MITSUBISHI ELECTRIC

Changes for the Better

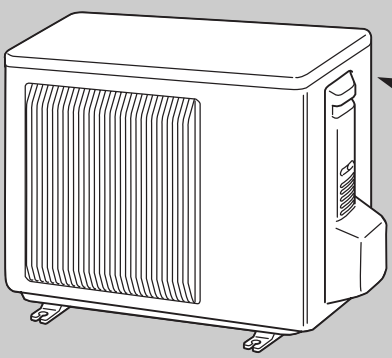
SPLIT-TYPE, AIR CONDITIONERS

No. OB397

SERVICE MANUAL

Wireless type
Models

MU-A08VD-P1
MU-A10VD-P1
MU-A13VD-P1



Indication of model name

MU-A08VD -P1
MU-A10VD -P1
MU-A13VD -P1

CONTENTS

Mr.SLIM™

NOTE:
- This service manual describes technical data of outdoor units.
- As for indoor units MS-A08VD -P1,MS-A10VD -P1 and MS-A13VD -P1, refer to the service manual OB396.

1 TECHNICAL CHANGES

MU-07UV - P1 → MU-A08VD - P1

1. Outdoor unit model has been changed.
   •Dimension has been changed. (780W×540H×255D → 800W×550H×285D)
   •Valve bed has been added.
2. Compressor has been changed. (RH135VGCC → RH135VHCC)
3. Outdoor fan motor has been changed. (RA6V23-HA → RA6V21-AC)
4. Outdoor fan motor capacitor has been changed.
5. Compressor capacitor has been changed.

MU-10UV - P1 → MU-A10VD - P1

1. Outdoor unit model has been changed.
   •Dimension has been changed. (780W×540H×255D → 800W×550H×285D)
   •Valve bed has been added.
2. Compressor has been changed. (RH165VGCC → RH145VHCC)
3. Outdoor fan motor has been changed. (RA6V23-HA → RA6V21-AC)
4. Outdoor fan motor capacitor has been changed.
5. Compressor capacitor has been changed.

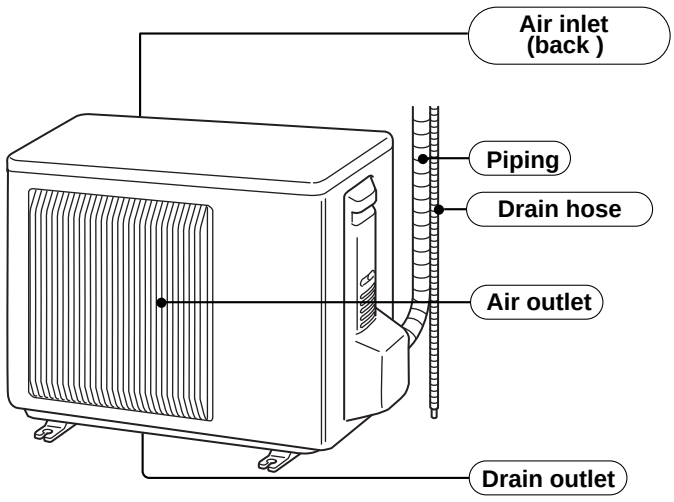
MU-13UV - P1 → MU-A13VD - P1

1. Outdoor unit model has been changed.
   •Dimension has been changed. (780W×540H×255D → 800W×550H×285D)
   •Valve bed has been added.
2. Compressor has been changed. (RH231VHAC → RH207VHAC)
3. Outdoor fan motor has been changed. (RA6V33-FA → RA6V33-KA)
4. Outdoor fan motor capacitor has been changed.
5. Compressor capacitor has been changed.

2 PART NAMES AND FUNCTIONS

OUTDOOR UNIT

MU-A08VD - P1
MU-A10VD - P1
MU-A13VD - P1



3 SPECIFICATION

Outdoor model			MU-A08VD - P1	MU-A10VD - P1	MU-A13VD - P1
Function			Cooling		
Power supply			Single phase 220-230-240V, 50Hz		
Capacity	Capacity	kW	2.3-2.3-2.3	2.75-2.75-2.75	3.7-3.7-3.7
	Dehumidification	ℓ /h	1.0	1.2	1.7
	Air flow	m³ /h	1740-1800-1860		1848-1872-1896
Electrical data	Starting current	A	17-18-19	18-19-20	28-29.5-31
	Compressor motor current	A	2.85-2.85-2.84	3.22-3.22-3.21	4.53-4.52-4.51
	Fan motor current	A	0.24-0.25-0.25		0.33-0.34-0.35
Coefficient of performance (C.O.P)			3.24-3.24-3.24	3.46-3.46-3.46	3.36-3.36-3.36
Compressor	Model		RH135VHCC	RH145VHCC	RH207VHAC
	Output	W	650	700	1000
	Winding resistance (at20℃)	Ω	C-R 4.18 C-S 5.76	C-R 4.03 C-S 5.71	C-R 2.59 C-S 3.94
Fan motor	Model		RA6V21-AC		RA6V33-KA
	Winding resistance (at20℃)	Ω	WHT-BLK 347 BLK-RED 281		WHT-BLK 215 BLK-RED 307
	Dimensions W×H×D	mm	800×550×285		
	Weight	kg	31		36
Special remarks	Sound level	dB	44-45-46		47-47-48
	Fan speed	rpm	725-745-770		835-845-855
	Fan speed regulator		1		
	Refrigerant filling capacity (R22)	kg	0.55		1.05
	Refrigeration oil (Model)	cc	300 (MS56)		520 (MS56)

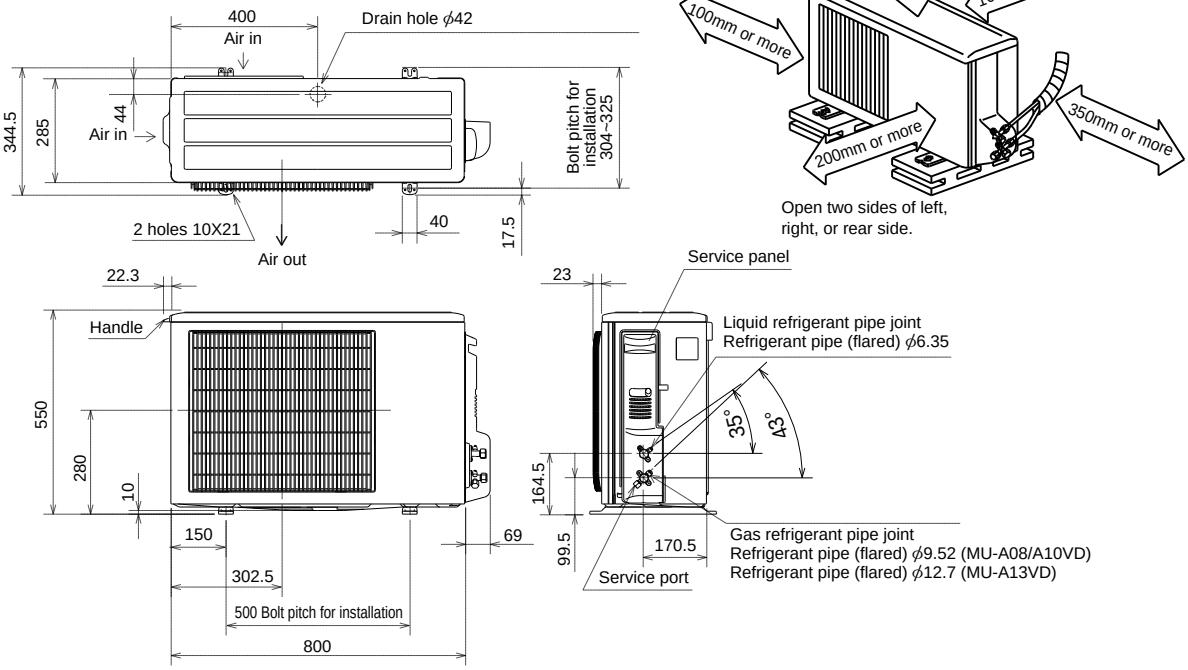
NOTE: Test conditions are based on JIS C 9612.
Cooling : Indoor DB27°C / WB19°C
Outdoor DB35°C / WB24°C
Indoor-Outdoor piping length 5 m

4 OUTLINES AND DIMENSIONS

OUTDOOR UNIT

MU-A08VD - P1
MU-A10VD - P1
MU-A13VD - P1

Unit : mm

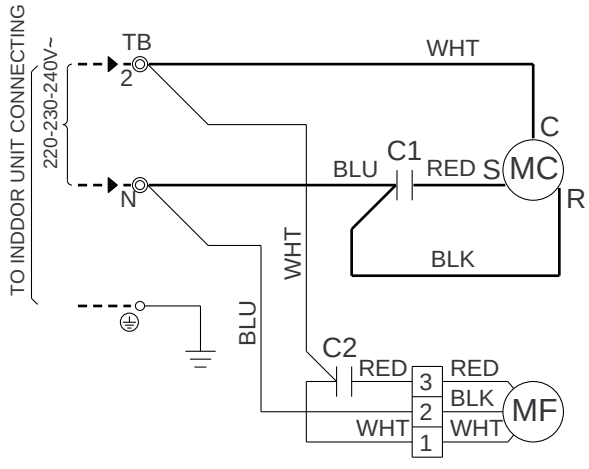


5 WIRING DIAGRAM

OUTDOOR UNIT

MU-A08VD - P1
MU-A10VD - P1
MU-A13VD - P1

MODEL WIRING DIAGRAM



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C1	COMPRESSOR CAPACITOR	MC	COMPRESSOR (INNER PROTECTOR)	TB	TERMINAL BLOCK
C2	OUTDOOR FAN CAPACITOR	MF	OUTDOOR FAN MOTOR (INNER FUSE)		

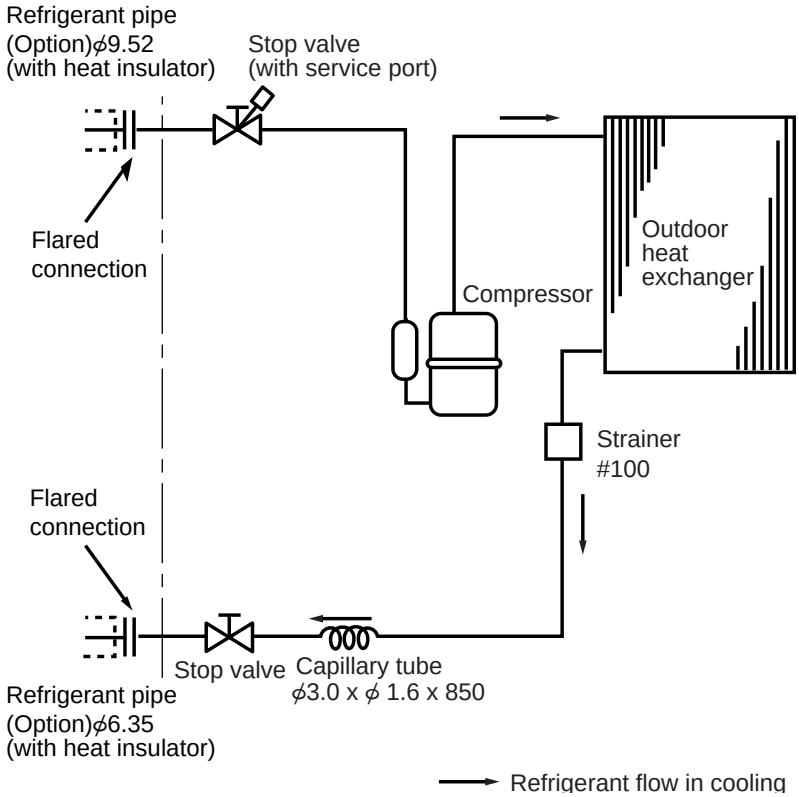
NOTE:1. About the indoor side electric wiring refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only. (For field wiring)
3. Symbols below indicate.
◎: Terminal block, □□□□: Connector

6 REFRIGERANT SYSTEM DIAGRAM

Unit : mm

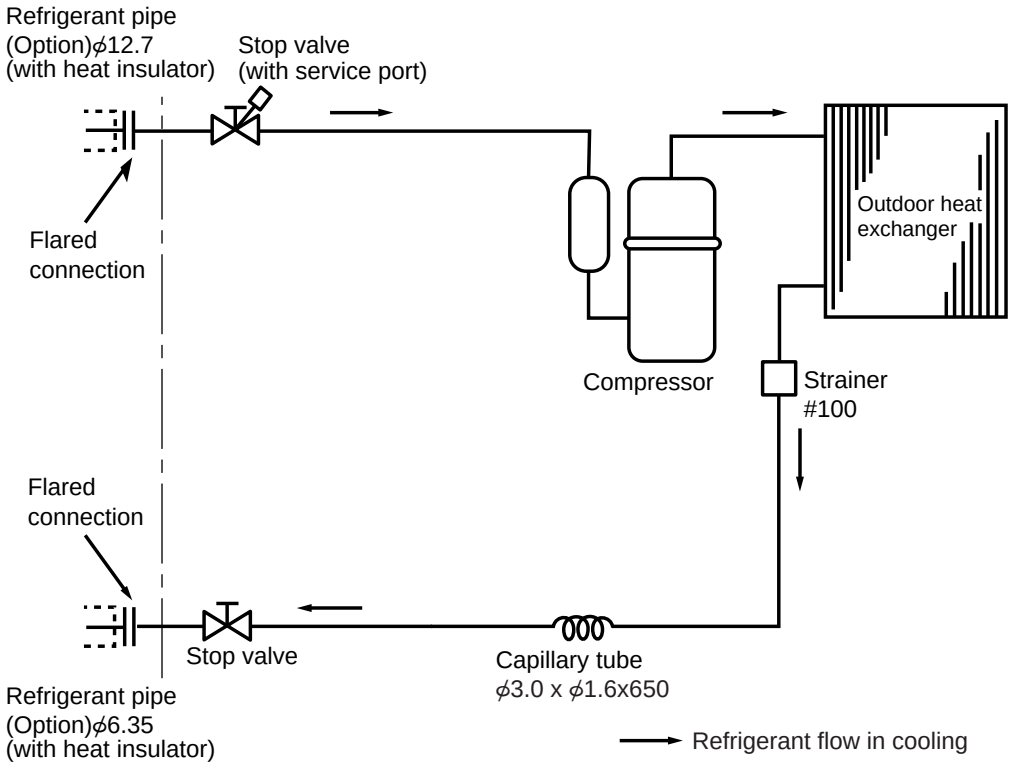
MU-A08VD - P1
MU-A10VD - P1

OUTDOOR UNIT



MU-A13VD - P1

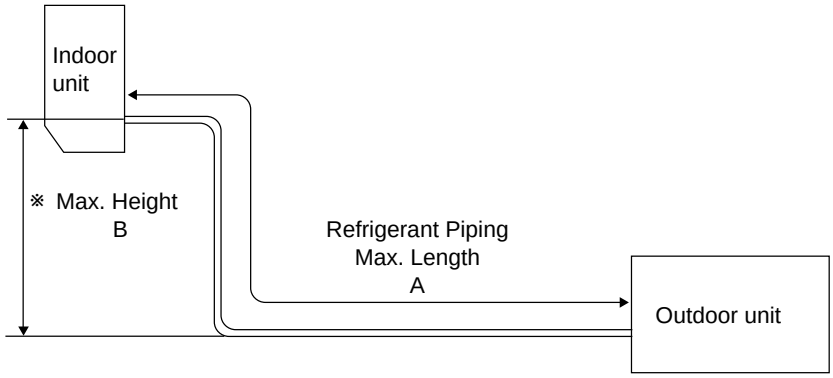
OUTDOOR UNIT



MAX.REFRIGERANT PIPING LENGTH

Model	Refrigerant piping : m		Piping size O.D : mm	
	Max. length	Max. height		
	A	B	Gas	Liquid
MU-A08VD - P1 MU-A10VD - P1	20	10	ϕ9.52	ϕ6.35
MU-A13VD - P1	20	10	ϕ12.7	

MAX.HEIGHT DIFFERENCE



ADDITIONAL REFRIGERANT CHARGE(R22 : g)

Model	Outdoor unit precharged	Refrigerant piping length (one way)			
		7m	10m	15m	20m
MU-A08VD - P1 MU-A10VD - P1	550	0	45	120	195
MU-A13VD - P1	1050	0	45	120	195

NOTE : Calculation : Xg=15g/m X (Refrigerant piping length (m)-7)

7 PERFORMANCE CURVES

MU-A08VD -P1
MU-A10VD -P1
MU-A13VD -P1

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.

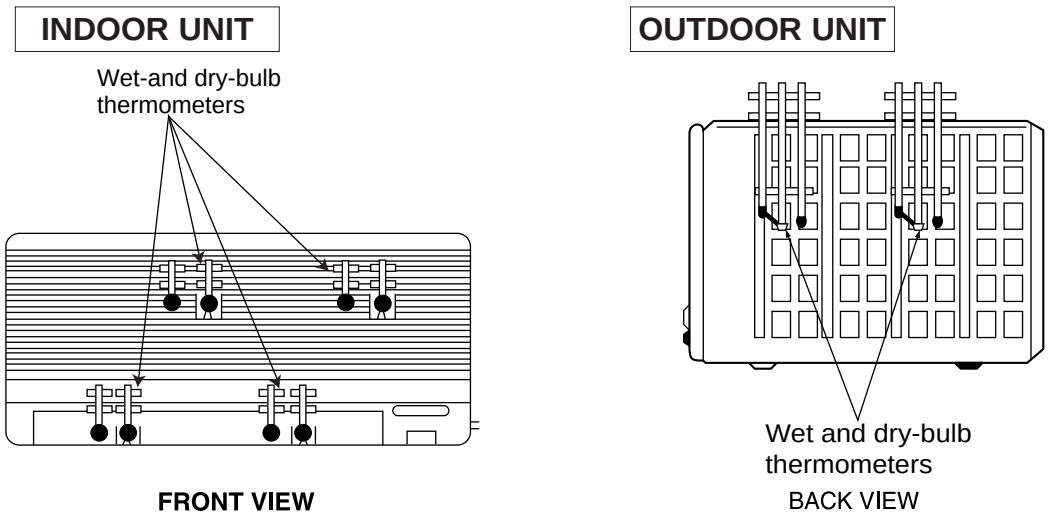
(3) MAIN READINGS

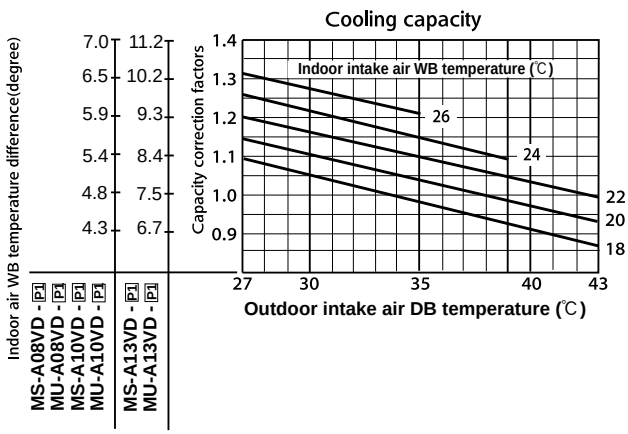
(1) Indoor intake air wet-bulb temperature : °CWB
(2) Indoor outlet air wet-bulb temperature : °CWB
(3) Outdoor intake air dry-bulb temperature : °CDB
(4) Total input: W

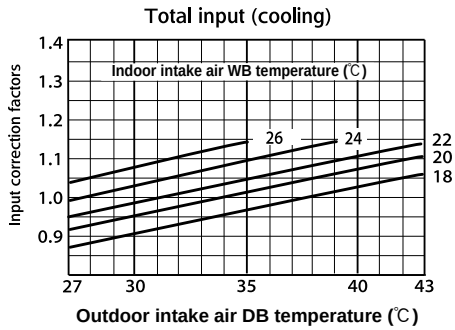
Indoor air wet/dry-bulb temperature difference on the left side of the chart on next page shows the difference between the indoor intake air wet/dry-bulb temperature and the indoor outlet air wet/dry-bulb temperature for your reference at service.

How to measure the indoor air wet/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 the room.
5. Press the EMERGENCY OPERATION switch once to start the EMERGENCY COOL 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

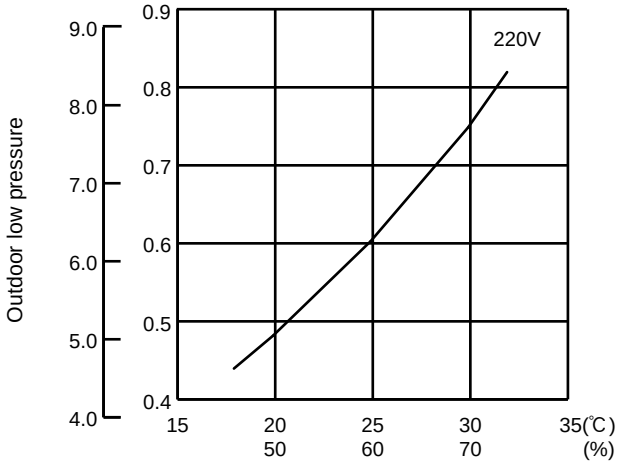
① Both indoor and outdoor units are under the same temperature/humidity condition.

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

② Air flow should be set at MAX.

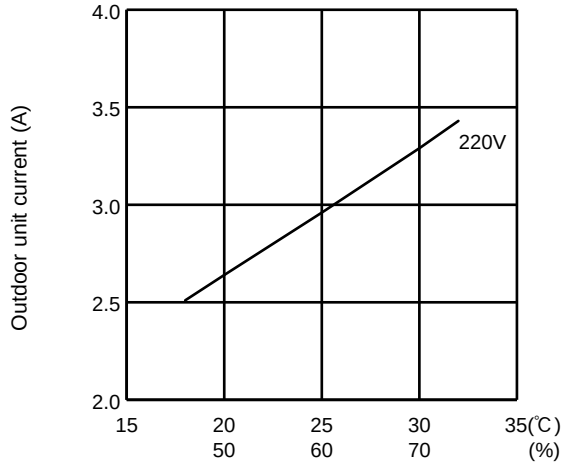
③ The unit of pressure has been changed to MPa on the international system of units(SI unit system).
The conversion factor is : **1(MPa [Gauge]) =10.2(kgf/㎠ [Gauge])**

MU-A08VD -P1
MU-A10VD -P1



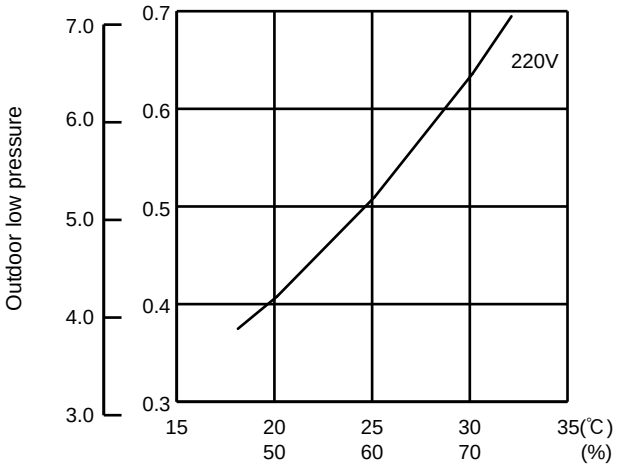
Ambient temperature (˚C)/Ambient humidity (%)

MU-A08VD -P1
MU-A10VD -P1



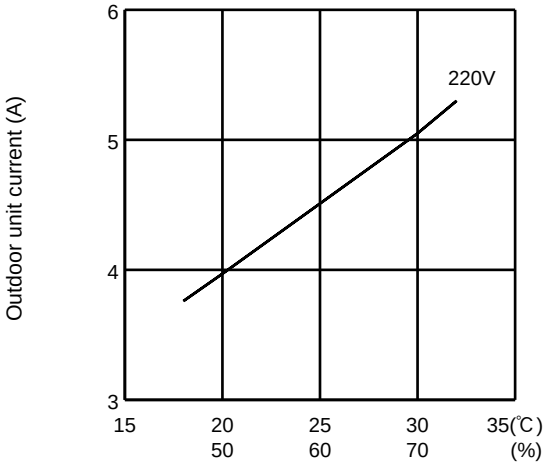
Ambient temperature (˚C)/Ambient humidity (%)

MU-A13VD -P1



Ambient temperature (˚C)/Ambient humidity (%)

MU-A13VD -P1



Ambient temperature (˚C)/Ambient humidity (%)

8 TROUBLESHOOTING

MU-A08VD -P1 MU-A10VD -P1 MU-A13VD -P1

8-1. 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.

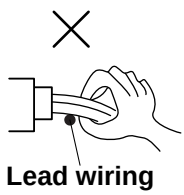
2. Take care the following during servicing.

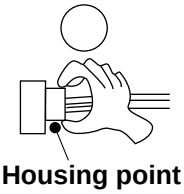
1).Before servicing the air conditioner, be sure to turn off the main unit first with the remote controller, and then after confirming the horizontal vane is closed, turn off the breaker and / or disconnect the power plug.

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.

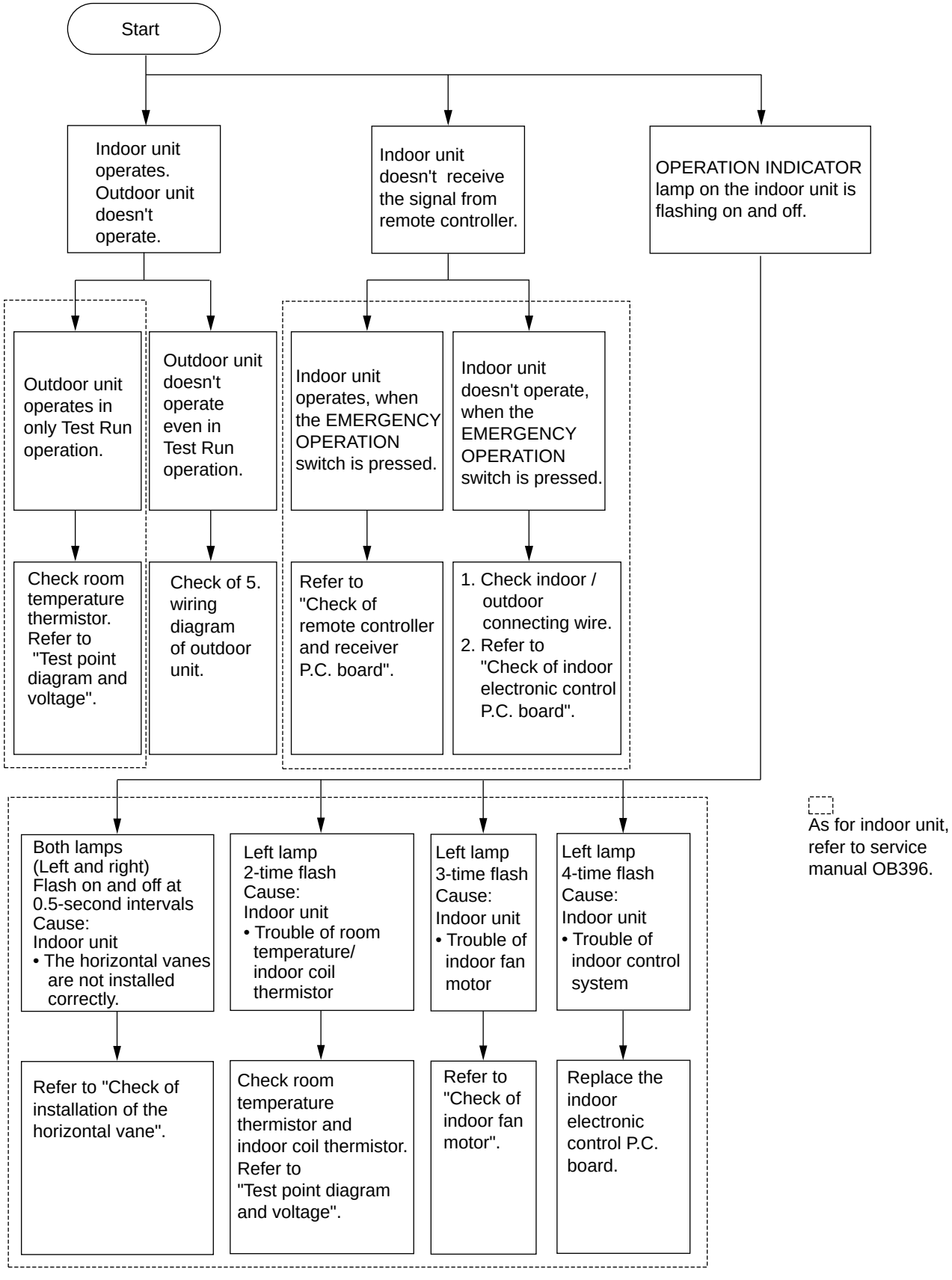
3) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.

4) When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.





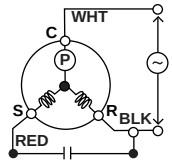
8-2. Instruction of troubleshooting

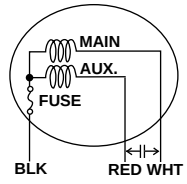


8-3. Trouble criterion of main parts

MU-A08VD - P1
MU-A10VD - P1
MU-A13VD - P1

<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Compressor (MC)

INNER PROTECTOR
MU-A08/A10VD
150± 5℃ OPEN
90±10℃ CLOSE
MU-A13VD
155± 5℃ OPEN
90±10℃ CLOSE</td><td>Measure the resistance between the terminals with a tester.
(Coil wiring temperature -10°C ~ 40°C)
<table><tr><td rowspan="2">Color of lead wire</td><td colspan="3">Normal</td><td rowspan="2">Abnormal</td></tr><tr><td>MU-A08VD</td><td>MU-A10VD</td><td>MU-A13VD</td></tr><tr><td>C-R</td><td>3.0 ~ 4.51 Ω</td><td>3.0 ~ 4.35 Ω</td><td>2.0 ~ 2.8 Ω</td><td rowspan="2">Open or short-circuit</td></tr><tr><td>C-S</td><td>5.0 ~ 6.22 Ω</td><td>5.0 ~ 6.16 Ω</td><td>3.0 ~ 4.25 Ω</td></tr></table></td><td> 
</td></tr>
<tr><td>Outdoor fan motor (MF)

INNER FUSE
149± 3℃ OPEN</td><td>Measure the resistance between the terminals with a tester.
(Coil wiring temperature -10°C ~ 40°C)
<table><tr><td rowspan="2">Color of lead wire</td><td colspan="2">Normal</td><td rowspan="2">Abnormal</td></tr><tr><td>MU-A08/A10VD</td><td>MU-A13VD</td></tr><tr><td>WHT-BLK</td><td>305 ~ 374 Ω</td><td>189 ~ 233 Ω</td><td rowspan="2">Open or short-circuit</td></tr><tr><td>BLK-RED</td><td>247 ~ 304 Ω</td><td>270 ~ 332 Ω</td></tr></table></td><td> 
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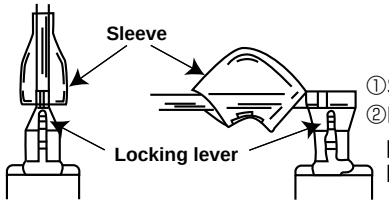
Ⓟ:INNER PROTECTOR

9 DISASSEMBLY INSTRUCTIONS

<"Terminal with locking mechanism" Detaching points>

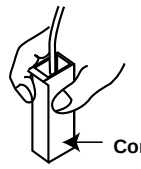
The terminal which has the locking mechanism can be detached as shown below.
There are two types (Refer to (1) and (2)) of the terminal with locking mechanism.
The terminal without locking mechanism can be detached by pulling it out.
Check the shape of the terminal before detaching.

(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 has the locking mechanism.



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

9-1. MU-A08VD - P1 MU-A10VD - P1 OUTDOOR UNIT

OPERATING PROCEDURE	PHOTOS

1. Removing the cabinet

(1) Remove the screws fixing the top panel. (See Photo 2 and 3.)
(2) Remove the top panel. (See Photo 3.)
(3) Remove the screw fixing the service panel. (See Photo 3.)
(4) Pull down the service panel and remove it. (See Photo 3.)
(5) Remove the screws fixing the cabinet.
(6) Remove the cabinet.
(7) Disconnect the indoor/outdoor connecting wire.
(8) Remove the screws fixing the back panel.
(9) Remove the back panel.

Photo 1

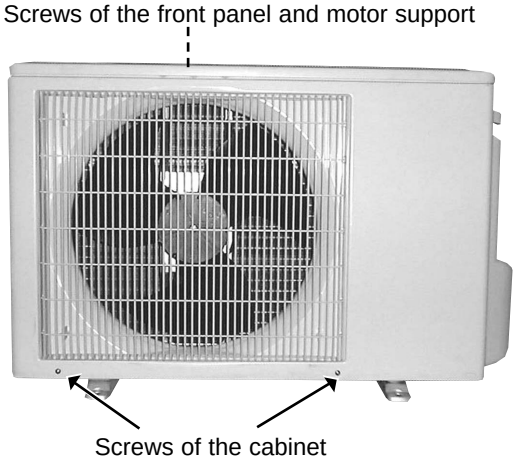


Photo 3

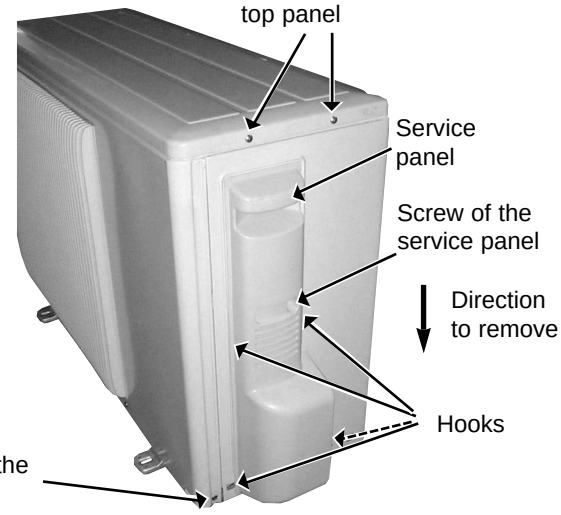
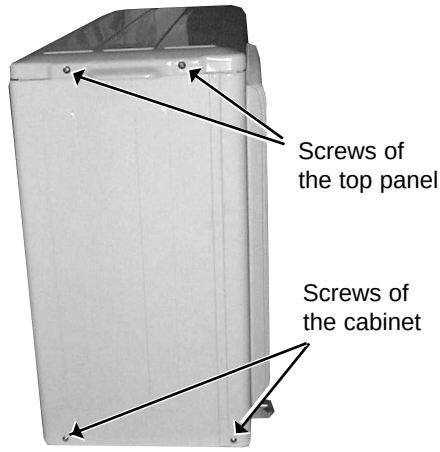
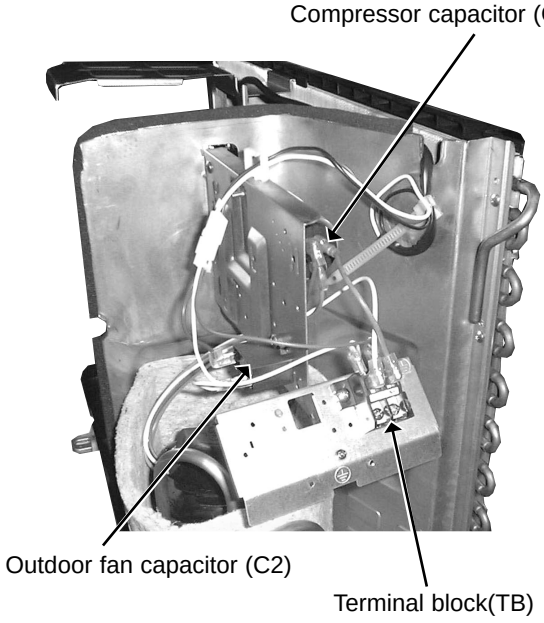
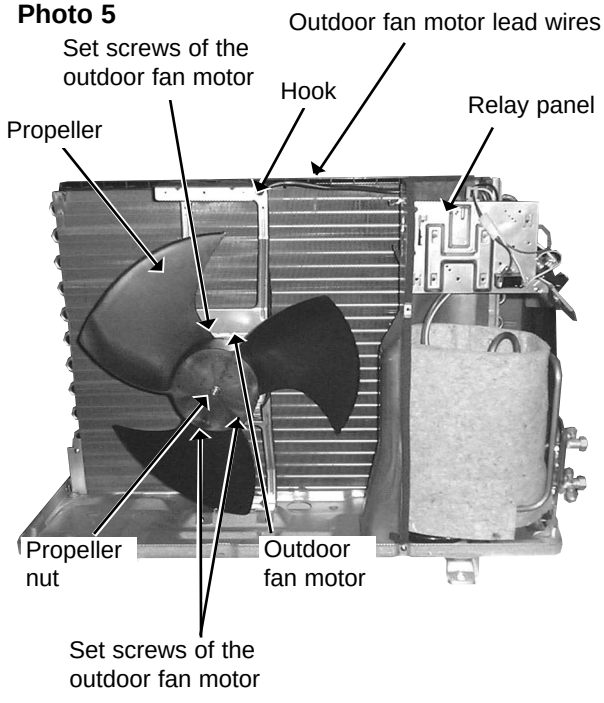
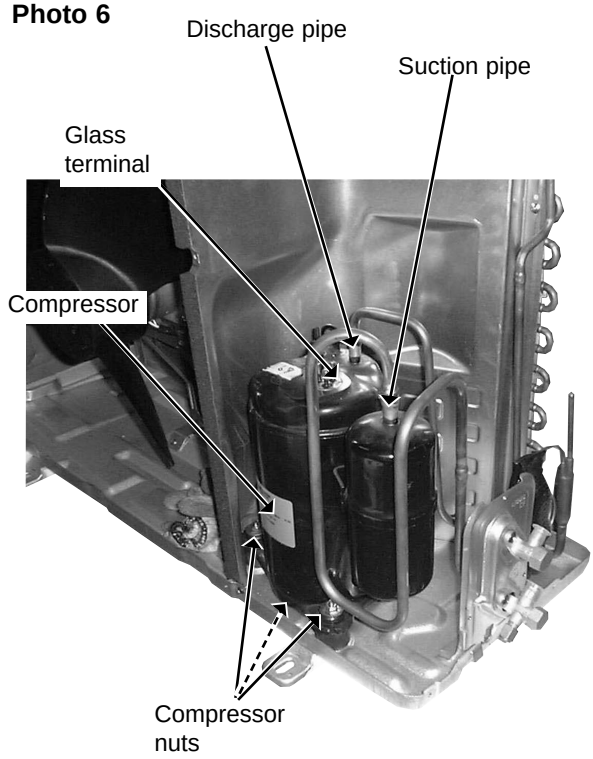


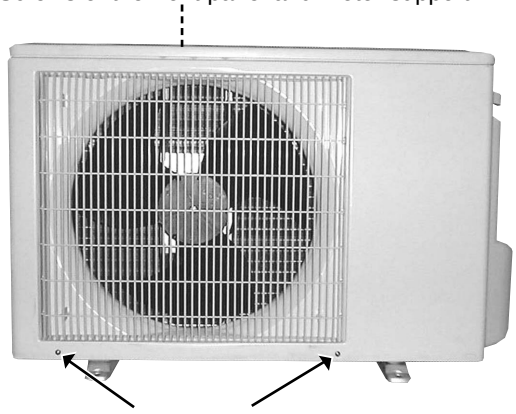
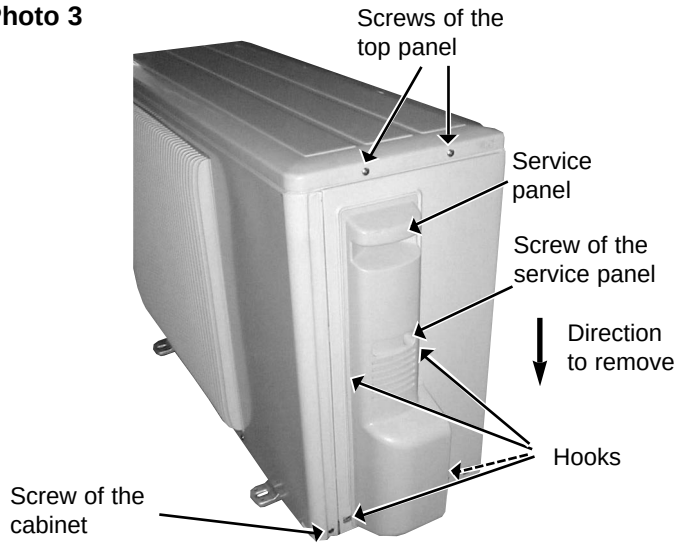
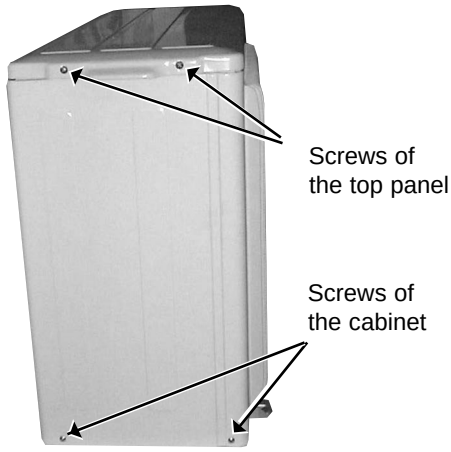
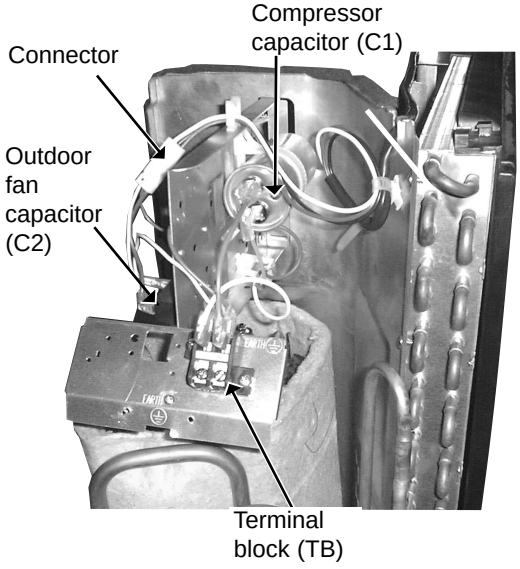
Photo 2

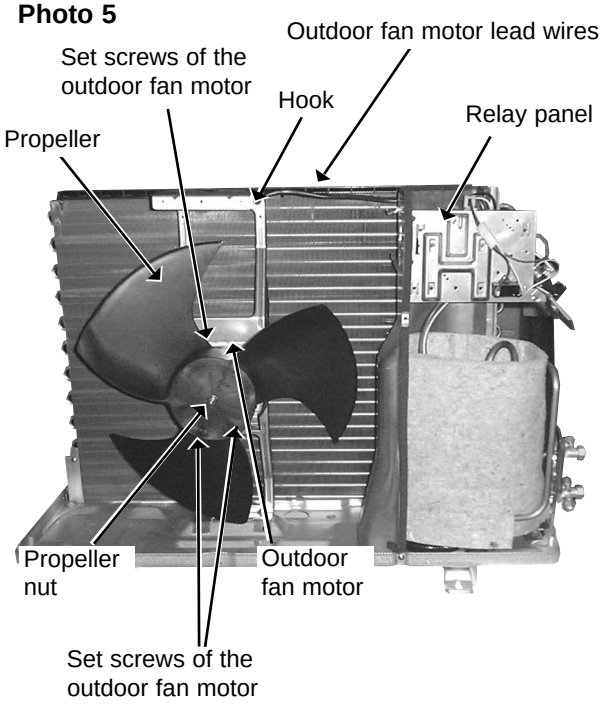
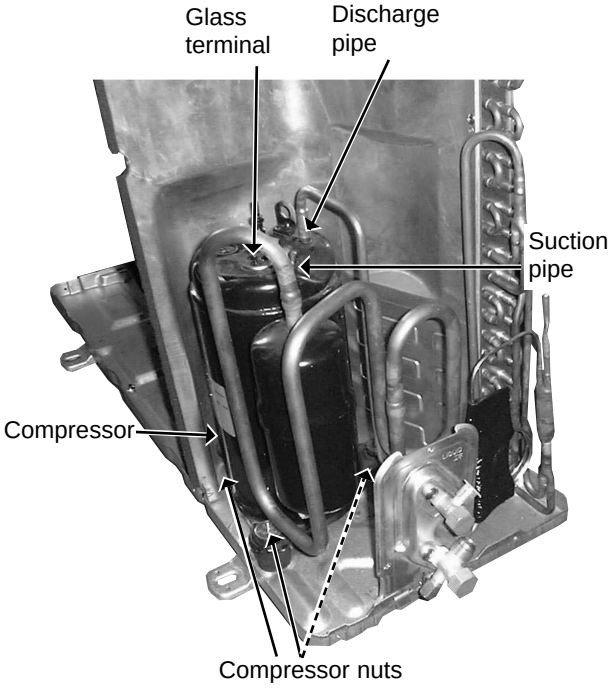


OPERATING PROCEDURE	PHOTOS
2. Removing the electrical parts (1) Remove the service panel and the cabinet.(Refer to 1.) (2) Remove the following parts. •Compressor capacitor (C1) •Outdoor fan capacitor (C2) •Terminal block (TB)	**Photo 4** 
3. Removing the propeller and the outdoor fan motor (1) Remove the cabinet. (Refer to 1.) (2) Remove the propeller nut and the propeller. **NOTE :** Loose the propeller in the rotating direction for removal. When attaching the propeller, align the mark on the propeller and the motor shaft cut section. Set the propeller in position by using the cut on the shaft and the mark on the propeller. (3) Remove the lead clamps and outdoor fan motor lead wires. (4) Remove the screws fixing the outdoor fan motor. (5) Remove the outdoor fan motor.	**Photo 5** 

OPERATING PROCEDURE	PHOTOS
4. Removing the compressor (1) Remove the cabinet. (Refer to 1.) (2) Remove the soundproof felt. (3) Remove the screws fixing the relay panel. (4) Remove the terminal cover. (5) Pull out the lead wires from the glass terminal of the compressor. (6) Recover gas from the refrigerant circuit. **NOTE :** Recover gas from the pipes until the pressure gauge shows 0 kg/cm^2 (0MPa). (7) Disconnect the welded part of the suction pipe and discharge pipe. (8) Remove the nuts fixing the compressor. (9) Remove the compressor.	**Photo 6** 

9-2. MU-A13VD - P1
OUTDOOR UNIT

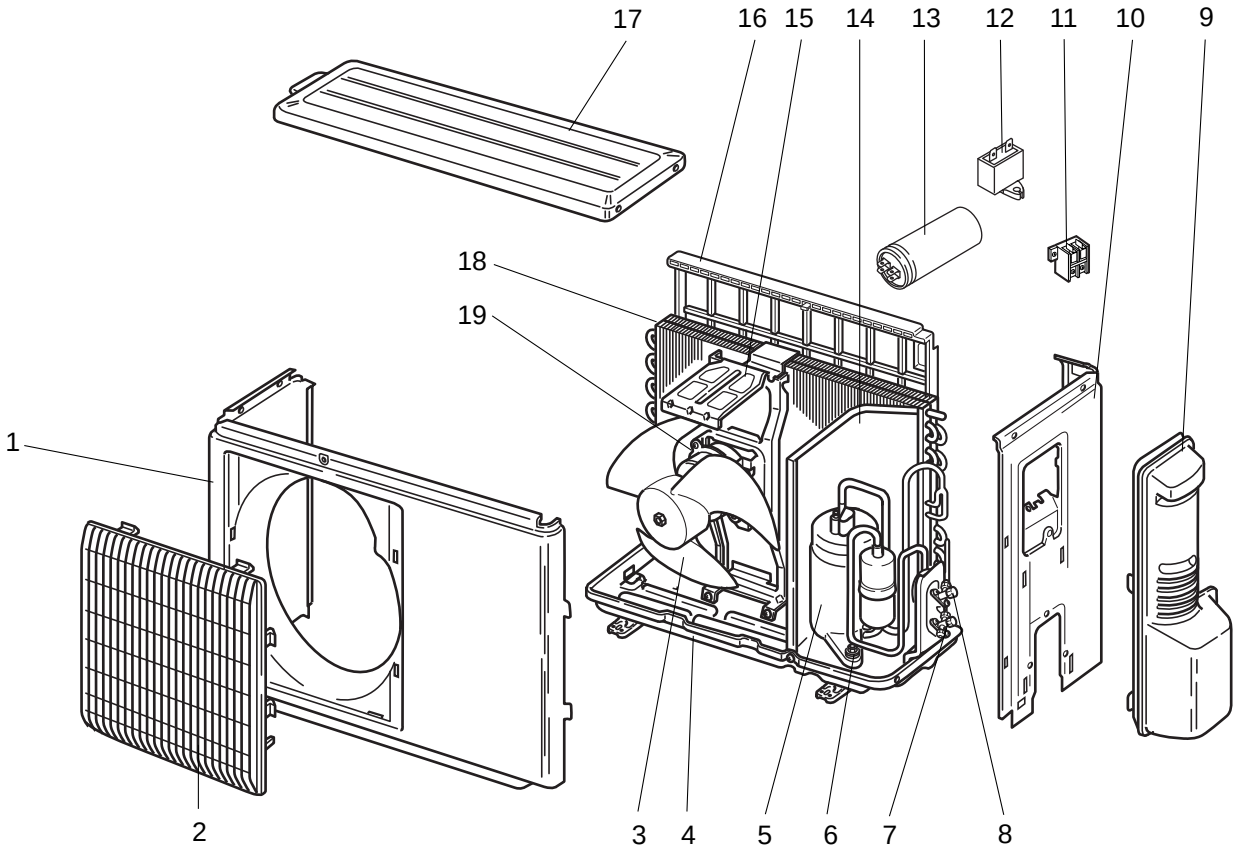
OPERATING PROCEDURE	PHOTOS
1. Removing the cabinet (1) Remove the screws fixing the top panel. (See Photo 2 and 3.) (2) Remove the top panel. (See Photo 3.) (3) Remove the screw fixing the service panel. (See Photo 3.) (4) Pull down the service panel and remove it. (See Photo 3.) (5) Remove the screws fixing the cabinet. (6) Remove the cabinet. (7) Disconnect the indoor/outdoor connecting wire. (8) Remove the screws fixing the back panel. (9) Remove the back panel.	**Photo 1** Screws of the front panel and motor support  Screws of the cabinet
Photo 3  	**Photo 2** 
2. Removing the electrical parts (1) Remove the service panel and the cabinet. (Refer to 1.) (2) Remove the following parts. •Compressor capacitor (C1) •Outdoor fan capacitor (C2) •Terminal block (TB)	**Photo 4** 

OPERATING PROCEDURE	PHOTOS
3. Removing propeller and the outdoor fan motor (1) Remove the cabinet. (Refer to 1) (2) Remove the propeller nut and remove the propeller. **NOTE :** Loose the propeller in the rotating direction for removal. When attaching the propeller, align the mark on the propeller and the motor shaft cut section. Set the propeller in position by using the cut on the shaft and the mark on the propeller. (3) Disconnect the connector and remove the lead clamps and outdoor fan motor lead wires. (4) Remove the screws fixing the outdoor fan motor. (5) Remove the outdoor fan motor.	**Photo 5** 
4. Removing the compressor (1) Remove the cabinet. (Refer to 1) (2) Remove the relay panel. (3) Remove the soundproof felt. (4) Remove the terminal cover. (5) Pull out the lead wires from the glass terminal of the compressor. (6) Recover gas from the refrigerant circuit. **NOTE :** Recover gas from the pipes until the pressure gauge shows 0 kg/cm^2 (0MPa). (7) Disconnect the welded part of the suction pipe and discharge pipe. (8) Remove the nuts fixing the compressor and the compressor.	**Photo 6** 

10 PARTS LIST

MU-A08VD -P1 MU-A10VD -P1 MU-A13VD -P1

10-1. OUTDOOR UNIT
STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS



This figure shows MU-A13VD.

MU-A08VD -P1 MU-A10VD -P1 MU-A13VD -P1

10-1. OUTDOOR UNIT

STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

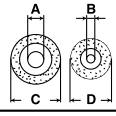
Part number that is circled is not shown in the illustration.

No.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit			Remarks
				MU-A08VD-P1	MU-A10VD-P1	MU-A13VD-P1	
1	E02 899 232	CABINET		1	1	1	
2	E02 927 521	GRILLE		1	1	1	
3	E02 665 501	PROPELLER		1	1	1	
4	E02 899 290	BASE		1	1		
	E02 900 290	BASE				1	
5	E02 940 900	COMPRESSOR	MC	1			RH135VHCC
	E02 899 900	COMPRESSOR	MC		1		RH145VHCC
	E02 900 900	COMPRESSOR	MC			1	RH207VHAC
6	E02 075 506	COMPRESSOR RUBBER SET		3	3	3	3RUBBERS/SET
7	E02 899 661	STOP VALVE (GAS)		1	1		ϕ9.52
	E02 900 661	STOP VALVE (GAS)				1	ϕ12.7
8	E02 899 662	STOP VALVE (LIQUID)		1	1	1	ϕ6.35
9	E02 927 245	SERVICE PANEL		1	1	1	
10	E02 899 233	BACK PANEL		1	1	1	
11	E02 815 374	TERMINAL BLOCK	TB	1	1	1	2P
12	E02 899 351	OUTDOOR FAN CAPACITOR	C2	1	1		1.8μF/440VAC
	E02 900 351	OUTDOOR FAN CAPACITOR	C2			1	2.0μF/440VAC
13	E02 665 353	COMPRESSOR CAPACITOR	C1	1	1		25μF/450VAC
	E02 900 353	COMPRESSOR CAPACITOR	C1			1	30μF/440VAC
14	E02 899 293	SEPARATOR		1	1		
	E02 900 293	SEPARATOR				1	
15	E02 899 515	MOTOR SUPPORT		1	1		
	E02 900 515	MOTOR SUPPORT				1	
16	E02 899 523	CONDENSER NET		1	1		
	E02 900 523	CONDENSER NET				1	
17	E02 927 297	TOP PANEL		1	1	1	
18	E02 899 630	OUTDOOR HEAT EXCHANGER		1	1		
	E02 900 630	OUTDOOR HEAT EXCHANGER				1	
19	E02 899 301	OUTDOOR FAN MOTOR	MF	1	1		RA6V21 - □□
	E02 900 301	OUTDOOR FAN MOTOR	MF			1	RA6V33 - □□
⑳	E02 746 936	CAPILLARY TUBE		1	1		ϕ3.0×ϕ1.6×850
	E02 746 937	CAPILLARY TUBE				1	ϕ3.0×ϕ1.6×650

11 OPTIONAL PARTS

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	
MU-A08VD- P1 MU-A10VD- P1	MAC-MS0905F	5m		9.52 (3/8)	ϕ6.35 (1/4)	ϕ27	ϕ21	0
MU-A13VD- P1	MAC-MF1305F	5m		12.7 (1/2)		ϕ31	ϕ27	

Mr.SLIM™

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