## Safety Precautions

- Before installing the unit, thoroughly read the following safety precautions.
- Observe these safety precautions for your safety.

⚠ **WARNING**
This symbol is intended to alert the user to the presence of important instructions that must be followed to avoid the risk of serious injury or death.

⚠ **CAUTION**
This symbol is intended to alert the user to the presence of important instructions that must be followed to avoid the risk of serious injury or damage to the unit.

- After reading this manual, give it to the user to retain for future reference.
- Keep this manual for easy reference. When the unit is moved or repaired, give this manual to those who provide these services.
  When the user changes, make sure that the new user receives this manual.

⚠ **WARNING**

**Ask your dealer or a qualified technician to install the unit.**

Improper installation by the user may result in water leakage, electric shock, smoke, and/or fire.

**Properly install the unit on a surface that can withstand the weight of the unit.**

Unit installed on an unstable surface may fall and cause injury.

**Only use specified cables. Securely connect each cable so that the terminals do not carry the weight of the cable.**

Improperly connected or fixed cables may produce heat and start a fire.

**Take appropriate safety measures against strong winds and earthquakes to prevent the unit from falling.**

If the unit is not installed properly, the unit may fall and cause serious injury to the person or damage to the unit.

**Do not make any modifications or alterations to the unit. Consult your dealer for repair.**

Improper repair may result in water leakage, electric shock, smoke, and/or fire.

**Do not touch the heat exchanger fins.**

The fins are sharp and dangerous.

**In the event of a refrigerant leak, thoroughly ventilate the room.**

If refrigerant gas leaks and comes in contact with an open flame, poisonous gases will be produced.

**When installing the All-Fresh type units, take it into consideration that the outside air may be discharged directly into the room when the thermo is turned off.**

Direct exposure to outdoor air may have an adverse effect on health. It may also result in food spoilage.

**Properly install the unit according to the instructions in the installation manual.**

Improper installation may result in water leakage, electric shock, smoke, and/or fire.

**Have all electrical work performed by an authorized electrician according to the local regulations and instructions in this manual, and a dedicated circuit must be used.**

Insufficient capacity of the power supply circuit or improper installation may result in malfunctions of the unit, electric shock, smoke, and/or fire.

⚠ **WARNING**

**Securely attach the terminal block cover (panel) to the unit.**

If the terminal block cover (panel) is not installed properly, dust and/or water may infiltrate and pose a risk of electric shock, smoke, and/or fire.

**Only use the type of refrigerant that is indicated on the unit when installing or reinstalling the unit.**

Infiltration of any other type of refrigerant or air into the unit may adversely affect the refrigerant cycle and may cause the pipes to burst or explode.

**When installing the unit in a small room, exercise caution and take measures against leaked refrigerant reaching the limiting concentration.**

Consult your dealer with any questions regarding limiting concentrations and for precautionary measures before installing the unit. Leaked refrigerant gas exceeding the limiting concentration causes oxygen deficiency.

**Consult your dealer or a specialist when moving or reinstalling the unit.**

Improper installation may result in water leakage, electric shock, and/or fire.

**After completing the service work, check for a gas leak.**

If leaked refrigerant is exposed to a heat source, such as a fan heater, stove, or electric grill, poisonous gases may be produced.

**Do not try to defeat the safety features of the unit.**

Forced operation of the pressure switch or the temperature switch by defeating the safety features of these devices, or the use of accessories other than the ones that are recommended by MITSUBISHI may result in smoke, fire, and/or explosion.

**Only use accessories recommended by MITSUBISHI.**

Ask a qualified technician to install the unit. Improper installation by the user may result in water leakage, electric shock, smoke, and/or fire.

## Precautions for handling units for use with R410A

⚠ **CAUTION**

**Do not use the existing refrigerant piping.**

- A large amount of chlorine that may be contained in the residual refrigerant and refrigerating machine oil in the existing piping may cause the refrigerating machine oil in the new unit to deteriorate.
- R410A is a high-pressure refrigerant and can cause the existing pipes to burst.

**Use refrigerant pipes made of phosphorus deoxidized copper. Keep the inner and outer surfaces of the pipes clean and free of such contaminants as sulfur, oxides, dust, dirt, shaving particles, oil, and water.**

These types of contaminants inside the refrigerant pipes may cause the refrigerant oil to deteriorate.

**Store the pipes to be installed indoors, and keep both ends of the pipes sealed until immediately before brazing. (Keep elbows and other joints wrapped in plastic.)**

Infiltration of dust, dirt, or water into the refrigerant system may cause the refrigerating machine oil to deteriorate or cause the unit to malfunction.

**Use a small amount of ester oil, ether oil, or alkylbenzene to coat flares and flanges.**

Infiltration of a large amount of mineral oil may cause the refrigerating machine oil to deteriorate.

**Charge liquid refrigerant (as opposed to gaseous refrigerant) into the system.**

If gaseous refrigerant is charged into the system, the composition of the refrigerant in the cylinder will change and may result in performance loss.

**Use a vacuum pump with a reverse-flow check valve.**

If a vacuum pump that is not equipped with a reverse-flow check valve is used, the vacuum pump oil may flow into the refrigerant cycle and cause the refrigerating machine oil to deteriorate.

**Prepare tools for exclusive use with R410A. Do not use the following tools if they have been used with the conventional refrigerant (gauge manifold, charging hose, gas leak detector, reverse-flow check valve, refrigerant charge base, vacuum gauge, and refrigerant recovery equipment.).**

- If the refrigerant or the refrigerating machine oil left on these tools are mixed in with R410A, it may cause the refrigerating machine oil to deteriorate.
- Infiltration of water may cause the refrigerating machine oil to deteriorate.
- Gas leak detectors for conventional refrigerants will not detect an R410A leak because R410A is free of chlorine.

**Do not use a charging cylinder.**

If a charging cylinder is used, the composition of the refrigerant will change, and the unit may experience power loss.

**Exercise special care when handling the tools for use with R410A.**

Infiltration of dust, dirt, or water into the refrigerant system may cause the refrigerating machine oil to deteriorate.

**Only use refrigerant R410A.**

The use of other types of refrigerant that contain chlorine (i.e. R22) may cause the refrigerating machine oil to deteriorate.

## Before installing the unit

⚠ **WARNING**

**Do not install the unit where a gas leak may occur.**

If gaseous refrigerant leaks and piles up around the unit, it may be ignited.

**Do not use the unit to keep food items, animals, plants, artifacts, or for other special purposes.**

The unit is not designed to preserve food products.

**Do not use the unit in an unusual environment.**

- Do not install the unit where a large amount of oil or steam is present or where acidic or alkaline solutions or chemical sprays are used frequently. Doing so may lead to a remarkable drop in performance, electric shock, malfunctions, smoke, and/or fire.
- The presence of organic solvents or corrosive gas (i.e. ammonia, sulfur compounds, and acid) may cause gas leakage or water leakage.

**When installing the unit in a hospital, take appropriate measures to reduce noise interference.**

High-frequency medical equipment may interfere with the normal operation of the air conditioner or vice versa.

**Do not install the unit on or over things that cannot get wet.**

When the humidity level exceeds 80% or if the drainage system is clogged, the indoor unit may drip water. Drain water is also discharged from the outdoor unit. Install a centralized drainage system if necessary.

## Before installing the unit (moving and reinstalling the unit) and performing electrical work

⚠ **WARNING**

**When installing or relocating the unit, make sure that no substance other than the specified refrigerant (R410A) enters the refrigerant circuit.**

Any presence of foreign substance such as air can cause abnormal pressure rise or explosion.

⚠ **CAUTION**

**Properly ground the unit.**

Do not connect the grounding wire to a gas pipe, water pipe, lightning rod, or grounding wire from a telephone pole. Improper grounding may result in electric shock, smoke, fire, and/or malfunction due to noise interference.

**Do not put tension on the power supply wires.**

If tension is put on the wires, they may break and result in excessive heat, smoke, and/or fire.

**Install an earth leakage breaker to avoid the risk of electric shock.**

Failure to install an earth leakage breaker may result in electric shock, smoke, and/or fire.

**Use the kind of power supply wires that are specified in the installation manual.**

The use of wrong kind of power supply wires may result in current leak, electric shock, and/or fire.

**Use breakers and fuses (current breaker, remote switch <switch + Type-B fuse>, moulded case circuit breaker) with the proper current capacity.**

The use of wrong capacity fuses, steel wires, or copper wires may result in malfunctions, smoke, and/or fire.

**Do not spray water on the air conditioner or immerse the air conditioner in water.**

Otherwise, electric shock and/or fire may result.

**Periodically check the installation base for damage.**

If the unit is left on a damaged platform, it may fall and cause injury.

**Properly install the drain pipes according to the instructions in the installation manual. Keep them insulated to avoid dew condensation.**

Improper plumbing work may result in water leakage and damage to the furnishings.

**Exercise caution when transporting products.**

- Products weighing more than 20 kg should not be carried alone.
- Do not carry the product by the PP bands that are used on some products.
- Do not touch the heat exchanger fins. They are sharp and dangerous.
- When lifting the unit with a crane, secure all four corners to prevent the unit from falling.

**Properly dispose of the packing materials.**

- Nails and wood pieces in the package may pose a risk of injury.
- Plastic bags may pose a risk of choking hazard to children. Tear plastic bags into pieces before disposing of them.

## Before the test run

⚠ **CAUTION**

**Turn on the unit at least 12 hours before the test run.**

Keep the unit turned on throughout the season. If the unit is turned off in the middle of a season, it may result in malfunctions.

**To avoid the risk of electric shock or malfunction of the unit, do not operate switches with wet hands.**

**Do not touch the refrigerant pipes with bare hands during and immediately after operation.**

During or immediately after operation, certain parts of the unit such as pipes and compressor may be either very cold or hot, depending on the state of the refrigerant in the unit at the time. To reduce the risk of frost bites and burns, do not touch these parts with bare hands.

**Do not operate the unit without panels and safety guards.**

Rotating, high-temperature, or high-voltage parts on the unit pose a risk of burns and/or electric shock.

**Do not turn off the power immediately after stopping the operation.**

Keep the unit on for at least five minutes before turning off the power to prevent water leakage or malfunction.

**Do not operate the unit without the air filter.**

Dust particles may build up in the system and cause malfunctions.

CONTENTS

# Ⅸ Troubleshooting

## [1] Check Code Lists

| Error Code | Preliminary error code | Error (preliminary) detail code | Error code definition | Searched unit | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Outdoor unit | Indoor unit | BC controller | LOSSNAY | Remote controller | |
| 0403 | 4300<br>4305 | 01<br>05<br>(Note) | Serial communication error | O | | | | | |
| 0900 | - | - | Test run mode | | | | O | | |
| 1102 | 1202 | - | Abnormal discharge air temperature | O | | | | | |
| 1301 | - | - | Abnormal low pressure | O | | | | | |
| 1302 | 1402 | - | Abnormal high pressure | O | | | | | |
| 1500 | 1600 | - | Excessive or insufficient refrigerant | O | | | | | |
| - | 1605 | - | Preliminary suction pressure abnormality | O | | | | | |
| 2500 | - | - | Water leakage | | O | | | | |
| 2502 | - | - | Drain pump failure/Float switch trip | | O | O | | | |
| 2503 | - | - | Drain pump failure/Float switch trip | | O | | O | | |
| 2600 | - | - | Water leakage | | | | O | | |
| 2601 | - | - | Water supply cut-off | | | | O | | |
| 4103 | - | - | Reverse phase/open phase | O | | | | | |
| 4108 | 4158 | - | Overcurrent protection | O | | | | | |
| 4115 | - | - | Power supply sync signal abnormality | O | | | | | |
| 4116 | - | - | RPM error/Motor malfunction | | O | | O | | |
| 4220<br>4225<br>(Note) | 4320<br>4325<br>(Note) | [108] | Bus voltage drop<br>(S/W detection) | O | | | | | |
| | | [109] | Bus voltage rise<br>(S/W detection) | O | | | | | |
| | | [110] | Bus voltage abnormality<br>(H/W detection) | O | | | | | |
| | | [111] | Logic error | O | | | | | |
| 4230<br>4235<br>(Note) | 4330<br>4325<br>(Note) | - | Heatsink overheat protection | O | | | | | |
| 4240<br>4245<br>(Note) | 4340<br>4345<br>(Note) | - | Overload protection | O | | | | | |
| 4250<br>4255<br>(Note) | 4350<br>4355<br>(Note) | [101] | IPM error | O | | | | | |
| | | [102] | ACCT overcurrent breaker trip (H/W detection) | O | | | | | |
| | | [103] | DCCT overcurrent breaker trip (H/W detection) | O | | | | | |
| | | [104] | IPM short/grounding abnormality | O | | | | | |
| | | [105] | Overcurrent error due to short-circuited motor | O | | | | | |
| | | [106] | Instantaneous overcurrent breaker trip (S/W detection) | O | | | | | |
| | | [107] | Effective overcurrent breaker trip (S/W detection) | O | | | | | |

| Error Code | Preliminary error code | Error (preliminary) detail code | Error code definition | | Searched unit | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outdoor unit | Indoor unit | BC controller | LOSSNAY | Remote controller | |
| 4260<br>4265<br>(Note) | 4360<br>4365<br>(No error history) | | Cooling fan abnormality | | O | | | | | |
| 5101 | 1202 | - | Temperature sensor failure | Suction air temperature (TH21) | | O | | | | |
| | | | | Return of OA processing unit (TH4) | | | | O | | |
| | | | | Discharge air temperature (TH11, TH12) | O | | | | | |
| 5102 | - | - | Temperature sensor failure | Indoor piping (TH22) | | O | | | | |
| | | | | Pipes on the OA processing unit (TH2) | | | | O | | |
| 5103 | - | - | Temperature sensor failure | Gas side pipe (TH23) | | O | | | | |
| | | | | Pipes on the OA processing unit (gas side) (TH3) | | | | O | | |
| 5104 | - | - | Temperature sensor failure | Pipes on the OA processing unit (TH1) | | | | O | | |
| | | | | Outside air temperature (TH24) | | O | | | | |
| 5105 | 1205 | - | Temperature sensor failure | Pipe (TH5) | O | | | | | |
| 5106 | 1221 | - | Temperature sensor failure | Outside air temperature (TH6) | O | | | | | |
| 5107 | 1216 | - | Temperature sensor failure | SC coil outlet (TH7) | O | | | | | |
| 5108 | 1217 | - | Temperature sensor failure | SC coil bypass outlet (TH8) | O | | | | | |
| 5110 | 1214 | 01<br>05<br>(Note) | Temperature sensor failure | Heatsink (THHS) | O | | | | | |
| 5111 | - | - | Temperature sensor failure (BC controller) | BC controller liquid inlet (TH11) | | | O | | | |
| 5112 | - | - | | Bypass outlet (TH12) | | | O | | | |
| 5115 | - | - | | Bypass inlet (TH15) | | | O | | | |
| 5116 | - | - | | Intermediate(TH16) | | | O | | | |
| 5201 | 1402 | - | High pressure sensor failure (OC: HPS) /BC controller (63HS) | | O | | O | | | |
| 5203 | - | - | BC controller intermediate pressure sensor (63HS3) | | | | O | | | |

| Error Code | Prelimi-nary error code | Error (prelim-inary) detail code | Error code definition | Searched unit | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Outdoor unit | Indoor unit | BC controller | LOSSNAY | Remote controller | |
| 5301 (Note) | 4300 (Note) | [115] | ACCT sensor failure | O | | | | | |
| | | [116] | DCCT sensor failure | O | | | | | |
| | | [117] | ACCT sensor circuit failure | O | | | | | |
| | | [118] | DCCT sensor circuit failure | O | | | | | |
| | | [119] | IPM open/Disconnected ACCT connector | O | | | | | |
| | | [120] | ACCT faulty wiring detection | O | | | | | |
| 6201 | - | - | Remote controller board failure (nonvolatile memory failure) | | | | | O | |
| 6202 | - | - | Remote controller board failure (clock IC failure) | | | | | O | |
| 6600 | - | - | Address overlaps | O | O | O | O | O | |
| 6601 | - | - | Polarity setting error | O | | | | | |
| 6602 | - | - | Transmission processor hardware error | O | O | O | O | O | |
| 6603 | - | - | Transmission circuit bus-busy | O | O | O | O | O | |
| 6606 | - | - | Communication error with the transmission processor | O | O | O | O | O | |
| 6607 | - | - | No ACK | O | O | O | O | O | |
| 6608 | - | - | No response | O | O | O | O | O | |
| 6831 | - | - | MA communication transmission error (No receipt) | | O | | | O | |
| 6832 | - | - | MA communication receipt error (Synchronization) | | O | | | O | |
| 6833 | - | - | MA communication transmission error (Hardware error) | | O | | | O | |
| 6834 | - | - | MA communication transmission error (Start bit detection error) | | O | | | O | |
| 7100 | - | - | Total capacity error | O | | | | | |
| 7101 | - | - | Capacity code error | O | O | | O | | |
| 7102 | - | - | Error in the number of connected units | O | | O | | | |
| 7105 | - | - | Address setting error | O | | | | | |
| 7106 | - | - | Attribute setting error | | | | O | | |
| 7107 | - | - | Port setting error | | | O | | | |
| 7110 | - | - | Unset unit connection information error | O | | | | | |
| 7111 | - | - | Remote controller sensor failure | | O | | O | | |
| 7113 | - | - | Function setting error | O | | | | | |
| 7116 | - | - | Replace Multi setting error | O | | | | | |
| 7117 | - | - | Model setting error | O | | | | | |
| 7130 | - | - | Incompatible units | O | | | | | |

Note: The last digit in the check error codes in the 4000's and 5000's and two-digit detail codes indicate if the codes apply to compressor inverter on fan inverter.

Example
Code 4225 : Bus voltage drop in the fan inverter system
Code 4250 : IPM / overcurrent breaker trip in the compressor inverter system

| The last digit | Inverter address (system) | Inverter system |
|---|---|---|
| 0 or 1 | 1 | Compressor inverter system |
| 5 | 5 | Fan inverter system |

## [2] Responding to Error Display on the Remote Controller

### -1- PUHY

#### 1. Mechanical system

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 0403 | Serial communication error | Serial communication error between the main board and the INV board on the compressor, and between the main board and the inverter board on the fan<br><br>Detail code 01:<br>Between the main board and the compressor INV board<br>Detail code 05:<br>Between the main board and the FAN INV board | (1) Faulty wiring | Check for wiring between the connector (CNRS3B) on the main board and the connector (CNRS1) on the compressor INV board or between the connector (CNRS3A) on the main board and the connector (CNRS2) on the FAN INV board and check contact of the connectors.<br>Check for contact of the connector (CNAC3) on the main board or of the connector (CNTR) on the FAN INV board. |
| | | | (2) Inverter address switch setting error | Check the setting for SW2-1 on the inverter board on the compressor.<br>Confirm that the SW2-1 on the fan inverter board is set to ON. |
| | | | (3) Transformer failure | Measure voltages between pins 1 and 3 of the male connector (CNTR) on the FAN INV board. |
| | | | (4) Compressor INV board failure<br>FAN INV board failure. | Replace the compressor INV board or the FAN board when the power turns on automatically, even if the power source is reset. |

Refer to section -8-"Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 1102 | Abnormal discharge air temperature | 1. If the discharge temperature of 120°C [248°F] or more is detected during the above operation (the first detection), the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.<br>2. If the discharge temperature of 120°C [248°F] or more is detected again (the second detection) within 30 minutes after the second stop of the outdoor unit described above, the mode will be changed to 3-minute restart mode, then the outdoor unit will restart in 3 minutes.<br>3. If the discharge temperature of 120°C [248°F] or more is detected (the third detection) within 30 minutes after the stop of the outdoor unit described above (regardless of the first or the second stop), the outdoor unit will make an error stop, and the error code "1102" will be displayed.<br>4. If the discharge temperature of 120°C [248°F] or more is detected more than 30 minutes after the previous stop of the outdoor unit, the detection is regarded as the first detection, and the operation described in step 1 above will start.<br>5. For 30 minutes after the stop (the first stop or the second stop) of the outdoor unit, preliminary errors will be displayed on the LED display. | (1) Gas leak, gas shortage | Refer to the page on refrigerant amount evaluation. |
| | | | (2) Overload operation | Check operating conditions and operation status of indoor/outdoor units. |
| | | | (3) LEV failure on the indoor unit<br>(4) LEV1 failure on the outdoor unit | Perform a cooling or heating operation and check the operation.<br>Cooling : LEV on the indoor unit<br>LEV1<br>Heating : LEV on the indoor unit<br>Refer to the page on troubleshooting LEV. |
| | | | (5) Closed ball valve | Confirm that the ball valve is fully open. |
| | | | (6) Outdoor fan (including fan parts) failure, motor failure, or fan controller malfunction<br>Rise in discharge temp. by low pressure drawing for (3) - (6). | Check the fan on the outdoor unit.<br>Refer to the section on troubleshooting the outdoor unit fan. |
| | | | (7) Gas leak between low and high pressures<br>(4-way valve failure, Compressor failur, Solenoid valve (SV1) failure) | Perform a cooling or heating operation and check the operation. |
| | | | (8) Thermistor failure (TH1,TH11,TH12) | Check the thermistor resistor. |
| | | | (9) Input circuit failure on the controller board thermistor | Check the inlet air temperature on the LED monitor. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 1301 | Abnormal low pressure | When starting the compressor from Stop Mode for the first time if low-pressure reads 0.098MPa [14psi] immediately before start-up, the operation immediately stops. | (1) Inner pressure drop due to a leakage.<br>(2) Low pressure sensor failure<br>(3) Short-circuited pressure sensor cable due to torn outer rubber<br>(4) A pin on the male connector is missing.<br>(5) Disconnected wire<br>(6) Failure of the low pressure input circuit on the controller board | Refer to the section on troubleshooting the low pressure sensor. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 1302 | Abnormal high pressure 1 (outdoor unit) | 1. If the pressure of 3.87MPa [561psi] or higher is detected by the pressure sensor during operation (the first detection), the outdoor stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.<br>2. If the pressure of 3.87MPa [561psi] or higher is detected by the pressure sensor again (the second detection) within 30 minutes after the first stop of the outdoor unit, the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.<br>3. If the pressure of 3.87MPa [561psi] or higher is detected by the pressure sensor (the third detection) within 30 minutes of the second stop of the outdoor unit, the outdoor unit will make an error stop, and the error code "1302" will be displayed.<br>4. If the pressure of 3.87MPa [561psi] or higher is detected more than 30 minutes after the stop of the outdoor unit, the detection is regarded as the first detection, and the operation described in step 1 above will start.<br>5. For 30 minutes after the stop of the outdoor unit, preliminary errors will be displayed on the LED display.<br>6. The outdoor unit makes an error stop immediately when not only the pressure sensor but also the pressure switch detects $4.15^{+0,-0.15}$ MPa [$601^{+0,-22}$ psi] | (1) LEV failure on the indoor unit<br>-> Heating | Perform a heating operation and check the operation.<br>Heating : LEV on the indoor unit<br>Refer to the page on troubleshooting LEV. |
| | | | (2) Closed ball valve | Confirm that the ball valve is fully open. |
| | | | (3) Short cycle on the indoor unit side<br>(4) Clogged filter on the indoor unit<br>(5) Reduced air flow due to dirty fan on the indoor unit fan<br>(6) Dirty heat exchanger of the indoor unit<br>(7) Indoor fan (including fan parts) failure or motor failure<br>Rise in high pressure caused by lowered condensing capacity in heating operation for (2) - (7). | Check the indoor units for problems and correct them, if any. |
| | | | (8) Short cycle on the outdoor unit<br>(9) Dirty heat exchanger of the outdoor unit | |
| | | | (10) Outdoor fan (including fan parts) failure, motor failure, or fan controller malfunction<br>Rise in discharge temp. by low pressure drawing for (3) - (6). | Check the fan on the outdoor unit.<br>Refer to the section on troubleshooting the outdoor unit fan. |
| | | | (11) Solenoid valve (SV1) malfunction (The by-pass valve (SV1) can not control rise in high pressure). | Refer to the section on troubleshooting the solenoid valve. |
| | | | (12) Thermistor failure (TH5, TH6). | Check the thermistor resistor. |
| | | | (13) Pressure sensor failure | Refer to the page on the troubleshooting of the high pressure sensor. |
| | | | (14) Failure of the thermistor input circuit and pressure sensor input circuit on the controller board | Check the temperature and the pressure of the sensor with LED monitor. |
| | | | (15) Faulty mounting of thermistor (TH5, TH6)<br>(16) Disconnected male connector on the pressure switch (63H) or disconnected wire | Check the temperature and the pressure of the sensor with LED monitor. |
| | | | (17) Melted fuse (F1 or F2) on the controller board | Check for a melted fuse.Check for short-circuited cooling FAN (MF), 4-way valve, or actuator like solenoid valve. |
| | Abnormal high pressure 2 (outdoor unit) | If the pressure of 0.098MPa [14psi] or lower is registered on the pressure sensor immediately before start-up, it will trigger an abnormal stop, and error code "1302" will be displayed. | (1) Inner pressure drop due to a leakage.<br>(2) Pressure sensor failure<br>(3) Shorted-circuited pressure sensor cable due to torn outer rubber<br>(4) A pin on the male connector on the pressure sensor is missing or contact failure<br>(5) Disconnected pressure sensor cable<br>(6) Failure of the pressure sensor input circuit on the controller board | Refer to the page on the troubleshooting of the high pressure sensor. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 1500 | Refrigerant overcharge | An error can be detected by the discharge temperature superheat.<br>1. If the discharge SH 10K [18°F] or less is detected during operation (the first detection), the outdoor unit stops at once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.<br>2. If the discharge SH 10K [18°F] or less is detected again within 30 minutes after first stop of the outdoor unit (the second detection), the outdoor unit will make an error stop, and the error code "1500" is displayed.<br>3. If discharge SH 10K [18°F] or less is detected more than 30 minutes after the outdoor unit stops, and the operation described in step 1 above will start.<br>4. For 30 minutes after the stop of the outdoor unit, preliminary errors will be displayed on the LED display. | (1) Overcharged refrigerant | Refer to the page on refrigerant amount evaluation. |
| | | | (2) Thermistor input circuit failure on the main board<br>(3) Faulty mounting of thermistor (TH11, TH12) | Check the temperature and the pressure of the sensor with LED monitor. |
| 2500 | Water leakage | When the drain sensor detects water or its tip becomes immersed in water. | Water leakage due to problems with such equipment as a humidifier | Check for water leakage around the humidifier and clogging of outlet of the drain pan. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 2502 | Drain pump failure<br>(The error code blinks on the indoor unit in trouble.) | When the drain sensor detects water or its tip becomes immersed in water during drain pump operation. | (1) Drain pump malfunction<br>(2) Clogged drain pump intake<br>(3) Clogged drain pipe<br>(4) Return water from drain pipe (Improper installation) | 1) Check for drain pump malfunction<br>♦**Check whether there is water in the drain pan.**<br>When the water level is approximately 10mm [13/32"] from the bottom of the drain pan, the drain pump may be normal.<br>♦**Check whether the drain pump operates properly.**<br>Check whether the resistance of the drain pump is normal or the drain pump operates normally when the power supply is applied.<br>2) Check for clogged drain pump intake.<br>Check whether there is no dust around the drain pump intake.<br>3) Check for clogged drain pipe<br>Check whether there is no clogging outside of the pipe body.<br>4) Check for return water.<br>Pour approximately 1-liter water in the drain pump, and start the drain pump.<br>When the water level in the drain pan becomes steadily lower, stop the pump, and check the amount of the return water to the drain pan.<br>*When a large amount of water returns, the gradient of drain pipe may be the reason.Check whether the drain pipe is installed properly as the instructions in the installation manual say.Furthermore, check whether the gradient of the unit installation is horizontal.An error may occur due to return water depending on the gradient.<br>Target gradient approximately 0.5°)<br><br>After checking the above, when all normal, misdetection of the drain sensor is possible.<br>♦**Check the drain sensor.**<br>Check the resistance value<br><br><Error reset method><br>Reset (error reset) the indoor unit in trouble with the remote controller. |
| | Drain pump failure<br>(The error code blinks on all the indoor units in the system with one outdoor unit.) | When the drain sensor detects water or its tip becomes immersed in water during drain pump operation on stopping indoor units. | (1) Drain pump malfunction<br>(2) Clogged drain pump intake<br>(3) Clogged drain pipe<br>(4) Return water from drain pipe (Improper installation) | Same as above<br><Error reset method><br>Reset the power of the indoor unit in trouble.However, the reset with the remote controller (error reset) must be made 10 minutes later after the power has been reset.All the indoor units must be reset with the remote controller. |

<table>
<tr><th colspan="2">Error Code</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr><td rowspan="2">2503</td><td rowspan="2">Drain sensor failure</td><td rowspan="2">When a short or an open is detected during operation (cannot be detected during OFF).<br>Short :<br>detectable at 90°C [194°F] or higher<br>Open :<br>detectable at<br>-20°C [-4°F] or lower</td><td>(1) Thermistor failure<br>(2) Connector contact failure (loose connector)<br>(3) Disconnected wire or partial disconnected thermistor wire</td><td>Check the thermistor resistance.<br>0°C [32°F] : 6.0 kohm<br>10°C [50°F] : 3.9 kohm<br>20°C [68°F]: 2.6 kohm<br>30°C [86°F] : 1.8 kohm<br>40°C [104°F] : 1.3 kohm</td></tr>
<tr><td>Indoor board (detection circuit) failure</td><td>Check the connector contact.<br>If no fault is found, the indoor board is a failure.</td></tr>
<tr><td>2600</td><td>Water leakage</td><td>-</td><td>Water leaks from the pipes in such as the humidifier.</td><td>Check the location of the leak.</td></tr>
<tr><td rowspan="5">2601</td><td rowspan="5">Water supply cut-off</td><td rowspan="5">-</td><td>(1) The water tank of the humidifier is empty.</td><td>Check the amount of supply water.<br>Check for the solenoid valve and for the connection.</td></tr>
<tr><td>(2) The solenoid valve for humidification is OFF.</td><td>Check the connector.</td></tr>
<tr><td>(3) Disconnected float switch</td><td>Check the connecting part.</td></tr>
<tr><td>(4) Poor operation of float switch</td><td>Check for the float switch.</td></tr>
<tr><td>(5) Frozen water tank</td><td>Turn off the power source of the water tank to defrost, and turn it on again.</td></tr>
<tr><td rowspan="5">4103</td><td rowspan="5">Reverse phase/open phase</td><td rowspan="2">1. When turning on the power, the operation cannot be started because of the open phase of one of the power lines (L1, L2 or L3).</td><td>(1) Faulty wiring</td><td>•Check whether the phase of the power supply terminal block (TB1) is normal.<br>•Check the wiring between the power supply terminal block (TB1) and the main boards (CN20 and CN21).<br><table><tr><th>TB1</th><th colspan="2">Pin</th></tr><tr><td>L1</td><td>CN20</td><td>5Pin</td></tr><tr><td>L2</td><td>CN21</td><td>3Pin</td></tr><tr><td>L3</td><td>CN21</td><td>1Pin</td></tr></table></td></tr>
<tr><td>(2) Main board failure.</td><td>If the above faults are not found, the main board is faulty.</td></tr>
<tr><td rowspan="3">2. The operation cannot be started because of the reserve phase of one of the power lines (L1, L2 or L3).</td><td>(1) Power supply error<br>•Open phase of power supply voltage<br>•Power-supply voltage drop</td><td>Check the input resistance of the power supply terminal block (TB1).</td></tr>
<tr><td>(2) Faulty wiring<br>Between the power supply terminal block (TB1) and the main boards (CN20 and 21)</td><td>•Measure voltages of pin 5 of the male connector (CN20) on the main board and between pins 1 and 3 of the male connector (CN21) on the main board.<br>•If the voltage is not the same as the power supply voltage, the wiring is faulty.</td></tr>
<tr><td>(3) A fuse is blown.</td><td>Check whether the fuses of the main board (both F01 and F02) are not blown.</td></tr>
<tr><td></td><td>(4) Main board failure</td><td>If the above faults are not found, the main board is faulty.</td></tr>
</table>

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 4108 | Overcurrent protection | 1. First detection<br>If 51C2 is started during the operation of No.2 compressor, the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes. (Set value of the over-current relay: 43A)<br>2. Second detection<br>If 51C2 is started again within a minute after restarting in compliance with 1. above, the unit makes an error stop and the error code "4108" will appear.<br>3. There will be a minute grace period of an error stop when No.2 compressor restarts after the outdoor unit stops and LED indicates, which means the grace period, will appear. | (1) Overload operation that exceeds unit use limit | Check the unit working condition. |
| | | | (2) Power supply error<br>•Power-supply voltage drop<br>•Open phase of power supply voltage | Check the voltage of the power supply terminal block (TB1).<br>Check for open phase. |
| | | | (3) Faulty wiring | Check 52C2 connector and the wiring. |
| | | | (4) Compressor failure<br>•Compressor open phase or grounding fault<br>•Compressor lock | Check the wiring and apply a megger to the compressor.<br>Start operation under no-load conditions.<br>Remove the power wire on the compressor-side, insulate the power line and start operation.<br>-> The compressor is faulty if 52C2 normally turns on. |
| 4115 | Power supply sync signal abnormality | The frequency cannot be determined when the power is switched on. | (1) Power supply error | Check the voltage of the power supply terminal block (TB1). |
| | | | (2) A fuse is blown | Check the fuses on the main board (F01 and F02). |
| | | | (3) Faulty wiring | Measure voltages of pin 5 of the male connector (CN20) on the main board and between pins 1 and 3 of the male connector (CN21) on the main board.<br>If the voltage (AC208/230V) is not the same as the power supply voltage, the wiring is faulty. |
| | | | (4) Main board failure | If none of the items described above is applicable, and if the trouble reappears even after the power is switched on again, replace the MAIN board. |
| 4116 | Motor abnormality | 1. LOSSNAY<br>•The motor keep running even if the power is OFF.<br>•The thermal overload relay is ON. (Only for the three-phase model)<br>2. Indoor unit<br>If detected less than 180rpm or more than 2000rpm, the indoor unit will restart and keep running for 3 minutes.If detected again, the display will appear. | (1) Board failure | Replace the board. |
| | | | (2) Motor malfunction<br>(3) Solenoid switch malfunction | Check for the motor and the solenoid switch. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 4220<br>4225 | Bus voltage drop<br>(Detail code 108) | If Vdc 150V or less is detected during Inverter operation. (S/W detection) | (1) Power supply environment | Check whether the unit makes an instantaneous stop when the detection result is abnormal or a power failure occurs.<br>Check whether the power voltage is 150V or less across all phases. |
| | | | (2) Voltage drop detected | **In the case of 4220**<br>Measure voltages of the male connector (CNDC2) on the compressor INV board.<br>-> Replace the INV board when there is no voltage drop.<br>-> Check the followings when there is a voltage drop.<br>1) Check the voltage of CN52C1 on the main board. Refer to (3).<br>2) Check whether 52C1 works normally Refer to (4). Or check 52C1 connecting piping.<br>3) Check for the diode stack. Refer to (5).<br>4) Check for the wiring and the connectors between the CNDC2-G on the compressor INV board and the CNDC1 on the G/A board.<br>Replace G/A board when no fault is found for the above (1) - (4).<br>**In the case of 4225**<br>Check the following.<br>1) Check the voltage of CN52C1 on the main board. Refer to (3).<br>2) Check whether 52C1 works normally Refer to (4). Or check 52C1 wire connection.<br>3) Check for diode stack failure. Refer to (5).<br>4) Check the wiring and the connectors of the CNVDC on the FAN INV board.<br>Replace FAN INV board when no fault is found for the above (1) - (4). |
| | | | (3) Main board failure | Check whether AC208/230V is applied to the male connector (CN52C1) on the main board during inverter operation.<br>->If not applied, check the main board and the fuse (F01 andF02). Replace the main board when no fault is found. |
| | | | (4) 52C1 failure | Refer to 9 [4]-8-(4) and check the coil resistance check. |
| | | | (5) Diode stack failure | Refer to 9 [4]-8-(6) and check the diode stack resistance. |
| | Bus voltage rise<br>(Detail code 109) | If Vdc 425V or more is detected during inverter operation. | (1) Different voltage connection | Check the power supply voltage on the power supply terminal block (TB1). |
| | | | (2) INV board failure | Replace the INV board when no fault is found.<br>In the case of 4220: Compressor INV board<br>In the case of 4225: FAN INV board |
| | Abnormal VDC<br>(Detail code 110) | Bus voltage abnormality If Vdc 400V or more or Vdc 160V or less is detected. (H/W detection) | Same as detail code No.108 and 109 of 4220 error | Same as detail code No.108 and 109 of 4220 error. |

Refer to section -8-"Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 4220<br>4225 | Logic error (Detail code No.111) | If only the H/W error logic circuit operates, and no identifiable error is detected. | **In the case of 4220**<br>(1) External noise<br>(2) Compressor INV board failure<br>(3) G/A board failure<br>(4) IPM failure<br>(5) DCCT failure | Refer to 9 [4]-8-(2) [1] and replace the G/A board.<br>Refer to 9 [4]-8-(2) [5] and replace DCCT. |
| | | | **In the case of 4225**<br>(1) External noise<br>(2) FAN INV board failure | Refer to 9 [4]-8-(2) [7]. |
| 4230<br>4235 | Heatsink overheat protection | **In the case of 4230**<br>When the heat sink temperature (THHS1) 95°C [203°F] or higher is detected.<br>**In the case of 4235**<br>When the heat sink temperature (THHS1) 85°C [185°F] or higher is detected. | (1) Power supply environment | Measure the power supply voltage. Ensure that the power supply voltage is 187V or more between each phase. |
| | | | (2) Air passage blockage | Check that the heat sink cooling air passage is not blocked. |
| | | | (3) Faulty wiring | Check for cooling fan wiring. |
| | | | (4) THHS failure | Check for THHS sensor resistor. |
| | | | (5) Compressor INV board failure and cooling fan failure | Check that a voltage of 208/230V is applied to the compressor INV board connector CNFAN while the inverter is in operation. |
| | | | (6) Cooling failure | Check the cooling fan operation under the above operating conditions. |
| | | | (7) IPM failure | Refer to 9 [4]-8-(2) [2] "Check for compressor ground fault or coil error".<br>Refer to 9 [4]-8-(2) [5] "Check the inverter circuit trouble". |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 4250<br>4255 | IPM error<br>(Detail code 101) | When an error signal of IPM is detected | **In the case of 4250**<br>(1) Inverter output related<br>(2) Same as 4230 error | Same as 4230 error |
| | | | **In the case of 4255**<br>(1) Fan motor abnormality<br>(2) FAN INV board failure | Refer to 9 [4]-8-(2) [6].<br>Refer to 9 [4]-8-(2) [7]. |
| | ACCT overcurrent breaker trip<br>(Detail code 102)<br>DCCT overcurrent breaker trip<br>(Detail code 103)<br>Overcurrent breaker trip<br>(Detail code 106,107) | When overcurrent break (150 Apeak or 60 Arms) is detected by the current sensor. | (1) Inverter output related | 9 [4]-8-(2) Inverter output related troubles<br>Refer to [1] - [5]. |
| | IPM short/ grounding fault<br>(Detail code 104) | When IPM short damage or grounding on the load side is detected just before starting the inverter. | **In the case of 4250**<br>(1) Grounding fault of compressor<br>(2) Inverter output related | Refer to 9 [4]-8-(2). |
| | | | **In the case of 4255**<br>(1) Grounding fault of fan motor<br>(2) FAN INV board failure | Refer to 9 [4]-8-(2) [6].<br>Refer to 9 [4]-8-(2) [7]. |
| | Overcurrent error due to short-circuited motor<br>(Detail code105) | When a short is detected on the compressor or the fan motor just before the inverter operation. | **In the case of 4250**<br>(1) Short-circuited compressor<br>(2) Output wiring<br>(3) Power supply | Refer to 9 [4]-8-(2) [2]. |
| | | | **In the case of 4255**<br>(1) Short-circuited fan motor<br>(2) Output wiring<br>(3) Power supply | Refer to [4]-8-(2) [6]. |
| 4260<br>4265 | Cooling fan abnormality | **In the case of 4260**<br>When the heat sink temperature (THHS1) 95°C [203°F] or more is detected for 10 or more minutes at inverter startup<br>**In the case of 4265**<br>When the heat sink temperature (THHS5) 85°C [185°F] or more is detected for 10 or more minutes at inverter startup | Same as 4230 error | Refer to Same as 4230 error. |

Refer to section -8-"Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

| **Temperature sensor failure (indoor unit)** | | | | |
|---|---|---|---|---|
| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
| 5101 | Air inlet | If a short or an open is detected during thermostat ON, the outdoor unit turns to anti-restart mode for 3 minutes. When the error is not restored after 3 minutes (if restored, the outdoor unit runs normally), the outdoor unit makes an error stop.<br>Short:<br>detectable at 90°C [194°F] or higher<br>Open :<br>detectable at -40°C [-40°F] or lower<br>*Sensor error at gas-side cannot be detected under the following conditions.<br>♦During heating operation<br>♦During cooling operation for 3 minutes after the compressor turns on. | (1) Thermistor failure<br>(2) Connector contact failure<br>(3) Disconnected wire or partial disconnected thermistor wire<br>(4) Unattached thermistor or contact failure | Check the thermistor resistor.<br>0°C [32°F]: 15 kohm<br>10°C [50°F]: 9.7 kohm<br>20°C [68°F] : 6.4 kohm<br>30°C [86°F] : 4.3 kohm<br>40°C [104°F] : 3.1 kohm |
| 5102 | Liquid pipe | | | |
| 5103 | Gas pipe | | | |
| 5104 | Outdoor air temperature | | (5) Indoor board (detection circuit) failure | Check the connector contact.<br>When no fault is found, the indoor board is a failure. |

| **(OA processing unit)** | | | | |
|---|---|---|---|---|
| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
| 5104 | Outdoor air temperature | - | (1) The connector (CN29) is not connected tightly.<br>(2) The outdoor air temperature sensor is broken. | Check the contact of the connector.<br>Replace the sensor. |

**Temperature sensor failure (outdoor unit)**

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5101 | Discharge (TH1) | 1. When a short (high temperature intake) or an open (low temperature intake) of the thermistor is detected (the first detection), the outdoor unit stops, turns to anti-restart mode for 3 minutes, and restarts when the detected temperature of the thermistor.<br>2. When a short or an open is detected again (the second detection) after the first restart of the outdoor unit, the outdoor unit stops, turns to anti-restart mode for 3 minutes, and restarts in 3 minutes when the detected temperature is within the normal range.<br>3. When a short or an open is detected again (the third detection) after the previous restart of the outdoor unit, the outdoor unit makes an error stop.<br>4. When a short or an open of the thermistor is detected just before the restart of the outdoor unit, the outdoor unit makes an error stop, and the error code "5101", "5103", "5104", "5105", "5106", "5107" or "5108" will appear.<br>5. During 3-minute anti-restart mode, preliminary errors will be displayed on the LED display.<br>6. A short or an open described above is not detected for 10 minutes after the compressor start, during defrost mode, or for 3 minutes after defrost mode. | (1) Thermistor failure | Check thermistor resistance. |
| 5105 | Piping (TH5) | | (2) Pinched lead wire | Check for pinched lead wire. |
| 5106 | Outdoor air temperature (TH6) | | (3) Torn wire coating | Check for wire coating. |
| 5107 | SC coil outlet (TH7) | | (4) A pin on the male connector is missing or contact failure | Check connector. |
| 5108 | SC coil bypass outlet (TH8) | | (5) Disconnected wire | Check for wire. |
| | | | (6) Thermistor input circuit failure on the main board | Check the intake temperature of the sensor with the LED monitor. When the temperature is far different from the actual temperature, replace the control board. |

| | Short detection | Open detection |
|---|---|---|
| TH1 | 240˚C [464˚F] and above (0.57 kΩ) | 0˚C [32˚F] and below (643 kΩ) |
| TH5 | 110˚C [230˚F] and above (0.4 kΩ) | -40˚C [-40˚F] and below (130 kΩ) |
| TH6 | 110˚C [230˚F] and above (0.4 kΩ) | -40˚C [-40˚F] and below (130 kΩ) |
| TH7 | 70˚C [158˚F] and above (1.14 kΩ) | -40˚C [-40˚F] and below (130 kΩ) |
| TH8 | 70˚C [158˚F] and above (0.4 kΩ) | -40˚C [-40˚F] and below (130 kΩ) |

<table>
<tr><th colspan="2">Error Code</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr><td>4240<br>4245</td><td>Overload protection</td><td>When the greater output current (Iac) than the Imax (Arms), or THHS of more than 90 °C [194°F] is detected for 10 minutes in a row.<br><table><tr><th></th><th>Imax</th></tr><tr><td>P72 model</td><td>40 Arms</td></tr><tr><td>P96 model</td><td>50 Arms</td></tr><tr><td>P108 model</td><td>50 Arms</td></tr><tr><td>P126 model</td><td>50 Arms</td></tr><tr><td>P144 model</td><td>53 Arms</td></tr><tr><td>P168 model</td><td>50 Arms</td></tr><tr><td>P192 model</td><td>50 Arms</td></tr><tr><td>P204 model</td><td>50 Arms</td></tr><tr><td>P216 model</td><td>53 Arms</td></tr><tr><td>P234 model</td><td>53 Arms</td></tr></table></td><td>(1) Short cycle of the air passage</td><td>Check that the waste heat from the outdoor unit fan is not short cycled.</td></tr>
<tr><td colspan="3"></td><td>(2) Air passage blockage</td><td>Check that the heat sink cooling air passage is not blocked.</td></tr>
<tr><td colspan="3"></td><td>(3) Power supply</td><td>Check whether the power supply voltage is 187V or more.</td></tr>
<tr><td colspan="3"></td><td>(4) Faulty wiring</td><td>Check for cooling fan wiring.</td></tr>
<tr><td colspan="3"></td><td>(5) THHS failure</td><td>Check for THHS sensor resistor.<br>In the case of 4240: THHS1<br>In the case of 4245: THHS5</td></tr>
<tr><td colspan="3"></td><td>(6) Compressor INV board failure and cooling fan failure</td><td>Check that a voltage of 208/230V is applied to the compressor INV board connector CNFAN while the inverter is in operation.</td></tr>
<tr><td colspan="3"></td><td>(7) Cooling failure</td><td>Check the cooling fan operation under the above operating conditions.</td></tr>
<tr><td colspan="3"></td><td>(8) Current sensor (ACCT) failure</td><td>Refer to 9 [4]-8-(4).<br>"Current sensor ACCT"</td></tr>
<tr><td colspan="3"></td><td>(9) Compressor Inverter circuit failure</td><td>Refer to 9 [4]-8-(2) [4].<br>"Check whether the inverter is damaged".</td></tr>
<tr><td colspan="3"></td><td>(10) Compressor failure</td><td>Check that the compressor has not overheated during operation.<br>-> Check the refrigerant circuit (oil return section).<br>Replace the compressor when no fault is found.</td></tr>
</table>

Refer to section -8-"Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5110 | Heat sink failure<br>Detail code No. 01: Compressor INV side<br>Detail code No. 05: Fan INV side | When a short or an open of THHS is detected just before or during the inverter operation. | (1) THHS sensor failure | Check for short circuit in THHS sensor. |
| | | | (2) Contact failure | Replace THHS sensor. |
| | | | (3) Compressor INV board or fan INV board failure | Replace compressor INV board or fan INV board. |

Refer to section -8- "Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5201 | High pressure sensor (outdoor unit) | 1. If the high pressure sensor detects 0.098MPa [14psi] or less during the operation, the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes when the detected high pressure sensor is 0.098MPa [14psi] or more.<br>2. If the high pressure sensor detects 0.098MPa [14psi] or less just before the restart, the outdoor unit makes an error stop, and the error code "5201" will appear.<br>3. During 3-minute anti-restart mode, preliminary errors will be displayed on the LED display.<br>4. A error is not detected for 3 minutes after the compressor start, during defrost operation, or 3 minutes after defrost operation. | (1) High pressure sensor failure | Refer to the page on the troubleshooting of the high pressure sensor. (9 [4] -1-) |
| | | | (2) Pressure drop due to refrigerant leak | |
| | | | (3) Torn wire coating | |
| | | | (4) A pin on the male connector is missing or contact failure | |
| | | | (5) Disconnected wire | |
| | | | (6) High pressure sensor input circuit failure on the main board | |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5301 | ACCT sensor circuit failure (Detail code 117) | When an error value is detected with the ACCT detection circuit just before the inverter starts | (1) Compressor INV board failure | Refer to 9 [4]-8-(2) [1] "Check the compressor INV board error detection circuit" |
| | | | (2) Grounding fault of compressor and IPM failure | Refer to 9 [4]-8-(2) [2] "Check for compressor ground fault or coil error" Refer to9 [4]-8-(2) [5] "Check the inverter circuit trouble" |
| | DCCT sensor circuit failure (Detail code 118) | When an error value is detected with the DCCT detection circuit just before the inverter starts | (1) Contact failure | Check the contact of the connector (CNCT) on the INV board, and the contact the connector on DCCT side. |
| | | | (2) Compressor INV board failure | Refer to 9 [4]-8-(2) [1] "Check the compressor INV board error " |
| | | | (3) DCCT failure | When no fault is found with items 1 and 2, replace the DCCT sensor, and check the polarity of DCCT sensor. |
| | | | (4) Grounding fault of the compressor and IPM failure | Refer to 9 [4]-8-(2) [2] "Check for compressor ground fault or coil error" Refer to9 [4]-8-(2) [5] "Check the inverter circuit trouble" |
| | ACCT sensor failure (Detail code 115) | When the effective output current between -2 Arms and 2 Arms is detected during inverter operation | (1) Contact failure | Check the contact of the connector CNCT2 (ACCT) on the compressor INV board. |
| | | | (2) ACCT sensor failure | Replace the ACCT sensor. |
| | DCCT sensor failure (Detail code 116) | When the bus current less than 18 Apeak is detected at startup | (1) Contact failure | Check the contact of the connector CNCT (DCCT) on the compressor INV board, and the contact around the connector on DCCT side. |
| | | | (2) Misorientation | Check the installation direction of DCCT. |
| | | | (3) DCCT sensor failure | Replace the DCCT sensor. |
| | | | (4) Compressor INV board failure | Replace the compressor INV board. |
| | IPM open/Disconnected ACCT connector (Detail code 119) | When IPM open damage or disconnected CNCT2 is not detected just before INV starts (Sufficient current is not detected just before startup) | (1) Disconnected ACCT sensor | Check the connector CNCT2 connection.(Check ACCT installation state) |
| | | | (2) Faulty wiring | Check CNDR2 connection on the compressor INV board, or CNDR1 connection on the G/A board. |
| | | | (3) ACCT sensor failure | Refer to9 [4]-8-(4) "Current sensor ACCT" , and check the resistance value. |
| | | | (4) Disconnected compressor wiring | Refer to9 [4]-8-(2) [2] "Check for compressor ground fault or coil error" |
| | | | (5) Compressor INV circuit failure | Refer to9 [4]-8-(2) [5] "Check the inverter circuit trouble" |
| | ACCT faulty wiring detection (Detail code 120) | ACCT sensor is not securely mounted. | (1) Wrongly mounted ACCT sensor | Refer to 9 [4]-8-(4) "Current sensor ACCT" |

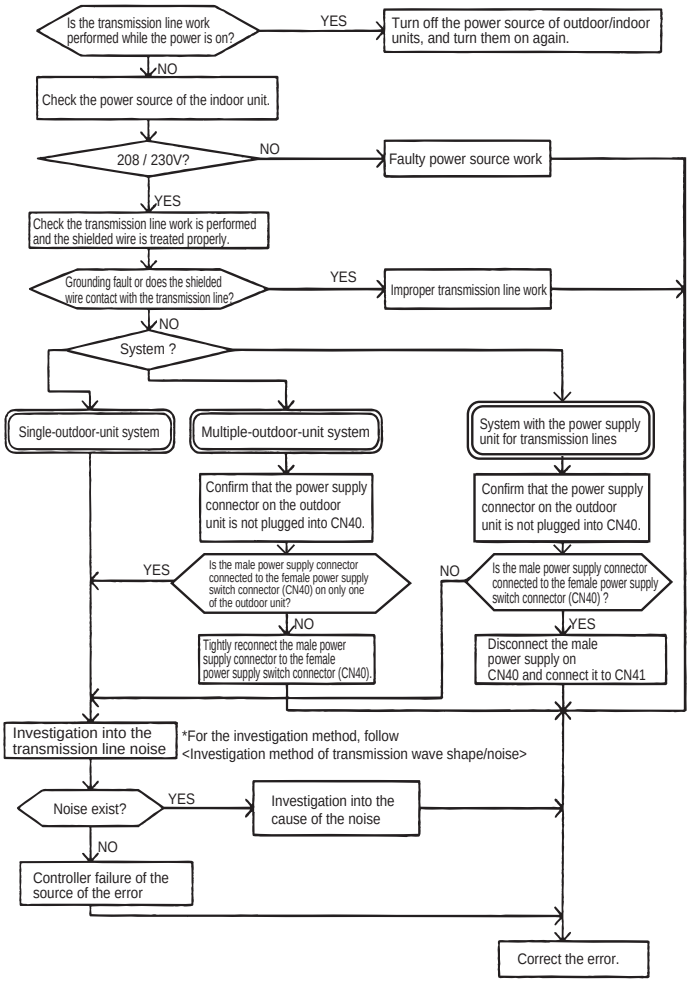
Refer to section -8- "Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

## 2. Transmission error

| Error Code | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|
| 6201 | Remote controller board failure<br>An error occurs when the data cannot be read normally from the nonvolatile memory built in on the remote controller. | Remote controller failure | Replace the remote controller. |
| 6202 | Remote controller board failure<br>An error occurs when the clock function built in on the remote controller does not work normally. | Remote controller failure | Replace the remote controller. |
| 6600 | Address overlaps<br>The error is detected when the same address is transmitted from different units.<br><br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | Two or more remote controllers for the outdoor units, the indoor units, LOSSNAY, and the M-NET remote controllers have the same addresses.<br><br><Example><br>The error code 6600 "01" appeared on the display on the remote controller indicates that an error occurred in No.1 unit.<br>Two or more units whose addresses are 01 exist in the same system. | Search for the unit which has the same address with that of the source of the trouble.<br><br>**When the same address is found, turn off the power of the outdoor unit, LOSSNAY and the indoor unit for 5 minutes or more after changing the address, and then turn them on it again.** |
| 6601 | Unset polarity<br><br>The error detected when transmission processor cannot distinguish the polarities of the M-NET transmission line. | (1) No voltage is applied to the M-NET transmission line that G-50A is connected to.<br>(2) M-NET transmission line to which G-50A is connected is short-circuited. | Check if power is supplied to the M-NET transmission line of the G-50A, and correct any problem found. |

| Error Code | Error definition and error detection method | Check method and remedy |
|---|---|---|
| 6602 | Transmission processor hardware error<br><br>Although "0" was surely transmitted by the transmission processor, "1" is displayed on the transmission line.<br><br>**The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | (1) When the wiring work of or the polarity of either the indoor or outdoor transmission line is performed or is changed while the power is on, the transmitted data will collide, the wave shape will be changed, and an error will be detected.<br>(2) Grounding fault of the transmission line<br>(3) When grouping the indoor units that are connected to different outdoor units, the male power supply connectors on the multiple outdoor units are connected to the female power supply switch connector (CN40).<br>(4) When the power supply unit for transmission lines is used in the system connected with MELANS, the male power supply connector is connected to the female power supply switch connector (CN40) on the outdoor unit.<br>(5) Controller failure of the source of the error<br>(6) When the transmission data is changed due to the noise on the transmission line<br>(7) Voltage is not applied on the transmission line for centralized control (in case of grouped indoor units connected to different outdoor units or in case of the system connected with MELANS) |

Check method and remedy



| Error Code | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|
| 6603 | Transmission circuit bus-busy<br><br>1. Generated error when the command cannot be transmitted for 4-10 minutes in a row due to bus-busy<br>2. Generated error when the command cannot be transmitted to the transmission line for 4-10 minutes in a row due to noise<br><br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | (1) The transmission processor cannot be transmitted as the short-wavelength voltage like noise exists consecutively on the transmission line.<br>(2) Error source controller failure | No noise indicates that the error source controller is a failure.<br>If noise exists, investigate the noise.<br>-> No noise indicates that the error source controller is a failure.<br>-> If noise exists, investigate the noise. |
| 6606 | Communication error with the transmission processor<br>Communication error between the main microcomputer on the indoor unit board and the microcomputer for transmission<br><br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | (1) Data is not properly transmitted due to accidental erroneous operation of the controller of the error source.<br>(2) Error source controller failure | Turn off the power source of the outdoor and the indoor units.(When the power source is turned off separately, the microcomputer will not be reset, and the error will not be corrected.)<br>-> If the same error occurs, the error source controller is a failure. |

### (1) System with one outdoor unit

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| Outdoor unit (OC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to OC | (1) Contact failure of transmission line of OC or IC<br>(2) Decrease of transmission line voltage/signal by exceeding acceptable range of transmission wiring .<br>Farthest:<br>200 m [656ft] or less<br>Remote controller wiring:<br>10m [656ft] or less<br>(3) Erroneous sizing of transmission line (Not within the range below).<br>Wire diameter:<br>1.25mm$^2$ [AWG16] or more<br>(4) Indoor unit main board failure | Turn off the power source of the outdoor unit, and turn it on again.<br>If the error is accidental, it will run normally.<br>If not, check the causes (1) - (4). |
| Indoor unit (IC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at RC transmission to IC | (1) When IC unit address is changed or modified during operation.<br>(2) Faulty or disconnected IC transmission wiring<br>(3) Disconnected IC connector (CN2M)<br>(4) Indoor unit board failure<br>(5) M-NET remote controller failure | Turn off the outdoor/indoor units for 5 or more minutes, and turn them on again.<br>If the error is accidental, they will run normally.<br>If not, check the causes (1) - (5). |
| LOSSNAY (LC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to LC | (1) The power source of LOSSNAY has been shut off.<br>(2) When the address of LOSSNAY is changed in the middle of the operation<br>(3) Faulty or disconnected transmission wiring of LOSSNAY<br>(4) Disconnected connector (CN1) on LOSSNAY<br>(5) Controller failure of LOSSNAY | Turn off the power source of LOSSNAY and turn it on again.<br>If the error is accidental, it will run normally.<br>If not, check the causes (1) - (5). |
| M-NET remote controller(RC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to RC | (1) Faulty transmission wiring at IC unit side.<br>(2) Faulty wiring of the transmission line for M-NET remote controller<br>(3) When the address of M-NET remote controller is changed in the middle of the operation<br>(4) M-NET remote controller failure | Turn off the power source of the outdoor unit for 5 minutes or more, and turn it on again.<br>If the error is accidental, it will run normally.<br>If not, check the causes (1) - (4). |

## (2) Grouping of units in a system with multiple outdoor units

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| Outdoor unit (OC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to OC | Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| Indoor unit (IC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at RC transmission to IC | (1) Same causes as (1) - (5) for system with one outdoor unit<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) When multiple outdoor units are connected and the power source of one of the outdoor units has been shut off.<br>(4) The male power supply connector of the outdoor unit is not connected to the female power supply switch connector (CN40).<br>(5) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for centralized control.<br>If an error occurs, after the unit runs normally once, the following causes may be considered.<br>•Total capacity error (7100)<br>•Capacity code error (7101)<br>•Error in the number of connected units (7102)<br>•Address setting error (7105) | 1) Turn off the power sources of the outdoor and indoor units for 5 or more minutes, and turn them on again. If the error is accidental, the will run normally.If not, check the cause 2).<br>2) Check the causes of (1) - (5). If the cause is found, correct it. If no cause is found, check 3).<br>3) Check the LED displays for troubleshooting on other remote controllers whether an error occurs.<br><br>If an error is found,<br>-> If an error is found, check the check code definition, and correct the error.<br>If no error is found,<br>-> Indoor unit board failure |
| LOSSNAY (LC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to LC | (1) Same causes as (1) - (5) for system with one outdoor unit (Interlocked operation between LOSSNAY and the indoor units in the system in which the indoor units connected to different outdoor units are grouped)<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) When multiple outdoor units are connected and the power source of one of the outdoor units has been shut off.<br>(4) The male power supply connector of the outdoor unit is not connected to the female power supply switch connector (CN40).<br>(5) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for centralized control.<br>If an error occurs, after the unit runs normally once, the following causes may be considered.<br>•Total capacity error (7100)<br>•Capacity code error (7101)<br>•Error in the number of connected units (7102)<br>•Address setting error (7105) | 1) Turn off the power source of LOSSNAY for 5 or more minutes, and turn it on again. If the error is accidental, it will run normally.If not, check the cause 2).<br>2) Check the causes of (1) - (5). If the cause is found, correct it. If no cause is found, check 3).<br>3) Same cause as that for indoor unit described in 3) |

### (2) Grouping of units in a system with multiple outdoor units

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note:The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| M-NET remote controller (RC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to RC | (1) Same causes as (1) - (4) for system with one outdoor unit<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) When multiple outdoor units are connected and the power source of one of the outdoor units has been shut off.<br>(4) The male power supply connector of the outdoor unit is not connected to the female power supply switch connector (CN40).<br>(5) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for centralized control.<br>If an error occurs, after the unit runs normally once, the following causes may be considered.<br>♦Total capacity error (7100)<br>♦Capacity code error (7101)<br>♦Error in the number of connected units (7102)<br>♦Address setting error (7105) | 1) Turn off the power source of LOSSNAY for 5 or more minutes, and turn it on again. If the error is accidental, it will run normally.If not, check the cause 2).<br>2) Check the causes of (1) - (5). If the cause is found, correct it. If no cause is found, check 3).<br>3) Same cause as that for indoor unit described in 3) |

### (3) System connected to the system controllers (MELANS)

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| Outdoor unit (OC) | M-NET remote controller (RC) system controller (SC) MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to OC | Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| Indoor unit (IC) | M-NET remote controller (RC) MA remote controller (MA) | No acknowledgement (ACK) at RC transmission to IC | Same as grouping of units in a system with multiple outdoor units | Same remedy as that for grouping of units in a system with multiple outdoor units |
| | system controller (SC) | No acknowledgement (ACK) at SC transmission to IC | 1. Error occurrence on some IC<br>(1) Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| | | | 2. Error occurrence on all IC in the system with one outdoor unit<br>(1) Total capacity error (7100)<br>(2) Capacity code error (7101)<br>(3) Error in the number of connected units (7102)<br>(4) Address setting error (7105)<br>(5) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(6) Turn off the power source of the outdoor unit<br>(7) Malfunction of electrical system for the outdoor unit | 1) Check the LED display for troubleshooting on the outdoor unit.<br>->If an error is found, check the check code definition, and correct the error.<br>->If no error is found, check 2).<br>2) Check (5) - (7) on the left. |
| | | | 3. Error occurrence on all IC<br>(1) Same causes as (1) - (7) described in 2.<br>(2) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for the transmission line for centralized control.<br>(3) Disconnection or shutdown of the power source of the power supply unit for transmission line<br>(4) System controller (MELANS) malfunction | Check voltage of the transmission line for centralized control.<br>20V or more : Check (1) and (2) on the left.<br>Less than 20V : Check (3) on the left. |

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| M-NET remote controller (RC) | M-NET remote controller (RC)<br>System controller (SC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to RC | Same as grouping of units in a system with multiple outdoor units | Same remedy as that for grouping of units in a system with multiple outdoor units |
| | system controller (SC) | No acknowledgement (ACK) at MELANS transmission to RC | 1. Error occurrence on some IC<br>(1) Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| | | | 2. Error occurrence on all IC in the system with one outdoor unit<br>(1) An error is found by the outdoor unit.<br>Total capacity error (7100)<br>Capacity code error (7101)<br>Error in the number of connected units (7102)<br>Address setting error (7105)<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) Turn off the power source of the outdoor unit<br>(4) Malfunction of electrical system for the outdoor unit | 1) Check the LED display for troubleshooting on the outdoor unit.<br>-> If an error is found, check the check code definition, and correct the error.<br>-> If no error is found, check the cause 2).<br>2) Check (2) - (4) on the left. |
| | | | 3. Error occurrence on all IC<br>(1) Same causes as (1) - (4) described in 2.<br>(2) When the power supply unit for transmission lines is used and the male power supply connector is connected to the female power supply switch connector (CN40) for the transmission line for centralized control<br>(3) Disconnection or shutdown of the power source of the power supply unit for transmission line<br>(4) System controller (MELANS) malfunction | Check (1) - (4) on the left. |

### (3) System connected to the system controllers (MELANS)

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.) **Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| system controller (SC) | M-NET remote controller (RC) MA remote controller (MA)) | No acknowledgement (ACK) at IC transmission to SC | 1. Error display on some displays on M-NET remote controllers<br>(1) Faulty wiring of the transmission line for M-NET remote controller<br>(2) Disconnection or contact failure of the transmission connector for M-NET remote controller<br>(3) M-NET remote controller failure | Check (1) - (3) on the left. |
| | | | 2. Error occurrence on all IC in the system with one outdoor unit<br>(1) An error is found by the outdoor unit.<br>Total capacity error (7100)<br>Capacity code error (7101)<br>Error in the number of connected units (7102)<br>Address setting error (7105)<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) Turn off the power source of the outdoor unit<br>(4) Malfunction of electrical system for the outdoor unit | 1) Check the LED display for troubleshooting on the outdoor unit.<br>-> If an error is found, check the check code definition, and correct the error.<br>-> If no error is found, check the cause 2)<br>2) Check (2) - (4) on the left.ÅB |
| | | | 3. Error display on all displays on M-NET remote controllers<br>(1) Same causes as (1) - (4) described in 2.<br>(2) When the power supply unit for transmission lines is used and the male power supply connector is connected to the female power supply switch connector (CN40) for the transmission line for centralized control<br>(3) Disconnection or shutdown of the power source of the power supply unit for transmission line<br>(4) System controller (MELANS) malfunction | Check (1) - (4) on the left |

### (4) Errors that are not limited to a particular system

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| Address which should not be existed | - | - | (1) Although the address of M-NET remote controller has been changed after the group is set using M-NET remote controller, the indoor unit is keeping the memory of the previous address.The same symptom will appear for the registration with SC.<br>(2) Although the address of LOSSNAY has been changed after the interlock registration of LOSSNAY is made using M-NET remote controller, the indoor unit is keeping the memory of the previous address. | Delete unnecessary information of non-existing address which some indoor units have.<br>Use either of the following two methods for deletion.<br>1) Address deletion by M-NET remote controller<br>Delete unnecessary address information using the manual setting function of M-NET remote controller. Refer to this service handbook "4. [2]. Group settings and interlock settings via the ME remote controller 1. (3) Address deletion".<br>2) Deletion of connection information of the outdoor unit by the deleting switch<br>**Note that this switch deletes all the group information set via M-NET remote controller and all the interlock information of LOSSNAY and the indoor unit.**<br>♦Turn off the power source of the outdoor unit, and wait for 5 minutes.<br>♦Turn on the dip switch (SW2-2) on the outdoor unit main board.<br>♦Turn on the power source of the outdoor unit, and wait for 5 minutes.<br>♦Turn off the power source of the outdoor unit, and wait for 5 minutes.<br>♦Turn off the dip switch (SW2-2) on the outdoor unit main board.<br>♦Turn on the power source of the outdoor unit. |

| Error Code | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|
| 6608 | No response<br>When no response command is returned although acknowledgement (ACK) is received after transmission, an error is detected.<br>When the data is transmitted 10 times in a row with 3 seconds interval, an error is detected on the transmission side.<br><br>**Note:The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | (1) The transmission line work is performed while the power is on, the transmitted data will collide, and the wave shape will be changed.<br>(2) The transmission is sent and received repeatedly due to noise.<br>(3) Decrease of transmission line voltage/signal by exceeding acceptable range of transmission wiring.<br>Farthest :<br>200m [656ft] or less<br>Remote controller wiring:<br>12m [39ft] or less<br>(4) The transmission line voltage/signal is decreased due to erroneous sizing of transmission line.<br>Wire diameter: 1.25mm$^2$ [AWG16] or more | 1) When an error occurs at commissioning<br>Turn off the power source of the outdoor unit, indoor unit, and LOSSNAY for 5 or more minutes, and turn them on again.<br>-> When they return to normal operation, the cause of the error is the transmission line work performed with the power on.<br>-> If an error occurs again, check the cause 2).<br>2) Check (3) and (4) on the left.<br>-> If the cause is found, correct it.<br>-> If no cause is found, check 3).<br>3) Check transmission wave shape/noise on trans-mission line by following <Investigation method of transmission wave shape/noise>.<br><br>**Noise is the most possible cause of the error "6608".** |

### 3. System error

<table>
<tr><th>Error Code</th><th>Error source</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr><td>7100</td><td>Outdoor unit</td><td>Total capacity error<br><br>The model total of indoor units in the system with one outdoor unit exceeds limitations.</td><td>The model total of indoor units in the system with one outdoor unit exceeds the following table.<br><table><tr><th>Model</th><th>Capacity Total</th></tr><tr><td>P72</td><td>93</td></tr><tr><td>P96</td><td>125</td></tr><tr><td>P108</td><td>140</td></tr><tr><td>P126</td><td>164</td></tr><tr><td>P144</td><td>187</td></tr><tr><td>P168</td><td>218</td></tr><tr><td>P192</td><td>250</td></tr><tr><td>P204</td><td>265</td></tr><tr><td>P216</td><td>281</td></tr><tr><td>P234</td><td>304</td></tr></table></td><td>1) Check the model total (capacity code total) of indoor units connected.<br>2) Check the model name (capacity code) of the connected indoor unit set by the switch (SW2 on indoor unit board).<br><br>When the model name set by the switch is different from that of the unit connected, turn off the power source of the outdoor and the indoor units, and change the setting of the model name (capacity code).</td></tr>
<tr><td>7101</td><td>Outdoor unit<br>Indoor unit</td><td>Capacity code error<br><br>The model name (capacity code) of the connected indoor unit connected is inappropriate.</td><td>The model name (capacity code) set by the switch (SW2) is wrong.<br><br>*The capacity of the indoor unit can be confirmed by the self-diagnosis function (SW1 operation) of the outdoor unit.</td><td>1) Check the model name (capacity code) of the indoor unit which has the error source address set by the switch (SW2 on indoor unit board).<br>When the model name set by the switch is different from that of the unit connected, turn off the power source of the outdoor and the indoor units, and change the setting of the capacity code.</td></tr>
</table>

<table>
<tr><th>Error Code</th><th>Error source</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr>
<td>7102</td>
<td>Outdoor unit</td>
<td>Error in the number of connected units<br><br>The number of connected indoor units is "0" or exceeds the allowable value.</td>
<td>(1) Number of indoor units connected to the outdoor terminal block (TB3) for indoor/outdoor transmission lines exceeds limitations described below.
<table>
<tr><th>Number of units</th><th>Restriction on the number of units</th></tr>
<tr><td rowspan="6">1) Total number of indoor units</td><td>1-13 : P72 model</td></tr>
<tr><td>1-16 : P96･P108 models</td></tr>
<tr><td>1-20 : P126 model</td></tr>
<tr><td>1-22 : P144 - P168 models</td></tr>
<tr><td>1-24 : P192 - P204 models</td></tr>
<tr><td>1-32 : P216･P234 models</td></tr>
<tr><td>2) Total number of LOSSNAY units (During auto address start-up only)</td><td>0 or 1</td></tr>
</table>
(2) Disconnected transmission line of the outdoor unit<br>
(3) Short-circuited transmission line<br>
When (2) and (3) apply, the following display will appear.<br>
♦In case of M-NET remote controller<br>
-> Nothing appears on the display as no power is supplied to the remote controller.<br>
♦In the case of MA remote controller<br>
-> "HO" will blink.</td>
<td>1) Check whether the number of units connected to the outdoor terminal block (TB3) for indoor/outdoor transmission lines does not exceed the limitation. (See (1) and (2) on the left.)<br>
2) Check (2) - (3) on the left.<br>
3) Check whether the transmission line for the terminal block for centralized control (TB7) is not connected to the terminal block for the indoor/outdoor transmission line (TB3).</td>
</tr>
<tr>
<td>7105</td>
<td>Outdoor unit</td>
<td>Address setting error<br><br>Erroneous setting of OC unit address</td>
<td>Erroneous setting of OC unit address<br>The address of outdoor unit is not being set to 51 - 100.</td>
<td>Check that the address of OC unit is set to 51- 100.Reset the address if it stays out of the range, while shutting the power source off.</td>
</tr>
<tr>
<td>7106</td>
<td>OA processing unit</td>
<td>Attribute setting error</td>
<td>MA remote controller intended for use with indoor units, such as an MA remote controller, is connected to the OA processing unit whose attribute is FU.</td>
<td>To operate the OA processing unit using remote controllers for indoor units, such as MA remote controller, set the DipSW3-1 on the OA processing unit to ON.
<table>
<tr><th>Operation method</th><th>SW 3-1</th></tr>
<tr><td>Interlock with the indoor unit</td><td>OFF</td></tr>
<tr><td>Direct operation with the MA remote controller</td><td>ON</td></tr>
</table>
</td>
</tr>
<tr>
<td>7110</td>
<td>Outdoor unit</td>
<td>Unset unit connection information error<br><br>The start-up of the unit has not completed normally in the system to which a transmission booster is connected.</td>
<td>When all power sources are turned off after the start-up of the unit has completed normally.<br>When the start-up of the unit has completed without turning on the power source of the transmission booster.<br>When the power source of the transmission booster is turned on afterwards.</td>
<td>1) Check whether the power source of the transmission is turned on.<br>
2) Turn off the power sources of outdoor/indoor units and transmission booster, and turn them on again.</td>
</tr>
</table>

| Error Code | Error source | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 7111 | Indoor unit<br>OA processing unit | **Remote controller sensor failure**<br><br>This error occurs when the temperature data is not sent although the remote controller sensor is specified. | The remote controller without the temperature sensor (the wireless remote controller or the M-NET compact remote controller (mounted type)) is used and the remote controller sensor for the indoor unit is specified. (SW1-1 is ON.) | Replace the remote controller with the one with built-in temperature sensor. |
| 7113 | Outdoor unit | **Model setting error (short detection)** | Short-circuit<br>Faulty wiring or contact failure | Check all main board connectors and rectify faulty connection. |
| 7117 | Outdoor unit | **Model setting error (Open detection)** | Disconnected connector, disconnected wire, or contact failure | Check for the contact of the connector CNTYP1, 4, 5 on the main board. |
| 7130 | Outdoor unit | **Incompatible units**<br><br>The check code will appear when the indoor units with different refrigerant systems are connected. | The indoor unit that uses only R22 refrigerant is connected.The wrong unit model is connected.<br>When connecting Mr. SLIM (A control) with M-NET, the connecting adapter for M-NET must be connected to the indoor unit. | Check the connected indoor unit model.<br>Check whether the connecting adapter for M-NET is not connected to the indoor unit.<br>(Connect the connecting adapter for M-NET to the outdoor unit.) |

<table>
<tr><th>Error Code</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr><td>6831</td><td>MA communication error or no reception error<br>Communication between the MA remote controller and the indoor unit is not done properly. No proper data has been received for 3 minutes.</td><td rowspan="2">(1) Contact failure of the remote controller lines of MA remote controller or the indoor unit.<br>(2) All the remote controllers are set to SUB.<br>(3) Failure to meet wiring regulations<br>♦Wire length<br>♦Wire size<br>♦Number of remote controllers<br>♦Number of indoor units<br>(4) The remote controller is removed after the installation without turning the power source off.<br>(5) Noise interference on the remote controller transmission lines<br>(6) Faulty circuit that is on the indoor board and performs transmission/reception of the signal from the remote controller<br>(7) Problems with the circuit on the remote controller that sends or receives the signals from the remote controller</td><td rowspan="4">1) Check for disconnected or loose transmission lines for the indoor units or MA remote controllers.<br>2) Confirm that the power is supplied to the main power source and the remote controller line.<br>3) Confirm that MA remote controller's capacity limit is not exceeded.<br>4) Check the sub/main setting of the MA remote controllers.One of them must be set to MAIN.<br>5) Diagnose the remote controller (described in the remote controller installation manual).<br>[OK]: no problems with the remote controller (check the wiring regulations)<br>[NO]: Replace the MA remote controller.<br>[6832, 6833, ERC]:<br>due to noise interference<br><Go to (5)><br>6) Check wave shape/noise on MA remote controller line by following <4. Investigation method of transmission wave shape/noise>.<br>7) When no problems are found with items 1 through 6, replace the indoor unit board or the MA remote controller.<br><br>The following status can be confirmed on LED1 and 2 on the indoor unit board.<br>♦LED1 is lit.<br>The main power source of the indoor unit is turned on.<br>♦LED2 is lit.<br>MA remote controller line is being powered.</td></tr>
<tr><td>6834</td><td>MA communication error or start bit detection error<br>Communication between the MA remote controller and the indoor unit is not done properly.<br>No proper data has been received for 2 minutes.</td></tr>
<tr><td>6832</td><td>MA communication error or synchronization recovery error<br>Communication between the MA remote controller and the indoor unit is not done properly.<br>Failure to detect opening in the transmission path and unable to send signals<br>Indoor unit : 3 minutes<br>Remote controller : 6 seconds</td><td rowspan="2">(1) Contact failure of the remote controller lines of MA remote controller or the indoor unit.<br>(2) 2 or more remote controllers are set to MAIN.<br>(3) Overlapped indoor unit address<br>(4) Noise interference on the remote controller lines<br>(5) Failure to meet wiring regulations<br>♦Wire length<br>♦Wire size<br>♦Number of remote controllers<br>♦Number of indoor units<br>(6) Problems with the circuit on the remote controller that sends or receives the signals from the remote controller</td></tr>
<tr><td>6833</td><td>MA communication error or transmission/reception H/W error<br>Communication between the MA remote controller and the indoor unit is not done properly.<br>An error occurs when the transmitted data and the received data differ for 30 times in a row.</td></tr>
</table>

## -2- PURY

### 1. Mechanical system

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 0403 | Serial communication error | Serial communication error between the main board and the INV board on the compressor, and between the main board and the INV board on the fan<br><br>Detail code 01:<br>Between the main board and the compressor INV board<br>Detail code 05:<br>Between the main board and the FAN INV board | (1) Faulty wiring | Check for wiring between the male connector (CNRS3B) on the main board and the male connector (CNRS1) on the compressor INV board or between the male connector (CNRS3A) on the main board and the male connector (CNRS2) on the FAN INV board and check for contact of the connectors.<br>Check for contact of the connector (CNAC3) on the main board or of the connector (CNTR) on the FAN INV board. |
| | | | (2) Inverter address switch setting error | Check the setting for SW2-1 on the inverter board on the compressor.<br>Confirm that the SW2-1 on the fan inverter board is set to ON. |
| | | | (3) Transformer failure | Measure voltages between pins 1 and 3 of the male connector (CNTR) on the FAN INV board. |
| | | | (4) Compressor INV board failure<br>FAN INV board failure. | Replace the compressor INV board or the FAN INV board when the power turns on automatically, even if the power source is reset. |

Refer to section -8- "Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 1102 | Abnormal discharge air temperature | 1. If the discharge temperature of 120 °C[248°F] or more is detected during the above operation (the first detection), the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.<br>2. If the discharge temperature of 120 °C[248°F] or more is detected again (the second detection) within 30 minutes after the second stop of the outdoor unit described above, the mode will be changed to 3-minute restart mode, then the outdoor unit will restart in 3 minutes.<br>3. If the discharge temperature of 120 °C [248°F] or more is detected (the third detection) within 30 minutes after the stop of the outdoor unit described above (regardless of the first or the second stop), the outdoor unit will make an error stop, and the error code "1102" will be displayed.<br>4. If the discharge temperature of 120 °C [248°F] or more is detected more than 30 minutes after the previous stop of the outdoor unit, the detection is regarded as the first detection, and the operation described in step 1 above will start.<br>5. For 30 minutes after the stop (the first stop or the second stop) of the outdoor unit, preliminary errors will be displayed on the LED display. | (1) Gas leak, gas shortage | Refer to the page on refrigerant amount evaluation. |
| | | | (2) Overload operation | Check operating conditions and operation status of indoor/outdoor units. |
| | | | (3) LEV failure on the indoor unit<br>(4) BC controller LEV malfunction<br>Cooling only : LEV3<br>Cooling main : LEV1,2,3<br>Heating only or heating main : LEV3<br>Defrost : FLEV3<br>(5) BC controller SVM1 and 2 malfunction<br>-> Cooling only or defrost<br>(6) BC controller SVA malfunction<br>-> Cooling only or cooling main<br>(7) BC controller SVB malfunction<br>-> Heating only or heating main<br>(8) Solenoid valve SV malfunction (4a-4d (P72-P144 models) ,4a-4d and 5a, 5b (P168-P234models)): heating only, heating main | Perform a heating operation and check the operation.<br>Cooling: LEV on the indoor unit<br>LEV1,2,3<br>SVM1,2<br>SVA<br>Heating: LEV on the indoor unit<br>LEV3<br>SVB<br>SV4a - 4d<br>SV5a,5b<br>Refer to the page on troubleshooting LEV. |
| | | | (9) Port address setting error. | Confirm the port address of the indoor unit. |
| | | | (10) Closed ball valve | Confirm that the ball valve is fully open. |
| | | | (11) Outdoor fan (including fan parts) failure, motor failure, or fan controller malfunction<br>-> Heating only or heating main<br>Rise in discharge temp. by low pressure drawing for (3) - (11). | Check the fan on the outdoor unit. Refer to the section on troubleshooting the outdoor unit fan. |
| | | | (12) Gas leak between low and high pressures(4-way valve failure, compressor failure, solenoid valve SV1, SV2 failure) | Perform a cooling or heating operation and check the operation. |
| | | | (13) Thermistor failure (TH11,TH12) | Check the thermistor resistor. |
| | | | (14) Input circuit failure on the controller board thermistor | Check the inlet air temperature on the LED monitor and check for contact failure of the connector. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 1301 | Abnormal low pressure | When starting the compressor from Stop Mode for the first time if low-pressure reads 0.098MPa[14psi] immediately before start-up, the operation immediately stops. | (1) Inner pressure drop due to a leakage.<br>(2) Low pressure sensor failure<br>(3) Short-circuited pressure sensor cable due to torn outer rubber<br>(4) A pin on the male connector is missing.<br>(5) Disconnected wire<br>(6) Failure of the low pressure input circuit on the controller board | Refer to the section on troubleshooting the low pressure sensor. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 1302 | Abnormal high pressure 1 (outdoor unit) | 1. If the pressure of 3.87MPa[561psi] or higher is detected by the pressure sensor during operation (the first detection), the outdoor stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.<br>2. If the pressure of 3.87MP[561psi] or higher is detected by the pressure sensor again (the second detection) within 30 minutes after the first stop of the outdoor unit, the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.<br>3. If the pressure of 3.87MP[561psi]a or higher is detected by the pressure sensor (the third detection) within 30 minutes of the second stop of the outdoor unit, the outdoor unit will make an error stop, and the error code "1302" will be displayed.<br>4. If the pressure of 3.87MPa[561psi] or higher is detected more than 30 minutes after the stop of the outdoor unit, the detection is regarded as the first detection, and the operation described in step 1 above will start.<br>5. For 30 minutes after the stop of the outdoor unit, preliminary errors will be displayed on the LED display.<br>6. The outdoor unit makes an error stop immediately when not only the pressure sensor but also the pressure switch detects $4.15^{+0,-0.15}$ MPa [$601^{+0,-22}$ psi] | (1) LEV failure on the indoor unit<br>(2) BC controller LEV malfunction<br>Heating only or heating main : Indoor LEV 3<br>Defrost : LEV3<br>(3) BC controller SVM1 and 2 malfunction<br>->Cooling only or defrost<br>(4) BC controller SVA malfunction<br>->Cooling only or cooling main<br>(5) BC controller SVB malfunction<br>->Heating only or heating main<br>(6) Solenoid valve SV malfunction (4a-4d (P72-P144 models) ,4a-4d and 5a, 5b (P168-P234models)): heating only, heating main<br>->Heating only or heating main | Perform a heating operation and check the operation.<br>Cooling: LEV on the indoor unit<br>LEV1,2,3<br>SVM1,2<br>SVA<br>Heating: LEV on the indoor unit<br>LEV3<br>SVM2<br>SVB<br>SV4a - 4d<br>SV5a,5b<br>Refer to the page on trouble-shooting for LEV and solenoid valve. |
| | | | (7) Port address setting error. | Confirm the port address of the indoor unit. |
| | | | (8) Closed ball valve | Confirm that the ball valve is fully open. |
| | | | (9) Short cycle on the indoor unit side<br>(10) Clogged filter on the indoor unit<br>(11) Reduced air flow due to dirty fan on the indoor unit fan<br>(12) Dirty heat exchanger of the indoor unit<br>(13) Indoor fan (including fan parts) failure or motor failure<br>For (9) - (13), rise in high pressure caused by lowered condensing capacity in heating only or heating main operation. | Check the indoor units for problems and correct them, if any. |
| | | | (14) Short cycle on the outdoor unit<br>(15) Dirty heat exchanger of the outdoor unit" | |
| | | | (16) Outdoor fan (including fan parts) failure, motor failure, or fan controller malfunction<br>-> Heating only or heating main<br>Rise in discharge temp. by low pressure drawing for (13) - (15). | Check the fan on the outdoor unit. Refer to the section on troubleshooting the outdoor unit fan. |
| | | | (17) Rise in high pressure cannot be controlled due to solenoid valve SV1 malfunction. | Refer to the section on troubleshooting the solenoid valve. |
| | | | (18) Thermistor failure (TH5 - TH7) | Check the thermistor resistor. |
| | | | (19) Pressure sensor failure | Refer to the page on the trouble-shooting of the high pressure sensor. |
| | | | (20) Failure of the thermistor input circuit and pressure sensor input circuit on the controller board | Check the temperature on the LED monitor and check for contact failure of the connector. |
| | | | (21) Faulty mounting of thermistor (TH5 - TH7) | |
| | | | (22) Disconnected male connector on the pressure switch (63H) or disconnected wire | |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 1302 | Abnormal high pressure 2 (outdoor unit) | If the pressure of 0.098MPa[14psi] or lower is registered on the pressure sensor immediately before start-up, it will trigger an abnormal stop, and error code "1302" will be displayed. | (1) Inner pressure drop due to a leakage.<br>(2) Pressure sensor failure<br>(3) Shorted-circuited pressure sensor cable due to torn outer rubber<br>(4) A pin on the male connector on the pressure sensor is missing or contact failure<br>(5) Disconnected pressure sensor cable<br>(6) Failure of the pressure sensor input circuit on the controller board | Refer to the page on the troubleshooting of the high pressure sensor. |
| 1500 | Refrigerant overcharge | An error can be detected by the discharge temperature superheat.<br>1. If the discharge SH 10K [18°F] or less is detected during operation (the first detection), the outdoor unit stops at once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.<br>2. If the discharge SH 10K [18°F] or less is detected again within 30 minutes after first stop of the outdoor unit (the second detection), the outdoor unit will make an error stop, and the error code "1500" is displayed.<br>3. If discharge SH 10K [18°F] or less is detected more than 30 minutes after the outdoor unit stops, and the operation described in step 1 above will start.<br>4. For 30 minutes after the stop of the outdoor unit, preliminary errors will be displayed on the LED display. | (1) Overcharged refrigerant | Refer to the page on refrigerant amount evaluation. |
| | | | (2) Thermistor input circuit failure on the main board<br>(3) Faulty mounting of thermistor (TH11, TH12) | Check the temperature and the pressure of the sensor on the LED monitor. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 2502 | Drain pump failure<br>(The error code blinks on the indoor unit in trouble.) | When the drain sensor detects water or its tip becomes immersed in water during drain pump operation. | (1) Drain pump malfunction<br>(2) Clogged drain pump intake<br>(3) Clogged drain pipe<br>(4) Return water from drain pipe (Improper installation) | 1) Check for drain pump malfunction<br>♦**Check whether there is water in the drain pan.**<br>Check whether there is water in the drain pan. When the water level is approximately 10mm [13/32"] from the bottom of the drain pan, the drain pump may be normal.<br>♦**Check whether the drain pump operates properly.**<br>Check whether the resistance of the drain pump is normal or the drain pump operates normally when the power supply is applied.<br>2) Check for clogged drain pump intake<br>Check whether there is no dust around the drain pump intake.<br>3) Check for clogged drain pipe<br>Check whether there is no clogging outside of the pipe body.<br>4) Check for return water.<br>Pour approximately 1-liter water in the drain pump, and start the drain pump. When the water level in the drain pan becomes steadily lower, stop the pump, and check the amount of the return water to the drain pan.<br>*When a large amount of water returns, the gradient of drain pipe may be the reason. Check whether the drain pipe is installed properly as the instructions in the installation manual say. Furthermore, check whether the gradient of the unit installation is horizontal. An error may occur due to return water depending on the gradient.<br>(Target gradient approximately 0.5 °)<br><br>After checking the above, when all normal, misdetection of the drain sensor is possible.<br>♦**Check the drain sensor.**<br>Check the resistance value<br><br><Error reset method><br>Reset (error reset) the indoor unit in trouble with the remote controller. |
| | Drain pump failure<br>(The error code blinks on all the indoor units in the system) | When the drain sensor detects water or its tip becomes immersed in water during drain pump operation on stopping indoor units. | (1) Drain pump malfunction<br>(2) Clogged drain pump intake<br>(3) Clogged drain pipe<br>(4) Return water from drain pipe (Improper installation) | Same as above<br><br><Error reset method><br>Reset the power of the indoor unit in trouble.However, the reset with the remote controller (error reset) must be made 10 minutes later after the power has been reset. All the indoor units must be reset with the remote controller. |

<table>
<tr><th colspan="2">Error Code</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr><td>2503</td><td>Drain sensor failure</td><td rowspan="2">When a short or an open is detected during operation (cannot be detected during OFF).<br>Short :<br>detectable at 90°C [194°F] or higher<br>Open :<br>detectable at<br>-20°C [-4°F] or lower</td><td>(1) Thermistor failure<br>(2) Connector contact failure (loose connector)<br>(3) Disconnected wire or partial disconnected thermistor wire</td><td>Check the thermistor resistance.<br>0°C [32°F] : 6.0 kohm<br>10°C [50°F] : 3.9 kohm<br>20°C [68°F] : 2.6 kohm<br>30°C [86°F] : 1.8 kohm<br>40°C [104°F] : 1.3 kohm</td></tr>
<tr><td>Indoor board (detection circuit) failure</td><td>Check the connector contact.<br>If no fault is found, the indoor board is a failure.</td></tr>
<tr><td>2600</td><td>Water leakage</td><td>-</td><td>Water leaks from the pipes in such as the humidifier.</td><td>Check the location of the leak.</td></tr>
<tr><td rowspan="5">2601</td><td rowspan="5">Water supply cut-off</td><td rowspan="5">-</td><td>(1) The water tank of the humidifier is empty.</td><td>Check the amount of supply water.<br>Check for the solenoid valve and for the connection.</td></tr>
<tr><td>(2) The solenoid valve for humidification is OFF.</td><td>Check the connector.</td></tr>
<tr><td>(3) Disconnected float switch</td><td>Check the connecting part.</td></tr>
<tr><td>(4) Poor operation of float switch</td><td>Check for the float switch.</td></tr>
<tr><td>(5) Frozen water tank</td><td>Turn off the power source of the water tank to defrost, and turn it on again.</td></tr>
<tr><td rowspan="6">4103</td><td rowspan="6">Reverse phase/open phase</td><td rowspan="2">1. When turning on the power, the operation cannot be started because of the open phase of one of the power lines (L1, L2 or L3).</td><td>(1) Faulty wiring</td><td>♦Check whether the phase of the power supply terminal block (TB1) is normal.<br>♦Check the wiring between the power supply terminal block (TB1) and the main boards (CN20 and CN21).<br><table><tr><th>TB1</th><th colspan="2">Pin</th></tr><tr><td>L1</td><td>CN20</td><td>5Pin</td></tr><tr><td>L2</td><td>CN21</td><td>3Pin</td></tr><tr><td>L3</td><td>CN21</td><td>1Pin</td></tr></table></td></tr>
<tr><td>(2) Main board failure</td><td>If the above faults are not found, the main board is faulty.</td></tr>
<tr><td rowspan="4">2. The operation cannot be started because of the reserve phase of one of the power lines (L1, L2 or L3).</td><td>(1) Power supply error<br>♦Open phase of power supply voltage<br>♦Power-supply voltage drop</td><td>Check the input resistance of the power supply terminal block (TB1).</td></tr>
<tr><td>(2) Faulty wiring<br>Between the power supply terminal block (TB1) and the main boards (CN20 and 21)</td><td>♦Measure voltages of pin 5 of the male connector (CN20) on the main board and between pins 1 and 3 of the male connector (CN21) on the main board.<br>♦If the voltage is not the same as the power supply voltage, the wiring is faulty.</td></tr>
<tr><td>(3) A fuse is blown.</td><td>Check whether the fuses of the main board (both F01 and F02) are not blown.</td></tr>
<tr><td>(4) Main board failure</td><td>If the above faults are not found, the main board is faulty.</td></tr>
</table>

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 4108 | Overcurrent protection | 1. First detection<br>If 51C2 is started during the operation of No.2 compressor, the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes. (Set value of the over-current relay: 43A)<br>2. Second detection<br>If 51C2 is started again within a minute after restarting in compliance with 1. above, the unit makes an error stop and the error code "4108" will appear.<br>3. There will be a minute grace period of an error stop when No.2 compressor restarts after the outdoor unit stops and LED indicates, which means the grace period, will appear. | (1) Overload operation that exceeds unit use limit | Check the unit working condition. |
| | | | (2) Power supply error<br>♦Power-supply voltage drop<br>♦Open phase of power supply voltage | Check the voltage of the power supply terminal block (TB1).<br>Check for open phase. |
| | | | (3) Faulty wiring | Check 52C2 connector and the wiring. |
| | | | (4) Compressor failure<br>♦Compressor open phase or grounding fault<br>♦Compressor lock | Check the wiring and apply a megger to the compressor.<br>Start operation under no-load conditions.<br>Remove the power wire on the compressor-side, insulate the power line and start operation.<br>-> The compressor is faulty if 52C2 normally turns on. |
| 4115 | Power supply sync signal abnormality | The frequency cannot be determined when the power is switched on. | (1) Power supply error | Check the voltage of the power supply terminal block (TB1). |
| | | | (2) A fuse is blown. | Check the fuses on the main board (F01 and F02). |
| | | | (3) Faulty wiring | Measure voltages of pin 5 of the male connector (CN20) on the main board and between pins 1 and 3 of the male connector (CN21) on the main board.<br>If the voltage (AC208 / 230V) is not the same as the power supply voltage, the wiring is faulty. |
| | | | (4) Main board failure | If none of the items described above is applicable, and if the trouble reappears even after the power is switched on again, replace the MAIN board. |
| 4116 | Motor abnormality | 1. LOSSNAY<br>♦The motor keep running even if the power is OFF.<br>♦The thermal overload relay is ON. (Only for the three-phase model)<br>2. Indoor unit<br>If detected less than 180rpm or more than 2000rpm, the indoor unit will restart and keep running for 3 minutes.<br>If detected again, the display will appear. | (1) Board failure | Replace the board. |
| | | | (2) Motor malfunction<br>(3) Solenoid switch malfunction | Check for the motor and the solenoid switch. |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 4220<br>4225 | Bus voltage drop<br>(Detail code 108) | If Vdc 150V or less is detected during Inverter operation. (S/W detection) | (1) Power supply environment | Check whether the unit makes an instantaneous stop when the detection result is abnormal or a power failure occurs.<br>Check whether the power voltage is 150V or less across all phases. |
| | | | (2) Voltage drop detected | **In the case of 4220**<br>Measure voltages of the male connector (CNDC2) on the compressor INV board.<br>-> Replace the INV board when there is no voltage drop.<br>-> Check the followings when there is a voltage drop.<br>1) Check the voltage of CN52C on the main board. Refer to (3).<br>2) Check whether 52C1 works normally. Refer to (4) or check 52C1 connecting piping.<br>3) Check for the diode stack. Refer to (5).<br>4) Check the wiring and the connectors between the CNDC2-G on the compressor INV board and the CNDC1 on the G/A board.<br>Replace G/A board when no fault is found for the above 1) - 4).<br>**In the case of 4225**<br>Check the followings.<br>1) Check the voltage of CN52C1 on the main board. Refer to (3).<br>2) Check whether 52C1 works normally. Refer to (4). Or check 52C1 wire connection.<br>3) Check diode stack failure. Refer to (5).<br>4) Check the wiring and the connectors of the CNVDC on the FAN INV board.<br>Replace FAN INV board when no fault is found for the above 1) - 4). |
| | | | (3) Main board failure | Check whether AC208 / 230 V is applied to the male connector (CN52C1) on the main board during inverter operation.<br>-> If not applied, check the main board and the fuse (F01 andF02). Replace the main board when no fault is found. |
| | | | (4) 52C1 failure | Refer to 9.[4].8.(4) and check the coil resistance check. |
| | | | (5) Diode stack failure | Refer to 9.[4].8.(6) and check the diode stack resistance. |
| | Bus voltage rise<br>(Detail code 109) | If Vdc 425V or more is detected during inverter operation. | (1) Different voltage connection | Check the power supply voltage on the power supply terminal block (TB1). |
| | | | (2) INV board failure | Replace the INV board when no fault is found.<br>In the case of 4220: Compressor INV board<br>In the case of 4225: FAN INV board |
| | Abnormal VDC<br>(Detail code 110) | Bus voltage abnormality If Vdc 400V or more or Vdc 160V or less is detected. (H/W detection) | Same as detail code No.108 and 109 of 4220 error. | Same as detail code No.108 and 109 of 4220 error. |

Refer to section -8- "Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

<table>
<tr><th colspan="2">Error Code</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr><td rowspan="2">4220<br>4225</td><td rowspan="2">Logic error<br>(Detail code No.111)</td><td rowspan="2">If only the H/W error logic circuit operates, and no identifiable error is detected.</td><td>In the case of 4220<br>(1) External noise<br>(2) Compressor INV board failure<br>(3) G/A board failure<br>(4) IPM failure<br>(5) DCCT failure</td><td>Refer to 9 [4]-8-(2)[1].<br>Replace the G/A board.<br>Refer to 9 [4]-8-(2)[5].<br>Replace DCCT.</td></tr>
<tr><td>In the case of 4225<br>(1) External noise<br>(2) FAN INV board failure</td><td>Refer to 9 [4]-8-(2) [7].</td></tr>
<tr><td rowspan="7">4230<br>4235</td><td rowspan="7">Heatsink overheat protection</td><td rowspan="7">In the case of 4230<br>When the heat sink temperature(THH S1) 95°C [203°F] or higher is detected.<br>In the case of 4235<br>When the heat sink temperature (THHS5) 85°C [185°F] or higher is detected.</td><td>(1) Power supply environment</td><td>Measure the power supply voltage. Ensure that the power supply voltage is 187V or more between each phase.</td></tr>
<tr><td>(2) Air passage blockage</td><td>Check that the heat sink cooling air passage is not blocked.</td></tr>
<tr><td>(3) Faulty wiring</td><td>Check cooling fan wiring.</td></tr>
<tr><td>(4) THHS failure</td><td>Check THHS sensor resistor.</td></tr>
<tr><td>(5) Compressor INV board failure and cooling fan failure</td><td>Check that a voltage of 208/230V is applied to the compressor INV board connector CNFAN while the inverter is in operation.</td></tr>
<tr><td>(6) Cooling failure</td><td>Check the cooling fan operation under the above operating conditions.</td></tr>
<tr><td>(7) IPM failure</td><td>Refer to 9.[4].8.(2) [2] "Check for compressor ground fault or coil error".<br>Refer to 9.[4].8.(2).[5] "Check the inverter circuit trouble"</td></tr>
<tr><td rowspan="11">4240<br>4245</td><td rowspan="11">Overload protection</td><td rowspan="11">When the greater output current (Iac) than the Imax (Arms), or THHS of more than 90°C [194°F] is detected for 10 minutes in a row.<br><table><tr><th></th><th>Imax</th></tr><tr><td>P72 model</td><td>40 Arms</td></tr><tr><td>P96 model</td><td>50 Arms</td></tr><tr><td>P108 model</td><td>50 Arms</td></tr><tr><td>P126 model</td><td>50 Arms</td></tr><tr><td>P144 model</td><td>53 Arms</td></tr><tr><td>P168 model</td><td>50 Arms</td></tr><tr><td>P192 model</td><td>50 Arms</td></tr><tr><td>P204 model</td><td>50 Arms</td></tr><tr><td>P216 model</td><td>53 Arms</td></tr><tr><td>P234 model</td><td>53 Arms</td></tr></table></td><td>(1) Short cycle of the air passage</td><td>Check that the waste heat from the outdoor unit fan is not short cycled.</td></tr>
<tr><td>(2) Air passage blockage</td><td>Check that the heat sink cooling air passage is not blocked.</td></tr>
<tr><td>(3) Power supply</td><td>Check whether the power supply voltage is 187V or more.</td></tr>
<tr><td>(4) Faulty wiring</td><td>Check cooling fan wiring.</td></tr>
<tr><td>(5) THHS failure</td><td>Check THHS sensor resistance.<br>In the case of 4240: THHS1<br>In the case of 4245: THHS5</td></tr>
<tr><td>(6) Compressor INV board failure and cooling fan failure</td><td>Check that a voltage of 208/230V is applied to the compressor INV board connector CNFAN while the inverter is in operation.</td></tr>
<tr><td>(7) Cooling failure</td><td>Check the cooling fan operation under the above operating conditions.</td></tr>
<tr><td>(8) Current sensor (ACCT) failure</td><td>Refer to 9.[4].8.(4) "Current sensor ACCT"</td></tr>
<tr><td>(9) Compressor Inverter circuit failure</td><td>Refer to 9.[4].8.(2).[4] "Check whether the inverter is damaged"</td></tr>
<tr><td>(10) Compressor failure</td><td>->Check that the compressor has not overheated during operation.<br>Replace the compressor when no fault is found.</td></tr>
</table>

Refer to section -8- "Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 4250<br>4255 | IPM error<br>(Detail code 111) | When an error signal of IPM is detected | **In the case of 4250**<br>(1) Inverter output related<br>(2) Same as 4230 error | Same as 4230 error |
| | | | **In the case of 4255**<br>(1) Fan motor abnormality<br>(2) FAN INV board failure | Refer to 9 [4]-8-(2) [6].<br>Refer to 9 [4]-8-(2) [7]. |
| | ACCT overcurrent breaker trip<br>(Detail code 102)<br>DCCT overcurrent breaker trip<br>(Detail code 103)<br>Overcurrent breaking<br>(Detail code 106,107) | When overcurrent break (150 Apeak or 60 Arms) is detected by the current sensor. | (1) Inverter output related | 9.[4].8.(2) Inverter output related troubles<br>Refer to [1] - [5]. |
| | IPM short/ grounding fault<br>(Detail code No.104) | When IPM short damage or grounding on the load side is detected just before starting the inverter. | **In the case of 4250**<br>(1) Grounding fault of compressor.<br>(2) Inverter output related | Refer to 9 [4]-8-(2). |
| | | | **In the case of 4255**<br>(1) Grounding fault of fan motor.<br>(2) FAN INV board failure | Refer to 9 [4]-8-(2) [6].<br>Refer to 9 [4]-8-(2) [7]. |
| | Overcurrent error due to short-circuited motor<br>(Detail code No.105) | When a short is detected on the compressor or the fan motor just before the inverter operation. | **In the case of 4250**<br>(1) Short-circuited compressor<br>(2) Output wiring<br>(3) Power supply | Refer to 9 [4]-8-(2) [2]. |
| | | | **In the case of 4255**<br>(1) Short-circuited fan motor<br>(2) Output wiring<br>(3) Power supply | Refer to 9 [4]-8-(2) [6]. |
| 4260<br>4265 | Cooling fan abnormality | **In the case of 4260**<br>In the case of 4260 When the heat sink temperature (THHS1) 95°C [203°F] or more is detected for 10 or more minutes at inverter startup<br>**In the case of 4265**<br>When the heat sink temperature (THHS5) 85°C [185°F] or more is detected for 10 or more minutes at inverter startup | Same as 4230 error | Same as 4230 error |

Refer to section -8- "Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

| **Temperature sensor failure (indoor unit)** | | | | |
|---|---|---|---|---|
| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
| 5101 | Air inlet | If a short or an open is detected during thermostat ON, the outdoor unit turns to anti-restart mode for 3 minutes. When the error is not restored after 3 minutes (if restored, the outdoor unit runs normally), the outdoor unit makes an error stop.<br>Short : detectable at 90°C [194°F] or higher<br>Open : detectable at -40°C [-40°F] or lower<br>Sensor error at gas-side cannot be detected under the following conditions.<br>♦During heating operation<br>♦During cooling operation for 3 minutes after the compressor turns on. | (1) Thermistor failure<br>(2) Connector contact failure<br>(3) Disconnected wire or partial disconnected thermistor wire<br>(4) Unattached thermistor or contact failure | Check the thermistor resistor.<br>0°C [32°F] : 15 kohm<br>10°C [50°F] : 9.7 kohm<br>20°C [68°F] : 6.4 kohm<br>30°C [86°F] : 4.3 kohm<br>40°C [104°F] : 3.1kohm |
| 5102 | Liquid pipe | | | |
| 5103 | Gas pipe | | | |
| 5104 | Outdoor air temperature | | (5) Indoor board (detection circuit) failure | Check the connector contact.<br>When no fault is found, the indoor board is a failure. |

| **(OA processing unit)** | | | | |
|---|---|---|---|---|
| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
| 5104 | Outdoor air temperature | - | (1) The connector (CN29) is not connected tightly.<br>(2) The outdoor air temperature sensor is broken. | Check the contact of the connector.<br>Replace the sensor. |

**Temperature sensor failure (outdoor unit)**

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5101 | Discharge (TH11) (TH12) | 1. When a short (high temperature intake) or an open (low temperature intake) of the thermistor is detected (the first detection), the outdoor unit stops, turns to anti-restart mode for 3 minutes, and restarts when the detected temperature of the thermistor<br>2. When a short or an open is detected again (the second detection) after the first restart of the outdoor unit, the outdoor unit stops, turns to anti-restart mode for 3 minutes, and restarts in 3 minutes when the detected temperature is within the normal range.<br>3. When a short or an open is detected again (the third detection) after the previous restart of the outdoor unit, the outdoor unit makes an error stop.<br>4. When a short or an open of the thermistor is detected just before the restart of the outdoor unit, the outdoor unit makes an error stop, and the error code "5101", "5103", "5104", "5105", "5106", or "5107" will appear.<br>5. During 3-minute anti-restart mode, preliminary errors will be displayed on the LED display.<br>6. A short or an open described above is not detected for 10 minutes after the compressor start, during defrost mode, or for 3 minutes after defrost mode. | (1) Thermistor failure | Check thermistor resistance. |
| 5105 | Piping (TH5) | | (2) Pinched lead wire | Check for pinched lead wire. |
| 5106 | Outdoor air temperature (TH6) | | (3) Torn wire coating | Check wire coating. |
| 5107 | Piping (TH7) | | (4) A pin on the male connector is missing or contact failure | Check connector. |
| | | | (5) Disconnected wire | Check for wire. |
| | | | (6) Thermistor input circuit failure on the main board | Check the intake temperature of the sensor with the LED monitor. When the temperature is far different from the actual temperature, replace the control board. |

| | Short is detection | Open detection |
|---|---|---|
| TH11/TH12 | 240˚C [464˚F] and above (0.57 kΩ) | 0˚C [32˚F] and below (643 kΩ) |
| TH5 | 110˚C [230˚F] and above (0.4kΩ) | -40˚C [-10˚F] and below (130 kΩ) |
| TH6 | 110˚C [230˚F] and above (0.4kΩ) | -40˚C [-40˚F] and below (130 kΩ) |
| TH7 | 70˚C [158˚F] and above (1.14kΩ) | -40˚C [-40˚F] and below (130 kΩ) |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5110 | Heat sink failure<br>Detail code No. 01: Compressor INV side<br>Detail code No. 05: Fan INV side | When a short or an open of THHS is detected just before or during the inverter operation. | (1) THHS sensor failure | Check for short circuit in THHS sensor. |
| | | | (2) Contact failure | Replace THHS sensor. |
| | | | (3) Compressor INV board or fan INV board failure | Replace compressor INV board or fan INV board. |

Refer to section - 8- "Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

**Temperature sensor failure (BC controller)**

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5111 | Liquid inlet (TH11) | 1. When a short (high temperature inlet) or an open (low temperature inlet) of the thermistor is detected during operation, an error stop will be made, and "5111", "5112", "5115", or "5116" will be displayed.<br>2. The short or open described above is not detected during defrost or 3 minutes after the operation mode is changed. | (1) Thermistor failure<br>(2) Pinched lead wire<br>(3) Torn wire coating<br>(4) A pin on the male connector is missing or contact failure<br>(5) Disconnected wire<br>(6) Thermistor input circuit failure on the main board | Check thermistor resistance.<br>Check lead wire.<br>Check for torn wire coating.<br>Check connector.<br>Check the intake temperature of the sensor with the LED monitor.<br>When the temperature is far different from the actual temperature, replace the control board. |
| 5112 | Bypass outlet (TH12) | | | |
| 5115 | LEV3 outlet (TH15) | | | |
| 5116 | LEV3 inlet (TH16) | | | |

| | Short is detection | Open detection |
|---|---|---|
| TH11 | 110˚C [230˚F] and above (0.57 kΩ) | -40˚C [-40˚F] and below (130 kΩ) |
| TH12 | 110˚C [230˚F] and above (0.4 kΩ) | -40˚C [-40˚F] and below (130 kΩ) |
| TH15 | 70˚C [158˚F] and above (0.4 kΩ) | -40˚C [-40˚F] and below (130 kΩ) |
| TH16 | 110˚C [230˚F] and above (1.14 kΩ) | -40˚C [-40˚F] and below (130 kΩ) |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5201 | High pressure sensor (outdoor unit) | 1. If the high pressure sensor detects 0.098MPa [14psi] or less during the operation, the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes when the detected high pressure sensor is 0.098MPa [14psi] or more.<br>2. If the high pressure sensor detects 0.098MPa [14psi] or less just before the restart, the outdoor unit makes an error stop, and the error code "5201" will appear.<br>3. During 3-minute anti-restart mode, preliminary errors will be displayed on the LED display.<br>4. A error is not detected for 3 minutes after the compressor start, during defrost operation, or 3 minutes after defrost operation. | (1) High pressure sensor failure | Refer to the page on the troubleshooting of the high pressure sensor.(9 [4] -1-) |
| | | | (2) Pressure drop due to refrigerant leak | |
| | | | (3) Torn wire coating | |
| | | | (4) A pin on the male connector is missing or contact failure | |
| | | | (5) Disconnected wire | |
| | | | (6) High pressure sensor input circuit failure on the main board | |

| **High pressure sensor failure (BC controller)** | | | | |
|---|---|---|---|---|
| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
| 5201 | Liquid side | When the pressure of 4.06MPa [589psi] or more is detected by the pressure sensor, an error code "5201" or "5203" will be displayed.However, an error stop is not made, and backup operation will be started by other sensors. | (1) High pressure sensor failure | Refer to the page on the troubleshooting of the high pressure sensor.(9 [4] -1-) |
| 5203 | Intermediate | | (2) Inner pressure drop due to a leakage.<br>(3) Torn wire coating<br>(4) A pin on the male connector is missing or contact failure<br>(5) Disconnected wire<br>(6) High pressure sensor input circuit failure on the main board | |

| Error Code | | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 5301 | ACCT sensor circuit failure (Detail code 117) | When an error value is detected with the ACCT detection circuit just before the inverter starts | (1) Compressor INV board failure | Refer to 9. [4].8.(2). [1] "Check the compressor INV board error detection circuit" |
| | | | (2) Ground fault of compressor and IPM failure | Refer to 9. [4].8.(2). [2] "Check for compressor ground fault or coil error"<br>Refer to 9. [4].8.(2). [5] "Check the inverter circuit trouble" |
| | DCCT sensor circuit failure (Detail code 118) | When an error value is detected with the DCCT detection circuit just before the inverter starts | (1) Contact failure | Check the contact of the connector (CNCT) on the INV board, and the contact the connector on DCCT side. |
| | | | (2) Compressor INV board failure | Refer to 9. [4].8.(2). [1] "Check the compressor INV board error detection circuit". |
| | | | (3) DCCT failure | When no fault is found with items 1 and 2, replace the DCCT sensor, and check the polarity of DCCT sensor. |
| | | | (4) Grounding fault of the compressor and IPM failure | Refer to 9. [4].8.(2). [2] "Check for compressor ground fault or coil error"<br>Refer to 9. [4].8.(2). [1] "Check the compressor INV board error detection circuit"<br>Refer to 9. [4].8.(2). [5] "Check the inverter circuit trouble" |
| | ACCT sensor failure (Detail code 115) | When the effective output current between -2 Arms and 2 Arms is detected during inverter operation | (1) Contact failure | Check the contact of the connector CNCT2 (ACCT) on the compressor INV board. |
| | | | (2) ACCT sensor failure | Replace the ACCT sensor. |
| | DCCT sensor failure (Detail code 116) | When the bus current of less than 18 Apeak is detected at startup (6Hz) | (1) Contact failure | Check the contact of the connector CNCT (DCCT) on the compressor INV board, and the contact around the connector on DCCT side. |
| | | | (2) Misorientation | Check the installation direction of DCCT. |
| | | | (3) DCCT sensor failure | Replace the DCCT sensor. |
| | | | (4) Compressor INV board failure | Replace the compressor INV board. |
| | Preliminary IPM open/Disconnected ACCT connector (Detail code119) | When IPM open damage or disconnected CNCT2 is not detected just before INV starts (Sufficient current is not detected just before startup) | (1) Disconnected ACCT sensor | Check the connector CNCT2 connection.(Check ACCT installation state) |
| | | | (2) Faulty wiring | Check CNDR2 connection on the compressor INV board, or CNDR1 connection on the G/A board. |
| | | | (3) ACCT sensor failure | Refer to 9. [4].8.(4)"Current sensor ACCT", and check the resistance value |
| | | | (4) Disconnected compressor wiring | Refer to 9. [4].8.(2). [2] "Check for compressor ground fault or coil error" |
| | | | (5) Compressor INV circuit failure | Refer to 9. [4].8.(2). [2] "Check for inverter circuit trouble" |
| | ACCT faulty wiring detection (Detail code120) | ACCT sensor is not securely mounted. | (1) Wrongly mounted ACCT sensor | Refer to 9. [4].8.(4) "Current sensor ACCT" |

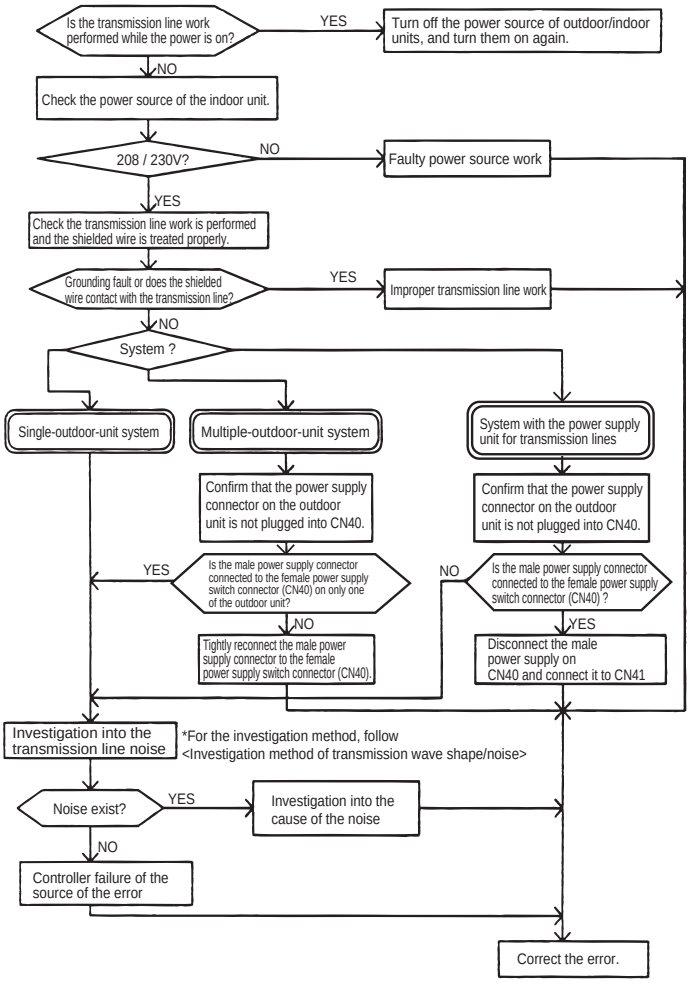
Refer to section - 8- "Inverter " under part [4] "Trouble shooting principal parts" for error codes related to the inverter.

## 2. Transmission error

| Error Code | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|
| 6201 | Remote controller board failure<br>An error occurs when the data cannot be read normally from the nonvolatile memory built in on the remote controller. | Remote controller failure | Replace the remote controller. |
| 6202 | Remote controller board failure<br>An error occurs when the clock function built in on the remote controller does not work normally. | Remote controller failure | Replace the remote controller. |
| 6600 | Address overlaps<br>The error is detected when the same address is transmitted from different units.<br><br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | Two or more remote controllers for the outdoor units, the indoor units, LOSSNAY, and the M-NET remote controllers have the same addresses.<br><br><Example><br>The error code 6600 "01" appeared on the display on the remote controller indicates that an error occurred in No.1 unit.<br>Two or more units whose addresses are 01 exist in the same system. | Search for the unit which has the same address with that of the source of the trouble.<br><br>**When the same address is found, turn off the power of the outdoor unit, LOSSNAY and the indoor unit for 5 minutes or more after changing the address, and then turn them on it again.** |
| 6601 | Unset polarity<br><br>The error detected when transmission processor cannot distinguish the polarities of the M-NET transmission line. | (1) No voltage is applied to the M-NET transmission line that G-50A is connected to.<br>(2) M-NET transmission line to which G-50A is connected is short-circuited. | Check if power is supplied to the M-NET transmission line of the G-50A, and correct any problem found. |

| Error Code | Error definition and error detection method | Check method and remedy |
|---|---|---|
| 6602 | Transmission processor hardware error<br><br>Although "0" was surely transmitted by the transmission processor, "1" is displayed on the transmission line<br><br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | (1) When the wiring work of or the polarity of either the indoor or outdoor transmission line is performed or is changed while the power is on, the transmitted data will collide, the wave shape will be changed, and an error will be detected.<br>(2) Grounding fault of the transmission line<br>(3) When grouping the indoor units that are connected to different outdoor units, the male power supply connectors on the multiple outdoor units are connected to the female power supply switch connector (CN40).<br>(4) When the power supply unit for transmission lines is used in the system connected with MELANS, the male power supply connector is connected to the female power supply switch connector (CN40) on the outdoor unit.<br>(5) Controller failure of the source of the error<br>(6) When the transmission data is changed due to the noise on the transmission line<br>(7) Voltage is not applied on the transmission line for centralized control (in case of grouped indoor units connected to different outdoor units or in case of the system connected with MELANS) |

Check method and remedy



| Error Code | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|
| 6603 | Transmission circuit bus-busy<br><br>1. Generated error when the command cannot be transmitted for 4-10 minutes in a row due to bus-busy<br>2. Generated error when the command cannot be transmitted to the transmission line for 4-10 minutes in a row due to noise<br><br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | (1) The transmission processor cannot be transmitted as the short-wavelength voltage like noise exists consecutively on the transmission line.<br>(2) Error source controller failure | Check transmission wave shape/noise on trans-mission line by following <Investigation method of transmission wave shape/ noise>.<br>-> No noise indicates that the error source controller is a failure.<br>-> If noise exists, investigate the noise. |
| 6606 | Communication error with the transmission processor Communication error between the main microcomputer on the indoor unit board and the microcomputer for transmission<br><br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | (1) Data is not properly transmitted due to accidental erroneous operation of the controller of the error source.<br>(2) Error source controller failure | Turn off the power source of the outdoor and the indoor units.(When the power source is turned off separately, the microcomputer will not be reset, and the error will not be corrected.s.)<br>-> If the same error occurs, the error source controller is a failure. |

### (1) System with one outdoor unit

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| Outdoor unit (OC) | M-NET remote controller (RC) MA remote controller (MA) | No acknowledgement (ACK) at BC transmission to OC | (1) Contact failure of transmission line of OC or BC<br>(2) Decrease of transmission line voltage/signal by exceeding acceptable range of transmission wiring .<br>Farthest :<br>200 m [656ft] or less<br>Remote controller wiring: 10m [32ft] or less<br>(3) Erroneous sizing of transmission line (Not within the range below).<br>Wire diameter: 1.25mm$^2$ [AWG16] or more<br>(4) Indoor unit main board failure<br>(5) Power circuit failure of outdoor unit | Turn off the power source of the outdoor unit, and turn it on again. If the error is accidental, it will run normally.<br>If not, check the causes (1) - (5).<br>Refer to 9. [4].7.(2) "Outdoor unit transmission power source circuit failure judgment" for (5). |
| BC controller (BC) | M-NET remote controller (RC) MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to BC | (1) When BC controller address is changed or modified during operation.<br>(2) Faulty or disconnected transmission wiring of BC controller<br>(3) Disconnected connector of BC controller (CN02)<br>(4) Faulty control board of BC controller | Turn off the outdoor/indoor units for 5 or more minutes, and turn them on again.<br>If the error is accidental, they will run normally. If not, check the causes (1) - (4). |
| Indoor unit (IC) | M-NET remote controller (RC) MA remote controller (MA) | No acknowledgement (ACK) at RC transmission to IC | (1) When IC unit address is changed or modified during operation.<br>(2) Faulty or disconnected IC transmission wiring<br>(3) Disconnected IC connector (CN2M)<br>(4) Indoor unit board failure<br>(5) M-NET remote controller failure | Turn off the outdoor/indoor units for 5 or more minutes, and turn them on again.<br>If the error is accidental, they will run normally. If not, check the causes (1) - (5). |
| LOSSNAY (LC) | M-NET remote controller (RC) MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to LC | (1) The power source of LOSSNAY has been shut off.<br>(2) When the address of LOSSNAY is changed in the middle of the operation<br>(3) Faulty or disconnected transmission wiring of LOSSNAY<br>(4) Disconnected connector (CN1) on LOSSNAY<br>(5) Controller failure of LOSSNAY | Turn off the power source of LOSSNAY and turn it on again. If the error is accidental, it will run normally.<br>If not, check the causes (1) - (5). |
| M-NET remote controller (RC) | M-NET remote controller (RC) | No acknowledgement (ACK) at IC transmission to RC | (1) Faulty transmission wiring at IC unit side.<br>(2) Faulty wiring of the transmission line for M-NET remote controller<br>(3) When the address of M-NET remote controller is changed in the middle of the operation<br>(4) M-NET remote controller failure | Turn off the power source of the outdoor unit for 5 minutes or more, and turn it on again. If the error is accidental, it will run normally. If not, check the causes (1) - (4). |

### (2) Grouping of units in a system with multiple outdoor units

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| Outdoor unit (OC) | M-NET remote controller (RC) MA remote controller (MA) | No acknowledgement (ACK) at BC transmission to OC | Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| BC controller (BC) | M-NET remote controller (RC) MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to BC | Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| Indoor unit (IC) | M-NET remote controller (RC) | No acknowledgement (ACK) at RC transmission to IC | (1) Same causes as (1) - (5) for system with one outdoor unit<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) When multiple outdoor units are connected and the power source of one of the outdoor units has been shut off.<br>(4) The male power supply connector of the outdoor unit is not connected to the female power supply switch connector (CN40).<br>(5) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for centralized control.<br>If an error occurs, after the unit runs normally once, the following causes may be considered.<br>♦Total capacity error (7100)<br>♦Capacity code error (7101)<br>♦Error in the number of connected units (7102)<br>♦Address setting error (7105) | 1) Turn off the power sources of the outdoor and indoor units for 5 or more minutes, and turn them on again. If the error is accidental, the will run normally.If not, check the cause 2).<br>2) Check the causes of (1) - (5). If the cause is found, correct it. If no cause is found, check 3).<br>3) Check the LED displays for troubleshooting on other remote controllers whether an error occurs.<br><br>If an error is found,<br>-> If an error is found, check the check code definition, and correct the error.<br>If no error is found,<br>-> Indoor unit board failure |

### (2) Grouping of units in a system with multiple outdoor units

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| LOSSNAY (LC) | M-NET remote controller (RC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to FU | (1) Same causes as (1) - (4) for system with one outdoor unit (Interlocked operation between the transmission line and LOSSNAY in the system in which the indoor units connected to different outdoor units are grouped)<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) When multiple outdoor units are connected and the power source of one of the outdoor units has been shut off.<br>(4) The male power supply connector of the outdoor unit is not connected to the female power supply switch connector (CN40).<br>(5) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for centralized control.<br>If an error occurs, after the unit runs normally once, the following causes may be considered.<br>•Total capacity error (7100)<br>•Capacity code error (7101)<br>•Error in the number of connected units (7102)<br>•Address setting error (7105) | 1) Turn off the power source of LOSSNAY for 5 or more minutes, and turn it on again. If the error is accidental, it will run normally.If not, check the cause 2).<br>2) Check the causes of (1) - (5). If the cause is found, correct it. If no cause is found, check 3).<br>3) Same cause as that for indoor unit described in 3) |
| M-NET remote controller (RC) | M-NET remote controller (RC) | No acknowledgement (ACK) at IC transmission to RC | (1) Same causes as (1) - (5) for system with one outdoor unit<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) When multiple outdoor units are connected and the power source of one of the outdoor units has been shut off.<br>(4) The male power supply connector of the outdoor unit is not connected to the female power supply switch connector (CN40).<br>(5) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for centralized control.<br>If an error occurs, after the unit runs normally once, the following causes may be considered.<br>•Total capacity error (7100)<br>•Capacity code error (7101)<br>•Error in the number of connected units (7102)<br>•Address setting error (7105) | 1) Turn off the power source of LOSSNAY for 5 or more minutes, and turn it on again. If the error is accidental, it will run normally.If not, check the cause 2).<br>2) Check the causes of (1) - (5). If the cause is found, correct it. If no cause is found, check 3).<br>3) Same cause as that for indoor unit described in 3)<br>If the operation does not return to normal, check the causes (1) through (5). |

### (3) System connected to the system controllers (MELANS)

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| Outdoor unit (OC) | M-NET remote controller (RC)<br>System controller (SC)<br>MA remote controller (MA) | No acknowledgement (ACK) at BC transmission to OC | Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| BC controller (BC) | M-NET remote controller (RC)<br>system controller (SC)<br>MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to BC | Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| Indoor unit (IC) | M-NET remote controller (RC) | No acknowledgement (ACK) at RC transmission to IC | Same as grouping of units in a system with multiple outdoor units | Same remedy as that for grouping of units in a system with multiple outdoor units |
| | system controller (SC) | No acknowledgement (ACK) at SC transmission to IC | 1. Error occurrence on some IC<br>(1) Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| | | | 2. Error occurrence on all IC in the system with one outdoor unit<br>(1) Total capacity error (7100)<br>(2) Capacity code error (7101)<br>(3) Error in the number of connected units (7102)<br>(4) Address setting error (7105)<br>(5) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(6) Turn off the power source of the outdoor unit<br>(7) Malfunction of electrical system for the outdoor unit | 1) Check the LED display for troubleshooting on the outdoor unit.<br>->If an error is found, check the check code definition, and correct the error.<br>->If no error is found, check 2).<br>2) Check (5) - (7) on the left. |
| | | | 3. Error occurrence on all IC<br>(1) Same causes as (1) - (7) described in 2.<br>(2) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for the transmission line for centralized control.<br>(3) Disconnection or shutdown of the power source of the power supply unit for transmission line<br>(4) System controller (MELANS) malfunction | Check voltage of the transmission line for centralized control.<br>20V or more : Check (1) and (2) on the left.<br>Less than 20V : Check (3) on the left. |

### (3) System connected to the system controllers (MELANS)

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| M-NET remote controller failure (RC) | M-NET remote controller (RC) System controller (SC) | No acknowledgement (ACK) at IC transmission to RC | Same as grouping of units in a system with multiple outdoor units | Same remedy as that for grouping of units in a system with multiple outdoor units |
| | system controller (SC) | No acknowledgement (ACK) at MELANS transmission to RC | 1. Error occurrence on some IC<br>(1) Same cause as that for system with one outdoor unit | Same remedy as that for system with one outdoor unit |
| | | | 2. Error occurrence on all IC in the system with one outdoor unit<br>(1) An error is found by the outdoor unit.<br>Total capacity error (7100)<br>Capacity code error (7101)<br>Error in the number of connected units (7102)<br>Address setting error (7105)<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) Turn off the power source of the outdoor unit.<br>(4) Malfunction of electrical system for the outdoor unit | 1) Check the LED display for troubleshooting on the outdoor unit.<br>->If an error is found, check the check code definition, and correct the error.<br>->If no error is found, check 2).<br>2) Check (2) - (4) on the left. |
| | | | 3. Error occurrence on all IC<br>(1) Same causes as (1) - (4) described in 2.<br>(2) The male power supply connector on the outdoor unit is connected to the female power supply switch connector (CN40) for the transmission line for centralized control.<br>(3) Disconnection or shutdown of the power source of the power supply unit for transmission line<br>(4) System controller (MELANS) malfunction | Check (1) - (4) on the left. |

### (3) System connected to the system controllers (MELANS)

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| System controller (SC) | M-NET remote controller (RC) MA remote controller (MA) | No acknowledgement (ACK) at IC transmission to SC | 1. Error display on some displays on M-NET remote controllers<br>(1) Faulty wiring of the transmission line for M-NET remote controller<br>(2) Disconnection or contact failure of the transmission connector for M-NET remote controller<br>(3) M-NET remote controller failure | Check (1) - (3) on the left. |
| | | | 2. Error occurrence on all IC in the system with one outdoor unit<br>(1) An error is found by the outdoor unit.<br>Total capacity error (7100)<br>Capacity code error (7101)<br>Error in the number of connected units (7102)<br>Address setting error (7105)<br>(2) Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized control line connection (TB7)<br>(3) Turn off the power source of the outdoor unit.<br>(4) Malfunction of electrical system for the outdoor unit | 1) Check the LED display for troubleshooting on the outdoor unit.<br>->If an error is found, check the check code definition, and correct the error.<br>->If no error is found, check 2).<br>2) Check (2) - (4) on the left. |
| | | | 3. Error display on all displays on M-NET remote controllers<br>(1) Same causes as (1) - (4) described in 2.<br>(2) The male power supply connector on the outdoor unit is connected to the female power supply switch connector (CN40) for the transmission line for centralized control.<br>(3) Disconnection or shutdown of the power source of the power supply unit for transmission line<br>(4) System controller (MELANS) malfunction | Check (1) - (4) on the left. |

### (4) Errors that are not limited to a particular system

| Error Code | Error definition and error detection method | |
|---|---|---|
| 6607 (Continued) | No ACK abnormality | The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)<br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).** |

| Error source address | Error display | Detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| Address which should not be existed | - | - | (1) Although the address of M-NET remote controller has been changed after the group is set using M-NET remote controller, the indoor unit is keeping the memory of the previous address.<br>The same symptom will appear for the registration with SC.<br>(2) Although the address of LOSSNAY has been changed after the interlock registration of LOSSNAY is made using M-NET remote controller, the indoor unit is keeping the memory of the previous address. | Delete unnecessary information of non-existing address which some indoor units have.<br>Use either of the following two methods for deletion.<br>1) Address deletion by M-NET remote controller<br>Delete unnecessary address information using the manual setting function of M-NET remote controller. Refer to this service handbook "4. [2]. Group settings and interlock settings via the ME remote controller 1. (3) Address deletion".<br>2) Deletion of connection information of the outdoor unit by the deleting switch<br>**Note that this switch deletes all the group information set via M-NET remote controller and all the interlock information of LOSSNAY and the indoor unit.**<br>♦Turn off the power source of the outdoor unit, and wait for 5 minutes.<br>♦Turn on the dip switch (SW2-2) on the outdoor unit main board.<br>♦Turn on the power source of the outdoor unit, and wait for 5 minutes.<br>♦Turn off the power source of the outdoor unit, and wait for 5 minutes.<br>♦Turn off the dip switch (SW2-2) on the outdoor unit main board.<br>♦Turn on the power source of the outdoor unit. |

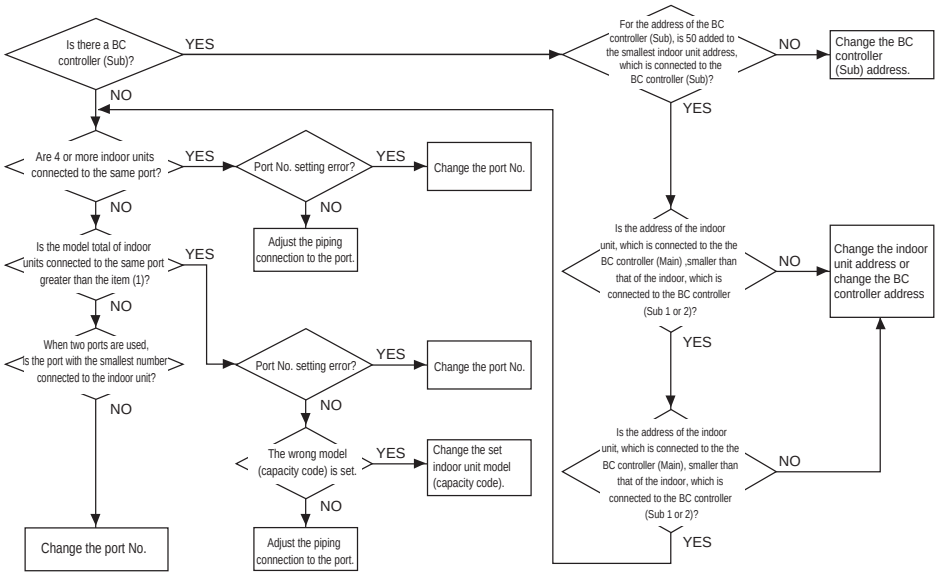
| Error Code | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|
| 6608 | No response<br>When no response command is returned although acknowledgement (ACK) is received after transmission, an error is detected.When the data is transmitted 10 times in a row with 3 seconds interval, an error is detected on the transmission side.<br><br>**Note: The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.** | (1) The transmission line work of one of the indoor unit, outdoor unit, or the BC controller is performed while the power is on, the transmitted data will collide, and the wave shape will be changed.<br>(2) The transmission is sent and received repeatedly due to noise.<br>(3) The transmission line voltage/ signal is decreased due to erroneous sizing of transmission line.<br>Farthest:<br>200 m [656ft] or less<br>Remote controller wiring:}<br>10m [32ft] or less<br>(4) The transmission line voltage/ signal is decreased due to erroneous sizing of transmission line.<br>Wire diameter:<br>1.25mm$^2$ [AGW16] or less | 1) When an error occurs at commissioning<br>Turn off the power sources of the outdoor unit, indoor unit, BC controller, and LOSSNAY for 5 or more minutes, and turn them on again.<br>-> When they return to normal operation, the cause of the error is the transmission line work performed with the power on.<br>If an error occurs again, check 2).<br>2) Check (3) and (4) on the left.<br>-> If the cause is found, correct it.<br>-> If no cause is found, check 3).<br>3) Check transmission wave shape/ noise on trans-mission line by following <Investigation method of transmission wave shape/noise>.<br><br>**Noise is the most possible cause of the error "6602".** |

| Error Code | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|
| 6831 | MA communication error or no reception error<br>Communication between the MA remote controller and the indoor unit is not done properly.<br>No proper data has been received for 3 minutes. | (1) Contact failure of the remote controller lines of MA remote controller or the indoor unit.<br>(2) All the remote controllers are set to SUB.<br>(3) Failure to meet wiring regulations<br>♦Wire length<br>♦Wire size<br>♦Number of remote controllers<br>♦Number of indoor units<br>(4) The remote controller is removed after the installation without turning the power source off.<br>(5) Noise interference on the remote controller transmission lines<br>(6) Faulty circuit that is on the indoor board and performs transmission/reception of the signal from the remote controller<br>(7) Problems with the circuit on the remote controller that sends or receives the signals from the remote controller | 1) Check for disconnected or loose transmission lines for the indoor units or MA remote controllers.<br>2) Confirm that the power is supplied to the main power source and the remote controller line.<br>3) Confirm that MA remote controller's capacity limit is not exceeded.<br>4) Check the sub/main setting of the MA remote controllers.One of them must be set to MAIN.<br>5) Diagnose the remote controller (described in the remote controller installation manual).<br>[OK]: no problems with the remote controller (check the wiring regulations)<br>[NO]: Replace the MA remote controller.<br>[6832, 6833, ERC]: due to noise interference <Go to (5)><br>6) Check wave shape/noise on MA remote controller line by following <4. Investigation method of transmission wave shape/noise>.<br>7) When no problems are found with items 1 through 6, replace the indoor unit board or the MA remote controller.<br><br>The following status can be confirmed on LED1 and 2 on the indoor unit board.<br>♦LED1 is lit.<br>The main power source of the indoor unit is turned on.<br>♦LED2 is lit.<br>MA remote controller line is being powered. |
| 6834 | MA communication error or start bit detection error<br>Communication between the MA remote controller and the indoor unit is not done properly.<br>No proper data has been received for 2 minutes. | | |
| 6832 | MA communication error or synchronization recovery error<br>Communication between the MA remote controller and the indoor unit is not done properly.<br>Failure to detect opening in the transmission path and unable to send signals<br>Indoor unit : 3 minutes<br>Remote controller : 6 seconds | (1) Contact failure of the remote controller lines of MA remote controller or the indoor unit.<br>(2) 2 or more remote controllers are set to MAIN.<br>(3) Overlapped indoor unit address<br>(4) Noise interference on the remote controller lines<br>(5) Failure to meet wiring regulations<br>♦Wire length<br>♦Wire size<br>♦Number of remote controllers<br>♦Number of indoor units<br>(6) Problems with the circuit on the remote controller that sends or receives the signals from the remote controller | |
| 6833 | MA communication error or transmission/reception H/W error<br>Communication between the MA remote controller and the indoor unit is not done properly.<br>An error occurs when the transmitted data and the received data differ for 30 times in a row. | | |

### 3. System error

<table>
<tr><th>Error Code</th><th>Error source</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr><td>7100</td><td>Outdoor unit</td><td>Total capacity error<br><br>The model total of indoor units in the system with one outdoor unit exceeds limitations.</td><td>The model total of indoor units in the system with one outdoor unit exceeds the following table.<br><table><tr><th>Model</th><th>Capacity Total</th></tr><tr><td>P72</td><td>108</td></tr><tr><td>P96</td><td>144</td></tr><tr><td>P108</td><td>162</td></tr><tr><td>P126</td><td>189</td></tr><tr><td>P144</td><td>216</td></tr><tr><td>P168</td><td>252</td></tr><tr><td>P192</td><td>288</td></tr><tr><td>P204</td><td>306</td></tr><tr><td>P216</td><td>324</td></tr><tr><td>P234</td><td>351</td></tr></table></td><td>1) Check the model total (capacity code total) of indoor units connected.<br>2) Check the model name (capacity code) of the connected indoor unit set by the switch (SW2 on indoor unit board).<br><br>When the model name set by the switch is different from that of the unit connected, turn off the power source of the outdoor and the indoor units, and change the setting of the model name (capacity code).</td></tr>
<tr><td>7101</td><td>Outdoor unit<br>Indoor unit</td><td>Capacity code error<br><br>The model name (capacity code) of the connected indoor unit connected is inappropriate.</td><td>The model name (capacity code) set by the switch (SW2) is wrong.<br><br>*The capacity of the indoor unit can be confirmed by the self-diagnosis function (SW1 operation) of the outdoor unit.</td><td>1) Check the model name (capacity code) of the indoor unit which has the error source address set by the switch (SW2 on indoor unit board).<br>When the model name set by the switch is different from that of the unit connected, turn off the power source of the outdoor and the indoor units, and change the setting of the capacity code.</td></tr>
</table>

<table>
<tr><th>Error Code</th><th>Error source</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr>
<td>7102</td>
<td>Outdoor unit</td>
<td>Error in the number of connected units<br><br>The number of connected indoor units is "0" or exceeds the allowable value.</td>
<td>(1) Number of indoor units connected to the outdoor terminal block (TB3) for indoor/outdoor transmission lines exceeds limitations described below.
<table>
<tr><th>Number of units</th><th>Restriction on the number of units</th></tr>
<tr><td rowspan="5">1) Total number of indoor units</td><td>1-15 : P72 model</td></tr>
<tr><td>1-19 : P96 model</td></tr>
<tr><td>1-20 : P108 •P126 models</td></tr>
<tr><td>1-24 : P144 - P204 models</td></tr>
<tr><td>1-32 : P216 •P234 models</td></tr>
<tr><td>2) Number of BC controllers</td><td>1<br>(P72 - P126 models only)</td></tr>
<tr><td>3) Number of Main BC controllers</td><td>0 or 1</td></tr>
<tr><td>4) Number of Sub BC controllers</td><td>0,1 or 2</td></tr>
<tr><td>5) Total number of LOSSNAY units (During auto address start-up only)</td><td>0 or 1</td></tr>
</table>
(2) The outdoor unit address is set to 51-100 although the address is automatically set up (MA remote controller). ("HO" appears on the display on MA remote controller.)<br>
(3) Disconnected transmission line of the outdoor unit<br>
(4) Short-circuited transmission line<br>
When (3) and (4) apply, the following display will appear.<br>
♦In case of M-NET remote controller<br>
-> Nothing appears on the display as no power is supplied to the remote controller.<br>
♦In the case of MA remote controller<br>
-> "HO" will blink<br>
(5) Disconnected transmission line on BC controller</td>
<td>1) Check whether the number of units connected to the outdoor terminal block (TB3) for indoor/outdoor transmission lines does not exceed the limitation. (See (1) to (4) on the left.)<br>
2) Check (2) - (5) on the left.<br>
3) Check whether the transmission line for the terminal block for centralized control (TB7) is not connected to the terminal block for the indoor/outdoor transmission line (TB3).</td>
</tr>
<tr>
<td>7105</td>
<td>Outdoor unit<br>BC controller</td>
<td>Address setting error<br><br>Erroneous setting of OC unit address<br>Erroneous setting of BC controller address</td>
<td>Erroneous setting of OC unit address<br>The address of outdoor unit is not set to 00 or to 51 - 100.The address of BC controller is not set to 51 - 100.</td>
<td>Check that the address of the OC unit and the BC controller is set to 51 - 100.<br>If the outdoor unit address is out of the allowable range, turn off the power of the outdoor unit, and set the address again.<br>If the BC controller address is out of the allowable range, turn off the power of both the outdoor unit and the BC controller, and set the address again.</td>
</tr>
</table>

| Error Code | Error source | Check method and remedy |
|---|---|---|
| 7107 | BC controller |  |



| Error Code | Error source | Error definition and error detection method | Cause | Check method and remedy |
|---|---|---|---|---|
| 7110 | Outdoor unit | **Unset unit connection information error**<br><br>The start-up of the unit has not completed normally in the system to which a transmission booster is connected. | When all power sources are turned off after the start-up of the unit has completed normally.<br>When the start-up of the unit has completed without turning on the power source of the transmission booster.<br>When the power source of the transmission booster is turned on afterwards. | 1) Check whether the power source of the transmission is turned on.<br>2) Turn off the power sources of outdoor/indoor units and transmission booster, and turn them on again. |
| 7111 | Indoor unit<br>OA processing unit | **Remote controller sensor failure**<br><br>This error occurs when the temperature data is not sent although the remote controller sensor is specified. | The remote controller without the temperature sensor (the wireless remote controller or the M-NET compact remote controller (mounted type)) is used and the remote controller sensor for the indoor unit is specified. (SW1-1 is ON.) | Replace the remote controller with the one with built-in temperature sensor. |
| 7113 | Outdoor unit | **Model setting error (short detection)** | Short-circuit<br>Faulty wiring or contact failure | Check all main board connectors and rectify faulty connection. |
| 7117 | Outdoor unit | **Model setting error (open detection)** | Disconnected connector, disconnected wire, or contact failure | Check for the contact of the connector CNTYP1, 4, 5 on the main board. |
| 7130 | Outdoor unit | **Incompatible units**<br><br>The check code will appear when the indoor unit or the BC controller with different refrigerant systems is connected. | The indoor unit that uses only R22 refrigerant is connected.<br>The wrong unit model or the wrong BC controller model is connected.<br>When connecting Mr. SLIM (A control) with M-NET, the connecting adapter for M-NET must be connected to the indoor unit. | Check the model names of the connected indoor unit and the BC controller.<br>Check whether the connecting adapter for M-NET is not connected to the indoor unit.<br>(Connect the connecting adapter for M-NET to the outdoor unit.) |

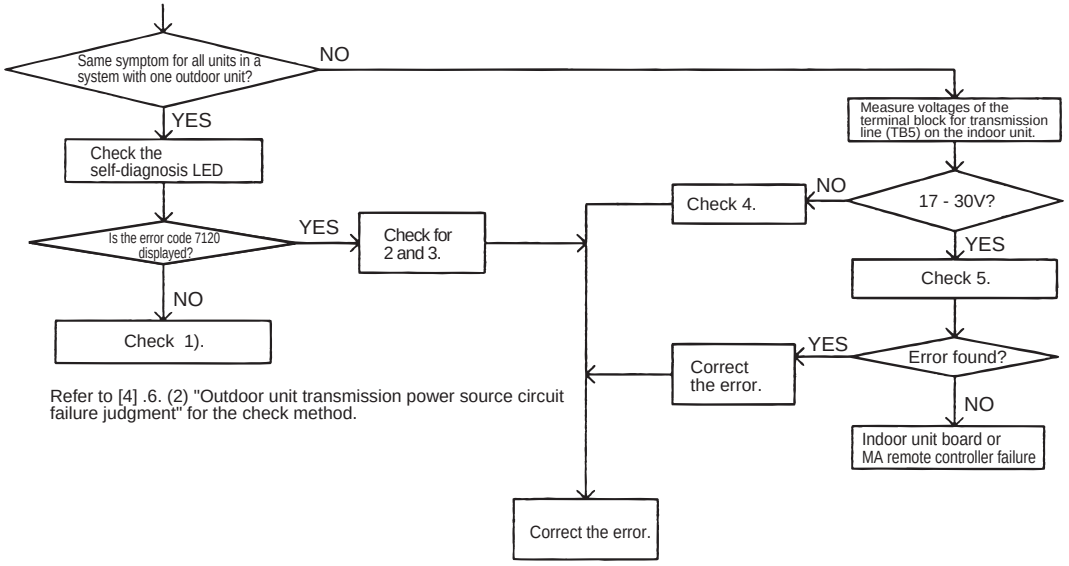
## 4. Troubleshooting according to the remote controller malfunction or the external input error

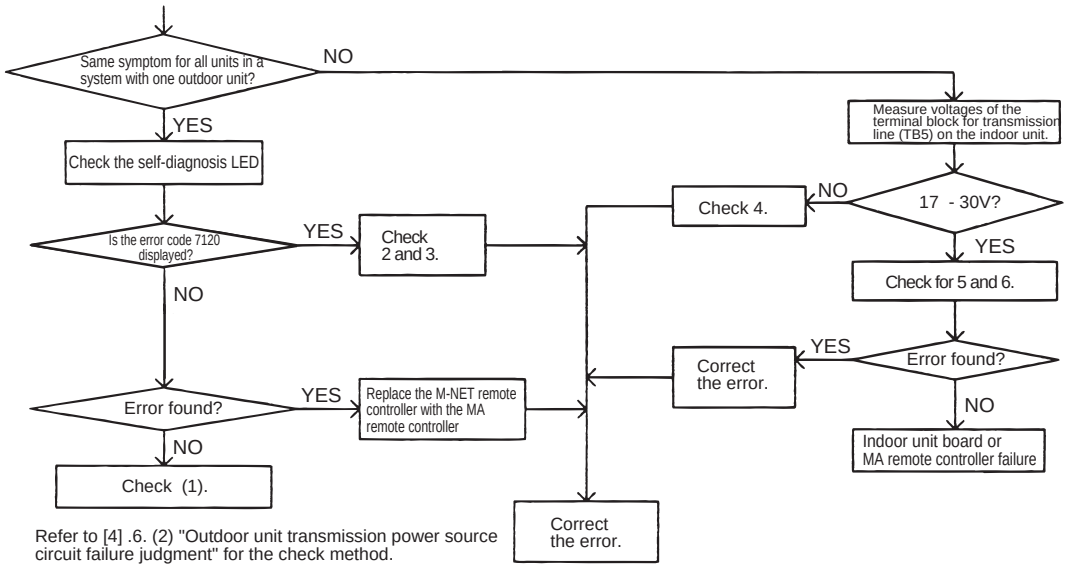
(1) In the case of MA remote controller

| | Phenomena | Cause | Check method and remedy |
|---|---|---|---|
| 1 | Even if the operation button on the remote controller is pressed, the display remains unlit and the unit does not start running.(Power indicator ◎ does not appear on the screen.) | 1. The power is not supplied to the indoor unit.<br>(i) The main power of the indoor unit is not on.<br>(ii) The connector on the indoor unit board has come off.<br>(iii) The fuse on the indoor unit board has melted.<br>(iv) Transformer failure and disconnected wire of the indoor unit.<br>2. Incorrect wiring for the MA remote controller<br>(i) Disconnected wire for the MA remote controller or disconnected line to the terminal block.<br>(ii) Short-circuited MA remote controller wiring<br>(iii) Incorrect wiring for the MA remote controller to the terminal block for transmission line connection (TB5) on the indoor unit<br>(iv) Reversed connection of the wire for the MA remote controller and the AC208 / 230V power wire<br>(v) Reversed connection of the wire for the MA remote controller and the M-NET transmission line on the indoor unit<br>3. The number of the MA remote controllers that are connected to an indoor unit exceeds the allowable range (2 units).<br>4. The length or the diameter of the wire for the MA remote controller are out of specification.<br>5. Short circuit of the wire for the remote display output of the outdoor unit or reversed polarity connection of the relay.<br>6. The indoor unit board failure<br>7. MA remote controller failure | (1) Measure voltages of the MA remote controller terminal (among (i) to (iii)).<br>♦If the voltage is between DC 8.5 and 12V, the remote controller is a failure.<br>♦If no voltage is applied<br>Check (1) described on the left. If the cause is found, correct it.<br>If no cause is found, refer to 2).<br>(2) Remove the wire for the remote controller from the terminal block (TB13) on the MA remote controller for the indoor unit, and check voltage among (i) to (iii).<br>♦If the voltage is between DC 8.5 and 12V<br>Check the (2). (iv) described on the left.<br>♦If no voltage is applied<br>Check 1. described on the left. If the cause is found, correct it.<br>If no cause is found, check the wire for the remote display output (the relay polarity).<br>If no further cause is found, replace the indoor unit board. |

| | Phenomena | Cause | Check method and remedy |
|---|---|---|---|
| 2 | When the remote controller operation SW is turned on, the operation status briefly appears on the display, then it goes off, and the display lights out immediately, and the unit stops. | 1. The power for the M-NET transmission line is not supplied from the outdoor unit.<br>2. Short circuit of the transmission line.<br>3. Incorrect wiring of the M-NET transmission line on the outdoor unit.<br>♦Disconnected wire for the MA remote controller or disconnected line to the terminal block.<br>♦The indoor transmission line is connected incorrectly to the transmission terminal block for centralized controller (TB7).<br>♦The male power supply connectors on the multiple outdoor units are connected to the female power supply switch connector (CN40).<br>In the system to which the power supply unit for transmission lines is connected, the male power supply connector is connected to the female power supply switch connector (CN40) on the outdoor unit.<br>4. Disconnected M-NET transmission line on the indoor unit side.<br>5. Disconnected wire between the terminal block for M-NET line (TB5) of the indoor unit and the indoor unit board (CN2M) or disconnected connector. | **When 2. and 3. apply, check code 7102 will be displayed on the self-diagnosis LED.** |

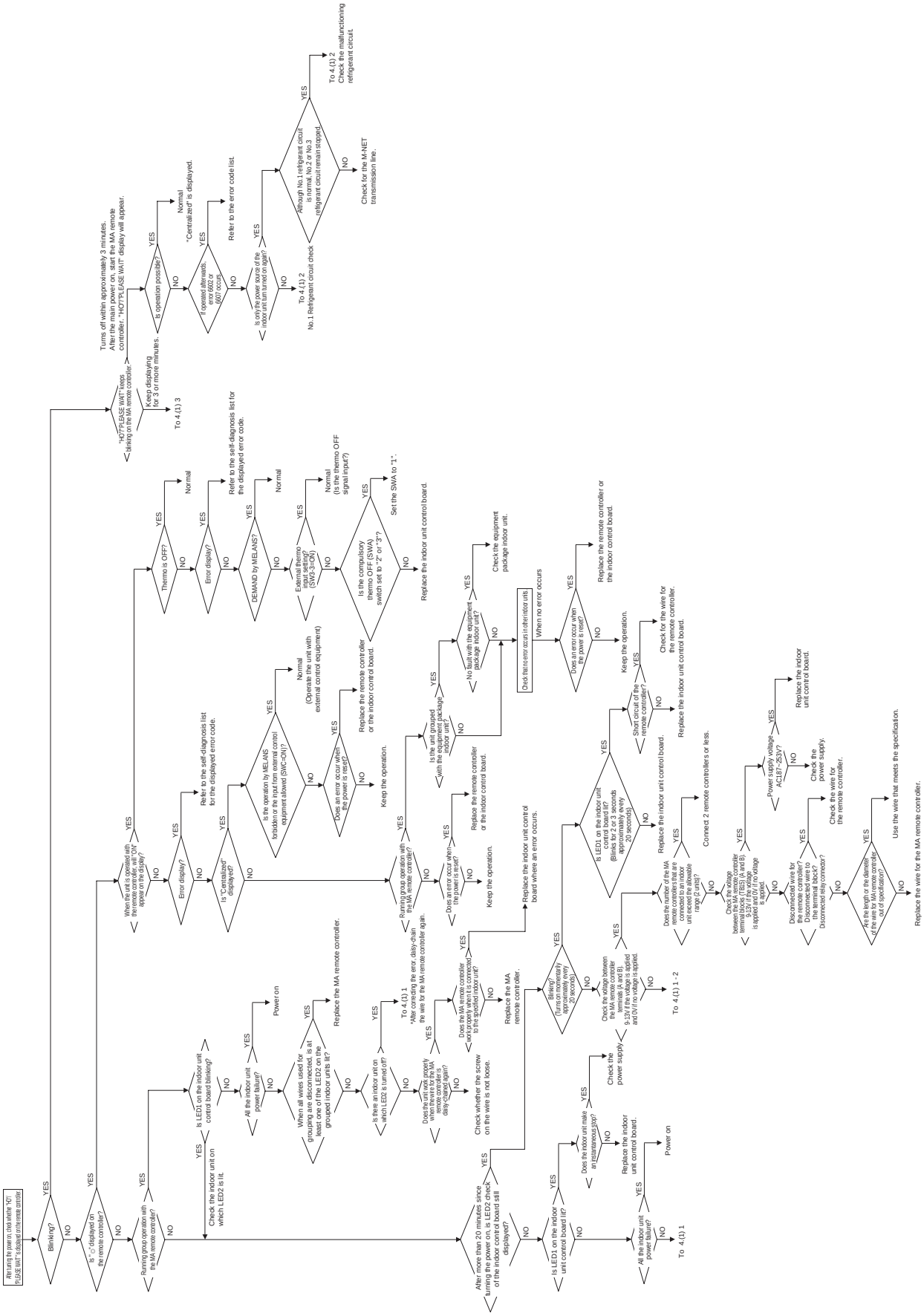
**Check method and remedy**



| | Phenomena | Cause |
|---|---|---|
| 3 | "HO" or "PLEASE WAIT" display on the remote controller does not disappear, and no operation is performed even if the button is pressed. ("HO" or "PLEASE WAIT" display will normally turn off 5 minutes later after the power on.) | 1. The power for the M-NET transmission line is not supplied from the outdoor unit.<br>2. Short-circuited transmission line<br>3. Incorrect wiring of the M-NET transmission line on the outdoor unit.<br>♦Disconnected wire for the MA remote controller or disconnected line to the terminal block.<br>♦The indoor transmission line is connected incorrectly to the transmission terminal block for centralized controller (TB7).<br>♦The male power supply connectors on the multiple outdoor units are connected to the female power supply switch connector (CN40).<br>In the system to which the power supply unit for transmission lines is connected, the male power supply connector is connected to the female power supply switch connector (CN40) on the outdoor unit<br>4. Disconnected M-NET transmission line on the indoor unit.<br>5. Disconnected wire between the terminal block for M-NET line (TB5) of the indoor unit and the indoor unit board (CN2M) or disconnected connector.<br>6. Incorrect wiring for the MA remote controller<br>♦Short-circuited wire for the MA remote controller<br>♦Disconnected wire for the MA remote controller (No.2) and disconnected line to the terminal block.<br>♦Reversed daisy-chain connection between groups<br>♦Incorrect wiring for the MA remote controller to the terminal block for transmission line connection (TB5) on the indoor unit<br>♦The M-NET transmission line is connected incorrectly to the terminal block (TB13) for the MA remote controller.<br>7. The sub/main setting of the MA remote controller is set to sub.<br>8. 2 or more main MA remote controllers are connected.<br>9. Indoor unit board failure (MA remote controller communication circuit)<br>10. Remote controller failure |
| | | **When 2. and 3. apply, check code 7102 will be displayed on the self-diagnosis LED.** |
| | **Check method and remedy**<br>  <br> | |

**Flow chart**

Even if the operation button on the remote controller is pressed, the indoor and the outdoor units do not start running.

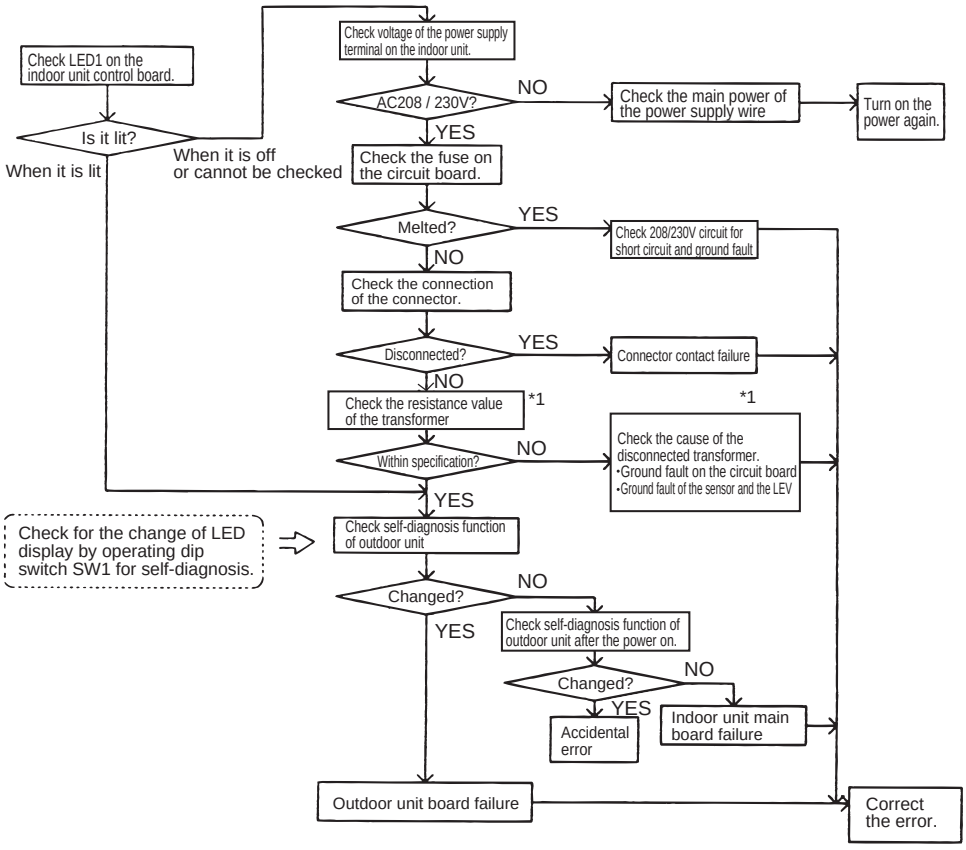


(2) In case of M-NET remote controller

| | Phenomena | Cause | Check method and remedy |
|---|---|---|---|
| 1 | Even if the operation button on the remote controller is pressed, the display remains unlit and the unit does not start running.<br>(Power indicator ◎ does not appear on the screen.) | 1. The power for the M-NET transmission line is not supplied from the outdoor unit.<br>2. Short circuit of the transmission line.<br>3. Incorrect wiring of the M-NET transmission line on the outdoor unit.<br>♦Disconnected wire for the MA remote controller or disconnected line to the terminal block.<br>♦The indoor transmission line is connected incorrectly to the transmission terminal block for centralized controller (TB7).<br>4. Disconnected transmission line on the remote controller.<br>5. Remote controller failure | Check voltage of the transmission terminal block for of the M-NET remote controller.<br>(1) If voltage between is 17V and 30V<br>-> M-NET remote controller failure<br>(2) When voltage is 17V or less<br>-> Refer to 9. [4].7.(2) "Outdoor unit transmission power source circuit failure judgment".<br>**When 2. and 3. apply, check code 7102 will be displayed on the self-diagnosis LED.** |

| | Phenomena | Cause | Check method and remedy |
|---|---|---|---|
| 2 | When the remote controller operation SW is turned on, a temporary operation display is indicated, and the display lights out immediately. | 1. The power is not supplied to the indoor unit.<br>♦The main power of the indoor unit (AC208/230V) is not on.<br>♦The connector on the indoor unit board has come off.<br>♦The fuse on the indoor unit board has melted.<br>♦Transformer failure and disconnected wire of the indoor unit<br>♦The indoor unit board failure | |
| | | 2. The outdoor MAIN board failure<br>As the indoor unit does not interact with the outdoor unit, the outdoor unit model cannot be recognized. | |

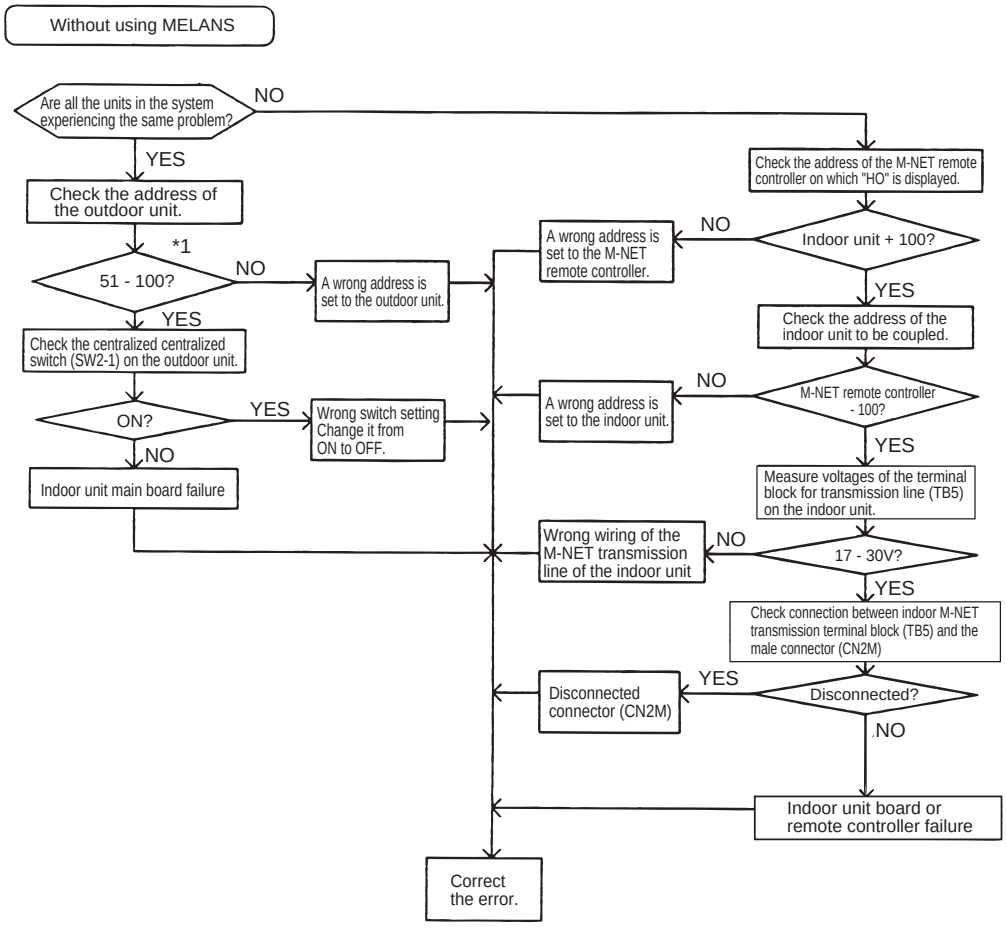
**Check method and remedy**




*1. Refer to the service handbook for the indoor unit "Simple checking Procedures for individual components".

| | Phenomena | Cause |
|---|---|---|
| 3 | "HO" display on the remote controller does not disappear, and no operation is performed even if the button is pressed. | **Without using MELANS**<br>1. Outdoor unit address is set to "00"<br>2. A wrong address is set.<br>♦A wrong address is set to the indoor unit to be coupled with the remote controller. 100 must be subtracted from the address of the M-NET remote controller.<br>♦A wrong address is set to the M-NET remote controller (100 must be added to the address of the indoor unit.)<br>3. Faulty wiring of the terminal block for transmission line (TB5) of the indoor unit in the same group with the remote controller.<br>4. The centralized control switch (SW2-1) on the outdoor unit is set to ON.<br>5. Disconnection or faulty wiring of indoor unit transmission line.<br>6. Disconnection between the terminal block for M-NET line connection (TB5) of the indoor unit and the male connector (CN2M)<br>7. The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for the transmission line for centralized control.<br>8. Outdoor unit main board failure<br>9. Indoor unit board failure<br>10.Remote controller failure |
| | | **Interlocking control with MELANS**<br>11.No group registration is made using MELANS. (The indoor unit and the M-NET remote controller are not grouped.)<br>12.Disconnected transmission line for centralized control (TB7) of the outdoor unit<br>13.In the system to which the power supply unit for transmission lines is connected, the male power supply connector is connected to the female power supply switch connector (CN40) on the outdoor unit |

**Check method and remedy**



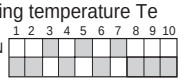
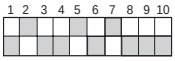

*1. When the indoor unit address is set to 1 - 50, the address will be forcibly set to 100.

**Using MELANS**

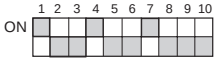
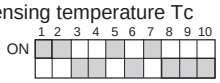
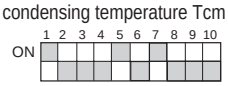
When MELANS is used, "HO" display on the remote controller will disappear when the indoor unit and the local remote controller (M-NET remote controller) are grouped.
If "HO" does not disappear after the registration, check the 11. - 13.

| | Phenomena | Cause | |
|---|---|---|---|
| 4 | "88" appears on the remote controller when the address is registered or confirmed. | **An error occurs when the address is registered or confirmed. (common)**<br>1. A wrong address is set to the unit to be coupled.<br>2. The transmission line of the unit to be coupled is disconnected or is not connected.<br>3. Circuit board failure of the unit to be coupled<br>4. Improper transmission line work | (1) Confirm the address of unit to be coupled.<br>(2) Check the connection of transmission line.<br>(3) Check voltage of the terminal block for transmission line of the unit to be coupled.<br>(i) Normal if voltage is between DC17 and 30V.<br>(ii) Check (4) in case other than i). |
| | | **Generates at interlocking registration between LOSSNAY and the indoor unit**<br>5. The power of LOSSNAY is OFF. | (4) Check for the main power of LOSSNAY. |
| | | **Generates at confirmation of controllers used in the system in which the indoor units connected to different outdoor units are grouped**<br>6. The power of the outdoor unit to be confirmed has been cut off.<br>7. The transmission line for centralized control (TB7) is disconnected.<br>8. When the indoor units connected to different outdoor units are grouped without MELANS, the male power supply connector is not connected to the female power supply switch connector (CN40) for the transmission line for centralized control.<br>9. The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for the transmission line for centralized control.<br>10. In the system to which MELANS is connected, the male power supply connector is connected to the female power supply switch connector (CN40) for the transmission line for centralized control.<br>11. Short circuit of the transmission line for centralized control | (5) Check the power supply of the outdoor unit which is coupled with the unit to be confirmed.<br>(6) Check that the transmission line for centralized control (TB7) of the outdoor unit is not disconnected.<br>(7) Check voltage of the transmission line for centralized control.<br>(i) Normal when voltage is between 10V and 30V<br>(ii) Check 8 - 11 described on the left in case other than i). |

(3) Both for MA remote controller and M-NET remote controller

| | Phenomena | Cause | Check method and remedy |
|---|---|---|---|
| 1 | Although cooling operation starts with the normal remote controller display, the capacity is not enough | 1. Compressor frequency does not rise sufficiently.<br>♦Faulty detection of pressure sensor.<br>♦Protection works and compressor frequency does not rise due to high discharge temperature<br>♦Protection works and compressor frequency does not rise due to high pressure<br>♦Pressure drops excessively. | (1) Check pressure difference between the detected pressure by the pressure sensor and the actual pressure with self-diagnosis LED.<br>-> If the accurate pressure is not detected, check the pressure sensor. (Refer to the page on Troubleshooting of Pressure Sensor).<br>Note: Lower inlet pressure by the low pressure sensor than the actual pressure causes insufficient capacity.<br>SW1 setting<br>High pressure sensor<br>  <br><br>Low pressure sensor<br>  <br><br>(2) Check temperature difference between the evaporating temperature (Te) and the target evaporating temperature (Tem) with self-diagnosis LED.<br>Note: Higher Te than Tem causes insufficient capacity.<br>SW1 setting<br>Evaporating temperature Te<br>  <br><br>Target evaporating temperature Tem<br>  <br><br>Note: Protection works and compressor frequency does not rise even at higher Te than Tem due to high discharge temperature and high pressure.<br>At high discharge temperature: Refer to 1102.<br>At high pressure: Refer to 1302. |
| | | 2. Indoor unit LEV malfunction<br>♦Insufficient refrigerant flows due to LEV malfunction (not enough opening) or protection works and compressor frequency does not rise due to pressure drop.<br>♦Refrigerant leak from LEV on the stopping unit causes refrigerant shortage on the running unit. | Refer to the page of LEV troubleshooting (9. [4] -6- ). |
| | | 3. RPM error of the outdoor unit FAN<br>♦Motor failure or board failure, or airflow rate decrease due to clogging of the heat exchanger<br>♦The fan is not properly controlled as the outdoor temperature cannot be precisely detected by the temperature sensor.<br>♦The fan is not properly controlled as the pressure cannot be precisely detected by the pressure sensor. | Refer to the page on troubleshooting of the outdoor unit fan.<br>Refer to 5106.<br>Refer to 1302. |

| | Phenomena | Cause | Check method and remedy |
|---|---|---|---|
| 1 | Although cooling operation starts with the normal remote controller display, the capacity is not enough. | 4. Long piping length<br>The cooling capacity varies greatly depending on the pressure loss. (When the pressure loss is large, the cooling capacity drops.) | Confirm that the characteristic of capacity drop due to piping length.<br>The piping pressure loss can be assumed by temperature difference between the heat exchanger inlet temperature (TH22) and TH2 (Te). -> Change the pipe. |
| | | 5. Piping size is not proper (thin) | |
| | | 6. Insufficient refrigerant amount<br>Protection works and compressor frequency does not rise due to high discharge temperature. | Refer to 1-1. (Compressor frequency does not rise sufficiently.)Refer to the page on refrigerant amount adjustment |
| | | 7. Clogging by foreign object | Check the temperature difference between in front of and behind the place where the foreign object is clogging the pipe (upstream side and downstream side). When the temperature drops significantly, the foreign object may clog the pipe.<br>-> Remove the foreign object inside the pipe. |
| | | 8. The indoor unit inlet temperature is excessively. (Less than 15°C [59°F] WB | Check the inlet air temperature and for short cycling. Change the environment where the indoor unit is used. |
| | | 9. Compressor failure<br>The amount of circulating refrigerant decreases due to refrigerant leak in the compressor. | Check the discharge temperature to determine if the refrigerant leaks, as it rises if there is a leak. |
| | | 10.LEV1 malfunction<br>Sufficient liquid refrigerant is not be supplied to the indoor unit as sufficient sub cool cannot be secured due to LEV1 malfunction. | Refer to the page of LEV troubleshooting (9. [4] -6- ).<br>It most likely happens when there is little difference or no difference between TH5 and TH7. |
| | | 11.TH5, TH7 and HPS sensor failure or faulty wiring<br>LEV1 is not controlled normally. | ♦Check the thermistor.<br>♦Check wiring. |

| | Phenomena | Cause | Check method and remedy |
|---|---|---|---|
| 2 | Although heating operation starts with the normal remote controller display, the capacity is not enough. | 1. Compressor frequency does not rise sufficiently.<br>♦Faulty detection of pressure sensor.<br>♦Protection works and compressor frequency does not rise due to high discharge temperature<br>♦Protection works and compressor frequency does not rise due to high pressure. | (1) Check pressure difference between the detected pressure by the pressure sensor and the actual pressure with self-diagnosis LED.<br>-> If the accurate pressure is not detected, check the pressure sensor.(Refer to the page on Troubleshooting of Pressure Sensor)<br>Note: Higher inlet pressure by the high pressure sensor than the actual pressure causes insufficient capacity.<br>SW1 setting<br>High pressure sensor<br>  <br>Low pressure sensor<br>  <br>(2) Check the difference between the condensing temperature (Tc) and the target condensing temperature (Tcm) with self-diagnosis LED.<br>Note: Higher Te than Tem causes insufficient capacity.<br>SW1 setting<br>Condensing temperature Tc<br>  <br>Target condensing temperature Tcm<br>  <br>Protection works and compressor frequency does not rise even at lower Tc than Tcm due to high discharge temperature and high pressure.<br>At high discharge temperature: Refer to 1102<br>At high pressure: Refer to 1302 |
| | | 2. Indoor unit LEV malfunction<br>Insufficient refrigerant flows due to LEV malfunction (not enough opening). | Refer to the page of LEV troubleshooting (9. [4]. -6- ). |
| | | 3. When the higher temperature than the actual temperature is detected due to malfunction of the piping sensor (TH22) on the indoor unit, the smaller sub cool is detected, and LEV opening will be smaller. | Check the thermistor (TH22). |
| | | 4. RPM error of the outdoor unit FAN<br>♦Motor failure or board failure, or airflow rate decrease, pressure drop due to clogging of the heat exchanger leading to high discharge temperature<br>♦The fan is not properly controlled as the temperature cannot be precisely detected with the piping sensor. | Refer to the page on outdoor unit fan ([4] -4- ). |

| | Phenomena | Cause | Check method and remedy |
|---|---|---|---|
| 2 | Although heating operation starts with the normal remote controller display, the capacity is not enough. | 5. Insulation failure of the refrigerant piping | |
| | | 6. Long piping length<br>Excessively long piping on the high pressure side causes pressure loss leading to increase in the high pressure. | Confirm that the characteristic of capacity drop due to piping length.<br>-> Change the pipe |
| | | 7. Piping size is not proper (thin) | |
| | | 8. Clogging by foreign object | Check the temperature difference between in front of and behind the place where the foreign object is clogging the pipe (upstream side and downstream side). Difficult to confirm if the object is clogged inside the extended piping. Run the unit in cooling mode, and find the foreign object using the same method as that for cooling operation.<br>-> Remove the foreign object. |
| | | 9. The indoor unit inlet temperature is excessively high.(exceeding 28°C [82°F]) | Check the inlet air temperature and for short cycling. Change the environment where the indoor unit is used. |
| | | 10. Insufficient refrigerant amount<br>Protection works and compressor frequency does not rise due to low discharge temperature<br>Refrigerant recovery operation is likely to start. | Refer to 2 - 1. (Compressor frequency does not rise sufficiently.)<br>Refer to the page on refrigerant amount adjustment |
| | | 11. Compressor failure (same as in case of cooling) | Check the discharge temperature. |
| 3 | Outdoor unit stops at times during operation. | The first stop is not considered as an error, as the unit turns to anti-restart mode for 3 minutes as a preliminary error.<br>**Error mode**<br>(i) Abnormal high pressure<br>(ii) Abnormal discharge air temperature<br>(iii) Heatsink thermistor failure<br>(iv) Thermistor failure<br>(v) Pressure sensor failure<br>(vi) Over-current break<br>(vii) Refrigerant overcharge<br>Note: Frost prevention tripping only under cooling mode may be considered in addition to the above. (Freeze protection is detected by one or all indoor units.)<br>Note: Even the second stop is not considered as an error when some specified errors occur. (eg. The third stop is considered as an error when the thermistor error occurs.) | (1) Check the mode operated in the past by displaying preliminary error history on LED display with SW1.<br>(2) Reoperate the unit to find the mode that stops the unit by displaying preliminary error history on LED display with SW1.<br>Refer to the reference page for each error mode.<br><br>*Display the indoor piping temperature table with SW1 to check whether the freeze proof operation runs properly, and check the temperature. |

## [3] Investigation of Transmission Wave Shape/Noise

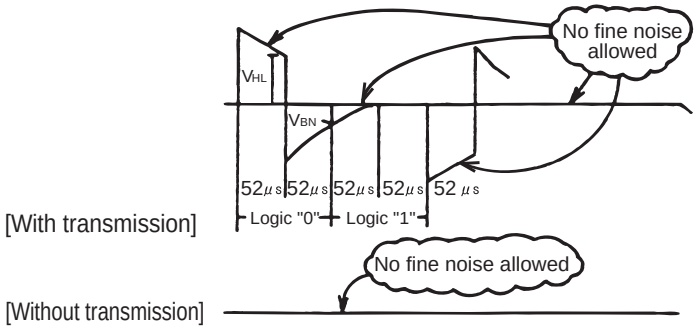
### 1. M-NET transmission

Control is performed by exchanging signals between the outdoor unit and the indoor unit (M-NET remote controller) through M-NET transmission. Noise interference on the transmission line will interrupt the normal transmission, leading to erroneous operation.

(1) Symptoms caused by noise interference on the transmission line

| Cause | Erroneous operation | Error code | Error code definition |
|---|---|---|---|
| Noise interference on the transmission line | Signal is transformed and will be misjudged as the signal of another address. | 6600 | Address overlaps |
| | Transmission wave pattern is transformed due to the noise creating a new signal | 6602 | Transmission processor hardware error |
| | Transmission wave pattern is transformed due to the noise, and will not be received normally leading to no acknowledgement (ACK). | 6607 | No ACK |
| | Transmission cannot be performed due to the fine noise. | 6603 | Transmission circuit bus-busy |
| | Transmission is successful; however, the acknowledgement (ACK) or the response cannot be received normally due to the noise. | 6607<br>6608 | No ACK<br>No response |

(2) Wave shape check




Check the wave pattern of the transmission line with an oscilloscope. The following conditions must be met.

1) Small wave pattern (noise) must not exist on the transmission signal. Minute noise (approximately 1V) can be generated by DC-DC converter or the inverter operation; however, such noise is not a problem when the shield of the transmission line is grounded.
2) The sectional voltage level of transmission signal should be as follows.

| Logic | Voltage level of the transmission line |
|---|---|
| 0 | $V_{HL}$ = 2.0V or higher |
| 1 | $V_{BN}$ = 1.3V or below |

(3) Check method and remedy

1) Measures against noise

Check the followings when noise exists on the wave or the errors described in (1) occur.

| | Error code definition | Remedy |
|---|---|---|
| Check that the wiring work is performed according to wiring specifications. | 1. The transmission line and the power 208 / 230 V line are not wired too closely. | Isolate the transmission line from the power line (5cm [1-31/32"] or more). Do not insert them in the same Do not insert them in the same conduit. |
| | 2. The transmission line is not bundled with that for another systems. | The transmission line must be isolated from another transmission line.<br>When they are bundled, erroneous operation may be caused. |
| | 3. The specified wire is used for the transmission line. | Use the specified transmission line.<br>Type: Shielded wire CVVS/CPEVS/MVVS (For M-NET remote controller)<br>Diameter: 1.25mm$^2$ [AGW16] or more<br>(Remote controller wire: 0.3 - 1.25mm$^2$ [AGW22-16]) |
| | 4. When the transmission line is daisy-chained on the indoor unit terminals, are the shields daisy-chained on the terminals, too? | The transmission is two-wire daisy-chained. The shielded wire must be also daisy-chained.<br>When the shielded cable is not daisy-chained, the noise cannot be reduced enough. |
| Check that the grounding work is performed according to grounding specifications. | 5. Is the grounding of the shield of the transmission line (for indoor unit control) provided on the indoor unit? | One point grounding must be provided on the outdoor unit.<br>If no grounding is provided, the noise on the transmission line cannot escape leading to change of the transmission signal. |
| | 6. Check the treatment method of the shield of the transmission line (for centralized control). | When group operation of indoor units connected to different outdoor units is performed, provide grounding of the shield of the transmission line for centralized control at the point of outdoor unit, and when the system controller is used, provide grounding at the point of the system controller, so that the effect of noise can be minimized.<br>The environment against noise varies depending on the distance of the transmission lines, the number of the connected units, the type of the controllers to be connected, or the environment of the installation site. Therefore, the transmission line work for centralized control must be performed as follows.<br>(1) When no grounding is provided<br>♦Group operation of indoor units connected to different outdoor units: One point grounding on one outdoor unit (power supply unit)<br>♦Use of MELANS: Grounding on the main controller (power supply device)<br>(2) When an error occurs even though one point grounding is provided: Ground the shield on all outdoor units. |

2) Check the followings when the error "6607" occurs, or "HO" / "PLEASE WAIT"appears on the display on the remote controller.

| Error code definition | Remedy |
|---|---|
| 7. The farthest distance of transmission line is 200m [656ft] or longer. | Check that the farthest distance from the outdoor unit to the indoor unit and to the remote controller is within 200m [656ft]. |
| 8. The types of transmission lines are different. | Use the specified transmission line.<br>Type: Shielded wire CVVS/CPEVS/MVVS (For M-NET remote controller)<br>Diameter: 1.25mm$^2$ [AWG16] or more<br>(Remote controller wire: 0.3-1.25mm$^2$ [AGW22-16]) |
| 9. Check the state of the choke coil on the transmission power supply circuit. | When resistance of the choke coil (L2) is between 0.5 and 2.6 ohm, the choke coil is normal.<br>When resistance (R3) on the outdoor unit MAIN board is 1kohm ± 5%, it is normal. Connectors CNS1 and CNS2 must be removed when resistance is measured. |
| 10.Indoor unit or remote controller failure | Replace the indoor unit controller board or the remote controller. |

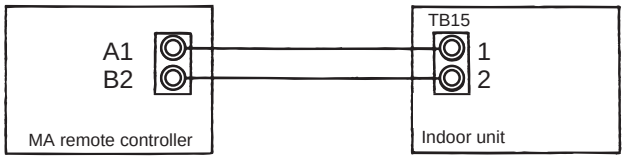
## 2. MA remote controller transmission

The communication between the MA remote controller and the indoor unit is performed with current tone burst.

(1) Symptoms caused by noise interference on the transmission line

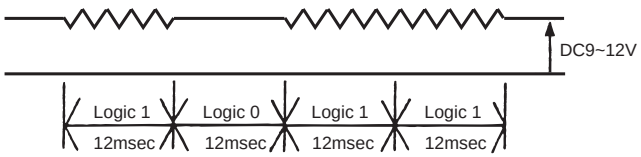
If noise is generated on the transmission line, and the communication between the MA remote controller and the indoor unit is interrupted for 3 minutes in a row, MA transmission error (6831) will occur.

(2) Confirmation of transmission specifications and wave pattern




A1, B2 : No polarity
Across terminal No. 1-2
: Power supply (8.5V to 12VDC)

Transmission waveform (Across terminal No.1 - 2)



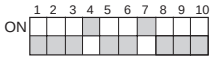

①Satisfies the formula
12 msec/bit ± 5%
②Voltage among terminals must be between DC9 and 12 V.

## [4] Troubleshooting Principal Parts

### -1- High-Pressure Sensor (63HS)

**1. Compare the pressure that is detected by the high pressure sensor, and the high-pressure gauge pressure to check for failure.**

Set the digital display switch (SW1) as shown below to display the pressure that is detected by the high pressure sensor on the light emitting diode




(1) While the sensor is stopped, compare the gauge pressure and the pressure displayed on self-diagnosis LED1.
  1) When the gauge pressure is between 0 and 0.098MPa [14psi], internal pressure is caused due to gas leak.
  2) When the pressure displayed on self-diagnosis LED1 is between 0 and 0.098MPa [14psi], the connector may be defective or be disconnected. Check the connector and go to (4).
  3) When the pressure displayed on self-diagnosis LED1 exceeds 4.15MPa [601psi], go to (3).
  4) If other than 1), 2) or 3), compare the pressures while the sensor is running. Go to (2).

(2) Compare the gauge pressure and the pressure displayed on self-diagnosis LED1 while the sensor is running. (Compare them by MPa [psi] unit.)
  1) When the difference between both pressures is within 0.098MPa [14psi], both the high pressure sensor and the main board are normal.
  2) When the difference between both pressures exceeds 0.098MPa [14psi], the high pressure sensor has a problem. (performance deterioration)
  3) When the pressure displayed on self-diagnosis LED1 does not change, the high pressure sensor has a problem.

(3) Remove the high pressure sensor from the main board to check the pressure on the self-diagnosis LED1.
  1) When the pressure displayed on self-diagnosis LED1 is between 0 and 0.098MPa [14psi], the high pressure sensor has a problem.
  2) When the pressure displayed on self-diagnosis LED1 is approximately 4.15MPa [601psi], the main board has a problem.

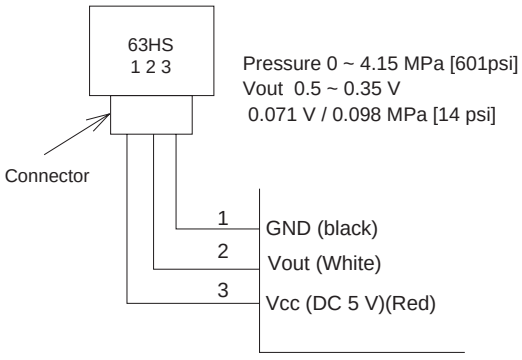
(4) Remove the high pressure sensor from the main board, and short-circuit between the No.2 and 3 connectors (63HS) to check the pressure with self-diagnosis LED1.
  1) When the pressure displayed on the self-diagnosis LED exceeds 4.15MPa [601psi], the low pressure sensor has a problem.
  2) If other than 1), the main board has a problem.

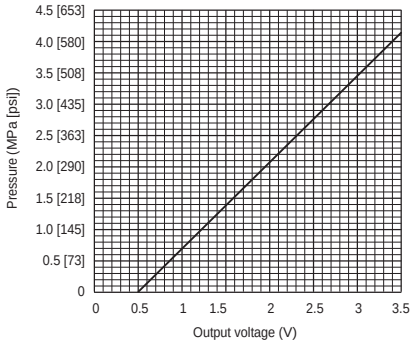
**2. Pressure sensor configuration**

The high pressure sensor consists of the circuit shown in the figure below. If DC 5V is applied between the red and the black wires, voltage corresponding to the pressure between the white and the black wires will be output, and the value of this voltage will be converted by the microcomputer. The output voltage is 0.071V per 0.098MPa [14psi].

∗The pressure sensor on the body side is designed to connect to the connector. The connector pin number on the body side is different from that on the main board side.

| | Body side | Main board side |
|---|---|---|
| Vcc | Pin 1 | Pin 3 |
| Vout | Pin 2 | Pin 2 |
| GND | Pin 3 | Pin 1 |



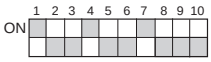



<table>
<tr><th>Error Code</th><th>Error source</th><th>Error definition and error detection method</th><th>Cause</th><th>Check method and remedy</th></tr>
<tr><td>7106</td><td></td><td>Attribute setting error</td><td>MA remote controller intended for use with indoor units, such as an MA remote controller, is connected to the OA processing unit whose attribute is FU.</td><td>To operate the OA processing unit using remote controllers for indoor units, such as MA remote controller, set the DipSW3-1 on the OA processing unit to ON.<br><table><tr><th>Operation method</th><th>SW 3-1</th></tr><tr><td>Interlock with the indoor unit</td><td>OFF</td></tr><tr><td>Direct operation with the MA remote controller</td><td>ON</td></tr></table></td></tr>
<tr><td>7107</td><td>BC controller</td><td>Port setting error<br><br>The port with wrong number is connected to the indoor unit.The model total connected to the port is greater than the specification.</td><td>(1) Model total of indoor units per each port or per each port merge is greater than the specification.<br><table><tr><th>Total port number</th><th>Model total</th></tr><tr><td>Single branching</td><td>54</td></tr><tr><td>2 branches merge</td><td>96</td></tr></table>(2) 4 or more indoor units are connected to the same port.<br>(3) When two ports are used, the port with the smaller number is not connected to the indoor unit.<br>(4) For the address of the BC controller (Sub 1 or 2), 50 is not added to the smallest indoor unit address, which is connected to the BC controller (Sub1 or 2).<br>(5) In the system to which multiple BC controllers are connected, the indoor unit address connected to the BC controller is not set as shown below.<br>(i) The indoor unit address which is connected to the BC controller (main)<br>(ii) The indoor unit address which is connected to the BC controller (Sub1)<br>(iii) he indoor unit address which is connected to the BC controller (Sub2)<br>Address setting<br>(i)<(ii)<(iii)<br>*(ii) and (iii) can be reversed.</td><td>Before resetting the port number using the port number setting switch or the model using the model (capacity code) setting switch, turn off the power of the outdoor unit, the BC controller and the indoor unit.</td></tr>
</table>

## -2- Low-Pressure Sensor (63LS)

### 1. Compare the pressure that is detected by the low pressure sensor, and the low pressure gauge pressure to check for failure.

Set the digital display switch (SW1) as shown below to display the pressure that is detected by the low pressure sensor on the self-diagnosis LED.




(1) While the sensor is stopped, compare the gauge pressure and the pressure displayed on self-diagnosis LED1.
  1) When the gauge pressure is between 0 and 0.098MPa [14psi], internal pressure is caused due to gas leak.
  2) When the pressure displayed on self-diagnosis LED1 is between 0 and 0.098MPa [14psi], the connector may be defective or be disconnected. Check the connector and go to (4).
  3) When the pressure displayed on self-diagnosis LED1 exceeds 4.15MPa [14psi], go to (3).
  4) If other than 1), 2) or 3), compare the pressures while the sensor is running. Go to (2).

(2) Compare the gauge pressure and the pressure displayed on self-diagnosis LED1 while the sensor is running.(Compare them by MPa [psi] unit.)
  1) When the difference between both pressures is within 0.03MPa [4psi], both the low pressure sensor and the main board are normal.
  2) When the difference between both pressures exceeds 0.03MPa [4psi], the low pressure sensor has a problem. (performance deterioration)
  3) When the pressure displayed on the self-diagnosis LED does not change, the low pressure sensor has a problem.

(3) Remove the low pressure sensor from the main board to check the pressure with the self-diagnosis LED display.
  1) When the pressure displayed on the self-diagnosis LED is between 0 and 0.098MPa [14psi], the low pressure sensor has a problem.
  2) When the pressure displayed on self-diagnosis LED is approximately 1.7MPa [247psi], the main board has a problem.
    ♦When the outdoor temperature is 30°C [86°F] or less, the main board has a problem.
    ♦When the outdoor temperature exceeds 30°C [86°F], go to (5).

(4) Remove the low pressure sensor from the main board, and short-circuit between the No.2 and 3 connectors (63HS) to check the pressure with the self-diagnosis LED.
  1) When the pressure displayed on the self-diagnosis LED exceeds 1.7MPa [247psi], the low pressure sensor has a problem.
  2) If other than 1), the main board has a problem.

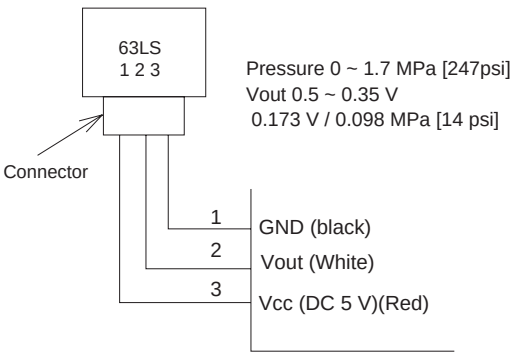
(5) Remove the high pressure sensor (63HS) from the main board, and insert it into the connector for the low pressure sensor (63LS) to check the pressure with the self-diagnosis LED.
  1) When the pressure displayed on the self-diagnosis LED exceeds 1.7MPa [247psi], the main board has a problem.
  2) If other than 1), the main board has a problem.

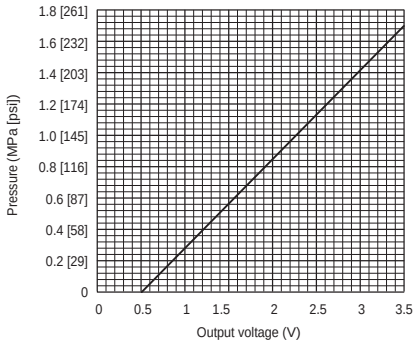
### 2. Low-pressure pressure configuration

The low pressure sensor consists of the circuit shown in the figure below. If DC5V is applied between the red and the black wires, voltage corresponding to the pressure between the white and the black wires will be output, and the value of this voltage will be converted by the microcomputer. The output voltage is 0.173V per 0.098MPa [14psi].

∗The pressure sensor on the body side is designed to connect to the connector. The connector pin number on the body side is different from that on the main board side.

| | Body side | Main board side |
|---|---|---|
| Vcc | Pin 1 | Pin 3 |
| Vout | Pin 2 | Pin 2 |
| GND | Pin 3 | Pin 1 |



## -3- Solenoid Valve

Check whether the output signal from the control board and the operation of the solenoid valve match.
Setting the self-diagnosis switch (SW1) as shown in the figure below causes the ON signal of each relay to be output to the LED's.
Each LED shows whether the relays for the following parts are ON or OFF.
∗The circuits on some parts are closed when the relays are ON. Refer to the following instructions.

| SW1 | Display | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 2 3 4 5 6 7 8 9 10 | LD1 | LD2 | LD3 | LD4 | LD5 | LD6 | LD7 | LD8 |
| ON 1 2 3 4 5 6 7 8 9 10 | 21S4a | 21S4b | | CH11 | CH12 | | | |
| ON 1 2 3 4 5 6 7 8 9 10 | SV1 | SV2 *1 | SV3 | SV4a *1 | SV4b *1 | SV4c *1 | | |
| ON 1 2 3 4 5 6 7 8 9 10 | SV5a *1 | SV5b | | | SV4d *1 | | 52F | |

*1 Applicable to the PURY sereis only

When a valve malfunctions, check if the wrong solenoid valve coil is not attached the lead wire of the coil is not disconnected, the connector on the board is not inserted wrongly, or the wire for the connector is not disconnected.

(1) In case of 21S4a (4-way switching valve)
About this 4-way valve
When not powered:
The electricity runs between the oil separator exit and the heat exchanger (in case of P126 - P144 model) HEXB, between heat exchangers at the rear (in case of P168 - P234 models), between HEX1a and 2a (heat exchanger on the right (as you face the front of the unit)), and between the gas ball valve (BV1) and the accumulator. This circulation is for cooling.
When powered:
The electricity runs between the oil separator and the gas ball valve, and between the heat exchanger and the accumulator. This circulation is for heating.

Check the LED display and the intake and the discharge temperature for the 4-way valve to check whether the valve has no faults and the electricity runs between where and where.Do not touch the pipe when checking the temperature, as the pipe on the oil separator side will be hot.
∗Do not give an impact from outside, as the outer hull will be deformed leading to the malfunction of the inner valve.

(2) In case of 21S4b (4-way switching valve) (only for P126-P234 models)
About this 4-way valve
When not powered:
The electricity runs between the oil separator exit and the heat exchanger (in the case of P126 - P144 model) HEXF, between heat exchangers at the front(in the case of P168-P234 models), and between HEX1b and 2b (heat exchanger on the left (as you face the front of the unit)).
When powered:
The electricity runs between the heat exchanger and the accumulator, and the valve opens or closes the heat exchanger circuit when cooling or heating.

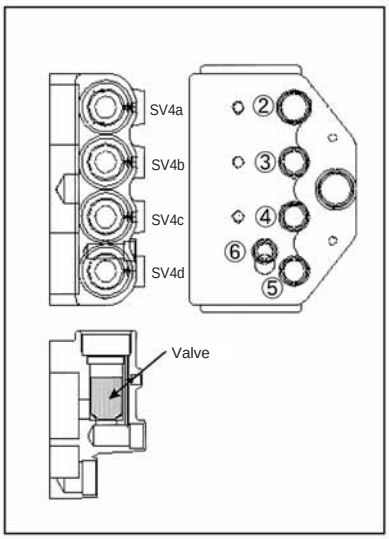
Check the LED display and the switching sound to check whether the valve has no faults, however, it may be occasionally difficult to check by the sound, as the switching coincides with 21S4a and 21S4c. In this case, check the intake and the discharge temperature for the 4-way valve to check that the electricity runs between where and where.
∗Do not touch the valve when checking the temperature, as it will be hot.
∗Do not give an impact from outside, as the outer hull will be deformed leading to the malfunction of the inner valve.

(3) In case of SV1 (Bypass valve)
This solenoid valve opens when powered (Relay ON).
1) At compressor start-up, the SV1 turns on for 4 minutes, and the operation can be checked by the self-diagnosis LED display and the closing sound.
2) To check whether the valve is open or closed, check the change of the SV1 downstream piping temperature while the valve is being powered.Even when the valve is closed, high-temperature refrigerant flows inside the capillary next to the valve.
(Therefore, temperature of the downstream piping will not be low with the valve closed.)

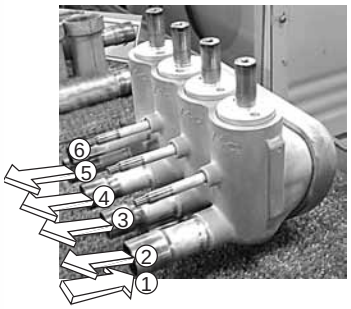
(4) In the case of SV2 (Bypass valve) (applicable to the PURY series only)
This solenoid valve opens when powered (Relay ON).
In the case of heating-only or heating-main, the valve turns on when the low pressure (LPS) becomes 0.25MPa [36psi] or less 5 minutes after the compressor starts.
To check whether the valve is open or closed, check the change of the SV2 downstream piping temperature while the valve is being powered. When the valve is open, high-temperature gas will run. Do not touch the pipe when checking the temperature.

(5) In case of SV3 (Bypass valve) (Only P168-P234 types)
This solenoid valve opens when powered (Relay ON).
The valve is normally powered while No.2 Comp is being stopped. (When the discharge temperature of No.1 Comp exceeds 110°C [230°F], the valve may be turned off.)
To check whether the valve is open or closed, check the change of the SV3 downstream piping temperature while the valve is being powered. When the valve is open, high-temperature gas will run. Do not touch the pipe when checking the temperature.

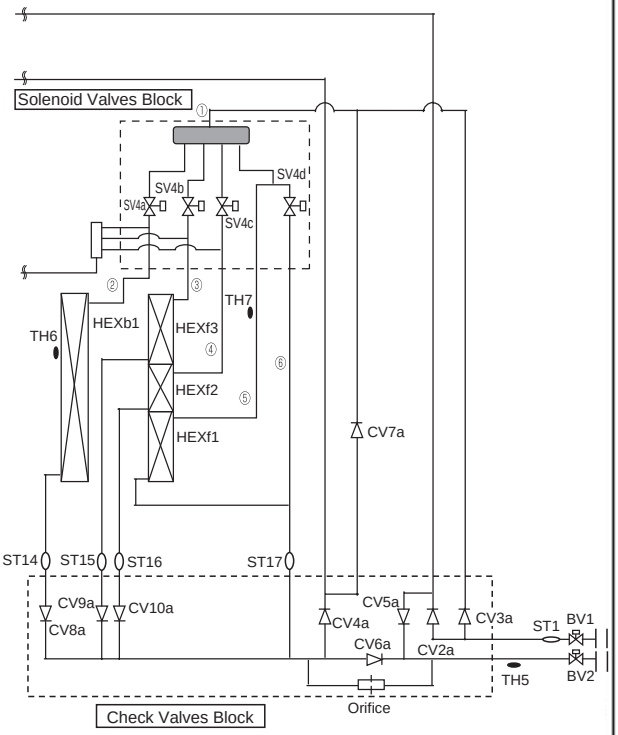
(6) In case of SV4a - 4d [P72 - P144 models], SV4a - 4d, 5a, 5b [P168 - P234 models] (heat exchanger capacity control) (applicable to the PURY series only)
1) In the case of cooling-only, one or more valves among SV4a - 4d, 5a, and 5b turn(s) on depending on the condition. Check the operation by LED display and operation sound of the solenoid valve.
2) In the case of heating only, all of SV4a - 4d, 5a, and 5b turn on. The operation can be checked by LED display and operation sound of the solenoid valve.
3) In the case of cooling-main or heating-main, one or more valves among SV4a - 4d, 5a, and 5b turn(s) on. Check the operation by LED display and operation sound of the solenoid valve.
4) Refrigerant flow is as shown in the figure below.In the case of cooling-only or cooling-main mode, high-temperature (high-pressure) flow is shown, and in the case of heating-only or heating-main mode, low-temperature gas or liquid flow is shown.Refer to the refrigerant circuit figure.Turn on or off the solenoid valve depending on the indoor unit capacity or the outdoor temperature.Check the LED monitor.Remove the SV coil, open the lid, and check the plunger. Pin-face tools, which are specified in service parts list, are required



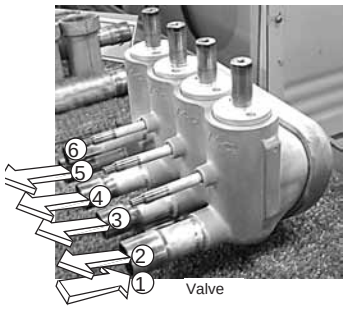

Solenoid valve block



Refrigerant Circuit Figure (P72 ~ P144 models)

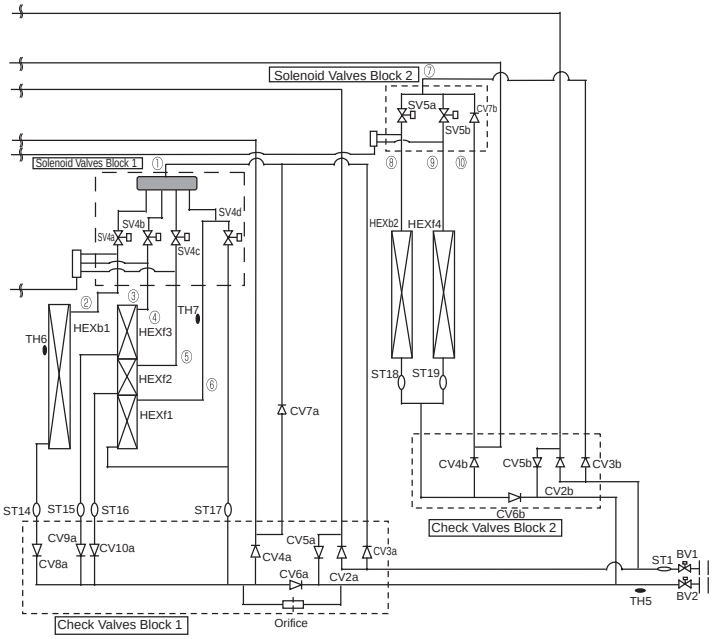


Solenoid valve block 1

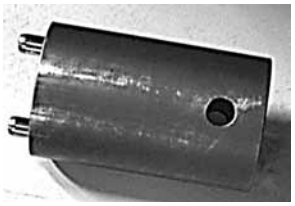



Solenoid valve block 2

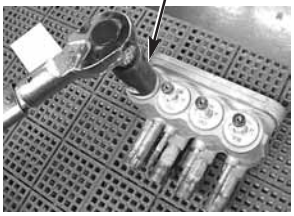
Refrigerant Circuit Figure (P168 ~ P234 models)

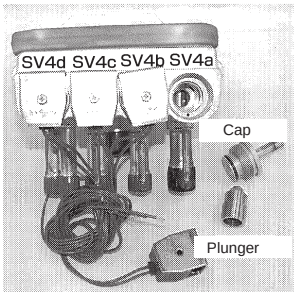



Pin-face tool



Pin-face tool






Tightening torque : 150N·m

(7) In case of SV5b (2-way switching valve) (only for P126-P234 models)
This 2-way valve is closed when powered. Check the LED display and the switching sound to check whether the valve has no faults.When cooling, the switching coincides with 21S4b. When it is difficult to check by the sound, check the temperature at the front and the back of the pipe to check whether the refrigerant is flowing.
∗Do not give an impact from the outside, as the outer hull will be deformed, leading to the malfunction of the inner valve.

## -4- Outdoor Unit Fan

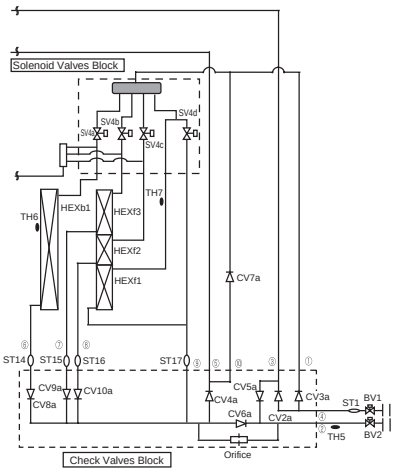
- To check the revolution of the fan, check the inverter output state on the self-diagnosis LED, as the inverter on the outdoor fan controls the revolutions of the fan.The revolution of the fan is approximately 600rpm at full speed.
- When starting the fan, the fan runs at full speed for 5 seconds.
- For the 2 fans for P168 - P234 models, the fan on the right (as you face the fan) runs at all times and the fan on the left runs when required.(When heating except for defrost, both fans run.)
- When setting the DIP SW1 as shown in the figure below, the inverter output [%] will appear. 100% indicates the full speed and 0% indicates the stopping.


- As the revolution of the fan changes under control, at the interphase or when the indoor unit operation capacity is low, the revolution of the fan may change.
- When the fan does not work or an abnormal vibration occurs, the FAN board has a problem, or the fan motor runs under open phase or opposite phase. (The microcomputer detects the open phase or the opposite phase of the main power source; however, these malfunctions)
- When the only one of the fans is running and the other fan is stopped, check the 52F output state on the self-diagnosis LED first and check the fan connector and 52F connector misconnection, 52F failure, or the lead wire disconnection.

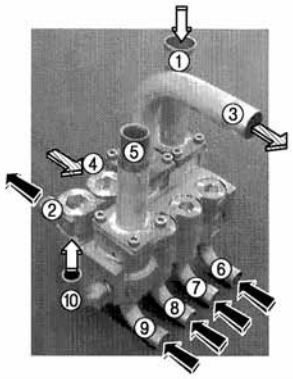
## -5- Check Valve Block (applicable to the PURY series only)

By turning on or off SV4a-4d, 5a, and 5b on and off, the refrigerant flows through ⑥, ⑦, ⑧, and ⑨. Check the LED monitor. Valve plug A, B, and C can be removed with 3 kinds of hex wrenches.

Refrigerant Circuit Figure (P72 ~ P144 models)

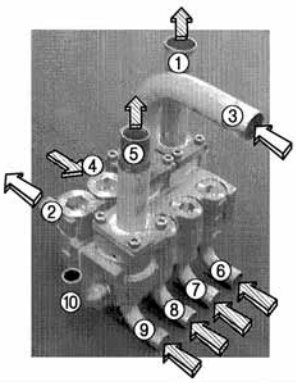



Refrigerant flow in the cooling cycle



Check valve block 1

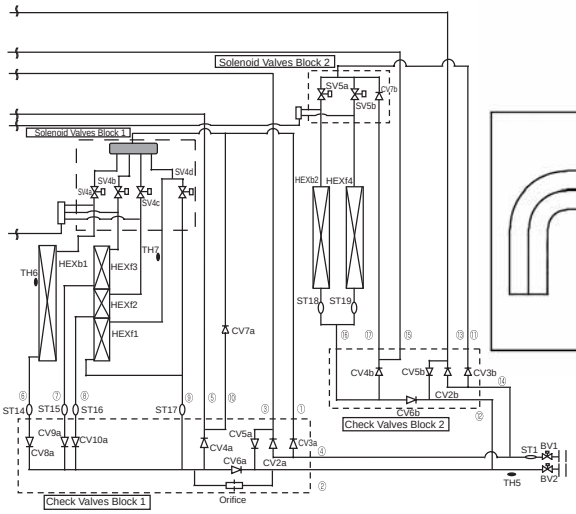
Refrigerant flow in the heating cycle



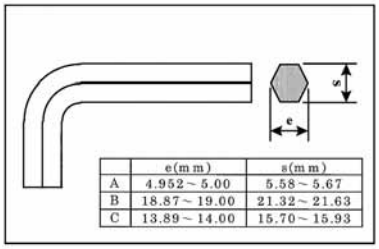
Check valve block 1

High pressure (gas)
High pressure (liquid)
Low pressure (gas/liquid)

Refrigerant Circuit Figure (P168 ~ P234 models)

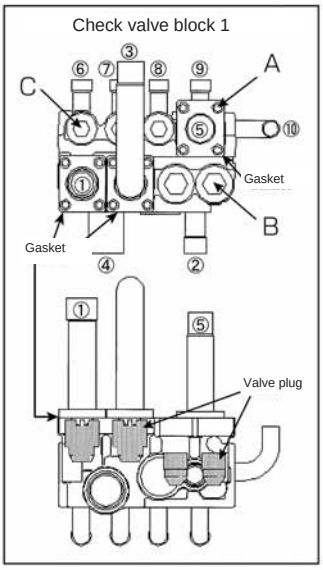



Hex wrench

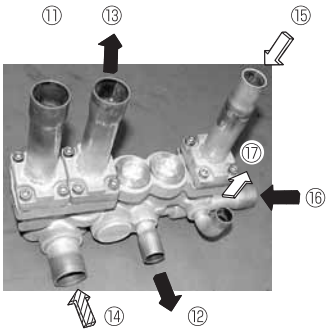



| | e(mm) | s(mm) |
|---|---|---|
| A | 4.952~5.00 | 5.58~5.67 |
| B | 18.87~19.00 | 21.32~21.63 |
| C | 13.89~14.00 | 15.70~15.93 |

Check valve block 1

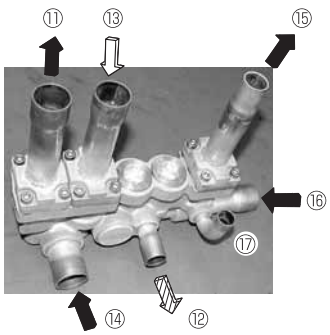



Refrigerant flow in the cooling cycle



Check valve block 2 (P168 ~ P234 models only)

Refrigerant flow in the heating cycle



Check valve block 2 (P168 ~ P234 models only)

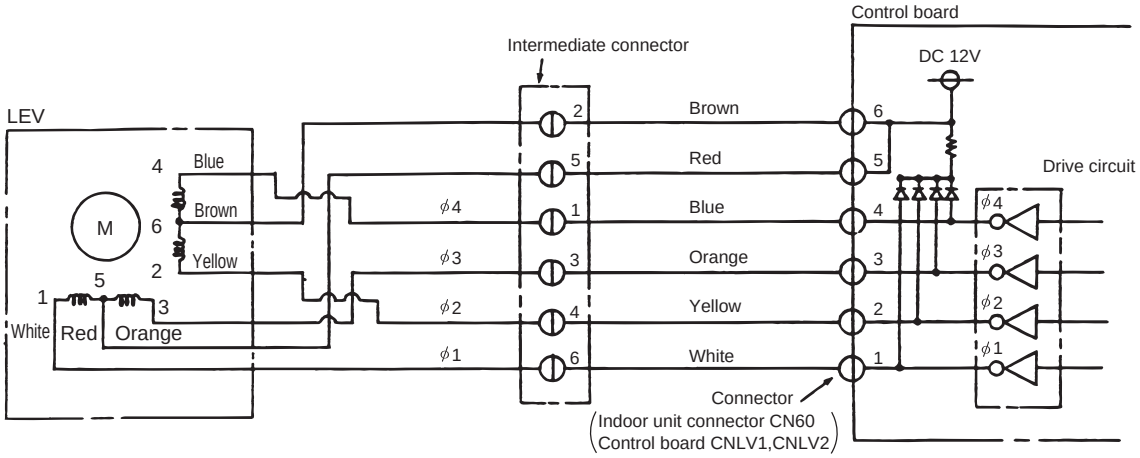
High pressure (gas)
High pressure (liquid)
High pressure (gas/liquid)

## -6- LEV

### LEV operation

The LEV receives pulse signal from the board and the valve is driven by the stepping motor.

(1) Indoor LEV and BC controller LEV
The valve opening changes according to the number of pulses.




Note. The connector numbers on the intermediate connector and the connector on the control board differ. Check the color of the lead wire to judge the number.

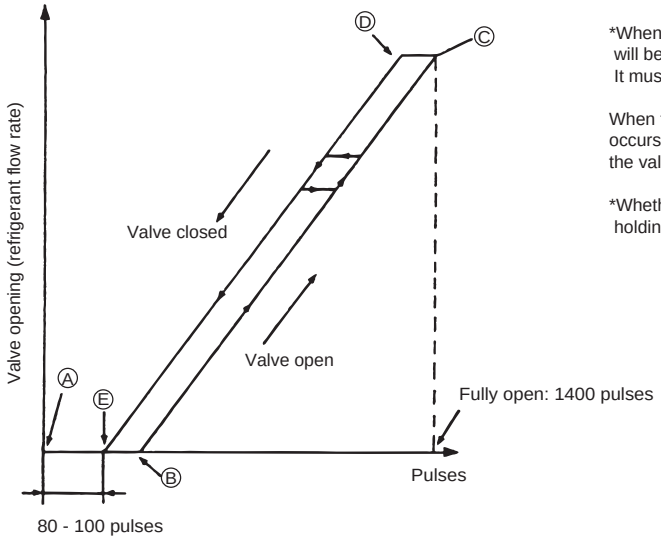
### Pulse signal output and valve operation

| Output (phase) number | Output state | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| φ1 | ON | OFF | OFF | ON |
| φ2 | ON | ON | OFF | OFF |
| φ3 | OFF | ON | ON | OFF |
| φ3 | OFF | OFF | ON | ON |

[Pulse signal output and valve operation]
Output pulses change in the following orders when the
Valve is closed; 1 →2 →3→ 4→ 1
Valve is open; 4 →3 →2→ 1→ 4

*1. When the LEV opening angle does not change, all the output phases will be off.
*2. When the output is open phase or remains ON, the motor cannot run smoothly, and rattles and vibrates.

### LEV valve closing and opening operation

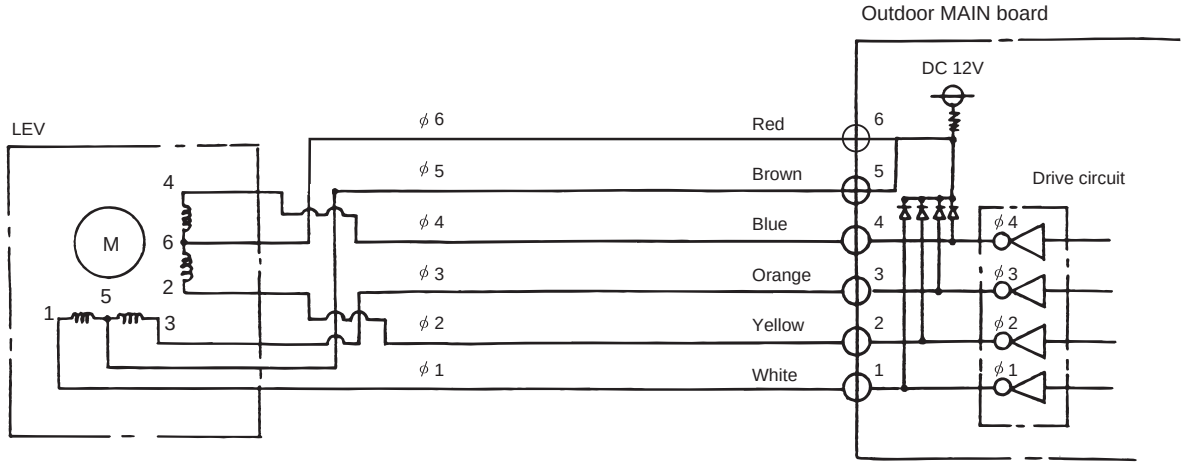



*When the power is turned on, the valve closing signal of 2200 pulses will be output from the indoor board to LEV to fix the valve position. It must be fixed at point Ⓐ

When the valve operates smoothly, no sound from LEV or no vibration occurs, however, when the pulses change from Ⓔ to Ⓐ in the chart or the valve is locked, a big sound occurs.

*Whether a sound is generated or not can be determined by holding a screwdriver against it, then placing your ear against the handle.

(2) Outdoor LEV (applicable to the PUHY series only)
The valve opening changes according to the number of pulses.
<Connections between the outdoor MAIN board and LEV1 (outdoor expansion valve)>



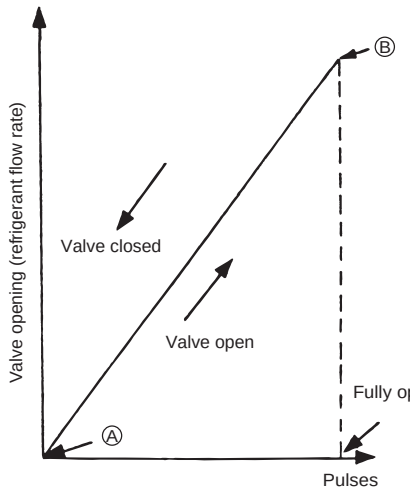

**Pulse signal output and valve operation**

| Output (phase) number | Output state | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| ϕ1 | ON | OFF | OFF | OFF | OFF | OFF | ON | ON |
| ϕ2 | ON | ON | ON | OFF | OFF | OFF | OFF | OFF |
| ϕ3 | OFF | OFF | ON | ON | ON | OFF | OFF | OFF |
| ϕ4 | OFF | OFF | OFF | OFF | ON | ON | ON | OFF |

[Pulse signal output and valve operation]
Output pulses change in the following orders when the
Valve is closed; 1 →2 → 3→ 4→ 5→ 6→7 →8 → 1
Valve is open; 8 →7 → 6→ 5→ 4→ 3→2 →1 →8

*1. When the LEV opening angle does not change, all the output phases will be off.
*2. When the output is open phase or remains ON, the motor cannot run smoothly, and rattles and vibrates.

**LEV valve closing and opening operation**




*When the power is turned on, the valve closing signal of 520 pulses will be output from the indoor board to LEV to fix the valve position. It must be fixed at point Ⓐ
(Pulse signal is output for approximately 17 seconds.)

When the valve operates smoothly, there is no sound from the LEV and no vibration occurs, but when the valve is locked, noise is generated.

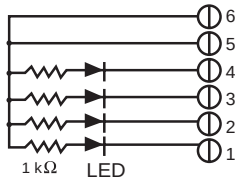
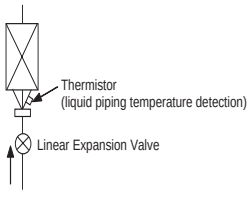
*Whether a sound is generated or not can be determined by holding a screwdriver against it, then placing your ear against the handle.

*If liquid refrigerant flows inside the LEV, the sound may become smaller.

(3) Judgment methods and possible failure mode

Note:

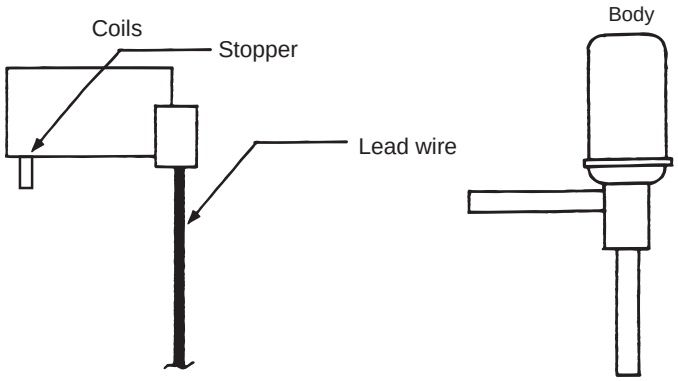
The specifications of the outdoor unit (outdoor LEV) and the indoor unit (indoor LEV) differ.Therefore, remedies for each failure may vary. Check the remedy specified for the appropriate LEV as indicated in the right column.

| Malfunction mode | Judgment method | Remedy | Target LEV |
|---|---|---|---|
| Microcomputer driver circuit failure | Disconnect the control board connector and connect the check LED as shown in the figure below.<br>  <br>When the main power is turned on, the indoor board or the outdoor MAIN board outputs pulse signals to the indoor LEV for 10 seconds, and to the outdoor LEV for 17 seconds. If the self-diagnosis LED is not lit, or remains lit, the driver circuit has a problem. | When the drive circuit has a problem, replace the control board. | Indoor<br>Outdoor |
| LEV mechanism is locked | If the LEV is locked, the drive motor runs idle, and makes a small clicking sound.<br>When the valve makes a closing and opening sound, the valve has a problem. | Replace the LEV. | Indoor<br>Outdoor |
| Disconnected or short-circuited LEV motor coil | Measure resistance between the coils (red - white, red -orange, brown - yellow, brown - blue) using a tester. They are normal if resistance is 150 ± 10%. | Replace the LEV coils. | Indoor |
| | Measure resistance between the coils (red - white, red -orange, brown - yellow, brown - blue) using a tester. They are normal if resistance is 46 within 3%. | Replace the LEV coils. | Outdoor |
| Incomple sealing (leak from the valve) | When checking the refrigerant leak from the indoor LEV, run the target indoor unit in the fan mode, and the other indoor units in the cooling mode. Then, check the liquid temperature (TH22) with the self-diagnosis LED. When the unit is running in the fan mode, the LEV is fully closed, and the temperature detected by the thermistor is not low. If there is a leak, however, the temperature will be low. If the temperature is extremely low compared with the inlet temperature displayed on the remote controller, the LEV is not properly sealed, however, if there is a little leak, it is not necessary to replace the LEV when there are no effects to other parts.<br>  | If there is a large amount of leakage, replace the LEV. | Indoor |
| Faulty wire connections in the connector or faulty contact. | 1. Check for loose pins on the connector and check the colors of the lead wires visually<br>2. Disconnect the control board's connector and conduct a continuity check using a tester. | Check the continuity at the points where an error occurs. | Indoor<br>Outdoor |

(4) Outdoor LEV coil removal procedure (applicable to the PUHY series only)

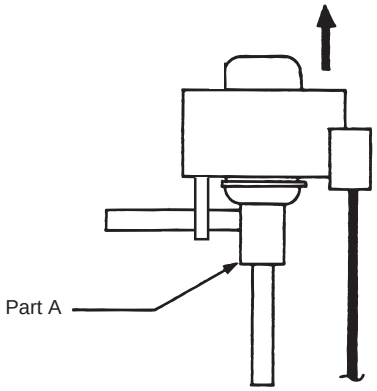
**LEV component**

As shown in the figure, the outdoor LEV is made in such a way that the coils and the body can be separated.




**Removing the coils:**

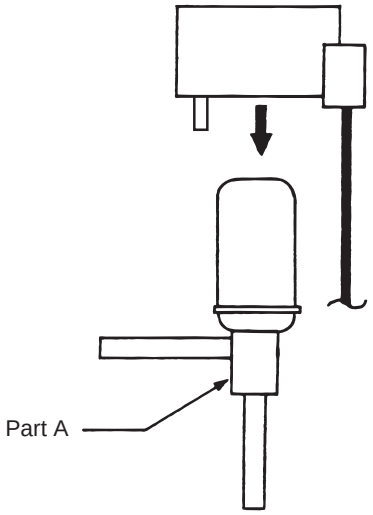
Fasten the body tightly at the bottom (Part A in the figure) so that the body will not move, then pull out the coils toward the top.If the coils are pulled out without the body gripped, undue force will be applied and the pipe will be bent.




**Installing the coils**

Fix the body tightly at the bottom (Part A in the figure) so that the body will not move, then insert the coils from the top, and insert the coil stopper securely in the pipe on the body. Hold the body when pulling out the coils to prevent so that the pipe will not be bent.

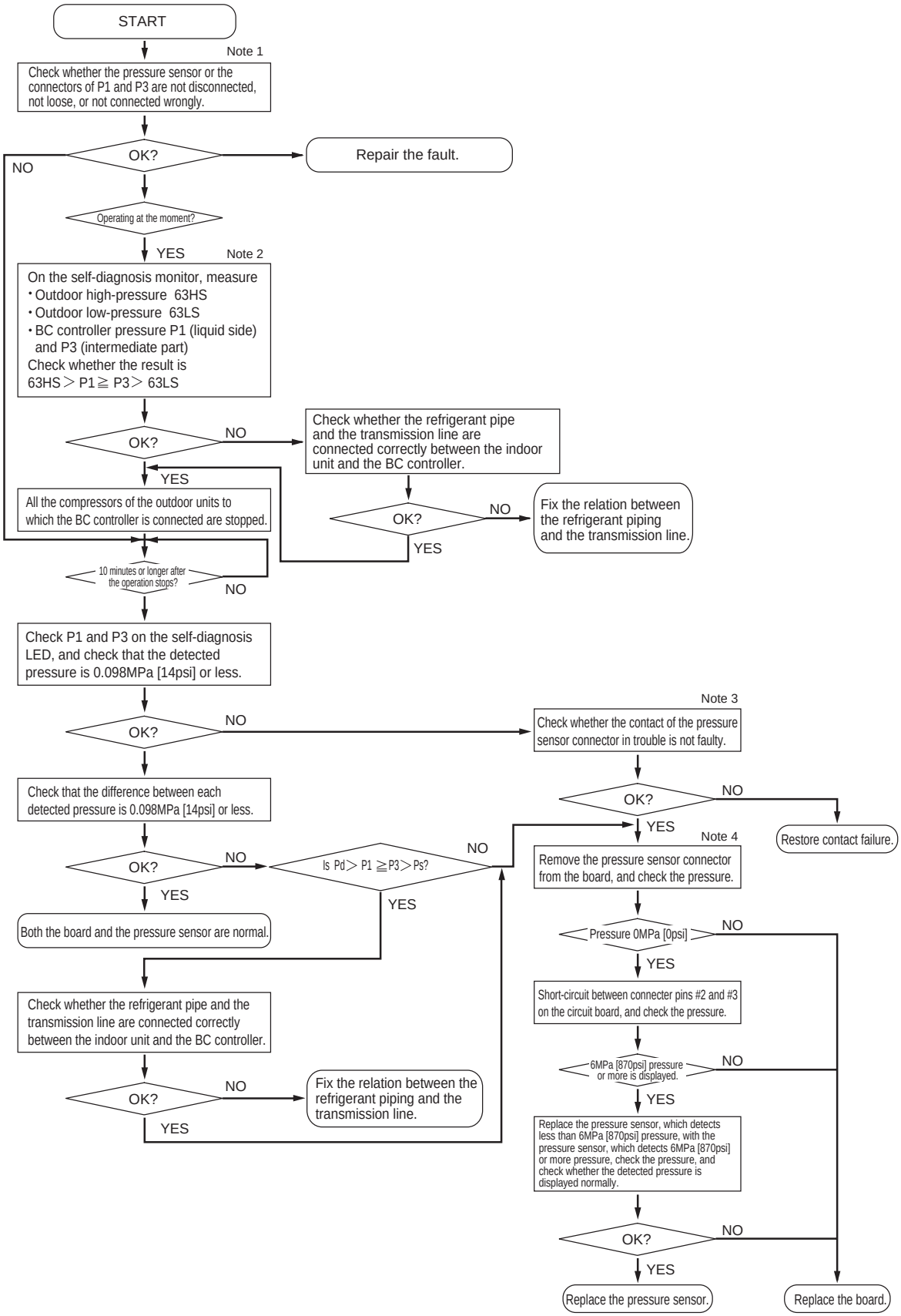
If the coils are pushed without the body gripped, undue force will be applied and the pipe will be bent. Hold the body when pulling out the coils to prevent so that the pipe will not be bent.



## -7- Troubleshooting Principal Parts of BC Controller

### 1. Pressure sensor

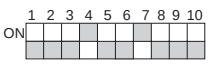
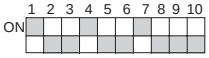
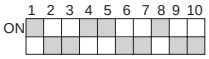
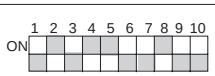
Troubleshooting flow chart for pressure sensor



Note1 BC controller: Phenomena when the pressure sensor is connected wrongly (reverse connection of P1 and P3) to the board.

| Symptoms | | | | | | |
|---|---|---|---|---|---|---|
| Cooling-only | Cooling-main | | Heating only | | Heating main | |
| Normal | Non-cooling | SC11 large<br>SC16 small<br>△PHM large | Indoor heating SC small<br>Heating indoor Thermo ON<br>Especially noise is large. | SC11 large<br>SC16 small<br>△PHM large | Non-cooling<br>Indoor heating SC small<br>Heating indoor Thermo ON<br>Especially noise is large. | SC11 large<br>SC16 small<br>△PHM large |

Note2 Check the self-diagnosis switch (Outdoor control board SW1).

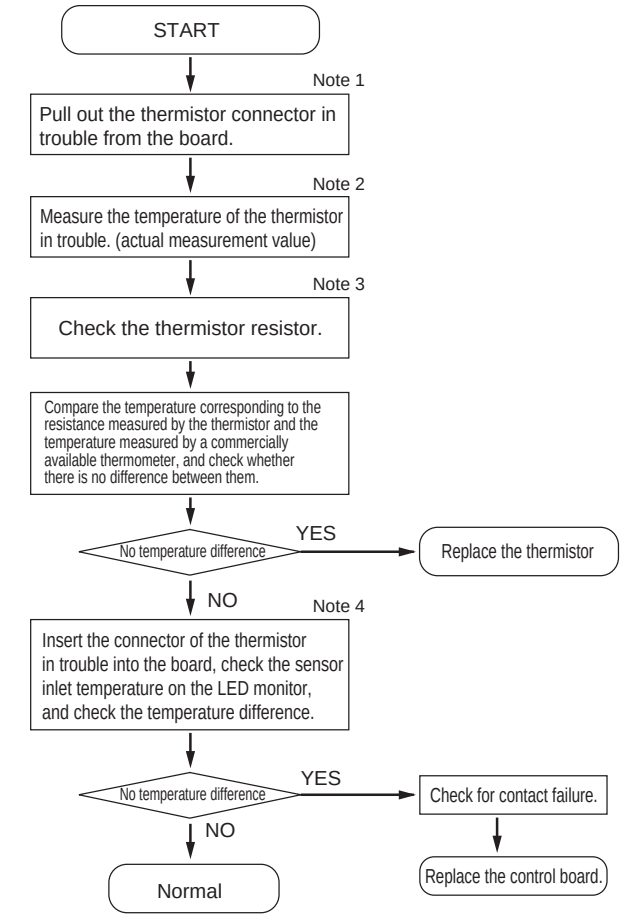
| | Measurement data | Symbol | SW1 setting value |
|---|---|---|---|
| | Outdoor high pressure | 63HS |  |
| | Outdoor low pressure | 63LS |  |
| | BC controller pressure (liquid side) | P1 |  |
| | BC controller pressure (intermediate part) | P3 |  |

Note3 Check whether CNP1 (liquid side) connector on the BC controller control board and the connector CNP2 (intermediate part) are not disconnected or not loose.

Note4 Check the pressure value on the self-diagnosis switch (same as note1) with the connector of the applied pressure sensor is disconnected from the board.

## 2. Temperature sensor

Troubleshooting instructions for thermistor

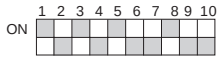
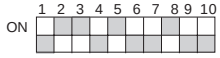
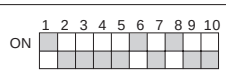
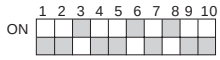
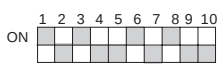


Note1 For the connectors on the board, TH11 and TH12 are connected to CN10, and TH15 and TH16 are connected to CN11. Disconnect the connector in trouble, and check the sensor of each number.

Note 2, 3

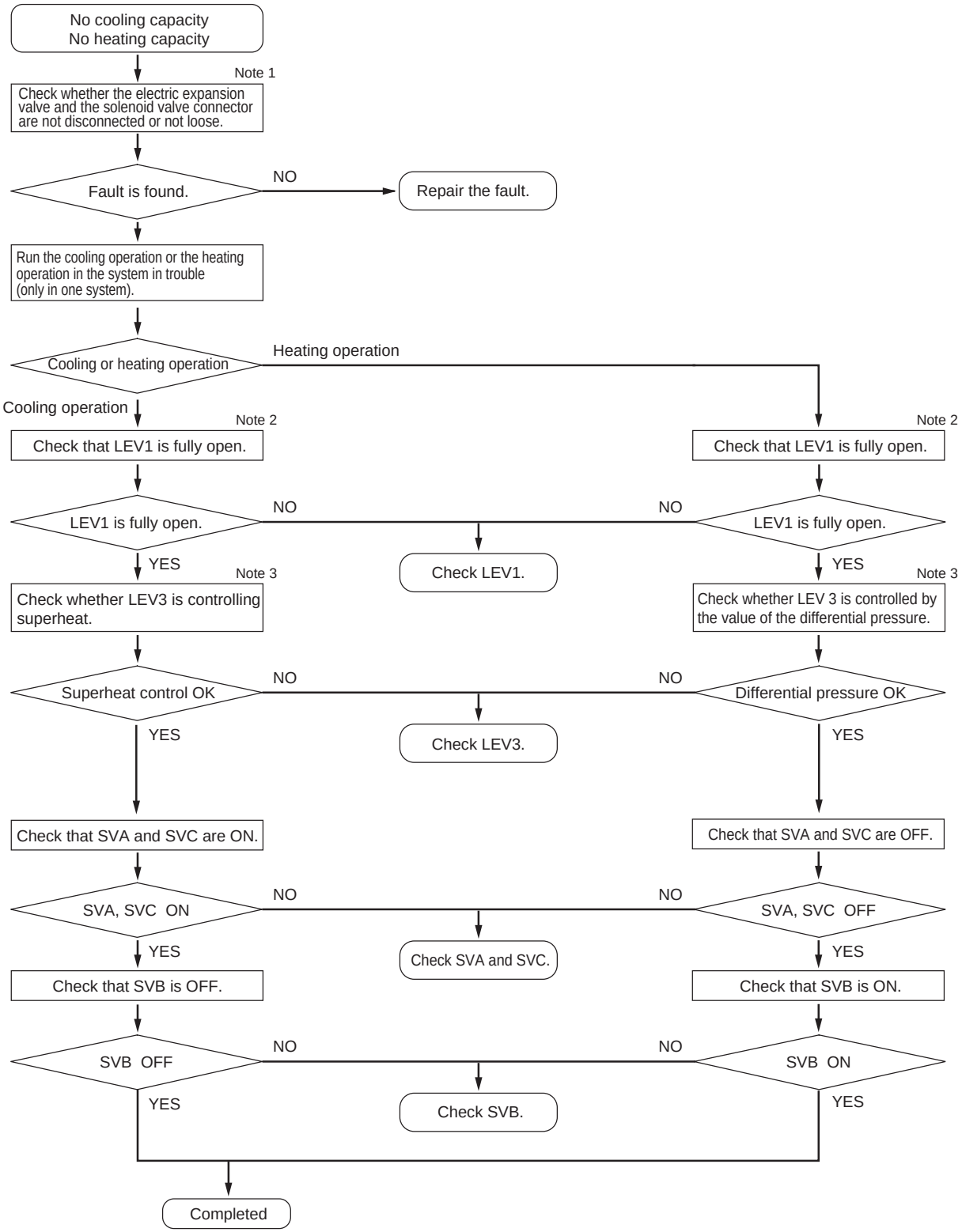
1) Pull out the sensor connector from the I/O board
   Do not pull the sensor by holding the lead wire.
2) Measure the resistance with such as a tester.
3) Compare the measured value with that of shown in the figure below. When the result is +-10%, it is normal.

Note4 Check the self-diagnosis switch (Outdoor control board SW1).

| | Measurement data | Symbol | SW1 setting value |
|---|---|---|---|
| NU-G・GA (Standard / main) | Liquid inlet temperature | TH11 |  |
| | Bypass outlet temperature | TH12 |  |
| | Bypass inlet temperature | TH15 |  |
| | Bypass inlet temperature | TH16 |  |
| NU-GB (Sub 1) | Bypass outlet temperature | TH22 |  |
| | Bypass inlet temperature | TH25 |  |
| NU-GB (Sub 2) | Bypass outlet temperature | TH22 |  |
| | Bypass inlet temperature | TH25 |  |

### 3. Troubleshooting flow chart for LEV Solenoid valve

#### (1) LEV



Note1 BC controller: Phenomena when LEV is connected wrongly (reverse connection of LEV1 and LEV3) to the board.

| Phenomena | | | |
|---|---|---|---|
| Cooling-only | Cooling-main | Heating only | Heating main |
| Non-cooling<br>SH12 small, SC11 small<br>SH16 small, branch pipe SC small<br>BC controller sound | Non-cooling and non-heating<br>SH12 small, SC11 small<br>SH16 large, but branch pipe SC small<br>BC controller sound △PHM large | Indoor heating SC small<br>△ PHM large | Non-cooling<br>Indoor heating SC small<br>△ PHM large |

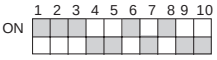
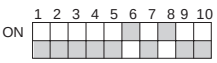
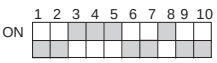
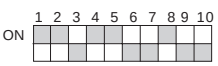
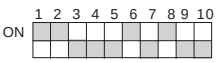
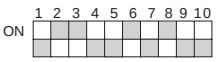
Note2 Check method of fully open state or fully closed state of LEV

1) Check LEV opening (pulse) on the self-diagnosis LED (Outdoor control board SW1).
   Full open: 2000 pulses
   Fully closed: 110 pulses (In the case of heating-only mode, however, the pulse may become 110 or more.)
2) When LEV is fully open, measure the temperature at the upstream and downstream pipes of LEV, and make sure that there is no temperature difference.
3) When LEV is fully closed, check that there is no refrigerant flowing sound.

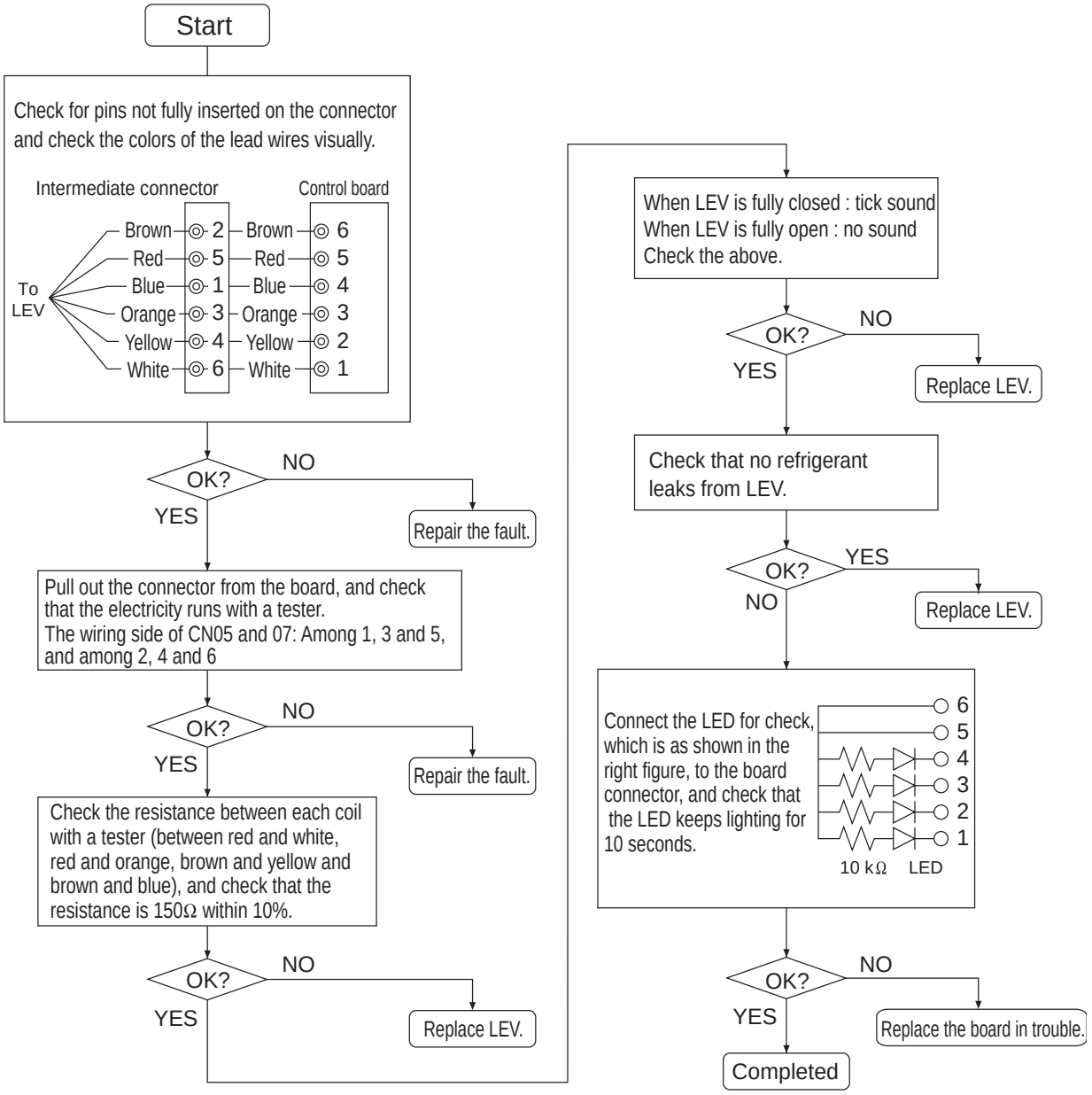
Note3 Refer to the chart below to judge LEV opening controlled by the values of the differential pressure and of the superheat. (BC controller LEV basic operation characteristic)

| | Part | Malfunction mode | Operation mode | Content | Standards of judgment on unit stable operation |
|---|---|---|---|---|---|
| NU-G,GA (Main) | LEV1 | Inclined to close | Heating only<br>Heating-main<br>Cooling-main | Difference between high pressure (P1) and intermediate pressure (P3) is large. | 0.3 - 0.4MPa<br>[44 - 58psi] |
| | | Inclined to open | | Difference between high pressure (P1) and intermediate pressure (P3) is small. | |
| | LEV3 | Inclined to close | Cooling-only<br>Cooling-main | SH12 is large. | SH12 < 20K [36°F] |
| | | | Heating only<br>Heating-main | Difference between high pressure (P1) and intermediate pressure (P3) is small. | 0.3 - 0.4MPa<br>[44 - 58psi] |
| | | Inclined to open | Cooling-only<br>Cooling-main | SC16 and SH12 are small. | SC16 > 3K [5°F]<br>SH12 > 3K [5°F] |
| | | | Heating only<br>Heating-main | Difference between high pressure (P1) and intermediate pressure (P3) is large. | 0.3 - 0.4MPa<br>[44 - 58psi] |
| NU-GB (Sub) | LEV3a | Inclined to close | Cooling-only<br>Cooling-main | SH22 is large. | SH22 < 20K [36°F] |
| | | Inclined to open | Cooling-only<br>Cooling-main | SH22 is small. | SH22 > 3K [5°F] |

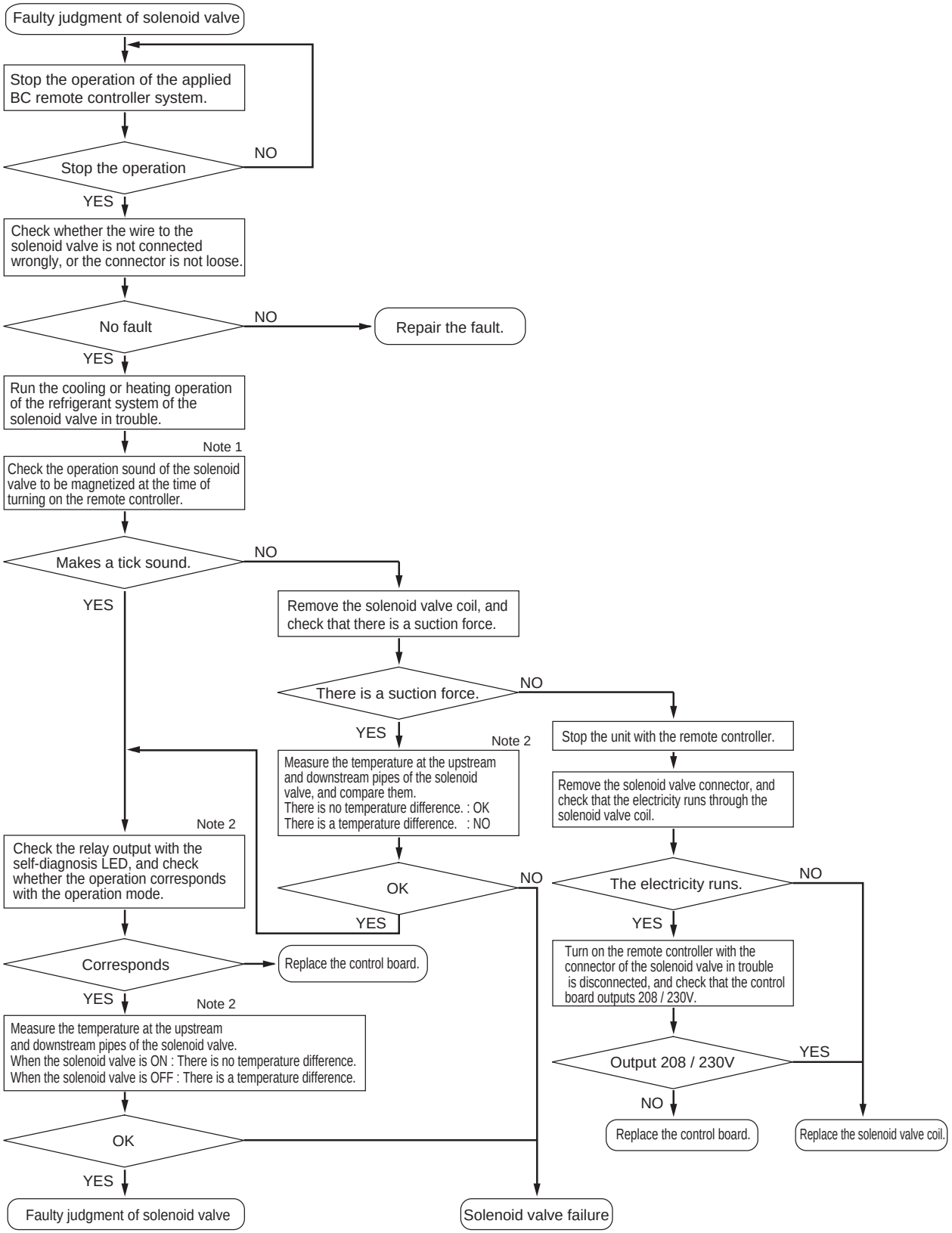
**Self-diagnosis LED**

| | Measurement data | Symbol | SW1 setting value |
|---|---|---|---|
| NU-G・GA (Standard / main) | LEV1 opening | — |  |
| | LEV2 opening | — |  |
| | LEV3 opening | — |  |
| | BC controller bypass outlet superheat | SH12 |  |
| | BC controller intermediate part subcool | SC16 |  |
| | BC controller liquid-side subcool | SC11 |  |
| NU-GB (Sub 1) | LEV3a opening | — |  |
| NU-GB (Sub 2) | LEV3a opening | — |  |

**Troubleshooting flow chart for solenoid Troubleshooting flow chart for solenoid valve body**



**(2) Solenoid valve (SVA, SVB, SVC)**



Check whether the BC board output signal corresponds with the solenoid valve operation correspond.

Note1 SVA, SVB, SVC

SVA, SVB, and SVC turn on or off according to the indoor unit operation mode.

| | | Mode | | | | |
|---|---|---|---|---|---|---|
| | | Cooling | Heating | Stopped | Defrost | Fan |
| Port | SVA | ON | OFF | OFF | OFF | OFF |
| | SVB | OFF | ON | OFF | OFF | OFF |
| | SVC | ON | OFF | OFF | OFF | ON |

SVM,SVM2

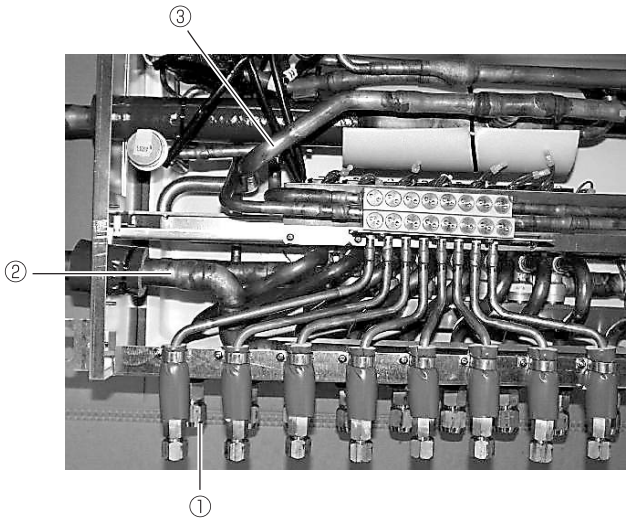
SVM1 and SVM2 turn on or off according to the operation mode.

| Operation mode | Cooling only | Cooling main | Heating only | Heating main | Defrost | Stopped |
|---|---|---|---|---|---|---|
| SVM1 | ON | Pressure differential control OFF or ON | OFF | OFF | ON | OFF |
| SVM2 | OFF | OFF | Pressure differential control OFF or ON | Pressure differential control OFF or ON | OFF | OFF |

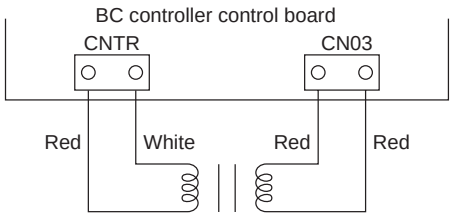
Note2 SVA, SVB, SVC

Measure the temperature at the upstream and downstream pipes ① and ② of SVA.

Measure the temperature at the upstream and downstream pipes ① and ③ of SVA.




## 4. BC controller transformer




| | Normal | Abnormal |
|---|---|---|
| CNTR(1) - (3) | about 58 ohm. | Open-phase or shorting |
| CN03(1) - (3) | about 16 ohm. | |

*Before measuring the resistance, pull out the connector.

## -8- Inverter

- ♦Replace only the compressor if only the compressor is found to be defective. Overcurrent will flow through the inverter if the compressor is damaged, however, the power supply is automatically cut when overcurrent is detected, protecting the inverter from damage.
- ♦Replace only the fan motor if only the fan motor is found to be defective. (Overcurrent will flow through the inverter if the fan motor is damaged, however, the power supply is automatically cut when overcurrrent is detected, protecting the inverter from damage.)
- ♦Replace the defective components if the inverter is found to be defective.
- ♦If both the compressor and the inverter are found to be defective, replace the defective component(s) of both devices.

(1) Inverter related problems and countermeasures

| | Error display/failure condition | Measure/inspection item |
|---|---|---|
| [1] | Inverter related errors<br>4250, 4255, 4220, 4225, 4230, 4235, 4240, 4245, 4260, 4265, 5301, 0403, 5110 | Check the details of the inverter error in the error log at 10.[1] Table of LED codes.<br>Take appropriate measures to the error code and the error details in accordance with 9. [3] Self-diagnosis on the basis of Error Display on Remote Controller and Remedy for Error. |
| [2] | Main power breaker trip | <1> Check the breaker capacity. |
| | | <2> Check whether the electrical system is short-circuited or ground-faulted. |
| | | <3> If items cause is not <1>or <2> are not the causes of the problem, see (3)-[1]. |
| [3] | Main power earth leakage breaker trip | <1> Check the earth leakage breaker capacity and the sensitivity current. |
| | | <2> Meg failure for electrical system other than the inverter |
| | | <3> If the cause is not <1>or <2>, see (3)-[1] |
| [4] | Only the compressor does not operate. | Check the inverter frequency on the LED monitor and proceed to (2) -[3] if the compressor is in operation. |
| [5] | The compressor vibrates violently at all times or makes an abnormal sound. | See (2)-[3]. |
| [6] | Only the fan motor does not operate. | Check the inverter frequency on the LED monitor and proceed to (2)-[6], [7] if the fan motor is in operation. |
| [7] | The fan motor shakes violently at all times or makes an abnormal sound. | Check the inverter frequency on the LED monitor and proceed to (2)-[6], [7] if the fan motor is in operation. |
| [8] | Noise is picked up by the peripheral device | <1> Check that power supply wiring of the peripheral device does not run close to the power supply wiring of the outdoor unit. |
| | | <2> Check that the inverter output wiring is not in close contact with the power supply wiring and the transmission lines. |
| | | <3> Check that the shielded wire is used as the transmission line when it is required, and check that the grounding work is performed properly on the shielded wire. |
| | | <4> Meg failure for electrical system other than the inverter |
| | | <5> Attach a ferrite core to the inverter output wiring. (Contact the factory for details of the service part settings.) |
| | | <6> Provide separate power supply to the air conditioner and other electric appliances. |
| | | <7> *If the error occurred suddenly, a ground fault of the inverter output can be considered. See (2)-[3]. |
| | | *Contact the factory for cases other than those listed above. |
| [9] | Sudden malfunction (as a result of external noise.) | <1> Check that the grounding work is performed properly. |
| | | <2>Check that the shielded wire is used as the transmission line when it is required, and check that the grounding work is performed properly on the shielded wire. |
| | | <3>Check that neither the transmission line nor the external connection wiring does not run close to another power supply system or does not run through the same conduit pipe. |
| | | * Contact the factory for cases other than those listed above. |

Note:
1. Due to a large capacity electrolytic capacitor used in the inverter, voltage still flows through even after the unit is turned off, which may cause electric shock.As a result, wait for a sufficient length of time (5~10 minutes) after the main power is turned off, and check the voltage drop at both terminals of the electrolytic condensers.
2. The components of the inverter such as IPM will be damaged if the screws for inverter wiring are not tightened tightly or the connectors are not properly inserted.When an error occurs after the components are replaced, the wrong wiring is the cause in most cases. Check that the wiring is correct, the screws are not loosely tightened, and the connectors and Faston are not loosely inserted.
3. Do not remove or insert inverter connectors with the main power supply on, as this will result in damage to the PCB.
4. The electric current sensor will be damaged if current flows without the control board being connected.Always insert connectors into the corresponding PCB when running the inverter.

(2) Inverter output related troubles

| | Items to be checked | Phenomena | Remedy |
|---|---|---|---|
| [1]<br>Check the compressor INV board error detection circuit. | Perform the following:<br>Remove the connector (CNDR2) on the compressor INV board.<br>Operate the outdoor unit after above steps.<br>Check the error status.<br>(The compressor does not run because CNDR2, which outputs the IPM drive signal, has been disconnected.) | 1) IPM/overcurrent breaker trip<br>(4250 Detail code No. 101, 102, 103, 104, 105, 106, and 107) | Replace the compressor INV board. |
| | | 2) Logic error<br>(4250 Detail code No. 111) | Replace the compressor INV board. |
| | | 3) ACCT sensor circuit failure<br>(5301 Detail code No.115) | Check the resistance of the current sensor ACCT referring to 9.[4].8.(4) "Current Sensor ACCT", and replace the sensor when abnormal.<br>Replace the compressor INV board if the ACCT is normal. |
| | | 4) DCCT sensor circuit failure<br>(5301 Detail code No.116) | Replace the DCCT sensor.<br>After replacing the DCCT, operate the outdoor unit again.In the case when the error occurs again, replace the compressor INV board.<br>(The DCCT may be normal.) |
| | | 5) IMP open (530 Detail code No.119) | Normal |
| [2]<br>Check for compressor ground fault or coil error. | Disconnect the compressor wiring, and check the compressor Meg, and coil resistance. | 1) Compressor Meg failure<br>Error if less than 1 Mohm.<br>When no liquid refrigerant in the compressor<br>2) Compressor coil resistance failure<br>Coil resistance value of 0.16 ohm (20°C [68°F) | Replace the compressor<br>Check that no liquid refrigerant in the compressor. |

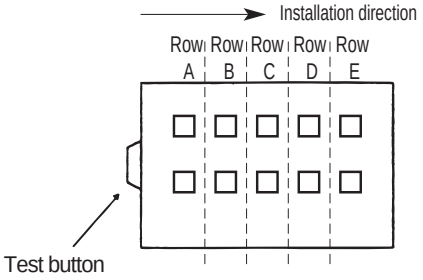
| | Items to be checked | Phenomena | Remedy |
|---|---|---|---|
| [3]<br>Check whether the inverter is damaged.<br>*Perform this check if an error occurs immediately before or after turning on the compressor. | Perform the following:<br>(1) Reconnect the connector that was removed in section [1].<br>(2) Disconnect the compressor wiring.<br>(3) Turn on SW1-1 on the compressor INV board.<br>Operate the outdoor unit after above steps.Check the inverter output voltage.<br>*It is recommended to use the tester used in the 9.[4] -5-(5) IPM troubleshooting when checking the inverter output voltage.<br>Measure voltage when the compressor inverter output frequency is stable. | 1) IPM/overcurrent breaker trip<br>(4250 Detail code No. 101, 102, 103, 104, 105, 106, and 107) | Refer to item [5] for inverter circuit trouble. |
| | | 2) The voltage imbalance across all wiring<br>There is a high possibility of an inverter circuit error if the voltage imbalance across all wiring is greater than the larger of the values represented by 5% or 5V. | |
| | | 3) No voltage imbalance across all wiring | See item [2].<br>Proceed to item [5], however if there is no problem in section [2].<br>Replace the compressor if there is no problem in section [5]. |
| [4]<br>Check whether the inverter is damaged.Perform this check if an error occurs during operation. | Turn on the outdoor unit.<br>Check the inverter output voltage.<br>*It is recommended to use the tester used in the 9.[4] -5- (5) IPM troubleshooting when checking the inverter output voltage.<br>*Measure voltage when the compressor inverter output frequency is stable. | 1) The voltage imbalance across all wiring<br>There is a high possibility of an inverter circuit error if the voltage imbalance across all wiring is greater than the larger of the values represented by 5% or 5V. | Refer to item [5] for inverter circuit trouble. |
| | | 2) No voltage imbalance across all wiring | See item [2].<br>Proceed to item [5], however if there is no problem in section [2].<br>Replace the compressor if there is no problem in section [5]. |

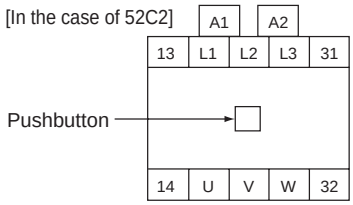
| | Items to be checked | Phenomena | Remedy |
|---|---|---|---|
| [5] Check the inverter circuit trouble. | Check whether the IPM screw terminal is not loose. | 1) Terminal screws are loose. | Check for loose IPM terminal screws and tighten them. |
| | Check the exterior of the IPM. | 2) IPM is cracked due to swelling. | Replace the IPM. Check the operation in [3] or [4] after replacing the IPM.<br>In the case of an output voltage imbalance or error reoccurrence: Replace the G/A board.<br>In the case of an output voltage imbalance or error reoccurrence after replacement:<br>Replace the INV board. |
| | Check the resistances between each terminal of IPM.<br>Refer to 9.[4].5.(5) for details on IPM troubleshooting. | 3) Check the resistances between each terminal of IPM. | Replace the IPM.Check the operation in [3] or [4] after replacing the IPM.<br>In the case of an output voltage imbalance or error reoccurrence: Replace the G/A board.In the case of an output voltage imbalance or error reoccurrence after replacement:<br>Replace the INV board. |
| | | 4) All normal for items 1) - 3) above. | Replace the IPM.<br>In the case of an output voltage imbalance or error reoccurrence:<br>Replace the G/A board.In the case of an output voltage imbalance or error reoccurrence after replacement:<br>Replace the INV board. |
| [6] Check the fan motor ground fault or the winding. | Remove the wire for the outdoor fan motor, and check the fan motor megger and the winding resistance. | 1) Fan motor megger failure<br>Failure when the megger is 1Mohm or less. | Replace the fan motor. |
| | | 2) Fan motor disconnection<br>Standard:<br>The winding resistance is approximately several ohm.It varies depending on the temperature, or while the inner thermo is operating, it will be ∞ ohm | |
| [7] Check the FAN INV board failure. | (1) Check the fan output wiring. | Connector contact failure<br>♦Board side (CNINV)<br>♦Fan motor side | Connect the connector. |
| | (2) Check the connector CN-VDC connection. | Connector contact failure | Connect the connector. |
| | (3) Check the FAN INV board failure. | 1) The voltage imbalance among each motor wiring during operation<br>The voltage imbalance is greater than the larger of the values represented by 5% or 5 V. | Replace the FAN INV board. |
| | | 2) The same error occurs even after the operation is restarted. | |
| | (4) Check the transformer on the FAN INV board. | The same error occurs even if the board is replaced as described in (3) | Replace the power-supply transformer on the FAN INV board. |

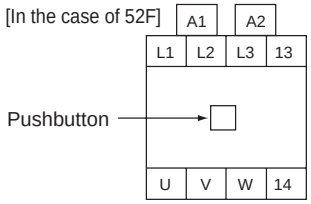
(3) Trouble treatment when the main power breaker is tripped.

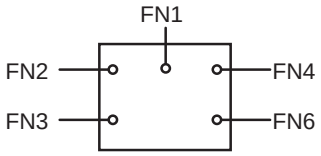
| | Items to be checked | Phenomena | Remedy |
|---|---|---|---|
| [1] | Perform Meg check between the terminals on the power terminal block TB1. | Zero to several ohm, or Meg failure | Check each part in the main inverter circuit.<br>*Refer to "Simple checking Procedures for individual components of main inverter circuit".<br>♦Diode stack<br>♦IPM<br>♦Rush current protection resistor<br>♦Electromagnetic relay<br>♦DC reactor<br>♦Noise filter (large current relay) |
| [2] | Turn on the power again and check again. | 1) Main power breaker trip | |
| | | 2) No remote control display | |
| [3] | Turn on the outdoor unit and check that it operates normally. | 1) Operates normally without tripping the main breaker. | a) The wiring may have been short-circuited. Search for the wire that short-circuited, and repair it.<br>b) If item a) above is not the cause of the problem, the compressor may have a problem. |
| | | 2) Main power breaker trip | A compressor ground fault can be considered. Go to (2)-[2]. |

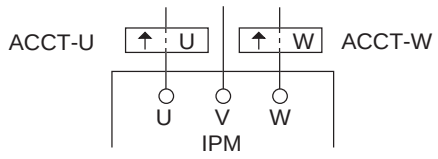
(4) Simple checking procedure for individual components of main inverter circuit
Before checking, turn the power off and remove the parts to be checked from the control box.

<table>
<tr><th>Part name</th><th>Judgment method</th></tr>
<tr><td>Diode stack</td><td>Refer to "Diode stack" ( 9.[4].5.(6) )</td></tr>
<tr><td>IPM (Intelligent power module)</td><td>Refer to "Intelligent power module (IPM)" ( 9.[4] -5- (5) )</td></tr>
<tr><td>Rush current protection resistor<br>R1</td><td>Measure the resistance between terminals: 22 ohm +- 10%</td></tr>
<tr><td>Electromagnetic relay<br>52C1</td><td>Measure resistance between terminals on each row.<br> 

<table>
<tr><th>Check point</th><th>Judgment value</th></tr>
<tr><td>Row A</td><td>Short circuit is not allowed.</td></tr>
<tr><td>Row B to Row E</td><td>∞</td></tr>
</table>
* The coil is driven when AC 208 / 230V is applied. Note that the coil is not driven at DC 12V, which is different from the conventional relays.<br>The resistance of row A cannot be measured with a tester. Check that it is not short-circuited.</td></tr>
<tr><td>Electromagnetic contactor<br>52C2, 52F</td><td>[In the case of 52C2]<br> 

[In the case of 52F]<br> 

<table>
<tr><th colspan="2">Check point</th><th>Judgment value</th></tr>
<tr><td colspan="2">A1-A2</td><td>0.1 k ~ 2.0 kΩ</td></tr>
<tr><td rowspan="5">Button on (hold down)</td><td>L1 - U</td><td>1Ω or less (almost 0Ω)</td></tr>
<tr><td>L2 - V</td><td>1Ω or less (almost 0Ω)</td></tr>
<tr><td>L3 - W</td><td>1Ω or less (almost 0Ω)</td></tr>
<tr><td>13 - 14</td><td>1Ω or less (almost 0Ω)</td></tr>
<tr><td>31 - 32</td><td>∞</td></tr>
<tr><td rowspan="5">Button OFF</td><td>L1 - U</td><td>∞</td></tr>
<tr><td>L2 - V</td><td>∞</td></tr>
<tr><td>L3 - W</td><td>∞</td></tr>
<tr><td>13 - 14</td><td>∞</td></tr>
<tr><td>31 - 32</td><td>1Ω or less (almost 0Ω)</td></tr>
</table></td></tr>
<tr><td>DC reactor DCL</td><td>Measure the resistance between terminals: 1ohm or lower (almost 0 ohm)<br>Measure the resistance between terminals and the chassis: ∞</td></tr>
<tr><td>Noise filter</td><td>Resistance check between each terminal and between terminal and case.<br> 

<table>
<tr><th>Check point</th><th>Judgment value</th></tr>
<tr><td>FN 3 - 6 , FN 2 - 4</td><td>1Ω or less (almost 0Ω)</td></tr>
<tr><td>FN 1 - 2 , FN 2 - 3 , FN 4 - 6</td><td>∞</td></tr>
<tr><td>FN1 , FN2 , FN3 , FN 4, FN6</td><td>∞</td></tr>
</table></td></tr>
<tr><td>Current sensor ACCT</td><td>Disconnect the CNCT2 connector and measure the resistance between terminals: 280 ohm +- 30 ohm<br>1 - 2 PIN (U-phase),3 - 4 PIN (W-phase)<br> 

* Check the ACCT connection phase and the direction of the connection.</td></tr>
</table>

(5) Intelligent power module (IPM)

Measure resistances between each pair of terminals on the IPM with a tester, and use the results for troubleshooting.

**Notes on measurement**

- Check the polarity before measuring. (On the tester, black normally indicates plus.)
- Check that the resistance is not open (∞ ohm) or not shorted (to 0 ohm).
- The values are for reference, and the margin of errors is allowed.
- The result that is more than double or half of the result that is measured at the same measurement point is not allowed.

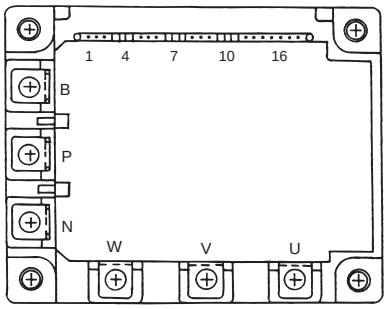
**Tester restriction**

- Use the tester whose internal electrical power source is 1.5V or greater
- Use the dry-battery-powered tester.
  (*The accurate diode-specific resistance cannot be measured with the button-battery-powered card tester, as the applied voltage is low.)
- Use a low-range tester if possible. A more accurate resistance can be measured.

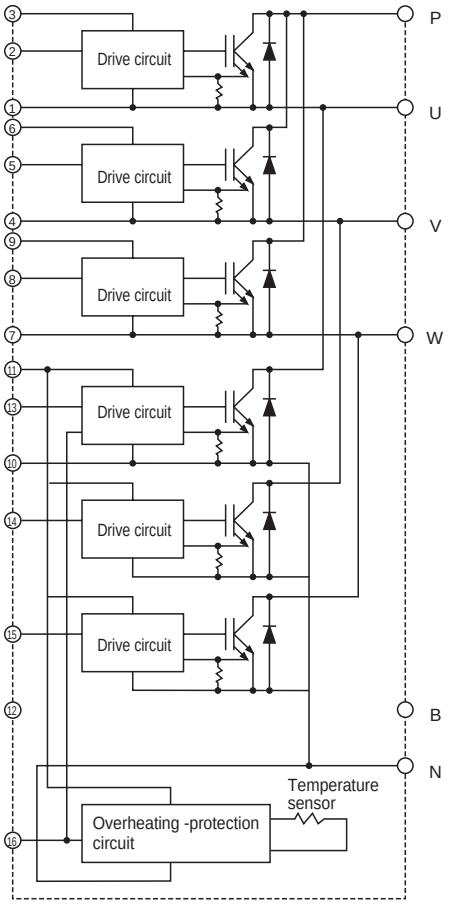
Judgment value (reference)

| | | Black ( + ) | | | | |
|---|---|---|---|---|---|---|
| | | P | N | U | V | W |
| Red (-) | P | - | - | 5 - 200 ohm | 5 - 200 ohm | 5 - 200 ohm |
| | N | - | - | ∞ | ∞ | ∞ |
| | U | ∞ | 5 - 200 ohm | - | - | - |
| | V | ∞ | 5 - 200 ohm | - | - | - |
| | W | ∞ | 5 - 200 ohm | - | - | - |

External view




Internal circuit diagram



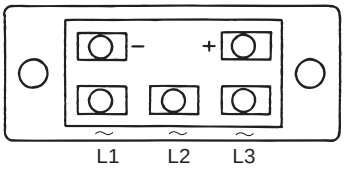
(6) Diode stack

Measure resistances between each pair of terminals on the diode stack with a tester, and use the results for troubleshooting.Refer to (5) " Intelligent power module (IPM) " for notes on measurement and tester selection.

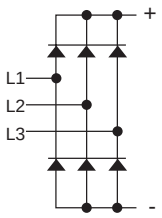
Judgment value (reference)

| | | Black ( + ) | | | | |
|---|---|---|---|---|---|---|
| | | + (P) | - (N) | to (L1) | to (L2) | to (L3) |
| Red (-) | + (P) | - | - | 5 - 200 ohm | 5 - 200 ohm | 5 - 200 ohm[1] |
| | - (N) | - | - | ∞ | ∞ | ∞ |
| | to (L1) | ∞ | 5 - 200 ohm | - | - | - |
| | to (L2) | ∞ | 5 - 200 ohm | - | - | - |
| | to (L3) | ∞ | 5 - 200 ohm | - | - | - |

External view




Internal circuit diagram




(7) Caution at replacement of inverter parts

1) Check for miswiring and loose connections.

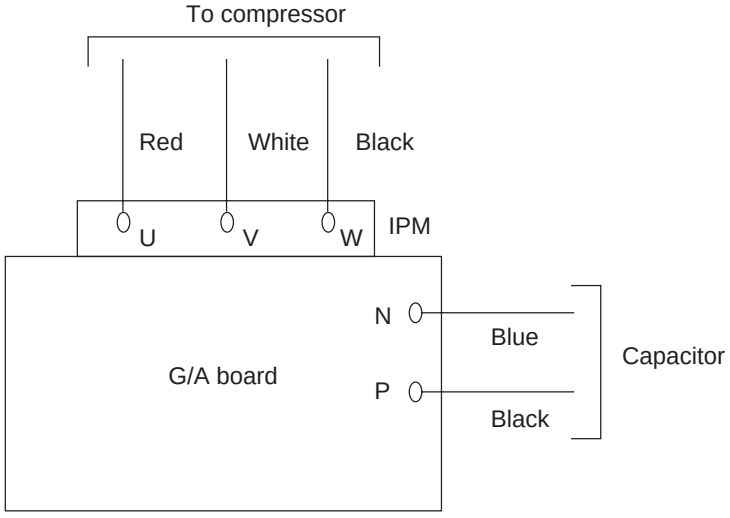
Incorrect or loose wiring of such circuit components as IPM and diode stack may cause the IPM damage. Thoroughly check the wiring. Retighten all screws upon completion of all other work.

Connect the IPM control terminal carefully to the G/A board, as the terminal is very small.If the output wire from the IPM to the compressor is connected incorrectly, the compressor will be damaged. Perform wiring carefully in order of color shown in the wiring diagram below.

2) Coat the radiation surface of the IPM and diode stack evenly with the grease that is provided with the service parts.

Apply a thin layer of grease to the entire surface of the back of the IPM and diode stack, and screw the module securely into place.

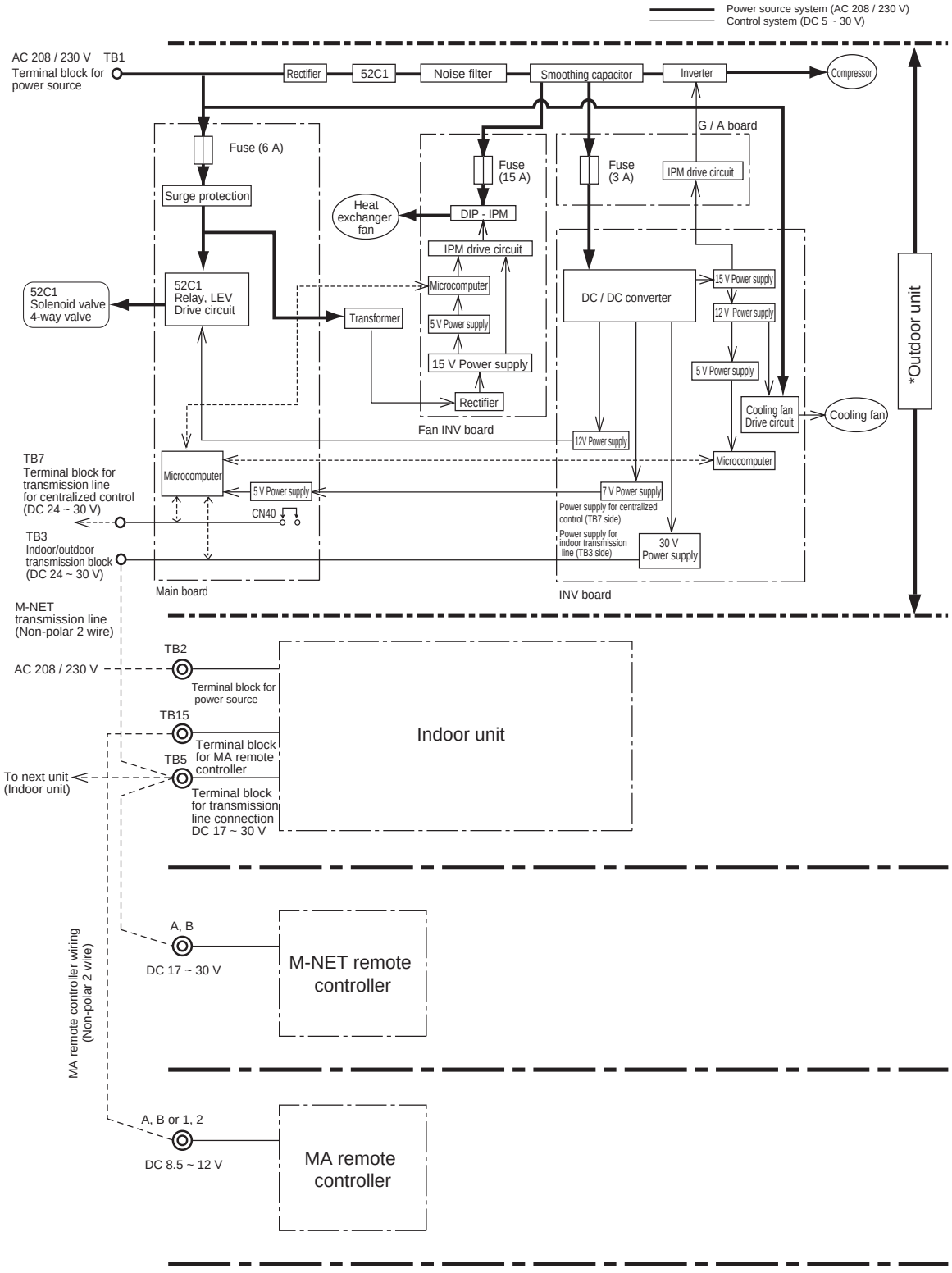
Wipe off any grease that may get on the wiring terminal to avoid terminal contact failure.



## -9- Control Circuit

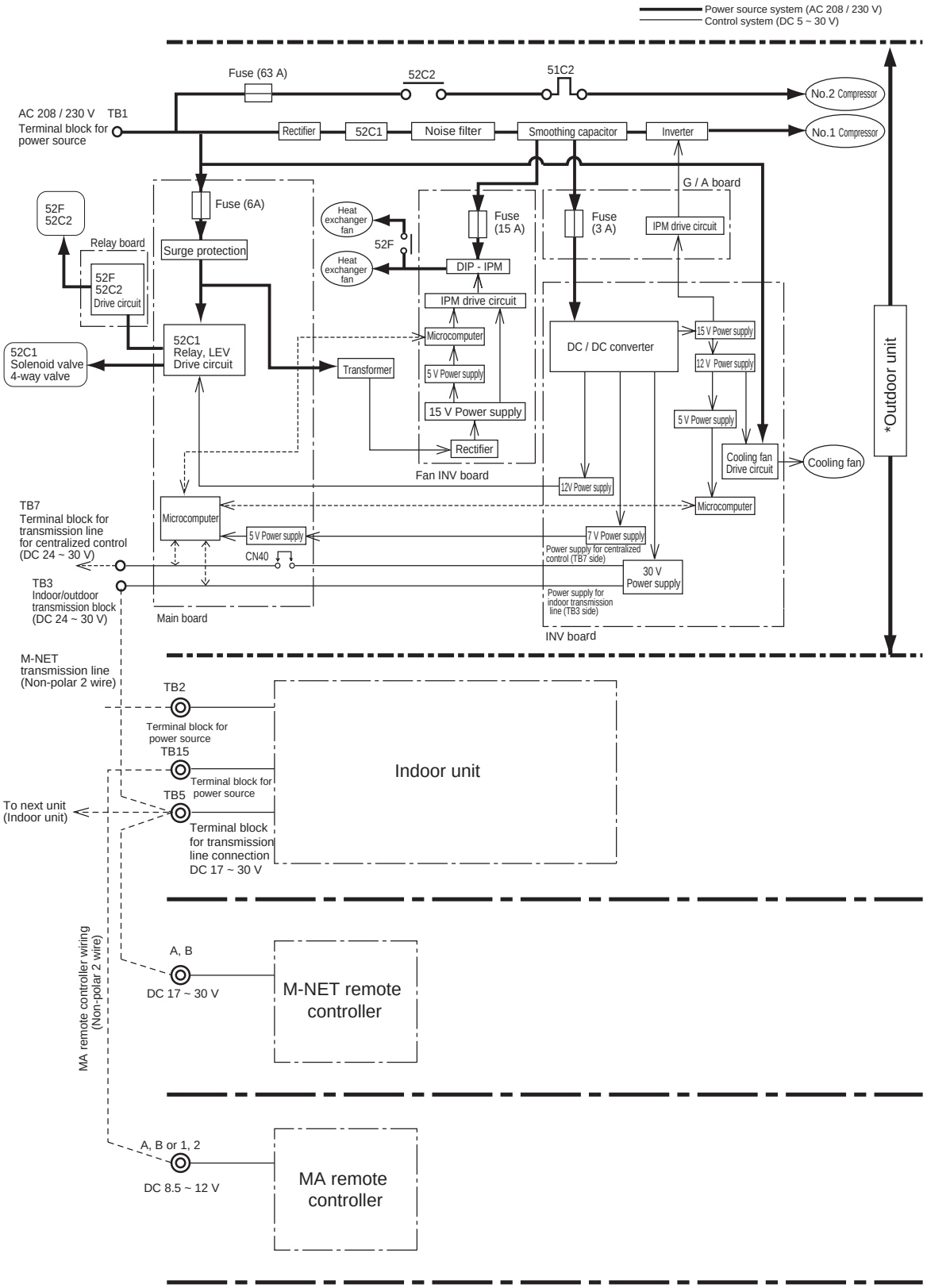
(1) Control power source function block

**P72 - P144 models**



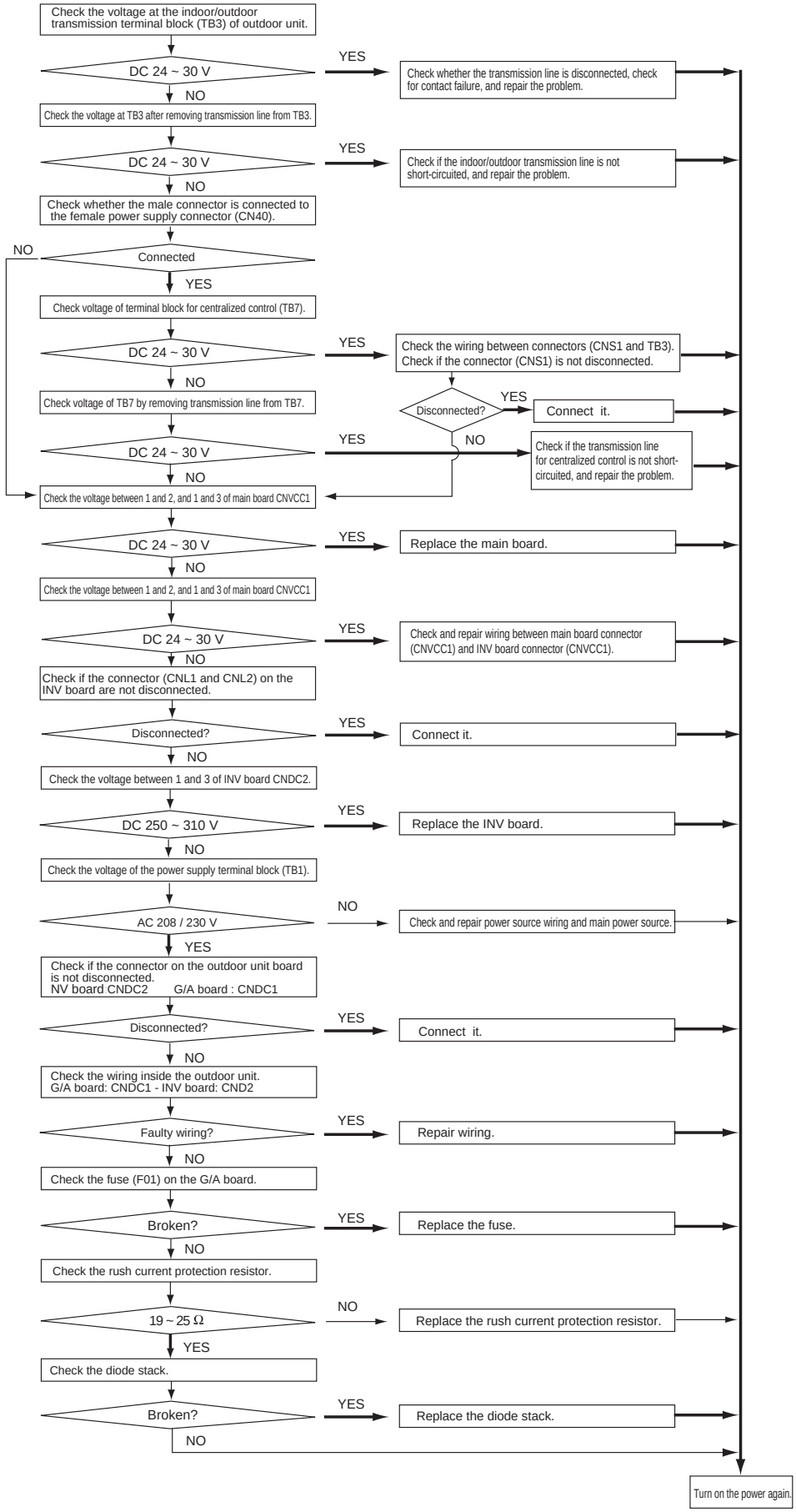

* MA remote controllers and M-NET remote controllers cannot be used together.

**P168 - P234 models**




* MA remote controllers and M-NET remote controllers cannot be used together.

(2) Troubleshooting transmission power circuit of outdoor unit



## [5] Refrigerant Leak

### 1. Leak spot: In the case of extension pipe for indoor unit (Cooling season)

1) Mount a pressure gauge on the service check joint (CJ2) on the low-pressure side.
2) Stop all the indoor units, and close the liquid ball valve (BV2) inside the outdoor unit while the compressor is being stopped.
3) Stop all the indoor units; turn on SW3-6 on the outdoor unit main board while the compressor is being stopped.(Pump down mode will start, and all the indoor units will run in cooling test run mode.)
4) In the pump down mode (SW3-6 is ON), all the indoor units will automatically stop when the low pressure (LPS) reaches 0.382MPa [55psi] or less or 15 minutes have passed after the pump mode started. Stop all the indoor units and compressors when the pressure indicated by the pressure gauge, which is on the check joint (CJ2) for low-pressure service, reaches 0.284MPa [41psi] or 20 minutes pass after the pump down operation is started.
5) Close the gas ball valve (BV1) inside the outdoor unit.
6) Collect the refrigerant that remains in the extended pipe for the indoor unit. Do not discharge refrigerant into the atmosphere when it is collected.
7) Repair the leak.
8) After repairing the leak, vacuum the extension pipe and the indoor unit.
9) To adjust refrigerant amount and to check the composition of refrigerant, open the ball valves (BV1 and BV2) inside the outdoor unit and turn off SW3-6.

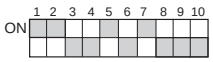
### 2. Leak spot: In the case of outdoor unit (Cooling season)

1) Run all the indoor units in the cooling test run mode.
   (i) To run the indoor unit in test run mode, turn SW3-2 from ON to OFF when SW3-1 on the outdoor MAIN board is ON.
   (ii) Change the setting of the remote controller for all the indoor units to the cooling mode.
   (iii) Check that all the indoor units are performing a cooling operation.

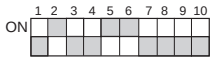
**In case of PUHY series**

2) Check the values of Tc and TH7.
   (To display the values on the LED screen, use the self-diagnosis switch (SW1) on the outdoor unit main board.)
   (i) When Tc-TH7 is 10K [18°F] or more : See the next item 4).
   (ii) When Tc-TH7 is less than 10K [18°F] : After the compressor stops, collect the refrigerant inside the system, repair the leak, perform evacuation, and recharge new refrigerant. (Leak spot: In the case of outdoor unit, handle in the same way as heating season.)

Tc self-diagnosis switch



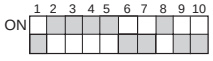

TH7 self-diagnosis switch




**In case of PURY series**

3) Check the values of SC16.
   (To display the values on the LED screen, use the self-diagnosis switch (SW1) on the outdoor unit main board.)
   (i) When SC16 is 10K [18°F] or more : See the next item 4).
   (ii) When SC16 is less than 10K [18°F] : After the compressor stops, collect the refrigerant inside the system, repair the leak, perform evacuation, and recharge new refrigerant. (Leak spot: In the case of outdoor unit, handle in the same way as heating season.)

SC16 self-diagnosis switch




4) Stop all the indoor units, and stop the compressor.
   (i) To stop all the indoor units and the compressors, turn SW3-2 from ON to OFF when SW3-1 on the outdoor MAIN board is ON.
   (ii) Check that all the indoor units are being stopped.
5) Close the ball valves (BV1 and BV2).
6) To prevent the liquid seal, extract small amount of refrigerant from the check joint of the liquid ball valve (BV2), as the liquid seal may cause a malfunction of the unit.
7) Collect the refrigerant that remains inside the outdoor unit.Do not discharge refrigerant into air into the atmosphere when it is collected.
8) Repair the leak.
9) After repairing the leak, replace the dryer with the new one, and perform evacuation inside the outdoor unit.

10) To adjust refrigerant amount, open the ball valves (BV1 and BV2) inside the outdoor unit.
Note : When the power to the outdoor/indoor unit must be turned off to repair the leak after closing the ball valves specified in the item 5, turn the power off in approximately one hour after the outdoor/indoor units stop.
(i) When 30 minutes have passed after the item 4 above, the indoor unit lev turns from fully closed to slightly open to prevent the refrigerant seal.
(ii) Therefore, if the power source is turned off within 30 minutes, the lev remains fully closed and the refrigerant remains sealed.
When only the power for the indoor unit is turned off, the indoor unit LEV turns from faintly open to fully closed.

**3. Leak spot: In the case of extension pipe for indoor unit (Heating season)**

1) Run all the indoor units in heating test run mode.
(i) To run the indoor unit in test run mode, turn SW3-2 from ON to OFF when SW3-1 on the outdoor MAIN board is ON.
(ii) Change the setting of the remote controller for all the indoor units to the heating mode.
(iii) Check that all the indoor units are performing a heating operation.

2) Stop all the indoor units, and stop the compressor.
(i) To stop all the indoor units and the compressors, turn SW3-2 from ON to OFF when SW3-1 on the outdoor MAIN board is ON.
(ii) Check that all the indoor units are stopped.

3) Close the ball valves (BV1 and BV2).
4) Collect the refrigerant that remains inside the outdoor unit. Do not discharge refrigerant into air into the atmosphere when it is collected.
5) Repair the leak.
6) After repairing the leak, perform evacuation of the extension pipe for the indoor unit, and open the ball valves (BV1 and BV2) to adjust refrigerant.

**4. Leak spot: In the case of outdoor unit (Heating season)**

1) Collect the refrigerant in the entire system (outdoor unit, extended pipe and indoor unit).Do not discharge refrigerant into the atmosphere when it is collected.
2) Repair the leak.
3) After repairing the leak, replace the dryer with the new one, and perform evacuation of the entire system, and calculate the standard amount of refrigerant to be added (for outdoor unit, extended pipe and indoor unit), and charge the refrigerant.
Refer to "8 [4] 3. "

## [6] Compressor Replacement Instructions (only P168-P234 types)

Follow the instructions below when replacing the compressor.

When replacing the compressor No.1 (inverter drive), determine if the compressor is malfunctioning or the inverter is malfunctioning.
When only one compressor is malfunctioning, operate the compressor for approximately an hour in emergency operation mode before the replacement, check the items below, and replace the compressor after examining whether the return oil circuit is working properly or not.

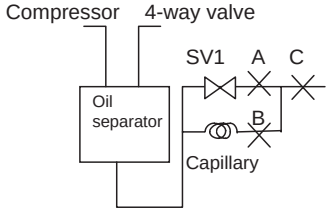
Refer to the diagram on the right for the temperature of each section.

<When normal>

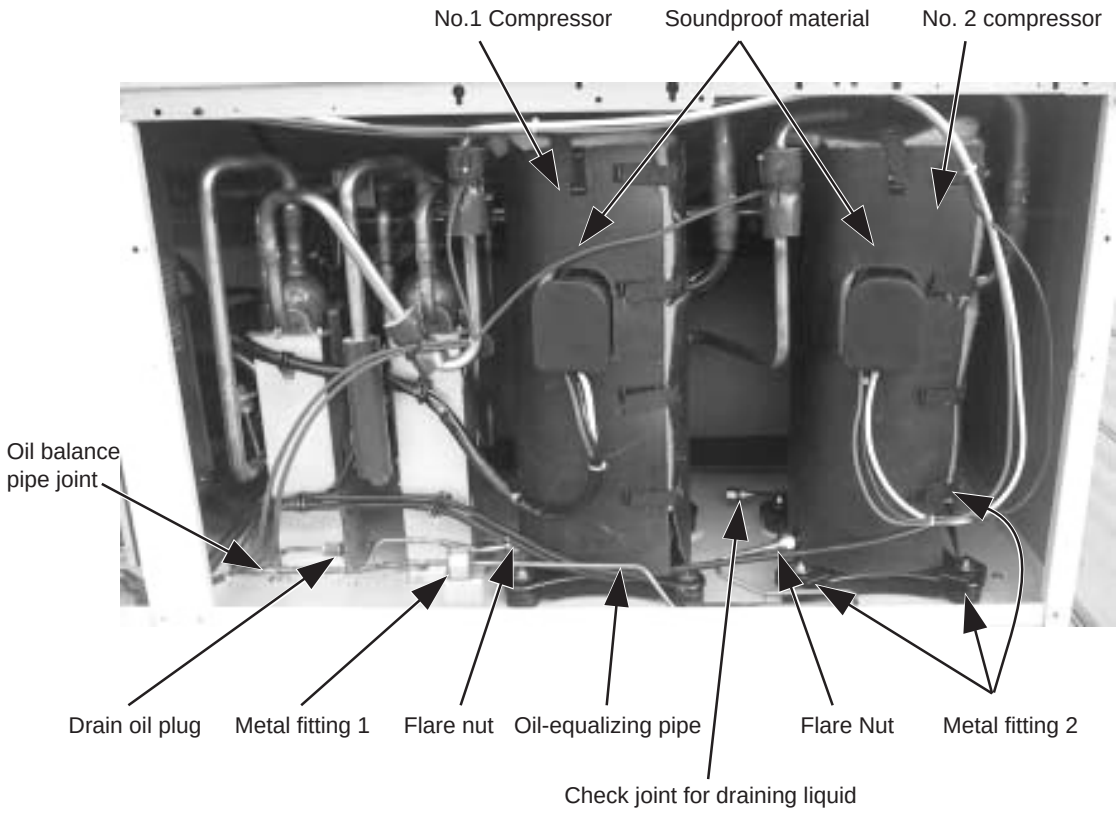
1) Temperature of A = Temperature of C,
and Temperature of A > Outdoor temperature + 10deg°C [18deg°F]
2) Temperature of B = Temperature of C,
and Temperature of B > Outdoor temperature + 10deg°C [18deg°F]

<When abnormal>

**When 1) is abnormal (out of range)**
Return oil failure due to SV1 circuit failure
-> Replace SV1 circuit.
**When 2) is abnormal (out of range)**
Return oil failure due to capillary blockage
-> Replace the capillary



1) Check that the main power is OFF.
   When replacing the compressor due to megger failure and when the megger is 1M ohm or more, megger drop is likely due to the liquified refrigerant entering and accumulating in the compressor. Turn the power off after powering the crankcase heater at least 12 hours, and apply megger again.
2) Remove the fin guard, the front panel and the front partition plate on the right (as you face the front).
3) Collect the refrigerant from the service check joints on both high and low-pressure sides.
   When collecting refrigerant from the accumulator, perform proper work with the reference of refrigerant collecting method from the accumulator.
4) Collect the oil from the drain oil pipe that is located on the oil balance pipe.
   Note:
   - When collecting the oil, prepare an approximately 10-liter container.
   - Keep collecting oil until the oil in the drain oil plug clears up.
   - Keep track of the amount of collected oil, as the same amount of oil will be added.
   - Do not splash oil.Do not leave the refrigerant circuit open for a long time, as the oil rapidly absorbs moisture.
   - The collected oil cannot be reused.
5) After draining oil from the refrigerant and the drain oil plug, remove the metal fitting-1 or the flare nuts (2 places) that connect the compressor and the oil balance pipe, and bend the oil balance pipe so as not to apply an excess force.
6) Close the oil balance pipe attachment point with a cap to prevent the oil from leaking.
7) Remove the compressor terminal cover, and remove the power supply wiring.
8) Remove the discharge temperature thermistor and the sound-proof material that is wrapped around the compressor.
9) Remove the crankcase heater.
10) Heat the brazed part of the discharge pipe and the suction pipe, and remove the pipes.
11) Remove the compressor fixing nuts and the metal fitting-2 (3 places on compressor-2).
12) Replace the compressor with the service compressor.
13) Braze the discharge pipe and the suction pipe.
14) Attach the oil balance pipe to both compressors.Attach the oil balance pipe to both compressors.After replacing the dryer, do not leave the refrigerant circuit open for long time.
    Note:
    When replacing the compressor and when the equal oil pipe is damaged or irreparably deformed, after replacing the compressor, heat the junction of the equal oil pipe, remove the equal oil pipe, and braze the service equal oil pipe.
15) Close the ball valves in the outdoor unit (both on the liquid and the gas side), and pressurize up to 4.15MPa [601si] with nitrogen from the check joints for high and low-pressure service.
16) After confirming the airtightness, release the nitrogen gas.
17) Open the ball valves in the outdoor unit (both on the liquid and the gas side), and perform vacuuming.
18) While vacuuming, add the same amount of oil that is collected from the drain oil plug on the oil balance pipe in the procedure 4).
    Note:
    - The oil to be added must be MEL32 made by Nisseki Mitsubishi.When adding oil, the oil must not absorb moisture, and do not use the oil that is over a year old.
    - Do not draw out the oil in the compressor when returning the compressor to find the cause of compressor malfunction.
19) Attach the crankcase heater.
    Note: Attach the appropriate crankcase heater to the appropriate compressor.
20) Attach the soundproof material to the compressor.
21) Attach the discharge temperature thermistor, and attach the insulation.
22) Attach the power source wire to the terminal on the compressor.
23) After vacuuming, calculate the amount of added refrigerant at factory shipment and the amount of added refrigerant on site, and charge the system.
24) After reconfirming the power source-wiring phase, apply a megger, attach the terminal cover, turn on the main power, and check whether the crankcase heater is powered.
25) Check that the ball valves (both on the liquid and the gas side) are open.
26) Operate all the indoor units, and check whether they run properly.
27) If there is something that needs to be improved in the installation or the usage, explain that to the customers.



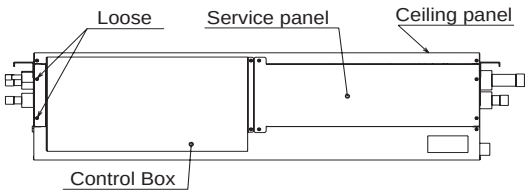

## [7] Collecting the Cooling Liquid from the Accumulator (Only P168-P234 types)

1) Perform evacuation inside the recovery cylinder.
2) Connect the check joint for collecting liquid that is derived from the accumulator and the recovery cylinder with a connection pipe (or hose that has predetermined withstand pressure).
   Note: When the check joint and the connecting pipe (hose) are connected, extremely low-temperature oil may flow out. Use some protective clothing, such as leather gloves.
3) Open the valves of the recovery cylinder while the recovery cylinder is being weighed, and collect the liquid inside the accumulator into the cylinder.
   Note: Allow some capacity when collecting the refrigerant so that the recovery cylinder will not overflow. Use several cylinders when collecting large amount of refrigerant.
4) After collecting the refrigerant, close the valve of the recovery cylinder, and remove the connecting pipe (hose).
   Note: When the check joint and the connecting pipe (hose) are connected, extremely low-temperature oil may flow out. Use some protective equipment, such as leather gloves.
5) Charge 3-liter oil from the check joint on the accumulator during evacuation.

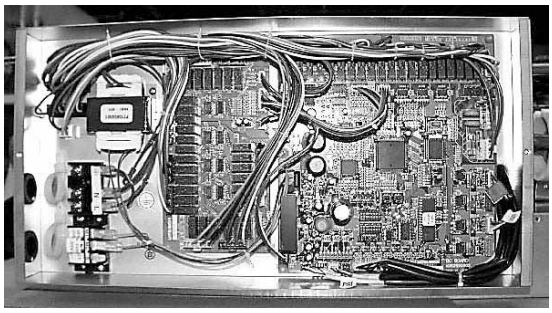
## [8] Servicing the BC controller

(1) Service panel

*Special care must be taken when replacing heavy parts.

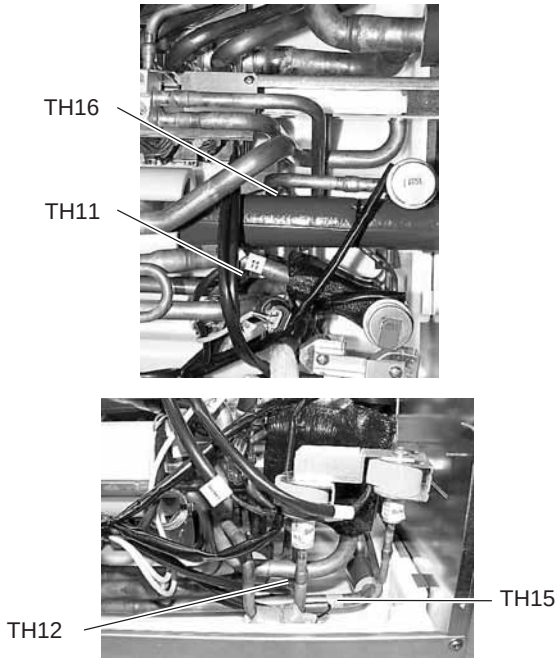
| Work procedure | Explanatory figure |
|---|---|
| 1. Remove 2 lock nuts on the control box, loosen 2 lock nuts, and remove the control box.<br>2. Remove 4 fixing screws on the service panel, and remove the service panel.<br>3. Remove 9 machine screws on the ceiling panel, and remove the ceiling panel. |  |

(2) Control box

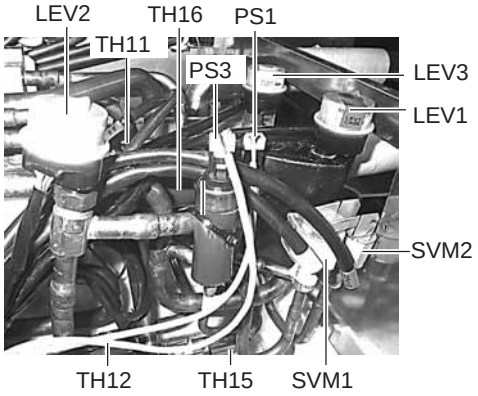
| Work procedure | Explanatory figure |
|---|---|
| 1. To check the inside of the control box, remove 2 lock nuts on the control box cover.<br>(1) Check the terminal connection of the power wire or of the transmission line.<br>(2) Check the transformer.<br>(3) Check the address switch.<br>2. When the control board is replaced, the followings must be noted.<br>(1) Check that the board type is NU-G,NU-GA, or NU-GB.<br>(2) Check that the wire or the connector is not incorrectly connected, not disconnected or not loose.<br>Note:<br>It is not required to remove 2 fixing screws on the control box when checking the inside. |  <br>CMB-1016NU-G, 1016NU-GA |

(3) Thermistor (liquid pipe/gas pipe temperature detection)

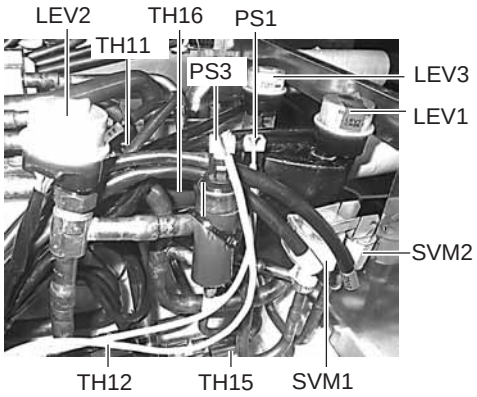
*Special care must be taken when replacing heavy parts.

| Work procedure | Explanatory figure |
|---|---|
| 1. Remove the service panel.<br>(1) For TH11, TH12, and TH15, refer to (1)-1.2.<br>(2) For TH16, refer to (1)-1.2.3.<br>2. Remove the lead wire of the piping sensor from the control board.<br>(1) TH11,TH12 (CN10)<br>(2) TH15,TH16 (CN11)<br>3. Pull out the temperature sensor from the temperature sensor housing, and replace the temperature sensor with the new one.<br>4. Connect the lead wire of the temperature sensor securely on the control board. |  <br>CMB-1016NU-GA |

(4) Pressure sensor

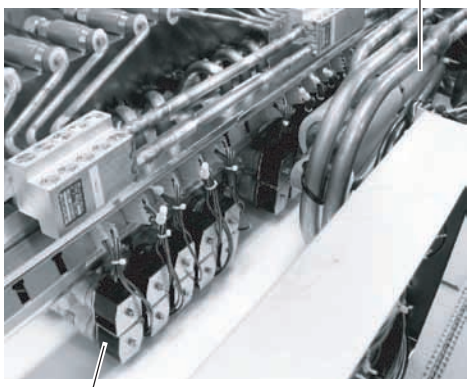
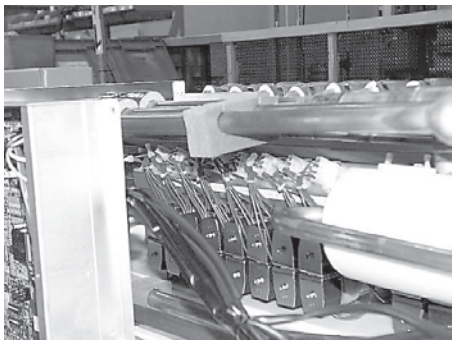
| Work procedure | Explanatory figure |
|---|---|
| 1. Remove the service panel.<br>(1) For the pressure sensors PS1 and PS3, refer to (1)-1.2.<br>2. Remove the pressure sensor connector in trouble from the control board, and insulate the connector.<br>(1) Liquid-side pressure sensor (CNP1)<br>(2) Intermediate-part pressure sensor (CNP3)<br>3. Attach a new pressure sensor to the place which is shown in the figure, and insert the connector to the control board.<br>Note: When gas leaks from the pressure sensor, repair the leak, and follow the instructions above if required. |  <br>*For NU-G-type, there is no SVM2.<br>CMB-1016NU-GA |

(5) LEV

| Work procedure | Explanatory figure |
|---|---|
| 1. Remove the service panel.(Refer to (1)-1.2.3.)<br>2. Replace the LEV in trouble.<br>Note: Secure enough service space in the ceiling for welding operation, and conduct the work carefully.If required, dismount the unit from the ceiling, and conduct the work. |  <br>*For NU-G-type, there is no SVM2.<br>CMB-1016NU-GA |

(6) Solenoid valve

*Special care must be taken when replacing heavy parts.

| Work procedure | Explanatory figure |
|---|---|
| 1. Remove the service panel.(Refer to (1)-1.2.3.)<br>2. Remove the connector of the solenoid valve in trouble.<br>3. Remove the solenoid valve coil.<br>(1) For the solenoid valve coil of SVA, SVB, or SVM1, 2, can be serviced from the inspection door is possible. For SVC, however, remove the rear panel (4 machine screws) to replace the coil if enough service space can be secured at the rear.(Only NU-GA type for SVM 2) | Double-pipe heat exchanger<br>  <br>CMB-1016NU-G<br>Solenoid valve<br>  <br>CMB-1016NU-GA |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