MITSUBISHI ELECTRIC

SPLIT-TYPE AIR CONDITIONERS

**Revision D:**
• Capacity corrections have been corrected [7-1. 2), 3)].

OBH747 REVISED EDITION-C is void.

# OUTDOOR UNIT

# SERVICE MANUAL

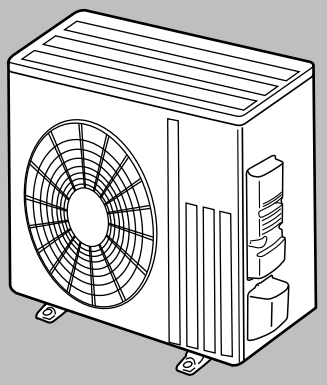
HFC utilized R410A

**No. OBH747**
**REVISED EDITION-D**

## Models

**MUZ-HM09NA** - U1, U8
**MUZ-HM09NA2** - U1, U8
**MUZ-HM12NA** - U1, U8
**MUZ-HM12NA2** - U1, U8
**MUZ-HM15NA** - U1
**MUZ-HM15NA2** - U1
**MUZ-HM18NA** - U1
**MUZ-HM18NA2** - U1
**MUZ-HM24NA** - U1
**MUZ-HM24NA2** - U1

**Indoor unit service manual**
**MSZ-HM•NA Series (OBH746)**



**MUZ-HM24NA**

## CONTENTS



**PARTS CATALOG (OBB747)**

**NOTE:**
RoHS compliant products have <G> mark on the spec name plate.

# 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.

**Revision A:**

• MUZ-HM09/12NA-U8, MUZ-HM09/12NA2-U8, MUZ-HM15/18NA-U1, MUZ-HM15/18NA2-U1 and MUZ-HM24NA2-U1 have been added.

**Revision B:**

• 3. SPECIFICATION has been modified.

**Revision C:**

• MUZ-HM09/12NA-U1, MUZ-HM09/12NA2-U1 have been added.

**Revision D:**

• Capacity corrections have been corrected [7-1. 2), 3)].

# 1 TECHNICAL CHANGES

**MUZ-HM24NA** - U1

1. New model

**MUZ-HM09NA** - U8
**MUZ-HM09NA2** - U8
**MUZ-HM12NA** - U8
**MUZ-HM12NA2** - U8
**MUZ-HM15NA** - U1
**MUZ-HM15NA2** - U1
**MUZ-HM18NA** - U1
**MUZ-HM18NA2** - U1
**MUZ-HM24NA2** - U1

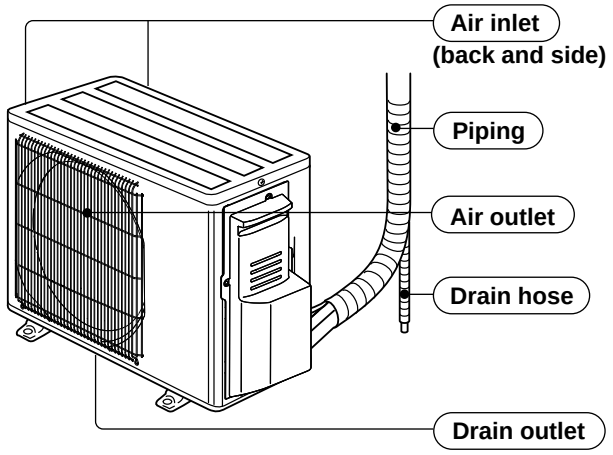
1. New model

**MUZ-HM09NA** - U1
**MUZ-HM09NA2** - U1
**MUZ-HM12NA** - U1
**MUZ-HM12NA2** - U1

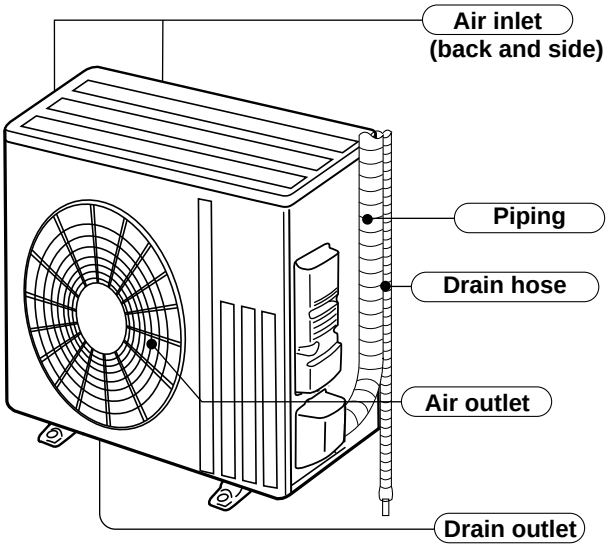
1. New model

# 2 PART NAMES AND FUNCTIONS

**MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2**
**MUZ-HM15NA MUZ-HM15NA2 MUZ-HM18NA MUZ-HM18NA2**




**MUZ-HM24NA MUZ-HM24NA2**



# 3 SPECIFICATION

| Outdoor unit model | | | MUZ-HM09NA - U1<br>MUZ-HM09NA2 - U1 | MUZ-HM09NA - U8<br>MUZ-HM09NA2 - U8 |
|---|---|---|---|---|
| Capacity<br>Rated (Minimum~Maximum) | Cooling ❄1 | Btu/h | 9,000 ( 3,800 ~ 10,000 ) | |
| | Heating 47 ❄1 | Btu/h | 10,900 ( 4,500 ~ 11,800 ) | |
| Capacity<br>Rated (Maximum) | Heating 17 ❄2 | Btu/h | 6,700 (7,200) | |
| Power consumption<br>Rated (Minimum~Maximum) | Cooling ❄1 | W | 750 (240 - 850) | 750 (205 - 850) |
| | Heating 47 ❄1 | W | 900 (240 - 1,000) | 900 (255 - 1,000) |
| Power consumption<br>Rated (Maximum) | Heating 17 ❄2 | W | 700 (780) | |
| EER ❄1 [SEER] ❄3 | Cooling | | 12.0 [ 18.0 ] | |
| HSPF IV ❄4 | Heating | | 10.0 [**NA**] / 8.5 [**NA2**] | |
| COP | Heating ❄1 | | 3.55 | |
| Power factor | Cooling (208/230) | % | 87/87 | 84/84 |
| | Heating (208/230) | % | 90/90 | 90/89 |
| Power supply | V , phase , Hz | | 208/230 , 1 , 60 | |
| Max. fuse size (time delay) | | A | 15 | |
| Min. circuit ampacity | | A | 9 | 12 |
| Fan motor | F.L.A | A | 0.50 | |
| Compressor | Model | | KNB073FRVMC | KNB073FQDHC |
| | R.L.A | A | 6.2 | 6.6 |
| | L.R.A | A | 7.7 | 8.2 |
| | Refrigeration oil | fl oz. (L) (Model) | 9.1 (0.27) (FV50S) | 10.8 (0.32) (NEO22) |
| Refrigerant control | | | Linear expansion valve | |
| Sound level ❄1 | Cooling | dB(A) | 46 | |
| | Heating | dB(A) | 50 | |
| Airflow<br>High - Med. - Low | Cooling | CFM | 1,063 | |
| | Heating | CFM | 1,282 - 1,105 | 1,240 - 1,105 |
| Fan speed<br>High - Med. - Low | Cooling | rpm | 740 | |
| | Heating | rpm | 890 - 770 | 860 - 770 |
| Defrost method | | | Reverse cycle | |
| Dimensions | W | in. | 31-1/2 | |
| | D | in. | 11-1/4 | |
| | H | in. | 21-5/8 | |
| Weight | | lb. | 73 | |
| External finish | | | Munsell 3Y 7.8/1.1 | |
| Refrigerant piping | | | Not supplied | |
| Refrigerant pipe size<br>(Min. wall thickness) | Liquid | in. | 1/4 (0.0315) | |
| | Gas | in. | 3/8 (0.0315) | |
| Connection method | Indoor | | Flared | |
| | Outdoor | | Flared | |
| Between the indoor & outdoor units | Height difference | ft. | 40 | |
| | Piping length | ft. | 65 | |
| Refrigerant charge (R410A) | | | 1 lb. 12 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: (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB

❄3: Test condition (Refer to page 9.)

❄4: Test condition (Refer to page 9.)

| Outdoor unit model | | | **MUZ-HM12NA** - U1<br>**MUZ-HM12NA2** - U1 | **MUZ-HM12NA** - U8<br>**MUZ-HM12NA2** - U8 |
|---|---|---|---|---|
| Capacity<br>Rated (Minimum~Maximum) | Cooling ❄1 | Btu/h | 12,000 ( 3,800 ~ 12,200 ) | |
| | Heating 47 ❄1 | Btu/h | 12,200 ( 4,500 ~ 14,500 ) | 12,200 ( 5,500 ~ 14,500 ) |
| Capacity<br>Rated (Maximum) | Heating 17 ❄2 | Btu/h | 7,600 (9,000) | |
| Power consumption<br>Rated (Minimum~Maximum) | Cooling ❄1 | W | 1,210 (240 - 1,300) | 1,210 (205 - 1,300) |
| | Heating 47 ❄1 | W | 990 (240 - 1,220) | 990 (340 - 1,660) |
| Power consumption<br>Rated (Maximum) | Heating 17 ❄2 | W | 800 (990) | |
| EER ❄1 [SEER] ❄3 | Cooling | | 9.9 [ 18.0 ] | |
| HSPF IV ❄4 | Heating | | 10.0 [**NA**] / 8.5 [**NA2**] | |
| COP | Heating ❄1 | | 3.61 | |
| Power factor | Cooling (208/230) | % | 95/95 | 94/94 |
| | Heating (208/230) | % | 93/93 | 95/96 |
| Power supply | V , phase , Hz | | 208/230 , 1 , 60 | |
| Max. fuse size (time delay) | | A | 15 | |
| Min. circuit ampacity | | A | 9 | 12 |
| Fan motor | F.L.A | A | 0.50 | |
| Compressor | Model | | KNB073FRVMC | KNB092FQAHC |
| | R.L.A | A | 6.2 | 6.6 |
| | L.R.A | A | 7.7 | 8.2 |
| | Refrigeration oil | fl oz. (L) (Model) | 9.1 (0.27) (FV50S) | 10.8 (0.32) (NEO22) |
| Refrigerant control | | | Linear expansion valve | |
| Sound level ❄1 | Cooling | dB(A) | 49 | |
| | Heating | dB(A) | 51 | |
| Airflow<br>High - Med. - Low | Cooling | CFM | 1,063 | 1,102 - 639 |
| | Heating | CFM | 1,282 - 1,105 | 1,186 - 1,116 - 1,045 |
| Fan speed<br>High - Med. - Low | Cooling | rpm | 740 | 810 - 490 |
| | Heating | rpm | 890 - 770 | 870 - 820 - 770 |
| Defrost method | | | Reverse cycle | |
| Dimensions | W | in. | 31-1/2 | |
| | D | in. | 11-1/4 | |
| | H | in. | 21-5/8 | |
| Weight | | lb. | 73 | |
| External finish | | | Munsell 3Y 7.8/1.1 | |
| Refrigerant piping | | | Not supplied | |
| Refrigerant pipe size<br>(Min. wall thickness) | Liquid | in. | 1/4 (0.0315) | |
| | Gas | in. | 3/8 (0.0315) | |
| Connection method | Indoor | | Flared | |
| | Outdoor | | Flared | |
| Between the indoor & outdoor units | Height difference | ft. | 40 | |
| | Piping length | ft. | 65 | |
| Refrigerant charge (R410A) | | | 1 lb. 12 oz. | 2 lb. 9 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: (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB

❄3: Test condition (Refer to page 9.)

❄4: Test condition (Refer to page 9.)

| Outdoor unit model | | | MUZ-HM15NA<br>MUZ-HM15NA2 | MUZ-HM18NA<br>MUZ-HM18NA2 |
|---|---|---|---|---|
| Capacity<br>Rated (Minimum~Maximum) | Cooling ❄1 | Btu/h | 14,000 (3,100 - 16,000) | 17,200 (5,800 - 18,000) |
| | Heating 47 ❄1 | Btu/h | 18,000 (4,800 - 18,500) | 18,000 (5,400 - 20,900) |
| Capacity<br>Rated (Maximum) | Heating 17 ❄2 | Btu/h | 11,500 (14,000) | 11,500 (15,000) |
| Power consumption<br>Rated (Minimum~Maximum) | Cooling ❄1 | W | 1,127 (187 - 1,957) | 1,598 (308 - 2,028) |
| | Heating 47 ❄1 | W | 1,570 (190 - 1,980) | 1,548 (288 - 2,208) |
| Power consumption<br>Rated (Maximum) | Heating 17 ❄2 | W | 1,290 (1,820) | 1,258 (1,908) |
| EER ❄1 [SEER] ❄3 | Cooling | | 12.0 [18.0] | 10.5 [18.0] |
| HSPF IV ❄4 | Heating | | 10.0 [**NA**] / 8.5 [**NA2**] | 10.0 [**NA**] / 8.5 [**NA2**] |
| COP | Heating ❄1 | | 3.30 | 3.32 |
| Power factor | Cooling (208/230) | % | 98/98 | 98/98 |
| | Heating (208/230) | % | 98/98 | 97/97 |
| Power supply | V , phase , Hz | | 208/230, 1 , 60 | 208/230, 1 , 60 |
| Max. fuse size (time delay) | | A | 15 | 15 |
| Min. circuit ampacity | | A | 10 | 10 |
| Fan motor | F.L.A | A | 0.50 | 0.50 |
| Compressor | Model | | SNB130FQBMT | SNB130FQBMT |
| | R.L.A | A | 7.4 | 7.4 |
| | L.R.A | A | 9.3 | 9.3 |
| | Refrigeration oil | fl oz. (L) (Model) | 11.8 (0.35) (FV50S) | 11.8 (0.35) (FV50S) |
| Refrigerant control | | | Linear expansion valve | |
| Sound level ❄1 | Cooling | dB(A) | 49 | 49 |
| | Heating | dB(A) | 51 | 51 |
| Airflow<br>High - Med. - Low | Cooling | CFM | 1,102 - 639 | 1,102 - 639 |
| | Heating | CFM | 1,186 - 1,045 - 1,045 | 1,186 - 1,045 - 1,045 |
| Fan speed<br>High - Med. - Low | Cooling | rpm | 810 - 490 | 810 - 490 |
| | Heating | rpm | 870 - 770 - 770 | 870 - 770 - 770 |
| Defrost method | | | Reverse cycle | |
| Dimensions | W | in. | 31-1/2 | 31-1/2 |
| | D | in. | 11-1/4 | 11-1/4 |
| | H | in. | 21-5/8 | 21-5/8 |
| Weight | | lb. | 81 | 81 |
| External finish | | | Munsell 3Y 7.8/1.1 | |
| Refrigerant piping | | | Not supplied | |
| Refrigerant pipe size<br>(Min. wall thickness) | Liquid | in. | 1/4 (0.0315) | 1/4 (0.0315) |
| | Gas | in. | 1/2 (0.0315) | 1/2 (0.0315) |
| Connection method | Indoor | | Flared | Flared |
| | Outdoor | | Flared | Flared |
| Between the indoor & outdoor units | Height difference | ft. | 40 | 40 |
| | Piping length | ft. | 65 | 65 |
| Refrigerant charge (R410A) | | | 2 lb. 9 oz. | 2 lb. 10 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: (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB

❄3: Test condition (Refer to page 9.)

❄4: Test condition (Refer to page 9.)

| Outdoor unit model | | | MUZ-HM24NA<br>MUZ-HM24NA2 |
|---|---|---|---|
| Capacity<br>Rated (Minimum~Maximum) | Cooling ❄1 | Btu/h | 22,500 (5,800 ~ 22,500) |
| | Heating 47 ❄1 | Btu/h | 26,000 (5,400 ~ 26,000) |
| Capacity<br>Rated (Maximum) | Heating 17 ❄2 | Btu/h | 18,500 (18,500) |
| Power consumption<br>Rated (Minimum~Maximum) | Cooling ❄1 | W | 2,575 (275 ~ 2,575) |
| | Heating 47 ❄1 | W | 2,445 (265 ~ 2,445) |
| Power consumption<br>Rated (Maximum) | Heating 17 ❄2 | W | 2,245 (2,245) |
| EER ❄1 [SEER] ❄3 | Cooling | | 8.6 [18.0] |
| HSPF IV ❄4 | Heating | | 9.5 [**NA**] / 8.5 [**NA2**] |
| COP | Heating ❄1 | | 3.05 |
| Power factor | Cooling (208/230) | % | 99/99 |
| | Heating (208/230) | % | 99/99 |
| Power supply | V , phase , Hz | | 208/230, 1 , 60 |
| Max. fuse size (time delay) | | A | 15 |
| Min. circuit ampacity | | A | 14 |
| Fan motor | | F.L.A | 0.93 |
| Compressor | Model | | SNB130FQBMT |
| | | R.L.A | 10 |
| | | L.R.A | 12.5 |
| | Refrigeration oil | fl oz. (L) (Model) | 11.8 (0.35) (FV50S) |
| Refrigerant control | | | Linear expansion valve |
| Sound level ❄1 | Cooling | dB(A) | 54 |
| | Heating | dB(A) | 55 |
| Airflow<br>High - Med. - Low | COOL | CFM | 1,742 - 922 |
| | HEAT | CFM | 1,691 - 1,691 - 1,372 |
| Fan speed<br>High - Med. - Low | Cooling | rpm | 840 - 450 |
| | Heating | rpm | 810 - 810 - 650 |
| Defrost method | | | Reverse cycle |
| Dimensions | W | in. | 33-1/16 |
| | D | in. | 13 |
| | H | in. | 34-5/8 |
| Weight | | lb. | 121 |
| External finish | | | Munsell 3Y 7.8/1.1 |
| Refrigerant piping | | | Not supplied |
| Refrigerant pipe size<br>(Min. wall thickness) | Liquid | in. | 3/8 (0.0315) |
| | Gas | in. | 5/8 (0.0315) |
| Connection method | Indoor | | Flared |
| | Outdoor | | Flared |
| Between the indoor & outdoor units | Height difference | ft. | 50 |
| | Piping length | ft. | 100 |
| Refrigerant charge (R410A) | | | 3 lb. 9 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: (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB

## Test condition

❊3,❊4

| ARI | Mode | Test | Indoor air condition (°F) | | Outdoor air condition (°F) | |
|---|---|---|---|---|---|---|
| | | | Dry bulb | Wet bulb | Dry bulb | Wet bulb |
| | SEER (Cooling) | "A-2" Cooling Steady State at rated compressor Speed | 80 | 67 | 95 | (75) |
| | | "B-2" Cooling Steady State at rated compressor Speed | 80 | 67 | 82 | (65) |
| | | "B-1" Cooling Steady State at minimum compressor Speed | 80 | 67 | 82 | (65) |
| | | "F-1" Cooling Steady State at minimum compressor Speed | 80 | 67 | 67 | (53.5) |
| | | "E-V" Cooling Steady State at Intermediate compressor Speed ❊5 | 80 | 67 | 87 | (69) |
| | HSPF (Heating) | "H1-2" Heating Steady State at rated compressor Speed | 70 | 60 | 47 | 43 |
| | | "H3-2" Heating at rated compressor Speed | 70 | 60 | 17 | 15 |
| | | "H0-1" Heating Steady State at minimum compressor Speed | 70 | 60 | 62 | 56.5 |
| | | "H1-1" Heating Steady State at minimum compressor Speed | 70 | 60 | 47 | 43 |
| | | "H2-V" 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<br>1 phase<br>60 Hz | Min. 187 208 230 Max. 253 |

(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 | -4 (**NA**), 5(**NA2**) | -5 (**NA**), 4 (**NA2**) |

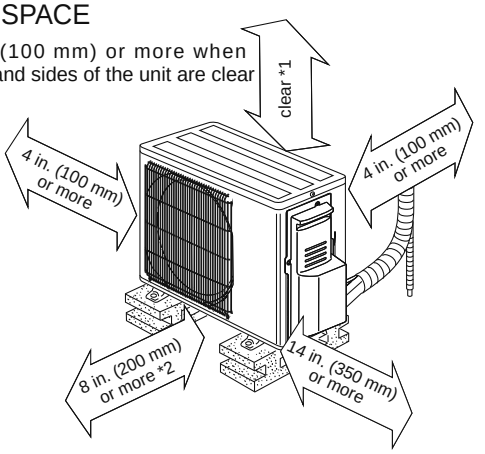
# 4 OUTLINES AND DIMENSIONS

**MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2**
**MUZ-HM15NA MUZ-HM15NA2 MUZ-HM18NA MUZ-HM18NA2**

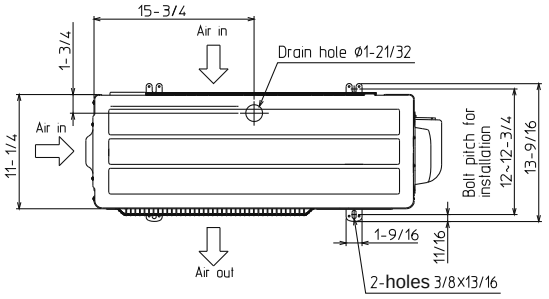
**Unit: inch**

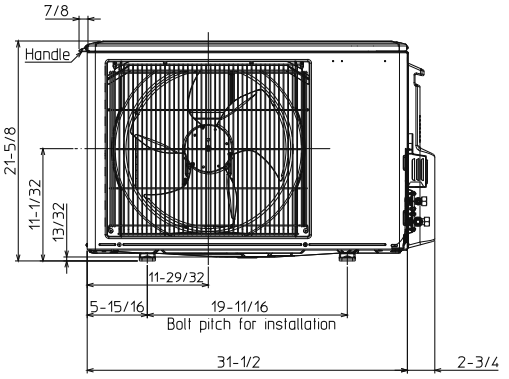
REQUIRED SPACE

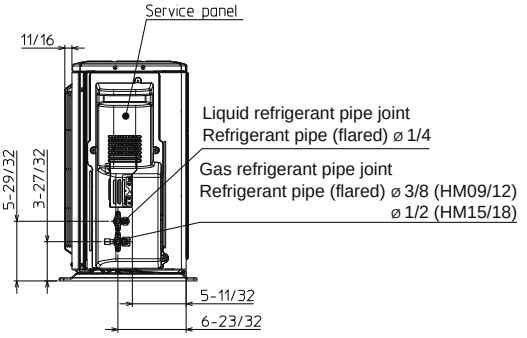
*1 4 in. (100 mm) or more when front and sides of the unit are clear




*2 When any 2 sides of left, right and rear of the unit are clear

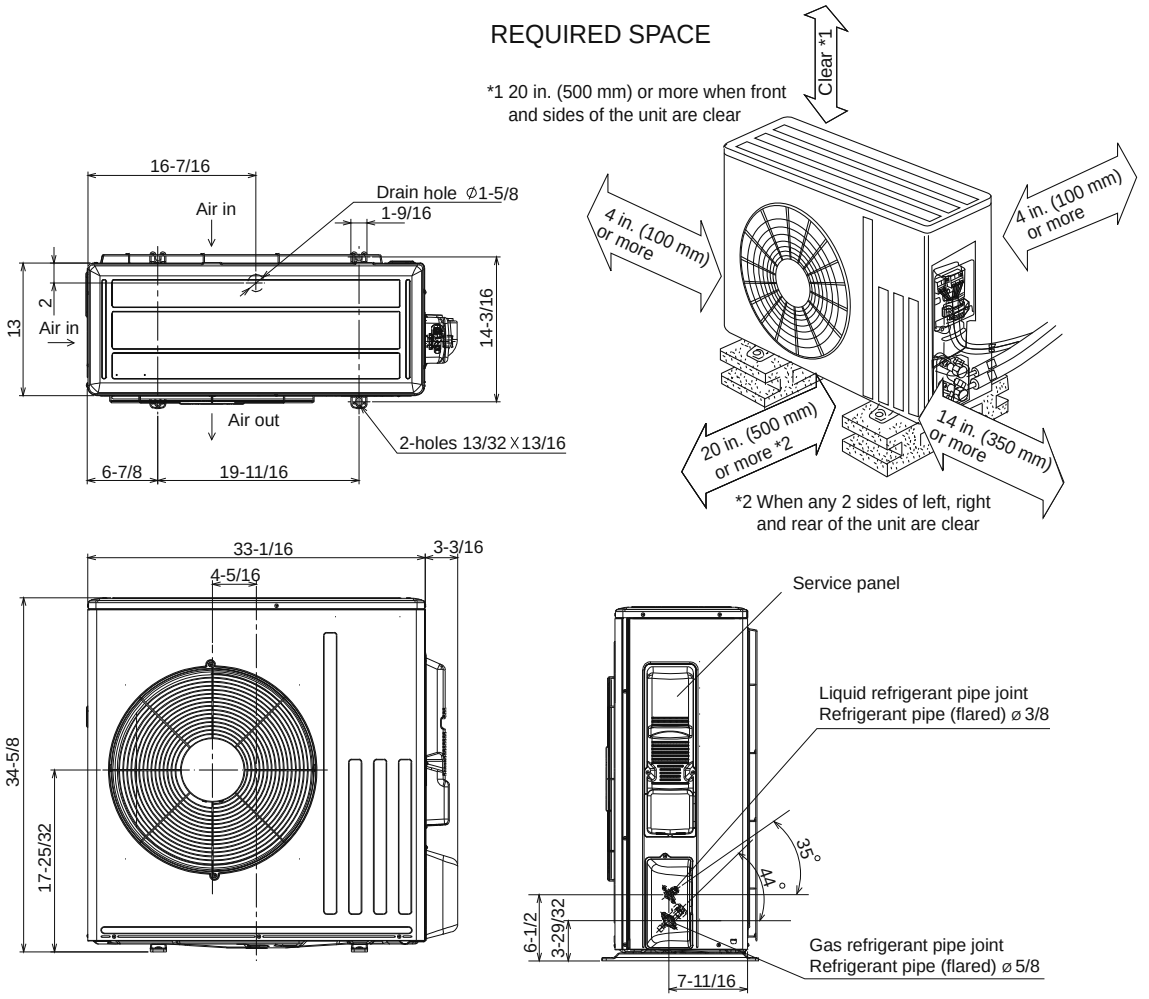


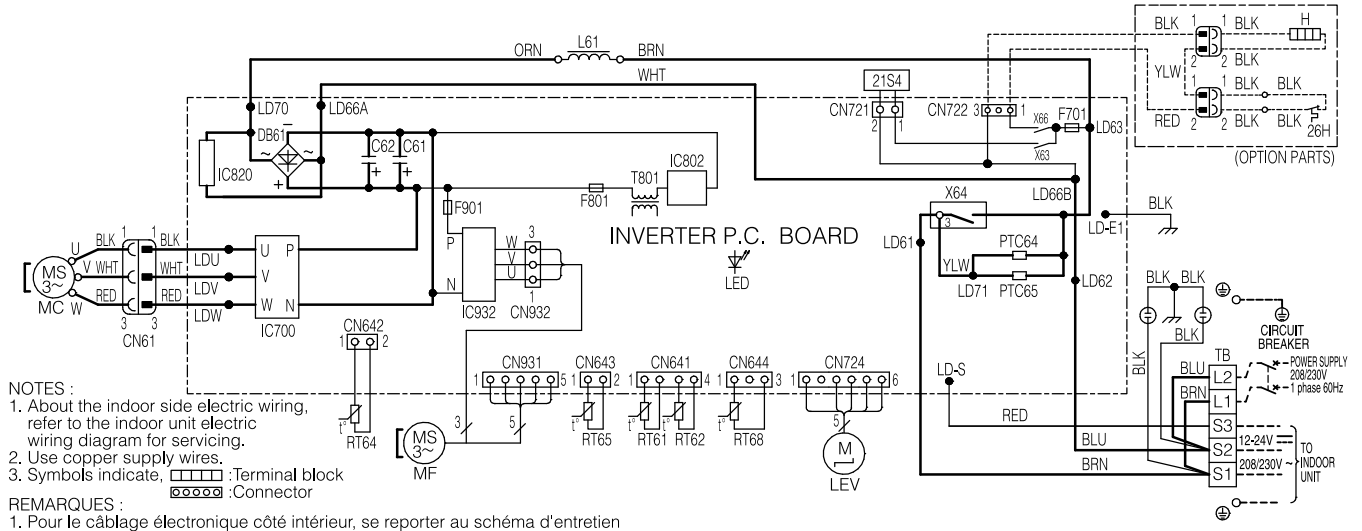
## MUZ-HM24NA MUZ-HM24NA2

**Unit: inch**



# 5 WIRING DIAGRAM

## MUZ-HM09NA - U1 MUZ-HM09NA2 - U1 MUZ-HM12NA - U1 MUZ-HM12NA2 - U1

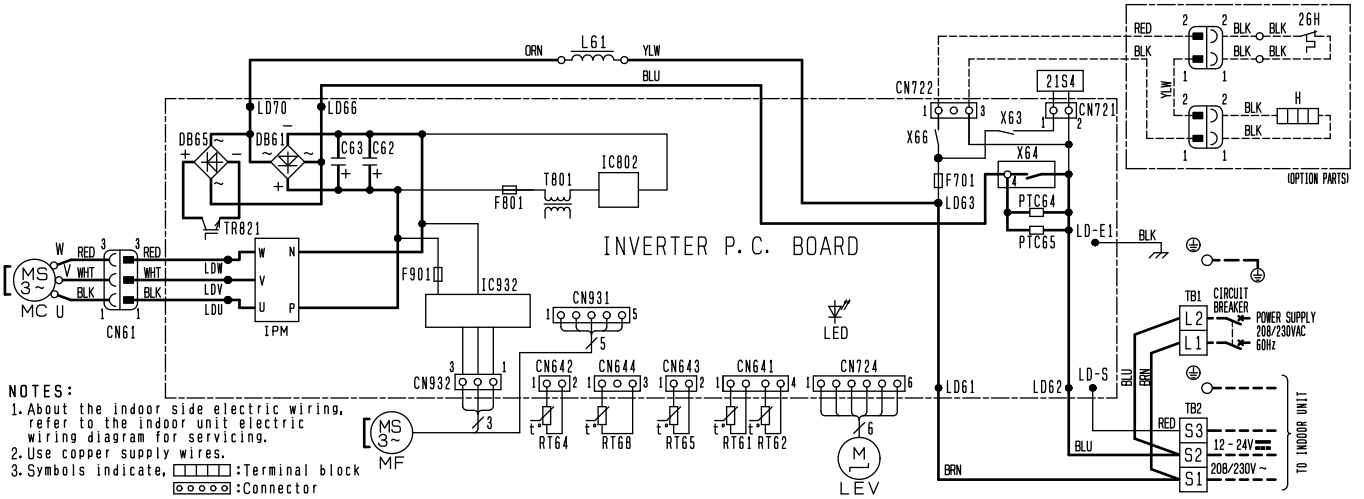



NOTES :
1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper supply wires.
3. Symbols indicate, □□□□□ :Terminal block
   ○○○○○ :Connector

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 |
|---|---|---|---|---|---|
| C61,C62 | SMOOTHING CAPACITOR | L61 | REACTOR | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR |
| DB61 | DIODE MODULE | MC | COMPRESSOR | | |
| F701,F801,F901 | FUSE (T3. 15AL250V) | MF | FAN MOTOR | TB | TERMINAL BLOCK |
| H | DEFROST HEATER(OPTION PARTS) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| IC700,IC820,IC932 | POWER MODULE | RT61 | DEFROST THERMISTOR | X63, X64, X66 | RELAY |
| IC802 | POWER DEVICE | RT62 | DISCHARGE TEMP. THERMISTOR | 21S4 | REVERSING VALVE COIL |
| LED | LED | RT64 | FIN TEMP. THERMISTOR | 26H | HEATER PROTECTOR(OPTION PARTS) |
| LEV | EXPANSION VALVE COIL | RT65 | AMBIENT TEMP. THERMISTOR | | |

## MUZ-HM09NA - U8 MUZ-HM09NA2 - U8 MUZ-HM12NA - U8 MUZ-HM12NA2 - U8

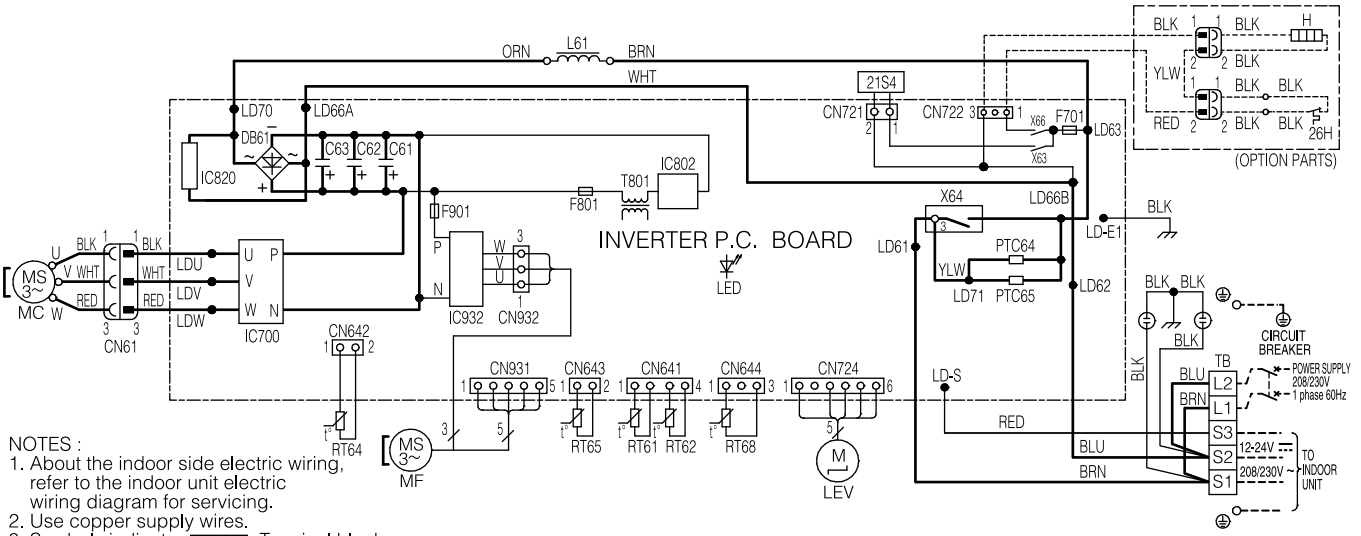



NOTES:
1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper supply wires.
3. Symbols indicate, □□□□□ :Terminal block
   ○○○○○ :Connector

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 |
|---|---|---|---|---|---|
| C62, C63 | SMOOTHING CAPACITOR | LEV | EXPANSION VALVE COIL | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR. |
| DB61, DB65 | DIODE MODULE | MC | COMPRESSOR | | |
| F701, F801, F901 | FUSE (T3. 15AL250V) | MF | FAN MOTOR | TB1, TB2 | TERMINAL BLOCK |
| H | DEFROST HEATER(OPTION PARTS) | PTC64, PTC65 | CIRCUIT PROTECTION | TR821 | SWITCHING POWER TRANSISTOR |
| IC802 | POWER DEVICE | RT61 | DEFROST THERMISTOR | T801 | TRANSFORMER |
| IPM, IC932 | POWER MODULE | RT62 | DISCHARGE TEMP. THERMISTOR | X63, X64, X66 | RELAY |
| L61 | REACTOR | RT64 | FIN TEMP. THERMISTOR | 21S4 | REVERSING VALVE COIL |
| LED | LED | RT65 | AMBIENT TEMP. THERMISTOR | 26H | HEATER PROTECTOR(OPTION PARTS) |

## MUZ-HM15NA - U1 MUZ-HM15NA2 - U1 MUZ-HM18NA - U1 MUZ-HM18NA2 - U1

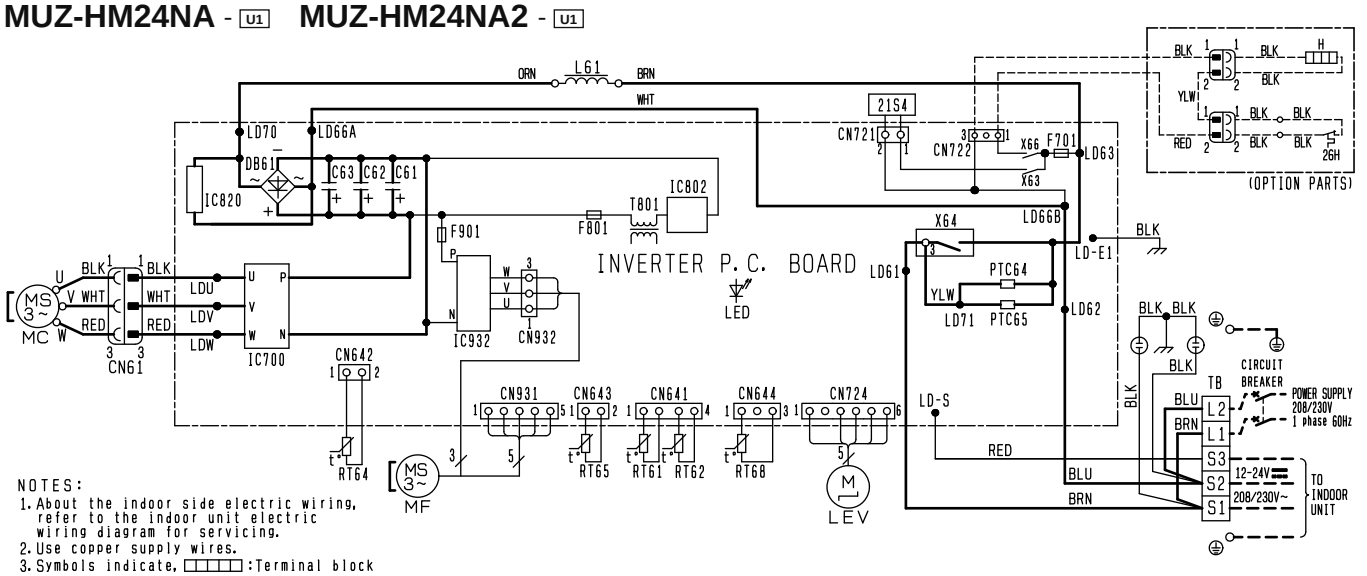



NOTES :
1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper supply wires.
3. Symbols indicate, ⊏⊏⊏⊏⊐ :Terminal block
   ⊏○○○○⊐ :Connector

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 ⊏⊏⊏⊏⊐ :Borne
   significations suivantes, ⊏○○○○⊐ :Connecteur

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| C61,C62,C63 | SMOOTHING CAPACITOR | L61 | REACTOR | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR |
| DB61 | DIODE MODULE | MC | COMPRESSOR | | |
| F701,F801,F901 | FUSE (T3. 15AL250V) | MF | FAN MOTOR | TB | TERMINAL BLOCK |
| H | DEFROST HEATER(OPTION PARTS) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| IC700,IC820,IC932 | POWER MODULE | RT61 | DEFROST THERMISTOR | X63, X64, X66 | RELAY |
| IC802 | POWER DEVICE | RT62 | DISCHARGE TEMP. THERMISTOR | 21S4 | REVERSING VALVE COIL |
| LED | LED | RT64 | FIN TEMP. THERMISTOR | 26H | HEATER PROTECTOR(OPTION PARTS) |
| LEV | EXPANSION VALVE COIL | RT65 | AMBIENT TEMP. THERMISTOR | | |

## MUZ-HM24NA - U1 MUZ-HM24NA2 - U1




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

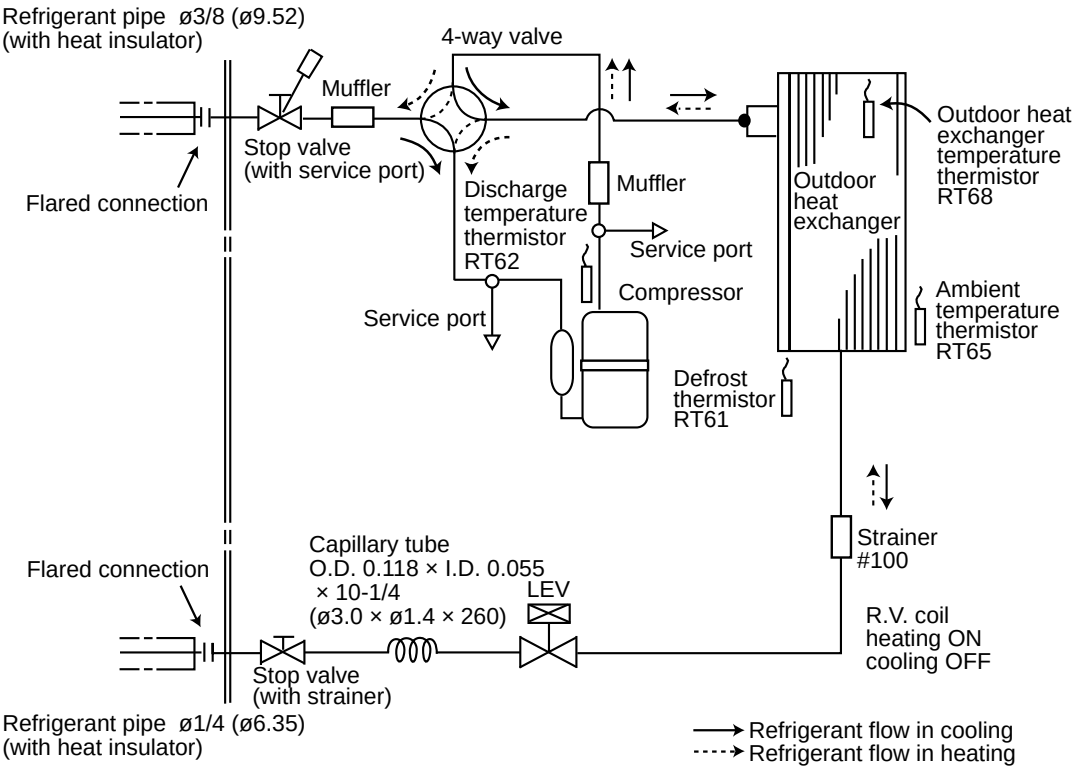
REMARQUES:
1. Pour le câblage électronique côté intérieur, se reporter au schéma d'entretien du câblage électronique de l'appareil intérieur.
2. Utiliser des fils d'alimentation en cuivre.
3. Les symboles ont les significations suivantes, ⊏⊏⊏⊏⊐ :Borne
   ⊏○○○○⊐ :Connecteur

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| C61, C62, C63 | SMOOTHING CAPACITOR | L61 | REACTOR | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR. |
| DB61 | DIODE MODULE | MC | COMPRESSOR | | |
| F701, F801, F901 | FUSE (T3.15AL250V) | MF | FAN MOTOR | TB | TERMINAL BLOCK |
| H | DEFROST HEATER (OPTION PARTS) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| IC700, IC820, IC932 | POWER MODULE | RT61 | DEFROST THERMISTOR | X63, X64, X66 | RELAY |
| IC802 | POWER DEVICE | RT62 | DISCHARGE TEMP. THERMISTOR | 21S4 | REVERSING VALVE COIL |
| LED | LED | RT64 | FIN TEMP. THERMISTOR | 26H | HEATER PROTECTOR (OPTION PARTS) |
| LEV | EXPANSION VALVE COIL | RT65 | AMBIENT TEMP. THERMISTOR | | |

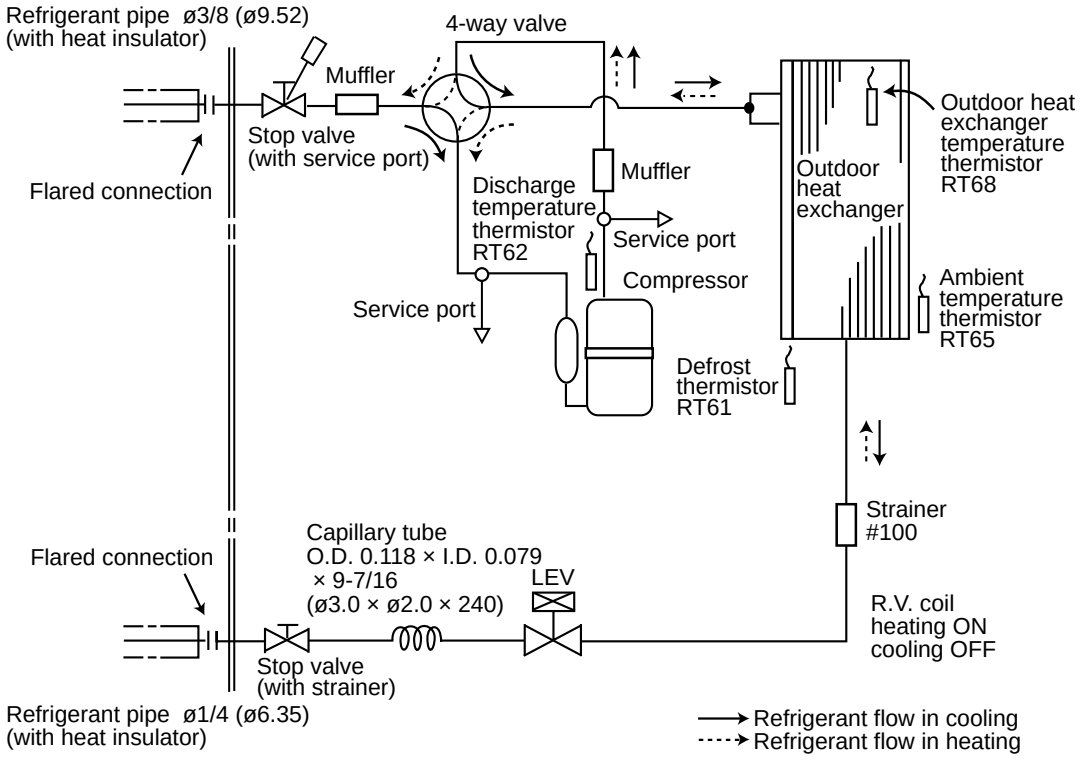
# 6 REFRIGERANT SYSTEM DIAGRAM

**MUZ-HM09NA** - U1 **MUZ-HM09NA2** - U1 **MUZ-HM12NA** - U1 **MUZ-HM12NA2** - U1

**Unit: Inch (mm)**

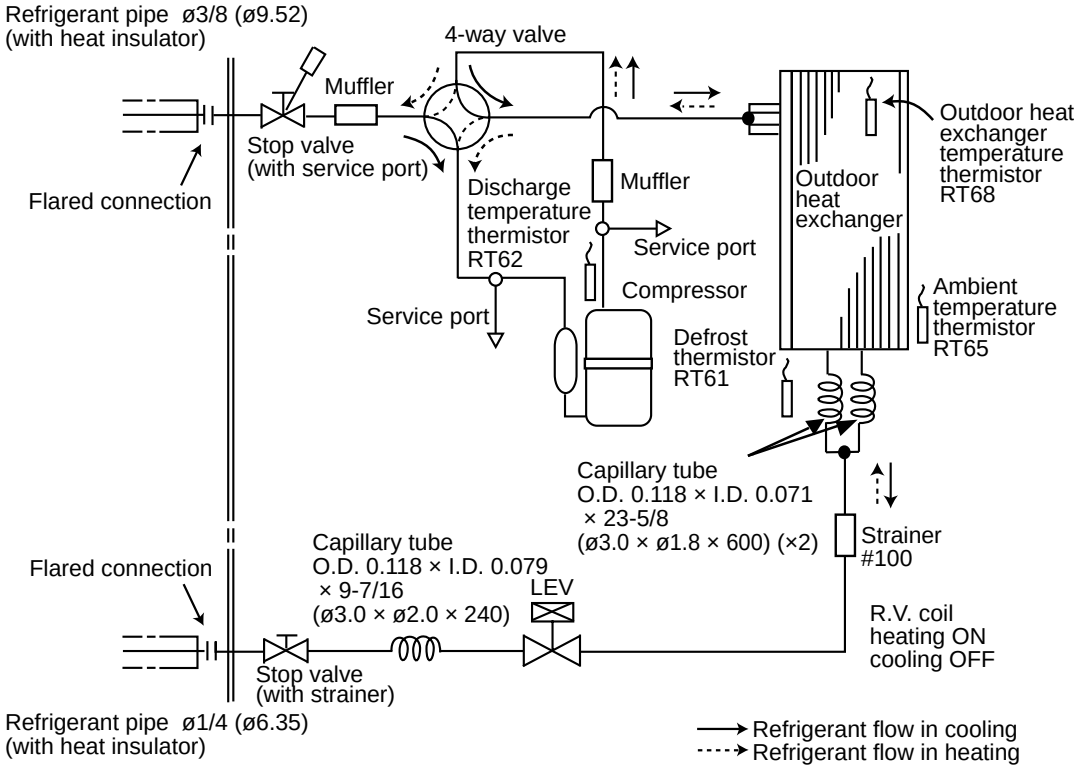



**MUZ-HM09NA** - U8 **MUZ-HM09NA2** - U8

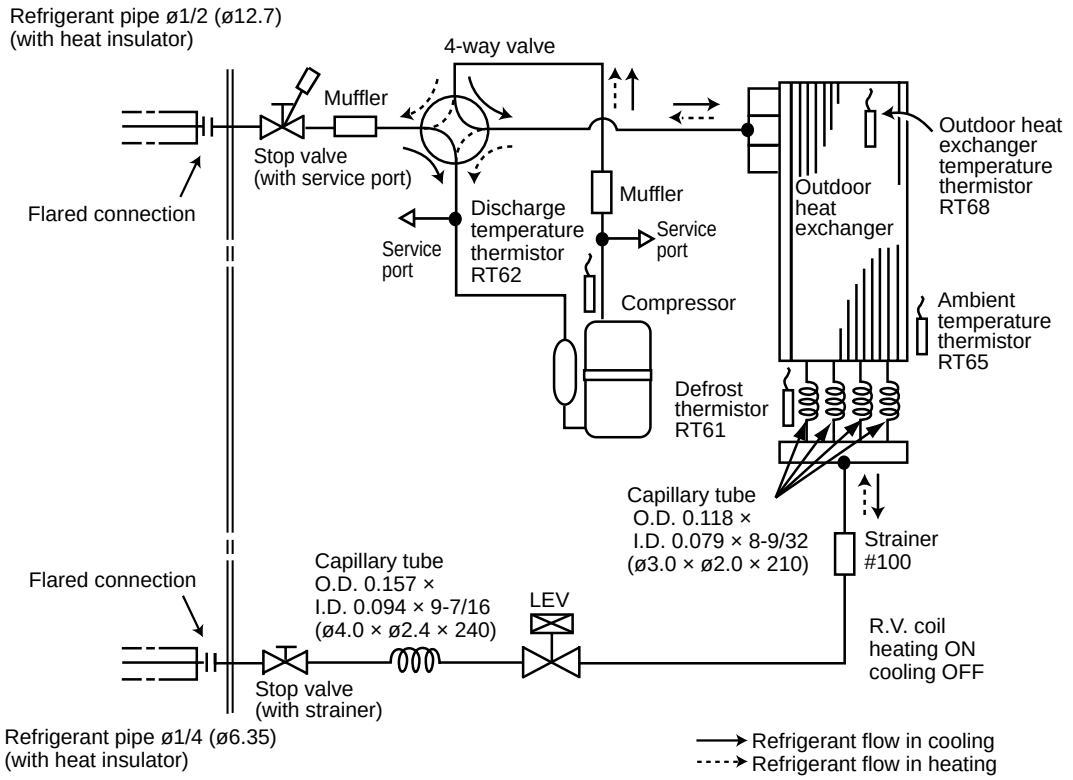


## MUZ-HM12NA - U8 MUZ-HM12NA2 - U8

**Unit: Inch (mm)**

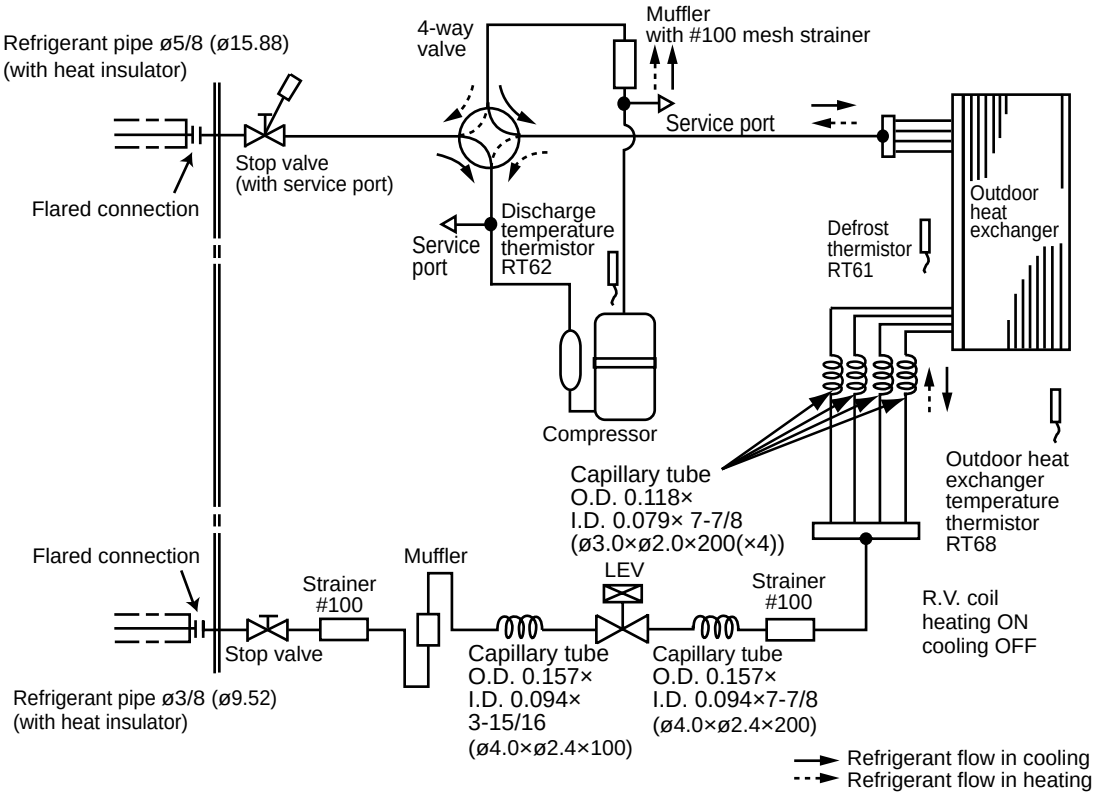



## MUZ-HM15NA MUZ-HM15NA2 MUZ-HM18NA MUZ-HM18NA2



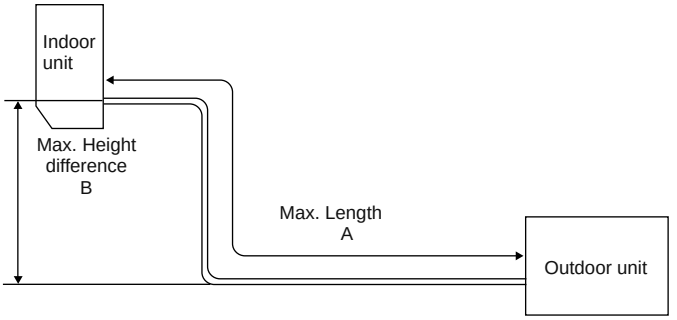
## MUZ-HM24NA MUZ-HM24NA2

**Unit: Inch (mm)**



## 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-HM09NA**<br>**MUZ-HM09NA2**<br>**MUZ-HM12NA**<br>**MUZ-HM12NA2** | 65 | 40 | 3/8 | 1/4 |
| **MUZ-HM15NA**<br>**MUZ-HM15NA2**<br>**MUZ-HM18NA**<br>**MUZ-HM18NA2** | | | 1/2 | |
| **MUZ-HM24NA**<br>**MUZ-HM24NA2** | 100 | 50 | 5/8 | 3/8 |




## 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-HM09NA**<br>**MUZ-HM09NA2**<br>**MUZ-HM12NA** - U1<br>**MUZ-HM12NA2** - U1 | 1 lb. 12 oz. | 0 | 1.08 | 3.24 | 5.40 | 7.56 | 8.64 |
| **MUZ-HM12NA** - U8<br>**MUZ-HM12NA2** - U8<br>**MUZ-HM15NA**<br>**MUZ-HM15NA2** | 2 lb. 9 oz. | | | | | | |
| **MUZ-HM18NA**<br>**MUZ-HM18NA2** | 2 lb. 10 oz. | | | | | | |

Calculation: X oz. = 1.08/5 oz./ft. × (Refrigerant piping length (ft.) - 25)

| Model | Outdoor unit precharged | Refrigerant piping length (one way): ft. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| **MUZ-HM24NA**<br>**MUZ-HM24NA2** | 3 lb. 9 oz. | 0 | 1.08 | 3.24 | 5.40 | 7.56 | 9.72 | 11.88 | 14.04 | 16.20 |

Calculation: X oz. = 1.08/5 oz./ft. × (Refrigerant piping length (ft.) - 25)

# 7 DATA

## MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2 MUZ-HM15NA MUZ-HM15NA2 MUZ-HM18NA MUZ-HM18NA2 MUZ-HM24NA MUZ-HM24NA2

### 7-1. PERFORMANCE DATA

#### 1) COOLING CAPACITY

| Model | Indoor air IWB (˚F) | Outdoor intake air DB temperature (˚F) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 75 | | | 85 | | | 95 | | | 105 | | | 115 | | |
| | | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC |
| **MUZ-HM09NA MUZ-HM09NA2** | 71 | 11.0 | 7.6 | 0.67 | 10.3 | 7.1 | 0.73 | 9.7 | 6.6 | 0.79 | 9.0 | 6.2 | 0.83 | 8.3 | 5.7 | 0.86 |
| | 67 | 10.4 | 8.6 | 0.63 | 9.7 | 8.0 | 0.69 | 9.0 | 7.4 | 0.75 | 8.4 | 6.9 | 0.80 | 7.7 | 6.3 | 0.83 |
| | 63 | 9.8 | 9.4 | 0.60 | 9.1 | 8.7 | 0.66 | 8.5 | 8.1 | 0.72 | 7.7 | 7.3 | 0.77 | 7.0 | 6.7 | 0.80 |
| **MUZ-HM12NA MUZ-HM12NA2** | 71 | 14.7 | 9.4 | 1.08 | 13.7 | 8.7 | 1.18 | 12.9 | 8.2 | 1.27 | 12.0 | 7.6 | 1.34 | 11.0 | 7.0 | 1.39 |
| | 67 | 13.9 | 10.7 | 1.02 | 13.0 | 10.0 | 1.12 | 12.0 | 9.2 | 1.21 | 11.2 | 8.6 | 1.28 | 10.3 | 7.9 | 1.34 |
| | 63 | 13.1 | 11.8 | 0.97 | 12.1 | 10.9 | 1.07 | 11.3 | 10.2 | 1.16 | 10.3 | 9.3 | 1.23 | 9.4 | 8.5 | 1.28 |
| **MUZ-HM15NA MUZ-HM15NA2** | 71 | 17.2 | 11.1 | 1.04 | 16.0 | 10.4 | 1.14 | 15.1 | 9.7 | 1.23 | 14.0 | 9.1 | 1.29 | 12.9 | 8.3 | 1.35 |
| | 67 | 16.2 | 12.7 | 0.98 | 15.1 | 11.8 | 1.08 | 14.0 | 10.9 | 1.17 | 13.0 | 10.2 | 1.24 | 12.0 | 9.3 | 1.30 |
| | 63 | 15.3 | 13.9 | 0.94 | 14.1 | 12.9 | 1.04 | 13.2 | 12.0 | 1.12 | 12.0 | 10.9 | 1.19 | 10.9 | 10.0 | 1.24 |
| **MUZ-HM18NA MUZ-HM18NA2** | 71 | 21.1 | 15.3 | 1.46 | 19.7 | 14.3 | 1.60 | 18.5 | 13.4 | 1.72 | 17.2 | 12.5 | 1.81 | 15.8 | 11.5 | 1.89 |
| | 67 | 20.0 | 17.2 | 1.38 | 18.6 | 16.0 | 1.52 | 17.2 | 14.8 | 1.64 | 16.0 | 13.8 | 1.74 | 14.7 | 12.6 | 1.82 |
| | 63 | 18.7 | 18.6 | 1.31 | 17.4 | 17.3 | 1.45 | 16.2 | 16.1 | 1.57 | 14.7 | 14.6 | 1.67 | 13.4 | 13.3 | 1.74 |
| **MUZ-HM24NA MUZ-HM24NA2** | 71 | 27.6 | 20.9 | 2.34 | 25.8 | 19.5 | 2.56 | 24.2 | 18.3 | 2.76 | 22.5 | 17.0 | 2.91 | 20.7 | 15.7 | 3.02 |
| | 67 | 26.1 | 23.2 | 2.21 | 24.3 | 21.6 | 2.43 | 22.5 | 20.0 | 2.63 | 20.9 | 18.6 | 2.79 | 19.2 | 17.1 | 2.92 |
| | 63 | 24.5 | 25.1 | 2.10 | 22.7 | 23.3 | 2.33 | 21.2 | 21.6 | 2.51 | 19.2 | 19.7 | 2.68 | 17.6 | 18.0 | 2.79 |

**NOTE**: 1. IWB : Intake air wet-bulb temperature TC : Total Capacity (x10$^3$Btu/h)
SHC : Sensible Heat Capacity (x10$^3$Btu/h) 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.) | | | | |
|---|---|---|---|---|
| Model | 25 (std.) | 40 | 65 | 100 |
| **MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2 MUZ-HM15NA MUZ-HM15NA2** | 1.0 | 0.988 | 0.967 | — |
| **MUZ-HM18NA MUZ-HM18NA2** | 1.0 | 0.985 | 0.963 | 0.933 |
| **MUZ-HM24NA MUZ-HM24NA2** | 1.0 | 0.983 | 0.956 | 0.921 |

### 3) HEATING CAPACITY CORRECTIONS

| Refrigerant piping length (one way: ft.) | | | | |
|---|---|---|---|---|
| Model | 25 (std.) | 40 | 65 | 100 |
| **MUZ-HM09NA<br>MUZ-HM09NA2<br>MUZ-HM12NA<br>MUZ-HM12NA2<br>MUZ-HM15NA<br>MUZ-HM15NA2** | 1.0 | 0.997 | 0.993 | — |
| **MUZ-HM18NA<br>MUZ-HM18NA2<br>MUZ-HM24NA<br>MUZ-HM24NA2** | 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-HM09NA<br>MUZ-HM09NA2** | 75 | 4.8 | 0.53 | 6.3 | 0.67 | 7.9 | 0.79 | 9.4 | 0.88 | 10.6 | 0.92 | 11.0 | 0.94 | 12.4 | 0.97 |
| | 70 | 5.2 | 0.51 | 6.7 | 0.65 | 8.2 | 0.77 | 9.6 | 0.86 | 10.9 | 0.90 | 11.2 | 0.92 | 12.7 | 0.95 |
| | 65 | 5.5 | 0.49 | 6.9 | 0.62 | 8.6 | 0.74 | 10.0 | 0.83 | 11.2 | 0.88 | 11.6 | 0.89 | 13.0 | 0.94 |
| **MUZ-HM12NA<br>MUZ-HM12NA2** | 75 | 5.4 | 0.58 | 7.1 | 0.74 | 8.8 | 0.87 | 10.6 | 0.97 | 11.9 | 1.01 | 12.3 | 1.03 | 13.9 | 1.07 |
| | 70 | 5.8 | 0.56 | 7.5 | 0.71 | 9.2 | 0.85 | 10.8 | 0.94 | 12.2 | 0.99 | 12.6 | 1.01 | 14.2 | 1.05 |
| | 65 | 6.1 | 0.53 | 7.7 | 0.68 | 9.6 | 0.82 | 11.2 | 0.92 | 12.6 | 0.97 | 12.9 | 0.98 | 14.5 | 1.03 |
| **MUZ-HM15NA<br>MUZ-HM15NA2** | 75 | 7.9 | 0.94 | 10.4 | 1.19 | 13.1 | 1.40 | 15.6 | 1.56 | 17.6 | 1.64 | 18.1 | 1.66 | 20.5 | 1.73 |
| | 70 | 8.6 | 0.90 | 11.1 | 1.15 | 13.5 | 1.37 | 15.9 | 1.52 | 18.0 | 1.60 | 18.5 | 1.63 | 21.0 | 1.70 |
| | 65 | 9.0 | 0.86 | 11.3 | 1.10 | 14.1 | 1.32 | 16.5 | 1.48 | 18.5 | 1.56 | 19.1 | 1.58 | 21.4 | 1.66 |
| **MUZ-HM18NA<br>MUZ-HM18NA2** | 75 | 7.9 | 0.94 | 10.4 | 1.18 | 13.1 | 1.39 | 15.6 | 1.55 | 17.6 | 1.63 | 18.1 | 1.65 | 20.5 | 1.72 |
| | 70 | 8.6 | 0.90 | 11.1 | 1.14 | 13.5 | 1.36 | 15.9 | 1.51 | 18.0 | 1.59 | 18.5 | 1.62 | 21.0 | 1.69 |
| | 65 | 9.0 | 0.86 | 11.3 | 1.10 | 14.1 | 1.31 | 16.5 | 1.47 | 18.5 | 1.55 | 19.1 | 1.57 | 21.4 | 1.65 |
| **MUZ-HM24NA<br>MUZ-HM24NA2** | 75 | 11.4 | 1.48 | 15.1 | 1.86 | 18.9 | 2.19 | 22.5 | 2.44 | 25.4 | 2.56 | 26.1 | 2.60 | 29.6 | 2.70 |
| | 70 | 12.4 | 1.41 | 16.0 | 1.80 | 19.5 | 2.14 | 23.0 | 2.38 | 26.0 | 2.50 | 26.8 | 2.55 | 30.3 | 2.65 |
| | 65 | 13.0 | 1.35 | 16.4 | 1.73 | 20.4 | 2.06 | 23.8 | 2.31 | 26.8 | 2.44 | 27.6 | 2.48 | 30.9 | 2.60 |

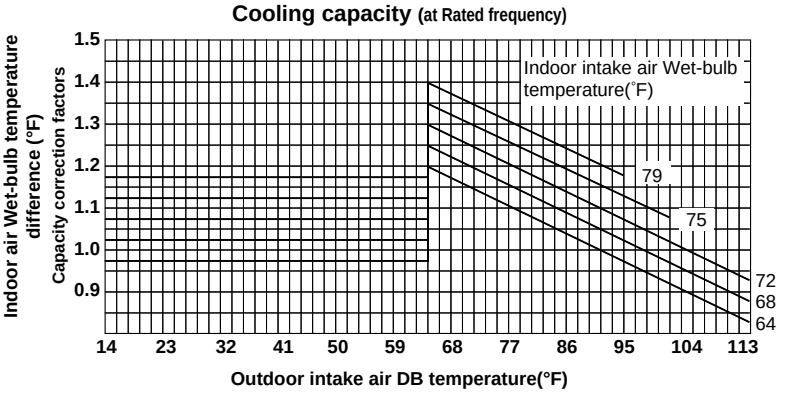
**NOTE**: 1. IDB : Intake air dry-bulb temperature
TC : Total Capacity (x$10^3$ Btu/h) TPC : Total Power Consumption (kW)
2. Above data is for heating operation without any frost.

How to operate with fixed operational frequency of the compressor.

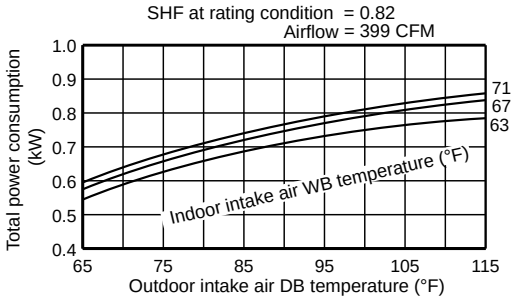
1. Press the EMERGENCY OPERATION switch on the front of the indoor unit, and select either EMERGENCY COOL mode or EMERGENCY HEAT mode before starting to operate the air conditioner.
2. The compressor starts with operational frequency.
3. The fan speed of the indoor unit is High.
4. This operation continues for 30 minutes.
5. In order to release this operation, press the EMERGENCY OPERATION switch or press any button on the remote controller.

## 7-2. PERFORMANCE CURVE

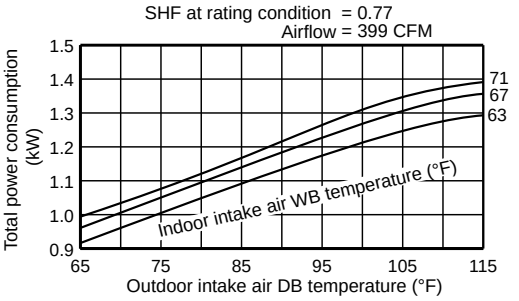
### Cooling



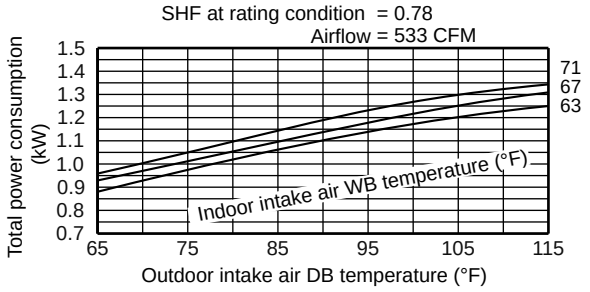

**MUZ-HM09NA MUZ-HM09NA2**



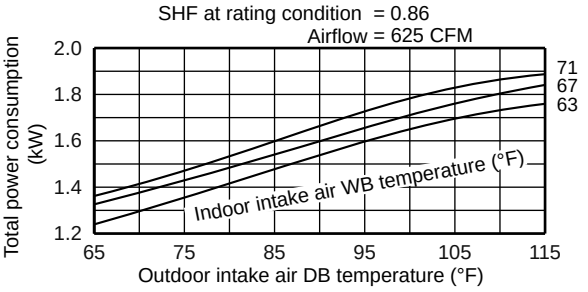

**MUZ-HM12NA MUZ-HM12NA2**



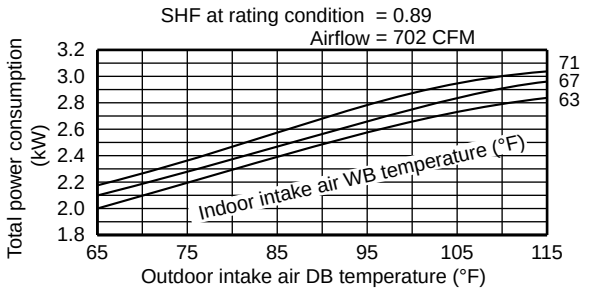

**MUZ-HM15NA MUZ-HM15NA2**




**MUZ-HM18NA MUZ-HM18NA2**

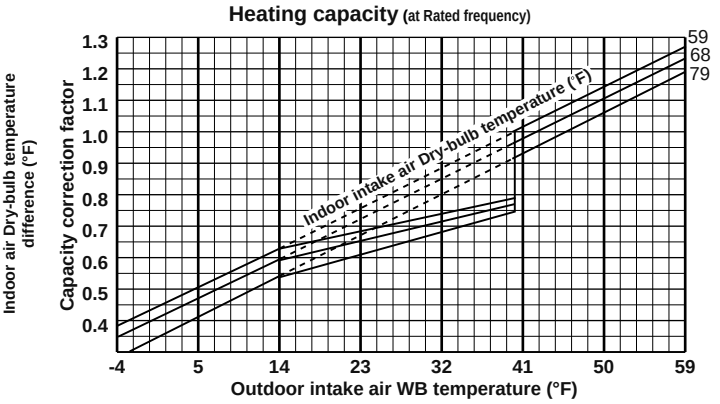



**MUZ-HM24NA MUZ-HM24NA2**

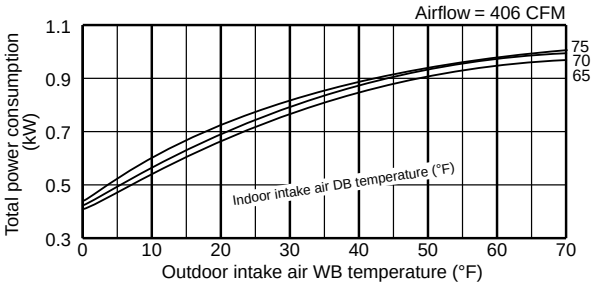



This value of frequency is not the same as the actual frequency in operating. Refer to 7-5 and 7-6 for the relationships between frequency and capacity.

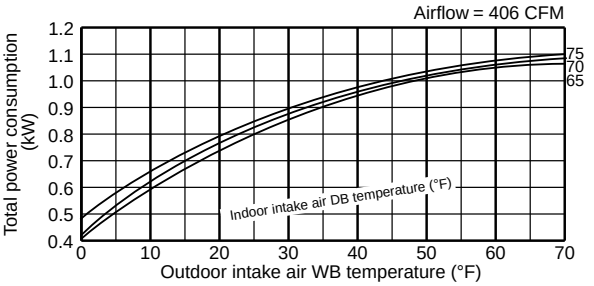
## Heating



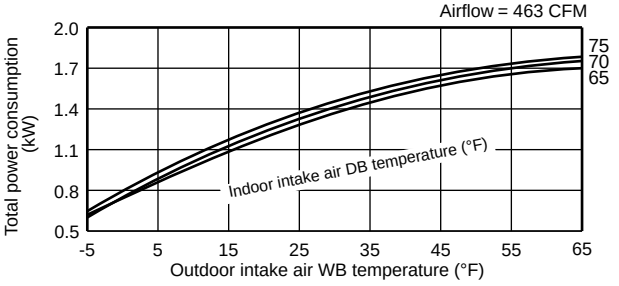

### MUZ-HM09NA MUZ-HM09NA2



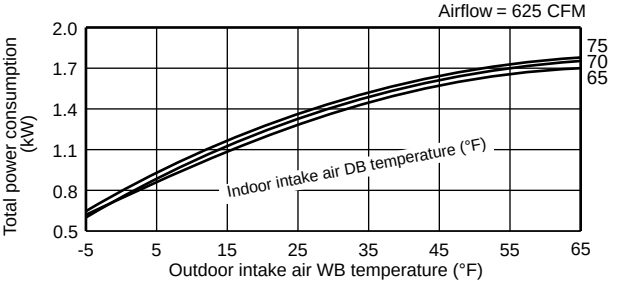

### MUZ-HM12NA MUZ-HM12NA2



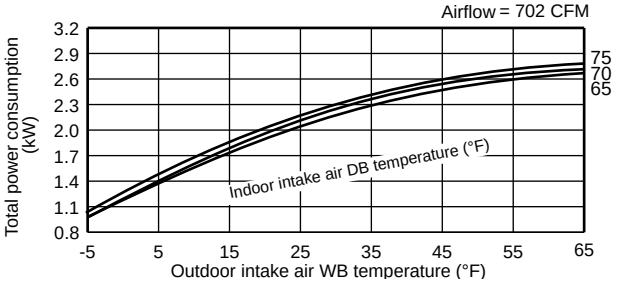

### MUZ-HM15NA MUZ-HM15NA2




### MUZ-HM18NA MUZ-HM18NA2




### MUZ-HM24NA MUZ-HM24NA2



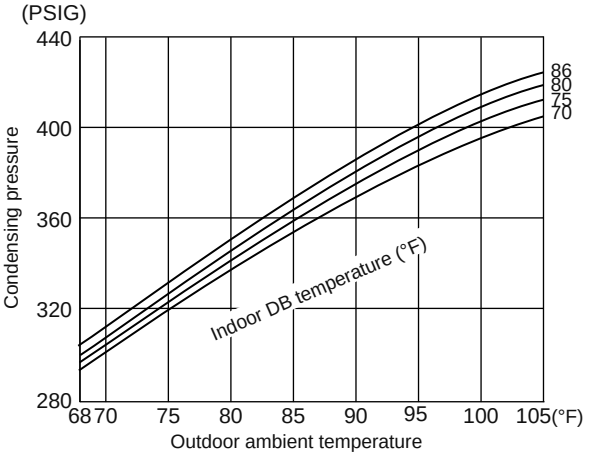

This value of frequency is not the same as the actual frequency in operating. Refer to 7-5 and 7-6 for the relationships between frequency and capacity.

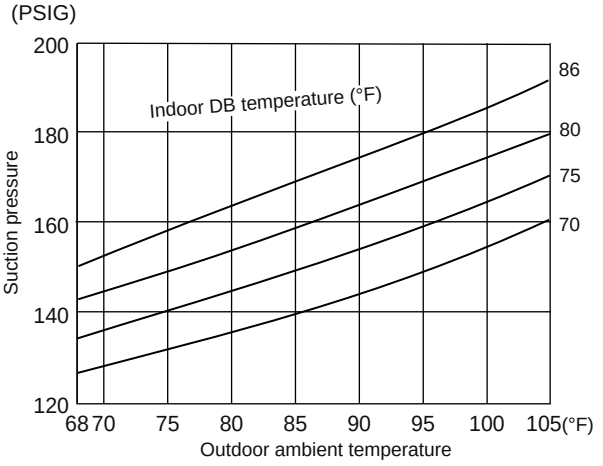
## 7-3. CONDENSING PRESSURE

### Cooling

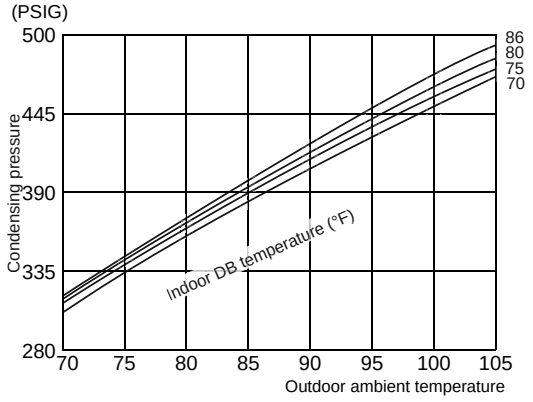
Data are based on the condition of indoor humidity 50 %.
Air flow should be set to High speed.

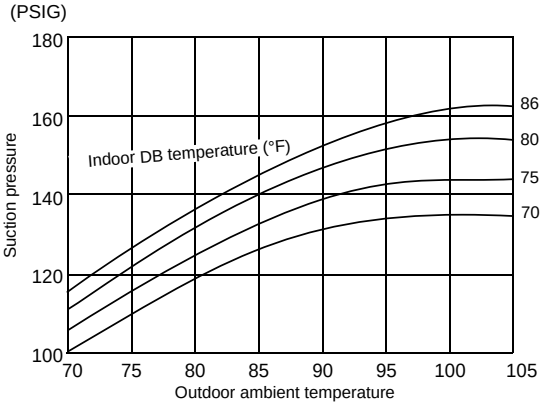
**MUZ-HM09NA MUZ-HM09NA2**



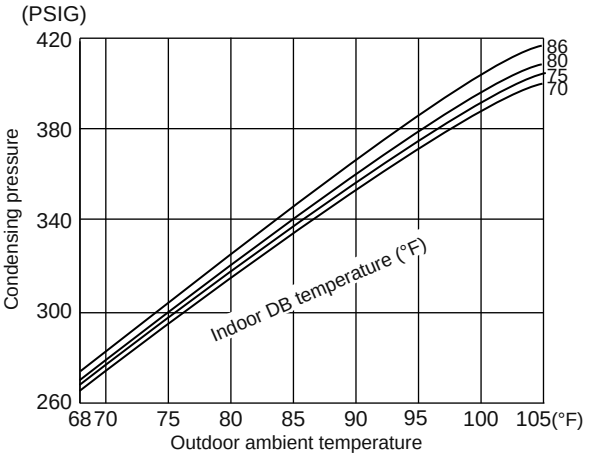



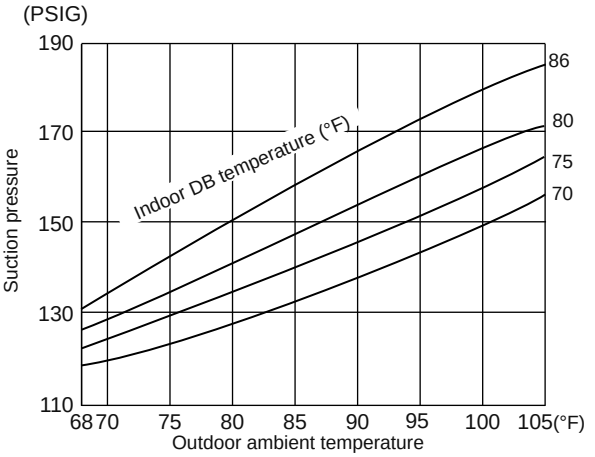

**MUZ-HM12NA - U1 MUZ-HM12NA2 - U1**



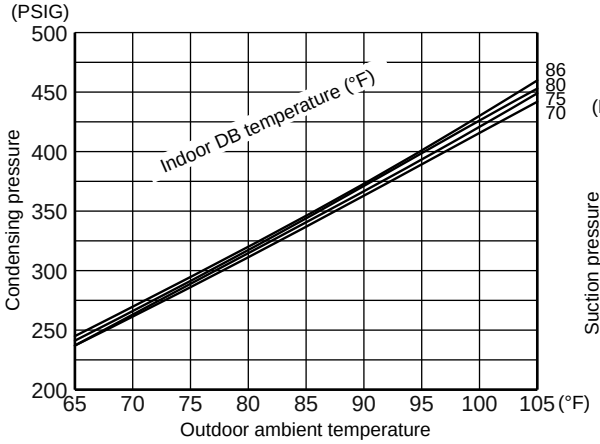



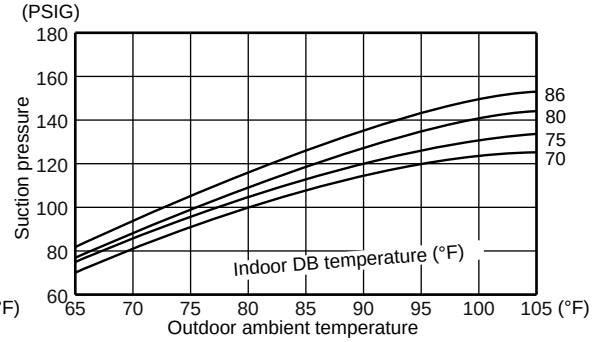

**MUZ-HM12NA - U8 MUZ-HM12NA2 - U8**



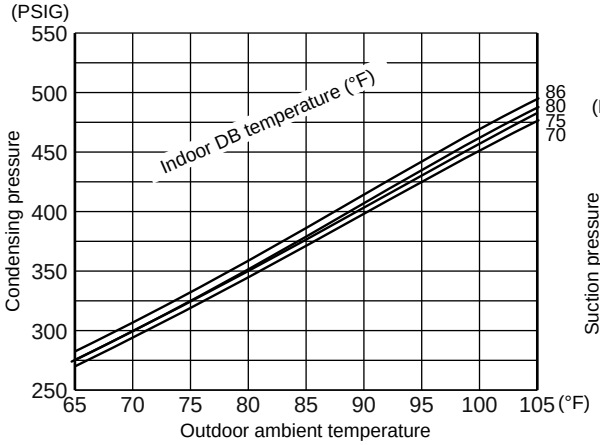



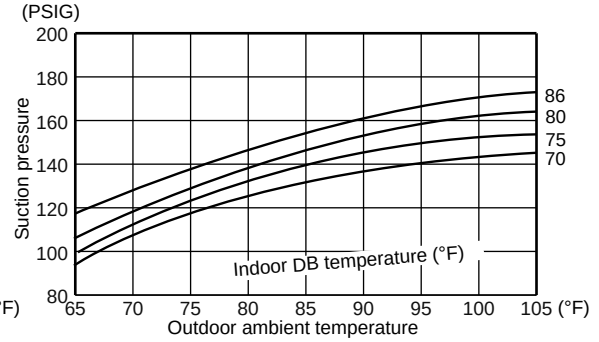
**MUZ-HM15NA MUZ-HM15NA2**



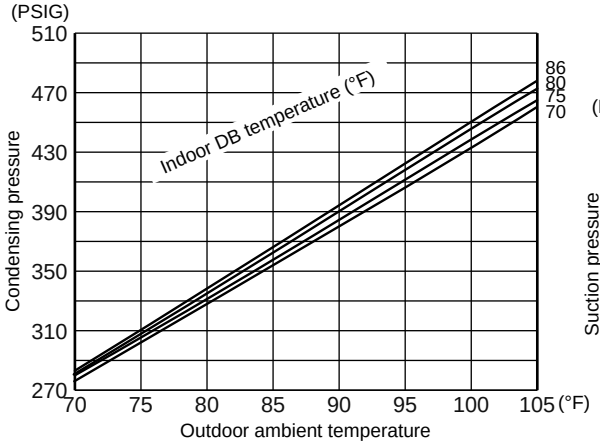



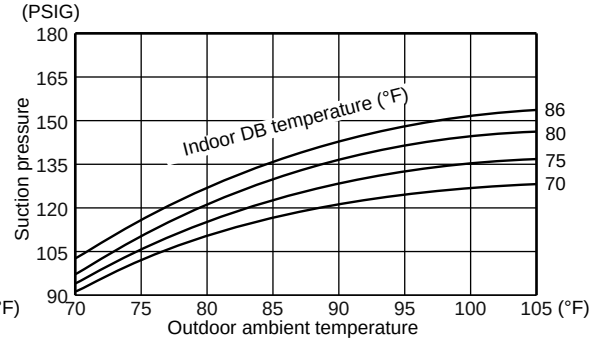

**MUZ-HM18NA MUZ-HM18NA2**




**MUZ-HM24NA MUZ-HM24NA2**

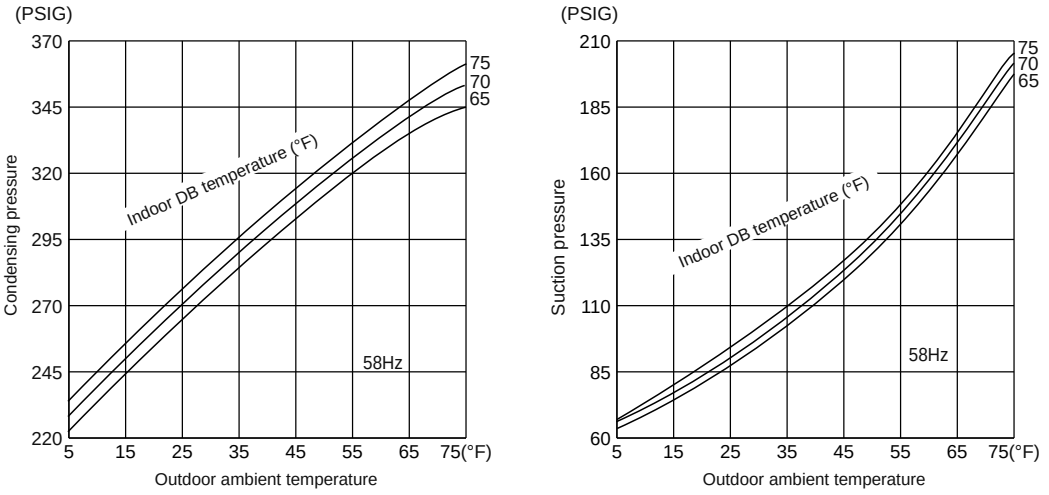


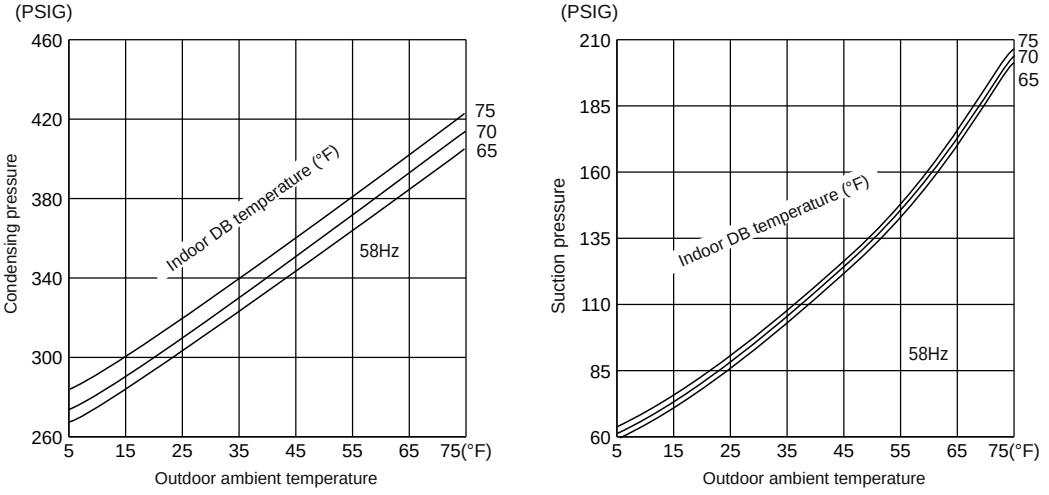

**Heating**

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.

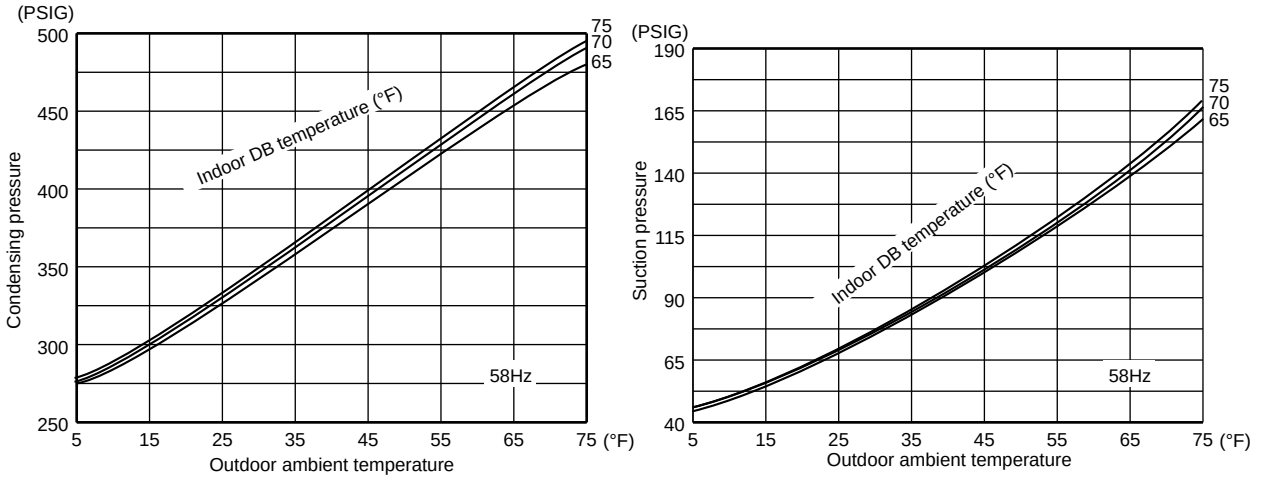
**MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA - U1 MUZ-HM12NA2 - U1**



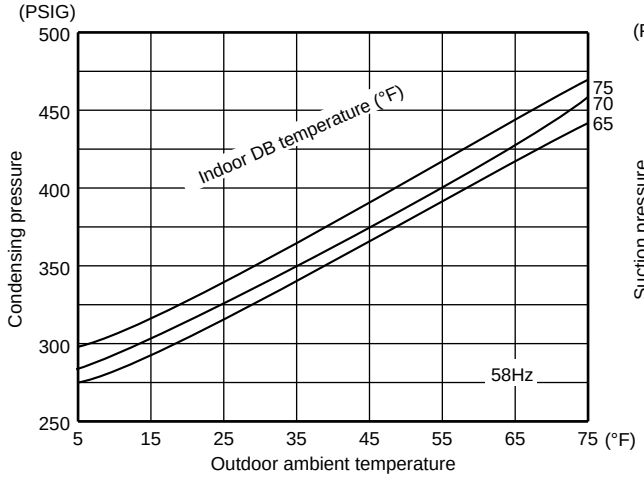

**MUZ-HM12NA - U8 MUZ-HM12NA2 - U8**

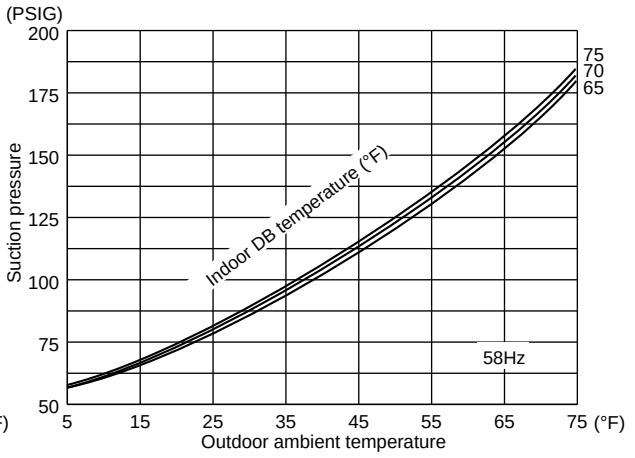



**MUZ-HM15NA MUZ-HM15NA2**

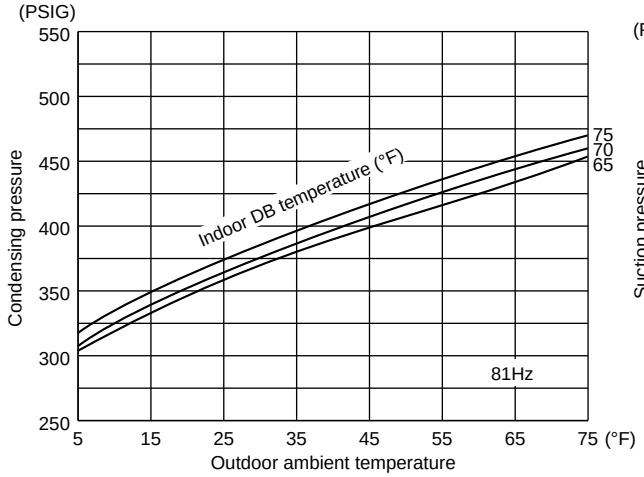


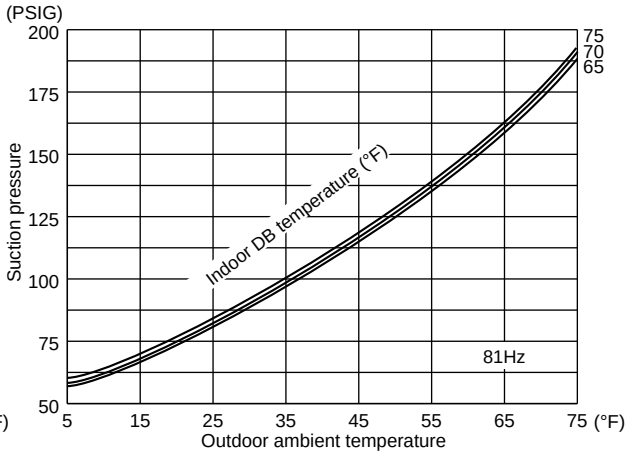
**MUZ-HM18NA MUZ-HM18NA2**




**MUZ-HM24NA MUZ-HM24NA2**



## 7-4. STANDARD OPERATION DATA

| Model | | | | MSZ-HM09NA - U1 | | MSZ-HM09NA - U8 | |
|---|---|---|---|---|---|---|---|
| Item | | | Unit | Cooling | Heating | Cooling | Heating |
| Total | Capacity | | Btu/h | 9,000 | 10,900 | 9,000 | 10,900 |
| | SHF | | — | 0.82 | — | 0.82 | — |
| | Input | | kW | 0.750 | 0.900 | 0.750 | 0.900 |
| | Rated frequency | | Hz | 59.5 | 79.0 | 59.5 | 77.5 |
| Electrical circuit | Indoor unit | | | MSZ-HM09NA | | MSZ-HM09NA | |
| | Power supply | | V, phase, Hz | 208/230, 1, 60 | | | |
| | Input | | kW | 0.022 | 0.023 | 0.022 | 0.023 |
| | Fan motor current | | A | 0.24/0.22 | 0.25/0.23 | 0.24/0.22 | 0.25/0.23 |
| | Outdoor unit | | | MUZ-HM09NA - U1<br>MUZ-HM09NA2 - U1 | | MUZ-HM09NA - U8<br>MUZ-HM09NA2 - U8 | |
| | Power supply | | V, phase, Hz | 208/230, 1, 60 | | | |
| | Input | | kW | 0.728 | 0.877 | 0.728 | 0.877 |
| | Comp. current | | A | 3.64/3.29 | 4.25/3.85 | 3.32/3.00 | 3.66/3.31 |
| | Fan motor current | | A | 0.27/0.24 | 0.30/0.27 | 0.27/0.24 | 0.30/0.27 |
| Refrigerant circuit | Condensing pressure | | PSIG | 384 | 331 | 389 | 331 |
| | Suction pressure | | PSIG | 152 | 102 | 151 | 103 |
| | Discharge temperature | | ˚F | 151 | 155 | 154 | 152 |
| | Condensing temperature | | ˚F | 113 | 101 | 115 | 103 |
| | Suction temperature | | ˚F | 58 | 41 | 59 | 39 |
| | Comp. shell bottom temperature | | ˚F | 146 | 149 | 151 | 149 |
| | Ref. pipe length | | ft. | 25 | | | |
| | Refrigerant charge (R410A) | | | 1 lb. 12 oz. | | | |
| Indoor unit | Intake air temperature | DB | ˚F | 80 | 70 | 80 | 70 |
| | | WB | ˚F | 67 | 60 | 67 | 60 |
| | Discharge air temperature | DB | ˚F | 60 | 97 | 60 | 97 |
| | | WB | ˚F | 58 | — | 58 | — |
| | Fan speed (High) | | rpm | 1,020 | 1,040 | 1,020 | 1,040 |
| | Airflow (High) | | CFM | 367 (Wet) | 413 | 367 (Wet) | 413 |
| Outdoor unit | Intake air temperature | DB | ˚F | 95 | 47 | 95 | 47 |
| | | WB | ˚F | — | 43 | — | 43 |
| | Fan speed | | rpm | 800 | 850 | 800 | 850 |
| | Airflow | | CFM | 1151 | 1225 | 1151 | 1225 |

## 7-4. STANDARD OPERATION DATA

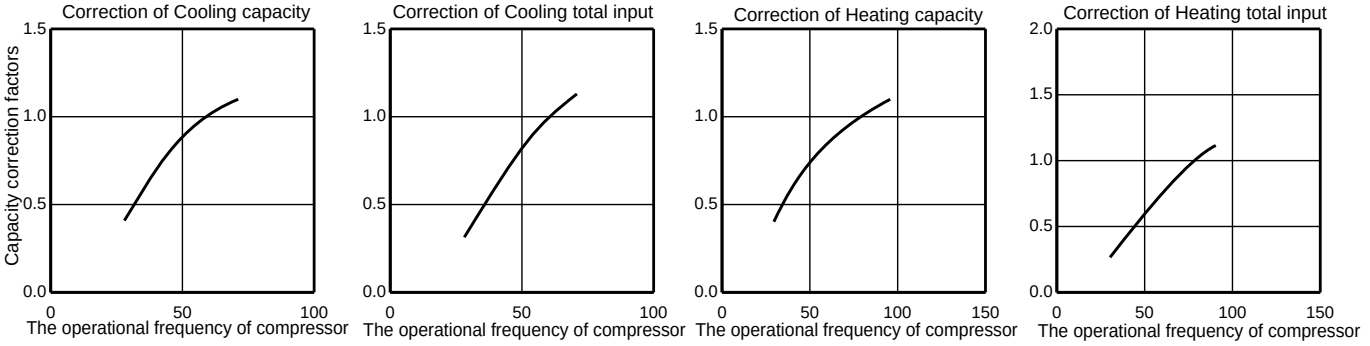
| Model | | | | MSZ-HM12NA - U1 | | MSZ-HM12NA - U8 | |
|---|---|---|---|---|---|---|---|
| Item | | | Unit | Cooling | Heating | Cooling | Heating |
| Total | Capacity | | Btu/h | 12,000 | 12,200 | 12,000 | 14,400 |
| | SHF | | — | 0.77 | — | 0.77 | — |
| | Input | | kW | 1.210 | 0.990 | 1.210 | 0.990 |
| | Rated frequency | | Hz | 89.0 | 90.0 | 69.0 | 77.0 |
| Electrical circuit | Indoor unit | | | MSZ-HM12NA | | MSZ-HM12NA | |
| | Power supply | | V, phase, Hz | 208/230, 1, 60 | | | |
| | Input | | kW | 0.022 | 0.023 | 0.022 | 0.023 |
| | Fan motor current | | A | 0.24/0.22 | 0.25/0.23 | 0.24/0.22 | 0.25/0.23 |
| | Outdoor unit | | | MUZ-HM12NA - U1<br>MUZ-HM12NA2 - U1 | | MUZ-HM12NA - U8<br>MUZ-HM12NA2 - U8 | |
| | Power supply | | V, phase, Hz | 208/230, 1, 60 | | | |
| | Input | | kW | 1.188 | 0.967 | 1.188 | 0.967 |
| | Comp. current | | A | 5.61/5.08 | 4.56/4.13 | 4.39/3.97 | 5.41/4.89 |
| | Fan motor current | | A | 0.27/0.24 | 0.30/0.27 | 0.34/0.31 | 0.31/0.28 |
| Refrigerant circuit | Condensing pressure | | PSIG | 429 | 347 | 389 | 397 |
| | Suction pressure | | PSIG | 135 | 99 | 133 | 104 |
| | Discharge temperature | | ˚F | 180 | 165 | 163 | 162 |
| | Condensing temperature | | ˚F | 120 | 104 | 115 | 116 |
| | Suction temperature | | ˚F | 60 | 41 | 56 | 35 |
| | Comp. shell bottom temperature | | ˚F | 174 | 157 | 158 | 158 |
| | Ref. pipe length | | ft. | 25 | | | |
| | Refrigerant charge (R410A) | | | 1 lb. 12 oz. | | 2 lb. 9 oz. | |
| Indoor unit | Intake air temperature | DB | ˚F | 80 | 70 | 80 | 70 |
| | | WB | ˚F | 67 | 60 | 67 | 60 |
| | Discharge air temperature | DB | ˚F | 56 | 108 | 56 | 108 |
| | | WB | ˚F | 55 | — | 55 | — |
| | Fan speed (High) | | rpm | 1,020 | 1,040 | 1,020 | 1,040 |
| | Airflow (High) | | CFM | 367 (Wet) | 413 | 367 (Wet) | 413 |
| Outdoor unit | Intake air temperature | DB | ˚F | 95 | 47 | 95 | 47 |
| | | WB | ˚F | — | 43 | — | 43 |
| | Fan speed | | rpm | 800 | 850 | 900 | 860 |
| | Airflow | | CFM | 1151 | 1225 | 1229 | 1172 |

## 7-4. STANDARD OPERATION DATA

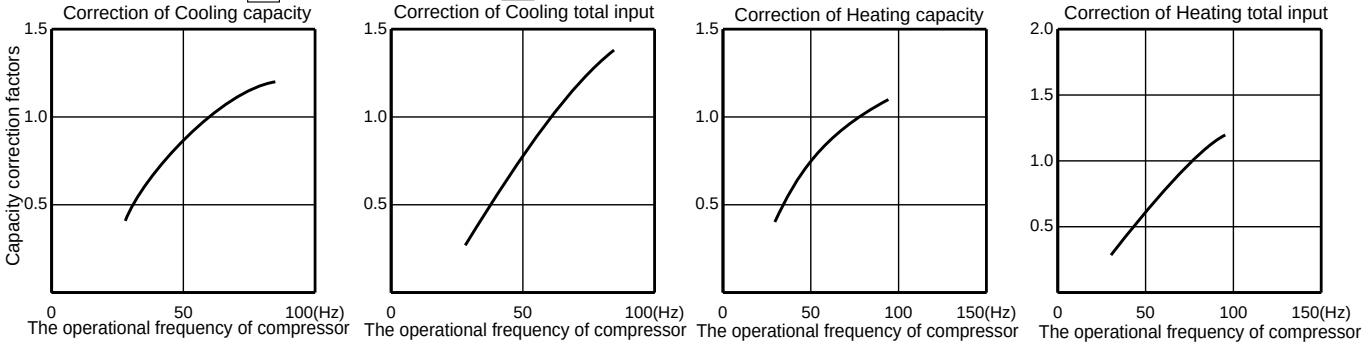
| Model | | | | MSZ-HM15NA | | MSZ-HM18NA | | MSZ-HM24NA | |
|---|---|---|---|---|---|---|---|---|---|
| Item | | | Unit | Cooling | Heating | Cooling | Heating | Cooling | Heating |
| Total | Capacity | | Btu/h | 14,000 | 18,000 | 17,200 | 18,000 | 22,500 | 26,000 |
| | SHF | | — | 0.78 | — | 0.86 | — | 0.89 | — |
| | Input | | kW | 1.17 | 1.60 | 1.64 | 1.59 | 2.63 | 2.5 |
| | Rated frequency | | Hz | 56.5 | 74 | 68 | 74 | 98 | 108 |
| Electrical circuit | Indoor unit | | | MSZ-HM15NA | | MSZ-HM18NA | | MSZ-HM24NA | |
| | Power supply | | V, phase, Hz | 208/230, 1, 60 | | | | | |
| | Input | | kW | 0.043 | 0.030 | 0.042 | 0.042 | 0.055 | |
| | Fan motor current | | A | 0.43/0.39 | 0.34/0.31 | 0.44/0.40 | 0.44/0.40 | 0.55/0.50 | |
| | Outdoor unit | | | MUZ-HM15NA MUZ-HM15NA2 | | MUZ-HM18NA MUZ-HM18NA2 | | MUZ-HM24NA MUZ-HM24NA2 | |
| | Power supply | | V, phase, Hz | 208/230, 1, 60 | | | | | |
| | Input | | kW | 1.127 | 1.570 | 1.598 | 1.548 | 2.575 | 2.445 |
| | Comp. current | | A | 4.91/4.44 | 7.11/6.43 | 7.22/6.53 | 7.11/6.43 | 11.11/10.05 | 10.56/9.55 |
| | Fan motor current | | A | 0.41/0.37 | 0.40/0.36 | 0.41/0.37 | 0.40/0.36 | 1.05/0.95 | 1.05/0.95 |
| Refrigerant circuit | Condensing pressure | | PSIG | 396 | 427 | 423 | 361 | 404 | 403 |
| | Suction pressure | | PSIG | 138 | 98 | 144 | 99 | 127 | 94 |
| | Discharge temperature | | ˚F | 168 | 178 | 165 | 161 | 174 | 194 |
| | Condensing temperature | | ˚F | 115 | 120 | 120 | 108 | 116 | 116 |
| | Suction temperature | | ˚F | 61 | 31 | 54 | 35 | 54 | 44 |
| | Comp. shell bottom temperature | | ˚F | 152 | 158 | 149 | 143 | 173 | 192 |
| | Ref. pipe length | | ft. | 25 | | | | | |
| | Refrigerant charge (R410A) | | | 2 lb. 9 oz. | | 2 lb. 10 oz. | | 3 lb 9 oz. | |
| Indoor unit | Intake air temperature | DB | ˚F | 80 | 70 | 80 | 70 | 80 | 70 |
| | | WB | ˚F | 67 | 60 | 67 | 60 | 67 | 60 |
| | Discharge air temperature | DB | ˚F | 58 | 114 | 58 | 114 | 57 | 108 |
| | | WB | ˚F | 56 | — | 56 | — | 56 | — |
| | Fan speed (High) | | rpm | 1,280 | 1,140 | 1,140 | 1,140 | 1,250 | 1,250 |
| | Airflow (High) | | CFM | 498 (Wet) | 463 | 562 (Wet) | 625 | 632 (Wet) | 702 |
| Outdoor unit | Intake air temperature | DB | ˚F | 95 | 47 | 95 | 47 | 95 | 47 |
| | | WB | ˚F | — | 43 | — | 43 | — | 43 |
| | Fan speed | | rpm | 910 | 900 | 910 | 900 | 810 | 810 |
| | Airflow | | CFM | 1,243 | 1,229 | 1,243 | 1,229 | 1,691 | 1,691 |

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

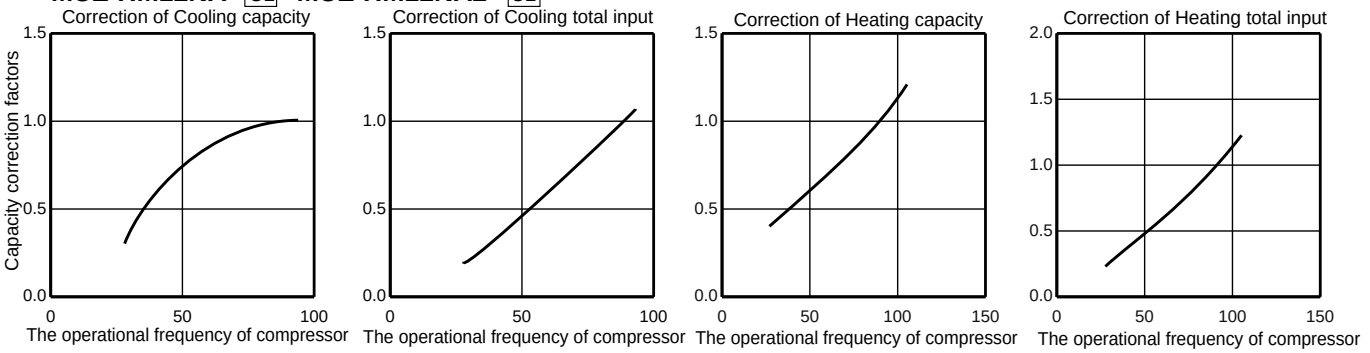
**MUZ-HM09NA - U1 MUZ-HM09NA2 - U1**



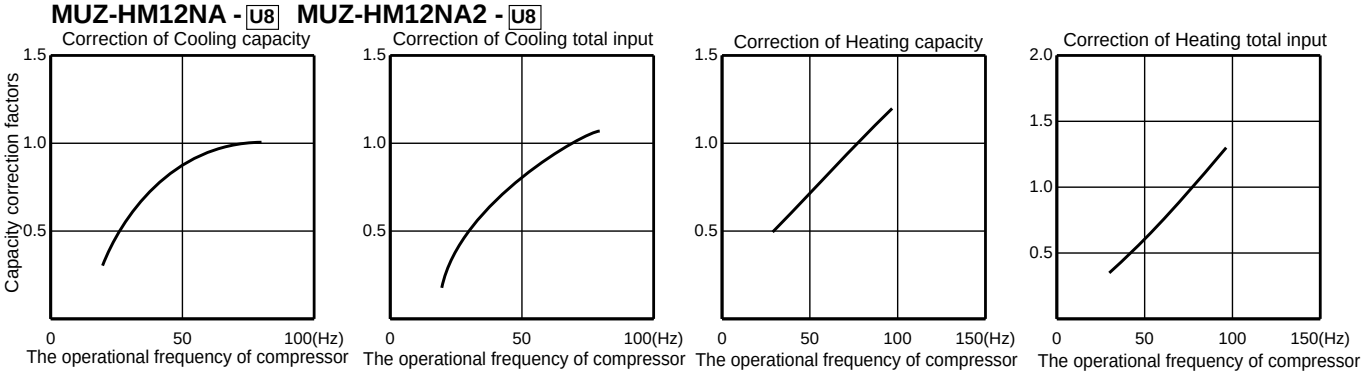

**MUZ-HM09NA - U8 MUZ-HM09NA2 - U8**



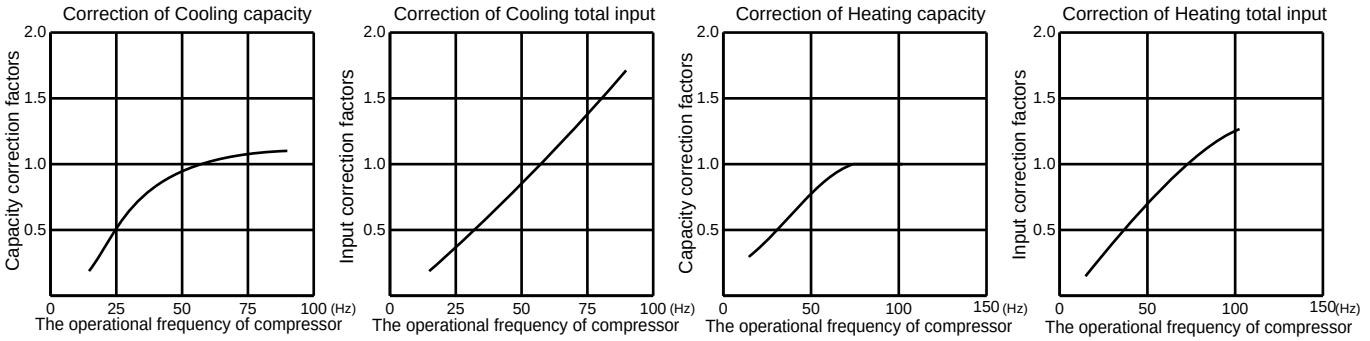

**MUZ-HM12NA - U1 MUZ-HM12NA2 - U1**



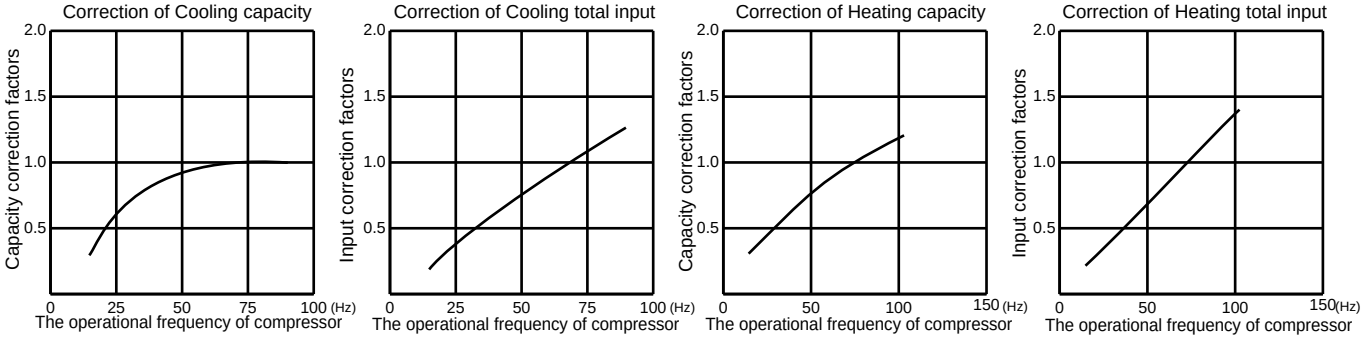

**MUZ-HM12NA - U8 MUZ-HM12NA2 - U8**



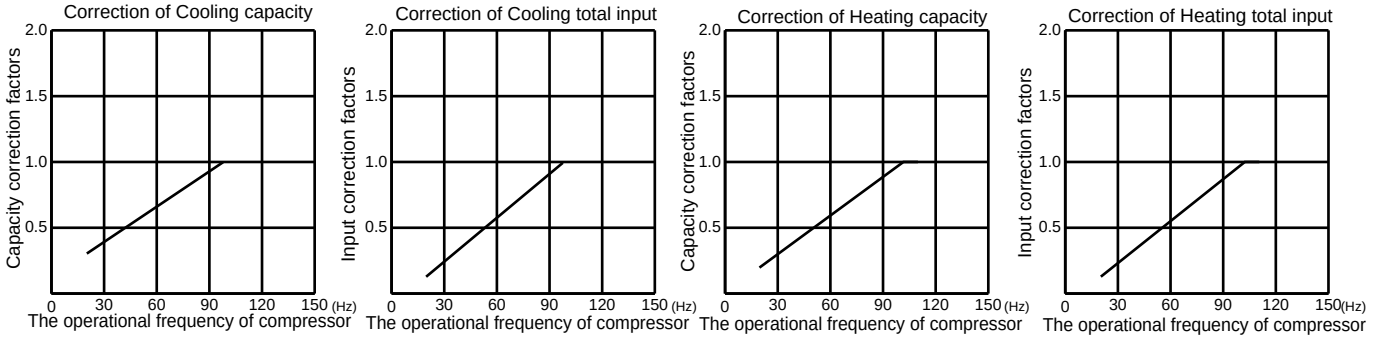
**MUZ-HM15NA MUZ-HM15NA2**




**MUZ-HM18NA MUZ-HM18NA2**




**MUZ-HM24NA MUZ-HM24NA2**




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

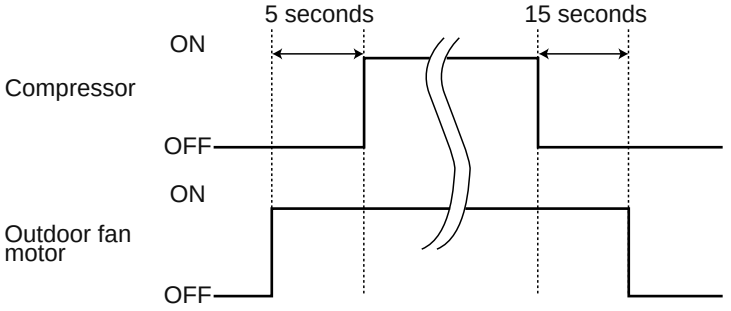
1. Press EMERGENCY OPERATION switch to start COOL or HEAT mode (COOL: Press once, HEAT: Press twice).
2. Test run operation starts and continues to operate for 30 minutes.
3. Compressor operates at rated frequency in COOL mode or 58 Hz in HEAT mode.
4. Indoor fan operates at High speed.
5. After 30 minutes, 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.

# 8 ACTUATOR CONTROL

**MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2**
**MUZ-HM15NA MUZ-HM15NA2 MUZ-HM18NA MUZ-HM18NA2**
**MUZ-HM24NA MUZ-HM24NA2**

## 8-1. OUTDOOR FAN MOTOR CONTROL

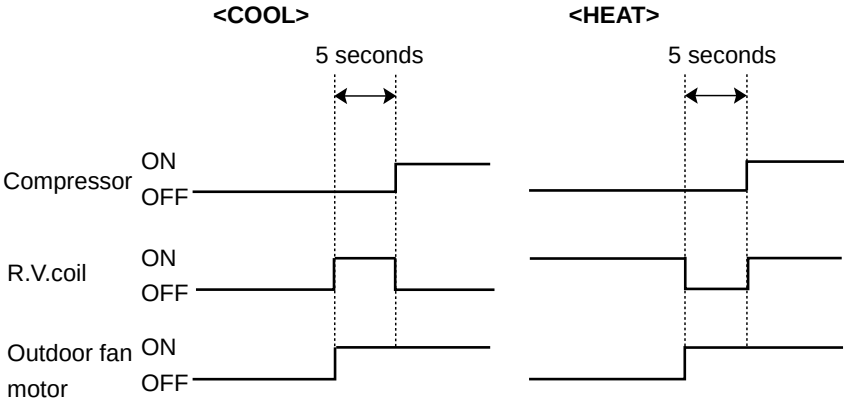
The fan motor turns ON/OFF, interlocking with the compressor.
[ON] The fan motor turns ON 5 seconds before the compressor starts up.
[OFF] The fan motor turns OFF 15 seconds after the compressor has stopped running.




## 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 | ○ | ○ | ○ | | | |

* Optional parts

# 9 SERVICE FUNCTIONS

**MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2**
**MUZ-HM15NA MUZ-HM15NA2 MUZ-HM18NA MUZ-HM18NA2**
**MUZ-HM24NA MUZ-HM24NA2**

## 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-HM09/12 - U1 | MUZ-HM09 - U8 | MUZ-HM12 - U8 | MUZ-HM15/18 | MUZ-HM24 |
| JS | Soldered (Initial setting) | 52°F (11°C) | 41°F (5°C) | 50°F (10°C) | 41°F (5°C) | 50°F (10°C) |
| | None (Cut) | 52°F (11°C) | 46°F (8°C) | 55°F (13°C) | 50°F (10°C) | 64°F (18°C) |

## 9-2. PRE-HEAT CONTROL SETTING

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 thermistor is 68°F (20°C) or below. When the pre-heat control turns ON, the compressor is energized. (About 50 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 |
|---|---|---|
| JK | Soldered | Deactivated (Factory setting) |
| | Cut | Activated |

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

# 10 TROUBLESHOOTING

**MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2**
**MUZ-HM15NA MUZ-HM15NA2 MUZ-HM18NA MUZ-HM18NA2**
**MUZ-HM24NA MUZ-HM24NA2**

## 10-1. CAUTIONS ON TROUBLESHOOTING

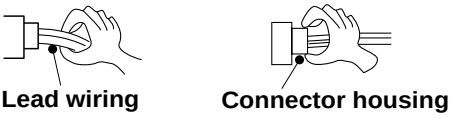
**1. Before troubleshooting, check the following**

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.

<Incorrect> <Correct>



**Lead wiring** **Connector housing**

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

**3. Troubleshooting procedure**

1) Check if the OPERATION INDICATOR lamp on the indoor unit is flashing on and off to indicate an abnormality. To make sure, check how many times the OPERATION INDICATOR lamp is flashing on and off before starting service work. (See the service manual of the indoor unit for a description of those failure codes.)
2) Before servicing, check that the connector and terminal are connected properly.
3) When the electronic control P.C. board seems to be defective, check the copper foil pattern for disconnection and the components for bursting and discoloration.
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.

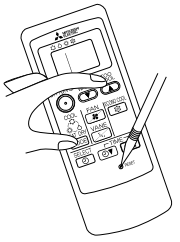
### 1. Flow chart of failure mode recall function for the indoor/outdoor unit

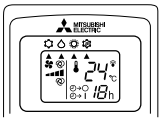
Operational procedure

The cause of abnormality cannot be found because the abnormality does not recur.

**Setting up the failure mode recall function**

Turn ON the power supply.
<Preparation of the remote controller>
① While pressing OPERATION SELECT button and TOO COOL 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 STOP/OPERATE (OFF/ON) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit. ※1

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

Does the upper lamp of the OPERATION INDICATOR lamp on the indoor unit blink at the interval of 0.5 seconds?
Blinks: Either indoor or outdoor unit is abnormal. Beep is emitted at the same timing as the blinking of the upper lamp of the OPERATION INDICATOR lamp. ※2

No (OFF) → Indoor unit is normal.
But the outdoor unit might be abnormal because there are some abnormalities that cannot be recalled with this way.
Check if outdoor unit is abnormal according to the detailed outdoor unit failure mode recall function. (Refer to 10-2.2)

Yes (Blinks)

**Judgment of indoor/outdoor abnormality**

Before blinking, does the upper lamp of the OPERATION INDICATOR lamp stay ON for 3 seconds?
When it stays ON for 3 seconds (without beep): The outdoor unit is abnormal.

Yes → The outdoor unit is abnormal.
Check the blinking pattern, and identify the abnormal point by referring to the table of outdoor unit failure mode recall function. (Refer to 10-2.3)
Make sure to check at least 2 consecutive blinking cycles. ※3

No → The indoor unit is abnormal.
Check the blinking pattern, and identify the abnormal point by referring to the table of indoor unit failure mode recall function. (Refer to indoor unit service manual.)
Make sure to check at least 2 consecutive blinking cycles. ※2

**Releasing the failure mode recall function**

Release the failure mode recall function by the following procedures.
Turn OFF the power supply and turn it ON again.
Press RESET button of the remote controller.

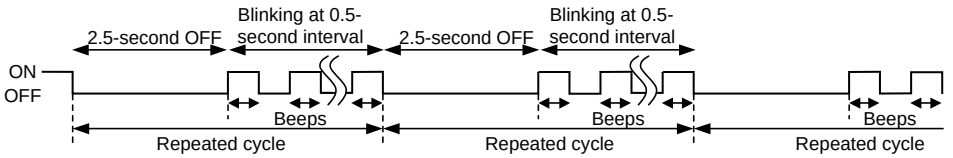
Repair the failure parts.

**Deleting the memorized abnormal condition**

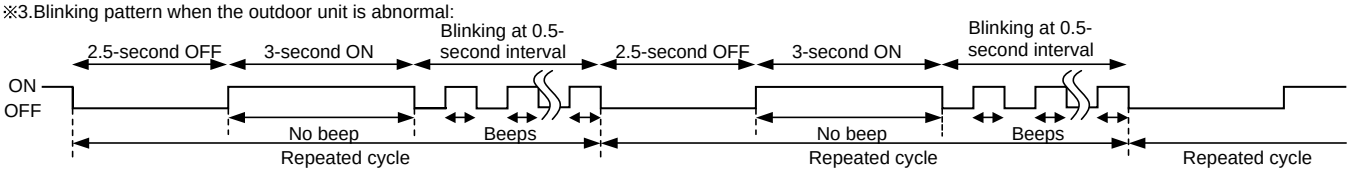
① After repairing the unit, recall the failure mode again according to "Setting up the failure mode recall function" mentioned above.
② Press STOP/OPERATE (OFF/ON) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit.
③ Press EMERGENCY OPERATION switch so that the memorized abnormal condition is deleted.
④ Release the failure mode recall function according to "Releasing the failure mode recall function" mentioned above.

**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

The outdoor unit might be abnormal.
Check if outdoor unit is abnormal according to the following procedures.

↓

Make sure that the remote controller is set to the failure mode recall function.

↓

With the remote controller headed towards the indoor unit, press TOO COOL button to adjust the set temperature to 77°F (25°C). ※1

※1. Regardless of normal or abnormal condition, 2 short beeps are emitted as the signal is received.

↓

Does the upper lamp of the OPERATION INDICATOR lamp on the indoor unit blink at the interval of 0.5 seconds?
Blinks: The outdoor unit is abnormal. Beep is emitted at the same timing as the blinking of the upper lamp of the OPERATION INDICATOR lamp. ※2

No (OFF) → The outdoor unit is normal.

Yes (Blinks)

↓

The outdoor unit is abnormal.
Check the blinking pattern, and identify the abnormal point by referring to the table of outdoor unit failure mode recall function (10-2.3.).
Make sure to check at least 2 consecutive blinking cycles. ※2

↓

Releasing the failure mode recall function

Release the failure mode recall function by the following procedures.
Turn OFF the power supply and turn it ON again.
Press RESET button of the remote controller.

The outdoor unit is normal. → Release the failure mode recall function according to the left mentioned procedure.

↓

Repair the failure parts.

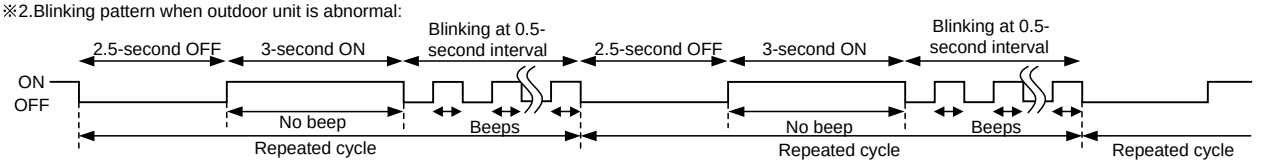
↓

Deleting the memorized abnormal condition

① After repairing the unit, recall the failure mode again according to "Setting up the failure mode recall function" (10-2.1.).
② Press STOP/OPERATE (OFF/ON) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit.
③ Press EMERGENCY OPERATION switch so that the memorized abnormal condition is deleted.
④ Release the failure mode recall function according to "Releasing the failure mode recall function" mentioned above.

**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:



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

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

**MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2**

| OPERATION INDICATOR upper 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) | — | — | — | — | — |
| 2-time flash 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.<br>•Refer to 10-5. Ⓐ"How to check inverter/ compressor".<br>•Check the stop valve. | ○ | ○ |
| 3-time flash 2.5 seconds OFF | Discharge temperature thermistor | 1-time flash every 2.5 seconds | Thermistor shorts or opens during compressor running. | •Refer to 10-5.Ⓖ"Check of outdoor thermistors". Defective outdoor thermistors can be identified by checking the blinking pattern of LED. | ○ | ○ |
| | Defrost thermistor | | | | | |
| | Fin temperature thermistor | 3-time flash 2.5 seconds OFF | | | | |
| | P.C. board temperature thermistor | 4-time flash 2.5 seconds OFF | | | | |
| | Ambient temperature thermistor | 2-time flash 2.5 seconds OFF | | | | |
| 4-time flash 2.5 seconds OFF | Overcurrent | 11-time flash 2.5 seconds OFF | Large current flows into intelligent power module/ power module ※1. | •Reconnect compressor connector.<br>•Refer to 10-5.Ⓐ"How to check inverter/ compressor".<br>•Check the stop valve. | — | ○ |
| | Compressor synchronous abnormality (Compressor start-up failure protection) | 12-time flash 2.5 seconds OFF | Waveform of compressor current is distorted. | •Reconnect compressor connector.<br>•Refer to 10-5.Ⓐ"How to check inverter/ compressor". | — | ○ |
| 5-time flash 2.5 seconds OFF | Discharge temperature | — | Temperature of discharge temperature thermistor exceeds 241°F (116°C), compressor stops.<br>Compressor can restart if discharge temperature thermistor reads 212°F (100°C) or less 3 minutes later. | •Check the refrigerant circuit and the refrigerant amount.<br>•Refer to 10-5.Ⓚ"Check of LEV". | — | ○ |
| 6-time flash 2.5 seconds OFF | High pressure | — | Temperature of indoor coil thermistor exceeds 158°F (70°C) in HEAT mode.<br>Temperature of outdoor heat exchanger temperature thermistor exceeds 158°F (70°C) in COOL mode. | •Check the refrigerant circuit and the refrigerant amount.<br>•Check the stop valve. | — | ○ |
| 7-time flash 2.5 seconds OFF | Fin temperature/ P.C. board temperature | 7-time flash 2.5 seconds OFF | Temperature of fin temperature thermistor on the inverter P.C. board exceeds 167 - 176°F (75 - 80°C), or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 158 - 167°F (70 - 75°C). | •Check around the outdoor unit.<br>•Check the outdoor unit air passage.<br>•Refer to 10-5.Ⓘ"Check of outdoor fan motor". | — | ○ |
| 8-time flash 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.Ⓘ"Check of outdoor fan motor".<br>Refer to 10-5.Ⓛ"Check of inverter P.C. board". | — | ○ |
| 9-time flash 2.5 seconds OFF | Nonvolatile memory data | 5-time flash 2.5 seconds OFF | Nonvolatile memory data cannot be read properly. | •Replace the inverter P.C. board. | ○ | ○ |
| 10-time flash 2.5 seconds OFF | Discharge temperature | — | Temperature of discharge temperature thermistor has been 122°F (50°C) or less for 20 minutes. | •Refer to 10-5.Ⓚ"Check of LEV".<br>•Check the refrigerant circuit and the refrigerant amount. | — | ○ |

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

| OPERATION INDICATOR upper 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 |
|---|---|---|---|---|---|---|
| 11-time flash 2.5 seconds OFF | DC voltage | 8-time flash 2.5 seconds OFF | DC voltage of inverter cannot be detected normally. | •Refer to 10-5.Ⓐ"How to check inverter/ compressor". | — | ○ |
| | Each phase current of compressor | 9-time flash 2.5 seconds OFF | Each phase current of compressor cannot be detected normally. | | | |
| 12-time flash 2.5 seconds OFF | Overcurrent Compressor open-phase | 10-time flash 2.5 seconds OFF | Large current flows into intelligent power module (IPM)/power module (IPM) ※1.<br>The open-phase operation of compressor is detected.<br>The interphase short circuit occurs in the output of the intelligent power module (IPM)/power module (IPM) ※1.<br>The compressor winding shorts circuit. | •Reconnect compressor connector.<br>•Refer to 10-5. Ⓐ"How to check inverter/ compressor". | — | ○ |
| 14-time flash 2.5 seconds OFF | Stop valve (Closed valve) | 14-time flash 2.5 seconds OFF | Closed valve is detected by compressor current. | •Check the stop valve | ○ | ○ |
| | 4-way valve/ Pipe temperature | 16-time flash 2.5 seconds OFF | The 4-way valve does not work properly.<br>The indoor coil thermistor detects an abnormal temperature. | •Check the 4-way valve.<br>•Replace the inverter P.C. board. | | |
| | Outdoor refrigerant system abnormality (**MUZ-HM09/12NA(2) -** U1) | 1-time flash 2.5 seconds OFF | 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. | •Check for a gas leak in a connecting piping etc.<br>•Check the stop valve.<br>•Refer to 10-5. Ⓞ "Check of outdoor refrigerant circuit". | ○ | ○ |

**MUZ-HM15NA MUZ-HM15NA2**
**MUZ-HM18NA MUZ-HM18NA2**
**MUZ-HM24NA MUZ-HM24NA2**

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

| The upper 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 flash 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. Ⓜ 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. Ⓜ How to check miswiring and serial signal error. | | |
| 2-time flash 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.<br>•Refer to 10-5. Ⓐ"How to check inverter/ compressor".<br>•Check stop valve. | ○ | ○ |
| 3-time flash 2.5 seconds OFF | Discharge temperature thermistor | 1-time flash every 2.5 seconds | Thermistor shorts or opens during compressor running. | •Refer to 10-5.Ⓖ "Check of outdoor thermistors". Defective outdoor thermistors can be identified by checking the blinking pattern of LED. | ○ | ○ |
| | Defrost thermistor | | | | | |
| | Fin temperature thermistor | 3-time flash 2.5 seconds OFF | | | | |
| | P.C. board temperature thermistor | 4-time flash 2.5 seconds OFF | | | | |
| | Ambient temperature thermistor | 2-time flash 2.5 seconds OFF | | | | |
| | Outdoor heat exchanger temperature thermistor | — | | | | |
| 4-time flash 2.5 seconds OFF | Overcurrent | 11-time flash 2.5 seconds OFF | Large current flows into the power module (IPM) (**MUZ-HM09/12NA(2) -** U8)/(IC700) (**MUZ-HM09/12/15/18/24NA(2) -** U1). | •Reconnect compressor connector.<br>•Refer to 10-5.Ⓐ"How to check inverter/ compressor".<br>•Check stop valve. | — | ○ |
| | Compressor synchronous abnormality (Compressor start-up failure protection) | 12-time flash 2.5 seconds OFF | Waveform of compressor current is distorted. | •Reconnect compressor connector.<br>•Refer to 10-5.Ⓐ"How to check inverter/ compressor". | — | ○ |
| 5-time flash 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.<br>•Refer to 10-5.Ⓚ"Check of LEV". | — | ○ |
| 6-time flash 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.<br>•Check stop valve. | — | ○ |
| 7-time flash 2.5 seconds OFF | Fin temperature/ P.C. board temperature | 7-time flash 2.5 seconds OFF | Temperature of the fin temperature thermistor on the inverter P.C. board exceeds 167 - 187°F (75 - 86°C), or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 162 - 185°F (72 - 85°C). | •Check around outdoor unit.<br>•Check outdoor unit air passage.<br>•Refer to 10-5.Ⓘ"Check of outdoor fan motor". | — | ○ |
| 8-time flash 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.Ⓘ"Check of outdoor fan motor". Refer to 10-5.Ⓛ"Check of inverter P.C. board". | — | ○ |
| 9-time flash 2.5 seconds OFF | Nonvolatile memory data | 5-time flash 2.5 seconds OFF | Nonvolatile memory data cannot be read properly. | •Replace the inverter P.C. board. | ○ | ○ |
| | Power module (IPM) (**MUZ-HM09/12NA(2) -** U8)/(IC700) (**MUZ-HM09/12/15/18/24NA(2) -** U1) | 6-time flash 2.5 seconds OFF | The interface short circuit occurs in the output of the power module (IPM) (**MUZ-HM09/12NA(2) -** U8)/(IC700) (**MUZ-HM09/12/15/18/24NA(2) -** U1). The compressor winding shorts circuit. | •Refer to 10-5. Ⓐ"How to check inverter/ compressor". | | |

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

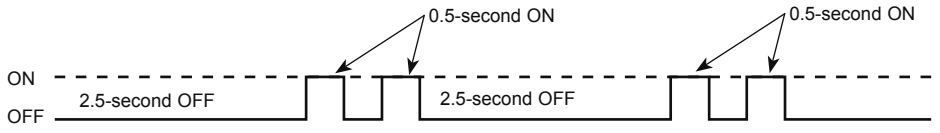
| The upper lamp of the OPERATION INDICATOR lamp (Indoor unit) | Abnormal point (Failure mode/protection) | LED indication (Outdoor P.C. board) | Condition | Remedy | Indoor/outdoor unit failure mode recall function | Outdoor unit failure mode recall function |
|---|---|---|---|---|---|---|
| 10-time flash 2.5 seconds OFF | Discharge temperature | — | Temperature of discharge temperature thermistor has been 122°F (50°C) or less for 20 minutes. | •Refer to 10-5.Ⓚ"Check of LEV".<br>•Check refrigerant circuit and refrigerant amount. | — | ○ |
| 11-time flash 2.5 seconds OFF | DC voltage | 8-time flash 2.5 seconds OFF | DC voltage of inverter cannot be detected normally. | •Refer to 10-5.Ⓐ"How to check inverter/ compressor". | — | ○ |
| | Each phase current of compressor | 9-time flash 2.5 seconds OFF | Each phase current of compressor cannot be detected normally. | | | |
| 14-time flash or more 2.5 seconds OFF | Stop valve (Closed valve) | 14-time flash 2.5 seconds OFF | Closed valve is detected by compressor current. | •Check stop valve. | ○ | ○ |
| | 4-way valve/ Pipe temperature | 16-time flash 2.5 seconds OFF | The 4-way valve does not work properly.<br>The indoor coil thermistor detects an abnormal temperature. | •Check the 4-way valve.<br>•Replace the inverter P.C. board. | | |
| | Outdoor refrigerant system abnormality | 1-time flash 2.5 seconds OFF | 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. | •Check for a gas leak in a connecting piping etc.<br>•Check the stop valve.<br>•Refer to 10-5. Ⓞ "Check of outdoor refrigerant circuit". | ○ | ○ |

## 10-3. TROUBLESHOOTING CHECK TABLE

| No. | Symptom | LED indication | Abnormal point/ Condition | Condition | Remedy |
|---|---|---|---|---|---|
| 1 | Outdoor unit does not operate. | 1-time flash every 2.5 seconds | Outdoor power system | Overcurrent protection cut-out operates 3 consecutive times within 1 minute after the compressor gets started. | •Reconnect connector of compressor.<br>•Refer to 10-5.Ⓐ "How to check inverter/compressor".<br>•Check stop valve. |
| 2 | | | Outdoor thermistors | Discharge temperature thermistor, fin temperature thermistor, defrost thermistor, P.C. board temperature thermistor, outdoor heat exchanger temperature thermistor or ambient temperature thermistor shorts or opens during compressor running. | •Refer to 10-5.Ⓔ "Check of outdoor thermistors". |
| 3 | | | Outdoor control system | Nonvolatile memory data cannot be read properly.<br><br>(The upper lamp of the OPERATION INDICATOR lamp on the indoor unit lights up or flashes 7-time.) | •Replace inverter P.C. board. |
| 4 | | 6-time flash 2.5 seconds OFF | Serial signal | The communication fails between the indoor and outdoor unit for 3 minutes. | •Refer to 10-5.Ⓜ "How to check miswiring and serial signal error. |
| 5 | | 11-time flash 2.5 seconds OFF | Stop valve/ Closed valve | Closed valve is detected by compressor current. | •Check stop valve. |
| 6 | | 16-time flash 2.5 seconds OFF | 4-way valve/ Pipe temperature | The 4-way valve does not work properly.<br>The indoor coil thermistor detects an abnormal temperature. | •Refer to 10-5.Ⓗ "Check of R.V. coil".<br>•Replace the inverter P.C. board. |
| 7 | | 17-time flash 2.5 seconds OFF (**MUZ-HM09/12/15/18/24NA(2) -** U1) | 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. | •Check for a gas leak in a connecting piping etc.<br>•Check the stop valve.<br>•Refer to 10-5. Ⓞ “Check of outdoor refrigerant circuit”. |
| 8 | 'Outdoor unit stops and restarts 3 minutes later' is repeated. | 2-time flash 2.5 seconds OFF | Overcurrent protection | Large current flows into the power module (IPM) (**MUZ-HM09/12NA(2) -** U8)/(IC700) (**MUZ-HM09/12/15/18/24NA(2) -** U1).<br>※ When overcurrent protection occurs within 10 seconds after compressor starts, compressor restarts after 15 seconds (**MUZ-HM09/12NA**). | •Reconnect connector of compressor.<br>•Refer to 10-5.Ⓐ "How to check inverter/compressor".<br>•Check stop valve. |
| 9 | | 3-time flash 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. | •Check refrigerant circuit and refrigerant amount.<br>•Refer to 10-5.Ⓚ "Check of LEV". |
| 10 | | 4-time flash 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 - 176°F (75 - 80°C) (**MUZ-HM09/12NA(2)**)/167 - 187°F<br>(75 - 86°C) (**MUZ-HM15/18/24NA(2)**) or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 158 - 167°F (70 - 75°C) (**MUZ-HM09/12NA(2)**)/162 - 185°F (72 - 85°C) (**MUZ-HM15/18/24NA(2)**). | •Check around outdoor unit.<br>•Check outdoor unit air passage.<br>•Refer to 10-5.Ⓘ "Check of outdoor fan motor". |
| 11 | | 5-time flash 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. | •Check refrigerant circuit and refrigerant amount.<br>•Check stop valve. |
| 12 | | 8-time flash 2.5 seconds OFF | Compressor synchronous abnormality | The waveform of compressor current is distorted. | •Reconnect connector of compressor.<br>•Refer to 10-5.Ⓐ "How to check inverter/compressor". |
| 13 | | 10-time flash 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.Ⓘ "Check of outdoor fan motor.<br>•Refer to 10-5.Ⓛ "Check of inverter P.C. board. |
| 14 | | 12-time flash 2.5 seconds OFF | Each phase current of compressor | Each phase current of compressor cannot be detected normally. | •Refer to 10-5.Ⓐ "How to check inverter/compressor". |
| 15 | | 13-time flash 2.5 seconds OFF | DC voltage | DC voltage of inverter cannot be detected normally. | •Refer to 10-5.Ⓐ "How to check inverter/compressor". |

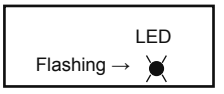
**NOTE:** 1. The location of LED is illustrated at the right figure. Refer to 10-6.1.
2. LED is lighted during normal operation.
3. Blinking patterns of this mode differ from the ones of the failure recall mode.

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

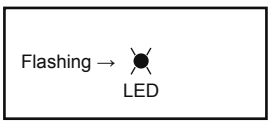



Inverter P.C. board

**MUZ-HM09/12NA(2)**



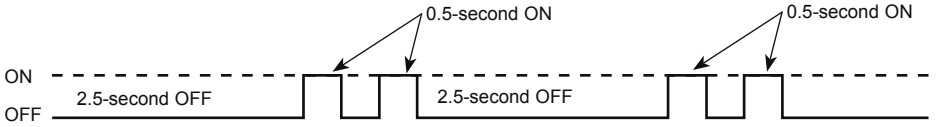

**MUZ-HM15/18/24NA(2)**



| No. | Symptom | LED indication | Abnormal point/ Condition | Condition | | Remedy |
|---|---|---|---|---|---|---|
| 16 | Outdoor unit operates. | 1-time flash 2.5 seconds OFF | Frequency drop by current protection | **MUZ-HM 09/12NA(2)** | Current from power outlet is nearing Max. fuse size. | The unit is normal, but check the following.<br>•Check if indoor filters are clogged.<br>•Check if refrigerant is short.<br>•Check if indoor/outdoor unit air circulation is short cycled. |
| | | | | **MUZ-HM15/ 18/24NA(2)** | When the input current exceeds approximately 10.5 A, compressor frequency lowers. | |
| 16 | | 3-time flash 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 flash 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.<br>•Refer to 10-5.Ⓚ "Check of LEV".<br>•Refer to 10-5.Ⓖ "Check of outdoor thermistors". |
| 19 | | 5-time flash 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 flash 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".<br>•Check refrigerant circuit and refrigerant amount. |
| 21 | | 8-time flash 2.5 seconds OFF | PAM protection PAM: Pulse Amplitude Modulation | The overcurrent flows into IGBT (Insulated Gate Bipolar transistor: TR821) (**MUZ-HM09/12NA(2) -** U8)/PFC (Power factor correction: IC820) (**MUZ-HM09/12/15/18/24NA(2) -** U1) or the DC voltage reaches 320 V (**MUZ-HM09/12NA(2) -** U8)/394 V (**MUZ-HM09/12/15/18/24NA(2) -** U1) or more, PAM stops and restarts. | | This is not malfunction. PAM protection will be activated in the following cases:<br>1 Instantaneous power voltage drop. (Short time power failure)<br>2 When the power supply voltage is high. |
| | | | Zero cross detecting circuit (**MUZ-HM09/12NA(2)**) | Zero cross signal for PAM control cannot be detected. | | |
| 22 | | 9-time flash 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". |

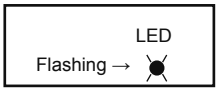
**NOTE:** 1. The location of LED is illustrated at the right figure. Refer to 10-6.1.
2. LED is lighted during normal operation.
3. Blinking patterns of this mode differ from the ones of the failure recall mode.

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

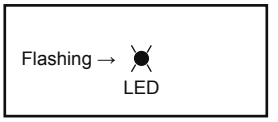



Inverter P.C. board

**MUZ-HM09/12NA(2)**

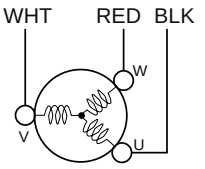
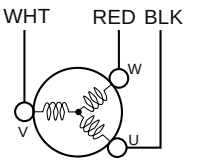
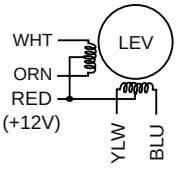



**MUZ-HM15/18/24NA(2)**



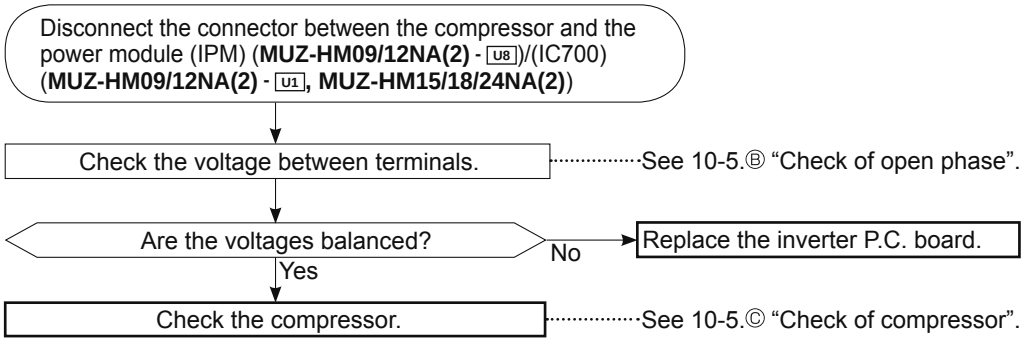
### 10-4. TROUBLE CRITERION OF MAIN PARTS

## MUZ-HM09NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM12NA2 MUZ-HM15NA MUZ-HM15NA2 MUZ-HM18NA MUZ-HM18NA2 MUZ-HM24NA MUZ-HM24NA2

<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Defrost thermistor (RT61)<br><br>Fin temperature thermistor (RT64)<br><br>Ambient temperature thermistor (RT65)<br><br>Outdoor heat exchanger temperature thermistor (RT68)</td><td>Measure the resistance with a tester.<br><br>Refer to 10-6. “Test point diagram and voltage”, 1. “Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Discharge temperature thermistor (RT62)</td><td>Measure the resistance with a tester. Before measurement, hold the thermistor with your hands to warm it up.<br><br>Refer to 10-6. “Test point diagram and voltage”, 1. “Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Compressor</td><td>Measure the resistance between terminals using a tester.<br>[Temperature: 14 - 104°F (-10 - 40°C)]
<table>
<tr><th></th><th colspan="4">Normal (Ω)</th></tr>
<tr><th></th><th>HM09/12 - U1</th><th>HM09 - U8</th><th>HM12 - U8</th><th>HM15/18/24</th></tr>
<tr><td>U-V<br>U-W<br>V-W</td><td>1.26 - 1.72</td><td>1.36 - 1.93</td><td>1.52 - 2.17</td><td>0.82 - 1.11</td></tr>
</table></td><td> 
</td></tr>
<tr><td>Outdoor fan motor</td><td>Measure the resistance between lead wires using a tester.<br>[Temperature: 14 - 104°F (-10 - 40°C)]
<table>
<tr><th rowspan="2">Color of lead wire</th><th colspan="2">Normal (Ω)</th></tr>
<tr><th>HM09/12/15/18</th><th>HM24</th></tr>
<tr><td>RED – BLK<br>BLK – WHT<br>WHT – RED</td><td>29 - 40</td><td>12 - 16</td></tr>
</table></td><td> 
</td></tr>
<tr><td>R. V. coil (21S4)</td><td>Measure the resistance using a tester.<br>[Temperature: 14 - 104°F (-10 - 40°C)]
<table>
<tr><th>Normal (kΩ)</th></tr>
<tr><td>0.97 - 1.38</td></tr>
</table></td><td></td></tr>
<tr><td>Expansion valve coil (LEV)</td><td>Measure the resistance using a tester.<br>[Temperature: 14 - 104°F (-10 - 40°C)]
<table>
<tr><th>Color of lead wire</th><th>Normal (Ω)</th></tr>
<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>
</table></td><td> 
</td></tr>
<tr><td>Defrost heater<br>(Optional parts)</td><td>Measure the resistance using a tester.<br>[Temperature: 14 - 104°F (-10 - 40°C)]
<table>
<tr><th>Normal (Ω)</th></tr>
<tr><td>349 - 428</td></tr>
</table></td><td></td></tr>
</table>

## 10-5. TROUBLESHOOTING FLOW

### Ⓐ How to check inverter/compressor




### Ⓑ Check of open phase

● With the connector between the compressor and the power module (IPM) (**MUZ-HM09/12NA(2)** - U8)/(IC700) (**MUZ-HM09/12NA(2)** - U1**, MUZ-HM15/18/24NA(2)**) disconnected, activate the inverter and check if the inverter is normal by measuring **the voltage balance** between the terminals.

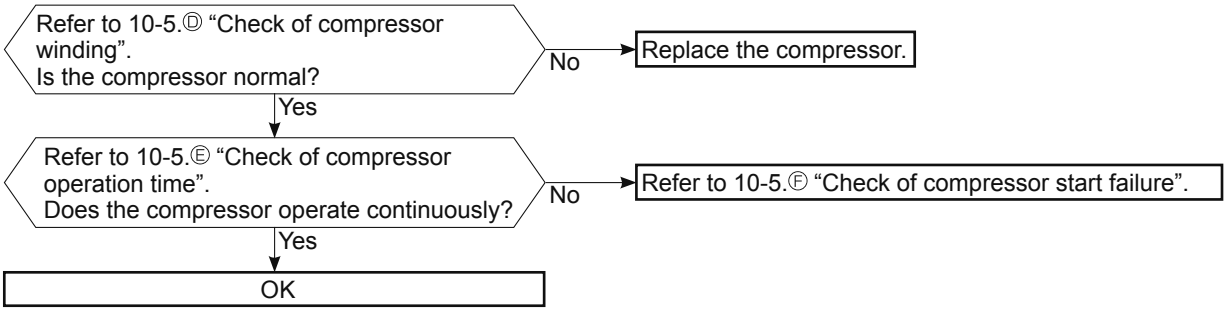
Output voltage is 50 - 130 V. (The voltage may differ according to the tester.)

<< 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 flashes 9 times. (Refer to 10-6.1.)

### Ⓒ Check of compressor



## Ⓓ Check of compressor winding

●Disconnect the connector between the compressor and the power module (IPM) (**MUZ-HM09/12NA(2)** - U8)/(IC700) (**MUZ-HM09/12NA(2)** - U1**, MUZ-HM15/18/24NA(2)**), 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.

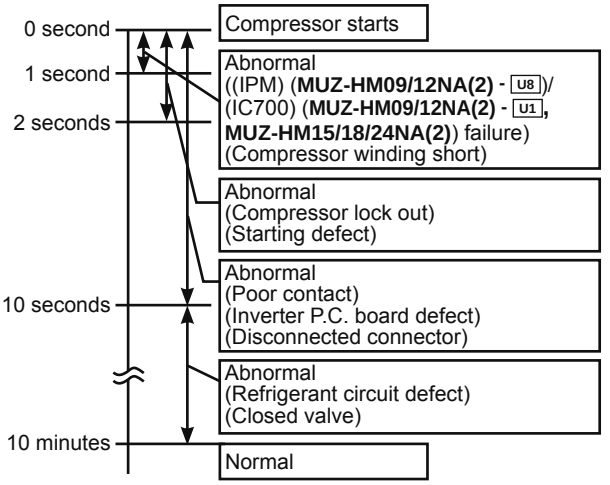
<<Judgement>>

Refer to 10-4.
0 [Ω] ·····Abnormal [short]
Infinite [Ω] ·····Abnormal [open]
**NOTE**: Be sure to zero the ohmmeter before measurement.

## Ⓔ 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>>



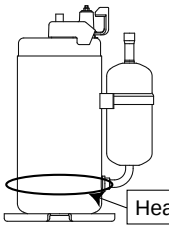

## Ⓕ Check of compressor start failure

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.Ⓑ)
③. Direct current voltage between DB61(+) and (-) on the inverter P.C. board
④. Voltage between outdoor terminal block S1-S2

Does the compressor run for 10 seconds or more after it starts?
Yes → Check the refrigerant circuit. Check the stop valve.
No

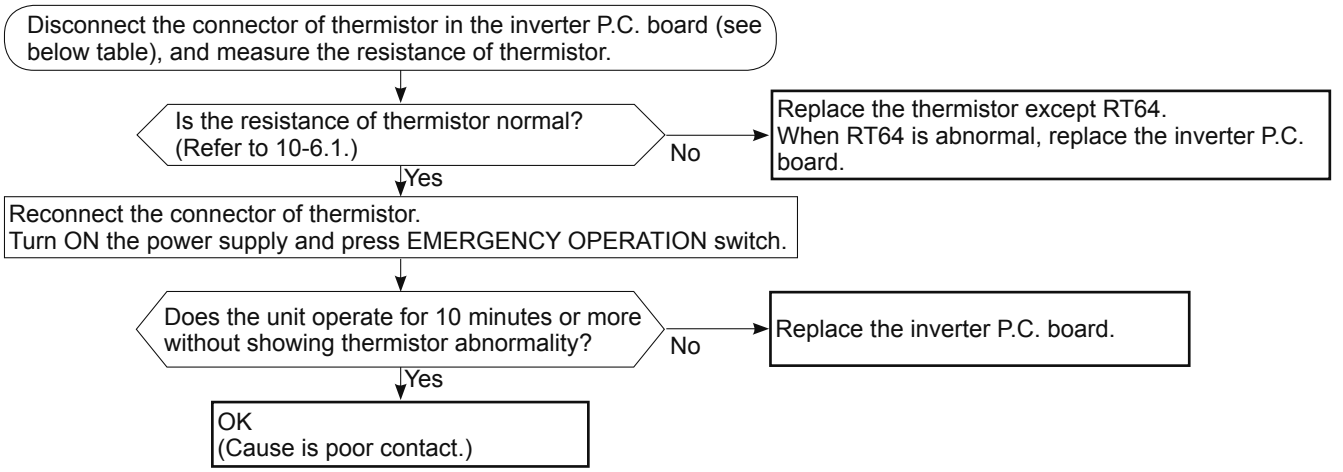
After the compressor is heated with a drier, does the compressor start? ※1
No → Replace the compressor.
Yes

Compressor start failure. Activate pre-heat control. (Refer to 9-2. "PRE-HEAT CONTROL SETTING")




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

## Ⓖ Check of outdoor thermistors

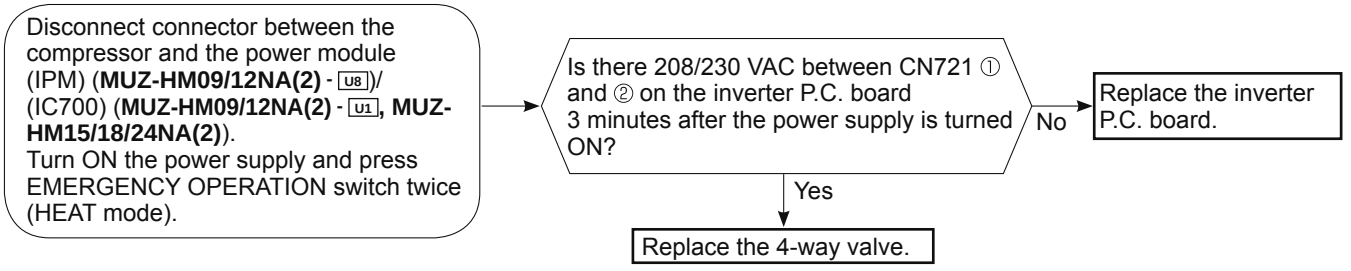



| Thermistor | Symbol | Connector, Pin No. | Board |
|---|---|---|---|
| Defrost | RT61 | Between CN641 pin1 and pin2 | Inverter P.C. board |
| Discharge temperature | RT62 | Between CN641 pin3 and pin4 | |
| Fin temperature | RT64 | Between CN642 pin1 and pin2 | |
| Ambient temperature | RT65 | Between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

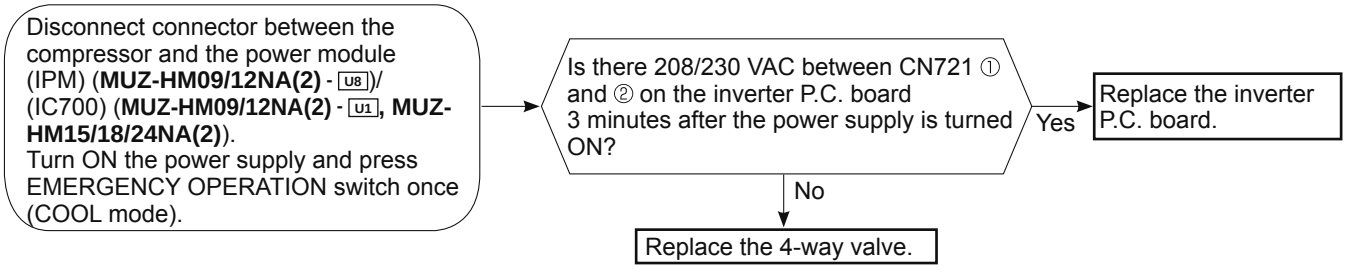
## Ⓗ Check of R.V. coil

※ First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to 10-4.
※ Check if there is 208/230 VAC at L1 - L2.
※ 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.

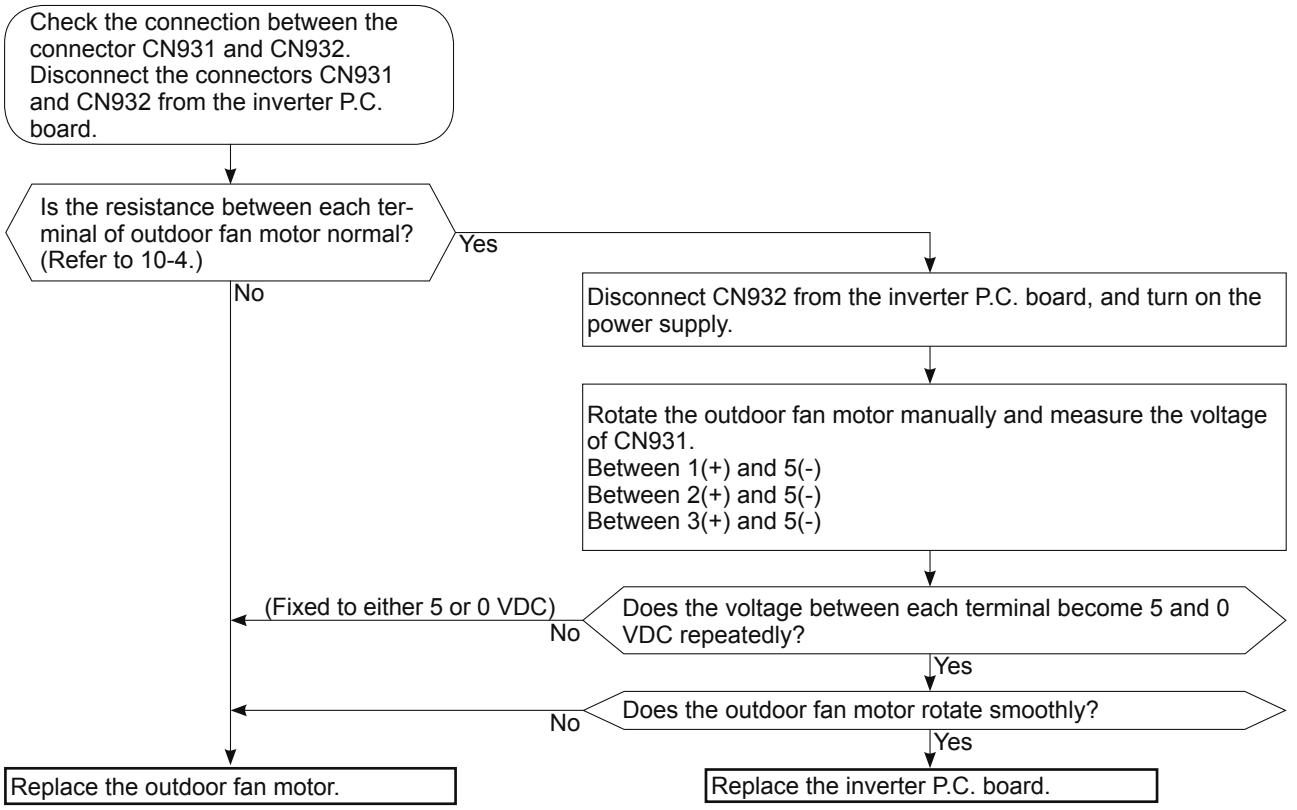
**Unit operates COOL mode even if it is set to HEAT mode.**



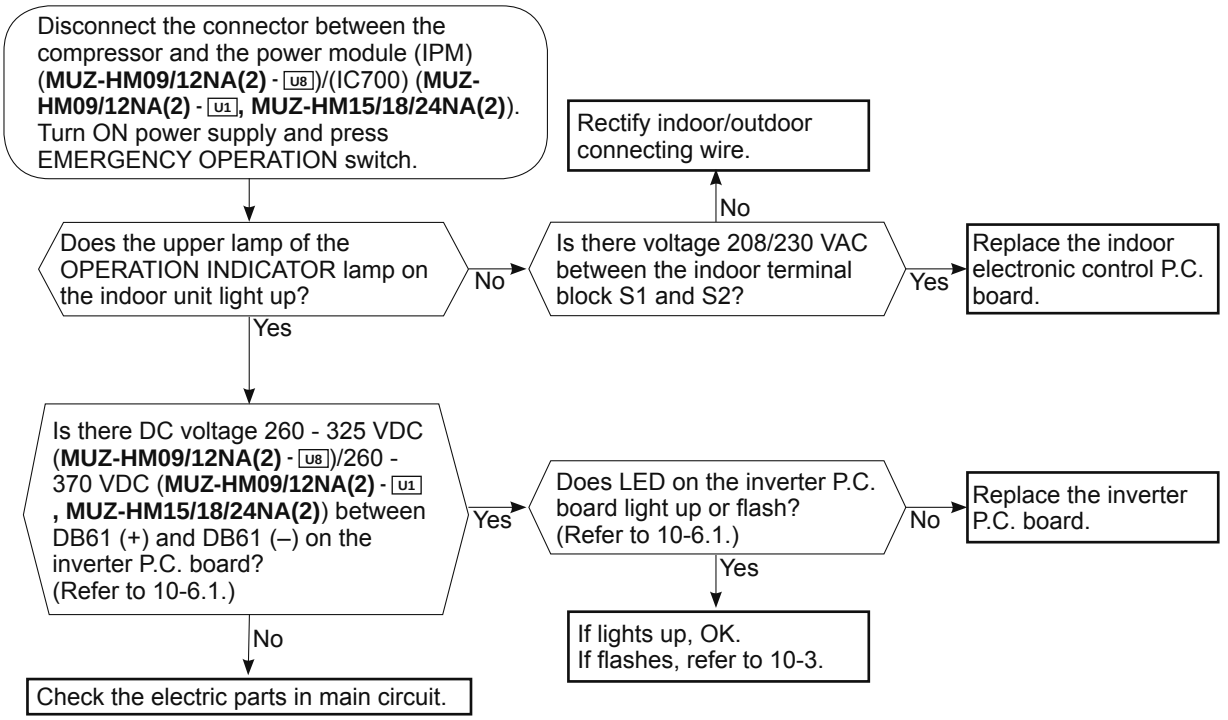

**Unit operates HEAT mode even if it is set to COOL mode.**

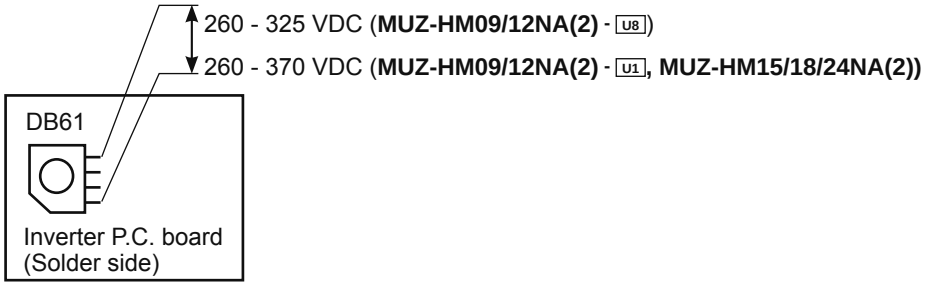


## ⓘ Check of outdoor fan motor



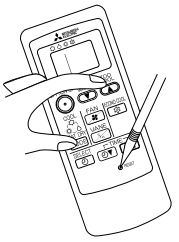
## Ⓙ Check of power supply

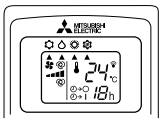


## Ⓚ Check of LEV (Expansion valve)

Turn ON the power supply.
<Preparation of the remote controller>
① While pressing both OPERATION SELECT button and TOO COOL 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 STOP/OPERATE (OFF/ON) 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.

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

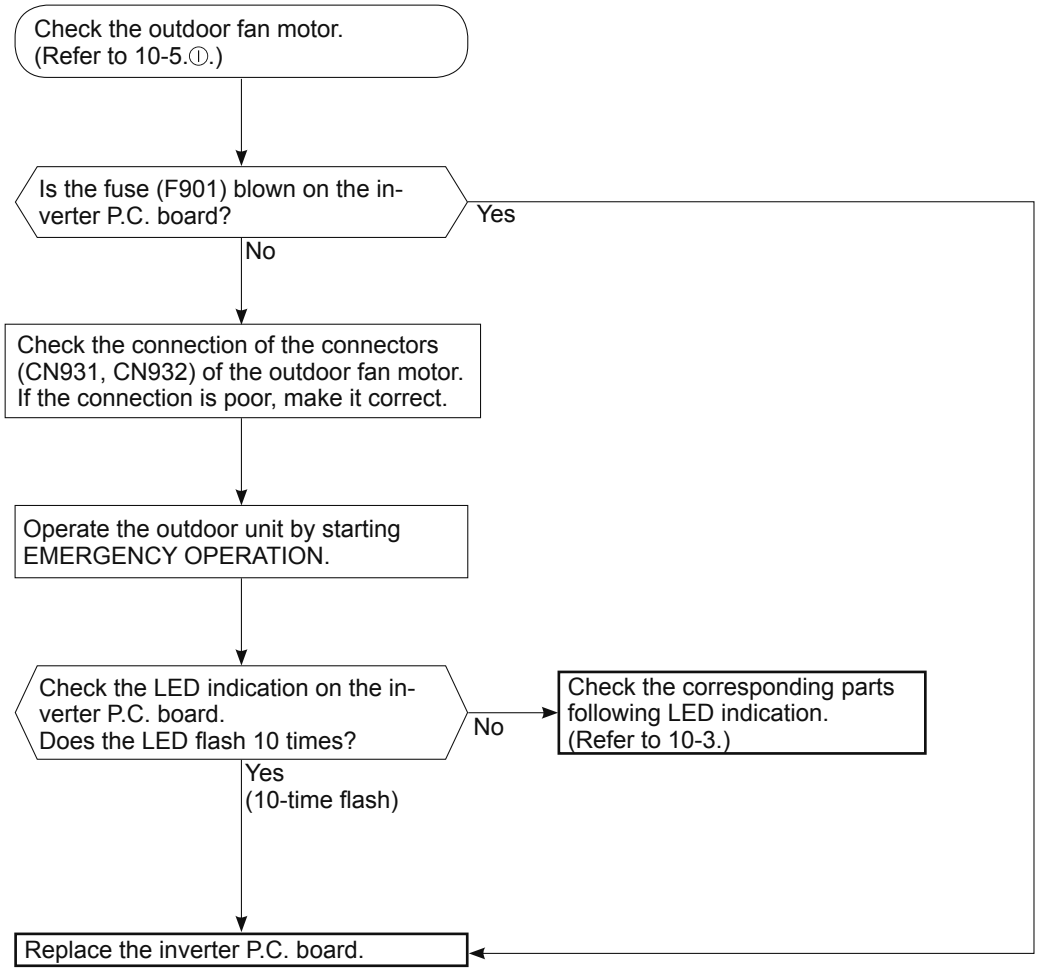
Do you hear the expansion valve "click, click·····"?
Do you feel the expansion valve vibrate when touching it ?
Yes → OK
No

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 VAC between each?
**NOTE:** Measure the voltage by an analog tester.
No → Replace the inverter P.C. board.
Yes → Replace the expansion valve.
No → Replace the LEV coil.

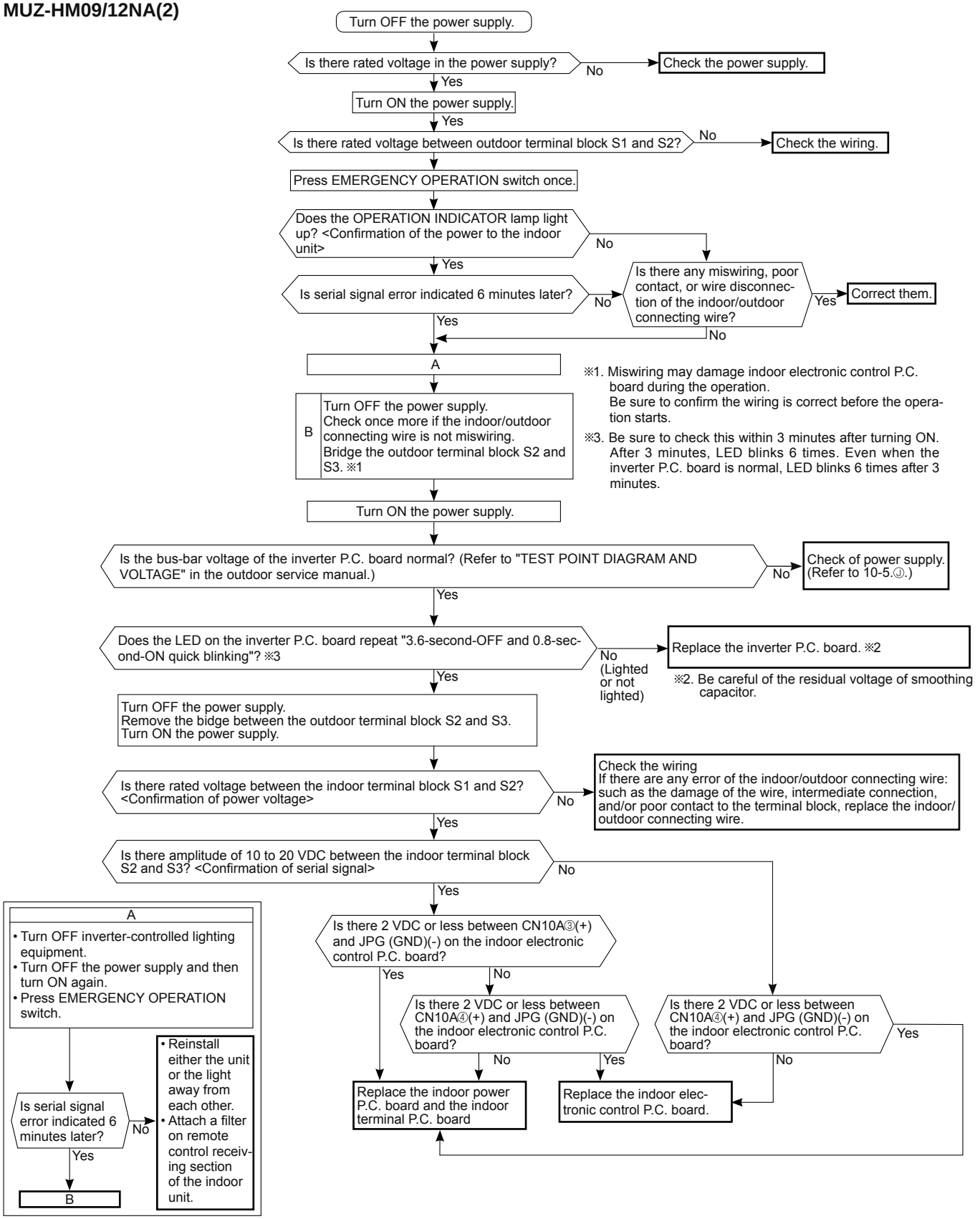
**NOTE**: After check of LEV, do the undermentioned operations.
1. Turn OFF the power supply and turn it ON again.
2. Press RESET button on the remote controller.

## Ⓛ Check of inverter P.C. board

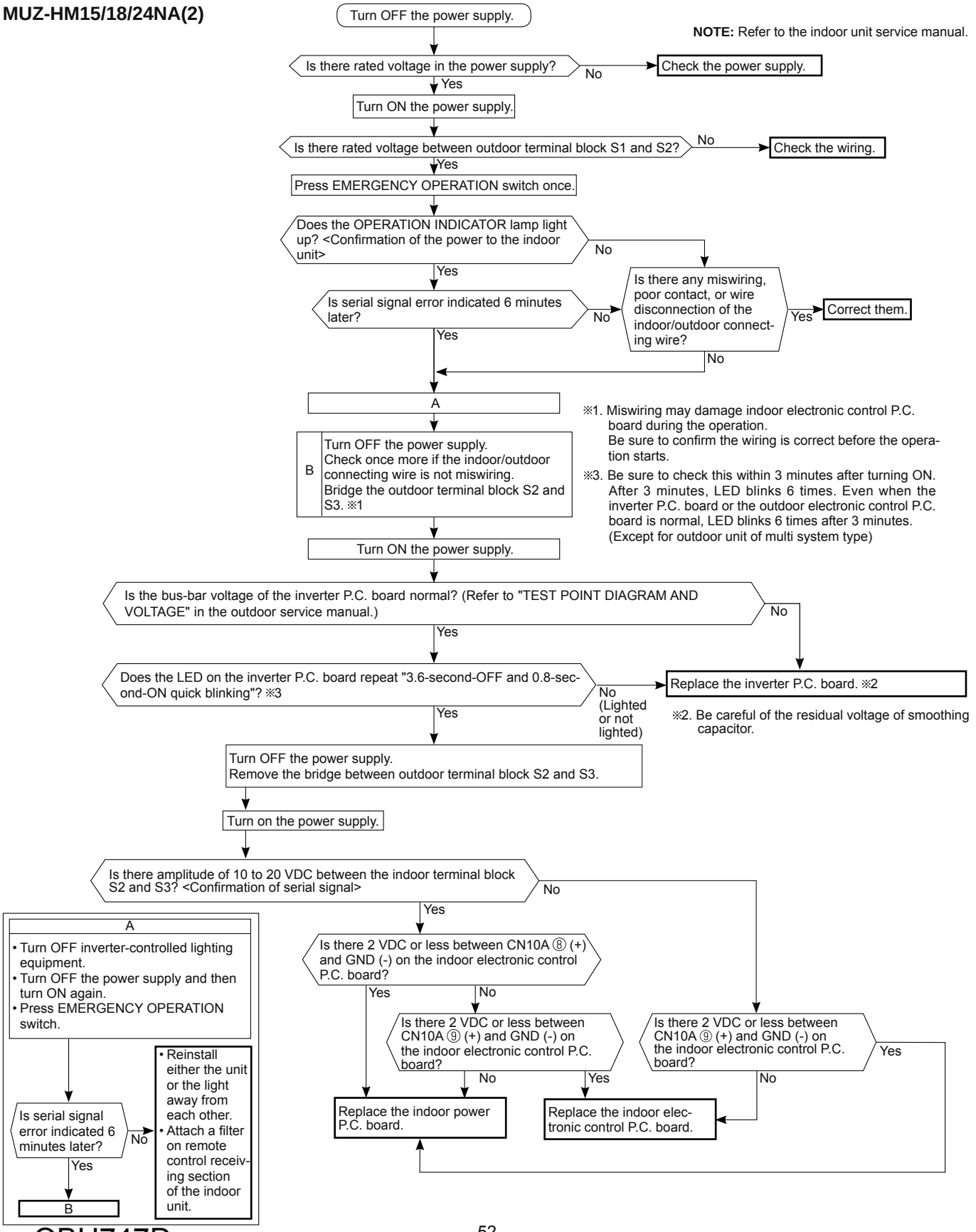


## Ⓜ How to check miswiring and serial signal error

**MUZ-HM09/12NA(2)**



**MUZ-HM15/18/24NA(2)**



## Ⓝ Check of defrost heater (Optional parts)

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...

Is there 208/230 VAC between CN722 ① and ③ on the inverter P.C. board? Refer to 10-6.1.

Yes → Not the problem of the inverter P.C. board.

No → Replace the inverter P.C. board.

## Ⓞ Check of outdoor refrigerant circuit (MUZ-HM09/12/15/18/24NA(2) - U1)

Has the operation stopped during pump down?

Yes → The operation has stopped to prevent the diesel explosion caused by air trapped in the refrigerant circuit. Close the stop valve, and disconnect the power plug or turn the breaker OFF. ※

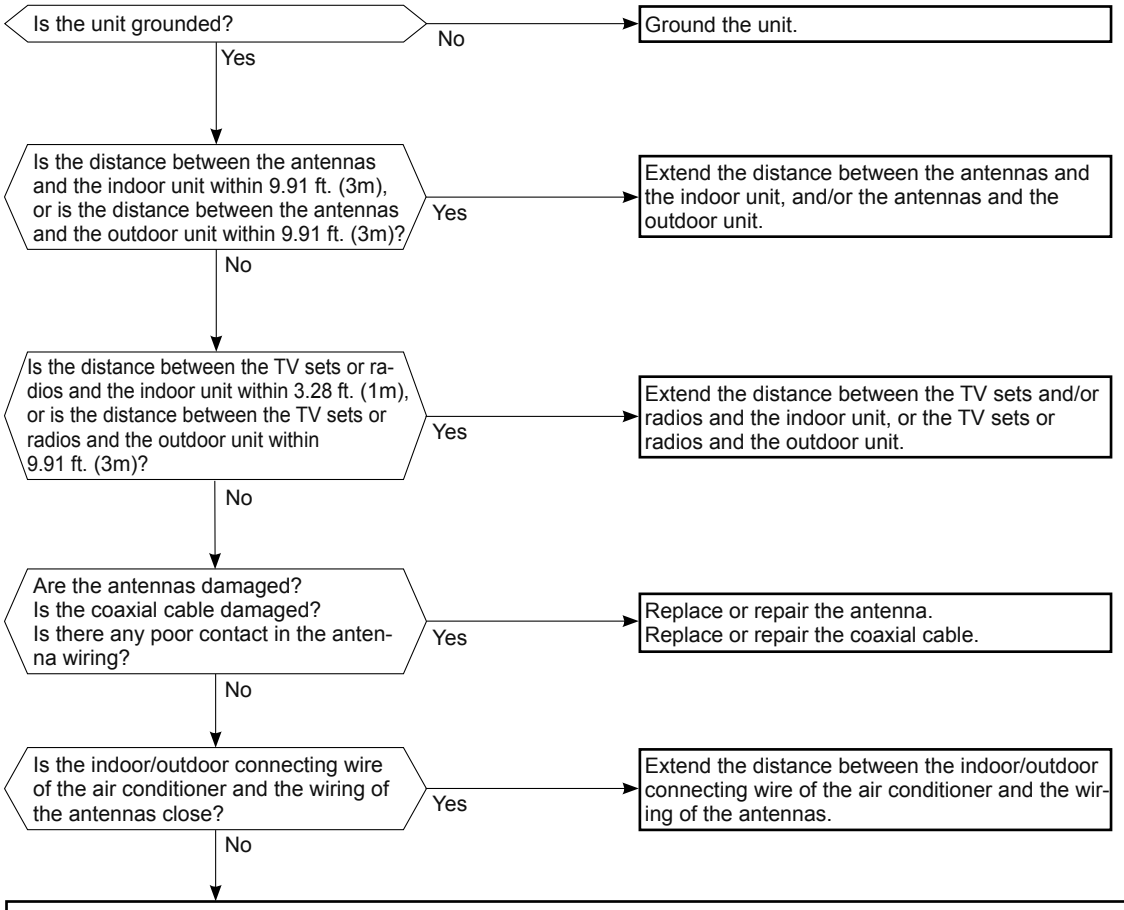
No → Was the operation started with the stop valve closed, and was it opened during operation?

Yes → The unit occasionally stops when the stop valve is opened or closed during operation. Open the stop valve and start the cooling operation again.

No → The refrigerant gas amount may be 60% or less than the normal amount. Identify where the gas is leaking from, and fix the leak.

※ **CAUTION : Do not start the operation again to prevent hazards.**

## Ⓟ Electromagnetic noise enters into TV sets or radios



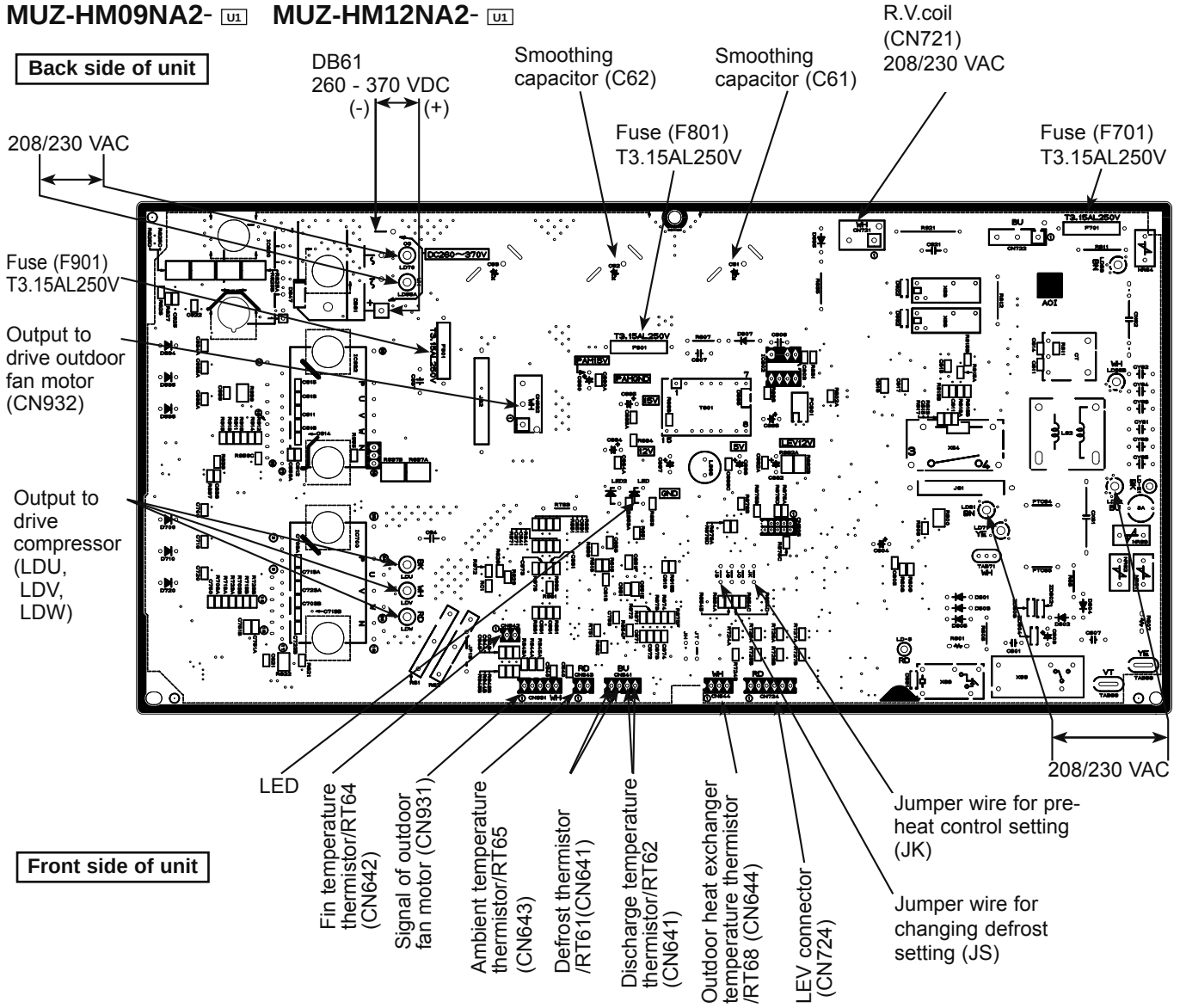

Even if all of the above conditions are fulfilled, the electromagnetic noise may enter, depending on the electric field strength or the installation condition (combination of specific conditions such as antennas or wiring).
Check the following before asking for service.

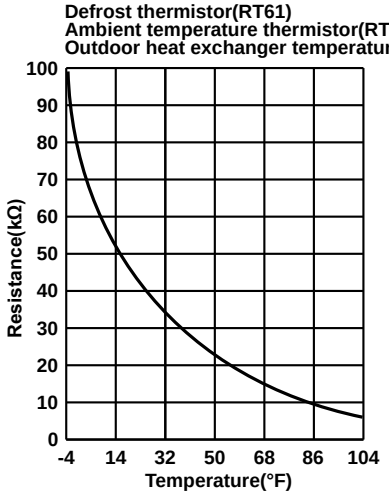
1. Devices affected by the electromagnetic noise
   TV sets, radios (FM/AM broadcast, shortwave)
2. Channel, frequency, broadcast station affected by the electromagnetic noise
3. Channel, frequency, broadcast station unaffected by the electromagnetic noise
4. Layout of:
   indoor/outdoor unit of the 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 STOP/OPERATE (OFF/ON) 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 STOP/OPERATE (OFF/ON) 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.

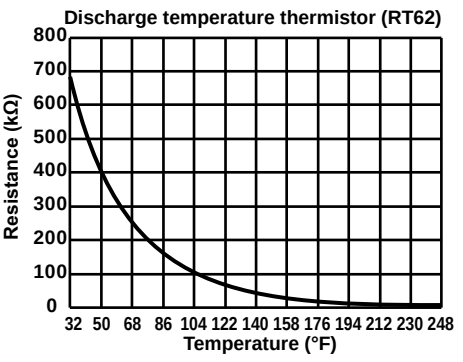
## 10-6. TEST POINT DIAGRAM AND VOLTAGE

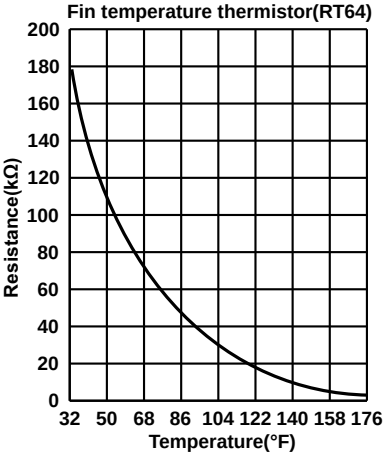
### 1. Inverter P.C. board

**MUZ-HM09NA-** U1 **MUZ-HM12NA-** U1
**MUZ-HM09NA2-** U1 **MUZ-HM12NA2-** U1



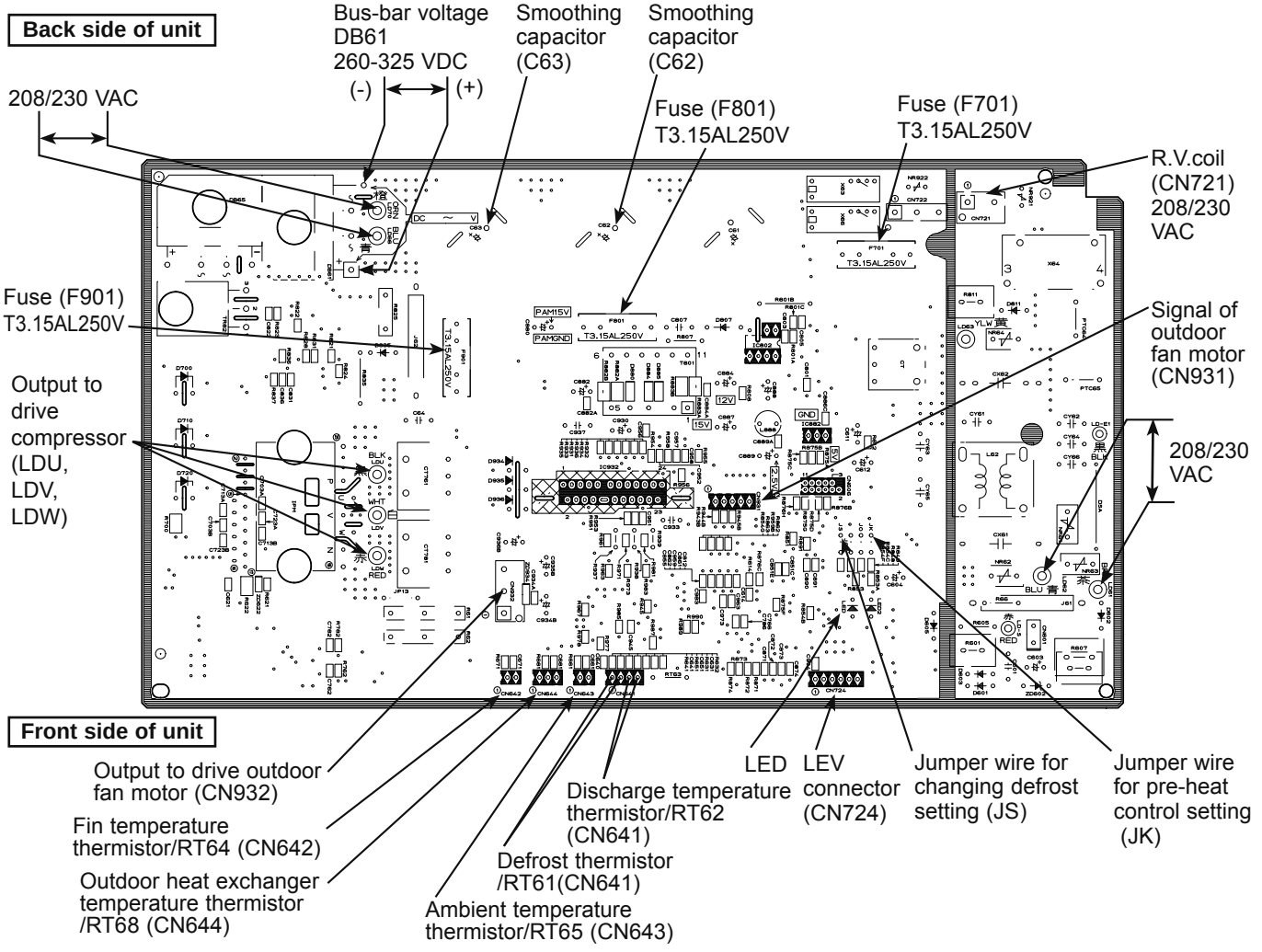



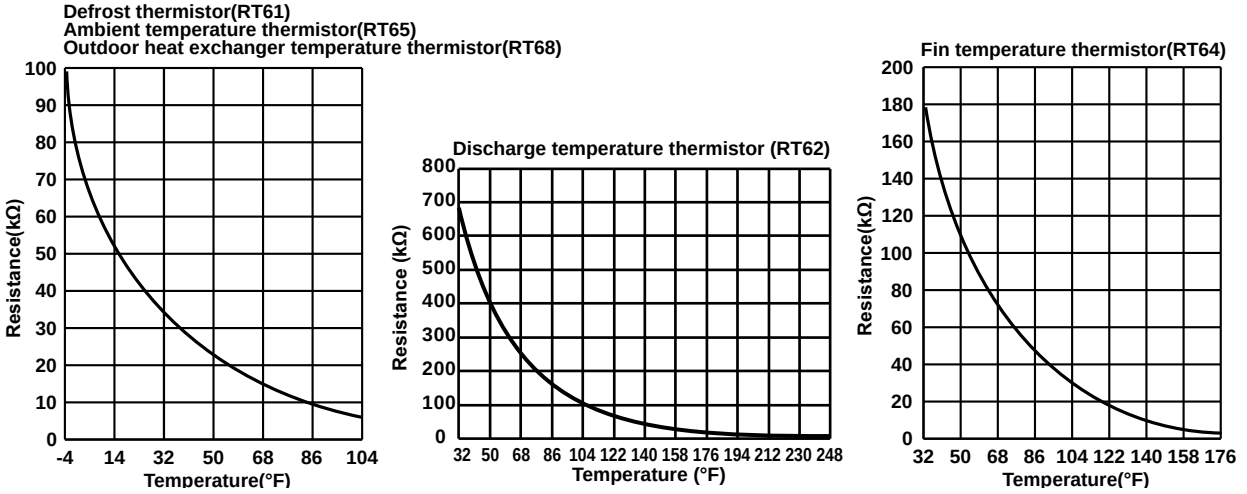



**1. Inverter P.C. board**

**MUZ-HM09NA-** U8 **MUZ-HM12NA-** U8
**MUZ-HM09NA2-** U8 **MUZ-HM12NA2-** U8

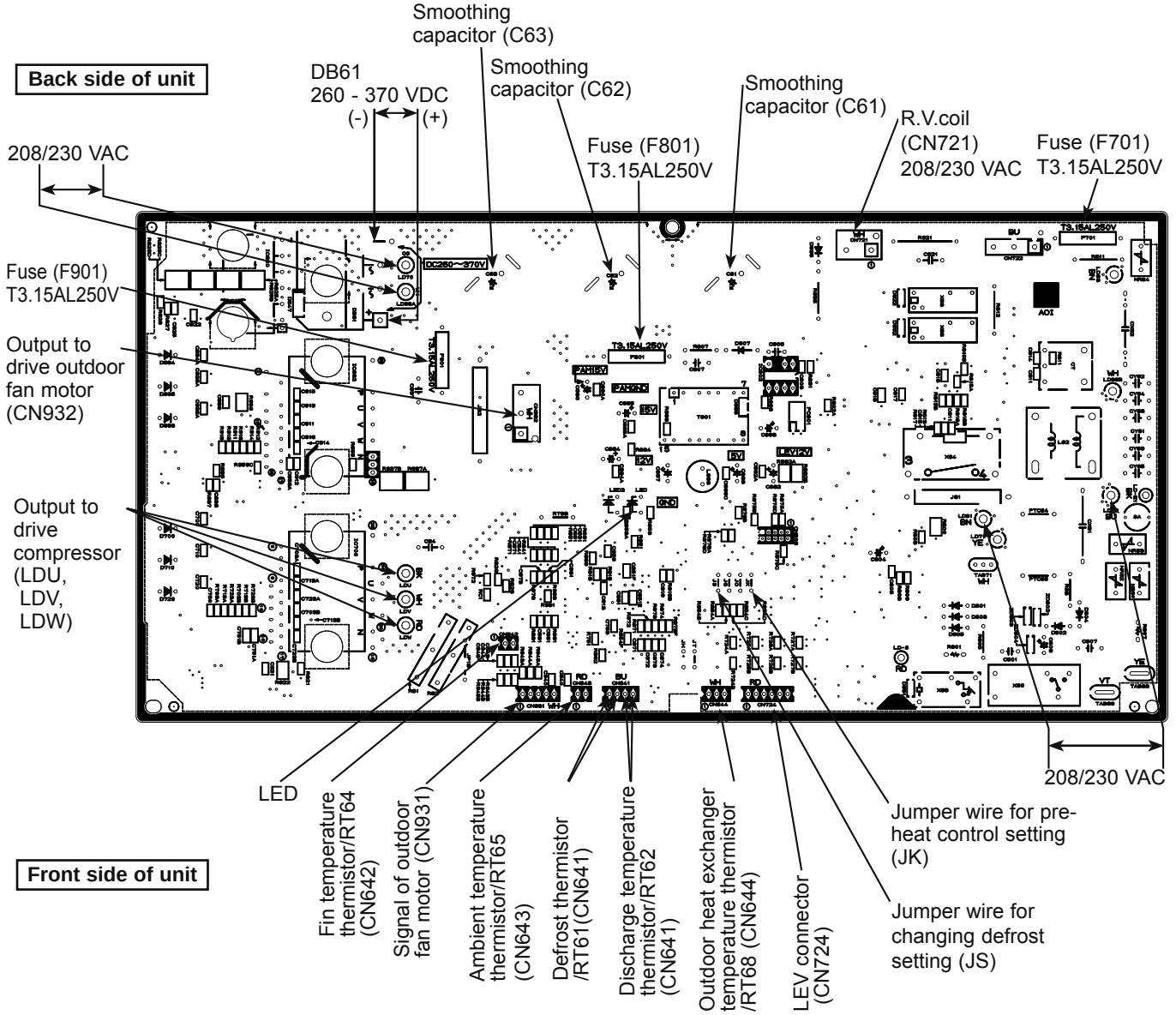


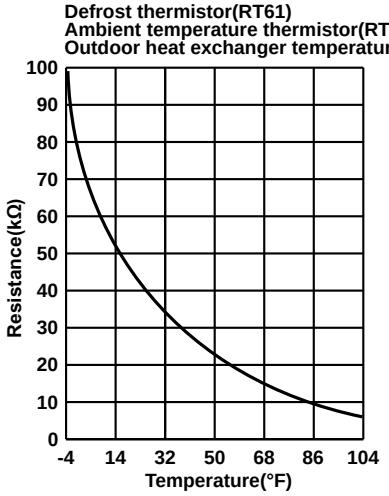



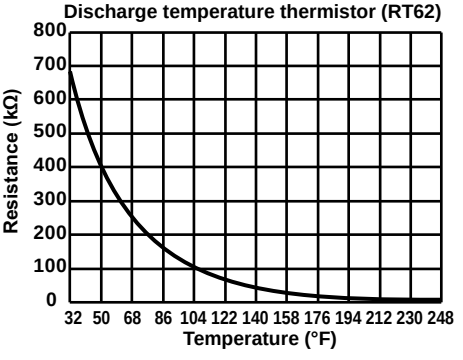
**1. Inverter P.C. board**

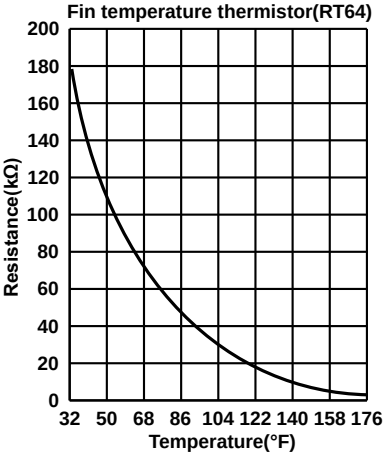
**MUZ-HM15NA MUZ-HM18NA**

**MUZ-HM15NA2 MUZ-HM18NA2**



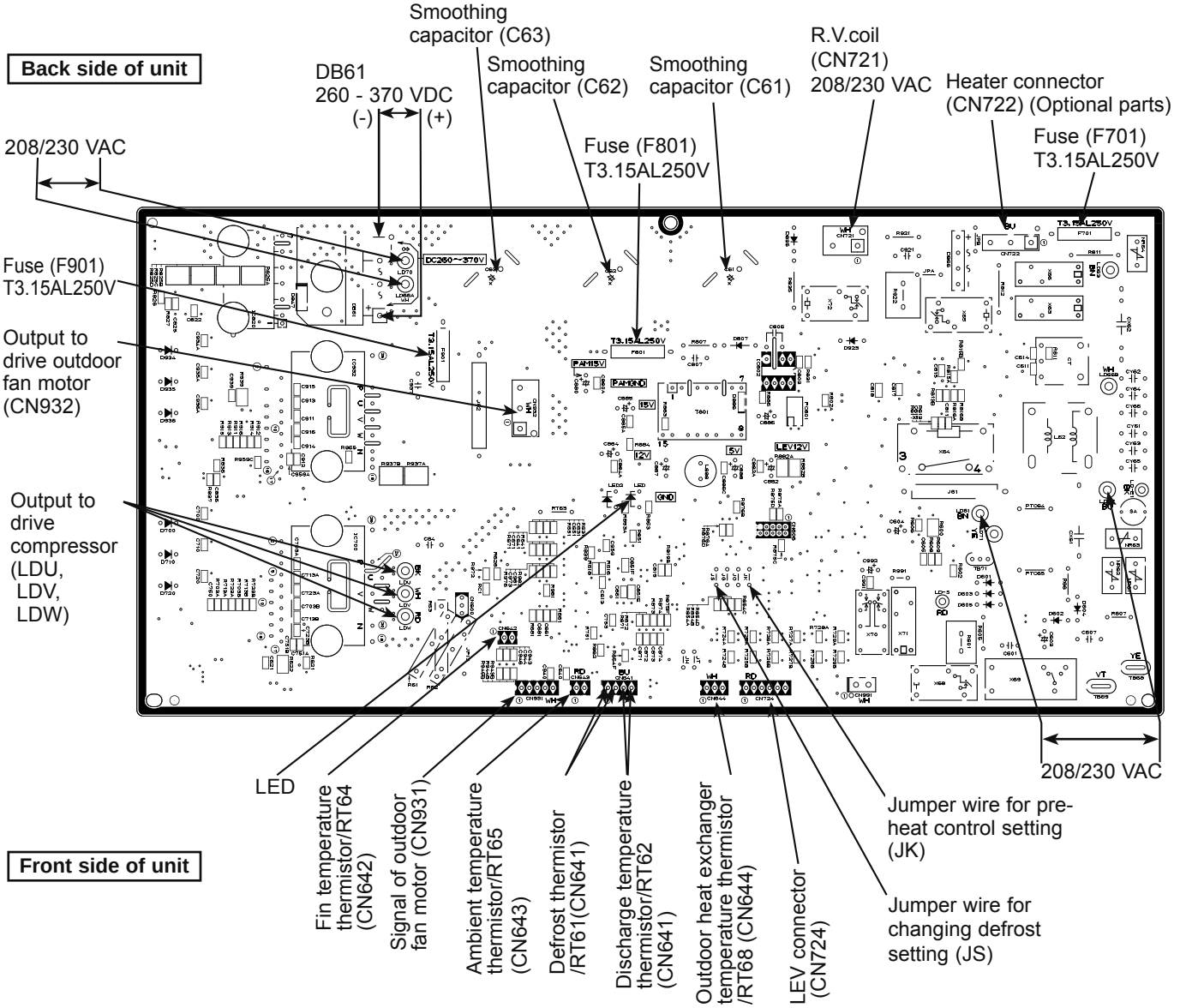



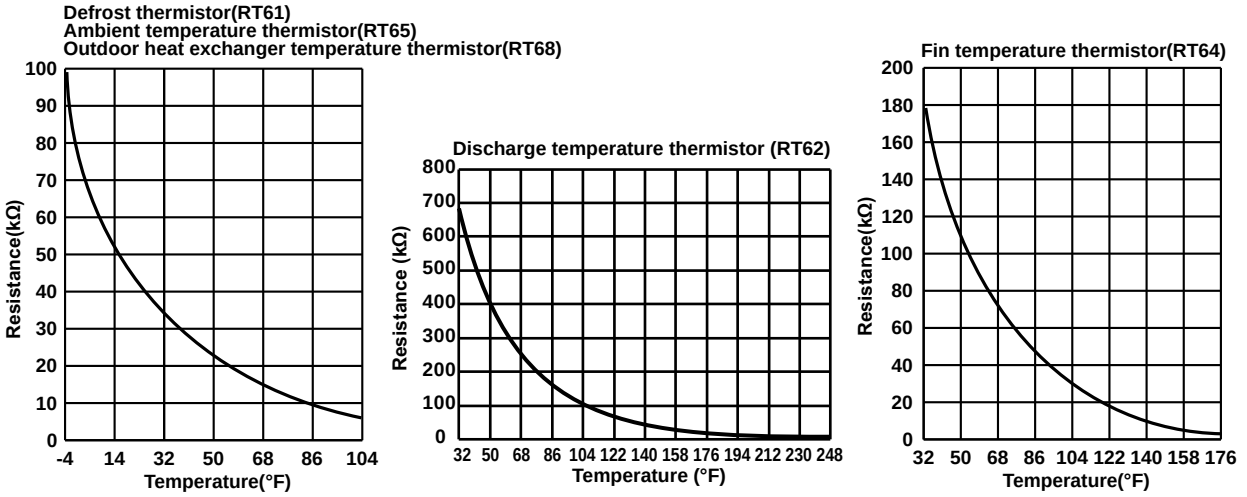



**1. Inverter P.C. board**

**MUZ-HM24NA**

**MUZ-HM24NA2**

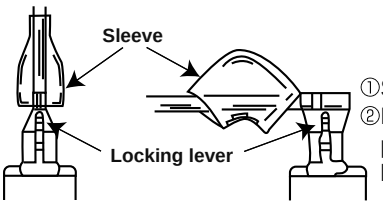


# 11 DISASSEMBLY INSTRUCTIONS

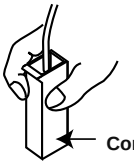
<"Terminal with locking mechanism" Detaching points>
The terminal which has the locking mechanism can be detached as shown below.
There are 2 types (refer to (1) and (2)) of the terminal with locking mechanism.
The terminal without locking mechanism can be detached by pulling it out.
Check the shape of the terminal before detaching.

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




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

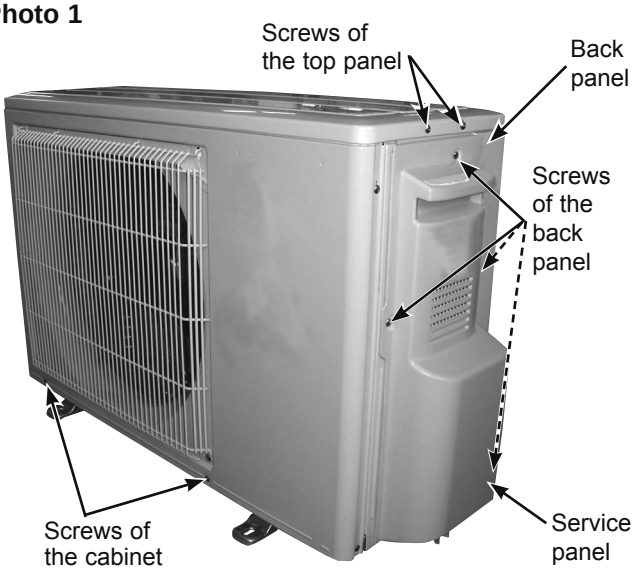
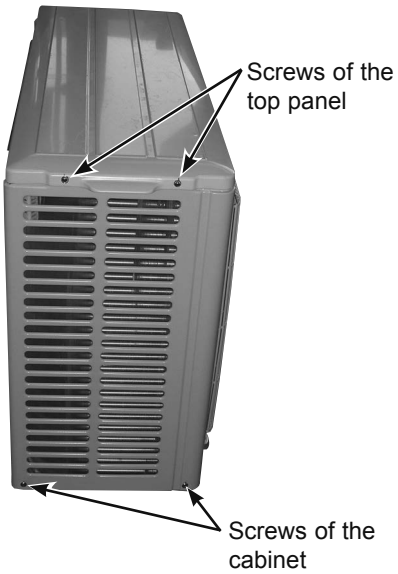
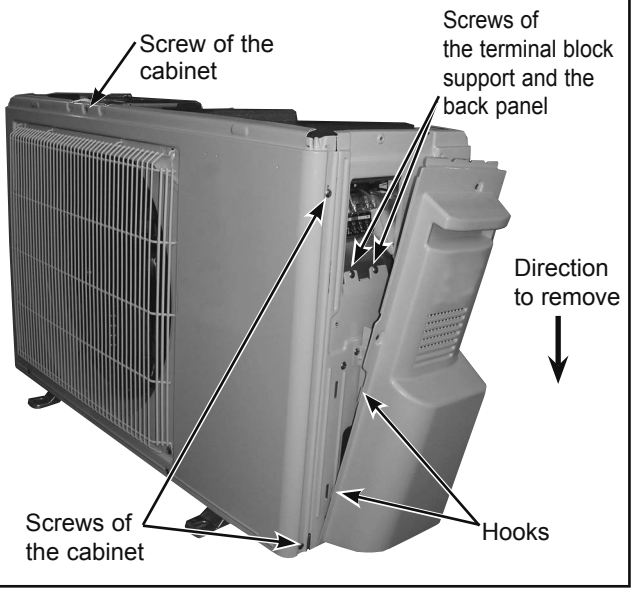
(2) The terminal with this connector has the locking mechanism.

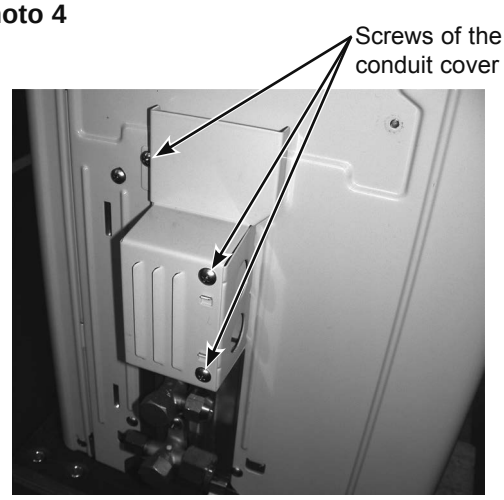
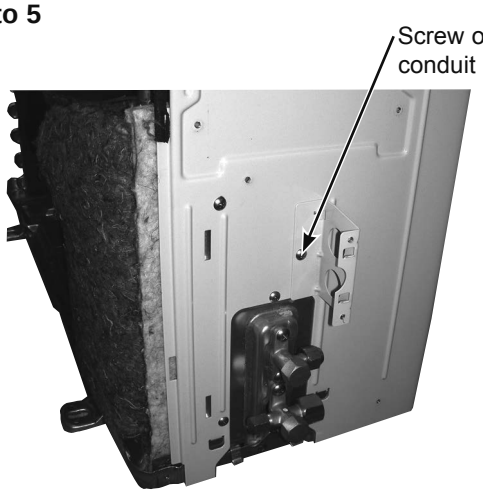
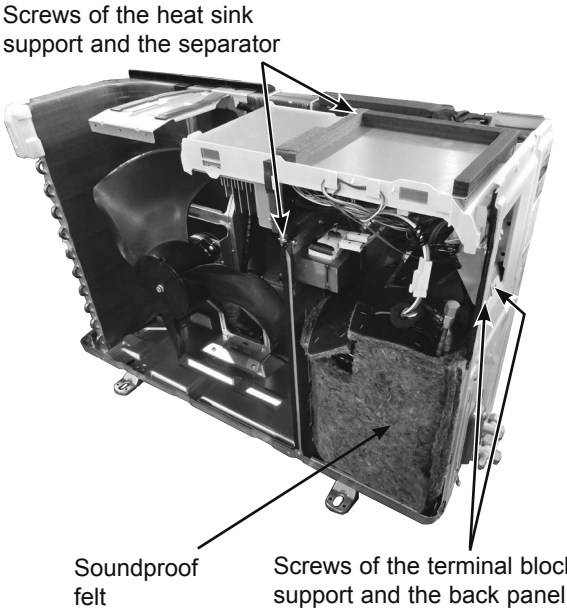
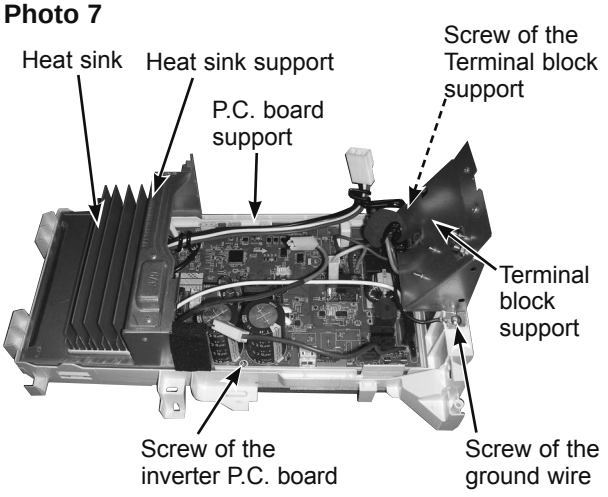


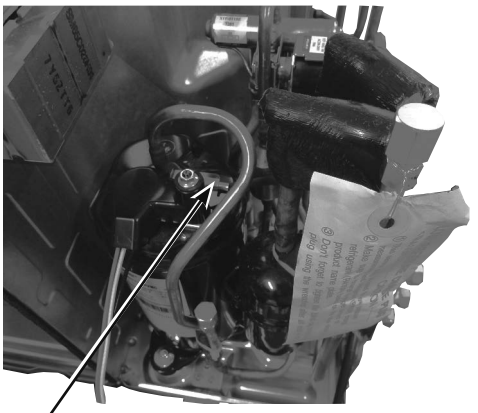
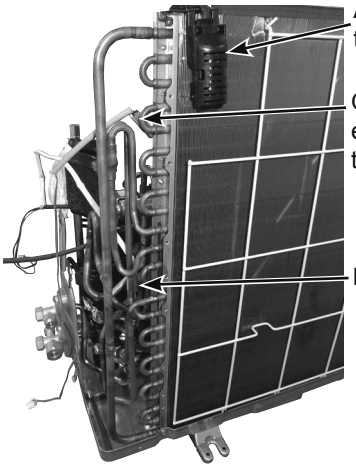

①Hold the sleeve, and pull out the terminal slowly.

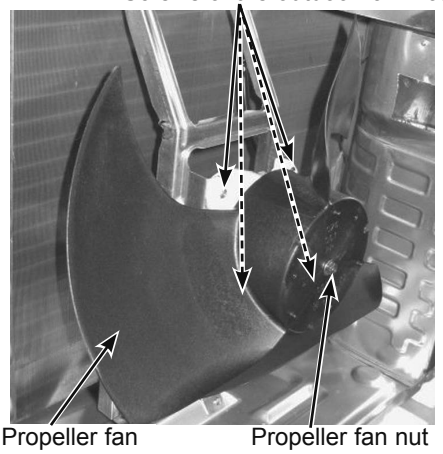
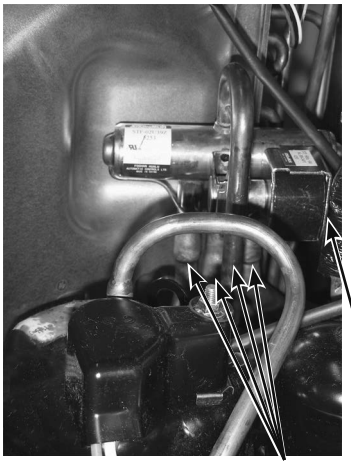
## 11-1. MUZ-HM09NA MUZ-HM12NA MUZ-HM09NA2 MUZ-HM12NA MUZ-HM15NA MUZ-HM18NA MUZ-HM15NA2 MUZ-HM18NA2

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

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

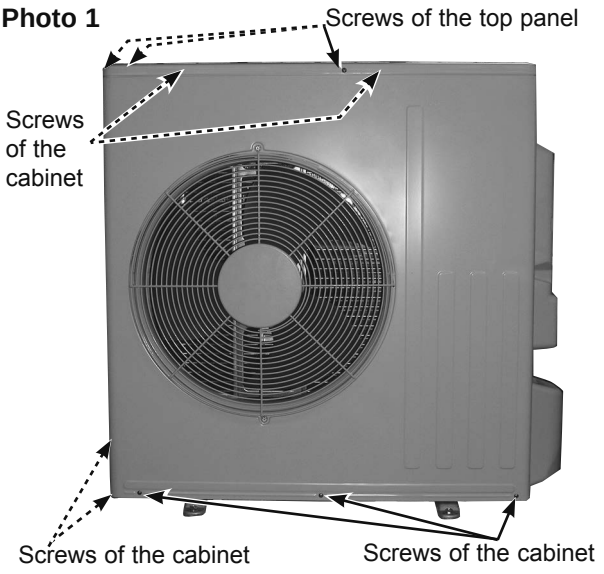
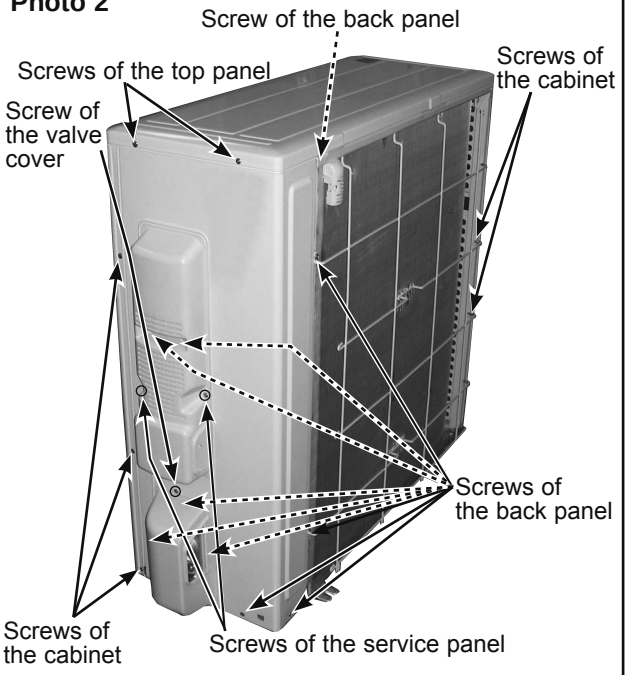
| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **Photo 4**<br>  <br> | **Photo 5**<br>  <br> |
| **2. Removing the inverter assembly, inverter P.C. board**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the lead wire to the reactor and the following connectors:<br><Inverter P.C. board><br>CN721 (R.V. coil)<br>CN931, CN932 (Fan motor)<br>CN641 (Defrost thermistor and discharge temperature thermistor)<br>CN643 (Ambient temperature thermistor)<br>CN644 (Outdoor heat exchanger temperature thermistor)<br>CN724 (LEV)<br>(3) Remove the compressor connector (CN61).<br>(4) Remove the screws fixing the heat sink support and the separator.<br>(5) Remove the fixing screws of the terminal block support and the back panel.<br>(6) Remove the inverter assembly.<br>(7) Remove the screw of the ground wire and screw of the terminal block support.<br>(8) Remove the heat sink support from the P.C. board support.<br>(9) Remove the screw of the inverter P.C. board and remove the inverter P.C. board from the P.C. board support. | **Photo 6**<br>  <br> |
| **3. Removing R.V. coil**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the following connectors:<br><Inverter P.C. board><br>CN721 (R.V. coil)<br>(3) Remove the R.V. coil. | **Photo 7**<br>  <br> |

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the lead wire to the reactor and the following connectors:<br><Inverter P.C. board><br>CN641 (Defrost thermistor and discharge temperature thermistor)<br>CN643 (Ambient temperature thermistor)<br>CN644 (Outdoor heat exchanger temperature thermistor)<br>(3) Pull out the discharge temperature thermistor from its holder.<br>(4) Pull out the defrost thermistor from its holder.<br>(5) Pull out the outdoor heat exchanger temperature thermistor from its holder.<br>(6) Pull out the ambient temperature thermistor from its holder. | **Photo 8**<br>  <br>Discharge temperature thermistor<br><br>**Photo 9**<br>  <br>Ambient temperature thermistor<br>Outdoor heat exchanger temperature thermistor<br>Defrost thermistor |

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **5. Removing outdoor fan motor**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the following connectors:<br><Inverter P.C. board><br>CN931, CN932 (Fan motor)<br>(3) Remove the propeller fan nut.<br>(4) Remove the propeller fan.<br>(5) Remove the screws fixing the fan motor.<br>(6) Remove the fan motor.<br>**NOTE**: The propeller fan nut is a revers thread. | **Photo 10**<br>Screws of the outdoor fan motor<br>  <br>Propeller fan<br>Propeller fan nut |
| **6. Removing the compressor and 4-way valve**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Remove the inverter assembly. (Refer to 2.)<br>(3) Remove the screws fixing the reactor.<br>(4) Remove the reactor.<br>(5) Remove the soundproof felt.<br>(6) Recover gas from the refrigerant circuit.<br>**NOTE:** Recover gas from the pipes until the pressure gauge shows 0 PSIG.<br>(7) Detach the brazed part of the suction and the discharge pipe connected with compressor.<br>(8) Remove the nuts fixing the compressor.<br>(9) Remove the compressor.<br>(10) Detach the brazed part of pipes connected with 4-way valve. | **Photo 11**<br>Screws of the reactor<br>  <br>Discharge pipe brazed part<br>Suction pipe brazed part |
| **Photo 12**<br>  <br>Screw of the R.V. coil<br>Brazed parts of 4-way valve | |

## 11-2. MUZ-HM24NA MUZ-HM24NA2

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

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **1. Removing the cabinet**<br>(1) Remove the screws of the service panel.<br>(2) Remove the screws of the top panel.<br>(3) Remove the screw of the valve cover.<br>(4) Remove the service panel.<br>(5) Remove the screws fixing the conduit cover.<br>(6) Remove the conduit cover.<br>(7) Remove the screw of fixing the conduit plate.<br>(8) Remove the conduit plate.<br>(9) Remove the top panel.<br>(10) Remove the valve cover.<br>(11) Disconnect the power supply and indoor/outdoor connecting wire.<br>(12) Remove the screws of the cabinet.<br>(13) Remove the cabinet.<br>(14) Remove the screws of the back panel.<br>(15) Remove the back panel. | **Photo 1**<br>  <br> |
| **Photo 3**<br>Screws of the conduit cover<br>  | **Photo 2**<br>  <br> |
| **Photo 4**<br>Screw of the conduit plate<br>  | |

## OPERATING PROCEDURE

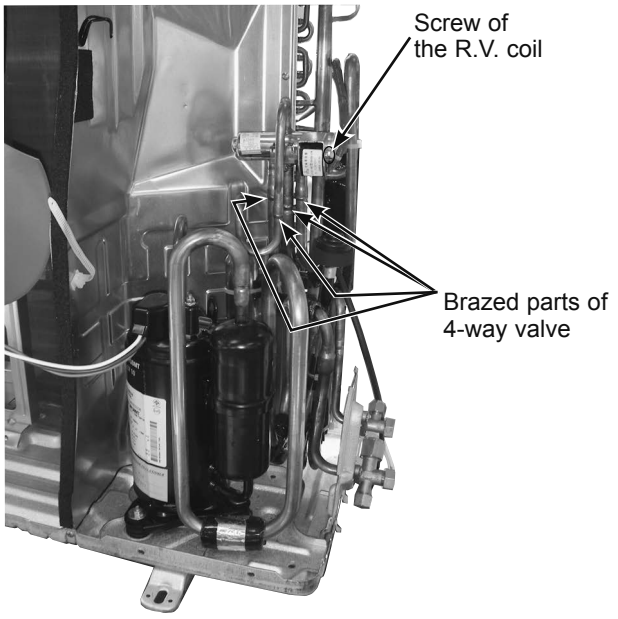
**2. Removing the inverter assembly, inverter P.C. board**

(1) Remove the cabinet and panels. (Refer to 1.)
(2) Disconnect the lead wire to the reactor and the following connectors:
<Inverter P.C. board>
CN721 (R.V. coil)
CN931, CN932 (Fan motor)
CN641 (Defrost thermistor and discharge temperature thermistor)
CN643 (Ambient temperature thermistor)
CN644 (Outdoor heat exchanger temperature thermistor)
CN724 (LEV)
(3) Remove the compressor connector.
(4) Remove the screw fixing the heat sink support and the separator.
(5) Remove the fixing screws of the terminal block support and the back panel.
(6) Remove the inverter assembly.
(7) Remove the screw of the ground wire, screw of the P.C. board cover and screws of the terminal block support.
(8) Remove the heat sink support from the P.C. board support.
(9) Remove the screw of the inverter P.C. board and the inverter P.C. board from the P.C. board support.

**3. Removing R.V. coil**

(1) Remove the cabinet and panels. (Refer to 1.)
(2) Disconnect the following connector:
<Inverter P.C. board>
CN721 (R.V. coil)
(3) Remove the R.V. coil.

**Photo 7**




## PHOTOS

**Photo 5**

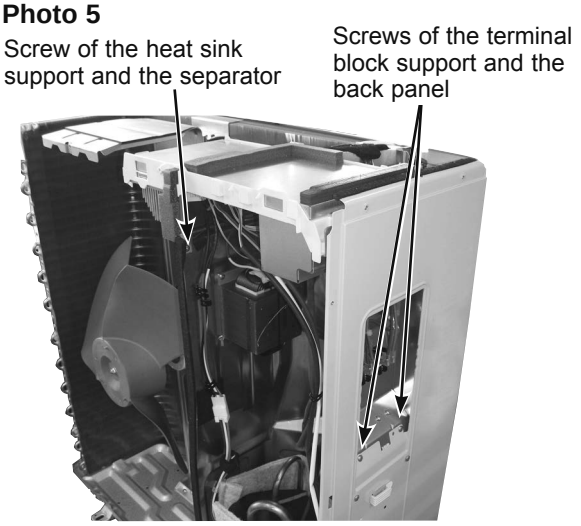
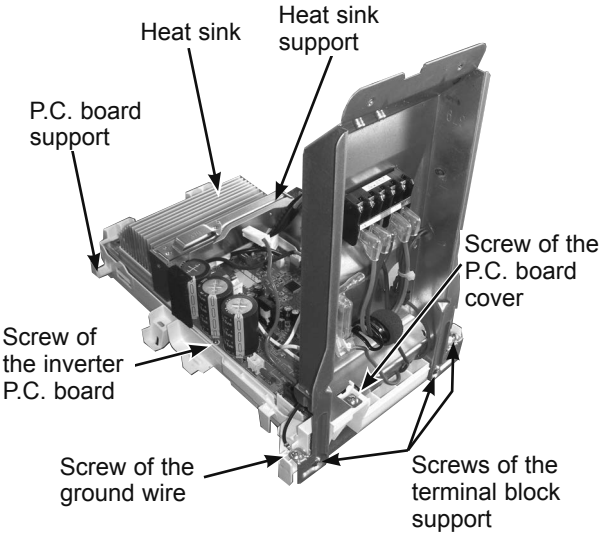
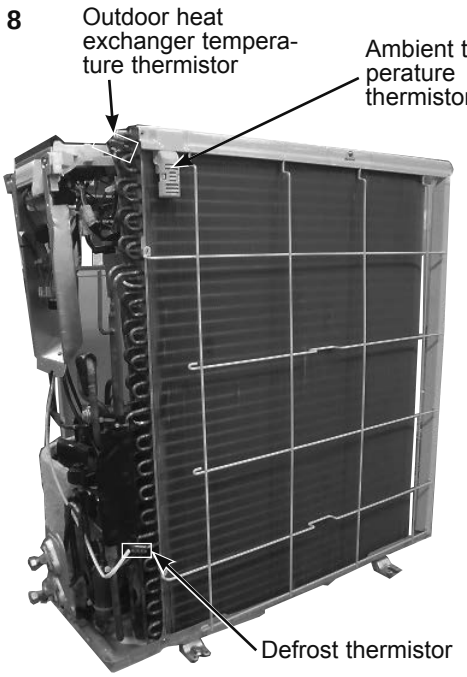
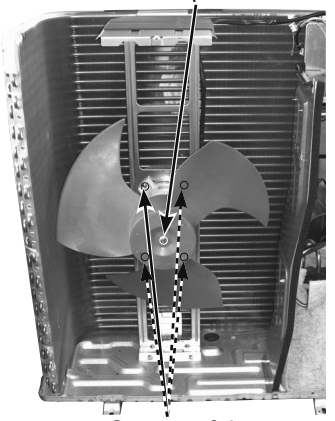
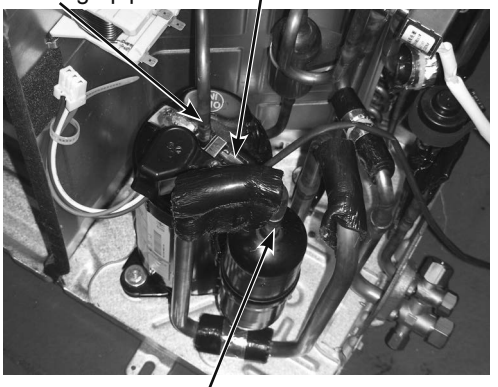



**Photo 6**



| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the lead wire to the reactor and the following connectors:<br><Inverter P.C. board><br>CN641 (Defrost thermistor and discharge temperature thermistor)<br>CN643 (Ambient temperature thermistor)<br>CN644 (Outdoor heat exchanger temperature thermistor)<br>(3) Pull out the discharge temperature thermistor from its holder.<br>(4) Pull out the defrost thermistor from its holder.<br>(5) Pull out the outdoor heat exchanger temperature thermistor from its holder.<br>(6) Pull out the ambient temperature thermistor from its holder. | **Photo 8**<br>  <br> |
| **5. Removing outdoor fan motor**<br>(1) Remove the top panel, cabinet and service panel. (Refer to 1.)<br>(2) Disconnect the following connectors:<br><Inverter P.C. board><br>CN931 and CN932 (Fan motor)<br>(3) Remove the propeller fan nut.<br>(4) Remove the propeller fan.<br>(5) Remove the screws fixing the fan motor.<br>(6) Remove the fan motor.<br>**NOTE**: The propeller fan nut is a reverse thread. | **Photo 9**<br>  <br> |
| **6. Removing the compressor and 4-way valve**<br>(1) Remove the top panel, cabinet and service panel. (Refer to 1.)<br>(2) Remove the back panel. (Refer to 1.)<br>(3) Remove the inverter assembly. (Refer to 2.)<br>(4) Recover gas from the refrigerant circuit.<br>**NOTE:** Recover gas from the pipes until the pressure gauge shows 0 PSIG.<br>(5) Detach the brazed part of the suction and the discharge pipe connected with compressor.<br>(6) Remove the compressor nuts.<br>(7) Remove the compressor.<br>(8) Detach the brazed part of 4-way valve and pipe. (Photo 7) | **Photo 10**<br>  <br> |

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BUILDING, 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN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**Issued: Feb. 2017. No. OBH747 REVISED EDITION-C**
**Issued: Mar. 2016. No. OBH747 REVISED EDITION-B**
**Issued: Feb. 2016. No. OBH747 REVISED EDITION-A**
**Published: Dec. 2015. No. OBH747**
**Made in Japan**