

Panasonic

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Service Manual

U-4..6ML5XPQ/DPQ

Urban Multi - Mini UM - Heat Pump



Mini UM ML4 - R-410A Heat Pump 50Hz

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1. Introduction

1.1 Safety Cautions

Cautions and Warnings

- Be sure to read the following safety cautions before conducting repair work.
- The caution items are classified into “ Warning” and “ Caution”. The “ Warning” items are especially important since they can lead to death or serious injury if they are not followed closely. The “ Caution” items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.
- About the pictograms
 -  This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.
 -  This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.
 -  This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.
- After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer

1.1.1 Caution in Repair

|  Warning | |
|--|---|
| <p>Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.</p> |  |
| <p>If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.</p> |  |
| <p>When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.</p> | |
| <p>If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.</p> |  |
| <p>The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.</p> |  |
| <p>Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.</p> |  |

|  Caution | |
|---|---|
| Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock. |  |
| Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock. |  |
| Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks. |  |
| Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury. |  |
| Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor. |  |
| Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns. | |
| Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency. |  |

1.1.2 Cautions Regarding Products after Repair

|  Warning | |
|--|-------------------------|
| Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire. | |
| When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury. | |
| Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury. | For integral units only |
| Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury. | For integral units only |
| Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire. | |

|  Warning | |
|--|---|
| Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire. | |
| When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire. | |
| Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable. |  |
| Do not mix air or gas other than the specified refrigerant (R-410A) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury. | |
| If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges. |  |
| When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately. | |

|  Caution | |
|--|---|
| Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks. | |
| Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire. |  |
| Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor. | For integral units only |

1.1.3 Inspection after Repair

|  Warning | |
|--|---|
| Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire. |  |
| If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire. |  |
| Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire. |  |

|  Caution | |
|--|---|
| Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock. | |
| If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury. | |
| Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock. |  |
| Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 Mohm or higher. Faulty insulation can cause an electrical shock. | |
| Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor. | |

1.1.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.1.5 Using Icons List

| Icon | Type of Information | Description |
|---|---------------------|---|
|  Note: | Note | A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks. |
|  Caution | Caution | A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure. |
|  Warning | Warning | A “warning” is used when there is danger of personal injury. |
|  | Reference | A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic. |

1.2 PREFACE

Thank you for your continued patronage of **Panasonic** products.

This is the new service manual for Panasonic's Year 2008 UM ML5 series Heat Pump System. Panasonic offers a wide range of models to respond to building and office air conditioning needs. We are confident that customers will be able to find the models that best suit their needs.

This service manual contains information regarding the servicing of UM ML5 series R-410A Heat Pump System.

July, 2008

After Sales Service Division

Part 1

General Information

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1. Model Names of Indoor/Outdoor Units

*Indoor Units

| Type | Model Name | | | | | | | | | Power Supply |
|--|------------|----|----|----|----|----|----|----|-----|--------------|
| Ceiling Mounted Cassette Type (Double Flow) | LM3 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | — | 125 |
| Ceiling Mounted Cassette Type (Round Flow) | UM4 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
| 600x600 Ceiling Mounted Cassette Type (Multi Flow) | YM3 | 20 | 25 | 32 | 40 | 50 | — | — | — | V1 |
| Ceiling Mounted Cassette Corner Type | DM3 | — | 25 | 32 | 40 | — | 63 | — | — | VE |
| Concealed Ceiling Unit (Small) | NM3 | 20 | 25 | — | — | — | — | — | — | V3 |
| Ceiling Mounted Built-In Type | FM3 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | |
| Ceiling Mounted Duct Type | EM3 | — | — | — | 40 | 50 | 63 | 80 | 100 | 125 |
| Ceiling Suspended Type | TM3 | — | — | 32 | — | — | 63 | — | 100 | — |
| Wall Mounted Type | KM3 | 20 | 25 | 32 | 40 | 50 | 63 | — | — | — |
| Floor Standing Type | PM3 | 20 | 25 | 32 | 40 | 50 | 63 | — | — | — |
| Concealed Floor Standing Type | RM3 | 20 | 25 | 32 | 40 | 50 | 63 | — | — | — |

Note: VE:1f, 220~240V, 50Hz, 1f, 220V, 60Hz

V1:1f, 220~240V, 50Hz

V3:1f, 230V, 50Hz

Outdoor Units

| Series | | | Model Name | | | Power Supply |
|----------|-----------|-------|------------|---|---|--------------|
| Inverter | Heat Pump | U-ML5 | 4 | 5 | 6 | Y1, V1 |
| | | | | | | |

Y1 :3φ, 380~415V, 50Hz
V1 :1φ, 220~240V, 50Hz



2. External Appearance

2.1 Indoor Units

| | | |
|--|---|--|
| Roundflow Ceiling Mounted Cassette S-20UM4JPQ S-25UM4JPQ S-32UM4JPQ S-40UM4JPQ S-50UM4JPQ S-63UM4JPQ S-80UM4JPQ S-100UM4JPQ S-125UM4JPQ |  | Concealed Ceiling Unit (Large) S-40EM3HPS S-50EM3HPS S-63EM3HPS S-80EM3HPS S-100EM3HPS S-125EM3HPS S-200EM3HPS S-250EM3HPS  S-40..125EM3HPS S-200..250EM3HPS |
| 600×600 4-Way Blow Ceiling Mounted Cassette S-20YM3HPQ S-25YM3HPQ S-32YM3HPQ S-40YM3HPQ S-50YM3HPQ |  | Ceiling Suspended Unit S-32TM3JPR S-63TM3JPR S-100TM3JPR  |
| 2-Way Blow Ceiling Mounted Cassette S-20LM3HPQ S-25LM3HPQ S-32LM3HPQ S-40LM3HPQ S-50LM3HPQ S-63LM3HPQ S-80LM3HPQ S-125LM3HPQ |  | Wall Mounted Unit S-20KM3HPR S-25KM3HPR S-32KM3HPR S-40KM3HPR S-50KM3HPR S-63KM3HPR  |
| Ceiling Mounted Corner Cassette S-25DM3HPS S-32DM3HPS S-40DM3HPS S-63DM3HPS |  | Floor Standing Unit S-20PM3HPS S-25PM3HPS S-32PM3HPS S-40PM3HPS S-50PM3HPS S-63PM3HPS  |
| Concealed Ceiling Unit (Small) S-20NM3HPQ S-25NM3HPQ |  | Concealed Floor Standing Unit S-20RM3HPS S-25RM3HPS S-32RM3HPS S-40RM3HPS S-50RM3HPS S-63RM3HPS  |
| Concealed Ceiling Unit S-20FM3HPQ S-25FM3HPQ S-32FM3HPQ S-40FM3HPQ S-50FM3HPQ S-63FM3HPQ S-80FM3HPQ S-100FM3HPQ S-125FM3HPQ |  | |

3. Capacity Range

Outdoor Units

| Capacity Range | 4HP | 5HP | 6HP |
|--|--------|------------|--------|
| U-ML5 | 4 | 5 | 6 |
| No of Indoor Units to be Connected | 6 | 8 | 9 |
| Total Capacity Index of Indoor Units to be Connected | 50~130 | 62.5~162.5 | 70~182 |

Indoor Units

| Capacity Range | 0.8HP | 1HP | 1.25HP | 1.6HP | 2HP | 2.5HP | 3.2HP | 4HP | 5HP |
|--|-------|-----|--------|-------|-----|-------|-------|-----|-----|
| Capacity Index | 20 | 25 | 31.25 | 40 | 50 | 62.5 | 80 | 100 | 125 |
| Ceiling Mounted Cassette Type (Double Flow) | LM3 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | — |
| Ceiling Mounted Cassette Type (Round Flow) | UM4 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| 600x600 Ceiling Mounted Cassette Type (Multi Flow) | YM3 | 20 | 25 | 32 | 40 | 50 | — | — | — |
| Ceiling Mounted Cassette Corner Type | DM3 | — | 25 | 32 | 40 | — | 63 | — | — |
| Concealed Ceiling Mounted (Small) | NM3 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| Ceiling Mounted Built-In Type | FM3 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| Ceiling Mounted Duct Type | EM3 | — | — | — | 40 | 50 | 63 | 80 | 100 |
| Ceiling Suspended Type | TM3 | — | — | 32 | — | — | 63 | — | 100 |
| Wall Mounted Type | KM3 | 20 | 25 | 32 | 40 | 50 | 63 | — | — |
| Floor Standing Type | PM3 | 20 | 25 | 32 | 40 | 50 | 63 | — | — |
| Concealed Floor Standing Type | RM3 | 20 | 25 | 32 | 40 | 50 | 63 | — | — |

Part 2

Specifications

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1. Specifications

1.1 Outdoor Units

Heat Pump 50Hz <U-4..6ML5XPQ>

| 1-1 TECHNICAL SPECIFICATIONS | | | U-4ML5XPQ | U-5ML5XPQ | U-6ML5XPQ |
|--|---------------------------------|---------------------------------------|-----------------------------|------------|-----------|
| Capacity | Cooling | kW | 11.2 | 14.0 | 15.5 |
| | Heating | kW | 12.5 | 16.0 | 18.0 |
| COP | Cooling | | 3.88 | 3.88 | 3.33 |
| | Heating | | 4.43 | 4.03 | 3.83 |
| Capacity range | | HP | 4 | 5 | 6 |
| PED category | | | Category I | | |
| Max n° of indoor units to be connected | | | 6 | 8 | 9 |
| Indoor index connection | Minimum | | 50 | 62.5 | 70 |
| | Maximum | | 130 | 162.5 | 182 |
| Casing | Colour | | White | | |
| | Material | | Painted galvanised steel | | |
| Dimensions | Packing | Height | mm | 1,524 | |
| | | Width | mm | 980 | 980 |
| | | Depth | mm | 420 | 420 |
| | Unit | Height | mm | 1,345 | |
| | | Width | mm | 900 | 900 |
| | | Depth | mm | 320 | 320 |
| Weight | Unit | kg | 120 | 120 | 120 |
| | Packed Unit | kg | 130 | 130 | 130 |
| Packing | Material | | Carton, wood + EPS | | |
| | Weight | kg | 8 | 8 | 8 |
| Heat Exchanger | Dimensions | Length | mm | 857 | 857 |
| | | Nr of Rows | | 2 | 2 |
| | | Fin Pitch | mm | 2 | 2 |
| | | Nr of Passes | | 10 | 10 |
| | | Face Area | m ² | 1,131 | |
| | | Nr of Stages | | 60 | 60 |
| | Tube type | | Hi-XSS (8) | | |
| | Fin | Fin type | Non-symmetric waffle louvre | | |
| | | Treatment | Corrosion resistant | | |
| Fan | Type | | Propeller | | |
| | Quantity | | 2 | 2 | 2 |
| | Air Flow Rate (nominal at 230V) | Cooling m ³ /min | 106 | 106 | 106 |
| | | Heating m ³ /min | 102 | 105 | 105 |
| | Discharge direction | | | Horizontal | |
| | Motor | Quantity | 2 | 2 | 2 |
| | | Model | Brushless DC motor | | |
| Motor | Speed (nominal) | Cooling rpm | 850/815 | | |
| | | Heating rpm | 820/785 | 840/805 | 840/805 |
| Fan | Motor | Drive | Direct drive | | |
| | | Output motor W | 70 | 70 | 70 |
| Compressor | Quantity | | 1 | 1 | 1 |
| | Motor | Quantity | 1 | 1 | 1 |
| | | Model | JT100G-VDLYR | | |
| | Type | Hermetically sealed scroll compressor | | | |
| | Speed rpm | | 6,480 | | |
| | Motor Output kW | | 2.5 | 3.0 | 3.5 |
| | Starting Method | | Direct on line | | |
| Cooling | Standard | Min °CDB | -5 | -5 | -5 |
| Operation Range | Cooling | Max °CDB | 46 | 46 | 46 |
| | Heating | Min °CWB | -20 | -20 | -20 |
| | | Max °CWB | 15.5 | 15.5 | 15.5 |

| 1-1 TECHNICAL SPECIFICATIONS | | | U-4ML5XPQ | U-5ML5XPQ | U-6ML5XPQ |
|------------------------------|---|--------------------------|-----------------------------------|------------------|------------------|
| Sound level | Cooling | Sound Power (Nominal) | dBA | 66 | 67 |
| | | Sound Pressure (Nominal) | dBA | 50 | 51 |
| | Heating | Sound Pressure (Nominal) | dBA | 52 | 53 |
| Refrigerant | Name | | R-410A | | |
| | Charge | kg | 4.0 | 4.0 | 4.0 |
| | Control | | Expansion valve (electronic type) | | |
| Refrigerant Oil | Nr of Circuits | | 1 | 1 | 1 |
| | Name | | Daphne FVC68D | | |
| | Charged Volume | l | 1.5 | 1.5 | 1.5 |
| Piping connections | Liquid (OD) | Type | Flare connection | | |
| | | Diameter (OD) mm | 9.52 | 9.52 | 9.52 |
| | Gas | Type | Flare connection | Flare connection | Braze connection |
| | | Diameter (OD) mm | 15.9 | 15.9 | 19.1 |
| | Drain | Quantity | 3 | 3 | 3 |
| | | Diameter (OD) mm | 26 × 3 | | |
| | Heat Insulation | | Both liquid and gas pipes | | |
| Max total length | | m | 300 | 300 | 300 |
| Defrost Method | | | | | |
| Defrost Control | | | | | |
| Capacity Control Method | | | | | |
| Capacity Control | | | | | |
| Safety devices | | | | | |
| Standard Accessories | | | | | |
| | | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 5m, level difference : 0m. | | | | |
| | Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 5m, level difference: 0m. | | | | |
| | Sound power level is an absolute value that a sound source generates. | | | | |
| | Sound pressure level is a relative value, depending on the distance and acoustic environment. For more details, please refer to sound level drawings. | | | | |
| | Sound values are measured in a semi-anechoic room. | | | | |

Heat pump 50Hz <U-4..6ML5DPQ>

| 1-1 TECHNICAL SPECIFICATIONS | | | U-4ML5DPQ | U-5ML5DPQ | U-6ML5DPQ |
|--|---------------------------------|----------------|--------------------------|---------------------------------------|-----------|
| Capacity | Cooling | kW | 11.2 | 14.0 | 15.5 |
| | Heating | kW | 12.5 | 16.0 | 18.0 |
| COP | Cooling | | 3.99 | 3.99 | 3.42 |
| | Heating | | 4.56 | 4.15 | 3.94 |
| Capacity range | | HP | 4 | 5 | 6 |
| PED category | | | Category I | | |
| Max n° of indoor units to be connected | | | 6 | 8 | 9 |
| Indoor index connection | Minimum | | 50 | 62.5 | 70 |
| | Maximum | | 130 | 162.5 | 182 |
| Casing | Colour | | White | | |
| | Material | | Painted galvanised steel | | |
| Dimensions | Packing | Height | mm | 1,524 | |
| | | Width | mm | 980 | 980 |
| | | Depth | mm | 420 | 420 |
| | Unit | Height | mm | 1,345 | |
| | | Width | mm | 900 | 900 |
| | | Depth | mm | 320 | 320 |
| Weight | Unit | kg | 120 | 120 | 120 |
| | Packed Unit | kg | 130 | 130 | 130 |
| Packing | Material | | Carton, wood + EPS | | |
| | Weight | kg | 8 | 8 | 8 |
| Heat Exchanger | Dimensions | Length | mm | 857 | 857 |
| | | Nr of Rows | | 2 | 2 |
| | | Fin Pitch | mm | 2 | 2 |
| | | Nr of Passes | | 10 | 10 |
| | | Face Area | m ² | 1,131 | |
| | | Nr of Stages | | 60 | 60 |
| | Tube type | | Hi-XSS (8) | | |
| | Fin | Fin type | | Non-symmetric waffle louvre | |
| | | Treatment | | Corrosion resistant | |
| Fan | Type | | Propeller | | |
| | Quantity | | 2 | 2 | 2 |
| | Air Flow Rate (nominal at 230V) | Cooling | m ³ /min | 106 | 106 |
| | | Heating | m ³ /min | 102 | 105 |
| | Discharge direction | | | Horizontal | |
| | Motor | Quantity | | 2 | 2 |
| | | Model | | Brushless DC motor | |
| Motor | Speed (nominal) | Cooling | rpm | 850/815 | |
| | | Heating | rpm | 820/785 | 840/805 |
| Fan | Motor | Drive | | Direct drive | |
| | | Output motor | W | 70 | 70 |
| Compressor | Quantity | | 1 | 1 | 1 |
| | Motor | Quantity | | 1 | 1 |
| | | Model | | JT100G-VDL | |
| | | Type | | Hermetically sealed scroll compressor | |
| | Speed | rpm | | 6,480 | |
| | Motor Output | kW | 2.5 | 3.0 | 3.5 |
| | Starting Method | | | Direct on line | |
| | Crankcase Heater | W | 33 | 33 | 33 |
| Cooling | Standard | Min | °CDB | -5 | -5 |
| Operation Range | Cooling | Max | °CDB | 46 | 46 |
| | Heating | Min | °CWB | -20 | -20 |
| | | Max | °CWB | 15.5 | 15.5 |
| Sound Level | Cooling | Sound Power | dBA | 66 | 67 |
| | | Sound Pressure | dBA | 50 | 51 |
| | Heating | Sound Pressure | dBA | 52 | 53 |
| | | | | | 55 |

| 1-1 TECHNICAL SPECIFICATIONS | | | U-4ML5DPQ | U-5ML5DPQ | U-6ML5DPQ | | |
|------------------------------|---|----------|---|------------------|---|--|--|
| Refrigerant | Name | | R-410A | | | | |
| | Charge | kg | 4.0 | 4.0 | 4.0 | | |
| | Control | | Expansion valve (electronic type) | | | | |
| | Nx of circuits | | 1 | 1 | 1 | | |
| Refrigerant Oil | Name | | Daphne FVC68D | | | | |
| | Charged Volume | l | 1.5 | 1.5 | 1.5 | | |
| Piping connections | Liquid (OD) | Type | Flare connection | | | | |
| | Diameter (OD) | mm | 9.52 | 9.52 | 9.52 | | |
| | Gas | Type | Flare connection | Flare connection | Braze connection | | |
| | Diameter (OD) | mm | 15.9 | 15.9 | 19.1 | | |
| | Drain | Quantity | 3 | 3 | 3 | | |
| | Diameter (OD) | mm | 26 × 3 | | | | |
| | Heat Insulation | | Both liquid and gas pipes | | | | |
| | Max total length | m | 300 | 300 | 300 | | |
| | Defrost Method | | Reversed cycle | | | | |
| Defrost Control | | | Sensor for outdoor heat exchanger temperature | | | | |
| Capacity Control Method | | | Inverter controlled | | | | |
| Capacity Control | | | 24 to 100 | | | | |
| Safety devices | | | HPS, Fan motor thermal protection, Inverter overload protector, PC board fuse | | | | |
| Standard Accessories | | | Installation manual, Operation manual | | Installation manual, Operation manual, Connection pipes | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 5m, level difference : 0m. | | | | | | |
| | 8 meter 1 | | | | | | |
| | Sound pressure | | | | | | |
| | Sound values | | | | | | |
| | Sound values are measured in a semi-anechoic room. | | | | | | |

1.2 Indoor Units

Ceiling Mounted Cassette Type (Double Flow)

| 1-1 TECHNICAL SPECIFICATIONS | | | S-20LM3HPQ | S-25LM3HPQ | S-32LM3HPQ | S-40LM3HPQ | S-50LM3HPQ | |
|------------------------------|----------------|-----------------------|---------------------|---------------------------|-------------|-------------|-------------|--|
| Nominal Capacity | Cooling | kW | 2.20 | 2.80 | 3.60 | 4.50 | 5.60 | |
| | Heating | kW | 2.50 | 3.20 | 4.00 | 5.00 | 6.30 | |
| Power input (Nominal) | Cooling | kW | 0.077 | 0.092 | 0.092 | 0.130 | 0.130 | |
| | Heating | kW | 0.044 | 0.059 | 0.059 | 0.097 | 0.097 | |
| Casing | Colour | Non painted | | | | | | |
| | Material | Galvanised steel | | | | | | |
| Dimensions | Packing | Height | mm | 405 | 405 | 405 | 405 | |
| | | Width | mm | 1060 | 1060 | 1060 | 1280 | |
| | | Depth | mm | 665 | 665 | 665 | 665 | |
| | Unit | Height | mm | 305 | 305 | 305 | 305 | |
| | | Width | mm | 780 | 780 | 780 | 995 | |
| | | Depth | mm | 600 | 600 | 600 | 600 | |
| Weight | Unit | kg | 26 | 26 | 26 | 31 | 32 | |
| | Packed Unit | kg | 30 | 30 | 30 | 37 | 38 | |
| Required Ceiling Void | | | mm | 350 | 350 | 350 | 350 | |
| Heat Exchanger | Dimensions | Length | mm | 475x2 | 475x2 | 690x2 | 475x2 | |
| | | Nr of Rows | | 2x2 | | | | |
| | | Fin Pitch | mm | 1.50 | 1.50 | 1.50 | 1.50 | |
| | | Nr of Passes | | 3x2 | | | | |
| | | Face Area | m ² | 0.1x2 | 0.1x2 | 0.1x2 | 0.145x2 | |
| | | Nr of Stages | | 10x2 | | | | |
| | Tube type | Empty Tubeplate Hole | | | | 6 | | |
| | | Tube type | | Hi-XSS (7) | | | | |
| | | Fin | Fin type | Symmetric waffle louvre | | | | |
| | | | Treatment | Hydrophilic | | | | |
| Fan | Type | Sirocco fan | | | | | | |
| | Quantity | | 1 | 1 | 1 | 2 | 2 | |
| Air Flow Rate | Cooling | High | m ³ /min | 7.0 | 9.0 | 9.0 | 12.0 | |
| | | Low | m ³ /min | 5.0 | 6.5 | 6.5 | 9.0 | |
| | Heating | High | m ³ /min | 7.0 | 9.0 | 9.0 | 12.0 | |
| | | Low | m ³ /min | 5.0 | 6.5 | 6.5 | 9.0 | |
| Fan | Motor | Quantity | | 1 | 1 | 1 | 1 | |
| | | Steps | | Phase cut control | | | | |
| | | Output (high) | W | 10 | 15 | 15 | 20 | |
| | | Drive | | Direct drive | | | | |
| Refrigerant | Name | R-410A | | | | | | |
| Sound Level | Cooling | Sound power (nominal) | dBA | 45.0 | 50.0 | 50.0 | 50.0 | |
| Cooling | Sound Pressure | High | dBA | 33.0 | 35.0 | 35.0 | 35.5 | |
| | | Low | dBA | 28.0 | 29.0 | 29.0 | 30.5 | |
| Heating | Sound Pressure | High | dBA | 33.0 | 35.0 | 35.0 | 35.5 | |
| | | Low | dBA | 28.0 | 29.0 | 29.0 | 30.5 | |
| Piping connections | Liquid (OD) | Type | | Flare connection | | | | |
| | | Diameter | mm | 6.35 | 6.35 | 6.35 | 6.35 | |
| | Gas | Type | | Flare connection | | | | |
| | | Diameter | mm | 12.7 | 12.7 | 12.7 | 12.7 | |
| | Drain | Diameter | mm | 32 | 32 | 32 | 32 | |
| Heat Insulation | | | | Both liquid and gas pipes | | | | |
| Decoration Panel | Model | | | CZ-01KPL11P | CZ-01KPL11P | CZ-02KPL11P | CZ-02KPL11P | |
| | Colour | | | White (10Y9/0,5) | | | | |
| | Dimensions | Height | mm | 53 | 53 | 53 | 53 | |
| | | Width | mm | 1030 | 1030 | 1030 | 1245 | |
| | | Depth | mm | 680 | 680 | 680 | 680 | |
| Weight | | kg | | 8.0 | 8.0 | 8.5 | 8.5 | |
| Drain-up Height | | | mm | 600 | 600 | 600 | 600 | |

| 1-1 TECHNICAL SPECIFICATIONS | S-20LM3HPQ | S-25LM3HPQ | S-32LM3HPQ | S-40LM3HPQ | S-50LM3HPQ |
|------------------------------|---|------------|--|------------|------------|
| Air Filter | | | Resin net with mold resistance | | |
| Air direction control | | | Up and downwards | | |
| Refrigerant control | | | Electronic expansion valve | | |
| Temperature control | | | Microprocessor thermostat for cooling and heating | | |
| Safety devices | | | PC board fuse, Fan motor thermal fuse, Drain pump fuse | | |
| Standard Accessories | Screws for fixing the paper pattern for installation, Washer for hanging bracket, Installation and operation manual, Paper pattern for installation, Insulation for fitting, Drain hose | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 270CDB, 190CWB, outdoor temperature : 350CDB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | |
| | Nominal heating capacities are based on : indoor temperature : 200CDB, outdoor temperature : 70CDB, 60CWB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | |

Ceiling Mounted Cassette Type (Double Flow)

| 1-1 TECHNICAL SPECIFICATIONS | | | | S-63LM3HPQ | S-80LM3HPQ | S-125LM3HPQ | | |
|------------------------------|---|-----------------------|---------------------|---|---|-------------|--|--|
| Nominal Capacity | Cooling | kW | 7.10 | 9.00 | 14.00 | | | |
| | Heating | kW | 8.00 | 10.00 | 16.00 | | | |
| Power input (Nominal) | Cooling | kW | 0.161 | 0.209 | 0.256 | | | |
| | Heating | kW | 0.126 | 0.176 | 0.223 | | | |
| Casing | Colour | | | Non painted | | | | |
| | Material | | | Galvanised steel | | | | |
| Dimensions | Packing | Height | mm | 405 | 405 | 405 | | |
| | | Width | mm | 1460 | 1808 | 1808 | | |
| | | Depth | mm | 665 | 645 | 645 | | |
| | Unit | Height | mm | 305 | 305 | 305 | | |
| | | Width | mm | 1180 | 1670 | 1670 | | |
| | | Depth | mm | 600 | 600 | 600 | | |
| Weight | Unit | kg | 35 | 47 | 48 | | | |
| | Packed Unit | kg | 42 | 55 | 56 | | | |
| Required Ceiling Void | | mm | 350 | 350 | 350 | | | |
| Heat Exchanger | Dimensions | Length | mm | 875x2 | 1365 | 1365 | | |
| | | Nr of Rows | | | 2x2 | | | |
| | | Fin Pitch | mm | 1.50 | 1.50 | 1.50 | | |
| | | Nr of Passes | | 6x2 | 5x2 | 6 | | |
| | | Face Area | m ² | 0.184x2 | 0.287x2 | 0.287x2 | | |
| | | Nr of Stages | | | 10x2 | | | |
| | | Empty Tubeplate Hole | | | 8 | | | |
| | Tube type | | | Hi-XSS (7) | | | | |
| | Fin | Fin type | | Symmetric waffle louvre | | | | |
| | | Treatment | | Hydrophilic | | | | |
| Fan | Type | | | Sirocco fan | | | | |
| | Quantity | | | 2 | 3 | 3 | | |
| Air Flow Rate | Cooling | High | m ³ /min | 16.5 | 26.0 | 33.0 | | |
| | | Low | m ³ /min | 13.0 | 21.0 | 25.0 | | |
| | Heating | High | m ³ /min | 16.5 | 26.0 | 33.0 | | |
| | | Low | m ³ /min | 13.0 | 21.0 | 25.0 | | |
| Fan | Motor | Quantity | | 1 | 1 | 1 | | |
| | | Steps | | Phase cut control | | | | |
| | | Output (high) | W | 30 | 50 | 85 | | |
| | | Drive | | Direct drive | | | | |
| Refrigerant | Name | | | R-410A | | | | |
| Sound Level | Cooling | Sound power (nominal) | dBA | 52.0 | 54.0 | 60.0 | | |
| Cooling | Sound Pressure | High | dBA | 38.0 | 40.0 | 45.0 | | |
| | | Low | dBA | 33.0 | 35.0 | 39.0 | | |
| Heating | Sound Pressure | High | dBA | 38.0 | 40.0 | 45.0 | | |
| | | Low | dBA | 33.0 | 35.0 | 39.0 | | |
| Piping connections | Liquid (OD) | Type | | Flare connection | | | | |
| | | Diameter | mm | 9.5 | 9.5 | 9.5 | | |
| | Gas | Type | | Flare connection | | | | |
| | | Diameter | mm | 15.9 | 15.9 | 15.9 | | |
| | Drain | Diameter | mm | 32 | 32 | 32 | | |
| Heat Insulation | | | | Both liquid and gas pipes | | | | |
| Decoration Panel | Model | | | CZ-03KPL11P | CZ-06KPL11P | CZ-06KPL11P | | |
| | Colour | | | White (10Y9/0,5) | | | | |
| | Dimensions | Height | mm | 53 | 53 | 53 | | |
| | | Width | mm | 1430 | 1920 | 1920 | | |
| | | Depth | mm | 680 | 680 | 680 | | |
| | Weight | kg | 9.5 | 12.0 | 12.0 | | | |
| Drain-up Height | | mm | 600 | 600 | 600 | | | |
| Air Filter | | | | Resin net with mold resistance | | | | |
| Air direction control | | | | Up and downwards | | | | |
| Refrigerant control | | | | Electronic expansion valve | | | | |
| Temperature control | | | | Microprocessor thermostat for cooling and heating | | | | |
| Safety devices | | | | PC board fuse, Fan motor thermal fuse, Drain pump fuse | PC board fuse, Fan motor thermal protector, Drain pump fuse | | | |
| Standard Accessories | | | | Screws for fixing the paper pattern for installation, Washer for hanging bracket, Clamps, Installation and operation manual, Paper pattern for installation, Insulation for fitting, Drain hose | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | | |

Ceiling Mounted Cassette Type (Round-flow)

| 1-1 TECHNICAL SPECIFICATIONS | | | S-20UM4JPQ | S-25UM4JPQ | S-32UM4JPQ | S-40UM4JPQ | S-50UM4JPQ | | | | | | | | | |
|------------------------------|---|-----------------------|--|---|------------|------------|------------|--|--|--|--|--|--|--|--|--|
| Capacity | Cooling | kW | 2.2 | 2.8 | 3.6 | 4.5 | 5.6 | | | | | | | | | |
| | Heating | kW | 2.5 | 3.2 | 4.0 | 5.0 | 6.3 | | | | | | | | | |
| Power Input | Cooling | kW | 0.053 | 0.053 | 0.053 | 0.063 | 0.083 | | | | | | | | | |
| | Heating | kW | 0.045 | 0.045 | 0.045 | 0.055 | 0.067 | | | | | | | | | |
| Casing | Material | | Galvanised steel | | | | | | | | | | | | | |
| Dimensions | Packing | Height | mm | 220 | 220 | 220 | 220 | | | | | | | | | |
| | | Width | mm | 882 | 882 | 882 | 882 | | | | | | | | | |
| | | Depth | mm | 882 | 882 | 882 | 882 | | | | | | | | | |
| | Unit | Height | mm | 204 | 204 | 204 | 204 | | | | | | | | | |
| | | Width | mm | 840 | 840 | 840 | 840 | | | | | | | | | |
| | | Depth | mm | 840 | 840 | 840 | 840 | | | | | | | | | |
| Weight | Unit | kg | 20.0 | 20.0 | 20.0 | 20.0 | 21.0 | | | | | | | | | |
| | Packed Unit | kg | 24.0 | 24.0 | 24.0 | 24.0 | 26.0 | | | | | | | | | |
| Dimensions | Length | Inside | mm | 2,096 | | | | | | | | | | | | |
| | | Outside | mm | 2,152 | | | | | | | | | | | | |
| Heat Exchanger | Dimensions | Nr of Rows | | 2 | 2 | 2 | 2 | | | | | | | | | |
| | | Fin Pitch | mm | 1.2 | 1.2 | 1.2 | 1.2 | | | | | | | | | |
| | | Nr of Passes | | 2 | 2 | 3 | 3 | | | | | | | | | |
| | | Face Area | m ² | 0.267 | 0.267 | 0.267 | 0.267 | | | | | | | | | |
| | | Nr of Stages | | 6 | 6 | 6 | 8 | | | | | | | | | |
| | | Empty Tubeplate Hole | | 4 | 4 | | | | | | | | | | | |
| | | Fin | Fin type | Cross fin coil (Multi louver fins and Hi-XSS tubes) | | | | | | | | | | | | |
| Fan | Type | | | Turbo fan | | | | | | | | | | | | |
| | Quantity | | | 1 | 1 | 1 | 1 | | | | | | | | | |
| Air Flow Rate | Cooling | High | m ³ /min | 12.5 | 12.5 | 12.5 | 13.5 | | | | | | | | | |
| | | Low | m ³ /min | 9.0 | 9.0 | 9.0 | 10.0 | | | | | | | | | |
| | Heating | High | m ³ /min | 12.5 | 12.5 | 12.5 | 13.5 | | | | | | | | | |
| | | Low | m ³ /min | 9.0 | 9.0 | 9.0 | 9.5 | | | | | | | | | |
| Fan | Motor | Model | | QTS48D11M | | | | | | | | | | | | |
| | | Steps | | 2 | 2 | 2 | 2 | | | | | | | | | |
| | | Output (high) | W | 56 | 56 | 56 | 56 | | | | | | | | | |
| Refrigerant | Name | | | R-410A | | | | | | | | | | | | |
| Sound Level | Cooling | Sound power (nominal) | dBA | 49 | 49 | 49 | 50 | | | | | | | | | |
| Cooling | Sound Pressure | High | dBA | 31 | 31 | 31 | 32 | | | | | | | | | |
| | | Low | dBA | 28 | 28 | 28 | 28 | | | | | | | | | |
| Heating | Sound Pressure | High | dBA | 31 | 31 | 31 | 32 | | | | | | | | | |
| | | Low | dBA | 28 | 28 | 28 | 28 | | | | | | | | | |
| Piping connections | Liquid (OD) | Type | Flare connection | | | | | | | | | | | | | |
| | | Diameter | mm | 6.35 | 6.4 | 6.4 | 6.4 | | | | | | | | | |
| | Gas | Type | Flare connection | | | | | | | | | | | | | |
| | | Diameter | mm | 12.7 | 12.7 | 12.7 | 12.7 | | | | | | | | | |
| | Drain | Diameter | mm | VP25 (I.D. 25/O.D. 32) | | | | | | | | | | | | |
| Decoration Panel | Heat Insulation | | | Foamed polystyrene/polyethylene | | | | | | | | | | | | |
| | Sound absorbing insulation | | | (Foamed Polyurethane) | | | | | | | | | | | | |
| | Model | | | CZ-06KPU12P | | | | | | | | | | | | |
| | Colour | | | RAL9010 | | | | | | | | | | | | |
| | Dimensions | Height | mm | 50 | 50 | 50 | 50 | | | | | | | | | |
| | | Width | mm | 950 | 950 | 950 | 950 | | | | | | | | | |
| | | Depth | mm | 950 | 950 | 950 | 950 | | | | | | | | | |
| Air Filter | | | | Resin net with mold resistance | | | | | | | | | | | | |
| Standard Accessories | | | Installation and operation manual, Drain hose, Washer for hanging bracket, Screws, Sealing Pads, Insulation for fitting, Clamp for drain hose, Installation guide, Drain sealing pad | | | | | | | | | | | | | |
| Notes | The sound pressure values are mentioned for a unit installed with rear suction | | | | | | | | | | | | | | | |
| | The sound power level is an absolute value indicating the power with a sound source generates. | | | | | | | | | | | | | | | |
| | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 5m, level difference : 0m. | | | | | | | | | | | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 5m (horizontal) | | | | | | | | | | | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | | | | | | | | | | |

Ceiling Mounted Cassette Type (Round-flow)

| 1-1 TECHNICAL SPECIFICATIONS | | | S-63UM4JPQ | S-80UM4JPQ | S-100UM4JPQ | S-125UM4JPQ |
|------------------------------|-----------------|-----------------------|---|---------------------------------|-------------|-------------|
| Capacity | Cooling | kW | 7.1 | 9.0 | 11.2 | 14.0 |
| | Heating | kW | 8.0 | 10.0 | 12.5 | 16.0 |
| Power Input | Cooling | kW | 0.095 | 0.120 | 0.173 | 0.258 |
| | Heating | kW | 0.114 | 0.108 | 0.176 | 0.246 |
| Casing | Material | | Galvanised steel | | | |
| Dimensions | Packing | Height | mm | 220 | 262 | 262 |
| | | Width | mm | 882 | 882 | 882 |
| | | Depth | mm | 882 | 882 | 882 |
| | Unit | Height | mm | 204 | 246 | 246 |
| | | Width | mm | 840 | 840 | 840 |
| | | Depth | mm | 840 | 840 | 840 |
| Weight | Unit | kg | 21.0 | 24.0 | 24.0 | 26.0 |
| | Packed Unit | kg | 26.0 | 28.0 | 28.0 | 31.0 |
| Dimensions | Length | Inside | mm | 2,096 | | |
| | | Outside | mm | 2,152 | | |
| Heat Exchanger | Dimensions | Nr of Rows | | 2 | 2 | 2 |
| | | Fin Pitch | mm | 1.2 | 1.2 | 1.2 |
| | | Nr of Passes | | 7 | 9 | 9 |
| | | Face Area | m² | 0.357 | 0.446 | 0.446 |
| | | Nr of Stages | | 8 | 10 | 10 |
| | Fin | Fin type | Cross fin coil (Multi louver fins and Hi-XSS tubes) | | | |
| Fan | Type | | | Turbo fan | | |
| | Quantity | | | 1 | 1 | 1 |
| Air Flow Rate | Cooling | High | m³/min | 16.5 | 23.5 | 26.5 |
| | | Low | m³/min | 11.0 | 14.5 | 17.0 |
| | Heating | High | m³/min | 17.5 | 23.5 | 28.0 |
| | | Low | m³/min | 12.0 | 14.5 | 17.5 |
| Fan | Motor | Model | | QTS48D11M | QTS48C15M | QTS48C15M |
| | | Steps | | 2 | 2 | 2 |
| | | Output (high) | W | 56 | 120 | 120 |
| Refrigerant | Name | | | R-410A | | |
| Sound Level | Cooling | Sound power (nominal) | dBA | 52 | 55 | 58 |
| Cooling | Sound Pressure | High | dBA | 34 | 38 | 41 |
| | | Low | dBA | 29 | 32 | 33 |
| Heating | Sound Pressure | High | dBA | 36 | 38 | 42 |
| | | Low | dBA | 30 | 32 | 34 |
| Piping connections | Liquid (OD) | Type | Flare connection | | | |
| | | Diameter | mm | 9.5 | 9.5 | 9.5 |
| | Gas | Type | Flare connection | | | |
| | | Diameter | mm | 15.9 | 15.9 | 15.9 |
| | Drain | Diameter | mm | VP25 (I.D. 25/O.D. 32) | | |
| | Heat Insulation | | | Foamed polystyrene/polyethylene | | |
| Sound absorbing insulation | | | (Foamed Polyurethane) | | | |
| Decoration Panel | Model | | | CZ-06KPU12P | | |
| | Colour | | | RAL9010 | | |
| | Dimensions | Height | mm | 50 | 50 | 50 |
| | | Width | mm | 950 | 950 | 950 |
| | | Depth | mm | 950 | 950 | 950 |
| Air Filter | Weight | | | 5.5 | 5.5 | 5.5 |
| Standard Accessories | | | Resin net with mold resistance | | | |
| Notes | | | The sound pressure values are mentioned for a unit installed with rear suction | | | |
| | | | The sound power level is an absolute value indicating the power which a sound source generates. | | | |
| | | | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 5m, level difference : 0m. | | | |
| | | | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 5m (horizontal) | | | |
| | | | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | |

600x600 Ceiling Mounted Cassette Type (Multi Flow)

| 1-1 TECHNICAL SPECIFICATIONS | | | | S-20YM3HPQ | S-25YM3HPQ | S-32YM3HPQ | S-40YM3HPQ | S-50YM3HPQ |
|---|--------------------------------|-----------------------|---------------------|--|------------|------------|------------|------------|
| Nominal Capacity | Cooling | kW | 2.20 | 2.80 | 3.60 | 4.50 | 5.60 | |
| | Heating | kW | 2.50 | 3.20 | 4.00 | 5.00 | 6.30 | |
| Power input (Nominal) | Cooling | kW | 0.073 | 0.073 | 0.076 | 0.089 | 0.115 | |
| | Heating | kW | 0.064 | 0.064 | 0.068 | 0.080 | 0.107 | |
| Casing | Material | | | Galvanised steel | | | | |
| Dimensions | Unit | Height | mm | 286 | 286 | 286 | 286 | 286 |
| | | Width | mm | 575 | 575 | 575 | 575 | 575 |
| | | Depth | mm | 575 | 575 | 575 | 575 | 575 |
| Weight | Unit | kg | | 18 | 18 | 18 | 18 | 18 |
| Heat Exchanger | Dimensions | Nr of Rows | | 2 | 2 | 2 | 2 | 2 |
| | | Fin Pitch | mm | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| | | Face Area | m ² | 0.269 | 0.269 | 0.269 | 0.269 | 0.269 |
| | | Nr of Stages | | 10 | 10 | 10 | 10 | 10 |
| Fan | Type | Turbo fan | | | | | | |
| | Quantity | | | 1 | 1 | 1 | 1 | 1 |
| Air Flow Rate | Cooling | High | m ³ /min | 9.00 | 9.00 | 9.50 | 11.00 | 14.00 |
| | | Low | m ³ /min | 7.00 | 7.00 | 7.50 | 8.00 | 10.00 |
| Fan | Motor | Quantity | | 1 | 1 | 1 | 1 | 1 |
| | | Model | QTS32C15M | | | | | |
| | | Output (high) | W | 55 | 55 | 55 | 55 | 55 |
| | | Drive | Direct drive | | | | | |
| Refrigerant | Name | R-410A | | | | | | |
| Sound Level | Cooling | Sound power (nominal) | dBA | 47.0 | 47.0 | 49.0 | 53.0 | 58.0 |
| Cooling | Sound Pressure | High | dBA | 30.0 | 30.0 | 32.0 | 36.0 | 41.0 |
| | | Low | dBA | 25.0 | 25.0 | 26.0 | 28.0 | 33.0 |
| Piping connections | Liquid (OD) | Type | Flare connection | | | | | |
| | | Diameter | mm | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| | Gas | Type | Flare connection | | | | | |
| | | Diameter | mm | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 |
| Decoration Panel | Drain | Diameter | mm | 26 | 26 | 26 | 26 | 26 |
| | Heat Insulation | | | Foamed polystyrene/polyethylene | | | | |
| | Model | | | CZ-02KPY12P | | | | |
| | Colour | | | White (Ral 9010) | | | | |
| | Dimensions | Height | mm | 55 | 55 | 55 | 55 | 55 |
| | | Width | mm | 700 | 700 | 700 | 700 | 700 |
| | | Depth | mm | 700 | 700 | 700 | 700 | 700 |
| Notes | Weight | kg | | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 |
| | Air Filter | | | | | | | |
| | Resin net with mold resistance | | | | | | | |
| | Refrigerant control | | | | | | | |
| Electronic expansion valve | | | | | | | | |
| Temperature control | | | | | | | | |
| Micropressor thermostat for cooling and heating | | | | | | | | |
| Safety devices | | | | | | | | |
| PC board fuse, Fan motor thermal protector | | | | | | | | |
| Standard Accessories | | | | Installation and operation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing Pads, Clamps, Screws, Washer for hanger bracket, Insulation for fitting | | | | |
| Notes | | | | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 7.5m (horizontal) | | | | |
| | | | | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 7.5m (horizontal) | | | | |
| | | | | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | |

Ceiling Mounted Cassette Corner Type

| 1-1 TECHNICAL SPECIFICATIONS | | | S-25DM3HPS | S-32DM3HPS | S-40DM3HPS | S-63DM3HPS |
|------------------------------|---|---------------------|---------------------|------------------|-------------|-------------|
| Nominal Capacity | Cooling | kW | 2.80 | 3.60 | 4.50 | 7.10 |
| | Heating | kW | 3.20 | 4.00 | 5.00 | 8.00 |
| Power input (Nominal) | Cooling | kW | 0.066 | 0.066 | 0.076 | 0.105 |
| | Heating | kW | 0.046 | 0.046 | 0.056 | 0.085 |
| Casing | Material | | Galvanised steel | | | |
| Dimensions | Unit | Height | mm | 215 | 215 | 215 |
| | | Width | mm | 1110 | 1110 | 1310 |
| | | Depth | mm | 710 | 710 | 710 |
| Weight | Unit | kg | | 31 | 31 | 34 |
| Heat Exchanger | Dimensions | Nr of Rows | | 2 | 2 | 3 |
| | | Fin Pitch | mm | 1.75 | 1.75 | 1.75 |
| | | Face Area | m ² | 0.180 | 0.180 | 0.226 |
| | | Nr of Stages | | 11 | 11 | 11 |
| Fan | Type | Sirocco fan | | | | |
| Quantity | | | 1 | 1 | 1 | 1 |
| Air Flow Rate | Cooling | High | m ³ /min | 11.00 | 11.00 | 13.00 |
| | | Low | m ³ /min | 9.00 | 9.00 | 10.00 |
| Fan | Motor | Quantity | | 1 | 1 | 1 |
| | | Model | | 3D12H1AN1V1 | 3D12H1AN1V1 | 3D12H1AP1V1 |
| | | Output (high) | W | 15 | 15 | 20 |
| | | Drive | | Direct drive | | |
| Refrigerant | Name | R-410A | | | | |
| Cooling | Sound Pressure | High | dBA | 38.0 | 38.0 | 40.0 |
| | | Low | dBA | 33.0 | 33.0 | 34.0 |
| Piping connections | Liquid (OD) | Type | | Flare connection | | |
| | | Diameter | mm | 6.4 | 6.4 | 6.4 |
| | Gas | Type | | Flare connection | | |
| | | Diameter | mm | 12.7 | 12.7 | 12.7 |
| | Drain | Diameter | mm | 32 | 32 | 32 |
| Heat Insulation | | Foamed Polyethylene | | | | |
| Decoration Panel | Model | | CZ-02KPD11P | CZ-02KPD11P | CZ-02KPD11P | CZ-03KPD11P |
| | Colour | | White | | | |
| | Dimensions | Height | mm | 70 | 70 | 70 |
| | | Width | mm | 1240 | 1240 | 1440 |
| | | Depth | mm | 800 | 800 | 800 |
| Weight | | kg | | 8.5 | 8.5 | 9.5 |
| Air Filter | Resin net with mold resistance | | | | | |
| Refrigerant control | Electronic expansion valve | | | | | |
| Temperature control | Microprocessor thermostat for cooling and heating | | | | | |
| Safety devices | PC board fuse, Drain pump fuse, Fan motor thermal | | | | | |
| Standard Accessories | Installation and operation manual, Metal clamp for drain hose, Clamps, Insulation for hangar bracket, Positioning Jig for Installation, Paper pattern for installation, Drain hose, Insulation for fitting, Sealing Pads, Screws, Washer, Air Outlet blocking pad | | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 7.5m (horizontal) | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 7.5m (horizontal) | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | |
| | Sound pressure levels are measured at 220V | | | | | |

Slim Ceiling Mounted Duct Type (with Drain Pump)

| 1-1 TECHNICAL SPECIFICATIONS | | | S-20NM3HPQ | | S-25NM3HPQ | |
|------------------------------|---|-----------------------|--|-------------------------|------------|-------|
| Nominal Capacity | Cooling | kW | 2.20 | | 2.80 | |
| | Heating | kW | 2.50 | | 3.20 | |
| Power input (Nominal) | Cooling | kW | 0.050 | | 0.050 | |
| | Heating | kW | 0.050 | | 0.050 | |
| Casing | Colour | | Non painted | | | |
| | Material | | Galvanised steel | | | |
| Dimensions | Packing | Height | mm | 301 | | 301 |
| | | Width | mm | 584 | | 584 |
| | | Depth | mm | 753 | | 753 |
| | Unit | Height | mm | 230 | | 230 |
| | | Width | mm | 502 | | 502 |
| | | Depth | mm | 652 | | 652 |
| Weight | Unit | kg | | 17 | | 17 |
| | Packed Unit | kg | | 18 | | 18 |
| Required Ceiling Void | | | mm | 250 | | 250 |
| Heat Exchanger | Dimensions | Length | mm | 430 | | 430 |
| | | Nr of Rows | | 2 | | 2 |
| | | Fin Pitch | mm | 1.40 | | 1.40 |
| | | Nr of Passes | | 2 | | 2 |
| | | Face Area | m ² | 0.108 | | 0.108 |
| | | Nr of Stages | | 12 | | 12 |
| | | Empty Tubeplate Hole | | | 4 | |
| | Tube type | | | Hi-XSS (7) | | |
| | Fin | Fin type | | Symmetric waffle louvre | | |
| | | Treatment | | Hydrophilic | | |
| Fan | Type | | | Sirocco fan | | |
| | Quantity | | | 1 | | 1 |
| Air Flow Rate | Cooling | High | m ³ /min | 6.70 | | 7.40 |
| | | Low | m ³ /min | 5.20 | | 5.80 |
| | Heating | High | m ³ /min | 6.70 | | 7.40 |
| | | Low | m ³ /min | 5.20 | | 5.80 |
| Fan | Motor | Quantity | | 1 | | 1 |
| | | Steps | | step motor | | |
| | | Output (high) | W | 10 | | 10 |
| | | Drive | | Direct drive | | |
| Refrigerant | Name | | | R-410A | | |
| Sound Level | Cooling | Sound power (nominal) | dBA | 50.0 | | 50.0 |
| Cooling | Sound Pressure | High | dBA | 37.0 | | 37.0 |
| | | Low | dBA | 32.0 | | 32.0 |
| Heating | Sound Pressure | High | dBA | 37.0 | | 37.0 |
| | | Low | dBA | 32.0 | | 32.0 |
| Piping connections | Liquid (OD) | Type | | Flare connection | | |
| | | Diameter | mm | 6.4 | | 6.4 |
| | Gas | Type | | Flare connection | | |
| | | Diameter | mm | 12.7 | | 12.7 |
| | Drain | Diameter | mm | 27.2 | | 27.2 |
| Air Filter | | | Resin net with mold resistance | | | |
| Air direction control | | | Up and downwards | | | |
| Refrigerant control | | | Electronic expansion valve | | | |
| Temperature control | | | Microprocessor thermostat for cooling and heating | | | |
| Safety devices | | | PC board fuse, Fan motor thermal protector | | | |
| Standard Accessories | | | Installation and operation manual, Fuse, Caution for servicing sticker, Suction air filter | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | |

Ceiling Mounted Built-in Type

| 1-1 TECHNICAL SPECIFICATIONS | | | S-20FM3HPQ | S-25FM3HPQ | S-32FM3HPQ | S-40FM3HPQ | S-50FM3HPQ | | | | | |
|---|--|--|---|-------------------------|-------------|-------------|-------------|--|--|--|--|--|
| Capacity (Conditions specified in 1) | Cooling | kW | 2.20 | 2.80 | 3.60 | 4.50 | 5.60 | | | | | |
| | Heating | kW | 2.50 | 3.20 | 4.00 | 5.00 | 6.30 | | | | | |
| Power input (Nominal) | Cooling | kW | 0.110 | 0.110 | 0.114 | 0.127 | 0.143 | | | | | |
| | Heating | kW | 0.090 | 0.090 | 0.094 | 0.107 | 0.123 | | | | | |
| Casing | Colour | | Non painted | | | | | | | | | |
| | Material | | Galvanised steel | | | | | | | | | |
| Dimensions | Packing | Height | mm | 354 | 354 | 354 | 354 | | | | | |
| | | Width | mm | 742 | 742 | 892 | 892 | | | | | |
| | | Depth | mm | 936 | 936 | 936 | 936 | | | | | |
| | Unit | Height | mm | 300 | 300 | 300 | 300 | | | | | |
| | | Width | mm | 550 | 550 | 700 | 700 | | | | | |
| | | Depth | mm | 800 | 800 | 800 | 800 | | | | | |
| Weight | Unit | kg | 30 | 30 | 30 | 30 | 31 | | | | | |
| | Packed Unit | kg | 34 | 34 | 34 | 34 | 35 | | | | | |
| Required Ceiling Void | | | mm | 350 | 350 | 350 | 350 | | | | | |
| Heat Exchanger | Dimensions | Length | mm | 300 | 300 | 450 | 450 | | | | | |
| | | Nr of Rows | | 3 | 3 | 3 | 3 | | | | | |
| | | Fin Pitch | mm | 1.75 | 1.75 | 1.75 | 1.75 | | | | | |
| | | Nr of Passes | | 3 | 3 | 4 | 4 | | | | | |
| | | Face Area | m² | 0.088 | 0.088 | 0.088 | 0.132 | | | | | |
| | | Nr of Stages | | 14 | 14 | 14 | 14 | | | | | |
| | Empty Tubeplate Hole | | | | | 14 | | | | | | |
| | Tube type | | Hi-XSS (7) | | | | | | | | | |
| Fan | Fin | Fin type | | Symmetric waffle louvre | | | | | | | | |
| | | Treatment | | Hydrophilic | | | | | | | | |
| Fan | Type | | Sirocco fan | | | | | | | | | |
| | Quantity | | 1 | 1 | 1 | 1 | 1 | | | | | |
| Air Flow Rate | Cooling | High | m³/min | 9.00 | 9.00 | 9.50 | 11.50 | | | | | |
| | | Low | m³/min | 6.50 | 6.50 | 7.00 | 9.00 | | | | | |
| | Heating | High | m³/min | 9.00 | 9.00 | 9.50 | 11.50 | | | | | |
| | | Low | m³/min | 6.50 | 6.50 | 7.00 | 9.00 | | | | | |
| Fan | External static pressure | High | Pa | 125 | 125 | 104 | 116 | | | | | |
| | | Standard | Pa | 105 | 105 | 88 | 98 | | | | | |
| | | Low | Pa | 96 | 96 | 78 | 85 | | | | | |
| | | Quantity | | 1 | 1 | 1 | 1 | | | | | |
| | Motor | Model | | D18H3AA1V1 | D18H3AA1V1 | D18H3AA1V1 | D18H2AC1V1 | | | | | |
| | | Steps | | step motor | | | | | | | | |
| | | Output (high) | W | 50 | 50 | 50 | 65 | | | | | |
| | | Drive | | Direct drive | | | | | | | | |
| Refrigerant | Name | | R-410A | | | | | | | | | |
| Sound Level | Cooling | Sound power (nominal) | dBA | 50.0 | 50.0 | 51.0 | 56.0 | | | | | |
| Cooling | Sound Pressure | High | dBA | 32.0 | 32.0 | 33.0 | 33.0 | | | | | |
| Heating | Sound Pressure | High | dBA | 32.0 | 32.0 | 33.0 | 33.0 | | | | | |
| Piping connections | Liquid (OD) | Type | | Flare connection | | | | | | | | |
| | | Diameter | mm | 6.35 | 6.35 | 6.35 | 6.35 | | | | | |
| | Gas | Type | | Flare connection | | | | | | | | |
| | | Diameter | mm | 12.7 | 12.7 | 12.7 | 12.7 | | | | | |
| Decoration Panel | Drain | Diameter | mm | 32 | 32 | 32 | 32 | | | | | |
| | Heat Insulation | | Both liquid and gas pipes | | | | | | | | | |
| | Model | | CZ-01HPF11P | CZ-01HPF11P | CZ-01HPF11P | CZ-02HPF11P | CZ-02HPF11P | | | | | |
| | Colour | | White (10Y9/0,5) | | | | | | | | | |
| | Dimensions | Height | mm | 55 | 55 | 55 | 55 | | | | | |
| | | Width | mm | 650 | 650 | 800 | 800 | | | | | |
| | | Depth | mm | 500 | 500 | 500 | 500 | | | | | |
| | Weight | kg | | 3 | 3 | 3.5 | 3.5 | | | | | |
| Drain-up Height | | mm | 600 | 600 | 600 | 600 | 600 | | | | | |
| Air Filter | | Resin net with mold resistance | | | | | | | | | | |
| Air direction control | | Up and downwards | | | | | | | | | | |
| Refrigerant control | | Electronic expansion valve | | | | | | | | | | |
| Temperature control | | Microprocessor thermostat for cooling and heating | | | | | | | | | | |
| Safety devices | | PC board fuse, Drain pump fuse, Fan motor thermal fuse | | | | | | | | | | |
| Standard Accessories | | | Metal clamp for drain hose, Paper pattern for installation, Drain hose, Insulation for fitting, Washer for hanger bracket, Screws for duct flanges, Screws for fixing the paper pattern for installation, Fuse, Installation and operation manual | | | | | | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | | | | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | | | | | | | | |
| | The external static pressure is changeable : change the connectors inside the electrical box, this pressure means : High static pressure -standard - low static pressure | | | | | | | | | | | |
| | The external static pressure is changeable : change the connectors inside the electrical box, this pressure means : High static pressure -standard | | | | | | | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | | | | | | |
| | The sound pressure values are mentioned for a unit installed with rear suction | | | | | | | | | | | |

Ceiling Mounted Built-in Type

| 1-1 TECHNICAL SPECIFICATIONS | | | S-63FM3HPQ | S-80FM3HPQ | S-100FM3HPQ | S-125FM3HPQ | | |
|---|--|-----------------------|---|---|--------------|-------------|--|--|
| Capacity (Conditions specified in 1) | Cooling | kW | 7.10 | 9.00 | 11.20 | 14.00 | | |
| | Heating | kW | 8.00 | 10.00 | 12.50 | 16.00 | | |
| Power input (Nominal) | Cooling | kW | 0.189 | 0.234 | 0.242 | 0.321 | | |
| | Heating | kW | 0.169 | 0.214 | 0.222 | 0.301 | | |
| Casing | Colour | | | Non painted | | | | |
| | Material | | | Galvanised steel | | | | |
| Dimensions | Packing | Height | mm | 354 | 356 | 356 | | |
| | | Width | mm | 1192 | 1596 | 1596 | | |
| | | Depth | mm | 936 | 938 | 938 | | |
| | Unit | Height | mm | 300 | 300 | 300 | | |
| | | Width | mm | 1000 | 1400 | 1400 | | |
| | | Depth | mm | 800 | 800 | 800 | | |
| Weight | Unit | kg | 41 | 51 | 51 | 52 | | |
| | Packed Unit | kg | 47 | 58 | 58 | 59 | | |
| Required Ceiling Void | | | mm | 350 | 350 | 350 | | |
| Heat Exchanger | Dimensions | Length | mm | 750 | 1150 | 1150 | | |
| | | Nr of Rows | | 3 | 3 | 3 | | |
| | | Fin Pitch | mm | 1.75 | 1.75 | 1.75 | | |
| | | Nr of Passes | | 7 | 10 | 10 | | |
| | | Face Area | m² | 0.221 | 0.338 | 0.338 | | |
| | | Nr of Stages | | 14 | 14 | 14 | | |
| | Tube type | | | Hi-XSS (7) | | | | |
| | Fin | Fin type | | Symmetric waffle louvre | | | | |
| | | Treatment | | Hydrophilic | | | | |
| Fan | Type | | | Sirocco fan | | | | |
| | Quantity | | | 2 | 3 | 3 | | |
| Air Flow Rate | Cooling | High | m³/min | 21.00 | 27.00 | 28.00 | | |
| | | Low | m³/min | 15.50 | 20.00 | 20.50 | | |
| | Heating | High | m³/min | 21.00 | 27.00 | 28.00 | | |
| | | Low | m³/min | 15.50 | 20.00 | 20.50 | | |
| Fan | External static pressure | High | Pa | 123 | 141 | 141 | | |
| | | Standard | Pa | 111 | 125 | 125 | | |
| | | Low | Pa | | 98 | | | |
| | Motor | Quantity | | 1 | 1 | 1 | | |
| | | Model | | 2D18H2AB1V1 | 3D18H2AH1V1 | 3D18H2AH1V1 | | |
| | | Steps | | | step motor | | | |
| | | Output (high) | W | 125 | 135 | 135 | | |
| | | Drive | | | Direct drive | | | |
| Refrigerant | Name | | | R-410A | | | | |
| Sound Level | Cooling | Sound power (nominal) | dBA | 56.0 | 55.0 | 56.0 | | |
| Cooling | Sound Pressure | High | dBA | 35.0 | 37.0 | 38.0 | | |
| | | Low | dBA | 30.0 | 31.0 | 35.0 | | |
| Heating | Sound Pressure | High | dBA | 35.0 | 37.0 | 38.0 | | |
| | | Low | dBA | 30.0 | 31.0 | 35.0 | | |
| Piping connections | Liquid (OD) | Type | | Flare connection | | | | |
| | | Diameter | mm | 9.5 | 9.5 | 9.5 | | |
| | Gas | Type | | Flare connection | | | | |
| | | Diameter | mm | 15.9 | 15.9 | 15.9 | | |
| | Drain | Diameter | mm | 32 | 32 | 32 | | |
| Heat Insulation | | | | Both liquid and gas pipes | | | | |
| Decoration Panel | Model | | | CZ-03HPF11P | CZ-06HPF11P | CZ-06HPF11P | | |
| | Colour | | | White (10Y9/0,5) | | | | |
| | Dimensions | Height | mm | 55 | 55 | 55 | | |
| | | Width | mm | 1100 | 1500 | 1500 | | |
| | | Depth | mm | 500 | 500 | 500 | | |
| | Weight | kg | | 4.5 | 6.5 | 6.5 | | |
| Drain-up Height | | | mm | 600 | 600 | 600 | | |
| Air Filter | | | | Resin net with mold resistance | | | | |
| Air direction control | | | | Up and downwards | | | | |
| Refrigerant control | | | | Electronic expansion valve | | | | |
| Temperature control | | | | Microprocessor thermostat for cooling and heating | | | | |
| Safety devices | | | PC board fuse, Drain pump fuse, Fan motor thermal fuse | PC board fuse, Drain pump fuse, Fan motor thermal protector | | | | |
| Standard Accessories | | | Metal clamp for drain hose, Paper pattern for installation, Drain hose, Insulation for fitting, Washer for hanger bracket, Screws for duct flanges, Screws for fixing the paper pattern for installation, Fuse, Installation and operation manual | | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 8m, level difference : 0m. | | | | | | | |
| | The external static pressure is changeable : change the connectors inside the electrical box, this pressure means : High static pressure -standard - low static pressure | | | | | | | |
| | The external static pressure is changeable : change the connectors inside the electrical box, this pressure means : High static pressure -standard | | | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | | |
| | The sound pressure values are mentioned for a unit installed with rear suction | | | | | | | |

Ceiling Mounted Duct Type

| 1-1 TECHNICAL SPECIFICATIONS | | | S-40EM3HPS | S-50EM3HPS | S-63EM3HPS | S-80EM3HPS | S-100EM3HPS | S-125EM3HPS | | | |
|------------------------------|--------------------------|---------------|------------------------|------------------------|--|------------------------|------------------------|------------------------|--|--|--|
| Capacity | Cooling | kW | 4.5 | 5.6 | 7.1 | 9.0 | 11.2 | 14.0 | | | |
| | Heating | kW | 5.0 | 6.3 | 8.0 | 10.0 | 12.5 | 16.0 | | | |
| Power Input | Cooling | kW | 0.194 (1) 0.193 (2) | 0.215 (1) 0.214 (2) | 0.230 (1) 0.229 (2) | 0.298 (1) 0.297 (2) | 0.376 (1) 0.375 (2) | 0.461 (1) 0.460 (2) | | | |
| | Heating | kW | 0.182 | 0.203 | 0.218 | 0.286 | 0.364 | 0.449 | | | |
| Casing | Material | | | | Galvanised steel plate | | | | | | |
| Dimensions | Unit | Height | mm | 300 | 300 | 300 | 300 | 300 | | | |
| | | Width | mm | 700 | 1,000 | 1,000 | 1,400 | 1,400 | | | |
| | | Depth | mm | 700 | 700 | 700 | 700 | 700 | | | |
| Weight | Unit | | kg | 28 | 36 | 36 | 46 | 46 | | | |
| Heat Exchanger | Dimensions | Nr of Rows | | 3 | 3 | 3 | 3 | 3 | | | |
| | | Fin Pitch | mm | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | | | |
| | | Face Area | m ² | 0.148 | 0.249 | 0.249 | 0.383 | 0.383 | | | |
| | | Nr of Stages | | 16 | 16 | 16 | 16 | 16 | | | |
| Fan | Type | | | | Sirocco fan | | | | | | |
| Air Flow Rate | Cooling | High high | m ³ /min | 16 | 18 | 19.5 | 25 | 32 | | | |
| | | High | m ³ /min | 13 | 16.5 | 17.5 | 22.5 | 27 | | | |
| | | Low | m ³ /min | 11 | 15 | 16 | 20 | 23 | | | |
| Fan | External static pressure | High | Pa | 160 | 200 | 200 | 200 | 200 | | | |
| | | Standard | Pa | 100 | 100 | 100 | 100 | 100 | | | |
| | | Low | Pa | 30 | 50 | 50 | 50 | 50 | | | |
| | Motor | Output (high) | W | 140 | 350 | 350 | 350 | 350 | | | |
| Piping connections | Liquid (OD) | Type | | | Flare connection | | | | | | |
| | | Diameter | mm | 6.35 | 9.52 | 9.52 | 9.52 | 9.52 | | | |
| | | Type | | | Flare connection | | | | | | |
| | Gas | Diameter | mm | 12.7 | 15.9 | 15.9 | 15.9 | 15.9 | | | |
| | Drain | Diameter | mm | | | VP25 (I.D. 32/O.D. 25) | | | | | |
| Refrigerant control | | | | | Electronic expansion valve | | | | | | |
| Temperature control | | | | | Microprocessor thermostat for cooling and heating | | | | | | |
| Safety devices | | | | | Fuse, Fan driver overload protector | | | | | | |
| Standard Accessories | | | | | Operation manual, Installation manual, Drain hose, Sealing pads, Clamps, Washer, Screws, Insulation for fitting, Clamp metal, Air discharge flange, Air suction flange | | | | | | |
| Notes | | | | | Nominal cooling capacities are based on following conditions: return air temperature: 27°CDB/19°CWB; outdoor temperature: 35°CDB; standard external static pressure: 100Pa; equivalent refrigerant piping: 7.5m (horizontal) | | | | | | |
| | | | | | Nominal heating capacities are based on following conditions: return air temperature: 20°CDB; outdoor temperature: 7°CDB/6°CWB; standard external static pressure: 100Pa; equivalent refrigerant piping: 7.5m (horizontal) | | | | | | |
| | | | | | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | |
| | | | | | External static pressure is changeable in 13 or 14 stages within the () range by the remote control. | | | | | | |
| | | | | | Air filter is not standard accessory, but please mount it in the duct system of the suction side. Select its colorimetric method(gravity method) 50% or more. | | | | | | |

Ceiling Suspended Type

| 1-1 TECHNICAL SPECIFICATIONS | | | S-32TM3JPR | | S-63TM3JPR | | S-100TM3JPR | | | | | | |
|------------------------------|--|---------------|---------------------|------------------|------------|-----------|-------------|--|--|--|--|--|--|
| Nominal Capacity | Cooling | kW | 3.60 | 7.10 | 11.20 | | | | | | | | |
| | Heating | kW | 4.00 | 8.00 | 12.50 | | | | | | | | |
| Power input (Nominal) | Cooling | kW | 0.111 | 0.115 | 0.135 | | | | | | | | |
| | Heating | kW | 0.111 | 0.115 | 0.135 | | | | | | | | |
| Casing | Colour | | White (10Y9/0,5) | | | | | | | | | | |
| Dimensions | Unit | Height | mm | 195 | 195 | 195 | | | | | | | |
| | | Width | mm | 960 | 1160 | 1400 | | | | | | | |
| | | Depth | mm | 680 | 680 | 680 | | | | | | | |
| Weight | Unit | kg | | 24 | 28 | 33 | | | | | | | |
| Heat Exchanger | Dimensions | Nr of Rows | | 2 | 3 | 3 | | | | | | | |
| | | Fin Pitch | mm | 1.75 | 1.75 | 1.75 | | | | | | | |
| | | Face Area | m ² | 0.182 | 0.233 | 0.293 | | | | | | | |
| | | Nr of Stages | | 12 | 12 | 12 | | | | | | | |
| Fan | Type | Sirocco fan | | | | | | | | | | | |
| | Quantity | | | 1 | 1 | 1 | | | | | | | |
| Air Flow Rate | Cooling | High | m ³ /min | 12.00 | 17.50 | 25.00 | | | | | | | |
| | | Low | m ³ /min | 10.00 | 14.00 | 19.50 | | | | | | | |
| Fan | Motor | Quantity | | 1 | 1 | 1 | | | | | | | |
| | | Model | | 3D12K1AA1 | 4D12K1AA1 | 3D12K2AA1 | | | | | | | |
| | | Output (high) | W | 62 | 62 | 130 | | | | | | | |
| | | Drive | | Direct drive | | | | | | | | | |
| Refrigerant | Name | R-410A | | | | | | | | | | | |
| Cooling | Sound Pressure | High | dBA | 36.0 | 39.0 | 45.0 | | | | | | | |
| | | Low | dBA | 31.0 | 34.0 | 37.0 | | | | | | | |
| Piping connections | Liquid (OD) | Type | | Flare connection | | | | | | | | | |
| | | Diameter | mm | 6.4 | 9.5 | 9.5 | | | | | | | |
| | Gas | Type | | Flare connection | | | | | | | | | |
| | | Diameter | mm | 12.7 | 15.9 | 15.9 | | | | | | | |
| | | Drain | Diameter | 26 | 26 | 26 | | | | | | | |
| | Heat Insulation | | | Glass wool | | | | | | | | | |
| Air Filter | Resin net with mold resistance | | | | | | | | | | | | |
| Refrigerant control | Electronic expansion valve | | | | | | | | | | | | |
| Temperature control | Microprocessor thermostat for cooling and heating | | | | | | | | | | | | |
| Safety devices | PC board fuse, Fan motor thermal protector | | | | | | | | | | | | |
| Standard Accessories | Installation and operation manual, Drain hose, Paper pattern for installation, Clamp metal, Insulation for fitting Clamps, Washer | | | | | | | | | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 7.5m (horizontal) | | | | | | | | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 7.5m (horizontal) | | | | | | | | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | | | | | | | |

Wall Mounted Type

| 1-1 TECHNICAL SPECIFICATIONS | | | S-20KM3HPR | S-25KM3HPR | S-32KM3HPR | S-40KM3HPR | S-50KM3HPR | S-63KM3HPR | | | | | | |
|------------------------------|--|----------------|---------------------------------|------------------|------------|------------|------------|------------|------|--|--|--|--|--|
| Nominal Capacity | Cooling | kW | 2.20 | 2.80 | 3.60 | 4.50 | 5.60 | 7.10 | | | | | | |
| | Heating | kW | 2.50 | 3.20 | 4.00 | 5.00 | 6.30 | 8.00 | | | | | | |
| Power input (Nominal) | Cooling | kW | 0.016 | 0.022 | 0.027 | 0.020 | 0.027 | 0.050 | | | | | | |
| | Heating | kW | 0.024 | 0.027 | 0.032 | 0.020 | 0.032 | 0.060 | | | | | | |
| Casing | Colour | | white (3.0Y8.5/0.5) | | | | | | | | | | | |
| Dimensions | Unit | Height | mm | 290 | 290 | 290 | 290 | 290 | | | | | | |
| | | Width | mm | 795 | 795 | 795 | 1050 | 1050 | | | | | | |
| | | Depth | mm | 230 | 230 | 230 | 230 | 230 | | | | | | |
| Weight | Unit | kg | | 11 | 11 | 11 | 14 | 14 | | | | | | |
| Heat Exchanger | Dimensions | Nr of Rows | | 2 | 2 | 2 | 2 | 2 | | | | | | |
| | | Fin Pitch | mm | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | | | | | | |
| | | Face Area | m ² | 0.161 | 0.161 | 0.161 | 0.213 | 0.213 | | | | | | |
| | | Nr of Stages | | 14 | 14 | 14 | 14 | 14 | | | | | | |
| Fan | Type | Cross flow fan | | | | | | | | | | | | |
| | Quantity | | | 1 | 1 | 1 | 1 | | | | | | | |
| Air Flow Rate | Cooling | High | m ³ /min | 7.50 | 8.00 | 9.00 | 12.00 | 15.00 | | | | | | |
| | | Low | m ³ /min | 4.50 | 5.00 | 5.50 | 9.00 | 12.00 | | | | | | |
| Fan | Motor | Quantity | | 1 | 1 | 1 | 1 | 1 | | | | | | |
| | | Model | | QCL9661M | QCL9661M | QCL9661M | QCL9686M | QCL9686M | | | | | | |
| | | Output (high) | W | 40 | 40 | 40 | 43 | 43 | | | | | | |
| | | Drive | | Direct drive | | | | | | | | | | |
| Refrigerant | Name | R-410A | | | | | | | | | | | | |
| Cooling | Sound Pressure | High | dBA | 35.0 | 36.0 | 37.0 | 39.0 | 42.0 | | | | | | |
| | | Low | dBA | 29.0 | 29.0 | 29.0 | 34.0 | 36.0 | | | | | | |
| Piping connections | Liquid (OD) | Type | | Flare connection | | | | | | | | | | |
| | | Diameter | mm | 6.4 | 6.4 | 6.4 | 6.4 | 6.35 | 9.5 | | | | | |
| | Gas | Type | | Flare connection | | | | | | | | | | |
| | | Diameter | mm | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | 15.9 | | | | | |
| | | Drain | Diameter | 18 | 18 | 18 | 18 | 18 | 18 | | | | | |
| Heat Insulation | | | Foamed polystyrene/polyethylene | | | | | | | | | | | |
| Air Filter | Washable resin net | | | | | | | | | | | | | |
| Refrigerant control | Electronic expansion valve | | | | | | | | | | | | | |
| Temperature control | Microprocessor thermostat for cooling and heating | | | | | | | | | | | | | |
| Safety devices | PC board fuse | | | | | | | | | | | | | |
| Standard Accessories | Installation and operation manual, Installation panel, Paper pattern for installation, Insulation tape, Clamps, Screws | | | | | | | | | | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 5m (horizontal) | | | | | | | | | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 5m (horizontal) | | | | | | | | | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | | | | | | | | |

Floor Standing Type

| 1-1 TECHNICAL SPECIFICATIONS | | | S-20PM3HPS | FS-25PM3HPS | S-32PM3HPS | S-40PM3HPS | S-50PM3HPS | S-63PM3HPS | |
|------------------------------|----------------|---------------|--|------------------|------------|------------|------------|------------|------|
| Nominal Capacity | Cooling | kW | 2.20 | 2.80 | 3.60 | 4.50 | 5.60 | 7.10 | |
| | Heating | kW | 2.50 | 3.20 | 4.00 | 5.00 | 6.30 | 8.00 | |
| Power input (Nominal) | Cooling | kW | 0.049 | 0.049 | 0.090 | 0.090 | 0.110 | 0.110 | |
| | Heating | kW | 0.049 | 0.049 | 0.090 | 0.090 | 0.110 | 0.110 | |
| Casing | Colour | | Ivory white (5Y7,5/1) | | | | | | |
| Dimensions | Unit | Height | mm | 600 | 600 | 600 | 600 | 600 | |
| | | Width | mm | 1000 | 1000 | 1140 | 1140 | 1420 | |
| | | Depth | mm | 222 | 222 | 222 | 222 | 222 | |
| Weight | Unit | kg | 25 | 25 | 30 | 30 | 36 | 36 | |
| Heat Exchanger | Dimensions | Nr of Rows | | 3 | 3 | 3 | 3 | 3 | |
| | | Fin Pitch | mm | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | |
| | | Face Area | m ² | 0.159 | 0.159 | 0.200 | 0.200 | 0.282 | |
| | | Nr of Stages | | 14 | 14 | 14 | 14 | 14 | |
| Fan | Type | Sirocco fan | | | | | | | |
| | Quantity | | | 1 | 1 | 1 | 1 | 1 | |
| Air Flow Rate | Cooling | High | m ³ /min | 7.00 | 7.00 | 8.00 | 11.00 | 14.00 | |
| | | Low | m ³ /min | 6.00 | 6.00 | 6.00 | 8.50 | 11.00 | |
| Fan | Motor | Quantity | | 1 | 1 | 1 | 1 | 1 | |
| | | Model | | D14B20 | D14B20 | 2D14B13 | 2D14B13 | 2D14B20 | |
| | | Output (high) | W | 15 | 15 | 25 | 25 | 35 | |
| | | Drive | | Direct drive | | | | | |
| Refrigerant | Name | R-410A | | | | | | | |
| Cooling | Sound Pressure | High | dBA | 35.0 | 35.0 | 35.0 | 38.0 | 39.0 | |
| | | Low | dBA | 32.0 | 32.0 | 32.0 | 33.0 | 34.0 | |
| Piping connections | Liquid (OD) | Type | | Flare connection | | | | | |
| | | Diameter | mm | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 9.5 |
| | Gas | Type | | Flare connection | | | | | |
| | | Diameter | mm | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | 15.9 |
| | Drain | Diameter | mm | O.D. 21 | | | | | |
| Heat Insulation | | | Glass Fiber/Urethane Foam | | | | | | |
| Air Filter | | | Resin net with mold resistance | | | | | | |
| Refrigerant control | | | Electronic expansion valve | | | | | | |
| Temperature control | | | Microprocessor thermostat for cooling and heating | | | | | | |
| Safety devices | | | PC board fuse, Fan motor thermal protector | | | | | | |
| Standard Accessories | | | Installation and operation manual, Insulation for fitting, Drain hose, Clamps, Screws, Level adjustment screw, Washer | | | | | | |
| Notes | | | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 7.5m (horizontal) | | | | | | |
| | | | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 7.5m (horizontal) | | | | | | |
| | | | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | |
| | | | Sound pressure levels are measured at 220V | | | | | | |

Concealed Floor Standing Type

| 1-1 TECHNICAL SPECIFICATIONS | | | S-20RM3HPS | S-25RM3HPS | S-32RM3HPS | S-40RM3HPS | FS-50RM3HPS | S-63RM3HPS | | | | | | |
|------------------------------|--|---------------|---------------------------|------------------|------------|------------|-------------|------------|------|--|--|--|--|--|
| Nominal Capacity | Cooling | kW | 2.20 | 2.80 | 3.60 | 4.50 | 5.60 | 7.10 | | | | | | |
| | Heating | kW | 2.50 | 3.20 | 4.00 | 5.00 | 6.30 | 8.00 | | | | | | |
| Power input (Nominal) | Cooling | kW | 0.049 | 0.049 | 0.090 | 0.090 | 0.110 | 0.110 | | | | | | |
| | Heating | kW | 0.049 | 0.049 | 0.090 | 0.090 | 0.110 | 0.110 | | | | | | |
| Casing | Material | | Galvanised steel | | | | | | | | | | | |
| Dimensions | Unit | Height | mm | 610 | 610 | 610 | 610 | 610 | | | | | | |
| | | Width | mm | 930 | 930 | 1070 | 1070 | 1350 | | | | | | |
| | | Depth | mm | 220 | 220 | 220 | 220 | 220 | | | | | | |
| Weight | Unit | kg | 19 | 19 | 23 | 23 | 27 | 27 | | | | | | |
| Heat Exchanger | Dimensions | Nr of Rows | | 3 | 3 | 3 | 3 | 3 | | | | | | |
| | | Fin Pitch | mm | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | | | | | | |
| | | Face Area | m ² | 0.159 | 0.159 | 0.200 | 0.200 | 0.282 | | | | | | |
| | | Nr of Stages | | 14 | 14 | 14 | 14 | 14 | | | | | | |
| Fan | Type | Sirocco fan | | | | | | | | | | | | |
| | Quantity | | | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Air Flow Rate | Cooling | High | m ³ /min | 7.00 | 7.00 | 8.00 | 11.00 | 14.00 | | | | | | |
| | | Low | m ³ /min | 6.00 | 6.00 | 6.00 | 8.50 | 11.00 | | | | | | |
| Fan | Motor | Quantity | | 1 | 1 | 1 | 1 | 1 | | | | | | |
| | | Model | | D14B20 | D14B20 | 2D14B13 | 2D14B13 | 2D14B20 | | | | | | |
| | | Output (high) | W | 15 | 15 | 25 | 25 | 35 | | | | | | |
| | | Drive | | Direct drive | | | | | | | | | | |
| Refrigerant | Name | R-410A | | | | | | | | | | | | |
| Cooling | Sound Pressure | High | dBA | 35.0 | 35.0 | 35.0 | 38.0 | 39.0 | | | | | | |
| | | Low | dBA | 32.0 | 32.0 | 32.0 | 33.0 | 34.0 | | | | | | |
| Piping connections | Liquid (OD) | Type | | Flare connection | | | | | | | | | | |
| | | Diameter | mm | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 9.5 | | | | | |
| | Gas | Type | | Flare connection | | | | | | | | | | |
| | | Diameter | mm | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | 15.9 | | | | | |
| | Drain | Diameter | mm | O.D. 21 | | | | | | | | | | |
| Heat Insulation | | | Glass Fiber/Urethane Foam | | | | | | | | | | | |
| Air Filter | Resin net with mold resistance | | | | | | | | | | | | | |
| Refrigerant control | Electronic expansion valve | | | | | | | | | | | | | |
| Temperature control | Microprocessor thermostat for cooling and heating | | | | | | | | | | | | | |
| Safety devices | PC board fuse, Fan motor thermal protector | | | | | | | | | | | | | |
| Standard Accessories | Installation and operation manual, Insulation for fitting, Drain hose, Clamps, Screws, Washer, Level adjustment screw | | | | | | | | | | | | | |
| Notes | Nominal cooling capacities are based on : indoor temperature : 27°CDB, 19°CWB, outdoor temperature : 35°CDB, equivalent refrigerant piping : 7.5m (horizontal) | | | | | | | | | | | | | |
| | Nominal heating capacities are based on : indoor temperature : 20°CDB, outdoor temperature : 7°CDB, 6°CWB, equivalent refrigerant piping : 7.5m (horizontal) | | | | | | | | | | | | | |
| | Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat. | | | | | | | | | | | | | |
| | Sound pressure levels are measured at 220V | | | | | | | | | | | | | |

Part 3

List of Electrical and Functional Parts

| | | |
|-----|---|----|
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| 1.1 | Outdoor Unit..... | 30 |
| 1.2 | Indoor Unit | 32 |

1. List of Electrical and Functional Parts

1.1 Outdoor Unit

U-4, 5, 6ML5XPQ

| Item | Name | Symbol | Model | | | Remark (PCB terminal) |
|------------------------|--------------------------------------|-------------------------------|--|------------|-------|--------------------------|
| | | | 4HP | 5HP | 6HP | |
| Compressor | Inverter | M1C | JT1G-VDLYR | | | Relay |
| | | | 2.5kW | 3.0kW | 3.5kW | A2P X102A |
| Crankcase heater (INV) | | | E1HC | 33W | | |
| Fan motor | Motor | M1F-M2F | 0.07kW | | | — |
| | Over-current relay | — | 3.2A | | | — |
| Functional parts | Electronic expansion valve (Main) | Cooling | Y1E | 480plis | | A1P X21A |
| | | Heating | | PI control | | |
| | Electronic expansion valve (Subcool) | Cooling | Y3E | PI control | | A1P X22A |
| | | Heating | | PI control | | |
| | 4 way valve | Y1S | STF-0404G | | | A1P X25A |
| | Solenoid valve (Hot gas) | Y2S | TEV1620DQ2 | | | A1P X26A |
| | Solenoid valve (Unload circuit) | Y3S | TEV1620DQ2 | | | A1P X27A |
| Pressure-related parts | Pressure switch (INV) | S1PH | ACB-4UB10 OFF: 4.0+0/-0.15MPa ON: 3.0±0.15MPa | | | A1P X32A |
| | Pressure sensor (HP) | S1NPH | PS8051A 0~4.15MPa | | | A1P X17A |
| | Pressure sensor (LP) | S1NPL | PS8051A -0.05~1.7MPa | | | A1P X18A |
| Thermistor | Main PCB | For outdoor air | R1T | 3.5~360kΩ | | |
| | | For discharge pipe | R2T | 5.0~640kΩ | | |
| | | For suction pipe 1 | R3T | 3.5~360kΩ | | |
| | | For subcooling heat exchanger | R4T | 3.5~360kΩ | | |
| | | For suction pipe 2 | R5T | 3.5~360kΩ | | |
| | | For heat exchanger | R6T | 3.5~360kΩ | | |
| | | For liquid pipe 1 | R7T | 3.5~360kΩ | | |
| | | For liquid pipe 2 | R8T | 3.5~360kΩ | | |
| Others | Fuse (A1P) | F1U | AC250V 6.3A Time lag fuse | | | — |

U-4, 5, 6ML5DPQ

| Item | Name | Symbol | Model | | | Remark (PCB terminal) | | |
|------------------------|--------------------------------------|-------------------------------|--|-----------|-------|--------------------------|--|--|
| | | | 4HP | 5HP | 6HP | | | |
| Compressor | Inverter | M1C | JT100G-VDL | | | Relay | | |
| | Output | | 2.5kW | 3.0kW | 3.5kW | A1P | | |
| Crankcase heater (INV) | | | E1HC | 33W | | A1P X28A | | |
| Fan motor | Motor | M1F-M2F | 0.07kW | | | — | | |
| | Over-current relay | — | 3.2A | | | — | | |
| Functional parts | Electronic expansion valve (Main) | Y1E | 480plis | | | A1P X21A | | |
| | Heating | | PI control | | | | | |
| | Electronic expansion valve (Subcool) | Y3E | PI control | | | A1P X22A | | |
| | Heating | | PI control | | | | | |
| | 4 way valve | Y1S | STF-0404G | | | A1P X25A | | |
| | Solenoid valve (Hot gas) | Y2S | TEV1620DQ2 | | | A1P X26A | | |
| | Solenoid valve (Unload circuit) | Y3S | TEV1620DQ2 | | | A1P X27A | | |
| Pressure-related parts | Pressure switch (INV) | S1PH | ACB-4UB10 OFF: 4.0+0/-0.15MPa ON: 3.0±0.15MPa | | | A1P X32A | | |
| | Pressure sensor (HP) | S1NPH | PS8051A 0~4.15MPa | | | A1P X17A | | |
| | Pressure sensor (LP) | S1NPL | PS8051A -0.05~1.7MPa | | | A1P X18A | | |
| Thermistor | Main PCB | For outdoor air | R1T | 3.5~360kΩ | | A1P X11A | | |
| | | For discharge pipe | R2T | 5.0~640kΩ | | A1P X12A 1-2Pin | | |
| | | For suction pipe 1 | R3T | 3.5~360kΩ | | A1P X12A 3-4Pin | | |
| | | For heat exchanger | R4T | 3.5~360kΩ | | A1P X12A 5-6Pin | | |
| | | For suction pipe 2 | R5T | 3.5~360kΩ | | A1P X12A 7-8Pin | | |
| | | For subcooling heat exchanger | R6T | 3.5~360kΩ | | A1P X13A 1-2Pin | | |
| | | For liquid pipe 1 | R7T | 3.5~360kΩ | | A1P X13A 3-4Pin | | |
| | | For liquid pipe 2 | R8T | 3.5~360kΩ | | A1P X13A 5-6Pin | | |
| Others | Fuse (A1P) | F1U | AC250V 6.3A Time lag fuse | | | — | | |

1.2 Indoor Unit

| Parts Name | | Symbol | Model | | | | | | | | Remark |
|-------------------|--|--------|---|----------------|----------------|----------------|----------------|----------------|----------------|---------------------|--------|
| | | | S-20UM4 JPQ | S-25UM4 JPQ | S-32UM4 JPQ | S-40UM4 JPQ | S-50UM4 JPQ | S-63UM4 JPQ | S-80UM4 JPQ | S-100 UM4 JPQ | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | | | | Option |
| | Wireless Remote Controller | | CZ-02RWU12P | | | | | | | | |
| Motors | Fan Motor | M1F | Thermal Protector : OFF : 108 ^{±5} (ON : 96 ^{±15}) | | | | | | | | |
| | Drain Pump | M1P | AC220-240V (50Hz) AC220V (60Hz) PLD-12230DM Thermal Fuse 145°C | | | | | | | | |
| | Swing Motor | M1S | MP35HCA[3P007482-1] Stepping Motor DC16V | | | | | | | | |
| Thermistors | Thermistor (Suction Air) | R1T | In PC board A4P or wired remote controller | | | | | | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-5 φ8 L1000 20kΩ (25°C) | | | | | | | | |
| | Thermistor (Heat Exchanger) | R2T | ST8602A-5 φ6 L1000 20kΩ (25°C) | | | | | | | | |
| Others | Float Switch | S1L | FS-0211B | | | | | | | | |
| | Fuse | F1U | 250V 5A φ5.2 | | | | | | | | |
| | Thermal Fuse | TFu | — | | | | | | | | |
| | Transformer | T1R | — | | | | | | | | |

| Parts Name | | Symbol | Model | | | | | | | | Remark |
|-------------------|--|--------|--|----------------|----------------|----------------|----------------|----------------|----------------|---------------------|--------|
| | | | S-20LM3 HPQ | S-25LM3 HPQ | S-32LM3 HPQ | S-40LM3 HPQ | S-50LM3 HPQ | S-63LM3 HPQ | S-80LM3 HPQ | S-120 LM3 HPQ | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | | | | Option |
| | Wireless Remote Controller | | CZ-01RWL12P | | | | | | | | |
| Motors | Fan Motor | M1F | AC 220~240V 50Hz | | | | | | | | |
| | | | 1φ10W | 1φ15W | 1φ20W | 1φ30W | 1φ50W | 1φ85W | | | |
| | Drain Pump | M1P | AC220-240V (50Hz) AC220V (60Hz) PLD-12230DM Thermal Fuse 145°C | | | | | | | | |
| | Swing Motor | M1S | MT8-L[3PA07509-1] AC200~240V | | | | | | | | |
| Thermistors | Thermistor (Suction Air) | R1T | ST8601-6 φ4 L1250 20kΩ (25°C) | | | | | | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-6 φ8 L1250 20kΩ (25°C) | | | | | | | | |
| | Thermistor (Heat Exchanger) | R2T | ST8602A-5 φ6 L1000 20kΩ (25°C) | | | | | | | | |
| Others | Float Switch | S1L | FS-0211B | | | | | | | | |
| | Fuse | F1U | 250V 5A φ5.2 | | | | | | | | |
| | Transformer | T1R | TR22H21R8 | | | | | | | | |

| Parts Name | | Symbol | Model | | | | | Remark |
|-------------------|--|--------|---|----------------|----------------|----------------|----------------|--------|
| | | | S-20YM3 HPQ | S-25YM3 HPQ | S-32YM3 HPQ | S-40YM3 HPQ | S-50YM3 HPQ | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | Option |
| | Wireless Remote Controller | | CZ-01RWY12P | | | | | |
| Motors | Fan Motor | M1F | AC 220~240V 50Hz | | | | | |
| | | | 1φ55W 4P | | | | | |
| | | | Thermal Fuse OFF : 130 ^{±5} / ON : 80 ^{±20} | | | | | |
| | Capacitor, fan motor | C1 | 4.0μF 400VAC | | | | | |
| Others | Drain Pump | M1P | AC220-240V (50Hz) PLD-12230DM Thermal Fuse 145°C | | | | | |
| | Swing Motor | M1S | MP35HCA [3P080801-1] AC200~240V | | | | | |
| | Thermistor (Suction Air) | R1T | ST8601A-1 φ4 L250 20kΩ (25°C) | | | | | |
| Thermistors | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-3 φ8 L630 20kΩ (25°C) | | | | | |
| | Thermistor (Heat Exchanger) | R2T | ST8602A-3 φ6 L630 20kΩ (25°C) | | | | | |
| | Float Switch | S1L | FS-0211 | | | | | |
| Others | Fuse | F1U | 250V 5A φ5.2 | | | | | |
| | Transformer | T1R | TR22H21R8 | | | | | |

| Parts Name | | Symbol | Model | | | | Remark | | | |
|-------------------|--|--------|---|----------------|--|----------------|----------|--|--|--|
| | | | S-25DM3 HPS | S-32DM3 HPS | S-40DM3 HPS | S-63DM3 HPS | | | | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | | | |
| | Wireless Remote Controller | | CZ-02RWD12P | | | | | | | |
| Motors | Fan Motor | M1F | AC 220~240V 50Hz | | | | | | | |
| | | | 1φ15W 4P | | | 1φ20W 4P | 1φ45W 4P | | | |
| | | | Thermal Fuse 146°C | | Thermal protector 120°C : OFF 105°C : ON | | | | | |
| | Drain Pump | M1P | AC 220-240V (50Hz) PLD-12200DM Thermal Fuse 145°C | | | | | | | |
| Thermistors | Swing Motor | M1S | MP35HCA [3P080801-1] AC200~240V | | | | | | | |
| | Thermistor (Suction Air) | R1T | ST8601-13 φ4 L630 20kΩ (25°C) | | | | | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-7 φ8 L1600 20kΩ (25°C) | | | | | | | |
| Others | Thermistor (Heat Exchanger) | R2T | ST8602A-7 φ6 L1600 20kΩ (25°C) | | | | | | | |
| | Float Switch | S1L | FS-0211B | | | | | | | |
| | Fuse | F1U | 250V 5A φ5.2 | | | | | | | |
| | Transformer | T1R | TR22H21R8 | | | | | | | |

| Parts Name | | Symbol | Model | | Remark |
|-------------------|--|--------|---|----------------|--------|
| | | | S-20NM3 HPQ | S-25NM3 HPQ | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | Option |
| | Wireless Remote Controller | | CZ-02RWF12P | | |
| Motors | Fan Motor | M1F | AC 200~240V 50/60Hz | | |
| | | | 1φ10W4P | | |
| | | | Thermal protector 135°C: OFF, 87°C: ON | | |
| Thermistors | Thermistor (Suction Air) | R1T | ST8601-4 φ4 L=800 20kΩ (25°C) | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-7 φ8 L=1600 20kΩ (25°C) | | |
| | Thermistor (Heat Exchanger) | R2T | ST8602A-6 φ6 L=1250 20kΩ (25°C) | | |
| Others | Fuse | F1U | 250V 10A | | |
| | Transformer | T1R | TR22H21R8 | | |

| Parts Name | | Symbol | Model | | | | | | | | | Remark | | | |
|-------------------|--|--------|--|--------------------|--------------------|--------------------|--------------------|--------------------|--|---------------------|---------------------|--------|--|--|--|
| | | | S-20 FM3 HPQ | S-25 FM3 HPQ | S-32 FM3 HPQ | S-40 FM3 HPQ | S-50 FM3 HPQ | S-63 FM3 HPQ | S-80 FM3 HPQ | S-100 FM3 HPQ | S-125 FM3 HPQ | | | | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | | | | | Option | | | |
| | Wireless Remote Controller | | CZ-02RWF12P | | | | | | | | | | | | |
| Motors | Fan Motor | M1F | AC 220~240V 50Hz | | | | | | | | | | | | |
| | | | 1φ50W | | | 1φ65W | 1φ85W | 1φ125W | 1φ225W | | | | | | |
| | | | Thermal Fuse 152°C | | | | | | Thermal protector 135°C : OFF 87°C : ON | | | | | | |
| | Drain Pump | M1P | AC220-240V (50Hz) PLD-12230DM Thermal Fuse 145°C | | | | | | | | | | | | |
| Thermistors | Thermistor (Suction Air) | R1T | ST8601-4 φ4 L800 20kΩ (25°C) | | | | | | | | | | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-7 φ8 L1600 20kΩ (25°C) | | | | | | | | | | | | |
| | Thermistor (Heat Exchanger) | R2T | ST8602A-6 φ6 L1250 20kΩ (25°C) | | | | | | | | | | | | |
| Others | Float Switch | S1L | FS-0211B | | | | | | | | | | | | |
| | Fuse | F1U | 250V 5A φ5.2 | | | | | | | | | | | | |
| | Transformer | T1R | TR22H21R8 | | | | | | | | | | | | |

| Parts Name | | Symbol | Model | | | | | | Remark |
|-------------------|--|---------|--|----------------|----------------|----------------|-----------------|-----------------|--------|
| | | | S-40EM3 HPS | S-50EM3 HPS | S-63EM3 HPS | S-80EM3 HPS | S-100EM3 HPS | S-125EM3 HPS | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | | |
| | Wireless Remote Controller | | CZ-02RWF12P | | | | | | |
| Motors | Fan Motor | M1F | DC280V 140W 8P | | | | DC373V 350W 8P | | |
| | Drain Pump | M1P | AC220-240V (50/60Hz) PLD-12230DM Thermal protector 145°C | | | | | | |
| Thermistors | Thermistor (Suction Air) | R1T | ST8601-3 φ L630 20kΩ (25°C) | | | | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-14 φ8 L1000 20kΩ (25°C) | | | | | | |
| | Thermistor (for Heat Exchanger) | R2T | ST8602A-6 φ8 L1250 20kΩ (25°C) | | | | | | |
| Others | Float Switch | S1L | FS-0211B | | | | | | |
| | Fuse (A1P) | F1U | 250V 3.15A | | | | | | |
| | Fuse (A2P, A3P) | F3U-F4U | 250V 6.3A | | | | | | |
| | Fuse (A2P) | F2U | 250V 5A | — | | | | | |

| Parts Name | | Symbol | Model | | | Remark |
|-------------------|--|--------|---|----------------|--------------------------------------|--------|
| | | | S-32TM3 JPR | S-63TM3 JPR | S-100TM3 JPR | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | Option |
| | Wireless Controller | | CZ-01RWT12P | | | |
| Motors | Fan Motor | M1F | AC 220~240V/220V 50Hz/60Hz | | | |
| | | | 1φ63W | 1φ130W | | |
| | Capacitor for Fan Motor | C1R | Thermal protector 130°C : OFF 80°C : ON | | | |
| Thermistors | Swing Motor | M1S | MT8-L[3P058751-1] AC200~240V | | | |
| | Thermistor (Suction Air) | R1T | ST8601A-1 φ4 L250 20kΩ (25°C) | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-6 φ8 L = 1250 20kΩ (25°C) | | ST8605-6 φ8 L = 1250 20kΩ (25°C) | |
| Others | Thermistor (Heat Exchanger) | R2T | ST8602A-6 φ6 L = 1250 20kΩ (25°C) | | ST8602A-6 φ6 L = 1250 20kΩ (25°C) | |
| | Fuse | F1U | 250V 5A φ5.2 | | | |
| | Transformer | T1R | TR22H21R8 | | | |

| Parts Name | | Symbol | Model | | | | | | Remark | | | |
|-------------------|--|--------|---|----------------|----------------|---------------------------------|----------------|----------------|--------|--|--|--|
| | | | S-20KM3 HPR | S-25KM3 HPR | S-32KM3 HPR | S-40KM3 HPR | S-50KM3 HPR | S-63KM3 HPR | | | | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | | Option | | | |
| | Wireless Remote Controller | | CZ-01RWT12P | | | | | | | | | |
| Motors | Fan Motor | M1F | AC 220~240V 50Hz | | | | | | | | | |
| | | | 1φ40W | 1φ43W | | | | | | | | |
| | Swing Motor | M1S | Thermal protector 130°C : OFF 80°C : ON | | | MP24 [3SB40333-1] AC200~240V | | | | | | |
| Thermistors | Thermistor (Suction Air) | R1T | ST8601-2 φ4 L400 20kΩ (25°C) | | | | | | | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-2 φ8 L400 20kΩ (25°C) | | | | | | | | | |
| | Thermistor (for Heat Exchanger) | R2T | ST8602-2 φ6 L400 20kΩ (25°C) | | | | | | | | | |
| Others | Float Switch | S1L | OPTION | | | | | | | | | |
| | Fuse | F1U | 250V 5A φ5.2 | | | | | | | | | |

| Parts Name | | Symbol | Model | | | | | | Remark |
|-------------------|--|--------|-----------------------------------|----------------|----------------|----------------|----------------|----------------|--------|
| | | | S-20PM3 HPS | S-25PM3 HPS | S-32PM3 HPS | S-40PM3 HPS | S-50PM3 HPS | S-63PM3 HPS | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | | Option |
| | Wireless Remote Controller | | CZ-02RWF12P | | | | | | |
| Motors | Fan Motor | M1F | AC 220~240V 50Hz | | | | | | |
| | | | 1φ15W | 1φ25W | 1φ35W | | | | |
| | Capacitor for Fan Motor | C1R | 1.0μF-400V | 0.5μF-400V | 1.0μF-400V | 1.5μF-400V | 2.0μF-400V | | |
| Thermistors | Thermistor (Suction Air) | R1T | ST8601-6 φ4 L1250 20kΩ (25°C) | | | | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-9 φ8 L2500 20kΩ (25°C) | | | | | | |
| | Thermistor (for Heat Exchanger) | R2T | ST8602A-9 φ6 L2500 20kΩ (25°C) | | | | | | |
| Others | Fuse | F1U | AC250V 5A | | | | | | |
| | Transformer | T1R | TR22H21R8 | | | | | | |

| Parts Name | | Symbol | Model | | | | | | Remark |
|-------------------|--|--------|-----------------------------------|----------------|----------------|----------------|----------------|----------------|--------|
| | | | S-20PM3 HPS | S-25PM3 HPS | S-32PM3 HPS | S-40PM3 HPS | S-50PM3 HPS | S-63PM3 HPS | |
| Remote Controller | Wired Remote Controller | | CZ-02RT11P | | | | | | Option |
| | Wireless Remote Controller | | CZ-02RWF12P | | | | | | |
| Motors | Fan Motor | M1F | AC 220~240V 50Hz | | | | | | |
| | | | 1φ15W | 1φ25W | 1φ35W | | | | |
| | Capacitor for Fan Motor | C1R | 1.0μF-400V | 0.5μF-400V | 1.0μF-400V | 1.5μF-400V | 2.0μF-400V | | |
| Thermistors | Thermistor (Suction Air) | R1T | ST8601-6 φ4 L1250 20kΩ (25°C) | | | | | | |
| | Thermistor (for Heat Exchanger High Temp.) | R3T | ST8605-9 φ8 L2500 20kΩ (25°C) | | | | | | |
| | Thermistor (for Heat Exchanger) | R2T | ST8602A-9 φ6 L2500 20kΩ (25°C) | | | | | | |
| Others | Fuse | F1U | AC250V 5A | | | | | | |
| | Transformer | T1R | TR22H21R8 | | | | | | |

Part 4

Refrigerant Circuit

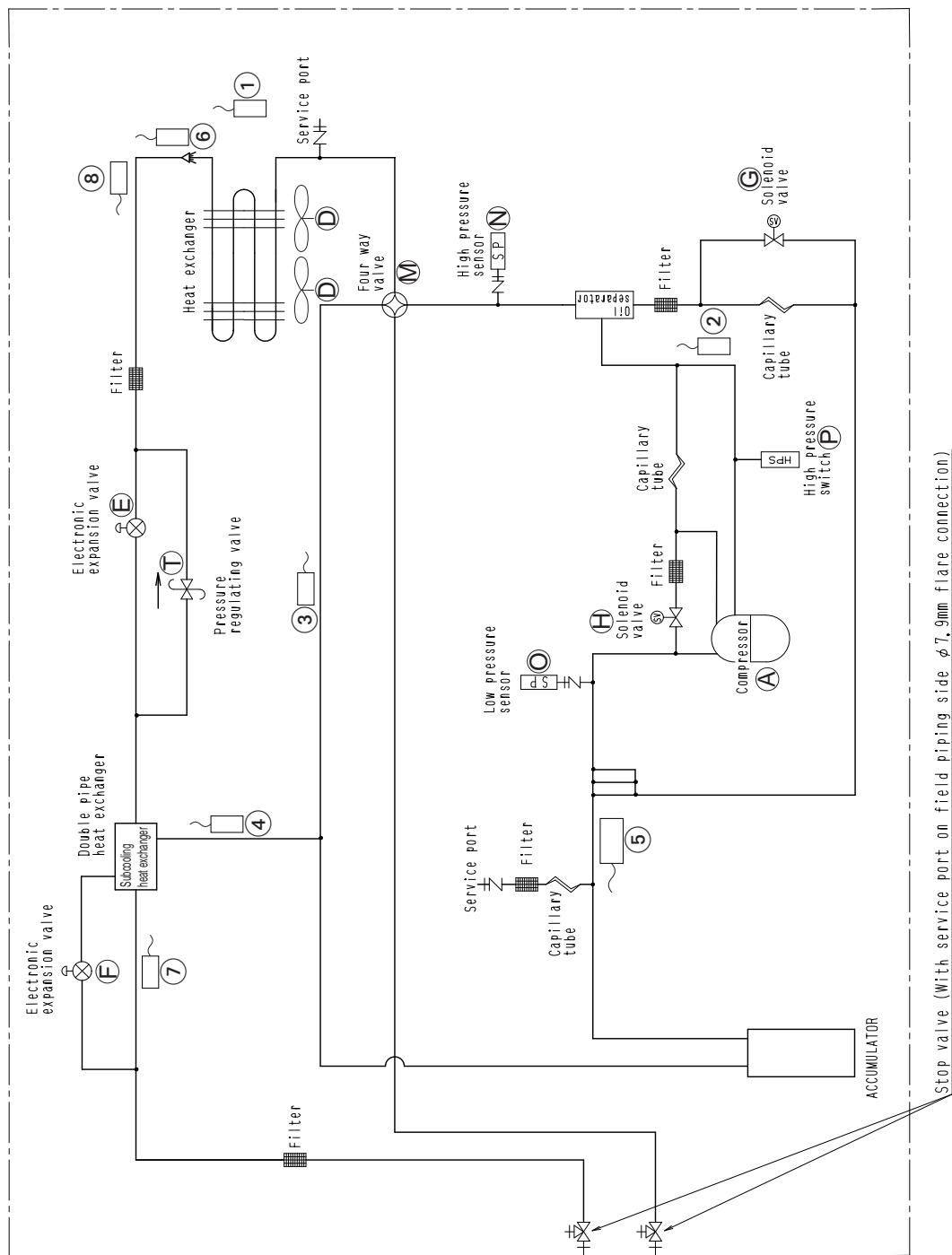
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|-----|-------------------------------|----|
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1. Refrigerant Circuit

1.1 Outdoor Unit

U-4, 5, 6ML5XPQ

| No. in refrigerant system diagram | Symbol | Name | Major Function |
|-----------------------------------|------------|--|--|
| A | M1C | Inverter compressor (INV) | Inverter compressor is operated on frequencies between 36 Hz and 195 Hz by using the inverter. 31 steps |
| D | M1F M2F | Inverter fan | Since the system is of air heat exchanging type, the fan is operated at 8-step rotation speed by using the inverter. |
| E | Y1E | Electronic expansion valve (Main: EV1) | While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant. |
| F | Y3E | Electronic expansion valve (Subcool: EV3) | PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant. |
| G | Y2S | Solenoid valve (Hot gas: SVP) | Used to prevent the low pressure from transient falling. |
| H | Y3S | Solenoid valve (Unload circuit SVUL) | Used to the unloading operation of compressor. |
| M | Y1S | Four way valve | Used to switch the operation mode between cooling and heating. |
| N | S1NPH | High pressure sensor | Used to detect high pressure. |
| O | S1NPL | Low pressure sensor | Used to detect low pressure. |
| P | S1PH | HP pressure switch (For INV compressor) | In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation. |
| T | — | Pressure regulating valve 1 (Receiver to discharge pipe) | This valve opens at a pressure of 4.0 MPa for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage. |
| 1 | R1T | Thermistor (Outdoor air: Ta) | Used to detect outdoor temperature, correct discharge pipe temperature, and others. |
| 2 | R2T | Thermistor (INV discharge pipe: Tdi) | used to detect discharge pipe temperature, make the temperature protection control of compressor, and others. |
| 3 | R3T | Thermistor (Suction pipe1: Ts1) | used to detect suction pipe temperature, keep the suction superheated degree constant in heating operation, and others. |
| 4 | R4T | Thermistor (Subcooling heat exchanger gas pipe: Tsh) | Used to control of subcooling electronic expansion valve. |
| 5 | R5T | Thermistor (Suction pipe2: Ts2) | Used to the calculation of an internal temperature of compressor etc. |
| 6 | R6T | Thermistor (Heat exchanger deicer: Tb) | Used to detect liquid pipe temperature of air heat exchanger, determine defrosting operation, and others. |
| 7 | R7T | Thermistor (Liquid pipe1: TI1) | Used to detect refrigerant over charge in check operation, and others. |
| 8 | R8T | Thermistor (Liquid pipe2: TI2) | Used to detect refrigerant over charge in check operation, and others. |

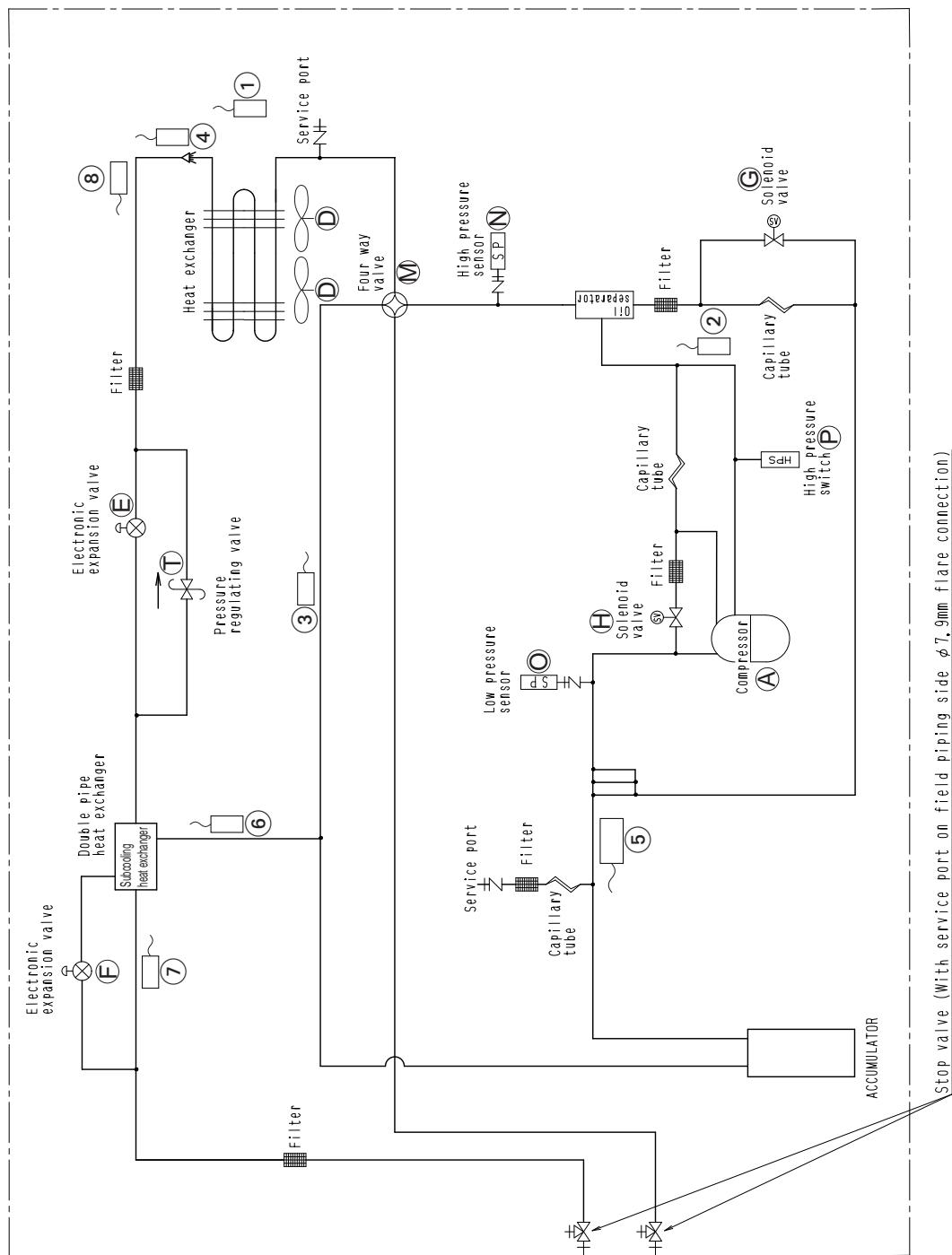


Stop valve (With service port on field piping side $\phi 7.9\text{mm}$ flare connection)

C : 3D052628

U-4, 5, 6ML5DPQ

| No. in refrigerant system diagram | Symbol | Name | Major Function |
|-----------------------------------|------------|--|--|
| A | M1C | Inverter compressor (INV) | Inverter compressor is operated on frequencies between 36 Hz and 195 Hz by using the inverter. 31 steps |
| D | M1F M2F | Inverter fan | Since the system is of air heat exchanging type, the fan is operated at 8-step rotation speed by using the inverter. |
| E | Y1E | Electronic expansion valve (Main: EV1) | While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant. |
| F | Y3E | Electronic expansion valve (Subcool: EV3) | PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant. |
| G | Y2S | Solenoid valve (Hot gas: SVP) | Used to prevent the low pressure from transient falling. |
| H | Y3S | Solenoid valve (Unload circuit SVUL) | Used to the unloading operation of compressor. |
| M | Y1S | Four way valve | Used to switch the operation mode between cooling and heating. |
| N | S1NPH | High pressure sensor | Used to detect high pressure. |
| O | S1NPL | Low pressure sensor | Used to detect low pressure. |
| P | S1PH | HP pressure switch (For INV compressor) | In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation. |
| T | — | Pressure regulating valve 1 (Receiver to discharge pipe) | This valve opens at a pressure of 4.0 MPa for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage. |
| 1 | R1T | Thermistor (Outdoor air: Ta) | Used to detect outdoor temperature, correct discharge pipe temperature, and others. |
| 2 | R2T | Thermistor (INV discharge pipe: Tdi) | used to detect discharge pipe temperature, make the temperature protection control of compressor, and others. |
| 3 | R3T | Thermistor (Suction pipe1: Ts1) | used to detect suction pipe temperature, keep the suction superheated degree constant in heating operation, and others. |
| 4 | R4T | Thermistor (Heat exchanger deicer: Tb) | Used to detect liquid pipe temperature of air heat exchanger, determine defrosting operation, and others. |
| 5 | R5T | Thermistor (Suction pipe2: Ts2) | Used to the calculation of an internal temperature of compressor etc. |
| 6 | R6T | Thermistor (Subcooling heat exchanger gas pipe: Tsh) | Used to control of subcooling electronic expansion valve. |
| 7 | R7T | Thermistor (Liquid pipe1: TI1) | Used to detect refrigerant over charge in check operation, and others. |
| 8 | R8T | Thermistor (Liquid pipe2: TI2) | Used to detect refrigerant over charge in check operation, and others. |

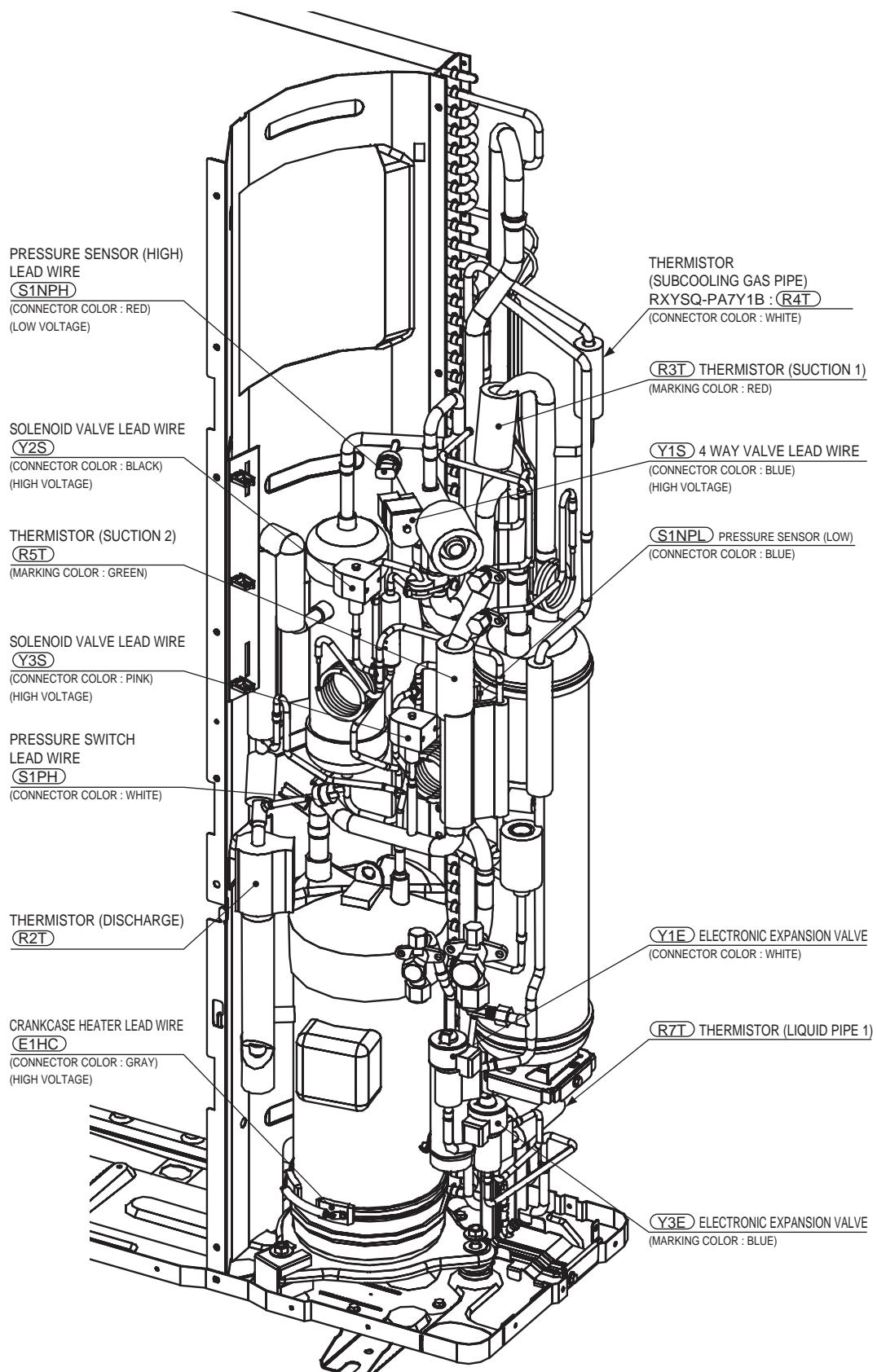


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2. Functional Parts Layout

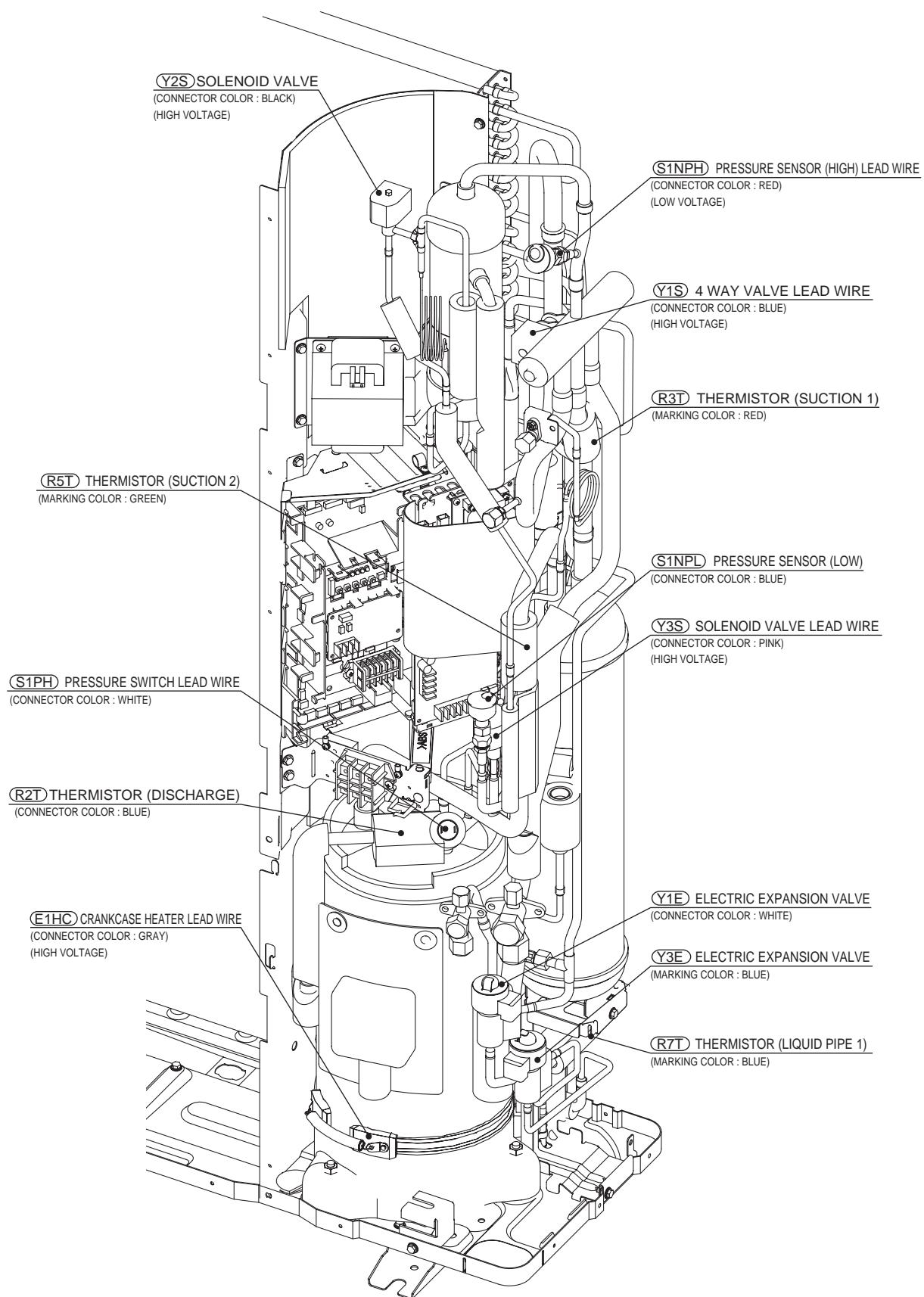
2.1 U-4, 5, 6ML5XPQ

Birds-eye view

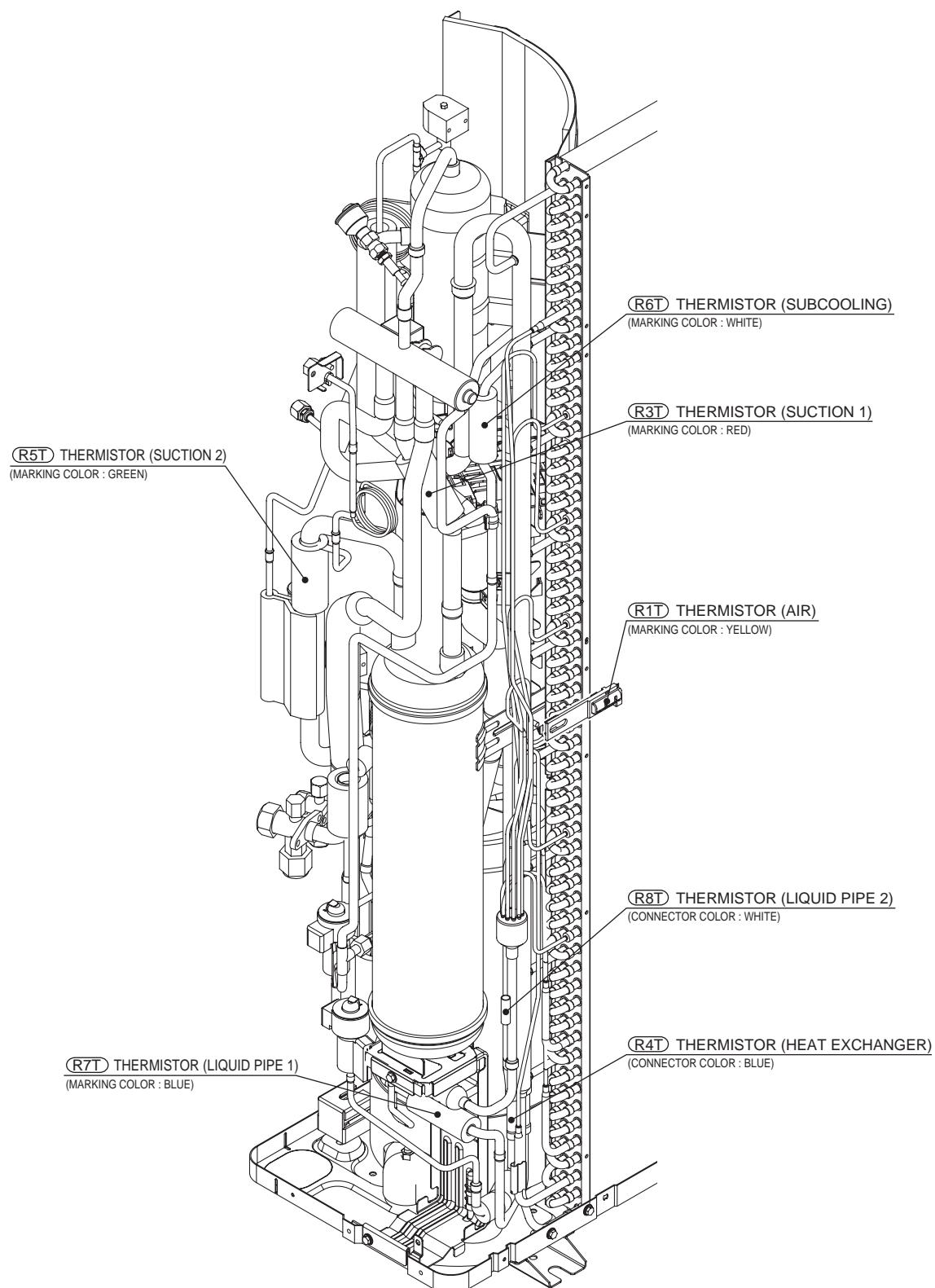


2.2 U-4, 5, 6ML5DPQ

Birds-eye view



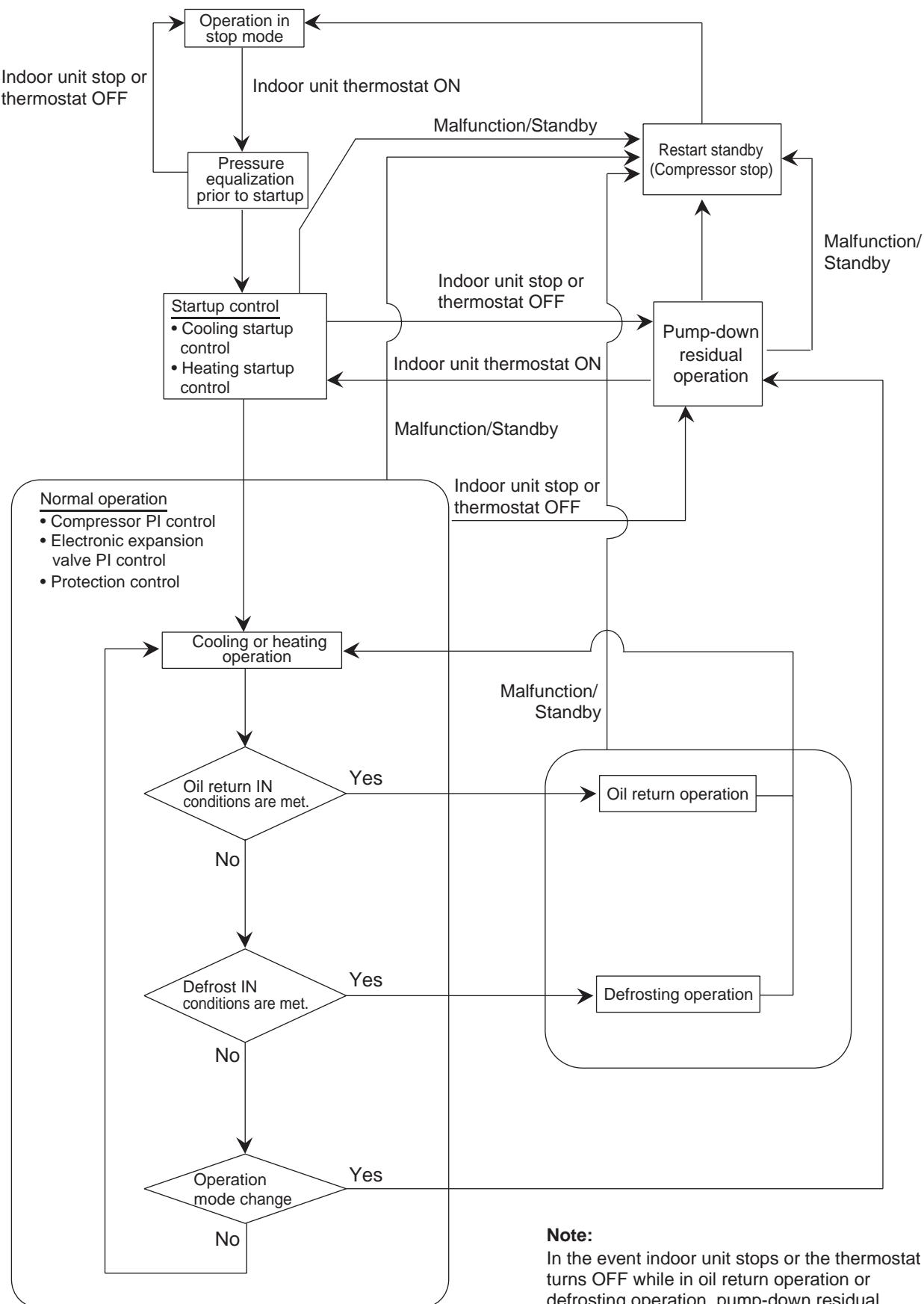
Back view



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1. Operation Mode



(V3152)

2. Basic Control

2.1 Normal Operation

■ Cooling Operation

| Actuator | Operation | Remarks |
|---|-----------------------|---|
| Compressor | Compressor PI control | Used for high pressure protection control, low pressure protection control, discharge pipe temperature protection control, and compressor operating frequency upper limit control with inverter protection control. |
| Outdoor unit fan | Cooling fan control | — |
| Four way valve | OFF | — |
| Main electronic expansion valve (EV1) | 480 pls | — |
| Subcooling electronic expansion valve (EV3) | PI control | — |
| Hot gas bypass valve (SVP) | OFF | This valve turns on with low pressure protection control. |

■ Heating Operation

| Actuator | Operation | Remarks |
|---|-----------------------|---|
| Compressor | Compressor PI control | Used for high pressure protection control, low pressure protection control, discharge pipe temperature protection control, and compressor operating frequency upper limit control with inverter protection control. |
| Outdoor unit fan | STEP 7 or 8 | — |
| Four way valve | ON | — |
| Main electronic expansion valve (EV1) | PI control | — |
| Subcooling electronic expansion valve (EV3) | PI control | — |
| Hot gas bypass valve (SVP) | OFF | This valve turns on with low pressure protection control. |

★Heating operation is not functional at an outdoor air temperature of 24°CDB or more.

2.2 Compressor PI Control

Compressor PI Control

Carries out the compressor capacity PI control to maintain Te at constant during cooling operation and Tc at constant during heating operation to ensure stable unit performance.

[Cooling operation]

Controls compressor capacity to adjust Te to achieve target value (TeS). Te : Low pressure equivalent saturation temperature (°C)

Te setting (Set in Set-up mode 2)

| L | M (Normal) (factory setting) | H |
|---|------------------------------------|---|
| 3 | 6 | 9 |

TeS : Target Te value
(Varies depending on Te setting, operating frequency, etc.)

[Heating operation]

Controls compressor capacity to adjust Tc to achieve target value (TcS). Tc : High pressure equivalent saturation temperature (°C)

Tc setting

| L | M (Normal) (factory setting) | H |
|----|------------------------------------|----|
| 43 | 46 | 49 |

TcS : Target Tc value
(Varies depending on Tc setting, operating frequency, etc.)

U-4, 5, 6ML5

| STn | INV(Fullload) | INV(Unload) |
|-----|---------------|-------------|
| 1 | | 36.0Hz |
| 2 | | 39.0Hz |
| 3 | | 43.0Hz |
| 4 | | 47.0Hz |
| 5 | | 52.0Hz |
| 6 | 52.0Hz | 57.0Hz |
| 7 | 57.0Hz | 64.0Hz |
| 8 | 62.0Hz | 71.0Hz |
| 9 | 68.0Hz | 78.0Hz |
| 10 | 74.0Hz | |

| STn | INV(Fullload) | INV(Unload) |
|-----|---------------|-------------|
| 11 | 80.0Hz | |
| 12 | 86.0Hz | |
| 13 | 92.0Hz | |
| 14 | 98.0Hz | |
| 15 | 104.0Hz | |
| 16 | 110.0Hz | |
| 17 | 116.0Hz | |
| 18 | 122.0Hz | |
| 19 | 128.0Hz | |
| 20 | 134.0Hz | |

| STn | INV(Fullload) | INV(Unload) |
|-----|---------------|-------------|
| 21 | 140.0Hz | |
| 22 | 146.0Hz | |
| 23 | 152.0Hz | |
| 24 | 158.0Hz | |
| 25 | 164.0Hz | |
| 26 | 170.0Hz | |
| 27 | 175.0Hz | |
| 28 | 180.0Hz | |
| 29 | 185.0Hz | |
| 30 | 190.0Hz | |
| 31 | 195.0Hz | |

- * Compressors may operate in a pattern other than those listed in above tables subject to the operating conditions. Selection of full load operation to/from unload operation is made with the unload circuit solenoid valve (Y3S=SVUL). The full load operation is performed with the SVUL set to OFF, while the unload operation is performed with the SVUL set to ON.

2.3 Electronic Expansion Valve PI Control

Main Electronic Expansion Valve EV1 Control

Carries out the electronic expansion valve (Y1E) PI control to maintain the evaporator outlet superheated degree (SH) at constant during heating operation to make maximum use of the outdoor unit heat exchanger (evaporator).

$$SH = Ts1 - Te$$

SH : Evaporator outlet superheated degree (°C)

Ts1 : Suction pipe temperature detected by thermistor R3T (°C)

Te : Low pressure equivalent saturation temperature (°C)

The optimum initial value of the evaporator outlet superheated degree is 3°C, but varies depending on the discharge pipe superheated degree of inverter compressor.

Subcooling Electronic Expansion Valve EV3 Control

Makes PI control of the electronic expansion valve (Y3E) to keep the superheated degree (SH) of the outlet gas pipe on the evaporator side for the full use of the subcooling heat exchanger.

$$SH = Tsh - Te$$

SH : Outlet superheated degree of evaporator (°C)

Tsh : Suction pipe temperature detected with the thermistor R4T (°C)

Te : Low pressure equivalent saturation temperature (°C)

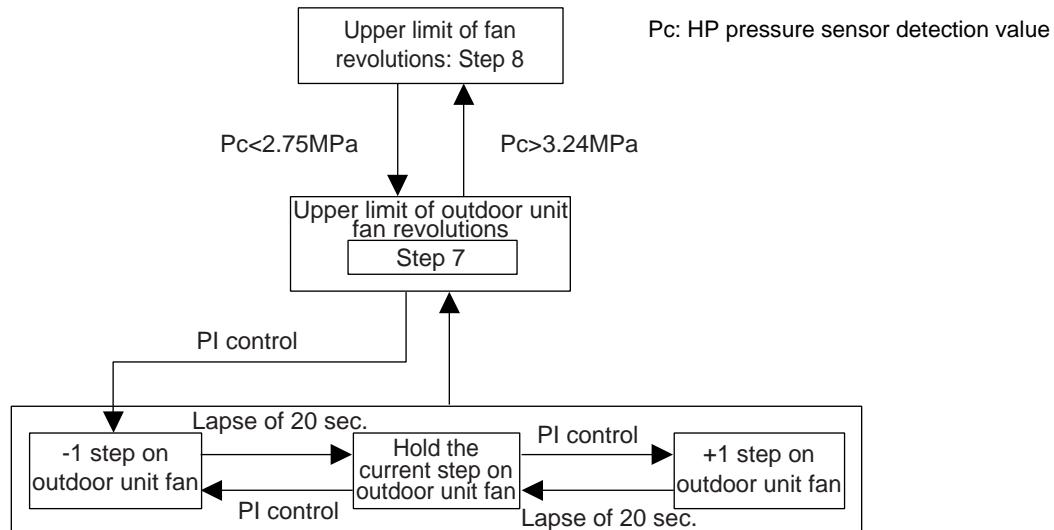
2.4 Cooling Operation Fan Control

In cooling operation with low outdoor air temperature, this control is used to provide the adequate amount of circulation air with liquid pressure secured by high pressure control using outdoor unit fan.

Furthermore, when outdoor temperature $\geq 20^{\circ}\text{C}$, the compressor will run in Step 7 or higher.

When outdoor temperature $\geq 18^{\circ}\text{C}$, it will run in Step 5 or higher.

When outdoor temperature $\geq 12^{\circ}\text{C}$, it will run in Step 1 or higher.



Fan Steps

| Cooling | M1F | M2F |
|---------|---------|---------|
| STEP0 | 0 rpm | 0 rpm |
| STEP1 | 250 rpm | 0 rpm |
| STEP2 | 400 rpm | 0 rpm |
| STEP3 | 285 rpm | 250 rpm |
| STEP4 | 360 rpm | 325 rpm |
| STEP5 | 445 rpm | 410 rpm |
| STEP6 | 580 rpm | 545 rpm |
| STEP7 | 715 rpm | 680 rpm |
| STEP8 | 850 rpm | 815 rpm |

3. Special Control

3.1 Startup Control

This control is used to equalize the pressure in the front and back of the compressor prior to the startup of the compressor, thus reducing startup loads. Furthermore, the inverter is turned ON to charge the capacitor.

In addition, to avoid stresses to the compressor due to oil return or else after the startup, the following control is made and the position of the four way valve is also determined. To position the four way valve, the master and slave units simultaneously start up.

3.1.1 Startup Control in Cooling Operation

| | Pressure equalization control prior to startup | Startup control | |
|---|---|--|--|
| | | STEP1 | STEP2 |
| Compressor | 0 Hz | 57 Hz Unload +2 steps/20 sec. (until $P_c - P_e > 0.39 \text{ MPa}$ is achieved) | 57 Hz Unload +2 steps/20 sec. (until $P_c - P_e > 0.39 \text{ MPa}$ is achieved) |
| Outdoor unit fan | STEP7 | Ta<20°C: OFF Ta≥20°C: STEP4 | +1 step/15 sec. (when $P_c > 2.16 \text{ MPa}$) -1 step/15 sec. (when $P_c < 1.77 \text{ MPa}$) |
| Four way valve (20S1) | Holds | OFF | OFF |
| Main electronic expansion valve (EV1) | 0 pls | 480 pls | 480 pls |
| Subcooling electronic expansion valve (EV3) | 0 pls | 0 pls | 0 pls |
| Hot gas bypass valve (SVP) | OFF | OFF | OFF |
| Ending conditions | OR • $P_c - P_e < 0.3 \text{ MPa}$ • A lapse of 1 to 5 min. | A lapse of 10 sec. | OR • A lapse of 130 sec. • $P_c - P_e > 0.39 \text{ MPa}$ |

3.1.2 Startup Control in Heating Operation

| | Pressure equalization control prior to startup | Startup control | |
|---|---|--|---|
| | | STEP1 | STEP2 |
| Compressor | 0 Hz | 57 Hz Unload +2 steps/20 sec. (until $P_c - P_e > 0.39 \text{ MPa}$ is achieved) | 57 Hz Unload +2 steps/20 sec. (until $P_c - P_e > 0.39 \text{ MPa}$ is achieved) |
| Outdoor unit fan | From starting ~ 1 min. : STEP 7 1 ~ 3 min. : STEP 3 3 ~ 5 min. : OFF | STEP8 | STEP8 |
| Four way valve | Holds | ON | ON |
| Main electronic expansion valve (EV1) | 0 pls | 0 pls | 0 pls |
| Subcooling electronic expansion valve (EV3) | 0 pls | 0 pls | 0 pls |
| Hot gas bypass valve (SVP) | OFF | OFF | OFF |
| Ending conditions | OR • $P_c - P_e < 0.3 \text{ MPa}$ • A lapse of 1 to 5 min. | A lapse of 10 sec. | OR • A lapse of 130 sec. • $P_c > 2.70 \text{ MPa}$ • $P_c - P_e > 0.39 \text{ MPa}$ |

3.2 Oil Return Operation

In order to prevent the compressor from running out of oil, the oil return operation is conducted to recover oil flown out from the compressor to the system side.

3.2.1 Oil Return Operation in Cooling Operation

[Start conditions]

Referring to the set conditions for the following items, start the oil return operation in cooling.

- Cumulative oil feed rate
- Timer setting (Make this setting so as to start the oil return operation when the initial cumulative operating time reaches two hours after power supply is turned ON and then every eight hours.)

Furthermore, the cumulative oil feed rate is computed from Tc, Te, and compressor loads.

| Outdoor unit actuator | Oil return preparation operation | Oil return operation | Post-oil-return operation |
|---|---|--|---|
| Compressor | Take the current step as the upper limit. | 52 Hz Full load (→ Low pressure constant control) | Same as the "oil return operation" mode. |
| Outdoor unit fan | Fan control (Normal cooling) | Fan control (Normal cooling) | Fan control (Normal cooling) |
| Four way valve | OFF | OFF | OFF |
| Main electronic expansion valve (EV1) | 480 pls | 480 pls | 480 pls |
| Subcooling electronic expansion valve (EV3) | SH control | 0 pls | 0 pls |
| Hot gas bypass valve (SVP) | OFF | OFF | OFF |
| Ending conditions | 20 sec. | or • 3 min. • Ts - Te<5°C | or • 3 min. • Pe<0.6MPa • HTdi>110°C |

| Indoor unit actuator | | Cooling oil return operation |
|----------------------------|---------------------|--|
| Fan | Thermostat ON unit | Remote controller setting |
| | Stopping unit | OFF |
| | Thermostat OFF unit | Remote controller setting |
| Electronic expansion valve | Thermostat ON unit | Normal opening |
| | Stopping unit | 224 pls |
| | Thermostat OFF unit | Normal opening with forced thermostat ON |

3.2.2 Oil Return Operation in Heating Operation

[Conditions to start]

The heating oil-returning operation is started referring following conditions.

- Integrated amount of displaced oil
- Timer

(After the power is turned on, integrated operating-time is 2 hours and subsequently every 8 hours.)

In addition, integrated amount of displaced oil is derived from Tc, Te, and the compressor load.

| Outdoor Unit Actuator | Oil return preparation operation | Oil return operation | Post-oil-return operation |
|---|----------------------------------|---|--|
| Compressor | Upper limit control | 140 Hz Full load | 2-step increase from 36 Hz Unload to (Pc - Pe>0.4 MPa) every 20 sec. |
| Outdoor unit fan | STEP8 | OFF | STEP8 |
| Four way valve | ON | OFF | ON |
| Main electronic expansion valve (EV1) | SH control | 480 pls | 55 pls |
| Subcooling electronic expansion valve (EV3) | 0 pls | 0 pls | 0 pls |
| Hot gas bypass valve (SVP) | OFF | OFF | OFF |
| Ending conditions | 2 min. | or $\begin{cases} \bullet 12 \text{ min.} \\ \& \{ \bullet Ts1 - Te < 5^\circ\text{C} \\ \bullet Tb > 11^\circ\text{C} \end{cases}$ | or $\begin{cases} \bullet 160 \text{ sec.} \\ \bullet Pc - Pe > 0.4 \text{ MPa} \end{cases}$ |

* From the preparing oil-returning operation to the oil-returning operation, and from the oil-returning operation to the operation after oil-returning, the compressor stops for 1 minute to reduce noise on changing of the four way valve.

| Indoor unit actuator | | Heating oil return operation |
|----------------------------|---------------------|------------------------------|
| Fan | Thermostat ON unit | OFF |
| | Stopping unit | OFF |
| | Thermostat OFF unit | OFF |
| Electronic expansion valve | Thermostat ON unit | 416 pls |
| | Stopping unit | 256 pls |
| | Thermostat OFF unit | 416 pls |

3.3 Defrosting Operation

The defrost operation is performed to solve frost on the outdoor unit heat exchanger when heating, and the heating capacity is recovered.

[Conditions to start]

The defrost operation is started referring following conditions.

- Outdoor heat exchanger heat transfer co-efficiency
- Temperature of heat-exchange (T_b)
- Timer (2 hours at the minimum)

In addition, outdoor heat-exchange co-efficiency is derived from T_c, T_e, and the compressor load.

| Outdoor unit actuator | Defrost preparation operation | Defrost operation | Post Defrost operation |
|---|-------------------------------|---|---|
| Compressor | Upper limit control | 140 Hz Full load | 2-step increase from 36 Hz Unload to (P _c - P _e >0.4 MPa) every 20 sec. |
| Outdoor unit fan | STEP8 | OFF | STEP8 |
| Four way valve | ON | OFF | ON |
| Main electronic expansion valve (EV1) | SH control | 480 pls | 55 pls |
| Subcooling electronic expansion valve (EV3) | 0 pls | 0 pls | 0 pls |
| Hot gas bypass valve (SVP) | OFF | ON | ON |
| Ending conditions | 2 min. | or • 15 min. & • T _b >11°C • T _{s1} - T _e <5°C | or • 160 sec. • P _c - P _e >0.4MPa |

* From the preparing operation to the defrost operation, and from the defrost operation to the operation after defrost, the compressor stops for 1 minute to reduce noise on changing of the four way valve.

| Indoor unit actuator | | Heating oil return operation |
|----------------------------|---------------------|------------------------------|
| Fan | Thermostat ON unit | OFF |
| | Stopping unit | OFF |
| | Thermostat OFF unit | OFF |
| Electronic expansion valve | Thermostat ON unit | 416 pls |
| | Stopping unit | 256 pls |
| | Thermostat OFF unit | 416 pls |

3.4 Pump-down Residual Operation

When activating compressor, if the liquid refrigerant remains in the heat-exchanger, the liquid enters into the compressor and dilutes oil therein resulting in decrease of lubricity.

Therefore, the pump-down residual operation is performed to collect the refrigerant in the heat-exchanger when the compressor is down.

3.4.1 Pump-down Residual Operation in Cooling Operation

| Actuator | Pump-down residual operation Step 1 | Pump-down residual operation Step 2 |
|---|-------------------------------------|-------------------------------------|
| Compressor | 124 Hz Full load | 52 Hz Full load |
| Outdoor unit fan | Fan control | Fan control |
| Four way valve | OFF | OFF |
| Main electronic expansion valve (EV1) | 480 pls | 240 pls |
| Subcooling electronic expansion valve (EV3) | 0 pls | 0 pls |
| Hot gas bypass valve (SVP) | OFF | OFF |
| Ending conditions | 2 sec. | 2 sec. |

3.4.2 Pump-down Residual Operation in Heating Operation

| Actuator | Pump-down residual operation |
|---|------------------------------|
| Compressor | 124 Hz Full load |
| Outdoor unit fan | STEP7 |
| Four way valve | ON |
| Main electronic expansion valve (EV1) | 0 pls |
| Subcooling electronic expansion valve (EV3) | 0 pls |
| Hot gas bypass valve (SVP) | OFF |
| Ending conditions | 4 sec. |

3.5 Restart Standby

Restart is stood by force to prevent frequent power-on/off and to equalize pressure in the refrigerant system.

| Actuator | Operation | Remarks |
|---|--------------------------------|---------|
| Compressor | OFF | — |
| Outdoor unit fan | Ta>30°C: STEP4 Ta≤30°C: OFF | — |
| Four way valve | Keep former condition. | — |
| Main electronic expansion valve (EV1) | 0 pls | — |
| Subcooling electronic expansion valve (EV3) | 0 pls | — |
| Hot gas bypass valve (SVP) | OFF | — |
| Ending conditions | 2 min. | — |

3.6 Stopping Operation

Operation of the actuator when the system is down, is cleared up.

3.6.1 When System is in Stop Mode

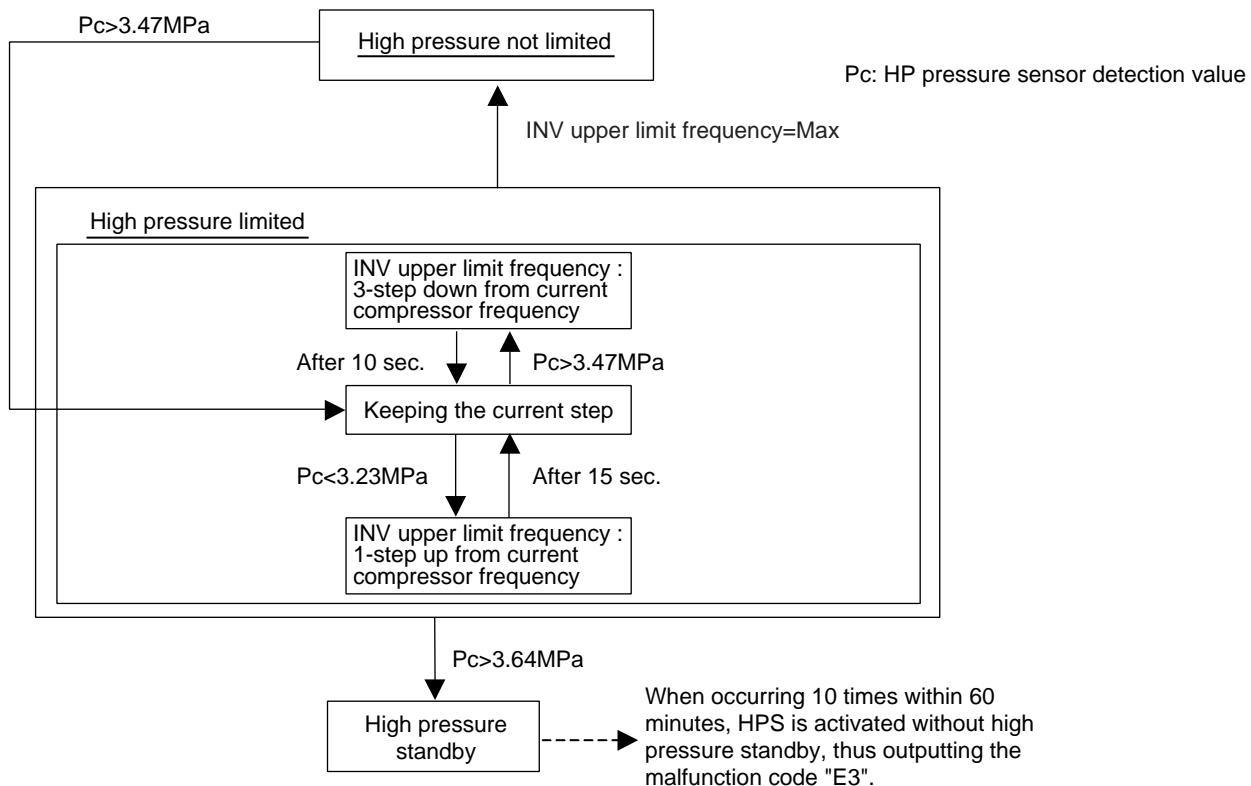
| Actuator | Operation |
|---|--------------------------------------|
| Compressor | OFF |
| Outdoor unit fan | OFF |
| Four way valve | Keep former condition. |
| Main electronic expansion valve (EV1) | 0 pls |
| Subcooling electronic expansion valve (EV3) | 0 pls |
| Hot gas bypass valve (SVP) | OFF |
| Ending conditions | Indoor unit thermostat is turned ON. |

4. Protection Control

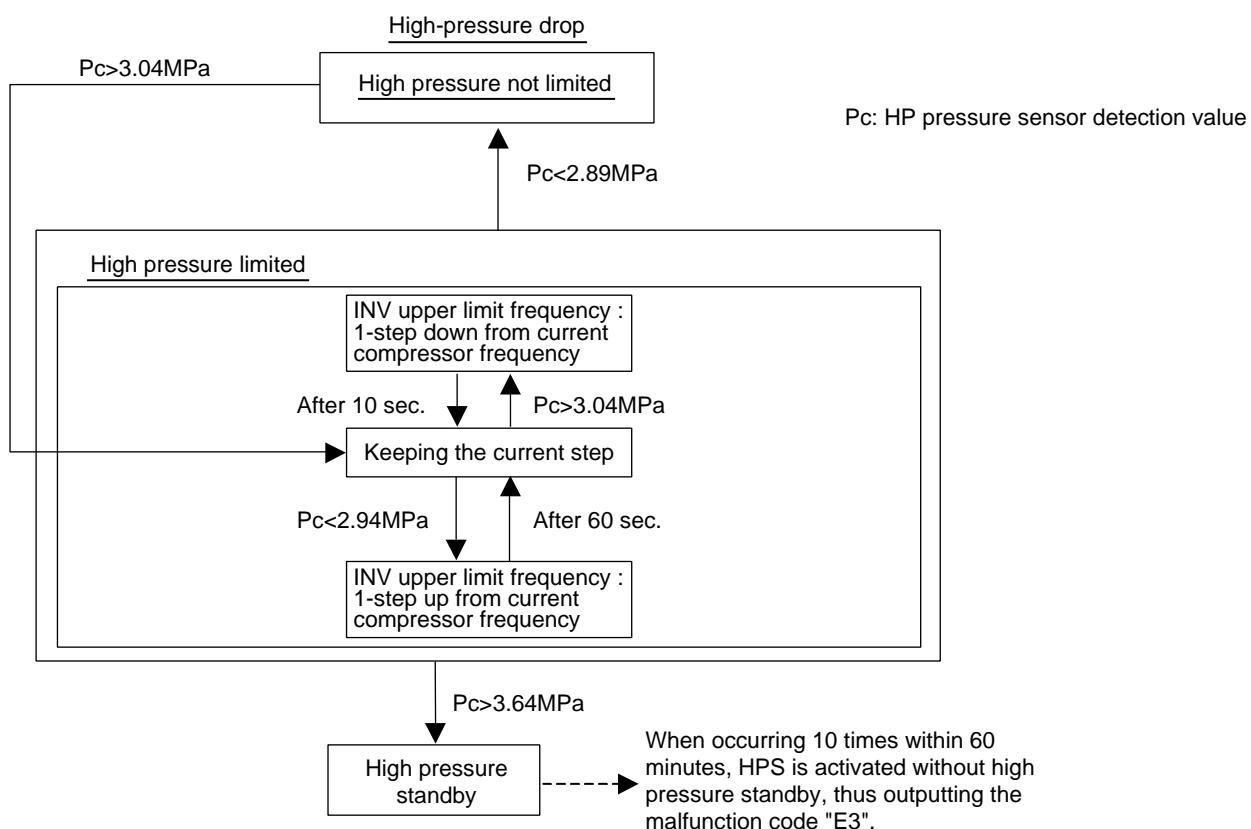
4.1 High Pressure Protection Control

This high pressure protection control is used to prevent the activation of protection devices due to abnormal increase of high pressure and to protect compressors against the transient increase of high pressure.

[In cooling operation]



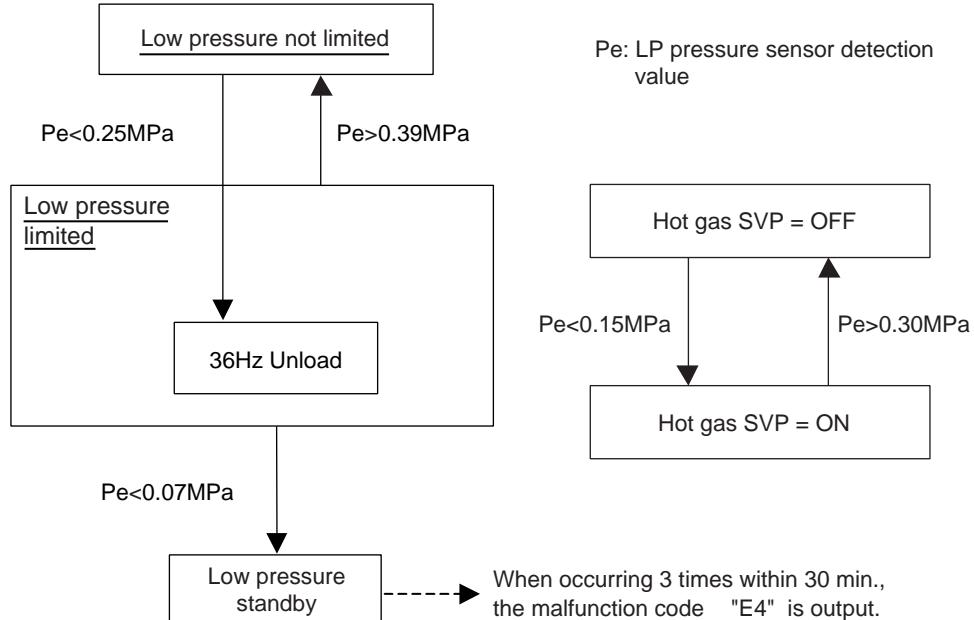
[In heating operation]



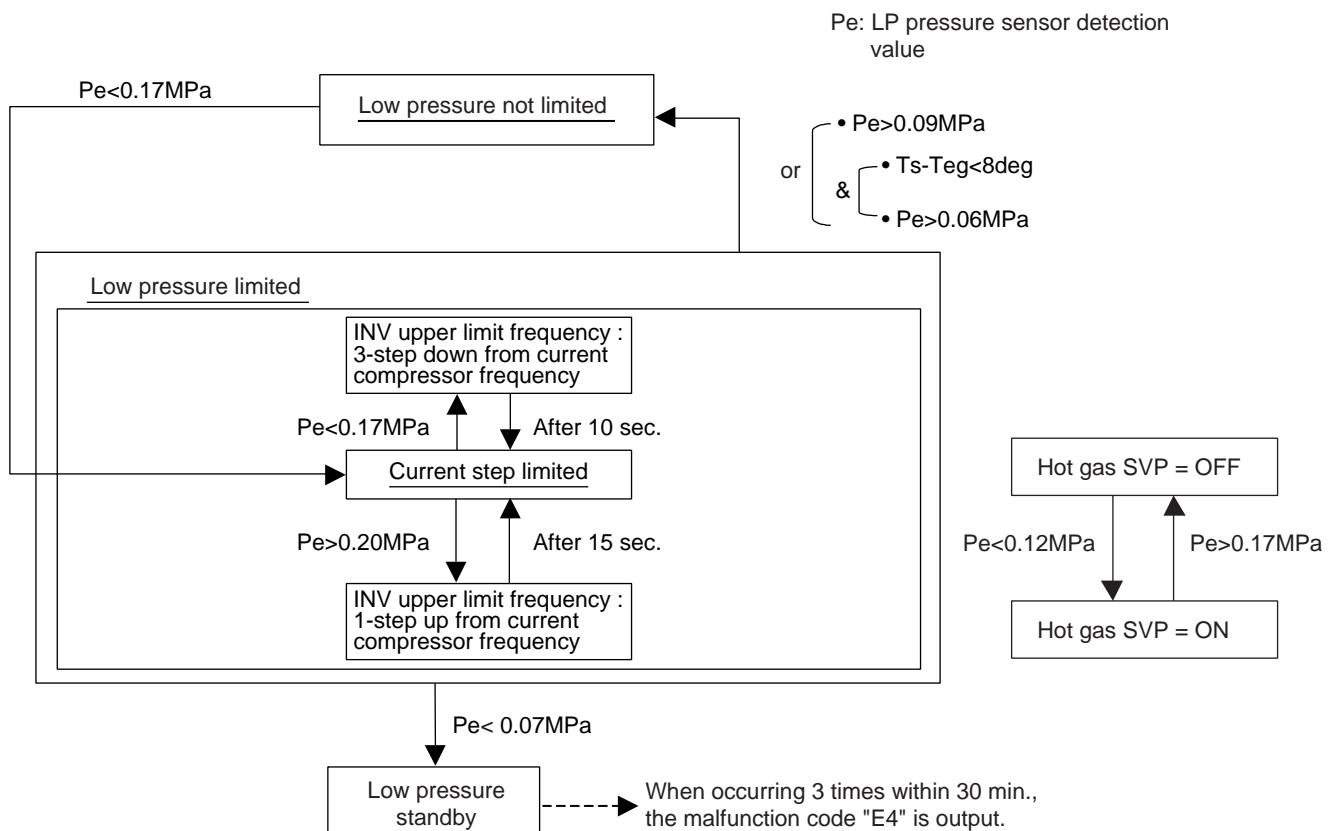
4.2 Low Pressure Protection Control

This low pressure protection control is used to protect compressors against the transient decrease of low pressure.

[In cooling operation]



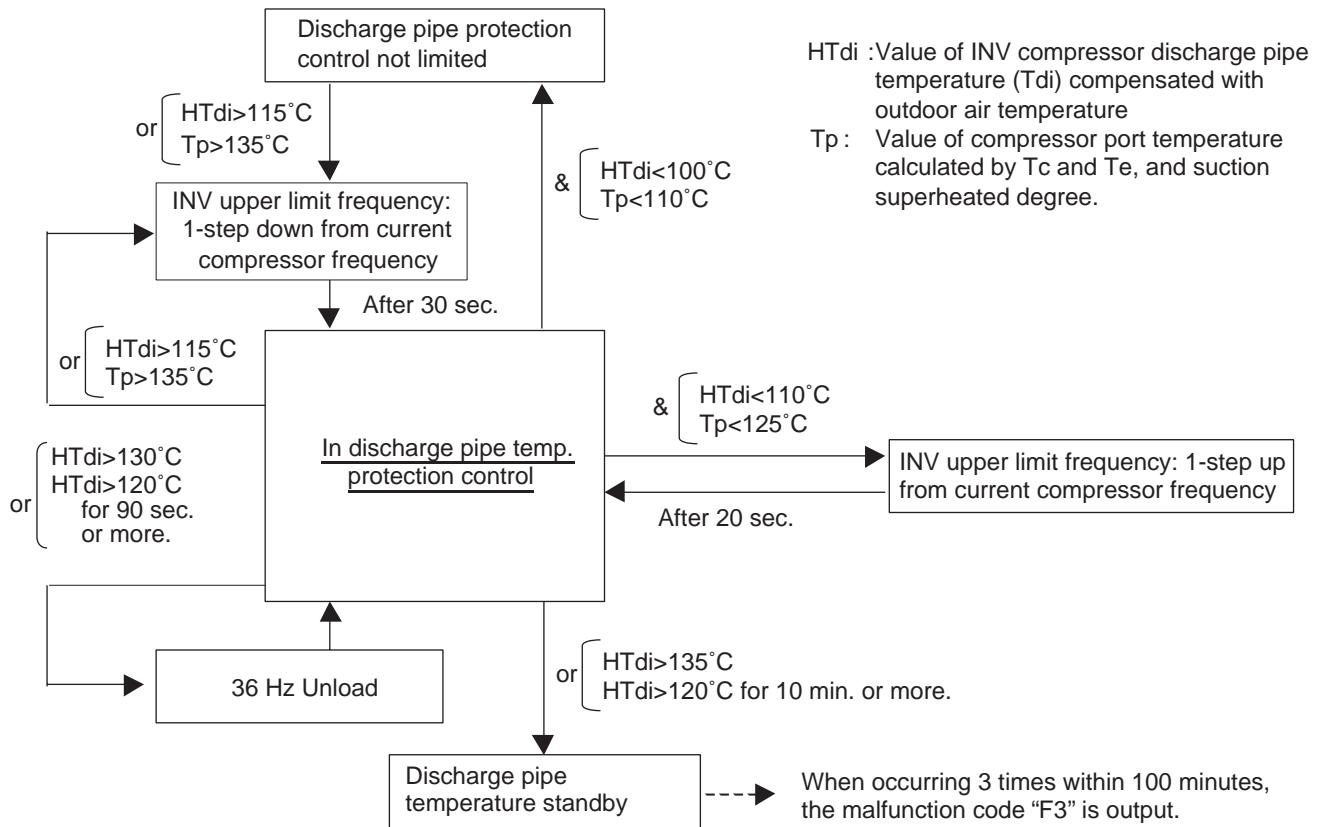
[In heating operation]



4.3 Discharge Pipe Protection Control

This discharge pipe protection control is used to protect the compressor internal temperature against a malfunction or transient increase of discharge pipe temperature.

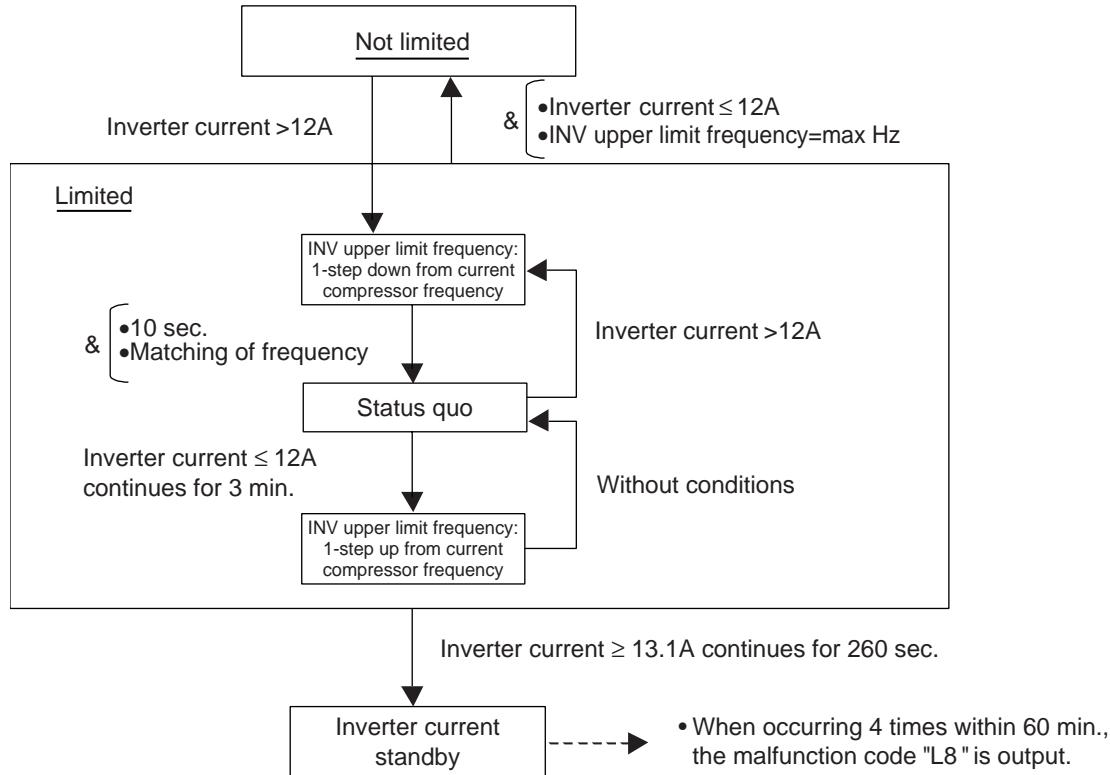
[INV compressor]



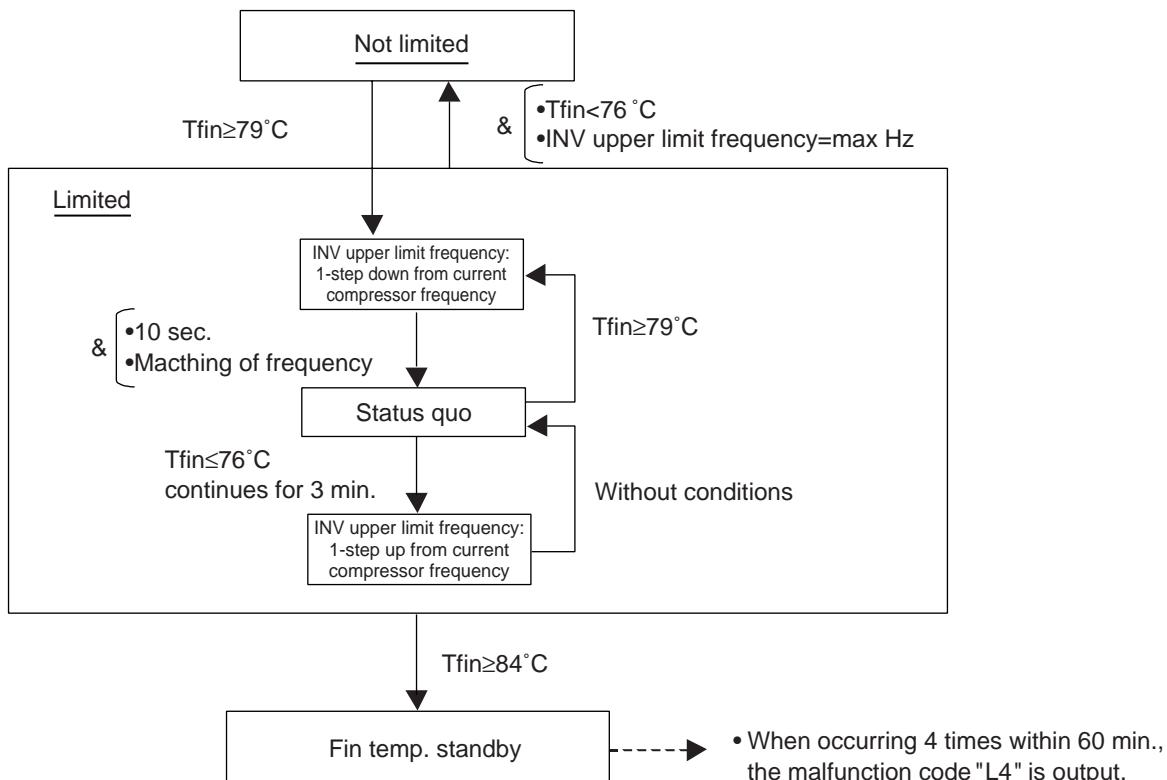
4.4 Inverter Protection Control

Inverter current protection control and inverter fin temperature control are performed to prevent tripping due to a malfunction, or transient inverter overcurrent, and fin temperature increase.

[Inverter overcurrent protection control]



[Inverter fin temperature control]



5. Other Control

5.1 Demand Operation

In order to save the power consumption, the capacity of outdoor unit is saved with control forcibly by using "Demand 1 Setting".

To operate the unit with this mode, additional setting of "Continuous Demand Setting".

[Demand 1 setting]

| Setting | Standard for upper limit of power consumption |
|--------------------------------------|---|
| Demand 1 setting 1 | Approx. 60% |
| Demand 1 setting 2 (factory setting) | Approx. 70% |
| Demand 1 setting 3 | Approx. 80% |

★ Other protection control functions have precedence over the above operation.

5.2 Heating Operation Prohibition

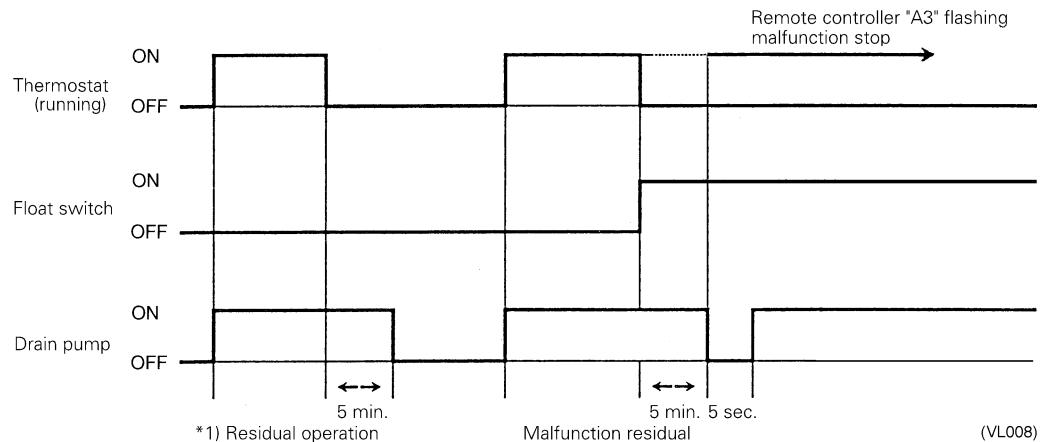
Heating operation is prohibited above 24°CDB outdoor air temperature.

6. Outline of Control (Indoor Unit)

6.1 Drain Pump Control

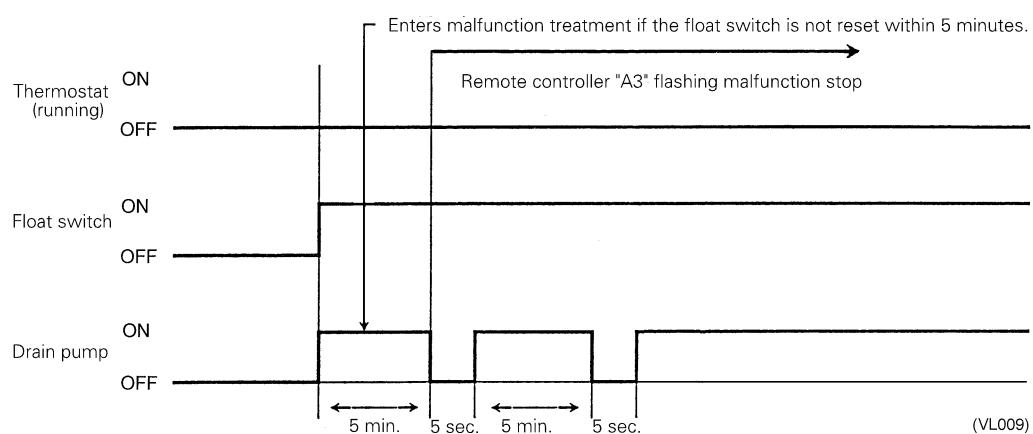
- The drain pump is controlled by the ON/OFF buttons (4 button (1) - (4) given in the figure below).

6.1.1 When the Float Switch is Tripped while the Cooling Thermostat is ON:

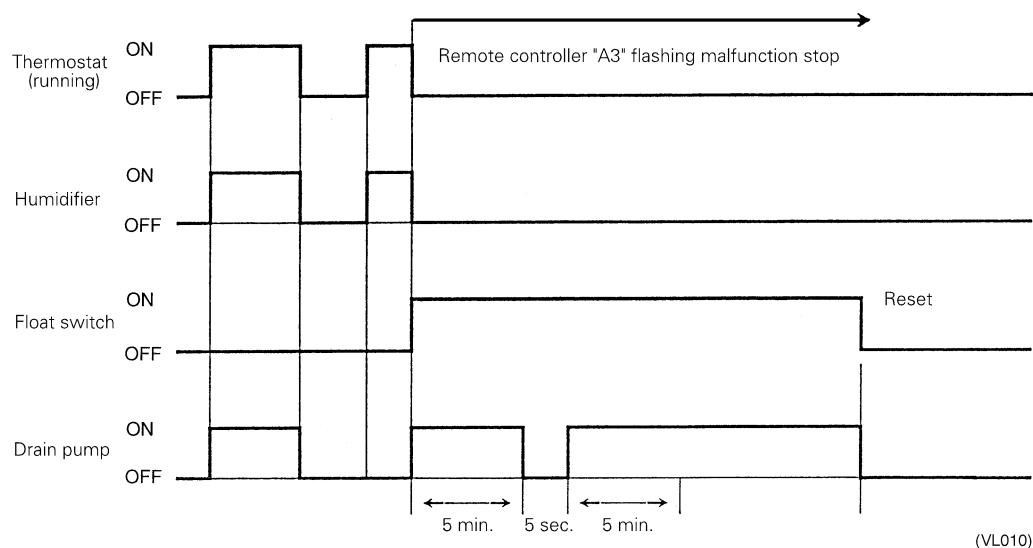


* 1. The objective of residual operation is to completely drain any moisture adhering to the fin of the indoor unit heat exchanger when the thermostat goes off during cooling operation.

6.1.2 When the Float Switch is Tripped while the Cooling Thermostat is OFF:

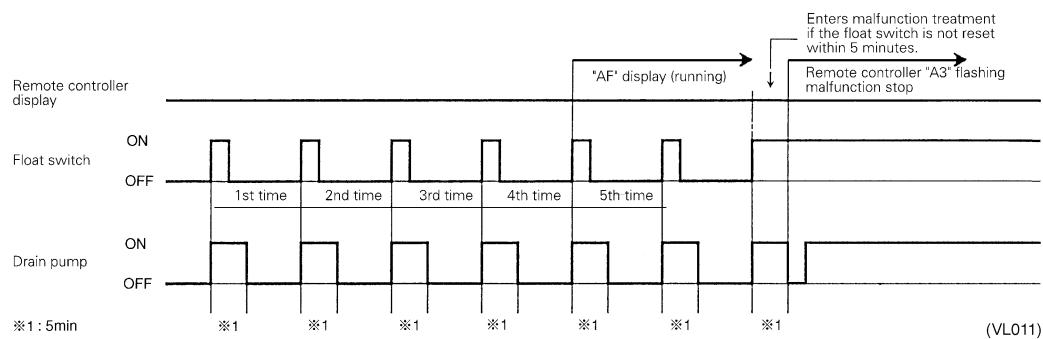


6.1.3 When the Float Switch is Tripped During Heating Operation:



During heating operation, if the float switch is not reset even after the 5 minutes operation, 5 seconds stop, 5 minutes operation cycle ends, operation continues until the switch is reset.

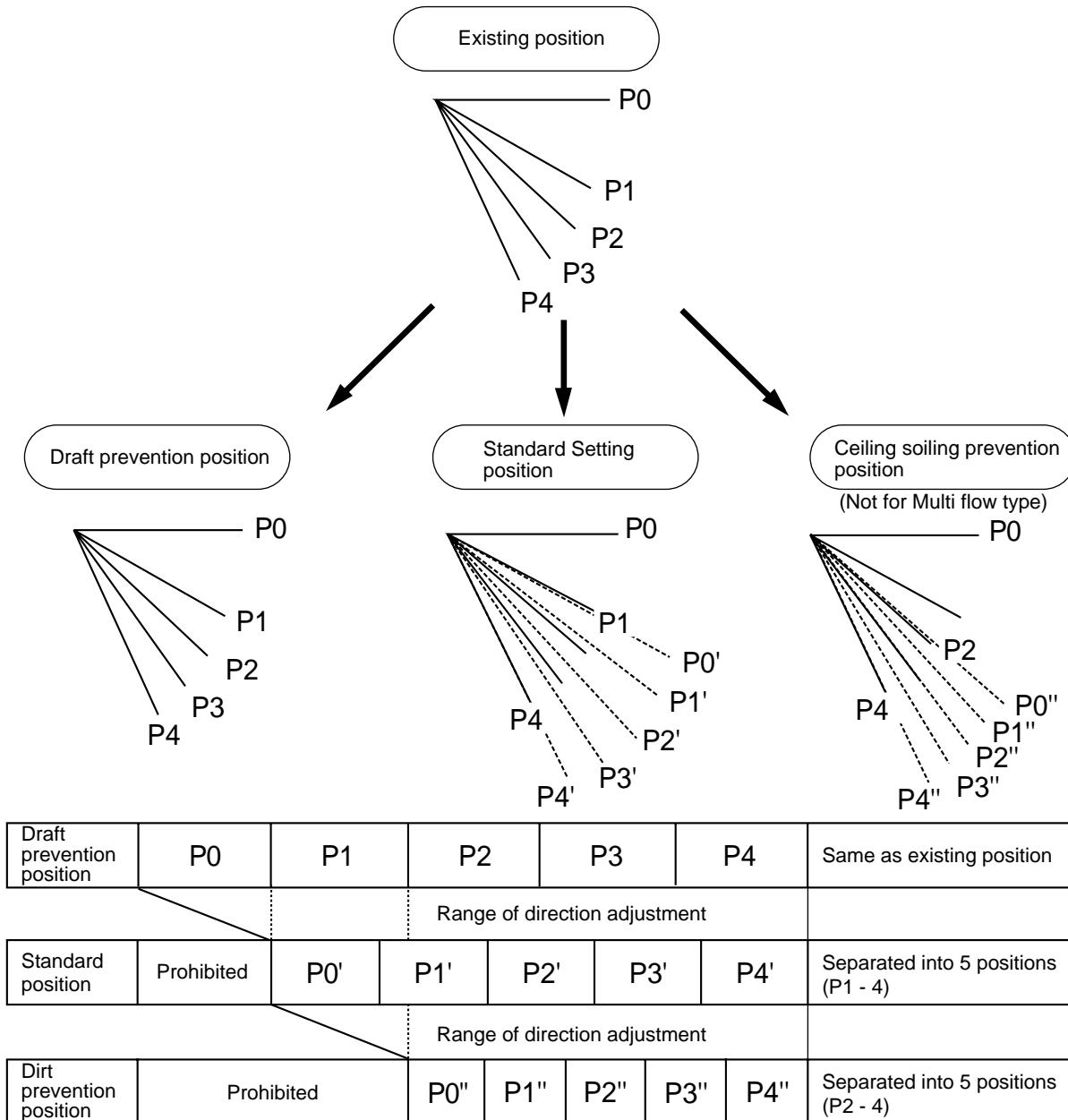
6.1.4 When the Float Switch is Tripped and “AF” is Displayed on the Remote Controller:



Note: If the float switch is tripped five times in succession, a drain malfunction is determined to have occurred. “AF” is then displayed as operation continues.

6.2 Louver Control for Preventing Ceiling Dirt

We have added a control feature that allows you to select the range of in which air direction can be adjusted in order to prevent the ceiling surrounding the air discharge outlet of ceiling mounted cassette type units from being soiled. (This feature is available on double flow, multi-flow and corner types.)



The factory set position is standard position.

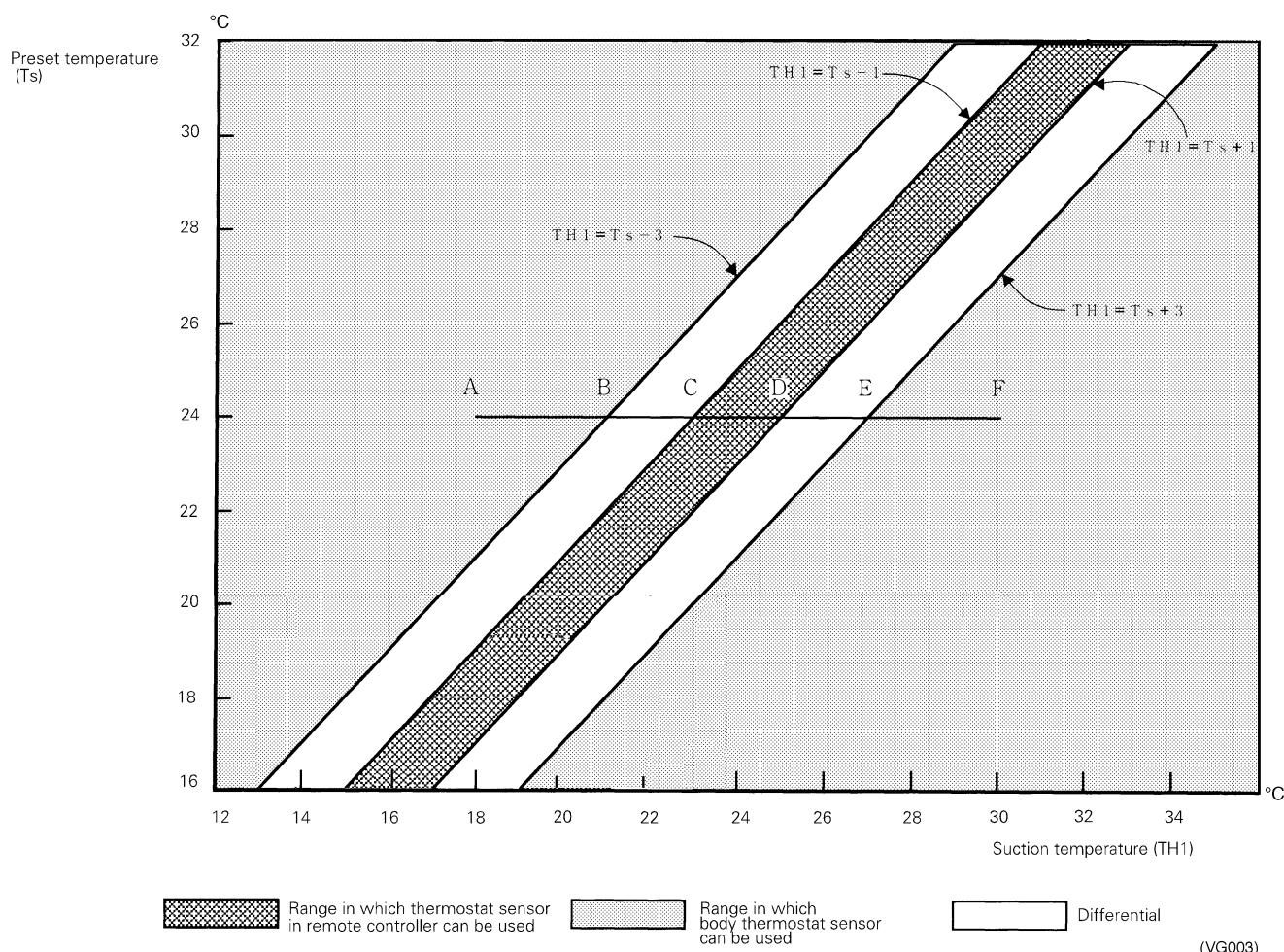
(VL012)

6.3 Thermostat Sensor in Remote Controller

Temperature is controlled by both the thermostat sensor in remote controller and air suction thermostat in the indoor unit. (This is however limited to when the field setting for the thermostat sensor in remote controller is set to "Use.")

Cooling

If there is a significant difference in the preset temperature and the suction temperature, fine adjustment control is carried out using a body thermostat sensor, or using the sensor in the remote controller near the position of the user when the suction temperature is near the preset temperature.



■ Ex: When cooling

Assuming the preset temperature in the figure above is 24°C, and the suction temperature has changed from 18°C to 30°C (A → F):

(This example also assumes there are several other air conditioners, the UM system is off, and that temperature changes even when the thermostat sensor is off.)

Body thermostat sensor is used for temperatures from 18°C to 23°C (A → C).

Remote controller thermostat sensor is used for temperatures from 23°C to 27°C (C → E).

Body thermostat sensor is used for temperatures from 27°C to 30°C (E → F).

And, assuming suction temperature has changed from 30°C to 18°C (F → A):

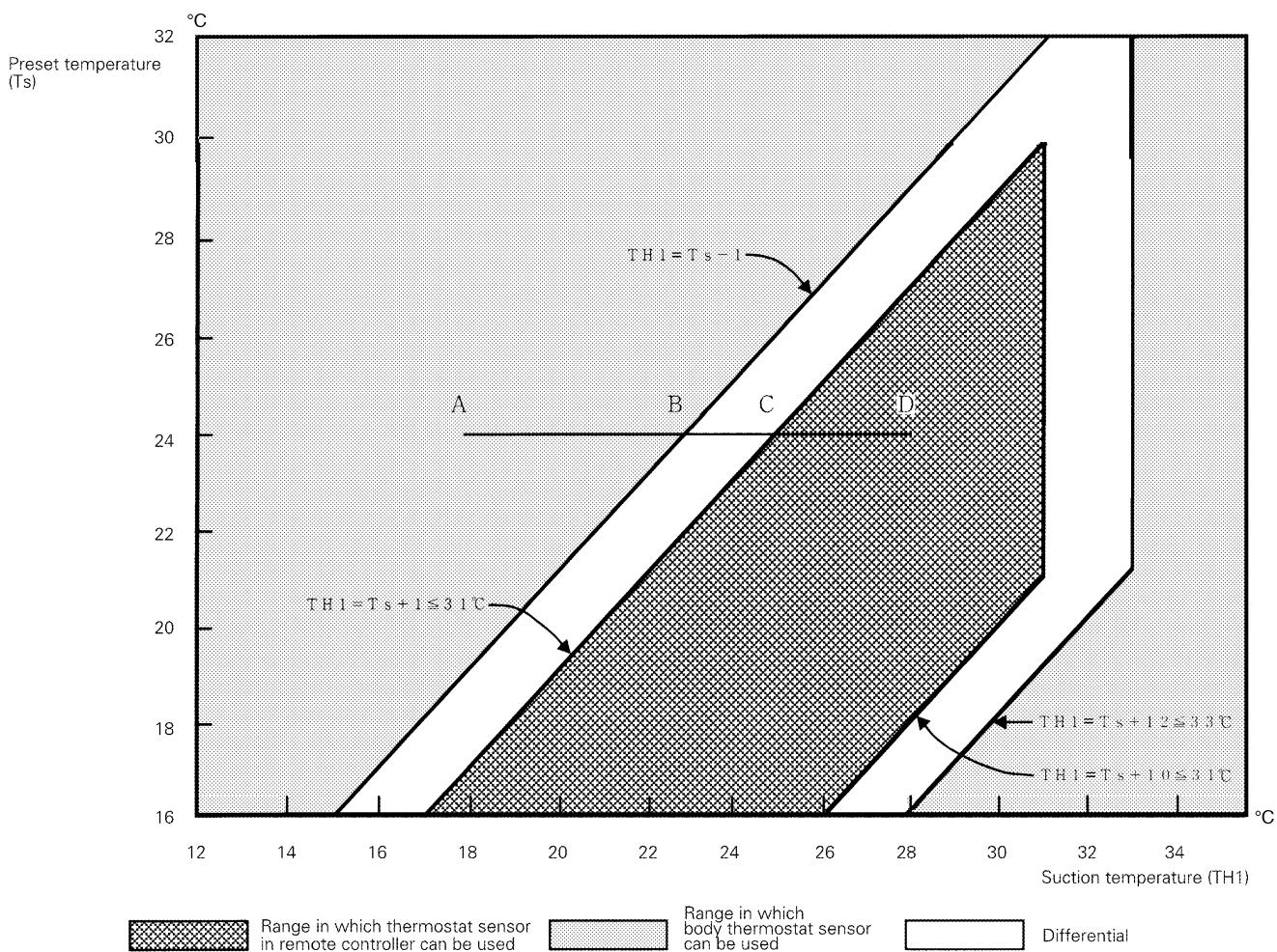
Body thermostat sensor is used for temperatures from 30°C to 25°C (F → D).

Remote controller thermostat sensor is used for temperatures from 25°C to 21°C (D → B).

Body thermostat sensor is used for temperatures from 21°C to 18°C (B → A).

Heating

When heating, the hot air rises to the top of the room, resulting in the temperature being lower near the floor where the occupants are. When controlling by body thermostat sensor only, the unit may therefore be turned off by the thermostat before the lower part of the room reaches the preset temperature. The temperature can be controlled so the lower part of the room where the occupants are doesn't become cold by widening the range in which thermostat sensor in remote controller can be used so that suction temperature is higher than the preset temperature.



(V2769)

■ Ex: When heating

Assuming the preset temperature in the figure above is 24°C, and the suction temperature has changed from 18°C to 28°C (A → D):

(This example also assumes there are several other air conditioners, the UM system is off, and that temperature changes even when the thermostat sensor is off.)

Body thermostat sensor is used for temperatures from 18°C to 25°C (A → C).

Remote controller thermostat sensor is used for temperatures from 25°C to 28°C (C → D).

And, assuming suction temperature has changed from 28°C to 18°C (D → A):

Remote controller thermostat sensor is used for temperatures from 28°C to 23°C (D → B).

Body thermostat sensor is used for temperatures from 23°C to 18°C (B → A).

6.4 Freeze Prevention

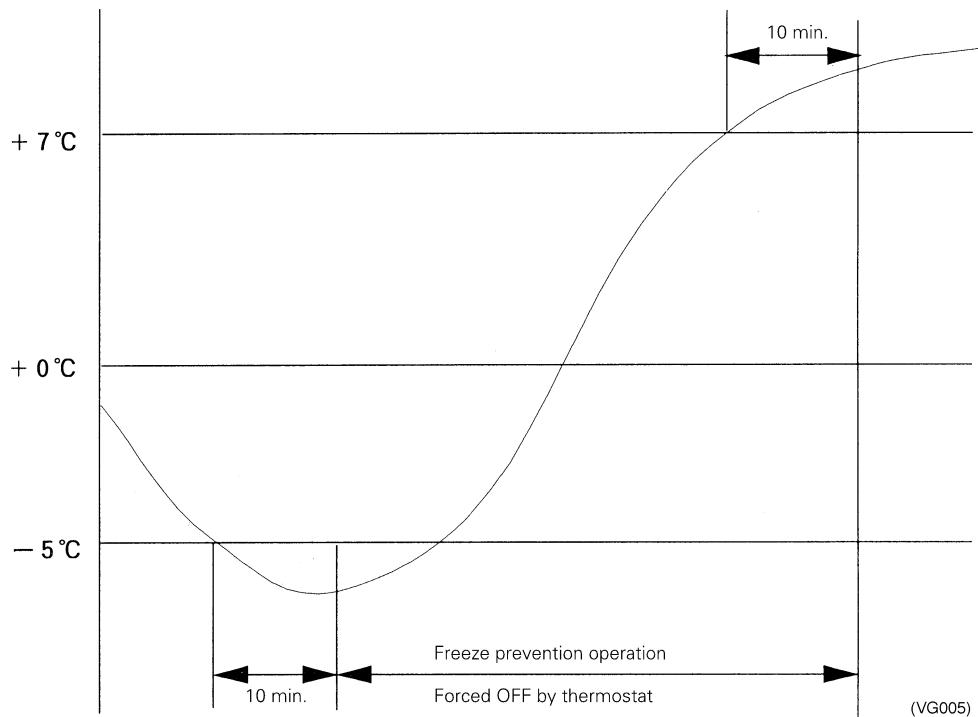
Freeze Prevention by Off Cycle (Indoor Unit)

When the temperature detected by liquid pipe temperature thermistor (R2T) of the indoor unit heat exchanger drops too low, the unit enters freeze prevention operation in accordance with the following conditions, and is also set in accordance with the conditions given below.

Conditions for starting freeze prevention: Temperature is -1°C or less for total of 40 min., or temperature is -5°C or less for total of 10 min.

Conditions for stopping freeze prevention: Temperature is $+7^{\circ}\text{C}$ or more for 10 min. continuously

Ex: Case where temperature is -5°C or less for total of 10 min.



6.5 View of Operations of Swing Flaps

Swing flaps work as following.

| | | | Fan | Flap control | | |
|---------|---|----------------------------|-----------------|--------------|-------------------|----------|
| | | | | UM4 | LM3 DM3 TM3 | KM3 |
| Heating | Hot-start from defrosting | Swinging | OFF | Level | Level | Level |
| | | Setting the wind direction | OFF | Level | Level | Level |
| | Defrosting | Swinging | OFF | Level | Level | Level |
| | | Setting the wind direction | OFF | Level | Level | Level |
| | Thermostat is off | Swinging | LL | Level | Level | Level |
| | | Setting the wind direction | LL | Level | Level | Level |
| | Hot-start from the state that the thermostat is off | Swinging | LL | Level | Level | Level |
| | | Setting the wind direction | LL | Level | Level | Level |
| | Halt | Swinging | OFF | Level | Level | Level |
| | | Setting the wind direction | OFF | Level | Level | Level |
| Cooling | Thermostat of microcomputer-dry is on | Swinging | L ^{*1} | Swinging | Swinging | Swinging |
| | | Setting the wind direction | L ^{*1} | Set up | Set up | Set up |
| | Thermostat of microcomputer-dry is off | Swinging | OFF or L | Swinging | Swinging | Swinging |
| | | Setting the wind direction | | Set up | Set up | Set up |
| | Cooling thermostat is off | Swinging | Set up | Swinging | Swinging | Swinging |
| | | Setting the wind direction | Set up | Set up | Set up | Set up |
| | Halt | Swinging | OFF | Level | Level | Level |
| | | Setting the wind direction | OFF | Set up | Level | Level |
| | Microcomputer is controlled (including the cooling state) | Swinging | L | Swinging | Swinging | Swinging |
| | | Setting the wind direction | L | Set up | Set up | Set up |

* 1. Only in UM4 case, L or LL.

6.6 Electronic Expansion Valve Control

- Electronic expansion Valve Control

In cooling, to maximize the capacity of indoor unit heat exchanger (evaporator), operate the electronic expansion valve under PI control so that the evaporator outlet superheated degree (SH) will become constant.

In heating, to maximize the capacity of indoor unit heat exchanger (condenser), operate the electronic expansion valve under PI control so that the evaporator outlet superheated degree (Condenser outlet subcooled degree) will become constant.

Cooling SH=TH₂-TH₁

(Heating SC=TC-TH₁)

SH : Evaporator outlet superheated degree

TH₁: Temperature (°C) detected with the liquid thermistor

TH₂: Temperature (°C) detected with the gas thermistor

SC : Condenser outlet subcooled degree

TC : High pressure equivalent saturated temperature

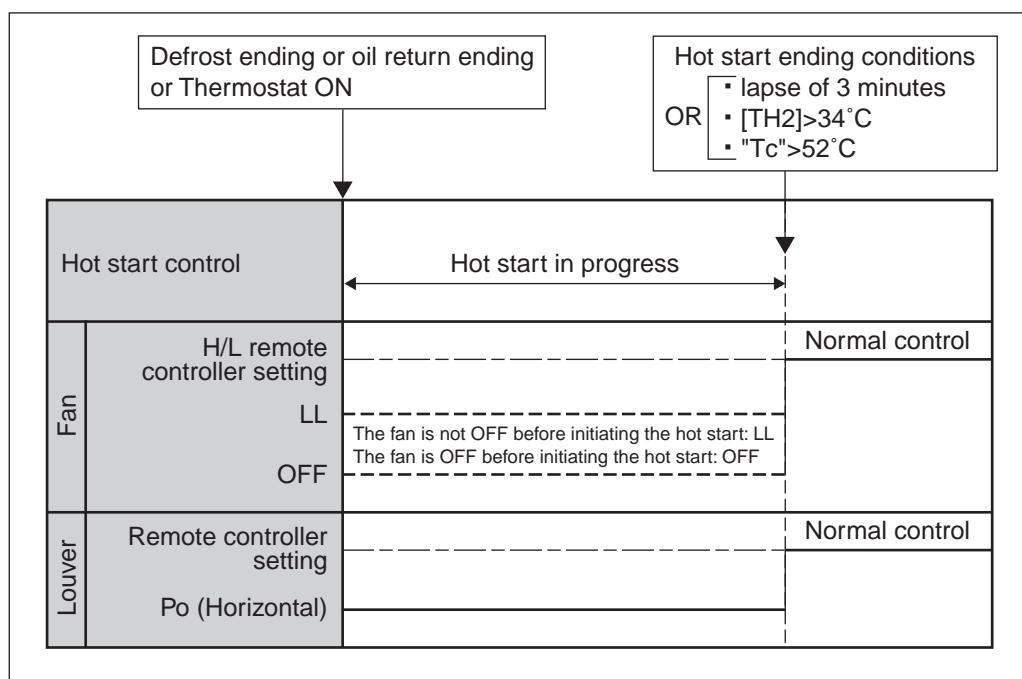
Furthermore, the default value of the optimal evaporator outlet superheated degree (condenser outlet subcooled degree) is 5 deg. However, this default value varies with the operating performance.

6.7 Hot Start Control (In Heating Operation Only)

At startup with thermostat ON or after the completion of defrosting in heating operation, the indoor unit fan is controlled to prevent cold air from blasting out and ensure startup capacity.

[Detail of operation]

When either the **start condition 1** or the **start condition 2** is established, the operations shown below will be conducted.



TH₂: Temperature (°C) detected with the gas thermistor

TC : High pressure equivalent saturated temperature

Part 6

Test Operation

| | | |
|-----|---|-----|
| 1. | Test Operation | 74 |
| 1.1 | Procedure and Outline | 74 |
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| 2. | Outdoor Unit PC Board Layout | 86 |
| 3. | Field Setting | 87 |
| 3.1 | Field Setting from Remote Controller..... | 87 |
| 3.2 | Field Setting from Outdoor Unit..... | 104 |

1. Test Operation

1.1 Procedure and Outline

Follow the following procedure to conduct the initial test operation after installation.

1.1.1 Check Work Prior to Turn Power Supply On

Check the below items.

- Power wiring
- Control transmission wiring between units
- Earth wire

- Is the power supply three-phase 380-415V / 50Hz?
- Have you finished a ductwork to drain?
- Have you detach transport fitting?
- Is the wiring performed as specified?
- Are the designated wires used?
- Is the grounding work completed?

Use a 500V megger tester to measure the insulation.

- Do not use a megger tester for other circuits than 380-415V circuit.

- Are the setscrews of wiring not loose?
- Is the electrical component box covered with an insulation cover completely?

Check on refrigerant piping

- Is pipe size proper? (The design pressure of this product is 4.0MPa.)

- Are pipe insulation materials installed securely?
Liquid and gas pipes need to be insulated. (Otherwise causes water leak.)

- Are respective stop valves on liquid and gas line securely open?

Check on amount of refrigerant charge

- Is refrigerant charged up to the specified amount?
If insufficient, charge the refrigerant from the service port of stop valve on the liquid side with outdoor unit in stop mode after turning power on.

- Has the amount of refrigerant charge been recorded on "Record Chart of Additional Refrigerant Charge Amount"?

(V3180)

1.1.2 Turn Power On

Turn outdoor unit power on.

- Be sure to turn the power on 6 hours before starting operation to protect compressors.

- Close outside panels of the outdoor unit.



Turn indoor unit power on.



Carry out field setting on outdoor PC board

(V3056)

1.1.3 Air Tight Test and Vacuum Drying

- Air tight test: Make sure to use nitrogen gas.
- Pressurize the liquid and gas pipes to 4.0 MPa (40 bar) (do not pressurize more than 4.0 MPa (40 bar)). If the pressure does not drop within 24 hours, the system passes the test. If the pressure drops, check where the nitrogen leaks from.
- Vacuum drying: Use a vacuum pump which can evacuate to -100.7 kPa (5 Torr, -755 mm Hg)
 1. Evacuate the system from the liquid and gas pipes by using a vacuum pump for more than 2 hours and bring the system to -100.7 kPa . After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.
 2. Following should be executed if there is a possibility of moisture remaining inside the pipe (if piping work is carried out during the raining season or over a long period of time, rainwater may enter the pipe during work).

After evacuating the system for 2 hours, pressurize the system to 0.05 MPa (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to -100.7 kPa (vacuum drying). If the system cannot be evacuated to -100.7 kPa within 2 hours, repeat the operation of vacuum break and vacuum drying.

Then, after leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.

1.1.4 Additional Refrigerant Charge



- Refrigerant cannot be charged until field wiring has been completed.
- Refrigerant may only be charged after performing the leak test and the vacuum drying (see above).
- When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.
- Charging with an unsuitable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant (R-410A) is charged.
- Refrigerant containers shall be opened slowly.
- Always use protective gloves and protect your eyes when charging refrigerant.
- When performing service on the unit requiring the refrigerant system to be opened, refrigerant must be evacuated according to local regulations.
- Do not use the automatic refrigerant charging function while working on the indoor units. When using the automatic refrigerant charging function, the indoor units operate automatically as well as the outdoor unit.
- When the power is on, please close the front panel when leaving the unit.

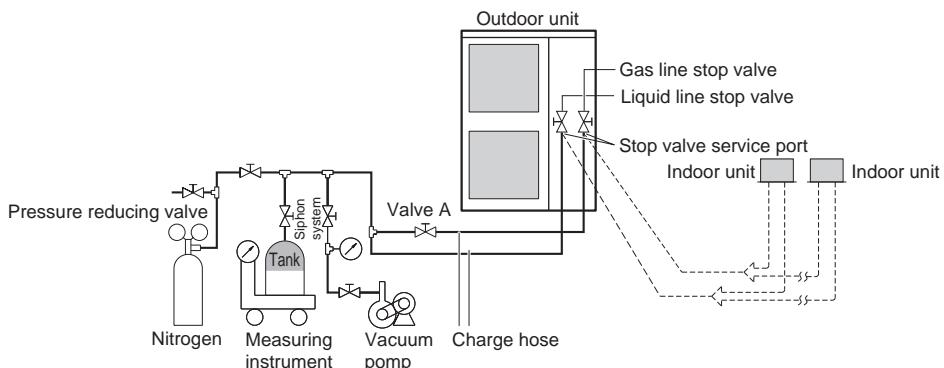


Fig. 6

To avoid compressor breakdown. Do not charge the refrigerant more than the specified amount.

- This outdoor unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant. See "How to calculate the additional refrigerant to be charged" on page 249.
- In case re-charge is required, refer to the nameplate of the unit. The nameplate states the type of refrigerant and necessary amount.

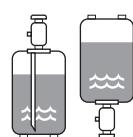
Precautions when adding R-410A

Be sure to charge the specified amount of refrigerant in liquid state to the liquid pipe.

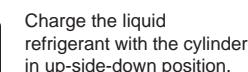
Since this refrigerant is a mixed refrigerant, adding it in gas form may cause the refrigerant composition to change, preventing normal operation.

- Before charging, check whether the refrigerant cylinder is equipped with a siphon tube or not.

Charge the liquid refrigerant with the cylinder in upright position.



Charge the liquid refrigerant with the cylinder in up-side-down position.



1.1.4.1 Important information regarding the refrigerant used

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent gases into the atmosphere.

Refrigerant type: R-410A

GWP⁽¹⁾ value: 1975

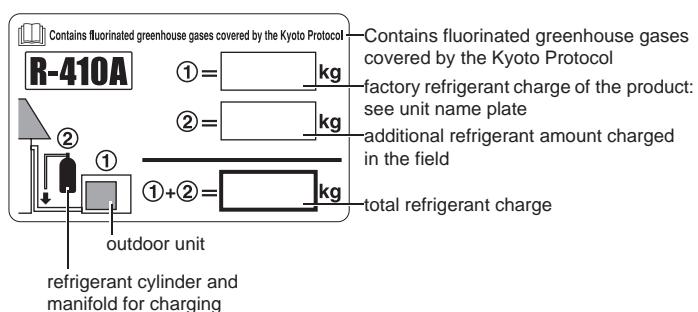
⁽¹⁾ GWP = global warming potential

Please fill in with indelible ink,

- ① the factory refrigerant charge of the product,
- ② the additional refrigerant amount charged in the field and
- ① + ② the total refrigerant charge

on the refrigerant charge label supplied with the product.

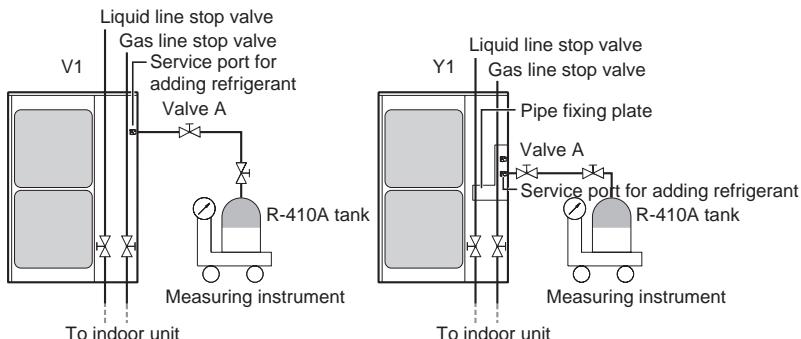
The filled out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the service cover).



1.1.4.2 Procedures for adding refrigerant

Procedure 1: Adding refrigerant by using the automatic refrigerant charging function
(recommended)

How to connect the tank?



When the refrigerant tank is connected and the specified operation is performed, the appropriate amount of refrigerant will be charged into the system. After charging, the system will stop automatically. The refrigerant must be charged according to the procedure described below.



Caution

- Make sure to turn ON the power 6 hours before starting the operation. This is necessary to warm the crankcase by the electric heater.
- Automatic charging is able to charge 6 kg/hour refrigerant at an outside temperature of 0°C to 24 kg/hour refrigerant at an outside temperature of 35°C.
The charging time depends on the amount of charged refrigerant and on the outside temperature.
- Automatic refrigerant charging is NOT possible if the following restrictions are exceeded:
 - Outside temperature: 0°C DB~43°C DB
 - Indoor temperature: 0°C DB~32°C DB
 - Indoor unit connection capacity: 50%~130%

Automatic refrigerant charging procedure

1. Open the liquid and gas side stop valves completely.



Note that valve A must be closed!

2. Turn on the power of the outdoor unit and indoor units.



Note

When an indoor unit is connected to the refrigerant system and the indoor unit is turned off, automatic charging will fail.

3. Make sure that the led on the PCB on the outdoor unit are as shown in the table below. This indicates that the system is operating normally.

| MODE | TEST/HWL | IND | MASTER | SLAVE | L.N.O.P. | DEMAND |
|------|----------|-----|--------|-------|----------|--------|
| H1P | H2P | H3P | H4P | H5P | H6P | H7P |
| ● | ● | ○ | ● | ● | ● | ● |

Led state

Throughout the manual the state of the leds is indicated as follows:

- OFF
- ON
- blinking
- * ON or OFF

If H2P is lit up, check the type of error based on the error code in the remote controller and correct the error in accordance with "1.1.5 Check Operation" on page 82.

4. Automatically charge the refrigerant according to the procedure described below.

**Warning**

Do not touch anything else than the push-buttons (BS1~5) on the PCB when making the settings. These settings must be done with the power on



4.1 Press **BS4 TEST** once.

| H1P | H2P | H3P | H4P | H5P | H6P | H7P |
|-----|-----|-----|-----|-----|-----|-----|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

4.2 Press **BS4 TEST** for 5 seconds. The unit will start running.

| H1P | H2P | H3P | H4P | H5P | H6P | H7P |
|-----|-----|-----|-----|-----|-----|-----|
| ● | ○● | ● | ● | ● | * | * |

If the led display below appears, the automatic refrigerant charging restriction has been exceeded. Additional refrigerant must be charged by calculating the additional refrigerant charging amount.

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Description of error |
|-----|-----|-----|-----|-----|-----|-----|-----------------------------------|
| ○ | ○● | ○● | ○● | ○ | ● | ● | Inappropriate outdoor temperature |

or

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Description of error |
|-----|-----|-----|-----|-----|-----|-----|----------------------------------|
| ○ | ○● | ○● | ○● | ● | ○ | ● | Inappropriate indoor temperature |

If the led display below appears, check the indoor unit connection capacity.

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Description of error |
|-----|-----|-----|-----|-----|-----|-----|---|
| ○ | ○● | ○● | ○● | ○● | ● | ○ | Inappropriate indoor unit connection capacity |

If the led display below appears, the liquid and gas side stop valves may be closed.

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Description of error |
|-----|-----|-----|-----|-----|-----|-----|----------------------|
| ○ | ● | * | * | * | * | * | Stop valve is closed |



Note If you want to repeat the automatic refrigerant charging operation from step 4.1, fully open the liquid and gas side stop valves and press the **BS1 MODE** button once.

4.3 When the led indication becomes as shown in the table below in about 15 to 30 minutes after start of operation, open valve A at once to start charging of the refrigerant. Immediately after starting charging of the refrigerant by opening valve A, press **BS4 TEST** once. When **BS4 TEST** is not pressed within 10 minutes after the led indication is shown, charging is stopped.

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Code on remote controller |
|-----|-----|-----|-----|-----|-----|-----|---------------------------|
| ○ | ○● | ○● | ● | ○ | ● | ○ | P8 |

4.4 The led indication becomes as shown in the table below during automatic refrigerant charging.

During automatic refrigerant charging, the remote controller indicates **TEST** (test operation) and  (external control).

| H1P | H2P | H3P | H4P | H5P | H6P | H7P |
|-----|-----|-----|-----|-----|-----|-----|
| ● | ● | * | * | * | * | * |



Note If the led display below appears, the refrigerant tank is empty. Replace the refrigerant tank, open valve A and re-charge.

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Code on remote controller |
|-----|-----|-----|-----|-----|-----|-----|---------------------------|
| ● | ● | ● | ● | ● | ● | ● | PG |

The led indication becomes as shown in the table below when automatic refrigerant charging is about to end. Prepare to close the valve on the refrigerant tank.

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Code on remote controller |
|-----|-----|-----|-----|-----|-----|-----|---------------------------|
| ● | ● | ● | ● | ● | ● | ● | PG |



Note It is possible that the code **PG** is not shown on the remote controller but this does not indicate a malfunction. The led indication can immediately shift to the situation as shown in "Case 1: Charging complete" on page 79.

4.5 When the led indication becomes as shown in the table below, quickly close valve A and follow instructions as described below.



Caution

- When adding refrigerant is done or when pausing, close the valve on the refrigerant tank immediately.
More refrigerant might be charged by any remaining pressure after the machine is stopped.
- The outdoor fan may keep rotating a little bit more, but this does not indicate a malfunction.

Case 1: Charging complete

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Code on remote controller |
|-----|-----|-----|-----|-----|-----|-----|---------------------------|
| ● | ● | ● | ● | ● | ● | ● | PG |

Charging of the refrigerant is complete. Press **BS1 MODE** button once and go to step 5.

Case 2: Recharging operation

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Code on remote controller |
|-----|-----|-----|-----|-----|-----|-----|---------------------------|
| ● | ● | ● | ● | ● | ● | ● | PG |

Press **BS1 MODE** button once and perform automatic refrigerant charging again starting from Step 4.1.

Case 3: Charging interrupted

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Code on remote controller |
|-----|-----|-----|-----|-----|-----|-----|---------------------------|
| ● | ● | ● | ● | ● | ● | ● | PG |

Something is preventing normal operation:

- Is the gas side stop valve completely open?
- Are the valve on the refrigerant tank and valve A open?
Check if the **BS4 TEST** button was pressed within 10 minutes after the valves were opened.
- Is the indoor unit air intake vent or outlet vent blocked?

After correcting the problem, press **BS1 MODE** button once and perform automatic refrigerant charging again starting from step 4.1.

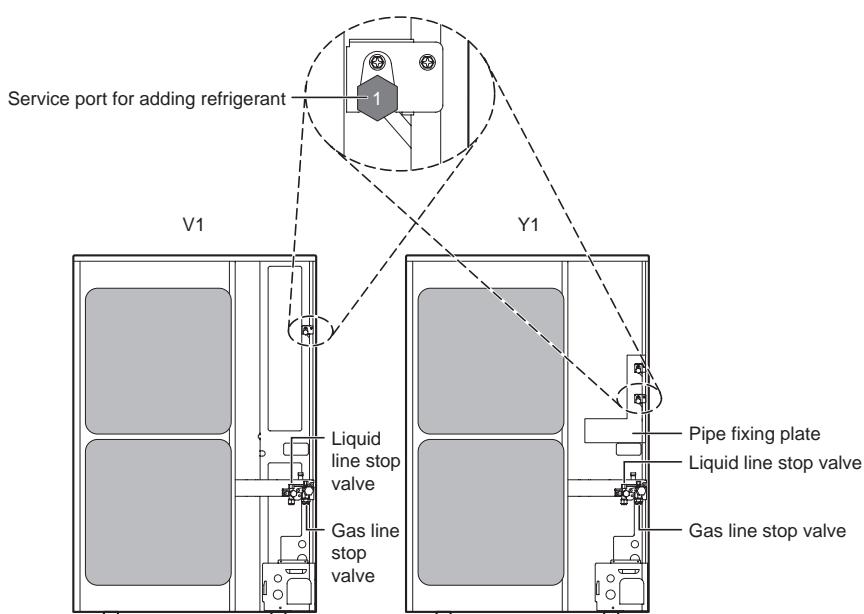
Case 4: Failure

| H1P | H2P | H3P | H4P | H5P | H6P | H7P | Error code on remote controller |
|-----|-----|-----|-----|-----|-----|-----|---------------------------------|
| ● | ○ | ○ | ● | ● | ● | ● | See footnote ^(*) |

(*) An error in the system interrupted the operation of the unit. Check the error by using the error code displayed on the remote controller. For an explanation of the error codes, see "Error codes on the remote controller" on page 75 and solve the problem.

After correcting the problem, press **BS1 MODE** button once and perform automatic refrigerant charging again starting from step 4.1.

5. When charging is complete, determine the weight of refrigerant that was added and fill in the amount in the "Additional refrigerant charge label" attached to service precautions plate on the unit.
6. After adding the refrigerant, do not forget to close the lid of the service port. The tightening torque for the lid is 11.5~13.9 N·m.



Procedure 2: Charging while the outdoor unit is at a standstill

See figure 6 on page 75.

1. Determine the weight of refrigerant to be charged additionally referring to the item "Additional refrigerant charge" in "How to calculate the additional refrigerant to be charged" on page 249 and fill in the amount in the "Additional refrigerant charge label" attached to the unit.
2. After the vacuum drying is finished, open valve A and charge the additional refrigerant in its liquid state through the service port on the liquid stop valve taking into account following instructions:
 - Turn on the power of the outdoor unit and indoor units.
 - Check that gas and liquid stop valves are closed.
 - Stop the compressor and charge the specified weight of refrigerant.



- To avoid compressor breakdown. Do not charge the refrigerant more than the specified amount.
- If the total refrigerant cannot be charged while the outdoor unit is at a standstill, it is possible to charge the refrigerant by operating the outdoor unit using the refrigerant charge function (refer to "Setting mode 2" on page 108) and follow "Procedure 3: Charging while the outdoor unit is operating" on page 81.

Procedure 3: Charging while the outdoor unit is operating

See the figure in "How to connect the tank?" on page 77.

1. Completely open the gas side stop valve and liquid side stop valve. Valve A must be left fully closed.
2. Close the front panel and turn on the power to all indoor units and the outdoor unit.
3. Open valve A immediately after starting of the compressor.
4. Charge the additional refrigerant in its liquid state through the service port of the liquid line stop valve.
5. While the unit is at a standstill and under setting mode 2 (refer to Checks before initial start-up, "Setting mode 2" on page 108), set the required function A (additional refrigerant charging operation) to **ON** (ON). Then operation starts. The blinking H2P led indicates test operation and the remote controller indicates **TEST** (test operation) and  (external control).
6. When the specified amount of refrigerant is charged, push the **BS3 RETURN** button. Then operation stops.
 - The operation automatically stops within 30 minutes.
 - If the refrigerant charge cannot be finished within 30 minutes, repeat step 5.
 - If the operation stops immediately after restart, there is a possibility that the system is overcharged.
The refrigerant cannot be charged more than this amount.
7. After the refrigerant charge hose is removed, make sure to close valve A.

1.1.5 Check Operation

- * During check operation, mount front panel to avoid the misjudging.
- * Check operation is mandatory for normal unit operation.
(When the check operation is not executed, alarm code "U3" will be displayed.)

Set to setting mode 1 (H1P led is off) (refer to "Setting mode 1" on page 107.)



Press and hold the TEST OPERATION button (BS4) on outdoor unit PC board for 5 seconds.



Check on operation

○ The test operation is started automatically.
The following judgements are conducted within 15 minutes(about 30 minutes at the maximum).

- “Check for wrong wiring”
- “Check stop valve for not open”
- “Check of refrigerant charge”
- “Pipe length automatic judgement”

The following indications are conducted while in test operation.

- LED lamp on outdoor unit PC board — H2P flickers (test operation)
- Remote controller — Indicates “UNDER CENTRALIZED CONTROL”
on upper right.
— Indicates “TEST OPERATION” on lower left.

(V3057)

On completion of test operation, LED on outdoor unit PC board displays the following.

H3P ON: Normal completion

H2P ON: Abnormal completion → Check the indoor unit remote controller for abnormal display and correct it.

Malfunction code

In case of an alarm code displayed on remote controller:

| Malfunction code | Nonconformity during installation | Remedial action |
|------------------|--|---|
| E3 | The shutoff valve of an outdoor unit is left closed. | Open the gas-side shutoff valve and the liquid-side shutoff valve. |
| | Refrigerant overcharge. | Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine. |
| E4 | The shutoff valve of an outdoor unit is left closed. | Open the gas-side shutoff valve and the liquid-side shutoff valve. |
| | Insufficient refrigerant. | Check if the additional refrigerant charge has been finished correctly. Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant. |
| F3 | Refrigerant overcharge. | Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine. |
| | The shutoff valve of an outdoor unit is left closed. | Open the gas-side shutoff valve and the liquid-side shutoff valve. |
| | Insufficient refrigerant. | Check if the additional refrigerant charge has been finished correctly. Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant. |
| F6 | Refrigerant overcharge | Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine. |
| U1 | Power supply cables are connected in the reverse phase instead of the normal phase. | Connect the power supply cables in normal phase. Change any two of the three power supply cables (L1, L2, L3) to correct phase. |
| U2 | Insufficient supply voltage | Check to see if the supply voltage is supplied properly. |
| U3 | If a check operation has not been performed. | Perform a check operation. |
| U4 | No power is supplied to an outdoor unit. | Turn the power on for the outdoor unit. |
| UA | If no dedicated indoor unit is being used. | Check the indoor unit. If it is not a dedicated unit, replace the indoor unit. |
| UF | The shutoff valve of an outdoor unit is left closed. | Open the gas-side shutoff valve and the liquid-side shutoff valve. |
| | If the right indoor unit piping and wiring are not properly connected to the outdoor unit. | Make sure that the right indoor unit piping and wiring are properly connected to the outdoor unit. |
| UH | If the interunit wiring has not be connected or it has shorted. | Make sure the interunit wiring is correctly attached to terminals (X2M) F1/F2 (TO IN/D UNIT) on the outdoor unit circuit board. |

1.1.6 Confirmation on Normal Operation

- Conduct normal unit operation after the check operation has been completed.
(When outdoor air temperature is 24°CDB or higher, the unit can not be operated with heating mode. See the installation manual attached.)
- Confirm that the indoor/outdoor units can be operated normally.
(When an abnormal noise due to liquid compression by the compressor can be heard, stop the unit immediately, and turn on the crankcase heater to heat up it sufficiently, then start operation again.)
- Operate indoor unit one by one to check that the corresponding outdoor unit operates.
- Confirm that the indoor unit discharges cold air (or warm air).
- Operate the air direction control button and flow rate control button to check the function of the devices.

1.2 Operation when Power is Turned On

1.2.1 When Turning On Power First Time

The unit cannot be run for up to 12 minutes to automatically set the master power and address (indoor-outdoor address, etc.).

Status

Outdoor unit

Test lamp H2P Blinks

Can also be set during operation described above.

Indoor unit

If ON button is pushed during operation described above, the "UH" malfunction indicator blinks.

(Returns to normal when automatic setting is complete.)

1.2.2 When Turning On Power the Second Time and Subsequent

Tap the RESET(BS5) button on the outdoor unit PC board. Operation becomes possible for about 2 minutes. If you do not push the RESET button, the unit cannot be run for up to 10 minutes to automatically set master power.

Status

Outdoor unit

Test lamp H2P Blinks

Can also be set during operation described above.

Indoor unit

If ON button is pushed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

1.2.3 When an Indoor Unit or Outdoor Unit has been Added, or Indoor or Outdoor Unit PC Board has been Changed

Be sure to push and hold the RESET button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outdoor address, etc.)

Status

Outdoor unit

Test lamp H2P ON

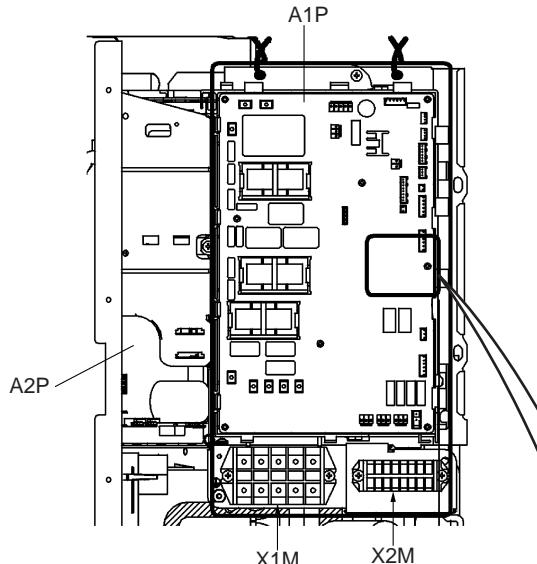
Can also be set during operation described above.

Indoor unit

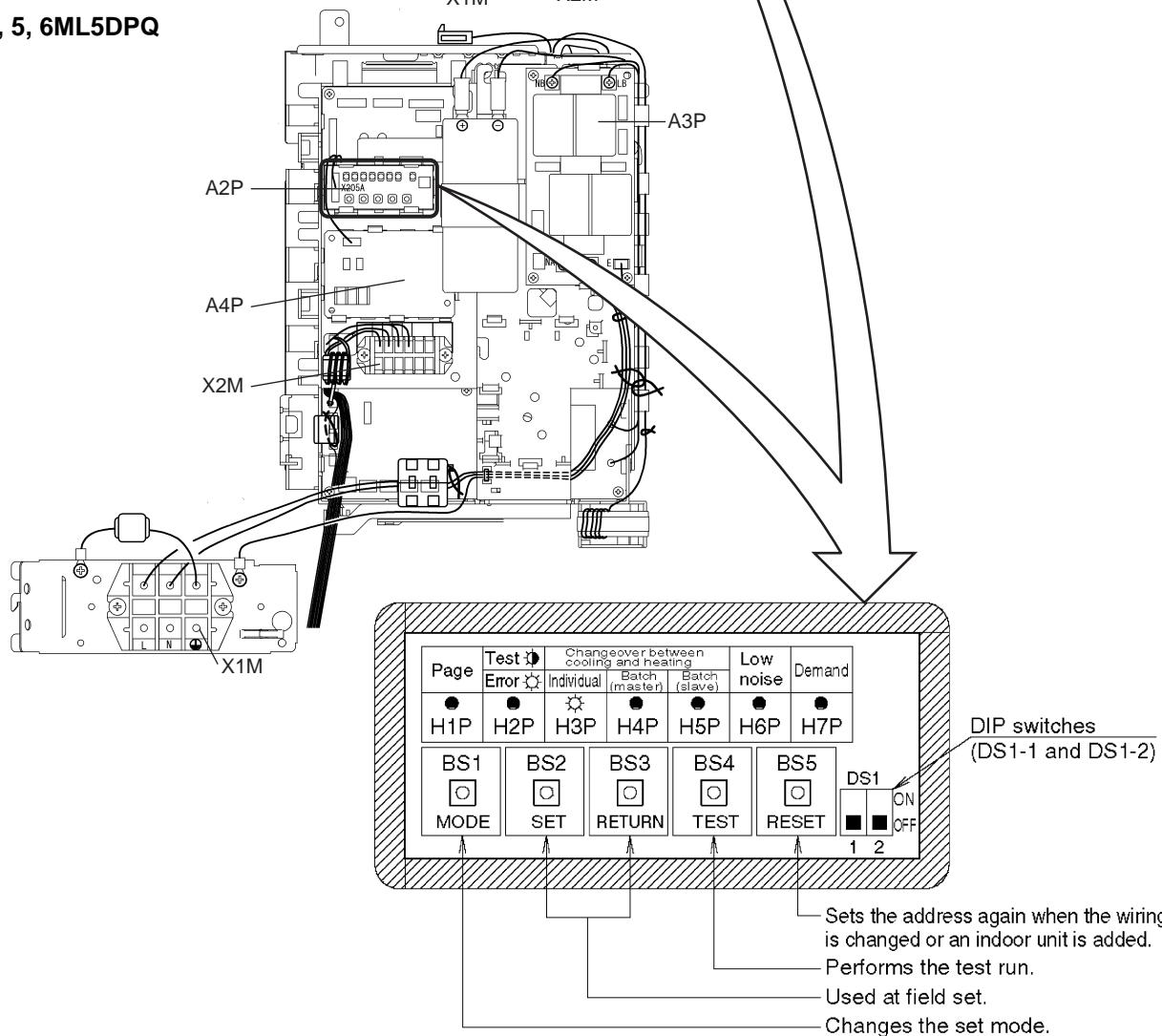
If ON button is pushed during operation described above, the "UH" or "U4" malfunction indicator blinks. (Returns to normal when automatic setting is complete.)

2. Outdoor Unit PC Board Layout

U-4, 5, 6ML5XPQ



U-4, 5, 6ML5DPQ



LED indicator status ● : Turn off ☀ : Turn on ⚡ : Flicker ✨ : Turn on or off

(The LED indicator status shown at left indicates the status at factory set.)

3. Field Setting

3.1 Field Setting from Remote Controller

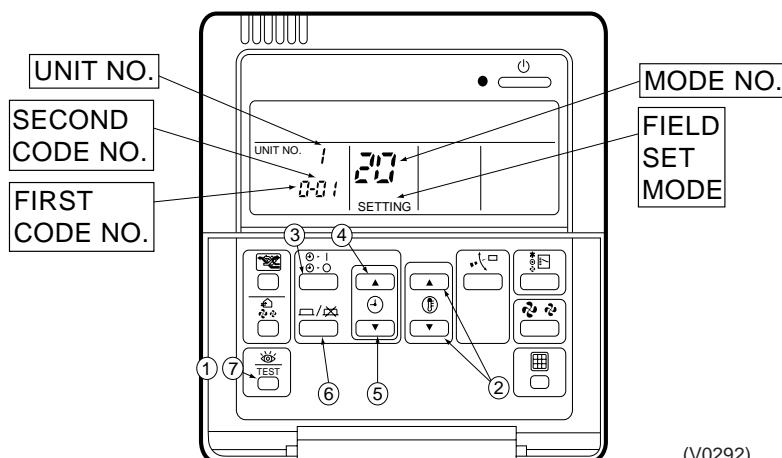
Individual function of indoor unit can be changed from the remote controller. At the time of installation or after service inspection / repair, make the local setting in accordance with the following description.

Wrong setting may cause malfunction.

(When optional accessory is mounted on the indoor unit, setting for the indoor unit may be required to change. Refer to information in the option handbook.)

3.1.1 Wired Remote Controller

CZ-02RT11P



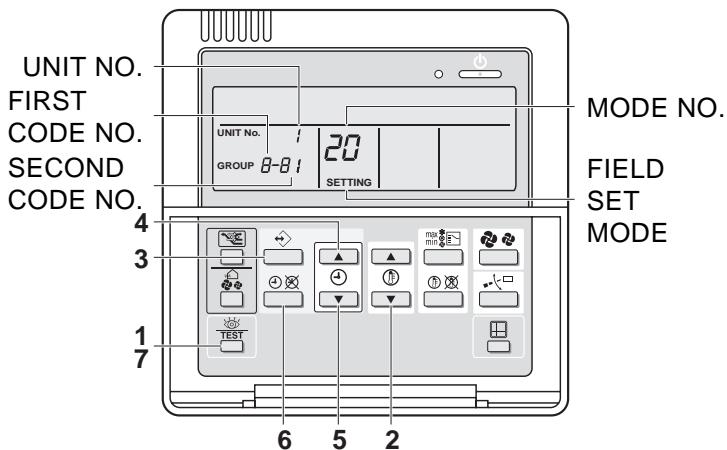
(V0292)

1. When in the normal mode, press the " " button for a minimum of four seconds, and the FIELD SET MODE is entered.
2. Select the desired MODE NO. with the " " button (②).
3. During group control, when setting by each indoor unit (mode No. 20, 22 and 23 have been selected), push the " " button (③) and select the INDOOR UNIT NO to be set. (This operation is unnecessary when setting by group.)
4. Push the " " upper button (④) and select FIRST CODE NO.
5. Push the " " lower button (⑤) and select the SECOND CODE NO.
6. Push the " " button (⑥) once and the present settings are SET.
7. Push the " " button (⑦) to return to the NORMAL MODE.

(Example)

If during group setting and the time to clean air filter is set to FILTER CONTAMINATION, HEAVY, SET MODE NO. to "10" FIRST CODE NO. to "0", and SECOND CODE NO. to "02".

CZ-01RT11P



If optional accessories are mounted on the indoor unit, the indoor unit setting may have to be changed. Refer to the instruction manual for each optional accessory.

1. When in the normal mode, press the “” button for a minimum of four seconds, and the FIELD SET MODE is entered.
2. Select the desired MODE NO. with the “” button.
3. During group control, when setting by each indoor unit (mode No. 20, 21, 22 and 23 have been selected), push the “” button and select the INDOOR UNIT NO. to be set. (This operation is unnecessary when setting by group.)
4. Push the “” upper button and select FIRST CODE NO.
5. Push the “” lower button and select the SECOND CODE NO.
6. Push the “” button once and the present settings are SET.
7. Push the “” button to return to the NORMAL MODE.

(Example)

If during group setting and the time to clean the air filter is set to FILTER CONTAMINATION - HEAVY, SET MODE NO. to “10”, FIRST CODE NO. to “0”, and SECOND CODE NO. to “02”.

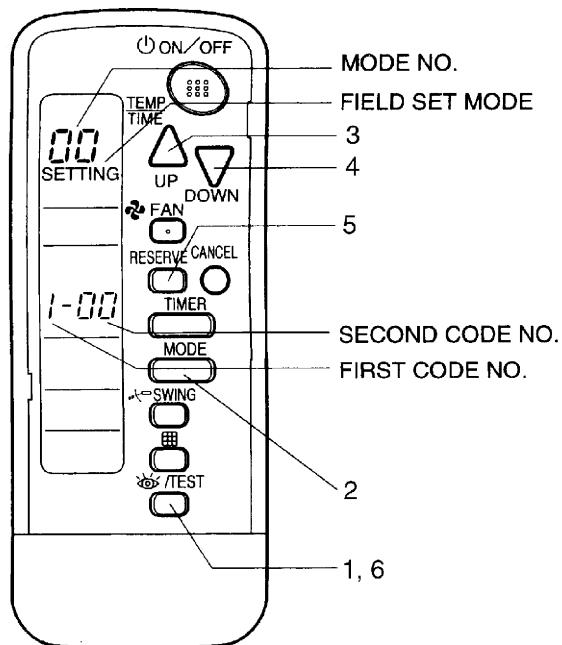
**Notes :**

1. Setting is carried out in the group mode, however, if the mode number inside the parentheses is selected, indoor units can also be set individually.
2. The SECOND CODE number is set to “01” when shipped from the factory.
3. Do not make any settings not given in the table.
4. Not displayed if the indoor unit is not equipped with that function.
5. When returning to the normal mode, “88” may be displayed in the LCD in order for the remote controller to initialize itself.
6. It is not possible to change field settings on the remote controller that is set to “sub”.

3.1.2 Wireless Remote Controller - Indoor Unit

CZ-02RW type

CZ-01RW type



(V2770)

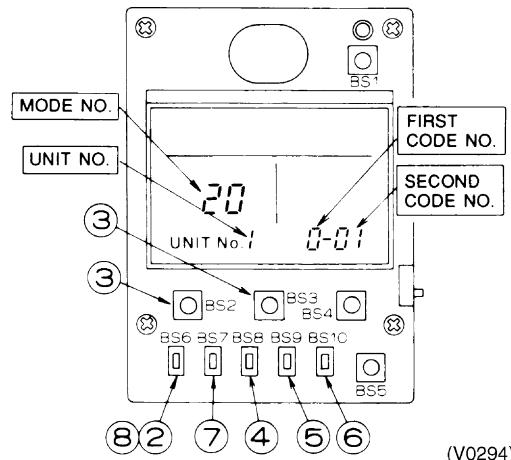
1. When in the normal mode, push the “” button for 4 seconds or more, and operation then enters the “field set mode.”
2. Select the desired “mode No.” with the “” button.
3. Pushing the “” button, select the first code No.
4. Pushing the “” button, select the second code No.
5. Push the timer “” button and check the settings.
6. Push the “” button to return to the normal mode.

(Example)

When setting the filter sign time to “Filter Dirtiness-High” in all group unit setting, set the Mode No. to “10”, Mode setting No. to “0” and setting position No. to “02”.

3.1.3 Simplified Remote Controller

CZ-02RE12P, CZ-03RE12P



1. Remove the upper part of remote controller.
2. When in the normal mode, press the [BS6] BUTTON (②) (field set), and the FIELD SET MODE is entered.
3. Select the desired MODE No. with the [BS2] BUTTON (③) (temperature setting ▲) and the [BS3] BUTTON (③) (temperature setting ▼).
4. During group control, when setting by each indoor unit (mode No. 20, 22, and 23 have been selected), push the [BS8] (④) BUTTON (unit No.) and select the INDOOR UNIT NO. to be set. (This operation is unnecessary when setting by group.)
5. Push the [BS9] BUTTON (⑤) (set A) and select FIRST CODE NO.
6. Push the [BS10] BUTTON (⑥) (set B) and select SECOND CODE NO.
7. Push the [BS7] BUTTON (⑦) (set/cancel) once and the present settings are SET.
8. Push the [BS6] BUTTON (⑧) (field set) to return to the NORMAL MODE.
9. (Example) If during group setting and the time to clean air filter is set to FILTER CONTAMINATION - HEAVY, SET MODE NO. to "10", FIRST CODE NO. to "0", and SECOND CODE NO. to "02".

3.1.4 Setting Contents and Code No. – UM Indoor unit

| | Mode No. Note 2 | Setting Switch No. | Setting Contents | Second Code No.(Note 3) | | | | | | | | Details No. | | |
|--------------------------------|--------------------|--------------------------|--|-------------------------------------|----------------------------------|------------------------------|----------------------------------|--------------------|--------------------|----|------|----------------|--|--|
| | | | | 01 | | 02 | | 03 | | 04 | | | | |
| UM system indoor unit settings | 10 (20) | 0 | Filter contamination heavy/light (Setting for display time to clean air filter) (Sets display time to clean air filter to half when there is heavy filter contamination.) | Super long life filter | Light | Approx. 10,000 hrs. | Heavy | Approx. 5,000 hrs. | — | — | (1) | | | |
| | | | | Long life filter | | Approx. 2,500 hrs. | | Approx. 1,250 hrs. | | | | | | |
| | | | | Standard filter | | Approx. 200 hrs. | | Approx. 100 hrs. | | | | | | |
| | | 1 | Long life filter type | Long life filter | Super long life filter | | — | | — | | (2) | | | |
| | 11 (21) | 2 | Thermostat sensor in remote controller | Use | No use | | — | | — | | (3) | | | |
| | | 3 | Display time to clean air filter calculation (Set when filter sign is not to be displayed.) | Display | No display | | — | | — | | (4) | | | |
| | | 7 | Airflow adjustment | OFF | Completion of airflow adjustment | | Start of airflow adjustment | | — | | (5) | | | |
| UM system indoor unit settings | 12 (22) | 0 | Optional accessories output selection (field selection of output for adaptor for wiring) | Indoor unit turned ON by thermostat | — | | Operation output | | Malfunction output | | (6) | | | |
| | | 1 | ON/OFF input from outside (Set when ON/OFF is to be controlled from outside.) | Forced OFF | ON/OFF control | | External protection device input | | — | | (7) | | | |
| | | 2 | Thermostat differential changeover (Set when remote sensor is to be used.) | 1°C | 0.5°C | | — | | — | | (8) | | | |
| | | 3 | OFF by thermostat fan speed | LL | Set fan speed | | — | | — | | (9) | | | |
| | | 4 | Automatic mode differential (automatic temperature differential setting for UM system heat recovery series cool/heat) | 01:0 02:1 | 03:2 04:3 | 05:4 06:5 | 07:6 08:7 | (10) | | | | | | |
| | | 5 | Power failure automatic reset | Not equipped | Equipped | | — | | — | | (11) | | | |
| | | 6 | Airflow When Cooling Thermostat is OFF | LL air flow | Preset air flow | | — | | — | | (12) | | | |
| UM system indoor unit settings | 13 (23) | 0 | High air outlet velocity (Set when installed in place with ceiling higher than 2.7 m.) | N | H | | S | | — | | (13) | | | |
| | | 1 | Selection of air flow direction (Set when a blocking pad kit has been installed.) | F (4 directions) | | T (3 directions) | | W (2 directions) | | | | (14) | | |
| | | 3 | Air flow direction adjustment (Set at installation of decoration panel.) | Equipped | Not equipped | | — | | — | | (15) | | | |
| | | 4 | Field set air flow position setting | Draft prevention | Standard | | Ceiling Soiling prevention | | — | | (16) | | | |
| | | 5 | Setting of the Static Pressure Selection | Standard | High static pressure | | — | | — | | (17) | | | |
| | | 6 | External Static Pressure Settings | 01:30 02:50 09:120 10:130 | 03:60 04:70 11:140 12:150 | 05:80 06:90 13:160 14:180 | 07:100 08:110 15:200 *7 | (18) | | | | | | |
| | 15 (25) | 1 | Thermostat OFF excess humidity | Not equipped | Equipped | | — | | — | | (19) | | | |
| | | 2 | Direct duct connection (when the indoor unit and heat reclaim ventilation unit are connected by duct directly.) *Note 6 | Not equipped | Equipped | | — | | — | | (20) | | | |
| | | 3 | Drain pump humidifier interlock selection | Not equipped | Equipped | | — | | — | | (21) | | | |
| | | 5 | Field set selection for individual ventilation setting by remote controller | Not equipped | Equipped | | — | | — | | (22) | | | |



- Notes :**
- Settings are made simultaneously for the entire group, however, if you select the mode No. inside parentheses, you can also set by each individual unit. Setting changes however cannot be checked except in the individual mode for those in parentheses.
 - The mode numbers inside parentheses cannot be used by wireless remote controllers, so they cannot be set individually. Setting changes also cannot be checked.
 - Marked **■** are factory set.
 - Do not make settings other than those described above. Nothing is displayed for functions the indoor unit is not equipped with.
 - “88” may be displayed to indicate the remote controller is resetting when returning to the normal mode.
 - If the setting mode to “Equipped”, heat reclaim ventilation fan conducts the fan residual operation by linking to indoor unit.
 - The S-50-63-80-100-125EM3HPS cannot be set to 30Pa.
• The S-40EM3HPS cannot be set to 180 or 200Pa.

3.1.5 Applicable Range of Field Setting

| | Ceiling mounted cassette | | | | Concealed ceiling unit (small) | Concealed ceiling unit | Concealed ceiling unit (large) | Ceiling suspended unit | Wall mounted unit | Floor standing unit | Concealed floor standing unit |
|---|--------------------------|------------|------------|-------------|--------------------------------|------------------------|--------------------------------|------------------------|-------------------|---------------------|-------------------------------|
| | Roundflow | 4-way blow | 2-way blow | Corner type | | | | | | | |
| | UM4 | YM3 | LM3 | DM3 | NM3 | FM3 | EM3 | TM3 | KM3 | PM3 | RM3 |
| Filter sign | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ultra long life filter sign | ○ | ○ | ○ | — | — | — | — | — | — | — | — |
| Remote controller thermostat sensor | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Set fan speed when thermostat OFF | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Air flow adjustment Ceiling height | ○ | — | — | — | — | — | — | ○ | — | — | — |
| Air flow direction | ○ | ○ | — | — | — | — | — | — | — | — | — |
| Air flow direction adjustment (Down flow operation) | — | — | — | ○ | — | — | — | — | — | — | — |
| Air flow direction adjustment range | ○ | ○ | ○ | ○ | — | — | — | — | — | — | — |
| Field set fan speed selection | ○ | — | — | — | — | — | — | ○ | — | — | — |
| Discharge air temp. (Cooling) | — | — | — | — | — | — | — | — | — | — | — |
| Discharge air temp. (Heating) | — | — | — | — | — | — | — | — | — | — | — |

3.1.6 Detailed Explanation of Setting Modes

(1) Filter Sign Setting

If switching the filter sign ON time, set as given in the table below.

Set Time

| Filter Specs. Setting | Standard | Long Life | Ultra Long Life Filter |
|--------------------------|----------|------------|------------------------|
| Contamination Light | 200 hrs. | 2,500 hrs. | 10,000 hrs. |
| Contamination Heavy | 100 hrs. | 1,250 hrs. | 5,000 hrs. |

(2) Ultra-Long-Life Filter Sign Setting

When a Ultra-long-life filter is installed, the filter sign timer setting must be changed.

Setting Table

| Mode No. | Setting Switch No. | Setting Position No. | Setting |
|----------|--------------------|----------------------|----------------------------|
| 10 (20) | 1 | 01 | Long-Life Filter |
| | | 02 | Ultra-Long-Life Filter (1) |
| | | 03 | — |

(3) Selection of Thermistor

Select the thermistor to control room temperature.

| Mode No. | First Code No. | Second Code No. | Thermistor that controls room temperature |
|----------|----------------|-----------------|--|
| 10 (20) | 2 | 01 | Indoor air thermistor for remote controller and suction air thermistor for indoor unit |
| | | 02 | Suction air thermistor for indoor unit |
| | | 03 | Thermistor for remote controller |

The factory setting for the Second Code No. is "01" and room temperature is controlled by the indoor unit suction air thermistor and remote controller thermistor.

When the Second Code No. is set to "02", room temperature is controlled by the suction air thermistor.

When the Second Code No. is set to "03", room temperature is controlled by the remote controller thermistor.

(4) "Filter Cleaning" Displayed or Not Displayed

Whether or not to display "Filter Cleaning" after operation of certain duration can be selected.

| Mode No. | First Code No. | Second Code No. | "Filter Cleaning" display |
|----------|----------------|-----------------|---------------------------|
| 10 (20) | 3 | 01 | Display |
| | | 02 | No display |

(5) Airflow Adjustment (AUTO)

External Static Pressure Settings

Make settings in either method (a) or method (b) as explained below.

(a) Use the airflow auto adjustment function to make settings.

Airflow auto adjustment: The volume of blow-off air is automatically adjusted to the rated quantity.

(b) Select External Static Pressure with Remote Controller Check that 01 (OFF) is set for the "SECOND CODE NO." in "MODE NO. 21" for airflow adjustment on an indoor unit basis in Table 4. The "SECOND CODE NO." is set to 01 (OFF) at factory set. Change the "SECOND CODE NO." as shown in Table according to the external static pressure of the duct to be connected.

| Mode No. | First Code No. | Second Code No. | Airflow adjustment |
|----------|----------------|-----------------|----------------------------------|
| 11 (21) | 7 | 01 | OFF |
| | | 02 | Completion of airflow adjustment |
| | | 03 | Start of airflow adjustment |

(6) Optional Output Switching

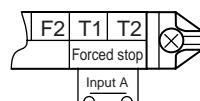
Using this setting, "operation output signal" and "abnormal output signal" can be provided.

Output signal is output between terminals K1 and K2 of "customized wiring adapter," an optional accessory.

| Mode No. | First Code No. | Second Code No. | Remarks |
|----------|----------------|-----------------|--|
| 12 (22) | 0 | 01 | Indoor unit thermostat ON/OFF signal is provided. |
| | | 03 | Output linked with "Start/Stop" of remote controller is provided. |
| | | 04 | In case of "Malfunction Display" appears on the remote controller, output is provided. |

(7) External ON/OFF input

This input is used for "ON / OFF operation" and "Protection device input" from the outside. The input is performed from the T1-T1 terminal of the operation terminal block (X1A) in the electric component box.



Setting Table

| Mode No. | Setting Switch No. | Setting Position No. | Operation by input of the signal A |
|----------|--------------------|----------------------|--|
| 12 (22) | 1 | 01 | ON: Forced stop (prohibition of using the remote controller) OFF: Permission of using the remote controller |
| | | 02 | OFF → ON: Permission of operation ON → OFF: Stop |
| | | 03 | ON: Operation OFF: The system stops, then the applicable unit indicates "A0". The other indoor units indicate "U9". |

(8) Thermostat Switching

Differential value during thermostat ON/OFF control can be changed.

| Mode No. | First Code No. | Second Code No. | Differential value |
|----------|----------------|-----------------|--------------------|
| 12(22) | 2 | 01 | 1°C |
| | | 02 | 0.5°C |

(9) Air Flow Setting When Heating Thermostat is OFF

This setting is used to set air flow when heating thermostat is OFF.

- * When thermostat OFF air flow volume up mode is used, careful consideration is required before deciding installation location. During heating operation, this setting takes precedence over "(7) Fan Stop When Thermostat is OFF."

| Mode No. | First Code No. | Second Code No. | Contents |
|----------|----------------|-----------------|-----------------|
| 12 (22) | 3 | 01 | LL air flow |
| | | 02 | Preset air flow |

(10) Setting of operation mode to "AUTO"

This setting makes it possible to change differential values for mode selection while in automatic operation mode.

| Mode No. | Setting switch No. | Setting position No. | | | | | | | |
|----------|--------------------|----------------------|-----|-----|-----|-----|-----|-----|-----|
| | | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
| 12 (22) | 4 | 0°C | 1°C | 2°C | 3°C | 4°C | 5°C | 6°C | 7°C |

The automatic operation mode setting is made by the use of the "Operation Mode Selector" button.

(11) Auto Restart after Power Failure Reset

For the air conditioners with no setting for the function (same as factory setting), the units will be left in the stop condition when the power supply is reset automatically after power failure reset or the main power supply is turned on again after once turned off. However, for the air conditioners with the setting, the units may start automatically after power failure reset or the main power supply turned on again (return to the same operation condition as that of before power failure).

For the above reasons, when the unit is set enabling to utilize "Auto restart function after power failure reset", utmost care should be paid for the occurrence of the following situation.



- Caution**
1. The air conditioner starts operation suddenly after power failure reset or the main power supply turned on again. Consequently, the user might be surprised (with question for the reason why).
 2. In the service work, for example, turning off the main power switch during the unit is in operation, and turning on the switch again after the work is completed start the unit operation (the fan rotates).

(12) Air Flow When Cooling Thermostat is OFF

This is used to set air flow to "LL air flow" when cooling thermostat is OFF.

| Mode No. | First Code No. | Second Code No. | Contents |
|----------|----------------|-----------------|-----------------|
| 12 (22) | 6 | 01 | LL air flow |
| | | 02 | Preset air flow |

(13) Setting of Normal Air Flow

Make the following setting according to the ceiling height. The setting position No. is set to "01" at the factory.

■ In the Case of KM3

| Mode No. | Setting Switch No. | Setting Position No. | Setting |
|----------|--------------------|----------------------|------------------------------------|
| 13(23) | 0 | 01 | Wall-mounted type: Standard |
| | | 02 | Wall-mounted type: Slight increase |
| | | 03 | Wall-mounted type: Normal increase |

■ In the Case of TM3

| Mode No. | First code No. | Second code No. | Ceiling height (m) |
|----------|----------------|-----------------|--------------------|
| 13(23) | 0 | 01 | 2.7 or less |
| | | 02 | 2.7-3.5 |

■ In the Case of 20~80UM4 (All round outlet)

| Mode No. | First code No. | Second code No. | Setting | Ceiling height (m) |
|----------|----------------|-----------------|-----------------------------|--------------------|
| 13 (23) | 0 | 01 | Standard • All round outlet | ≤2.7 |
| | | 02 | High Ceiling (1) | 2.7-3 |
| | | 03 | Higher Ceiling (2) | 3-3.5 |

■ In the Case of 100~125UM4 (All round outlet)

| Mode No. | First code No. | Second code No. | Setting | Ceiling height (m) |
|----------|----------------|-----------------|-----------------------------|--------------------|
| 13 (23) | 0 | 01 | Standard • All round outlet | ≤3.2 |
| | | 02 | High Ceiling (1) | 3.2-3.6 |
| | | 03 | Higher Ceiling (2) | 3.6-4.2 |

■ In the Case of 20~80UM4 (*²4-Way, 3-Way, 2-Way Outlets)

| Mode No. | First code No. | Second code No. | Setting | Ceiling height | | |
|----------|----------------|-----------------|--------------------|------------------|------------------|------------------|
| | | | | 4-way Outlets | 3-way Outlets | 2-way Outlets |
| 13 (23) | 0 | 01 | Standard (N) | Lower than 3.1 m | Lower than 3.0 m | Lower than 3.5 m |
| | | 02 | High Ceiling (H) | Lower than 3.4 m | Lower than 3.3 m | Lower than 3.8 m |
| | | 03 | Higher Ceiling (S) | Lower than 4.0 m | Lower than 3.5 m | — |

■ In the Case of 100~125UM4 (*²4-Way, 3-Way, 2-Way Outlets)

| Mode No. | First code No. | Second code No. | Setting | Ceiling height | | |
|----------|----------------|-----------------|--------------------|------------------|------------------|------------------|
| | | | | 4-way Outlets | 3-way Outlets | 2-way Outlets |
| 13 (23) | 0 | 01 | Standard (N) | Lower than 3.4 m | Lower than 3.6 m | Lower than 4.2 m |
| | | 02 | High Ceiling (H) | Lower than 3.9 m | Lower than 4.0 m | Lower than 4.2 m |
| | | 03 | Higher Ceiling (S) | Lower than 4.5 m | Lower than 4.2 m | — |

*1 "Mode No." setting is done in a batch for the group. To make or confirm settings for an individual unit, set the internal mode number in parentheses.

*2 The figure of the ceiling height is for the all round outlet. For the settings for four-direction (part of corner closed off), three-direction and two-direction outlets, see the installation manual and technical guide supplied with the separately sold closure material kit.

(14) Air Flow Direction Setting

Set the air flow direction of indoor units as given in the table below. (Set when optional air outlet blocking pad has been installed.) The second code No. is factory set to "01."

Setting Table

| Mode No. | First Code No. | Second Code No. | Setting |
|----------|----------------|-----------------|--------------------------|
| 13 (23) | 1 | 01 | F : 4-direction air flow |
| | | 02 | T : 3-direction air flow |
| | | 03 | W : 2-direction air flow |

(15) Operation of Downward Flow Flap: Yes/No

Only the model DM3 has the function.

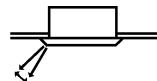
When only the front-flow is used, sets yes/no of the swing flap operation of down-flow.

Setting Table

| Mode No. | First Code No. | Second Code No. | Setting |
|----------|----------------|-----------------|--------------------------|
| 13 (23) | 3 | 01 | Down-flow operation: Yes |
| | | 02 | Down-flow operation: No |

(16) Setting of Air Flow Direction Adjustment Range

Make the following air flow direction setting according to the respective purpose.



(S2537)

Setting Table

| Mode No. | First Code No. | Second Code No. | Setting |
|----------|----------------|-----------------|---------------------------------------|
| 13 (23) | 4 | 01 | Upward (Draft prevention) |
| | | 02 | Standard |
| | | 03 | Downward (Ceiling soiling prevention) |

* Some indoor unit models are not equipped with draft prevention (upward) function.

(17) Setting of the Static Pressure Selection**■ (for future model use)**

| Model No. | First Code No. | Second Code No. | External static pressure |
|-----------|----------------|-----------------|-----------------------------|
| 13 (23) | 5 | 01 | Standard (10Pa) |
| | | 02 | High static pressure (30Pa) |

(18) External Static Pressure Settings (for EM3 model)

| MODE NO. | FIRST CODE NO. | SECOND CODE NO. | External Static Pressure |
|----------|----------------|-----------------|--------------------------|
| 13 (23) | 06 | 01 | 30Pa (*1) |
| | | 02 | 50Pa |
| | | 03 | 60Pa |
| | | 04 | 70Pa |
| | | 05 | 80Pa |
| | | 06 | 90Pa |
| | | 07 | 100Pa |
| | | 08 | 110Pa |
| | | 09 | 120Pa |
| | | 10 | 130Pa |
| | | 11 | 140Pa |
| | | 12 | 150Pa |
| | | 13 | 160Pa |
| | | 14 | 180Pa (*2) |
| | | 15 | 200Pa (*2) |

The "SECOND CODE NO." is set to 07 (an external static pressure of 100 Pa) at factory set.

*1 The 50 · 63 · 80 · 100 · 125EM3 cannot be set to 30 Pa.

*2 The 40EM3 cannot be set to 180 or 200 Pa.

(19) Humidification When Heating Thermostat is OFF

Setting to "Humidification Setting" turns ON the humidifier if suction temperature is 20°C or above and turns OFF the humidifier if suction temperature is 18°C or below when the heating thermostat is OFF.

| Mode No. | First Code No. | Second Code No. | Setting |
|----------|----------------|-----------------|-----------------------|
| 15 (25) | 1 | 01 | — |
| | | 02 | Setting of humidifier |

(20) Setting of Direct Duct Connection

This is used when "fresh air intake kit equipped with fan" is connected. The indoor fan carries out residual operation for one minute after the thermostat is stopped. (For the purpose of preventing dust on the air filter from falling off.)

| Mode No. | First Code No. | Second Code No. | Contents |
|----------|----------------|-----------------|---|
| 15 (25) | 2 | 01 | Without direct duct connection |
| | | 02 | With direct duct connection equipped with fan |

(21) Interlocked Operation between Humidifier and Drain Pump

This is used to interlock the humidifier with the drain pump. When water is drained out of the unit, this setting is unnecessary.

| Mode No. | First Code No. | Second Code No. | Contents |
|----------|----------------|-----------------|---|
| 15 (25) | 3 | 01 | Individual operation of humidifier |
| | | 02 | Interlocked operation between humidifier and drain pump |

(22) Individual Setting of Ventilation

This is set to perform individual operation of heat reclaim ventilation using the remote controller/central unit when heat reclaim ventilation is built in.
(Switch only when heat reclaim ventilation is built in.)

| Mode No. | First Code No. | Second Code No. | Contents |
|----------|----------------|-----------------|-------------------------------------|
| 15 (25) | 5 | 01 | — |
| | | 02 | Individual operation of ventilation |

3.1.7 Centralized Control Group No. Setting

CZ-02RT11P Type

In order to conduct the central remote control using the central remote controller and the unified ON/OFF controller, Group No. settings should be made by group using the operating remote controller.

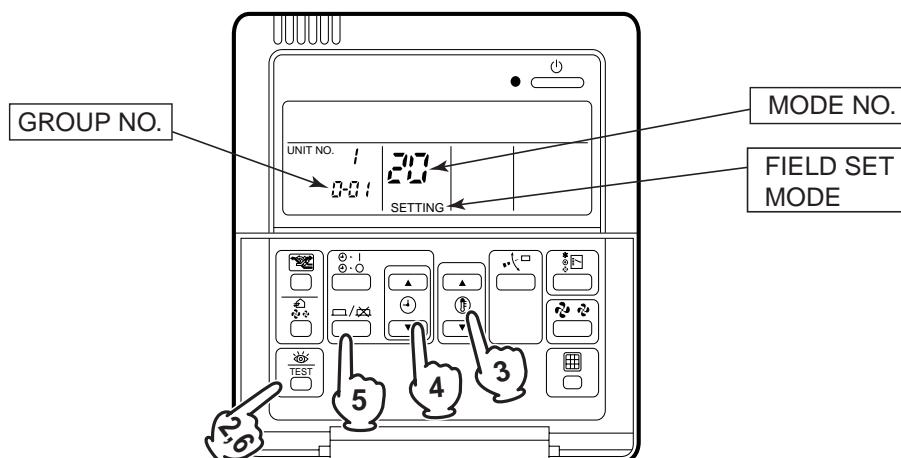
Make Group No. settings for central remote control using the operating remote controller.

1. Turn ON the power of the indoor unit and unified ON/OFF controller. (Unless the power is ON, no setting can be made.)

Check that the installation and electrical wiring are correct before turning the power supply ON.

When the power supply is turned ON, all LCD appear once and the unit may not accept the operation for about one minute with the display of "HOST" flashing (an interval of ON, ON, and OFF)

2. While in normal mode, press and hold the "TEST" switch for a period of four seconds or more to set the system to "Field Setting Mode".
3. Select the MODE No. "00" with the "UP" button.
4. Use the "DOWN" button to select the group No. for each group.
(Group numbers increase in the order of 1-00, 1-01, ... 1-15, 2-00, ... 4-15.)
5. Press "SET" to set the selected group No.
6. Press "TEST" to return to the NORMAL MODE.



Note:

- For wireless remote controller, see the following.
- For setting group No. of HRV and wiring adaptor for other air conditioners, etc., refer to the instruction manual attached.

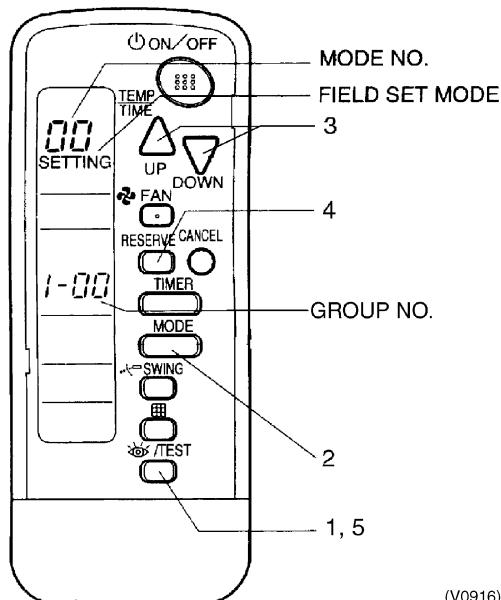
NOTICE

Enter the group No. and installation place of the indoor unit into the attached installation table. Be sure to keep the installation table with the operation manual for maintenance.

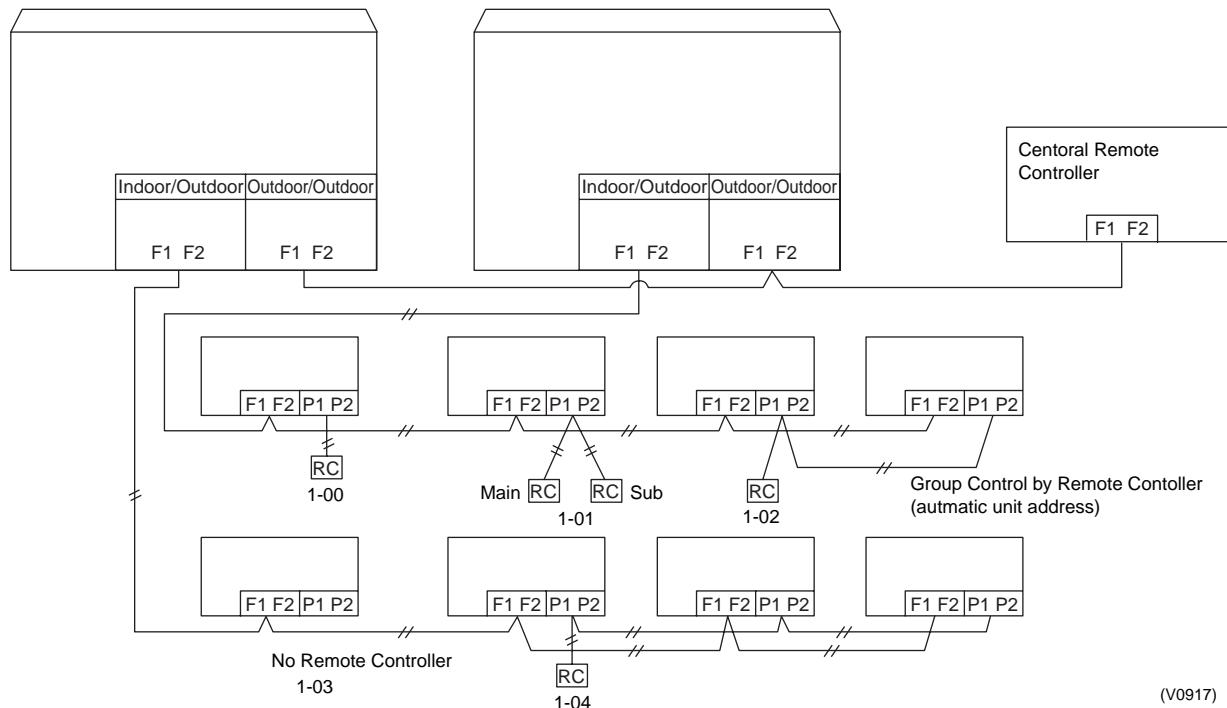
CZ-02RW type
CZ-01RW type

- Group No. setting by wireless remote controller for centralized control

1. When in the normal mode, push “ TEST” button for 4 seconds or more, and operation then enters the “field set mode.”
2. Set mode No. “00” with “ MODE” button.
3. Set the group No. for each group with “ UP” “ DOWN” button (advance/backward).
4. Enter the selected group numbers by pushing “ RESERVE” button.
5. Push “ TEST” button and return to the normal mode.



(V0916)

Group No. Setting Example


(V0917)

**Caution**

When turning the power supply on, the unit may often not accept any operation while “88” is displaying after all indications were displayed once for about 1 minute on the liquid crystal display. This is not an operative fault.

3.1.8 Setting of Operation Control Mode from Remote Controller (Local Setting)

The operation control mode is compatible with a variety of controls and operations by limiting the functions of the operation remote controller. Furthermore, operations such as remote controller ON/OFF can be limited in accordance with the combination conditions. (Refer to information in the next page.)

Central remote controller is normally available for operations. (Except when centralized monitor is connected)

3.1.9 Contents of Control Modes

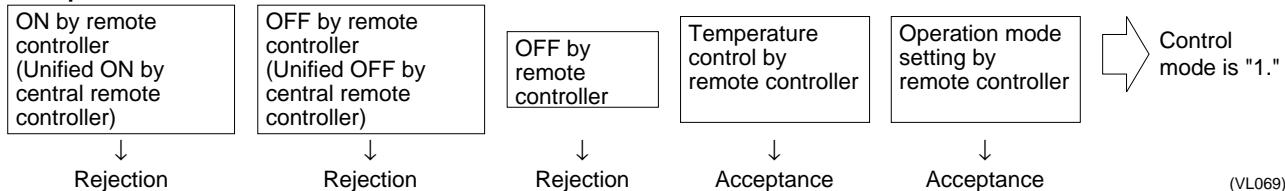
Twenty modes consisting of combinations of the following five operation modes with temperature and operation mode setting by remote controller can be set and displayed by operation modes 0 through 19.

- ◆ ON/OFF control impossible by remote controller
Used when you want to turn on/off by central remote controller only.
(Cannot be turned on/off by remote controller.)
- ◆ OFF control only possible by remote controller
Used when you want to turn on by central remote controller only, and off by remote controller only.
- ◆ Centralized
Used when you want to turn on by central remote controller only, and turn on/off freely by remote controller during set time.
- ◆ Individual
Used when you want to turn on/off by both central remote controller and remote controller.
- ◆ Timer operation possible by remote controller
Used when you want to turn on/off by remote controller during set time and you do not want to start operation by central remote controller when time of system start is programmed.

How to Select Operation Mode

Whether operation by remote controller will be possible or not for turning on/off, controlling temperature or setting operation mode is selected and decided by the operation mode given on the right edge of the table below.

Example

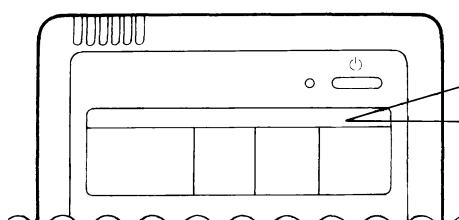


| Control mode | Control by remote controller | | | | Control mode | |
|--|--|--|----------------------|----------------------|--------------|--|
| | Operation | | OFF | Temperature control | | |
| | Unified operation, individual operation by central remote controller, or operation controlled by timer | Unified OFF, individual stop by central remote controller, or timer stop | | | | |
| ON/OFF control impossible by remote controller | Rejection (Example) | Rejection (Example) | Rejection (Example) | Acceptance | 0 | |
| | | | | Rejection | 10 | |
| | | | Acceptance (Example) | Acceptance (Example) | 1(Example) | |
| | | | | Rejection | 11 | |
| OFF control only possible by remote controller | | | Rejection | Acceptance | 2 | |
| | | | | Rejection | 12 | |
| | | | Acceptance | Acceptance | 3 | |
| | | | | Rejection | 13 | |
| Centralized | Acceptance | Acceptance | Rejection | Acceptance | 4 | |
| | | | | Rejection | 14 | |
| | | | Acceptance | Acceptance | 5 | |
| | | | | Rejection | 15 | |
| Individual | | | Rejection | Acceptance | 6 | |
| | | | | Rejection | 16 | |
| | | | Acceptance | Acceptance | 7 *1 | |
| | | | | Rejection | 17 | |
| Timer operation possible by remote controller | Acceptance (During timer at ON position only) | Acceptance (During timer at ON position only) | Rejection | Acceptance | 8 | |
| | | | | Rejection | 18 | |
| | | | Acceptance | Acceptance | 9 | |
| | | | | Rejection | 19 | |

Do not select "timer operation possible by remote controller" if not using a remote controller.

Operation by timer is impossible in this case.

*1. Factory setting



Central remote controller
When ON/OFF, temperature setting and operation mode setting by local remote controller is forbidden, "UNDER CENTRAL CONTROL" is displayed on the remote controller.

3.2 Field Setting from Outdoor Unit

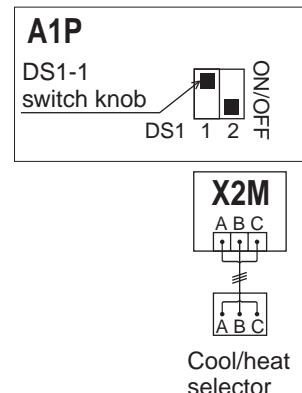
3.2.1 Setting by Dip Switches

The following field settings are made by dip switches on PC board.

| Dipswitch | | Setting item | Description |
|-----------|-------------------|---------------------------------|---|
| No. | Setting | | |
| DS1-1 | ON | Cool / Heat change over setting | Used to set cool / heat change over setting by remote controller equipped with outdoor unit. (Note 1) |
| | OFF (Factory set) | | |
| DS1-2 | ON | Not used | Do not change the factory settings. |
| | OFF (Factory set) | | |

Cool/heat selector connection procedure

- Set the remote controller only when changing over the operation mode between cooling and heating using the remote controller installed in the outdoor.
- ① Connect the cool/heat selector (optional accessory) to the terminals (A, B and C) on the outdoor X2M Terminal board (A, B and C).
 - ② Set the cool/heat selector switch DS1-1 from "OFF" (which is selected at the factory before shipment) to "ON".



**Caution****Capacity Setting after changing the main PC Board(A1P) to spare parts PC Board**

When you change the main PC Board(A1P) to spare parts PC Board, please carry out the following setting.

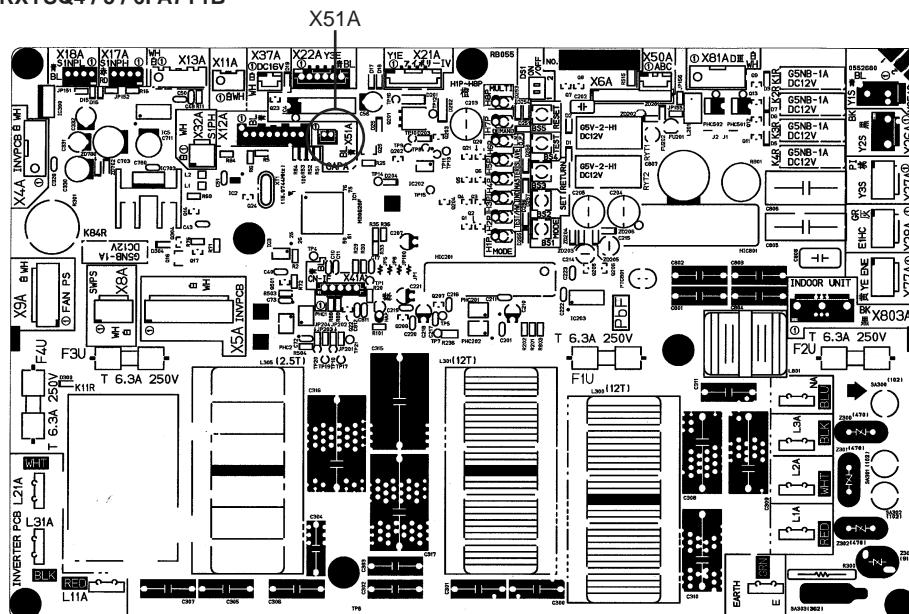
Please Attach the Capacity Setting Adaptor corresponding to Capacity Class (ex. 112, 140, 160) in connector X51A. (See Below)

Capacity Setting Adaptor

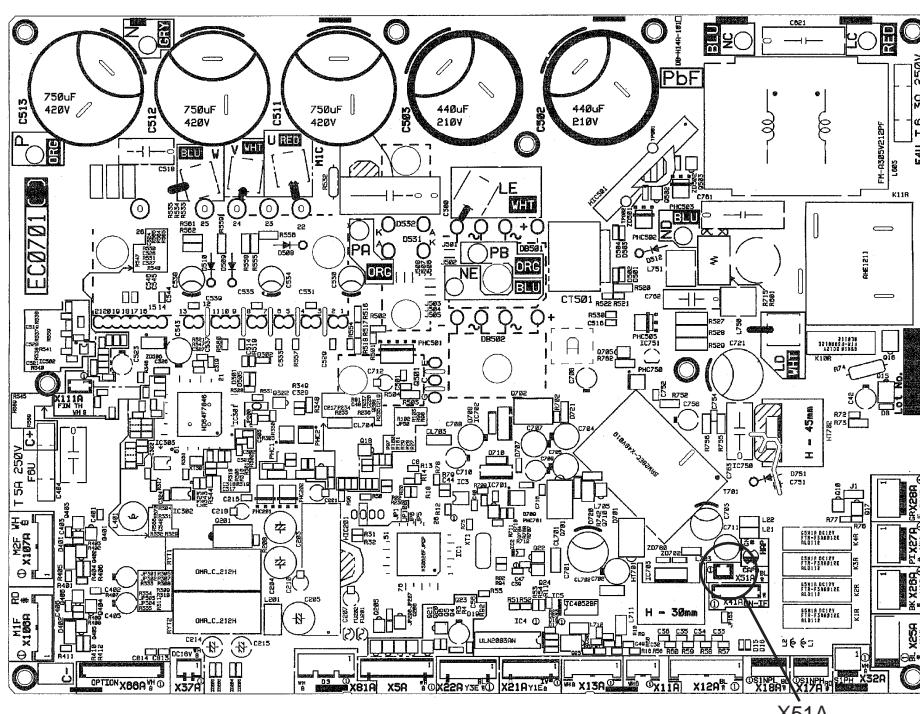
| | Capacity Class | Note |
|---|----------------|---|
| ① | 4 (112) | CAPACITY SETTING ADAPTOR (for 100/J112) |
| ② | 5 (140) | CAPACITY SETTING ADAPTOR (for 125/J140) |
| ③ | 6 (160) | CAPACITY SETTING ADAPTOR (for 140/J160) |

Position of Attaching the Capacity Setting Adaptor

RXYSQ4 / 5 / 6PA7Y1B



RXYSQ4 / 5 / 6PA7V1B

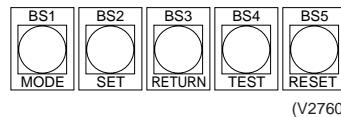


■ Setting by pushbutton switches

The following settings are made by pushbutton switches on PC board.

| | H1P | H2P | H3P | H4P | H5P | H6P | H7P |
|----------------|-----|-----|-----|-----|-----|-----|-----|
| LED indication | ● | ● | ○ | ● | ● | ● | ● |

(Factory setting)



There are the following three setting modes.

① Setting mode 1 (H1P off)

Initial status (when normal) : Also indicates during "abnormal".

② Setting mode 2 (H1P on)

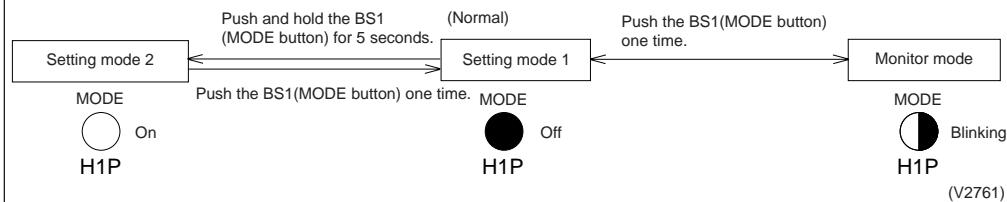
Used to modify the operating status and to set program addresses, etc. Usually used in servicing the system.

③ Monitor mode (H1P blinks)

Used to check the program made in Setting mode 2.

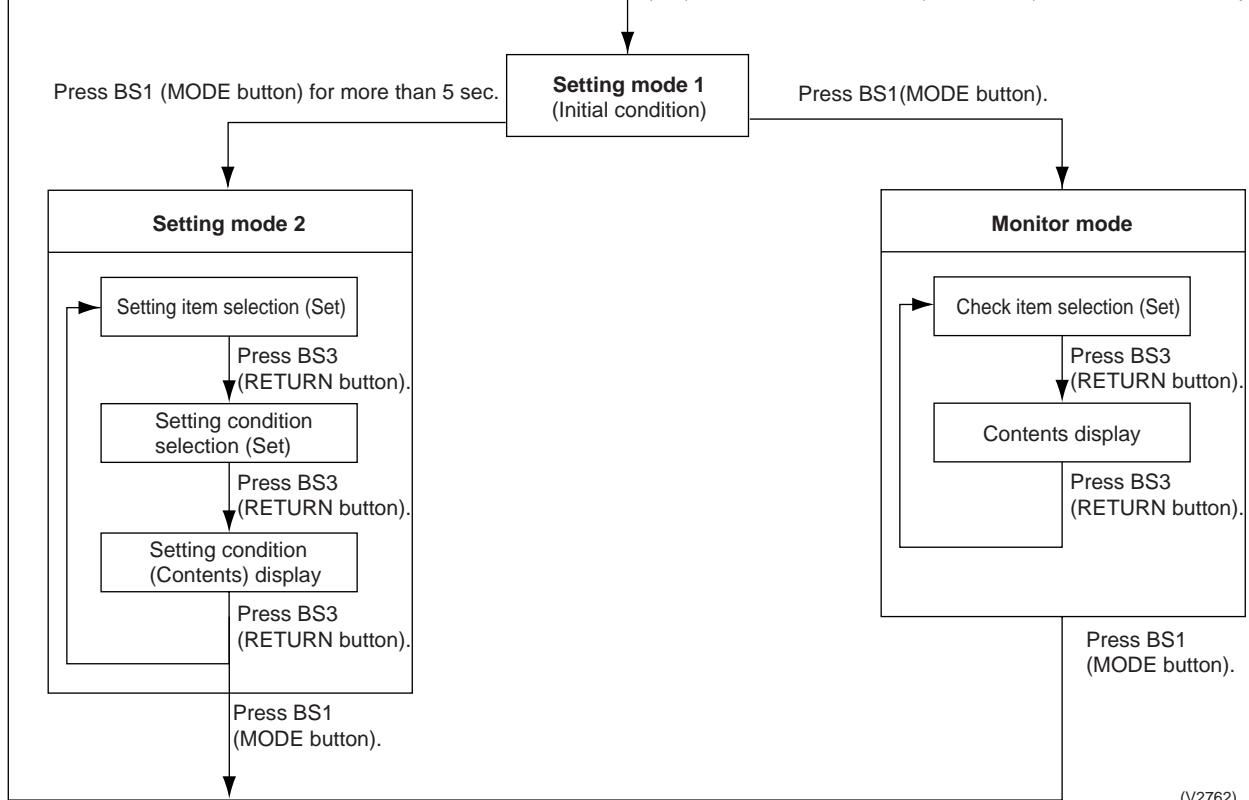
■ Mode changing procedure

Using the MODE button, the modes can be changed as follows.



■ Mode changing procedure

(Set): Select mode with BS2 (SET button) in each selection step.



a. "Setting mode 1"

This mode is used to set and check the following items.

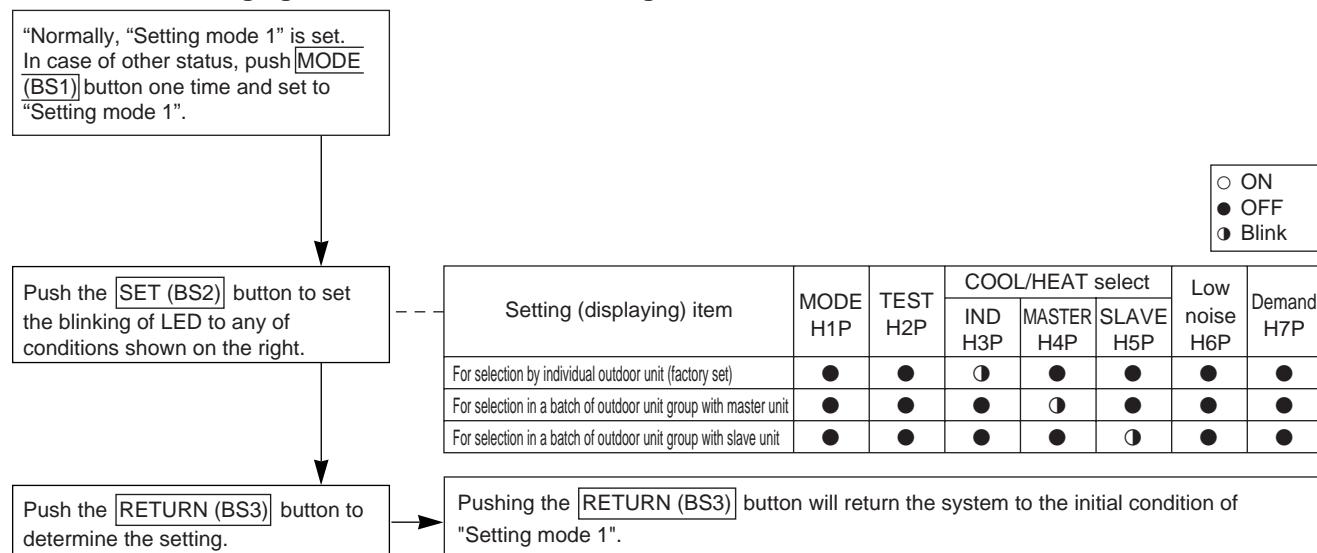
1. Set items In order to make COOL/HEAT selection in a batch of outdoor unit group, change the setting.

- COOL/HEAT selection (IND) Used to select COOL or HEAT by individual outdoor unit (factory set).
- COOL/HEAT selection (MASTER) Used to select COOL or HEAT by outdoor unit group with the master unit.
- COOL/HEAT selection (SLAVE) Used to select COOL or HEAT by outdoor unit group with the slave unit.

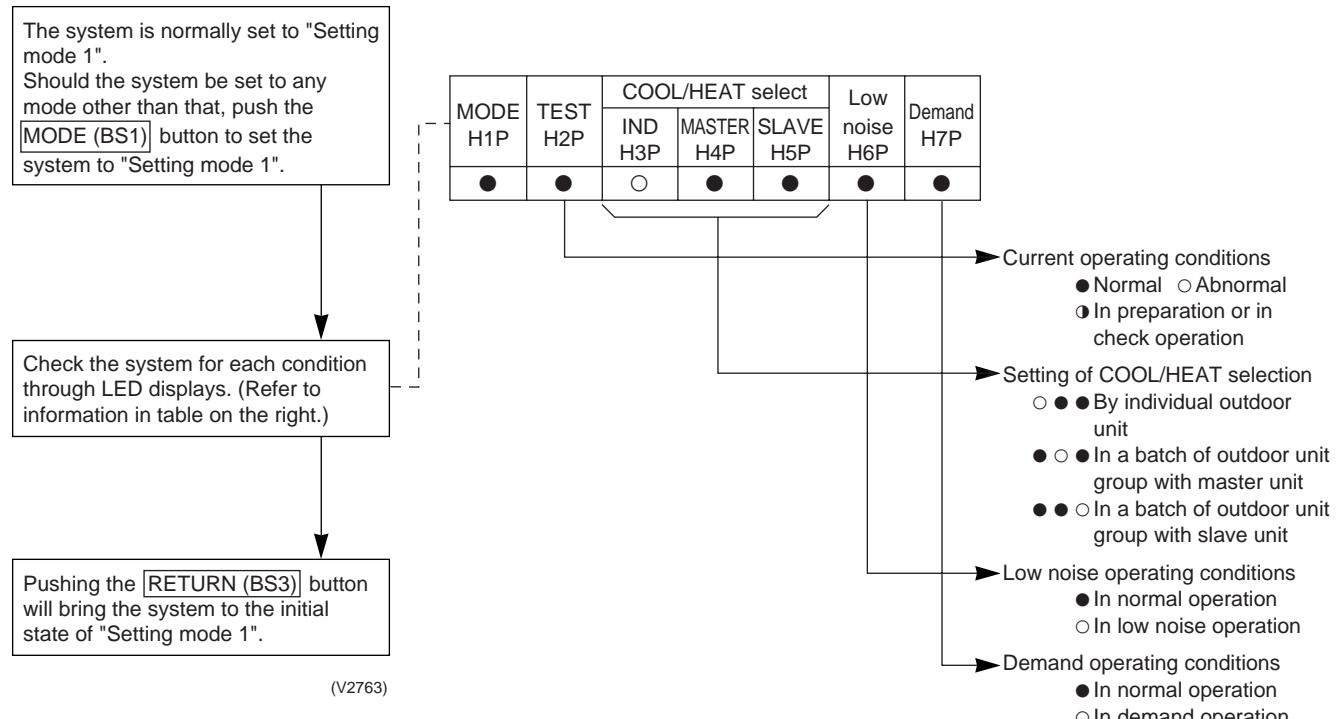
2. Check items The following items can be checked.

- (1) Current operating conditions (Normal / Abnormal / In check operation)
- (2) Setting conditions of COOL/HEAT selection (Individual / Batch master / Batch slave)
- (3) Low noise operating conditions (In normal operation / In low noise operation)
- (4) Demand operating conditions (In normal operation / In demand operation)

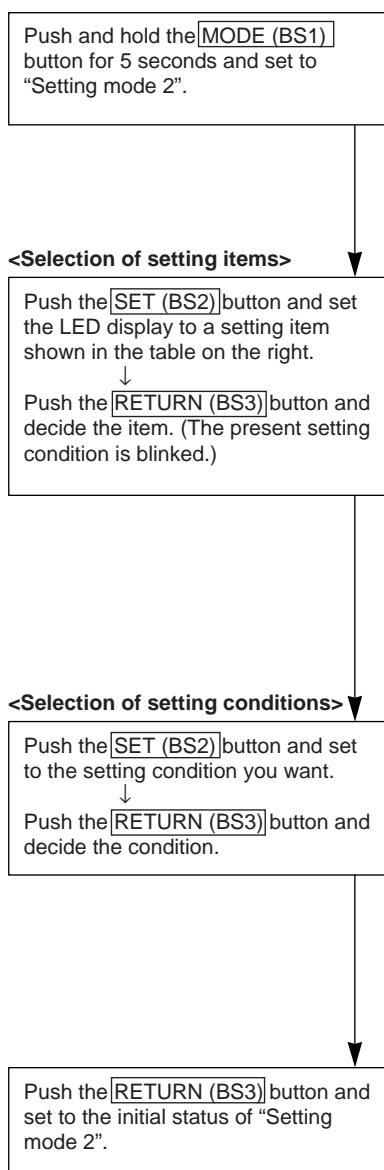
Procedure for changing COOL/HEAT selection setting



Procedure for checking check items



b. "Setting mode 2"



* If you become unsure of how to proceed, push the **MODE (BS1)** button and return to setting mode 1.

(V2764)

| No. | Setting item | Description |
|-----|---|--|
| 1 | Cool/heat unified address | Sets address for cool/heat unified operation. |
| 2 | Low noise/demand address | Address for low noise/demand operation |
| 3 | Test operation settings | Used to conduct test operation without making changes to the PCB and replacing the refrigerant, after the completion of maintenance. |
| 5 | Indoor unit forced fan H | Allows forced operation of indoor unit fan while unit is stopped. (H tap) |
| 6 | Indoor unit forced operation | Allows forced operation of indoor unit. |
| 8 | Te setting | Target evaporation temperature for cooling |
| 9 | Tc setting | Target condensation temperature for heating |
| 10 | Defrost changeover setting | Changes the temperature condition for defrost and sets to quick defrost or slow defrost. |
| 12 | External low noise setting / Demand setting | Reception of external low noise or demand signal |
| 13 | AIRNET address | Set address for AIRNET. |
| 16 | Setting of hot water | Make this setting to conduct heating operation with hot water heater. |
| 20 | Additional refrigerant charge operation setting | Carries out additional refrigerant charge operation. |
| 21 | Refrigerant recovery / vacuuming mode setting | Sets to refrigerant recovery or vacuuming mode. |
| 22 | Night-time low noise setting | Sets automatic nighttime low noise operation in a simple way. The operating time is based on "Starting set" and "Ending set". |
| 25 | Setting of external low noise level | Sets low noise level when the low noise signal is input from outside. |
| 26 | Night-time low noise operation start setting | Sets starting time of nighttime low noise operation. (Night-time low noise setting is also required.) |
| 27 | Night-time low noise operation end setting | Sets ending time of nighttime low noise operation. (Night-time low noise setting is also required.) |
| 28 | Power transistor check mode *Check after disconnection of compressor wires | Used for trouble diagnosis of DC compressor. Since the waveform of inverter is output without wiring to the compressor, it is convenient to probe whether the trouble comes from the compressor or PC board. |
| 29 | Capacity precedence setting | If the capacity control is required, the low noise control is automatically released by this setting during carrying out low noise operation and nighttime low noise operation. |
| 30 | Demand setting 1 | Changes target value of power consumption when demand control 1 is input. |
| 32 | Normal demand setting | Normally enables demand control 1 without external input. (Effective to prevent a problem that circuit breaker of small capacity is shut down due to large load.) |

The numbers in the "No." column represent the number of times to press the **SET (BS2)** button.

| No. | Setting item display | | | | | | | Setting condition display * Factory set | |
|-----|---|----------|------------|---------------|---|---|---------------|--|---|
| | Setting item | MODE H1P | TEST H2P | C/H selection | | | Low noise H6P | Demand H7P | |
| | | IND H3P | Master H4P | Slave H5P | | | | | |
| 1 | Cool / Heat Unified address | ○ | ● | ● | ● | ● | ● | ○ | Address 0 ○ ● ● ● ● ● ● * Binary number (6 digits) 1 ○ ● ● ● ● ○ ~ 31 ○ ● ○ ○ ○ ○ ○ ○ |
| 2 | Low noise/demand address | ○ | ● | ● | ● | ● | ○ | ● | Address 0 ○ ● ● ● ● ● ● * Binary number (6 digits) 1 ○ ● ● ● ● ○ ~ 31 ○ ● ○ ○ ○ ○ ○ ○ |
| 3 | Test operation | ○ | ● | ● | ● | ● | ○ | ○ | Test operation : OFF ○ ● ● ● ● ○ ○ Test operation : ON ○ ● ● ● ○ ○ ● * |
| 5 | Indoor forced fan H | ○ | ● | ● | ● | ○ | ● | ○ | Normal operation ○ ● ● ● ● ○ ○ * Indoor forced fan H ○ ● ● ● ○ ○ ● |
| 6 | Indoor forced operation | ○ | ● | ● | ● | ○ | ○ | ● | Normal operation ○ ● ● ● ○ ○ * Indoor forced operation ○ ● ● ● ○ ○ ● |
| 8 | Te setting | ○ | ● | ● | ○ | ● | ● | ● | High ○ ● ● ○ ○ ● ● Normal (factory setting) ○ ● ● ○ ○ ○ ● * Low ○ ● ● ○ ○ ○ ○ |
| 9 | Tc setting | ○ | ● | ● | ○ | ● | ● | ○ | High ○ ● ● ○ ○ ● ● Normal (factory setting) ○ ● ● ○ ○ ○ ● * Low ○ ● ● ○ ○ ○ ○ |
| 10 | Defrost changeover setting | ○ | ● | ● | ○ | ● | ○ | ● | Quick defrost ○ ● ● ○ ○ ● ● Normal (factory setting) ○ ● ● ○ ○ ○ ● * Slow defrost ○ ● ● ○ ○ ○ ○ |
| 12 | External low noise/demand setting | ○ | ● | ● | ○ | ○ | ● | ● | External low noise/demand: NO ○ ● ● ○ ○ ○ ○ * External low noise/demand: YES ○ ● ● ○ ○ ○ ● |
| 13 | Airnet address | ○ | ● | ● | ○ | ○ | ● | ○ | Address 0 ○ ● ● ● ● ● ● * Binary number (6 digits) 1 ○ ● ● ● ● ○ ○ ~ 63 ○ ○ ○ ○ ○ ○ ○ |
| 16 | Setting of hot water heater | ○ | ● | ○ | ● | ● | ● | ● | OFF ○ ● ● ● ● ○ ○ * ON ○ ● ● ○ ○ ○ ● |
| 20 | Additional refrigerant charging operation setting | ○ | ● | ○ | ● | ○ | ● | ● | Refrigerant charging: OFF ○ ● ● ● ● ○ ○ * Refrigerant charging: ON ○ ● ● ○ ○ ○ ● |
| 21 | Refrigerant recovery / vacuuming mode setting | ○ | ● | ○ | ● | ○ | ● | ○ | Refrigerant recovery / vacuuming: OFF ○ ● ● ○ ○ ○ ○ * Refrigerant recovery / vacuuming: ON ○ ● ● ○ ○ ○ ● |
| 22 | Night-time low noise setting | ○ | ● | ○ | ● | ○ | ○ | ● | OFF ○ ● ● ○ ○ ○ ○ * Level 1 (outdoor fan with 6 step or lower) ○ ● ● ○ ○ ○ ○ Level 2 (outdoor fan with 5 step or lower) ○ ● ● ○ ○ ○ ● Level 3 (outdoor fan with 4 step or lower) ○ ● ● ○ ○ ○ ○ |

The numbers in the "No." column represent the number of times to press the SET (BS2) button.

| No. | Setting item display | | | | | | | | Setting condition display * Factory set | |
|-----|--|----------|----------|---------------|------------|-----------|---------------|------------|--|--|
| | Setting item | MODE H1P | TEST H2P | C/H selection | | | Low noise H6P | Demand H7P | | |
| | | | | IND H3P | Master H4P | Slave H5P | | | | |
| 25 | Low noise setting | ○ | ● | ○ | ○ | ● | ● | ○ | Level 1 (outdoor fan with 6 step or lower) ○ ● ● ● ● ● ○ Level 2 (outdoor fan with 5 step or lower) ○ ● ● ● ● ○ ● * Level 3 (outdoor fan with 4 step or lower) ○ ● ● ● ○ ● ● | |
| 26 | Night-time low noise operation start setting | ○ | ● | ○ | ○ | ● | ○ | ● | About 20:00 ○ ● ● ● ● ● ○ ○ About 22:00 (factory setting) ○ ● ● ● ● ○ ● ● * About 24:00 ○ ● ● ● ○ ● ● | |
| 27 | Night-time low noise operation end setting | ○ | ● | ○ | ○ | ● | ○ | ○ | About 6:00 ○ ● ● ● ● ● ○ ○ About 7:00 ○ ● ● ● ● ○ ● ● About 8:00 (factory setting) ○ ● ● ● ○ ● ● * | |
| 28 | Power transistor check mode | ○ | ● | ○ | ○ | ○ | ● | ● | OFF ○ ● ● ● ● ● ○ ○ * ON ○ ● ● ● ● ○ ● ● | |
| 29 | Capacity precedence setting | ○ | ● | ○ | ○ | ○ | ● | ○ | OFF ○ ● ● ● ● ● ○ ○ * ON ○ ● ● ● ○ ● ● | |
| 30 | Demand setting 1 | ○ | ● | ○ | ○ | ○ | ○ | ● | 60 % demand ○ ● ● ● ● ● ○ ○ 70 % demand ○ ● ● ● ● ○ ● ● * 80 % demand ○ ● ● ● ○ ● ● | |
| 32 | Normal demand setting | ○ | ○ | ● | ● | ● | ● | ● | OFF ○ ● ● ● ● ● ○ ○ * ON ○ ● ● ● ○ ● ● | |

The numbers in the "No." column represent the number of times to press the SET (BS2) button.

c. Monitor mode

To enter the monitor mode, push the MODE (BS1) button when in "Setting mode 1".

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

<Confirmation on setting contents>

Push the RETURN (BS3) button to display different data of set items.

Push the RETURN (BS3) button and switches to the initial status of "Monitor mode".

* Push the MODE (BS1) button and returns to "Setting mode 1".

(V2765)

| No. | Setting item | LED display | | | | | | | Data display |
|-----|--|-------------|-----|-----|-----|-----|-----|-----|---|
| | | H1P | H2P | H3P | H4P | H5P | H6P | H7P | |
| 0 | Various setting | ○ | ● | ● | ● | ● | ● | ● | See below |
| 1 | C/H unified address | ○ | ● | ● | ● | ● | ● | ○ | |
| 2 | Low noise/demand address | ○ | ● | ● | ● | ● | ○ | ● | |
| 3 | Not used | ○ | ● | ● | ● | ● | ○ | ○ | |
| 4 | Airnet address | ○ | ● | ● | ● | ● | ○ | ● | |
| 5 | Number of connected indoor units | ○ | ● | ● | ● | ● | ○ | ● | ○ |
| 7 | Number of connected zone units (excluding outdoor and HR unit) | ○ | ● | ● | ● | ● | ○ | ○ | ○ |
| 8 | Number of outdoor units | ○ | ● | ● | ● | ○ | ● | ● | ● |
| 11 | Number of zone units (excluding outdoor and HR unit) | ○ | ● | ● | ● | ○ | ● | ○ | ○ |
| 12 | Number of terminal blocks | ○ | ● | ● | ● | ○ | ○ | ● | ● |
| 13 | Number of terminal blocks | ○ | ● | ● | ● | ○ | ○ | ● | ○ |
| 14 | Contents of malfunction (the latest) | ○ | ● | ● | ○ | ○ | ○ | ● | Malfunction code table |
| 15 | Contents of malfunction (1 cycle before) | ○ | ● | ● | ○ | ○ | ○ | ○ | Refer to page 138, 139. |
| 16 | Contents of malfunction (2 cycle before) | ○ | ● | ○ | ● | ● | ● | ● | |
| 20 | Contents of retry (the latest) | ○ | ● | ○ | ● | ○ | ● | ● | |
| 21 | Contents of retry (1 cycle before) | ○ | ● | ○ | ● | ○ | ● | ○ | |
| 22 | Contents of retry (2 cycle before) | ○ | ● | ○ | ● | ○ | ○ | ● | |
| 25 | Normal judgment of outdoor units PC board | ○ | ● | ○ | ○ | ● | ● | ○ | Lower 2 digits: ○ ● Abnormal ● ○ Normal ● ● Unjudgment |

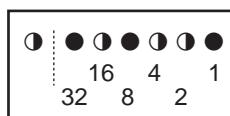
The numbers in the "No." column represent the number of times to press the SET (BS2) button.

Setting item 0 Display contents of "Various setting"

| | | | | | | | | |
|--|--------|---|---|---|---|---|---|---|
| EMG operation / backup operation setting | ON | ○ | ● | ● | ○ | ● | ● | ● |
| | OFF | ○ | ● | ● | ● | ● | ● | ● |
| Defrost select setting | Short | ○ | ● | ● | ● | ○ | ● | ● |
| | Medium | ○ | ● | ● | ● | ● | ● | ● |
| | Long | ○ | ● | ● | ● | ● | ● | ● |
| Te setting | H | ○ | ● | ● | ● | ● | ○ | ● |
| | M | ○ | ● | ● | ● | ● | ● | ● |
| | L | ○ | ● | ● | ● | ● | ● | ● |
| Tc setting | H | ○ | ● | ● | ● | ● | ● | ○ |
| | M | ○ | ● | ● | ● | ● | ● | ● |
| | L | ○ | ● | ● | ● | ● | ● | ● |

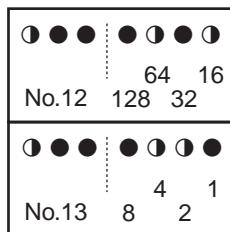
Push the SET button and match with the LEDs No. 1 - 15, push the RETURN button, and confirm the data for each setting.

★ Data such as addresses and number of units is expressed as binary numbers; the two ways of expressing are as follows:



The No. 1 cool/heat unified address is expressed as a binary number consisting of the lower 6 digits. (0 - 63)

In ① the address is 010110 (binary number), which translates to $16 + 4 + 2 = 22$ (base 10 number). In other words, the address is 22.



The number of terminal blocks for No. 12 and 13 is expressed as an 8-digit binary number, which is the combination of four upper, and four lower digits for No. 12 and 13 respectively. (0 - 128)

In ② the address for No. 12 is 0101, the address for No. 13 is 0110, and the combination of the two is 01010110 (binary number), which translates to $64 + 16 + 4 + 2 = 86$ (base 10 number). In other words, the number of terminal block is 86.

★ See the preceding page for a list of data, etc. for No. 0 - 25.

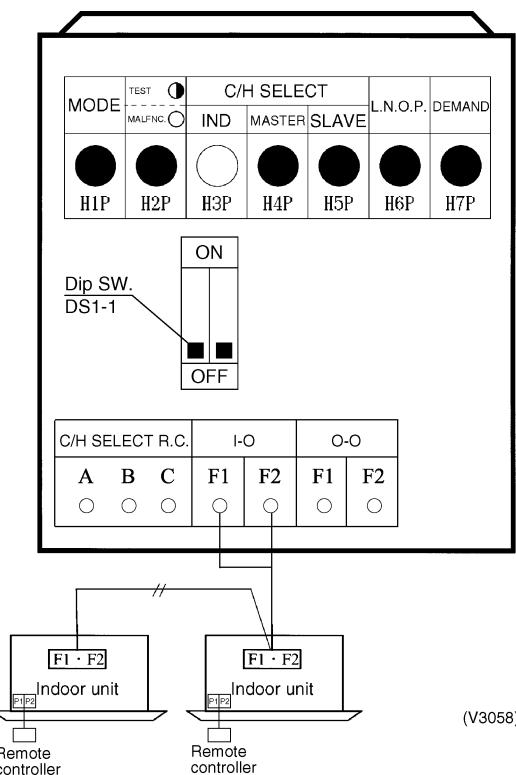
3.2.2 Cool / Heat Mode Switching

There are the following 4 cool/heat switching modes.

- ① Set cool/heat separately for each outdoor unit system by indoor unit remote controller.
- ② Set cool/heat separately for each outdoor unit system by cool/heat switching remote controller.
- ③ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by indoor unit remote controller.
- ④ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by cool/heat switching remote controller.

① Set Cool / Heat Separately for Each Outdoor Unit System by Indoor Unit Remote Controller

- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PC board DS1-1 to IN (factory set).
- ◆ Set cool/heat switching to IND (individual) for "Setting mode 1" (factory set).



<Set the master unit (= indoor unit having the right to select the cooling/heating operation mode).>

In the case of wired remote controllers

- After the check operation, “**CHANGEOVER UNDER CONTROL**” is flashing in all connected remote controllers.
- Select an indoor unit to be used as the master unit in accordance with the request from the customer.
(It is recommended to select an indoor unit which will be used most often as the master unit.)
- Press the operation mode selector button in the remote controller of the indoor unit selected as the master unit.
- In that remote controller, “**CHANGEOVER UNDER CONTROL**” disappears. That remote controller will control changeover of the cooling/heating operation mode.
- In other remote controllers, “**CHANGEOVER UNDER CONTROL**” lights.

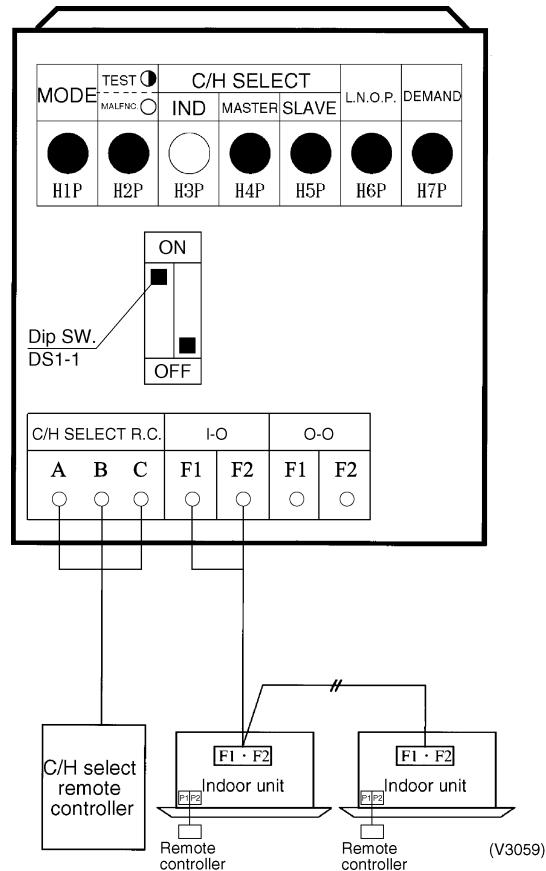
For the details, refer to the installation manual supplied together with the indoor unit.

In the case of wireless remote controllers

- After the check operation, the timer lamp is flashing in all connected indoor units.
- Select an indoor unit to be used as the master unit in accordance with the request from the customer.
(It is recommended to select an indoor unit which will be used most often as the master unit.)
- Press the operation selector mode button in the remote controller of the indoor unit selected as the master unit. A “peep” sound is emitted, and the timer lamp turns off in all indoor units.
- That indoor unit will control changeover of the cooling/heating operation mode.

② Set Cool / Heat Separately for Each Outdoor Unit System by Cool/Heat Switching Remote Controller

- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PC board DS1-1 to OUT (factory set).
- ◆ Set cool/heat switching to IND (individual) for "Setting mode 1" (factory set).



3.2.3 Setting of Low Noise Operation and Demand Operation

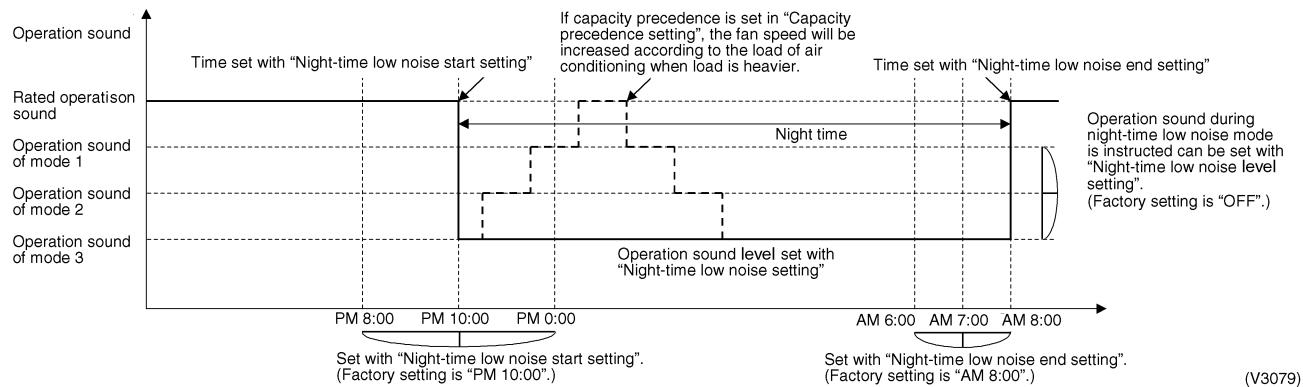
Setting of Low Noise Operation

By connecting the external contact input to the low noise input of the outdoor unit external control adaptor (optional), you can lower operating noise by 2-3 dB.

When the low noise operation is carried out automatically at night (The external control adaptor for outdoor unit is not required)

1. While in "Setting mode 2", select the setting condition (i.e., "Mode 1", "Mode 2", or "Mode 3") for set item No. 22 (Setting of nighttime low noise level).
2. If necessary, while in "Setting mode 2", select the setting condition (i.e., "20:00", "22:00", or "24:00") for set item No. 26 (Setting of start time of nighttime low noise operation).
(Use the start time as a guide since it is estimated according to outdoor temperatures.)
3. If necessary, while in "Setting mode 2", select the setting condition (i.e., "06:00", "07:00", or "08:00") for set item No. 27 (Setting of end time of nighttime low noise operation).
(Use the end time as a guide since it is estimated according to outdoor temperatures.)
4. If necessary, while in "Setting mode 2", set the setting condition for set item No. 29 (Setting of capacity precedence) to "ON".
(If the condition is set to "ON", when the air-conditioning load reaches a high level, the system will be put into normal operation mode even during nighttime.)

Image of operation



Setting of Demand Operation

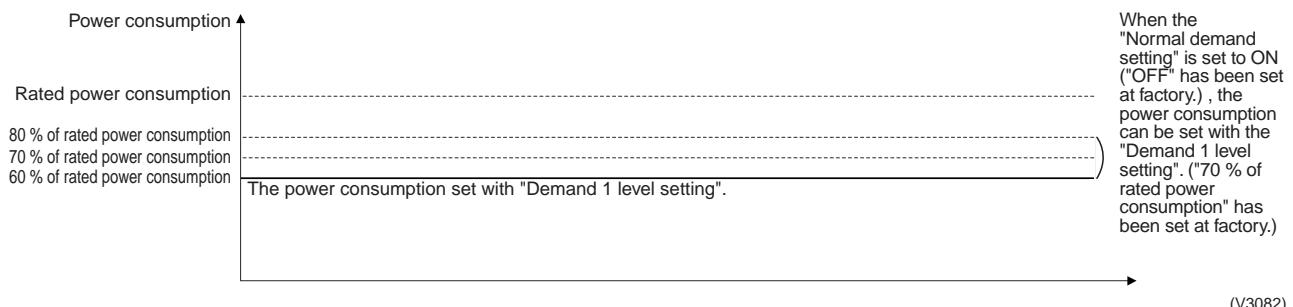
By connecting the external contact input to the demand input of the outdoor unit external control adaptor (optional), the power consumption of unit operation can be saved suppressing the compressor operating condition.

| Set item | Condition | Content |
|----------|-----------|---|
| Demand | Mode 1 | The compressor operates at approx. 60% or less of rating. |
| | Mode 2 | The compressor operates at approx. 70% or less of rating. |
| | Mode 3 | The compressor operates at approx. 80% or less of rating. |

When the normal demand operation is carried out. (Use of the external control adaptor for outdoor unit is not required.)

1. While in "Setting mode 2", make setting of the set item No. 32 (Setting of constant demand) to "ON".
2. While in "Setting mode 2", select the set item No. 30 (Setting of Demand 1 level) and then set the setting condition to targeted mode.

Image of operation



Detailed Setting Procedure of Low Noise Operation and Demand Control**1. Setting mode 1 (H1P off)**

- ① In setting mode 2, push the BS1 (MODE button) one time. → Setting mode 1 is entered and H1P off.
During the setting mode 1 is displayed, “In low noise operation” and “In demand control” are displayed.

2. Setting mode 2 (H1P on)

- ① In setting 1, push and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.
- ② Push the BS2 (SET button) several times and match the LED display with the Setting No. you want.
- ③ Push the BS3 (RETURN button) one time, and the present setting content is displayed.
→ Push the BS2 (SET button) several times and match the LED display with the setting content (as shown on next page) you want.
- ④ Push the BS3 (RETURN button) two times. → Returns to ①.
- ⑤ Push the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.

○: ON ●: OFF ○: Blink

| Setting No. | Setting contents | Setting No. indication | | | | | | | Setting No. indication | | | | | | | Setting contents | Setting contents indication (Initial setting) | | | | | | |
|-------------|-------------------------------------|------------------------|-----|-----|-----|-----|-----|-----|------------------------|-----|-----|-----|-----|-----|-----|---|---|-----|-----|-----|-----|-----|-----|
| | | H1P | H2P | H3P | H4P | H5P | H6P | H7P | H1P | H2P | H3P | H4P | H5P | H6P | H7P | | H1P | H2P | H3P | H4P | H5P | H6P | H7P |
| | | ○ | ● | ● | ● | ● | ● | ● | ○ | ● | ● | ○ | ○ | ● | ● | | ○ | ● | ● | ● | ● | ● | ● |
| 12 | External low noise / Demand setting | | | | | | | | | | | | | | | NO (Factory set) | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | YES | ○ | ● | ● | ● | ● | ● | ● |
| 22 | Night-time low noise setting | | | | | | | | | | | | | | | OFF (Factory setting) | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | Mode 1 | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | Mode 2 | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | Mode 3 | ○ | ● | ● | ● | ● | ● | ● |
| 26 | Night-time low noise start setting | | | | | | | | | | | | | | | PM 8:00 | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | PM 10:00 (Factory setting) | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | PM 0:00 | ○ | ● | ● | ● | ● | ● | ● |
| 27 | Night-time low noise end setting | | | | | | | | | | | | | | | AM 6:00 | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | AM 7:00 | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | AM 8:00 (Factory setting) | ○ | ● | ● | ● | ● | ● | ● |
| 29 | Capacity precedence setting | | | | | | | | | | | | | | | Low noise precedence (Factory setting) | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | Capacity precedence | ○ | ● | ● | ● | ● | ● | ● |
| 30 | Demand setting 1 | | | | | | | | | | | | | | | 60 % of rated power consumption | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | 70 % of rated power consumption (Factory setting) | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | 80 % of rated power consumption | ○ | ● | ● | ● | ● | ● | ● |
| 32 | Normal demand setting | | | | | | | | | | | | | | | OFF (Factory setting) | ○ | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | | | | ON | ○ | ● | ● | ● | ● | ● | ● |

 Setting mode indication section

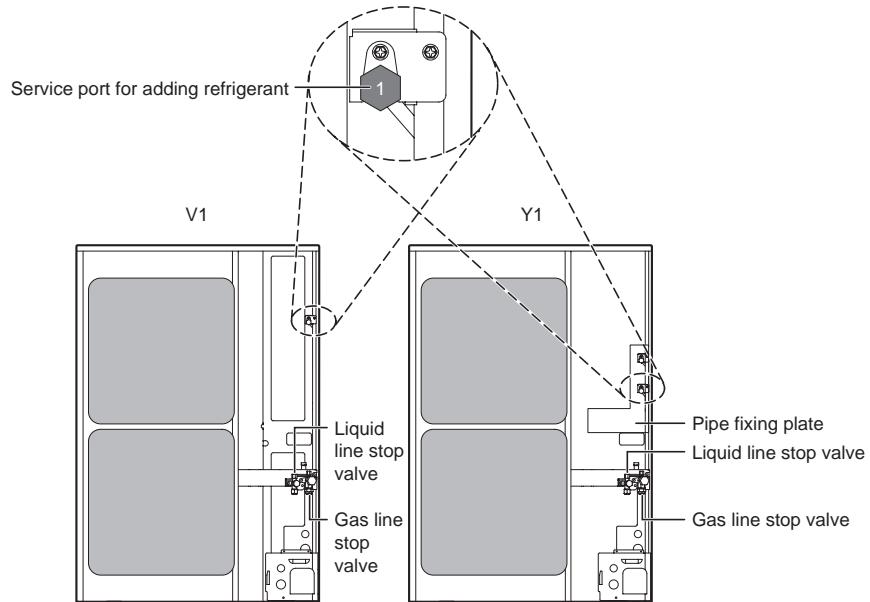
 Setting No. indication section

 Set contents indication section

3.2.4 Setting of Refrigerant Additional Charging Operation

- * When the outdoor unit is stopped and the entire quantity of refrigerant cannot be charged from the stop valve on the liquid side, make sure to charge the remaining quantity of refrigerant using this procedure. If the refrigerant quantity is insufficient, the unit may malfunction.
 - ① Turn ON the power of the indoor unit and the outdoor unit.
 - ② Make sure to completely open the stop valve on the gas side and the stop valve on the liquid side.
 - ③ Connect the refrigerant charge hose to the service port (for additionally charging the refrigerant).
 - ④ In the stopped status, set to ON the refrigerant additional charging operation Ⓐ in [set mode 2] (H1P: Turn on).
 - ⑤ The operation is automatically started.
(The LED indicator H2P flickers, and "Test run" and "Under centralized control" are displayed in the remote controller.)
 - ⑥ After charging the specified quantity of refrigerant, press the RETURN button (BS3) to stop the operation.

The operation is automatically stopped within 30 minutes.
If charging is not completed within 30 minutes, set and perform the refrigerant additional charging operation Ⓐ again.
If the refrigerant additional charging operation is stopped soon, the refrigerant may be overcharged.
Never charge extra refrigerant.
 - ⑦ Disconnect the refrigerant charge hose.



3.2.5 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective expansion valve of indoor and outdoor units

All indoor and outdoor unit's operation are prohibited.

[Operation procedure]

- ① In "Setting Mode 2" with units in stop mode, set "B Refrigerant Recovery / Vacuuming mode" to ON. The respective expansion valve of indoor and outdoor units are fully opened. "TEST OPERATION" and "UNDER CENTRALIZED CONTROL" are displayed on the remote controller, and the indoor / outdoor unit operation is prohibited.
After setting, do not cancel "Setting Mode 2" until completion of refrigerant recovery operation.
- ② Collect the refrigerant using a refrigerant recovery unit. (See the operation manual attached to the refrigerant recovery unit for more detail.)
- ③ Press Mode button "BS1" once and reset "Setting Mode 2".

3.2.6 Setting of Vacuuming Mode

In order to perform vacuuming operation at site, fully open the expansion valves of indoor and outdoor units and turn on some solenoid valves.

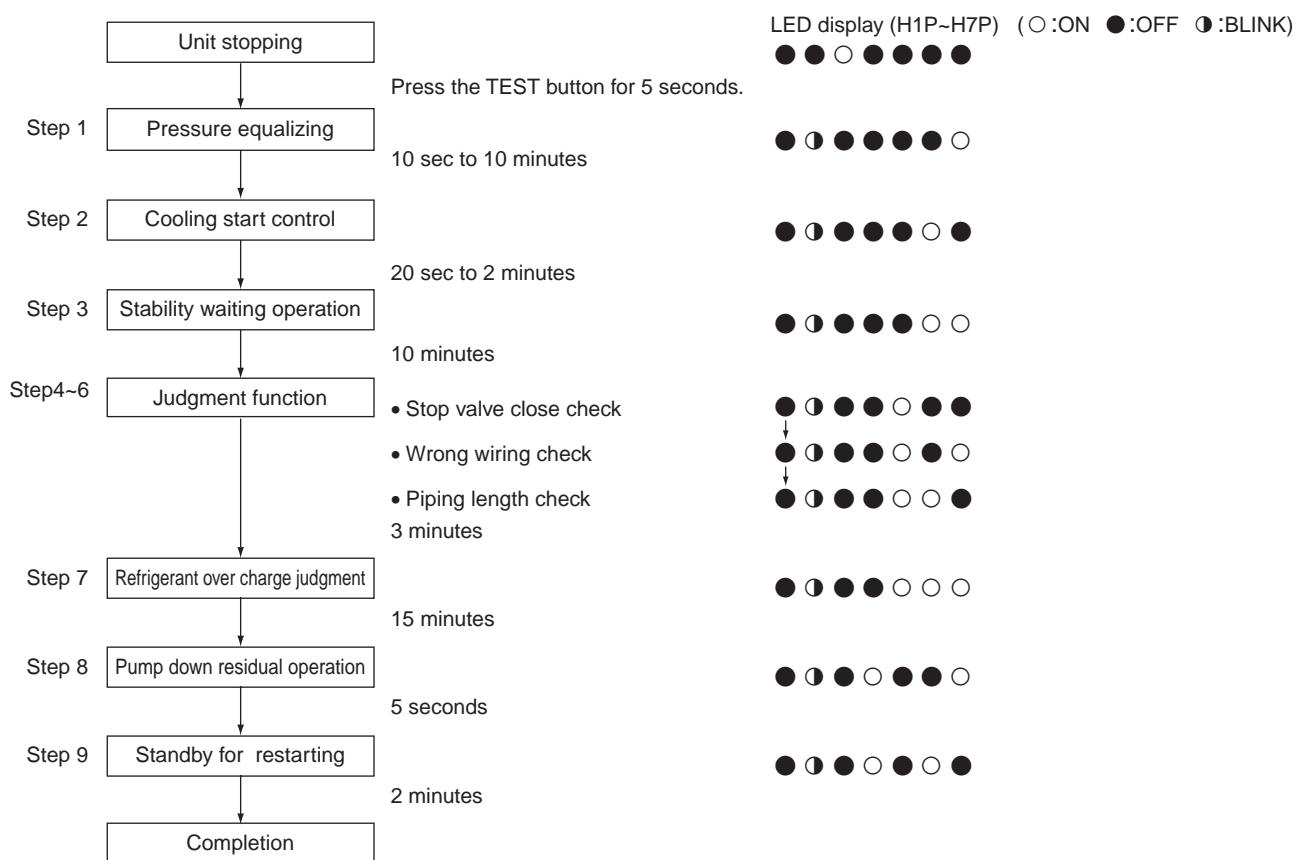
[Operating procedure]

- ① In "Setting Mode 2" with units in stop mode, set "B Refrigerant Recovery / Vacuuming mode" to ON. The respective expansion valve of indoor and outdoor units are fully opened. "TEST OPERATION" and "UNDER CENTRALIZED CONTROL" are displayed on the remote controller, and the indoor / outdoor unit operation is prohibited.
After setting, do not cancel "Setting Mode 2" until completion of Vacuuming operation.
- ② Use the vacuum pump to perform vacuuming operation.
- ③ Press Mode button "BS1" once and reset "Setting Mode 2".

3.2.7 Check Operation

To prevent any trouble in the period of installation at site, the system is provided with a test operation mode enabling check for incorrect wiring, stop valve left in closed, coming out (or misplacing with suction pipe thermistor) or discharge pipe thermistor and judgment of piping length, refrigerant overcharging, and learning for the minimum opening degree of electronic expansion valve.

CHECK OPERATION FUNCTION



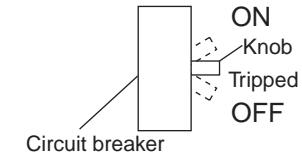
Part 7

Troubleshooting

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1. Symptom-based Troubleshooting

| | Symptom | Supposed Cause | Countermeasure |
|---|--|--|---|
| 1 | The system does not start operation at all. | Blowout of fuse(s) | Turn Off the power supply and then replace the fuse(s). |
| | | Cutout of breaker(s) | <ul style="list-style-type: none"> If the knob of any breaker is in its OFF position, turn ON the power supply. If the knob of any circuit breaker is in its tripped position, do not turn ON the power supply.  |
| | | Power failure | After the power failure is reset, restart the system. |
| | | Open phase in power supply cable | Check power supply. After that, properly connect the power supply cable, and then turn ON the power supply. |
| 2 | The system starts operation but makes an immediate stop. | Blocked air inlet or outlet of indoor or outdoor unit | Remove obstacle(s). |
| | | Clogged air filter(s) | Clean the air filter(s). |
| 3 | The system does not cool or heat air well. | Blocked air inlet or outlet of indoor or outdoor unit | Remove obstacle(s). |
| | | Clogged air filter(s) | Clean the air filter(s). |
| | | Enclosed outdoor unit(s) | Remove the enclosure. |
| | | Improper set temperature | Set the temperature to a proper degree. |
| | | Airflow rate set to "LOW" | Set it to a proper airflow rate. |
| | | Improper direction of air diffusion | Set it to a proper direction. |
| | | Open window(s) or door(s) | Shut it tightly. |
| | | Direct sunlight received | Hang curtains or shades on windows. |
| | | [In cooling] | Too many persons staying in a room |
| | | [In cooling] | |
| 4 | The system does not operate. | The system stops and immediately restarts operation. Pressing the TEMP ADJUST button immediately resets the system. | If the OPERATION lamp on the remote controller turns ON, the system will be normal. These symptoms indicate that the system is controlled so as not to put unreasonable loads on the system. |
| | | The remote controller displays "UNDER CENTRALIZED CONTROL", which blinks for a period of several seconds when the OPERATION button is depressed. | The system is controlled with centralized controller. Blinking display indicates that the system cannot be operated using the remote controller. |
| | | The system stops immediately after turning ON the power supply. | The system is in preparation mode of micro computer operation. |
| | | | Wait for a period of approximately one minute. |
| 5 | The system makes intermittent stops. | The remote controller displays malfunction codes "U4" and "U5", and the system stops but restarts after a lapse of several minutes. | Remove causes of electrical noises. If these causes are removed, the system will automatically restart operation. |

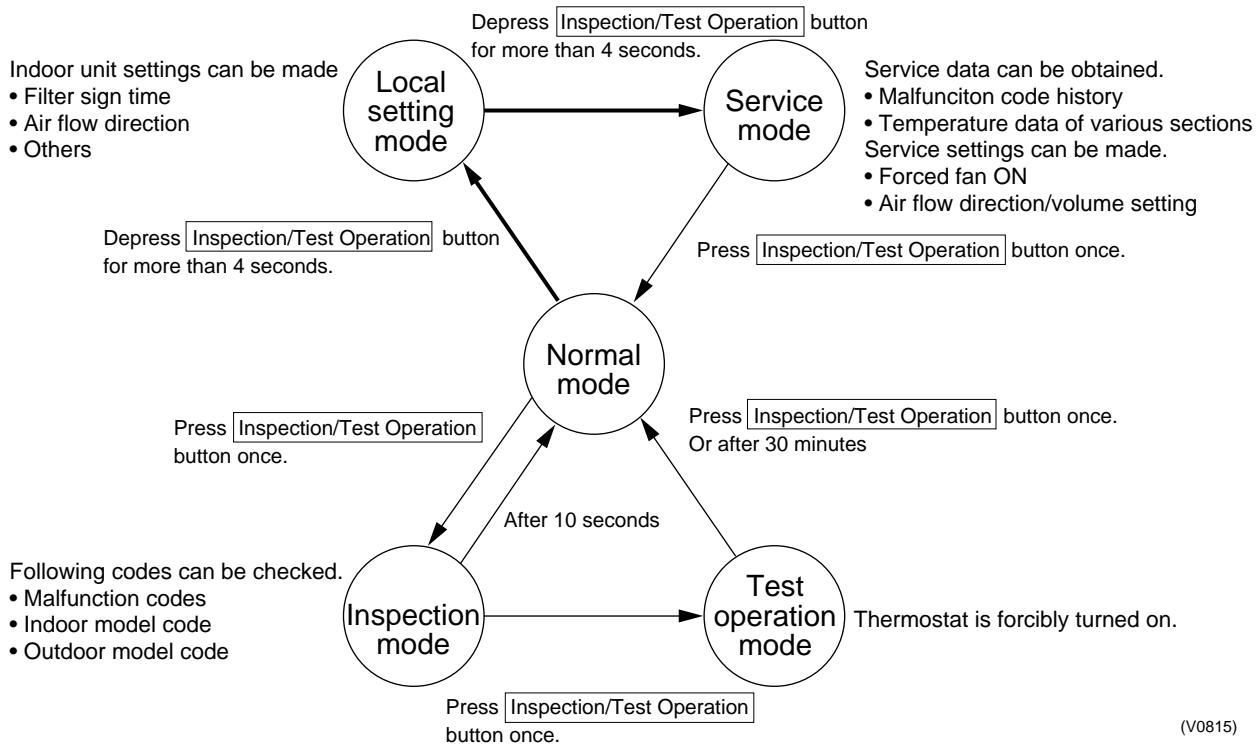
| | | Symptom | Supposed Cause | Countermeasure |
|----|---|---|--|---|
| 6 | COOL-HEAT selection is disabled. | The remote controller displays "UNDER CENTRALIZED CONTROL". | This remote controller has no option to select cooling operation. | Use a remote controller with option to select cooling operation. |
| | | The remote controller displays "UNDER CENTRALIZED CONTROL", and the COOL-HEAT selection remote controller is provided. | COOL-HEAT selection is made using the COOL-HEAT selection remote controller. | Use the COOL-HEAT selection remote controller to select cool or heat. |
| 7 | The system conducts fan operation but not cooling or heating operation. | This symptom occurs immediately after turning ON the power supply. | The system is in preparation mode of operation. | Wait for a period of approximately 10 minutes. |
| 8 | The airflow rate is not reproduced according to the setting. | Even pressing the AIRFLOW RATE SET button makes no changes in the airflow rate. | In heating operation, when the room temperature reaches the set degree, the outdoor unit will stop while the indoor unit is brought to fan LL operation so that no one gets cold air. Furthermore, if fan operation mode is selected when other indoor unit is in heating operation, the system will be brought to fan LL operation. (The fan LL operation is also enabled while in oil return mode in cooling operation.) | Normal operation. |
| 9 | The airflow direction is not reproduced according to the setting. | The airflow direction is not corresponding to that displayed on the remote controller. The flap does not swing. | Automatic control | Normal operation. |
| 10 | A white mist comes out from the system. | <Indoor unit> In cooling operation, the ambient humidity is high. (This indoor unit is installed in a place with much oil or dust.) | Uneven temperature distribution due to heavy stain of the inside of the indoor unit | Clean the inside of the indoor unit. |
| | | <Indoor unit> Immediately after cooling operation stopping, the ambient temperature and humidity are low. | Hot gas (refrigerant) flown in the indoor unit results to be vapor from the unit. | Normal operation. |
| | | <Indoor and outdoor units> After the completion of defrosting operation, the system is switched to heating operation. | Defrosted moisture turns to be vapor and comes out from the units. | Normal operation. |

| | Symptom | Supposed Cause | Countermeasure |
|----|--|---|---|
| 11 | <Indoor unit> Immediately after turning ON the power supply, indoor unit produces "ringing" sounds. | These are operating sounds of the electronic expansion valve of the indoor unit. | Normal operation. This sound becomes low after a lapse of approximately one minute. |
| | <Indoor and outdoor units> "Hissing" sounds are continuously produced while in cooling or defrosting operation. | These sounds are produced from gas (refrigerant) flowing respectively through the indoor and outdoor units. | Normal operation. |
| | <Indoor and outdoor units> "Hissing" sounds are produced immediately after the startup or stop of the system, or the startup or stop of defrosting operation. | These sounds are produced when the gas (refrigerant) stops or changes flowing. | Normal operation. |
| | <Indoor unit> Faint sounds are continuously produced while in cooling operation or after stopping the operation. | These sounds are produced from the drain discharge device in operation. | Normal operation. |
| | <Indoor unit> "Creaking" sounds are produced while in heating operation or after stopping the operation. | These sounds are produced from resin parts expanding and contracting with temperature changes. | Normal operation. |
| | <Indoor unit> Sounds like "trickling" or the like are produced from indoor units in the stopped state. | On UM systems, these sounds are produced when other indoor units in operation. The reason is that the system runs in order to prevent oil or refrigerant from dwelling. | Normal operation. |
| 12 | <Outdoor unit> Pitch of operating sounds changes. | The reason is that the compressor changes the operating frequency. | Normal operation. |
| | Dust comes out from the system. | Dust comes out from the system when it restarts after the stop for an extended period of time. | Dust, which has deposited on the inside of indoor unit, is blown out from the system. Normal operation. |
| 13 | Odors come out from the system. | In operation | Odors of room, cigarettes or else adsorbed to the inside of indoor unit are blown out. The inside of the indoor unit should be cleaned. |
| 14 | Outdoor unit fan does not rotate. | In operation | The reason is that fan revolutions are controlled to put the operation to the optimum state. Normal operation. |
| 15 | LCD display "88" appears on the remote controller. | Immediately after turning ON the power supply | The reason is that the system is checking to be sure the remote controller is normal. Normal operation. This code is displayed for a period of approximately one minute at maximum. |
| 16 | The outdoor unit compressor or the outdoor unit fan does not stop. | After stopping operation | It stops in order to prevent oil or refrigerant from dwelling. Normal operation. It stops after a lapse of approximately 5 to 10 minutes. |
| 17 | The outdoor gets hot. | While stopping operation | The reason is that the compressor is warmed up to provide smooth startup of the system. Normal operation. |
| 18 | Hot air comes out from the system even though it stops. | Hot air is felt while the system stops. | On UM systems, small quantity of refrigerant is fed to indoor units in the stopped state when other indoor units are in operation. Normal operation. |
| 19 | The system does not cool air well. | The system is in dry operation. | The reason is that the dry operation serves not to reduce the room temperature where possible. Change the system to cooling operation. |

2. Troubleshooting by Remote Controller

2.1 The INSPECTION / TEST Button

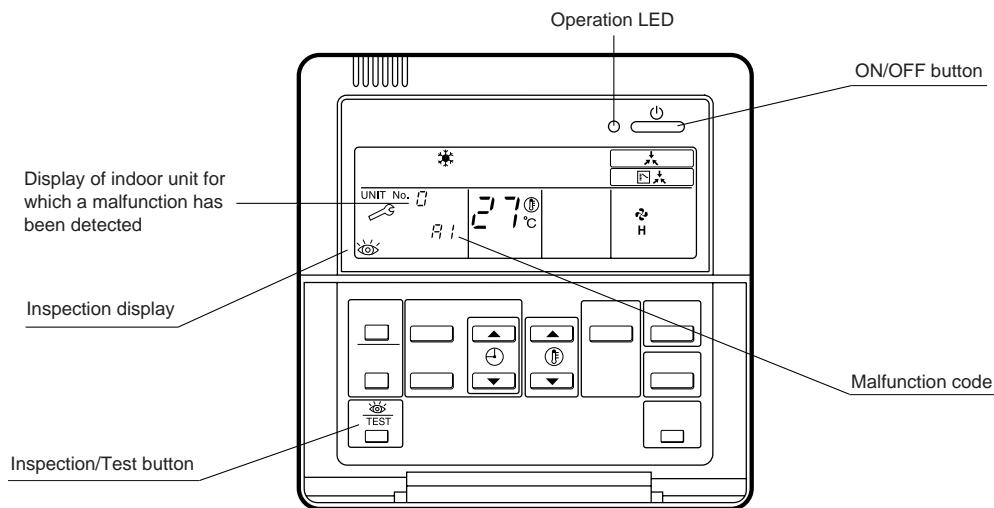
The following modes can be selected by using the [Inspection/Test Operation] button on the remote control.



2.2 Self-diagnosis by Wired Remote Controller

Explanation

If operation stops due to malfunction, the remote controller's operation LED blinks, and malfunction code is displayed. (Even if stop operation is carried out, malfunction contents are displayed when the inspection mode is entered.) The malfunction code enables you to tell what kind of malfunction caused operation to stop. See page 136 for malfunction code and malfunction contents.



Note:

1. Pressing the INSPECTION/TEST button will blink the check indication.
2. While in check mode, pressing and holding the ON/OFF button for a period of five seconds or more will clear the failure history indication shown above. In this case, on the codes display, the malfunction code will blink twice and then change to "00" (=Normal), the Unit No. will change to "0", and the operation mode will automatically switch from check mode to normal mode (displaying the set temperature).

2.3 Self-diagnosis by Wireless Remote Controller

**In the Case of
CZ-02RW Type
CZ-01RW Type**

If equipment stops due to a malfunction, the operation indicating LED on the light reception section flashes.

The malfunction code can be determined by following the procedure described below. (The malfunction code is displayed when an operation error has occurred. In normal condition, the malfunction code of the last problem is displayed.)

1. Press the INSPECTION/TEST button to select "Inspection."

The equipment enters the inspection mode. The "Unit" indication lights and the Unit No. display shows flashing "0" indication.

2. Set the Unit No.

Press the UP or DOWN button and change the Unit No. display until the buzzer (*1) is generated from the indoor unit.

*1 Number of beeps

3 short beeps : Conduct all of the following operations.

1 short beep : Conduct steps 3 and 4.

Continue the operation in step 4 until a buzzer remains ON. The continuous buzzer indicates that the malfunction code is confirmed.

Continuous beep : No abnormality.

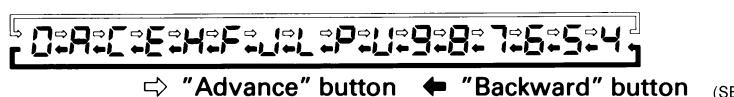
3. Press the MODE selector button.

The left "0" (upper digit) indication of the malfunction code flashes.

4. Malfunction code upper digit diagnosis

Press the UP or DOWN button and change the malfunction code upper digit until the malfunction code matching buzzer (*2) is generated.

- The upper digit of the code changes as shown below when the UP and DOWN buttons are pressed.



(SE006)

*2 Number of beeps

Continuous beep : Both upper and lower digits matched. (Malfunction code confirmed)

2 short beeps : Upper digit matched.

1 short beep : Lower digit matched.

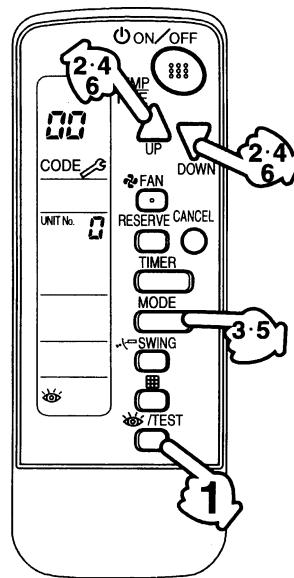
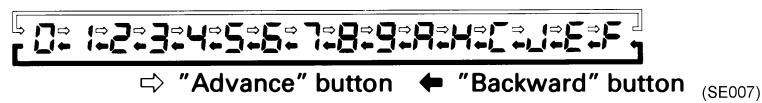
5. Press the MODE selector button.

The right "0" (lower digit) indication of the malfunction code flashes.

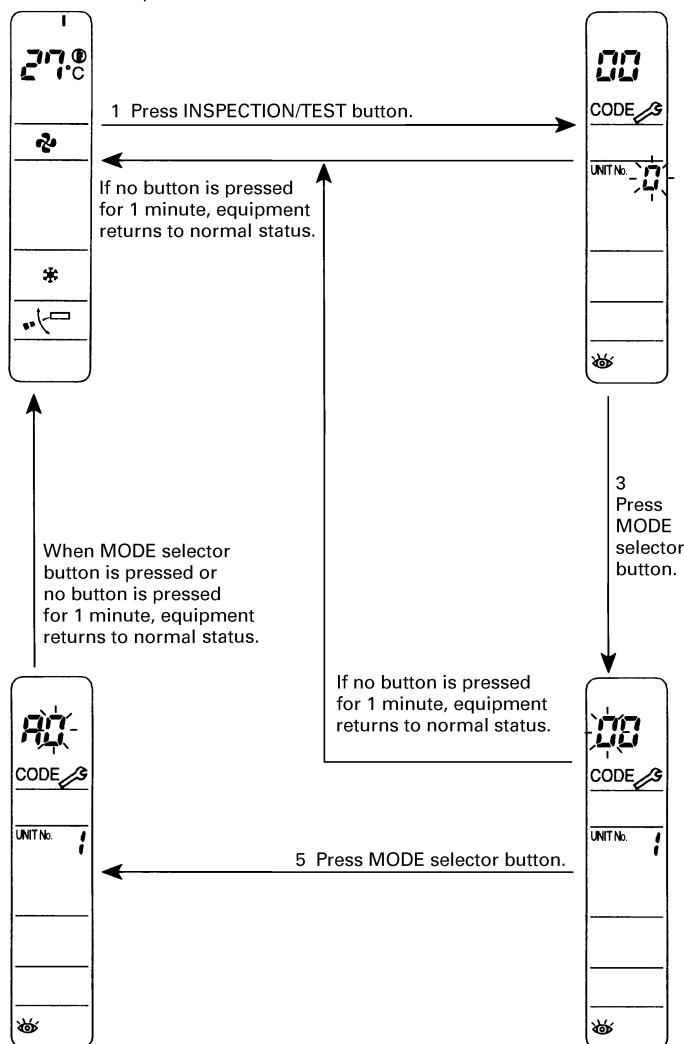
6. Malfunction code lower digit diagnosis

Press the UP or DOWN button and change the malfunction code lower digit until the continuous malfunction code matching buzzer (*2) is generated.

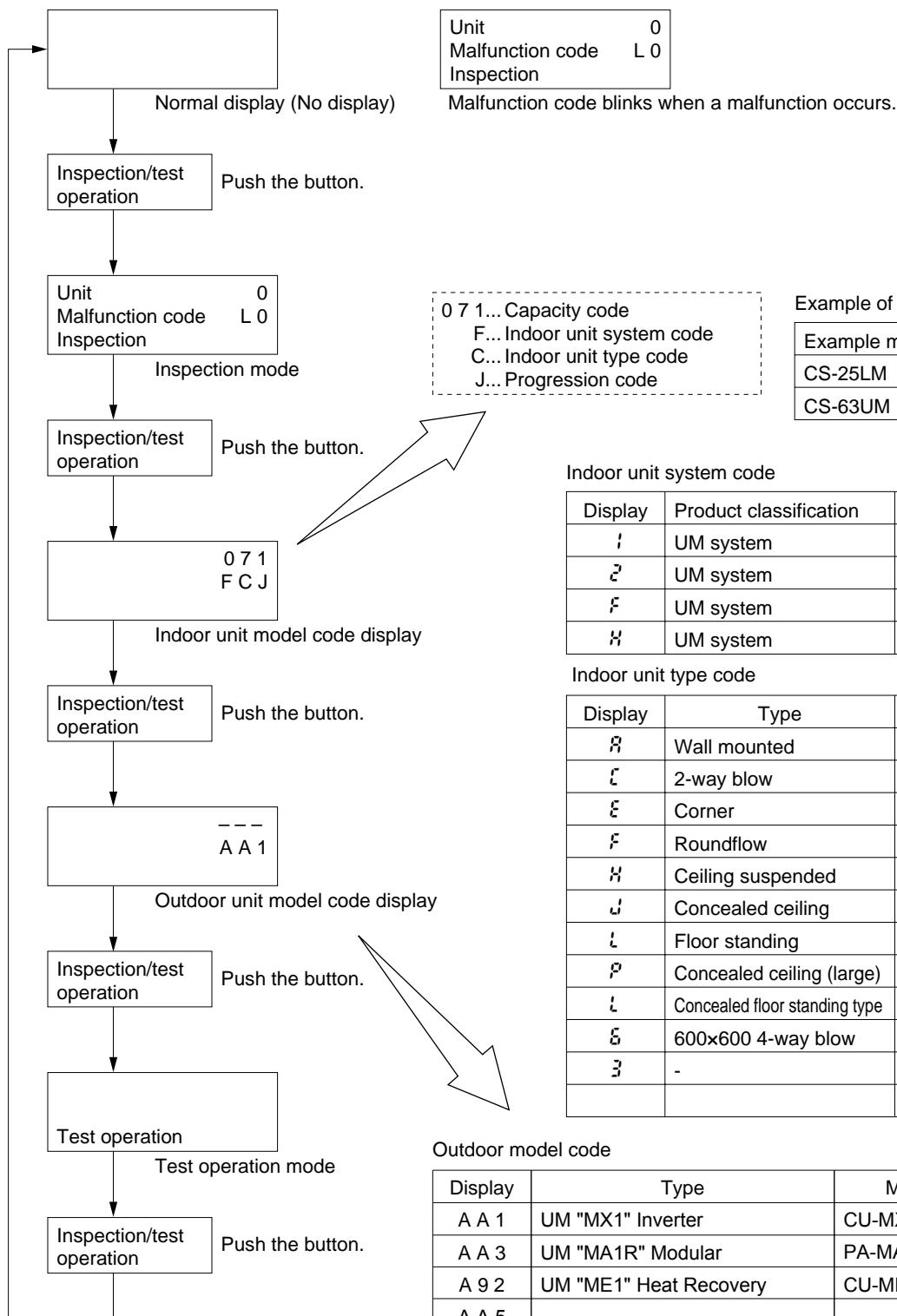
- The lower digit of the code changes as shown below when the UP and DOWN buttons are pressed.



Normal status
Enters inspection mode from normal status when the INSPECTION/TEST button is pressed.



2.4 Operation of the Remote Controller's Inspection / Test Operation Button



Unit 0
Malfunction code L 0
Inspection

Malfunction code blinks when a malfunction occurs.

0 7 1... Capacity code
F... Indoor unit system code
C... Indoor unit type code
J... Progression code

Example of capacity code display

| Example model | Display |
|---------------|---------|
| CS-25LM | 028 |
| CS-63UM | 071 |

Indoor unit system code

| Display | Product classification | System classification |
|---------|------------------------|--------------------------------|
| 1 | UM system | (VAV indoor unit) |
| 2 | UM system | Outdoor air processing unit |
| F | UM system | Standard indoor unit |
| H | UM system | New ceiling suspended cassette |

Indoor unit type code

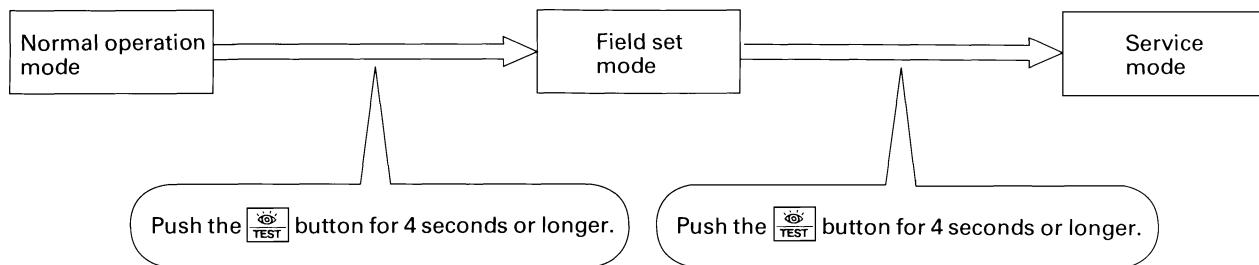
| Display | Type | Model |
|---------|-------------------------------|--------|
| A | Wall mounted | CS-KM |
| C | 2-way blow | CS-LM |
| E | Corner | CS-DM |
| F | Roundflow | CS-UM |
| H | Ceiling suspended | CS-TM |
| J | Concealed ceiling | CS-FM |
| L | Floor standing | PCS-PM |
| P | Concealed ceiling (large) | CS-EM |
| R | Concealed floor standing type | CS-RM |
| S | 600x600 4-way blow | CS-YM |
| Z | - | - |

Outdoor model code

| Display | Type | Model |
|---------|-------------------------------|--------------|
| A A 1 | UM "MX1" Inverter | CU-MX1 |
| A A 3 | UM "MA1R" Modular | PA-MA1R |
| A 9 2 | UM "ME1" Heat Recovery | CU-ME1 |
| A A 5 | - | - |
| A A A | UM "MX3", "ME3" - R410A | U-ME3, U-MX3 |
| A A E | UM "MX4" Inverter Series | U-MX4 |
| A 8 E | UM "ME4" Heat Recovery Series | U-ME4 |
| A 9 E | Mini UM "ML4", "ML5" | U-ML4, U-ML5 |

2.5 Remote Controller Service Mode

How to Enter the Service Mode



(VF020)

Service Mode Operation Method

1. Select the mode No.

Set the desired mode No. with the button.

(For wireless remote controller, Mode 43 only can be set.)

2. Select the unit No. (For group control only)

Select the indoor unit No. to be set with the time mode . (For wireless remote controller, button.)

3. Make the settings required for each mode. (Modes 41, 44, 45)

In case of Mode 44, 45, push button to be able to change setting before setting work.
(LCD “code” blinks.)

For details, refer to the table in next page.

4. Define the setting contents. (Modes 44, 45)

Define by pushing the timer button.

After defining, LCD “code” changes blinking to ON.

5. Return to the normal operation mode.

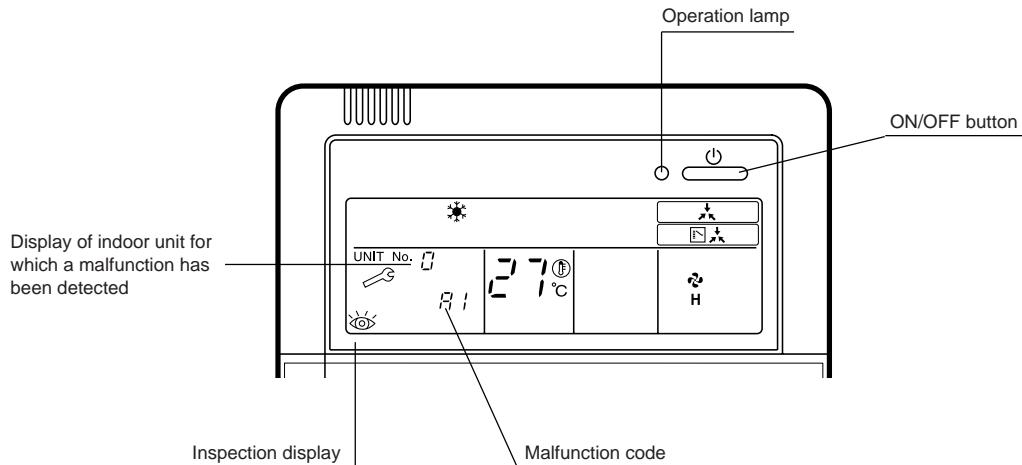
Push the button one time.

| Mode No | Function | Contents and operation method | Remote controller display example |
|---------|------------------------------------|--|--|
| 40 | Malfunction hysteresis display | <p>Display malfunction hysteresis.</p> <p>The history No. can be changed with the button.</p> | <p>Unit 1 Malfunction code 40 2-U4 Malfunction code Hystory No: 1 - 9 1: Latest</p> <p>(VE007)</p> |
| 41 | Display of sensor and address data | <p>Display various types of data.</p> <p>Select the data to be displayed with the button. Sensor data 0: Thermostat sensor in remote controller. 1: Suction 2: Liquid pipe 3: Gas pipe</p> <p>Address data 4: Indoor unit address 5: Outdoor unit address 6: HR-Box unit address 7: Zone control address 8: Cool/heat group address 9: Demand / low noise address</p> | <p>Sensor data display Unit No. 1 1 Sensor type 41 2 7 Temperature °C</p> <p>Address display Unit No. 1 8 Address type 41 1 Address</p> <p>(VE008)</p> |
| 43 | Forced fan ON | <p>Manually turn the fan ON by each unit. (When you want to search for the unit No.)</p> <p>By selecting the unit No. with the button, you can turn the fan of each indoor unit on (forced ON) individually.</p> | <p>Unit 1 43</p> <p>(VE009)</p> |
| 44 | Individual setting | <p>Set the fan speed and air flow direction by each unit</p> <p>Select the unit No. with the time mode button. Set the fan speed with the button.</p> <p>Set the air flow direction with the button.</p> | <p>Unit 1 Code 44 1 3 Fan speed 1: Low 3: High Air flow direction P0 - P4</p> <p>(VE010)</p> |
| 45 | Unit No. transfer | <p>Transfer unit No.</p> <p>Select the unit No. with the button. Set the unit No. after transfer with the button.</p> | <p>Present unit No. Unit 1 Code 0 2 45 Unit No. after transfer</p> <p>(VE011)</p> |

2.6 Remote Controller Self-Diagnosis Function

The remote controller switches are equipped with a self diagnosis function so that more appropriate maintenance can be carried out. If a malfunction occurs during operation, the operation lamp, malfunction code and display of malfunctioning unit No. let you know the contents and location of the malfunction.

When there is a stop due to malfunction, the contents of the malfunction given below can be diagnosed by a combination of operation lamp, INSPECTION display of the liquid crystal display and display of malfunction code. It also lets you know the unit No. during group control.



(VL050)

○ : ON ● : OFF ○ : Blink

| | Malfunction code | Operation lamp | Malfunction contents | Page Referred |
|--------------|------------------|----------------|---|---------------|
| Indoor Unit | A0 | ● | Error of external protection device | 142 |
| | A1 | ● | PC board defect, E ² PROM defect | 143 |
| | A3 | ● | Malfunction of drain level control system (S1L) | 144 |
| | A6 | ● | Fan motor (M1F) lock, overload | 146 |
| | A7 | ○ | Malfunction of swing flap motor (M1S) | 147 |
| | A8 | ● | Abnormal power supply voltage | 149 |
| | A9 | ● | Malfunction of moving part of electronic expansion valve (Y1E) | 150 |
| | AF | ○ | Drain level above limit | 152 |
| | AJ | ● | Malfunction of capacity setting | 153 |
| | C1 | ● | Failure of transmission (between indoor unit PC board and fan PC board) | 154 |
| | C4 | ● | Malfunction of thermistor (R2T) for heat exchange (loose connection, disconnection, short circuit, failure) | 156 |
| | C5 | ● | Malfunction of thermistor (R3T) for gas pipes (loose connection, disconnection, short circuit, failure) | 157 |
| | C6 | ● | Failure of combination (between indoor unit PC board and fan PC board) | 158 |
| | C9 | ● | Malfunction of thermistor (R1T) for suction air (loose connection, disconnection, short circuit, failure) | 159 |
| | CA | ● | Malfunction of thermistor for discharge air (loose connection, disconnection, short circuit, failure) | 160 |
| | CC | ○ | Malfunction of humidity sensor system | 161 |
| | CJ | ○ | Malfunction of thermostat sensor in remote controller | 162 |
| Outdoor Unit | E1 | ● | PC board defect | 163 |
| | E3 | ● | Actuation of high pressure switch | 164 |
| | E4 | ● | Actuation of low pressure sensor | 166 |
| | E5 | ● | Compressor motor lock | 168 |
| | E6 | ● | Standard compressor lock or over current | — |
| | E7 | ● | Malfunction of outdoor unit fan motor | 169 |
| | E9 | ● | Malfunction of moving part of electronic expansion valve (Y1E, Y3E) | 170 |
| | F3 | ● | Abnormal discharge pipe temperature | 172 |
| | F6 | ● | Refrigerant overcharged | 173 |
| | H3 | ○ | Failure of high pressure switch | — |
| | H4 | ● | Actuation of low pressure switch | — |
| | H7 | ● | Abnormal outdoor fan motor signal | — |
| | H9 | ● | Malfunction of thermistor (R1T) for outdoor air (loose connection, disconnection, short circuit, failure) | 174 |
| | J2 | ● | Current sensor malfunction | — |
| | J3 | ● | Malfunction of discharge pipe thermistor (R2T) (loose connection, disconnection, short circuit, failure) | 175 |
| | J5 | ● | Malfunction of thermistor (R3T, R5T) for suction pipe (loose connection, disconnection, short circuit, failure) | 176 |
| | J6 | ● | Malfunction of thermistor (R6T) for heat exchanger (loose connection, disconnection, short circuit, failure) | 177 |
| | J7 | ● | Malfunction of thermistor (R7T) for outdoor unit liquid pipe | 178 |
| | J9 | ● | Malfunction of subcooling heat exchanger gas pipe thermistor (R4T) | 179 |
| | JA | ● | Malfunction of high pressure sensor | 180 |
| | JC | ● | Malfunction of low pressure sensor | 181 |
| | L0 | ● | Inverter system error | — |
| | L1 | ● | Malfunction of PC board | 182 |
| | L4 | ● | Malfunction of inverter radiating fin temperature rise | 183 |
| | L5 | ● | Inverter compressor abnormal | 184 |
| | L8 | ● | Inverter current abnormal | 185 |
| | L9 | ● | Inverter start up error | 186 |

○: ON ●: OFF ○: Blink

| | Malfunction code | Operation lamp | Malfunction contents | Page Referred |
|--|------------------|----------------|--|---------------|
| Outdoor Unit | LA | ● | Malfunction of power unit | — |
| | LC | ● | Malfunction of transmission between inverter and control PC board | 187 |
| | P1 | ● | High voltage of capacitor in main inverter circuit. | 188 |
| System | U0 | ○ | Low pressure drop due to refrigerant shortage or electronic expansion valve failure | 189 |
| | U1 | ● | Reverse phase / open phase | — |
| | U2 | ● | Power supply insufficient or instantaneous failure | 191 |
| | U3 | ● | Check operation is not completed. | 193 |
| | U4 | ● | Malfunction of transmission between indoor and outdoor units | 194 |
| | U5 | ● | Malfunction of transmission between remote controller and indoor unit | 196 |
| | U5 | ● | Failure of remote controller PC board or setting during control by remote controller | 196 |
| | U7 | ● | Malfunction of transmission between outdoor units | — |
| | U8 | ● | Malfunction of transmission between main and sub remote controllers (malfunction of sub remote controller) | 197 |
| | U9 | ● | Malfunction of transmission between indoor unit and outdoor unit in the same system | 198 |
| | UA | ● | Excessive number of indoor units | 200 |
| | UC | ○ | Address duplication of central remote controller | 201 |
| | UE | ● | Malfunction of transmission between central remote controller and indoor unit | 202 |
| Central Remote Controller and Schedule Timer | UF | ● | System is not set yet | 204 |
| | UH | ● | Malfunction of system, refrigerant system address undefined | 205 |
| | UE | ● | Malfunction of transmission between centralized remote controller and indoor unit | 206 |
| | M1 | ○ or ● | PC board defect | 207 |
| | M8 | ○ or ● | Malfunction of transmission between optional controllers for centralized control | 208 |
| Heat Reclaim Ventilation | MA | ○ or ● | Improper combination of optional controllers for centralized control | 209 |
| | MC | ○ or ● | Address duplication, improper setting | 211 |
| | 64 | ○ | Indoor unit's air thermistor error | — |
| | 65 | ○ | Outside air thermistor error | — |
| | 68 | ○ | Malfunction of HVU | — |
| | 6A | ○ | Damper system alarm | — |
| | 6A | ● | Damper system + thermistor error | — |
| | 6F | ○ | Malfunction of simple remote controller | — |
| | 94 | ● | Internal transmission error | — |

 The system operates for malfunction codes indicated in black squares, however, be sure to check and repair.

Malfunction code indication by outdoor unit PC board

<Monitor mode>

To enter the monitor mode, push the [MODE (BS1)] button when in "Setting mode 1".

<Selection of setting item>

Push the [SET (BS2)] button and set the LED display to a setting item.

<Confirmation of malfunction 1>

Push the [RETURN (BS3)] button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the [SET (BS2)] button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>

Push the [SET (BS2)] button once to display "malfunction location".

<Confirmation of malfunction 4>

Push the [SET (BS2)] button once to display "master or slave 1 or slave 2" and "malfunction location".

Push the [RETURN (BS3)] button and switches to the initial status of "Monitor mode".

* Push the [MODE (BS1)] button and returns to "Setting mode 1".

Detail
description
on next
page.

| Contents of malfunction | | Malfunction code |
|--|---|------------------|
| In-phase malfunction of UM Net | Detection of UM Net | E1 |
| Abnormal discharge pressure | HPS activated | E3 |
| Abnormal suction pressure | Abnormal Pe | E4 |
| Compressor lock | Detection of INV compressor lock | E5 |
| Over load, over current, abnormal lock of outdoor unit fan motor | Detection of DC fan 1 motor lock Detection of DC fan 2 motor lock | E7 |
| Malfunction of electronic expansion valve | EV1 EV3 | E9 |
| Faulty sensor of outdoor air temperature | Faulty Ta sensor (short) | H9 |
| Abnormal discharge pipe temperature | Abnormal Td | F3 |
| Abnormal heat exchanger temperature | Refrigerant over charge | F6 |
| Faulty sensor of discharge pipe temperature | Faulty Tdi sensor (short) | J3 |
| Faulty sensor of suction pipe temperature | Faulty Ts1 sensor (short) Faulty Ts2 sensor (short) | J5 |
| Faulty sensor of heat exchanger temperature | Faulty Tb sensor (short) | J6 |
| Malfunction of the liquid pipe temperature sensor | Faulty TI sensor (short) | J7 |
| Faulty sensor of subcool heat exchanger temperature | Faulty Tsh sensor (short) | J9 |
| Faulty sensor of discharge pressure | Faulty Pc sensor (short) | JA |
| Faulty sensor of suction pressure | Faulty Pe sensor (short) | JC |
| Faulty Inverter PC board | Faulty IPM Abnormal Current sensor offset Abnormal IGBT Faulty Current sensor Abnormal SP-PAM over-voltage | L1 |
| Inverter radiation fin temperature rising | Over heating of inverter radiation fin temperature | L4 |
| DC output over current | Inverter instantaneous over current | L5 |
| Electronic thermal | Electronic thermal switch 1 Electronic thermal switch 2 Out-of-step Speed down after startup Lightening detection | L8 |
| Stall prevention (Limit time) | Stall prevention (Current increasing) Stall prevention (Faulty start up) Abnormal wave form in startup Out-of-step | L9 |
| Transmission error between inverter and outdoor unit | Inverter transmission error | LC |

○: ON ●: OFF ○: Blink

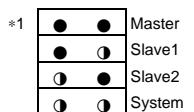
| Malfunction code | Confirmation of malfunction 1 | | | | | | | Confirmation of malfunction 2 | | | | | | | Confirmation of malfunction 3 | | | | | | | Confirmation of malfunction 4 | | | | | | | | |
|------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|---|---|
| | H1P | H2P | H3P | H4P | H5P | H6P | H7P | H1P | H2P | H3P | H4P | H5P | H6P | H7P | H1P | H2P | H3P | H4P | H5P | H6P | H7P | H1P | H2P | H3P | H4P | H5P | H6P | H7P | | |
| E1 | ○ | | | ● | ● | ○ | ○ | ○ | | ● | ● | ● | ● | ○ | ○ | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ● | ● | ○ | ○ | | |
| E3 | | | | | | | | ○ | | ● | ● | ○ | ○ | ○ | | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| E4 | | | | | | | | ○ | | ● | ● | ● | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| E5 | | | | | | | | ○ | | ● | ● | ● | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| E7 | | | | | | | | ○ | | ● | ● | ○ | ○ | ○ | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | ○ | | | |
| E9 | | | | | | | | ○ | | ○ | ● | ● | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| H9 | | | | | | | | ○ | | ○ | ● | ● | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| F3 | ○ | | | ● | ○ | ● | ○ | ○ | | ● | ● | ● | ○ | ○ | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| F6 | | | | | | | | ○ | | ● | ● | ○ | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | ○ | ○ | ○ | ○ |
| J3 | | | | ● | ● | ○ | ● | ● | | ● | ● | ● | ○ | ○ | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| J5 | | | | | | | | ○ | | ● | ● | ● | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| J6 | | | | | | | | ○ | | ● | ● | ○ | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● |
| J7 | | | | | | | | ○ | | ● | ● | ○ | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| J9 | | | | | | | | ○ | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| JA | ○ | | | | | | | ○ | | ● | ● | ○ | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| JC | | | | | | | | ○ | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| L1 | | | | ● | ● | ○ | ● | ○ | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● |
| L4 | | | | | | | | ○ | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| L5 | | | | | | | | ○ | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| L8 | | | | | | | | ○ | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● |
| L9 | | | | | | | | ○ | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| LC | | | | | | | | ○ | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |

Display of contents of malfunction (first digit)

Display of contents of malfunction (second digit)

Display 1 of malfunction in detail

Display 2 of malfunction in detail



<Monitor mode>

To enter the monitor mode, push the [MODE (BS1)] button when in "Setting mode 1".

<Selection of setting item>

Push the [SET (BS2)] button and set the LED display to a setting item.

<Confirmation of malfunction 1>

Push the [RETURN (BS3)] button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the [SET (BS2)] button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>

Push the [SET (BS2)] button once to display "malfunction location".

<Confirmation of malfunction 4>

Push the [SET (BS2)] button once to display "master or slave 1 or slave 2" and "malfunction location".

Push the [RETURN (BS3)] button and switches to the initial status of "Monitor mode".

* Push the [MODE (BS1)] button and returns to "Setting mode 1".

| Contents of malfunction | | Malfunction code |
|--|---|------------------|
| Open phase/Power supply imbalance | Imbalance of inverter power supply voltage | P1 |
| Faulty temperature sensor of inverter radiation fin | Faulty thermistor of inverter fin | P4 |
| Refrigerant shortage | Refrigerant shortage alarm | U0 |
| Abnormal power supply voltage | Insufficient Inverter voltage Faulty charge of capacitor in main inverter circuit Malfunction due to SP-PAM overvoltage Malfunction due to P-N short circuit | U2 |
| No implementation of test-run | | U3 |
| Transmission error between indoor and outdoor unit | I/O transmission error I/O transmission error | U4 |
| Transmission error of other system | Indoor unit system abnormal in other system or other indoor unit system abnormal in own system | U9 |
| Erroneous field setting | System transmission malfunction Overconnection malfunction of indoor units Malfunction of field setting Refrigerant abnormal Connection error (BP unit) | UA |
| Faulty system malfunction | Wiring error (Auto-address error) | UH |
| Conflict in wiring and piping, no setting for system | Conflict in wiring and piping | UF |

Detail description on next page.

○: ON ●: OFF ○:Blink

| Malfunction code | Confirmation of malfunction 1 | | | | | | | Confirmation of malfunction 2 | | | | | | | Confirmation of malfunction 3 | | | | | | | Confirmation of malfunction 4 | | | | | | |
|------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| | H1P | H2P | H3P | H4P | H5P | H6P | H7P | H1P | H2P | H3P | H4P | H5P | H6P | H7P | H1P | H2P | H3P | H4P | H5P | H6P | H7P | H1P | H2P | H3P | H4P | H5P | H6P | H7P |
| P1 | ● | | | ● | ● | ● | ● | ○ | | | ● | ● | ● | ● | ○ | | | | ● | ● | ● | ● | ○ | | | | | |
| P4 | | | | | | | | ○ | | | ● | ○ | ● | ● | ● | ○ | | | ● | ● | ● | ● | ● | | | *1 | | |
| U0 | ○ | | | ● | ● | ● | ● | ○ | | | ● | ● | ● | ● | ● | ○ | | | ● | ● | ● | ● | ● | ● | ● | | | |
| U2 | | | | | | | | ○ | | | ● | ● | ● | ● | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | ● | *1 | | |
| U3 | | | | | | | | | | | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | |
| U4 | | | | | | | | | | | ● | ○ | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | |
| U9 | | | | | | | | | | | ○ | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | |
| UA | | | | | | | | | | | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | |
| UH | | | | | | | | | | | ○ | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | |
| UF | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ● | | ● | ● | ● | ● | ● | ● | ● | | | |

Display of contents of malfunction (first digit) Display of contents of malfunction (second digit) Display 1 of malfunction in detail Display 2 of malfunction in detail
 *1

| | |
|-----|--------|
| ● ● | Master |
| ● ○ | Slave1 |
| ○ ● | Slave2 |
| ○ ○ | System |

3. Troubleshooting by Indication on the Remote Controller

3.1 "RD" Indoor Unit: Error of External Protection Device

Remote
Controller
Display

RD

Applicable
Models

All indoor unit models

Method of
Malfunction
Detection

Malfunction
Decision
Conditions

Supposed
Causes

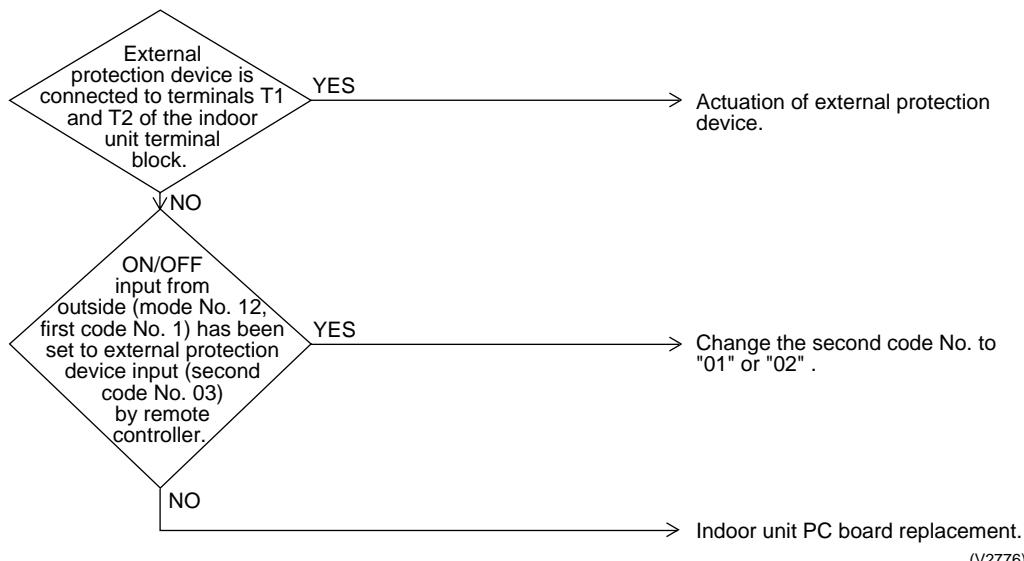
- Actuation of external protection device
- Improper field set
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2776)

3.2 “R /” Indoor Unit: PC Board Defect

**Remote
Controller
Display**

R /

**Applicable
Models**

All indoor unit models

**Method of
Malfunction
Detection**

Check data from E²PROM.

**Malfunction
Decision
Conditions**

When data could not be correctly received from the E²PROM
E²PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.

**Supposed
Causes**

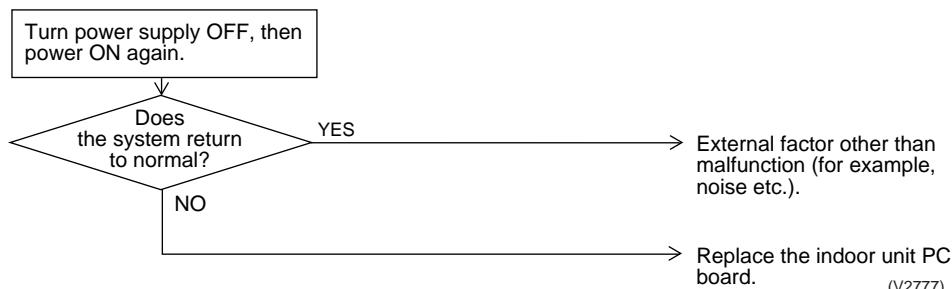
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3.3 “R3” Indoor Unit: Malfunction of Drain Level Control System (S1L)

Remote
Controller
Display

R3

Applicable
Models

LM3, UM4, FXSQ, DM3, NM3, EM3, TM3 (Option), 200..250EM3 (Option), KM3 (Option)

Method of
Malfunction
Detection

By float switch OFF detection

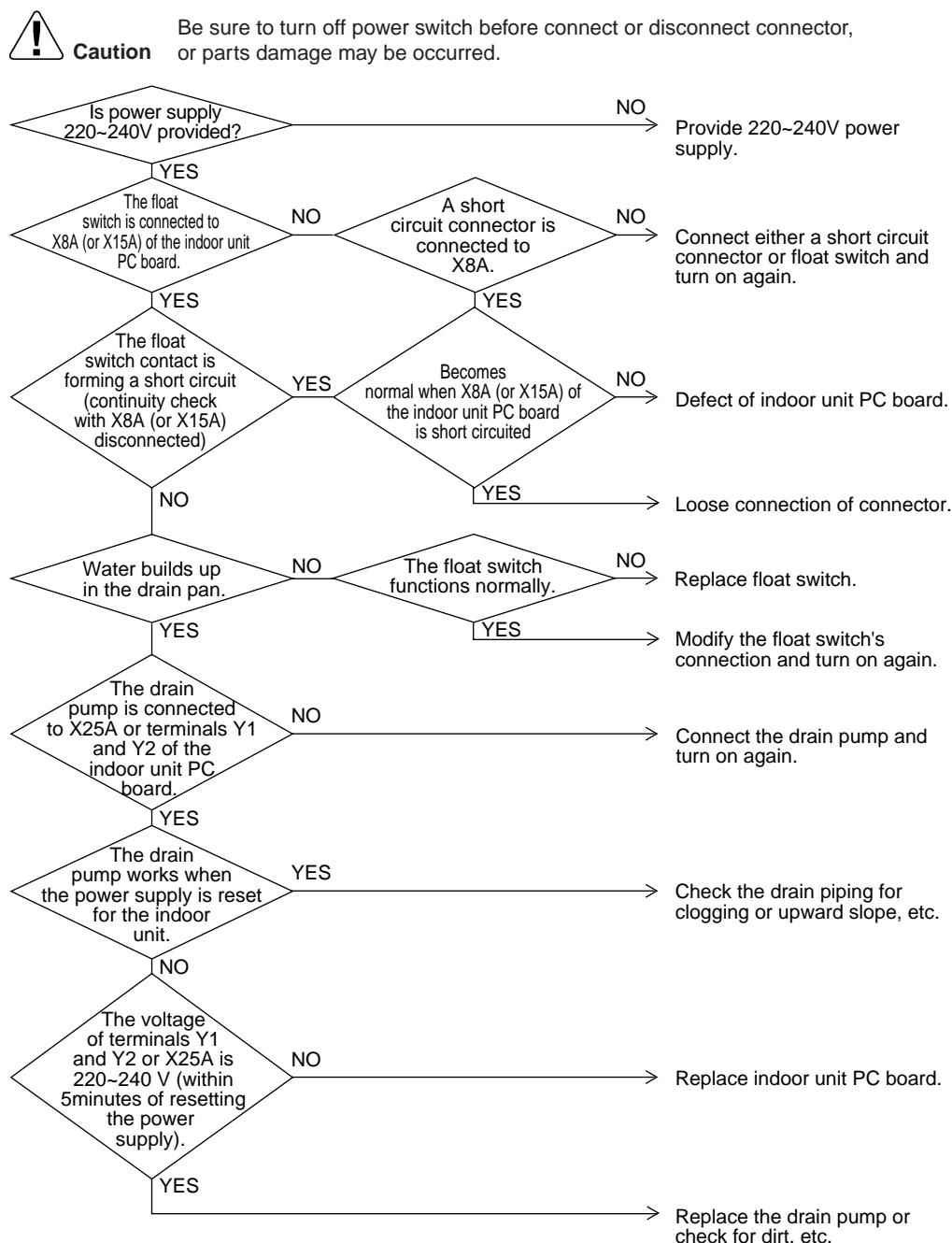
Malfunction
Decision
Conditions

When rise of water level is not a condition and the float switch goes OFF.

Supposed
Causes

- 220~240V power supply is not provided
- Defect of float switch or short circuit connector
- Defect of drain pump
- Drain clogging, upward slope, etc.
- Defect of indoor unit PC board
- Loose connection of connector

Troubleshooting



(V2778)

3.4 “R6” Indoor Unit: Fan Motor (M1F) Lock, Overload

**Remote
Controller
Display**

R6

**Applicable
Models**

All indoor unit models

**Method of
Malfunction
Detection**

Detection by failure of signal for detecting number of turns to come from the fan motor

**Malfunction
Decision
Conditions**

When number of turns can't be detected even when output voltage to the fan is maximum

**Supposed
Causes**

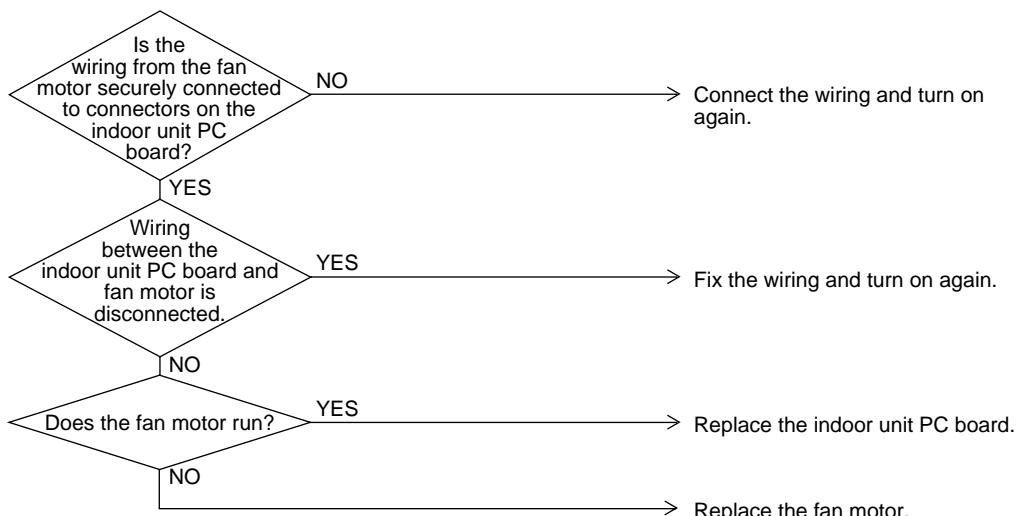
- Fan motor lock
- Disconnected or faulty wiring between fan motor and PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2779)

3.5 “R7” Indoor Unit: Malfunction of Swing Flap Motor (M1S)

Remote
Controller
Display



Applicable
Models

LM3, TM3, DM3, YM3

Method of
Malfunction
Detection

Utilizes ON/OFF of the limit switch when the motor turns.

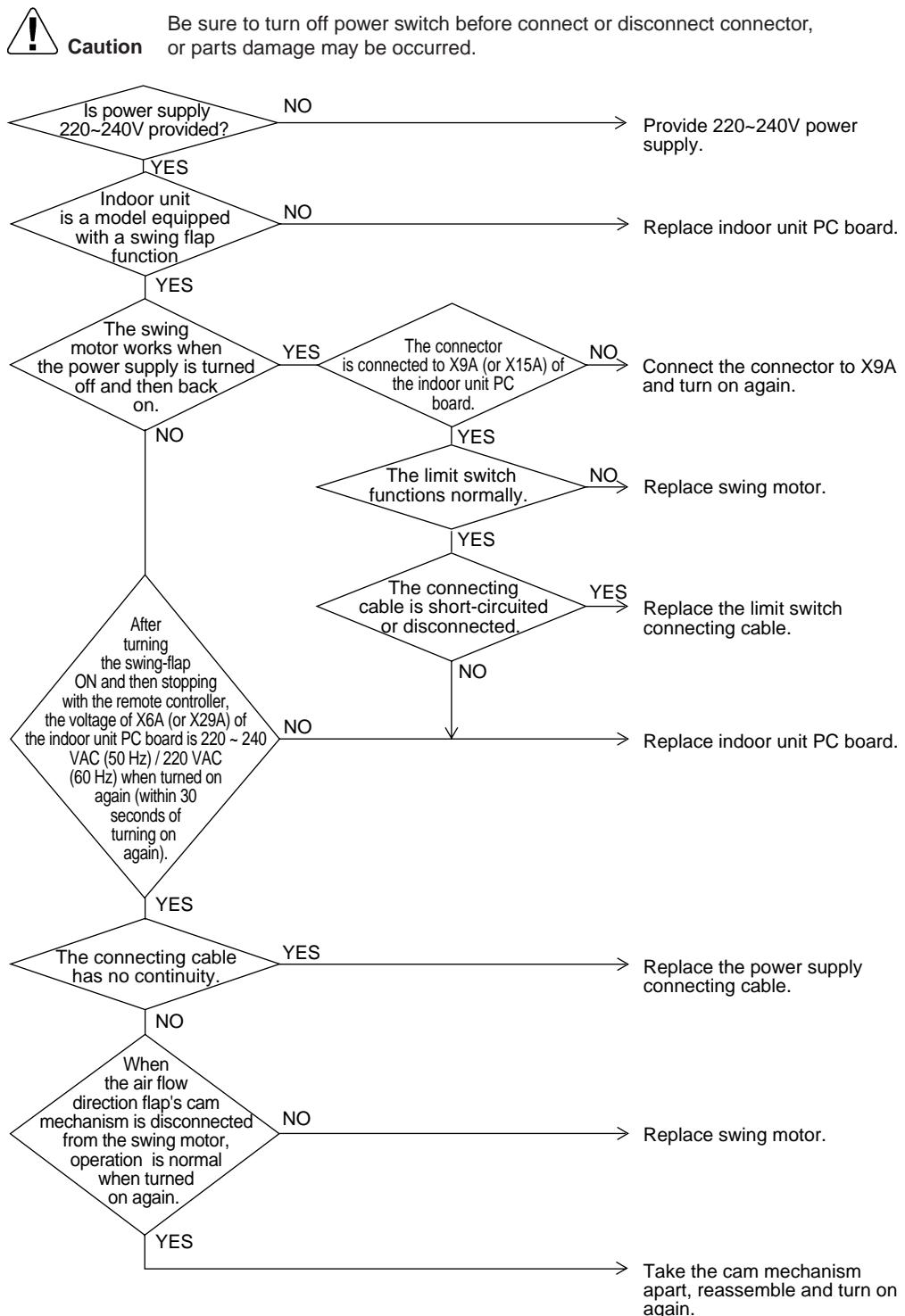
Malfunction
Decision
Conditions

When ON/OFF of the microswitch for positioning cannot be reversed even though the swing flap motor is energized for a specified amount of time (about 30 seconds).

Supposed
Causes

- Defect of swing motor
- Defect of connection cable (power supply and limit switch)
- Defect of air flow direction adjusting flap-cam
- Defect of indoor unit PC board

Troubleshooting



(V2780)

3.6 Abnormal Power Supply Voltage

**Remote
Controller
Display**

88

**Applicable
Models**

S-40..125EM3

**Method of
Malfunction
Detection**

Detect malfunction checking the input voltage of fan motor.

**Malfunction
Decision
Conditions**

When the input voltage of fan motor is 150V and below, or 386V and above.

**Supposed
Causes**

The possible causes are:

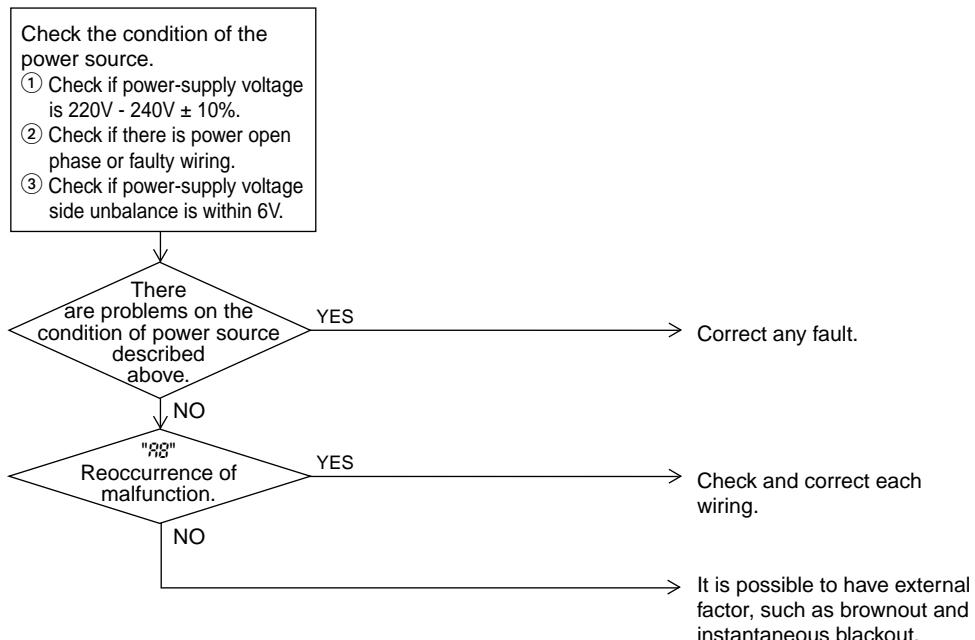
- Power-supply voltage malfunction.
- Connection defect on signal line.
- Wiring defect.
- Instantaneous blackout, others.

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3.7 “R9” Indoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

**Remote
Controller
Display**

R9

**Applicable
Models**

All indoor unit models

**Method of
Malfunction
Detection**

**Malfunction
Decision
Conditions**

**Supposed
Causes**

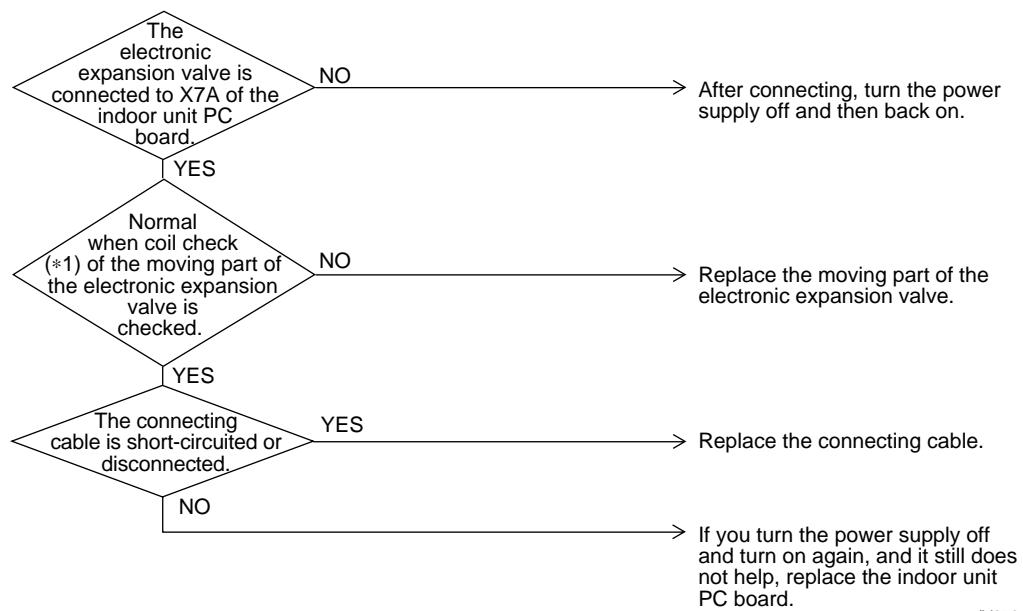
- Malfunction of moving part of electronic expansion valve
- Defect of indoor unit PC board
- Defect of connecting cable

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2781)

*1: Coil check method for the moving part of the electronic expansion valve
Disconnect the electronic expansion valve from the PC board and check the continuity between the connector pins.

(Normal)

| Pin No. | 1. White | 2. Yellow | 3. Orange | 4. Blue | 5. Red | 6. Brown |
|-----------|----------|-----------|----------------------|----------------------|----------------------|----------------------|
| 1. White | | x | ○ Approx. 300Ω | x | ○ Approx. 150Ω | x |
| 2. Yellow | | | x | ○ Approx. 300Ω | x | ○ Approx. 150Ω |
| 3. Orange | | | | x | ○ Approx. 150Ω | x |
| 4. Blue | | | | | x | ○ Approx. 150Ω |
| 5. Red | | | | | | x |
| 6. Brown | | | | | | |

○: Continuity

x: No continuity

3.8 “RF” Indoor Unit: Drain Level above Limit

**Remote
Controller
Display**



**Applicable
Models**

LM3, FM3, DM3, EM3

**Method of
Malfunction
Detection**

Water leakage is detected based on float switch ON/OFF operation while the compressor is in non-operation.

**Malfunction
Decision
Conditions**

When the float switch changes from ON to OFF while the compressor is in non-operation.

**Supposed
Causes**

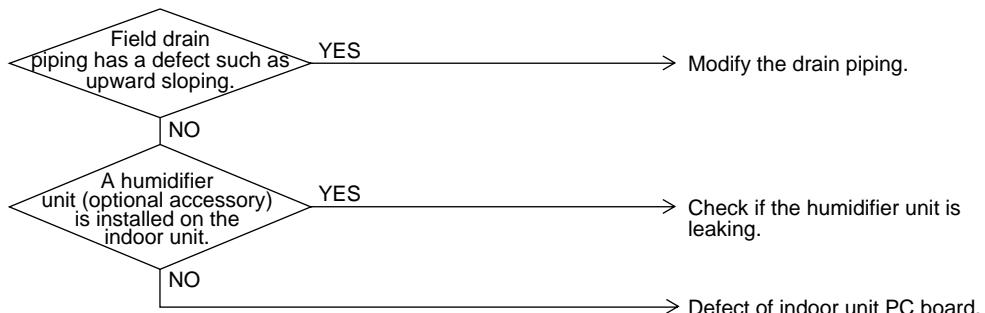
- Humidifier unit (optional accessory) leaking
- Defect of drain pipe (upward slope, etc.)
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2782)

3.9 “RU” Indoor Unit: Malfunction of Capacity Determination Device

**Remote
Controller
Display**



**Applicable
Models**

All indoor unit models

**Method of
Malfunction
Detection**

Capacity is determined according to resistance of the capacity setting adaptor and the memory inside the IC memory on the indoor unit PC board, and whether the value is normal or abnormal is determined.

**Malfunction
Decision
Conditions**

Operation and:

1. When the capacity code is not contained in the PC board's memory, and the capacity setting adaptor is not connected.
2. When a capacity that doesn't exist for that unit is set.

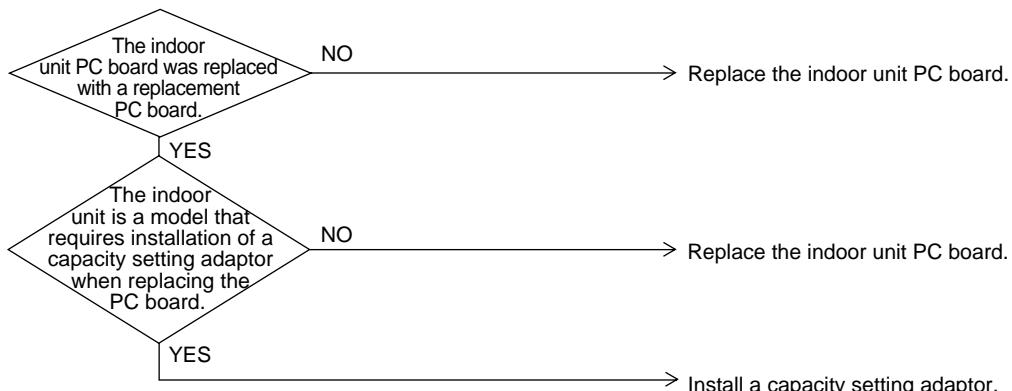
**Supposed
Causes**

- You have forgotten to install the capacity setting adaptor.
- Defect of indoor unit PC board

Troubleshooting



Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2783)

3.10 “C /” Indoor Unit: Failure of Transmission (Between Indoor unit PC Board and Fan PC Board)

Remote
Controller
Display



Applicable
Models

S-40..125EM3

Method of
Malfunction
Detection

Check the condition of transmission between indoor PC board (A1P) and PC board for fan (A2P) using computer.

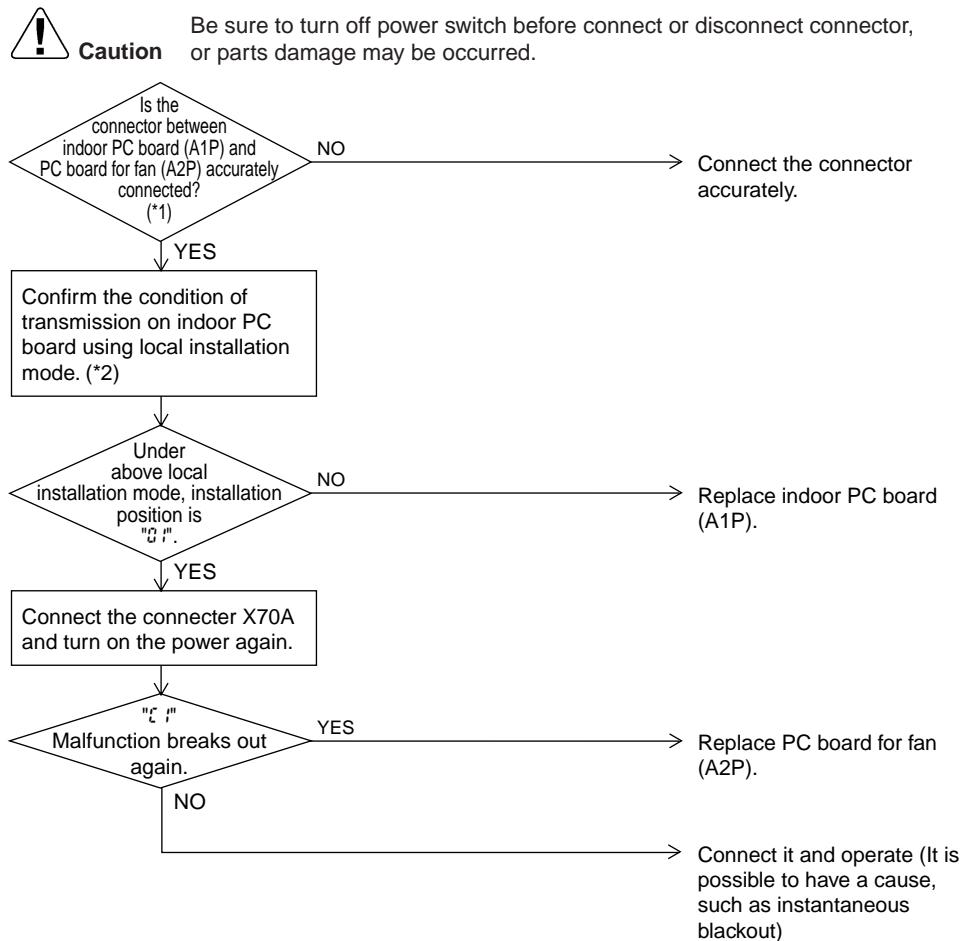
Malfunction
Decision
Conditions

When normal transmission is not conducted for certain duration.

Supposed
Causes

- Connection defect of the connector between indoor PC board (A1P) and PC board for fan (A2P).
- Malfunction of indoor PC board (A1P).
- Malfunction of PC board for fan (A2P).
- External factor, such as instantaneous blackout.

Troubleshooting



*1. Pull out and insert the connector once and check it is absolutely connected.

*2. Method to check transmission part of indoor PC board.

- ① Turn off the power and remove the connector X70A of indoor PC board (A1P).
- ② Short-circuit X70A.
- ③ After turning on the power, check below numbers under local setting remote control.
(Confirmation: Setting position NO. at the condition of setting switch No. 21 on mode No. 41)



Determination 01: Normal

Other than 01: Transmission defect on indoor PC board

- ★ After confirmation, turn off the power, take off the short-circuit and connect X70A back to original condition.

3.11 “C4” Indoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger

Remote
Controller
Display

C4

Applicable
Models

All indoor unit models

Method of
Malfunction
Detection

Malfunction detection is carried out by temperature detected by heat exchanger thermistor.

Malfunction
Decision
Conditions

When the heat exchanger thermistor becomes disconnected or shorted while the unit is running.

Supposed
Causes

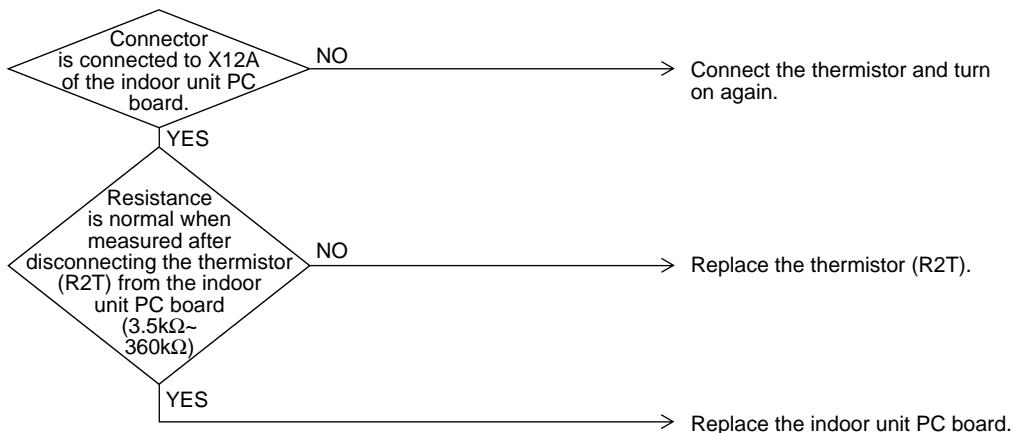
- Defect of thermistor (R2T) for liquid pipe
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2784)



* Refer to thermistor resistance / temperature characteristics table on P251.

3.12 "CS" Indoor Unit: Malfunction of Thermistor (R3T) for Gas Pipes

**Remote
Controller
Display**

CS

**Applicable
Models**

All indoor unit models

**Method of
Malfunction
Detection**

Malfunction detection is carried out by temperature detected by gas pipe thermistor.

**Malfunction
Decision
Conditions**

When the gas pipe thermistor becomes disconnected or shorted while the unit is running.

**Supposed
Causes**

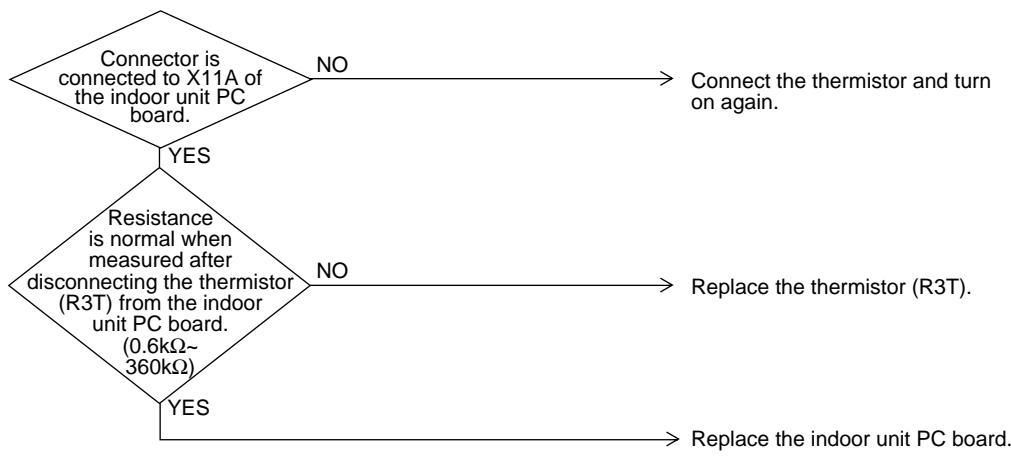
- Defect of indoor unit thermistor (R3T) for gas pipe
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



* Refer to thermistor resistance / temperature characteristics table on P251.

3.13 “C6” Indoor Unit: Failure of Combination (Between Indoor unit PC Board and Fan PC Board)

**Remote
Controller
Display**

C6

**Applicable
Models**

S-40..125EM3

**Method of
Malfunction
Detection**

Conduct open line detection with PC board for fan (A2P) using indoor PC board (A1P).

**Malfunction
Decision
Conditions**

When the communication data of PC board for fan (A2P) is determined as incorrect.

**Supposed
Causes**

The possible causes are:

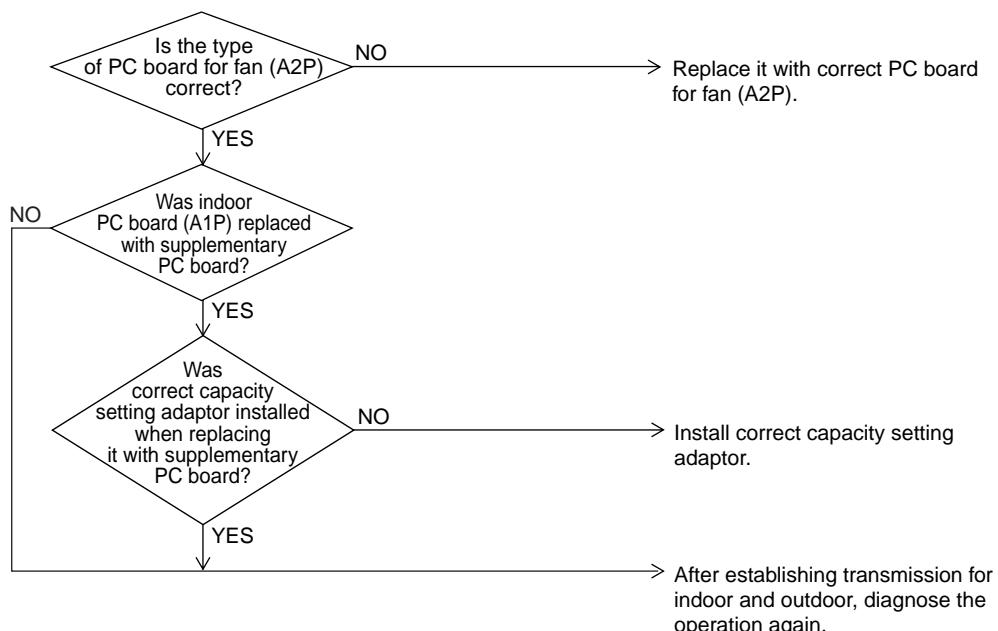
- Malfunction of PC board for fan (A2P).
- Connection defect of capacity setting adapter.
- Setting mistake on site.

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3.14 “CS” Indoor Unit: Malfunction of Thermistor (R1T) for Suction Air

Remote Controller Display

CS

Applicable Models

All indoor unit models

Method of Malfunction Detection

Malfunction detection is carried out by temperature detected by suction air temperature thermistor.

Malfunction Decision Conditions

When the suction air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

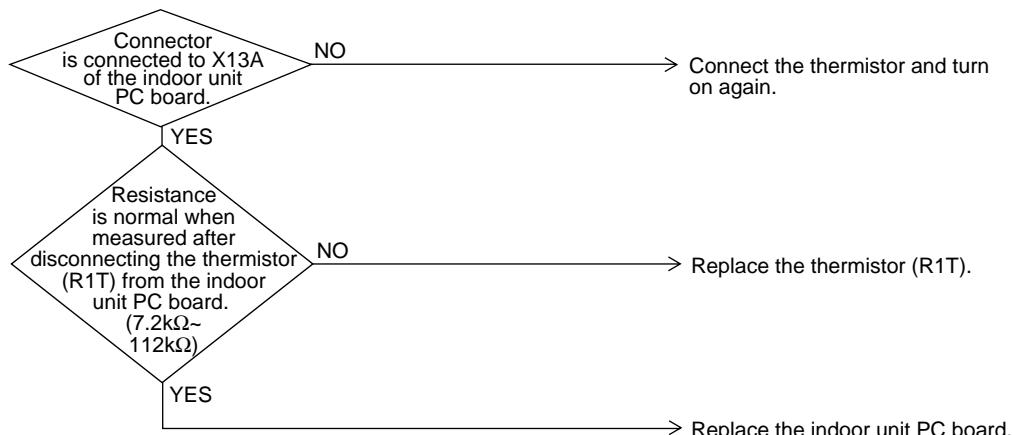
- Defect of indoor unit thermistor (R1T) for air inlet
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2786)



* Refer to thermistor resistance / temperature characteristics table on P251.

3.15 “CR” Indoor Unit: Malfunction of Thermistor for Discharge Air

**Remote
Controller
Display**

CR

**Applicable
Models**

All indoor unit models

**Method of
Malfunction
Detection**

Malfunction detection is carried out by temperature detected by discharge air temperature thermistor.

**Malfunction
Decision
Conditions**

When the discharge air temperature thermistor becomes disconnected or shorted while the unit is running.

**Supposed
Causes**

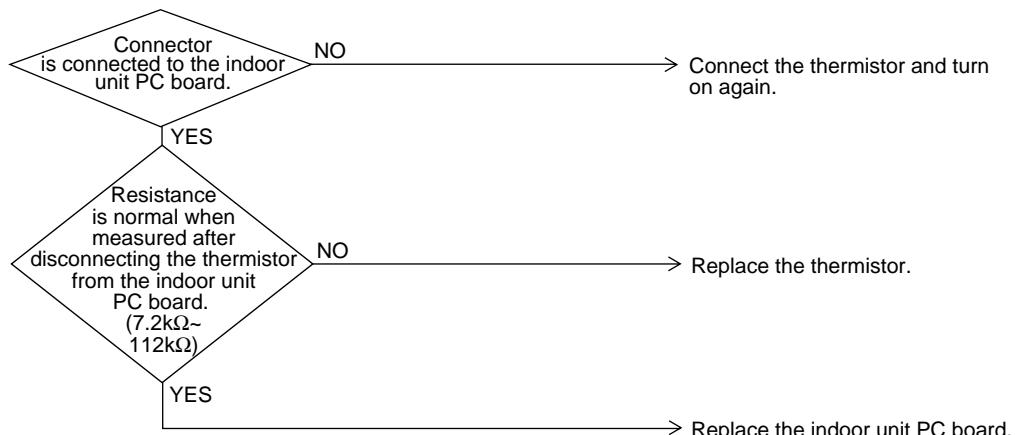
- Defect of indoor unit thermistor for air outlet
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2786)



* Refer to thermistor resistance / temperature characteristics table on P251.

3.16 "EE" Indoor Unit: Malfunction of Humidity Sensor System

**Remote
Controller
Display**

EE

**Applicable
Models**

UM4

**Method of
Malfunction
Detection**

Even if a malfunction occurs, operation still continues.

Malfunction is detected according to the moisture (output voltage) detected by the moisture sensor.

**Malfunction
Decision
Conditions**

When the moisture sensor is disconnected or short-circuited

**Supposed
Causes**

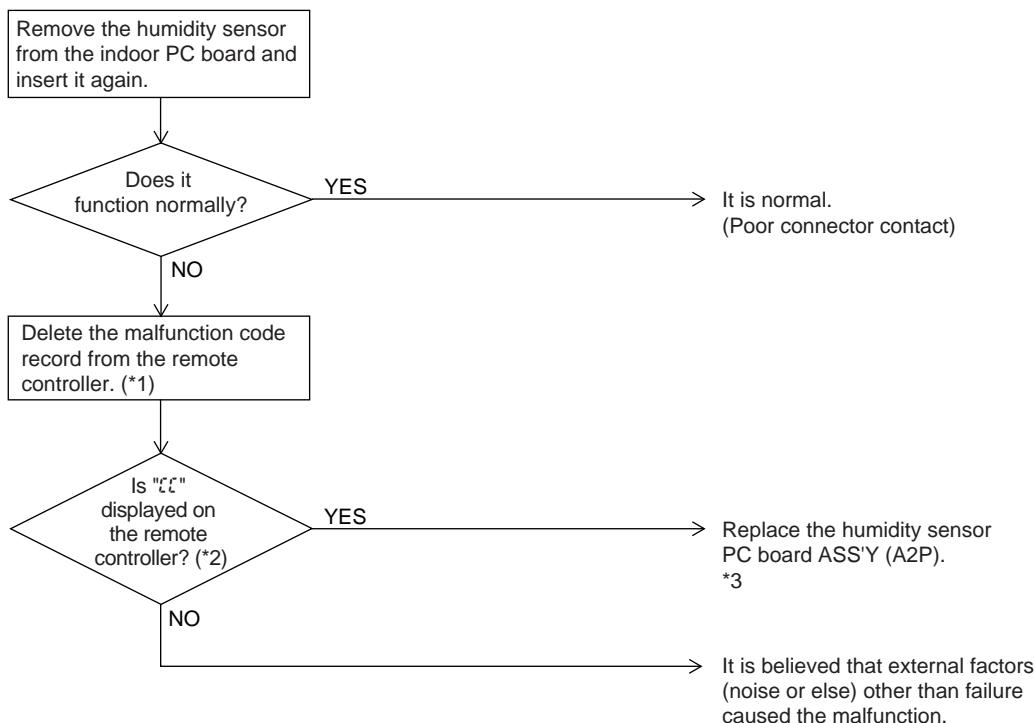
- Faulty sensor
- Disconnection

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1: To delete the record, the [ON/OFF] button of the remote controller must be pushed and held for 5 seconds in the check mode.

*2: To display the code, the [Inspection/Test Operation] button of the remote controller must be pushed and held in the normal mode.

*3: If "EE" is displayed even after replacing the humidity sensor PC board ASS'Y (A2P) and taking the steps *1 and 2, replace the indoor PC board ASS'Y (A1P).

3.17 "CU" Indoor Unit: Malfunction of Thermostat Sensor in Remote Controller

Remote Controller Display



Applicable Models

All indoor unit models

Method of Malfunction Detection

Malfunction detection is carried out by temperature detected by remote controller air temperature thermistor. (Note1)

Malfunction Decision Conditions

When the remote controller air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

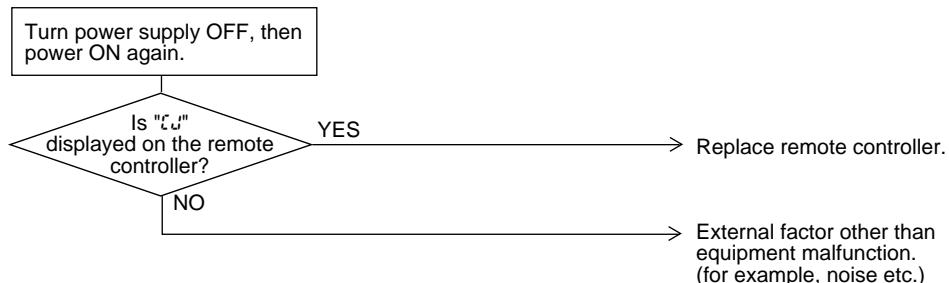
- Defect of remote controller thermistor
- Defect of remote controller PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2787)



Note: In case of remote controller thermistor malfunction, unit is still operable by suction air thermistor on indoor unit.



* Refer to thermistor resistance / temperature characteristics table on P251.

3.18 “E /” Outdoor Unit: PC Board Defect

**Remote
Controller
Display**

E /

**Applicable
Models**

U-4..6ML5DPQ, U-4..6ML5XPQ

**Method of
Malfunction
Detection**

Check data from E²PROM

**Malfunction
Decision
Conditions**

When data could not be correctly received from the E²PROM
E²PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.

**Supposed
Causes**

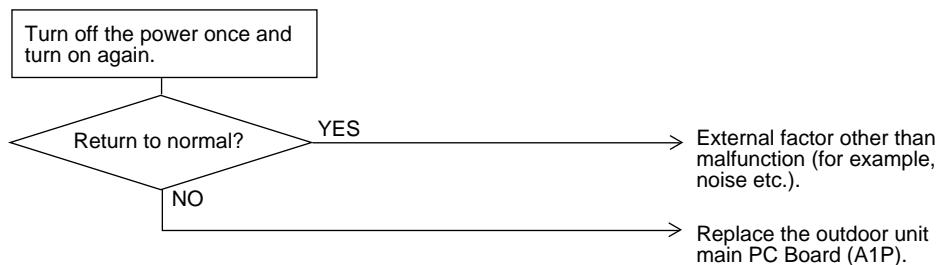
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3064)

3.19 “E3” Outdoor Unit: **Actuation of High Pressure Switch**

Remote
Controller
Display

E3

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Abnormality is detected when the contact of the high pressure protection switch opens.

Malfunction
Decision
Conditions

Error is generated when the HPS activation count reaches the number specific to the operation mode.

(Reference) Operating pressure of high pressure switch

Operating pressure: 4.0MPa

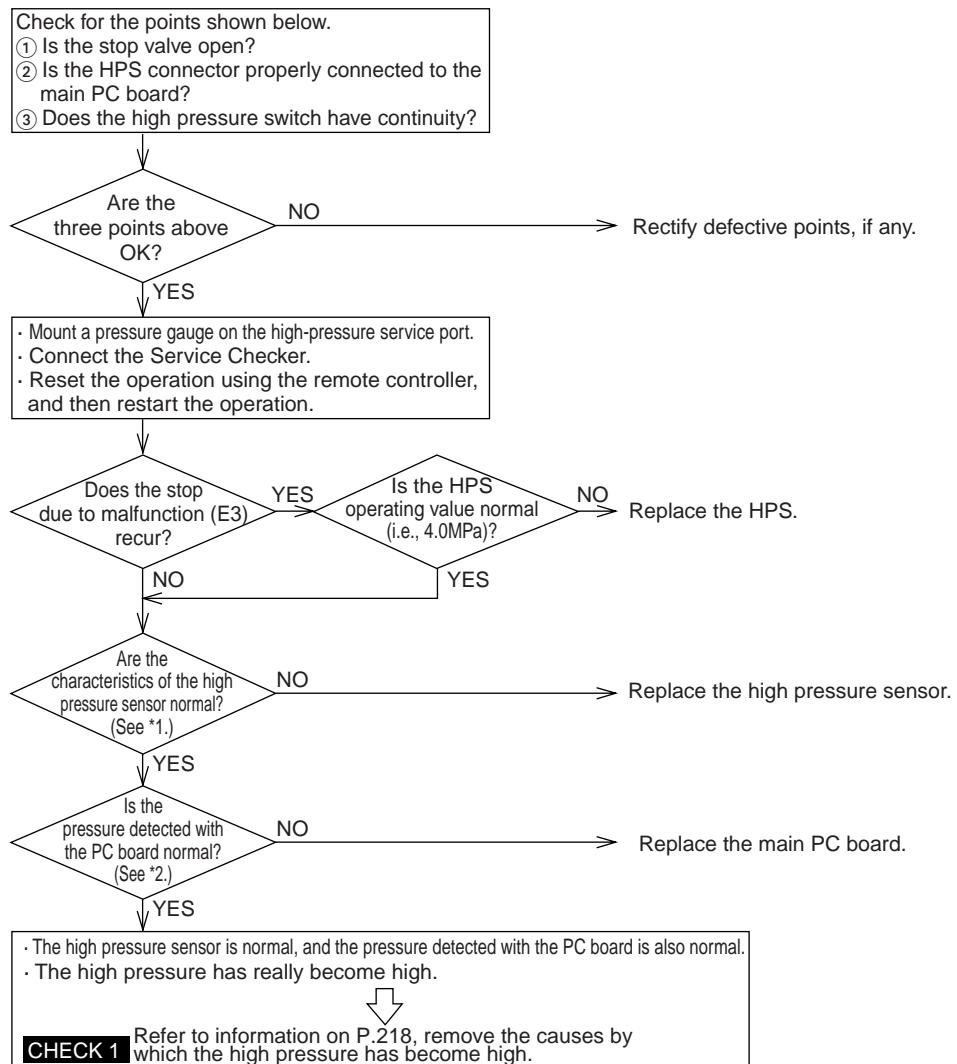
Reset pressure: 3.0MPa

Supposed
Causes

- Actuation of outdoor unit high pressure switch
- Defect of High pressure switch
- Defect of outdoor unit PC board (A1P)
- Instantaneous power failure
- Faulty high pressure sensor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

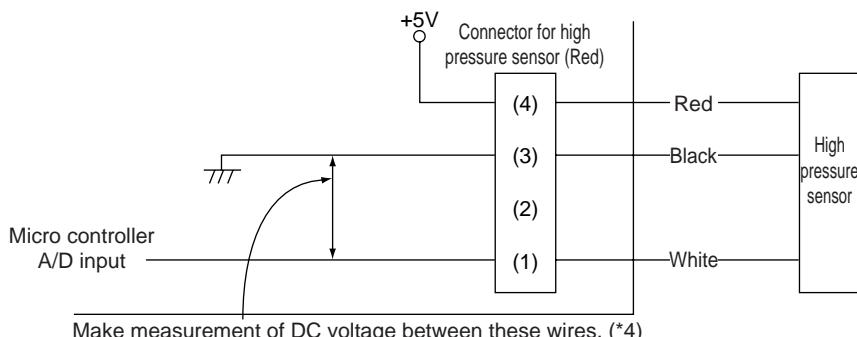


*1: Make a comparison between the voltage of the pressure sensor (*4) and that read by the pressure gauge.

(As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information on P.253.)

*2: Make a comparison between the high pressure value checked with the Service Checker and the voltage of the pressure sensor (see *1).

*3: Make measurement of voltage of the pressure sensor.



3.20 “E4” Outdoor Unit: Actuation of Low Pressure Sensor

Remote
Controller
Display

E4

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Abnormality is detected by the pressure value with the low pressure sensor.

Malfunction
Decision
Conditions

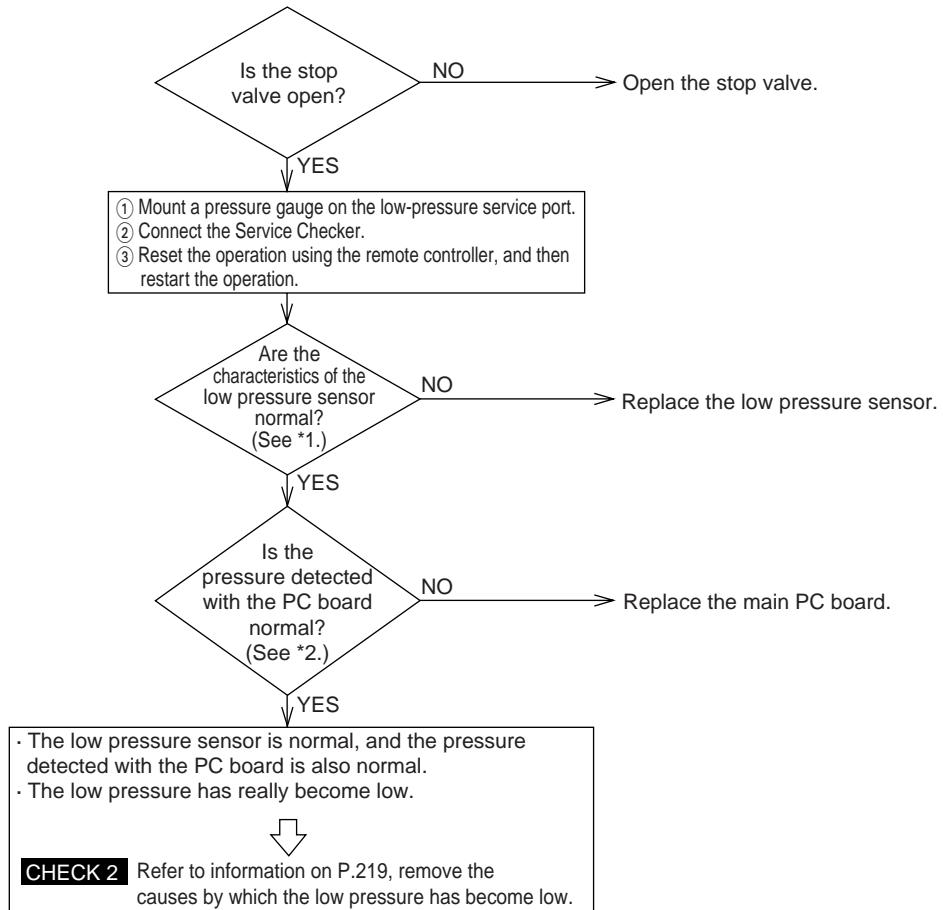
Error is generated when the low pressure is dropped under specific pressure.
Operating pressure:0.07MPa

Supposed
Causes

- Abnormal drop of low pressure (Lower than 0.07MPa)
- Defect of low pressure sensor
- Defect of outdoor unit PC board (A1P)
- Stop valve is not opened.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

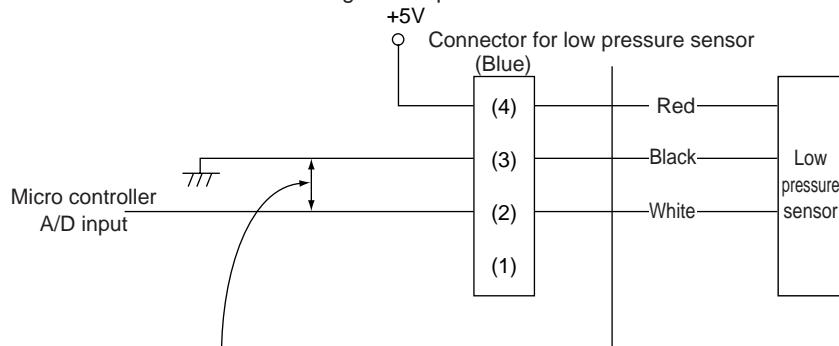


*1: Make a comparison between the voltage of the pressure sensor (*4) and that read by the pressure gauge.

(As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information on P.253.)

*2: Make a comparison between the low pressure value checked with the Service Checker and the voltage of the pressure sensor (see *1).

*3: Make measurement of voltage of the pressure sensor.



Make measurement of DC voltage between these wires. (*4)

3.21 “E5” Inverter Compressor Motor Lock

**Remote
Controller
Display**

E5

**Applicable
Models**

U-4..6ML5DPQ, U-4..6ML5XPQ

**Method of
Malfunction
Detection**

Inverter PC board takes the position signal from UVW line connected between the inverter and compressor, and the malfunction is detected when any abnormality is observed in the phase-current waveform.

**Malfunction
Decision
Conditions**

This malfunction will be output when the inverter compressor motor does not start up even in forced startup mode.

**Supposed
Causes**

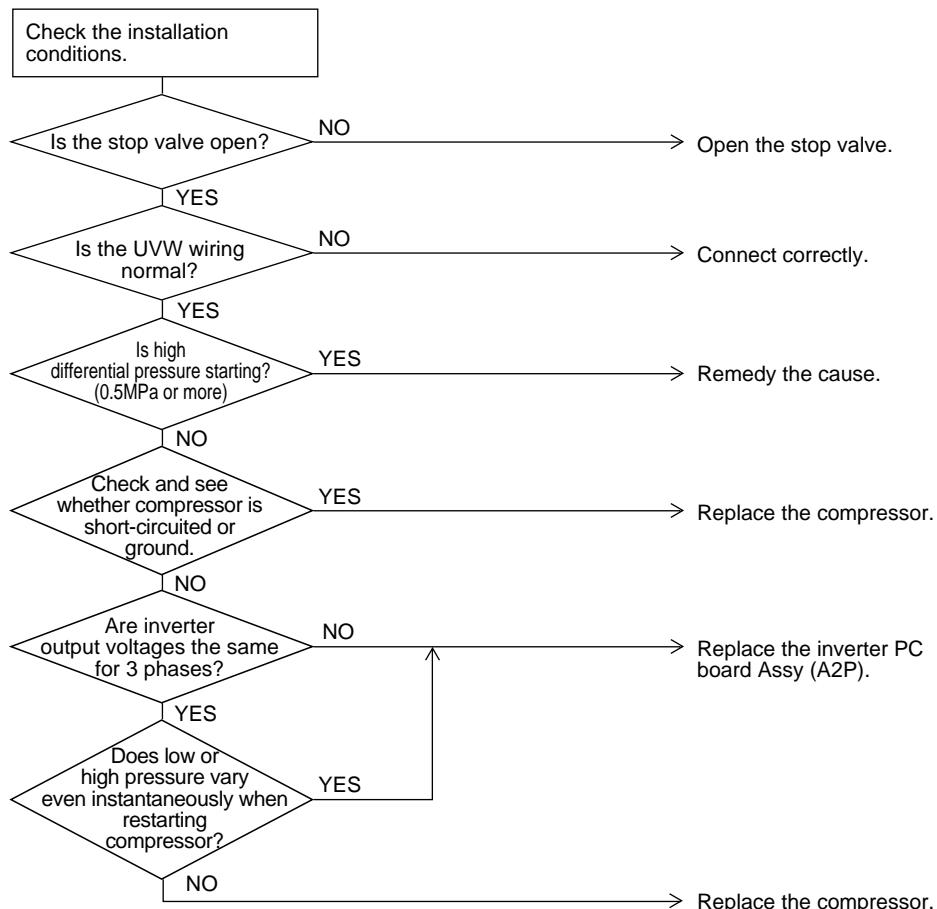
- Compressor lock
- High differential pressure (0.5MPa or more)
- Incorrect UVW wiring
- Faulty inverter PC board
- Stop valve is left in closed.

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2793)

3.22 "E7" Malfunction of Outdoor Unit Fan Motor

Remote
Controller
Display

E7

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction of fan motor system is detected according to the fan speed detected by hall IC when the fan motor runs.

Malfunction
Decision
Conditions

- When the fan runs with speed less than a specified one for 6 seconds or more when the fan motor running conditions are met
- When malfunction is generated 4 times, the system shuts down.

Supposed
Causes

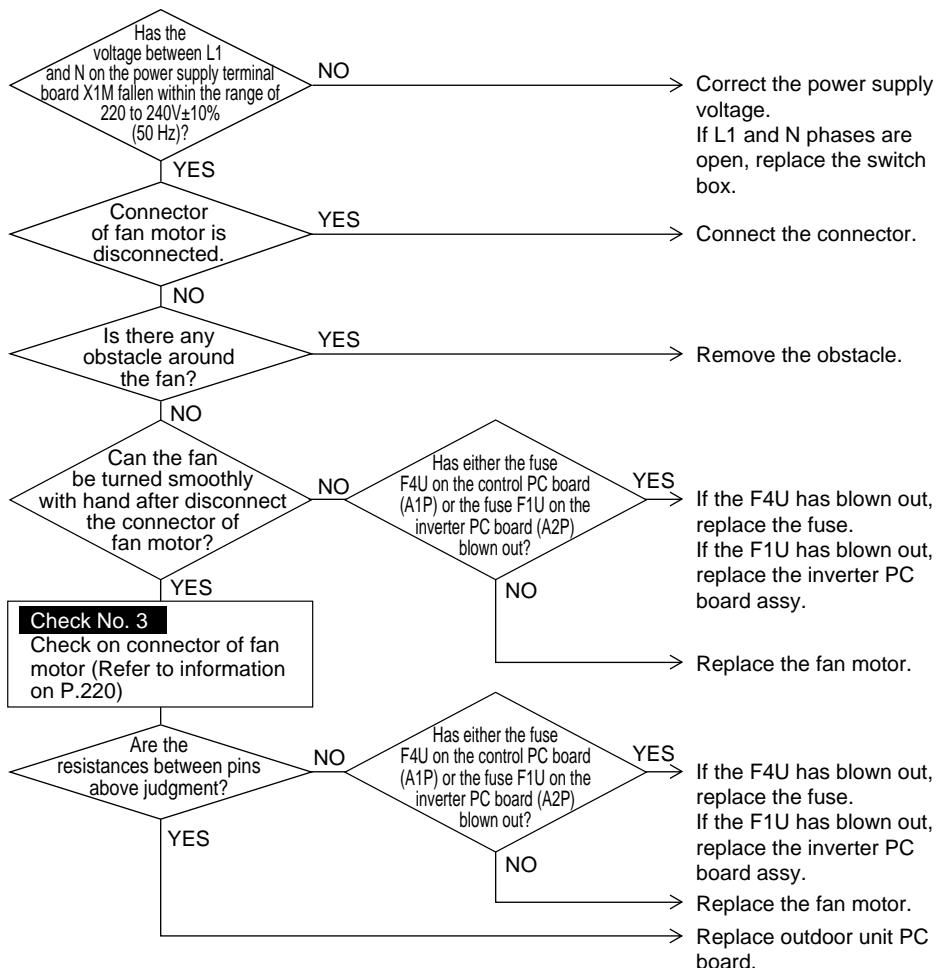
- Malfunction of fan motor
- The harness connector between fan motor and PC board is left in disconnected, or faulty connector
- Fan does not run due to foreign matters tangled
- Clearing condition: Operate for 5 minutes (normal)
- Open phase L1 or open phase N.

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3.23 “E9” Outdoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y3E)

Remote
Controller
Display

E9

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Check disconnection of connector
Check continuity of expansion valve coil

Malfunction
Decision
Conditions

Error is generated under no common power supply when the power is on.

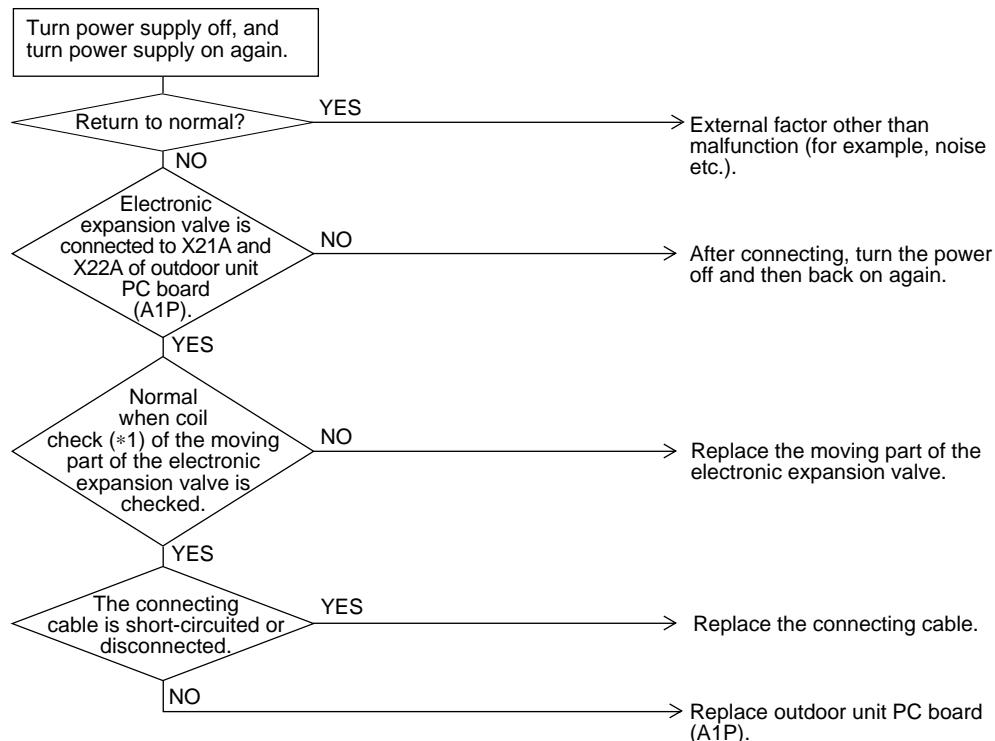
Supposed
Causes

- Defect of moving part of electronic expansion valve
- Defect of outdoor unit PC board (A1P)
- Defect of connecting cable

Troubleshooting

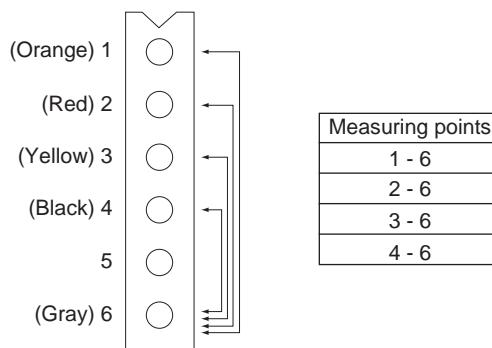
**Caution**

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3067)

*Make measurement of resistance between the connector pins, and then make sure the resistance falls in the range of 40 to 50Ω.



(V3067)

3.24 “F3” Outdoor Unit: Abnormal Discharge Pipe Temperature

Remote Controller Display

F3

Applicable Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of Malfunction Detection

Abnormality is detected according to the temperature detected by the discharge pipe temperature sensor.

Malfunction Decision Conditions

When the discharge pipe temperature rises to an abnormally high level
When the discharge pipe temperature rises suddenly

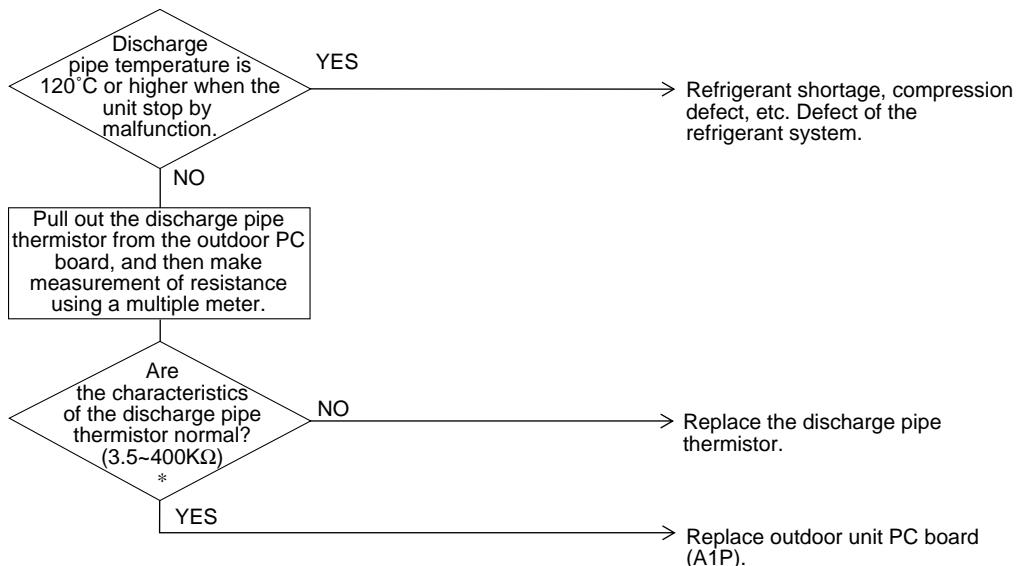
Supposed Causes

- Faulty discharge pipe temperature sensor
- Faulty connection of discharge pipe temperature sensor
- Faulty outdoor unit PC board

Troubleshooting



Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3068)



* Refer to “Thermistor Resistance / Temperature Characteristics” table on P252.

3.25 “F6” Outdoor Unit: Refrigerant Overcharged

Remote
Controller
Display

F6

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Excessive charging of refrigerant is detected by using the heat exchanging deicer temperature during a check operation.

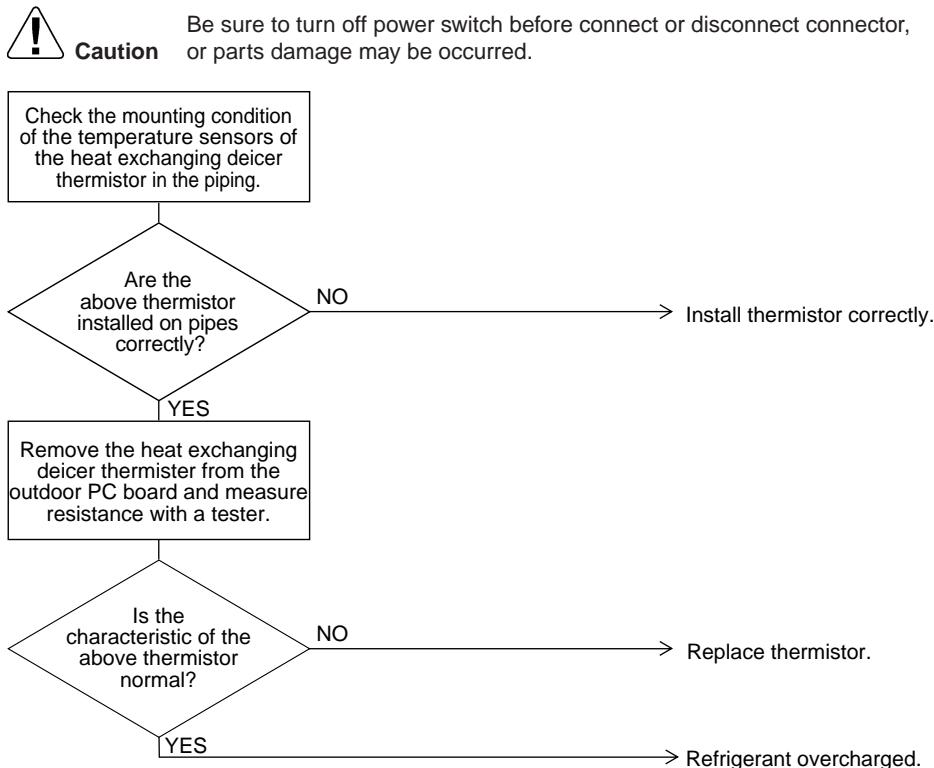
Malfunction
Decision
Conditions

When the amount of refrigerant, which is calculated by using the heat exchanging deicer temperature during a check run, exceeds the standard.

Supposed
Causes

- Refrigerant overcharge
- Misalignment of the thermistor for heat exchanger
- Defect of the thermistor for heat exchanger

Troubleshooting



(V2797)



* Refer to “Thermistor Resistance / Temperature Characteristics” table on P251.

3.26 "H3" Outdoor Unit: Malfunction of Thermistor (R1T) for Outdoor Air

Remote
Controller
Display

H3

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected from the temperature detected by the outdoor air thermistor.

Malfunction
Decision
Conditions

When the outside air temperature thermistor has short circuit or open circuit.

Supposed
Causes

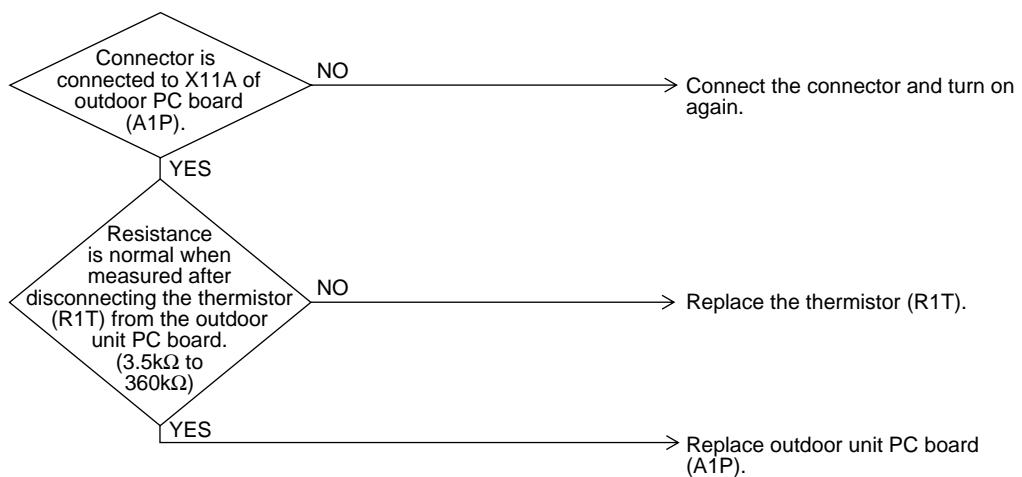
- Defect of thermistor (R1T) for outdoor air
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3070)



* Refer to "Thermistor Resistance / Temperature Characteristics" table on P251.

3.27 "U3" Outdoor Unit: Malfunction of Discharge Pipe Thermistor (R2T)

Remote
Controller
Display

U3

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected from the temperature detected by discharge pipe temperature thermistor.

Malfunction
Decision
Conditions

When a short circuit or an open circuit in the discharge pipe temperature thermistor is detected.

Supposed
Causes

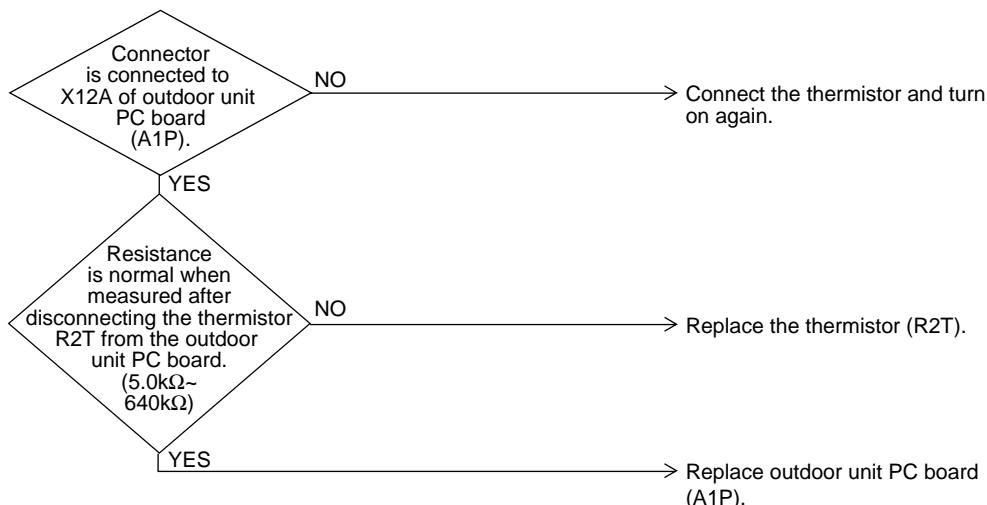
- Defect of thermistor (R2T) for outdoor unit discharge pipe
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3072)



* Refer to thermistor resistance / temperature characteristics table on P252.

3.28 “U5” Outdoor Unit: Malfunction of Thermistor (R3T, R5T) for Suction Pipe 1, 2

Remote
Controller
Display

U5

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected from the temperature detected by the thermistor for suction pipe 1, 2.

Malfunction
Decision
Conditions

When a short circuit or an open circuit in the thermistor for suction pipe 1, 2 are detected.

Supposed
Causes

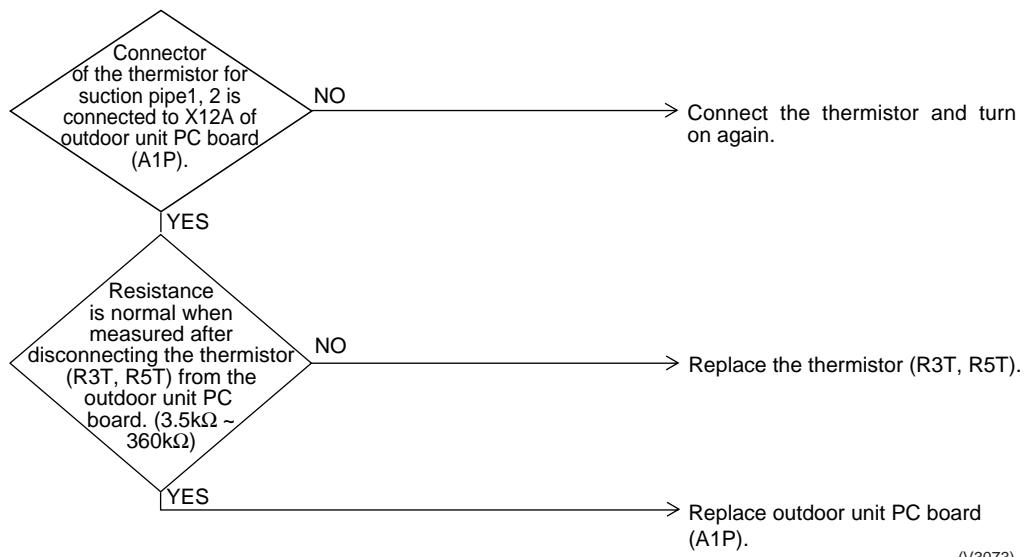
- Defect of thermistor (R3T, R5T) for outdoor unit suction pipe
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3073)



* Refer to thermistor resistance / temperature characteristics table on P251.

3.29 “U5” Outdoor Unit: Malfunction of Thermistor (R6T)

Remote
Controller
Display



Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected from the temperature detected by the heat exchanger thermistor.

Malfunction
Decision
Conditions

When a short circuit or an open circuit in the heat exchange thermistor is detected.

Supposed
Causes

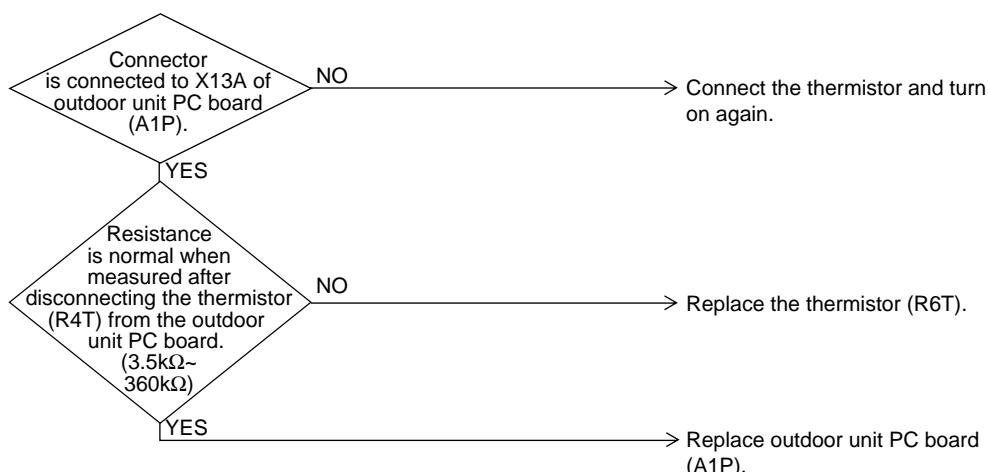
- Defect of thermistor (R6T) for outdoor unit heat exchanger
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3074)



* Refer to thermistor resistance / temperature characteristics table on P251.

3.30 “U” Outdoor Unit: Malfunction of Thermistor (R7T) for Outdoor Unit Liquid Pipe

Remote
Controller
Display



Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected from the temperature detected by the liquid pipe thermistor.

Malfunction
Decision
Conditions

When a short circuit or an open circuit in the heat exchange thermistor is detected.

Supposed
Causes

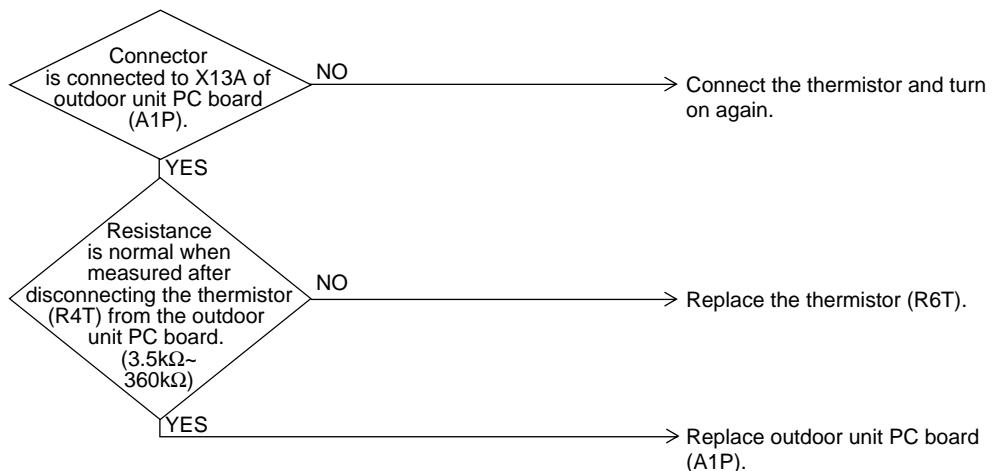
- Defect of thermistor (R7T) for outdoor unit liquid pipe
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3074)



* Refer to thermistor resistance / temperature characteristics table on P251.

3.31 "U3" Outdoor Unit: Malfunction of Thermistor (R4T)

Remote
Controller
Display

U3

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected according to the temperature detected by subcooling heat exchanger gas pipe thermistor.

Malfunction
Decision
Conditions

When the subcooling heat exchanger gas pipe thermistor is short circuited or open.

Supposed
Causes

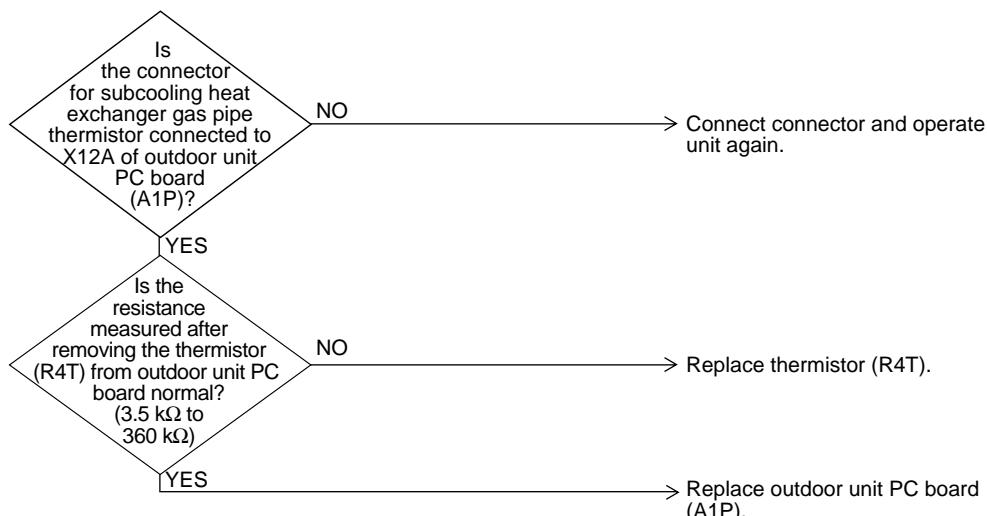
- Faulty subcooling heat exchanger gas pipe thermistor (R4T)
- Faulty outdoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3075)



* Refer to "Thermistor Resistance / Temperature Characteristics" table on P251.

3.32 "UR" Outdoor Unit: Malfunction of High Pressure Sensor

**Remote
Controller
Display**



**Applicable
Models**

U-4..6ML5DPQ, U-4..6ML5XPQ

**Method of
Malfunction
Detection**

Malfunction is detected from the pressure detected by the high pressure sensor.

**Malfunction
Decision
Conditions**

When the high pressure sensor is short circuit or open circuit.

**Supposed
Causes**

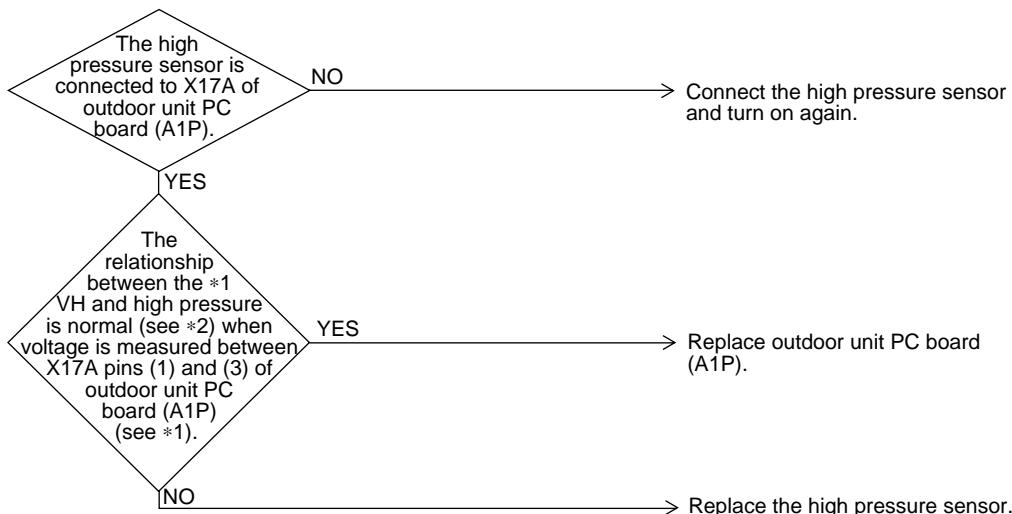
- Defect of high pressure sensor
- Connection of low pressure sensor with wrong connection.
- Defect of outdoor unit PC board.

Troubleshooting



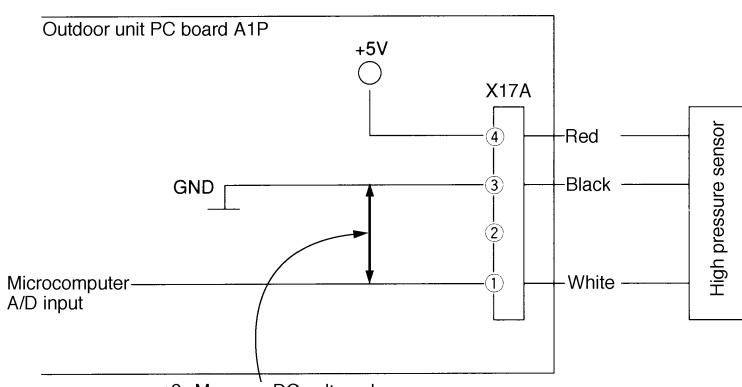
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1: Voltage measurement point

(V2806)



(V2807)



*2: Refer to "Pressure Sensor", pressure / voltage characteristics table on P253.

3.33 "UL" Outdoor Unit: Malfunction of Low Pressure Sensor

Remote
Controller
Display



Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected from pressure detected by low pressure sensor.

Malfunction
Decision
Conditions

When the low pressure sensor is short circuit or open circuit.

Supposed
Causes

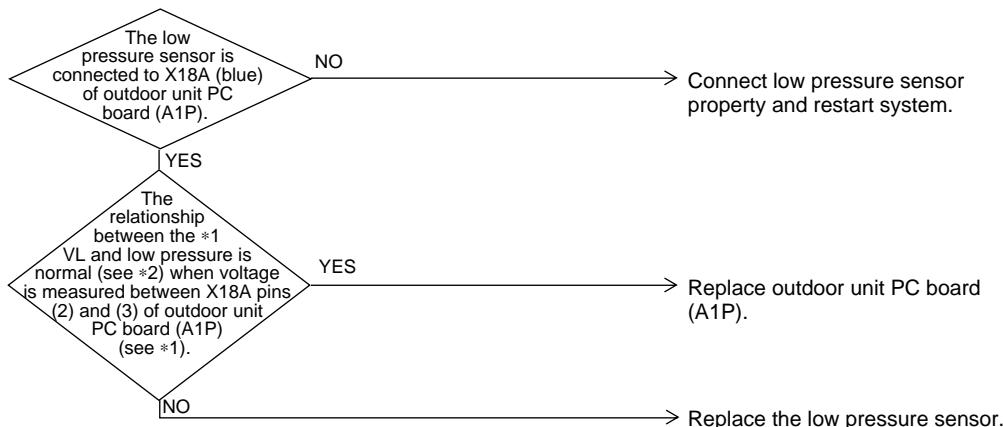
- Defect of low pressure sensor
- Connection of high pressure sensor with wrong connection.
- Defect of outdoor unit PC board.

Troubleshooting



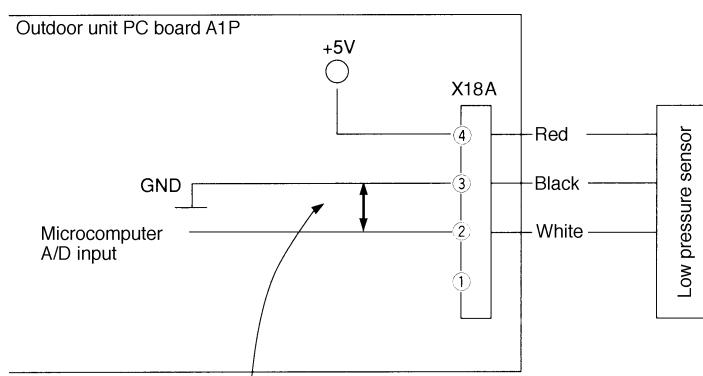
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1: Voltage measurement point

(V2808)



*2 Measure voltage here.

(V2809)



*2: Refer to "Pressure Sensor", pressure/voltage characteristics table on P253.

3.34 “L /” Outdoor Unit: Malfunction of PC Board

**Remote
Controller
Display**

L /

**Applicable
Models**

U-4..6ML5DPQ, U-4..6ML5XPQ

**Method of
Malfunction
Detection**

- Detect malfunctions by current value during waveform output before compressor startup.
- Detect malfunctions by current sensor value during synchronized operation at the time of startup.

**Malfunction
Decision
Conditions**

- In case of overcurrent (OCP) during waveform output
- When the current sensor malfunctions during synchronized operation
- In case of IGBT malfunction

**Supposed
Causes**

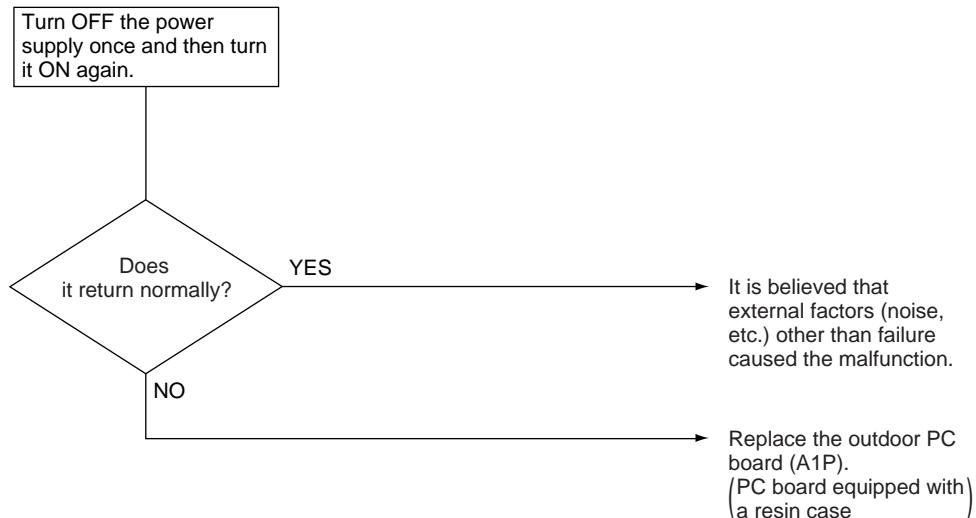
- Faulty outdoor PC board (A1P)
 - IPM failure
 - Current sensor failure
 - Failure of IGBT or drive circuit

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3.35 "L4" Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise

Remote Controller Display

L4

Applicable Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of Malfunction Detection

Fin temperature is detected by the thermistor of the radiation fin.

Malfunction Decision Conditions

When the temperature of the inverter radiation fin increases above 83°C.

Supposed Causes

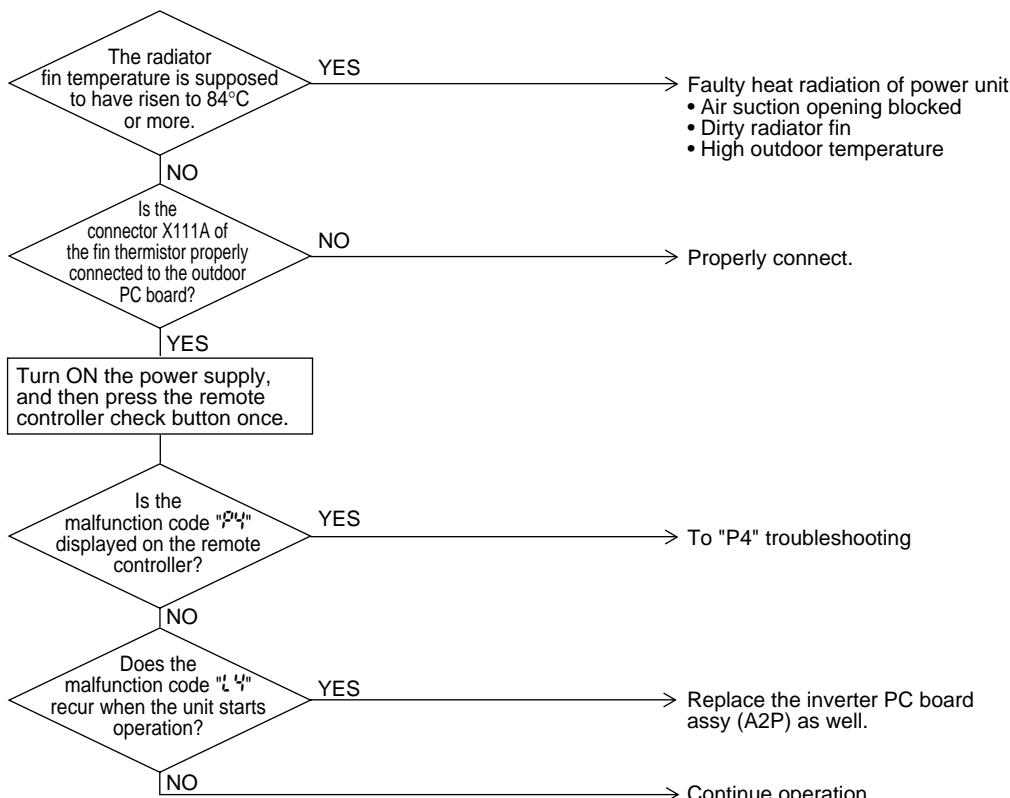
- Actuation of fin thermal (Actuates above 83°C)
- Defect of inverter PC board (A2P)
- Defect of fin thermistor

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3.36 "LS" Outdoor Unit: Inverter Compressor Abnormal

Remote
Controller
Display

LS

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected from current flowing in the power transistor.

Malfunction
Decision
Conditions

When an excessive current flows in the power transistor.
(Instantaneous overcurrent also causes activation.)

Supposed
Causes

- Defect of compressor coil (disconnected, defective insulation)
- Compressor start-up malfunction (mechanical lock)
- Defect of inverter PC board (A2P)

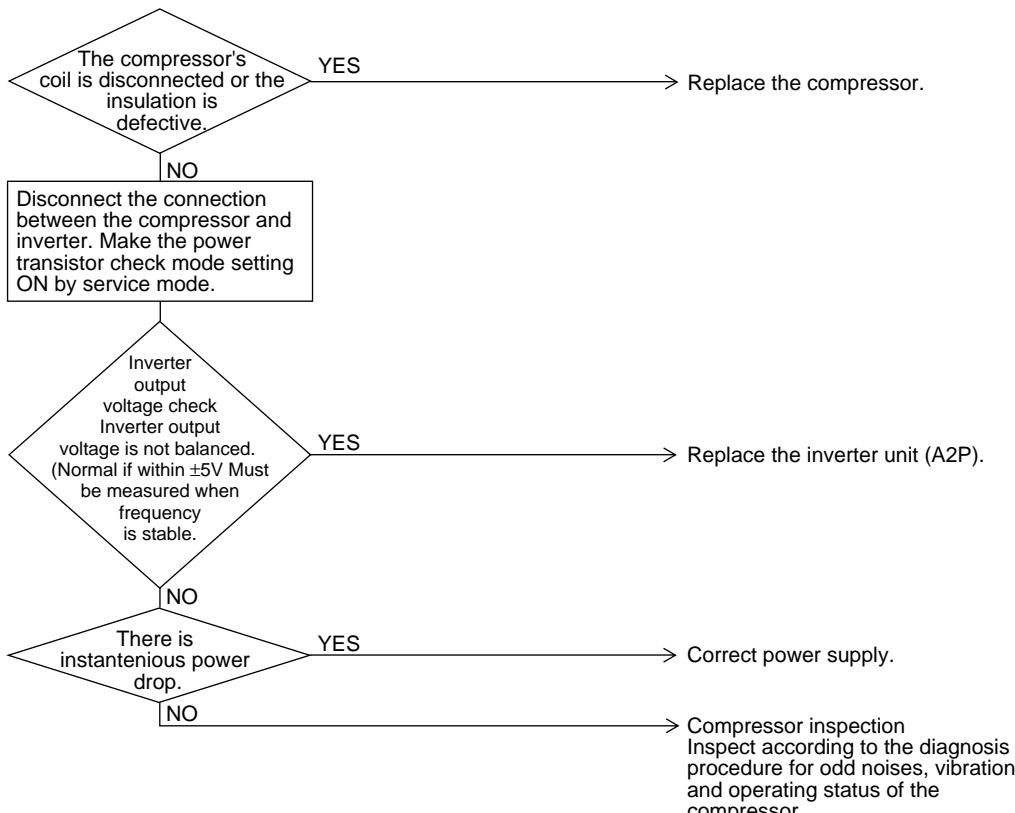
Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Compressor inspection



(V2812)

Higher voltage than actual is displayed when the inverter output voltage is checked by tester.

3.37 "L8" Outdoor Unit: Inverter Current Abnormal

Remote
Controller
Display

L8

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Malfunction is detected by current flowing in the power transistor.

Malfunction
Decision
Conditions

When overload in the compressor is detected.

Supposed
Causes

- Compressor overload
- Compressor coil disconnected
- Defect of outdoor unit PC board (A2P)

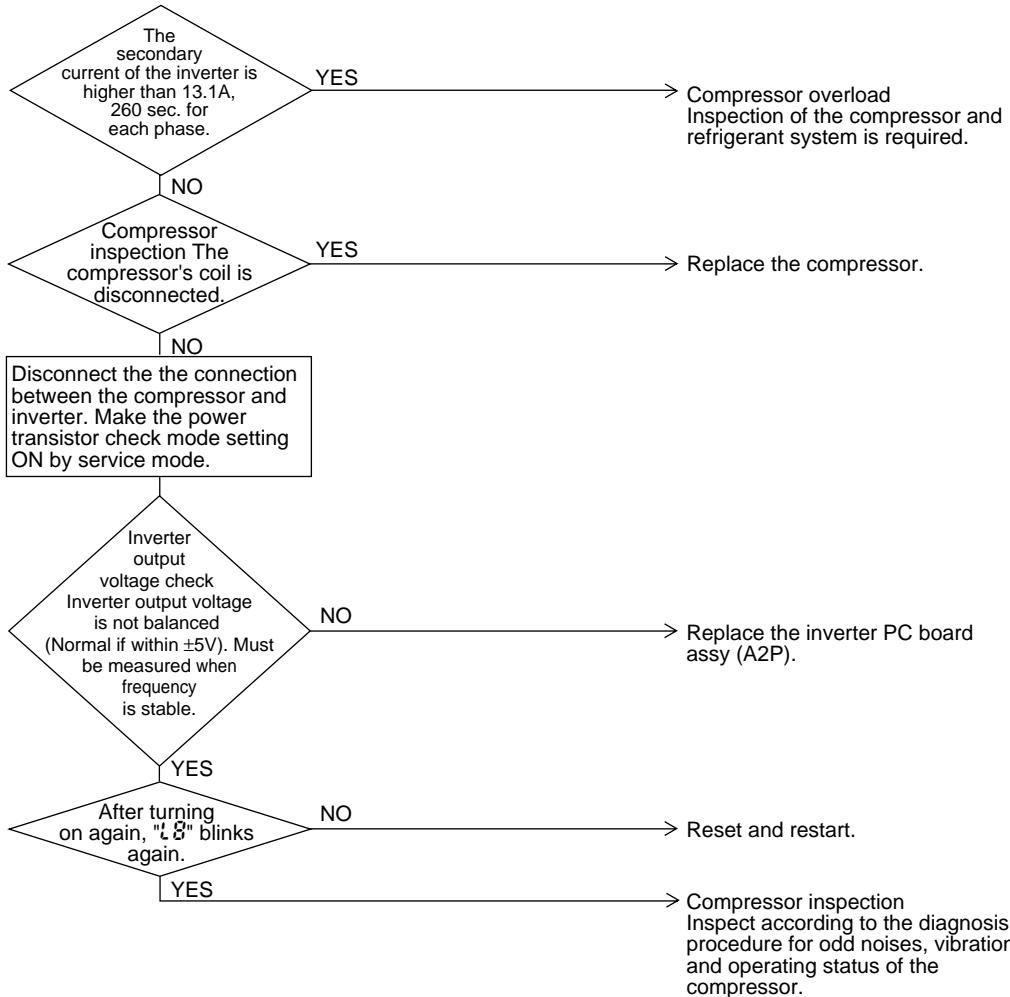
Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Output current check



(V3184)

3.38 "L9" Outdoor Unit: Inverter Start up Error

**Remote
Controller
Display**

L9

**Applicable
Models**

U-4..6ML5DPQ, U-4..6ML5XPQ

**Method of
Malfunction
Detection**

Malfunction is detected from current flowing in the power transistor.

**Malfunction
Decision
Conditions**

When overload in the compressor is detected during startup

**Supposed
Causes**

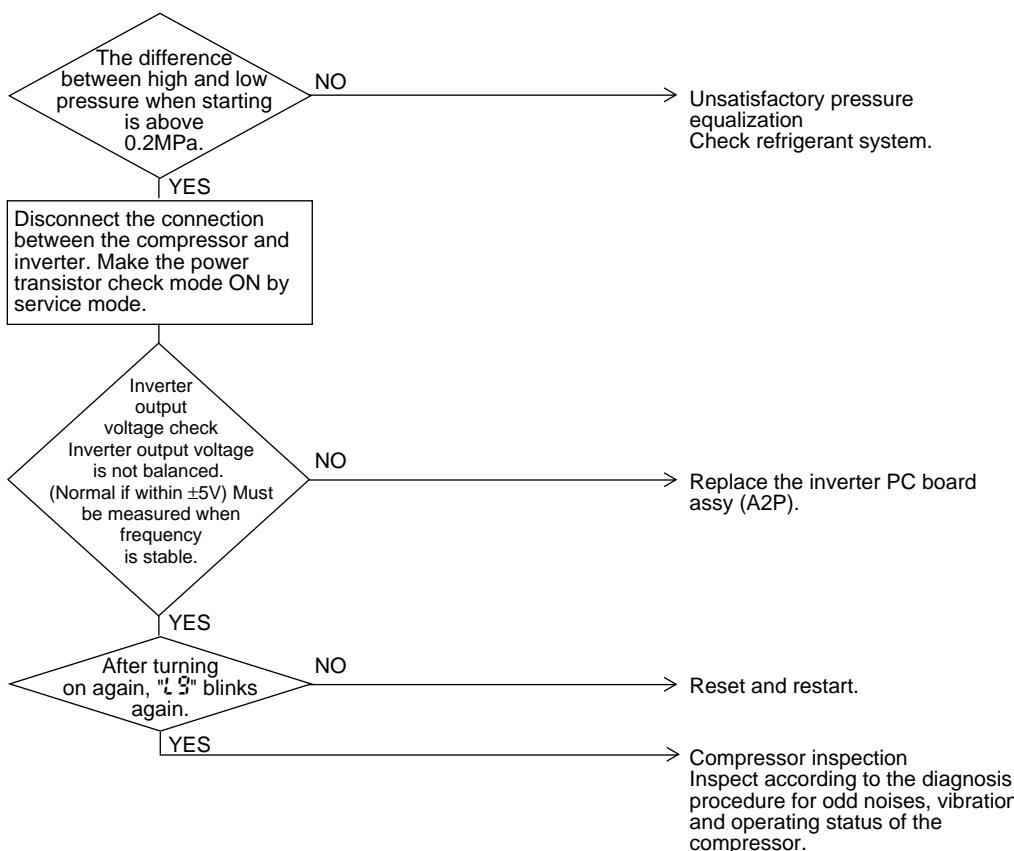
- Defect of compressor
- Pressure differential start
- Defect of outdoor unit PC board (A2P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2814)

3.39 "LC" Outdoor Unit: Malfunction of Transmission between Inverter and Control PC Board

**Remote
Controller
Display**

LC

**Applicable
Models**

U-4..6ML5DPQ, U-4..6ML5XPQ

**Method of
Malfunction
Detection**

Check the communication state between inverter PC board and control PC board by micro-computer.

**Malfunction
Decision
Conditions**

When the correct communication is not conducted in certain period.

**Supposed
Causes**

- Malfunction of connection between the inverter microcomputer and outdoor control microcomputer
- Defect of outdoor unit PC board (A1P)
- External factor (Noise etc.)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

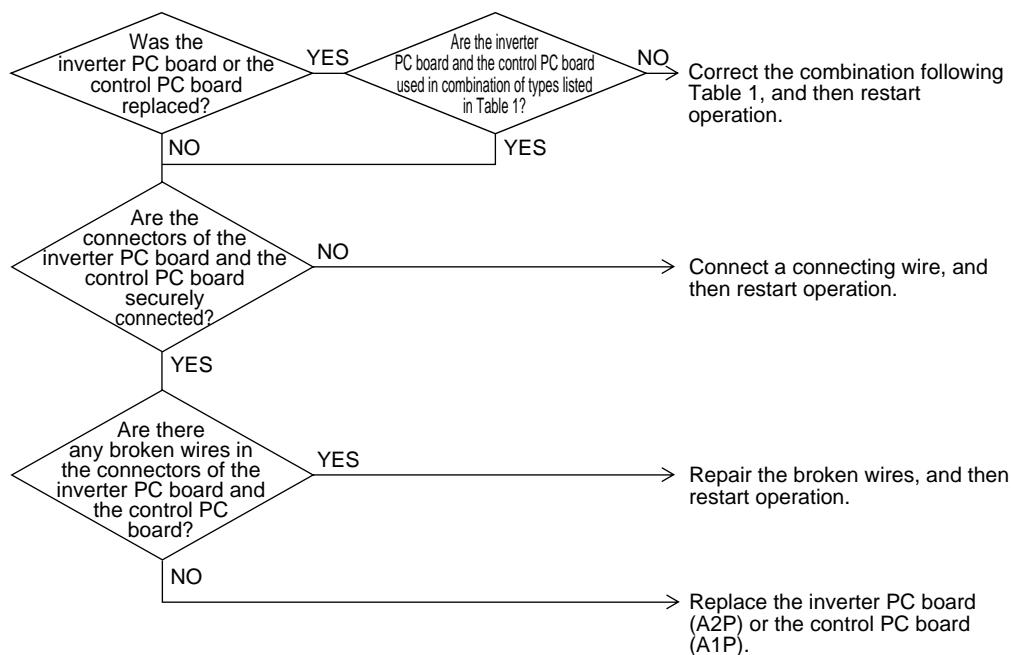


Table 1: Combination of PC boards

| | Type of control PC board | Type of inverter PC board |
|-------------------------------------|--------------------------|---------------------------|
| U-4ML5XPQ U-5ML5XPQ U-6ML5XPQ | EC0640-1 | PC0625-1 |

3.40 “P1” Outdoor Unit: High Voltage of Capacitor in Main Inverter Circuit

Remote Controller Display

P1

Applicable Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of Malfunction Detection

Malfunction is detected according to the voltage waveform of main circuit capacitor built in the inverter.

Malfunction Decision Conditions

When the aforementioned voltage waveform becomes identical with the waveform of the power supply open phase.

Supposed Causes

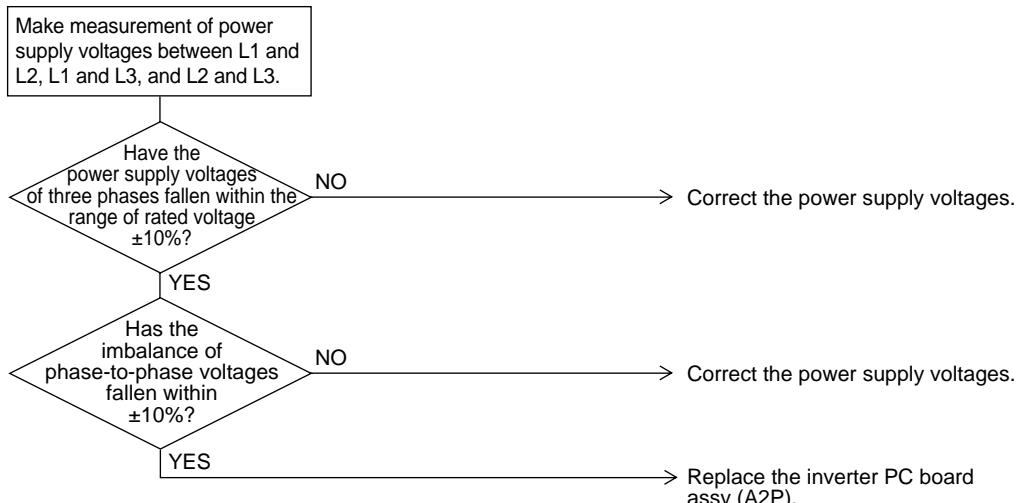
- Defect of main circuit capacitor
- Improper main circuit wiring
- Defect of outdoor unit PC board (A2P)
- Imbalance of phase-to-phase voltages
- Open phase

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3.41 "U0" Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure

Remote
Controller
Display

U0

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Short of gas malfunction is detected by discharge pipe temperature thermistor and low pressure saturation temperature.

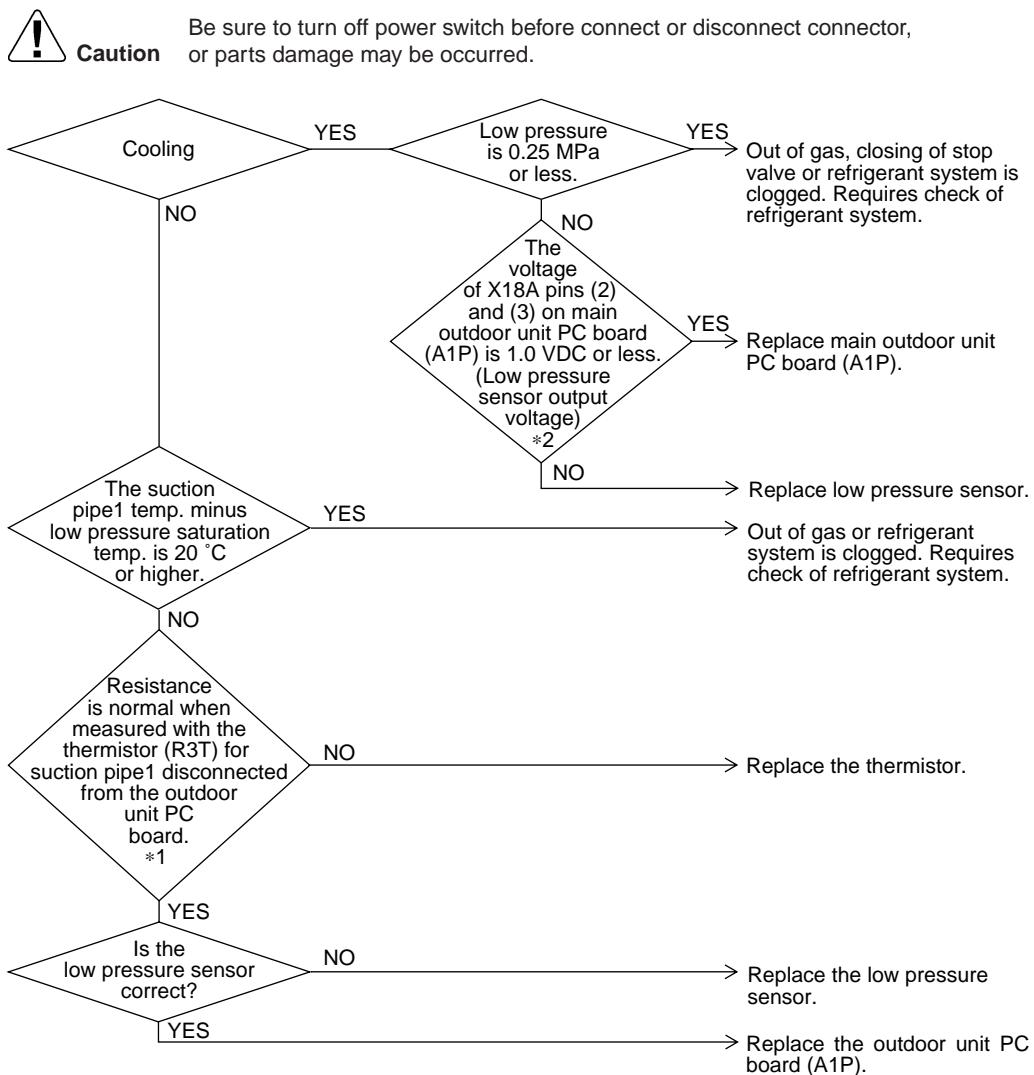
Malfunction
Decision
Conditions

Microcomputer judge and detect if the system is short of refrigerant.
★Malfunction is not decided while the unit operation is continued.

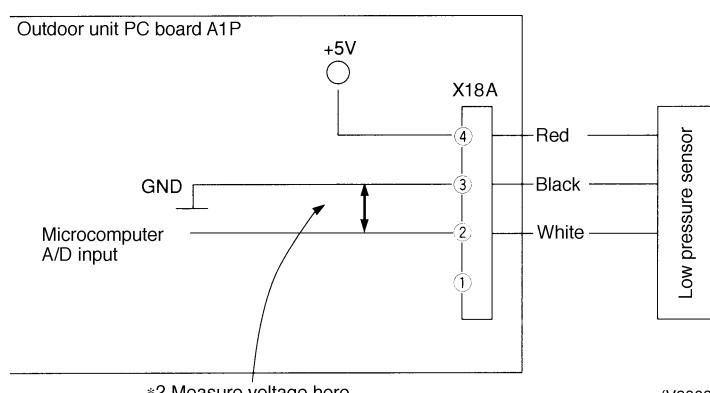
Supposed
Causes

- Out of gas or refrigerant system clogging (incorrect piping)
- Defect of pressure sensor
- Defect of outdoor unit PC board (A1P)
- Defect of thermistor R3T

Troubleshooting



*2: Voltage measurement point



(V2809)



*1: Refer to "Thermistor Resistance / Temperature Characteristics" table on P251.
 *2: Refer to "Pressure Sensor, Pressure / Voltage Characteristics" table on P253.

3.42 "U2" Power Supply Insufficient or Instantaneous Failure

Remote
Controller
Display

U2

Applicable
Models

U-4..6ML5DPQ, U-4..6ML5XPQ

Method of
Malfunction
Detection

Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.

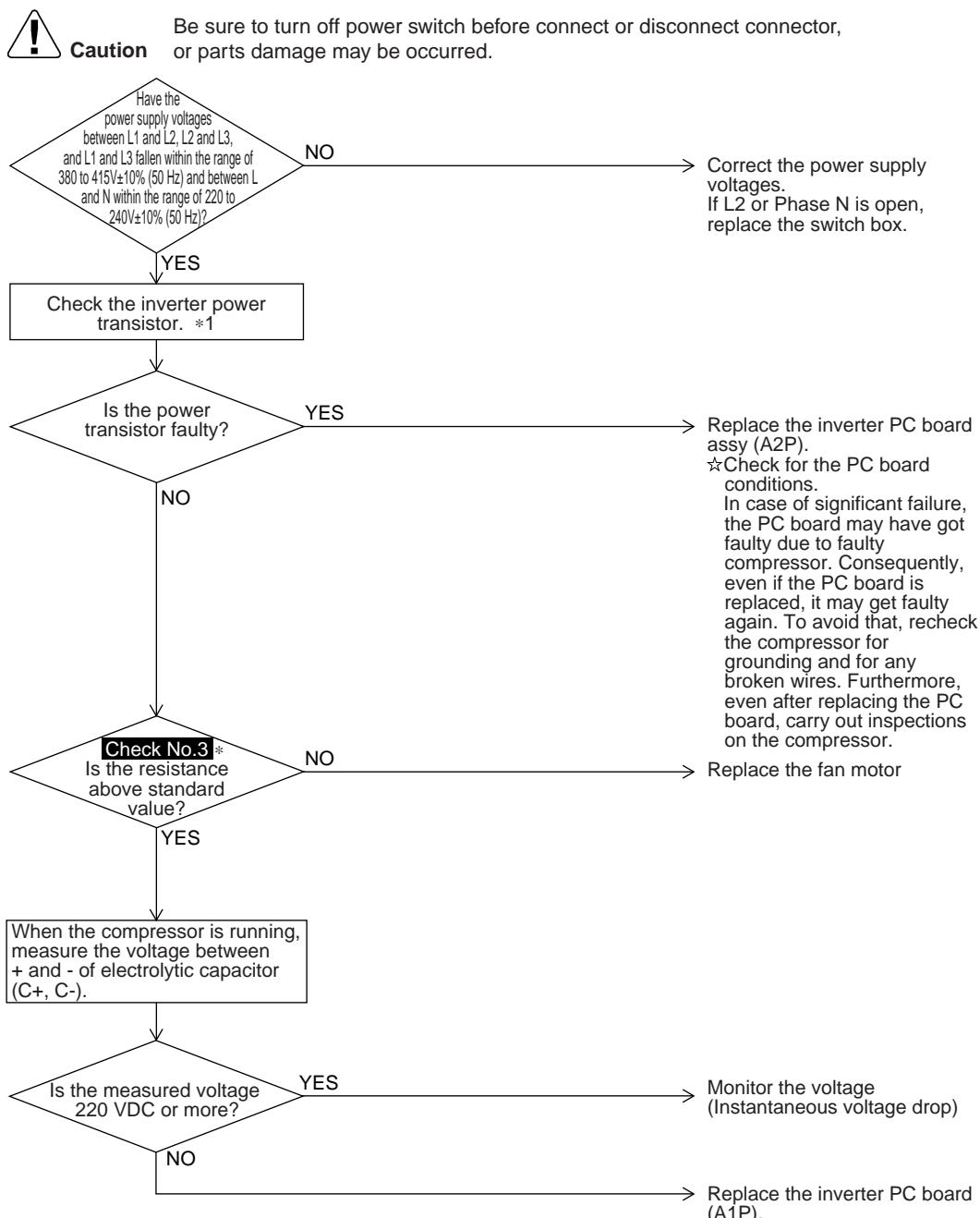
Malfunction
Decision
Conditions

When the abnormal voltage of main circuit capacitor built in the inverter and abnormal power supply voltage are detected.

Supposed
Causes

- Power supply insufficient
- Instantaneous power failure
- Defect of outdoor unit fan motor
- Defect of outdoor inverter PC board (A2P)

Troubleshooting



(S2605)



*1: Inverter's Power Transistors Check : Refer to information on P.254~256.

*Check No.3 : Refer to information on P.220.

3.43 "U3" Check Operation not Executed

**Remote
Controller
Display**

U3

**Applicable
Models**

U-4..6ML5DPQ, U-4..6ML5XPQ

**Method of
Malfunction
Detection**

Check operation is executed or not

**Malfunction
Decision
Conditions**

Malfunction is decided when the unit starts operation without check operation.

**Supposed
Causes**

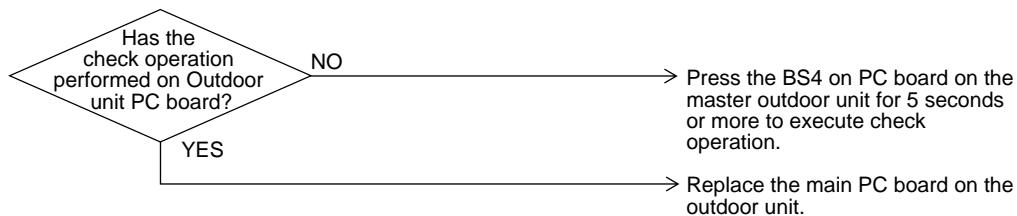
- Check operation is not executed.

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



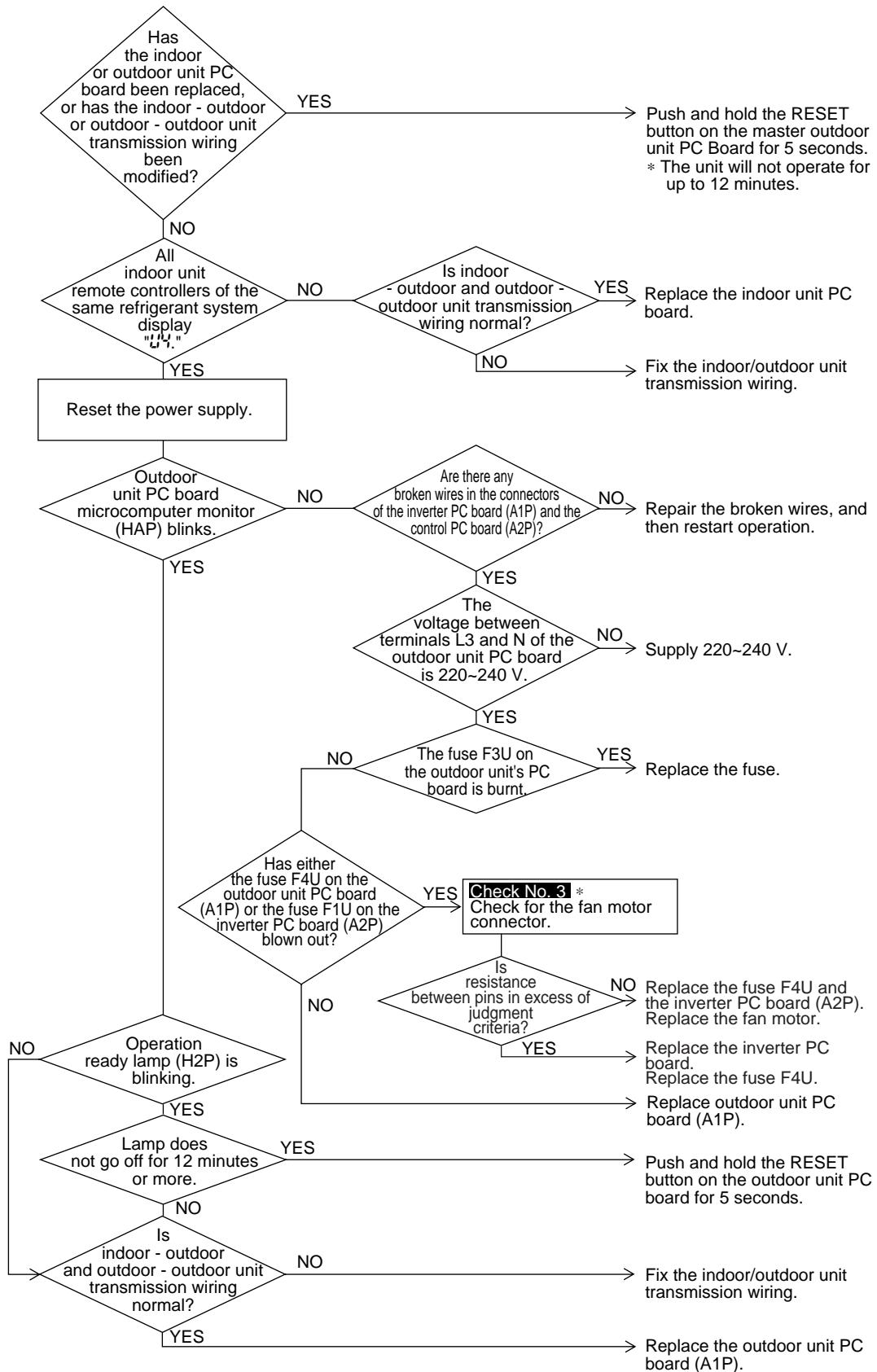
(V3052)

3.44 “U4” Malfunction of Transmission between Indoor Units and Outdoor Units

| | |
|---------------------------------|--|
| Remote Controller Display |  |
| Applicable Models | All indoor unit models U-4..6ML5DPQ, U-4..6ML5XPQ |
| Method of Malfunction Detection | Microcomputer checks if transmission between indoor and outdoor units is normal. |
| Malfunction Decision Conditions | When transmission is not carried out normally for a certain amount of time |
| Supposed Causes | <ul style="list-style-type: none">■ Indoor to outdoor, outdoor to outdoor transmission wiring F1, F2 disconnection, short circuit or wrong wiring■ Outdoor unit power supply is OFF■ System address doesn't match■ Defect of outdoor unit PC board■ Defect of indoor unit PC board |

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3187)



* Check No.3 : Refer to information on P.220.

3.45 "US" Malfunction of Transmission between Remote Controller and Indoor Unit

Remote Controller Display

US

Applicable Models

All indoor unit models

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer is signal transmission between indoor unit and remote controller (main and sub) is normal.

Malfunction Decision Conditions

Normal transmission does not continue for specified period.

Supposed Causes

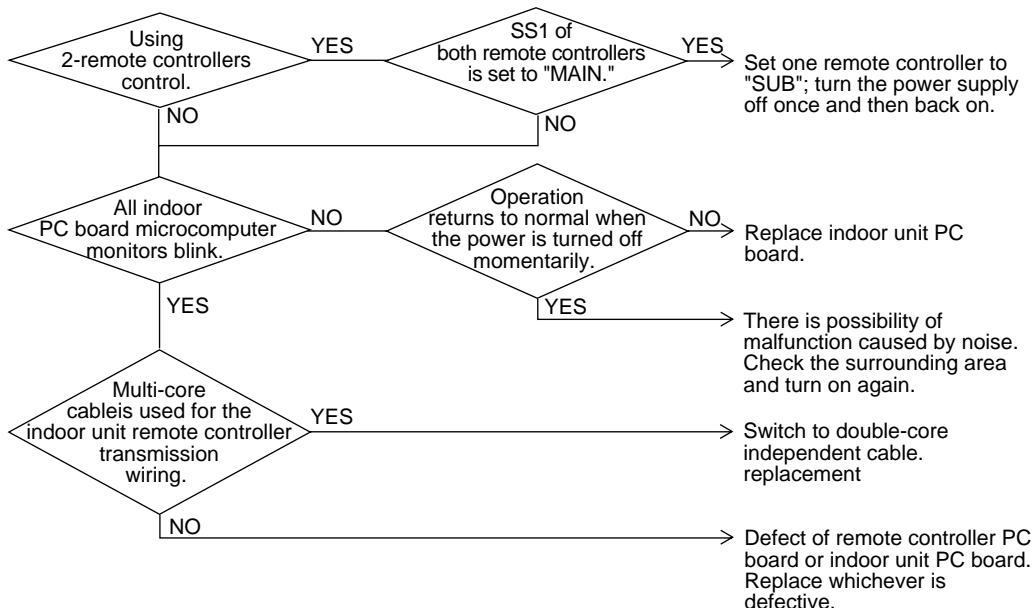
- Malfunction of indoor unit remote controller transmission
- Connection of two main remote controllers (when using 2 remote controllers)
- Defect of indoor unit PC board
- Defect of remote controller PC board
- Malfunction of transmission caused by noise

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2823)

3.46 "U8" Malfunction of Transmission between Main and Sub Remote Controllers

Remote Controller Display

U8

Applicable Models

All indoor unit models

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer if signal transmission between indoor unit and remote controller (main and sub) is normal.

Malfunction Decision Conditions

Normal transmission does not continue for specified period.

Supposed Causes

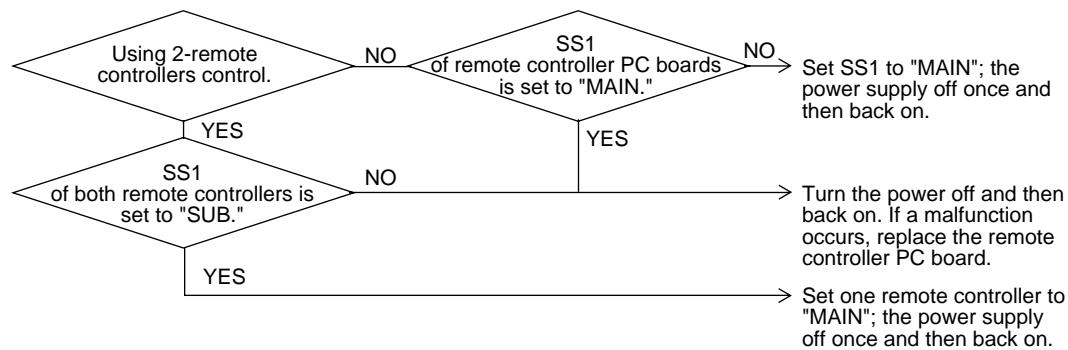
- Malfunction of transmission between main and sub remote controller
- Connection between sub remote controllers
- Defect of remote controller PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

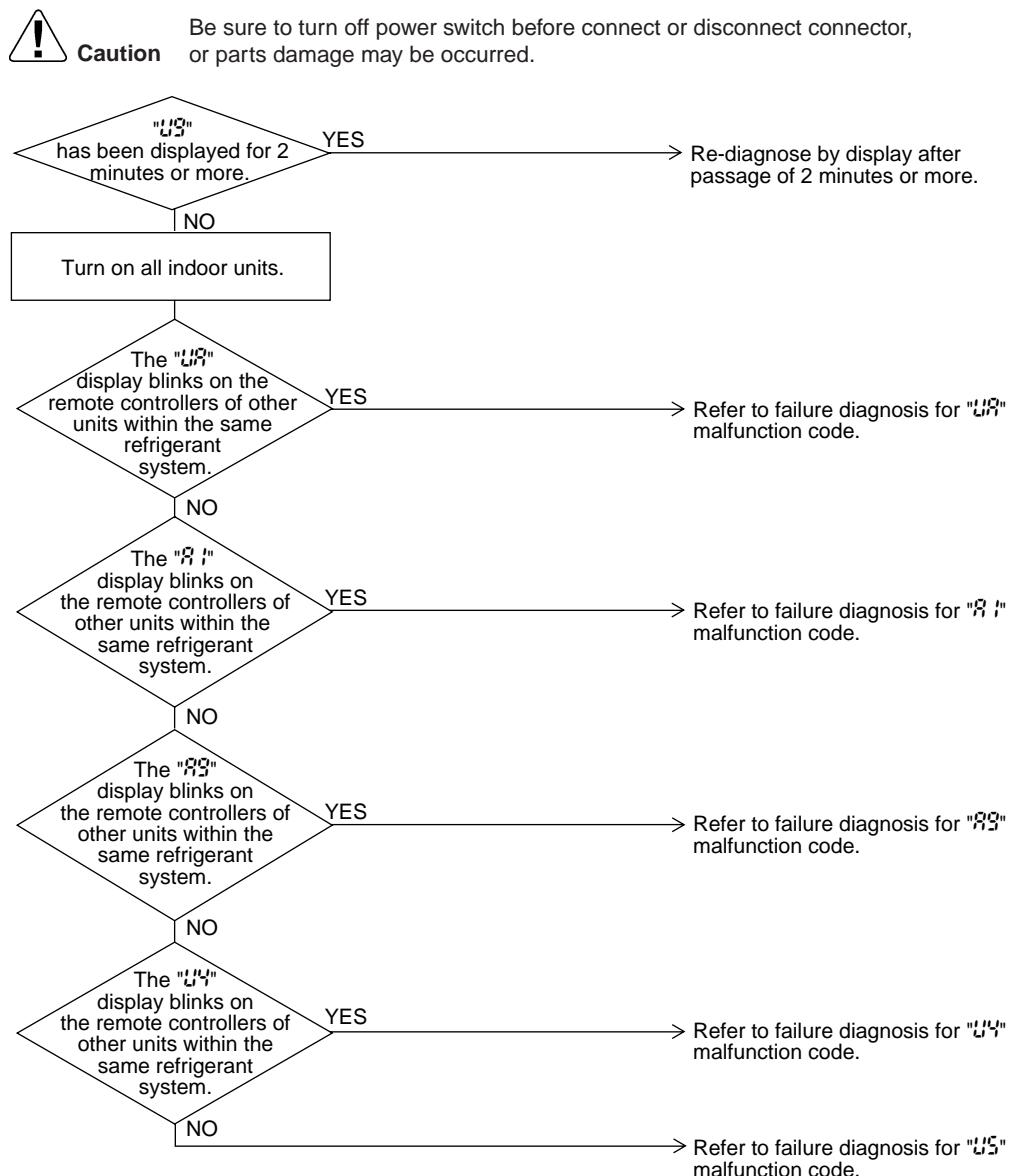


(V2825)

3.47 “U9” Malfunction of Transmission between Indoor and Outdoor Units in the Same System

| | |
|---------------------------------|---|
| Remote Controller Display | U9 |
| Applicable Models | All indoor unit models |
| Method of Malfunction Detection | |
| Malfunction Decision Conditions | |
| Supposed Causes | <ul style="list-style-type: none">■ Malfunction of transmission within or outside of other system■ Malfunction of electronic expansion valve in indoor unit of other system■ Defect of PC board of indoor unit in other system■ Improper connection of transmission wiring between indoor and outdoor unit |

Troubleshooting



(V2826)

3.48 "UR" Excessive Number of Indoor Units

**Remote
Controller
Display**

UR

**Applicable
Models**

All indoor unit models

**Method of
Malfunction
Detection**

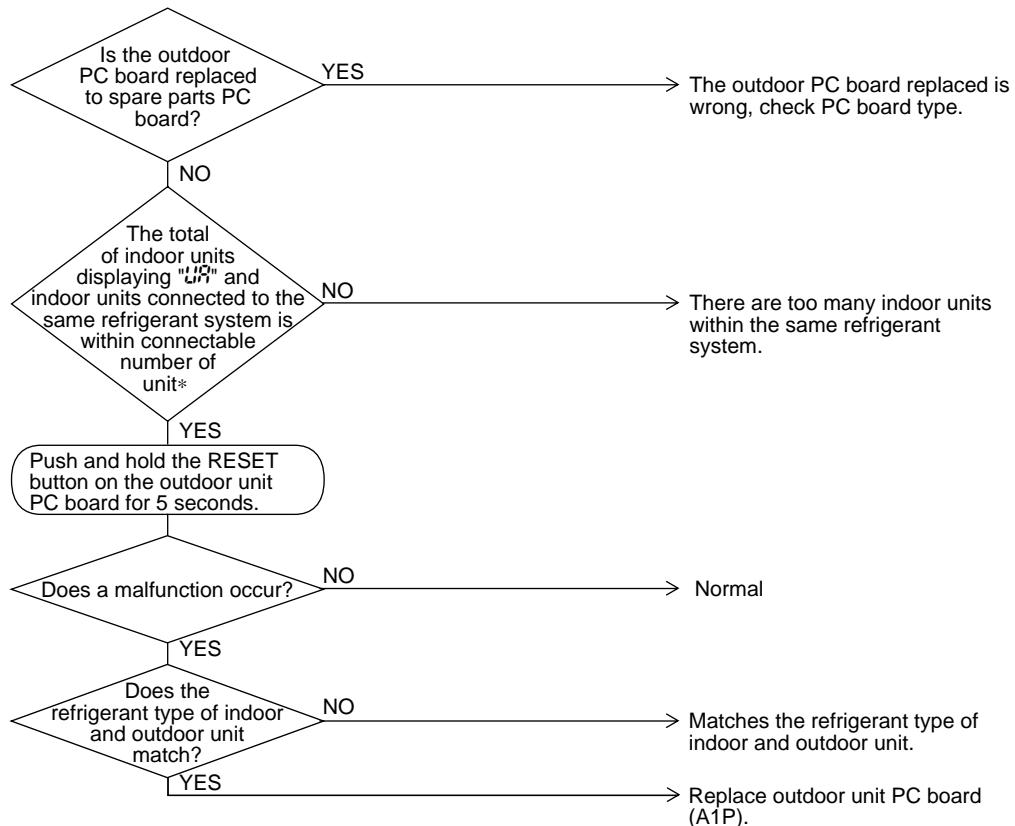
**Malfunction
Decision
Conditions**

**Supposed
Causes**

- Excess of connected indoor units
- Defect of outdoor unit PC board (A1P)
- Mismatching of the refrigerant type of indoor and outdoor unit.
- Setting of outdoor PC board was not conducted after replacing to spare parts PC board.

Troubleshooting

 **Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3169)

* The number of indoor units that can be connected to a single outdoor unit system depends on the type of outdoor unit.

3.49 "UL" Address Duplication of Central Remote Controller

Remote
Controller
Display



Applicable
Models

All indoor unit models

Method of
Malfunction
Detection

Malfunction
Decision
Conditions

Supposed
Causes

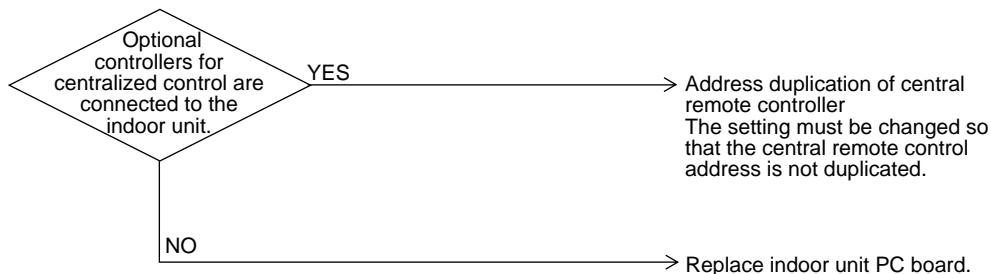
- Address duplication of centralized remote controller
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

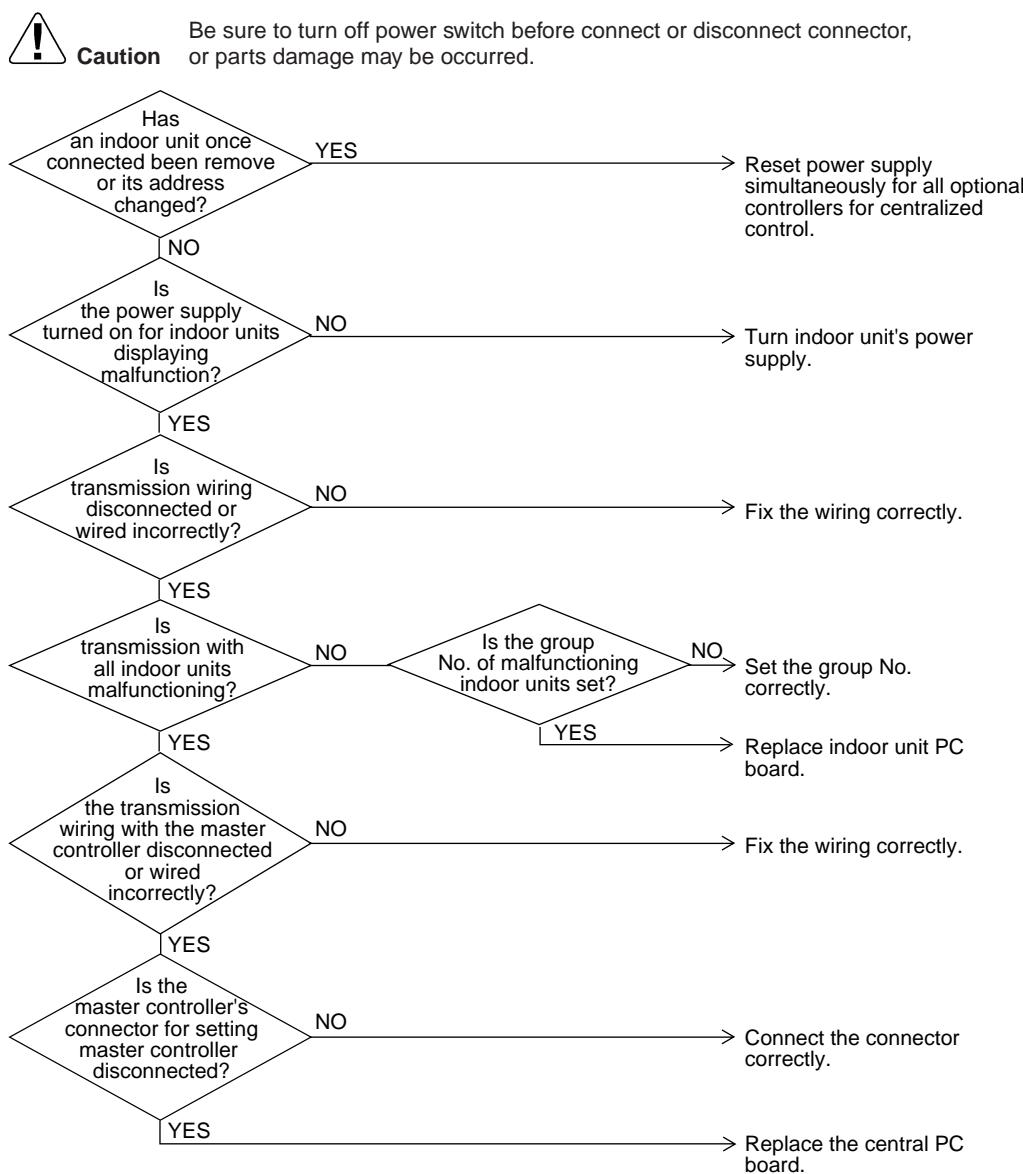


(V2828)

3.50 “UE” Malfunction of Transmission between Central Remote Controller and Indoor Unit

| | |
|---------------------------------|--|
| Remote Controller Display | UE |
| Applicable Models | All indoor unit models Centralized controller |
| Method of Malfunction Detection | Microcomputer checks if transmission between indoor unit and centralized remote controller is normal. |
| Malfunction Decision Conditions | When transmission is not carried out normally for a certain amount of time |
| Supposed Causes | <ul style="list-style-type: none">■ Malfunction of transmission between optional controllers for centralized control and indoor unit■ Connector for setting master controller is disconnected.■ Failure of PC board for centralized remote controller■ Defect of indoor unit PC board |

Troubleshooting



(V2829)

3.51 “UF” System is not Set yet

**Remote
Controller
Display**

UF

**Applicable
Models**

All models of indoor units
U-4..6ML5DPQ, U-4..6ML5XPQ

**Method of
Malfunction
Detection**

On check operation, the number of indoor units in terms of transmission is not corresponding to that of indoor units that have made changes in temperature.

**Malfunction
Decision
Conditions**

The malfunction is determined as soon as the abnormality aforementioned is detected through checking the system for any erroneous connection of units on the check operation.

**Supposed
Causes**

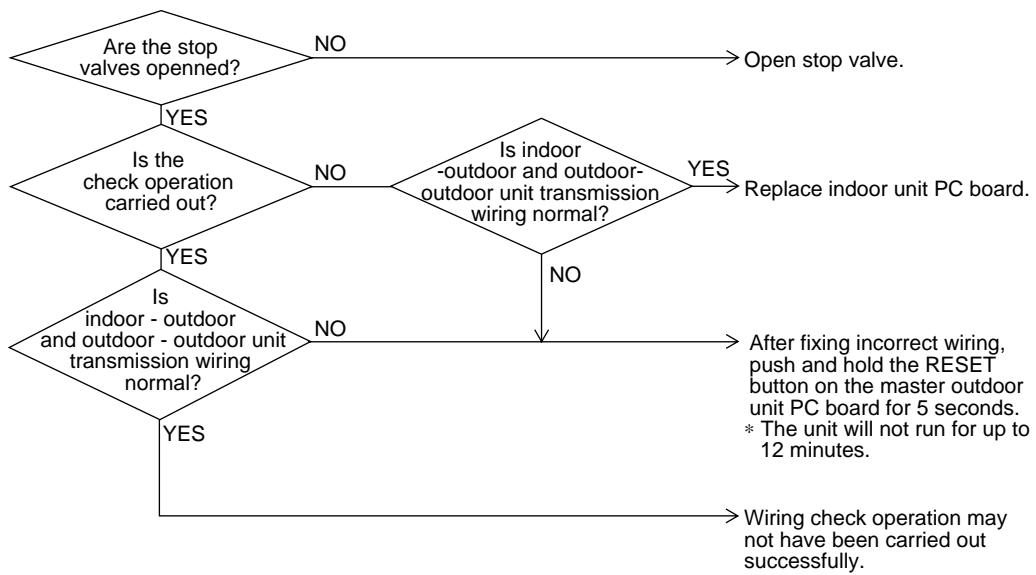
- Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units
- Failure to execute check operation
- Defect of indoor unit PC board
- Stop valve is left in closed

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2830)



Note: Wiring check operation may not be successful if carried out after the outdoor unit has been off for more than 12 hours, or if it is not carried out after running all connected indoor units in the fan mode for at least an hour.

3.52 "UH" Malfunction of System, Refrigerant System Address Undefined

Remote Controller Display

UH

Applicable Models

All indoor unit models
U-4..6ML5DPQ, U-4..6ML5XPQ

Method of Malfunction Detection

Malfunction Decision Conditions

Supposed Causes

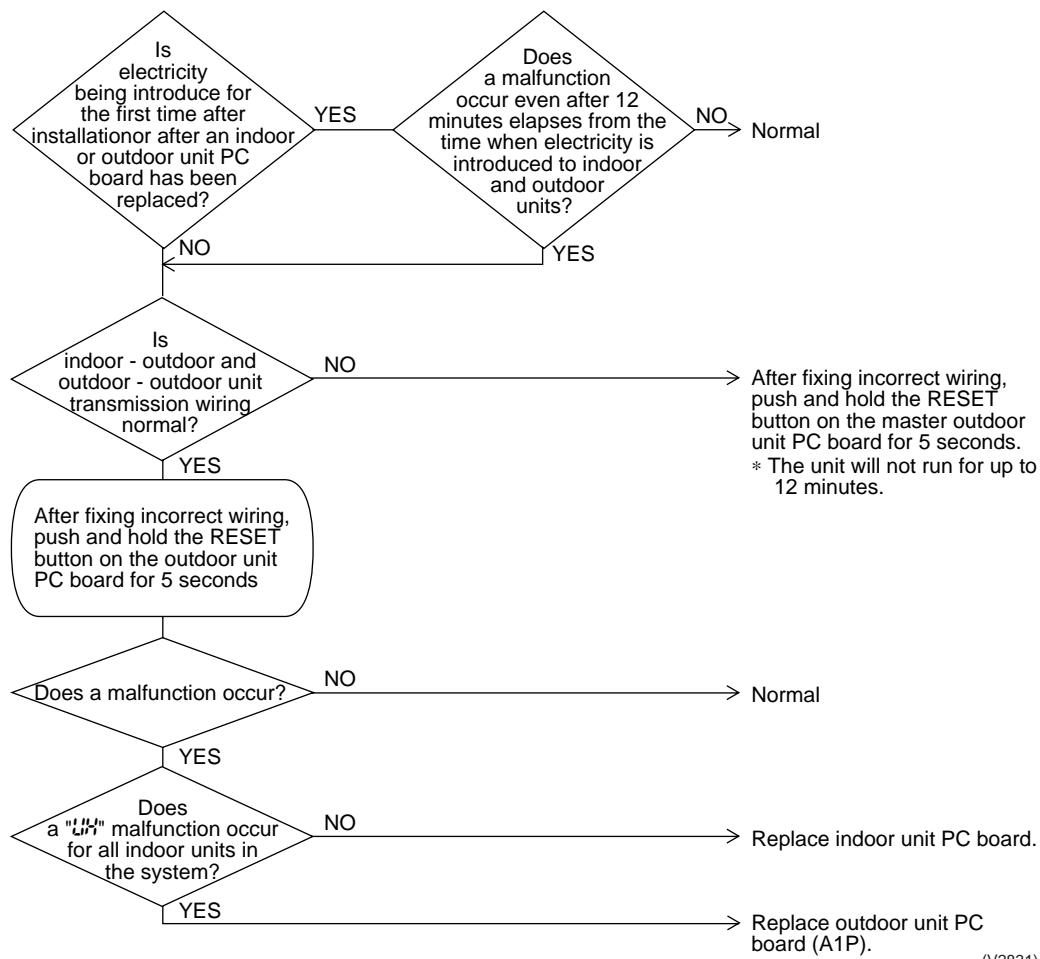
- Improper connection of transmission wiring between outdoor unit and outdoor unit outside control adaptor
- Defect of indoor unit PC board
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

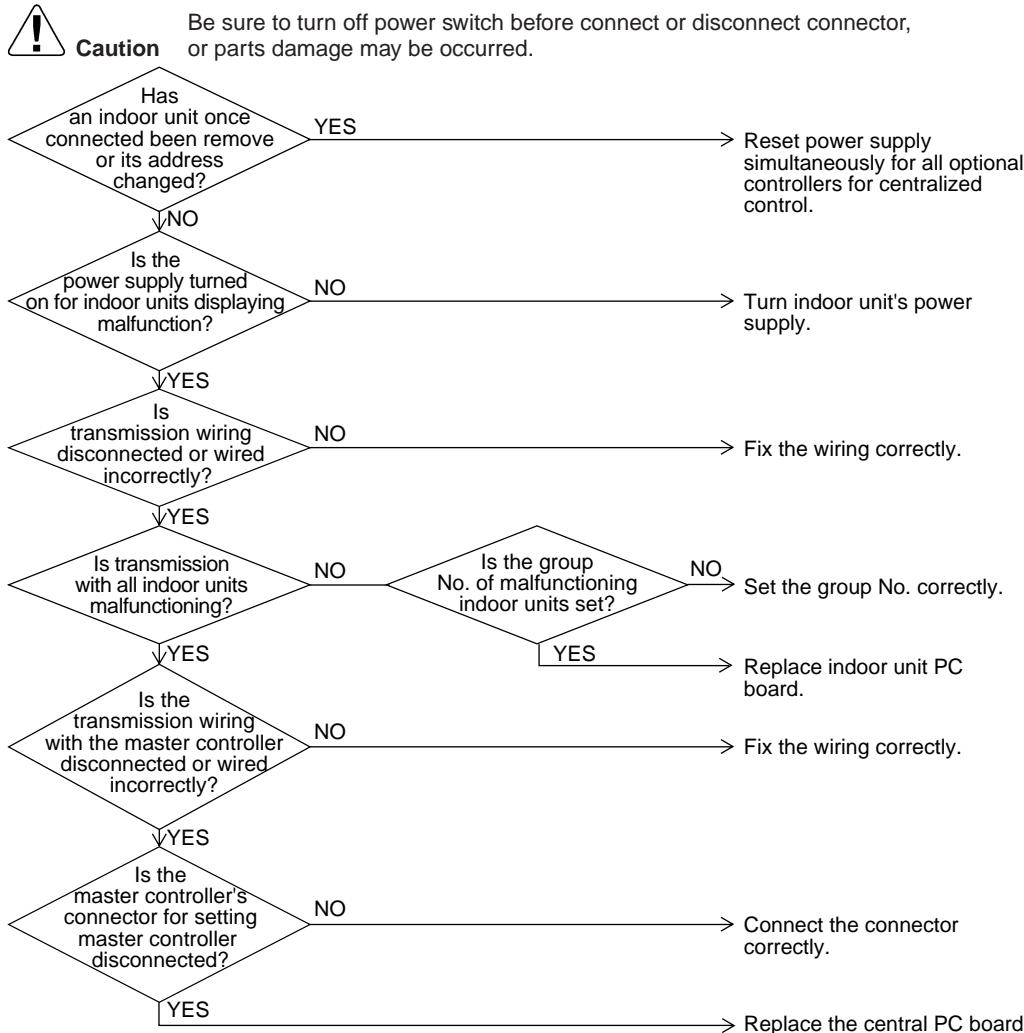
Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2831)

4. Troubleshooting by Indication on the Centralized Remote Controller

4.1 "UE" Malfunction of Transmission between Centralized Remote Controller and Indoor Unit

| | |
|---------------------------------|--|
| Remote Controller Display |  |
| Applicable Models | All indoor unit models Centralized Remote Controller |
| Method of Malfunction Detection | Microcomputer checks if transmission between indoor unit and central remote controller is normal. |
| Malfunction Decision Conditions | When transmission is not carried out normally for a certain amount of time |
| Supposed Causes | <ul style="list-style-type: none"> ■ Malfunction of transmission between optional controllers for centralized control and indoor unit ■ Connector for setting master controller is disconnected. ■ Failure of PC board for central remote controller ■ Defect of indoor unit PC board |
| Troubleshooting | <p>Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.</p>  <pre> graph TD A{Has an indoor unit once connected been removed or its address changed?} -- YES --> B[Reset power supply simultaneously for all optional controllers for centralized control.] A -- NO --> C{Is the power supply turned on for indoor units displaying malfunction?} C -- NO --> D[Turn indoor unit's power supply.] C -- YES --> E{Is transmission wiring disconnected or wired incorrectly?} E -- NO --> F{Is transmission with all indoor units malfunctioning?} E -- YES --> G{Is the transmission wiring with the master controller disconnected or wired incorrectly?} F -- NO --> H{Is the group No. of malfunctioning indoor units set?} F -- YES --> I[Set the group No. correctly.] H -- NO --> J[Fix the wiring correctly.] H -- YES --> K[Replace indoor unit PC board.] G -- NO --> L{Is the master controller's connector for setting master controller disconnected?} G -- YES --> M[Connect the connector correctly.] L -- NO --> N[Replace the central PC board.] L -- YES --> O[Replace the central PC board.] </pre> |

4.2 “M1” PC Board Defect

Remote
Controller
Display

M1

Applicable
Models

Centralized remote controller

Method of
Malfunction
Detection

Malfunction
Decision
Conditions

Supposed
Causes

- Defect of central remote controller PC board

Troubleshooting

Replace the central remote controller PC board.

4.3 “M8” Malfunction of Transmission between Optional Controllers for Centralized Control

Remote Controller Display

M8

Applicable Models

Centralized remote controller

Method of Malfunction Detection

Malfunction Decision Conditions

Supposed Causes

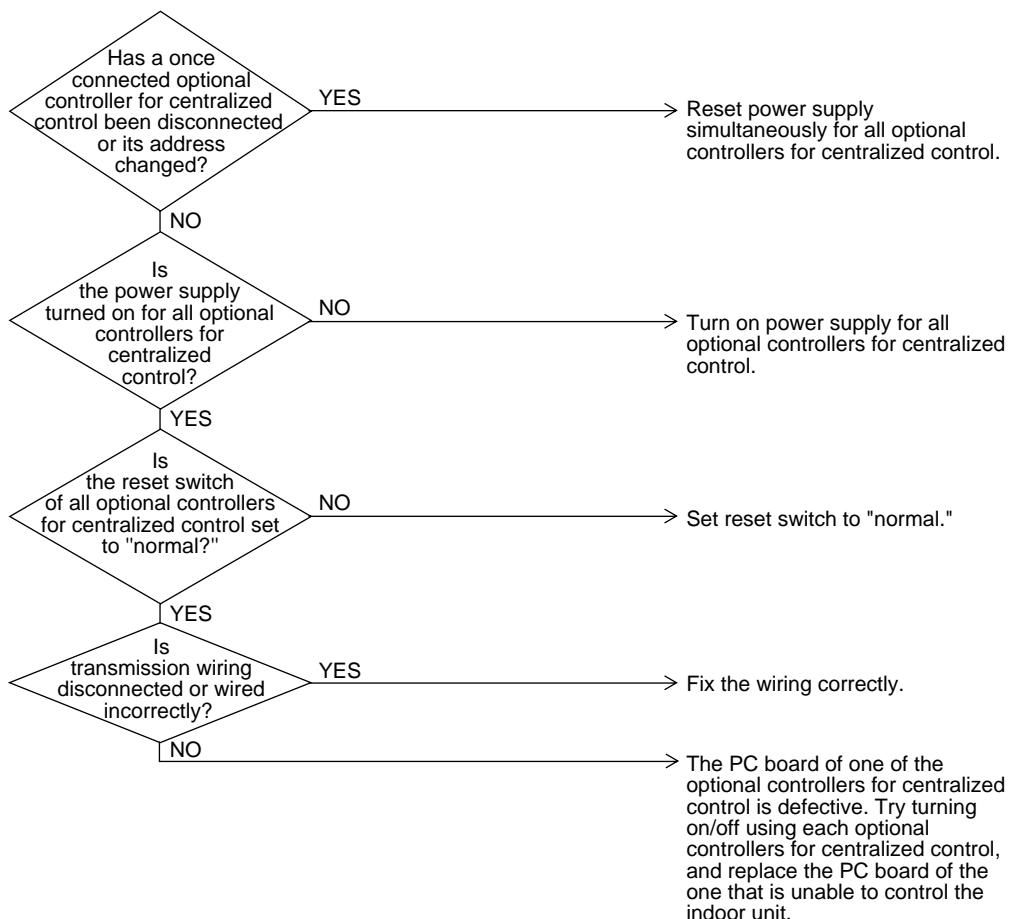
- Malfunction of transmission between optional controllers for centralized control
- Defect of PC board of optional controllers for centralized control

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

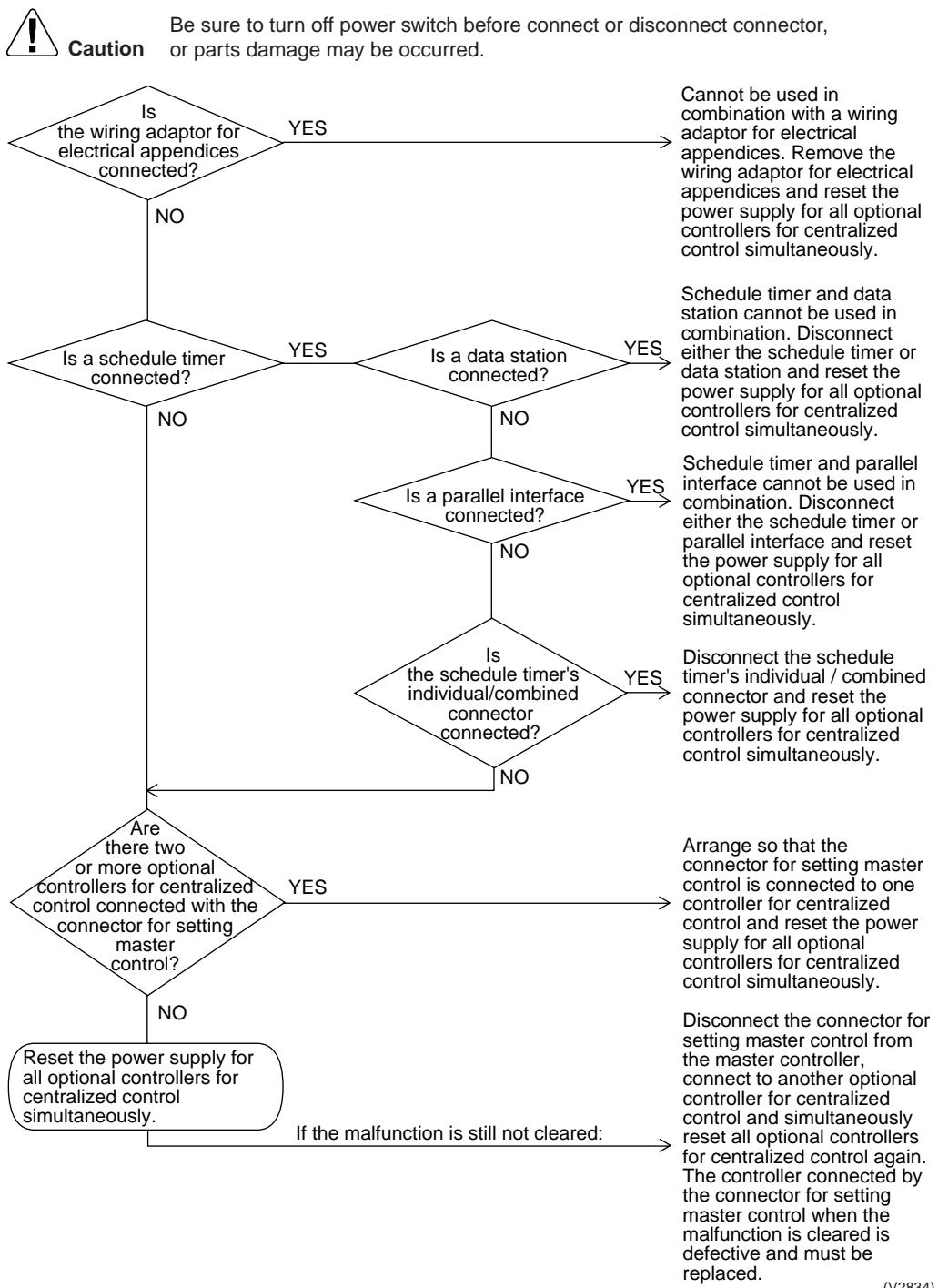


(V2833)

4.4 “MR” Improper Combination of Optional Controllers for Centralized Control

| | |
|---------------------------------|---|
| Remote Controller Display | MR |
| Applicable Models | Centralized remote controller |
| Method of Malfunction Detection | |
| Malfunction Decision Conditions | |
| Supposed Causes | <ul style="list-style-type: none">■ Improper combination of optional controllers for centralized control■ More than one master controller is connected■ Defect of PC board of optional controller for centralized control |

Troubleshooting



(V2834)

4.5 “MC” Address Duplication, Improper Setting

Remote
Controller
Display

MC

Applicable
Models

Centralized remote controller

Method of
Malfunction
Detection

Malfunction
Decision
Conditions

Supposed
Causes

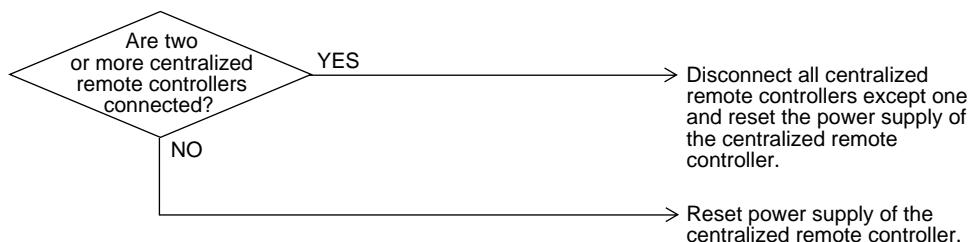
- Address duplication of centralized remote controller

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



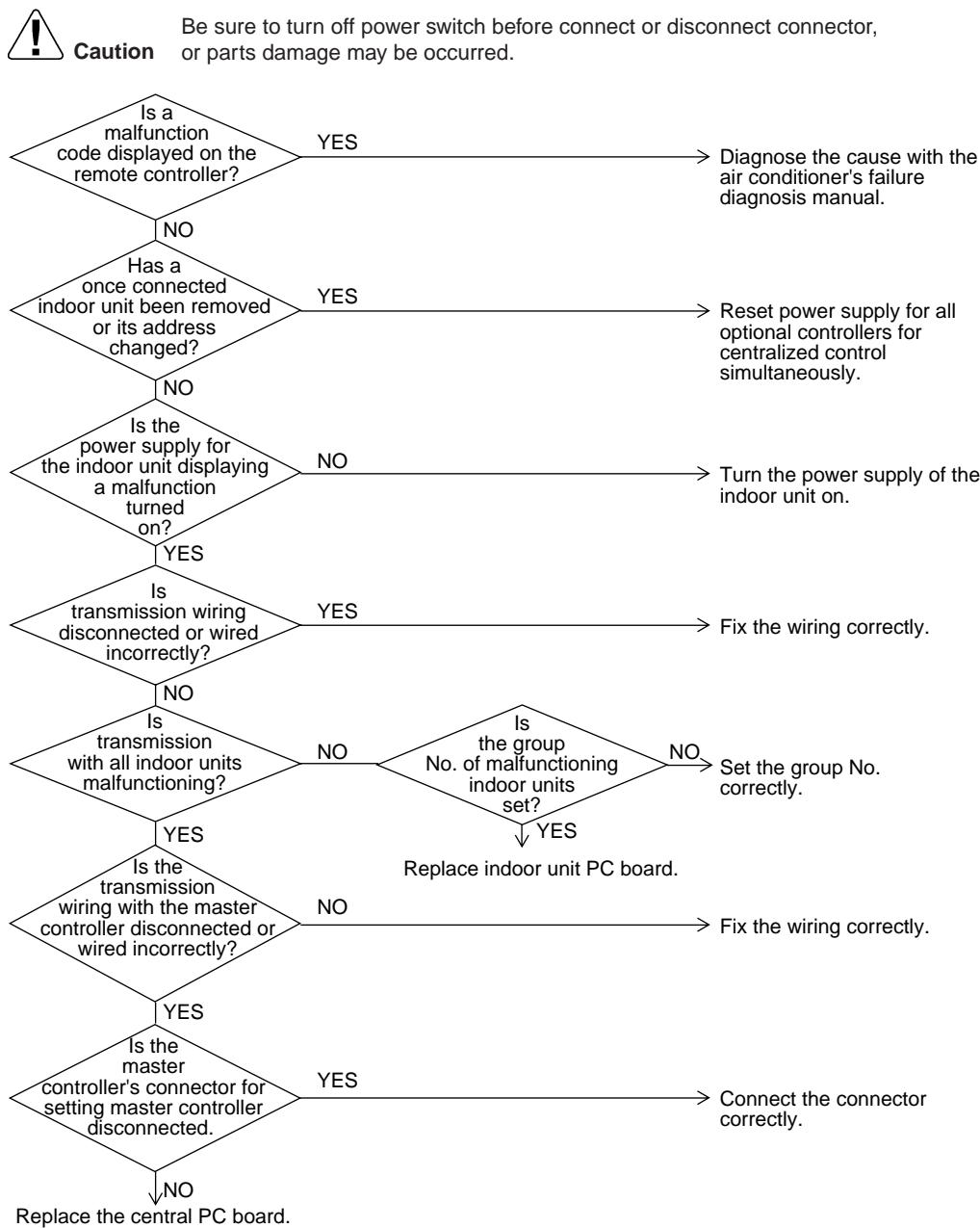
(V2835)

5. Troubleshooting by Indication on the Unified ON/OFF Controller

5.1 Operation Lamp Blinks

| | |
|---------------------------------|---|
| Remote Controller Display | Operation lamp blinks |
| Applicable Models | All models of indoor units Unified ON/OFF controller |
| Method of Malfunction Detection | |
| Malfunction Decision Conditions | |
| Supposed Causes | <ul style="list-style-type: none">■ Malfunction of transmission between optional controller and indoor unit■ Connector for setting master controller is disconnected■ Defect of unified ON/OFF controller■ Defect of indoor unit PC board■ Malfunction of air conditioner |

Troubleshooting

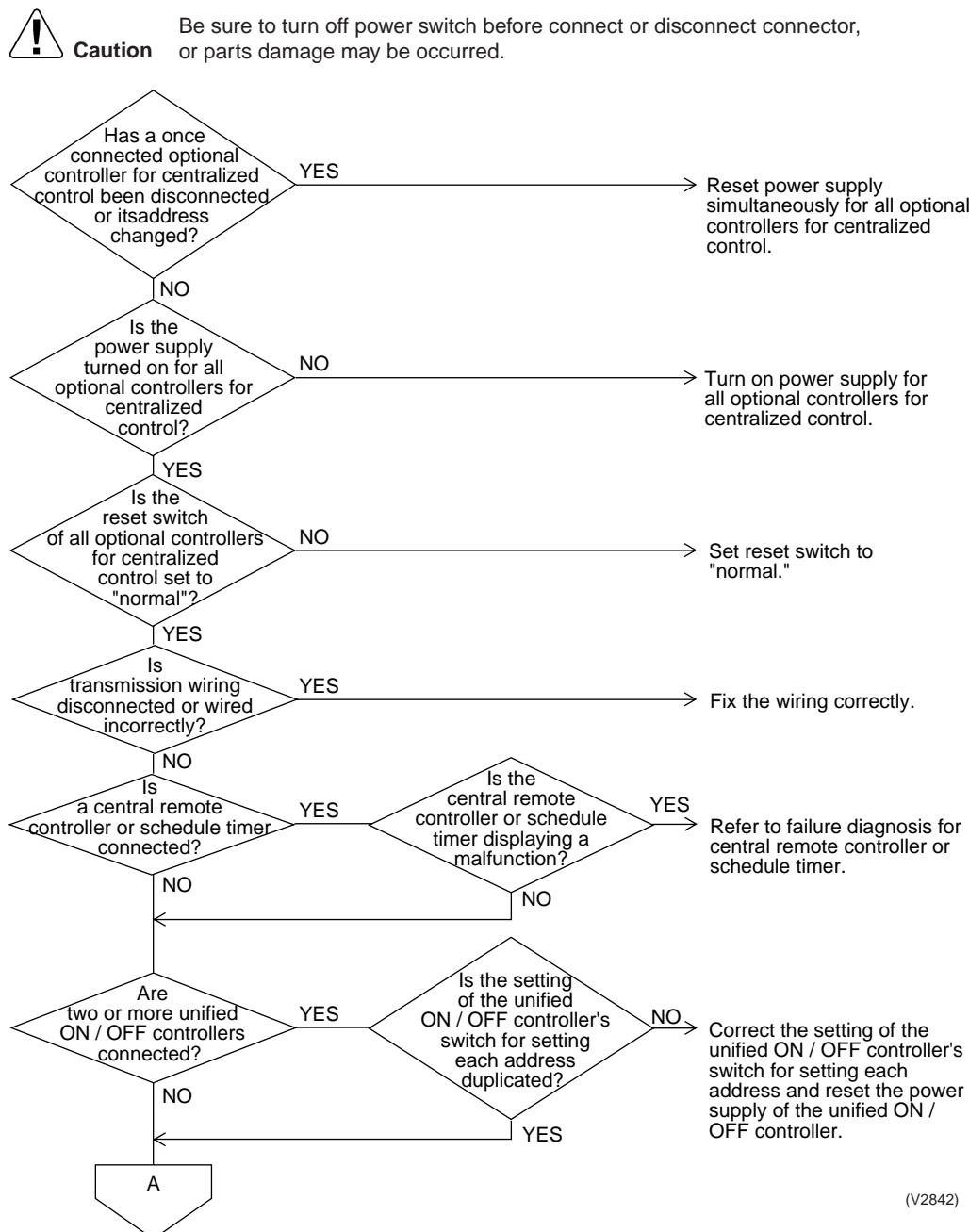


(V2841)

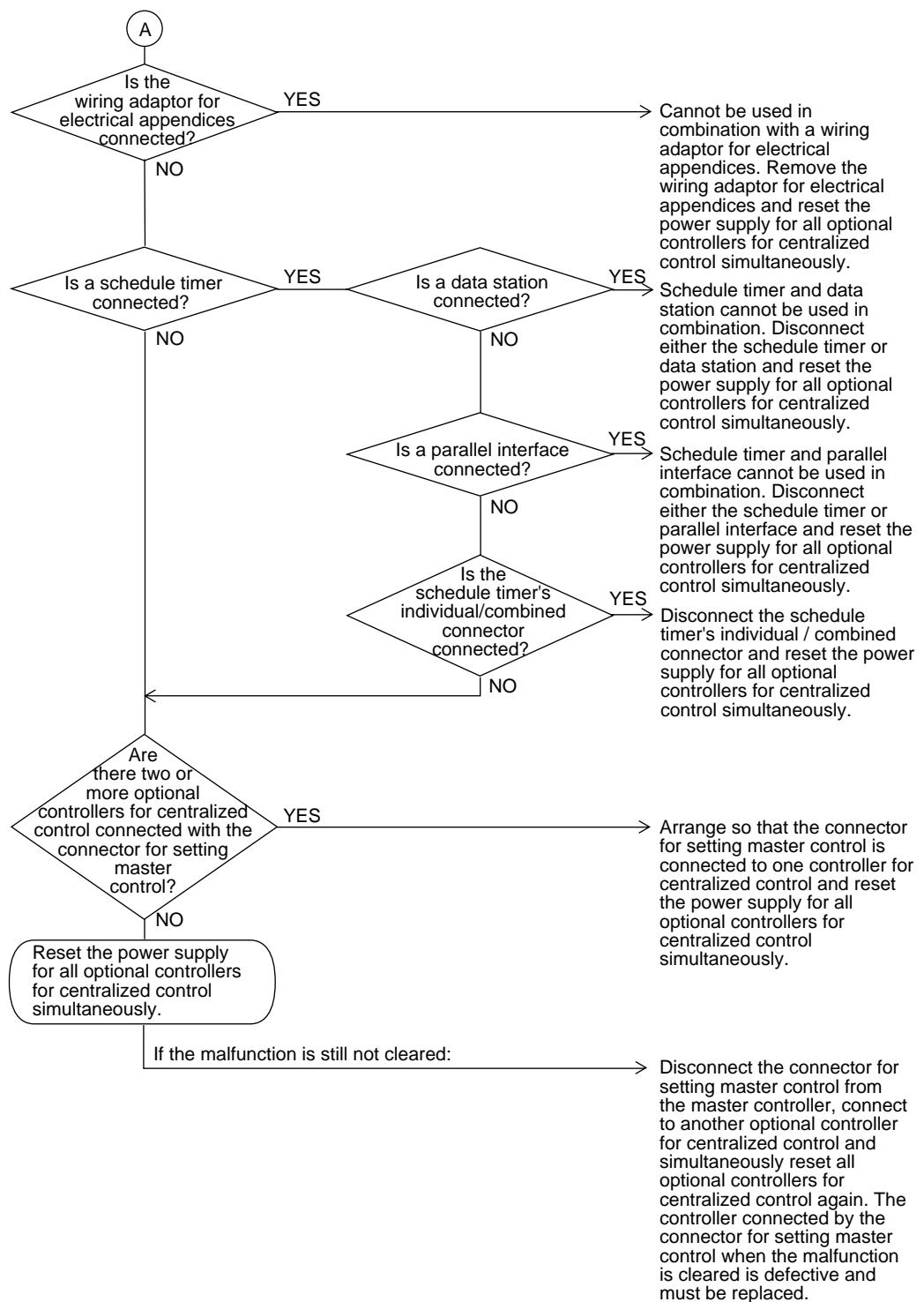
5.2 Display “Under Host Computer Integrate Control” Blinks (Repeats Single Blink)

| | |
|---------------------------------|---|
| Remote Controller Display | “under host computer integrated control” (Repeats single blink) |
| Applicable Models | Unified ON/OFF controller Central controller, Schedule timer |
| Method of Malfunction Detection | |
| Malfunction Decision Conditions | |
| Supposed Causes | <ul style="list-style-type: none">■ Address duplication of central remote controller■ Improper combination of optional controllers for centralized control■ Connection of more than one master controller■ Malfunction of transmission between optional controllers for centralized control■ Defect of PC board of optional controllers for centralized control |

Troubleshooting



(V2842)



(V2843)

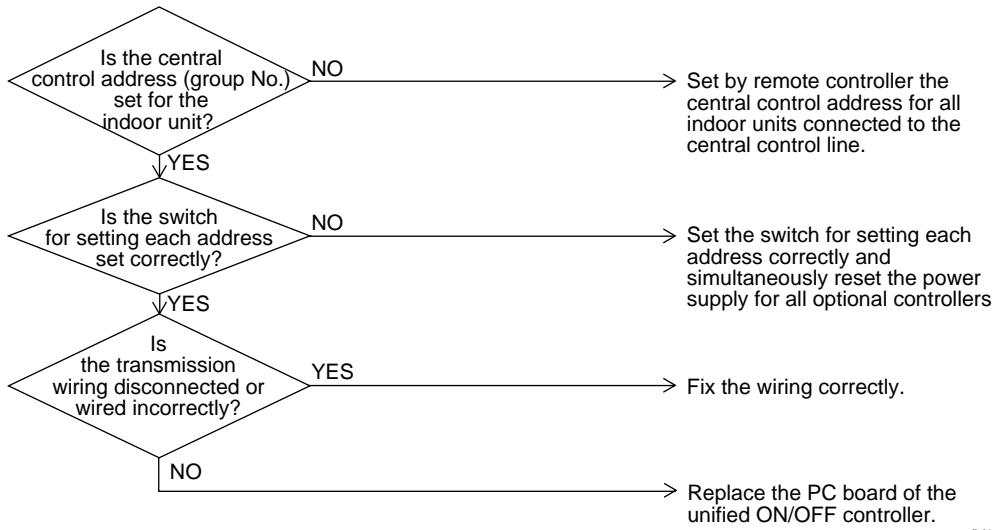
5.3 Display “Under Host Computer Integrate Control” Blinks (Repeats Double Blink)

| | |
|--|---|
| Remote Controller Display | “under host computer integrated control” (Repeats double blink) |
| Applicable Models | Unified ON/OFF controller |
| Method of Malfunction Detection | |
| Malfunction Decision Conditions | |
| Supposed Causes | <ul style="list-style-type: none"> ■ Central control address (group No.) is not set for indoor unit. ■ Improper address setting ■ Improper wiring of transmission wiring |

Troubleshooting


Caution

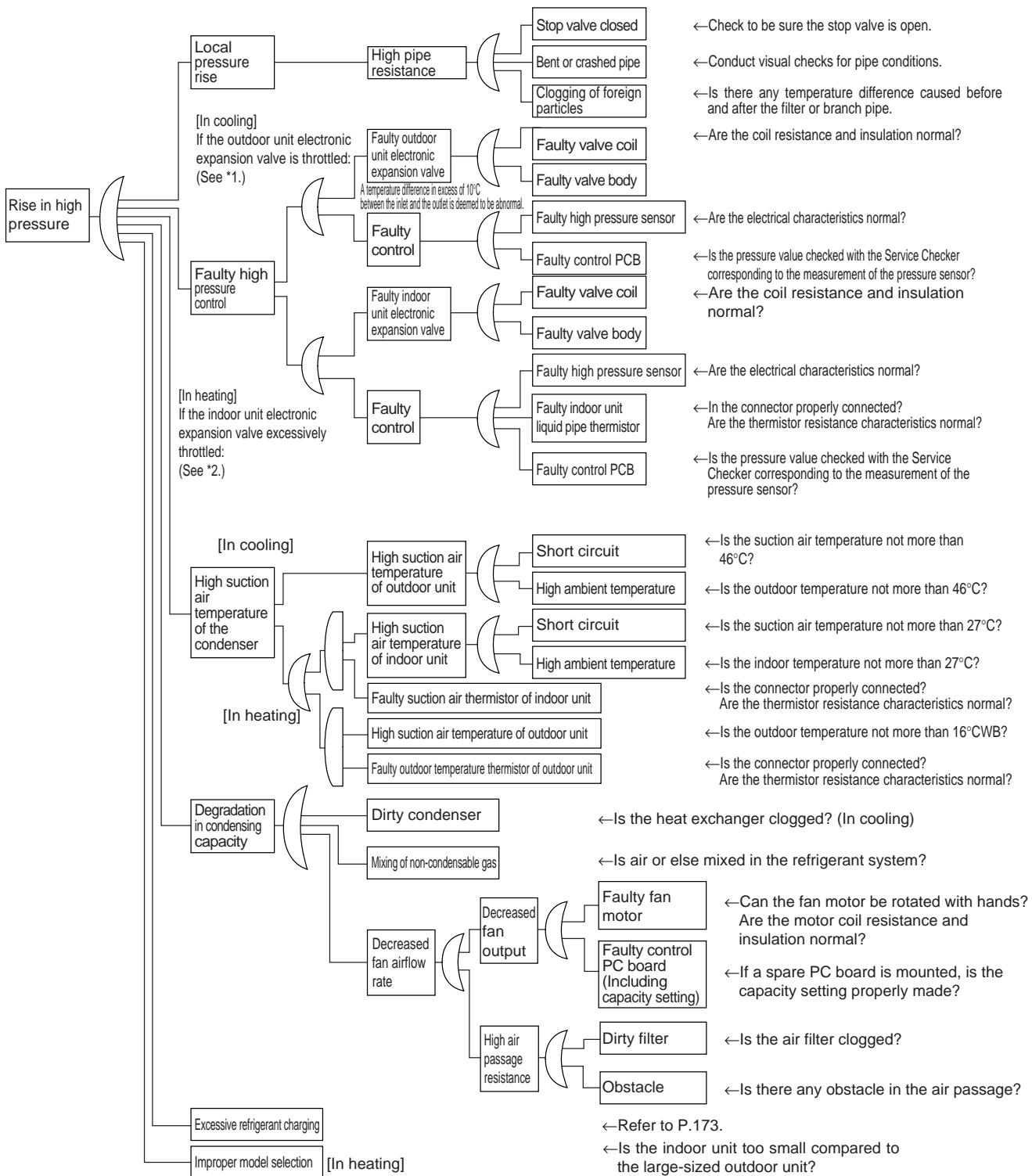
Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2844)

[CHECK 1] Check for causes of rise in high pressure

Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.



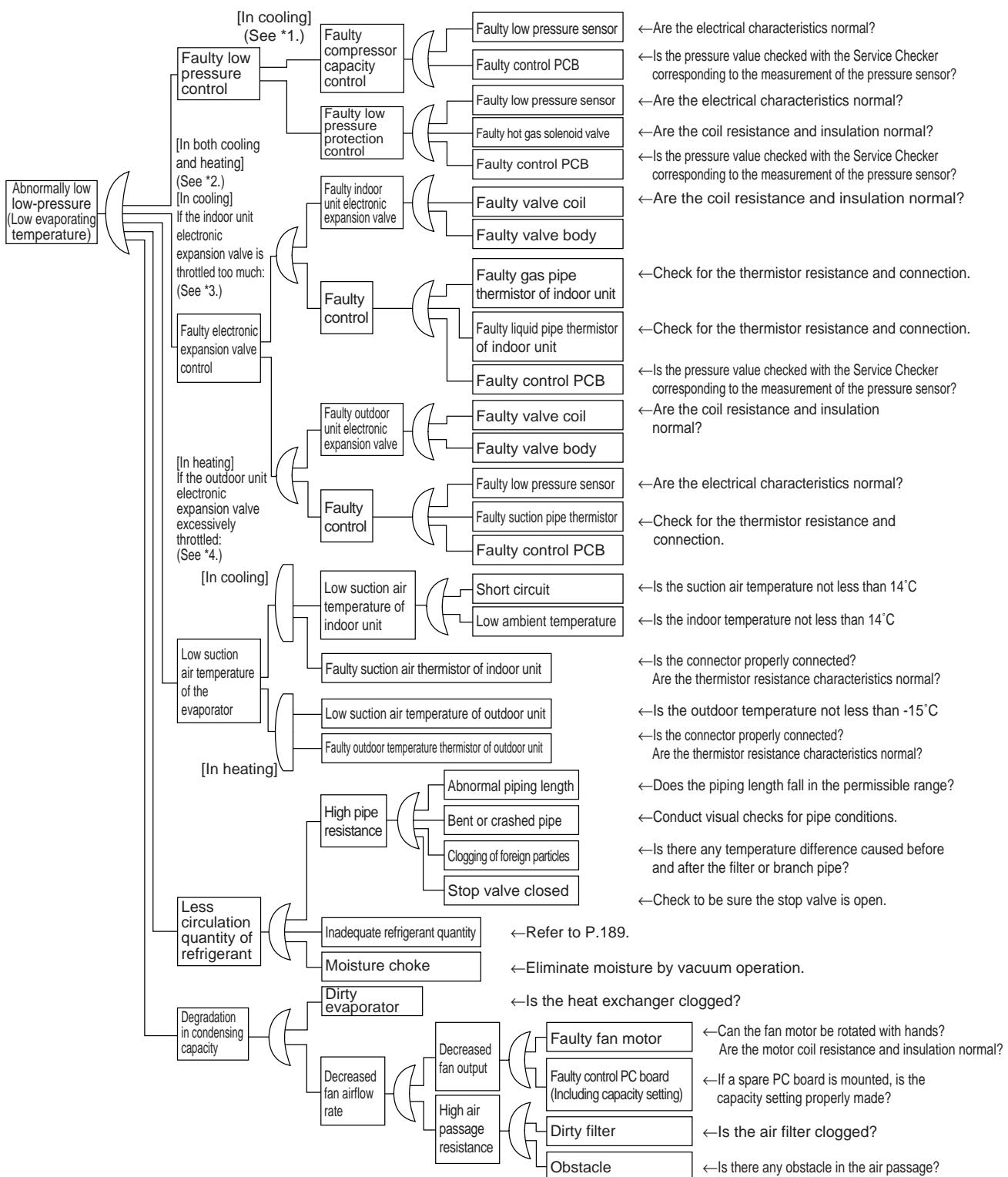
*1: In cooling, it is normal if the outdoor unit electronic expansion valve (EV1) is fully open.

*2: In heating, the indoor unit electronic expansion valve is used for "subcooled degree control".

(For details, refer to "Electronic Expansion Valve Control" on P.72.)

[CHECK 2] Check for causes of drop in low pressure

Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.



←Are the electrical characteristics normal?

←Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?

←Are the electrical characteristics normal?

←Are the coil resistance and insulation normal?

←Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?

←Are the coil resistance and insulation normal?

←Check for the thermistor resistance and connection.

←Check for the thermistor resistance and connection.

←Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?

←Are the coil resistance and insulation normal?

←Are the electrical characteristics normal?

←Check for the thermistor resistance and connection.

←Is the suction air temperature not less than 14°C

←Is the indoor temperature not less than 14°C

←Is the connector properly connected?
Are the thermistor resistance characteristics normal?

←Is the outdoor temperature not less than -15°C
←Is the connector properly connected?

Are the thermistor resistance characteristics normal?

←Does the piping length fall in the permissible range?

←Conduct visual checks for pipe conditions.

←Is there any temperature difference caused before and after the filter or branch pipe?

←Check to be sure the stop valve is open.

←Refer to P.189.

←Eliminate moisture by vacuum operation.

←Is the heat exchanger clogged?

←Can the fan motor be rotated with hands?
Are the motor coil resistance and insulation normal?

←If a spare PC board is mounted, is the capacity setting properly made?

←Is the air filter clogged?

←Is there any obstacle in the air passage?

*1: For details of the compressor capacity control while in cooling, refer to "Compressor PI Control" on P.50.

*2: The "low pressure protection control" includes low pressure protection control and hot gas bypass control. For details, refer to P.61.

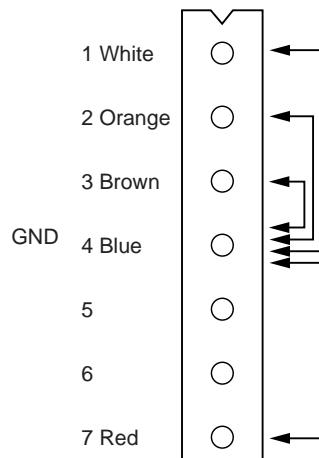
*3: In cooling, the indoor unit electronic expansion valve is used for "superheated degree control". (For details, refer to P.72.)

*4: In heating, the outdoor unit electronic expansion valve (EV1) is used for "superheated degree control of outdoor unit heat exchanger".

(For details, refer to P.51.)

[CHECK 3] Check for Fan Motor Connector

- (1) Turn the power supply off.
- (2) With the fan motor connector on motor side disconnected, measure the resistance between each pin, then make sure that the resistance is more than the value mentioned in the following table.



| Measurement point | Judgment |
|-------------------|---------------|
| 1 - 4 | 1MΩ or more |
| 2 - 4 | 100kΩ or more |
| 3 - 4 | 100Ω or more |
| 4 - 7 | 100kΩ or more |

Part 8 Appendix

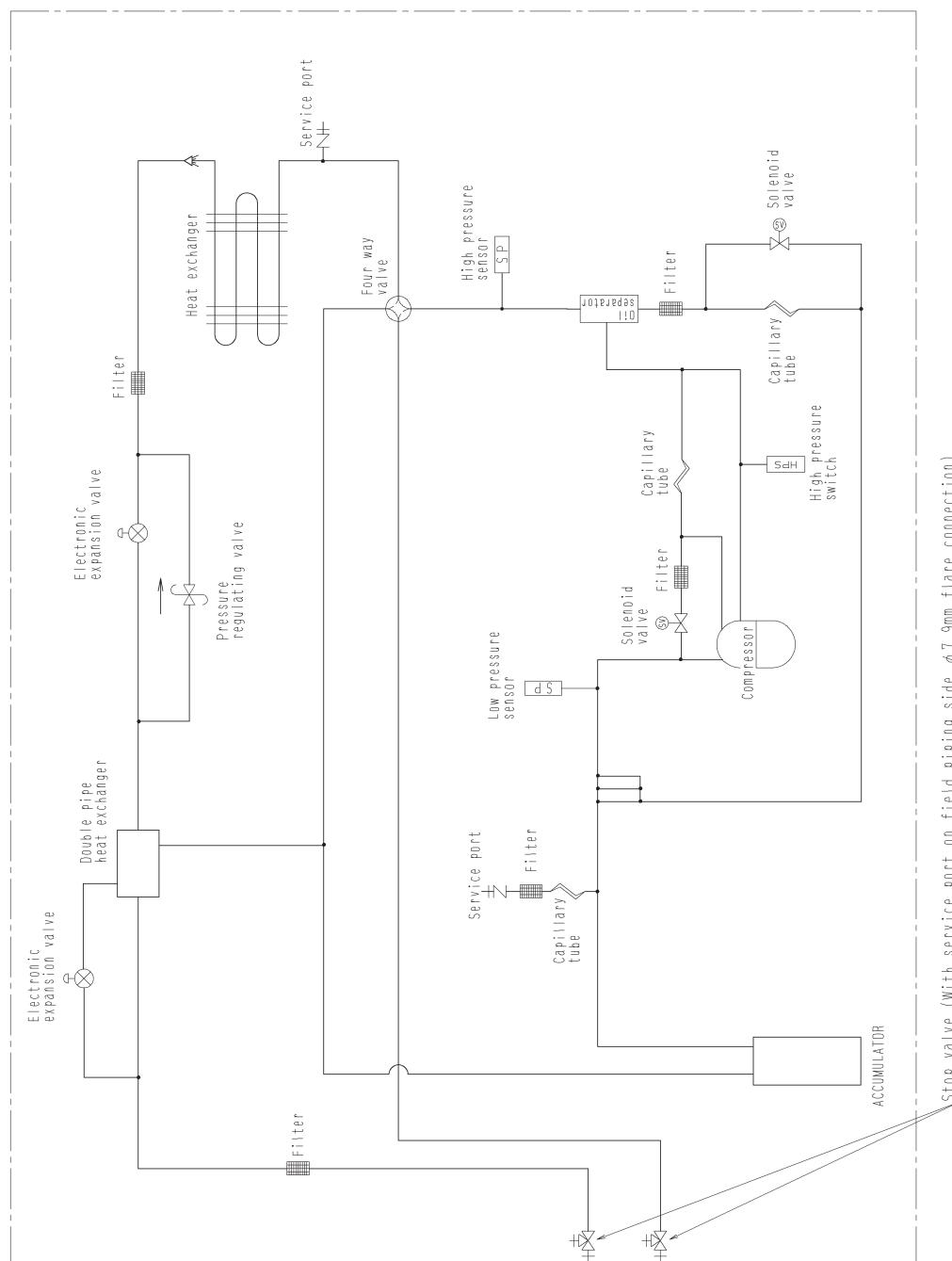
| | |
|--|-----|
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1. Piping Diagrams

1.1 Outdoor Unit

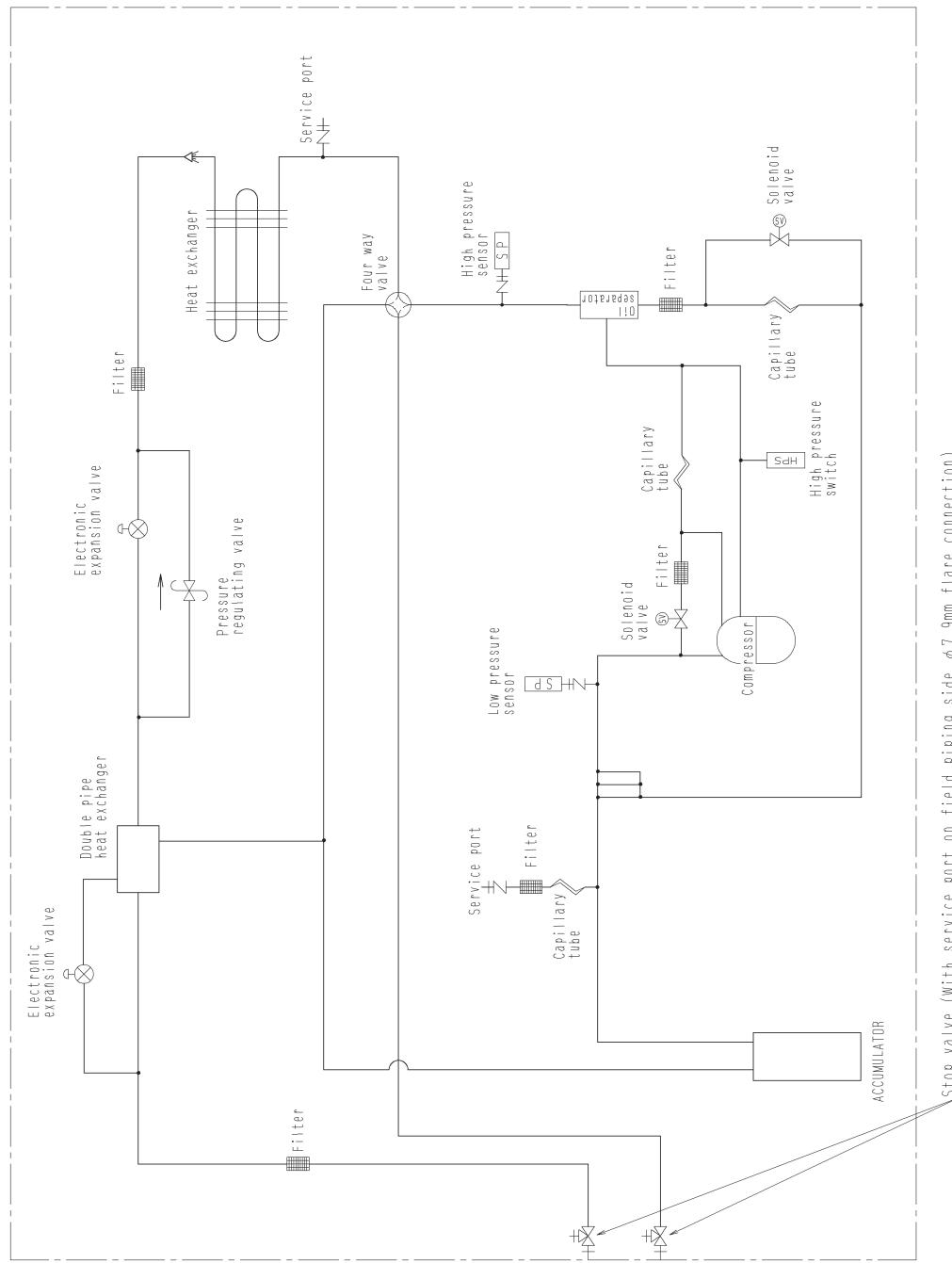
U-4, 5, 6ML5XPQ

3D057917



Stop valve (With service port on field piping side $\phi 7,9\text{mm}$ flare connection)

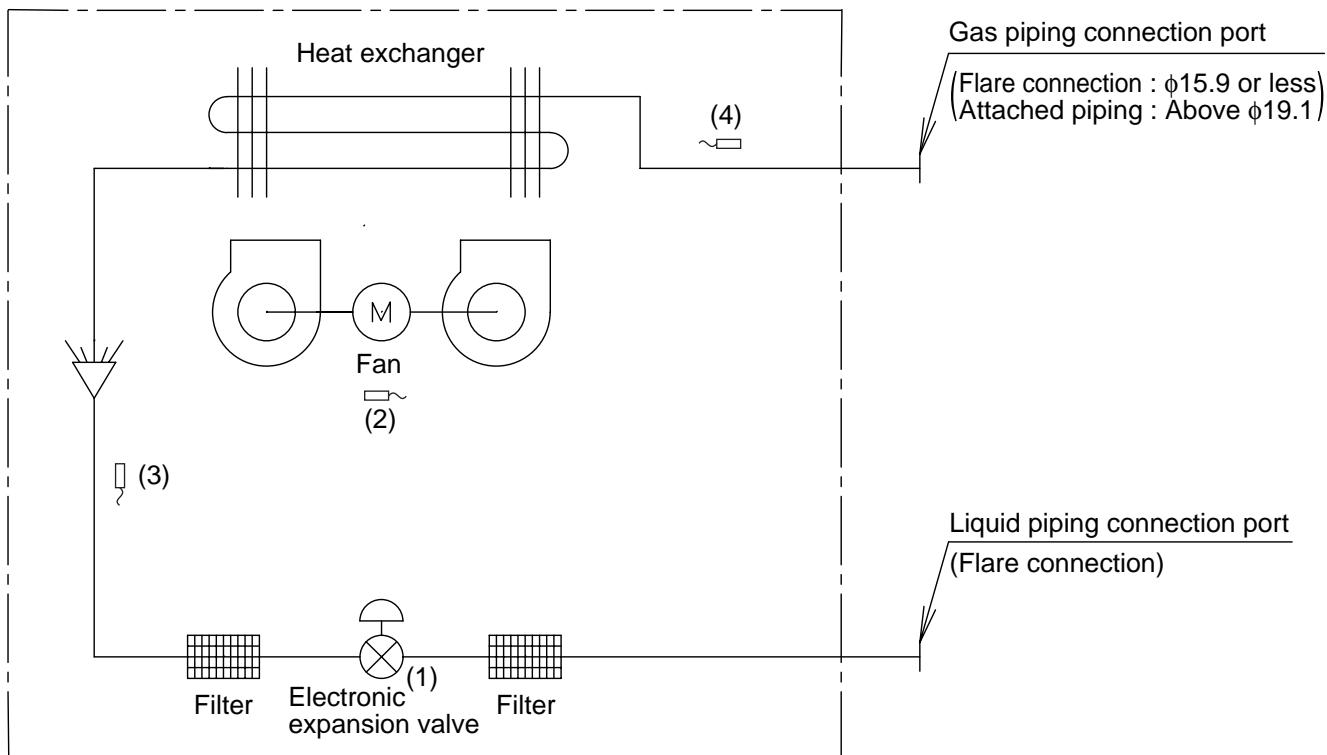
U-4, 5, 6ML5DPQ



3D052712

1.2 Indoor Unit

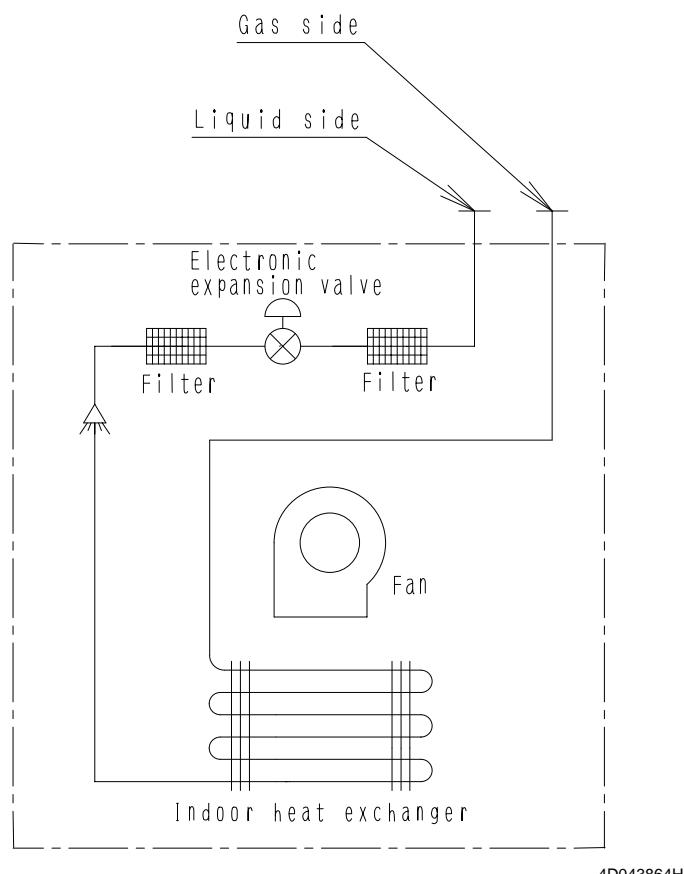
LM3, UM4, YM3, DM3, FM3, EM3, TM3, KM3, PM3, RM3



DU220-602J

| Code | Name | Code | Main function |
|------|------------------------------------|------|--|
| (1) | Electronic expansion valve | Y1E | Used for gas superheated degree control while in cooling operation or subcooled degree control while in heating operation. |
| (2) | Suction air temperature thermistor | R1T | Used for thermostat control. |
| (3) | Liquid pipe | R2T | Used for gas superheated degree control while in cooling operation or subcooled degree control while in heating operation. |
| (4) | Gas pipe | R3T | Used for gas superheated degree control while in cooling operation. |

| (mm) | | |
|------------------------|-------------|------------|
| Capacity | GAS | Liquid |
| 20 / 25 / 32 / 40 / 50 | $\phi 12.7$ | $\phi 6.4$ |
| 63 / 80 / 100 / 125 | $\phi 15.9$ | $\phi 9.5$ |

NM3

4D043864H

■ Refrigerant pipe connection port diameters

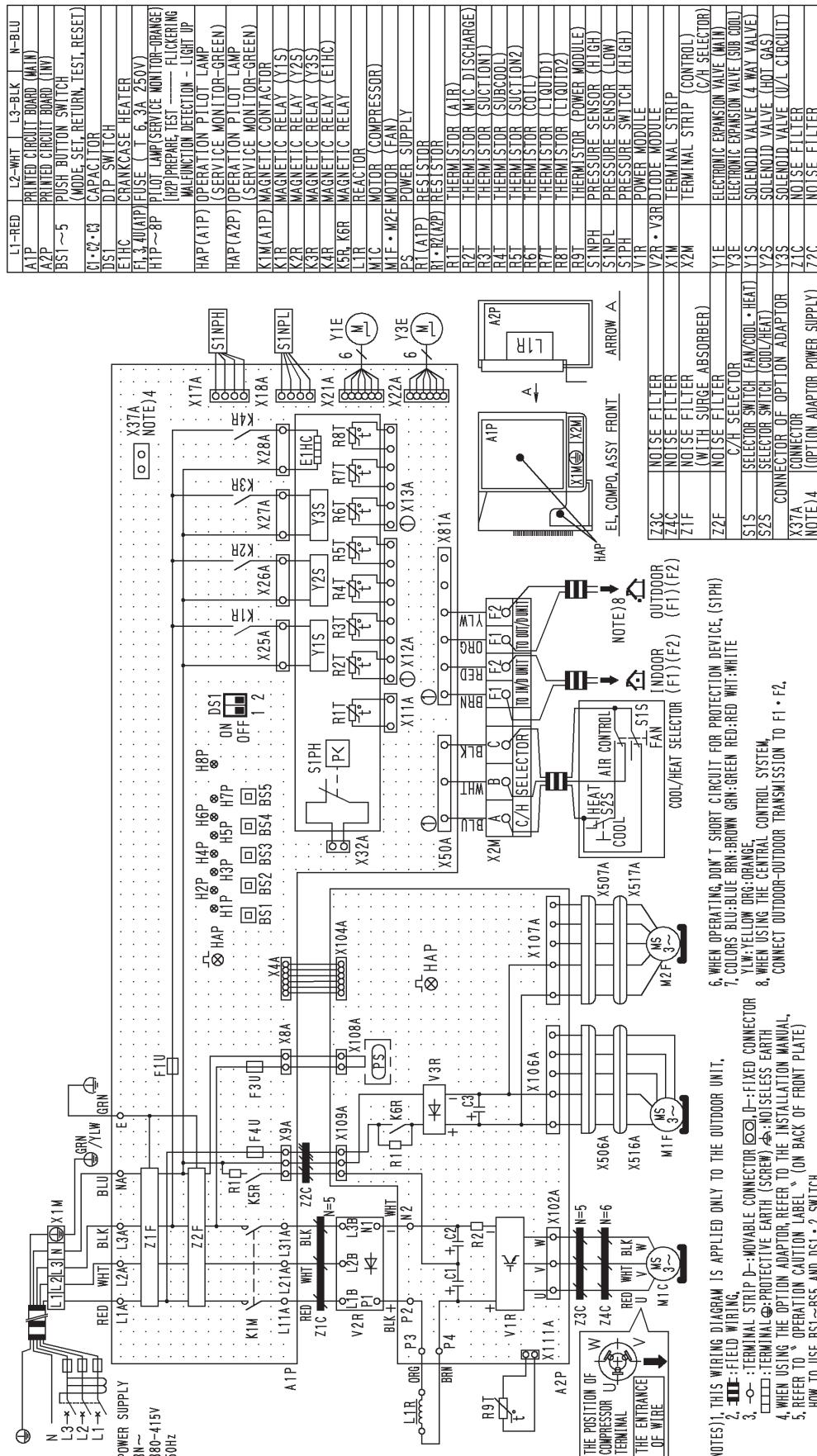
(mm)

| Model | Gas | Liquid |
|-------------|-------|--------|
| 20 / 25 NM3 | φ12.7 | φ6.4 |
| | | |

2. Wiring Diagrams

2.1 Outdoor Unit

U-4, 5, 6ML5XPQ

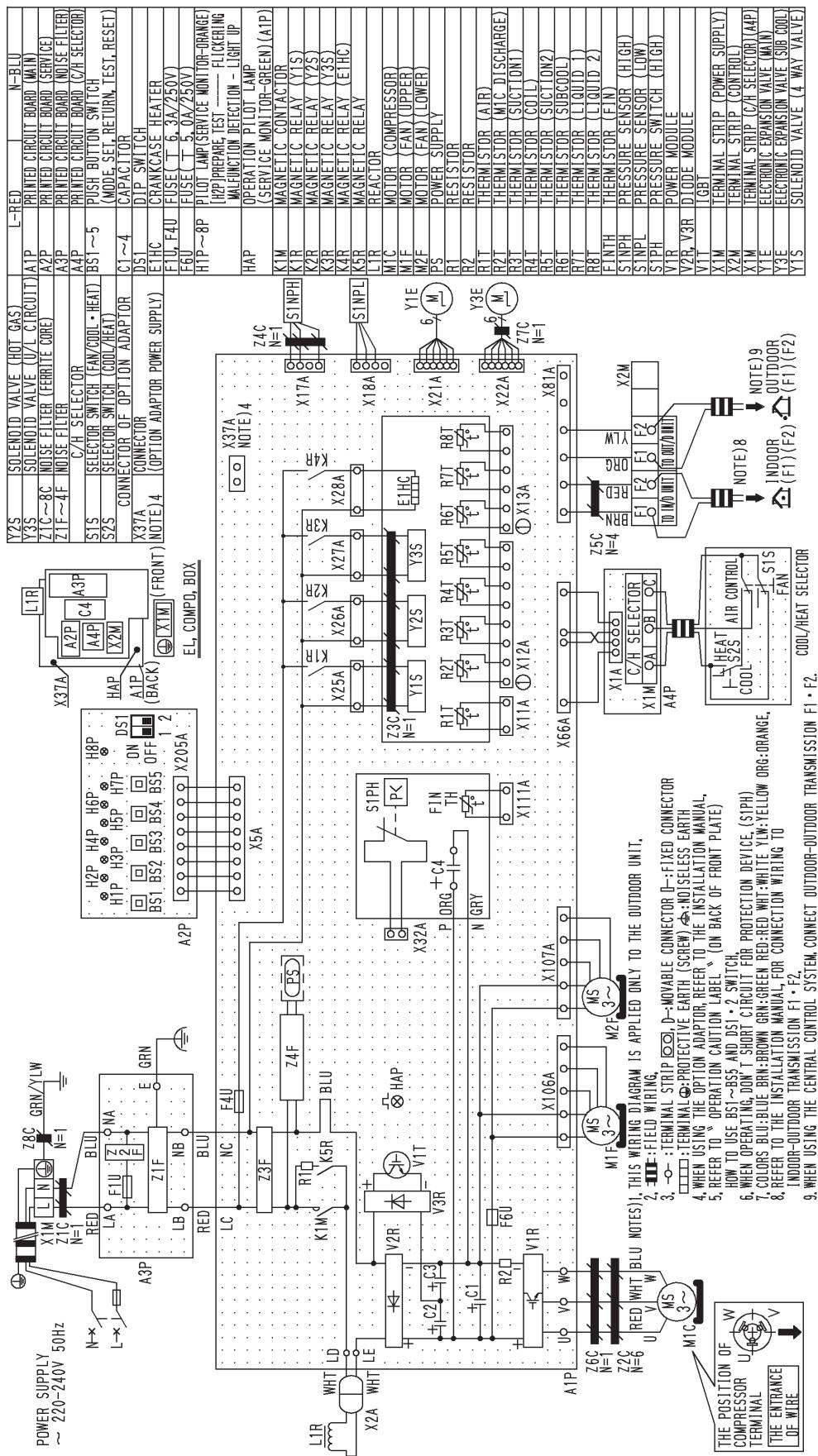


NOTES:

1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. **III**-FIELD WIRING.
3. **D**-MOVABLE CONNECTOR B-FIXED CONNECTOR
4. WHEN USING THE OPTION ADAPTER, REFER TO THE INSTALLATION MANUAL.
5. REFER TO OPERATING CAUTION LABEL (ON BACK OF FRONT PLATE) HOW TO USE DRYER AND DRYER DRAIN TUBE.
6. WHEN OPERATING, DON'T SHORT CIRCUIT FOR PROTECTION DEVICE, (SIPH)
7. COLORS BLU-BLUE BRN-BROWN GRN-GREEN RED:WHITE YEL-YELLOW ORG:ORANGE
8. WHEN USING THE CENTRAL CONTROL SYSTEM, CONNECT OUTDOOR-OUTDOOR TRANSMISSION TO F1 • F2.

20050510

U-4, 5, 6ML5DPQ

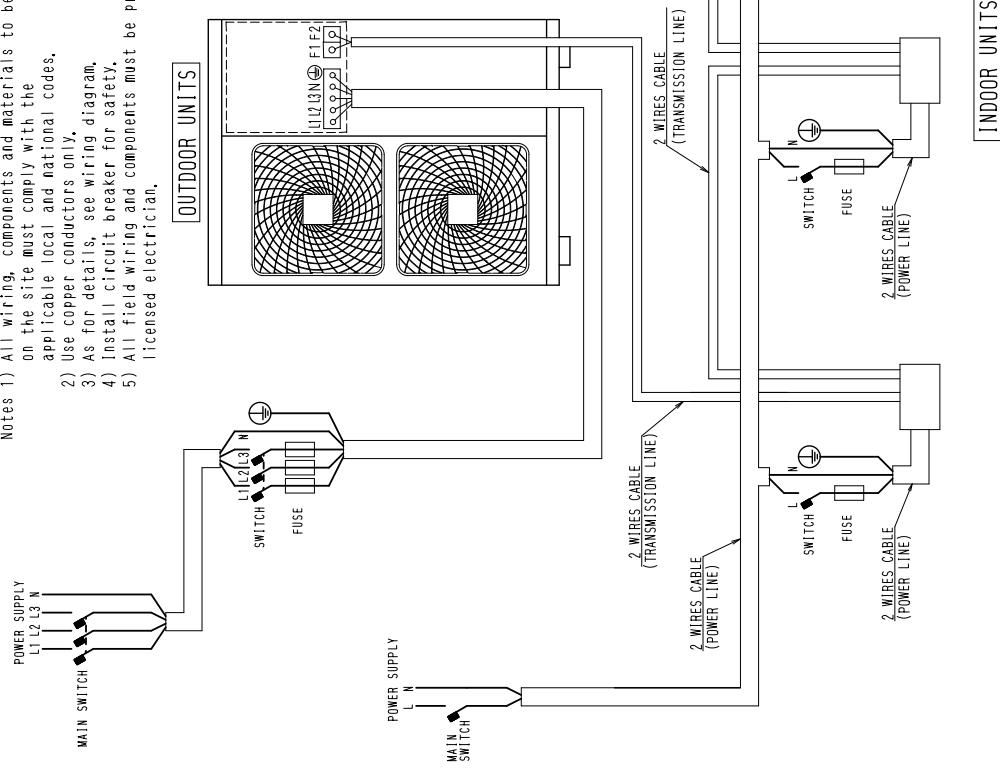


2.2 Field Wiring

U-4, 5, 6ML5XPQ

- Notes 1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
 2) Use copper conductors only.
 3) As for details, see wiring diagram.
 4) Install circuit breaker for safety.
 5) All field wiring and components must be provided by licensed electrician.

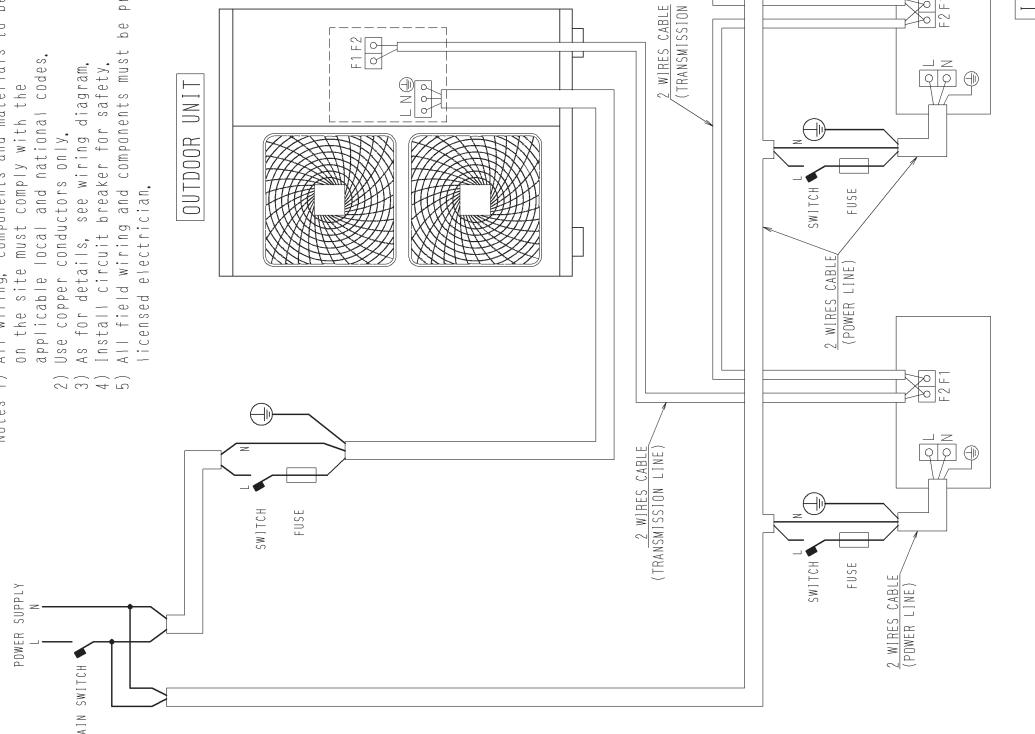
- 6) Unit shall be grounded in compliance with the applicable local and national codes.
 7) Wiring shown are general point-to-point connection guides only and are not intended for or to include all details for a specific installation.
 8) Be sure to install the switch and the fuse to the power line of each equipment.
 9) Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources, if there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally.
 Running the product in reversed phase may break the compressor and other parts.



U-4, 5, 6ML5DPQ

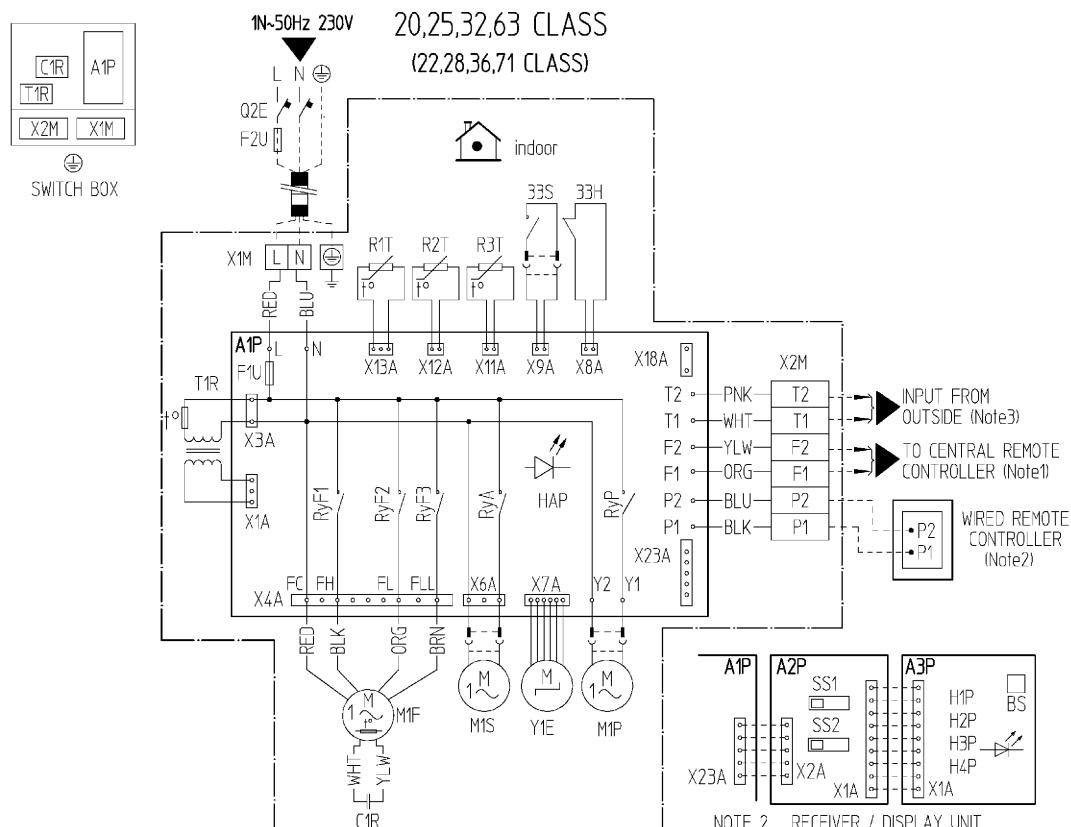
Notes 1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
 2) Use copper conductors only.
 3) As for details, see wiring diagram.
 4) Install circuit breaker for safety.
 5) All field wiring and components must be provided by licensed electrician.

- 6) Unit shall be grounded in compliance with the applicable local and national codes.
- 7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
- 8) Be sure to install the switch and the fuse to the power line of each equipment.
- 9) Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.



2.3 Indoor Unit

S-20, 25, 32, 63LM3HPQ



FIELD WIRING

L : LIVE
N : NEUTRAL
— : CONNECTOR
○ : WIRE CLAMP
□ : PROTECTIVE EARTH (SCREW)

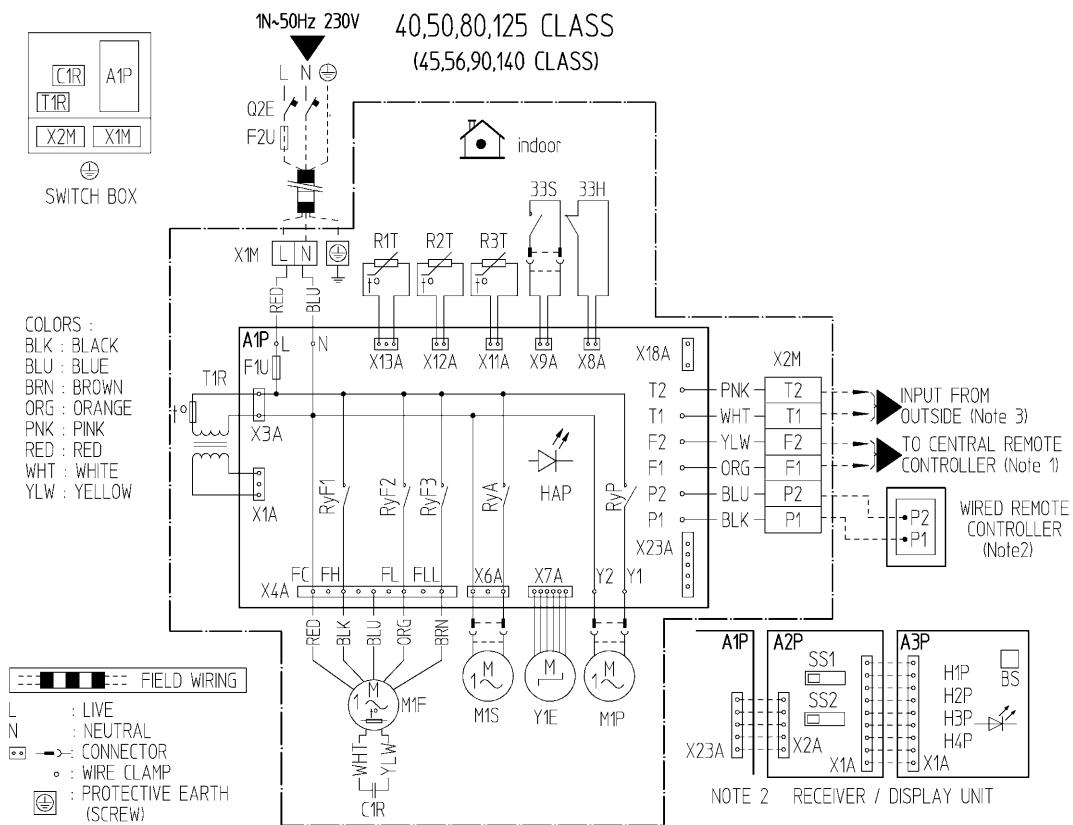
COLORS:
BLK : BLACK
BLU : BLUE
BRN : BROWN
ORG : ORANGE
PNK : PINK
RED : RED
WHT : WHITE
YLW : YELLOW

| | | | | | |
|-----|--|----------|--|------|---|
| 33H | FLOAT SWITCH | R2T, R3T | THERMISTOR (COIL) | H1P | LIGHT EMITTING DIODE (ON-RED) |
| 33S | LIMIT SWITCH (SWING FLAP) | Q2E | EARTH LEAK DETECTOR | H2P | LIGHT EMITTING DIODE (TIMER-GREEN) |
| A1P | PRINTED CIRCUIT BOARD | RyA | MAGNETIC RELAY (M1S) | H3P | LIGHT EMITTING DIODE (FILTER SIGN-RED) |
| C1R | CAPACITOR (MF) | RyF1-3 | MAGNETIC RELAY (MF) | H4P | LIGHT EMITTING DIODE (DEFROST-ORANGE) |
| F1T | THERMAL FUSE (152°C) (MF EMBEDDED) | RyP | MAGNETIC RELAY (M1P) | SS1 | SELECTOR SWITCH (MAIN/SUB) |
| F1U | FUSE (250V, 5A) | T1R | TRANSFORMER (220-240V/22V) | SS2 | SELECTOR SWITCH (WIRELESS ADDRESS SET) |
| F2U | FIELD FUSE | X1M | TERMINAL STRIP (POWER) | | CONNECTOR FOR OPTIONAL PARTS |
| HAP | LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN) | X2M | TERMINAL STRIP (CONTROL) | X18A | CONNECTOR (WIRING, ADAPTOR FOR ELECTRICAL APPENDICES) |
| M1F | MOTOR (INDOOR FAN) | Y1E | ELECTRONIC EXPANSION VALVE | X23A | CONNECTOR (WIRELESS REMOTE CONTROLLER) |
| M1S | MOTOR (SWING FLAP) | | RECEIVER/DISPLAY UNIT (ATTACHED TO WIRELESS REMOTE CONTROLLER) | | |
| M1P | MOTOR (DRAIN PUMP) | A2P, A3P | PRINTED CIRCUIT BOARD | | |
| R1T | TERMISTOR (AIR) | BS | ON/OFF BUTTON | | |

NOTES :

1. WHEN USING A CENTRAL REMOTE CONTROLLER, SEE MANUAL FOR CONNECTION TO THE UNIT.
2. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS USED.
3. WHEN CONNECTING THE INPUT WIRES FROM THE OUTDOOR UNIT, "FORCED OFF" OR "ON/OFF" OPERATION CAN BE SELECTED BY THE REMOTE CONTROLLER.
FOR MORE DETAILS SEE INSTALLATION MANUAL.
4. USE COPPER CONDUCTORS ONLY.

2TW23776-1D

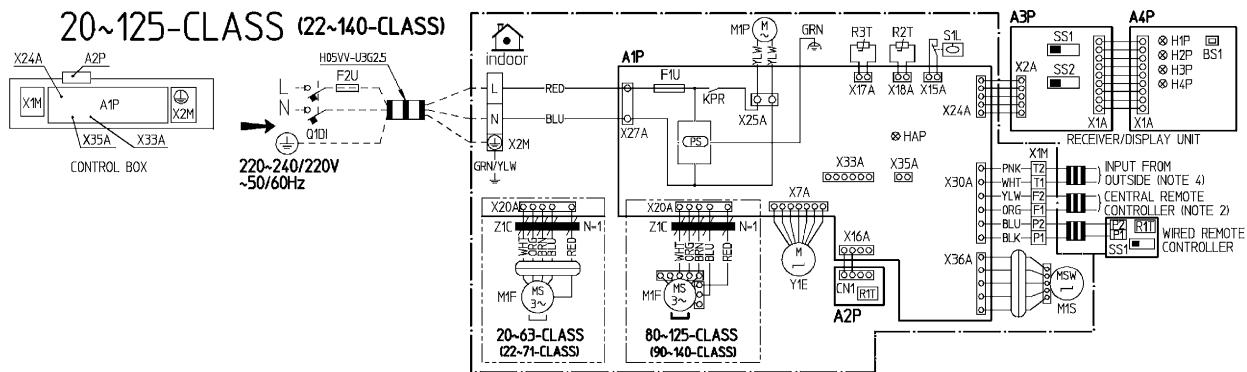
S-40, 50, 80, 125LM3HPQ

| | | | | | |
|-----|--|--|----------------------------|------|---|
| 33H | FLOAT SWITCH | R2T, R3T | TERMISTOR (COIL) | H1P | LIGHT EMITTING DIODE (ON-RED) |
| 33S | LIMIT SWITCH (SWING FLAP) | Q2E | EARTH LEAK DETECTOR | H2P | LIGHT EMITTING DIODE (TIMER-GREEN) |
| A1P | PRINTED CIRCUIT BOARD | RyA | MAGNETIC RELAY (M1S) | H3P | LIGHT EMITTING DIODE (FILTER SIGN-RED) |
| C1R | CAPACITOR (M1F) | RyF1-3 | MAGNETIC RELAY (M1F) | H4P | LIGHT EMITTING DIODE (DEFROST-ORANGE) |
| F1T | THERMAL FUSE (152°C/MIF EMBEDDED) | RyP | MAGNETIC RELAY (M1P) | SS1 | SELECTOR SWITCH (MAIN/SUB) |
| F1U | FUSE (250V, 5A) | T1R | TRANSFORMER (220-240V/22V) | SS2 | SELECTOR SWITCH (WIRELESS ADDRESS SET) |
| F2U | FIELD FUSE | X1M | TERMINAL STRIP (POWER) | | CONNECTOR FOR OPTIONAL PARTS |
| HAP | LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN) | X2M | TERMINAL STRIP (CONTROL) | X18A | CONNECTOR (WIRING, ADAPTOR FOR ELECTRICAL APPENDICES) |
| M1F | MOTOR (INDOOR FAN) | RECEIVER/DISPLAY UNIT (ATTACHED TO WIRELESS REMOTE CONTROLLER) | | X23A | CONNECTOR (WIRELESS REMOTE CONTROLLER) |
| M1S | MOTOR (SWING FLAP) | A2P, A3P | PRINTED CIRCUIT BOARD | | |
| M1P | MOTOR (DRAIN PUMP) | BS | ON/OFF BUTTON | | |
| R1T | TERMISTOR (AIR) | | | | |

NOTES :

1. WHEN USING A CENTRAL REMOTE CONTROLLER, SEE MANUAL FOR CONNECTION TO THE UNIT.
2. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS USED.
3. WHEN CONNECTING THE INPUT WIRES FROM THE OUTDOOR UNIT, "FORCED OFF" OR "ON/OFF" OPERATION CAN BE SELECTED BY THE REMOTE CONTROLLER.
FOR MORE DETAILS SEE INSTALLATION MANUAL.
4. USE COPPER CONDUCTORS ONLY.

2TW23806-1D

S-20, 25, 32, 40, 50, 63, 80, 100, 125UM4JPQ

| INDOOR UNIT | | M1S | MOTOR (SWING FLAP) | RECEIVER/DISPLAY UNIT (ATTACHED TO WIRELESS REMOTE CONTROLLER) | | SS2 | SELECTOR SWITCH (WIRELESS ADDRESS SET) |
|-------------|--------------------------|------|----------------------|--|--|------|--|
| A1P | PRINTED CIRCUIT BOARD | PS | POWER SUPPLY CIRCUIT | A3P | PRINTED CIRCUIT BOARD | X24A | CONNECTOR (WIRELESS REMOTE CONTROLLER) |
| A2P | PRINTED CIRCUIT BOARD | G1D1 | EARTH LEAK DETECTOR | A4P | PRINTED CIRCUIT BOARD | X2A | CONNECTOR (ADAPTOR FOR WIRING) |
| C1 | CAPACITOR | R1T | THERMISTOR (AIR) | BS1 | PUSH BUTTON (ON/OFF) | X33A | CONNECTOR (GROUP CONTROL ADAPTOR) |
| F1U | FUSE (T, 5A, 250V) | R2T | THERMISTOR (COIL) | H1P | LIGHT EMITTING DIODE (ON-RED) | X35A | CONNECTOR (WIRELESS ADDRESS SET) |
| F2U | FIELD FUSE | R3T | THERMISTOR (HEADER) | H2P | LIGHT EMITTING DIODE (TIMER-GREEN) | X36A | WIRED REMOTE CONTROLLER |
| HAP | LIGHT EMITTING DIODE | S1L | FLOAT SWITCH | H3P | LIGHT EMITTING DIODE (FILTER SIGN-RED) | X30A | CONNECTOR (WIRELESS REMOTE CONTROLLER) |
| KPR | ISERVICE MONITOR (GREEN) | X1M | TERMINAL STRIP | H4P | LIGHT EMITTING DIODE (DEFROST-ORANGE) | X1A | CONNECTOR (WIRELESS ADDRESS SET) |
| L1 | COIL | X2M | TERMINAL STRIP | SS1 | SELECTOR SWITCH (MAIN/SUB) | X1A | CONNECTOR (WIRELESS ADDRESS SET) |
| MF | MOTOR (INDOOR FAN) | Z1C | FERRITE CORE | | | | |
| MIP | MOTOR (DRAIN PUMP) | | | | | | |

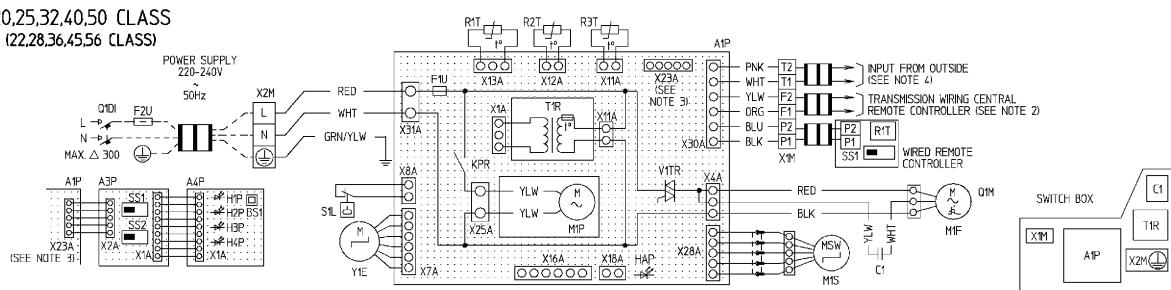
NOTES:

- : TERMINAL □□, □: CONNECTOR □: FIELD WIRING
- IN CASE OF USING A CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
- X24A, X33A AND X35A ARE CONNECTED WHEN THE OPTIONAL ACCESSORIES ARE BEING USED.
- WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY THE REMOTE CONTROLLER.
SEE INSTALLATION MANUAL FOR MORE DETAILS.
- CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCH (SS1, SS2) BY INSTALLATION MANUAL AND ENGINEERING DATA, ETC.
- COLOUR LEGEND:
RED: RED BLK: BLACK WHT: WHITE YLW: YELLOW GRN: GREEN
ORG: ORANGE BRN: BROWN GRY: GREY BLU: BLUE PNK: PINK

3TW28836-1B

S-20, 25, 32, 40, 50YM3HPQ

20,25,32,40,50 (CLASS)
(22,28,36,45,56 (CLASS))



| | | | | | |
|-----|--|------|--|------------|---|
| A1P | PRINTED CIRCUIT BOARD | T1R | TRANSFORMER (220-240V/22V) | H3P | LIGHT EMITTING DIODE (FILTER SIGN - RED) |
| C1 | CAPACITOR (MF) | V1TR | TRIAC | | |
| F1U | FUSE (⑩, 5A, 250V) | X1M | TERMINAL STRIP | H4P | LIGHT EMITTING DIODE (DEFROST - ORANGE) |
| F2U | FUSED FUSE | X2M | TERMINAL STRIP | SS1 | SELECTOR SWITCH (MAIN/SUB) |
| HAP | LIGHT EMITTING DIODE (SERVICE MONITOR GREEN) | Y1E | ELECTRONIC EXPANSION VALVE | SS2 | SELECTOR SWITCH (WIRELESS ADDRESS SET) |
| KPR | MAGNETIC RELAY (MP) | W1R | WIRED REMOTE CONTROLLER | | CONNECTOR FOR OPTIONAL PARTS |
| M1F | MOTOR (INDOOR FAN) | R1T | THERMISTOR (AIR) | | |
| M1P | MOTOR (DRAIN PUMP) | SS1 | SELECTOR SWITCH (MAIN/SUB) | X16A | CONNECTOR (ADAPTOR FOR WIRE) |
| M1S | MOTOR (SWING FLAP) | | WIRELESS REMOTE CONTROLLER (RECEIVER/DISPLAY UNIT) | | |
| Q1D | FIELD EARTH LEAK DETECTOR (MAX. 300mA) | A3P | PRINTED CIRCUIT BOARD | X1BA | CONNECTOR (ON/OFF) (WIRING ADAPTOR FOR ELECTRICAL APPENDICES) |
| Q1M | THERMAL PROTECTOR (MF EMBEDDED) | A4P | PRINTED CIRCUIT BOARD | | |
| | | BS1 | PUSH BUTTON (ON/OFF) | | |
| R1T | THERMISTOR (AIR) | H1P | LIGHT EMITTING DIODE (ON - RED) | RED/RED | PNK/PINK |
| R2T | THERMISTOR (COIL-LIQUID) | | | BLK/BLACK | ORG/ORANGE |
| R3T | THERMISTOR (COIL-GAS) | H2P | LIGHT EMITTING DIODE (TIMER - GREEN) | WHT/WHITE | GRN/GREEN |
| S1L | FLOAT SWITCH | | | YLW/YELLOW | BLUBLUE |

: TERMINAL

: CONNECTOR

— : WIRE CLAMP

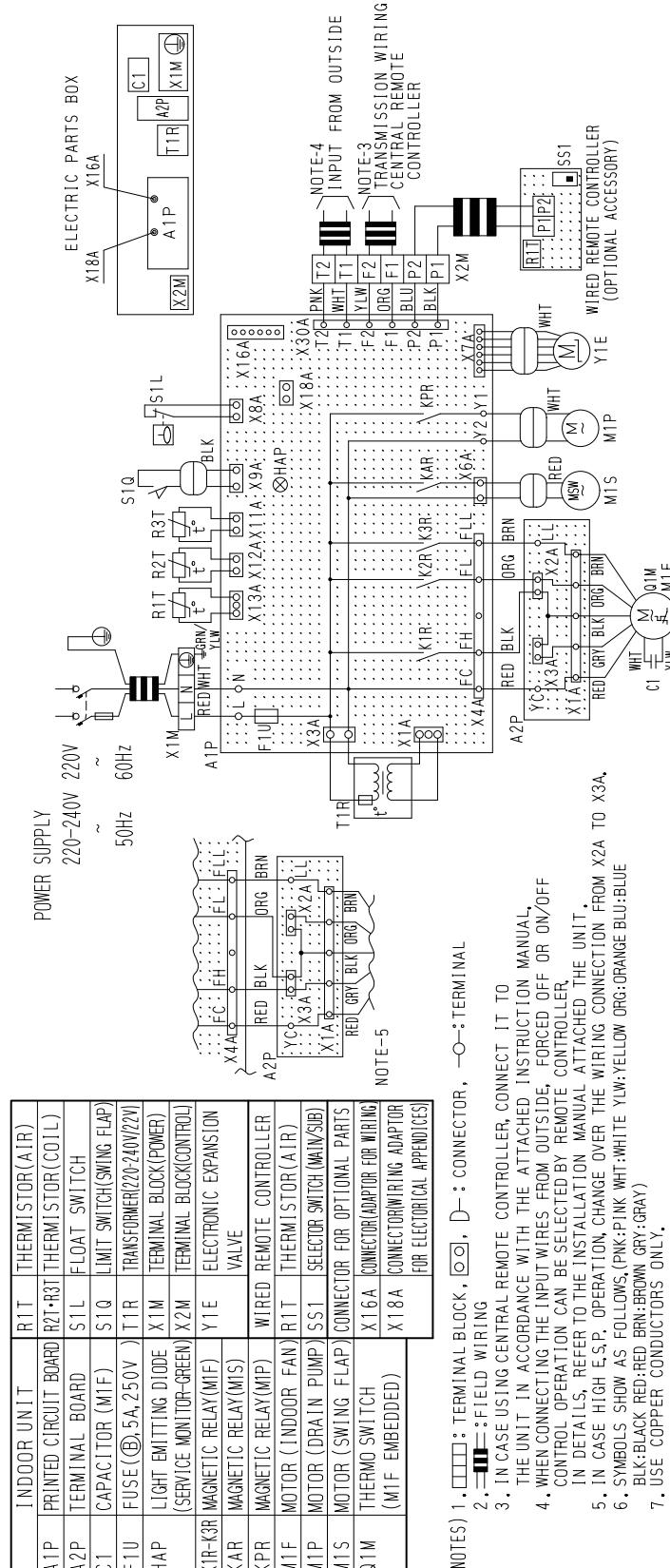
: FIELD WIRING

NOTES:

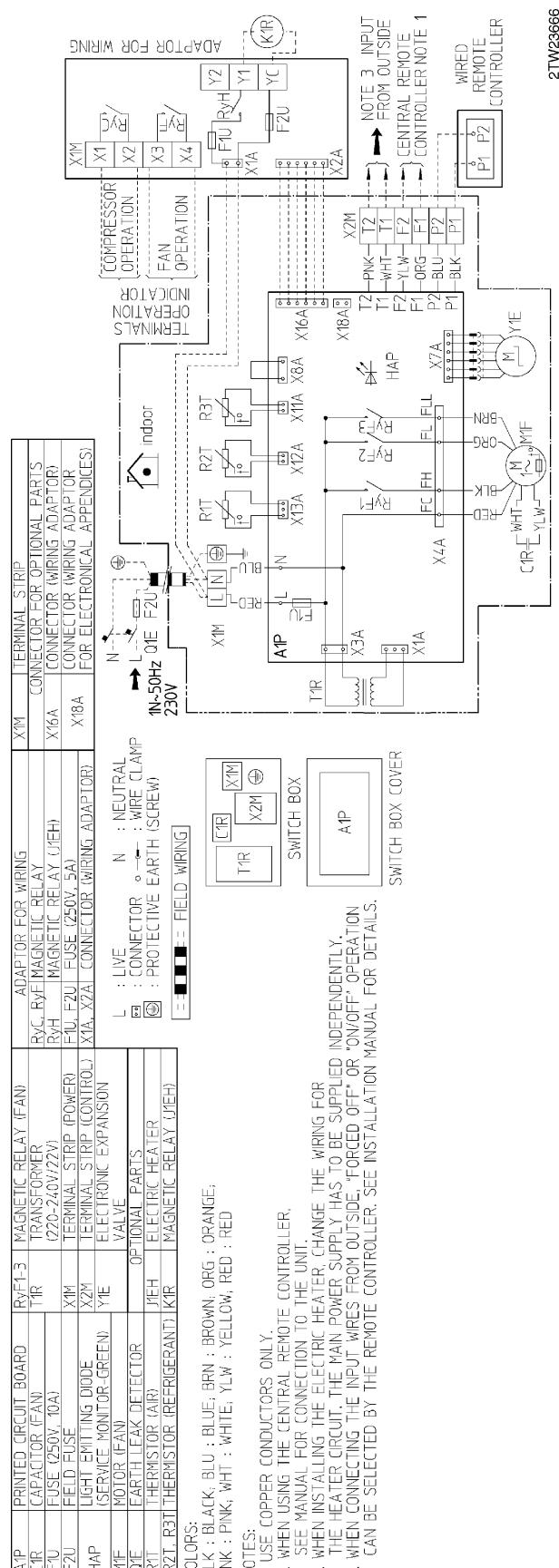
1. IN CASE OF USING A REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE TO THE ATTACHED INSTALLATION MANUAL.
 2. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
 3. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED TO THE UNIT.
 4. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM.
SEE TECHNICAL DATA AND CATALOGS, ETC. BEFORE CONNECTING.

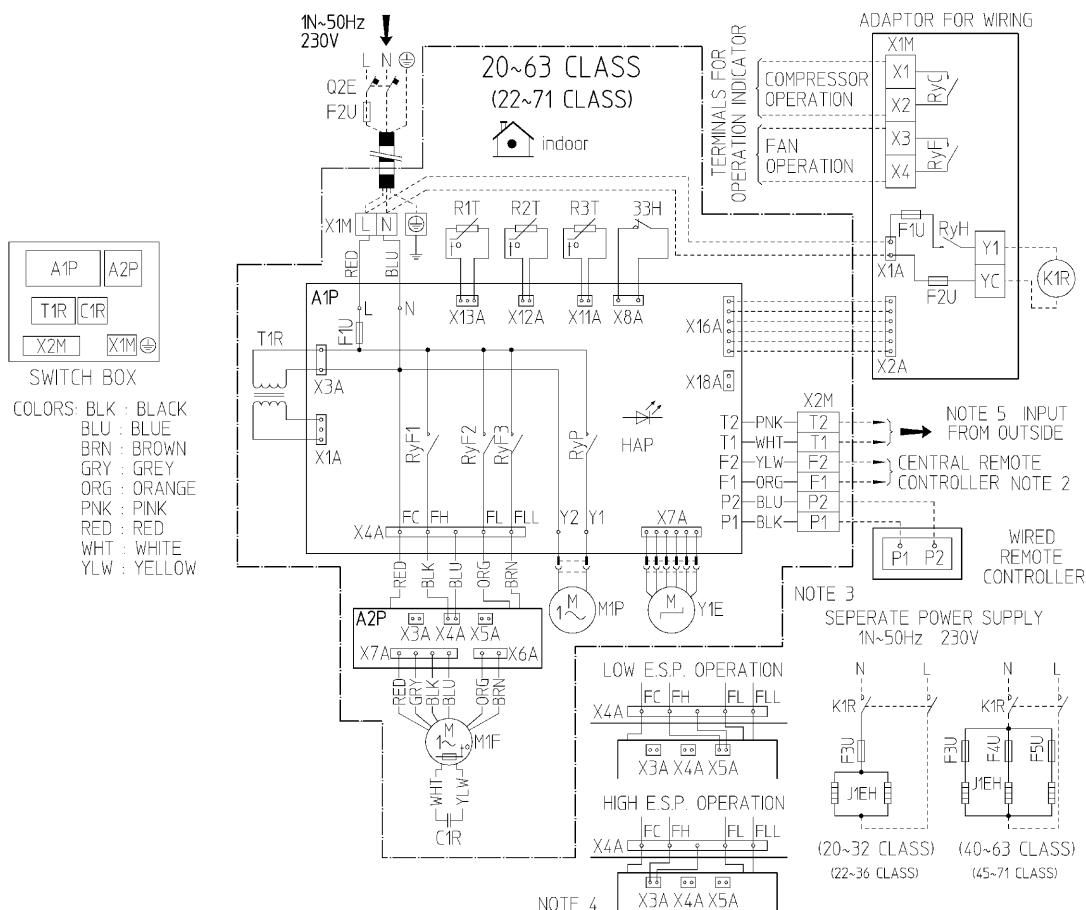
3TW26426-1B

S-25, 32, 40, 63DM3HPS



S-20, 25NM3HPQ



S-20, 25, 32, 40, 50, 63FM3HPQ

| | | | | | |
|-----|--|----------|-----------------------------|----------|--|
| B3H | FLOAT SWITCH | R1T | THERMISTOR (AIR) | K1R | MAGNETIC RELAY (J1EH) |
| A1P | PRINTED CIRCUIT BOARD | R2T, R3T | THERMISTOR (REFRIGERANT) | | ADAPTOR FOR WIRING |
| A2P | TERMINAL BOARD | RyF1-3 | MAGNETIC RELAY (FAN) | RyC, RyF | MAGNETIC RELAY |
| C1R | CAPACITOR (FAN) | RyP | MAGNETIC RELAY (DRAIN PUMP) | RyH | MAGNETIC RELAY (J1EH) |
| F1U | FUSE (250V, 10A) | T1R | TRANSFORMER (220-240V/22V) | F1U, F2U | FUSE (250V, 5A) |
| F2U | FIELD FUSE | X1M | TERMINAL STRIP (POWER) | X1A, X2A | CONNECTOR (WIRING ADAPTOR) |
| HAP | LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN) | X2M | TERMINAL STRIP (CONTROL) | X1M | TERMINAL STRIP |
| M1F | MOTOR (FAN) | Y1E | ELECTRONIC EXPANSION VALVE | | CONNECTOR FOR OPTIONAL PARTS |
| M1P | MOTOR (DRAIN PUMP) | F3-5U | OPTIONAL PARTS | X16A | CONNECTOR (WIRING ADAPTOR) |
| Q2E | EARTH LEAK DETECTOR | J1EH | FUSE (250V, 16A) | X18A | CONNECTOR (WIRING ADAPTOR FOR ELECTRONICAL APPENDICES) |
| | | | J1EH | | |

FIELD WIRING

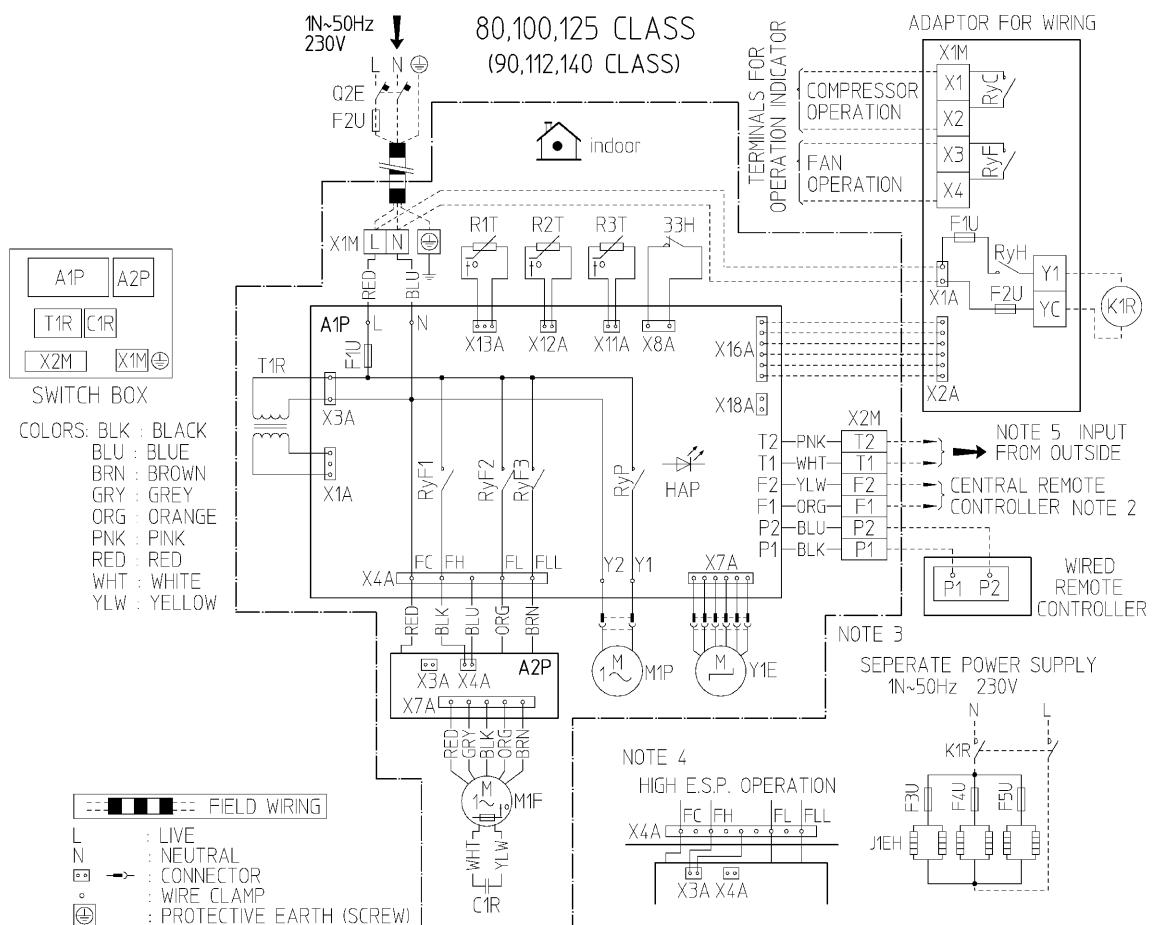
- : LIVE
- : NEUTRAL
- : CONNECTOR
- : WIRE CLAMP
- : PROTECTIVE EARTH (SCREW)

NOTES :

1. USE COPPER CONDUCTORS ONLY.
2. WHEN USING THE CENTRAL REMOTE CONTROLLER, SEE MANUAL FOR CONNECTION TO THE UNIT.
3. WHEN INSTALLING THE ELECTRIC HEATER, CHANGE THE WIRING FOR THE HEATER CIRCUIT.
THE MAIN POWER SUPPLY HAS TO BE SUPPLIED INDEPENDENTLY.
4. FOR HIGH OR LOW E.S.P. OPERATION, CHANGE THE WIRING CONNECTION OF X4A AS SHOWN ON THE WIRING DIAGRAM.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, 'FORCED OFF' OR 'ON/OFF' OPERATION CAN BE SELECTED BY THE REMOTE CONTROLLER. SEE INSTALLATION MANUAL FOR MORE DETAILS.

2TW23686-1C

S80, 100, 125FM3HPQ



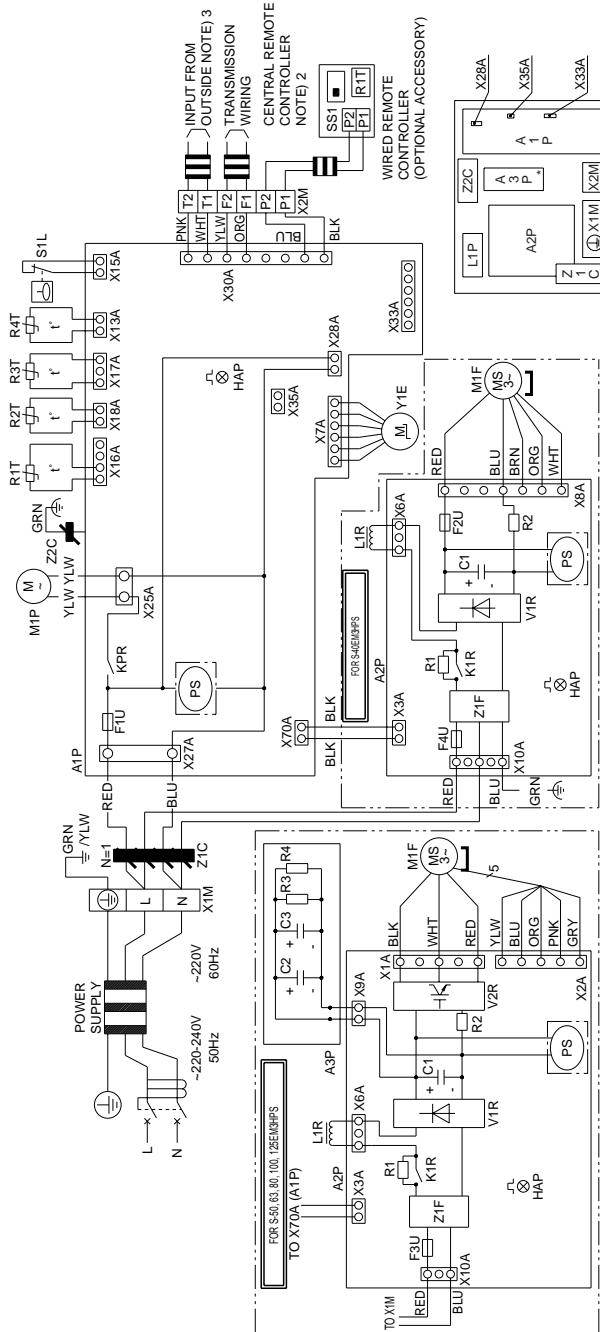
| | | | | |
|-----|--|----------|-----------------------------|--|
| 33H | FLOAT SWITCH | R2T, R3T | THERMISTOR (REFRIGERANT) | ADAPTOR FOR WIRING |
| A1P | PRINTED CIRCUIT BOARD | RyF1-3 | MAGNETIC RELAY (FAN) | RyC, RyF |
| A2P | TERMINAL BOARD | RyP | MAGNETIC RELAY (DRAIN PUMP) | MAGNETIC RELAY |
| C1R | CAPACITOR (FAN) | T1R | TRANSFORMER (220V/27V) | MAGNETIC RELAY (J1EH) |
| F1U | FUSE (250V, 10A) | X1M | TERMINAL STRIP (POWER) | F1U, F2U |
| F2U | FIELD FUSE | X2M | TERMINAL STRIP (CONTROL) | FUSE (250V, 5A) |
| HAP | LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN) | Y1E | ELECTRONIC EXPANSION VALVE | X1A, X2A |
| M1F | MOTOR (FAN) | F3-5U | OPTIONAL PARTS | CONNECTOR (WIRING ADAPTOR) |
| M1P | MOTOR (DRAIN PUMP) | J1EH | FUSE (250V, 16A) | X16A |
| Q2E | EARTH LEAK DETECTOR | K1R | ELECTRIC HEATER | CONNECTOR (WIRING ADAPTOR FOR ELECTRONICAL APPENDICES) |
| R1T | THERMISTOR (AIR) | | | |

NOTES :

1. USE COPPER CONDUCTORS ONLY.
2. WHEN USING THE CENTRAL REMOTE CONTROLLER, SEE MANUAL FOR CONNECTION TO THE UNIT.
3. WHEN INSTALLING THE ELECTRIC HEATER, CHANGE THE WIRING FOR THE HEATER CIRCUIT. THE MAIN POWER SUPPLY HAS TO BE SUPPLIED INDEPENDENTLY.
4. FOR HIGH E.S.P. OPERATION, CHANGE THE WIRING CONNECTION OF X4A AS SHOWN ON THE WIRING DIAGRAM.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED "OFF" OR "ON/OFF" OPERATION CAN BE SELECTED BY THE REMOTE CONTROLLER.
SEE INSTALLATION MANUAL FOR MORE DETAILS.

2TW23736-1C

S-40, 50, 63, 80, 100, 125EM3HPS



*ONLY FXM050PVE • 63PVE • 80PVE • 100PVE • 125PVE

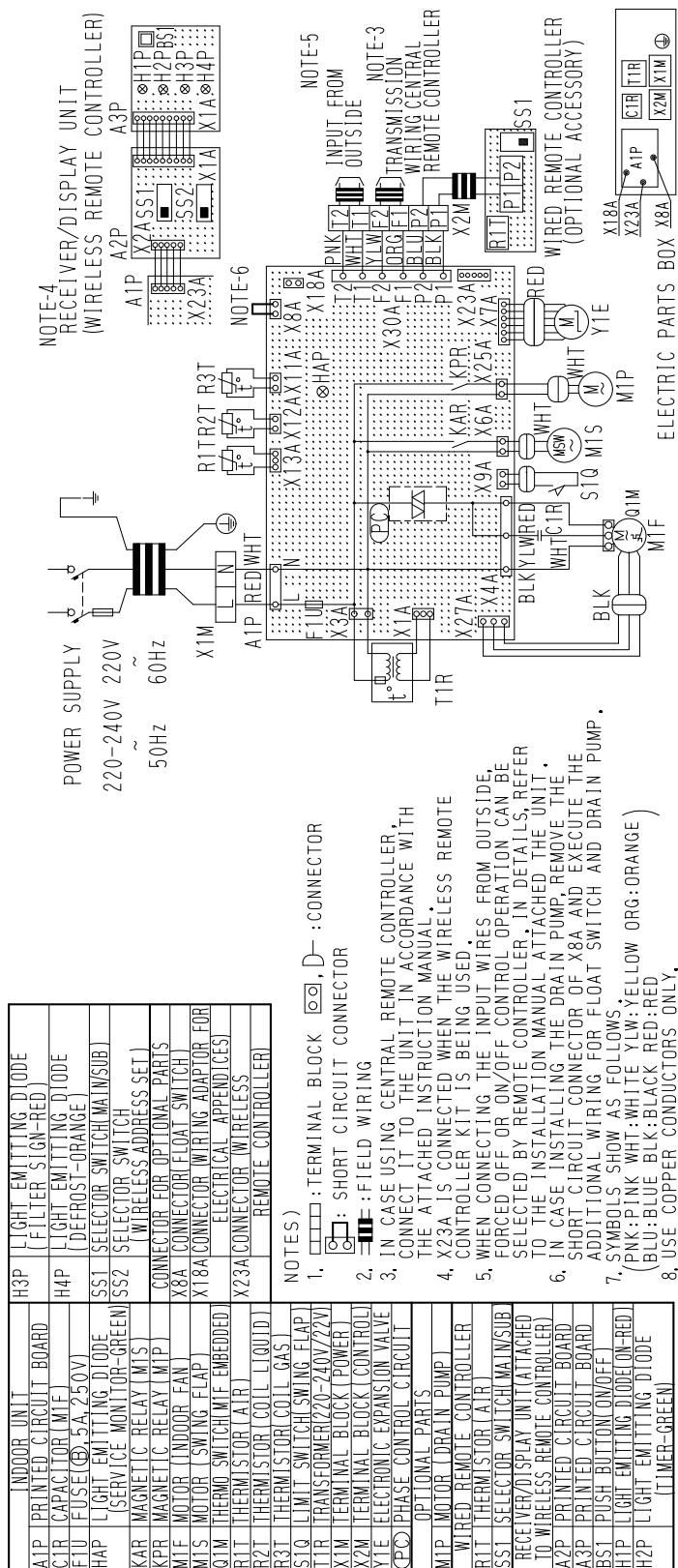
| INDOOR UNIT | | PS | SWITCHING POWER SUPPLY (A1P, A2P) | Y1E | ELECTRONIC EXPANSION VALVE |
|-------------|-----------------------------------|--------|--|----------|---|
| A1P | PRINTED CIRCUIT BOARD | R1 | RESISTOR (CURRENT LIMITING) | Z1C, Z2C | NOISE FILTER (FERRITE CORE) |
| A2P | PRINTED CIRCUIT BOARD (FAN) | R2 | CURRENT SENSING DEVICE | Z1F | NOISE FILTER |
| A3P | PRINTED CIRCUIT BOARD (CAPACITOR) | R3, R4 | RESISTOR (ELECTRIC DISCHARGE) | X28A | CONNECTOR OPTIONAL (POWER SUPPLY FOR WIRING) |
| C1, C2, C3 | CAPACITOR | F1U | FUSE (T, 3.15A, 250V) | R1T | TERMINATOR (SUCTION AIR) |
| F2U | FUSE (T, 5A, 250V) | F3U | FUSE (T, 6.3A, 250V) | R2T | TERMINATOR (LIQUID) |
| F4U | FUSE (T, 6.3A, 250V) | HAP | LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN) | R3T | TERMINATOR (GAS) |
| KPR | MAGNETIC RELAY | K1R | MAGNETIC RELAY | R4T | TERMINATOR (DISCHARGE AIR) |
| L1R | REACTOR | M1F | MOTOR (FAN) | S1L | FLOAT SWITCH |
| M1P | MOTOR (DRAIN PUMP) | | | V1R | DIODE BRIDGE |
| | | | | V2R | POWER MODULE |
| | | | | X1M | TERMINAL STRIP (POWER SUPPLY) |
| | | | | X2M | TERMINAL STRIP (CONTROL) |
| | | | | SS1 | SELECTOR SWITCH (MAIN/SUB) |

NOTES) 1. : TERMINAL : CONNECTOR : FIELD WIRING
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.

3. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.

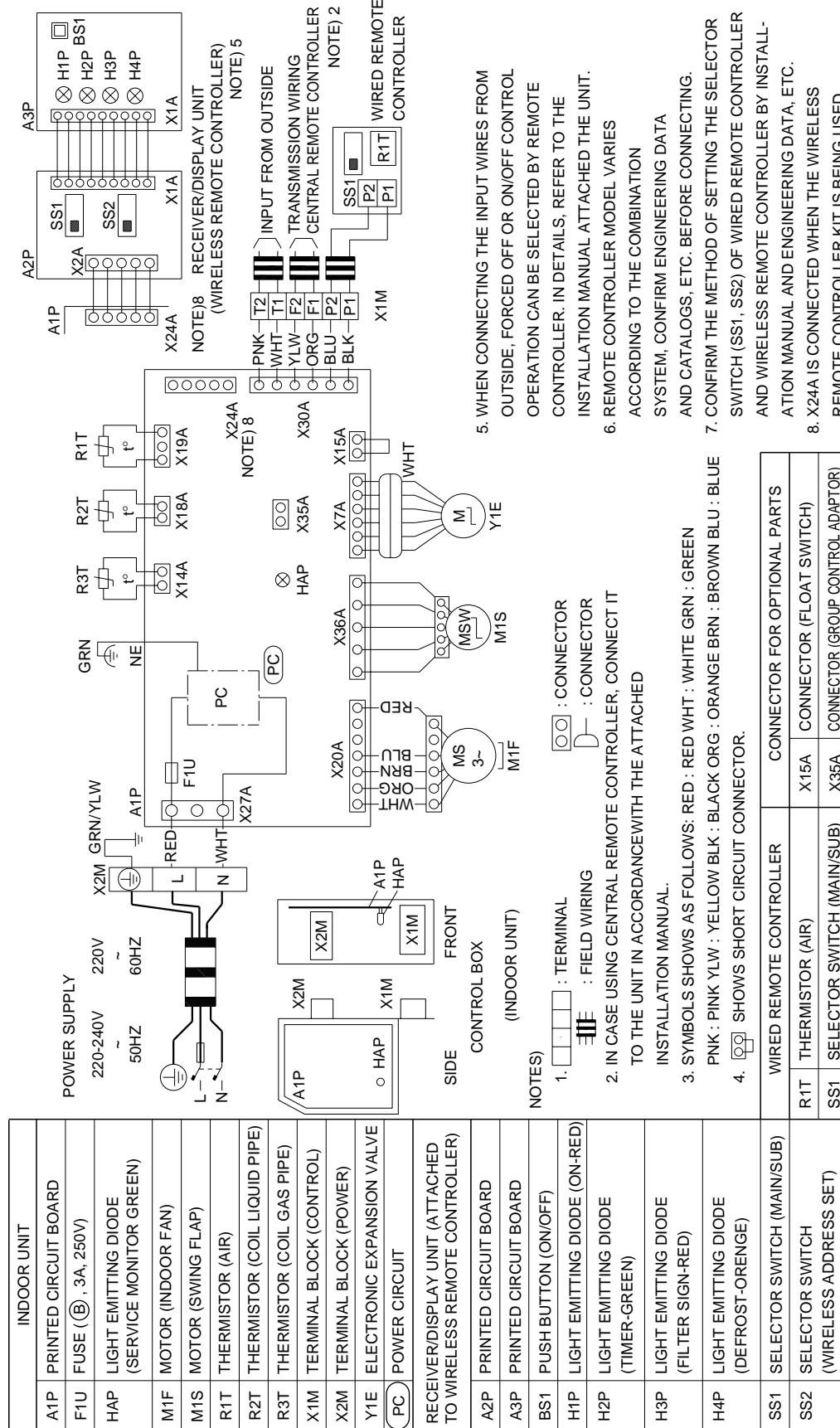
4. COLORS BLK: BLACK RED: RED BLU: BLUE WHT: WHITE PNK: PINK YLW: YELLOW BRN: BROWN GRY: GRAY GRN: GREEN ORG: ORANGE.

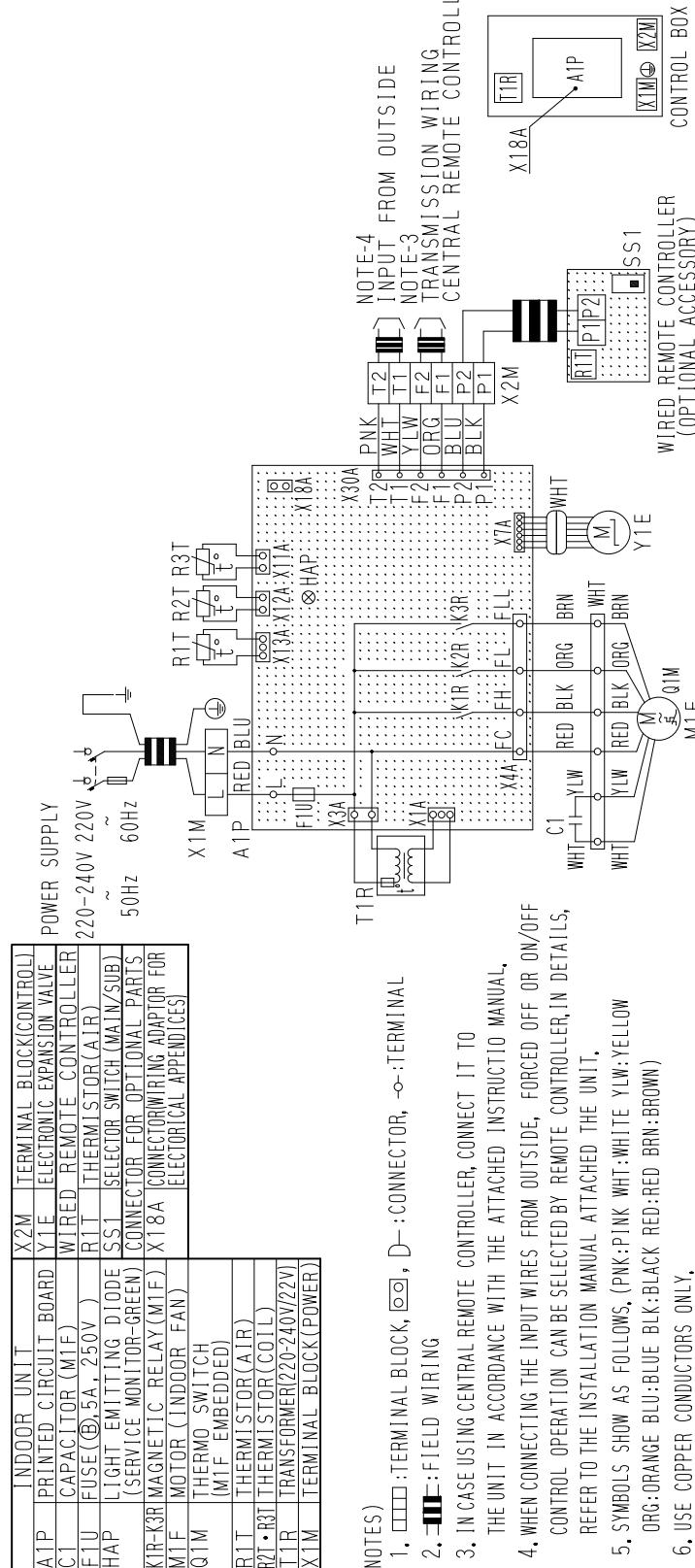
S-32, 63, 100TM3JPR



3D039801D

S-20, 25, 32, 40, 50, 63KM3HPR



S-20, 25, 32, 40, 50, 63PM3HPS**S-20, 25, 32, 40, 50, 63RM3HPS**

3. Option List

3.1 Option List of Controllers

Operation Control System Optional Accessories

| No. | Item | Type | UM4 | YM3 | LM3 | DM3 | NM3 | FM3 | EM3 | TM3 | KM3 | PM3 | RM3 |
|-----|---|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|
| 1 | Wired remote control | | | | | | | | CZ-02RT11P | | | | |
| 2 | Infrared remote control | | CZ-02RWU12P | CZ-01RWY12P | CZ-01RWL12P | CZ-02RWD12P | | CZ-02RWF12P | CZ-02RWF12P | CZ-02RWT12P | CZ-01RWK12P | CZ-02RWF12P | |
| 3 | Simplified remote control | | | — | | | | CZ-02RE11P | | — | | CZ-02RE11P | |
| 4 | Simplified remote control for hotel use | | | — | | | | CZ-03RE11P | | — | | CZ-03RE11P | |
| 5 | Centralised remote control | | | | | | | CZ-02ESM11P | | | | | |
| 6 | Unified ON/OFF control | | | | | | | CZ-01ANA11P | | | | | |
| 7 | Schedule timer | | | | | | | CZ-01ESW11P | | | | | |
| 8 | Wiring adapter | | — | KRP1B57*1 | — | KRP1B61 | KRP1B61 | — | KRP1C6 | KRP1B3 | — | KRP1B61 | |
| 9 | Wiring adapter (hour meter) | | EKR1C11*1 | — | EKR1B2 | — | EKR1B2*2 | EKR1B2 | — | | | — | |
| 10 | Wiring adapter for electrical appendices (1) | | KRP2A526*1 | KRP2A516*1 | KRP2A61 | KRP2A516 | KRP2A516 | KRP2A61 | KRP2A61 | KRP2A62* | | KRP2A51 | |
| 11 | Wiring adapter for electrical appendices (2) | | KRP4AA531 | KRP4A536*1 | KRP4A516*1 | KRP4A51 | KRP4A516 | KRP4A516 | KRP4A51 | KRP4A52* | | KRP4A51 | |
| 12 | Remote sensor | | KRCS01-4 | | | | | | KRCS01-1B | | | | |
| 13 | Installation box for adapter PCB | | KRP1H98 | KRP1BA101 | KRP1B98*3/4 | | — | KRP1BA101 | — | KRP1C93*3 | KRP4A93*3/4 | — | |
| 14 | Electrical box with earth terminal (3 blocks) | | — | | | | | | KJB311A | | | | |
| 15 | Electrical box with earth terminal (2 blocks) | | KJB212AA | | | | | | KJB212A | | | | |
| 16 | Noise filter (for electromagnetic interface only) | | — | | | | | | KEK26-1A | | | | |
| 17 | External control adaptor | | — | CZ-104AP13P | CZ-104AP12P | CZ-104AP12P | CZ-104AP12P | CZ-104AP12P | CZ-104AP13P | CZ-104AP12P | CZ-104AP12P | CZ-104AP12P | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Note:

1. Installation box is required
2. Fixingbox is KRP1A90
3. Up to 2 adapters can be fixed per installation box
4. Only 1 installation box can be installed per indoor unit

Various PC Boards

| No. | Part name | Model No. | Function |
|-----|-------------------------|--|---|
| 1 | Adaptor for wiring | KRP1B56 KRP1B57 KRP1B61 KRP1B3 KRP4A53 | ■ PC board when equipped with auxiliary electric heater in the indoor unit. |
| 2 | UM-NET Expander Adaptor | CZ-109AP11P | ■ Up to 1,024 units can be centrally controlled in 64 different groups. ■ Wiring restrictions (max. length: 1,000 m, total wiring length: 2,000 m, max. number of branches: 16) apply to each adaptor. |

System Configuration

| No. | Part name | Model No. | Function |
|-----|---|-----------------------|--|
| 1 | Central remote controller | CZ-02ESM11P | • Up to 64 groups of indoor units(128 units) can be connected, and ON/OFF, temperature setting and monitoring can be accomplished individually or simultaneously. Connectable up to 2 controllers in one system. |
| 1-1 | Electrical box with earth terminal (3 blocks) | KJB311A | |
| 2 | Unified ON/OFF controller | CZ-01ANA11P | • Up to 16 groups of indoor units(128 units) can be turned, ON/OFF individually or simultaneously, and operation and malfunction can be displayed. Can be used in combination with up to 8 controllers. |
| 2-1 | Electrical box with earth terminal (2 blocks) | KJB212A | |
| 2-2 | Noise filter (for electromagnetic interface use only) | KEK26-1 | |
| 3 | Schedule timer | CZ-01ESW11P | • Programmed time weekly schedule can be controlled by unified control for up to 64 groups of indoor units (128 units). Can turn units ON/OFF twice per day. |
| 4 | Interface adaptor for US series | R-407C/R-22 R-410A | ★CZ-102AP11P ★CZ-112AP11P |
| 5 | Central control adaptor kit | For UAT(Y)-K(A),FD-K | ★DTA107A55 |
| 6 | Wiring adaptor for other air-conditioner | ★CZ-103AP11P | * To use any of the above optional controllers, an appropriate adaptor must be installed on the product unit to be controlled. |
| 7 | UM-NET Expander Adaptor | CZ-109AP11P | • Up to 1024 units can be centrally controlled in 64 different groups. • Wiring restrictions (max. length : 1,000m, total wiring length : 2,000m, max. number of branches : 16) apply to each adaptor. |
| 7-1 | Mounting plate | KRP4A92 | • Fixing plate for CZ-109AP11P |

Note:

1. Installation box for * adaptor must be procured on site.

3.2 Option List of Outdoor Unit

U-4..6ML5DPQ, U-4..6ML5XPQ

| Optional accessories | | U-4ML5XPQ U-5ML5XPQ U-6ML5XPQ | U-4ML5DPQ U-5ML5DPQ U-6ML5DPQ |
|------------------------|---------------|-------------------------------------|-------------------------------------|
| Cool/Heat Selector | | CZ-02RD12P | |
| Fixing box | | K-JB111A | |
| Distributive Piping | Refnet header | CZ-P29HK32Q | |
| | Refnet joint | CZ-P20BK32Q | |
| Central drain plug | | K-KPJ5F180 | |

4TW26101

4. Example of Connection

| Example of connection (Connection of 8 indoor units Heat pump system) | | | Branch with refnet joint | Branch with refnet joint and refnet header | Branch with refnet header | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|--|---|-----------------------------|--------------|--------------|--|----------------------------|-----------------------------|--------------|--------------|--------------------------|--------------|--|--|--|----------|-------------|-----------|----------|--|-----------------------|--|--|--|----------|-------------|----------------|-----------|----------|---------------|-----------|----------|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maximum allowable length | Between outdoor and indoor units | Actual pipe length | Pipe length between outdoor and indoor units 150 m [Example] unit 8: a+b+c+d+e+f+g+p 150 m | [Example] unit 6: a+b+h 150 m, unit 8: a+i+k 150 m | [Example] unit 8: a+i 150 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Equivalent length | Equivalent pipe length between outdoor and indoor units 175 m (Assume equivalent pipe length of refnet joint to be 0.5 m and of the refnet header to be 1.0 m. (for calculation purposes)) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Total extension length | Total piping length from outdoor unit to all indoor units between 10 m and 300 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allowable height | Between outdoor and indoor units | Difference in height | Difference in height between outdoor and indoor units (H1) 50 m (40 m if outdoor unit is located in a lower position). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Between indoor and indoor units | Difference in height | Difference in height between adjacent indoor units (H2) 15 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allowable length after the branch | | Actual pipe length | Pipe length from first refrigerant branch kit (either refnet joint or refnet header) to indoor unit 40 m [Example] unit 8: b+c+d+e+f+g+p 40 m | [Example] unit 6: b+h 40 m, unit 8: i+k 40 m | [Example] unit 8: i 40 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Refrigerant branch kit selection | | | Use the following refnet joint | Use the following refnet header | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Refrigerant branch kits can only be used with R-410A. | | | <table border="1"> <tr> <th>Outdoor unit capacity type</th> <th>Refrigerant branch kit name</th> </tr> <tr> <td>U-4..6ML5</td> <td>CZ-P20BK32Q</td> </tr> </table> | Outdoor unit capacity type | Refrigerant branch kit name | U-4..6ML5 | CZ-P20BK32Q | <table border="1"> <tr> <th>Outdoor unit capacity type</th> <th>Refrigerant branch kit name</th> </tr> <tr> <td>U-4..6ML5</td> <td>CZ-P29HK32Q</td> </tr> </table> | Outdoor unit capacity type | Refrigerant branch kit name | U-4..6ML5 | CZ-P29HK32Q | | | | | | | | | | | | | | | | | | | | | | |
| Outdoor unit capacity type | Refrigerant branch kit name | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U-4..6ML5 | CZ-P20BK32Q | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Outdoor unit capacity type | Refrigerant branch kit name | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U-4..6ML5 | CZ-P29HK32Q | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pipe size selection Caution on selecting connection pipes If the overall equivalent piping length is 90 m, be sure to enlarge the pipe diameter of the gas-side main piping. If the recommended pipe size is not available, stick to the original pipe diameter (which may result in a small capacity decrease). [Gas side] U-4..5ML5: Ø15.9, Ø19.1 U-6ML5: Ø19.1, Ø22.2 | <p>Main pipe (enlarge) First refrigerant branch kit Indoor unit</p> | <p>A. Piping between outdoor unit and refrigerant branch kit</p> <ul style="list-style-type: none"> Match to the size of the connection piping on the outdoor unit. <p>Outdoor unit connection piping size</p> <table border="1"> <thead> <tr> <th>Outdoor unit capacity type</th> <th colspan="2">Piping size (outer diameter x minimum thickness)</th> </tr> <tr> <th></th> <th>Gas pipe</th> <th>Liquid pipe</th> </tr> </thead> <tbody> <tr> <td>U-4..5ML5</td> <td>Ø15.9x1.0 (Ø19.1x1.0)</td> <td>Ø9.5x0.8</td> </tr> <tr> <td>U-6ML5</td> <td>Ø19.1x1.0 (Ø22.2x1.0)</td> <td></td> </tr> </tbody> </table> | Outdoor unit capacity type | Piping size (outer diameter x minimum thickness) | | | Gas pipe | Liquid pipe | U-4..5ML5 | Ø15.9x1.0 (Ø19.1x1.0) | Ø9.5x0.8 | U-6ML5 | Ø19.1x1.0 (Ø22.2x1.0) | | <p>B. Piping between refrigerant branch kits</p> <ul style="list-style-type: none"> Use the pipe size from the following table. <table border="1"> <thead> <tr> <th colspan="2">Piping size (outer diameter x minimum thickness)</th> </tr> <tr> <th>Gas pipe</th> <th>Liquid pipe</th> </tr> </thead> <tbody> <tr> <td>Ø15.9x1.0</td> <td>Ø9.5x0.8</td> </tr> </tbody> </table> | Piping size (outer diameter x minimum thickness) | | Gas pipe | Liquid pipe | Ø15.9x1.0 | Ø9.5x0.8 | <p>C. Piping between refrigerant branch kit and indoor unit</p> <ul style="list-style-type: none"> Pipe size for direct connection to indoor unit must be the same as the connection size of indoor unit. <table border="1"> <thead> <tr> <th>Indoor capacity index</th> <th colspan="2">Piping size (outer diameter x minimum thickness)</th> </tr> <tr> <th></th> <th>Gas pipe</th> <th>Liquid pipe</th> </tr> </thead> <tbody> <tr> <td>20+25+32+40+50</td> <td>Ø12.7x0.8</td> <td>Ø6.4x0.8</td> </tr> <tr> <td>63+80+100+125</td> <td>Ø15.9x1.0</td> <td>Ø9.5x0.8</td> </tr> </tbody> </table> | Indoor capacity index | Piping size (outer diameter x minimum thickness) | | | Gas pipe | Liquid pipe | 20+25+32+40+50 | Ø12.7x0.8 | Ø6.4x0.8 | 63+80+100+125 | Ø15.9x1.0 | Ø9.5x0.8 |
| Outdoor unit capacity type | Piping size (outer diameter x minimum thickness) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Gas pipe | Liquid pipe | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U-4..5ML5 | Ø15.9x1.0 (Ø19.1x1.0) | Ø9.5x0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U-6ML5 | Ø19.1x1.0 (Ø22.2x1.0) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Piping size (outer diameter x minimum thickness) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas pipe | Liquid pipe | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ø15.9x1.0 | Ø9.5x0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Indoor capacity index | Piping size (outer diameter x minimum thickness) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Gas pipe | Liquid pipe | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+25+32+40+50 | Ø12.7x0.8 | Ø6.4x0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63+80+100+125 | Ø15.9x1.0 | Ø9.5x0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How to calculate the additional refrigerant to be charged Additional refrigerant to be charged R (kg) R should be rounded off in units of 0.1 kg | | $R = \left(\text{Total length (m) of liquid piping size at } \varnothing 9.5 \right) \times 0.054 + \left(\text{Total length (m) of liquid piping size at } \varnothing 6.4 \right) \times 0.022$ | | Example for refrigerant branch using refnet joint and refnet header <table border="1"> <tr> <td>a: Ø9.5x30 m</td> <td>d: Ø9.5x13 m</td> <td>g: Ø6.4x10 m</td> <td>j: Ø6.4x10 m</td> </tr> <tr> <td>b: Ø9.5x10 m</td> <td>e: Ø6.4x10 m</td> <td>h: Ø6.4x20 m</td> <td>k: Ø6.4x9 m</td> </tr> <tr> <td>c: Ø9.5x10 m</td> <td>f: Ø6.4x10 m</td> <td>i: Ø9.5x10 m</td> <td></td> </tr> </table> | | a: Ø9.5x30 m | d: Ø9.5x13 m | g: Ø6.4x10 m | j: Ø6.4x10 m | b: Ø9.5x10 m | e: Ø6.4x10 m | h: Ø6.4x20 m | k: Ø6.4x9 m | c: Ø9.5x10 m | f: Ø6.4x10 m | i: Ø9.5x10 m | | | | | | | | | | | | | | | | | | |
| a: Ø9.5x30 m | d: Ø9.5x13 m | g: Ø6.4x10 m | j: Ø6.4x10 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b: Ø9.5x10 m | e: Ø6.4x10 m | h: Ø6.4x20 m | k: Ø6.4x9 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c: Ø9.5x10 m | f: Ø6.4x10 m | i: Ø9.5x10 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $R = [73 \times 0.054] + [69 \times 0.022] = 5.46 \quad 5.5 \text{ kg}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

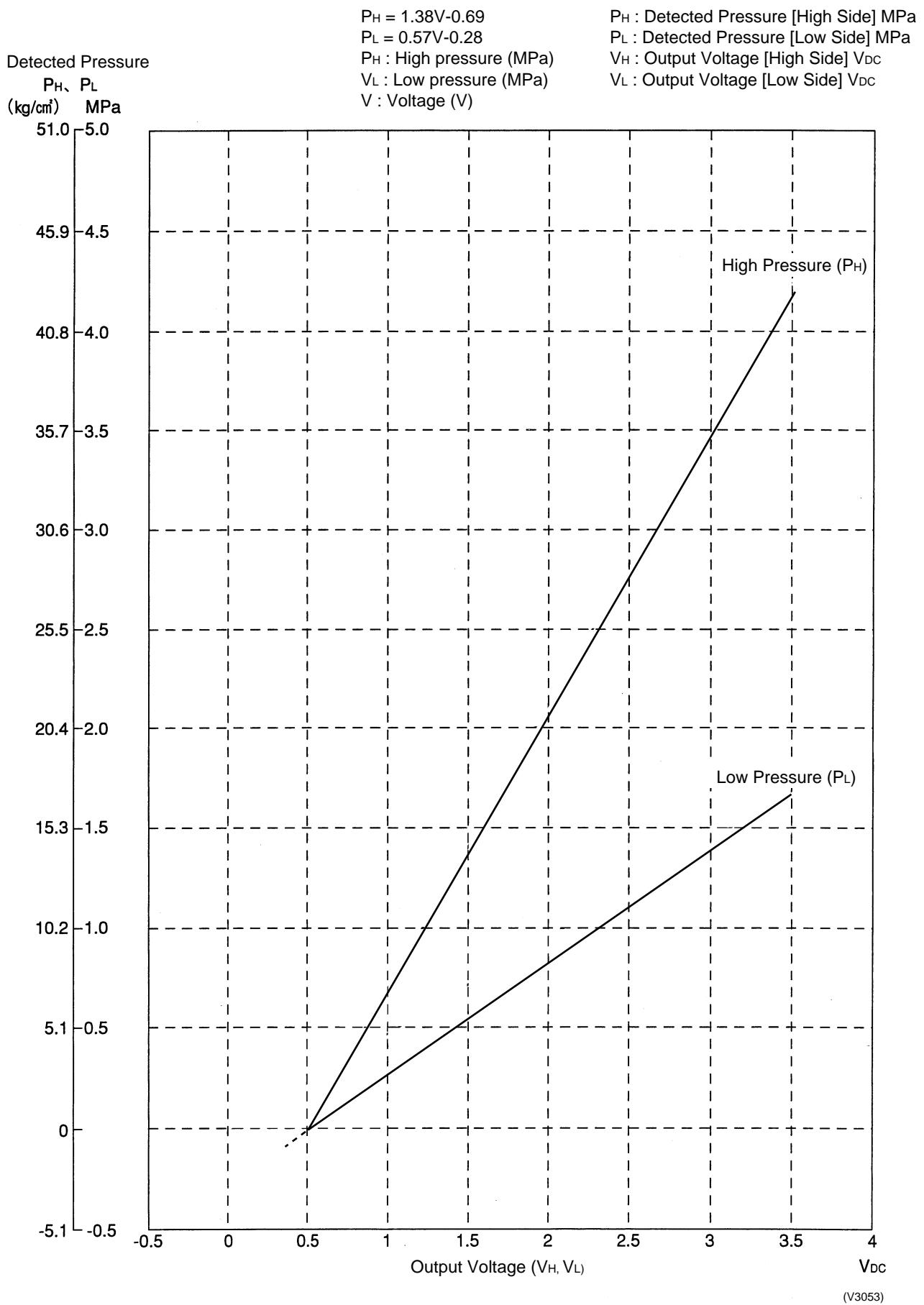
5. Thermistor Resistance / Temperature Characteristics

| | | | | |
|---------------------------------|------|--------------|--------------------------------------|------------------|
| Outdoor unit for fin thermistor | R1T | Indoor unit | For air suction | R1T |
| | | | For liquid pipe | R2T |
| | | | For gas pipe | R3T |
| | | Outdoor unit | For outdoor air | R1T |
| | | | For suction pipe 1 | R3T |
| | | | For heat exchanger | R4T, R6T |
| | | | For suction pipe 2 | R5T |
| | | | For Subcooling heat exchanger outlet | R6T, R4T |
| | | | For Liquid pipe | R7T, R8T (kΩ) |
| T°C | 0.0 | T°C | 0.0 | 0.5 |
| -10 | - | -20 | 197.81 | 192.08 |
| -8 | - | -19 | 186.53 | 181.16 |
| -6 | 88.0 | -18 | 175.97 | 170.94 |
| -4 | 79.1 | -17 | 166.07 | 161.36 |
| -2 | 71.1 | -16 | 156.80 | 152.38 |
| 0 | 64.1 | -15 | 148.10 | 143.96 |
| 2 | 57.8 | -14 | 139.94 | 136.05 |
| 4 | 52.3 | -13 | 132.28 | 128.63 |
| 6 | 47.3 | -12 | 125.09 | 121.66 |
| 8 | 42.9 | -11 | 118.34 | 115.12 |
| 10 | 38.9 | -10 | 111.99 | 108.96 |
| 12 | 35.3 | -9 | 106.03 | 103.18 |
| 14 | 32.1 | -8 | 100.41 | 97.73 |
| 16 | 29.2 | -7 | 95.14 | 92.61 |
| 18 | 26.6 | -6 | 90.17 | 87.79 |
| 20 | 24.3 | -5 | 85.49 | 83.25 |
| 22 | 22.2 | -4 | 81.08 | 78.97 |
| 24 | 20.3 | -3 | 76.93 | 74.94 |
| 26 | 18.5 | -2 | 73.01 | 71.14 |
| 28 | 17.0 | -1 | 69.32 | 67.56 |
| 30 | 15.6 | 0 | 65.84 | 64.17 |
| 32 | 14.2 | 1 | 62.54 | 60.96 |
| 34 | 13.1 | 2 | 59.43 | 57.94 |
| 36 | 12.0 | 3 | 56.49 | 55.08 |
| 38 | 11.1 | 4 | 53.71 | 52.38 |
| 40 | 10.3 | 5 | 51.09 | 49.83 |
| 42 | 9.5 | 6 | 48.61 | 47.42 |
| 44 | 8.8 | 7 | 46.26 | 45.14 |
| 46 | 8.2 | 8 | 44.05 | 42.98 |
| 48 | 7.6 | 9 | 41.95 | 40.94 |
| 50 | 7.0 | 10 | 39.96 | 39.01 |
| 52 | 6.7 | 11 | 38.08 | 37.18 |
| 54 | 6.0 | 12 | 36.30 | 35.45 |
| 56 | 5.5 | 13 | 34.62 | 33.81 |
| 58 | 5.2 | 14 | 33.02 | 32.25 |
| 60 | 4.79 | 15 | 31.50 | 30.77 |
| 62 | 4.46 | 16 | 30.06 | 29.37 |
| 64 | 4.15 | 17 | 28.70 | 28.05 |
| 66 | 3.87 | 18 | 27.41 | 26.78 |
| 68 | 3.61 | 19 | 26.18 | 25.59 |
| 70 | 3.37 | 20 | 25.01 | 24.45 |
| 72 | 3.15 | 21 | 23.91 | 23.37 |
| 74 | 2.94 | 22 | 22.85 | 22.35 |
| 76 | 2.75 | 23 | 21.85 | 21.37 |
| 78 | 2.51 | 24 | 20.90 | 20.45 |
| 80 | 2.41 | 25 | 20.00 | 19.56 |
| 82 | 2.26 | 26 | 19.14 | 18.73 |
| 84 | 2.12 | 27 | 18.32 | 17.93 |
| 86 | 1.99 | 28 | 17.54 | 17.17 |
| 88 | 1.87 | 29 | 16.80 | 16.45 |
| 90 | 1.76 | 30 | 16.10 | 15.76 |
| 92 | 1.65 | | | |
| 94 | 1.55 | | | |
| 96 | 1.46 | | | |
| 98 | 1.38 | | | |

Outdoor Unit**Thermistors for
Discharge Pipe
(R2T)**

| T°C | 0.0 | 0.5 | T°C | 0.0 | 0.5 | T°C | 0.0 | 0.5 | (kΩ) |
|-----|--------|--------|-----|-------|-------|-----|-------|-------|------|
| 0 | 640.44 | 624.65 | 50 | 72.32 | 70.96 | 100 | 13.35 | 13.15 | |
| 1 | 609.31 | 594.43 | 51 | 69.64 | 68.34 | 101 | 12.95 | 12.76 | |
| 2 | 579.96 | 565.78 | 52 | 67.06 | 65.82 | 102 | 12.57 | 12.38 | |
| 3 | 552.00 | 538.63 | 53 | 64.60 | 63.41 | 103 | 12.20 | 12.01 | |
| 4 | 525.63 | 512.97 | 54 | 62.24 | 61.09 | 104 | 11.84 | 11.66 | |
| 5 | 500.66 | 488.67 | 55 | 59.97 | 58.87 | 105 | 11.49 | 11.32 | |
| 6 | 477.01 | 465.65 | 56 | 57.80 | 56.75 | 106 | 11.15 | 10.99 | |
| 7 | 454.60 | 443.84 | 57 | 55.72 | 54.70 | 107 | 10.83 | 10.67 | |
| 8 | 433.37 | 423.17 | 58 | 53.72 | 52.84 | 108 | 10.52 | 10.36 | |
| 9 | 413.24 | 403.57 | 59 | 51.98 | 50.96 | 109 | 10.21 | 10.06 | |
| 10 | 394.16 | 384.98 | 60 | 49.96 | 49.06 | 110 | 9.92 | 9.78 | |
| 11 | 376.05 | 367.35 | 61 | 48.19 | 47.33 | 111 | 9.64 | 9.50 | |
| 12 | 358.88 | 350.62 | 62 | 46.49 | 45.67 | 112 | 9.36 | 9.23 | |
| 13 | 342.58 | 334.74 | 63 | 44.86 | 44.07 | 113 | 9.10 | 8.97 | |
| 14 | 327.10 | 319.66 | 64 | 43.30 | 42.54 | 114 | 8.84 | 8.71 | |
| 15 | 312.41 | 305.33 | 65 | 41.79 | 41.06 | 115 | 8.59 | 8.47 | |
| 16 | 298.45 | 291.73 | 66 | 40.35 | 39.65 | 116 | 8.35 | 8.23 | |
| 17 | 285.18 | 278.80 | 67 | 38.96 | 38.29 | 117 | 8.12 | 8.01 | |
| 18 | 272.58 | 266.51 | 68 | 37.63 | 36.98 | 118 | 7.89 | 7.78 | |
| 19 | 260.60 | 254.72 | 69 | 36.34 | 35.72 | 119 | 7.68 | 7.57 | |
| 20 | 249.00 | 243.61 | 70 | 35.11 | 34.51 | 120 | 7.47 | 7.36 | |
| 21 | 238.36 | 233.14 | 71 | 33.92 | 33.35 | 121 | 7.26 | 7.16 | |
| 22 | 228.05 | 223.08 | 72 | 32.78 | 32.23 | 122 | 7.06 | 6.97 | |
| 23 | 218.24 | 213.51 | 73 | 31.69 | 31.15 | 123 | 6.87 | 6.78 | |
| 24 | 208.90 | 204.39 | 74 | 30.63 | 30.12 | 124 | 6.69 | 6.59 | |
| 25 | 200.00 | 195.71 | 75 | 29.61 | 29.12 | 125 | 6.51 | 6.42 | |
| 26 | 191.53 | 187.44 | 76 | 28.64 | 28.16 | 126 | 6.33 | 6.25 | |
| 27 | 183.46 | 179.57 | 77 | 27.69 | 27.24 | 127 | 6.16 | 6.08 | |
| 28 | 175.77 | 172.06 | 78 | 26.79 | 26.35 | 128 | 6.00 | 5.92 | |
| 29 | 168.44 | 164.90 | 79 | 25.91 | 25.49 | 129 | 5.84 | 5.76 | |
| 30 | 161.45 | 158.08 | 80 | 25.07 | 24.66 | 130 | 5.69 | 5.61 | |
| 31 | 154.79 | 151.57 | 81 | 24.26 | 23.87 | 131 | 5.54 | 5.46 | |
| 32 | 148.43 | 145.37 | 82 | 23.48 | 23.10 | 132 | 5.39 | 5.32 | |
| 33 | 142.37 | 139.44 | 83 | 22.73 | 22.36 | 133 | 5.25 | 5.18 | |
| 34 | 136.59 | 133.79 | 84 | 22.01 | 21.65 | 134 | 5.12 | 5.05 | |
| 35 | 131.06 | 128.39 | 85 | 21.31 | 20.97 | 135 | 4.98 | 4.92 | |
| 36 | 125.79 | 123.24 | 86 | 20.63 | 20.31 | 136 | 4.86 | 4.79 | |
| 37 | 120.76 | 118.32 | 87 | 19.98 | 19.67 | 137 | 4.73 | 4.67 | |
| 38 | 115.95 | 113.62 | 88 | 19.36 | 19.05 | 138 | 4.61 | 4.55 | |
| 39 | 111.35 | 109.13 | 89 | 18.75 | 18.46 | 139 | 4.49 | 4.44 | |
| 40 | 106.96 | 104.84 | 90 | 18.17 | 17.89 | 140 | 4.38 | 4.32 | |
| 41 | 102.76 | 100.73 | 91 | 17.61 | 17.34 | 141 | 4.27 | 4.22 | |
| 42 | 98.75 | 96.81 | 92 | 17.07 | 16.80 | 142 | 4.16 | 4.11 | |
| 43 | 94.92 | 93.06 | 93 | 16.54 | 16.29 | 143 | 4.06 | 4.01 | |
| 44 | 91.25 | 89.47 | 94 | 16.04 | 15.79 | 144 | 3.96 | 3.91 | |
| 45 | 87.74 | 86.04 | 95 | 15.55 | 15.31 | 145 | 3.86 | 3.81 | |
| 46 | 84.38 | 82.75 | 96 | 15.08 | 14.85 | 146 | 3.76 | 3.72 | |
| 47 | 81.16 | 79.61 | 97 | 14.62 | 14.40 | 147 | 3.67 | 3.62 | |
| 48 | 78.09 | 76.60 | 98 | 14.18 | 13.97 | 148 | 3.58 | 3.54 | |
| 49 | 75.14 | 73.71 | 99 | 13.76 | 13.55 | 149 | 3.49 | 3.45 | |
| 50 | 72.32 | 70.96 | 100 | 13.35 | 13.15 | 150 | 3.41 | 3.37 | |

6. Pressure Sensor



7. Method of Replacing the Inverter's Power Transistors Modules

Checking failures in power semiconductors mounted on inverter PC board

Check the power semiconductors mounted on the inverter PC board by the use of a multiple tester.

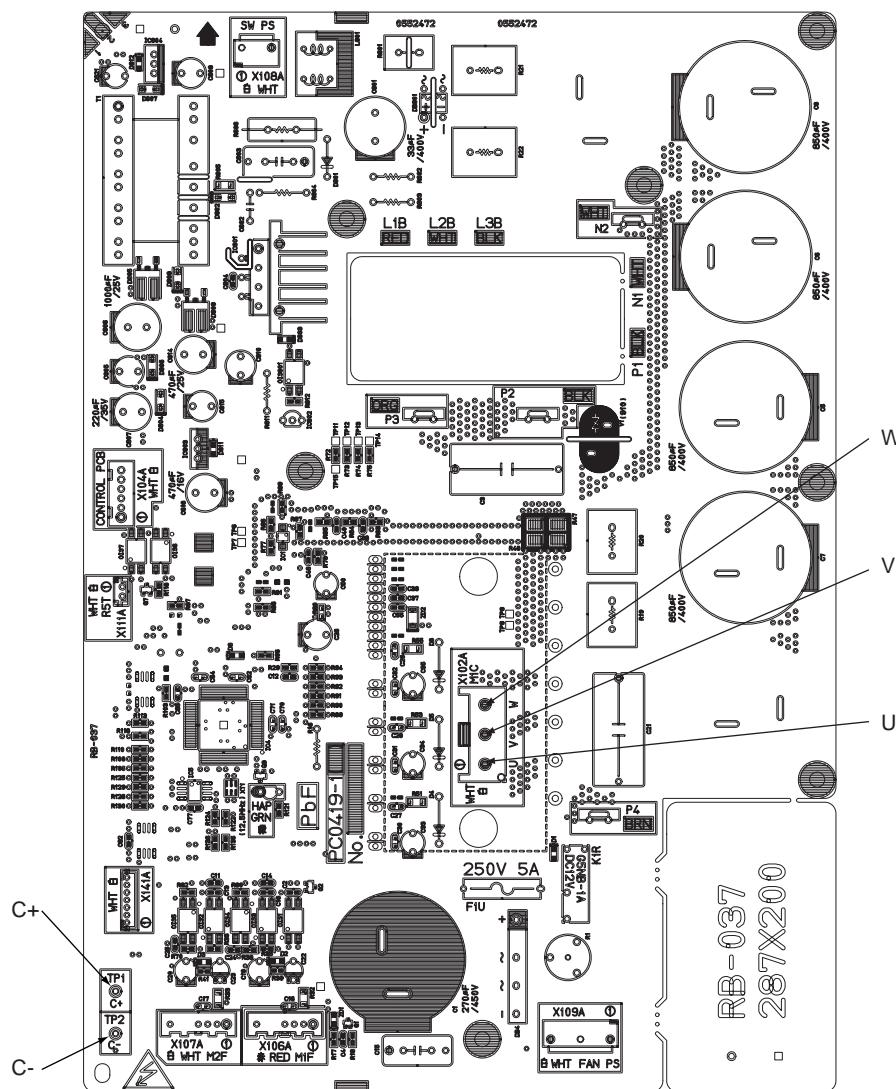
<Items to be prepared>

- Multiple tester : Prepare the digital type of multiple tester with diode check function.

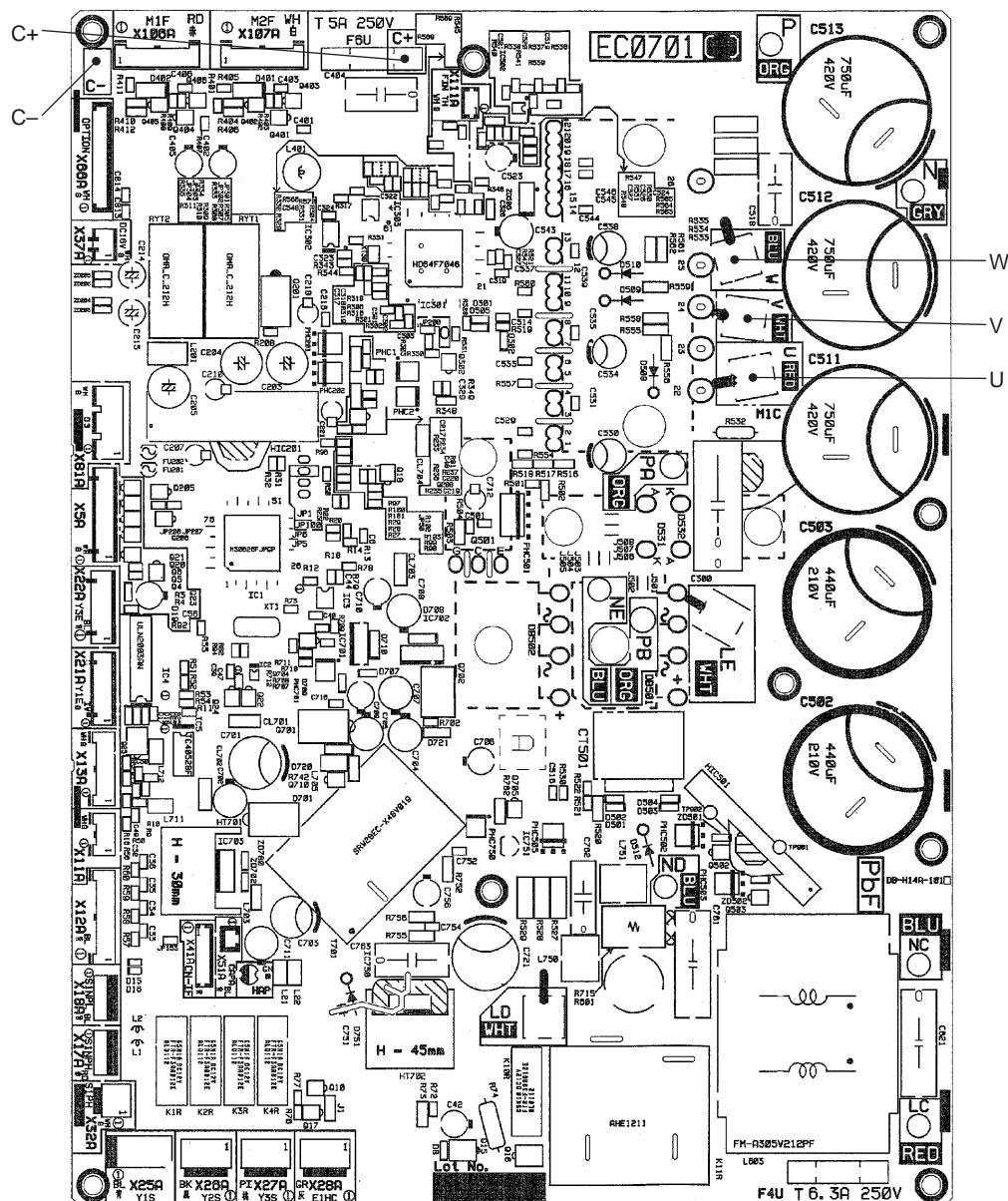
<Preparation>

- Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.
- To make measurement, disconnect all connectors and terminals.

Inverter PC board (U-4, 5, 6ML5XPQ)



Inverter PC board (U-4, 5, 6ML5DPQ)



Power module checking

When using the digital type of multiple tester, make measurement in diode check mode.

| Tester terminal | | Criterion | Remark |
|-----------------|----|--|--|
| + | - | | |
| C+ | U | Not less than 0.3V (including ∞) [*] | It may take time to determine the voltage due to capacitor charge or else. |
| | V | | |
| | W | | |
| U | C- | Not less than 0.3V (including ∞) [*] | |
| | V | | |
| | W | | |
| V | C+ | 0.3 to 0.7V (including ∞) [*] | |
| | U | | |
| | W | | |
| W | U | 0.3 to 0.7V (including ∞) [*] | |
| | V | | |
| | C- | | |

*There needs to be none of each value variation.

The following abnormalities are also doubted besides the PC board abnormality.

- Faulty compressor (ground fault, ground leakage)
- Faulty fan motor (ground leakage)

Part 9

Precautions for New Refrigerant (R-410A)

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1. Precautions for New Refrigerant (R-410A)

1.1 Outline

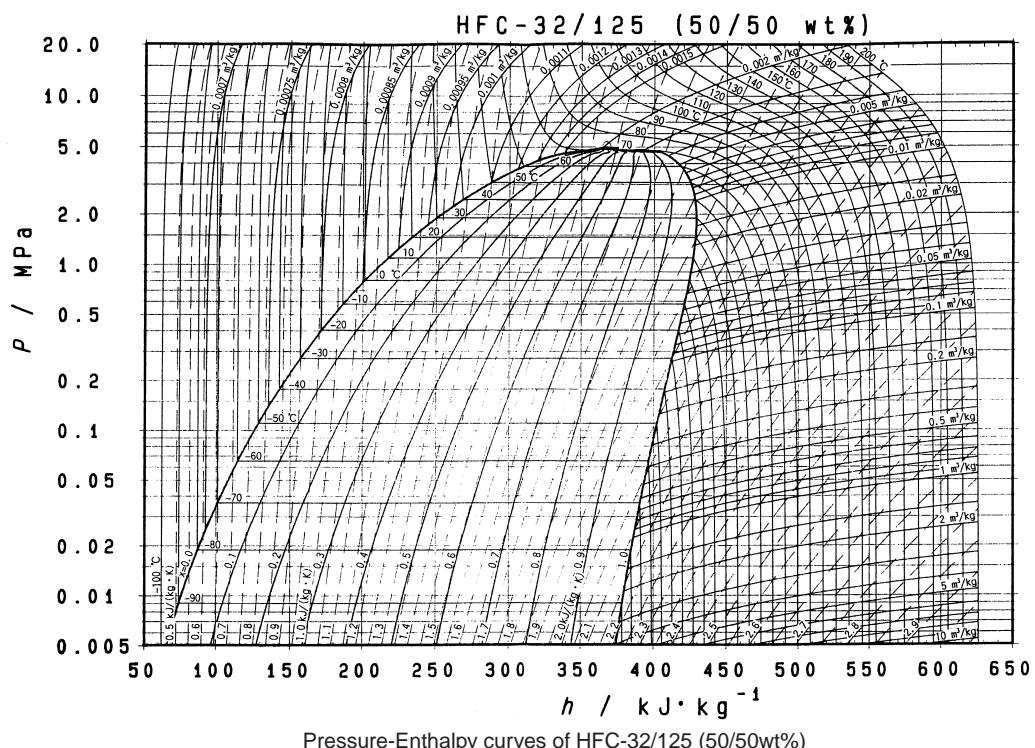
1.1.1 About Refrigerant R-410A

- Characteristics of new refrigerant, R-410A
- 1. Performance
Almost the same performance as R-22 and R-407C
- 2. Pressure
Working pressure is approx. 1.4 times more than R-22 and R-407C.
- 3. Refrigerant composition
Few problems in composition control, since it is a Quasi-azeotropic mixture refrigerant.

| | HFC units (Units using new refrigerants) | | HCFC units |
|--------------------------------|--|--|--|
| Refrigerant name | R-407C | R-410A | R-22 |
| Composing substances | Non-azeotropic mixture of HFC32, HFC125 and HFC134a (*1) | Quasi-azeotropic mixture of HFC32 and JFC125 (*1) | Single-component refrigerant |
| Design pressure | 3.2 MPa (gauge pressure) = 32.6 kgf/cm ² | 4.0 MPa (gauge pressure) = 40.8 kgf/cm ² | 2.75MPa (gauge pressure) = 28.0 kgf/cm ² |
| Refrigerant oil | Synthetic oil (Ether) | | Mineral oil (Suniso) |
| Ozone destruction factor (ODP) | 0 | 0 | 0.05 |
| Combustibility | None | None | None |
| Toxicity | None | None | None |

- ★1. Non-azeotropic mixture refrigerant: mixture of two or more refrigerants having different boiling points.
- ★2. Quasi-azeotropic mixture refrigerant: mixture of two or more refrigerants having similar boiling points.
- ★3. The design pressure is different at each product. Please refer to the installation manual for each product.

(Reference) 1 MPa ≈ 10.19716 kgf / cm²



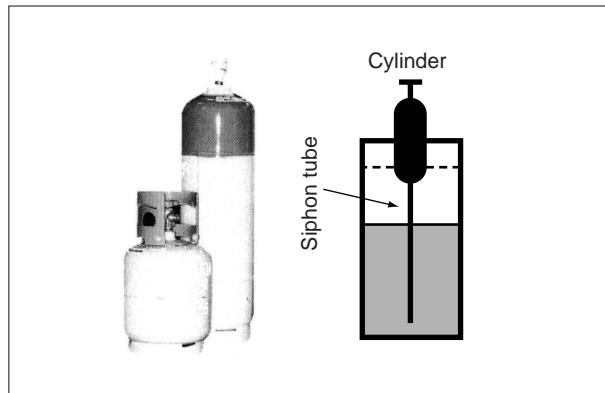
■ Thermodynamic characteristic of R-410A

DAIREP ver2.0

| Temperature (°C) | Steam pressure (kPa) | | Density (kg/m³) | | Specific heat at constant pressure (kJ/kgK) | | Specific enthalpy (kJ/kg) | | Specific entropy (kJ/KgK) | |
|---------------------|-------------------------|--------|--------------------|-------|--|-------|------------------------------|-------|------------------------------|-------|
| | Liquid | Vapor | Liquid | Vapor | Liquid | Vapor | Liquid | Vapor | Liquid | Vapor |
| -70 | 36.13 | 36.11 | 1410.7 | 1.582 | 1.372 | 0.695 | 100.8 | 390.6 | 0.649 | 2.074 |
| -68 | 40.83 | 40.80 | 1404.7 | 1.774 | 1.374 | 0.700 | 103.6 | 391.8 | 0.663 | 2.066 |
| -66 | 46.02 | 45.98 | 1398.6 | 1.984 | 1.375 | 0.705 | 106.3 | 393.0 | 0.676 | 2.058 |
| -64 | 51.73 | 51.68 | 1392.5 | 2.213 | 1.377 | 0.710 | 109.1 | 394.1 | 0.689 | 2.051 |
| -62 | 58.00 | 57.94 | 1386.4 | 2.463 | 1.378 | 0.715 | 111.9 | 395.3 | 0.702 | 2.044 |
| -60 | 64.87 | 64.80 | 1380.2 | 2.734 | 1.379 | 0.720 | 114.6 | 396.4 | 0.715 | 2.037 |
| -58 | 72.38 | 72.29 | 1374.0 | 3.030 | 1.380 | 0.726 | 117.4 | 397.6 | 0.728 | 2.030 |
| -56 | 80.57 | 80.46 | 1367.8 | 3.350 | 1.382 | 0.732 | 120.1 | 398.7 | 0.741 | 2.023 |
| -54 | 89.49 | 89.36 | 1361.6 | 3.696 | 1.384 | 0.737 | 122.9 | 399.8 | 0.754 | 2.017 |
| -52 | 99.18 | 99.03 | 1355.3 | 4.071 | 1.386 | 0.744 | 125.7 | 400.9 | 0.766 | 2.010 |
| -51.58 | 101.32 | 101.17 | 1354.0 | 4.153 | 1.386 | 0.745 | 126.3 | 401.1 | 0.769 | 2.009 |
| -50 | 109.69 | 109.51 | 1349.0 | 4.474 | 1.388 | 0.750 | 128.5 | 402.0 | 0.779 | 2.004 |
| -48 | 121.07 | 120.85 | 1342.7 | 4.909 | 1.391 | 0.756 | 131.2 | 403.1 | 0.791 | 1.998 |
| -46 | 133.36 | 133.11 | 1336.3 | 5.377 | 1.394 | 0.763 | 134.0 | 404.1 | 0.803 | 1.992 |
| -44 | 146.61 | 146.32 | 1330.0 | 5.880 | 1.397 | 0.770 | 136.8 | 405.2 | 0.816 | 1.987 |
| -42 | 160.89 | 160.55 | 1323.5 | 6.419 | 1.401 | 0.777 | 139.6 | 406.2 | 0.828 | 1.981 |
| -40 | 176.24 | 175.85 | 1317.0 | 6.996 | 1.405 | 0.785 | 142.4 | 407.3 | 0.840 | 1.976 |
| -38 | 192.71 | 192.27 | 1310.5 | 7.614 | 1.409 | 0.792 | 145.3 | 408.3 | 0.852 | 1.970 |
| -36 | 210.37 | 209.86 | 1304.0 | 8.275 | 1.414 | 0.800 | 148.1 | 409.3 | 0.864 | 1.965 |
| -34 | 229.26 | 228.69 | 1297.3 | 8.980 | 1.419 | 0.809 | 150.9 | 410.2 | 0.875 | 1.960 |
| -32 | 249.46 | 248.81 | 1290.6 | 9.732 | 1.424 | 0.817 | 153.8 | 411.2 | 0.887 | 1.955 |
| -30 | 271.01 | 270.28 | 1283.9 | 10.53 | 1.430 | 0.826 | 156.6 | 412.1 | 0.899 | 1.950 |
| -28 | 293.99 | 293.16 | 1277.1 | 11.39 | 1.436 | 0.835 | 159.5 | 413.1 | 0.911 | 1.946 |
| -26 | 318.44 | 317.52 | 1270.2 | 12.29 | 1.442 | 0.844 | 162.4 | 414.0 | 0.922 | 1.941 |
| -24 | 344.44 | 343.41 | 1263.3 | 13.26 | 1.448 | 0.854 | 165.3 | 414.9 | 0.934 | 1.936 |
| -22 | 372.05 | 370.90 | 1256.3 | 14.28 | 1.455 | 0.864 | 168.2 | 415.7 | 0.945 | 1.932 |
| -20 | 401.34 | 400.06 | 1249.2 | 15.37 | 1.461 | 0.875 | 171.1 | 416.6 | 0.957 | 1.927 |
| -18 | 432.36 | 430.95 | 1242.0 | 16.52 | 1.468 | 0.886 | 174.1 | 417.4 | 0.968 | 1.923 |
| -16 | 465.20 | 463.64 | 1234.8 | 17.74 | 1.476 | 0.897 | 177.0 | 418.2 | 0.980 | 1.919 |
| -14 | 499.91 | 498.20 | 1227.5 | 19.04 | 1.483 | 0.909 | 180.0 | 419.0 | 0.991 | 1.914 |
| -12 | 536.58 | 534.69 | 1220.0 | 20.41 | 1.491 | 0.921 | 182.9 | 419.8 | 1.003 | 1.910 |
| -10 | 575.26 | 573.20 | 1212.5 | 21.86 | 1.499 | 0.933 | 185.9 | 420.5 | 1.014 | 1.906 |
| -8 | 616.03 | 613.78 | 1204.9 | 23.39 | 1.507 | 0.947 | 189.0 | 421.2 | 1.025 | 1.902 |
| -6 | 658.97 | 656.52 | 1197.2 | 25.01 | 1.516 | 0.960 | 192.0 | 421.9 | 1.036 | 1.898 |
| -4 | 704.15 | 701.49 | 1189.4 | 26.72 | 1.524 | 0.975 | 195.0 | 422.6 | 1.048 | 1.894 |
| -2 | 751.64 | 748.76 | 1181.4 | 28.53 | 1.533 | 0.990 | 198.1 | 423.2 | 1.059 | 1.890 |
| 0 | 801.52 | 798.41 | 1173.4 | 30.44 | 1.543 | 1.005 | 201.2 | 423.8 | 1.070 | 1.886 |
| 2 | 853.87 | 850.52 | 1165.3 | 32.46 | 1.552 | 1.022 | 204.3 | 424.4 | 1.081 | 1.882 |
| 4 | 908.77 | 905.16 | 1157.0 | 34.59 | 1.563 | 1.039 | 207.4 | 424.9 | 1.092 | 1.878 |
| 6 | 966.29 | 962.42 | 1148.6 | 36.83 | 1.573 | 1.057 | 210.5 | 425.5 | 1.103 | 1.874 |
| 8 | 1026.5 | 1022.4 | 1140.0 | 39.21 | 1.584 | 1.076 | 213.7 | 425.9 | 1.114 | 1.870 |
| 10 | 1089.5 | 1085.1 | 1131.3 | 41.71 | 1.596 | 1.096 | 216.8 | 426.4 | 1.125 | 1.866 |
| 12 | 1155.4 | 1150.7 | 1122.5 | 44.35 | 1.608 | 1.117 | 220.0 | 426.8 | 1.136 | 1.862 |
| 14 | 1224.3 | 1219.2 | 1113.5 | 47.14 | 1.621 | 1.139 | 223.2 | 427.2 | 1.147 | 1.859 |
| 16 | 1296.2 | 1290.8 | 1104.4 | 50.09 | 1.635 | 1.163 | 226.5 | 427.5 | 1.158 | 1.855 |
| 18 | 1371.2 | 1365.5 | 1095.1 | 53.20 | 1.650 | 1.188 | 229.7 | 427.8 | 1.169 | 1.851 |
| 20 | 1449.4 | 1443.4 | 1085.6 | 56.48 | 1.666 | 1.215 | 233.0 | 428.1 | 1.180 | 1.847 |
| 22 | 1530.9 | 1524.6 | 1075.9 | 59.96 | 1.683 | 1.243 | 236.4 | 428.3 | 1.191 | 1.843 |
| 24 | 1615.8 | 1609.2 | 1066.0 | 63.63 | 1.701 | 1.273 | 239.7 | 428.4 | 1.202 | 1.839 |
| 26 | 1704.2 | 1697.2 | 1055.9 | 67.51 | 1.721 | 1.306 | 243.1 | 428.6 | 1.214 | 1.834 |
| 28 | 1796.2 | 1788.9 | 1045.5 | 71.62 | 1.743 | 1.341 | 246.5 | 428.6 | 1.225 | 1.830 |
| 30 | 1891.9 | 1884.2 | 1034.9 | 75.97 | 1.767 | 1.379 | 249.9 | 428.6 | 1.236 | 1.826 |
| 32 | 1991.3 | 1983.2 | 1024.1 | 80.58 | 1.793 | 1.420 | 253.4 | 428.6 | 1.247 | 1.822 |
| 34 | 2094.5 | 2086.2 | 1012.9 | 85.48 | 1.822 | 1.465 | 256.9 | 428.4 | 1.258 | 1.817 |
| 36 | 2201.7 | 2193.1 | 1001.4 | 90.68 | 1.855 | 1.514 | 260.5 | 428.3 | 1.269 | 1.813 |
| 38 | 2313.0 | 2304.0 | 989.5 | 96.22 | 1.891 | 1.569 | 264.1 | 428.0 | 1.281 | 1.808 |
| 40 | 2428.4 | 2419.2 | 977.3 | 102.1 | 1.932 | 1.629 | 267.8 | 427.7 | 1.292 | 1.803 |
| 42 | 2548.1 | 2538.6 | 964.6 | 108.4 | 1.979 | 1.696 | 271.5 | 427.2 | 1.303 | 1.798 |
| 44 | 2672.2 | 2662.4 | 951.4 | 115.2 | 2.033 | 1.771 | 275.3 | 426.7 | 1.315 | 1.793 |
| 46 | 2800.7 | 2790.7 | 937.7 | 122.4 | 2.095 | 1.857 | 279.2 | 426.1 | 1.327 | 1.788 |
| 48 | 2933.7 | 2923.6 | 923.3 | 130.2 | 2.168 | 1.955 | 283.2 | 425.4 | 1.339 | 1.782 |
| 50 | 3071.5 | 3061.2 | 908.2 | 138.6 | 2.256 | 2.069 | 287.3 | 424.5 | 1.351 | 1.776 |
| 52 | 3214.0 | 3203.6 | 892.2 | 147.7 | 2.362 | 2.203 | 291.5 | 423.5 | 1.363 | 1.770 |
| 54 | 3361.4 | 3351.0 | 875.1 | 157.6 | 2.493 | 2.363 | 295.8 | 422.4 | 1.376 | 1.764 |
| 56 | 3513.8 | 3503.5 | 856.8 | 168.4 | 2.661 | 2.557 | 300.3 | 421.0 | 1.389 | 1.757 |
| 58 | 3671.3 | 3661.2 | 836.9 | 180.4 | 2.883 | 2.799 | 305.0 | 419.4 | 1.403 | 1.749 |
| 60 | 3834.1 | 3824.2 | 814.9 | 193.7 | 3.191 | 3.106 | 310.0 | 417.6 | 1.417 | 1.741 |
| 62 | 4002.1 | 3992.7 | 790.1 | 208.6 | 3.650 | 3.511 | 315.3 | 415.5 | 1.433 | 1.732 |
| 64 | 4175.7 | 4166.8 | 761.0 | 225.6 | 4.415 | 4.064 | 321.2 | 413.0 | 1.450 | 1.722 |

1.2 Refrigerant Cylinders

- Cylinder specifications
 - The cylinder is painted refrigerant color (pink).
 - The cylinder valve is equipped with a siphon tube.



Refrigerant can be charged in liquid state with cylinder in upright position.

Caution: Do not lay cylinder on its side during charging, since it cause refrigerant in gas state to enter the system.

■ Handling of cylinders

(1) Laws and regulations

R-410A is liquefied gas, and the High-Pressure Gas Safety Law must be observed in handling them. Before using, refer to the High-Pressure Gas Safety Law.

The Law stipulates standards and regulations that must be followed to prevent accidents with high-pressure gases. Be sure to follow the regulations.

(2) Handing of vessels

Since R-410A is high-pressure gas, it is contained in high-pressure vessels.

Although those vessels are durable and strong, careless handling can cause damage that can lead to unexpected accidents. Do not drop vessels, let them fall, apply impact or roll them on the ground.

(3) Storage

Although R-410A is not flammable, it must be stored in a well-ventilated, cool, and dark place in the same way as any other high-pressure gases.

It should also be noted that high-pressure vessels are equipped with safety devices that releases gas when the ambient temperature reaches more than a certain level (fusible plug melts) and when the pressure exceeds a certain level (spring-type safety valve operates).

1.3 Service Tools

R-410A is used under higher working pressure, compared to previous refrigerants (R-22,R-407C). Furthermore, the refrigerating machine oil has been changed from Suniso oil to Ether oil, and if oil mixing is occurred, sludge results in the refrigerants and causes other problems. Therefore, gauge manifolds and charge hoses that are used with a previous refrigerant (R-22,R-407C) can not be used for products that use new refrigerants.
Be sure to use dedicated tools and devices.

■ Tool compatibility

| Tool | Compatibility | | | Reasons for change |
|---|-----------------------------|--------|------|---|
| | HFC | | HCFC | |
| | R-410A | R-407C | R-22 | |
| Gauge manifold Charge hose | X | | | <ul style="list-style-type: none"> • Do not use the same tools for R-22 and R-410A. • Thread specification differs for R-410A and R-407C. |
| Charging cylinder | X | O | | <ul style="list-style-type: none"> • Weighting instrument used for HFCs. |
| Gas detector | O | X | | <ul style="list-style-type: none"> • The same tool can be used for HFCs. |
| Vacuum pump (pump with reverse flow preventive function) | O | | | <ul style="list-style-type: none"> • To use existing pump for HFCs, vacuum pump adaptor must be installed. |
| Weighting instrument | O | | | |
| Charge mouthpiece | X | | | <ul style="list-style-type: none"> • Seal material is different between R-22 and HFCs. • Thread specification is different between R-410A and others. |
| Flaring tool (Clutch type) | O | | | <ul style="list-style-type: none"> • For R-410A, flare gauge is necessary. |
| Torque wrench | O | | | <ul style="list-style-type: none"> • Torque-up for 1/2 and 5/8 |
| Pipe cutter | O | | | |
| Pipe expander | O | | | |
| Pipe bender | O | | | |
| Pipe assembling oil | X | | | <ul style="list-style-type: none"> • Due to refrigerating machine oil change. (No Suniso oil can be used.) |
| Refrigerant recovery device | Check your recovery device. | | | |
| Refrigerant piping | See the chart below. | | | <ul style="list-style-type: none"> • Only φ19.1 is changed to 1/2H material while the previous material is "O". |

As for the charge mouthpiece and packing, 1/2UNF20 is necessary for mouthpiece size of charge hose.

■ Copper tube material and thickness

| Pipe size | R-407C | | R-410A | |
|-----------|----------|------------------|----------|------------------|
| | Material | Thickness t (mm) | Material | Thickness t (mm) |
| φ6.4 | O | 0.8 | O | 0.8 |
| φ9.5 | O | 0.8 | O | 0.8 |
| φ12.7 | O | 0.8 | O | 0.8 |
| φ15.9 | O | 1.0 | O | 1.0 |
| φ19.1 | O | 1.0 | 1/2H | 1.0 |
| φ22.2 | 1/2H | 1.0 | 1/2H | 1.0 |
| φ25.4 | 1/2H | 1.0 | 1/2H | 1.0 |
| φ28.6 | 1/2H | 1.0 | 1/2H | 1.0 |
| φ31.8 | 1/2H | 1.2 | 1/2H | 1.1 |
| φ38.1 | 1/2H | 1.4 | 1/2H | 1.4 |
| φ44.5 | 1/2H | 1.6 | 1/2H | 1.6 |

* O: Soft (Annealed)

H: Hard (Drawn)

1. Flaring tool



■ Specifications

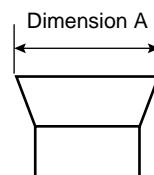
- Dimension A

Unit:mm

| Nominal size | Tube O.D. | $A^{+0}_{-0.4}$ | | |
|--------------|-----------|-----------------|------------------|------------------------|
| | | Do | Class-2 (R-410A) | Class-1 (Conventional) |
| 1/4 | 6.35 | | 9.1 | 9.0 |
| 3/8 | 9.52 | | 13.2 | 13.0 |
| 1/2 | 12.70 | | 16.6 | 16.2 |
| 5/8 | 15.88 | | 19.7 | 19.4 |
| 3/4 | 19.05 | | 24.0 | 23.3 |

■ Differences

- Change of dimension A



For class-1: R-407C
For class-2: R-410A

Conventional flaring tools can be used when the work process is changed.
(change of work process)

Previously, a pipe extension margin of 0 to 0.5mm was provided for flaring. For R-410A air conditioners, perform pipe flaring with a pipe extension margin of 1.0 to 1.5mm.

(For clutch type only)

Conventional tool with pipe extension margin adjustment can be used.

2. Torque wrench



■ Specifications

- Dimension B

Unit:mm

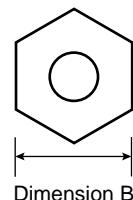
| Nominal size | Class-1 | Class-2 | Previous |
|--------------|---------|---------|----------|
| 1/2 | 24 | 26 | 24 |
| 5/8 | 27 | 29 | 27 |

No change in tightening torque

No change in pipes of other sizes

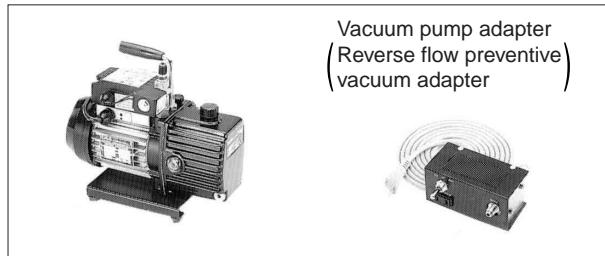
■ Differences

- Change of dimension B
- Only 1/2", 5/8" are extended



For class-1: R-407C
For class-2: R-410A

3. Vacuum pump with check valve



■ Specifications

- Discharge speed
50 l/min (50Hz)
60 l/min (60Hz)
- Suction port UNF7/16-20(1/4 Flare)
UNF1/2-20(5/16 Flare) with adapter

● Maximum degree of vacuum

Select a vacuum pump which is able to keep the vacuum degree of the system in excess of -100.7 kPa (5 torr – 755 mmHg).

■ Differences

- Equipped with function to prevent reverse oil flow
- Previous vacuum pump can be used by installing adapter.

4. Leak tester



■ Specifications

- Hydrogen detecting type, etc.
- Applicable refrigerants
R-410A, R-407C, R-404A, R-507A, R-134a, etc.

■ Differences

- Previous testers detected chlorine. Since HFCs do not contain chlorine, new tester detects hydrogen.

5. Refrigerant oil (Air compal)



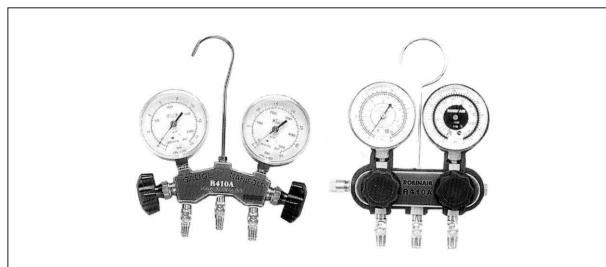
■ Specifications

- Contains synthetic oil, therefore it can be used for piping work of every refrigerant cycle.
- Offers high rust resistance and stability over long period of time.

■ Differences

- Can be used for R-410A and R-22 units.

6. Gauge manifold for R-410A

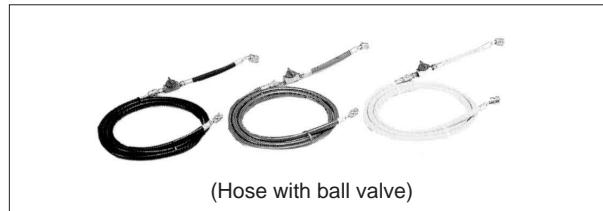


■ Specifications

- High pressure gauge
- 0.1 to 5.3 MPa (-76 cmHg to 53 kg/cm²)
- Low pressure gauge
- 0.1 to 3.8 MPa (-76 cmHg to 38 kg/cm²)
- 1/4" → 5/16" (2min → 2.5min)
- No oil is used in pressure test of gauges.
→ For prevention of contamination

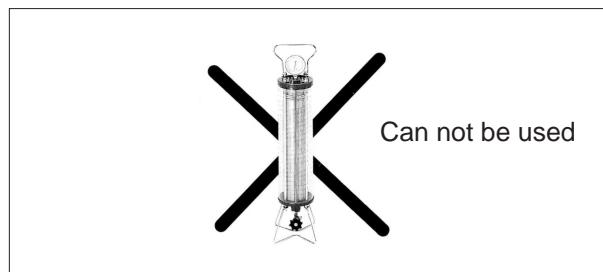
- Temperature scale indicates the relationship between pressure and temperature in gas saturated state.
- Differences
 - Change in pressure
 - Change in service port diameter

7. Charge hose for R-410A



- Specifications
 - Working pressure 5.08 MPa (51.8 kg/cm²)
 - Rupture pressure 25.4 MPa (259 kg/cm²)
 - Available with and without hand-operate valve that prevents refrigerant from outflow.
- Differences
 - Pressure proof hose
 - Change in service port diameter
 - Use of nylon coated material for HFC resistance

8. Charging cylinder



- Specifications
 - Use weigher for refrigerant charge listed below to charge directly from refrigerant cylinder.
- Differences
 - The cylinder can not be used for mixed refrigerant since mixing ratio is changed during charging.

When R-410A is charged in liquid state using charging cylinder, foaming phenomenon is generated inside charging cylinder.

9. Weigher for refrigerant charge

- Specifications
 - High accuracy
 - TA101A (for 10-kg cylinder) = $\pm 2\text{g}$
 - TA101B (for 20-kg cylinder) = $\pm 5\text{g}$
 - Equipped with pressure-resistant sight glass to check liquid refrigerant charging.
 - A manifold with separate ports for HFCs and previous refrigerants is equipped as standard accessories.
- Differences
 - Measurement is based on weight to prevent change of mixing ratio during charging.

10. Charge mouthpiece

- Specifications
 - For R-410A, $1/4'' \rightarrow 5/16''$ (2min → 2.5min)
 - Material is changed from CR to H-NBR.
- Differences
 - Change of thread specification on hose connection side (For the R-410A use)
 - Change of sealer material for the HFCs use.

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