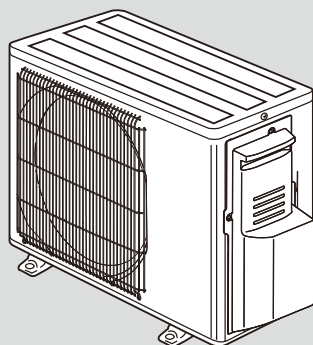


## OUTDOOR UNIT

# SERVICE MANUAL


**No. OBH873  
REVISED EDITION-B**

### Models

**MUZ-FS06NA - U1**
**MUZ-FS09NA - U1**
**MUZ-FS12NA - U1**
**MUZ-FS15NA - U1**
**MUZ-FS18NA - U1**
**MUZ-FS06NAH - U1**
**MUZ-FS09NAH - U1**
**MUZ-FS12NAH - U1**
**MUZ-FS15NAH - U1**
**MUZ-FS18NAH - U1**

**MUZ-FS06NA MUZ-FS06NAH  
MUZ-FS09NA MUZ-FS09NAH  
MUZ-FS12NA MUZ-FS12NAH**
**Indoor unit service manual  
MSZ-FS•NA Series (OBH872)**

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**PARTS CATALOG (OBB873)**

# Use the specified refrigerant only

## Never use any refrigerant other than that specified.

Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.

Correct refrigerant is specified in the manuals and on the spec labels provided with our products.

We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

### <Preparation before the repair service>

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the air conditioner, turn off the power-supply breaker and pull the power plug.
- Discharge the capacitor before the work involving the electric parts.

### <Precautions during the repair service>

- Do not perform the work involving the electric parts with wet hands.
- Do not pour water into the electric parts.
- Do not touch the refrigerant.
- Do not touch the hot or cold areas in the refrigeration cycle.
- When the repair or the inspection of the circuit needs to be done without turning off the power, exercise great caution not to touch the live parts.

### WARNING

- When the refrigeration circuit has a leak, do not execute pump down with the compressor.
- When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes. The compressor may burst if air etc. get into it.
- When opening or closing the valve below freezing temperatures, refrigerant may spurt out from the gap between the valve stem and the valve body, resulting in injuries.

### Revision A:

- A warning when opening or closing the valve has been added.

### Revision B:

- 3. SPECIFICATION has been corrected.

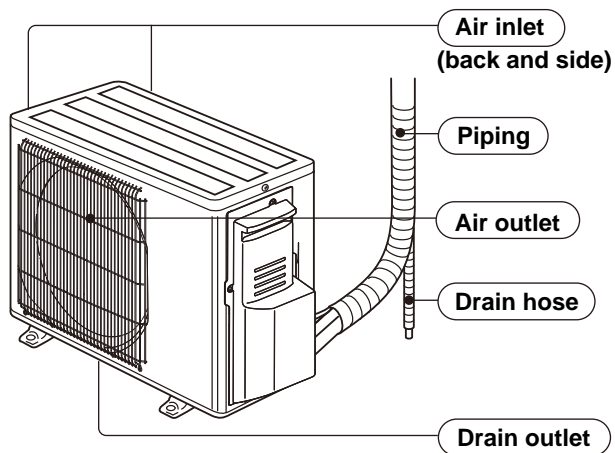
## 1

## TECHNICAL CHANGES

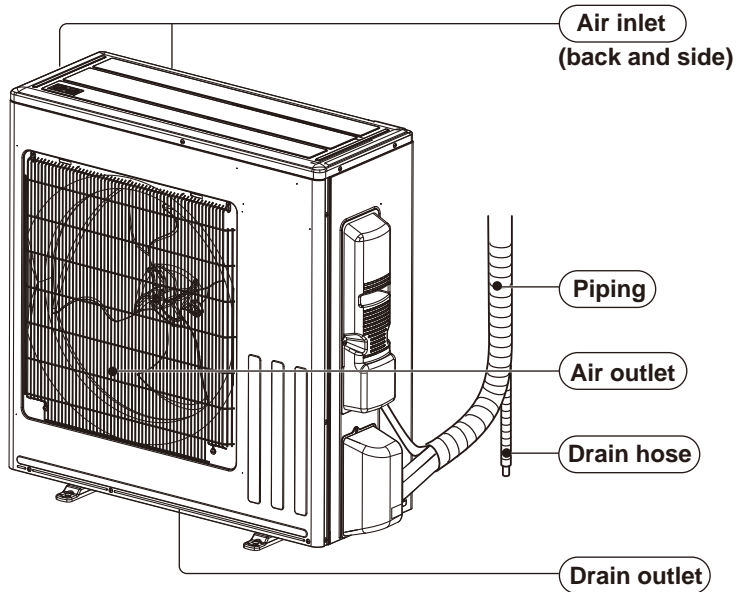
MUZ-FS06NA	MUZ-FS06NAH
MUZ-FS09NA	MUZ-FS09NAH
MUZ-FS12NA	MUZ-FS12NAH
MUZ-FS15NA	MUZ-FS15NAH
MUZ-FS18NA	MUZ-FS18NAH

1. New model

MUZ-FS06NA    MUZ-FS06NAH  
MUZ-FS09NA    MUZ-FS09NAH  
MUZ-FS12NA    MUZ-FS12NAH



MUZ-FS15NA    MUZ-FS15NAH  
MUZ-FS18NA    MUZ-FS18NAH



Outdoor unit model			MUZ-FS06NA MUZ-FS06NAH	MUZ-FS09NA MUZ-FS09NAH	MUZ-FS12NA MUZ-FS12NAH	MUZ-FS15NA MUZ-FS15NAH	MUZ-FS18NA MUZ-FS18NAH
Capacity Rated (Minimum~Maximum)	Cooling *1	Btu/h	6,000 (1,700 ~ 9,000)	9,000 (1,700 ~ 12,000)	12,000 (2,500 ~ 13,600)	14,000 (6,450 ~ 19,000)	17,200 (6,450 ~ 21,000)
	Heating 47 *1	Btu/h	8,700 (1,600 ~ 14,000)	9,600 (1,600 ~ 18,000)	12,300 (3,700 ~ 21,000)	16,000 (5,150 ~ 24,000)	19,000 (5,150 ~ 30,000)
Capacity Rated (Maximum)	Heating 17 *2	Btu/h	5,400 (12,700)	5,900 (14,000)	7,600(17,300)	9,800 (22,700)	11,700 (27,000)
Power consumption Rated (Minimum~Maximum)	Cooling *1	W	315 (100 ~ 560)	560 (100 ~ 1,000)	870 (170 ~ 1,150)	1,000 (410 ~ 2,000)	1,375 (410 ~ 2,220)
	Heating 47 *1	W	545 (110 ~ 1,270)	620 (110 ~ 1,740)	850 (280 ~ 1,980)	1,155 (430 ~ 3,190)	1,610 (430 ~ 3,990)
Power consumption Rated (Maximum)	Heating 17 *2	W	390 (1,000)	450 (1,710)	610 (1,980)	830 (2,480)	1,160 (3,820)
EER *1 [SEER] *3	Cooling		19.0 [33.1]	16.1 [30.5]	13.8 [26.1]	14.0 [22.2]	12.5 [21.0]
HSPF IV *4	Heating		<b>NA:</b> 13.5	<b>NA:</b> 13.5	<b>NA:</b> 12.5	<b>NA:</b> 12.5	<b>NA:</b> 12.5
			<b>NAH:</b> 12.5	<b>NAH:</b> 12.5	<b>NAH:</b> 12.0	<b>NAH:</b> 12.0	<b>NAH:</b> 12.0
COP	Heating *1		4.68	4.54	4.24	4.06	3.46
Power supply	V , phase , Hz		208/230, 1 , 60				
Max. fuse size (time delay)		A	15			20	
Min. circuit ampacity		A	10			18	
Fan motor	F.L.A	A	0.50			0.93	
Compressor	Model		SNB092FQAMT		SNB140FQUMT	SNB172FQKMT	
	R.L.A	A	7.4			13.6	
	L.R.A	A	9.2			17.0	
	Refrigeration oil	fl oz. (L)/(Model)	11.8 (0.35)/(FV50S)			13.5 (0.40)/(FV50S)	
Refrigerant control			Linear expansion valve				
Sound level *1	Cooling	dB(A)	47	48	49	51	52
	Heating	dB(A)	49	49	51	55	55
Defrost method			Reverse cycle				
Dimensions	W	in.	31-1/2			33-1/16	
	D	in.	11-1/4			13	
	H	in.	21-5/8			34-5/8	
Weight		lb.	<b>NA:</b> 82		<b>NA:</b> 83	<b>NA:</b> 117	
			<b>NAH:</b> 83		<b>NAH:</b> 84	<b>NAH:</b> 118	
External finish			Munsell 3Y 7.8/1.1				
Remote controller			Wireless type				
Control voltage (by built-in transformer)		V DC	12 - 24				
Refrigerant piping			Not supplied				
Refrigerant pipe size (Min. wall thickness)	Liquid	in.	1/4 (0.0315)				
	Gas	in.	3/8 (0.0315)			1/2 (0.0315)	
Connection meth- od	Indoor		Flared				
	Outdoor		Flared				
Between the indoor & outdoor units	Height difference	ft.	40			50	
	Piping length	ft.	65			100	
Refrigerant charge (R410A)			2 lb. 9 oz.			3 lb. 7 oz.	

**NOTE:** Test conditions are based on AHRI 210/240.

\*1: Rating conditions (Cooling) — Indoor: 80°FDB, 67°FWB, Outdoor: 95°FDB, (75°FWB)  
(Heating) — Indoor: 70°FDB, 60°FWB, Outdoor: 47°FDB, 43°FWB

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

## Test condition

\*3, \*4

AHRI 210/240	Mode	Test	Indoor air condition (°F)		Outdoor air condition (°F)	
			Dry bulb	Wet bulb	Dry bulb	Wet bulb
	SEER (Cooling)	"A-Full" Cooling Steady State at rated compressor speed	80	67	95	(75)
		"B-Full" Cooling Steady State at rated compressor speed	80	67	82	(65)
		"B-Low" Cooling Steady State at minimum compressor speed	80	67	82	(65)
		"F-Low" Cooling Steady State at minimum compressor speed	80	67	67	(53.5)
		"E-Int" Cooling Steady State at intermediate compressor speed *5	80	67	87	(69)
	HSPF (Heating)	"H1-Nom" Heating Steady State at rated compressor speed	70	60	47	43
		"H3-Full" Heating at rated compressor speed	70	60	17	15
		"H0-Low" Heating Steady State at minimum compressor speed	70	60	62	56.5
		"H1-Low" Heating Steady State at minimum compressor speed	70	60	47	43
		"H2-Int" Heating at intermediate compressor speed *5	70	60	35	33

\*5: At intermediate compressor speed

= ("Rated compressor speed" - "minimum compressor speed") / 3 + "minimum compressor speed".

## OPERATING RANGE

### (1) POWER SUPPLY

	Rated voltage	Guaranteed voltage (V)
Outdoor unit	208/230 V 1 phase 60 Hz	<div> Min. 187 208 230 Max. 253 </div>

### (2) OPERATION

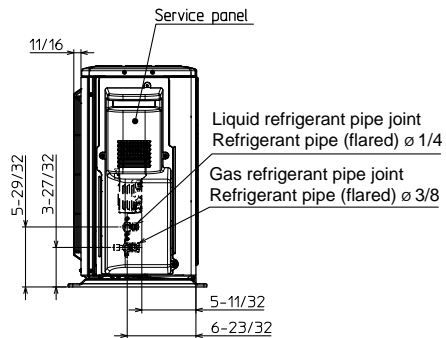
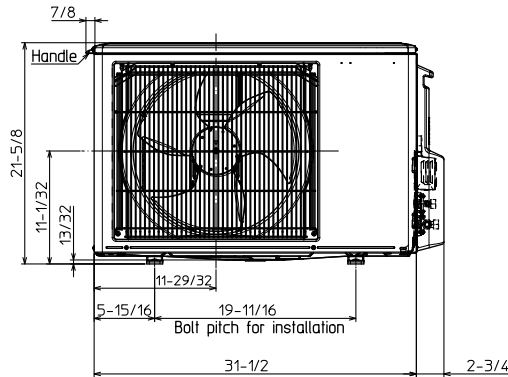
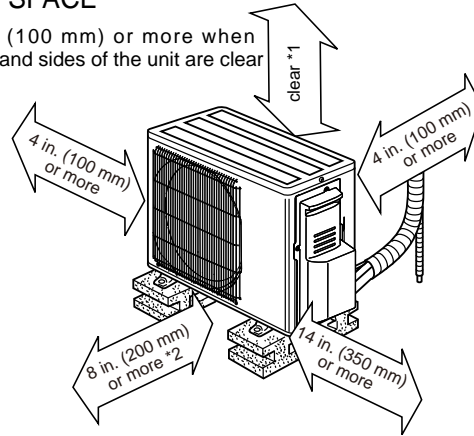
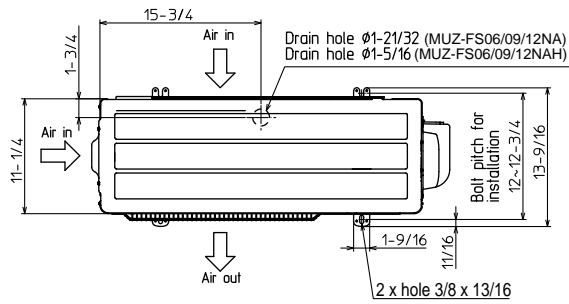
Mode	Condition	Intake air temperature (°F)			
		Indoor		Outdoor	
		DB	WB	DB	WB
Cooling	Standard temperature	80	67	95	—
	Maximum temperature	90	73	115	—
	Minimum temperature	67	57	14	—
	Maximum humidity	78 %		—	
Heating	Standard temperature	70	60	47	43
	Maximum temperature	80	67	75	65
	Minimum temperature	70	60	-13	-14

MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH

Unit: inch

## REQUIRED SPACE

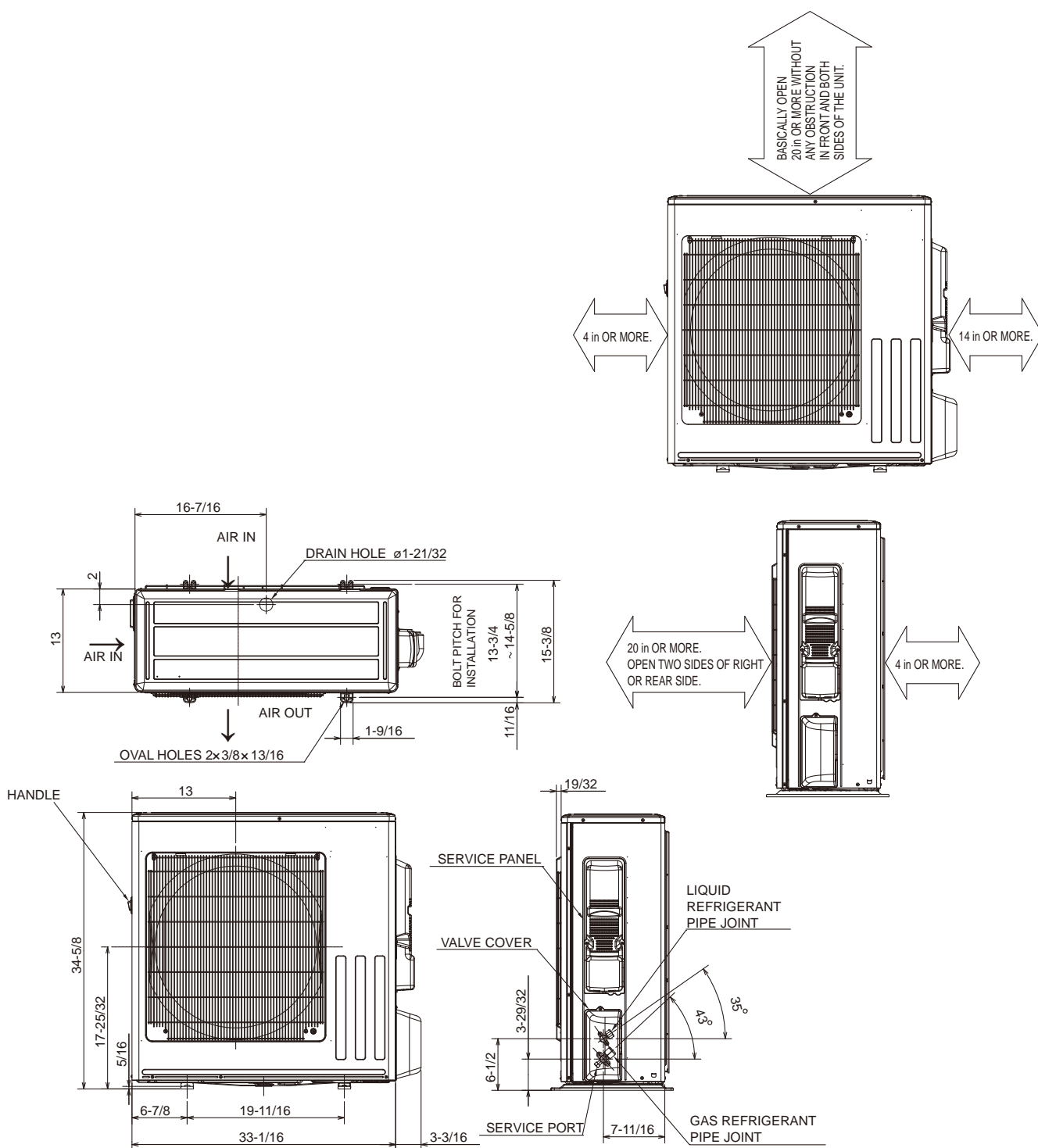
\*1 4 in. (100 mm) or more when  
front and sides of the unit are clear



# MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH

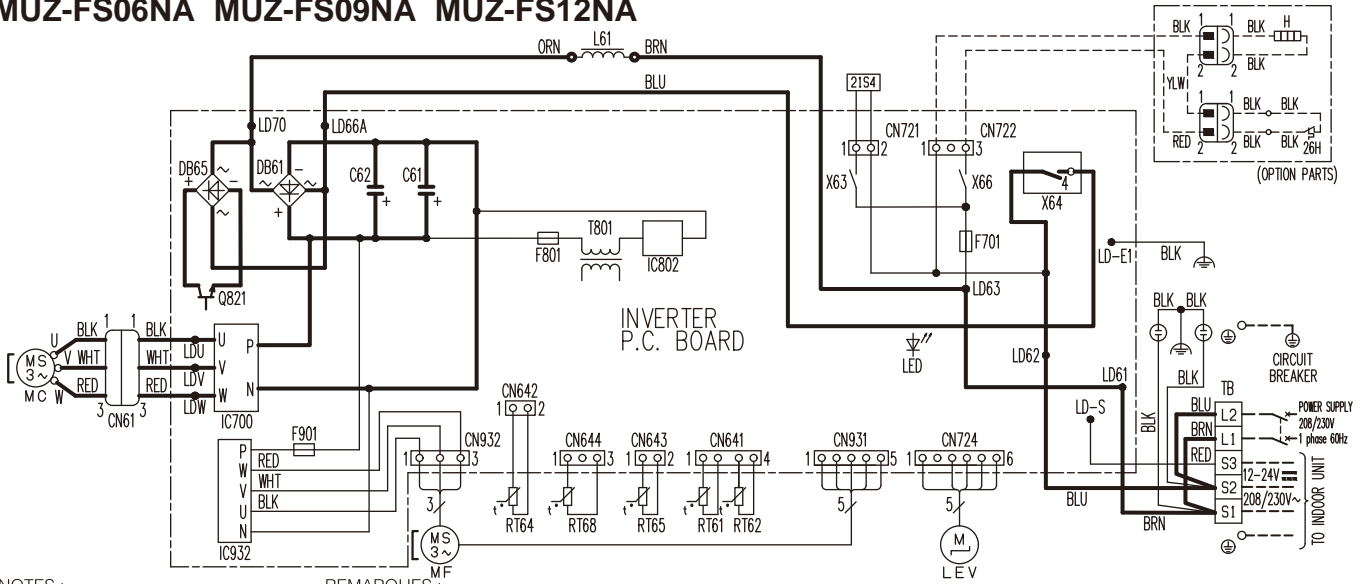
Unit: inch

## REQUIRED SPACE



REFRIGERANT PIPE JOINT	LIQUID REFRIGERANT PIPE	FLARED ø6.35 (1/4")
	GAS REFRIGERANT PIPE	FLARED ø12.7 (1/2")

## MUZ-FS06NA MUZ-FS09NA MUZ-FS12NA



## NOTES :

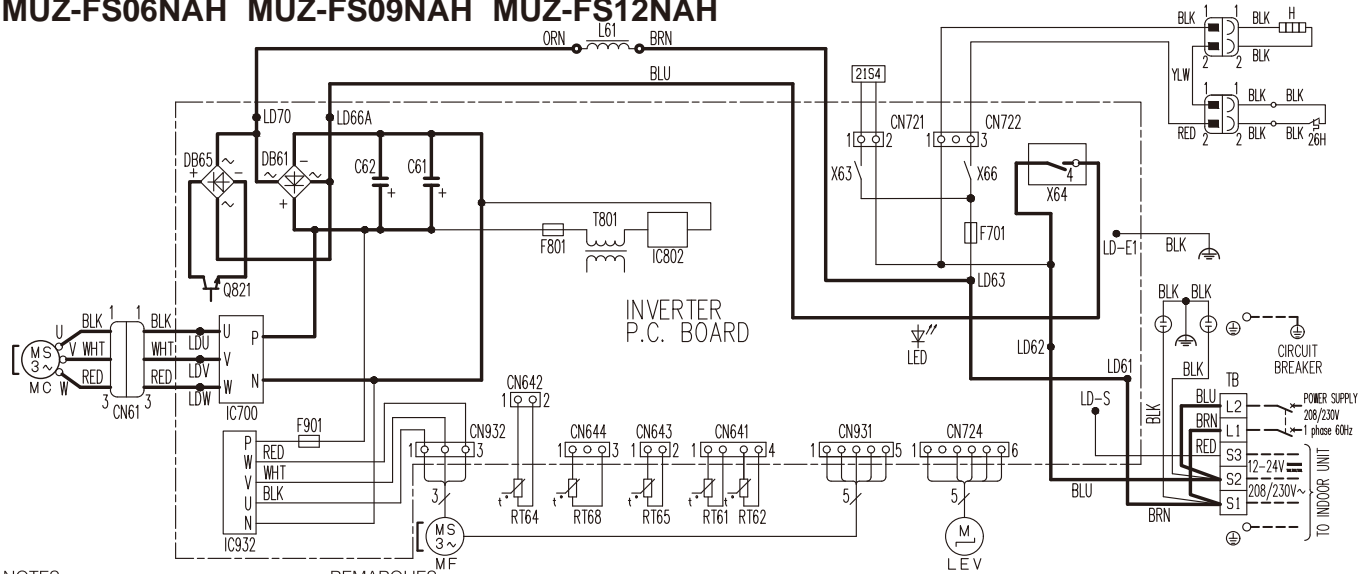
1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper supply wires.
3. Symbols indicate, : Terminal block : Connector

## REMARQUES :

1. Pour le câblage électronique côté intérieur, se reporter au schéma d'entretien du câblage électronique de l'appareil intérieur.
2. Utiliser des fils d'alimentation en cuivre.
3. Les symboles ont les significations suivantes, : Borne : Connecteur

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CN61	CONNECTOR	LEV	EXPANSION VALVE COIL	RT65	AMBIENT TEMP. THERMISTOR
C61,C62	SMOOTHING CAPACITOR	L61	REACTOR	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR
DB61,DB65	DIODE MODULE	MC	COMPRESSOR	TB	TERMINAL BLOCK
F701,F801,F901	FUSE (T3, 15AL250V)	MF	FAN MOTOR	T801	TRANSFORMER
H	DEFROST HEATER (OPTION PARTS)	Q821	SWITCHING POWER TRANSISTOR	X63, X64, X66	RELAY
IC700,IC932	POWER MODULE	RT61	DEFROST THERMISTOR	21S4	REVERSING VALVE COIL
IC802	POWER DEVICE	RT62	DISCHARGE TEMP. THERMISTOR	26H	HEATER PROTECTOR (OPTION PARTS)
LED	LED	RT64	FIN TEMP. THERMISTOR		

## MUZ-FS06NAH MUZ-FS09NAH MUZ-FS12NAH



## NOTES :

1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
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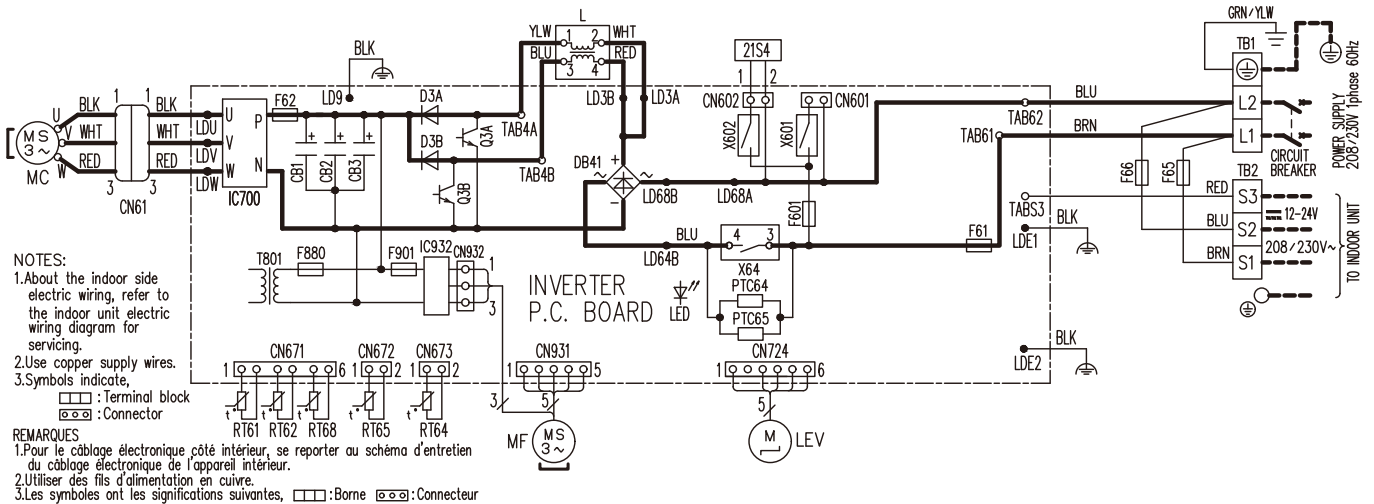
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SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
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C61,C62	SMOOTHING CAPACITOR	L61	REACTOR	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR
DB61,DB65	DIODE MODULE	MC	COMPRESSOR	TB	TERMINAL BLOCK
F701,F801,F901	FUSE (T3, 15AL250V)	MF	FAN MOTOR	T801	TRANSFORMER
H	DEFROST HEATER	Q821	SWITCHING POWER TRANSISTOR	X63, X64, X66	RELAY
IC700,IC932	POWER MODULE	RT61	DEFROST THERMISTOR	21S4	REVERSING VALVE COIL
IC802	POWER DEVICE	RT62	DISCHARGE TEMP. THERMISTOR	26H	HEATER PROTECTOR
LED	LED	RT64	FIN TEMP. THERMISTOR		

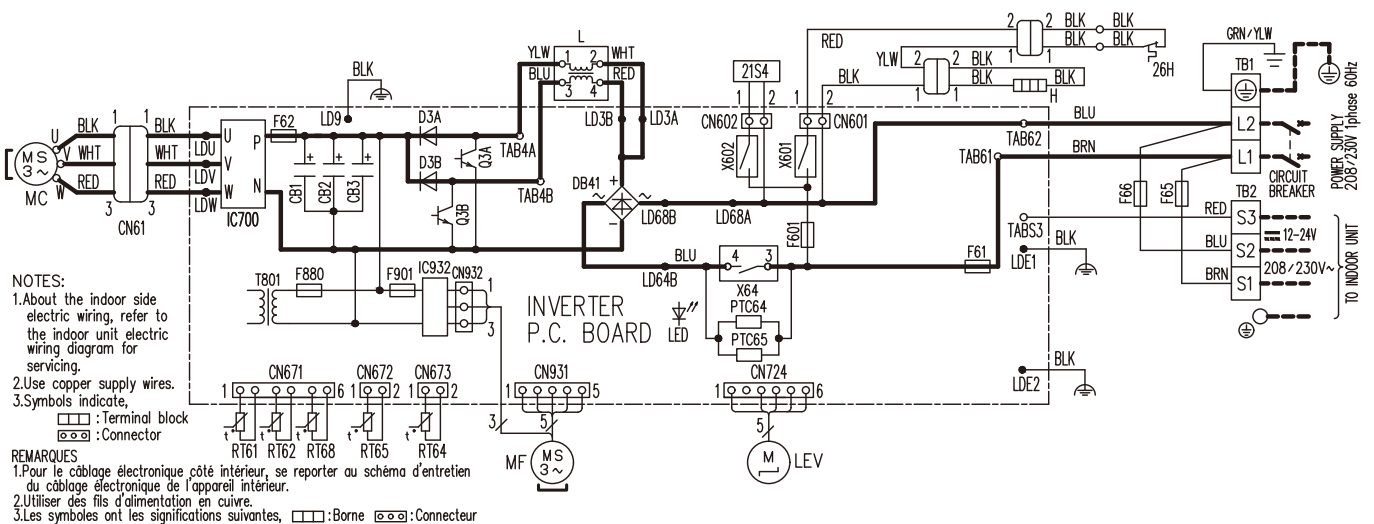


## MUZ-FS15NA MUZ-FS18NA



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CB1,CB2,CB3	SMOOTHING CAPACITOR	LED	LED	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR
CN61	CONNECTOR	LEV	EXPANSION VALVE COIL	TB1,TB2	TERMINAL BLOCK
DB41	DIODE MODULE	MC	COMPRESSOR	T801	TRANSFORMER
D3A,D3B	DIODE	MF	FAN MOTOR	X64,X601,X602	RELAY
F61	FUSE (25A 250V)	PTC64,PTC65	CIRCUIT PROTECTION	21S4	REVERSING VALVE COIL
F62	FUSE (15A 250V)	Q3A,Q3B	SWITCHING POWER TRANSISTOR		
F65,F66	FUSE (T6.3AL250V)	RT61	DEFROST TEMP. THERMISTOR		
F601,F880,F901	FUSE (T3.15AL250V)	RT62	DISCHARGE TEMP. THERMISTOR		
IC700,IC932	POWER MODULE	RT64	FIN TEMP. THERMISTOR		
L	REACTOR	RT65	AMBIENT TEMP. THERMISTOR		

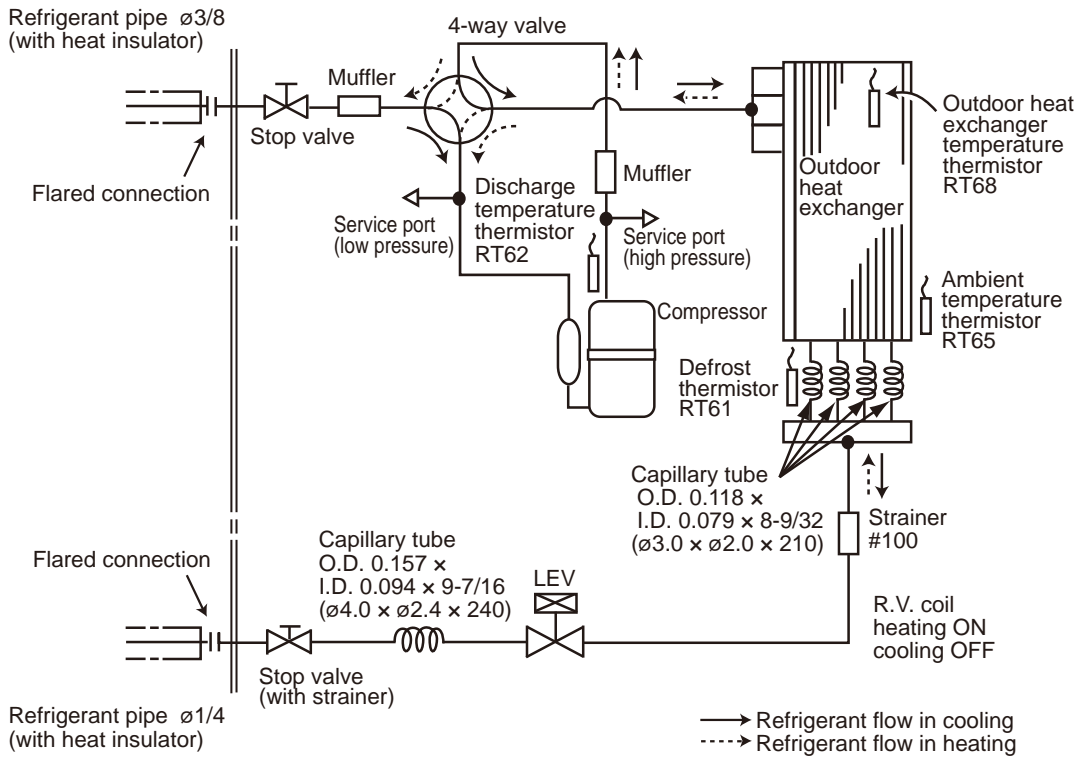
## MUZ-FS15NAH MUZ-FS18NAH



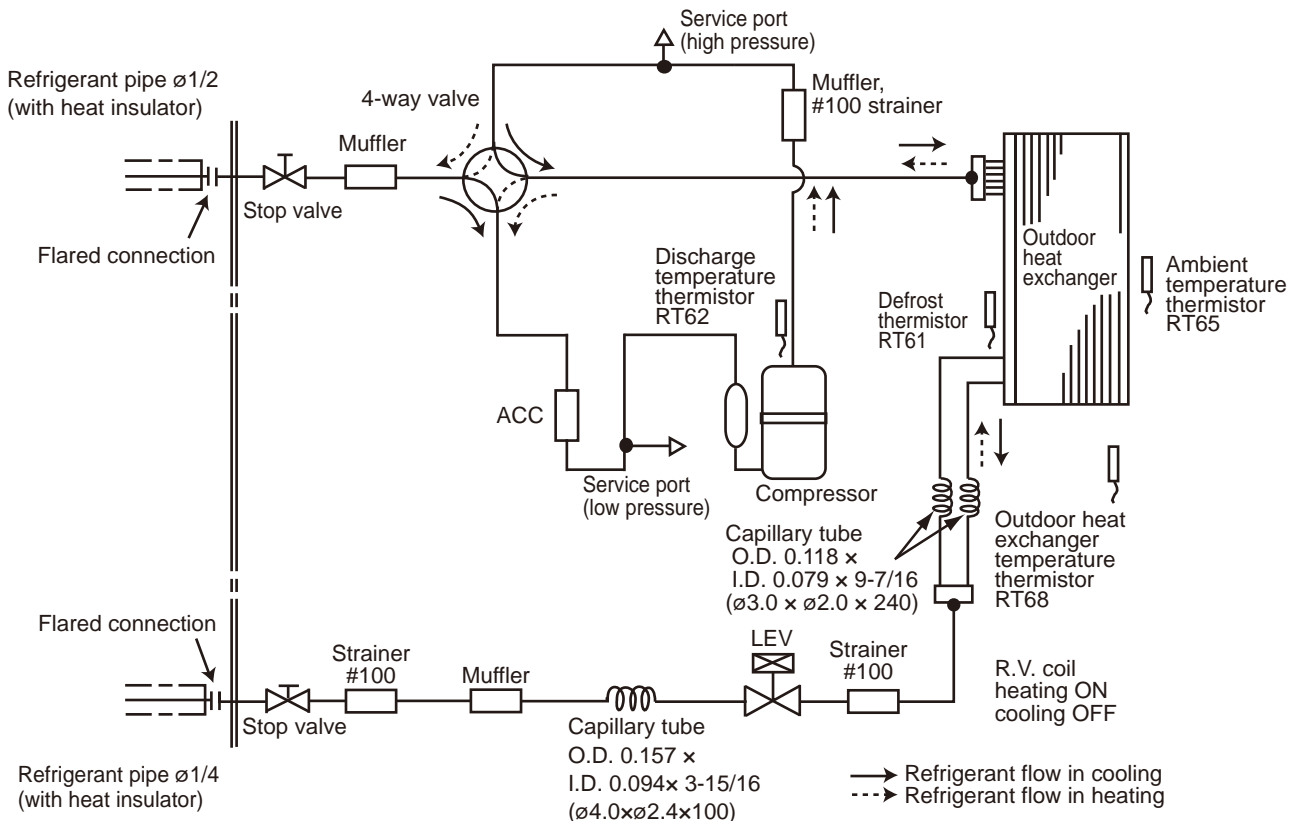
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CB1,CB2,CB3	SMOOTHING CAPACITOR	L	REACTOR	RT65	AMBIENT TEMP. THERMISTOR
CN61	CONNECTOR	LED	LED	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR
DB41	DIODE MODULE	LEV	EXPANSION VALVE COIL	TB1,TB2	TERMINAL BLOCK
D3A,D3B	DIODE	MC	COMPRESSOR	T801	TRANSFORMER
F61	FUSE (25A 250V)	MF	FAN MOTOR	X64,X601,X602	RELAY
F62	FUSE (15A 250V)	PTC64,PTC65	CIRCUIT PROTECTION	21S4	REVERSING VALVE COIL
F65,F66	FUSE (T6.3AL250V)	Q3A,Q3B	SWITCHING POWER TRANSISTOR	26H	HEATER PROTECTOR
F601,F880,F901	FUSE (T3.15AL250V)	RT61	DEFROST TEMP. THERMISTOR		
H	DEFROST HEATER	RT62	DISCHARGE TEMP. THERMISTOR		
IC700,IC932	POWER MODULE	RT64	FIN TEMP. THERMISTOR		

MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH

Unit: inch

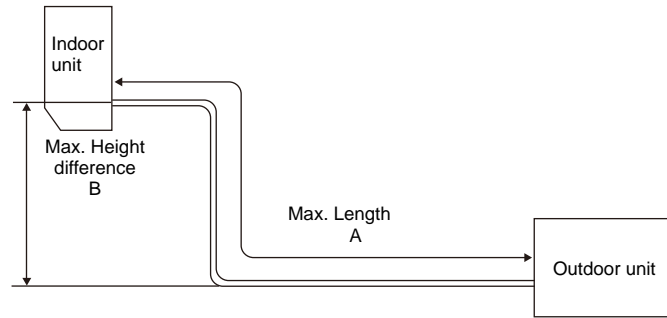


MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH



## MAX. REFRIGERANT PIPING LENGTH and MAX. HEIGHT DIFFERENCE

Model	Refrigerant piping: ft.		Piping size O.D: in.	
	Max. Length A	Max. Height difference B	Gas	Liquid
MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH	65	40	3/8	1/4
MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH	100	50	1/2	1/4



## ADDITIONAL REFRIGERANT CHARGE (R410A: oz.)

**NOTE:** Refrigerant piping exceeding 25 ft. requires additional refrigerant charge according to the calculation.

Model	Outdoor unit precharged	Refrigerant piping length (one way): ft.					
		25	30	40	50	60	65
MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH	2 lb. 9 oz.	0	1.08	3.24	5.40	7.56	8.64

Calculation:  $X \text{ oz.} = 1.08/5 \text{ oz./ft.} \times (\text{Refrigerant piping length (ft.)} - 25)$

**NOTE:** Refrigerant piping exceeding 25 ft. requires additional refrigerant charge according to the calculation.

Model	Outdoor unit precharged	Refrigerant piping length (one way): ft.								
		25	30	40	50	60	70	80	90	100
MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH	3 lb. 7 oz.	0	1.08	3.24	5.40	7.56	9.72	11.88	14.04	16.20

Calculation:  $X \text{ oz.} = 1.08/5 \text{ oz./ft.} \times (\text{Refrigerant piping length (ft.)} - 25)$

**MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH  
MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH**

**7-1. PERFORMANCE DATA**

**1) COOLING CAPACITY**

Model	Indoor air IWB (°F)	Outdoor intake air DB temperature (°F)											
		75				85				95			
		TC	SHC	SHF	TPC	TC	SHC	SHF	TPC	TC	SHC	SHF	TPC
<b>MUZ-FS06NA MUZ-FS06NAH</b>	71	7.4	6.1	0.83	0.28	6.9	5.7	0.83	0.31	6.5	5.3	0.83	0.33
	67	7.0	6.7	0.96	0.26	6.5	6.2	0.96	0.29	6.0	5.8	0.96	0.32
	63	6.5	7.2	1.09	0.25	6.1	6.6	1.09	0.28	5.6	6.2	1.09	0.30
<b>MUZ-FS09NA MUZ-FS09NAH</b>	71	11.0	8.7	0.79	0.50	10.3	8.1	0.79	0.55	9.7	7.6	0.79	0.59
	67	10.4	9.6	0.92	0.47	9.7	8.9	0.92	0.52	9.0	8.3	0.92	0.56
	63	9.8	10.3	1.05	0.45	9.1	9.6	1.05	0.50	8.5	8.9	1.05	0.53
<b>MUZ-FS12NA MUZ-FS12NAH</b>	71	14.7	10.2	0.70	0.77	13.7	9.6	0.70	0.85	12.9	9.0	0.70	0.91
	67	13.9	11.6	0.83	0.73	13.0	10.8	0.83	0.80	12.0	10.0	0.83	0.87
	63	13.1	12.6	0.96	0.70	12.1	11.7	0.96	0.77	11.3	10.9	0.96	0.83
<b>MUZ-FS15NA MUZ-FS15NAH</b>	71	17.2	9.7	0.57	0.89	16.0	9.1	0.57	0.98	15.1	8.5	0.57	1.05
	67	16.2	11.4	0.70	0.84	15.1	10.6	0.70	0.93	14.0	9.8	0.70	1.00
	63	15.3	12.7	0.83	0.80	14.1	11.8	0.83	0.89	13.2	11.0	0.83	0.96
<b>MUZ-FS18NA MUZ-FS18NAH</b>	71	21.1	11.3	0.54	1.22	19.7	10.6	0.54	1.34	18.5	9.9	0.54	1.44
	67	20.0	13.4	0.67	1.16	18.6	12.4	0.67	1.27	17.2	11.5	0.67	1.38
	63	18.7	15.1	0.80	1.10	17.4	14.0	0.80	1.22	16.2	13.0	0.80	1.31

Model	Indoor air IWB (°F)	Outdoor intake air DB temperature (°F)							
		105				115			
		TC	SHC	SHF	TPC	TC	SHC	SHF	TPC
<b>MUZ-FS06NA MUZ-FS06NAH</b>	71	6.0	5.0	0.83	0.35	5.5	4.6	0.83	0.36
	67	5.6	5.4	0.96	0.33	5.1	4.9	0.96	0.35
	63	5.1	5.6	1.09	0.32	4.7	5.1	1.09	0.33
<b>MUZ-FS09NA MUZ-FS09NAH</b>	71	9.0	7.1	0.79	0.62	8.3	6.5	0.79	0.64
	67	8.4	7.7	0.92	0.59	7.7	7.1	0.92	0.62
	63	7.7	8.1	1.05	0.57	7.0	7.4	1.05	0.59
<b>MUZ-FS12NA MUZ-FS12NAH</b>	71	12.0	8.4	0.70	0.96	11.0	7.7	0.70	1.00
	67	11.2	9.3	0.83	0.92	10.3	8.5	0.83	0.97
	63	10.3	9.9	0.96	0.89	9.4	9.0	0.96	0.92
<b>MUZ-FS15NA MUZ-FS15NAH</b>	71	14.0	7.9	0.57	1.11	12.9	7.3	0.57	1.15
	67	13.0	9.1	0.70	1.06	12.0	8.4	0.70	1.11
	63	12.0	10.0	0.83	1.02	10.9	9.1	0.83	1.06
<b>MUZ-FS18NA MUZ-FS18NAH</b>	71	17.2	9.2	0.54	1.52	15.8	8.5	0.54	1.58
	67	16.0	10.7	0.67	1.46	14.7	9.9	0.67	1.53
	63	14.7	11.8	0.80	1.40	13.4	10.8	0.80	1.46

**NOTE:** 1. IWB : Intake air wet-bulb temperature TC : Total Capacity (x10<sup>3</sup>Btu/h)  
SHC : Sensible Heat Capacity (x10<sup>3</sup>Btu/h) SHF : Sensible Heat Factor  
TPC : Total Power Consumption (kW)

2. SHC is based on 80°F of indoor Intake air DB temperature.

## 2) COOLING CAPACITY CORRECTIONS

Refrigerant piping length (one way: ft.)				
	25 (std.)	40	65	100
MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH	1.0	0.988	0.967	-
MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH	1.0	0.985	0.963	0.933

## 3) HEATING CAPACITY CORRECTIONS

Refrigerant piping length (one way: ft.)				
	25 (std.)	40	65	100
MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH	1.0	0.997	0.993	-
MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH	1.0	0.997	0.993	0.987

#### 4) HEATING CAPACITY

Model	Indoor air IDB (°F)	Outdoor intake air WB temperature (°F)													
		5		15		25		35		43		45		55	
		TC	TPC	TC	TPC	TC	TPC	TC	TPC	TC	TPC	TC	TPC	TC	TPC
MUZ-FS06NA	75	3.8	0.32	5.0	0.41	6.3	0.48	7.5	0.53	8.5	0.56	8.7	0.57	9.9	0.59
	70	4.1	0.31	5.4	0.39	6.5	0.47	7.7	0.52	8.7	0.55	9.0	0.56	10.1	0.58
	65	4.4	0.29	5.5	0.38	6.8	0.45	8.0	0.50	9.0	0.53	9.2	0.54	10.4	0.57
MUZ-FS06NAH	75	3.8	0.45	5.0	0.54	6.3	0.61	7.5	0.53	8.5	0.56	8.7	0.57	9.9	0.59
	70	4.1	0.44	5.4	0.52	6.5	0.60	7.7	0.52	8.7	0.55	9.0	0.56	10.1	0.58
	65	4.4	0.42	5.5	0.51	6.8	0.58	8.0	0.50	9.0	0.53	9.2	0.54	10.4	0.57
MUZ-FS09NA	75	4.2	0.37	5.6	0.46	7.0	0.54	8.3	0.60	9.4	0.64	9.6	0.64	10.9	0.67
	70	4.6	0.35	5.9	0.45	7.2	0.53	8.5	0.59	9.6	0.62	9.9	0.63	11.2	0.66
	65	4.8	0.33	6.0	0.43	7.5	0.51	8.8	0.57	9.9	0.60	10.2	0.61	11.4	0.64
MUZ-FS09NAH	75	4.2	0.50	5.6	0.59	7.0	0.67	8.3	0.60	9.4	0.64	9.6	0.64	10.9	0.67
	70	4.6	0.48	5.9	0.58	7.2	0.66	8.5	0.59	9.6	0.62	9.9	0.63	11.2	0.66
	65	4.8	0.46	6.0	0.56	7.5	0.64	8.8	0.57	9.9	0.60	10.2	0.61	11.4	0.64
MUZ-FS12NA	75	5.4	0.50	7.1	0.63	8.9	0.74	10.6	0.83	12.0	0.87	12.4	0.88	14.0	0.92
	70	5.8	0.48	7.6	0.61	9.2	0.73	10.9	0.81	12.3	0.85	12.7	0.87	14.3	0.90
	65	6.2	0.46	7.7	0.59	9.7	0.70	11.3	0.79	12.7	0.83	13.0	0.84	14.6	0.88
MUZ-FS12NAH	75	5.4	0.63	7.1	0.76	8.9	0.87	10.6	0.83	12.0	0.87	12.4	0.88	14.0	0.92
	70	5.8	0.61	7.6	0.74	9.2	0.86	10.9	0.81	12.3	0.85	12.7	0.87	14.3	0.90
	65	6.2	0.59	7.7	0.72	9.7	0.83	11.3	0.79	12.7	0.83	13.0	0.84	14.6	0.88
MUZ-FS15NA	75	7.0	0.68	9.3	0.86	11.6	1.01	13.8	1.13	15.6	1.18	16.1	1.20	18.2	1.25
	70	7.6	0.65	9.8	0.83	12.0	0.99	14.2	1.10	16.0	1.16	16.5	1.18	18.6	1.22
	65	8.0	0.62	10.1	0.80	12.6	0.95	14.6	1.07	16.5	1.13	17.0	1.14	19.0	1.20
MUZ-FS15NAH	75	7.0	0.80	9.3	0.98	11.6	1.13	13.8	1.13	15.6	1.18	16.1	1.20	18.2	1.25
	70	7.6	0.77	9.8	0.95	12.0	1.11	14.2	1.10	16.0	1.16	16.5	1.18	18.6	1.22
	65	8.0	0.74	10.1	0.92	12.6	1.07	14.6	1.07	16.5	1.13	17.0	1.14	19.0	1.20
MUZ-FS18NA	75	8.4	0.95	11.0	1.20	13.8	1.41	16.4	1.57	18.5	1.65	19.1	1.67	21.7	1.74
	70	9.0	0.91	11.7	1.16	14.3	1.38	16.8	1.53	19.0	1.61	19.6	1.64	22.1	1.71
	65	9.5	0.87	12.0	1.11	14.9	1.33	17.4	1.49	19.6	1.57	20.1	1.59	22.6	1.67
MUZ-FS18NAH	75	8.4	1.07	11.0	1.32	13.8	1.53	16.4	1.57	18.5	1.65	19.1	1.67	21.7	1.74
	70	9.0	1.03	11.7	1.28	14.3	1.50	16.8	1.53	19.0	1.61	19.6	1.64	22.1	1.71
	65	9.5	0.99	12.0	1.23	14.9	1.45	17.4	1.49	19.6	1.57	20.1	1.59	22.6	1.67

NOTE: 1. IDB : Intake air dry-bulb temperature

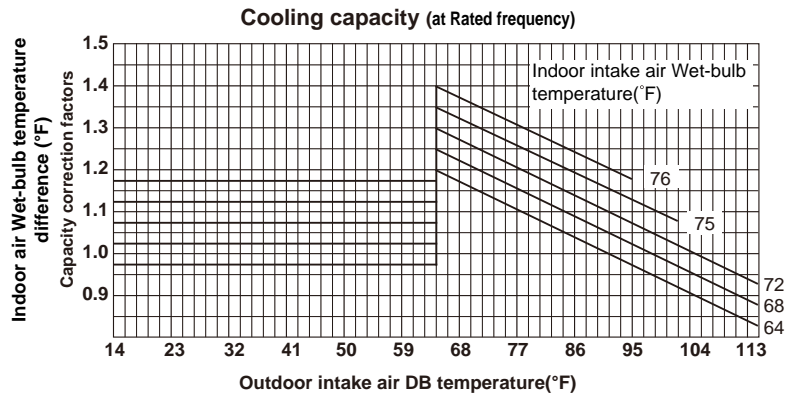
TC : Total Capacity (x10<sup>3</sup> Btu/h)

TPC : Total Power Consumption (kW)

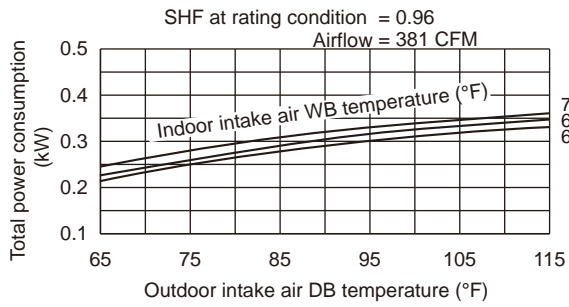
2. Above data is for heating operation without any frost.

## 7-2. PERFORMANCE CURVE

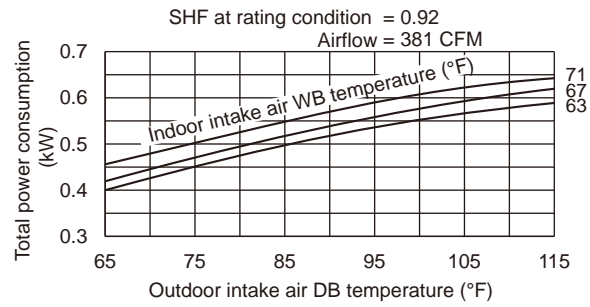
### Cooling



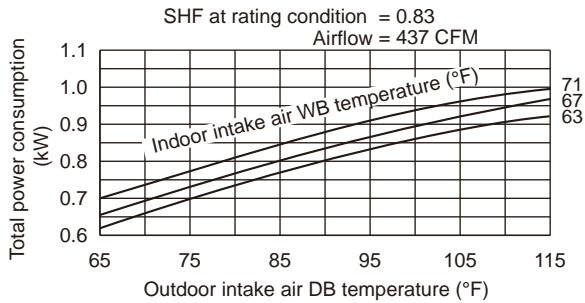
#### MUZ-FS06NA MUZ-FS06NAH



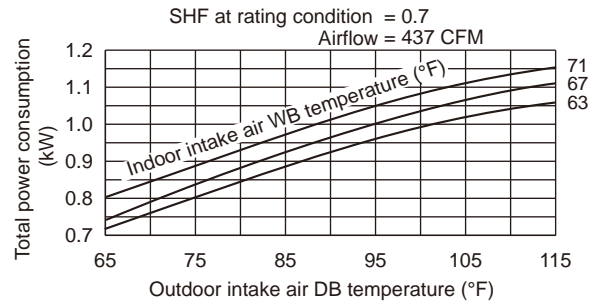
#### MUZ-FS09NA MUZ-FS09NAH



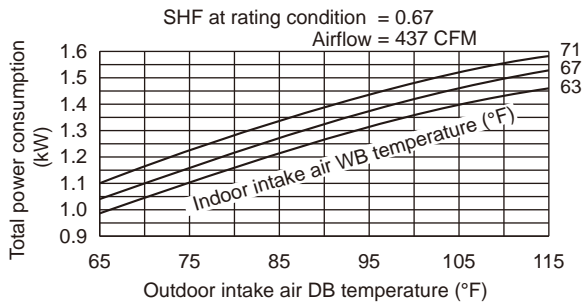
#### MUZ-FS12NA MUZ-FS12NAH



#### MUZ-FS15NA MUZ-FS15NAH

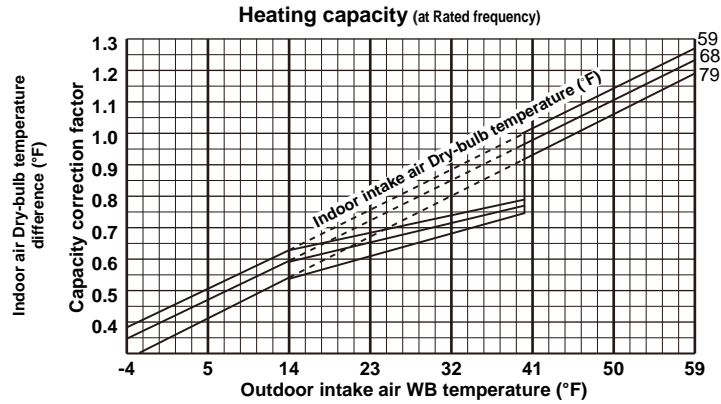


#### MUZ-FS18NA MUZ-FS18NAH

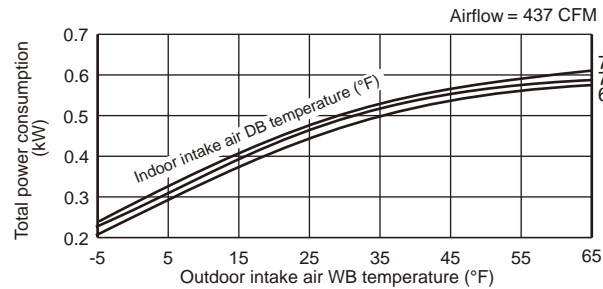


This value of frequency is not the same as the actual frequency in operating. Refer to 7-5 and 7-6 for the relationships between frequency and capacity.

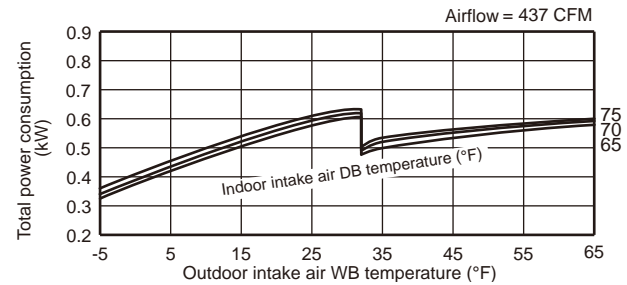
## Heating



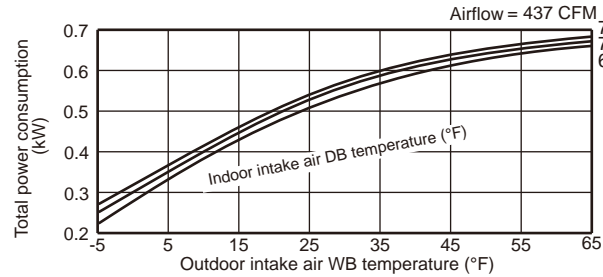
### MUZ-FS06NA



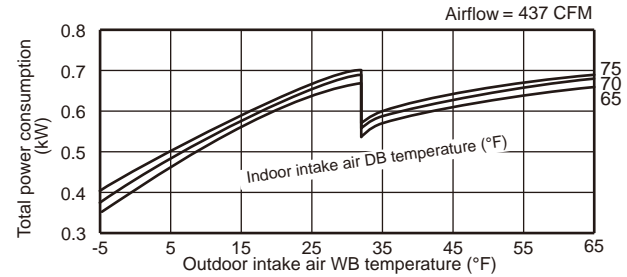
### MUZ-FS06NAH



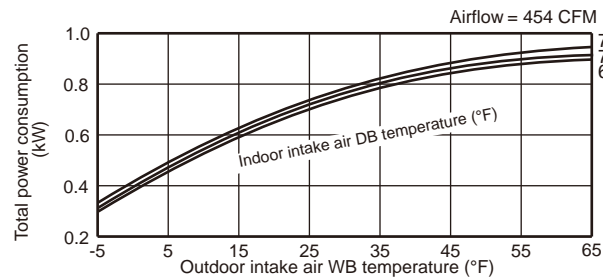
### MUZ-FS09NA



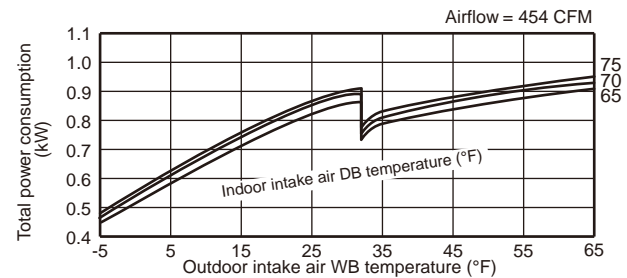
### MUZ-FS09NAH



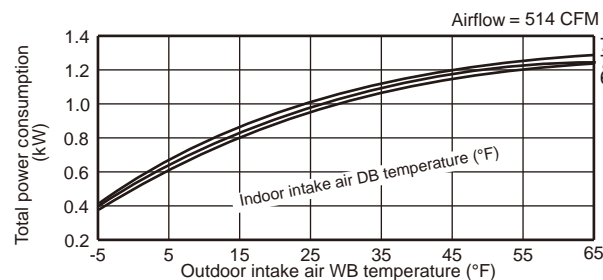
### MUZ-FS12NA



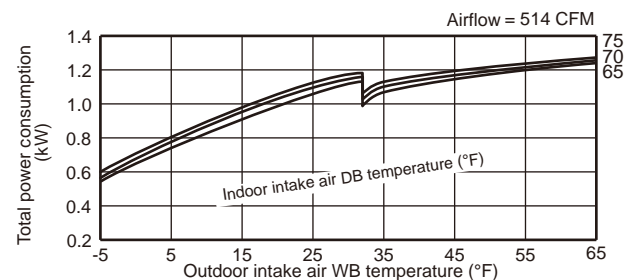
### MUZ-FS12NAH



### MUZ-FS15NA

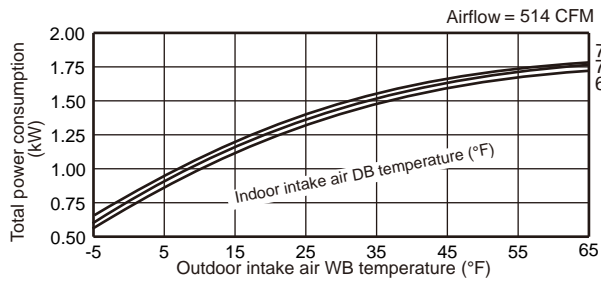


### MUZ-FS15NAH

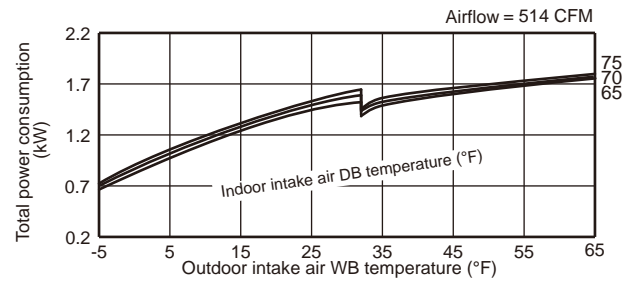




## MUZ-FS18NA



## MUZ-FS18NAH



This value of frequency is not the same as the actual frequency in operating. Refer to 7-5 and 7-6 for the relationships between frequency and capacity.

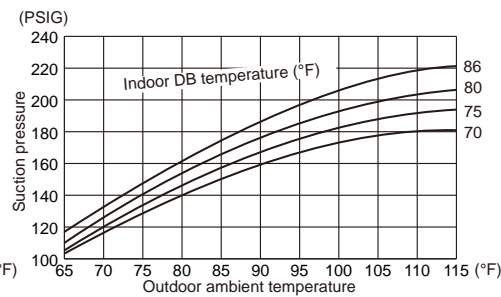
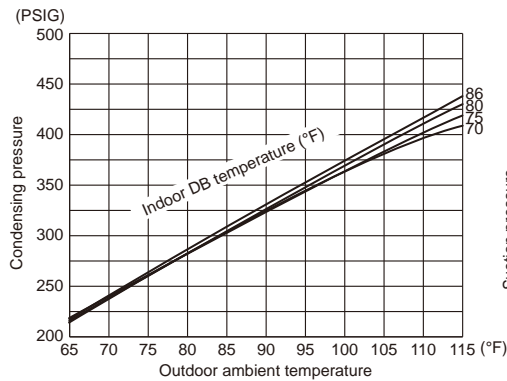
## 7-3. CONDENSING PRESSURE

### Cooling

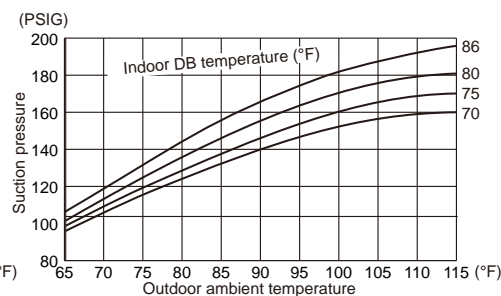
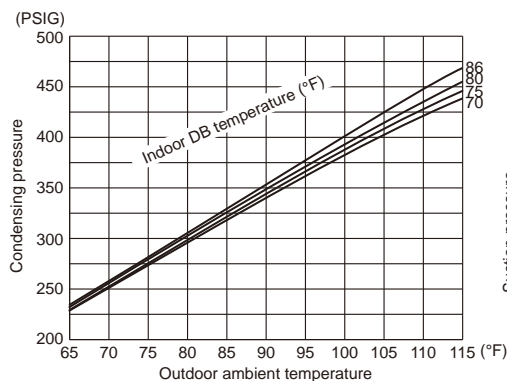
Data are based on the condition of indoor humidity 50 %.

Air flow should be set to High speed.

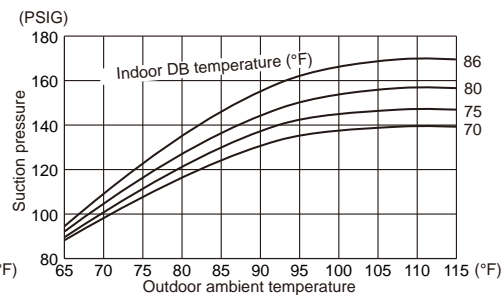
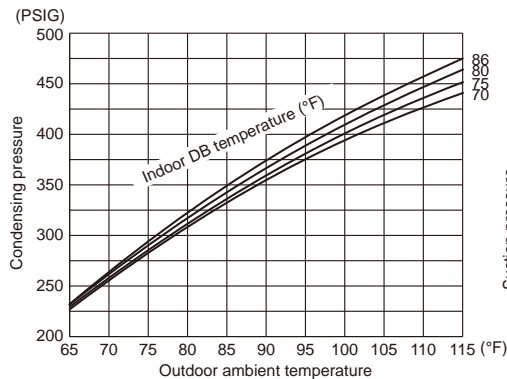
### MUZ-FS06NA MUZ-FS06NAH



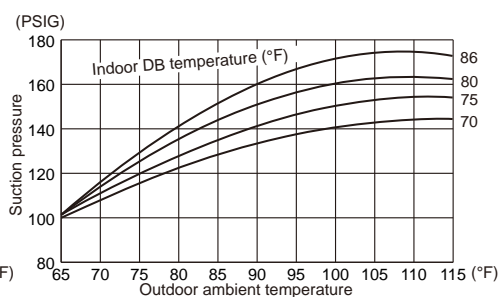
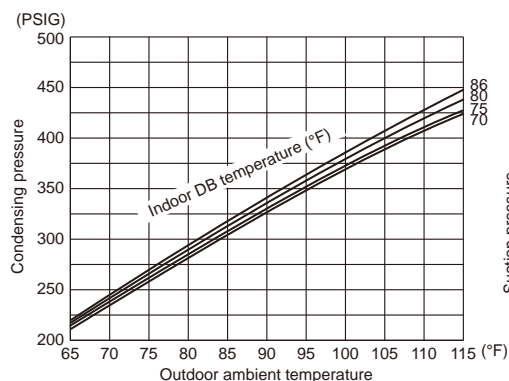
### MUZ-FS09NA MUZ-FS09NAH



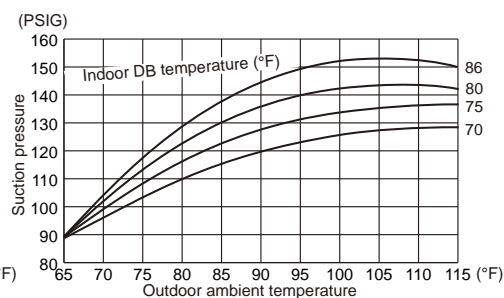
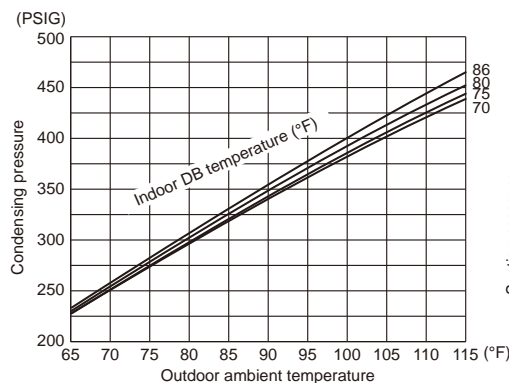
### MUZ-FS12NA MUZ-FS12NAH



## MUZ-FS15NA MUZ-FS15NAH



## MUZ-FS18NA MUZ-FS18NAH



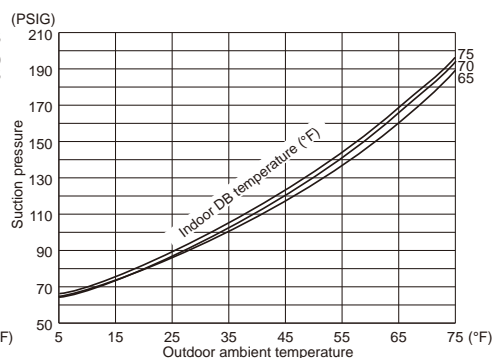
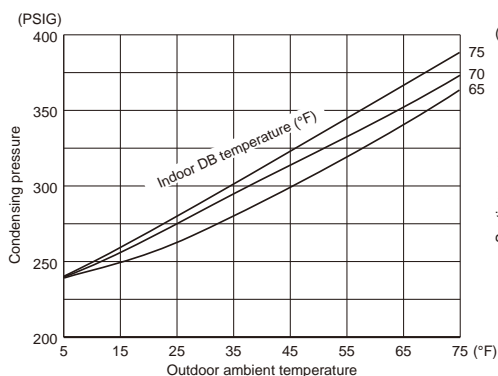
## Heating

Data are based on the condition of outdoor humidity 75%.

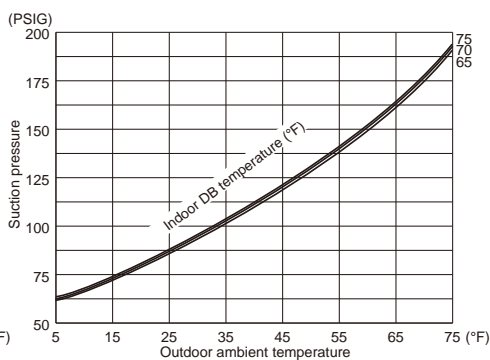
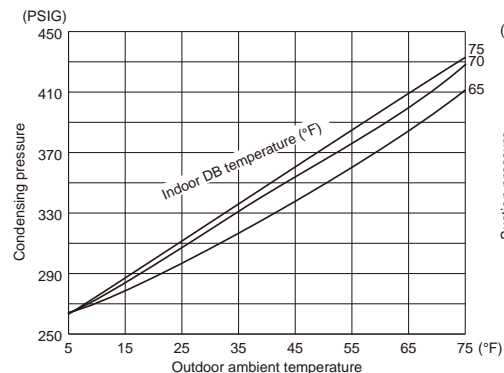
Air flow should be set to High speed.

Data are for heating operation without any frost.

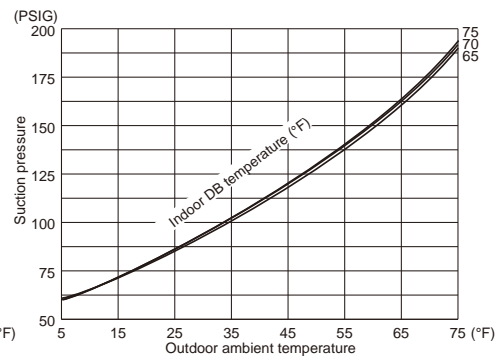
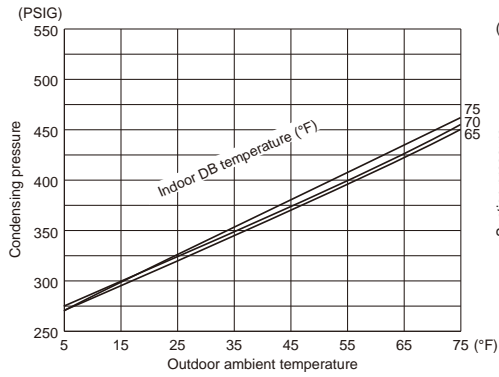
## MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH



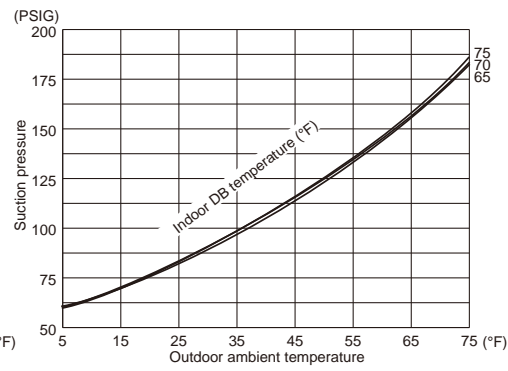
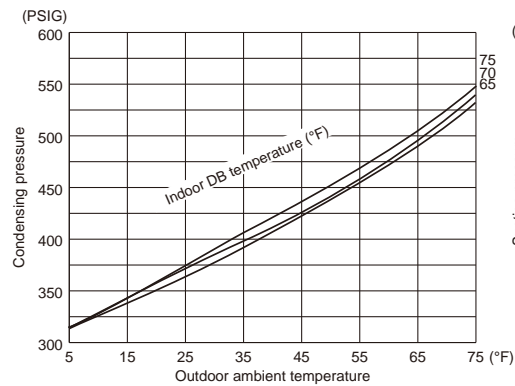
## MUZ-FS12NA MUZ-FS12NAH



## MUZ-FS15NA MUZ-FS15NAH



## MUZ-FS18NA MUZ-FS18NAH

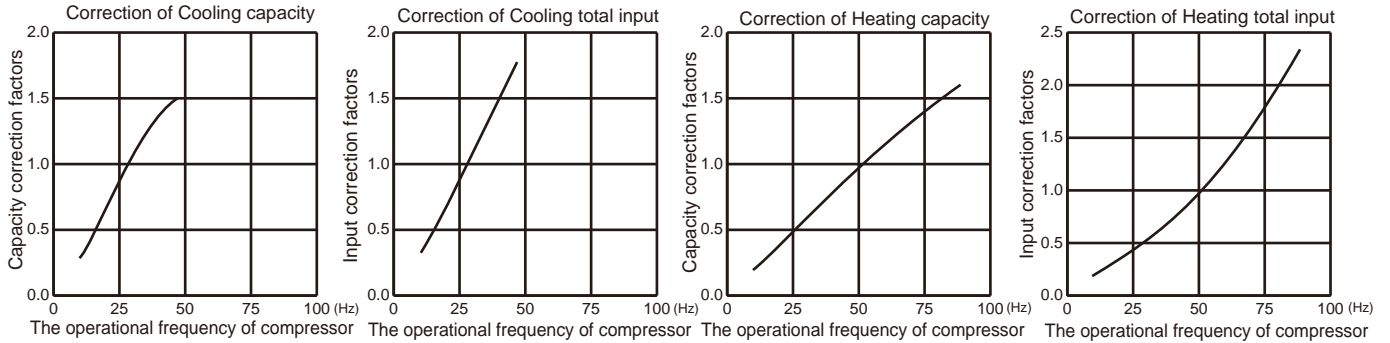


## 7-4. STANDARD OPERATION DATA

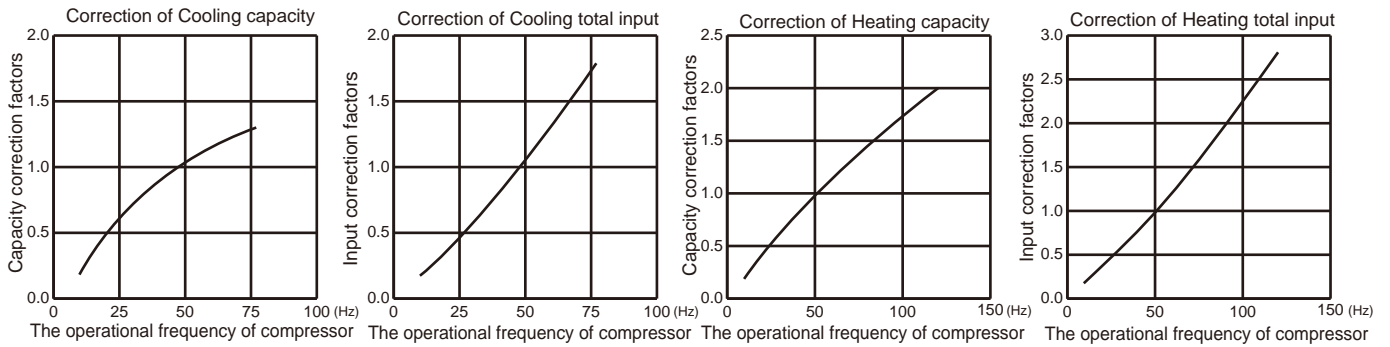
Model			MSZ-FS06NA		MSZ-FS09NA		MSZ-FS12NA		MSZ-FS15NA		MSZ-FS18NA		
Item		Unit	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	
Total	Capacity	Btu/h	6,000	8,700	9,000	9,600	12,000	12,300	14,000	16,000	17,200	19,000	
	SHF	—	0.96	—	0.92	—	0.83	—	0.70	—	0.67	—	
	Input	kW	0.315	0.545	0.560	0.620	0.870	0.850	1.000	1.155	1.375	1.610	
	Rated frequency	Hz	28	51	47.5	51	46	49	45	45	58	58	
Electrical circuit	Indoor unit		MSZ-FS06NA		MSZ-FS09NA		MSZ-FS12NA		MSZ-FS15NA		MSZ-FS18NA		
	Power supply	V, phase, Hz	208/230, 1, 60										
	Input	kW	Cooling: 0.019 Heating: 0.025				Cooling: 0.025 Heating: 0.027		Cooling: 0.025 Heating: 0.036				
	Fan motor current	A	Cooling: 0.21/0.19 Heating: 0.27/0.24				Cooling: 0.27/0.24 Heating: 0.29/0.26		Cooling: 0.27/0.24 Heating: 0.36/0.33				
	Outdoor unit		MUZ-FS06NA MUZ-FS06NAH		MUZ-FS09NA MUZ-FS09NAH		MUZ-FS12NA MUZ-FS12NAH		MUZ-FS15NA MUZ-FS15NAH		MUZ-FS18NA MUZ-FS18NAH		
	Power supply	V, phase, Hz	208/230, 1, 60										
	Input	kW	0.296	0.520	0.541	0.595	0.845	0.823	0.975	1.119	1.350	1.574	
	Comp. current	A	1.33/1.18	2.25/2.01	2.43/2.18	2.55/2.31	3.75/3.39	3.63/3.28	3.86/3.49	4.32/3.91	5.63/5.09	6.54/5.91	
	Fan motor current	A	0.36/0.33	0.39/0.35	0.36/0.33	0.39/0.35	0.41/0.37	0.40/0.36	0.85/0.77	0.95/0.86	0.85/0.77	0.95/0.86	
	Refrigerant circuit	Condensing pressure	PSIG	336	295	360	295	377	333	345	363	361	410
Suction pressure		PSIG	175	110	152	110	137	104	139	109	123	107	
Discharge temperature		°F	133	139	146	139	163	150	143	163	153	178	
Condensing temperature		°F	104	94	108	94	112	102	106	108	109	117	
Suction temperature		°F	69	46	61	46	63	41	53	46	47	44	
Comp. shell bottom temperature		°F	122	126	136	126	151	137	130	142	141	159	
Ref. pipe length		ft.	25										
Refrigerant charge (R410A)		2 lb. 9 oz.						3 lb 7 oz.					
Indoor unit	Intake air temperature	DB	°F	80	70	80	70	80	70	80	70	80	
		WB	°F	67	60	67	60	67	60	67	60	60	
	Discharge air temperature	DB	°F	64	92	58	92	57	100	56	103	52	112
		WB	°F	60	—	55	—	54	—	54	—	51	—
	Fan speed (High)	rpm	1,150	1,280	1,150	1,280	1,280	1,320	1,280	1,460	1,280	1,460	
Outdoor unit	Airflow (High)		CFM	328 (Wet)	437	328 (Wet)	437	376 (Wet)	454	376 (Wet)	514	376 (Wet)	514
	Intake air temperature	DB	°F	95	47	95	47	95	47	95	47	95	47
		WB	°F	—	43	—	43	—	43	—	43	—	43
	Fan speed		rpm	860	890	860	890	910	900	740	800	740	800
	Airflow		CFM	1,141	1,183	1,141	1,183	1,215	1,201	1,801	1,949	1,801	1,949

## 7-5. CAPACITY AND INPUT CORRECTION BY INVERTER OUTPUT FREQUENCY

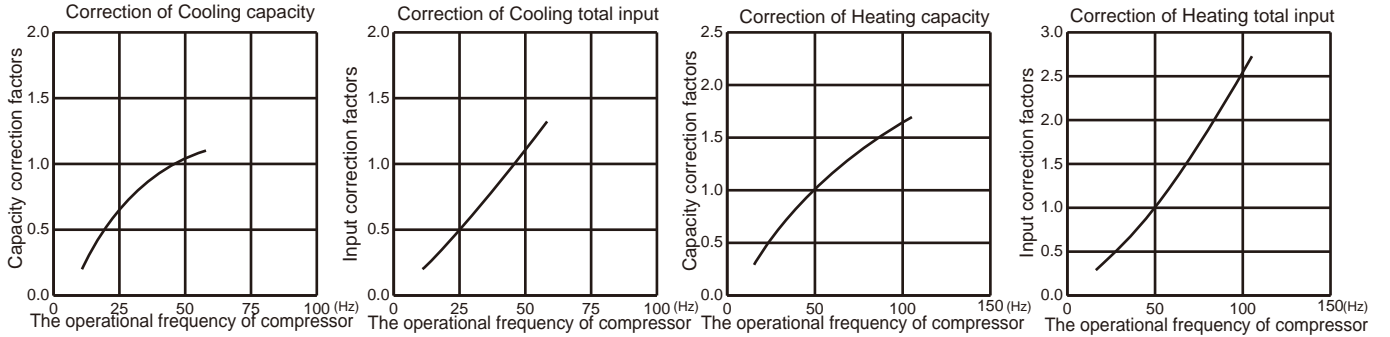
### MUZ-FS06NA MUZ-FS06NAH



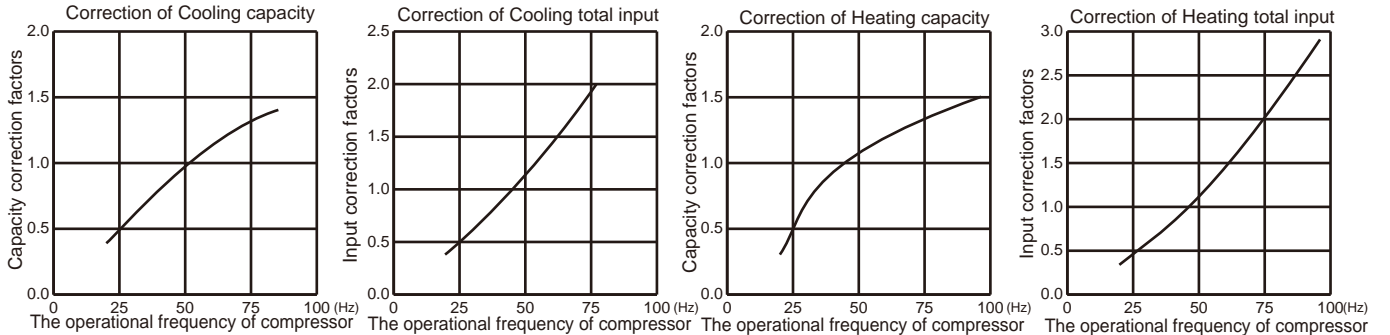
### MUZ-FS09NA MUZ-FS09NAH



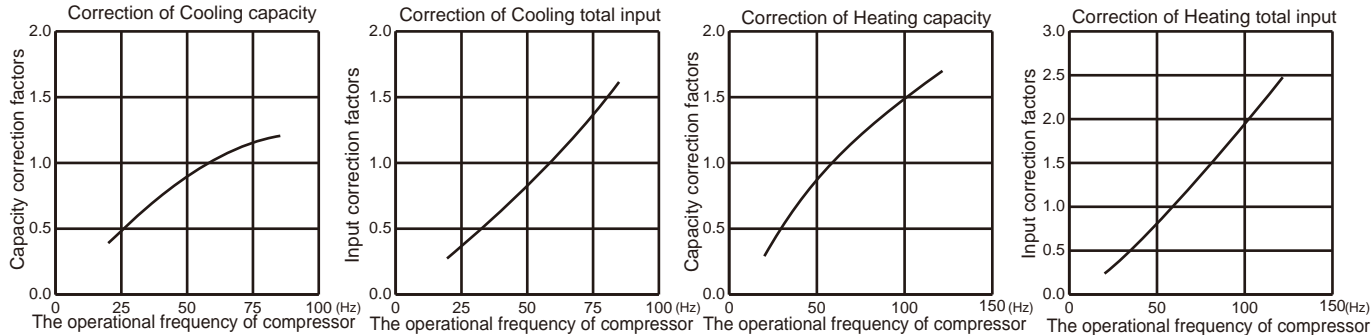
### MUZ-FS12NA MUZ-FS12NAH



### MUZ-FS15NA MUZ-FS15NAH



## MUZ-FS18NA MUZ-FS18NAH



### 7-6. HOW TO OPERATE FIXED-FREQUENCY OPERATION (Test run operation)

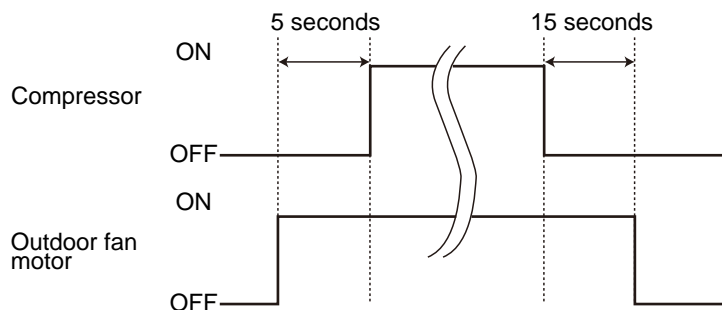
1. Press EMERGENCY OPERATION switch to start COOL or HEAT mode (COOL: Press once, HEAT: Press twice).
2. Test run operation starts and continues to operate for 30 minutes.
3. Compressor operates at rated frequency in COOL mode or 58 Hz in HEAT mode.
4. Indoor fan operates at High speed.
5. After 30 minutes, test run operation finishes and EMERGENCY OPERATION starts (operation frequency of compressor varies).
6. To cancel test run operation (EMERGENCY OPERATION), press EMERGENCY OPERATION switch or any button on remote controller.

**MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH  
MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH**
**8-1. OUTDOOR FAN MOTOR CONTROL**

The fan motor turns ON/OFF, interlocking with the compressor.

[ON] The fan motor turns ON 5 seconds before the compressor starts up.

[OFF] The fan motor turns OFF 15 seconds after the compressor has stopped running.

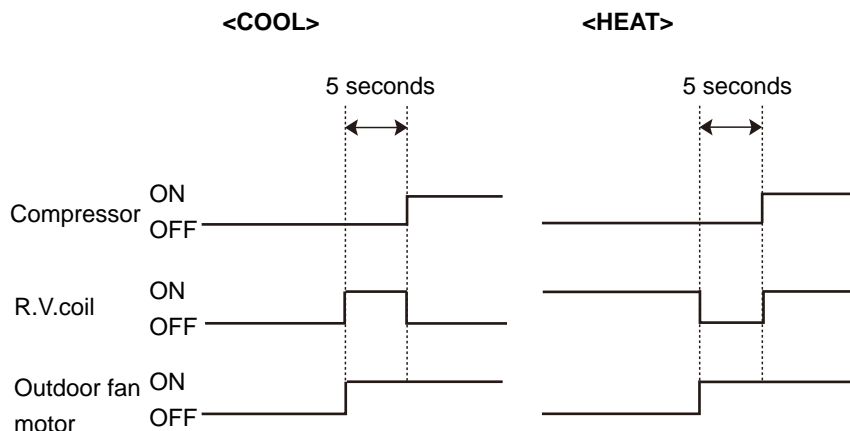

**8-2. R.V. COIL CONTROL**

Heating . . . . . ON

Cooling . . . . . OFF

Dry . . . . . OFF

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


**8-3. RELATION BETWEEN MAIN SENSOR AND ACTUATOR**

Sensor	Purpose	Actuator					
		Compressor	LEV	Outdoor fan motor	R.V.coil	Indoor fan motor	Defrost heater *
Discharge temperature thermistor	Protection	○	○				
Indoor coil temperature thermistor	Cooling: Coil frost prevention	○					
	Heating: High pressure protection	○	○				
Defrost thermistor	Heating: Defrosting	○	○	○	○	○	
Fin temperature thermistor	Protection	○		○			
Ambient temperature thermistor	Cooling: Low ambient temperature operation	○	○	○			
	Heating: Defrosting (Heater)						○
Outdoor heat exchanger temperature thermistor	Cooling: Low ambient temperature operation	○	○	○			
	Cooling: High pressure protection	○	○	○			

\* MUZ-FS•NAH only.

**MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH  
MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH**

### 9-1. CHANGE IN DEFROST SETTING

#### Changing defrost finish temperature

<JS> To change the defrost finish temperature, cut/solder the JS wire of the outdoor inverter P.C. board (Refer to 10-6.1.).

Jumper		Defrost finish temperature	
		MUZ-FS06/09/12NA MUZ-FS06/09/12NAH	MUZ-FS15/18NA MUZ-FS15/18NAH
JS	Soldered (Initial setting)	41°F (5°C)	50°F (10°C)
	None (Cut)	50°F (10°C)	64°F (18°C)

### 9-2. PRE-HEAT CONTROL SETTING

#### MUZ-FS06/09/12

When moisture gets into the refrigerant cycle, it may interfere with the start-up of the compressor at low outside temperature. The pre-heat control prevents this interference. The pre-heat control turns ON when the discharge temperature thermometer is 68°F (20°C) or below. When the pre-heat control turns ON, the compressor is energized. (About 50 W)

#### MUZ-FS15/18

Prolonged low load operation, in which the thermostat is OFF for a long time, at low outside temperature [32°F (0°C) or less] may cause the following troubles. To prevent those troubles, activate the pre-heat control.

- 1) If moisture gets into the refrigerant cycle and freezes, it may interfere the start-up of the compressor.
- 2) If liquid refrigerant collects in the compressor, a failure in the compressor may occur.

The pre-heat control turns ON when the compressor temperature is 68°F (20°C) or below. When the pre-heat control turns ON, the compressor is energized. (About 70 W)

#### Pre-heat control setting

<JK>

ON: To activate the pre-heat control, cut JK wire of the inverter P.C. board.

OFF: To deactivate the pre-heat control, solder JK wire of the inverter P.C. board.

(Refer to 10-6.1)

Jumper		Pre-heat control setting	
		MUZ-FS06/09/12NA MUZ-FS06/09/12NAH	MUZ-FS15/18NA MUZ-FS15/18NAH
JK	Soldered	Deactivated (Initial setting)	Deactivated (Initial setting)
	Cut	Activated	Activated

**NOTE:** When the inverter P.C. board is replaced, check the jumper wires, and cut/solder them if necessary.



MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH  
 MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH

### 10-1. CAUTIONS ON TROUBLESHOOTING

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

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

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

- 1) Before servicing the air conditioner, be sure to turn OFF the main unit first with the remote controller, 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 electrical parts, be careful of the residual voltage of smoothing capacitor.
- 4) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.
- 5) When connecting or disconnecting the connectors, hold the connector housing. DO NOT pull the lead wires.

<Incorrect>



Lead wiring

<Correct>



Connector housing

#### 3. Troubleshooting procedure

- 1) Check if the OPERATION INDICATOR lamp on the indoor unit is blinking on and off to indicate an abnormality. To make sure, check how many times the OPERATION INDICATOR lamp is blinking on and off before starting service work.
- 2) Before servicing, verify that all connectors and terminals are connected properly.
- 3) When the electronic control P.C. board seems to be defective, check for disconnection of the copper foil pattern and burnt or discolored components.
- 4) Refer to 10-2 and 10-3.

## 10-2. FAILURE MODE RECALL FUNCTION

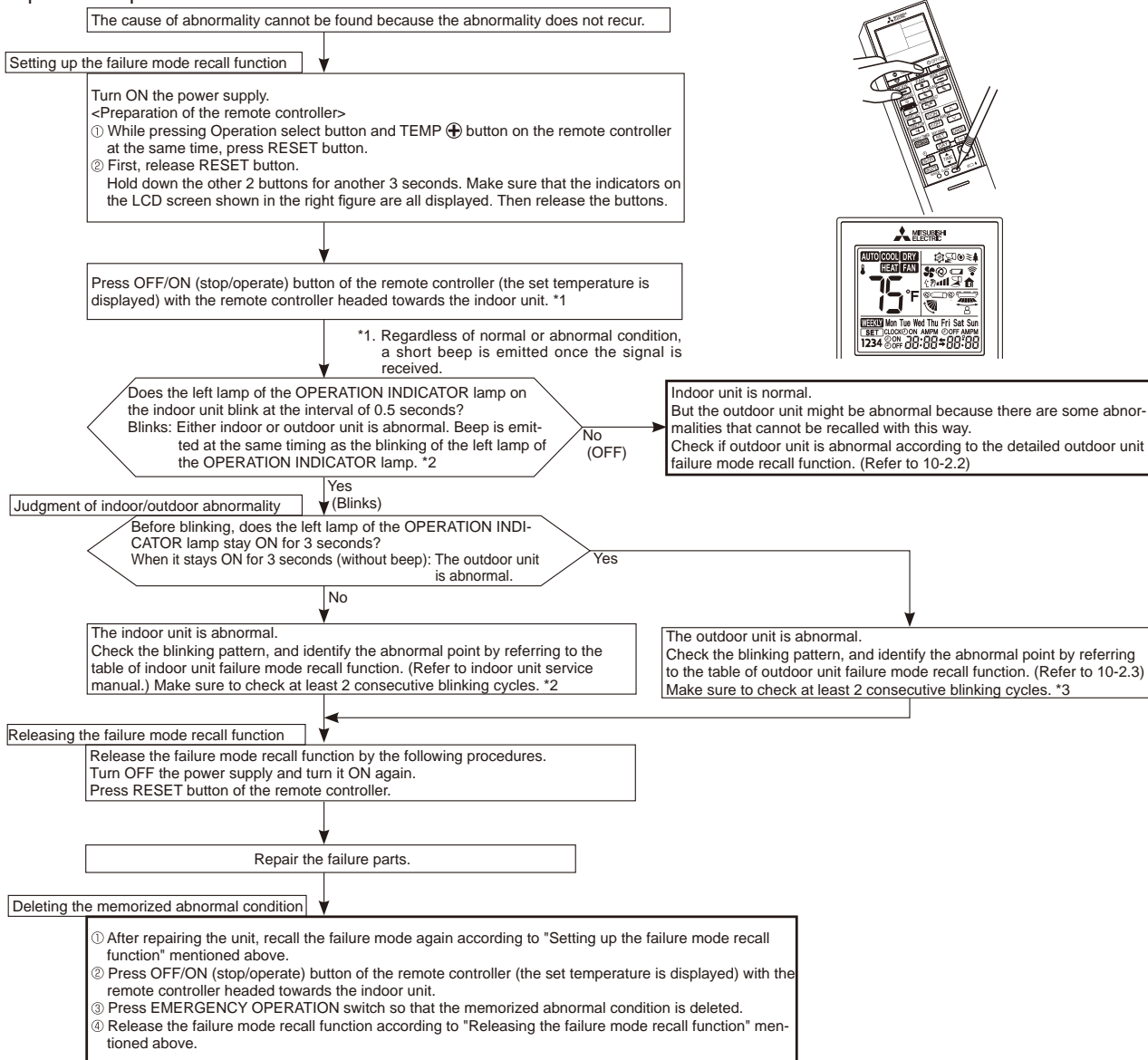
Outline of the function

This air conditioner can memorize the abnormal condition which has occurred once.

Even though LED indication listed on the troubleshooting check table (10-3.) disappears, the memorized failure details can be recalled.

### 1. Flow chart of failure mode recall function for the indoor/outdoor unit

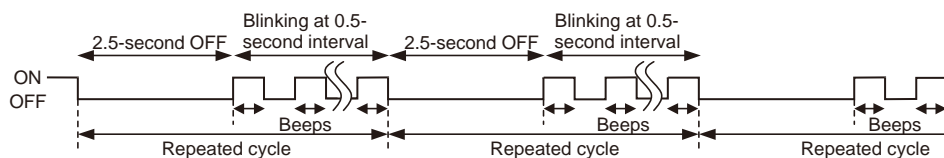
Operational procedure



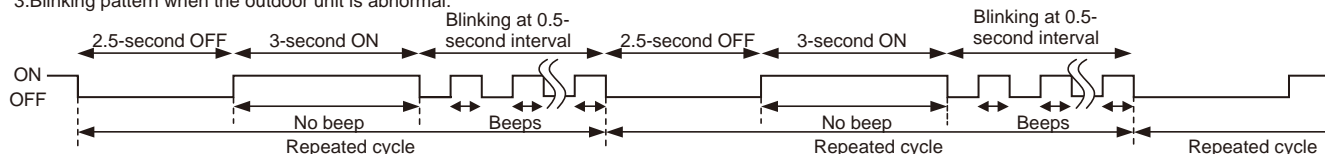
**NOTE:** 1. Make sure to release the failure mode recall function after it is set up, otherwise the unit cannot operate properly.

2. If the abnormal condition is not deleted from the memory, the last abnormal condition is kept memorized.

\*2. Blinking pattern when the indoor unit is abnormal:

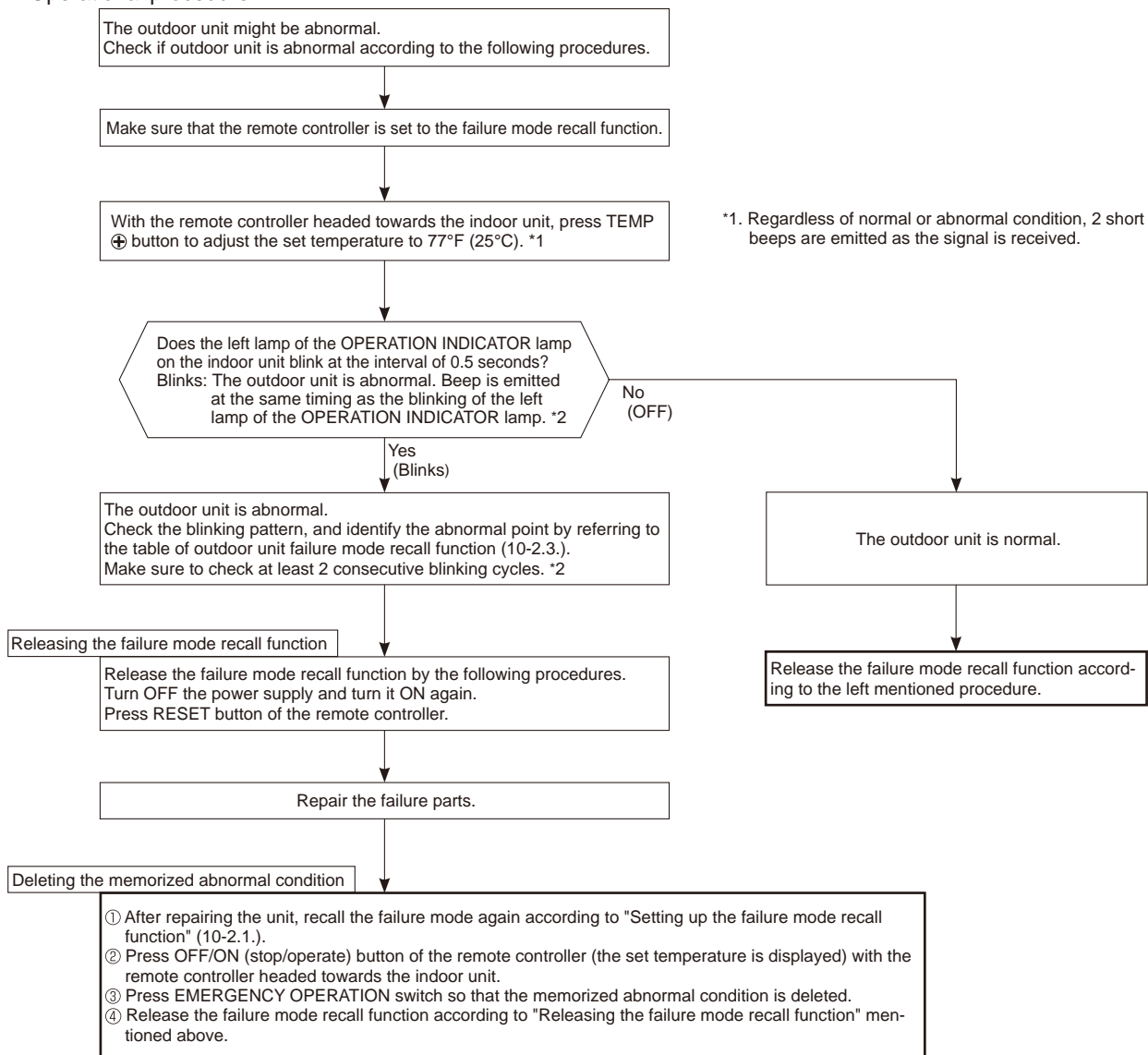


\*3. Blinking pattern when the outdoor unit is abnormal:



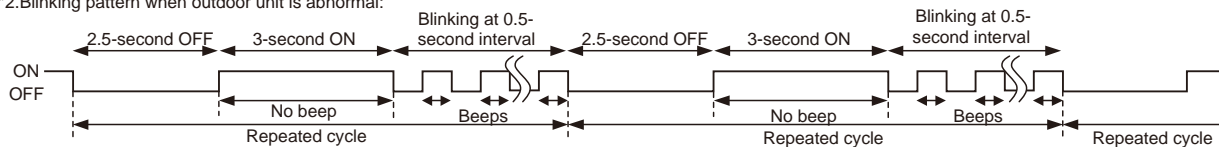
## 2. Flow chart of the detailed outdoor unit failure mode recall function

### Operational procedure



**NOTE:** 1. Make sure to release the failure mode recall function after it is set up, otherwise the unit cannot operate properly.  
2. If the abnormal condition is not deleted from the memory, the last abnormal condition is kept memorized.

\*2. Blinking pattern when outdoor unit is abnormal:





**NOTE:** Blinking patterns of this mode differ from the ones of TROUBLESHOOTING CHECK TABLE (10-3.).

### 3. Table of outdoor unit failure mode recall function

The left lamp of the OPERATION INDICATOR lamp (Indoor unit)	Abnormal point (Failure mode/protection)	LED indication (Outdoor P.C. board)	Condition	Remedy	Indoor/outdoor unit failure mode recall function	Outdoor unit failure mode recall function
OFF	None (Normal)	—	—	—	—	—
1-time blink 2.5 seconds OFF	Indoor/outdoor communication, receiving error	—	Any signals from the inverter P.C. board cannot be received normally for 3 minutes.	•Refer to 10-5. ㉔ How to check miswiring and serial signal error.	○	○
	Indoor/outdoor communication, receiving error	—	Although the inverter P.C. board sends signal "0", signal "1" has been received 30 consecutive times.	•Refer to 10-5. ㉔ How to check miswiring and serial signal error.		
2-time blink 2.5 seconds OFF	Outdoor power system	—	Overcurrent protection cut-out operates 3 consecutive times within 1 minute after the compressor gets started.	•Reconnect connectors. •Refer to 10-5. ㉔ How to check inverter/compressor". •Check stop valve.	○	○
3-time blink 2.5 seconds OFF	Discharge temperature thermistor	1-time blink every 2.5 seconds	Thermistor shorts or opens during compressor running.	•Refer to 10-5. ㉔ "Check of outdoor thermistors". Defective outdoor thermistors can be identified by checking the blinking pattern of LED.  •Replace the inverter P.C. board.	○	○
	Defrost thermistor					
	Fin temperature thermistor	3-time blink 2.5 seconds OFF				
	Ambient temperature thermistor	2-time blink 2.5 seconds OFF				
	Outdoor heat exchanger temperature thermistor	—				
	P.C. board temperature thermistor	4-time blink 2.5 seconds OFF				
4-time blink 2.5 seconds OFF	Overcurrent	11-time blink 2.5 seconds OFF	Large current flows into the power module (IC700).	•Reconnect compressor connector. •Refer to 10-5. ㉔ How to check inverter/compressor". •Check stop valve.	—	○
	Compressor synchronous abnormality (Compressor start-up failure protection)	12-time blink 2.5 seconds OFF	Waveform of compressor current is distorted.	•Reconnect compressor connector. •Refer to 10-5. ㉔ How to check inverter/compressor".	—	○
5-time blink 2.5 seconds OFF	Discharge temperature	—	Temperature of discharge temperature thermistor exceeds 241°F (116°C), compressor stops. Compressor can restart if discharge temperature thermistor reads 212°F (100°C) or less 3 minutes later.	•Check refrigerant circuit and refrigerant amount. •Refer to 10-5. ㉔ Check of LEV".	—	○
6-time blink 2.5 seconds OFF	High pressure	—	Temperature indoor coil thermistor exceeds 158°F (70°C) in HEAT mode. Temperature defrost thermistor exceeds 158°F (70°C) in COOL mode.	•Check refrigerant circuit and refrigerant amount. •Check stop valve.	—	○
7-time blink 2.5 seconds OFF	Fin temperature/ P.C. board temperature	7-time blink 2.5 seconds OFF	Temperature of the fin temperature thermistor on the inverter P.C. board exceeds 167 - 187°F (75 - 86°C) (FS06/09/12)/167 - 176°F (75 - 80°C) (FS15/18), or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 162 - 185°F (72 - 85°C) (FS06/09/12)/158 - 167°F (70 - 75°C) (FS15/18).	•Check around outdoor unit. •Check outdoor unit air passage. •Refer to 10-5. ㉔ Check of outdoor fan motor".	—	○
8-time blink 2.5 seconds OFF	Outdoor fan motor	—	Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up.	•Refer to 10-5. ㉔ Check of outdoor fan motor". Refer to 10-5. ㉔ Check of inverter P.C. board".	—	○
9-time blink 2.5 seconds OFF	Nonvolatile memory data	5-time blink 2.5 seconds OFF	Nonvolatile memory data cannot be read properly.	•Replace the inverter P.C. board.	○	○
	Power module (IC700)	6-time blink 2.5 seconds OFF	The interface short circuit occurs in the output of the power module (IC700). The compressor winding shorts circuit.	•Refer to 10-5. ㉔ How to check inverter/compressor".	—	

**NOTE:** Blinking patterns of this mode differ from the ones of TROUBLESHOOTING CHECK TABLE (10-3.).

The left lamp of the OPERATION INDICATOR lamp (Indoor unit)	Abnormal point (Failure mode/protection)	LED indication (Outdoor P.C. board)	Condition	Remedy	Indoor/outdoor unit failure mode recall function	Outdoor unit failure mode recall function
10-time blink 2.5 seconds OFF	Discharge temperature	—	Temperature of discharge temperature thermistor has been 122°F (50°C) or less for 20 minutes.	<ul style="list-style-type: none"> <li>Refer to 10-5. ③ "Check of LEV".</li> <li>Check refrigerant circuit and refrigerant amount.</li> </ul>	—	○
11-time blink 2.5 seconds OFF	Bus-bar voltage (DC)	8-time blink 2.5 seconds OFF	Bus-bar voltage of inverter cannot be detected normally.	<ul style="list-style-type: none"> <li>Refer to 10-5. ④ "How to check inverter/compressor".</li> </ul>	—	○
	Each phase current of compressor	9-time blink 2.5 seconds OFF	Each phase current of compressor cannot be detected normally.			
14-time blink 2.5 seconds OFF *1	Stop valve (Closed valve)	14-time blink 2.5 seconds OFF	<ul style="list-style-type: none"> <li>Closed valve is detected by compressor current.</li> <li>An abnormality of the indoor thermistors, the defrost thermistor or ambient temperature thermistor is detected.</li> </ul>	<ul style="list-style-type: none"> <li>Check stop valve.</li> <li>Refer to "TEST POINT DIAGRAM AND VOLTAGE" on the service manual of indoor and outdoor unit for the characteristics of the thermistors. (Do not start the operation again without repair to prevent hazards.)</li> </ul>	○	○
	4-way valve/ Pipe temperature	16-time blink 2.5 seconds OFF	<ul style="list-style-type: none"> <li>The 4-way valve does not work properly.</li> <li>The indoor coil thermistor detects an abnormal temperature.</li> <li>An abnormality of the indoor thermistor is detected.</li> </ul>	<ul style="list-style-type: none"> <li>Check the 4-way valve.</li> <li>Replace the inverter P.C. board.</li> <li>Refer to "TEST POINT DIAGRAM AND VOLTAGE" on the service manual of indoor and outdoor unit for the characteristics of the thermistors. (Do not start the operation again without repair to prevent hazards.)</li> </ul>		
16-time blink 2.5 seconds OFF *1	Outdoor refrigerant system abnormality	1-time blink 2.5 seconds OFF	<ul style="list-style-type: none"> <li>A closed valve and air trapped in the refrigerant circuit are detected based on the temperature sensed by the indoor and outdoor thermistors and the current of the compressor.</li> <li>An abnormality of the indoor thermistors, the defrost thermistor or ambient temperature thermistor is detected.</li> </ul>	<ul style="list-style-type: none"> <li>Check for a gas leak in a connecting piping etc.</li> <li>Check the stop valve.</li> <li>Refer to 10-5. ⑤ "Check of outdoor refrigerant circuit".</li> <li>Refer to "TEST POINT DIAGRAM AND VOLTAGE" on the service manual of indoor and outdoor unit for the characteristics of the thermistors. (Do not start the operation again without repair to prevent hazards.)</li> </ul>	○	○

\*1 There is possibility that diesel explosion may occur due to the air mixed in the refrigerant circuit.

First, ensure that there are no leakage points on the valves, flare connections, etc. that allow the air to flow into the refrigerant circuit, or no blockage points (e.g. clogged or closed valves) in the refrigerant circuit that cause an increase in pressure.

If there is no abnormal point like above and the system operates cooling and heating modes normally, the indoor thermistor might have a problem, resulting in false detection.

Check both the indoor coil thermistor and the room temperature thermistor, and replace faulty thermistor(s), if any.

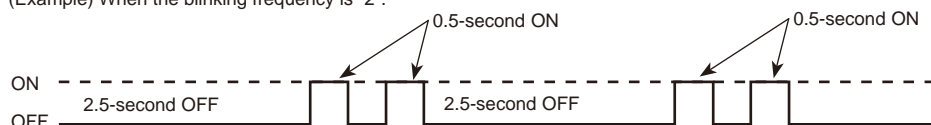
**NOTE:** Do not start the operation again without repair to prevent hazards.

### 10-3. TROUBLESHOOTING CHECK TABLE

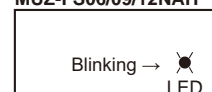
No.	Symptom	LED indication	Abnormal point/Condition	Condition	Remedy
1	Outdoor unit does not operate.	1-time blink every 2.5 seconds	Outdoor power system	Overcurrent protection cut-out operates 3 consecutive times within 1 minute after the compressor gets started.	<ul style="list-style-type: none"> <li>•Reconnect connector of compressor.</li> <li>•Refer to 10-5.④ "How to check inverter/compressor".</li> <li>•Check stop valve.</li> </ul>
2			Outdoor thermistors	Discharge temperature thermistor, fin temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor or ambient temperature thermistor shorts or opens during compressor running.	•Refer to 10-5.⑤ "Check of outdoor thermistors".
				P.C. board temperature thermistor shorts or opens during compressor running.	•Replace inverter P.C. board.
3			Outdoor control system	Nonvolatile memory data cannot be read properly. (The left lamp of the OPERATION INDICATOR lamp on the indoor unit lights up or blinks 7-time.)	•Replace inverter P.C. board.
4		6-time blink 2.5 seconds OFF	Serial signal	The communication fails between the indoor and outdoor unit for 3 minutes.	•Refer to 10-5.⑥ "How to check miswiring and serial signal error."
5		11-time blink 2.5 seconds OFF	Stop valve/ Closed valve	Closed valve is detected by compressor current.	•Check stop valve.
6		16-time blink 2.5 seconds OFF	4-way valve/ Pipe temperature	The 4-way valve does not work properly. The indoor coil thermistor detects an abnormal temperature.	<ul style="list-style-type: none"> <li>•Refer to 10-5.⑦ "Check of R.V. coil".</li> <li>•Replace the inverter P.C. board.</li> </ul>
7		17-time blink 2.5 seconds OFF	Outdoor refrigerant system abnormality	A closed valve and air trapped in the refrigerant circuit are detected based on the temperature sensed by the indoor and outdoor thermistors and the current of the compressor.	<ul style="list-style-type: none"> <li>•Check for a gas leak in a connecting piping etc.</li> <li>•Check the stop valve.</li> <li>•Refer to 10-5.⑧ "Check of outdoor refrigerant circuit".</li> </ul>
8	'Outdoor unit stops and restarts 3 minutes later' is repeated.	2-time blink 2.5 seconds OFF	Overcurrent protection	Large current flows into the power module (IC700).	<ul style="list-style-type: none"> <li>•Reconnect connector of compressor.</li> <li>•Refer to 10-5.④ "How to check inverter/compressor".</li> <li>•Check stop valve.</li> </ul>
9		3-time blink 2.5 seconds OFF	Discharge temperature overheat protection	Temperature of discharge temperature thermistor exceeds 241°F (116°C), compressor stops. Compressor can restart if discharge temperature thermistor reads 212°F (100°C) or less 3 minutes later.	<ul style="list-style-type: none"> <li>•Check refrigerant circuit and refrigerant amount.</li> <li>•Refer to 10-5.⑨ "Check of LEV".</li> </ul>
10		4-time blink 2.5 seconds OFF	Fin temperature /P.C. board temperature thermistor overheat protection	Temperature of the fin temperature thermistor on the heat sink exceeds 167 - 187°F (75 - 86°C) (FS06/09/12)/167 - 176°F (75 - 80°C) (FS15/18) or temperature of P.C. board temperature thermistor on the inverter P.C.board exceeds 162 - 185°F (72 - 85°C) (FS06/09/12)/158 - 167°F (70 - 75°C) (FS15/18).	<ul style="list-style-type: none"> <li>•Check around outdoor unit.</li> <li>•Check outdoor unit air passage.</li> <li>•Refer to 10-5.① "Check of outdoor fan motor".</li> </ul>
11		5-time blink 2.5 seconds OFF	High pressure protection	Indoor coil thermistor exceeds 158°F (70°C) in HEAT mode. Defrost thermistor exceeds 158°F (70°C) in COOL mode.	<ul style="list-style-type: none"> <li>•Check refrigerant circuit and refrigerant amount.</li> <li>•Check stop valve.</li> </ul>
12		8-time blink 2.5 seconds OFF	Compressor synchronous abnormality	The waveform of compressor current is distorted.	<ul style="list-style-type: none"> <li>•Reconnect connector of compressor.</li> <li>•Refer to 10-5.④ "How to check inverter/compressor".</li> </ul>
13		10-time blink 2.5 seconds OFF	Outdoor fan motor	Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up.	<ul style="list-style-type: none"> <li>•Refer to 10-5.① "Check of outdoor fan motor."</li> <li>•Refer to 10-5.② "Check of inverter P.C. board."</li> </ul>
14		12-time blink 2.5 seconds OFF	Each phase current of compressor	Each phase current of compressor cannot be detected normally.	•Refer to 10-5.④ "How to check inverter/compressor".
15		13-time blink 2.5 seconds OFF	Bus-bar voltage (DC)	Bus-bar voltage of inverter cannot be detected normally.	<ul style="list-style-type: none"> <li>•It occurs with following case. Instantaneous power voltage drop. (Short time power failure) (FS15/18)</li> <li>•Refer to 10-5.⑩ "Check of power supply". (FS15/18)</li> <li>•Refer to 10-5.④ "How to check inverter/compressor".</li> </ul>

**NOTE:** 1. The location of LED is illustrated at the right figure. Refer to 10-6.1.  
2. LED is lit during normal operation.

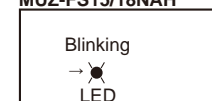
The blinking frequency shows the number of times the LED blinks after every 2.5-second OFF.  
(Example) When the blinking frequency is "2".



Inverter P.C. board  
**MUZ-FS06/09/12NA**  
**MUZ-FS06/09/12NAH**



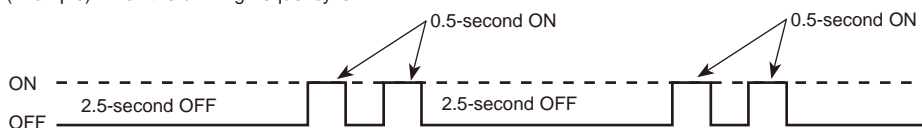
**MUZ-FS15/18NA**  
**MUZ-FS15/18NAH**



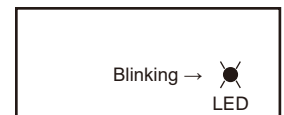
No.	Symptom	LED indication	Abnormal point/ Condition	Condition	Remedy
16	Outdoor unit operates.	1-time blink 2.5 seconds OFF	Frequency drop by current protection	<b>FS06/09/12</b> When the input current exceeds approximately 10A ( <b>FS06/09</b> )/10.5A ( <b>FS12</b> ), compressor frequency lowers.	The unit is normal, but check the following. •Check if indoor filters are clogged. •Check if refrigerant is short. •Check if indoor/outdoor unit air circulation is short cycled.
				<b>FS15/18</b> Current from power outlet is nearing breaker capacity.	
17		3-time blink 2.5 seconds OFF	Frequency drop by high pressure protection	Temperature of indoor coil thermistor exceeds 131 °F (55°C) in HEAT mode, compressor frequency lowers.	
			Frequency drop by defrosting in COOL mode	Indoor coil thermistor reads 46°F (8°C) or less in COOL mode, compressor frequency lowers.	
18		4-time blink 2.5 seconds OFF	Frequency drop by discharge temperature protection	Temperature of discharge temperature thermistor exceeds 232°F (111°C), compressor frequency lowers.	•Check refrigerant circuit and refrigerant amount. •Refer to 10-5.Ⓚ "Check of LEV". •Refer to 10-5.Ⓢ "Check of outdoor thermistors".
19		<b>MUZ-FS06/09/12</b> 5-time blink 2.5 seconds OFF	Outside temperature thermistor protection	When the outside temperature thermistor shorts or opens, protective operation without that thermistor is performed.	•Refer to 10-5.Ⓢ Check of outdoor thermistors.
20	Outdoor unit operates.	7-time blink 2.5 seconds OFF	Low discharge temperature protection	Temperature of discharge temperature thermistor has been 122°F (50°C) or less for 20 minutes.	•Refer to 10-5.Ⓚ "Check of LEV". •Check refrigerant circuit and refrigerant amount.
21		8-time blink 2.5 seconds OFF	<b>MUZ-FS06/09/12</b> PAM protection PAM: Pulse Amplitude Modulation	The overcurrent flows into PFC (Power factor correction :IC820) or the bus-bar voltage reaches 394 V or more, PAM stops and restarts.	This is not malfunction. PAM protection will be activated in the following cases: 1 Instantaneous power voltage drop. (Short time power failure) 2 When the power supply voltage is high. •It occurs with following cases. 1 Instantaneous power voltage drop. (Short time power failure) 2 Distortion of primary voltage •Refer to 10-5.Ⓢ "Check of power supply".
			<b>MUZ-FS15/18</b> Zero cross detecting circuit	Zero cross signal cannot be detected.	
22		9-time blink 2.5 seconds OFF	Inverter check mode	The connector of compressor is disconnected, inverter check mode starts.	•Check if the connector of the compressor is correctly connected. Refer to 10-5.Ⓢ "How to check inverter/compressor".

**NOTE:** 1. The location of LED is illustrated at the right figure. Refer to 10-6.1.  
2. LED is lit during normal operation.

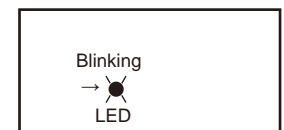
The blinking frequency shows the number of times the LED blinks after every 2.5-second OFF.  
(Example) When the blinking frequency is "2".



Inverter P.C. board  
**MUZ-FS06/09/12**



**MUZ-FS15/18**



#### 10-4. TROUBLESHOOTING CRITERION OF MAIN PARTS

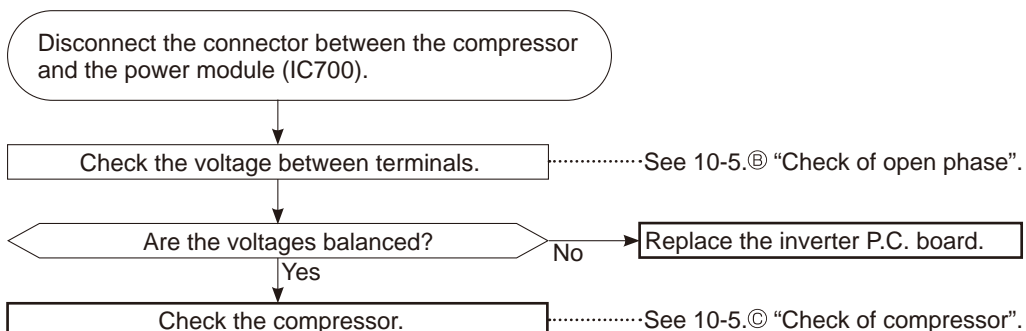
**MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH  
MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH**

Part name	Check method and criterion	Figure														
Defrost thermistor (RT61)	Measure the resistance with a tester.															
Fin temperature thermistor (RT64)	Refer to 10-6. "Test point diagram and voltage", 1. "Inverter P.C. board", for the chart of thermistor.															
Ambient temperature thermistor (RT65)																
Outdoor heat exchanger temperature thermistor (RT68)																
Discharge temperature thermistor (RT62)	Measure the resistance with a tester. Before measurement, hold the thermistor with your hands to warm it up.  Refer to 10-6. "Test point diagram and voltage", 1. "Inverter P.C. board", for the chart of thermistor.															
Compressor	Measure the resistance between terminals using a tester. [Temperature: 14 - 104°F (-10 - 40°C)] <table border="1"><thead><tr><th></th><th colspan="3">Normal (Ω)</th></tr><tr><th></th><th>MUZ-FS06/09</th><th>MUZ-FS12</th><th>MUZ-FS15/18</th></tr></thead><tbody><tr><td>U-V</td><td rowspan="3">1.60 - 2.17</td><td rowspan="3">1.66 - 2.26</td><td rowspan="3">0.87 - 1.18</td></tr><tr><td>U-W</td></tr><tr><td>V-W</td></tr></tbody></table>		Normal (Ω)				MUZ-FS06/09	MUZ-FS12	MUZ-FS15/18	U-V	1.60 - 2.17	1.66 - 2.26	0.87 - 1.18	U-W	V-W	
	Normal (Ω)															
	MUZ-FS06/09	MUZ-FS12	MUZ-FS15/18													
U-V	1.60 - 2.17	1.66 - 2.26	0.87 - 1.18													
U-W																
V-W																
Outdoor fan motor	Measure the resistance between lead wires using a tester. [Temperature: 14 - 104°F (-10 - 40°C)] <table border="1"><thead><tr><th rowspan="2">Color of lead wire</th><th colspan="2">Normal (Ω)</th></tr><tr><th>MUZ-FS06/09/12</th><th>MUZ-FS15/18</th></tr></thead><tbody><tr><td>RED – BLK</td><td rowspan="3">29 - 37</td><td rowspan="3">8 - 10</td></tr><tr><td>BLK – WHT</td></tr><tr><td>WHT – RED</td></tr></tbody></table>	Color of lead wire	Normal (Ω)		MUZ-FS06/09/12	MUZ-FS15/18	RED – BLK	29 - 37	8 - 10	BLK – WHT	WHT – RED					
Color of lead wire	Normal (Ω)															
	MUZ-FS06/09/12	MUZ-FS15/18														
RED – BLK	29 - 37	8 - 10														
BLK – WHT																
WHT – RED																
R. V. coil (21S4)	Measure the resistance using a tester. [Temperature: 14 - 104°F (-10 - 40°C)] <table border="1"><thead><tr><th>Normal (kΩ)</th></tr></thead><tbody><tr><td>0.97 - 1.38</td></tr></tbody></table>	Normal (kΩ)	0.97 - 1.38													
Normal (kΩ)																
0.97 - 1.38																
Expansion valve coil (LEV)	Measure the resistance using a tester. [Temperature: 14 - 104°F (-10 - 40°C)] <table border="1"><thead><tr><th>Color of lead wire</th><th>Normal (Ω)</th></tr></thead><tbody><tr><td>RED – ORN</td><td rowspan="4">37 - 54</td></tr><tr><td>RED – WHT</td></tr><tr><td>RED – BLU</td></tr><tr><td>RED – YLW</td></tr></tbody></table>	Color of lead wire	Normal (Ω)	RED – ORN	37 - 54	RED – WHT	RED – BLU	RED – YLW								
Color of lead wire	Normal (Ω)															
RED – ORN	37 - 54															
RED – WHT																
RED – BLU																
RED – YLW																
Defrost heater	Measure the resistance using a tester. [Temperature: 14 - 104°F (-10 - 40°C)] <table border="1"><thead><tr><th colspan="2">Normal (Ω)</th></tr><tr><th>MUZ-FS06/09/12NAH</th><th>MUZ-FS15/18NAH</th></tr></thead><tbody><tr><td>349 - 428</td><td>376 - 461</td></tr></tbody></table>	Normal (Ω)		MUZ-FS06/09/12NAH	MUZ-FS15/18NAH	349 - 428	376 - 461									
Normal (Ω)																
MUZ-FS06/09/12NAH	MUZ-FS15/18NAH															
349 - 428	376 - 461															



## 10-5. TROUBLESHOOTING FLOW

### Ⓐ How to check inverter/compressor



### Ⓑ Check of open phase

- With the connector between the compressor and the power module (IC700) disconnected, activate the inverter and check if the inverter is normal by measuring **the voltage balance** between the terminals.

Output voltage is 50 - 130 V. (The voltage may differ according to the tester.)

<< Operation method >>

Start cooling or heating operation by pressing EMERGENCY OPERATION switch on the indoor unit. (TEST RUN OPERATION: Refer to 7-6.)

<< Measurement point >>

At 3 points

BLK (U)-WHT (V)

BLK (U)-RED (W)

WHT(V)-RED (W)

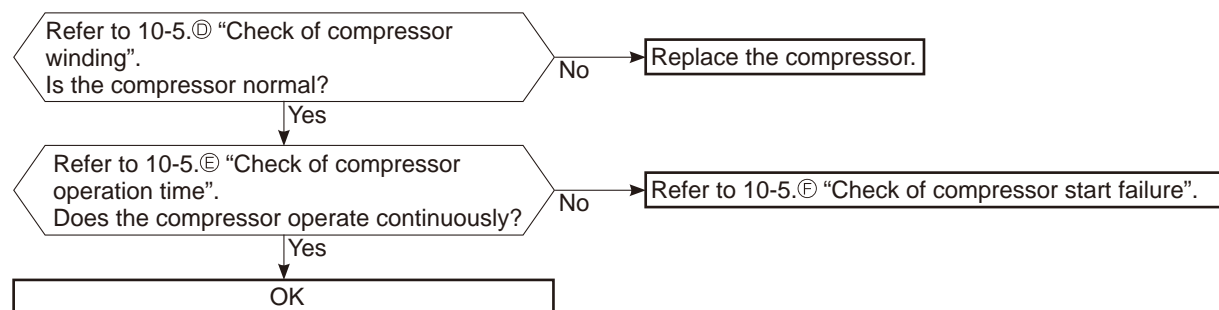
\*Measure AC voltage between the lead wires at 3 points.

**NOTE:** 1. Output voltage varies according to power supply voltage.

2. Measure the voltage by analog type tester.

3. During this check, LED of the inverter P.C. board blinks 9 times. (Refer to 10-6.1.)

### Ⓒ Check of compressor



## D Check of compressor winding

- Disconnect the connector between the compressor and the power module (IC700), and measure the resistance between the compressor terminals.

<<Measurement point>>

At 3 points

BLK-WHT

BLK-RED

WHT-RED

\*Measure the resistance between the lead wires at 3 points.

<<Judgement>>

Refer to 10-4.

0 [ $\Omega$ ] ..... Abnormal [short]

Infinite [ $\Omega$ ] ..... Abnormal [open]

**NOTE:** Be sure to zero the ohmmeter before measurement.

## E Check of compressor operation time

- Connect the compressor and activate the inverter. Then measure the time until the inverter stops due to overcurrent.

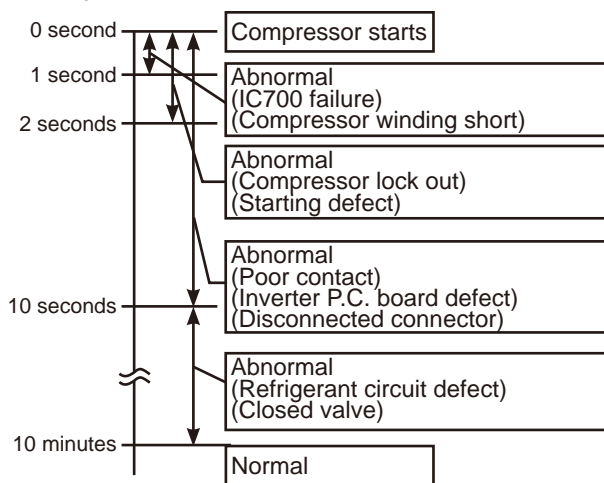
<<Operation method>>

Start heating or cooling operation by pressing EMERGENCY OPERATION switch on the indoor unit. (TEST RUN OPERATION: Refer to 7-6.)

<<Measurement>>

Measure the time from the start of compressor to the stop of compressor due to overcurrent.

<<Judgement>>



## F Check of compressor start failure

Confirm that ①~④ is normal.

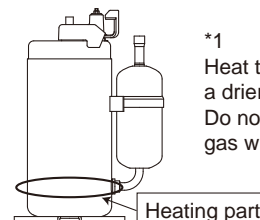
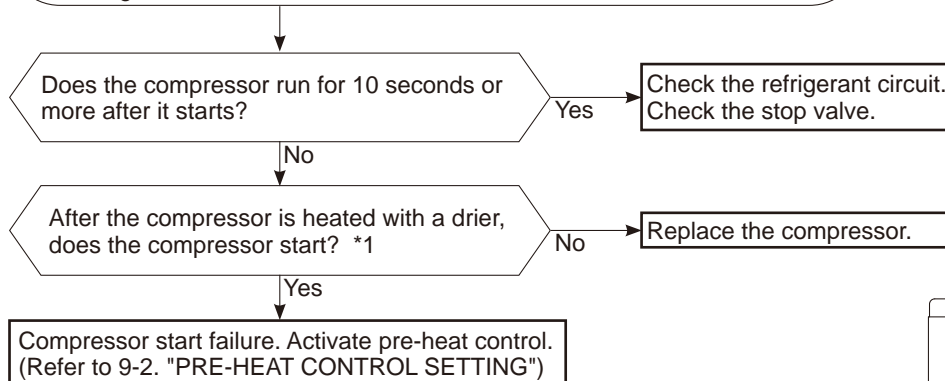
- Electrical circuit check

①. Contact of the compressor connector

②. Output voltage of inverter P.C. board and balance of them (See 10-5.⑥)

③. Direct current voltage between DB61(+) and (-) (**MUZ-FS06/09/12**)/IC700(P) and (N) (**MUZ-FS15/18**) on the inverter P.C. board

④. Voltage between outdoor terminal block S1-S2



\*1  
Heat the compressor with a drier for about 20 minutes. Do not recover refrigerant gas while heating.

## G Check of outdoor thermistors

Disconnect the connector of thermistor in the inverter P.C. board (see below table), and measure the resistance of thermistor.

Is the resistance of thermistor normal?  
(Refer to 10-6.1.)

No

Replace the thermistor except RT64.  
When RT64 is abnormal, replace the inverter P.C. board.

Yes

Reconnect the connector of thermistor.  
Turn ON the power supply and press EMERGENCY OPERATION switch.

Does the unit operate for 10 minutes or more  
without showing thermistor abnormality?

No

Replace the inverter P.C. board.

Yes

OK  
(Cause is poor contact.)

### MUZ-FS06/09/12

Thermistor	Symbol	Connector, Pin No.	Board
Defrost	RT61	Between CN641 pin1 and pin2	Inverter P.C. board
Discharge temperature	RT62	Between CN641 pin3 and pin4	
Fin temperature	RT64	Between CN642 pin1 and pin2	
Ambient temperature	RT65	Between CN643 pin1 and pin2	
Outdoor heat exchanger temperature	RT68	Between CN644 pin1 and pin3	

### MUZ-FS15/18

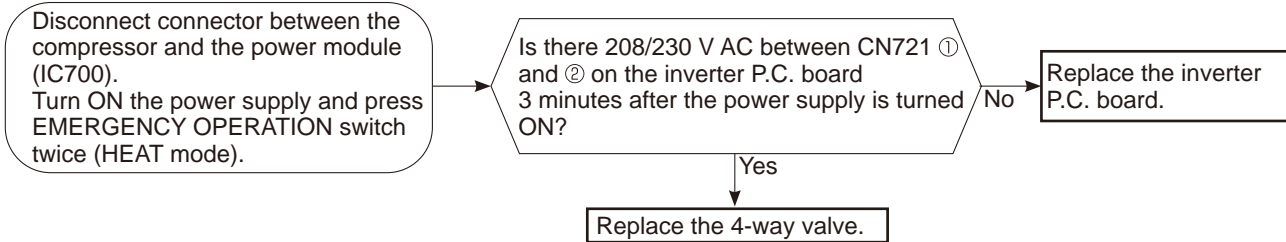
Thermistor	Symbol	Connector, Pin No.	Board
Defrost	RT61	Between CN671 pin1 and pin2	Inverter P.C. board
Discharge temperature	RT62	Between CN671 pin3 and pin4	
Fin temperature	RT64	Between CN673 pin1 and pin2	
Ambient temperature	RT65	Between CN672 pin1 and pin2	
Outdoor heat exchanger temperature	RT68	Between CN671 pin5 and pin6	

## H Check of R.V. coil

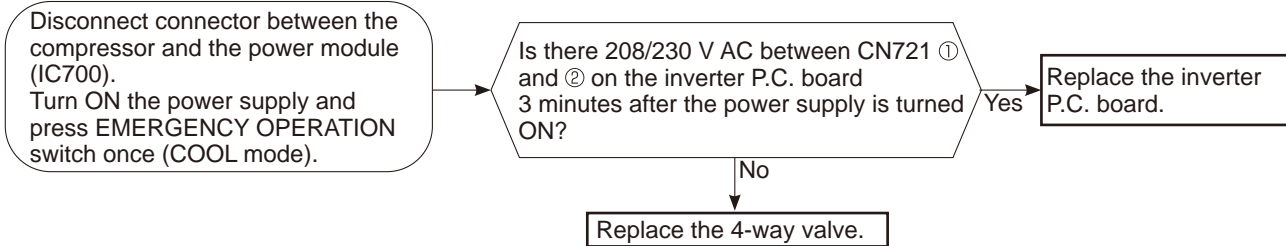
### MUZ-FS06/09/12

- \* First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to 10-4.
- \* In case CN721 is disconnected or R.V. coil is open, voltage is generated between the terminal pins of the connector although no signal is being transmitted to R.V. coil.  
Check if CN721 is connected.

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



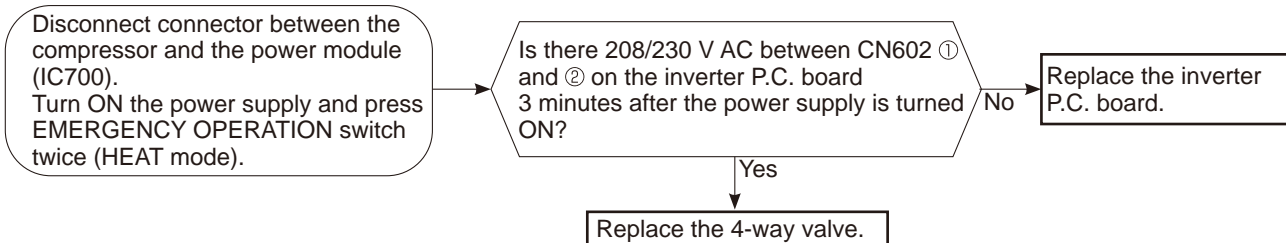
#### Unit operates in HEAT mode even if it is set to COOL mode.



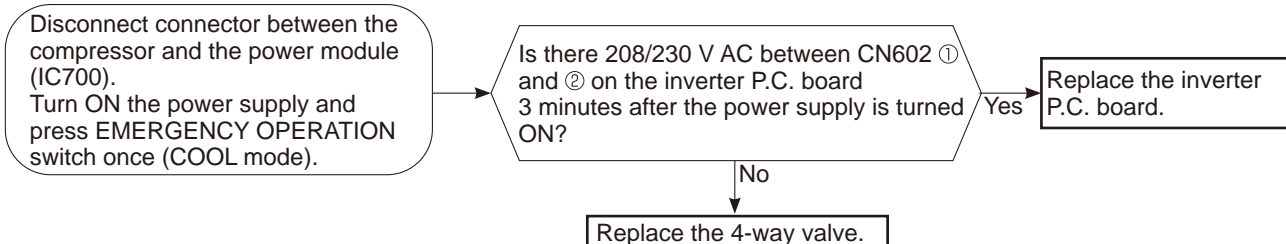
### MUZ-FS15/18

- \* First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to 10-4.
- \* In case CN602 is disconnected or R.V. coil is open, voltage is generated between the terminal pins of the connector although no signal is being transmitted to R.V. coil.  
Check if CN602 is connected.

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



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



## ① Check of outdoor fan motor

Disconnect the connectors CN931 and CN932 from the inverter P.C. board.  
Check the connection between the connector CN931 and CN932.

Is the resistance between each terminal of outdoor fan motor normal?  
(Refer to 10-4.)

Yes

Disconnect CN932 from the inverter P.C. board, and turn on the power supply.

Rotate the outdoor fan motor manually and measure the voltage of CN931.  
Between 1(+) and 5(-)  
Between 2(+) and 5(-)  
Between 3(+) and 5(-)

No

(Fixed to either 5 or 0 V DC)

No

Does the voltage between each terminal become 5 and 0 V DC repeatedly?

Yes

No

Does the outdoor fan motor rotate smoothly?

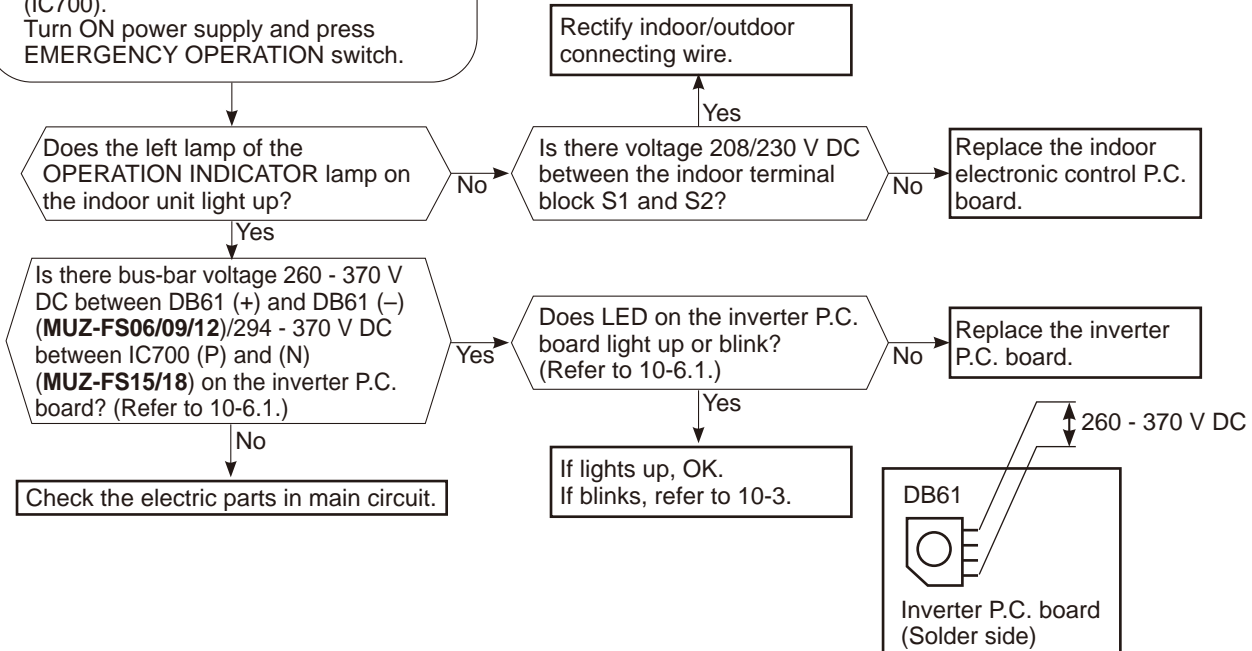
Yes

Replace the outdoor fan motor.

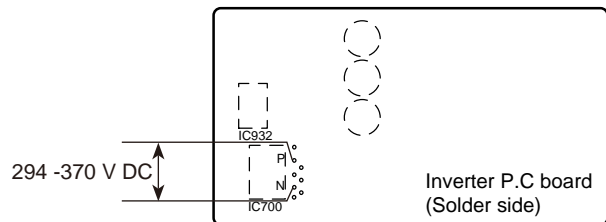
Replace the inverter P.C. board.

## J Check of power supply

Disconnect the connector between the compressor and the power module (IC700).  
Turn ON power supply and press EMERGENCY OPERATION switch.



MUZ-FS06/09/12



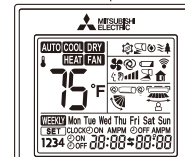
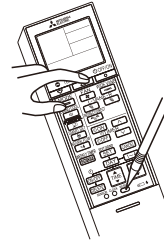
MUZ-FS15/18

## K Check of LEV (Expansion valve)

Turn ON the power supply.

<Preparation of the remote controller>

- ① While pressing both Operation select button and TEMP  $\oplus$  button on the remote controller at the same time, press RESET button.
- ② First, release RESET button.  
Hold down the other 2 buttons for another 3 seconds.  
Make sure that the indicators on the LCD screen shown in the right figure are all displayed. Then release the buttons.



Press OFF/ON (stop/operate) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit. \*1

Expansion valve operates in full-opening direction.

Do you hear the expansion valve "click, click....."?  
Do you feel the expansion valve vibrate when touching it?

Yes → OK

No

Is LEV coil properly fixed to the expansion valve?

No

Properly fix the LEV coil to the expansion valve.

Yes

Does the resistance of LEV coil have the characteristics? (Refer to 10-4.)

Yes

Measure each voltage between connector pins of CN724 on the inverter P.C. board.

1. Pin③(-) — Pin①(+)
2. Pin④(-) — Pin①(+)
3. Pin⑤(-) — Pin①(+)
4. Pin⑥(-) — Pin①(+)

Is there about 3 - 5 V DC between each?  
**NOTE:** Measure the voltage by an analog tester.

Yes

Replace the expansion valve.

No → Replace the inverter P.C. board.

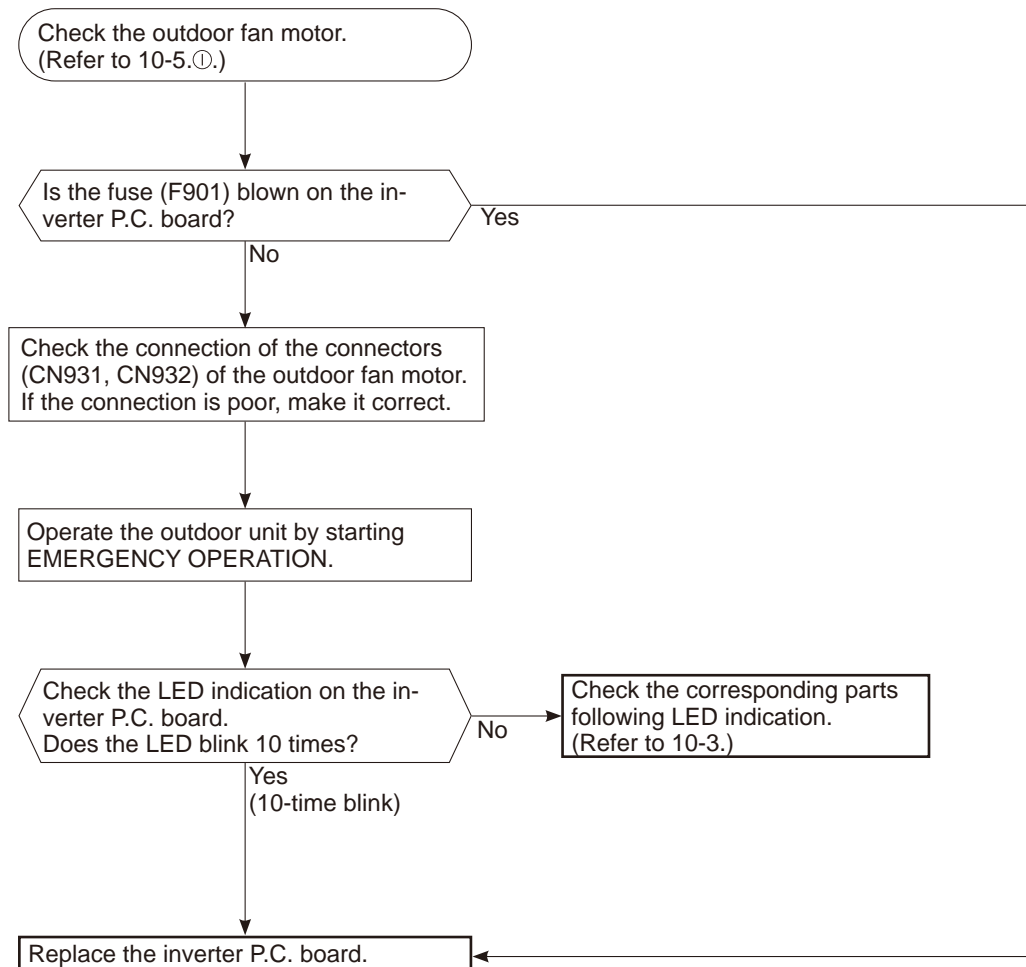
No → Replace the LEV coil.

\*1. Regardless of normal or abnormal condition, a short beep is emitted once the signal is received.

**NOTE:** After check of LEV, take the following steps.

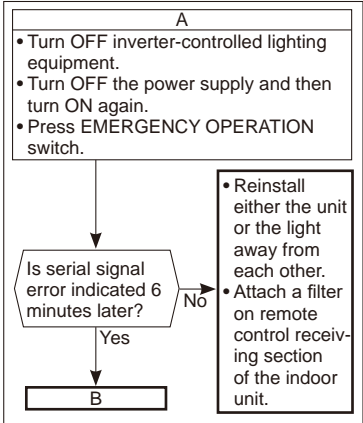
1. Turn OFF the power supply and turn it ON again.
2. Press RESET button on the remote controller.

## **L Check of inverter P.C. board**





## **(M) How to check miswiring and serial signal error**



## N Check of defrost heater

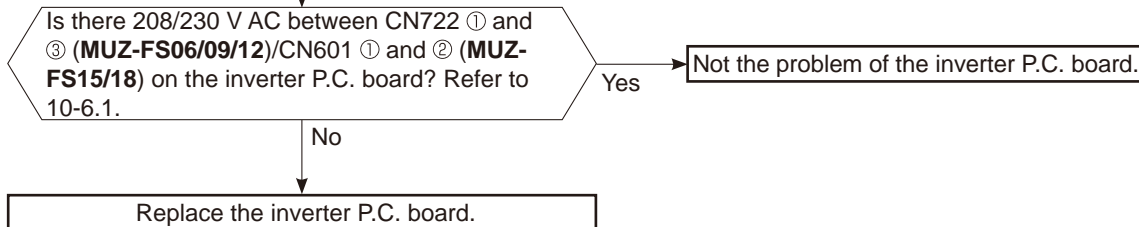
### MUZ-FS06NAH MUZ-FS09NAH MUZ-FS12NAH MUZ-FS15NAH MUZ-FS18NAH

Check the following points before checking electric continuity.

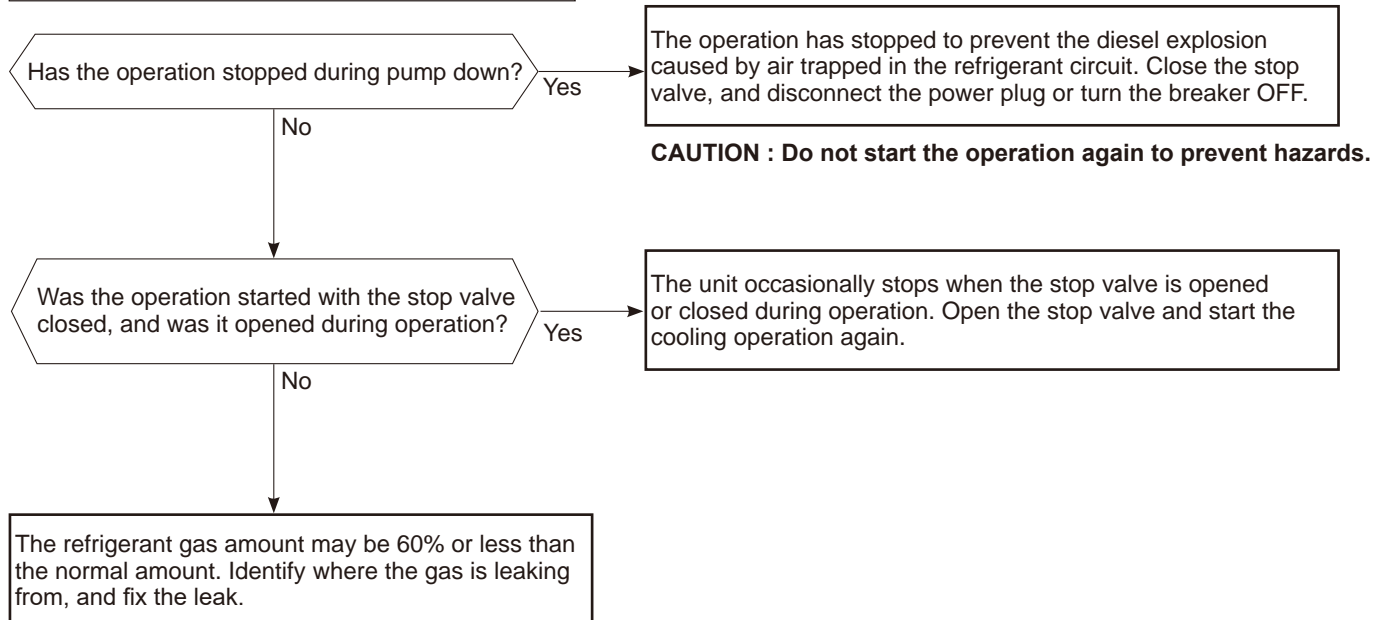
1. Does the resistance of ambient temperature thermistor have the characteristics? Refer to 10-6.1.
2. Is the resistance of defrost heater normal? Refer to 10-4.
3. Does the heater protector remain conducted (not open)?
4. Are both ambient temperature thermistor and circuit of defrost heater securely connected to connectors?

In HEAT mode, for more than 5 minutes, let the ambient temperature thermistor continue to read 32°F (0°C) or below, and let the defrost thermistor continue to read 30°F (-1°C) or below.

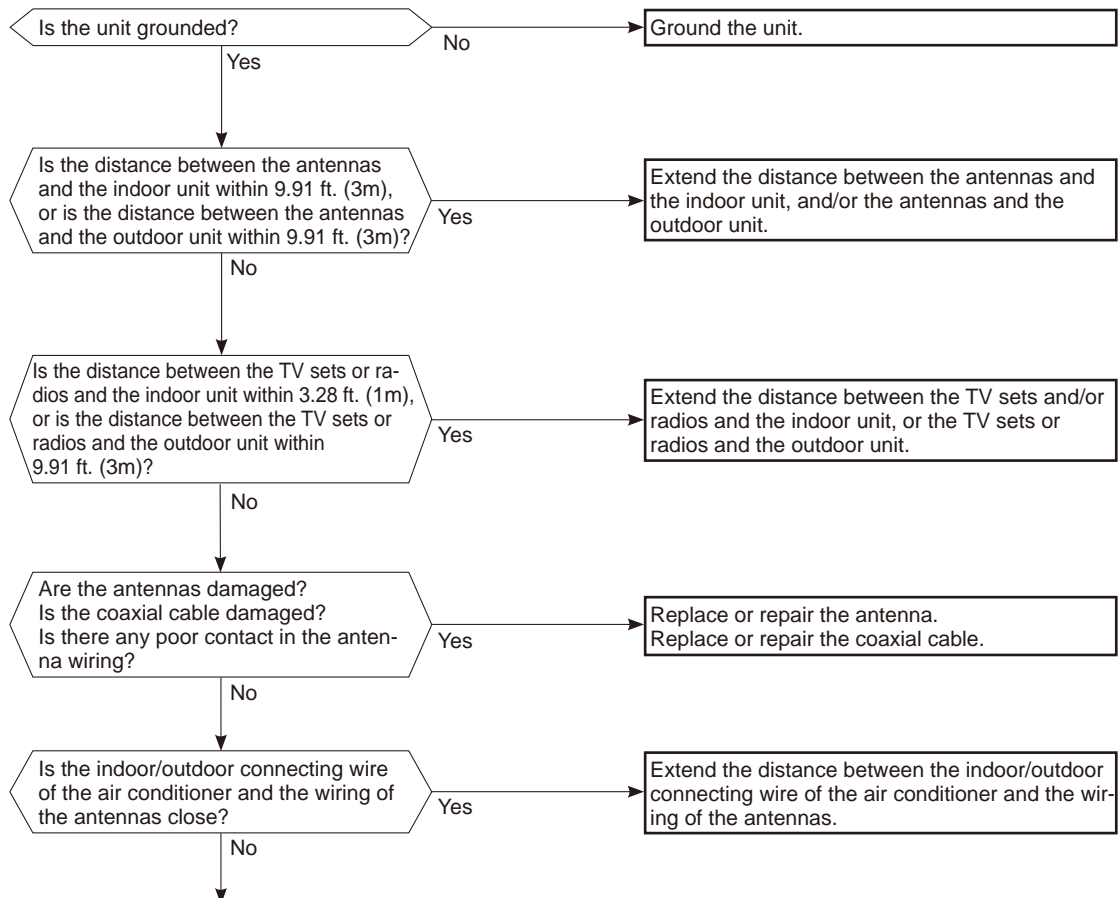
**NOTE:** In case both thermistors are more than the above temperature, cool them with cold water etc.



## O Check of outdoor refrigerant circuit



## P Electromagnetic noise enters into TV sets or radios



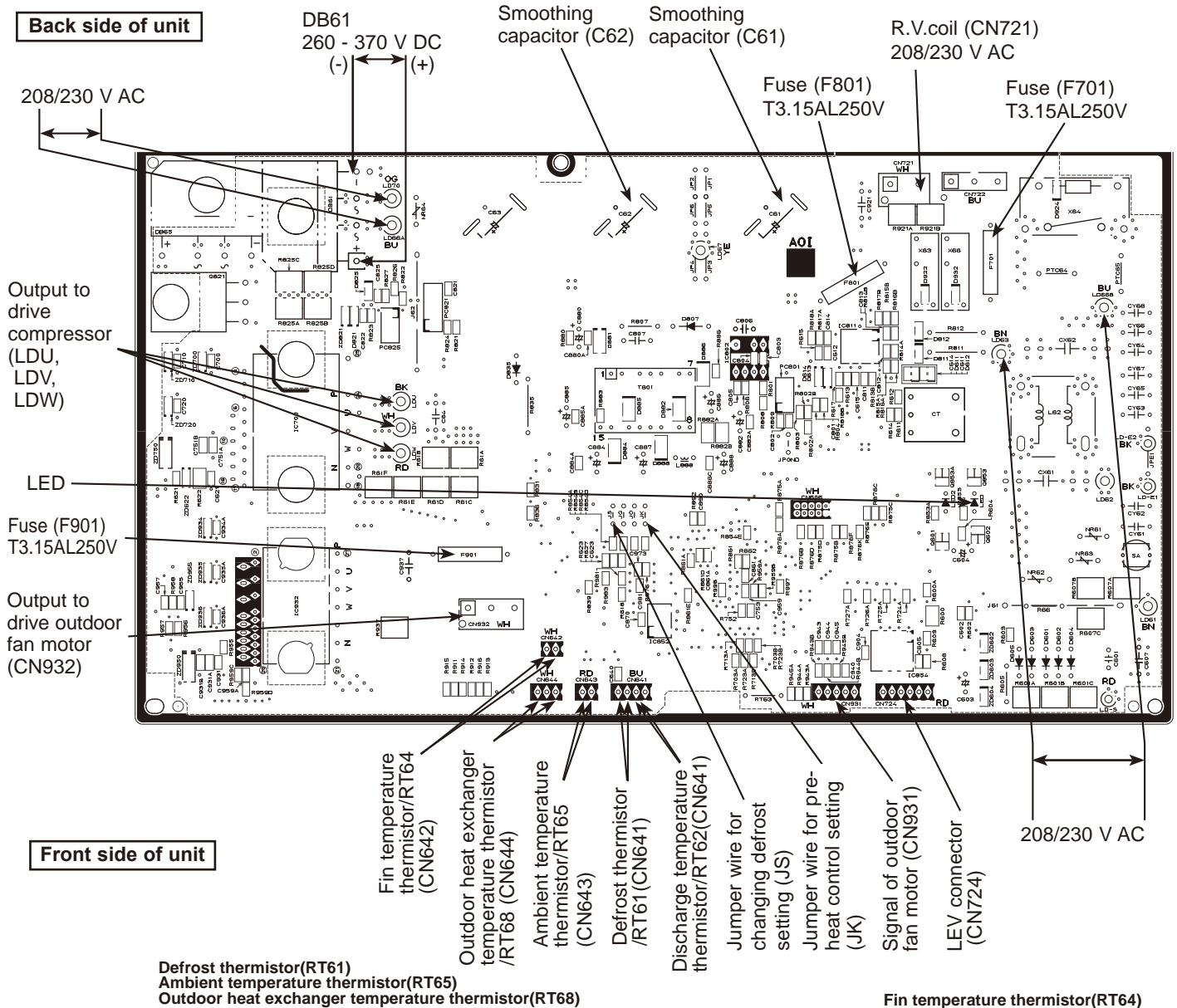
Even if all of the above conditions are fulfilled, the electromagnetic noise may enter, depending on the electric field strength or the installation condition (combination of specific conditions such as antennas or wiring). Check the following before asking for service.

1. Devices affected by the electromagnetic noise  
TV sets, radios (FM/AM broadcast, shortwave)
2. Channel, frequency, broadcast station affected by the electromagnetic noise
3. Channel, frequency, broadcast station unaffected by the electromagnetic noise
4. Layout of:  
indoor/outdoor unit of the air conditioner, indoor/outdoor wiring, ground wire, antennas, wiring from antennas, receiver
5. Electric field intensity of the broadcast station affected by the electromagnetic noise
6. Presence or absence of amplifier such as booster
7. Operation condition of air conditioner when the electromagnetic noise enters in
  - 1) Turn OFF the power supply once, and then turn ON the power supply. In this situation, check for the electromagnetic noise.
  - 2) Within 3 minutes after turning ON the power supply, press OFF/ON (stop/operate) button on the remote controller for power ON, and check for the electromagnetic noise.
  - 3) After a short time (3 minutes later after turning ON), the outdoor unit starts running. During operation, check for the electromagnetic noise.
  - 4) Press OFF/ON (stop/operate) button on the remote controller for power OFF, when the outdoor unit stops but the indoor/outdoor communication still runs on. In this situation, check for the electromagnetic noise.

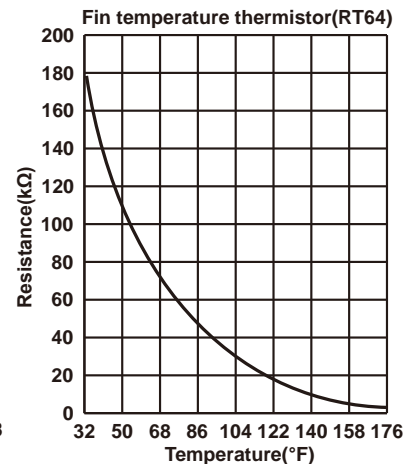
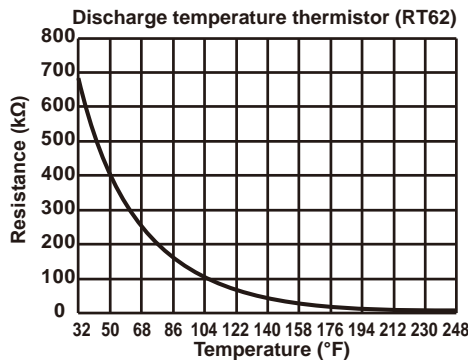
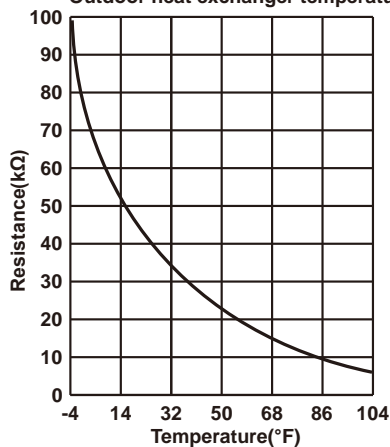
## 10-6. TEST POINT DIAGRAM AND VOLTAGE

### 1. Inverter P.C. board

MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH

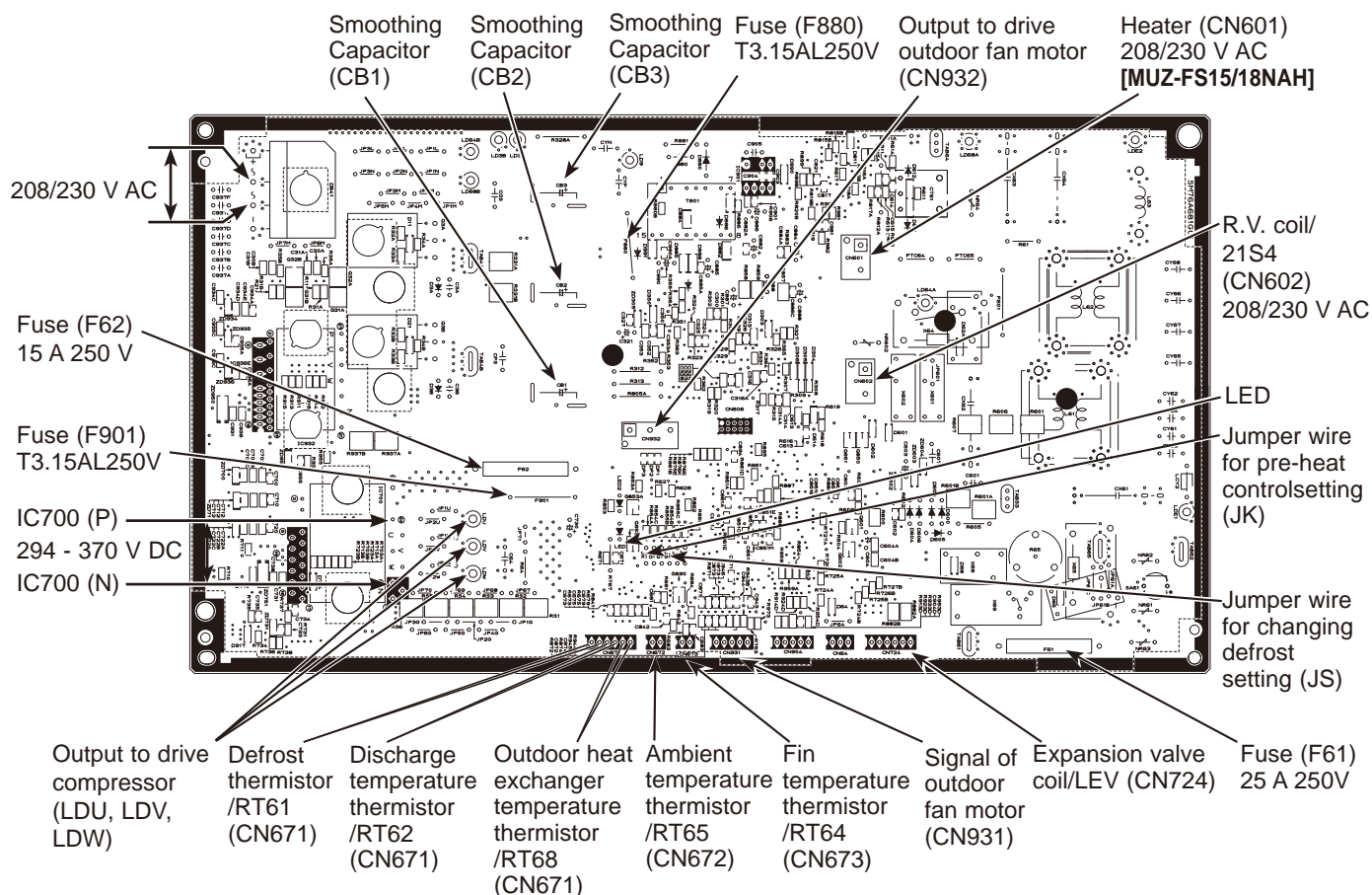


Defrost thermistor (RT61)  
Ambient temperature thermistor (RT65)  
Outdoor heat exchanger temperature thermistor (RT68)



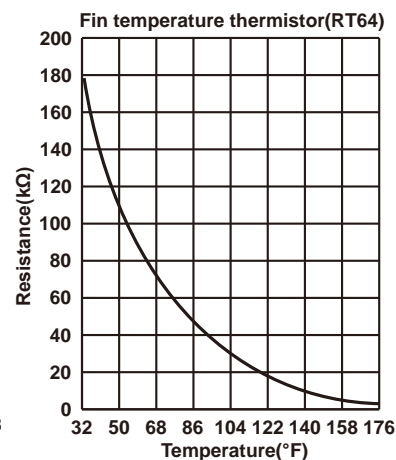
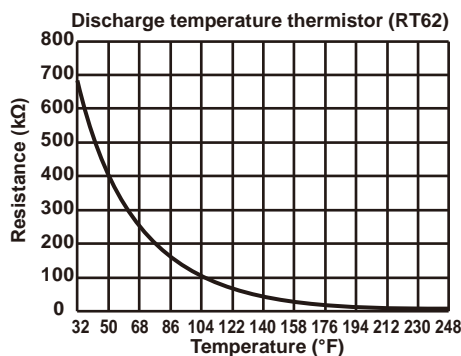
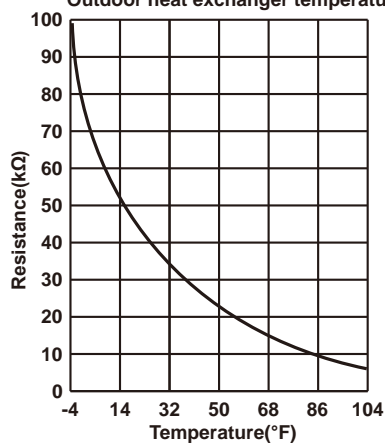
# MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH

## Back side of unit



## Front side of unit

Defrost thermistor(RT61)  
Ambient temperature thermistor(RT65)  
Outdoor heat exchanger temperature thermistor(RT68)



## &lt;Detaching method of the terminal with locking mechanism&gt;

The terminal which has the locking mechanism can be detached as shown below.

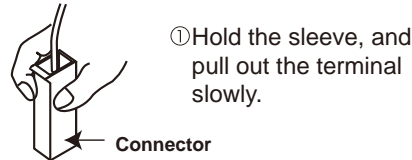
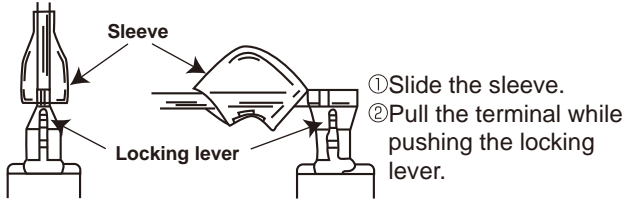
There are 2 types of the terminal with locking mechanism.

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.

(2) The terminal with the connector shown below has the locking mechanism.



### 11-1. MUZ-FS06NA MUZ-FS06NAH MUZ-FS09NA MUZ-FS09NAH MUZ-FS12NA MUZ-FS12NAH

**NOTE:** Turn OFF the power supply before disassembly.

—————>: Indicates the visible parts in the photos/figures.  
----->: Indicates the invisible parts in the photos/figures.

#### OPERATING PROCEDURE

##### 1. Removing the cabinet

- (1) Remove the screw fixing the service panel.
- (2) Pull down the service panel and remove it.
- (3) Remove the screws fixing the conduit cover.
- (4) Remove the conduit cover. (Photo 4)
- (5) Remove the screw fixing the conduit plate. (Photo 5)
- (6) Remove the conduit plate.
- (7) Disconnect the power supply wire and indoor/outdoor connecting wire.
- (8) Remove the screws fixing the top panel.
- (9) Remove the top panel.
- (10) Remove the screws fixing the cabinet.
- (11) Remove the cabinet.
- (12) Remove the screws fixing the back panel.
- (13) Remove the back panel.

#### PHOTOS/FIGURES

Photo 1

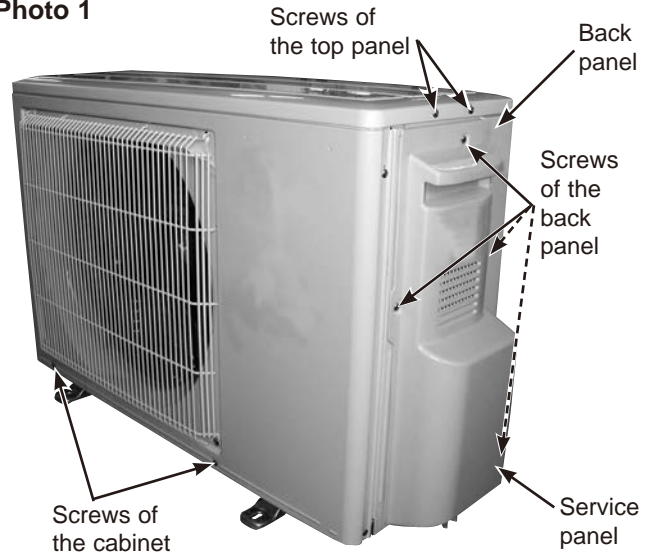


Photo 2

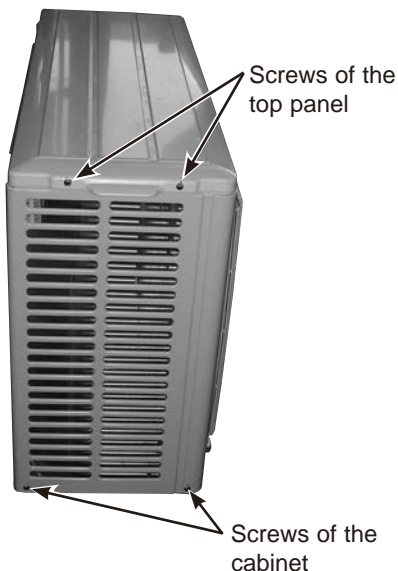
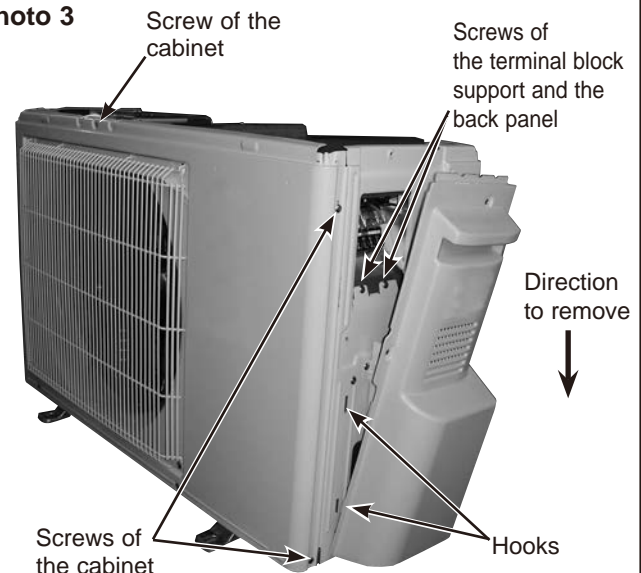


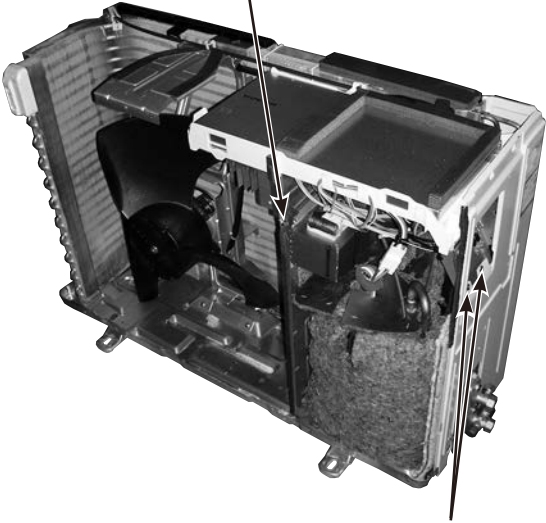
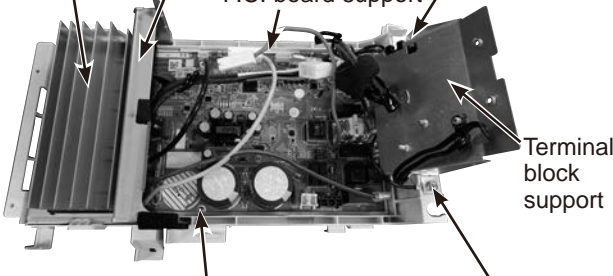


Photo 3





OPERATING PROCEDURE	PHOTOS/FIGURES
<p><b>Photo 4</b></p>  <p>Screws of the conduit cover</p>	<p><b>Photo 5</b></p>  <p>Screw of the conduit plate</p>
<p><b>2. Removing the inverter assembly, inverter P.C. board</b></p> <p>(1) Remove the cabinet and panels. (Refer to section 1.)</p> <p>(2) Disconnect the lead wire to the reactor and the following connectors:</p> <p>&lt;Inverter P.C. board&gt;</p> <p>CN721 (R.V. coil)</p> <p>CN722 (Defrost heater and heater protector) (<b>MUZ-FS06/09/12NAH</b>)</p> <p>CN931, CN932 (Fan motor)</p> <p>CN641 (Defrost thermistor and discharge temperature thermistor)</p> <p>CN643 (Ambient temperature thermistor)</p> <p>CN644 (Outdoor heat exchanger temperature thermistor)</p> <p>CN724 (LEV)</p> <p>(3) Remove the compressor connector (CN61).</p> <p>(4) Remove the screws fixing the heat sink support and the separator.</p> <p>(5) Remove the fixing screws of the terminal block support and the back panel.</p> <p>(6) Remove the inverter assembly.</p> <p>(7) Remove the screw of the ground wire and screw of the terminal block support.</p> <p>(8) Remove the heat sink support from the P.C. board support.</p> <p>(9) Remove the screw of the inverter P.C. board and remove the inverter P.C. board from the P.C. board support.</p>	<p><b>Photo 6</b></p>  <p>Screw of the heat sink support and the separator</p> <p>Screws of the terminal block support and the back panel</p>
<p><b>3. Removing R.V. coil</b></p> <p>(1) Remove the cabinet and panels. (Refer to section 1.)</p> <p>(2) Disconnect the following connectors:</p> <p>&lt;Inverter P.C. board&gt;</p> <p>CN721 (R.V. coil)</p> <p>(3) Remove the R.V. coil.</p>	<p><b>Photo 7</b></p>  <p>Heat sink</p> <p>Heat sink support</p> <p>P.C. board support</p> <p>Screw of the terminal block support</p> <p>Terminal block support</p> <p>Screw of the inverter P.C. board</p> <p>Screw of the ground wire</p>

## OPERATING PROCEDURE

### 4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor

- (1) Remove the cabinet and panels. (Refer to section 1.)
- (2) Disconnect the lead wire to the reactor and the following connectors:
  - <Inverter P.C. board>
  - CN641 (Defrost thermistor and discharge temperature thermistor)
  - CN643 (Ambient temperature thermistor)
  - CN644 (Outdoor heat exchanger temperature thermistor)
- (3) Pull out the discharge temperature thermistor from its holder.
- (4) Pull out the defrost thermistor from its holder. (Photo 9)
- (5) Pull out the outdoor heat exchanger temperature thermistor from its holder. (Photo 9)
- (6) Pull out the ambient temperature thermistor from its holder.

## PHOTOS/FIGURES

Photo 8

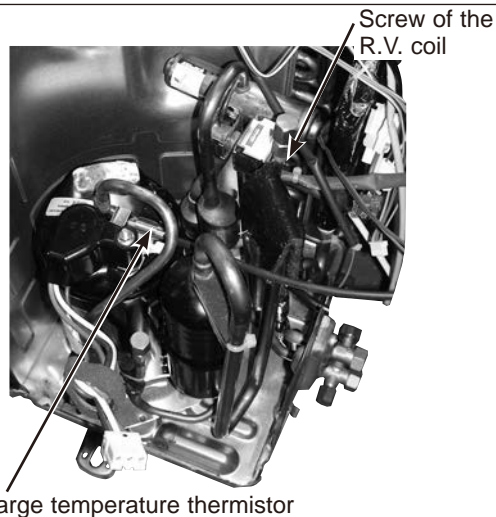


Photo 9

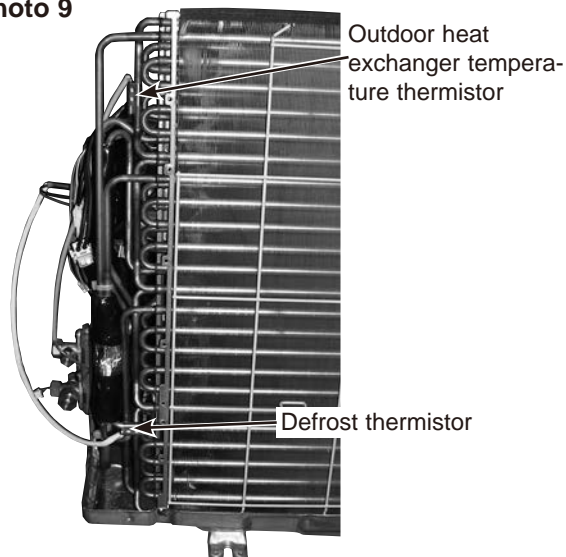
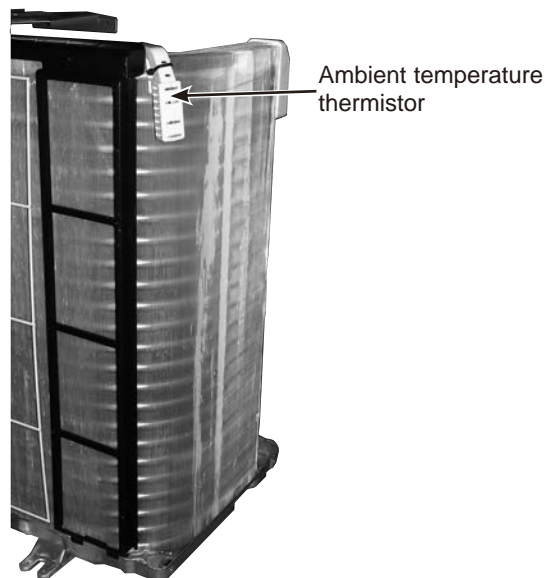
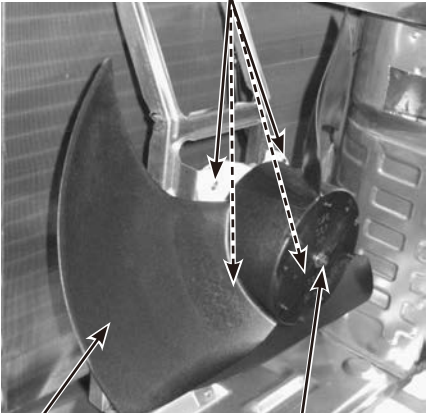
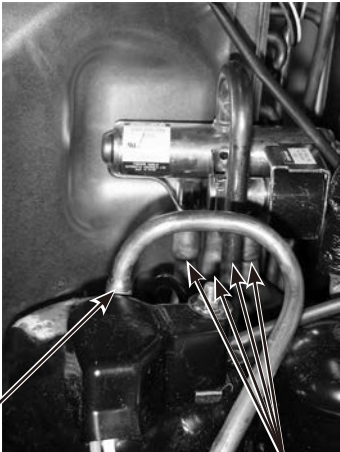
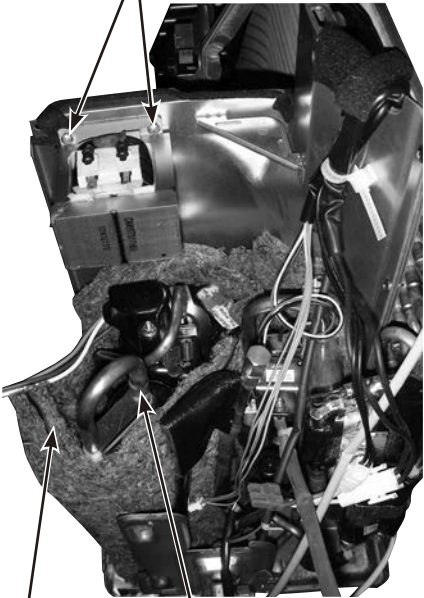


Photo 10



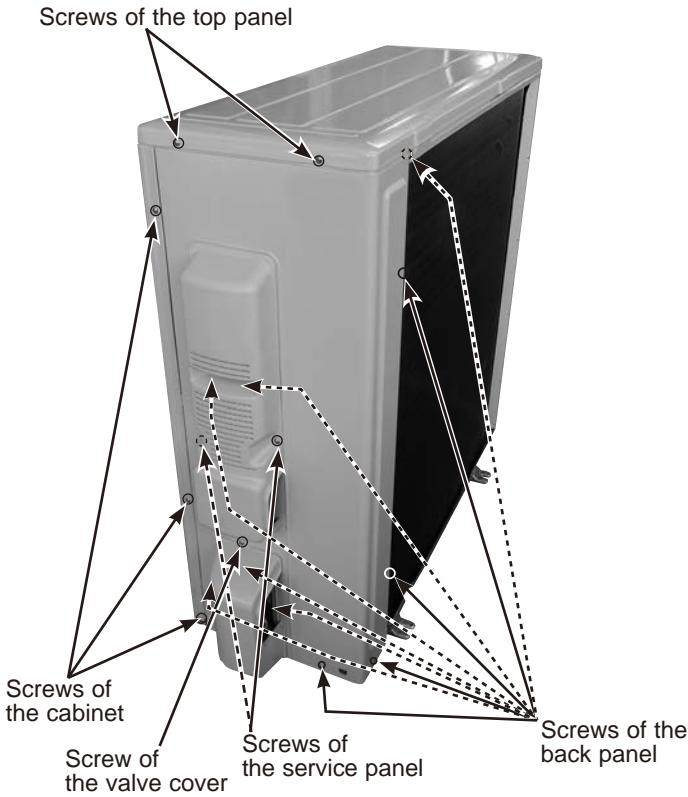
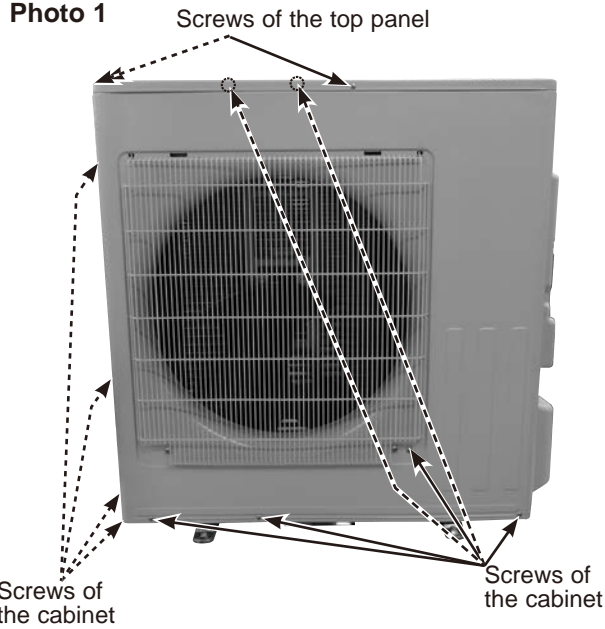
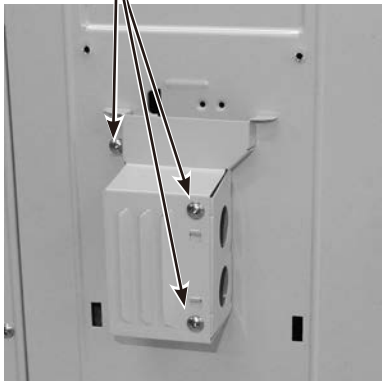
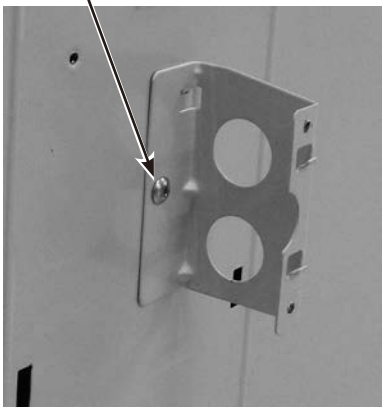




OPERATING PROCEDURE	PHOTOS/FIGURES
<p><b>5. Removing outdoor fan motor</b></p> <ol style="list-style-type: none"><li>(1) Remove the cabinet and panels. (Refer to section 1.)</li><li>(2) Disconnect the following connectors:     &lt;Inverter P.C. board&gt;     CN931, CN932 (Fan motor)</li><li>(3) Remove the propeller fan nut.</li><li>(4) Remove the propeller fan.</li><li>(5) Remove the screws fixing the fan motor.</li><li>(6) Remove the fan motor.</li></ol>	<p><b>Photo 11</b></p> <p>Screws of the outdoor fan motor</p>  <p>Propeller fan      Propeller fan nut</p>
<p><b>6. Removing the compressor and 4-way valve</b></p> <ol style="list-style-type: none"><li>(1) Remove the cabinet and panels. (Refer to section 1.)</li><li>(2) Remove the inverter assembly. (Refer to section 2.)</li><li>(3) Remove the screws fixing the reactor.</li><li>(4) Remove the reactor.</li><li>(5) Remove the soundproof felt.</li><li>(6) Recover gas from the refrigerant circuit.     <b>NOTE:</b> Recover gas from the pipes until the pressure gauge shows 0 PSIG.</li><li>(7) Detach the brazed part of the suction and the discharge pipe connected with compressor.</li><li>(8) Remove the nuts fixing the compressor.</li><li>(9) Remove the compressor.</li><li>(10) Detach the brazed part of pipes connected with 4-way valve.</li></ol> <p><b>Photo 13</b></p>  <p>Discharge pipe brazed part      Brazed parts of 4-way valve</p>	<p><b>Photo 12</b></p> <p>Screws of the reactor</p>  <p>Soundproof felt      Suction pipe brazed part</p>

## 11-2. MUZ-FS15NA MUZ-FS15NAH MUZ-FS18NA MUZ-FS18NAH

**NOTE:** Turn OFF the power supply before disassembly.

OPERATING PROCEDURE	PHOTOS/FIGURES
<p><b>1. Removing the cabinet</b></p> <ol style="list-style-type: none"> <li>(1) Remove the screws of the service panel.</li> <li>(2) Remove the screws of the top panel.</li> <li>(3) Remove the screw of the valve cover.</li> <li>(4) Remove the service panel.</li> <li>(5) Remove the top panel.</li> <li>(6) Remove the valve cover.</li> <li>(7) Disconnect the power supply and indoor/outdoor connecting wire.</li> <li>(8) Remove the screws of the cabinet.</li> <li>(9) Remove the cabinet.</li> <li>(10) Remove the screws of the back panel.</li> <li>(11) Remove the back panel.</li> </ol> <p><b>Photo 2</b></p>  <p>Screws of the top panel</p> <p>Screws of the cabinet</p> <p>Screw of the valve cover</p> <p>Screws of the service panel</p> <p>Screws of the back panel</p>	<p><b>Photo 1</b></p>  <p>Screws of the top panel</p> <p>Screws of the cabinet</p> <p>Screws of the cabinet</p> <p><b>Photo 3</b></p>  <p>Screws of the conduit cover</p> <p><b>Photo 4</b></p>  <p>Screw of the conduit plate</p>

## OPERATING PROCEDURE

### 2. Removing the inverter assembly and inverter P.C. board

- (1) Remove the cabinet and panels. (Refer to section 1.)
- (2) Disconnect the lead wire to the reactor and the following connectors:  
 <Inverter P.C. board>  
 CN602 (R.V. coil)  
 CN931, CN932 (Fan motor)  
 CN671 (Defrost thermistor, discharge temperature thermistor and outdoor heat exchanger temperature thermistor)  
 CN672 (Ambient temperature thermistor)  
 CN724 (LEV)  
 CN601 (Defrost heater and heater protector)  
**(MUZ-FS15/18NAH)**
- (3) Remove the compressor connector (CN61).
- (4) Remove the screws fixing the heat sink support and the separator.
- (5) Remove the screws fixing the P.C. board support and the motor support.
- (6) Remove the fixing screws of the terminal block support and the back panel.
- (7) Remove the inverter assembly.
- (8) Remove the screws of the ground wires.
- (9) Remove the screw of the heat sink support, and the heat sink support from the P.C. board support.
- (10) Remove the screws of the terminal block support, and the screws of the ground wires. (Photo 7)
- (11) Remove the terminal block support.

## PHOTOS/FIGURES

Photo 5

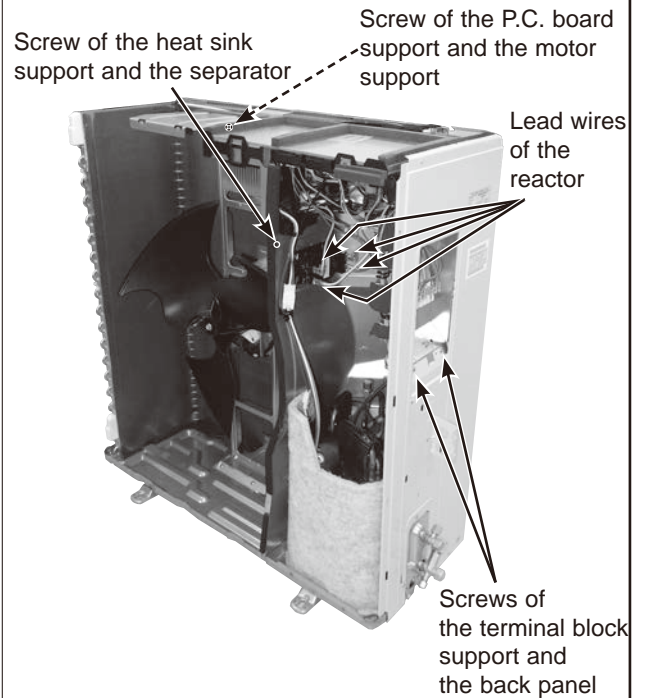
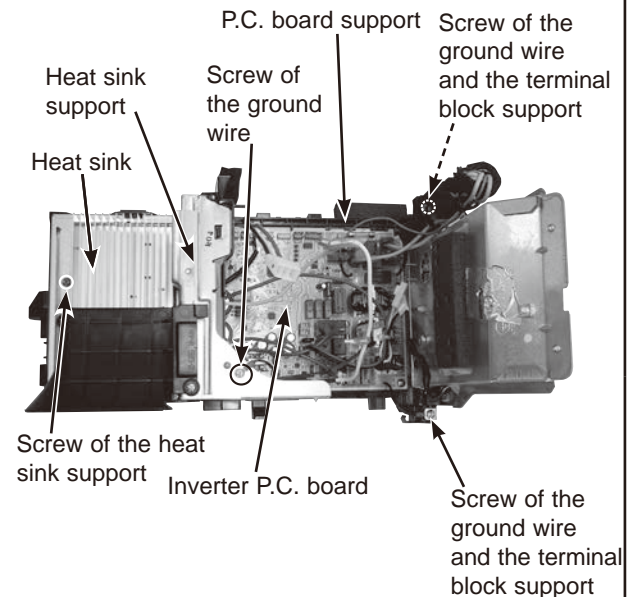


Photo 6 (Inverter assembly)



## OPERATING PROCEDURE

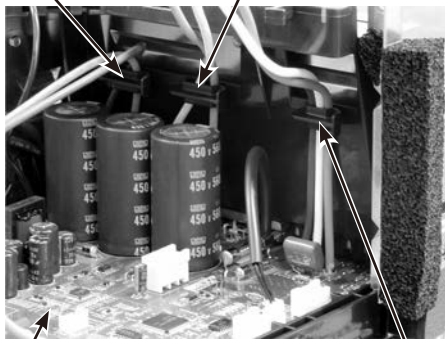
### \* Connection procedure when attaching the inverter P.C. board (Photo 8, 9)

1. Attach the heat sink support to the P.C. board support.
2. Hook the lead wires of the compressor, the reactor and the P.C. board to each hooks on the heat sink support as shown Photo 8.
3. Connect the lead wires of the expansion valve coil to the connector on the inverter P.C. board. Pull the lead wires of the expansion valve coil toward you and put them on the left hook on the P.C. board support as shown in Photo 9.

**Photo 8**

Hook of the lead wires of the P.C. board

Hook of the lead wires of the reactor

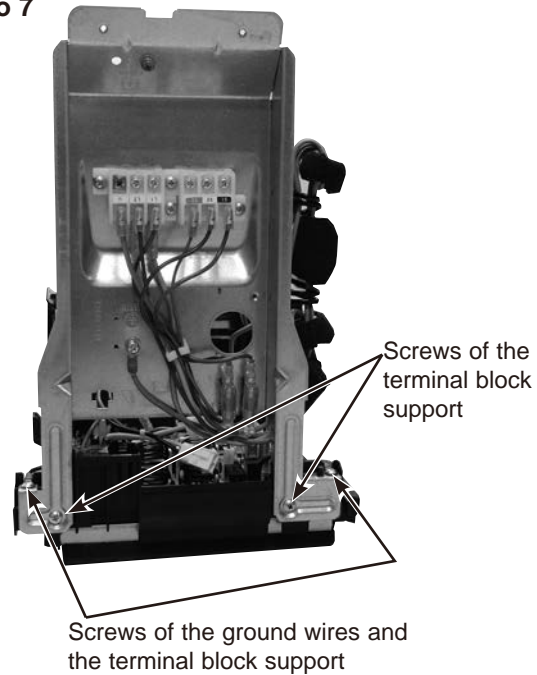


Inverter P.C. board

Hook of the lead wires of the compressor

## PHOTOS/FIGURES

**Photo 7**

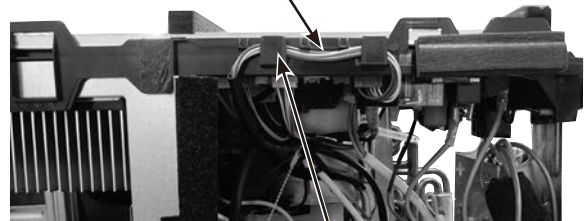


Screws of the terminal block support

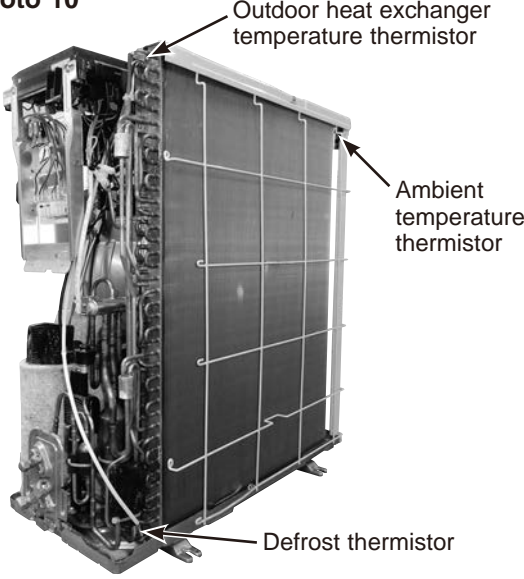
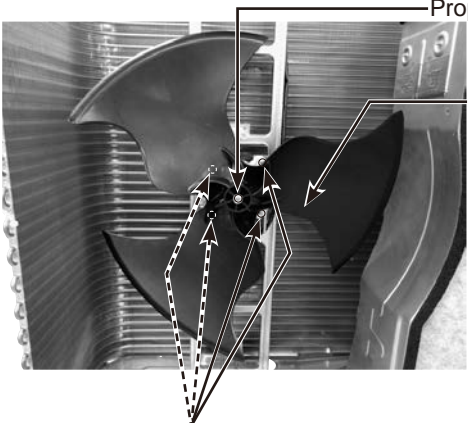
Screws of the ground wires and the terminal block support

**Photo 9**

Lead wires of the expansion valve coil



Inverter P.C. board support

OPERATING PROCEDURE	PHOTOS/FIGURES
<p><b>3. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor</b></p> <p>(1) Remove the cabinet and panels. (Refer to section 1.)</p> <p>(2) Disconnect the lead wire to the reactor and the following connectors:          &lt;Inverter P.C. board&gt;          CN671 (Defrost thermistor, discharge temperature thermistor and outdoor heat exchanger temperature thermistor)          CN672 (Ambient temperature thermistor)</p> <p>(3) Pull out the discharge temperature thermistor from its holder. (Photo 12)</p> <p>(4) Pull out the defrost thermistor from its holder.</p> <p>(5) Pull out the outdoor heat exchanger temperature thermistor from its holder. (Photo 10)</p> <p>(6) Pull out the ambient temperature thermistor from its holder.</p>	<p><b>Photo 10</b></p>  <p>Outdoor heat exchanger temperature thermistor</p> <p>Ambient temperature thermistor</p> <p>Defrost thermistor</p>
<p><b>4. Removing outdoor fan motor</b></p> <p>(1) Remove the top panel, cabinet and service panel. (Refer to section 1.)</p> <p>(2) Disconnect the following connectors:          &lt;Inverter P.C. board&gt;          CN931, CN932 (Fan motor)</p> <p>(3) Remove the propeller fan nut.</p> <p>(4) Remove the propeller fan.</p> <p>(5) Remove the screws fixing the fan motor.</p> <p>(6) Remove the fan motor.</p>	<p><b>Photo 11</b></p>  <p>Propeller fan nut</p> <p>Propeller fan</p> <p>Screws of the outdoor fan motor</p>



## OPERATING PROCEDURE

### 5. Removing the compressor and 4-way valve

- (1) Remove the top panel, cabinet and service panel. (Refer to section 1.)
- (2) Remove the back panel. (Refer to section 1.)
- (3) Remove the inverter assembly. (Refer to section 2.)
- (4) Recover gas from the refrigerant circuit.

**NOTE:** Recover gas from the pipes until the pressure gauge shows 0 PSIG.

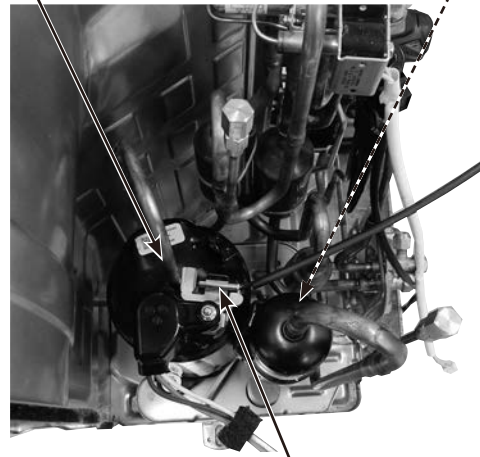
- (5) Detach the brazed part of the suction and the discharge pipe connected with compressor.
- (6) Remove the compressor nuts.
- (7) Remove the compressor.
- (8) Detach the brazed parts of 4-way valve and pipe. (Photo 13)

## PHOTOS/FIGURES

**Photo 12**

Brazed part of the discharge pipe

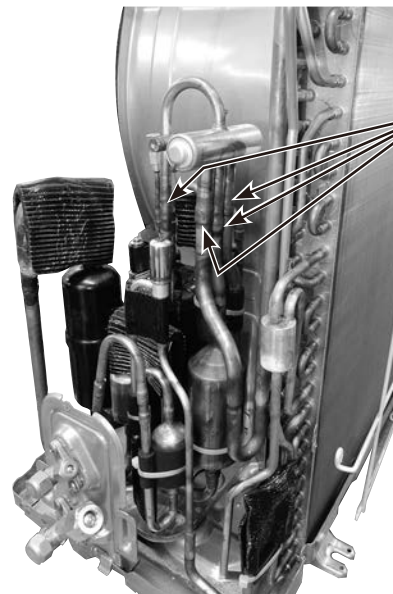
Brazed part of the suction pipe



Discharge temperature thermistor

**Photo 13**

Brazed parts of 4-way valve



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