

June 2021

No. OCH699
REVISED EDITION-A

SERVICE MANUAL

R410A
Outdoor unit
[Model Name]

SUZ-KA09NA2
SUZ-KA09NAH2

SUZ-KA12NA2
SUZ-KA12NAH2

SUZ-KA15NA2
SUZ-KA15NAH2

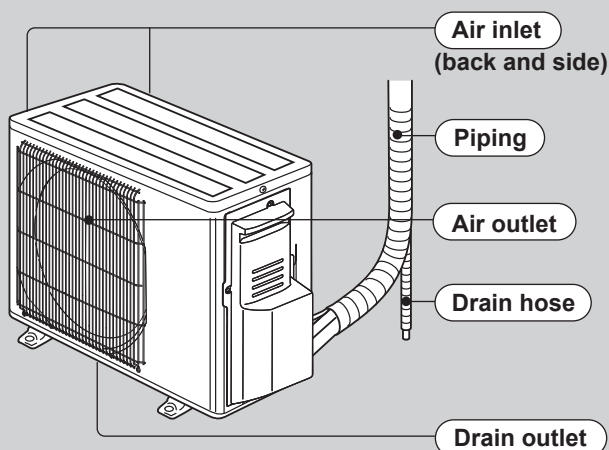
[Service Ref.]
SUZ-KA09NA2.MX
SUZ-KA09NAH2.MX
SUZ-KA12NA2.MX
SUZ-KA12NAH2.MX
SUZ-KA15NA2.MX
SUZ-KA15NAH2.MX
Revision:

Some descriptions have
been modified in REVISED
EDITION-A.

OCH699 is void.

Note:

- This service manual describes service data of the outdoor units only.


SUZ-KA09NA(H)2.MX

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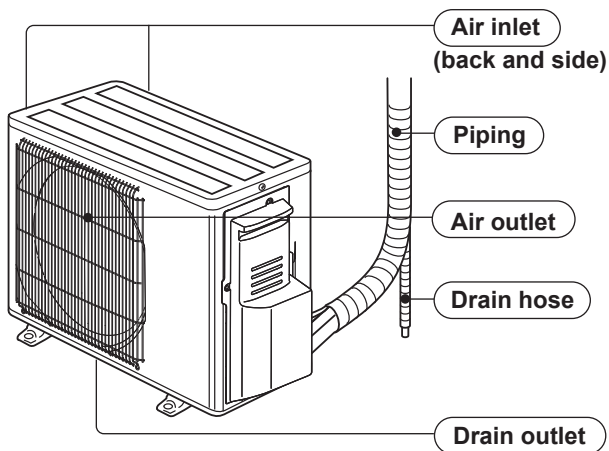
PARTS CATALOG (OCB699)

1 COMBINATION OF INDOOR AND OUTDOOR UNITS

| | Indoor unit | | Outdoor unit | | |
|-----------------------------------|------------------------|--------------------|-------------------|-------------------|-------------------|
| | | | Heat pump type | | |
| | | | SUZ- | | |
| | Service Ref. | Service Manual No. | KA09 NA(H)2.MX | KA12 NA(H)2.MX | KA15 NA(H)2.MX |
| Heat pump without electric heater | SLZ-KF09/12/15NA.TH | OCH699 | ○ | ○ | ○ |
| | SEZ-KD09/12/15NA4R1.TH | HWE08020 | ○ | ○ | ○ |
| | PEAD-A09/12/15AA7.MX | HWE1608A | ○ | ○ | ○ |
| | SVZ-KP12NA.MX | | — | ○ | — |
| | MLZ-KP09/12NA-U1 | OBH802 | ○ | ○ | — |

2 PART NAMES AND FUNCTIONS

SUZ-KA09NA(H)2.MX SUZ-KA12NA(H)2.MX SUZ-KA15NA(H)2.MX



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SPECIFICATION

| Outdoor unit model | | | SUZ-KA09NA(H)2 | SUZ-KA12NA(H)2 | SUZ-KA15NA(H)2 |
|--|-------------------|-------------------------------------|------------------------|--------------------|--------------------|
| Power supply | V , phase , Hz | | 208/230 , 1 , 60 | | |
| Max. fuse size (time delay) | A | | 15 | | |
| Min. circuit ampacity | A | | 9 | 9 | 10 |
| Fan motor | F.L.A | | 0.50 | | |
| Compressor | Model | | KNB073FRVMC | SNB092FQAMT | SNB130FQBMT |
| | | R.L.A | 6.2 | 6.6 | 7.4 |
| | | L.R.A | 7.7 | 8.2 | 9.3 |
| | | Refrigeration oil oz(L)/ (Model) | 9.1(0.27)/(FV50S) | 11.8(0.35)/(FV50S) | 11.8(0.35)/(FV50S) |
| Refrigerant control | | | Linear expansion valve | | |
| Sound level*1 | Cooling | dB(A) | 48 | 49 | 49 |
| | Heating | dB(A) | 50 | 51 | 51 |
| Defrost method | | | Reverse cycle | | |
| Dimensions | W | in | 31-1/2 | | |
| | D | in | 11-1/4 | | |
| | H | in | 21-5/8 | | |
| Weight | | lb | 81 | | |
| External finish | | | Munsell 3Y 7.8/1.1 | | |
| Control voltage (by built-in transformer) | | VDC | 12 - 24 | | |
| Refrigerant piping | | | Not supplied | | |
| Refrigerant pipe size (Min. wall thickness) | Liquid | in | 1/4 (0.0315) | | |
| | Gas | in | 3/8 (0.0315) | | 1/2 (0.0315) |
| Connection method | Indoor | | Flared | | |
| | Outdoor | | Flared | | |
| Between the indoor & outdoor units | Height difference | ft | 40 | | |
| | Piping length | ft | 65 | | |
| Refrigerant charge (R410A) | | | 2 lb 5 oz | 2 lb 9 oz | |

Note: Test conditions are based on AHRI 210/240.

Rating conditions (Cooling) — Indoor: 80°F D.B., 67°F W.B., Outdoor: 95°F D.B., (75°F W.B.)
(Heating) — Indoor: 70°F D.B., 60°F W.B., Outdoor: 47°F D.B., 43°F W.B.

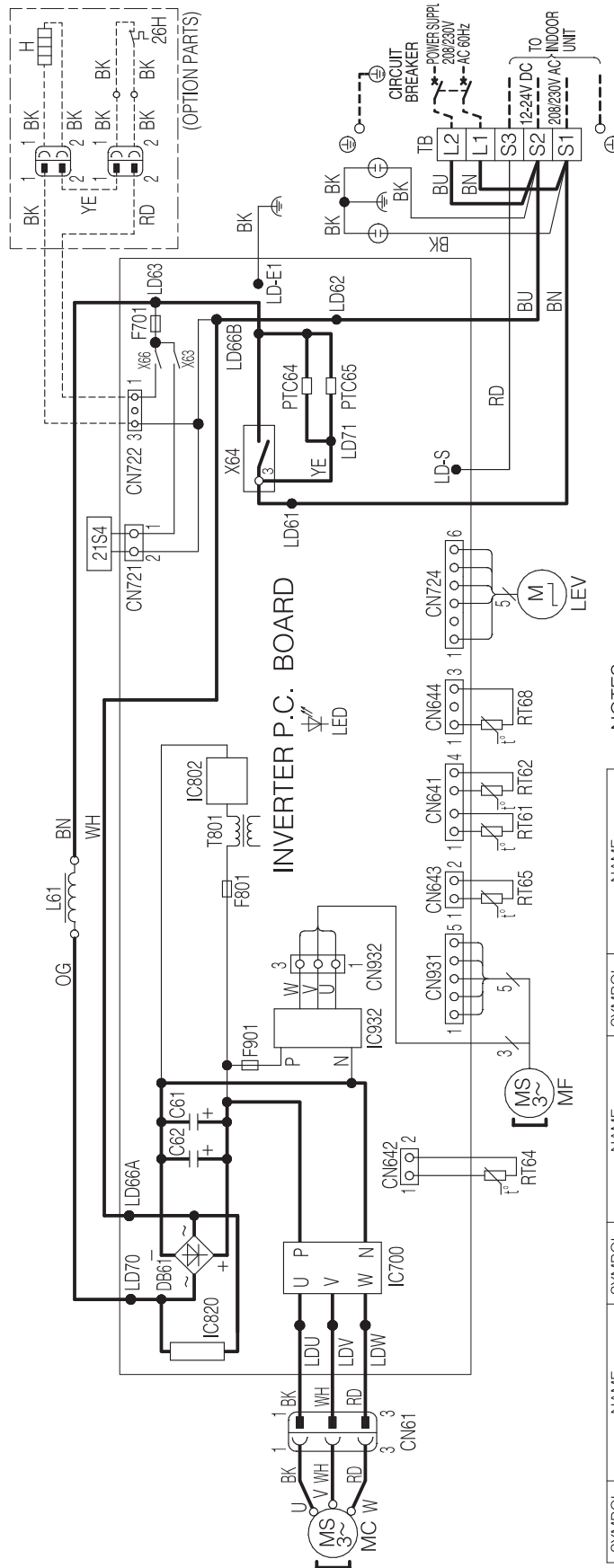
OPERATING RANGE

(1) POWER SUPPLY

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

SUZ-KA09NA2.MX

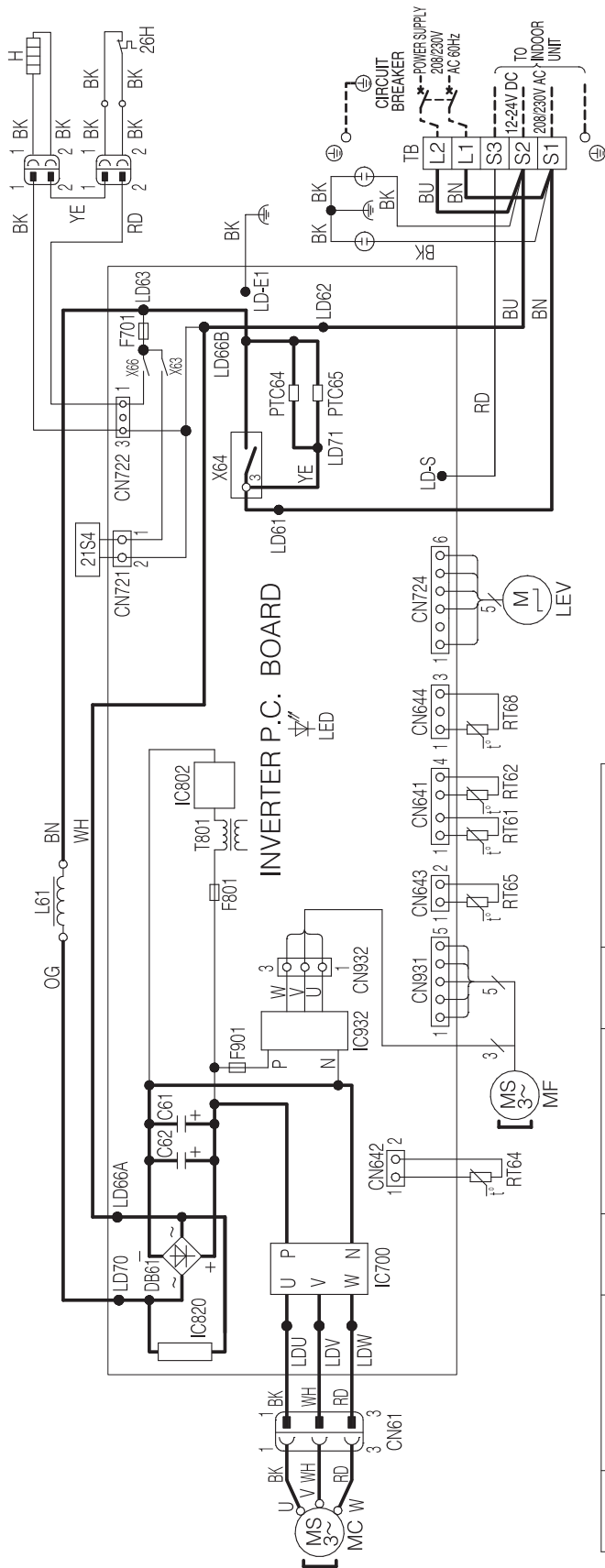
SUZ-KA12NA2.MX



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

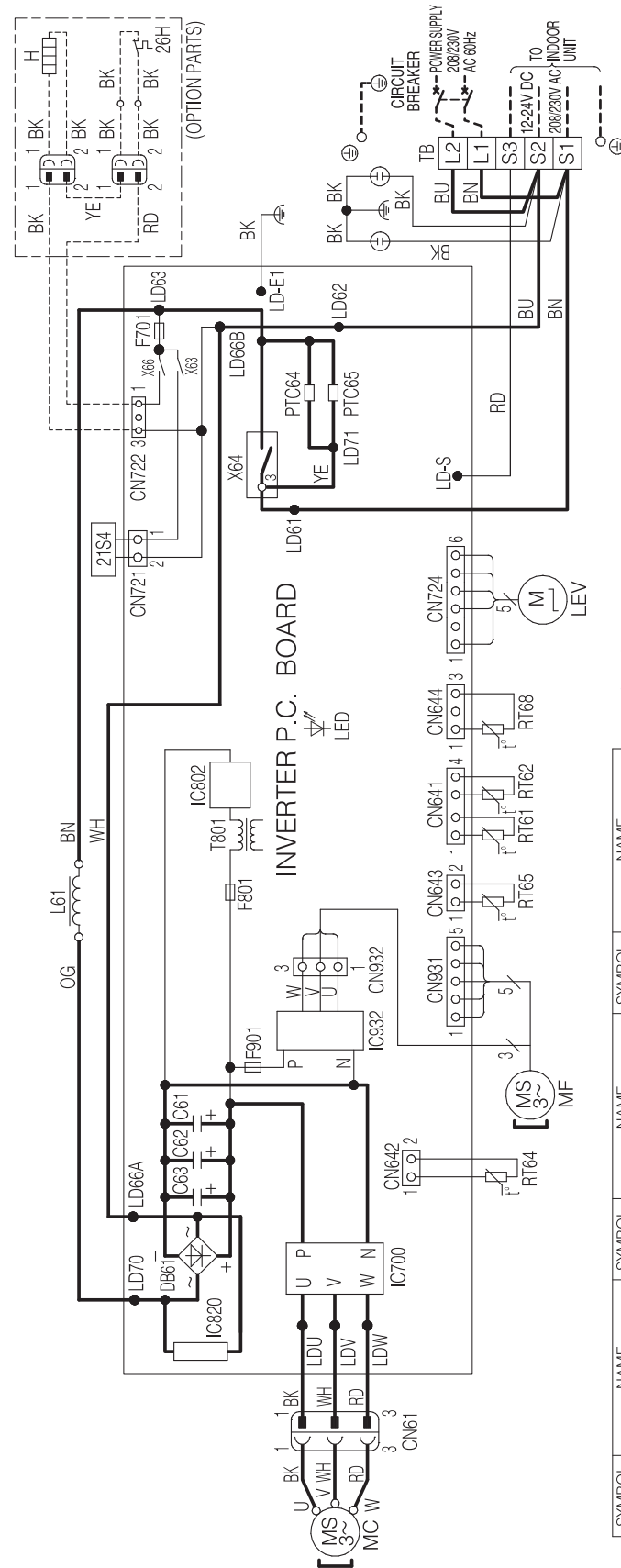
| SYMBOL | NAME | SYMBOL | NAME |
|---------------------|-------------------------------|---------------|---|
| C61, C62 | SMOOTHING CAPACITOR | L61 | REACTOR |
| DB61 | DIODE MODULE | MC | COMPRESSOR |
| F701, F801, F901 | FUSE (T3, 15A/250V) | MF | FAN MOTOR |
| H | DEFROST HEATER (OPTION PARTS) | PTC64, PTC65 | CIRCUIT PROTECTION |
| IC700, IC820, IC932 | POWER MODULE | RT61 | DEFROST THERMISTOR |
| IC802 | POWER DEVICE | RT62 | DISCHARGE TEMP. THERMISTOR |
| LED | LED | RT64 | FIN TEMP. THERMISTOR |
| LEV | EXPANSION VALVE COIL | RT65 | AMBIENT TEMP. THERMISTOR |
| | | RT66 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR |
| | | TB | TERMINAL BLOCK |
| | | T801 | TRANSFORMER |
| | | X63, X64, X66 | RELAY |
| | | 21S4 | REVERSING VALVE COIL |
| | | 26H | HEATER PROTECTOR (OPTION PARTS) |



- 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

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|-------------------|----------------------|--------------|----------------------------|---------------|------------------------|
| C61,C62 | SMOOTHING CAPACITOR | L61 | REACTOR | RT68 | OUTDOOR HEAT EXCHANGER |
| DB61 | DIODE MODULE | MC | COMPRESSOR | | TEMP. THERMISTOR |
| F701,F801,F901 | FUSE (T3, 15A/250V) | MF | FAN MOTOR | TB | TERMINAL BLOCK |
| H | DEFROST HEATER | 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 |
| LEV | EXPANSION VALVE COIL | RT65 | AMBIENT TEMP. THERMISTOR | | |

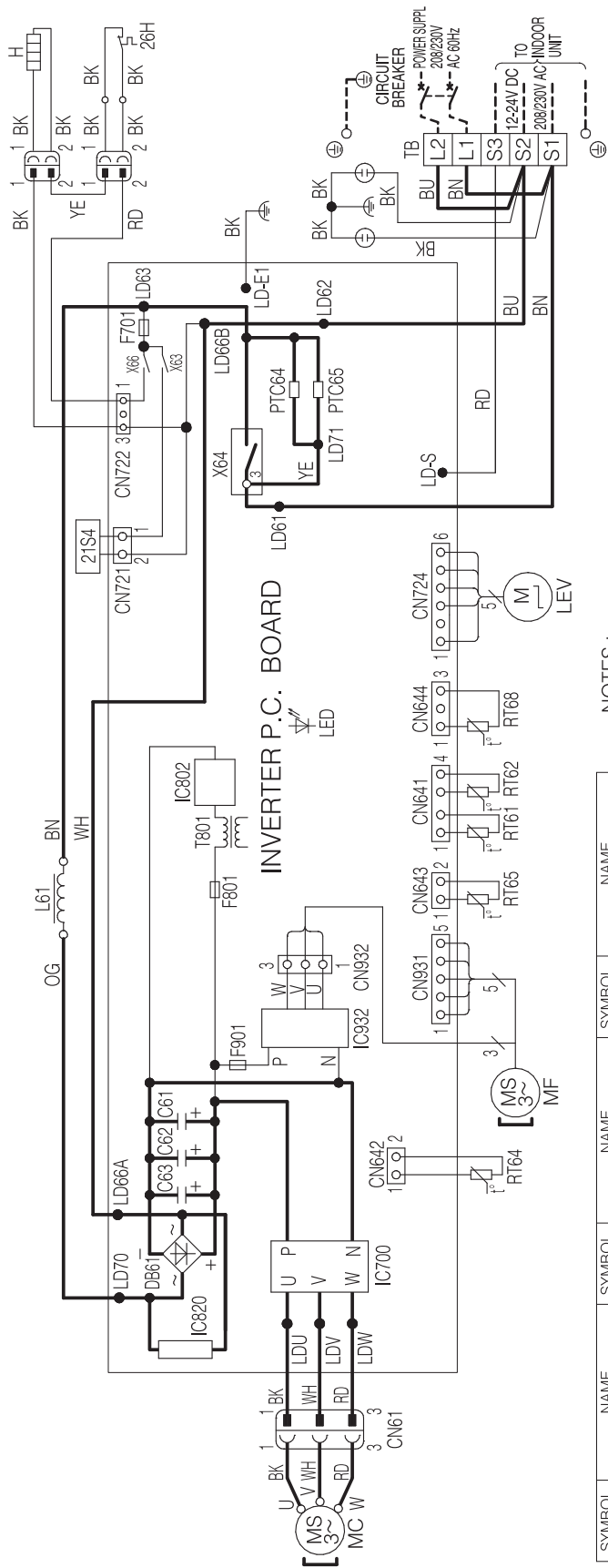
SUZ-KA15NA2.MX



- 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

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---------------------|-------------------------------|--------------|----------------------------|---------------|---------------------------------|
| C61, C62, C63 | SMOOTHING CAPACITOR | L61 | REACTOR | RT68 | OUTDOOR HEAT EXCHANGER |
| DB61 | DIODE MODULE | MC | COMPRESSOR | | TEMP. THERMISTOR |
| F701, F801, F901 | FUSE (T3, 15A/250V) | MF | FAN MOTOR | TB | TERMINAL BLOCK |
| H | DEFROST HEATER (OPTION PARTS) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| IC700, IC820, IC832 | POWER MODULE | RT61 | DEFROST THERMISTOR | X63, X64, X66 | RELAY |
| IC802 | DISCHARGE TEMP. THERMISTOR | RT62 | DISCHARGE TEMP. THERMISTOR | 21S4 | REVERSING VALVE COIL |
| LED | LED | RT64 | FIN TEMP. THERMISTOR | | HEATER PROTECTOR (OPTION PARTS) |
| LEV | EXPANSION VALVE COIL | RT65 | AMBIENT TEMP. THERMISTOR | | |

SUZ-KA15NAH2.MX



- 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

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

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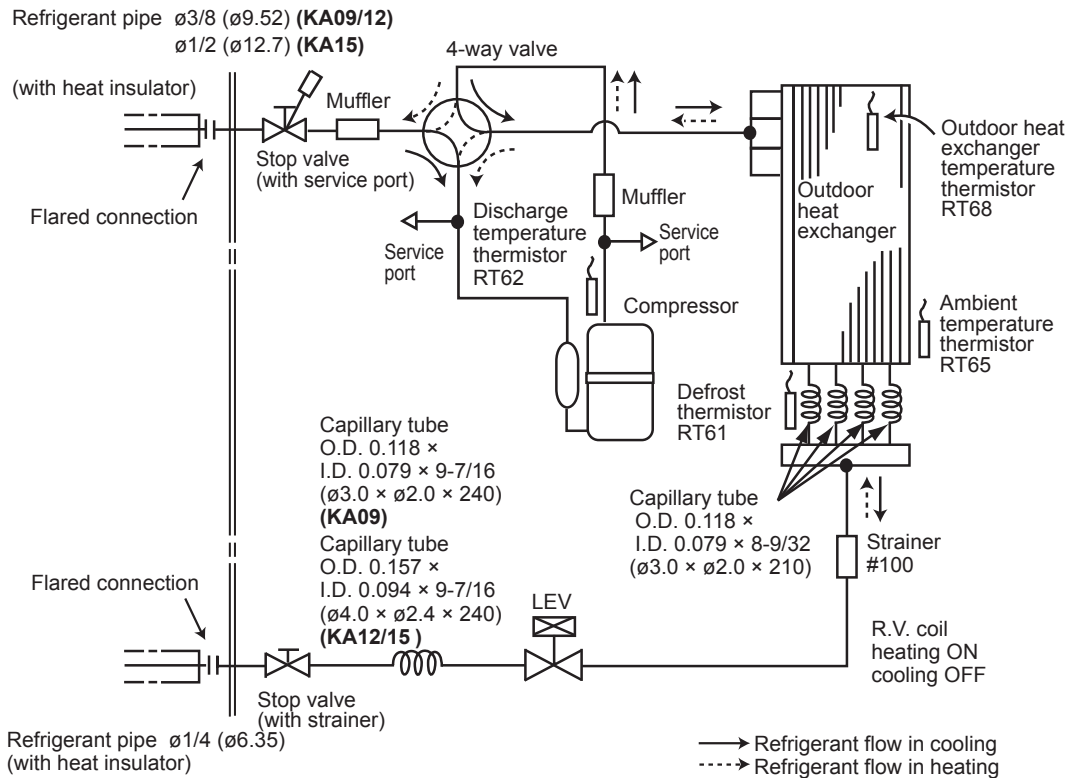
REFRIGERANT SYSTEM DIAGRAM

SUZ-KA09NA(H)2.MX

SUZ-KA12NA(H)2.MX

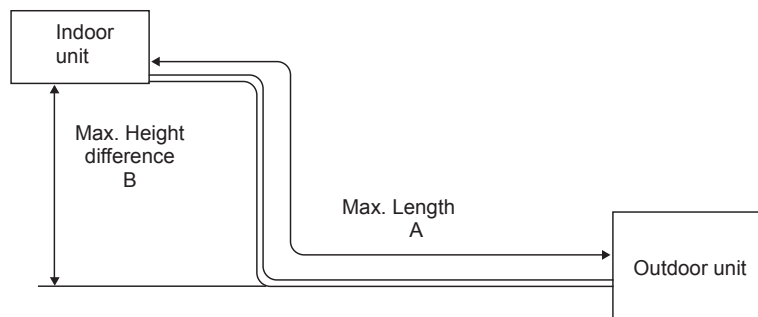
SUZ-KA15NA(H)2.MX

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 |
| SUZ-KA 09/12/15NA(H)2 | 65 | 40 | $3/8$ (KA09/12) $1/2$ (KA15) | $1/4$ |



ADDITIONAL REFRIGERANT CHARGE (R410A: oz)

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 |
| SUZ-KA09NA(H)2 | 2 lb 5 oz | 0 | 1.08 | 2.16 | 3.24 | 4.32 | 5.4 |
| SUZ-KA12NA(H)2 | 2 lb 9 oz | | | | | | |
| SUZ-KA15NA(H)2 | | | | | | | |

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

STANDARD OPERATION DATA

| Representative matching | | | SEZ-KD09NA4 | | SEZ-KD12NA4 | | SEZ-KD15NA4 | | |
|-------------------------|-----------------------------|-------|----------------|---------|----------------|---------|----------------|---------|-----|
| Item | | Unit | Cooling | Heating | Cooling | Heating | Cooling | Heating | |
| Total | Capacity | BTU/h | 9000 | 12000 | 12000 | 15000 | 15000 | 18000 | |
| | SHF | - | 0.82 | — | 0.82 | — | 0.86 | — | |
| | Input | kW | 0.7 | 1.1 | 0.93 | 1.33 | 1.15 | 1.44 | |
| Electrical circuit | Indoor unit | | SEZ-KD09NA4 | | SEZ-KD12NA4 | | SEZ-KD15NA4 | | |
| | Power supply (V, phase, Hz) | | 230, 1, 60 | | | | | | |
| | Input | kW | 0.06 | 0.04 | 0.07 | 0.05 | 0.09 | 0.07 | |
| | Current | A | 0.5 | 0.39 | 0.57 | 0.46 | 0.74 | 0.63 | |
| | Outdoor unit | | SUZ-KA09NA(H)2 | | SUZ-KA12NA(H)2 | | SUZ-KA15NA(H)2 | | |
| | Power supply (V, phase, Hz) | | 230, 1, 60 | | | | | | |
| | Input | kW | 0.64 | 1.06 | 0.86 | 1.28 | 1.06 | 1.37 | |
| | Current | A | 2.89 | 4.64 | 3.47 | 5.29 | 4.24 | 5.63 | |
| Refrigerant circuit | Condensing pressure | PSIG | 358 | 473 | 387 | 441 | 415 | 386 | |
| | Suction pressure | PSIG | 133 | 110 | 147 | 99 | 141 | 99 | |
| | Discharge temperature | °F | 160 | 169 | 167 | 168 | 166 | 167 | |
| | Condensing temperature | °F | 109 | 114 | 114 | 124 | 119 | 114 | |
| | Suction temperature | °F | 63 | 36 | 66 | 31 | 55 | 31 | |
| | Ref. pipe length | ft | 25 | | | | | | |
| | Refrigerant charge (R410A) | - | 1.05 | | 1.15 | | 1.15 | | |
| 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 | 59 | 104 | 57 | 105 | 57 | 101 |
| Outdoor unit | Intake air temperature | DB | °F | 95 | 47 | 95 | 47 | 95 | 47 |
| | | WB | °F | 75 | 43 | 75 | 43 | 75 | 43 |

| Representative matching | | | SLZ-KF09NA | | SLZ-KF12NA | | SLZ-KF15NA | | |
|-------------------------|-----------------------------|-------|----------------|---------|----------------|---------|----------------|---------|-----|
| Item | | Unit | Cooling | Heating | Cooling | Heating | Cooling | Heating | |
| Total | Capacity | BTU/h | 9000 | 11000 | 12000 | 13000 | 14100 | 18000 | |
| | SHF | - | 0.87 | — | 0.74 | — | 0.75 | — | |
| | Input | kW | 0.67 | 0.81 | 0.9 | 1.31 | 1.15 | 1.73 | |
| Electrical circuit | Indoor unit | | SLZ-KF09NA | | SLZ-KF12NA | | SLZ-KF15NA | | |
| | Power supply (V, phase, Hz) | | 230, 1, 60 | | | | | | |
| | Input | kW | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | |
| | Current | A | 0.2 | 0.15 | 0.24 | 0.19 | 0.32 | 0.27 | |
| | Outdoor unit | | SUZ-KA09NA(H)2 | | SUZ-KA12NA(H)2 | | SUZ-KA15NA(H)2 | | |
| | Power supply (V, phase, Hz) | | 230, 1, 60 | | | | | | |
| | Input | kW | 0.65 | 0.79 | 0.88 | 1.29 | 1.12 | 1.7 | |
| | Current | A | 2.67 | 3.34 | 3.67 | 5.48 | 4.82 | 7.38 | |
| Refrigerant circuit | Condensing pressure | PSIG | 358 | 393 | 391 | 483 | 397 | 490 | |
| | Suction pressure | PSIG | 131 | 113 | 142 | 104 | 127 | 101 | |
| | Discharge temperature | °F | 159 | 167 | 167 | 159 | 168 | 191 | |
| | Condensing temperature | °F | 108 | 115 | 115 | 131 | 116 | 131 | |
| | Suction temperature | °F | 56 | 40 | 62 | 33 | 54 | 32 | |
| | Ref. pipe length | ft | 25 | | | | | | |
| | Refrigerant charge (R410A) | - | 1.05 | | 1.15 | | 1.15 | | |
| 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 | 57 | 103 | 56 | 105 | 57 | 112 |
| Outdoor unit | Intake air temperature | DB | °F | 95 | 47 | 95 | 47 | 95 | 47 |
| | | WB | °F | 75 | 43 | 75 | 43 | 75 | 43 |



| Representative matching | | | PEAD-A09AA7 | | PEAD-A12AA7 | | PEAD-A15AA7 | | |
|-------------------------|-----------------------------|-------|----------------|---------|----------------|---------|----------------|---------|----|
| Item | | Unit | Cooling | Heating | Cooling | Heating | Cooling | Heating | |
| Total | Capacity | BTU/h | 9000 | 12000 | 12000 | 15000 | 15000 | 18000 | |
| | SHF | - | 0.9 | — | 0.9 | — | 0.9 | — | |
| | Input | kW | 0.72 | 0.9 | 0.93 | 1.16 | 1.15 | 1.35 | |
| Electrical circuit | Indoor unit | | PEAD-A09AA7 | | PEAD-A12AA7 | | PEAD-A15AA7 | | |
| | Power supply (V, phase, Hz) | | 230, 1, 60 | | | | | | |
| | Input | kW | 0.07 | 0.05 | 0.09 | 0.07 | 0.11 | 0.09 | |
| | Current | A | 0.54 | 0.43 | 0.67 | 0.56 | 0.95 | 0.84 | |
| | Outdoor unit | | SUZ-KA09NA(H)2 | | SUZ-KA12NA(H)2 | | SUZ-KA15NA(H)2 | | |
| | Power supply (V, phase, Hz) | | 230, 1, 60 | | | | | | |
| | Input | kW | 0.65 | 0.85 | 0.84 | 1.09 | 1.04 | 1.26 | |
| | Current | A | 2.55 | 3.48 | 3.36 | 4.45 | 4.01 | 5.01 | |
| Refrigerant circuit | Condensing pressure | PSIG | 358 | 380 | 383 | 374 | 412 | 343 | |
| | Suction pressure | PSIG | 133 | 111 | 153 | 93 | 144 | 97 | |
| | Discharge temperature | °F | 157 | 162 | 167 | 175 | 165 | 167 | |
| | Condensing temperature | °F | 108 | 113 | 113 | 111 | 119 | 105 | |
| | Suction temperature | °F | 57 | 38 | 49 | 40 | 57 | 38 | |
| | Ref. pipe length | ft | 25 | | | | | | |
| | Refrigerant charge (R410A) | - | 1.05 | | 1.15 | | | | |
| 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 | 103 | 59 | 100 | 58 | 99 |
| Outdoor unit | Intake air temperature | DB | °F | 95 | 47 | 95 | 47 | 95 | 47 |
| | | WB | °F | 75 | 43 | 75 | 43 | 75 | 43 |

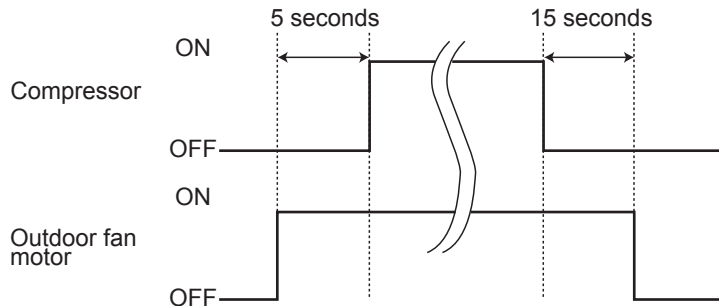
| Representative matching | | | SVZ-KP12NA | | MLZ-KP09NA | | MLZ-KP12NA | | |
|-------------------------|-----------------------------|-------|----------------|---------|----------------|---------|----------------|---------|---------|
| Item | | | Unit | Cooling | Heating | Cooling | Heating | Cooling | Heating |
| Total | Capacity | BTU/h | 12000 | 11000 | 9000 | 12000 | 12000 | 15400 | |
| | SHF | - | 0.89 | — | 0.82 | — | 0.74 | — | |
| | Input | kW | 0.94 | 1.24 | 0.71 | 0.86 | 0.96 | 1.3 | |
| Electrical circuit | Indoor unit | | SVZ-KP12NA | | MLZ-KP09NA | | MLZ-KP12NA | | |
| | Power supply (V, phase, Hz) | | 230, 1, 60 | | 230, 1, 60 | | | | |
| | Input | kW | 0.1 | | 0.04 | | | | |
| | Current | A | 0.9 | | 0.3 | | | | |
| | Outdoor unit | | SUZ-KA12NA(H)2 | | SUZ-KA09NA(H)2 | | SUZ-KA12NA(H)2 | | |
| | Power supply (V, phase, Hz) | | 230, 1, 60 | | 230, 1, 60 | | | | |
| | Input | kW | 0.84 | 1.11 | 0.67 | 0.82 | 0.92 | 1.26 | |
| | Current | A | 3.18 | 4.33 | 2.77 | 3.4 | 3.92 | 5.32 | |
| Refrigerant circuit | Condensing pressure | PSIG | 384 | 374 | 355 | 344 | 372 | 437 | |
| | Suction pressure | PSIG | 153 | 96 | 130 | 108 | 137 | 98 | |
| | Discharge temperature | °F | 167 | 170 | 158 | 162 | 165 | 172 | |
| | Condensing temperature | °F | 113 | 111 | 108 | 105 | 96 | 109 | |
| | Suction temperature | °F | 70 | 41 | 56 | 41 | 65 | 37 | |
| | Ref. pipe length | ft | 25 | | 25 | | | | |
| | Refrigerant charge (R410A) | - | 1.05 | | 1.05 | | 1.15 | | |
| 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 | 59 | 100 | 57 | 104 | 57 | 111 |
| Outdoor unit | Intake air temperature | DB | °F | 95 | 47 | 95 | 47 | 95 | 47 |
| | | WB | °F | 75 | 43 | 75 | 43 | 75 | 43 |

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.



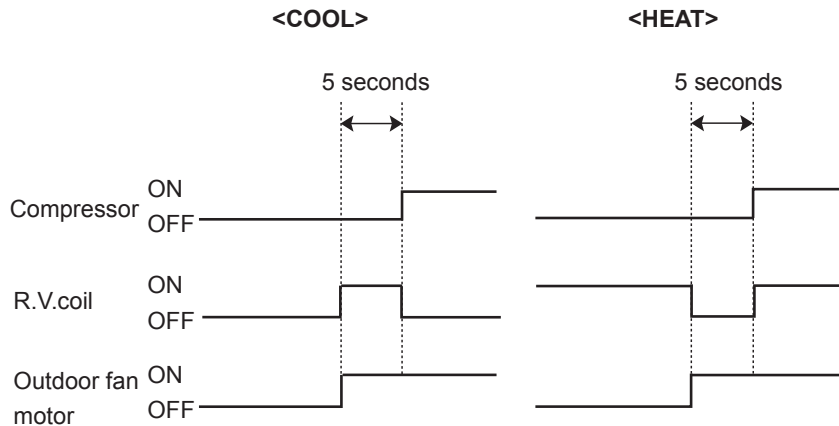
8-2. R.V. COIL CONTROL

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 | ○ | ○ | ○ | | | |

*. SUZ-KA-NAH2 only.

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. TEST POINT DIAGRAM AND VOLTAGE".)

| Jumper | | Defrost finish temperature SUZ-KA09/12/15 |
|--------|-------------------------------|--|
| JS | Soldered (Initial setting) | 41°F (5°C) |
| | None (Cut) | 50°F (10°C) |

9-2. PRE-HEAT CONTROL SETTING

When moisture gets into the refrigerant cycle, it may interfere 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 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.

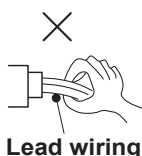
10-1. CAUTIONS ON TROUBLESHOOTING

1. Before troubleshooting, check the following

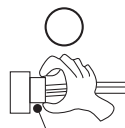
- 1) Check the power supply voltage.
- 2) Check the indoor/outdoor connecting wire for miswiring.

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, and turn off the breaker.
- 2) Be sure to turn OFF the power supply before removing the front panel, the cabinet, the top panel, and the electronic control P.C. board.
- 3) When removing the electrical parts, be careful of the residual voltage of smoothing capacitor.
- 4) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.
- 5) When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.



Lead wiring



Housing point

3. Troubleshooting procedure

- 1) First, check if the OPERATION INDICATOR lamp is blinking ON and OFF to indicate an abnormality.
- 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. TROUBLESHOOTING CHECK TABLE" and "10-3. HOW TO PROCEED "SELF-DIAGNOSIS"".

10-2. TROUBLE SHOOTING CHECK TABLE

SUZ-KA09NA(H)2.MX

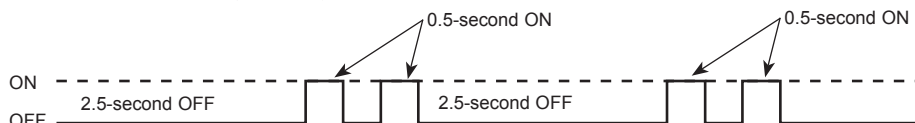
SUZ-KA12NA(H)2.MX

SUZ-KA15NA(H)2.MX

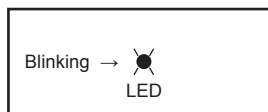
| No. | Symptoms | LED indication | check code | Abnormal point/ Condition | Condition | Remedy |
|-----|--|--------------------------------|------------|---|--|---|
| 1 | Outdoor unit does not operate. | 1-time blink every 2.5 seconds | UP | Outdoor power system | Overcurrent protection cut-out operates 3 consecutive times within 1 minute after the compressor gets started. | •Reconnect connector of compressor. •Refer to "10-5.④How to check inverter/compressor". •Check stop valve. |
| 2 | | | U3 | Outdoor thermistors | Discharge temperature thermistor shorts, or opens during compressor running. | •Refer to "10-5.④Check of outdoor thermistors". |
| | | | U4 | | 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. | |
| 3 | | | FC | Outdoor control system | Nonvolatile memory data cannot be read properly. | •Replace inverter P.C. board. |
| 4 | | 6-time blink 2.5 seconds OFF | E8 E9 | Serial signal | The communication fails between the indoor and outdoor unit for 3 minutes. | •Check indoor/outdoor connecting wire. •Replace indoor or outdoor P.C. board if abnormality is displayed again. |
| 5 | | 11-time blink 2.5 seconds OFF | UE | Stop valve/Closed valve | Closed valve is detected by compressor current. | •Check stop valve. |
| 6 | | 16-time blink 2.5 seconds OFF | PL | 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. •Check stop valve. •Refer to "10-5.④Check of outdoor refrigerant circuit". |
| 7 | 'Outdoor unit stops and restarts 3 minutes later' is repeated. | 2-time blink 2.5 seconds OFF | | Overcurrent protection | Large current flows into intelligent power module. | •Reconnect connector of compressor. •Refer to "10-5.④How to check inverter/compressor". •Check stop valve. |
| 8 | | 3-time blink 2.5 seconds OFF | | Discharge temperature overheat protection | Temperature of discharge temperature thermistor exceeds 116°C, compressor stops. Compressor can restart if discharge temperature thermistor reads 100°C or less 3 minutes later. | •Check refrigerant circuit and refrigerant amount. •Refer to "10-5.④Check of LEV". |
| 9 | | 4-time blink 2.5 seconds OFF | | Fin temperature/P.C. board temperature thermistor overheat protection | Temperature of fin temperature thermistor on the heat sink exceeds 72 to 86°C or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 72 to 85°C. | •Check around outdoor unit. •Check outdoor unit air passage. •Refer to "10-5.④Check of outdoor fan motor". |
| 10 | | 5-time blink 2.5 seconds OFF | | High pressure protection | Indoor coil thermistor exceeds 70°C in HEAT mode. Defrost thermistor exceeds 70°C in COOL mode. | •Check refrigerant circuit and refrigerant amount. •Check stop valve. |
| 11 | | 8-time blink 2.5 seconds OFF | | Compressor synchronous abnormality | The waveform of compressor current is distorted. | •Reconnect connector of compressor. •Refer to "10-5.④How to check inverter/compressor". |
| 12 | | 10-time blink 2.5 seconds OFF | | Outdoor fan motor | Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up. | •Refer to "10-5.④Check of outdoor fan motor". •Refer to "10-5.④Check of inverter P.C. board". |
| 13 | | 12-time blink 2.5 seconds OFF | | Each phase current of compressor | Each phase current of compressor cannot be detected normally. | •Refer to "10-5.④Check of inverter P.C. board". |
| 14 | | 13-time blink 2.5 seconds OFF | | DC voltage | DC voltage of inverter cannot be detected normally. | •Refer to "10-5.④How to check inverter/compressor". |
| 15 | Outdoor unit operates. | 1-time blink 2.5 seconds OFF | | Frequency drop by current protection | When the input current exceeds approximately 7A(KA09)/8A(KA12)/9A(KA15), compressor | The unit is normal, but check the following. •Check if indoor filters are clogged. •Check if refrigerant is short. •Check if indoor/outdoor unit air circulation is short cycled. |
| 16 | | 3-time blink 2.5 seconds OFF | | Frequency drop by high pressure protection | Temperature of indoor coil thermistor exceeds 131 °F [55 °C] in HEAT mode, compressor frequency lowers. | |
| | | | | Frequency drop by defrosting in COOL mode | Indoor coil thermistor reads 46 °F [8 °C] or less in COOL mode, compressor frequency lowers. | •Check refrigerant circuit and refrigerant amount. •Refer to "10-5.④Check of LEV". •Refer to "10-5.④Check of outdoor thermistors". |
| 17 | | 4-time blink 2.5 seconds OFF | | Frequency drop by discharge temperature protection | Temperature of discharge temperature thermistor exceeds 232 °F [111 °C], compressor frequency lowers. | |
| 18 | | 7-time blink 2.5 seconds OFF | | Low discharge temperature protection | Temperature of discharge temperature thermistor has been 122 °F [50 °C] or less for 20 minutes. | •Refer to "10-5.④Check of LEV". •Check refrigerant circuit and refrigerant amount. |
| 19 | | 8-time blink 2.5 seconds OFF | | PAM protection PAM: Pulse Amplitude Modulation | The overcurrent flows into IGBT (Insulated Gate Biopolar transistor:TR821) or the bus-bar voltage reaches 320 V or more, PAM stops and restarts. | This is not malfunction. PAM protection will be activated in the following cases: 1. Instantaneous power voltage drop. (Short time power failure) 2. When the power supply voltage is high. |
| | | | | Zero cross detecting circuit | Zero cross signal for PAM control cannot be detected. | |
| 20 | | 9-time blink 2.5 seconds OFF | | Inverter check mode | The connector of compressor is disconnected, inverter check mode starts. | •Check if the connector of the compressor is correctly connected. •Refer to "10-5.④How to check inverter/compressor". |

NOTE: 1. The location of LED is illustrated at the right figure. Refer to "10-6. TEST POINT DIAGRAM".
2. LED is lighted during normal operation.

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




Inverter P.C. board




10-3. HOW TO PROCEED "SELF-DIAGNOSIS"

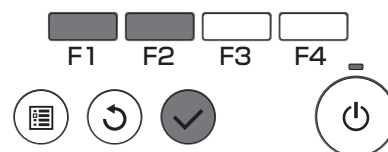
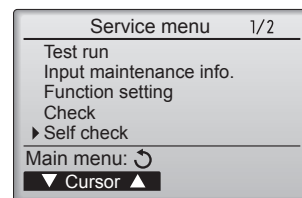
As this air conditioner has a function to memorize all the failures that had occurred, the latest failure detail can be recalled by following the procedure below. Use this function when the check code is not displayed with wired remote controller or the remote controller at use is wireless type.

10-3-1. Self-diagnosis <PAR-3xMAA ("x" represents 0 or later)>

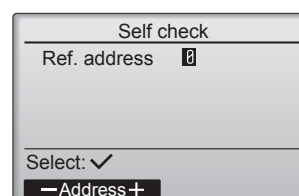
1 Select "Service" from the Main menu, and press the  button.



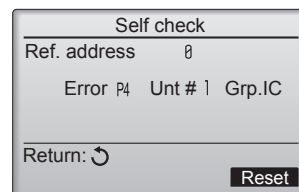
Select "Self check" with the **[F1]** or **[F2]** button, and press the  button.



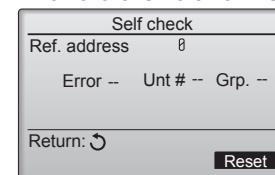
② With the **[F1]** or **[F2]** button, enter the refrigerant address, and press the  button.



③ Check code, unit number, attribute will appear.
"-" will appear if no error history is available.



When there is no error history



④ Resetting the error history.

Press the **[F4]** button (Reset) on the screen that shows the error history.

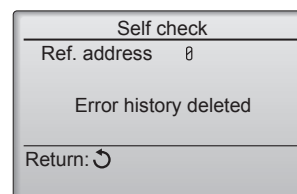
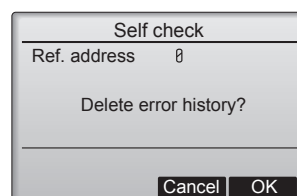


A confirmation screen will appear asking if you want to delete the error history.





Press the **[F4]** button (OK) to delete the error history.

If deletion fails, "Request rejected" will appear.
"Unit not exist" will appear if no indoor units that are correspond to the entered address are found.



Navigating through the screens

- To go back to the Service menu  button
- To return to the previous screen  button



10-3-2. Self-diagnosis <Wireless remote controller>

<In case of trouble during operation>

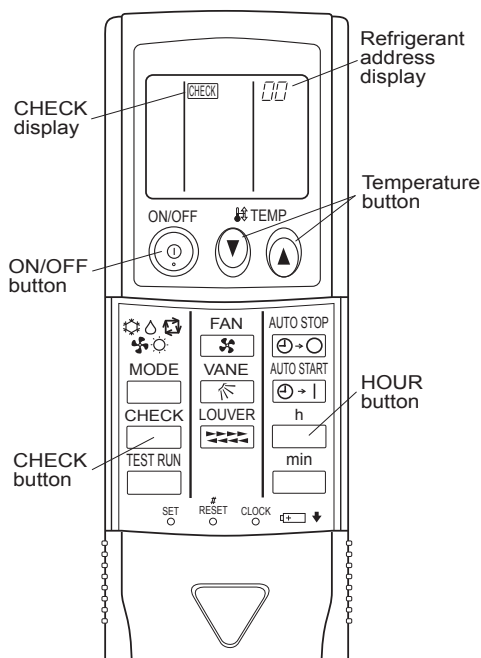
When a malfunction occurs to air conditioner, both indoor unit and outdoor unit will stop and operation lamp blinks to inform unusual stop.

<Malfunction-diagnosis method at maintenance service>

[Procedure]

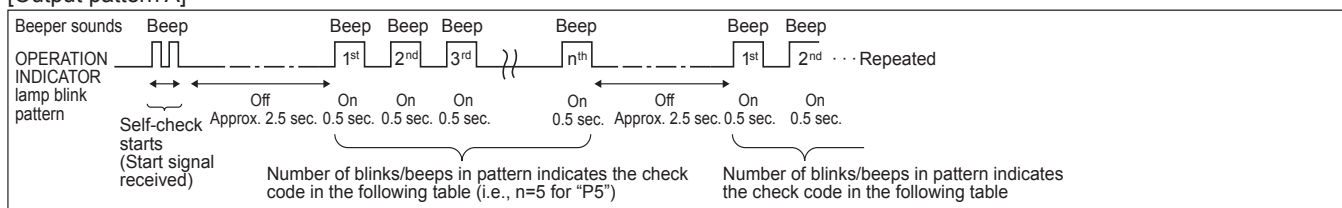
1. Press the CHECK button twice.
 - "CHECK" lights, and refrigerant address "00" blinks.
 - Check that the remote controller's display has stopped before continuing.
2. Press the temperature   buttons.
 - Select the refrigerant address of the indoor unit for the self-diagnosis.

Note: Set refrigerant address using the outdoor unit's DIP switch (SW1).
(For more information, see the outdoor unit installation manual.)
3. Point the remote controller at the sensor on the indoor unit and press the HOUR button.
 - If an air conditioner error occurs, the indoor unit's sensor emits an intermittent buzzer sound, the operation light blinks, and the check code is output.
(It takes 3 seconds at most for check code to appear.)
4. Point the remote controller at the sensor on the indoor unit and press the ON/OFF button.
 - The check mode is cancelled.

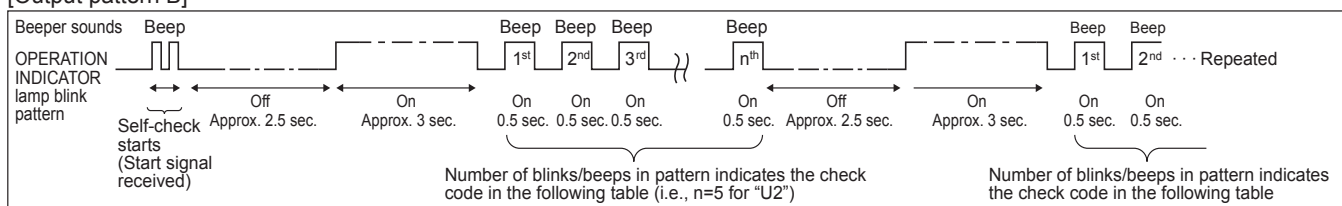


- Refer to the following tables for details on the check codes.

[Output pattern A]



[Output pattern B]



[Output pattern A] Errors detected by indoor unit

| Wireless remote controller | Wired remote controller | | |
|--|-------------------------|---|--|
| Beeper sounds/OPERATION | Check code | Symptom | Remark |
| INDICATOR lamp blinks (Number of times) | | | |
| 1 | P1 | Intake sensor error | As for indoor unit, refer to indoor unit's service manual. |
| 2 | P2 | Pipe (TH2) sensor error | |
| | P9 | Pipe (TH5) sensor error | |
| 3 | E6,E7 | Indoor/outdoor unit communication error | |
| 4 | P4 | Drain sensor error/Float switch connector (CN4F) open | |
| 5 | P5 | Drain pump error | |
| | PA | Forced compressor stop (due to water leakage abnormality) | |
| 6 | P6 | Freezing/Overheating protection operation | |
| 7 | EE | Communication error between indoor and outdoor units | |
| 9 | E4,E5 | Remote controller signal receiving error | |
| 12 | Fb (FB)* | Indoor unit control system error (memory error, etc.) | |
| 14 | PL | Abnormality of refrigerant circuit | |
| - | E0,E3 | Remote controller transmission error | |
| - | E1,E2 | Remote controller control board error | |

[Output pattern B] Errors detected by unit other than indoor unit (outdoor unit, etc.)

| Wireless remote controller | Wired remote controller | |
|--|-------------------------|---|
| Beeper sounds/OPERATION | Check code | Symptom |
| INDICATOR lamp blinks (Number of times) | | |
| 1 | E9 | Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit) |
| 2 | UP | Compressor overcurrent interruption |
| 3 | U3,U4 | Open/short of outdoor unit thermistors |
| 14 | Others | Other errors (Refer to the technical manual for the outdoor unit.) |

Notes: 1. If the beeper does not sound again after the initial 2 beeps to confirm the self-check start signal was received and the OPERATION INDICATOR lamp does not come on, there are no error records.

2. If the beeper sounds 3 times continuously "beep, beep, beep (0.4 + 0.4 + 0.4 sec.)" after the initial 2 beeps to confirm the self-check start signal was received, the specified refrigerant address is incorrect.

*The check code in the parenthesis indicates PAR-3xMAA model. ("x" represents 0 or later).

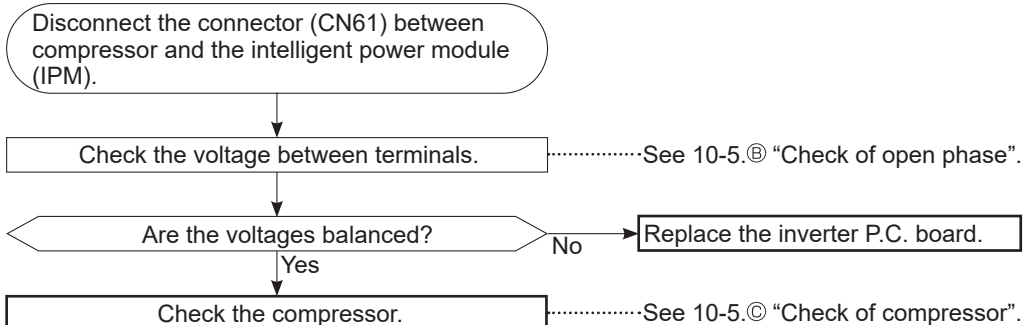
10-4. TROUBLE CRITERION OF MAIN PARTS

SUZ-KA09NA(H)2.MX SUZ-KA12NA(H)2.MX SUZ-KA15NA(H)2.MX

| Part name | Check method and criterion | Figure | | | | | | | | | | | | | | | | | | | | |
|---|--|--------------------|-------------|------------|-------------------------------|---------|---------|---------|------|-----|--|--|--|-----|-------------|-------------|-------------|-----|--|--|--|--|
| Defrost thermistor (RT61) Fin temperature thermistor (RT64) Ambient temperature thermistor (RT65) Outdoor heat exchanger temperature thermistor (RT68) | Measure the resistance with a tester. Refer to “Inverter P.C. board” in "10-6. TEST POINT DIAGRAM AND VOLTAGE”, for the chart of thermistor. | | | | | | | | | | | | | | | | | | | | | |
| Discharge temperature thermistor (RT62) | Measure the resistance with a tester. Before measurement, hold the thermistor with your hands to warm it up. Refer to “Inverter P.C. board” in "10-6. TEST POINT DIAGRAM AND VOLTAGE”, for the chart of thermistor. | | | | | | | | | | | | | | | | | | | | | |
| Compressor | Measure the resistance between terminals with a tester. (Temperature: 14 - 104 °F (-10 - 40 °C)) <table><tr><td></td><td colspan="3">Normal (Ω)</td></tr><tr><td></td><td>KA09</td><td>KA12</td><td>KA15</td></tr><tr><td>U-V</td><td></td><td></td><td></td></tr><tr><td>U-W</td><td>1.26 - 1.72</td><td>1.60 - 2.17</td><td>0.82 - 1.11</td></tr><tr><td>V-W</td><td></td><td></td><td></td></tr></table> | | Normal (Ω) | | | | KA09 | KA12 | KA15 | U-V | | | | U-W | 1.26 - 1.72 | 1.60 - 2.17 | 0.82 - 1.11 | V-W | | | | |
| | Normal (Ω) | | | | | | | | | | | | | | | | | | | | | |
| | KA09 | KA12 | KA15 | | | | | | | | | | | | | | | | | | | |
| U-V | | | | | | | | | | | | | | | | | | | | | | |
| U-W | 1.26 - 1.72 | 1.60 - 2.17 | 0.82 - 1.11 | | | | | | | | | | | | | | | | | | | |
| V-W | | | | | | | | | | | | | | | | | | | | | | |
| Outdoor fan motor | Measure the resistance between lead wires with a tester. (Temperature: 14 ~ 104 °F (-10 ~ 40 °C)) <table><tr><td rowspan="2">Color of lead wire</td><td>Normal (Ω)</td></tr><tr><td>KA09/12/15</td></tr><tr><td>RD – BK BK – WH WH – RD</td><td>29 - 40</td></tr></table> | Color of lead wire | Normal (Ω) | KA09/12/15 | RD – BK BK – WH WH – RD | 29 - 40 | | | | | | | | | | | | | | | | |
| Color of lead wire | Normal (Ω) | | | | | | | | | | | | | | | | | | | | | |
| | KA09/12/15 | | | | | | | | | | | | | | | | | | | | | |
| RD – BK BK – WH WH – RD | 29 - 40 | | | | | | | | | | | | | | | | | | | | | |
| R. V. coil (21S4) | Measure the resistance using a tester. [Temperature: 14 - 104°F (-10 - 40°C)] <table><tr><td>Normal (kΩ)</td></tr><tr><td>0.97 - 1.38</td></tr></table> | Normal (kΩ) | 0.97 - 1.38 | | | | | | | | | | | | | | | | | | | |
| Normal (kΩ) | | | | | | | | | | | | | | | | | | | | | | |
| 0.97 - 1.38 | | | | | | | | | | | | | | | | | | | | | | |
| Expansion valve coil (LEV) | Measure the resistance using a tester. [Temperature: 14 - 104°F (-10 - 40°C)] <table><tr><td>Color of lead wire</td><td>Normal (Ω)</td></tr><tr><td>RD – OG</td><td rowspan="4">37 - 54</td></tr><tr><td>RD – WH</td></tr><tr><td>RD – BU</td></tr><tr><td>RD – YE</td></tr></table> | Color of lead wire | Normal (Ω) | RD – OG | 37 - 54 | RD – WH | RD – BU | RD – YE | | | | | | | | | | | | | | |
| Color of lead wire | Normal (Ω) | | | | | | | | | | | | | | | | | | | | | |
| RD – OG | 37 - 54 | | | | | | | | | | | | | | | | | | | | | |
| RD – WH | | | | | | | | | | | | | | | | | | | | | | |
| RD – BU | | | | | | | | | | | | | | | | | | | | | | |
| RD – YE | | | | | | | | | | | | | | | | | | | | | | |
| Defrost heater (SUZ-KA-NAH2) | Measure the resistance using a tester. [Temperature: 14 - 104°F (-10 - 40°C)] <table><tr><td>Normal (Ω)</td></tr><tr><td>349 - 428</td></tr></table> | Normal (Ω) | 349 - 428 | | | | | | | | | | | | | | | | | | | |
| Normal (Ω) | | | | | | | | | | | | | | | | | | | | | | |
| 349 - 428 | | | | | | | | | | | | | | | | | | | | | | |

10-5. TROUBLESHOOTING FLOW

Ⓐ How to check inverter/compressor



Ⓑ Check of open phase

- With the connector between the compressor and the intelligent power module 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 (Test run operation)>

- Press the TEST (RUN) button twice.
- Press the MODE button and switch to the COOL (or HEAT) mode.
- Compressor starts at rated frequency in COOL mode or 58 Hz in HEAT mode.
- Indoor fan operates at High speed.
- To cancel test run operation, press the ON/OFF button on remote controller.

<Measurement point>

at 3 points

BK (U) - WH (V)

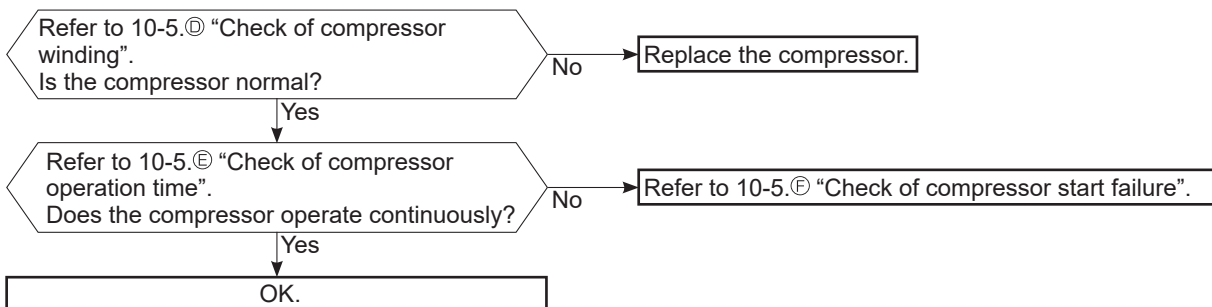
BK (U) - RD (W)

WH(V) - RD (W)

Measure AC voltage between the lead wires at 3 points.

- NOTE:**
- Output voltage varies according to power supply voltage.
 - Measure the voltage by analog type tester.
 - During this check, LED of the inverter P.C. board blinks 9 times.
(Refer to "10-6. TEST POINT DIAGRAM AND VOLTAGE".)

Ⓒ Check of compressor



D Check of compressor winding

- Disconnect the connector between the compressor and intelligent power module, and measure the resistance between the compressor terminals.

<Measurement point>

Measure the resistance between the lead wires at 3 points.

BK - WH

BK - RD

WH - RD

<Judgement>

Refer to "10-4. TROUBLE CRITERION OF MAIN PARTS".

0[Ω] Abnormal [short]

Infinite [Ω] Abnormal [open]

NOTE: Be sure to zero the ohmmeter before measurement.

E Check of compressor operation time

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

<Operation method>

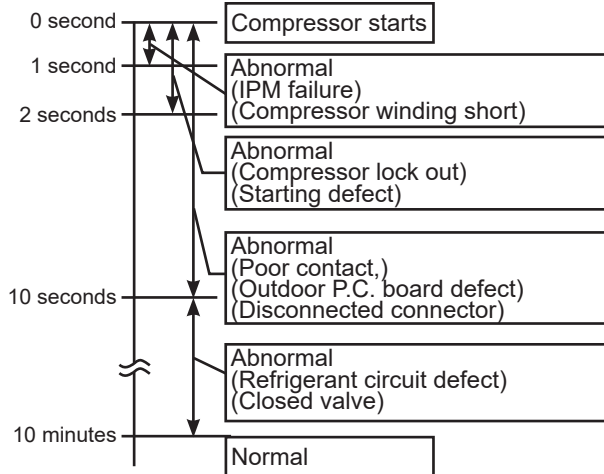
Start heating or cooling operation by pressing the TEST button twice on the remote controller. (Test run mode)

(TEST RUN OPERATION: Refer to 10-5 ⑥.)

<Measurement>

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

<Judgement>



F Check of compressor start failure

Confirm that 1~4 is normal.

- Electrical circuit check
 - Contact of the compressor connector
 - Output voltage of inverter P.C. board and balance of them (See 10-5.⑥)
 - Direct current voltage between DB61(+) and (-) on the inverter P.C. board
 - 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

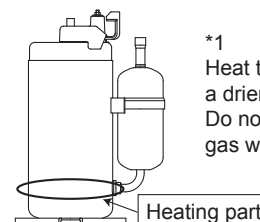
Replace the compressor.

Yes

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

WARNING:

When opening or closing the valve below freezing temperatures, refrigerant may spurt out from the gap between the valve stem and the valve body, resulting in injuries.

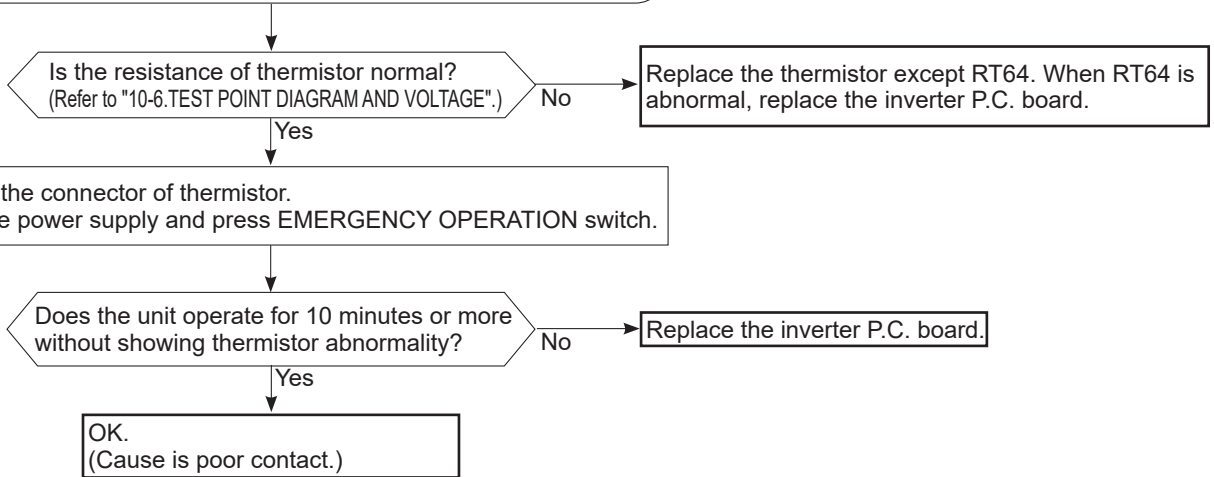


*1

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

G Check of outdoor thermistors

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



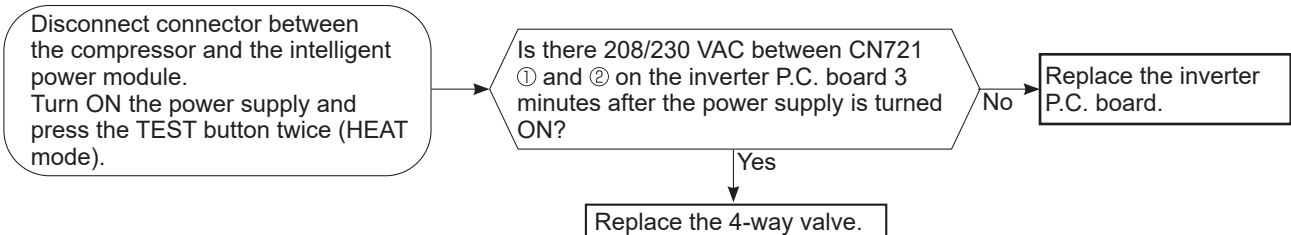
| Thermistor | Symbol | Connector, Pin No. | Board |
|------------------------------------|--------|-----------------------------|---------------------|
| Defrost | RT61 | Between CN641 pin1 and pin2 | Inverter P.C. board |
| Discharge temperature | RT62 | Between CN641 pin3 and pin4 | |
| Fin temperature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

H Check of R.V. coil

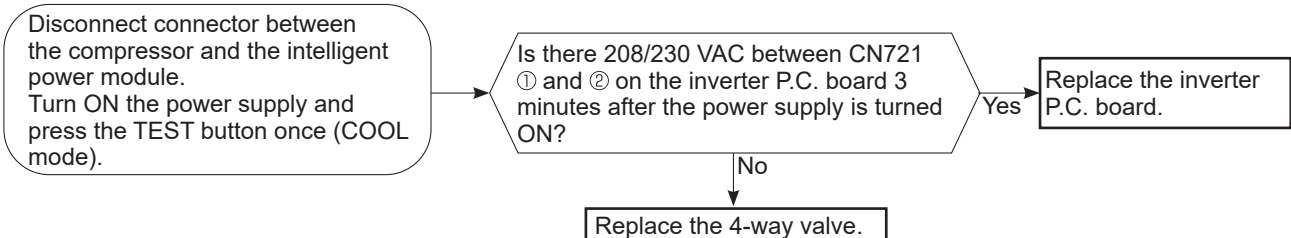
First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to "10-4. TROUBLE CRITERION OF MAIN PARTS".

In case CN721 is disconnected or R.V. coil is open, voltage is generated between the terminal pins of the connector although no signal is being transmitted to R.V. coil. Check if CN721 is connected.

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



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



① Check of outdoor fan motor

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

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

Yes

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

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

(Fixed to either 5 or 0 VDC)

No

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

Yes

Does the outdoor fan motor rotate smoothly?

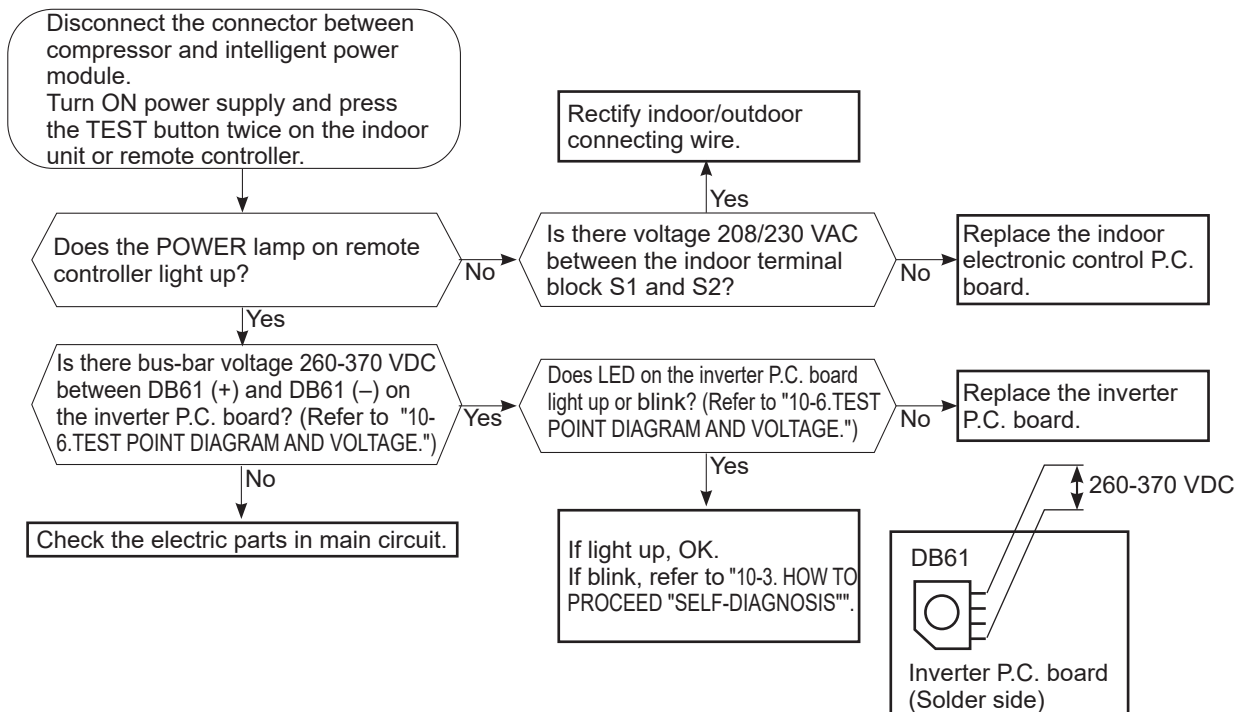
No

Yes

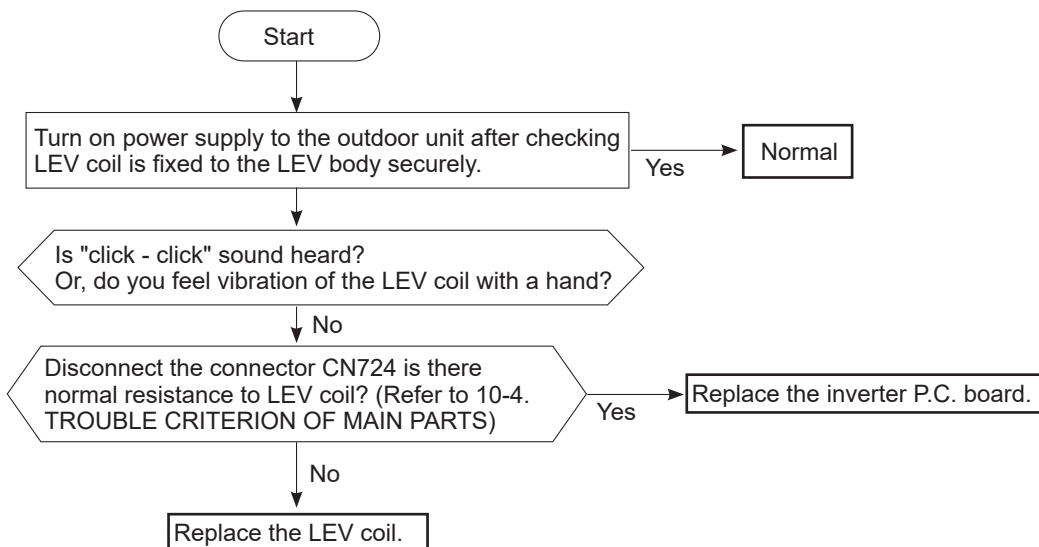
Replace the outdoor fan motor.

Replace the inverter P.C. board.

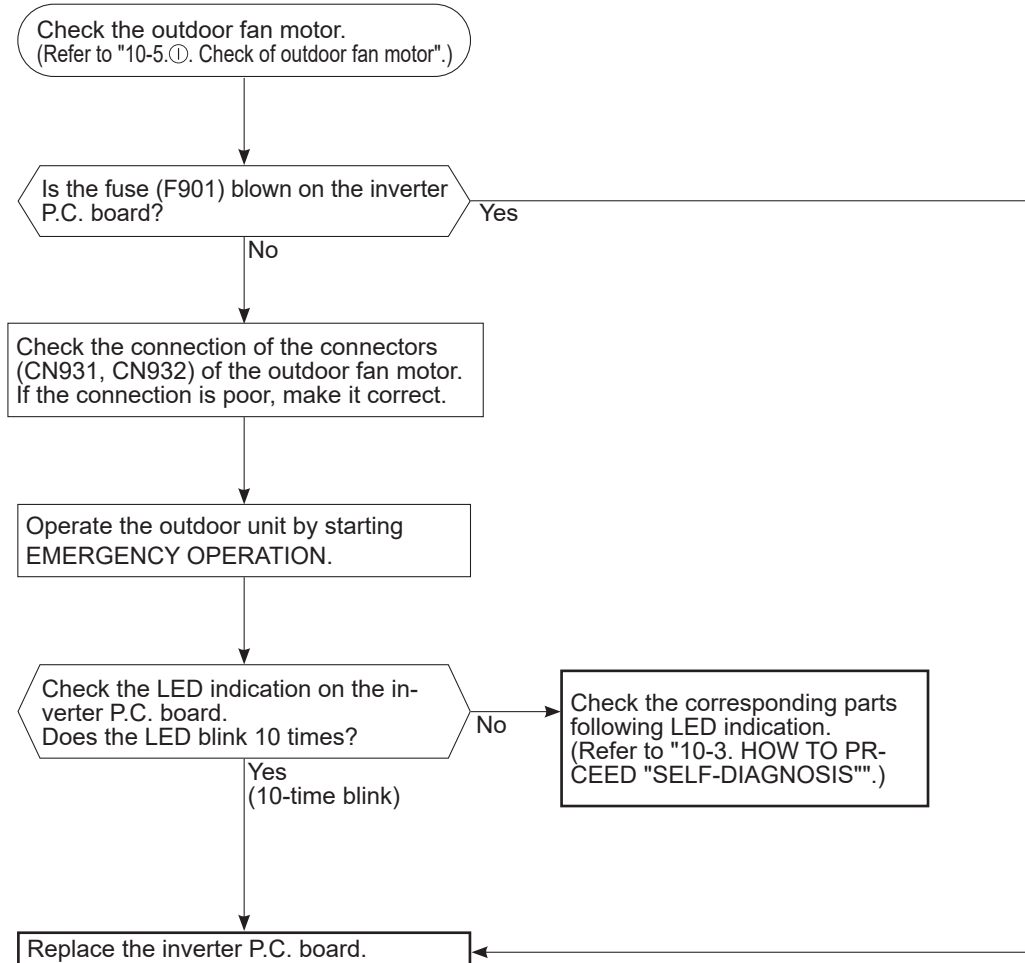
J Check of power supply



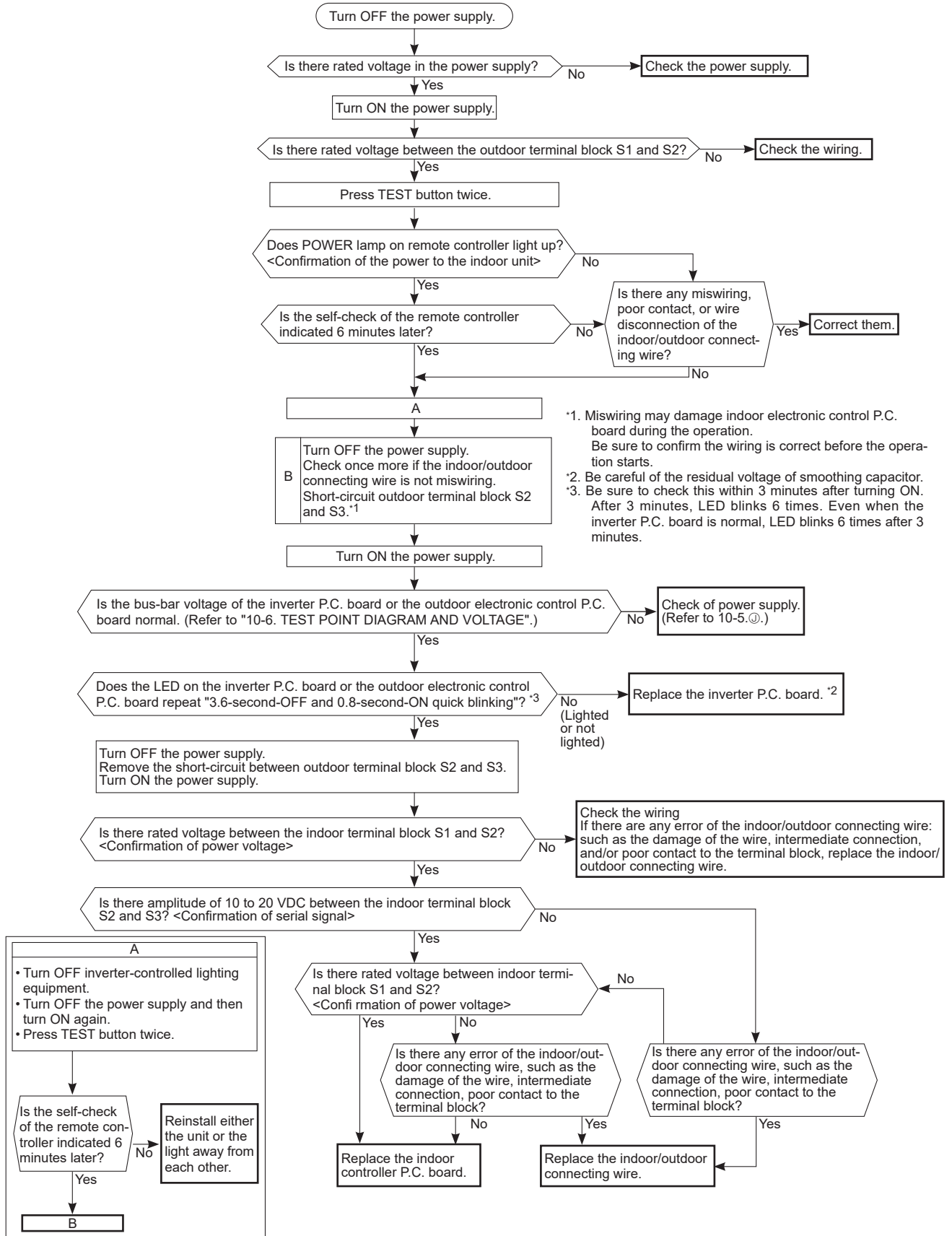
K Check of LEV (Expansion valve)



Ⓐ Check of inverter P.C. board



M How to check miswiring and serial signal error



Ⓝ Check the defrost heater

SUZ-KA09/12/15NAH2

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. Is the heater protector closed?
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 ② 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

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. *

WARNING:

When opening or closing the valve below freezing temperatures, refrigerant may spurt out from the gap between the valve stem and the valve body, resulting in injuries.

No

Was the operation started with the stop valve closed, and was it opened during operation?

No

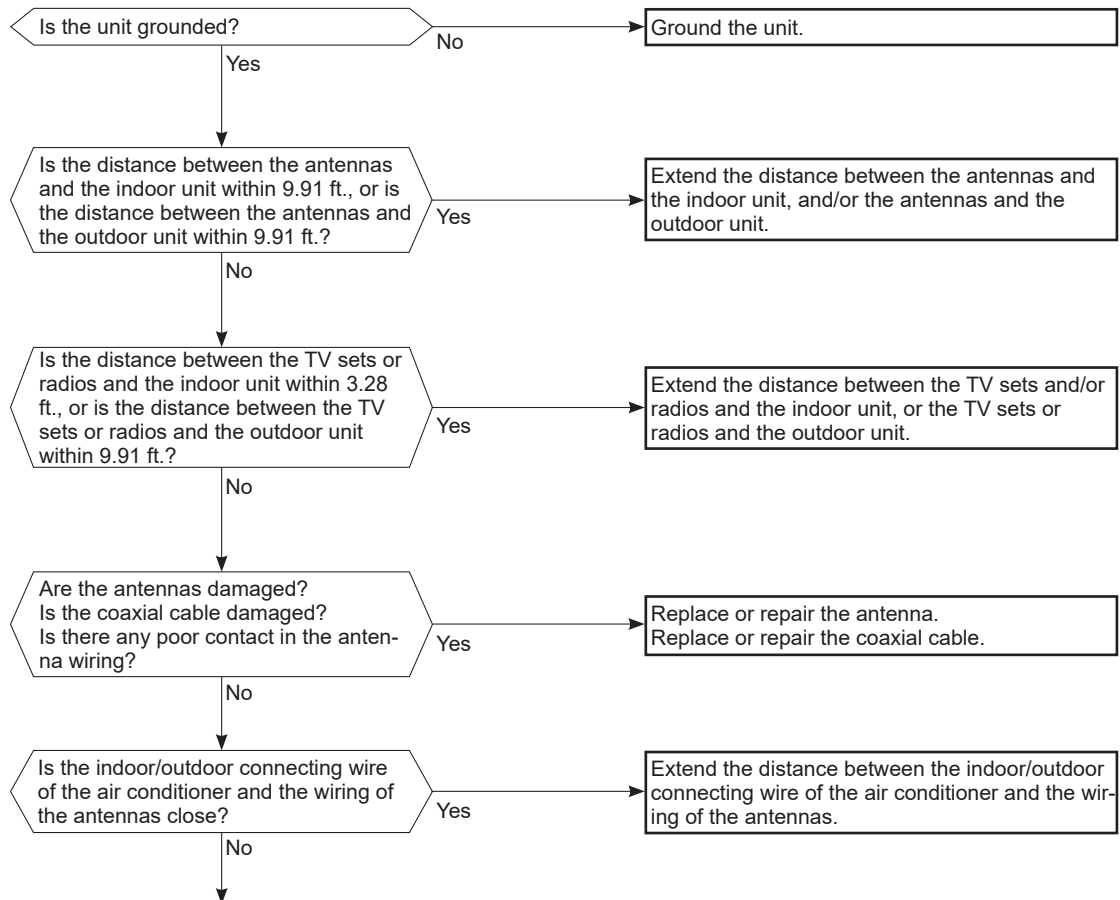
The refrigerant gas amount may be 60% or less than the normal amount. Identify where the gas is leaking from, and fix the leak.

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.

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

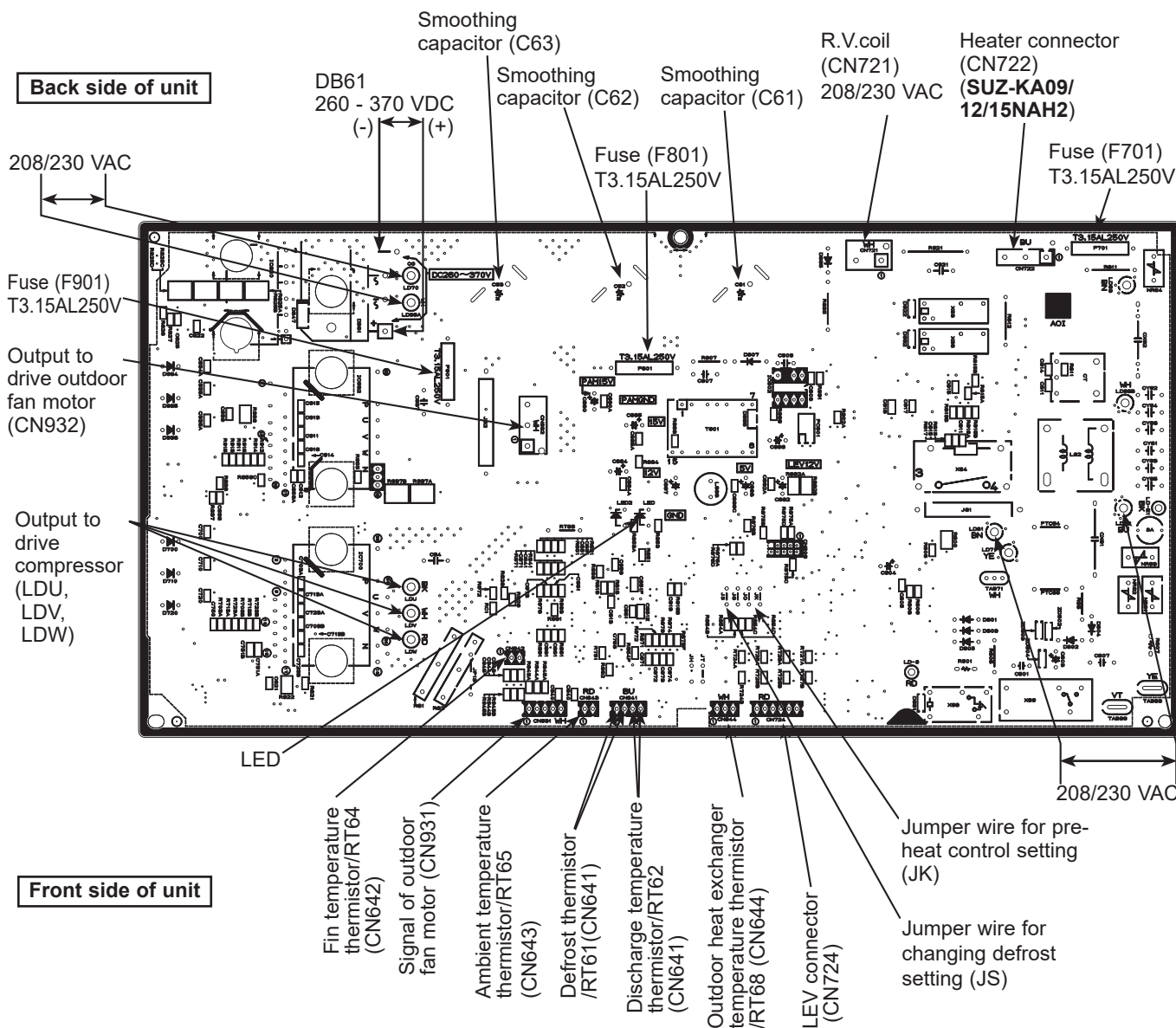
P Electromagnetic noise enters into TV sets or radios



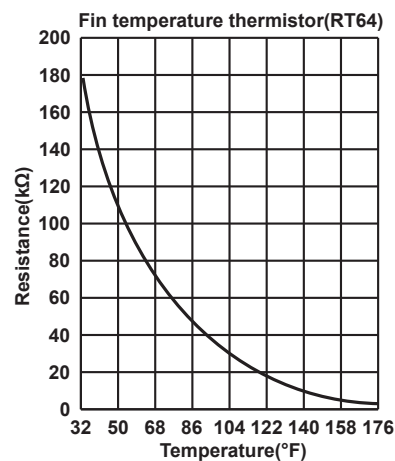
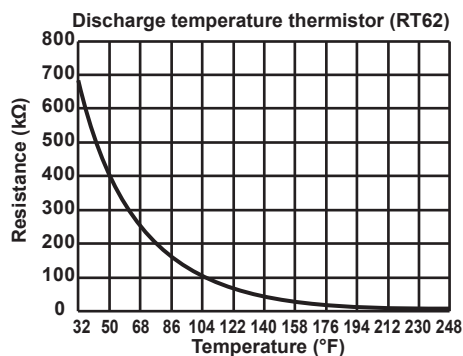
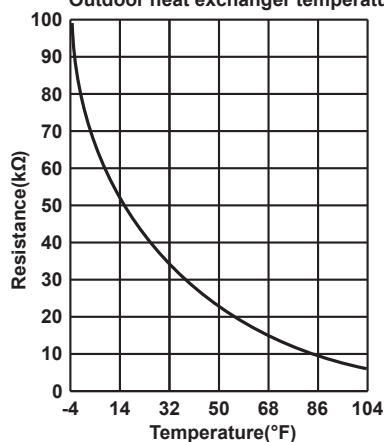
10-6. TEST POINT DIAGRAM AND VOLTAGE

Inverter P.C. board

SUZ-KA09NA(H)2.MX SUZ-KA12NA(H)2.MX SUZ-KA15NA(H)2.MX



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



11-1. UNIT FUNCTION SETTING BY THE REMOTE CONTROLLER

Each function can be set according to necessity using the remote controller. The setting of function for each unit can only be done by the remote controller. Select function available from the table 1.

<Table 1> Function selections

(1) Functions available when setting the unit number to 00 (Select 00 referring to ④ setting the indoor unit number.)

| Function | Settings | Mode No. Wired remote controller (RF thermostat) | Setting No. | ● : Initial setting (when sent from the factory) | Check | Remarks |
|----------------------------------|---|--|-------------|---|-------|---|
| Power failure automatic recovery | Not available | 01 | 1 | | | The setting is applied to all the units in the same refrigerant system. |
| Indoor temperature detecting | Available (Approx. 4-minute wait-period after power is restored.) | (101) | 2 | ● | | |
| LOSSNAY connectivity | Indoor unit's internal sensor | 02 | 1 | ● | | |
| | Data from main remote controller *1 | (—) | 2 | | | |
| | | | 3 | | | |
| Power supply voltage | Not supported | 03 | 1 | ● | | |
| | Supported (indoor unit dose not intake outdoor air through LOSSNAY) | (103) | 2 | | | |
| | Supported (indoor unit intakes outdoor air through LOSSNAY) | | 3 | | | |
| Frost prevention temperature | 230V | 04 | 1 | ● | | |
| | 208V | (104) | 2 | | | |
| | 2°C [36°F] (Normal) | 15 | 1 | ● | | |
| | 3°C [37°F] | (115) | 2 | | | |

*1 Can be set only when a wired remote controller is used.

When using 2 remote controllers (2-remote controller operation), the remote controller with built-in sensor must be set as a main remote controller.

(2) Functions are available when setting the unit number to 01.

| Function | Settings | Mode No. Wired remote controller (RF thermostat) | Setting No. | ● : Initial setting (Factory setting) | | | | Check |
|---|--|--|-------------|--|------------------|--------------------------|--------------------------|-------|
| | | | | Ceiling concealed | Ceiling cassette | Ceiling suspended | Multi position | |
| | | | | SEZ-KD-NA4 | SLZ-KA-NA | PEAD-A-AA | SVZ-KP-NA | |
| Filter sign | 100h | 07 (107) | 1 | | | | | |
| | 2500h | | 2 | | ● | | | |
| | No filter sign indicator | | 3 | ● | | ● | ● | |
| External static pressure | 5/15/35/50Pa (0.02/0.06/0.14/0.20in.WG) | 08 (108) | 1 | Refer to the table below | — | Refer to the table below | Refer to the table below | |
| | | 10 (110) | 2 | Refer to the table below | — | Refer to the table below | Refer to the table below | |
| | | | 3 | | | | | |
| Heater control *2 | No heater present | 11 (111) | 1 | — | — | ● | ● | |
| | Heater present | | 2 | — | — | | | |
| | SEZ, SLZ :Set temp -4.5°F ON PEAD, SVZ :Heater not operation in Defrost/Error | 23 (123) | 1 | ● | ● | ● | ● | |
| | SEZ, SLZ :Set temp -1.8°F ON PEAD, SVZ :Heater not operation in Defrost/Error*4 | | 2 | | | | | |
| Set temperature in heating mode *3 | Available | 24 (124) | 1 | ● | ● | ● | ● | |
| | Not available | | 2 | | | | | |
| Fan speed during the heating thermo OFF | Extra low | 25 (125) | 1 | ● | ● | ● | ● | |
| | Stop | | 2 | | | | | |
| | Set fan speed | | 3 | | | | | |
| Fan speed during the cooling thermo OFF | Set fan speed | 27 (127) | 1 | ● | ● | ● | ● | |
| | Stop | | 2 | | | | | |
| Detection of abnormality of the pipe temperature (P8) | Available | 28 (128) | 1 | ● | ● | | | |
| | Not available | | 2 | | | ● | ● | |

*2 For the detail of Heater control, refer to the service manual.

*3 4 degC (7.2 degF) up

*4 Depend on the error, heater may not operate please refer to SVZ service manual.

External static pressure setting for SEZ.

| External static pressure | Setting No. | | ● : Initial setting (Factory setting) | Check |
|--------------------------|-------------|-------------|--|-------|
| | Mode No. 08 | Mode No. 10 | | |
| 5Pa (0.02in.WG) | 1 | 2 | | |
| 15Pa (0.06in.WG) | 1 | 1 | ● | |
| 35Pa (0.14in.WG) | 2 | 1 | | |
| 50Pa (0.20in.WG) | 3 | 1 | | |

External static pressure setting for SVZ (Vertical, Horizontal left, Horizontal right position*).

| External static pressure | Setting No. | | ● : Initial setting (Factory setting) | Check |
|--------------------------|-------------|-------------|--|-------|
| | Mode No. 08 | Mode No. 10 | | |
| 75Pa (0.3in.WG) | 1 | 1 | | |
| 125Pa (0.5in.WG) | 2 | 1 | ● | |
| 200Pa (0.8in.WG) | 3 | 1 | | |

* Regarding to down flow setting, please refer to down flow kit installation manual.


External static pressure setting for PEAD.

| External static pressure | Setting No. | | ● : Initial setting (Factory setting) | Check |
|--------------------------|-------------|-------------|--|-------|
| | Mode No. 08 | Mode No. 10 | | |
| 35Pa (0.14in.WG) | 2 | 1 | | |
| 50Pa (0.20in.WG) | 3 | 1 | ● | |
| 70Pa (0.28in.WG) | 1 | 2 | | |
| 100Pa (0.40in.WG) | 2 | 2 | | |
| 150Pa (0.60in.WG) | 3 | 2 | | |

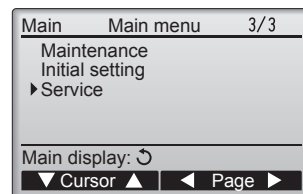
11-1-1. Selecting functions using the wired remote controller <PAR-3xMAA ("x" represents 0 or later)>

<Service menu>

Maintenance password is required

- ① Select "Service" from the Main menu, and press the  button.

*At the main display, the menu button and select "Service" to make the maintenance setting.




- ② When the Service menu is selected, a window will appear asking for the password.

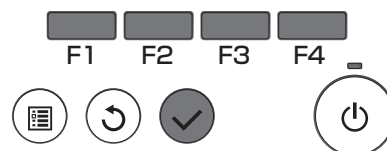
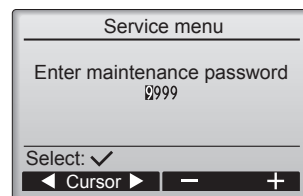
To enter the current maintenance password (4 numerical digits), move the cursor to the digit you want to change with the **F1** or **F2** button.



Set each number (0 through 9) with the **F3** or **F4** button.



Then, press the .



Note: The initial maintenance password is "9999". Change the default password as necessary to prevent unauthorized access. Have the password available for those who need it.

: If you forget your maintenance password, you can initialize the password to the default password "9999" by pressing and holding the **F1** and **F2** buttons simultaneously for three seconds on the maintenance password setting screen.

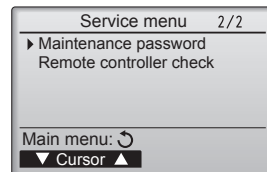
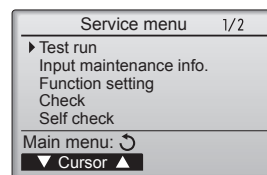
- ③ If the password matches, the Service menu will appear.

The type of menu that appears depends on the connected indoor units' type.



Note: Air conditioning units may need to be stopped to make certain settings. There may be some settings that cannot be made when the system is centrally controlled.



A screen will appear that indicates the setting has been saved.



Navigating through the screens

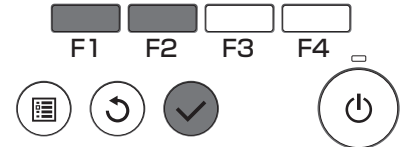
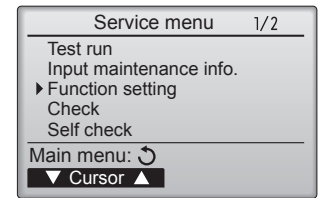
- To go back to the Main menu  button
- To return to the previous screen.....  button

<Function setting>

- ① Select "Service" from the Main menu, and press the button.



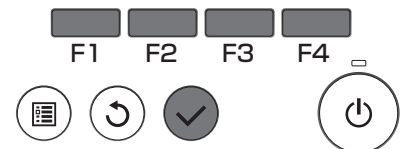
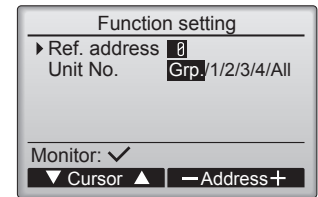
Select "Function setting" with the **[F1]** or **[F2]** button, and press the .



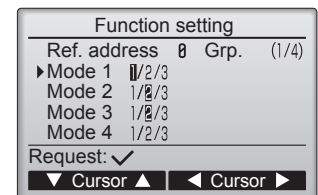
- ② Set the indoor unit refrigerant addresses and unit numbers with the **[F1]** through **[F4]** buttons, and then press the to confirm the current setting.

<Checking the indoor unit No.>

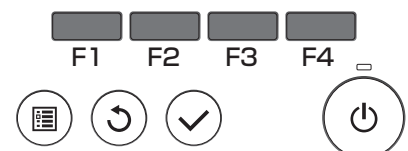
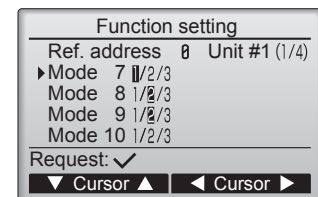
When the is pressed, the target indoor unit will start fan operation. If the unit is common or when running all units, all indoor units for the selected refrigerant address will start fan operation.



- ③ When data collection from the indoor units is completed, the current settings appears highlighted.
Non-highlighted items indicate that no function settings are made.
Screen appearance varies depending on the "Unit No." setting.



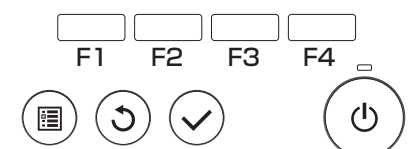
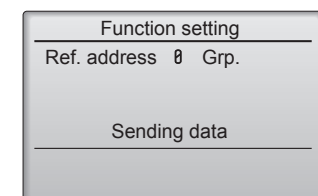
- ④ Use the **[F1]** or **[F2]** button to move the cursor to select the mode number, and change the setting number with the **[F3]** or **[F4]** button.



- ⑤ When the settings are completed, press the to send the setting data from the remote controller to the indoor units.
When the transmission is successfully completed, the screen will return to the Function setting screen.

Note:

- Make the above settings only on Mr. Slim units as necessary.
- The above function settings are not available for the CITY MULTI units.
- Table 1 summarizes the setting options for each mode number. Refer to the indoor unit Installation Manual for the detailed information about initial settings, mode numbers, and setting numbers for the indoor units.
- Be sure to write down the settings for all functions if any of the initial settings has been changed after the completion of installation work.



<"Terminal with locking mechanism" Detaching points>

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

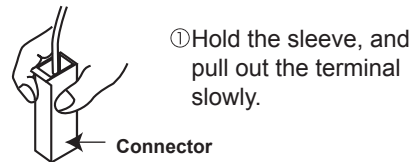
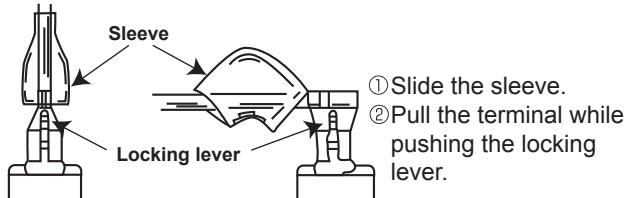
There are two types (refer to (1) and (2)) of the terminal with locking mechanism.

The terminal without locking mechanism can be detached by pulling it out.

Check the shape of the terminal before detaching.

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

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


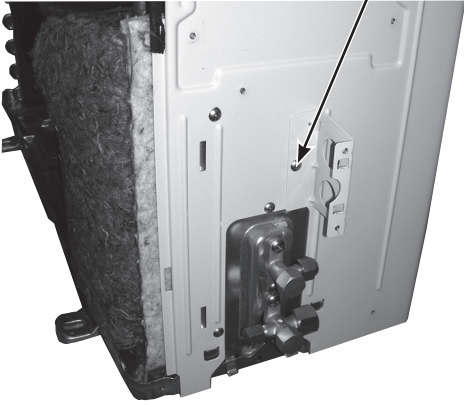
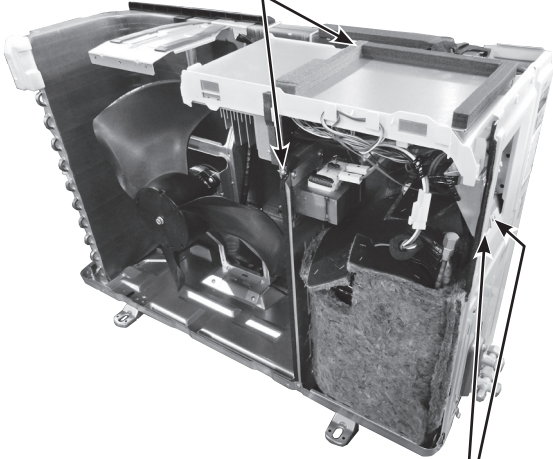
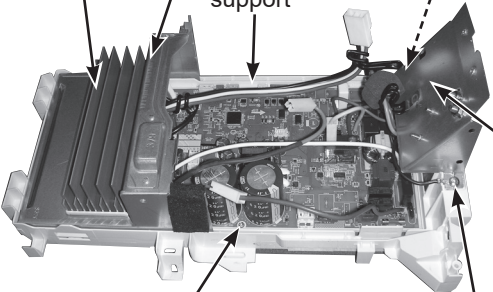
**12-1. SUZ-KA09NA(H)2.MX SUZ-KA12NA(H)2.MX SUZ-KA15NA(H)2.MX**

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

NOTE: Turn OFF the power supply before disassembly.

| OPERATING PROCEDURE | PHOTOS/FIGURES |
|---|--|
| <p>1. Removing the cabinet</p> <ol style="list-style-type: none"> (1) Remove the screw fixing the service panel. (2) Pull down the service panel and remove it. (3) Remove the screws fixing the conduit cover. (4) Remove the conduit cover. (Photo 4) (5) Remove the screw fixing the conduit plate. (Photo 5) (6) Remove the conduit plate. (7) Disconnect the power supply wire and indoor/outdoor connecting wire. (8) Remove the screws fixing the top panel. (9) Remove the top panel. (10) Remove the screws fixing the cabinet. (11) Remove the cabinet. (12) Remove the screws fixing the back panel. (13) Remove the back panel. <p>Photo 2</p> <p>Screws of the top panel</p> <p>Screws of the cabinet</p> | <p>Photo 1</p> <p>Screws of the top panel</p> <p>Back panel</p> <p>Screws of the back panel</p> <p>Service panel</p> <p>Screws of the cabinet</p> <p>Photo 3</p> <p>Screw of the cabinet</p> <p>Screws of the terminal block support and the back panel</p> <p>Direction to remove</p> <p>Hooks</p> <p>Screws of the cabinet</p> |



| OPERATING PROCEDURE | PHOTOS/FIGURES |
|--|---|
| <p>Photo 4</p>  <p>Screws of the conduit cover</p> | <p>Photo 5</p>  <p>Screw of the conduit plate</p> |
| <p>2. Removing the inverter assembly, inverter P.C. board</p> <p>(1) Remove the cabinet and panels. (Refer to 1.)</p> <p>(2) Disconnect the lead wire to the reactor and the following connectors:</p> <p><Inverter P.C. board></p> <p>CN721 (R.V. coil)</p> <p>CN722 (Defrost heater and heater protector) (SUZ-KA09/12/15NAH2)</p> <p>CN931, CN932 (Fan motor)</p> <p>CN641 (Defrost thermistor and discharge temperature thermistor)</p> <p>CN643 (Ambient temperature thermistor)</p> <p>CN644 (Outdoor heat exchanger temperature thermistor)</p> <p>CN724 (LEV)</p> <p>(3) Remove the compressor connector (CN61).</p> <p>(4) Remove the screws fixing the heat sink support and the separator.</p> <p>(5) Remove the fixing screws of the terminal block support and the back panel.</p> <p>(6) Remove the inverter assembly.</p> <p>(7) Remove the screw of the ground wire and screw of the terminal block support.</p> <p>(8) Remove the heat sink support from the P.C. board support.</p> <p>(9) Remove the screw of the inverter P.C. board and remove the inverter P.C. board from the P.C. board support.</p> | <p>Photo 6</p>  <p>Screws of the heat sink support and the separator</p> <p>Screws of the terminal block support and the back panel</p> |
| <p>3. Removing R.V. coil</p> <p>(1) Remove the cabinet and panels. (Refer to 1.)</p> <p>(2) Disconnect the following connectors:</p> <p><Inverter P.C. board></p> <p>CN721 (R.V. coil)</p> <p>(3) Remove the R.V. coil.</p> | <p>Photo 7</p>  <p>Heat sink</p> <p>Heat sink support</p> <p>P.C. board support</p> <p>Screw of the Terminal block support</p> <p>Terminal block support</p> <p>Screw of the inverter P.C. board</p> <p>Screw of the ground wire</p> |

OPERATING PROCEDURE

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

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

PHOTOS/FIGURES

Photo 8

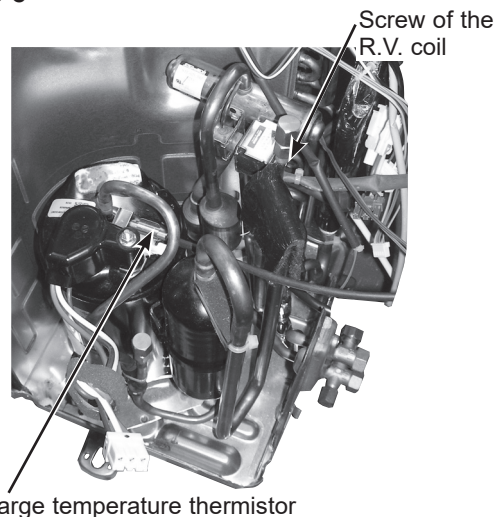
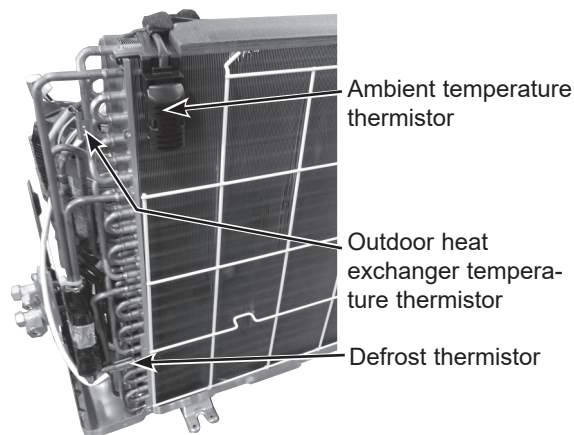


Photo 9





mitsubishi electric corporation

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