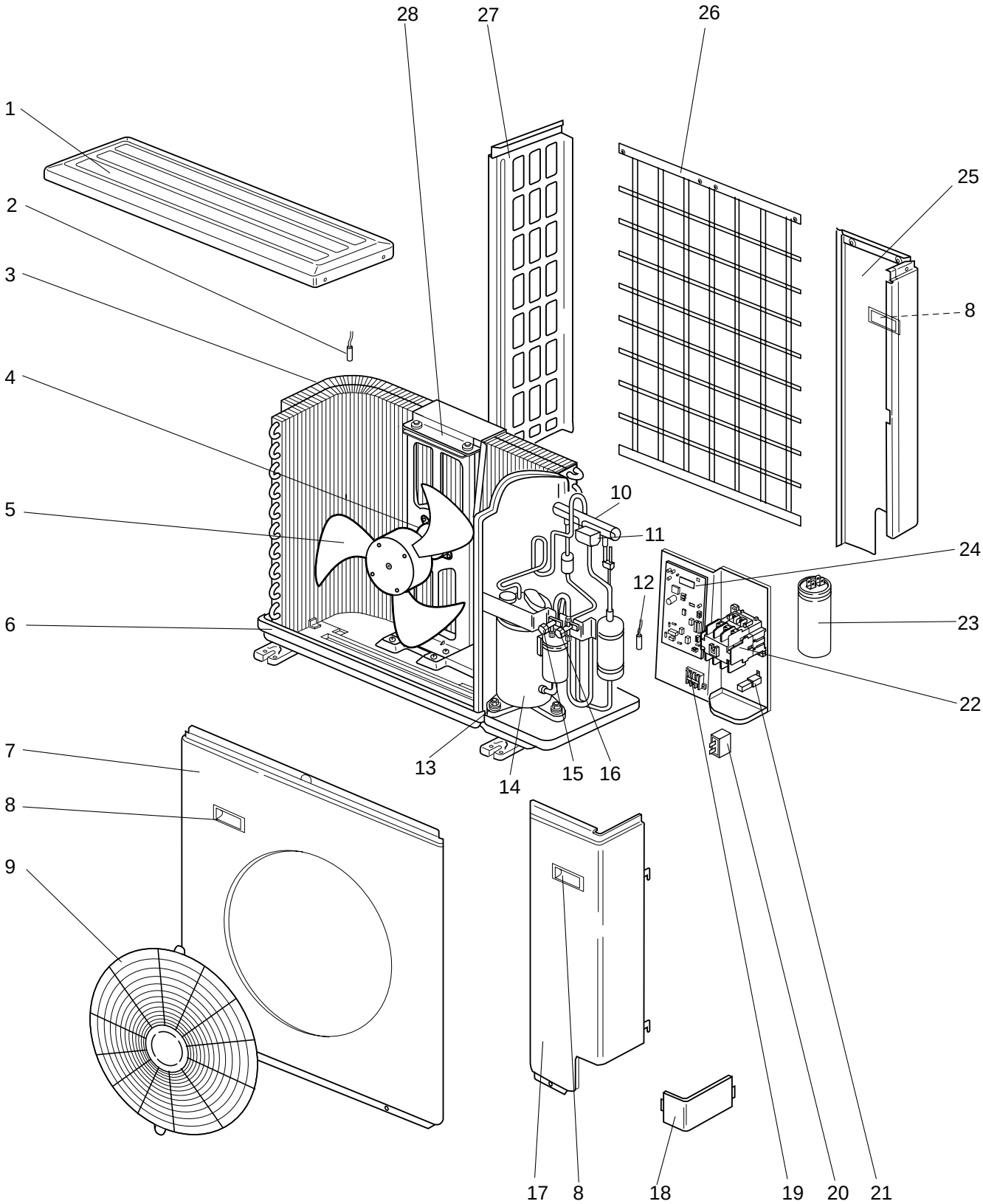


Part numbers that are circled are not shown in the illustration.

No.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit MUCFH-18TN- S1	Remarks
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 172 900	COMPRESSOR	MC	1	NH-30NCDT
9	E02 172 290	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 089 353	COMPRESSOR CAPACITOR	C1	1	35μF/440V AC
15	E02 144 301	OUTDOOR FAN MOTOR	MF	1	RA6V50 - □□
16	E02 540 374	TERMINAL BLOCK	TB	1	4P
17	E02 645 451	DEICER P.C. BOARD		1	
18	E02 645 310	DEFROST THERMISTOR	RT61	1	
⑲	E02 004 340	COMPRESSOR CONTACTOR	52C	1	
⑳	E02 139 936	CAPILLARY TUBE		2	ϕ3.0×ϕ1.6×750
	E02 322 936	CAPILLARY TUBE		1	ϕ3.0×ϕ2.0×300
	E02 156 936	CAPILLARY TUBE		1	ϕ3.0×ϕ1.4×500
㉑	E02 095 382	FUSE	F61	1	250V / 2A
㉒	E02 172 490	R.V. COIL	21S4	1	
㉓	E02 128 383	SURGE ABSORBER	DSAR	1	
㉔	E02 096 642	CHECK VALVE		1	
	E02 214 642	CHECK VALVE		1	
㉕	E02 069 644	DISCHARGE PRESSURE REGULATOR		1	2.55MPa(26.0kgf/cm²)OPEN

MUCFH-24TN -S1

11-5. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS



MUCFH-24TN -S1

11-5. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

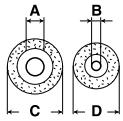
Part numbers that are circled are not shown in the illustration.

No.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUCFH-24TN -S1	
1	E02 214 297	TOP PANEL		1	
2	E02 540 309	AMBIENT TEMPERATURE THRMISTOR	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 646 490	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 177 900	COMPRESSOR	MC	1	NH-38NBDT
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 177 342	COMPRESSOR CONTACTOR	52C	1	
23	E02 082 353	COMPRESSOR CAPACITOR	C1	1	50μF/440V AC
24	E02 646 451	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 096 642	CHECK VALVE		1	
	E02 646 642	CHECK VALVE		1	
㉛	E02 646 937	CAPILLARY TUBE		1	ϕ4.0×ϕ2.4×300
	E02 660 936	CAPILLARY TUBE		1	ϕ4.0×ϕ2.4×400
㉜	E02 069 644	DISCHARGE PRESSURE REGULATOR		1	2.55MPa(26.0kgf/cm²)OPEN

12 OPTIONAL PARTS

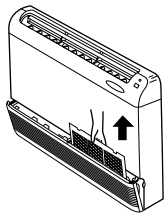
12-1. REFRIGERANT PIPES

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

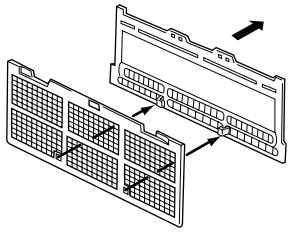
Model	Part No.	Pipe length	Pipe size O.D mm (in.)					Additional refrigerant charge R22(g)
			Cross-section	A-Gas	B-Liquid	Insulation		
						C	D	
MCFH-18TN- S1 **MUCFH-18TN-** S1	MAC-670PI	3m		15.88 (5/8)	6.35 (1/4)	31	27	0
	MAC-671PI	5m						
	MAC-672PI	7m						
	MAC-673PI	10m						150
	MAC-674PI	15m						400
MCFH-24TN- S1 **MUCFH-24TN-** S1	MAC-860PI	3m			9.52 (3/8)			0
	MAC-861PI	5m						
	MAC-862PI	7m						
	MAC-863PI	10m						195
	MAC-864PI	15m						520

12-2. AIR CLEANING FILTER

- If the air cleaning filter is clogged, it may lower the unit's capacity or cause condensation at the air outlet.
- The air cleaning filter is disposable. The standard usable term is about 4 months . However, if the color of the filter turns to dark brown, replace soon.



Remove the air filter and the air cleaning filter together.

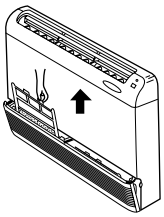


Separate the air cleaning filter (white bellow type) from the air filter.

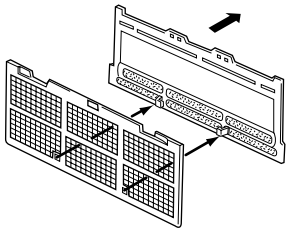
Model	Part No.
MCFH-18TN - S1 **MCFH-24TN -** S1	MAC-1200FT

12-3. DEODORIZING FILTER

- Clean the filter every two weeks. When it becomes too dirt, clean it more often.
- Replace the filter with a new one when its color can not be restored even after washing or when the filter becomes dark.
- Standard interval for the filter replacement is about 1 year.



Remove the air filter and the deodorizing filter together.



Separate the deodorizing filter (gray sponge type) from the air filter.

Model	Part No.
MCFH-18TN - S1 **MCFH-24TN -** S1	MAC-1700DF

Mr.SLIM™

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