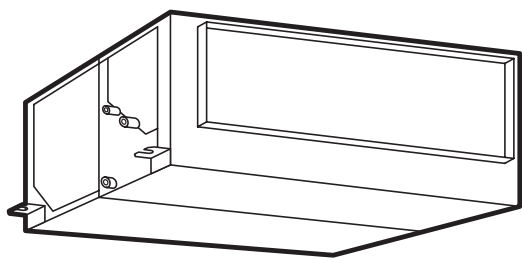


SERVICE MANUAL

INVERTER-DRIVEN MULTI-SPLIT SYSTEM HEAT PUMP AIR CONDITIONERS

Service Manual



< Indoor Units >

- DOAS (Dedicated Outdoor Air System) Type
(H,Y)DOA096B21S

Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit is operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This heat pump air conditioning unit has been designed for a specific temperature range. For optimum performance and long life, operate this unit within the range limits.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.



1. Introduction

This Service Manual concentrates on the heat pump air conditioning units.
Read this manual carefully before performing service.


This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

(Transportation/Installation Work) > (Refrigerant Piping Work) > (Electrical Wiring Work) > (Ref. Charge Work) > (Test Run) > (User)

2. Important Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. Refer back to these instructions as needed.
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- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a wet cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage.
 - Will void product warranties.
 - May invalidate product regulatory certifications.
 - May violate OSHA standards.

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (approximately 1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the condensate pipe. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the condensate hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.
- If the wired controller is installed in a location where electromagnetic radiation is generated, make sure that the wired controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operational temperature boundary in the manual. If there is no specified temperature, use the unit within the operational temperature boundary of 32 to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions

WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable wind baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow protection hood.
- If the remote sensors are not used with this controller, then do not install this controller...
 - in a room where there is no thermostat.
 - where the unit is exposed to direct sunshine or direct light.
 - where the unit is in close proximity to a heat source.
 - where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - in areas with poor air circulation and ventilation.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere.
 - Where fire, oil, steam, or powder can directly enter the unit, such as in close proximity or directly above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the condensate pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the condensate pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If condensate piping becomes clogged, moisture can back up and can drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.
- During transportation, do not allow the backrest of the forklift make contact with the unit, otherwise, it may cause damage to the heat exchanger and also may cause injury when stopped or started suddenly.
- Remove gas inside the closing pipe when the brazing work is performed. If the brazing filler metal is melted with remaining gas inside, the pipes will be blown off and it may cause injury.
- Be sure to use nitrogen gas for an airtight test. If other gases such as oxygen gas, acetylene gas or fluorocarbon gas are accidentally used, it may cause explosion or gas intoxication.

After installation work for the system has been completed, explain the "Safety Precautions," the proper use and maintenance of the unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. The installation should meet the requirements in ASHRAE Standards 15 and 34. If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Check the design pressure for this product is 601 psi (4.15MPa). The pressure of the refrigerant R410A is 1.4 times higher than that of the refrigerant R22. Therefore, the refrigerant piping for R410A shall be thicker than that for R22. Make sure to use the specified refrigerant piping. If not, the refrigerant piping may rupture due to an excessive refrigerant pressure. Besides, pay attention to the piping thickness when using copper refrigerant piping. The thickness of copper refrigerant piping differs depending on its material.
- The refrigerant R410A is adopted. The refrigerant oil tends to be affected by foreign matters such as moisture, oxide film, (or fat). Perform the installation work with care to prevent moisture, dust, or different refrigerant from entering the refrigerant cycle. Foreign matter can be introduced into the cycle from such parts as expansion valve and the operation may be unavailable.
- To avoid the possibility of different refrigerant or refrigerant oil being introduced into the cycle, the sizes of the charging connections have been changed from R407C type and R22 type. It is necessary to prepare the appropriate tools before performing installation work.
- Use refrigerant pipes and joints which are approved for use with R410A.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.
- When pipes are removed out from under the piping cover, after the insulation work is completed, cover the gap between the piping cover and pipes by a packing (field-supplied). If the gap is not covered, the unit may be damaged if snow, rain water or small animals enter the unit.
- Do not apply an excessive force to the spindle valve at the end of opening. Otherwise, the spindle valve flies out due to refrigerant pressure. At the test run, fully open the gas and liquid valves, otherwise, these devices will be damaged. (It is closed before shipment.)
- If the arrangement for outdoor units is incorrect, it may cause flowback of the refrigerant and result in failure of the outdoor unit.
- The refrigerant system may be damaged if the slope of the piping connection kit exceeds $\pm 15^\circ$.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
 - Perform all electrical work in strict accordance with this manual and all the relevant regulatory standards.
 - Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
 - Only use electrical protection equipment and tools suited for this installation.
 - Insulate a wired controller against moisture and temperature extremes.
 - Use specified cables between units.
 - The new air conditioner may not function normally in the following instances:
 - If electrical power for the new air conditioner is supplied from the same transformer as the external equipment* referred to below.
 - If the power source cables for this external equipment* and the new air conditioner unit are located in close proximity to each other.

external equipment*: (Example): A lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch.
- Regarding the cases mentioned above, surge voltage may be inducted into the power supply cables for the packaged air conditioner due to a rapid change in power consumption of the device and an activation of a switch.
- Check field regulations and standards before performing electrical work in order to protect the power supply for the new air conditioner unit.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
 - The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
 - Use an exclusive power supply for the air conditioner at the unit's rated voltage.
 - Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
 - Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
 - Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
 - This equipment can be installed with a Ground Fault Circuit Breaker (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.

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1. Installation

1.1 Outdoor Unit

Refer to the Installation Manual for Outdoor Unit.

1.2 Change-Over Box

Refer to the Installation Manual for Change-Over Box.

1.3 Indoor Unit

Refer to the Installation Manual for DOAS.

1.4 Control Device

- 1.4.1 Wired Controller: CIW01**
- 1.4.2 Simplified Wired Controller: CIS01**
- 1.4.3 Wireless Controller: CIR01**
- 1.4.4 Mini Central Controller: CCM01**
- 1.4.5 Large Central Controller: CCL01**
- 1.4.6 Computerized Central Controller Management Software: CCCS01**
- 1.4.7 Computerized Central Controller Software / Operation Ratio for CCCS01**
- 1.4.8 Computerized Central Controller Adapter: CCCA01**
- 1.4.9 Infrared (IR) Receiver Kit: CWDIRK01**

For more information of the above Control Devices, please refer to the Installation Manuals for each product.

1.5 Optional Parts

- 1.5.1 Seismic Suspension Bracket: SSB-IDH-01**
- 1.5.2 Relay and 3 Pin Connector Kit: PSC-5RA**
- 1.5.3 Remote Sensor: THM-R2A**
- 1.5.4 3P Connector Cable: PCC-1A**

For more information of the above Optional Parts, please refer to the Installation Manuals for each product.

2. Operation

2.1 Indoor Unit

Refer to the Operation Manual for DOAS.

2.2 Control Device

- 2.2.1 Wired Controller: CIW01**
- 2.2.2 Simplified Wired Controller: CIS01**
- 2.2.3 Mini Central Controller: CCM01**
- 2.2.4 Large Central Controller: CCL01**
- 2.2.5 Computerized Central Controller Management Software: CCCS01**
- 2.2.6 Computerized Central Controller Software / Operation Ratio for CCCS01**
- 2.2.7 Infrared (IR) Receiver Kit: CWDIRK01**

For more information of the above Control Devices, please refer to the Operation Manuals for each product.

3. Troubleshooting

3.1 Initial Troubleshooting

3.1.1 Checking Electrical Wiring and Power Source

Check the following items for any abnormalities in the activation of the system.

No.	Check Situation	Check Method
1	Is any power source breaker or fuse open?	Check the voltage (secondary side) of the breaker and also check the continuity of the fuse with a tester.
2	Is the voltage at the secondary side of the transformer correct?	Disconnect at the secondary side of the transformer and measure voltage with a tester.
3	Is the wiring firmly secured and correctly connected?	<p>Check that the following wiring connection on O.U./I.U. printed circuit boards (PCBs) is not loose.</p> <ul style="list-style-type: none"> • The connection for thermistors • The connection for the wired controller cable • The connection for communication cable • Each connection for power source line <p>Check that the wiring connection on O.U./I.U. PCBs is not loose or misconnected on the site according to the "Electrical Wiring Diagram" of the Engineering Manual.</p>

NOTE:

If the fuse(s) on an I.U. PCB blow out, diagnose the cause of overcurrent and recover the fuse(s).

In addition, check the power source of optional parts because the fuse may blow out because of the power source failure.

- For Outdoor Unit

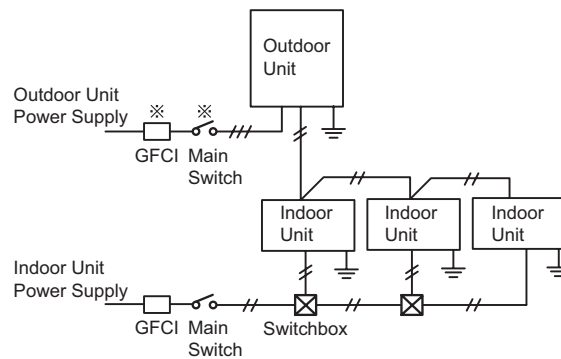
Refer to the Service Manual for Outdoor Unit.

- For Indoor Units

The electrical wiring capacity of the outdoor unit is according to the “Installation and Maintenance Manual” of the outdoor unit. Setting DIP switches may be required depending on the combinations with the outdoor unit.

Select wiring capacity according to Table 3.1 below. This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.

Heat Pump System



※ Refer to the “Installation and Maintenance Manual” for the connected outdoor unit for details of wire, GFCI and main switch for outdoor unit.

NOTE:

DOAS unit cannot be connected with Heat Recovery System.

NOTICE

- This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers/ fuses/ / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Check the recommended size of ELB shown in Table 3.1.
Select high-sensitive high speed ELB or GFCI when the rated sensitive current is less than 30mA. (The motion time should be within 0.1 second.)
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive electrical noise to reduce the possibility of communication errors between system components. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI (Ground Fault Circuit Interrupter) in accordance with the regulations for each region, the "Installation and Maintenance Manual", and the dedicated electrical circuit that must be used.
- Outside of the indoor unit, installation of the power supply wiring, communication cable, and wired controller cable should be spaced as far apart as possible.

- Dedicated Outdoor Air System (DOAS)

Table 3.1 Recommended Wiring Capacity and Size

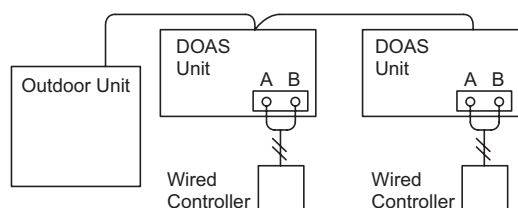
Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA (Minimum Circuit Ampacity)
		Power Source Wiring Size < Main >	Ground Wiring Size	Commu- nication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
(H,Y)DOA096B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	4.3

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.
- 3) Total operating current should be less than 12A.
- 4) Fuse should be slow blowing capability.

- Wired Controller Connecting Diagram

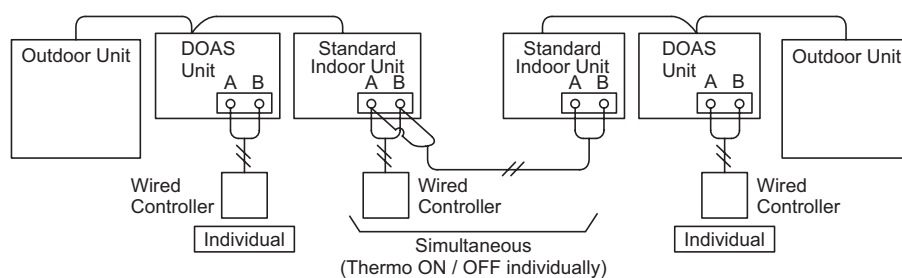
(a) Wired Controllers at each unit for individual operation setting



NOTE:

Each DOAS unit must have it's own wired controller.

(b) Wired Controller connections between different refrigerant systems



NOTE:

Each DOAS unit must have it's own wired controller.

Thermo-ON: The outdoor unit and some indoor units are running.

Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

3.1.2 Location of Printed Circuit Boards (PCBs)

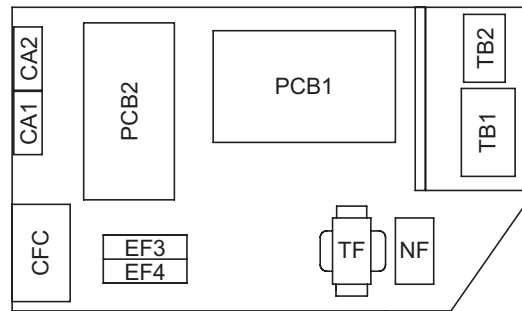
(1) Outdoor Unit

Refer to the Service Manual for Outdoor Unit.

(2) Indoor Unit

- DOAS

< (H,Y)DOA096B21S >

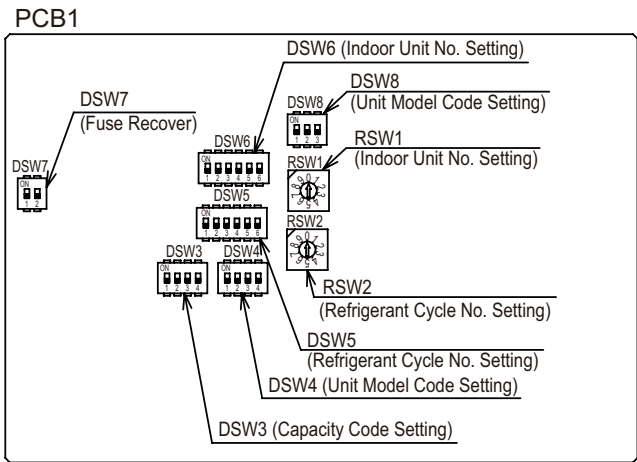


3.1.3 Checking Rotary Switch and DIP Switch Settings

The following diagram indicates the factory settings of DSWs on PCBs in the indoor and outdoor units. When simultaneous operation control of multiple units or room thermo control is operated, the DSW setting is different as shown below.

- (1) Outdoor Unit (Factory Setting)
 Refer to the Service Manual for Outdoor Unit.
- (2) Indoor Unit (Factory Setting)
 The positions of the DIP switches on the PCB are shown in the figure below. Turn OFF all power sources before setting.
 Without turning OFF all power sources, the switches do not work and the settings are invalid.
 The “■” mark indicates the position of DIP switches.

- DOAS
- < (H,Y)DOA096B21S >



DIP Switch Settings

- (1) Turn OFF the power supply of the indoor unit and the outdoor unit before DIP switch setting. Not doing so makes the setting invalid.
- (2) Factory settings for DSW6 and RSW1 are set to “0”. If connecting the indoor unit to H-LINK II supporting the outdoor unit without setting any DIP switches, auto-address setting is performed by the wired controller.
- (3) Auto-Address Setting by Wired Controller
 The address numbering is started from “0” by the auto-address function when the wired controller is connected to H-LINK II.
- (4) Unit No. Setting (RSW1 and DSW6)
 The indoor unit numbers of all indoor units are not required. The indoor unit numbers are set by the auto-address function. If the indoor unit number setting is required, set the unit numbers of all indoor units respectively and serially by following setting positions. It is recommended to assign a number to each indoor unit beginning with “1.” Though a maximum of 64 indoor units per refrigerant system can be connected to the H-LINK II System, available numbers range from 0 to 63. Therefore, the applicable number for the 64th indoor unit is “0.”
 For centralized control, this setting is required.

Unit No. Setting		
DSW6 (Tens Digit)	RSW1 (Units Digit)	Ex.) Set at No.16 Unit
<div> </div>	<div> </div>	<div> </div>
Factory settings for DSW6 and RSW1 are set at "0". For the units supporting H-LINK II, the unit numbers can be set for a maximum of 64 indoor units (No.0 to 63).		
		<div> </div>

TROUBLESHOOTING

(5) Capacity Code Setting (DSW3)

No setting is required because of the factory setting. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.

Indoor Unit Capacity (MBH)	96
DSW3 Setting Position	

(6) Refrigerant Cycle Number Settings (RSW2 and DSW5) Setting is required. Factory settings are all OFF.

Refrigerant Cycle Number Setting

DSW5 (Tens Digit)	RSW2 (Units Digit)	Ex.) Set at No.5 Cycle
Factory settings for DSW5 and RSW2 are set at "0". For the units supporting H-LINK II, the refrigerant cycle numbers can be set for a maximum of 64 cycles. (No. 0 to 63)		Set All Pins OFF Set at "5"

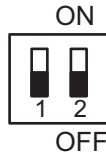
(7) Unit Model Code Setting (DSW4)

No setting is required. It is for setting the model code of the indoor unit.

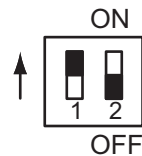


(8) Fuse Recover (DSW7)

* Factory Setting



* When applying high voltage to terminals 1 and 2 of TB2, the 0.5A fuse on the PCB is cut. In such a case, first reconnect the wirings correctly to TB2, and then set the No.1 pin to ON.



(9) Control Mode Setting (DSW8)

If the control mode type is "Outlet Air Temperature Control", this setting is required depending on the setting method of control mode.

Indoor Temperature Control (Factory Setting)	Outlet Air Temperature Control
All are OFF. 	No.3 is ON.

3.1.4 Checking Wired Controller

Wired Controller Model: CIW01

Each “Check Menu” item and its function are explained in the following table.

Check Menu Item	Function
Check 1	Sensor condition of air conditioner is monitored and indicated.
Check 2	Sensor data of air conditioner prior to alarm occurrence is indicated.
Alarm History Display	Previous alarm record (date, time, alarm code) is indicated.
Model Display	Model name and manufacturing number is indicated.
I.U./O.U. PCB Check	The result of PCB check is indicated.
Self Checking	Checking of wired controller is carried out.

● Setting Method

Normal Mode Display

Check Menu Display

Press and hold “Menu” and “ECO” simultaneously for three seconds during the normal mode.

(1) Check 1 and Check 2

<p>(1) Press and hold “Menu” and “ECO” simultaneously for three seconds during the normal mode. The Check Menu is displayed.</p>	
<p>(2) Select “Check 1” (or “Check 2”) from the Check Menu and press “OK”.</p>	
<p>(3) Select the Set Indoor Unit by pressing “△ ▽ ◁ ▷” and press “OK”. This screen is NOT displayed when there is only one indoor unit connected with the wired controller. In this case, (4) below is displayed.</p>	
<p>(4) Press “△” or “▽” to change the screen.</p>	

Features of Check Mode 1

No.	Item	Data Name
1	b1	Set Temp.
2	b2	Inlet Air Temp.
3	b3	Discharge Air Temp.
4	b4	Liquid Pipe Temp.
5	b5	Remote Thermistor Temp.
6	b6	Outdoor Air Temp.
7	b7	Gas Pipe Temp.
8	b8	Evaporating Temp. at Heating
9	b9	Condensing Temp. at Cooling
10	bA	Comp. Top Temp.
11	bb	Thermo Temp. of Wired Controller
12	bC	Not Prepared
13	C1	I.U. Micro-Computer
14	C2	O.U. Micro-Computer
15	d1	Stopping Cause State Indication
16	E1	Times of Abnormality
17	E2	Times of Power Failure
18	E3	Times of Abnormal Transmitting
19	E4	Times of Inverter Tripping
20	F1	Louver Sensor State
21	H1	Discharge Pressure

No.	Item	Data Name
22	H2	Suction Pressure
23	H3	Control Information
24	H4	Operating Frequency
25	J1	I.U. Capacity
26	J2	O.U. Code
27	J3	System Number (1)
28	J4	System Number (2)
29	L1	I.U. Electronic Expansion Valve
30	L2	O.U. Electronic Expansion Valve 1
31	L3	O.U. Electronic Expansion Valve 2
32	L4	O.U. Electronic Expansion Valve B
33	P1	Comp. Current
34	P2	Comp. Operating Accumulated Time
35	q1	Motion Sensor Reaction Rate * ¹
36	q2	Radiation Sensor Temp. * ¹
37	q3	Motion Sensor 1 Reaction Rate * ¹
38	q4	Motion Sensor 2 Reaction Rate * ¹
39	q5	Motion Sensor 3 Reaction Rate * ¹
40	q6	Motion Sensor 4 Reaction Rate * ¹
41	q7	Setting Temp. Collected Value

*¹ The average value for 30 seconds (update cycle time of Check Mode) is displayed on the LCD.

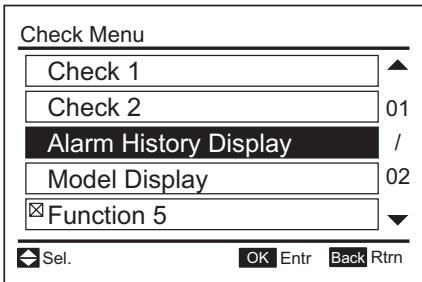
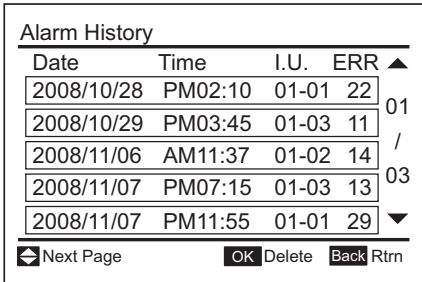
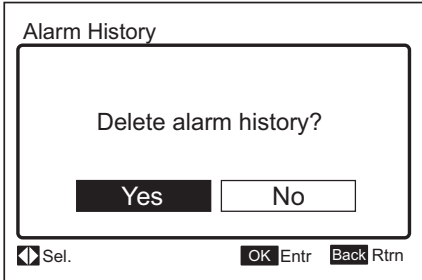
Features of Check Mode 2

No.	Item	Data Name
1	q1	Inlet Air Temp.
2	q2	Discharge Air Temp.
3	q3	Liquid Pipe Temp.
4	q4	Outdoor Air Temp.
5	q5	Gas Pipe Temp.
6	q6	Evaporating Temp. at Heating
7	q7	Condensing Temp. at Cooling
8	q8	Comp. Top Temp.

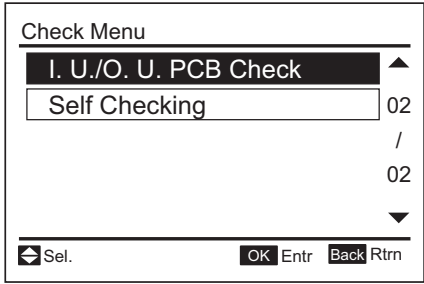
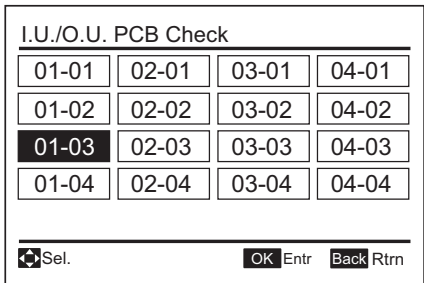
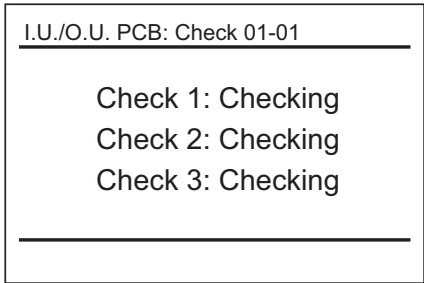
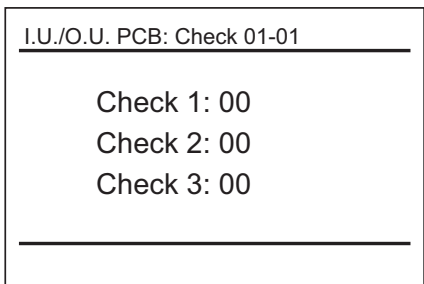
No.	Item	Data Name
9	q9	Discharge Pressure
10	qA	Suction Pressure
11	qb	Control Information
12	qC	Operating Frequency
13	qd	I.U. Expansion Valve
14	qE	O.U. Expansion Valve 1
15	qF	Comp. Current

(2) Alarm History Display

The Alarm History Display is accessed from the Check Menu.

<p>(1) Press and hold “Menu” and “ECO” simultaneously for 3 seconds during the normal mode. The Check Menu is displayed.</p>	
<p>(2) Select “Alarm History Display” from Check Menu and press “OK”.</p>	
<p>(3) The Alarm History Display changes by pressing “Δ” or “∇”.</p>	
<p>(4) To delete the alarm history, press “OK”. The confirmation screen is displayed. Select “Yes” and press “OK”. The alarm history is deleted and the screen returns to (3) above. If “No” is pressed, the screen returns to (3) above.</p>	

(3) I.U./O.U. PCB Check

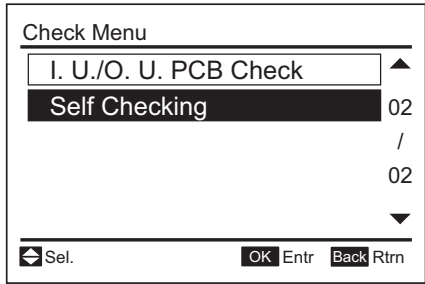
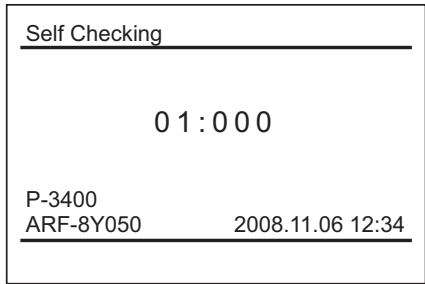
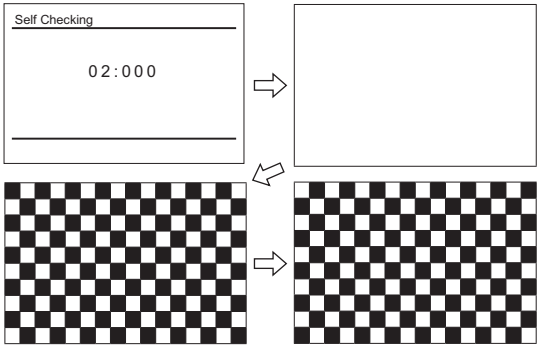
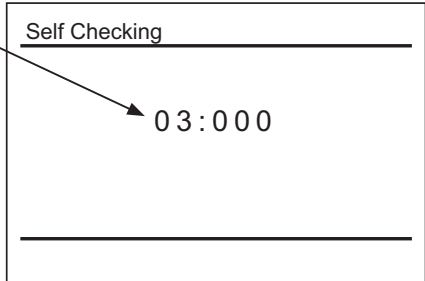
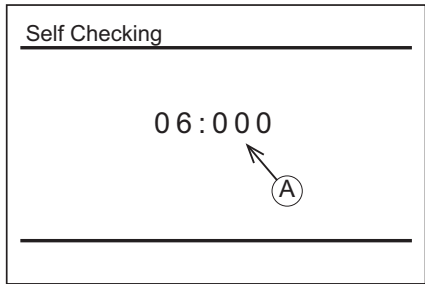
<p>(1) Press and hold "Menu" and "ECO" simultaneously for three seconds during the normal mode. Check Menu is displayed.</p>	
<p>(2) Select "I.U./O.U. PCB Check" from the Check Menu and press "OK".</p>	
<p>(4) The indoor unit PCB and the outdoor unit PCB checks are started. * If "Menu" is pressed during the check, the check is canceled and the screen returns to (2). * If "Back/Help" is pressed during the check, the check is canceled and the screen returns to (3) above.</p>	
<p>(5) After completing the check, the results of the PCB check is indicated. Press "Back/Help" and return to (3) above.</p>	

< Results of Check Table >

Indoor Unit PCB		Outdoor Unit PCB	
00	Normal	00	Normal
01	Abnormality of Inlet Air Temp. Thermistor	07	Abnormality of Transmission of Outdoor Unit
02	Abnormality of Outlet Air Temp. Thermistor	F4	ITO Input Failure
03	Abnormality of Liquid Pipe Temp. Thermistor	F5	PSH Input Failure
04	Abnormality of Remote Thermistor	F6	Abnormality of Protection Signal Detection Circuit
05	Abnormality of Gas Pipe Temp. Thermistor	F7	Abnormality of Phase Detection
08	Abnormality of Transmission of Central Station	F8	Abnormality of Transmission of Inverter
0A	Abnormality of EEPROM	FA	Abnormality of High Pressure Sensor
0b	Zero Cross Input Failure	Fb	Abnormality of Comp. Discharge Gas Temp. Thermistor
EE	Abnormality of Transmission of I.U. during Check	FC	Abnormality of Low Pressure Sensor
		Fd	Abnormality of Evaporating Temp. Thermistor at Heating
		FF	Abnormality of Ambient Air Temp. Thermistor

(4) Self-Checking

Self-Checking checks the wired controller and clears EEPROM (storage cell inside of the wired controller).

<p>(1) Press and hold "Menu" and "ECO" simultaneously for three seconds during the normal mode (when unit is not operating). The Check Menu is displayed.</p>	
<p>(2) Select "Self Checking" from the Check Menu and press "OK".</p>	
<p>(3) Select the process for "Self Checking".</p> <ul style="list-style-type: none"> * To start self check, press "ECO". * To clear EEPROM, press "▽" and "ECO" simultaneously. → See EEPROM clear process (15) below. <p>(4) LCD Test Press "OK" and the screen changes as shown at the right.</p>	
<p>(5) Backlight Test LCD brightness is changed gradually by pressing "OK".</p>	<p>03: Backlight Test 04: Contrast Test 05: Run Indicator Test</p> 
<p>(6) Contrast Test Contrast of the LCD gradually changes by pressing "OK".</p>	
<p>(7) Run Indicator Test Press "OK" and the run indicator flashes in red and green twice for each.</p>	
<p>(8) Button Input Test Press the nine buttons one-by-one. The number indicated with "(A)" counts up as buttons are being pressed.</p> <ul style="list-style-type: none"> * The order of pressing buttons is random. Do not press more than one button at a time. It is not be counted. 	

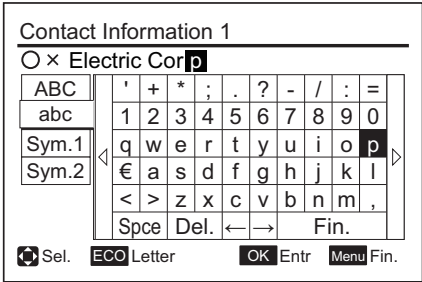
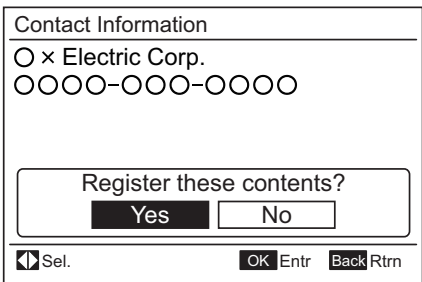
<p>(9) No Function This function is not used. Press "OK" to proceed.</p>	<div> <div>07: No Function 08: Transmission Test</div> <div> <div>Self Checking</div> <div>07:000</div> </div> </div>
<p>(10) Communication (Transmission) Circuit Test The wired controller automatically starts to check the communication circuit.</p>	
<p>(11) Wired Controller Thermistor Test The detected temperature by the wired controller thermistor is displayed at "A" in the figure at the right.</p>	<div> <div>Self Checking</div> <div>09:025</div> <div>A</div> </div>
<p>(12) Date/Time Test The date and time is changed from "2012.03.04 12:34" to "2008. 01. 01 00:00".</p>	<div> <div>Self Checking</div> <div>10:000</div> <div>2008.01.01 00:00</div> </div>
<p>(13) EEPROM Test < EEPROM Clearing Cancel > Press "?" (help). < EEPROM Clear > Press "OK" or wait 15 seconds. EEPROM data is cleared. During the process, the numbers indicate the location with "A". If A has a value of "999", EEPROM is in a faulty condition. *If "A" has "999", the process does not proceed to the next step.</p>	<div> <div>Self Checking</div> <div>11:000</div> <div>A</div> </div>

EEPROM Process

<p>(14) Clear EEPROM The wired controller automatically starts the EEPROM clearing process.</p>	<div> <div>Self Checking</div> <div>13:000</div> </div>
<p>(15) After several seconds pass, the self checking is completed and the wired controller is automatically restarted.</p>	

(5) Contact Information Registration

Contact information can be registered from "Contact Information".

(1) Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds during the normal mode (when unit is not operating). The Test Run Menu is displayed.	
(2) Select "Contact Information" from the Test Run Menu and press "OK". Contact Information 1 is displayed.	
(3) Press "Back/Help" to change font types.	
(4) Press "△ ▽ ◀ ▶" to select letters.	
(5) Press "OK" to confirm the letters. (Max.: 28 letters)	
(6) Select "Fin." and press "OK" (or simply press "Menu"), (7) is displayed.	
(7) Repeat (3) through (5) to register contact information and continue. Select "Fin." and press "OK", the confirmation screen is displayed. (Also, press "Menu" and the confirmation screen is displayed.)	
(8) Select "Yes" and press "OK". The Test Run Menu is displayed after the setting is confirmed. If "No" is pressed, the screen returns to (3) above.	

3.1.5 Checking Using 7-Segment Display

Refer to the Service Manual for Outdoor Unit.

3.1.6 Checking Alarm Code History

Refer to the Service Manual for Outdoor Unit.

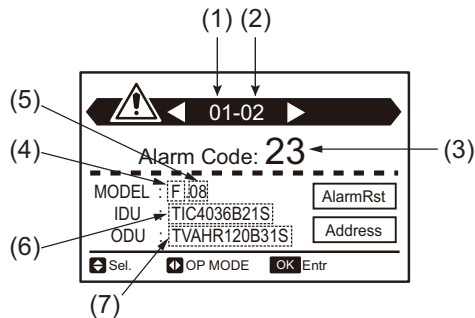
3.1.7 Emergency Operation

Refer to the Service Manual for Outdoor Unit.

3.2 Troubleshooting Procedures

● Alarm Code Indication of Wired Controller

< CIW01 >



- (1) Refrigerant Cycle No. (*1)
- (2) Indoor Unit No. (*1)
- (3) Alarm Code
- (4) Unit Model Code
- (5) Total Number of Indoor Units in the Same System as the Indoor Unit Having Trouble
- (6) Indoor Unit Model (*2) (*3)
- (7) Outdoor Unit Model (*2) (*3)

- (*1): If two or more indoor units having trouble are connected to the wired controller, the indicated indoor unit is selectable.
- (*2): The initial of model names are indicated as "T". These "T" are replaced with "H" or "Y".
(Except for the wall mount model.)
When there is a combination of outdoor units, ODU indication is the model of the main outdoor unit (Unit A).
- (*3): The model names are not indicated depending on the unit type.

3.2.1 Alarm Code Table

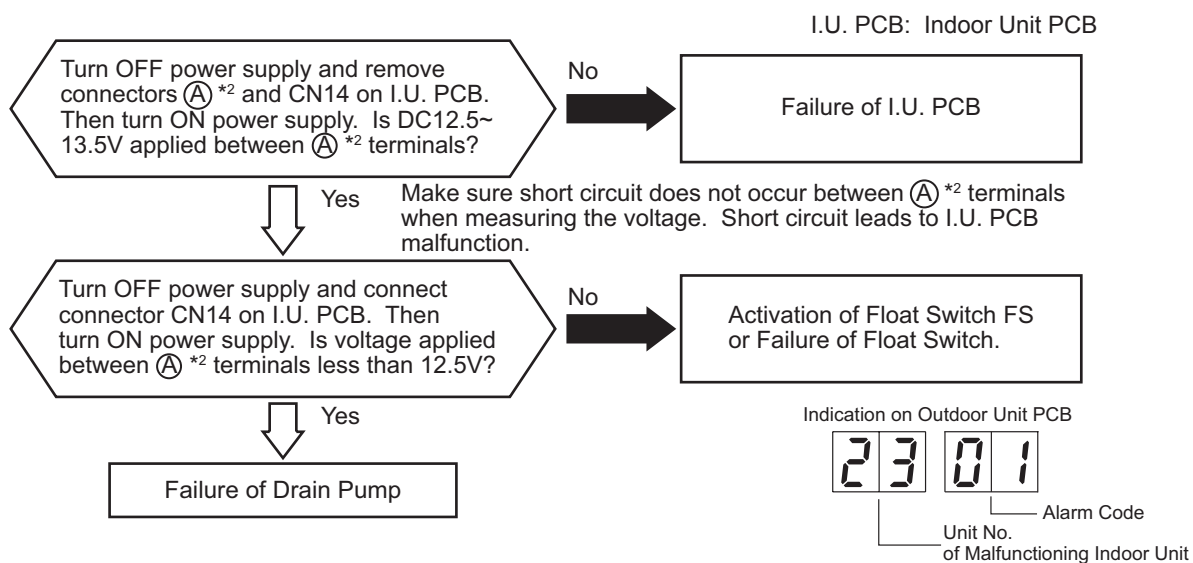
Code	Category	Content of Abnormality	Leading Cause
01	Indoor Unit	Activation of Protection Device (Float Switch)	Activation of Float Switch (High Water Level in Condensation Drainage Pan, Problem with Drain Piping, Float Switch, or Condensation Drainage Pan)
03	Communication	Abnormal Communication between Indoor and Outdoor Units	Incorrect Wiring, Loose Terminals, Disconnect Wire, Blowout of Fuse, Outdoor Unit Power OFF
11	Sensor on Indoor Unit	Abnormal of Inlet Air Thermistor	Incorrect Wiring, Disconnecting Wiring Breaking Wire, Short Circuit
12		Abnormal of Outlet Air Thermistor	
13		Abnormal of Freeze Protection Thermistor	
14		Abnormal of Gas Piping Thermistor	
16		Abnormal of Remote Thermistor (DOAS)	
17		Abnormal of Thermistor for Controller (DOAS)	
19	Fan Motor	Activation of Protection Device for Indoor Fan Motor	Fan Motor Overheat, Lockup
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	Incorrect Capacity Code Setting of Combination Excessive or Insufficient Indoor Unit Total Capacity Code
35		Incorrect Setting of Indoor Unit No.	Duplication of Indoor Unit No. in same Refrigerant Group
36		Incorrect Indoor Unit Combination	Indoor Unit is Designed for R22
b0		Incorrect Setting of Unit Model Code	Unit model code setting is not set or is set for the incorrect indoor unit type.
b1		Incorrect Setting of Unit and Refrigerant Cycle Number	There are 64 or More Number is Set for Address or Refrigerant Cycle.

3.2.2 Troubleshooting Using Alarm Codes

Alarm Code	01	Activation of Protection Device (Float Switch) in Indoor Unit
------------	----	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- ^{*1)} Except for some models.

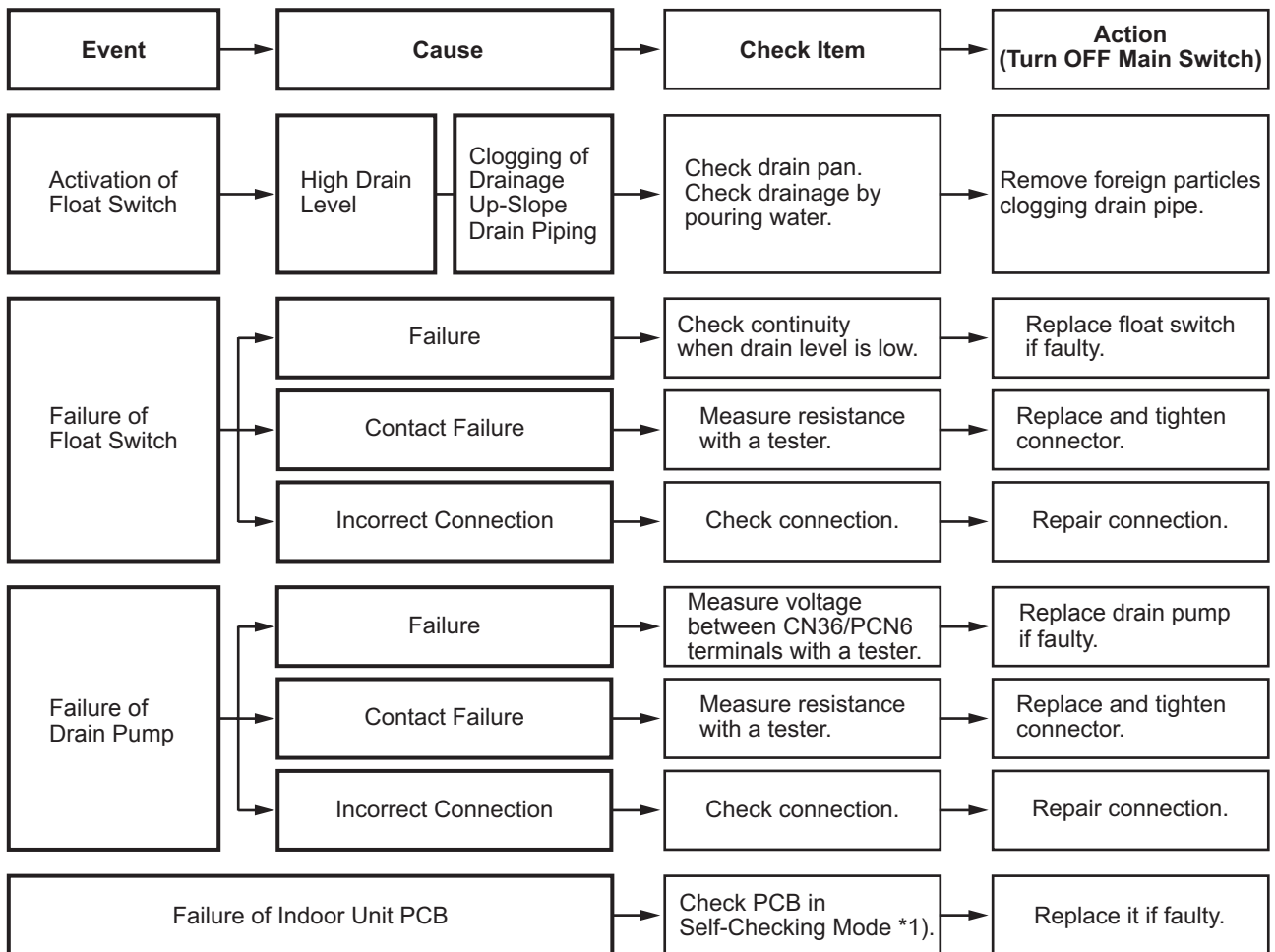
★ This alarm code is displayed when the contact between #1 and #2 of CN14 on the I.U. PCB is opened for over 120 seconds during the cooling, dry, fan, or heating operation.



^{*2)}: Connector for Drain Pump

Indoor Unit Type	Ⓐ Connector for Drain Pump
DOAS	PCN6 on PCB1

TROUBLESHOOTING



*1): Refer to Section 3.1.4 (3) above for details.

Alarm
Code

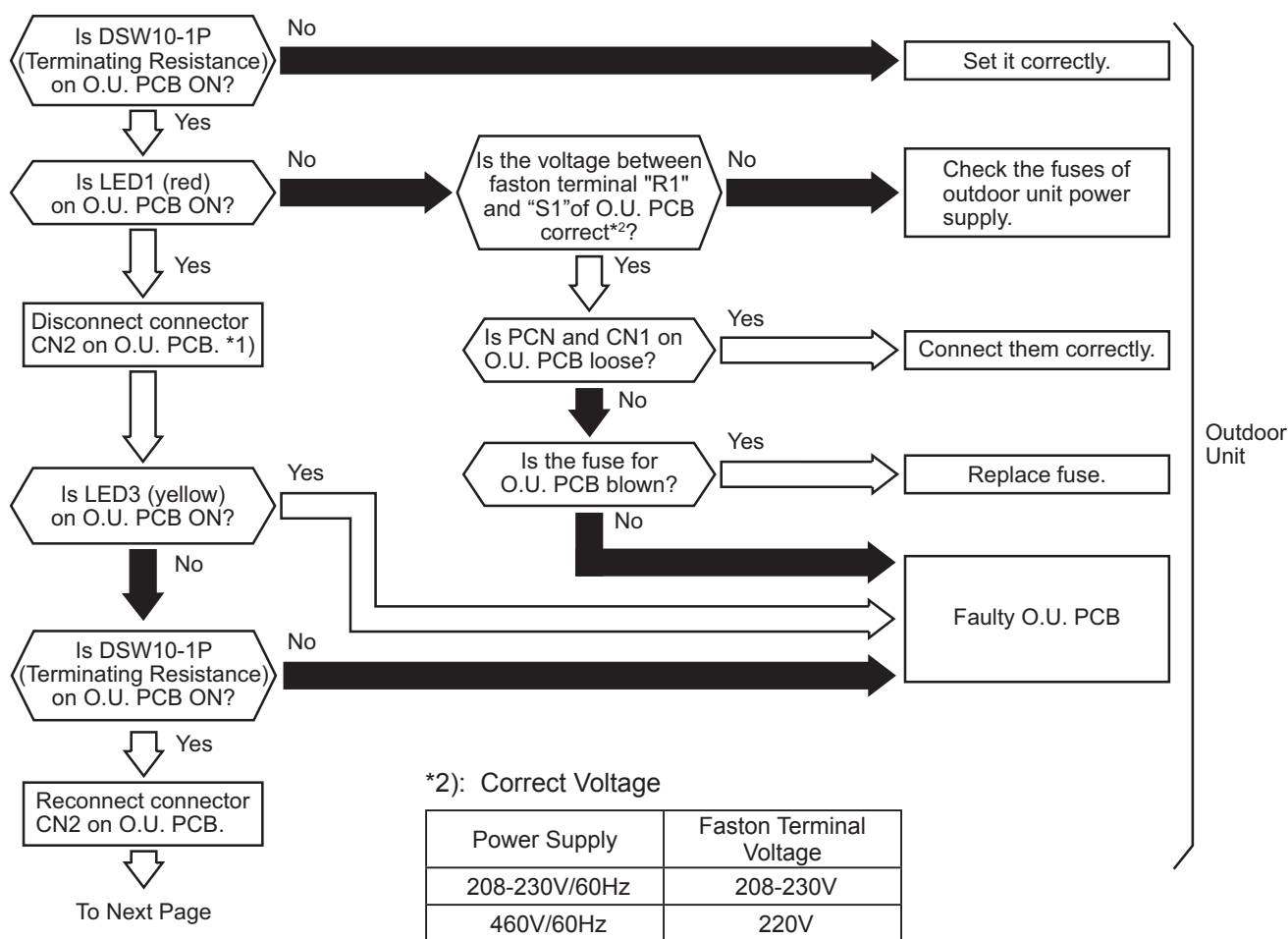
03

Abnormal Communication between Indoor Units and Outdoor Units

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD, and the indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

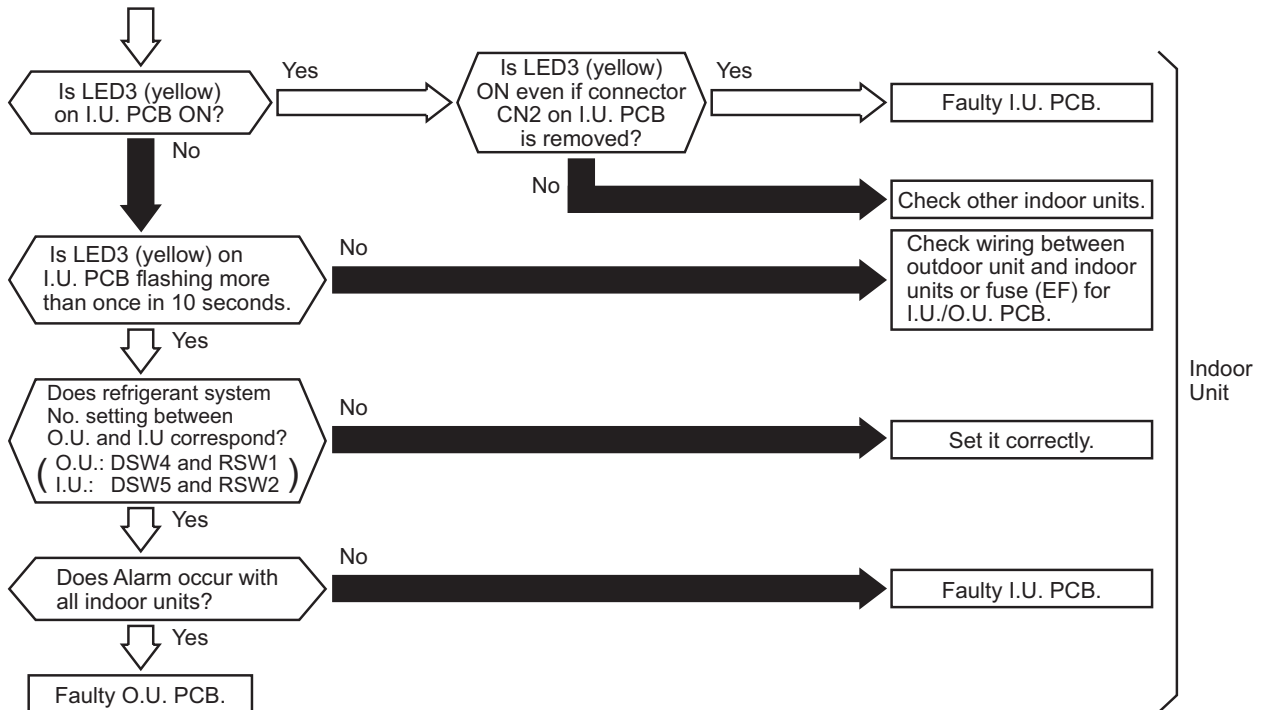
^{*1)} Except for some models.

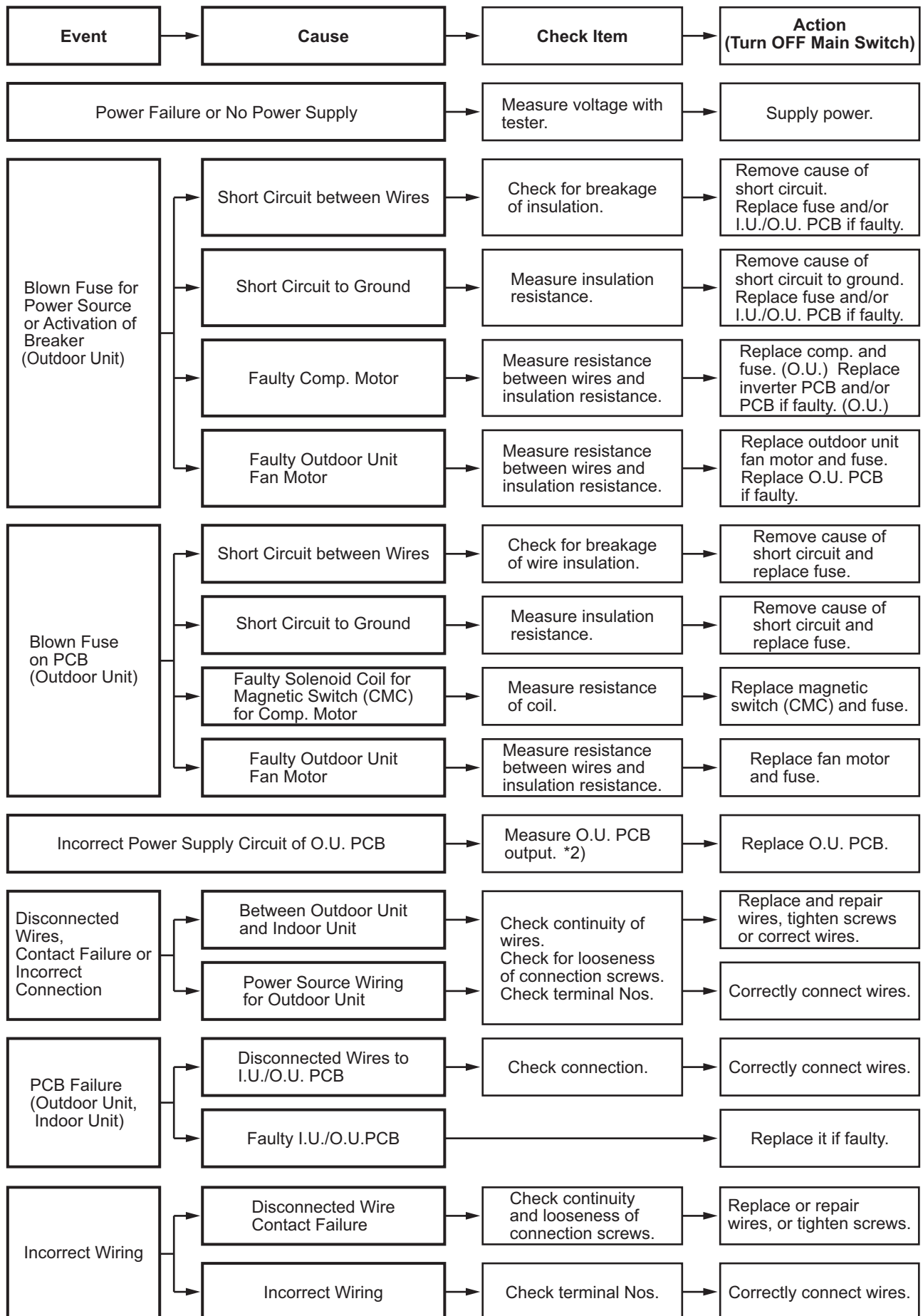
- ★ When fuses are blown, or the circuit breakers are activated, check the cause of overcurrent and take necessary action.
- ★ This alarm code is displayed when an abnormal condition continues for three minutes after normal communication between indoor units and outdoor units. The abnormal condition continues for 30 seconds even after the micro-computer is automatically reset. If communication failure occurs from the beginning, the alarm code is displayed after 30 seconds from start up.



TROUBLESHOOTING

O.U. PCB: Outdoor Unit PCB
I.U. PCB: Indoor Unit PCB





O.U. PCB: Outdoor Unit PCB

I.U. PCB: Indoor Unit PCB

TROUBLESHOOTING

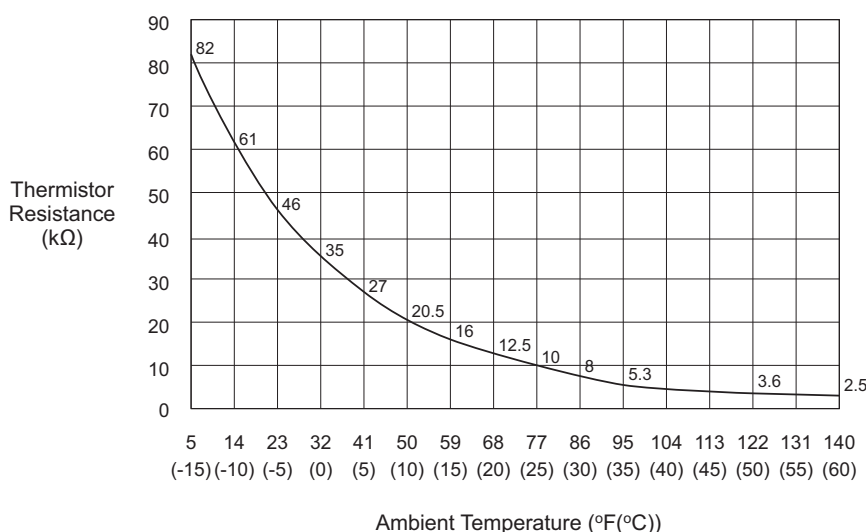
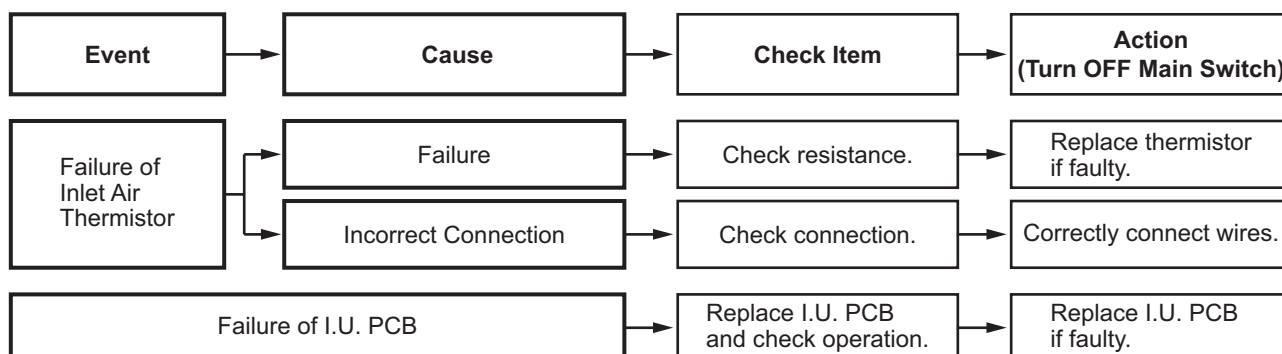
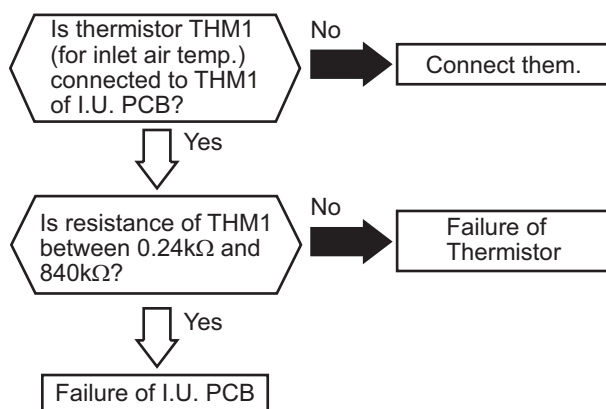
- *1): If the end terminal resistance (DSW10) is set to OFF for H-LINK connection, set the end terminal resistance to ON when CN2 is disconnected. Set the end terminal resistance to OFF when CN2 is reconnected.
- *2): 12VDC between VCC12 and GND2
5VDC between VCC05 and GND1
12VDC between VCC12 and GND1
15VDC between VCC15 and GND1
24VDC between VCC24 and GND1
12VDC between VCC12T and GND1

Alarm Code	11	Abnormality of Thermistor for Indoor Unit Inlet Air Temperature (Inlet Air Thermistor)
------------	----	---

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

*1) Except for some models.

- ★ This alarm code is displayed when a short circuit ($0.24\text{k}\Omega$ or less) or disconnection ($840\text{k}\Omega$ or more) of the thermistor is detected during a heating or cooling operation. The operation automatically restarts when the malfunction is removed.



Indication on Outdoor Unit PCB
(Alarm Code 11 ~ 19)



Alarm Code
(11 ~ 19)

Unit No. of
Malfunctioning Indoor Unit

NOTE:

This figure is applicable to the following thermistors.

1. Inlet Air Thermistor (THM1), 2. Liquid Pipe Thermistor (Freeze Protection) (THM3), 3. Gas Pipe Thermistor (THM5), 4. Outlet Air Thermistor (THM2), 5. Outside Air Thermistor or Remote Thermistor (THM4)

Alarm
Code

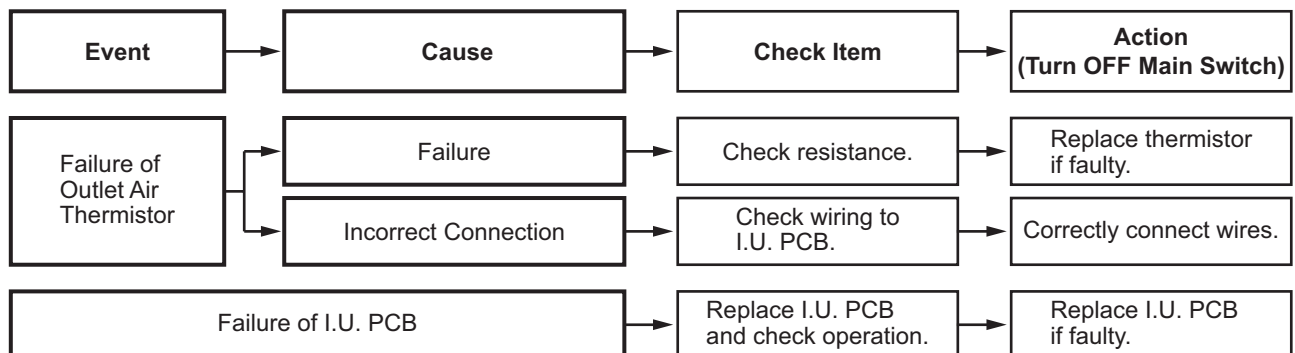
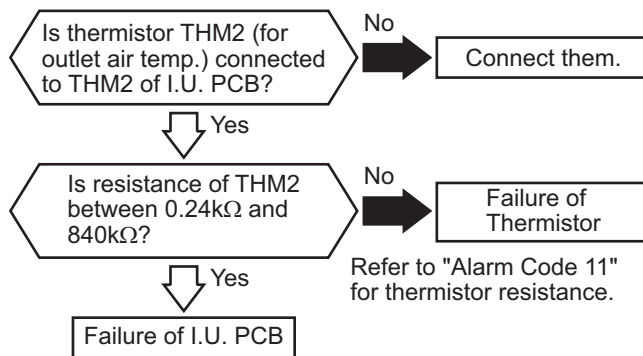
12

Abnormality of Thermistor for Indoor Unit Outlet Air Temperature (Outlet Air Thermistor)

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

*1) Except for some models.

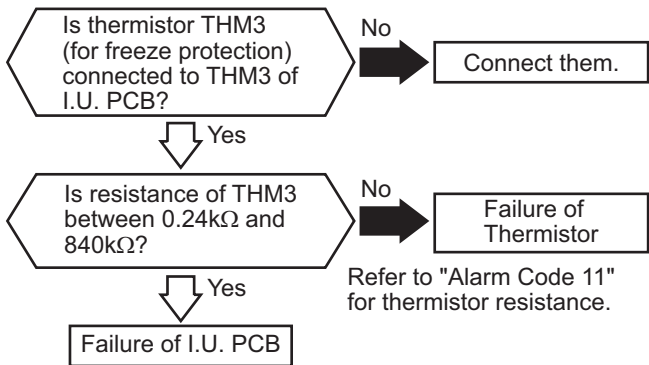
- ★ This alarm code is displayed when a short circuit ($0.24\text{k}\Omega$ or less) or disconnection ($840\text{k}\Omega$ or more) of the thermistor is detected during a heating or cooling operation. The operation automatically restarts when the malfunction is removed.



Alarm Code	13	Abnormality of Thermistor for Liquid Refrigerant Pipe Temperature at Indoor Unit Heat Exchanger (Freeze Protection Thermistor)
------------	----	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- ^{*1)} Except for some models.

★ This alarm code is displayed when a short circuit (0.24kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during a heating or cooling operation. The operation automatically restarts when the malfunction is removed.



Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Freeze Protection Thermistor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to I.U. PCB.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.

Alarm
Code

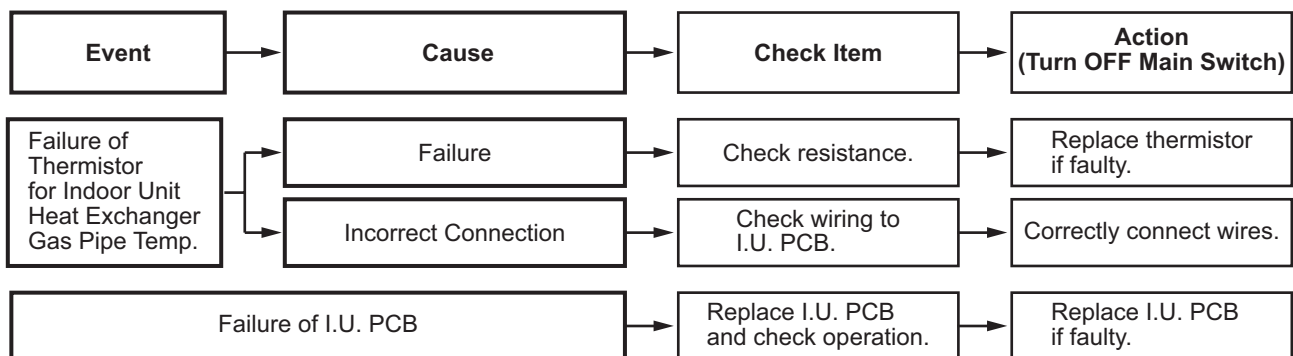
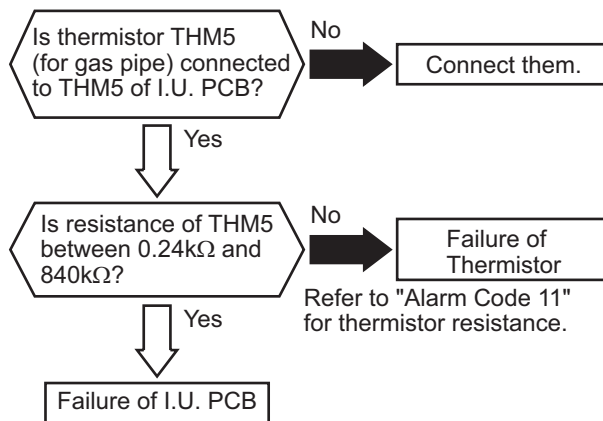
14

Abnormality of Thermistor for Gas Refrigerant Pipe Temperature at Indoor Unit Heat Exchanger (Gas Pipe Thermistor)

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

^{*1)} Except for some models.

- ★ This alarm code is displayed when a short circuit ($0.24\text{k}\Omega$ or less) or disconnection ($840\text{k}\Omega$ or more) of the thermistor is detected during a heating or cooling operation. The operation automatically restarts when the malfunction is removed.



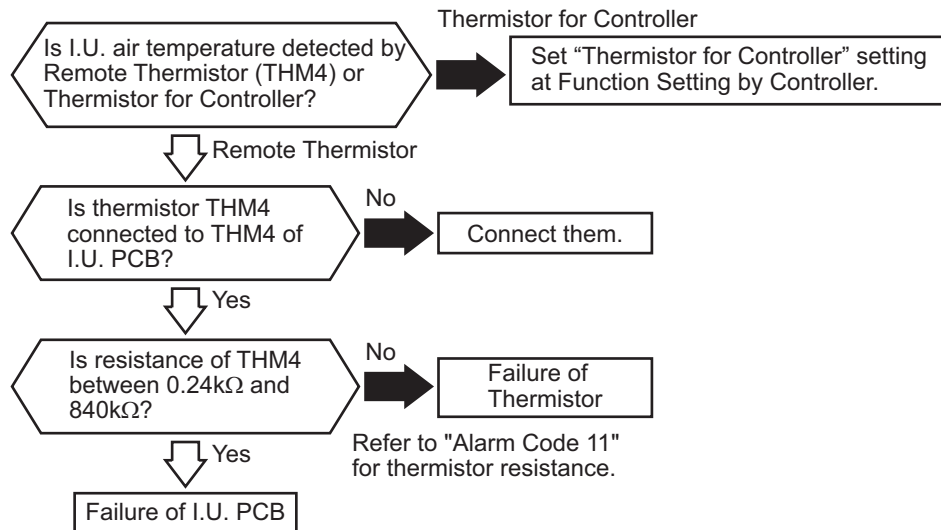
^{*1)}: The heating operation is available only during the test run.

Alarm
Code

16

Abnormality of Remote Thermistor
(for DOAS Unit)

- The RUN indicator (red) flashes.
 - The indoor unit number and the alarm code are displayed on the LCD. The alarm code is displayed on the 7-segment display of the outdoor unit PCB.
- ★ This alarm code is displayed when a short circuit ($0.24\text{k}\Omega$ or less) or disconnection ($840\text{k}\Omega$ or more) of the thermistor is detected during a heating, cooling or fan operation.



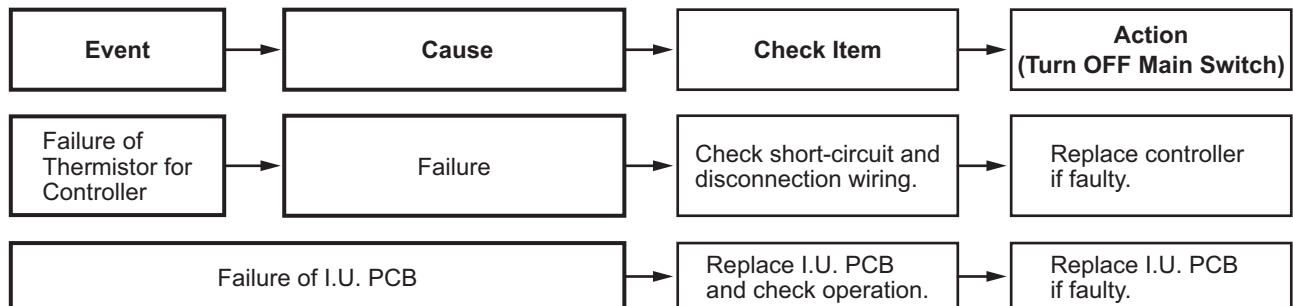
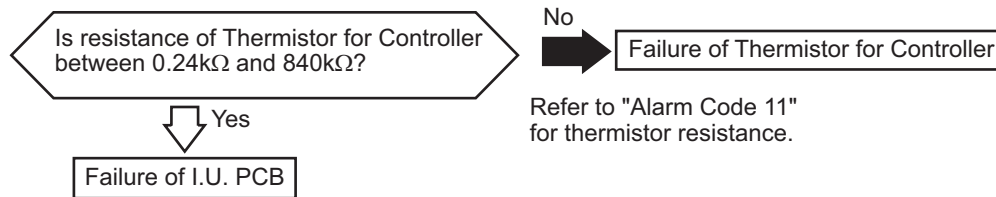
Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Remote Thermistor	Failure	Check resistance.	Replace remote thermistor if faulty.
	Incorrect Connection	Check wiring to I.U. PCB.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.

Alarm
Code

17

Abnormality of Thermistor for Controller (for DOAS Unit)

- The RUN indicator (red) flashes.
- The indoor unit number and the alarm code are displayed on the LCD. The alarm code is displayed on the 7-segment display of the outdoor unit PCB.
- ★ This alarm code is displayed when a short circuit ($0.24\text{k}\Omega$ or less) or disconnection ($840\text{k}\Omega$ or more) of the thermistor is detected during a heating or cooling operation.



NOTE:

The DOAS is able to operate while utilizing the Remote Thermistor and the Controller Thermistor under certain mode.

While operating in this mode:

- if one of the thermistors fail, operation can be continued by using the value measured from the only thermistor working,
- if both of thermistors fail, this alarm code is displayed.

This alarm code will only appear when both thermistors are being used and both have failed. For checking follow the previous page "Alarm Code 16".

Alarm Code

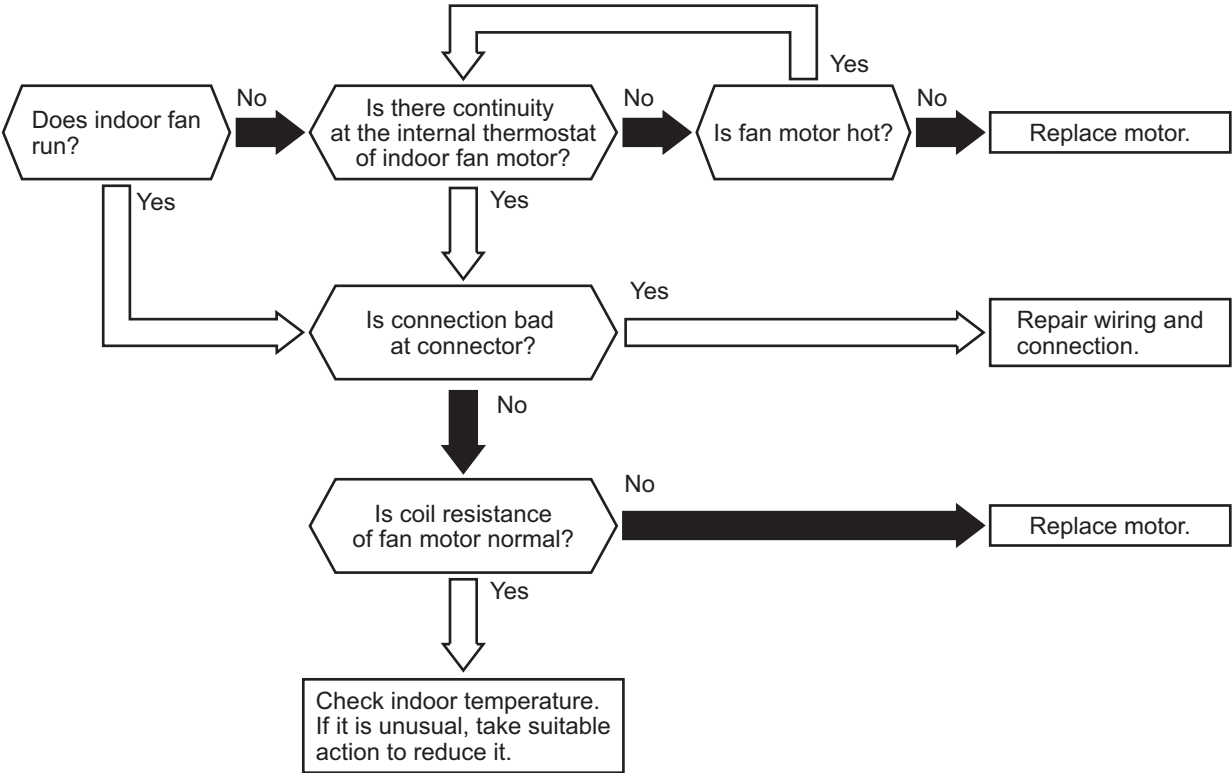
19

Activation of Protection Device for Indoor Fan Motor

(Indoor Unit with AC Motor)

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ This alarm code is displayed when over approximately 1A is applied to the indoor unit fan motor.



Event	Cause	Check Item	Action (Turn OFF Main Switch)
Activation of Internal Thermostat for Indoor Unit Fan Motor	Faulty Indoor Unit Fan Motor	Measure coil resistance and insulation resistance.	Replace motor if faulty.
	Faulty Internal Thermostat	Failure	Check continuity after fan motor temperature decreases to room temp.
		Contact Failure	Measure resistance with a tester.
		Incorrect Connection	Check connection.
			Repair connection.

Alarm
Code

31

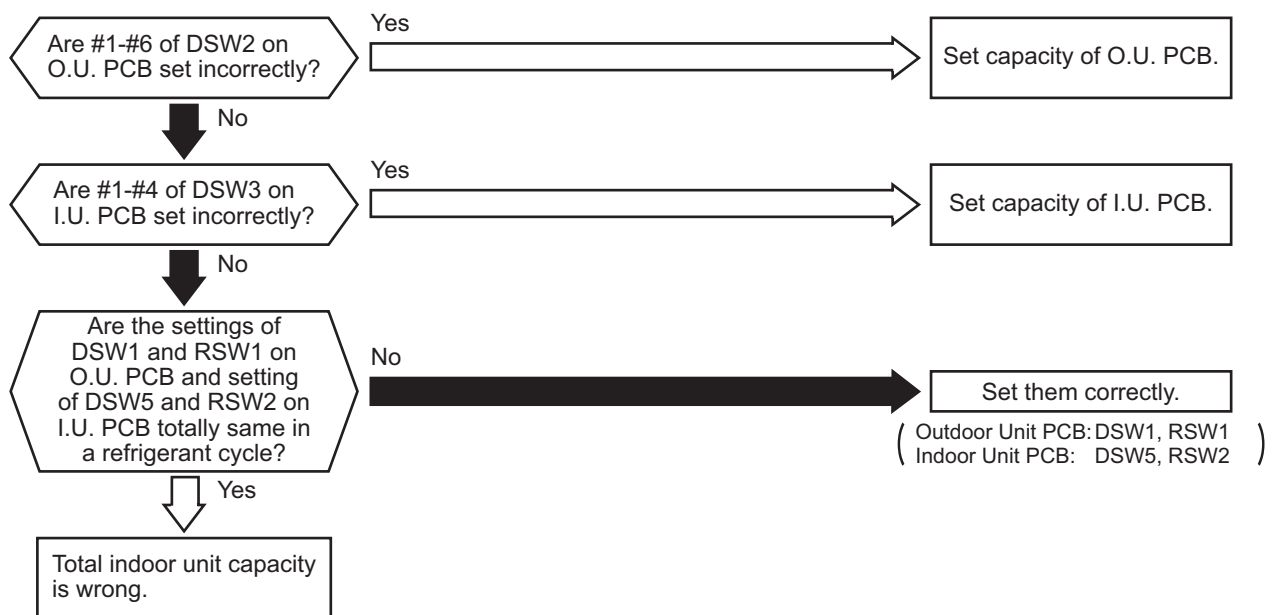
Incorrect Capacity Setting of Indoor Unit and Outdoor Unit

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

*1) Except for some models.

- ★ This alarm code is indicated when the capacity setting DIP switch, DSW2, on the outdoor unit PCB, is not set (all the settings from #1 to #6 are OFF) or set incorrectly.
- ★ This alarm code is displayed when the total indoor unit capacity exceed the connectable indoor unit capacity ratio of outdoor unit.

O.U. PCB: Outdoor Unit PCB
I.U. PCB: Indoor Unit PCB



Event	Cause	Check Item	Action (Turn OFF Main Switch)
Incorrect Capacity Setting of Indoor Unit		Check combination of indoor units and capacity setting of I.U. PCB.	Correctly set DIP switch, DSW3.
Incorrect Capacity Setting of Outdoor Unit		Check capacity setting of O.U. PCB.	Correctly set DIP switch, DSW2.
Total Indoor Unit Capacity Connected to Outdoor Unit is Beyond Permissible Range		Check outdoor unit model by calculating total indoor units capacity.	Ensure that total indoor unit capacity is from 50% to 130%.
Refrigerant Cycle Setting of Outdoor Unit and Indoor Unit is Different		Check refrigerant cycle setting of O.U. PCB and I.U. PCB.	Set them correctly.

Refrigerant Cycle No. Setting

	Setting Switch	
	10 digit	1 digit
Outdoor Unit	DSW1	RSW1
Indoor Unit	DSW5	RSW2

Example of Setting Refrigerant Cycle No.25



Turn ON No. 2 pin.



Set Dial No.5.

DSW and RSW factory setting is 0.
Maximum in setting refrigerant cycle No. is 63.

Alarm Code	35	Incorrect Indoor Unit No. Setting
------------	----	-----------------------------------

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

^{*1)} Except for some models.

- ★ This alarm code is displayed five minutes after power-on of the outdoor unit, if the indoor unit number set by DSW6 and RSW1 duplicates in the same refrigerant group.

Alarm Code	36	Incorrect Indoor Unit Combination
------------	----	-----------------------------------

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

^{*1)} Except for some models.

Alarm
Code

60

Incorrect Setting of Unit Model Code

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

^{*1)} Except for some models.

- ★ This alarm code is displayed in the following condition. Check the unit model code setting (DSW4) of I.U. PCB after turning OFF the power source.

Condition	Action
The unit model code setting (DSW4) is not set (all pins are "OFF"), or is set for the incorrect indoor unit type.	Set DSW4 correctly.

Alarm
Code

61

Incorrect Setting of Unit and Refrigerant Cycle Number

- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code^{*1)}, the model name^{*1)} and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.

^{*1)} Except for some models.

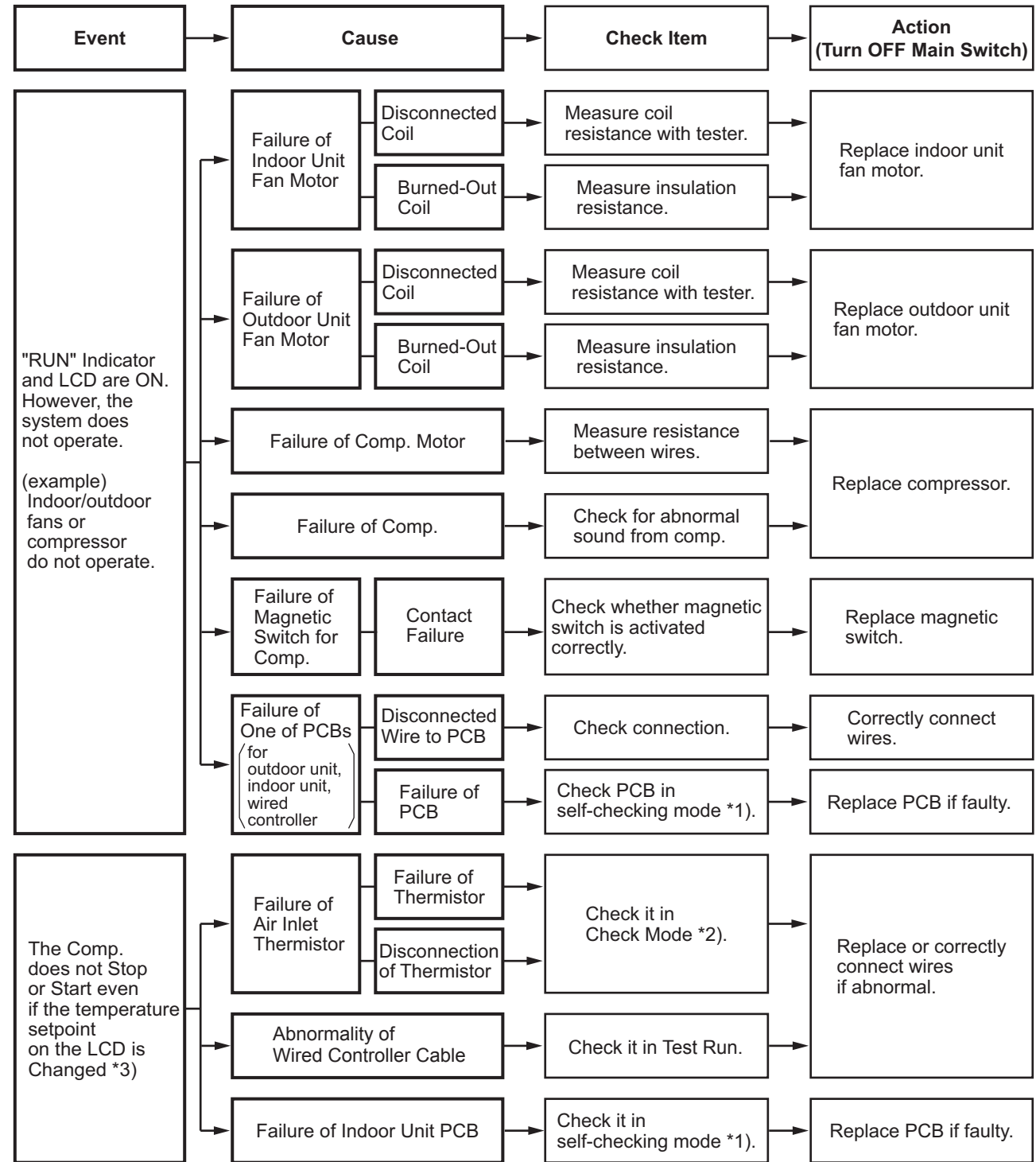
- ★ This alarm code is displayed in the following condition. Check the settings of the DIP switch (DSW) and the rotary switch (RSW) after turning OFF the power source.

Condition	Action
The unit No. setting (DSW6 and RSW1) or the refrigerant cycle No. setting (DSW5 and RSW2) is set as "64" or more, or more than 2 pins of DSW5 or DSW6 are set.	<p>a) Unit No. Setting / Ref. Cycle No. Setting Starting from "1" (recommended) Set the unit No. and the refrigerant cycle No. from "1" to "63". (Setting No. for the 64th unit shall be "0".)</p> <p>b) Unit No. Setting / Ref. Cycle No. Setting Starting from "0" Set the unit No. and the refrigerant cycle No. from "0" to "63". (Setting No. for the 64th unit must be "63".)</p>

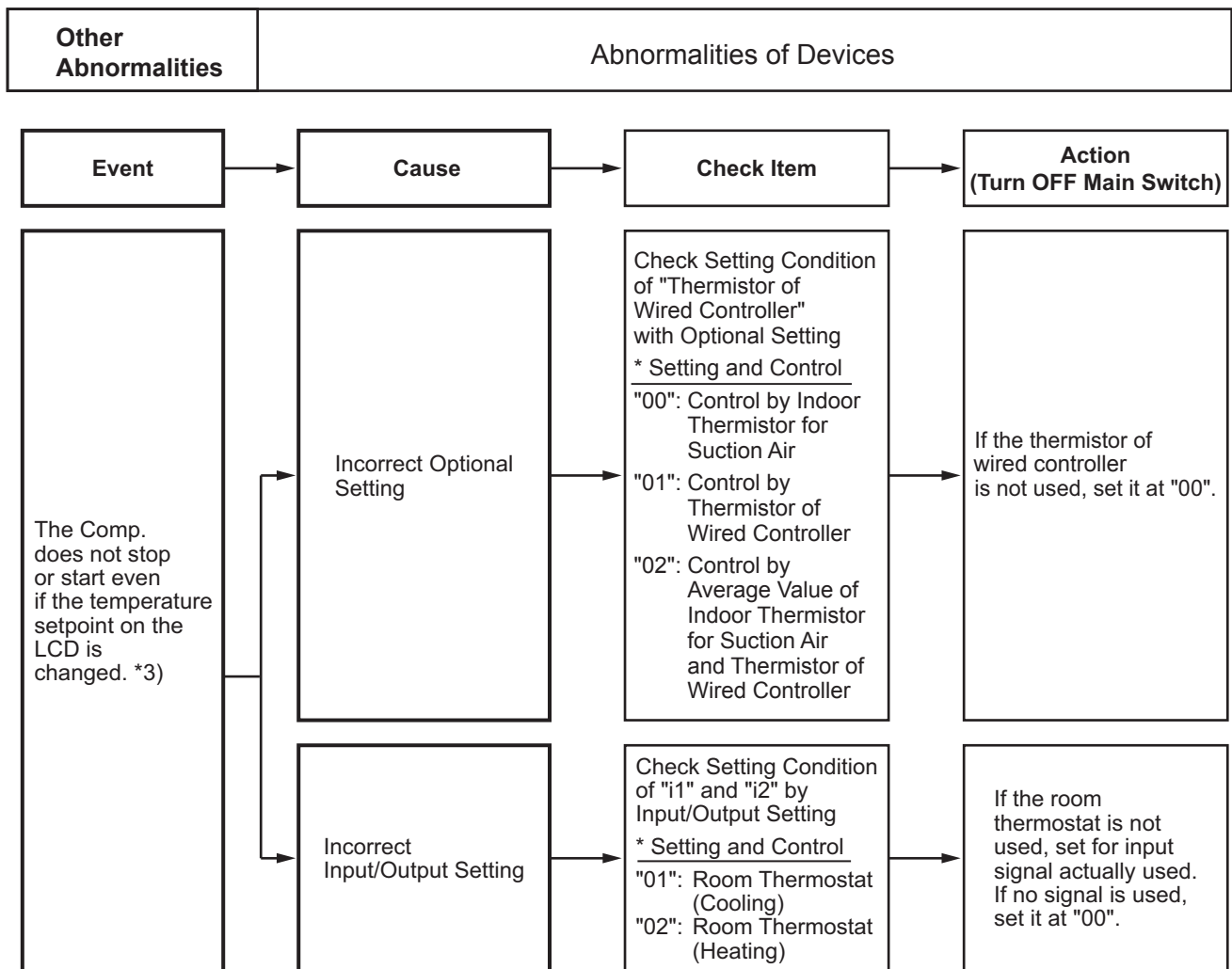
3.2.3 Abnormalities of Devices

Other Abnormalities	Abnormalities of Devices
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If there is no abnormality (Alarm Code) indicated on the wired controller, and normal operation is not available, take necessary action according to the following procedures.



*1): For CIW01, refer to Section 3.1.4 (3).
*2): For CIW01, refer to Section 3.1.4 (2).
*3): Even if controllers are normal, the compressor does not operate under the following conditions.
* Indoor Air Temp. is lower than 69.8°F (21°C) or Outdoor Air Temp. is lower than 23°F (-5°C) during cooling operation.
* Indoor Air Temp. is higher than 86°F (30°C) or Outdoor Air Temp. is higher than 73.4°F (23°C) during heating operation.
* When a cooling (or heating) operation signal is given to the outdoor unit and a different operation signal is given to indoor units.
* When demand signal or emergency stop signal is given to outdoor unit.



*1): For CIW01, refer to Section 3.1.4 (3).

*2): For CIW01, refer to Section 3.1.4 (2).

*3): Even if controllers are normal, the compressor does not operate under the following conditions.

- * Indoor Air Temp. is lower than 69.8°F (21°C) or Outdoor Air Temp. is lower than 23°F (-5°C) during cooling operation.
- * Indoor Air Temp. is higher than 86°F (30°C) or Outdoor Air Temp. is higher than 73.4°F (23°C) during heating operation.
- * When a cooling (or heating) operation signal is given to the outdoor unit and a different operation signal is given to indoor units.
- * When demand signal or emergency stop signal is given to outdoor unit.

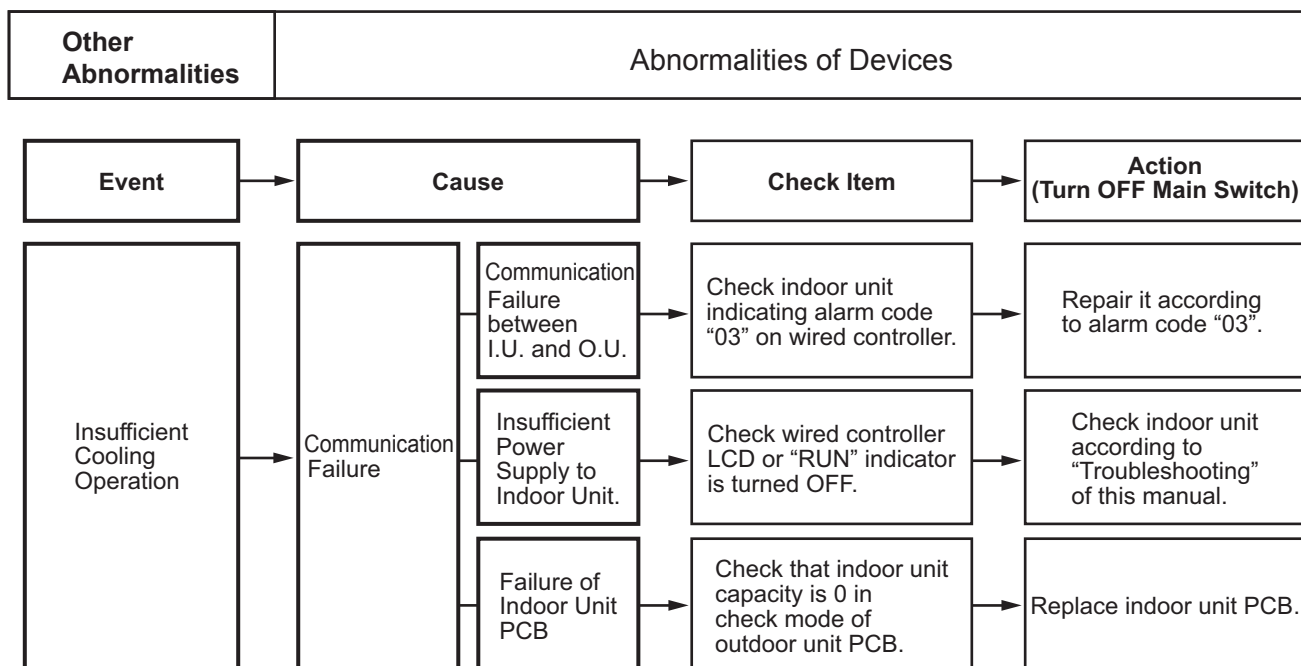
Other Abnormalities	Abnormalities of Devices			
Event	Cause		Check Item	Action (Turn OFF Main Switch)
Indoor Fan Speed is Not Changed	Failure of Discharge Air Temp. Thermistor	Failure of Thermistor	Check Thermistor in Self-Checking mode *2).	Replace or correctly connect wires if abnormal.
		Disconnected Wire of Thermistor		
	Failure of Wired Controller	Check it in Self-Checking mode *1).	Replace wired controller if faulty.	
	Failure of Indoor Unit PCB			Replace PCB if faulty.
No Defrosting Operation Mode is Available while Heating Operation or Defrosting Operation is Continued	Failure of Thermistor for Outdoor Evaporating Temp. during Heating	Failure of Thermistor		Replace or correctly connect it if abnormal.
		Disconnected Wire of Thermistor		
	Failure of Reversing Valve	Disconnected Reversing Valve Coil	Measure resistance of coil.	Replace reversing valve.
		Incorrect Activation of Reversing Valve	Supply power forcibly.	
	Disconnected Control Wires between Indoor Unit and Outdoor Unit		Check connectors.	Correctly connect wires.
	Failure of Outdoor Unit PCB	Disconnected Wire to PCB	Check connectors.	Correctly connect wires.
		Failure of PCB	Check it in Self-Checking mode *1).	Replace it when check mode is not available.
	Failure of Indoor Unit PCB	Disconnected Wire to PCB	Check connectors.	Correctly connect wires.
		Failure of PCB		
Light and LCD Indication on Wired Controller are Kept ON	Failure of PCB in Indoor Unit or Wired Controller		Check PCB in Self-Checking mode *1).	Replace PCB if faulty.

*1): For CIW01, refer to Section 3.1.4 (3).

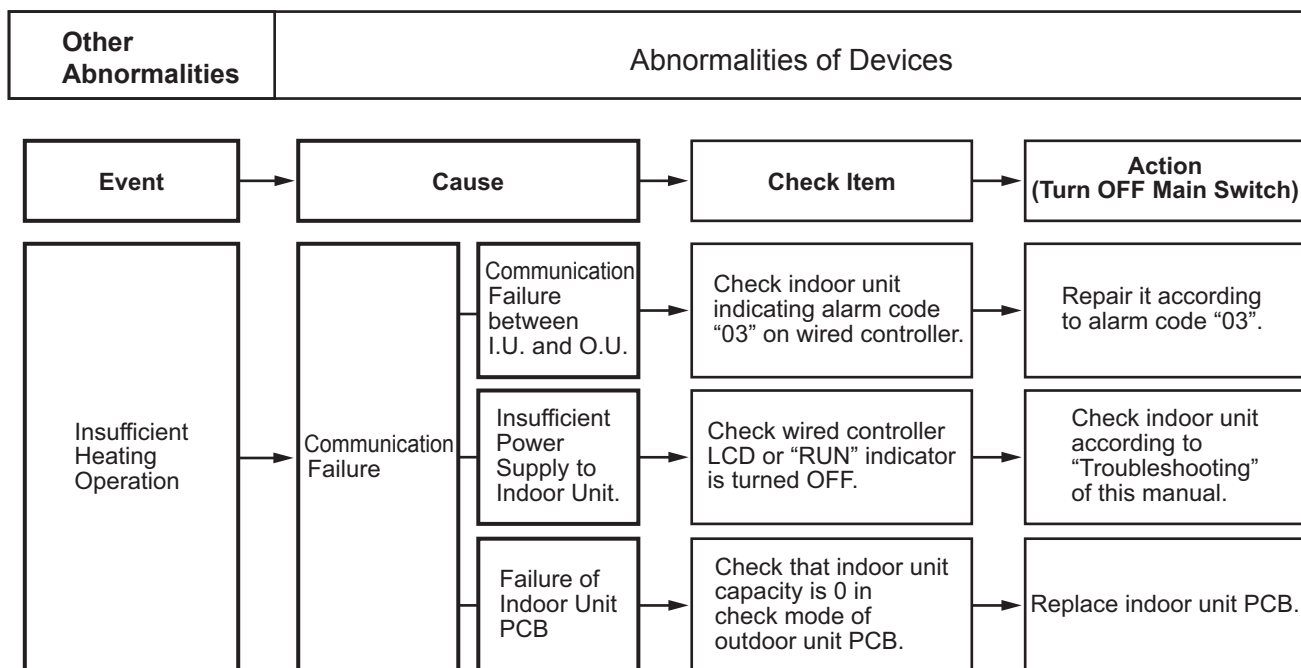
*2): Refer to Section 3.1.4 (2).

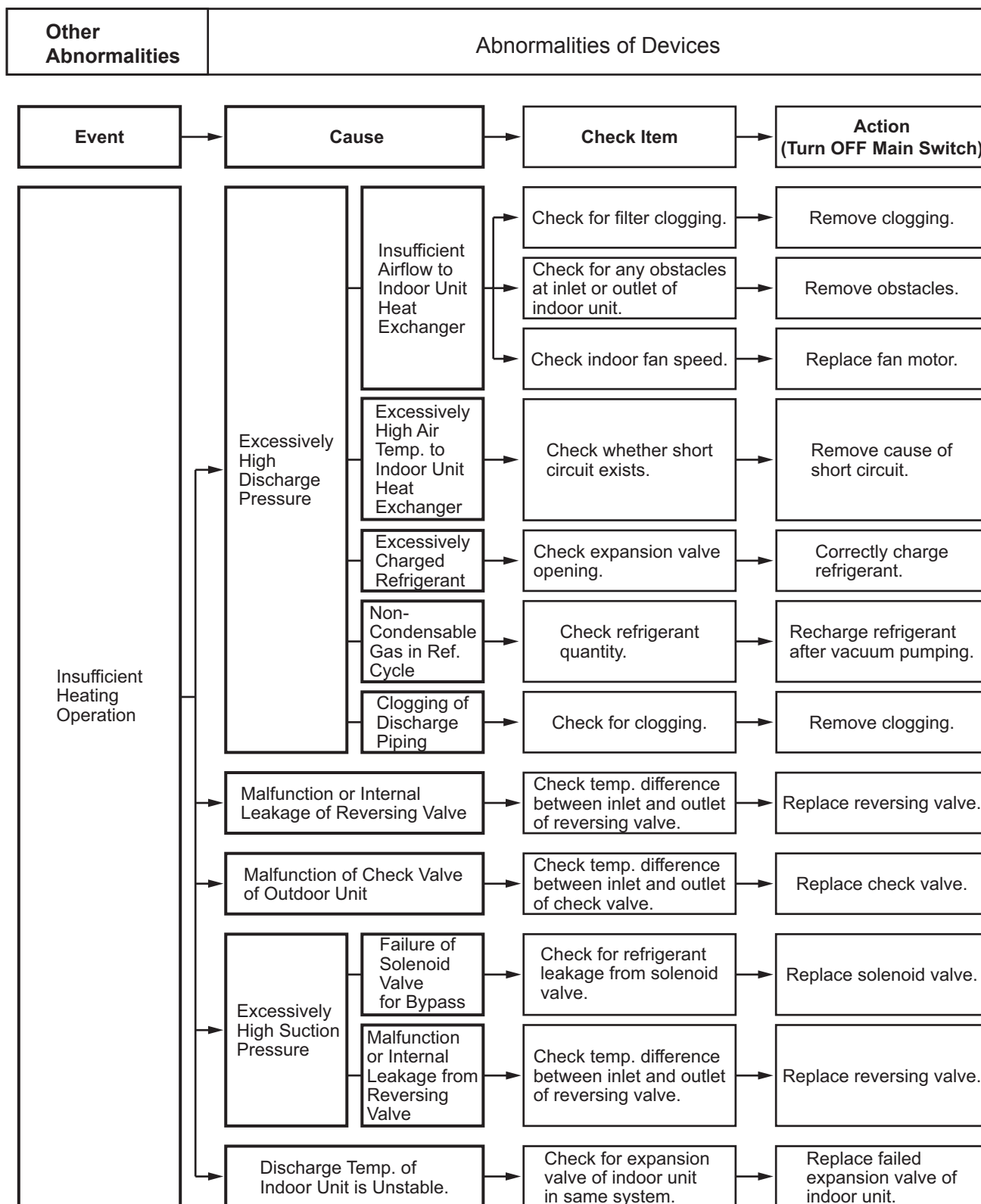
Other Abnormalities	Abnormalities of Devices			
Event	Cause	Check Item	Action (Turn OFF Main Switch)	
Insufficient Cooling Operation	Indoor Heat Load is Larger than Cooling Capacity	Calculate heat load.	Use a larger unit.	
	Excessively Low Suction Pressure	Gas Leakage or Shortage of Refrigerant	Measure superheat.	Correctly charge refrigerant after repairing gas leakage.
		Excessively Small Diameter Tube or Long Piping	Measure and check field-supplied pipes.	Use correct pipes.
		Incorrect Activation of Check Valve of Outdoor Unit	Check whether or not temp. difference exists before/after check valve.	Replace check valve for outdoor unit.
		Failure or Malfunction of Electronic Expansion Valve	Check for any clogging.	Remove clogging.
			Check connection cord and connector.	Replace connector.
			Is there operation sound from coil?	Replace coil.
			Is thermistor on compressor normal?	Replace thermistor.
			Is thermistor installed correctly on compressor?	Correctly install it.
		Clogged Strainer in Indoor Unit Clogging at Low Pressure Piping	Check temp. difference at inlet and outlet of strainer.	Replace strainer in indoor unit.
		Clogging at Low Pressure Piping	Check temp. difference.	Remove clogging.
		Insufficient Airflow to Indoor Unit Heat Exchanger	Check for clogged air filter.	Clean air filter.
			Check for obstacle at inlet or outlet.	Remove obstacles.
		Excessively Low Air Temp. to Indoor Unit Heat Exchanger	Insufficient revolution of indoor unit fan motor?	Replace fan motor.
			Check short-circuited indoor unit air.	Remove cause of short-circuited.

Other Abnormalities	Abnormalities of Devices			
Event	Cause		Check Item	Action (Turn OFF Main Switch)
Insufficient Cooling Operation	Excessively High Discharge Pressure	Insufficient Airflow to Outdoor Unit Heat Exchanger	Check clogging of outdoor unit heat exchanger.	Remove clogging.
			Obstacles at inlet or outlet of outdoor unit heat exchanger?	Remove obstacles.
			Is service space for outdoor unit sufficient?	Secure sufficient service space.
			Correct fan speed?	Replace fan motor.
		Excessively High Air Temp. to Outdoor Unit Heat Exchanger	Short-circuited outdoor unit air	Remove cause of short-circuit.
			Any other heat load near outdoor unit?	Remove heat source.
		Excessively Charged Refrigerant	Check expansion valve opening.	Correctly charge refrigerant.
		Non-Condensable Gas in Cycle	Check each temp. and pressure.	Charge refrigerant after vacuum pumping.
		Clogging of Discharge Piping	Check for clogging.	Remove clogging.
		Failure or Malfunction of Expansion Valve	Check for clogging.	Remove clogging.
			Check for connecting wire and connector.	Replace connector.
			Is there operation sound from coil?	Replace coil.
			Is thermistor on compressor normal?	Replace thermistor.
			Is thermistor installed correctly on compressor?	Correctly install it.
		Malfunction or Internal Leakage from Reversing Valve	Check temp. difference between inlet and outlet of reversing valve.	Replace reversing valve.
	Excessively Low Suction Pressure	Failure of Solenoid Valve for Bypass	Check leakage from solenoid valve.	Replace solenoid valve.
		Malfunction or Internal Leakage from Reversing Valve	Check temp. difference between inlet and outlet of reversing valve.	Replace reversing valve.
	Discharge Temp. of Indoor Unit is Unstable.		Check for expansion valve of indoor unit in the same system.	Replace failed expansion valve of indoor unit.



Other Abnormalities	Abnormalities of Devices			
Event	Cause	Check Item	Action (Turn OFF Main Switch)	
Insufficient Heating Operation	Indoor Heat Load is Larger than Heating Capacity	Calculate heat load.	Use larger unit.	
	Excessively Low Suction Pressure	Gas Leakage or Insufficient Refrigerant Charge	Measure superheat.	Correctly charge refrigerant after gas leakage check and repair.
		Excessively Small Diameter or Long Piping	Measure field-supplied pipes.	Use specified pipes.
		Failure or Malfunction of Electronic Expansion Valve	Check for clogging.	Remove clogging.
			Check for connecting cord and connector.	Replace connector.
			Is there operation sound from coil?	Replace coil.
			Is thermistor on compressor normal?	Replace thermistor.
			Is thermistor installed correctly on compressor?	Correctly install it.
		Clogging of Indoor Unit/ Outdoor Unit Strainer	Check temp. difference between inlet and outlet of strainer.	Replace strainer for outdoor unit or indoor unit.
		Clogging of Suction Piping	Check temp. difference of each part.	Remove clogging.
		Insufficient Airflow to Outdoor Unit Heat Exchanger	Is outdoor unit heat exchanger clogged?	Remove clogging.
			Are there any obstacles at inlet or outlet of outdoor unit?	Remove obstacles.
			Is service space for outdoor unit sufficient?	Secure sufficient service space.
			Check outdoor fan speed.	Replace fan motor.
		Excessively Low Air Temp. to Outdoor Unit Heat Exchanger	Check for any short-circuited outdoor unit air.	Remove cause of short circuit.
Defrosting is Insufficiently Completed	Check thermistor for defrosting.	Replace thermistor for defrosting.		





Other Abnormalities	Abnormalities of Devices		
Event	Cause	Check Item	Action (Turn OFF Main Switch)
Cooling or Heating Operation with Abnormal Sound	Foreign Particles Inside Fan Casing	Check it by viewing.	Remove foreign particles.
	Indoor Unit Fan Wheel Contacts Casing	Check it by viewing.	Adjust position of fan wheel.
	Outdoor Unit Propeller Fan Comes in Contact with Fan Shroud	Check it by viewing.	Adjust position of propeller fan.
	Abnormal Sound from Compressor	Failure of Installation	Check each part is tightly secured.
		Liquid Ref. Compression	Tightly secure it.
		Wear or Breakage of Internal Comp. Parts	Check expansion valve opening.
		Is there any abnormal sound from inside of compressor?	Ensure superheat.
Outdoor Fan does Not Operate even when Compressor is Operating	Humming Sound from Magnetic Contactor	Check resistance of crankcase heater or fuse.	Replace compressor.
	Abnormal Vibration of Cabinets	Check surface of contacts.	Replace magnetic switch.
Indoor Fan does Not Operate even when Compressor is Operating	Obstacle at Outdoor Fan	Check obstacles.	Tightly secure it.
	Preparatory State for Heating Operation	Wait for switching of reversing Valve. (1 to 3 minutes)	Remove obstacles.
	Discharge pressure does not increase higher than 319 psi (2.2MPa) due to insufficient refrigerant.	Check operation pressure.	If the reversing valve is not switched, check for insufficient refrigerant.
	Disconnected Wire for Indoor Fan	Check wiring.	Add refrigerant.
	Failure of AC chopper	Check AC chopper.	Correctly connect wires.
			Replace AC chopper.

3.3 Procedures for Checking

3.3.1 Self-Checking of PCBs using Wired Controller

Refer to Section 3.1.4 "Checking Wired Controller"

3.3.2 Self-Checking of Wired Controller

Refer to Section 3.1.4 "Checking Wired Controller"

3.4 Test Run

Turn OFF all the power source switches.
Use a tester and make sure that all the switches are turned OFF.

Before the test run, check that the unit is appropriately installed according to the Installation and Maintenance Manual. After that, inspect the following items.

Check Item		Contents
1	Damage	Are the unit appearance and inside of the unit damaged?
2	Fan Motor	Is the fan motor runner installed in the center of the casing? Is the fan motor installed away from the casing? (The fan motor should NOT be touched by the casing.)
3	Fasteners	Are the screws loose due to vibration during transportation? Check that the fasteners are secured firmly during installation, <u>especially for electrical wiring.</u>
4	Refrigerant Leaks	<u>Check that there are NO refrigerant leaks.</u> The tightening part of the pipe (flare part) may be loose because of vibration during transportation.
5	DSW Setting	Check that the DSW setting is the same as the factory setting. (Refer to Section 3.1.3.)
6	Insulation ^{*1)}	Measure resistance between electrical component terminal and ground with a tester. It is normal if the resistance is 1MΩ and over. If 1MΩ or less, do not perform the operation due to insulation failure of electrical parts. <u>Do NOT apply electricity to the terminal board of operating line. (Control PCB may be damaged.)</u>
7	Stop Valve Fully Open	Prior to test run, check that the stop valve of the outdoor unit is completely open.
8	Power Source Phase	The operation is NOT possible with the incorrect power phase order or lacking phase. • Alarm "05" is indicated on the LCD of the wired controller. • "05" is indicated on the 7-segment display of the outdoor unit. Check the power source phase according to the caution label attached close to the outdoor unit terminal block or inside of the service cover.
9	Turn ON Crankcase Heater ^{*2)}	After completion of item checks 1 to 8, turn ON the power supply of the outdoor unit. Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil..
10	Indoor and Outdoor Temperature	<For Use in both Cooling and Heating Operation> Is indoor temperature DB80°F (27°C) or less during heating operation? (Heating operation may not be operated due to the activation of the overload operation prevention under the ambient temperature of 66°F (19°C) or over.) To perform the test run, set the test run mode with the wired controller.

*1): Insulation Resistance

- If the unit has been turned OFF for long periods, insulation resistance may decrease to 1MΩ or less because the refrigerant is retained in the compressor. Check the following points.
 - (a) Disconnect the cables of the compressor and measure the insulation resistance of the compressor itself.
If the resistance is 1MΩ or less, an insulation failure of another electrical charge part has occurred.
 - (b) If the resistance is 1MΩ or less, reconnect the compressor and turn ON the main power supply.
The compressor will warm up automatically. Check the insulation resistance again after applying current for at least three hours. (Preheating time depends on the air condition, piping length or refrigerant condition.)
- Before the leakage breaker is activated, check the rated capacity.

*2): Stoppage of Compressor Operation

The compressor may NOT be operational for a maximum of four hours if the power supply is NOT turned ON in advance.

At this time, the stoppage Code (d1-22) is displayed on the LCD of wired controller and the forced Thermo-OFF function starts.

If operation of the compressor is necessary, turn ON the power supply of the outdoor unit, wait for 30 seconds and press PSW5 on the outdoor unit PCB for at least three seconds. The forced Thermo-OFF function (d1-22) is cancelled and the compressor operation is available.

NOTE:

Thermo-ON: The outdoor unit and some indoor units are running.

Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

3.4.1 Test Run Using Wired Controller

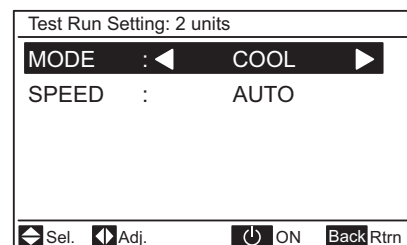
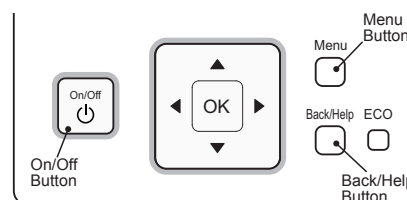
(1) Wired Controller (CIW01)

- (1) Turn ON the power source of the indoor and outdoor units.
 (2) Set the TEST RUN mode with the wired controller.

Press and hold the "Menu" and the "Back/Help" buttons simultaneously for more than three seconds. Select "Test Run" by pressing " $\Delta \nabla$ " and press "OK". The Test Run screen is displayed.

NOTE:

For other controllers, refer to the "Installation Manual" for each controller.

**NOTE:**

When "00 unit" is indicated, the auto-address function may be performing. Cancel "Test Run" mode and set it again.

Normal → If "TEST RUN" and the total number of the units connected to the wired controller (for example "2 units") are indicated on the wired controller, the connection of the controller cable is correct.

- * The total number of indoor units connected is indicated on the liquid crystal display (LCD).
- * If the indicated number is not equal to the actual number of connected indoor units, the auto-address function is not performed correctly due to incorrect wiring, or electromagnetic interference. Turn OFF the power supply, and correct the wiring after checking the following points. (Do not repeat turning ON and OFF within 10 seconds.)
 - (a) The power supply for the indoor unit is NOT turned ON or incorrect wiring.
 - (b) Loose connection between Indoor Units or Wired Controller.
 - (c) Incorrect Setting of Indoor Unit Address (The indoor unit address is duplicated.)

Abnormal → If no indication or "00" appears, or the number of units indicated is less than the actual number of units, there is an abnormality.

(3) Checking Procedures for Abnormalities

Wired Controller Indication	Fault	Inspection Points after the Power Source is OFF
No Indication	<ul style="list-style-type: none"> * The power source is not turned ON. * The connection of the controller cable is incorrect. * The connecting wires of power supply line are incorrect or loose. 	<ul style="list-style-type: none"> 1. Connection between Connector and Wires 2. Connecting Points of Controller Cable 3. Contact of Connectors of Controller Cable 4. Connection Order of each Terminal Block 5. Screw Fastening of each Terminal Block
Number of connected units is incorrect.	<ul style="list-style-type: none"> * The electrical wiring between indoor unit and outdoor unit is disconnected, or the power source is not turned ON. * The setting of unit number is incorrect. * The connection of control cables between each indoor unit are incorrect. (When one wired controller controls multiple units.) 	<ul style="list-style-type: none"> 6. RSW Setting on Indoor Unit Printed Circuit Board 7. Wire Connecting Order of Bridge Cable 8. Connecting Points of Bridge Cable 9. Contact of Connectors of Bridge Cable

Back to (1) after checking

Move to (4) on the next page. ←

(4) Press "On/Off" button.

Normal

The test run operation is started. The operation mode, the airflow volume, the airflow direction and the test run time can be set on the Test Run screen.
Select the item by pressing " $\Delta \nabla < \triangleright$ ".
The test run is completed by pressing the "Back/Help" button during the stoppage or "On/Off" button during the operation.

Abnormal

If the units do not start or the operation light on the wired controller flashes, there is an abnormality.

(5) Checking Procedure for Abnormalities

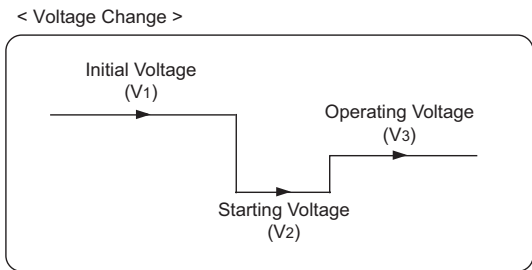
Wired Controller Indication	Unit Condition	Fault	Inspection Points when the Power Source is OFF
The operation light flashes. (1 time/1 sec.) And the Unit No. and Alarm Code "03" flash.	The unit does not start.	The power source is not turned ON.	
		The connecting wires of operating line are incorrect or loose.	<p>1. Connecting Order of each Terminal Block. The fuse on the PCB may be blown due to miswiring. (Can be recovered only once by the DSW on the PCB)</p> <p>Procedures for Recovery When Transmitting Circuit Fuse is Blown</p> <p>1. Correct the wiring for the terminal block. 2. Setting positions of the model code are shown below.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Indoor Unit PCB</p> <p>DSW7</p> <div style="display: flex; justify-content: space-around;"> <div>ON OFF</div> <div style="display: flex; align-items: center;"> <div style="width: 10px; height: 10px; background-color: black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; background-color: white; margin-right: 5px;"></div> </div> <div>1 2</div> </div> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Outdoor Unit PCB</p> <p>DSW10</p> <div style="display: flex; justify-content: space-around;"> <div>ON OFF</div> <div style="display: flex; align-items: center;"> <div style="width: 10px; height: 10px; background-color: black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; background-color: white; margin-right: 5px;"></div> </div> <div>1 2</div> </div> </div> </div> <p>2. Screw Fastening of each Terminal Block. 3. Connecting Order of Power Line Between Indoor Units and Outdoor Unit.</p>
The operation light flashes. (1 time/2 sec.)	The unit does not start.	The connection of controller cable is incorrect.	This is the same as above items 1 through 3.
Other alarm codes or indications than those above (Refer to the Alarm Code Table.)	The unit does not start, or starts once and then stops.	The connection of the thermistors or other connectors are incorrect. Tripping of protector exists.	An authorized service person should check the unit using the Alarm Code Table in this manual.
The operation light flashes. (1 time/1 sec.) And the Unit No. 00 . Alarm Code dd and Unit Code E.00 flash.	The unit does not start.	The connecting wires of operating line are incorrect or loose.	An authorized service person should check the unit using the Alarm Code Table in this manual.

Back to (1) after checking

3.4.2 Test Run from Outdoor Unit Side
Refer to the Service Manual for Outdoor Unit.

3.4.3 Checking the Test Run

- (1) Indoor and Outdoor Fan
Check that the indoor fan and outdoor fan rotate correctly and the airflow is smooth.
- (2) Power Supply Voltage
Check the power supply.
If the power supply is abnormal, contact the electric power company.
Usually, voltage drop occurs when starting the operation as shown in the figure (V₂).
In order to protect the device, comply with the following normal range of the power supply voltage.



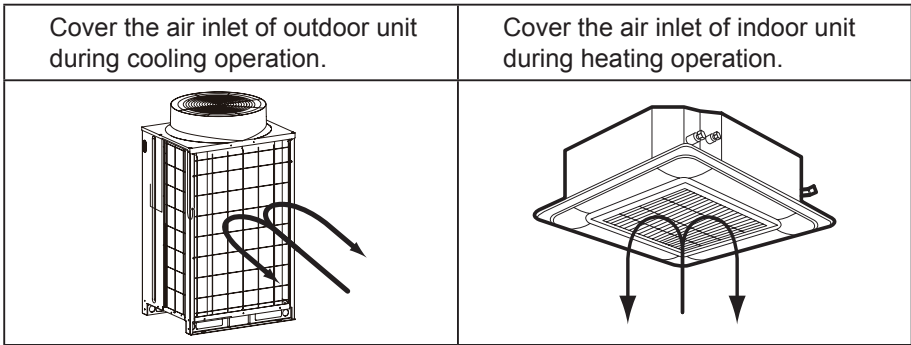
<Normal Range of Power Supply Voltage>

- Supply Voltage: Rated Voltage $\leq \pm 10\%$
- Starting Voltage (V₂): Rated Voltage $\geq -15\%$
- Operating Voltage (V₃): Rated Voltage $\leq \pm 10\%$
- Voltage Imbalance between Phase: $\leq 3\%$

- (3) Normal Operating Pressure
Normal operating suction pressure is 29 to 159.5 psi (0.2 to 1.1 MPa) and normal operating discharge pressure is 145 to 507.6 psi (1.0 to 3.5 MPa) when the refrigerant charge quantity is correct. Check the operation pressure in the test run mode.
- (4) High Pressure Switch
Check the operation pressure of the high pressure switch in the table below.

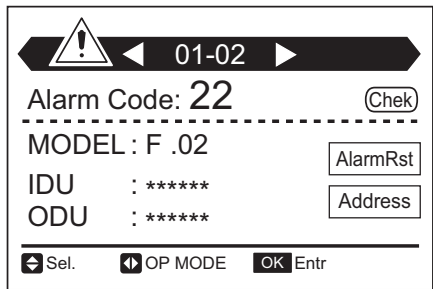
Refrigerant	Operation Pressure
R410A	601 psi (4.15MPa)

- (5) High Pressure Increase Retry (Protection Control)
 - (a) High pressure will increase when one of the following procedures is performed.



- (b) When the high pressure retry control is activated, alarm code “P13” is indicated on the 7-segment display of the outdoor unit PCB. If the high pressure retry control occurs three times or more within 30 minutes, alarm code “45” is indicated on the LCD of the wired controller or the 7-segment display of the outdoor unit PCB.

< For CIW01 >



NOTE:
High pressure may not increase until the high pressure switch is activated because of the temperature condition.

4. Maintenance

4.1 Maintenance of Outdoor Unit

Refer to the Service Manual for Outdoor Unit.

4.2 Maintenance of Indoor Unit

! DANGER

Use the specified non-flammable refrigerant (R410A) to the outdoor unit in the refrigerant cycle. Do not charge the unit with materials other than R410A, such as hydrocarbon refrigerants (propane, etc.), oxygen, flammable gases (acetylene, etc.) or poisonous gases when installing, maintaining and moving the unit. Contamination of these are extremely dangerous and may cause an explosion, a fire, and an injury.

4.2.1 DOAS Type ((H,Y)DOA096B21S)

! WARNING

TURN OFF all power source switches.

4.2.1.1 Removing Long Life Filter

The air intake grilles are field-supplied. Replacement of the long life filter depends on the way it was installed. Check it carefully.

4.2.1.2 Removing PCB

- (1) Remove the electrical box cover.

Product Produced in 2017 or earlier

Loosen five M4 screws securing the electrical box cover and remove the electrical box cover by laying it down along electric wires.

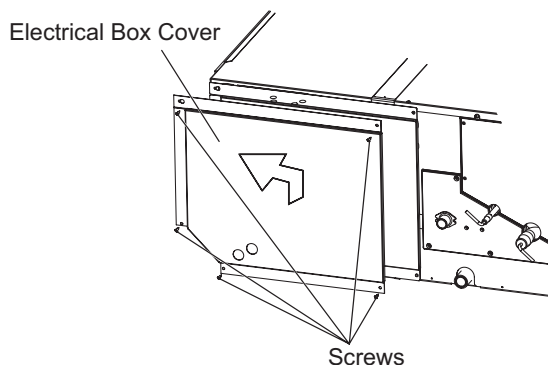
Product Produced in 2018 or later

Loosen seven M4 screws securing the electrical box cover and remove the electrical box cover.

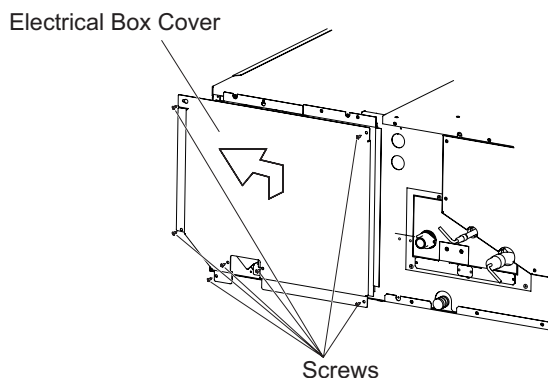
Tool

Phillips Screwdriver

Product Produced in 2017 or earlier



Product Produced in 2018 or later





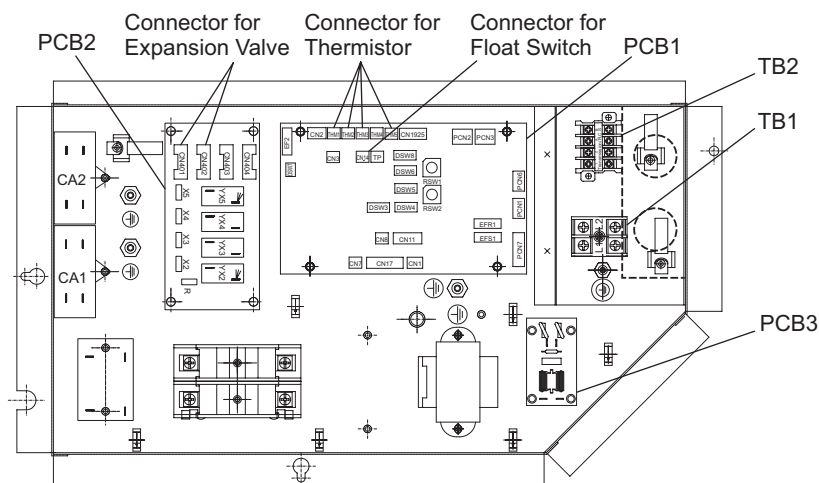
WARNING

TURN OFF all power source switches.

- (2) There are three PCBs. PCB1 (Control PCB), PCB2 and PCB3 are secured with four PCB tabs. Clamp the center of the PCB tabs using a long-nose plier and pull out the PCB.

Tool

Phillips Screwdriver, Long-nose Pliers



NOTE:

Do not touch any components on the PCB.

Do not apply excessive force to the PCB or it will cause a malfunction.

! WARNING

TURN OFF all power source switches.

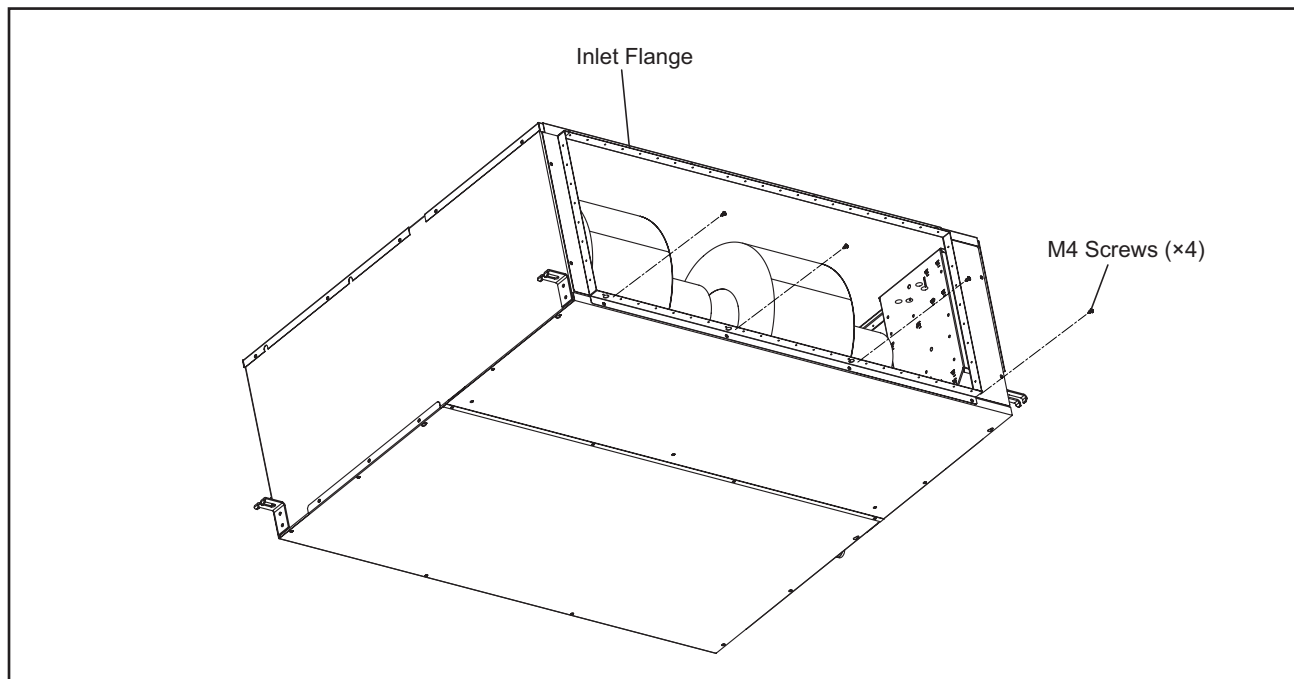
4.2.1.3 Removing Fan and Fan Motor

Remove the indoor fan and the fan motor from the back bottom side.

- (1) Remove the lower M4 screws securing the inlet flange.

Tool

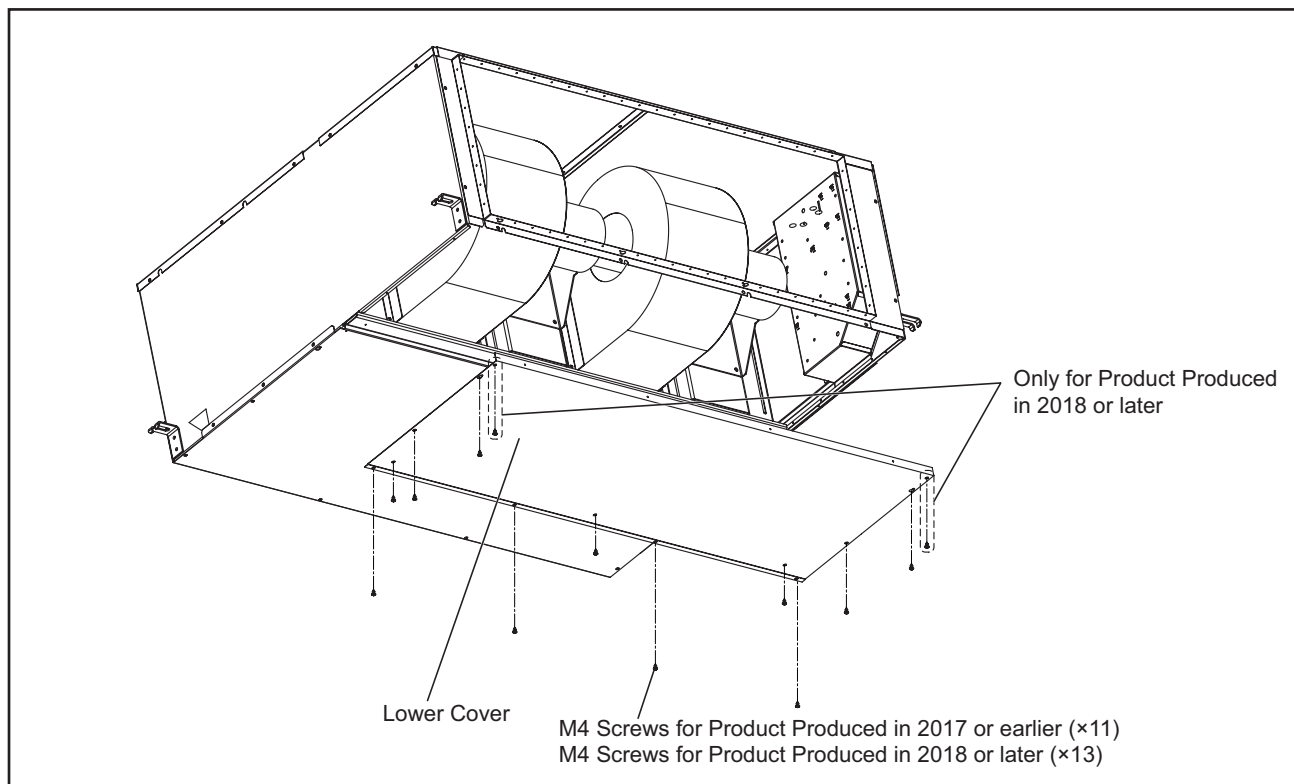
Phillips Screwdriver



- (2) Remove the lower M4 screws that secure the back bottom side.

Tool

Phillips Screwdriver



MAINTENANCE

(DOAS Type)

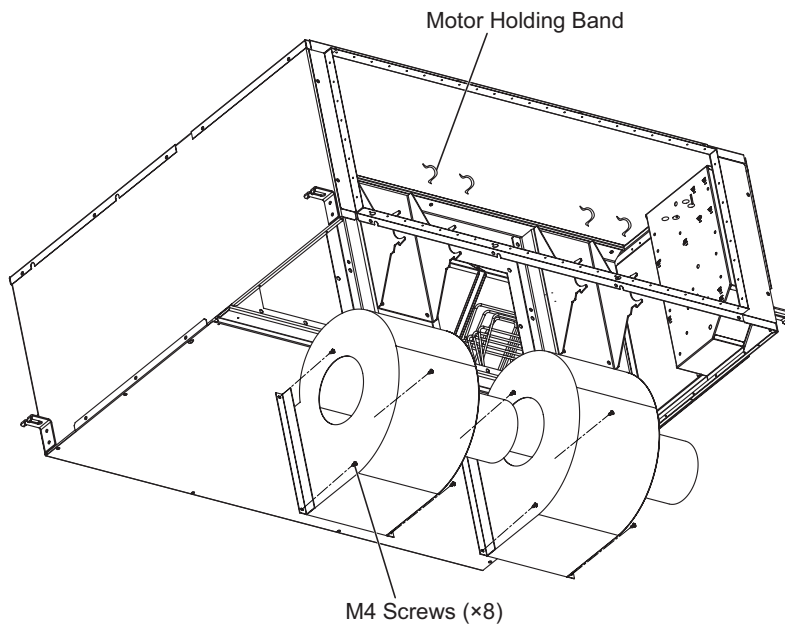
WARNING

TURN OFF all power source switches.

- (3) Remove the lower cover so the fan assembly is visible.
Remove the wiring for the motor by unclipping the cord clamp.
- (4) Remove the screws that are securing plate and move the casing slightly.
- (5) Loosen the four screws of the motor holding bands, and remove the motor and the casing at the same time.

Tool

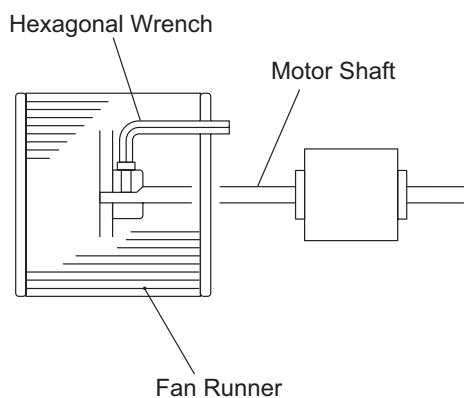
Phillips Screwdriver



- (6) Loosen the screws securing the fan motor shaft and the fan runner using the hexagonal wrench (for M8 screw), and remove the fan runner.

Tool

Hexagonal Wrench



! WARNING

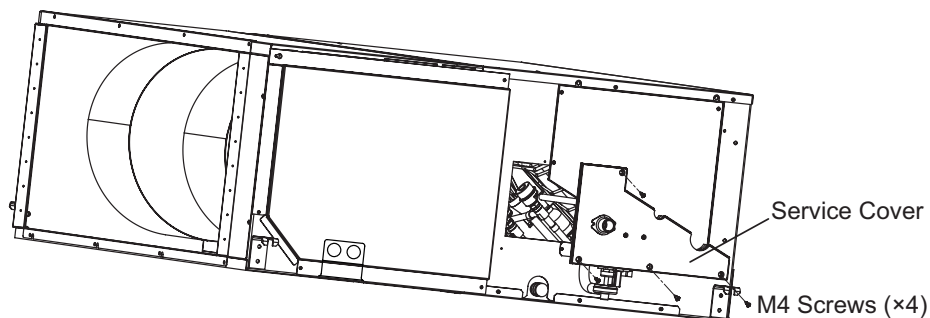
TURN OFF all power source switches.

4.2.1.4 Removing Thermistors for Liquid Pipe and Gas Pipe

- (1) Remove four M4 screws securing the service cover and remove the service cover.

Tool

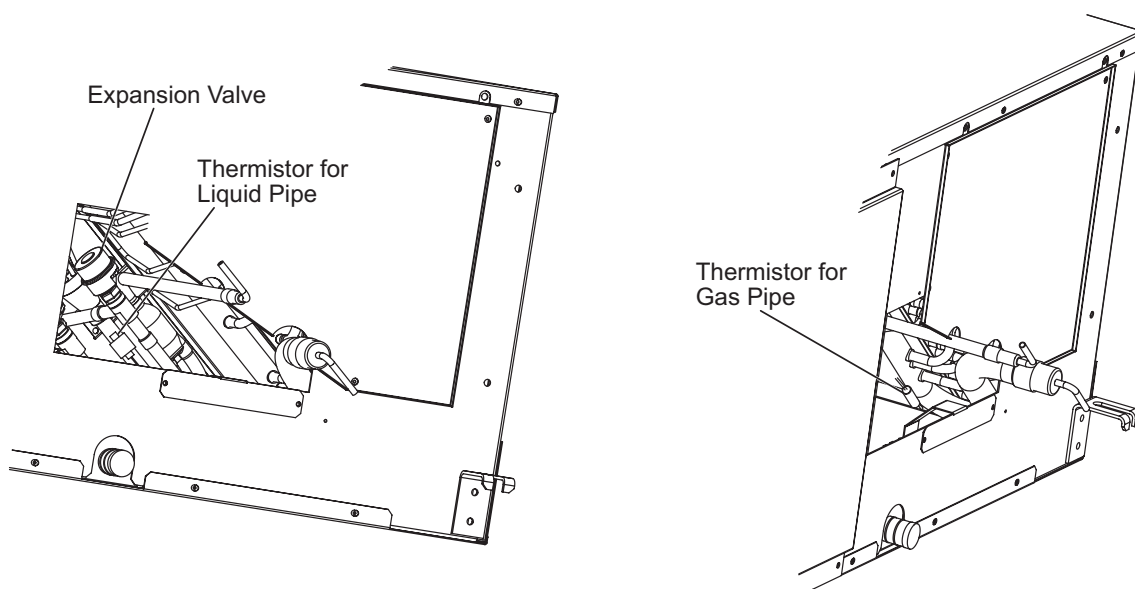
Phillips Screwdriver



- (2) Remove the cork tape, pipe insulation, and thermistor clamps. Then remove the liquid pipe and gas pipe thermistors.

Tool

Phillips Screwdriver

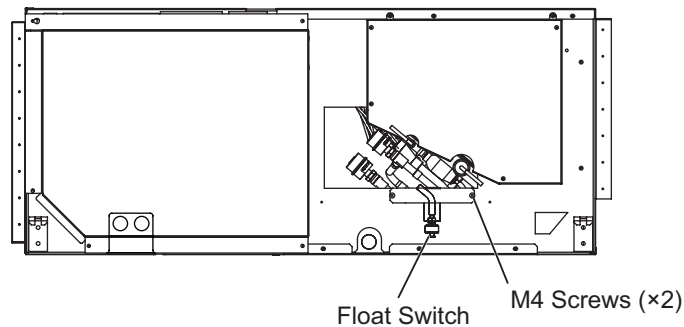


! WARNING**TURN OFF all power source switches.****4.2.1.5 Removing Float Switch**

- (1) Remove the service cover according to Section 4.2.1.4 "Removing Thermistors for Liquid Pipe and Gas Pipe".
- (2) Remove two M4 screws securing the float switch onto the side cover and remove the float switch.

Tool

Phillips Screwdriver

**NOTE:**

When assembling the float switch, handle carefully.

(Tightening Torque: Approx. 0.2lbf·ft (0.3N·m). Overtightening damages the nut.)

If the float switch is dropped, it is damaged and should be replaced.

! WARNING

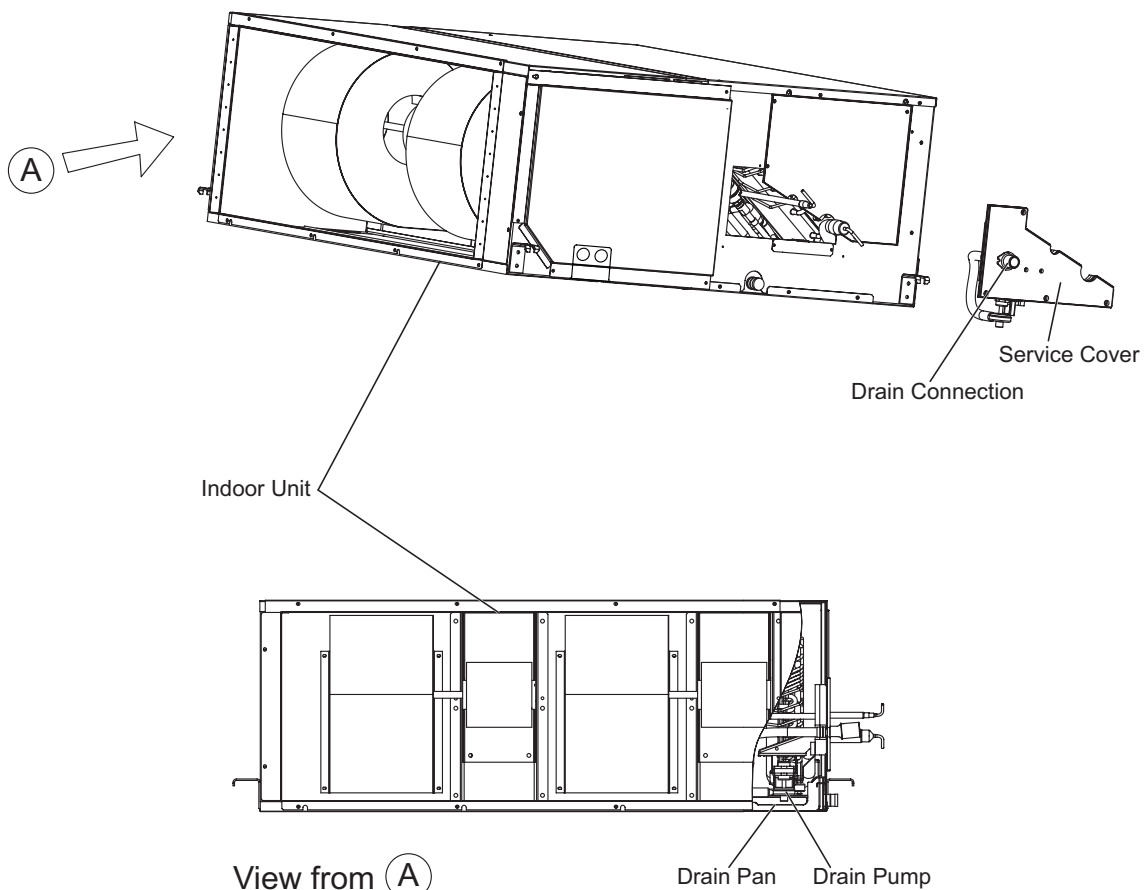
TURN OFF all power source switches.

4.2.1.6 Removing Drain Pump

The drain pump is secured to the service cover. Remove the securing screws and remove the drain pump.

Tool

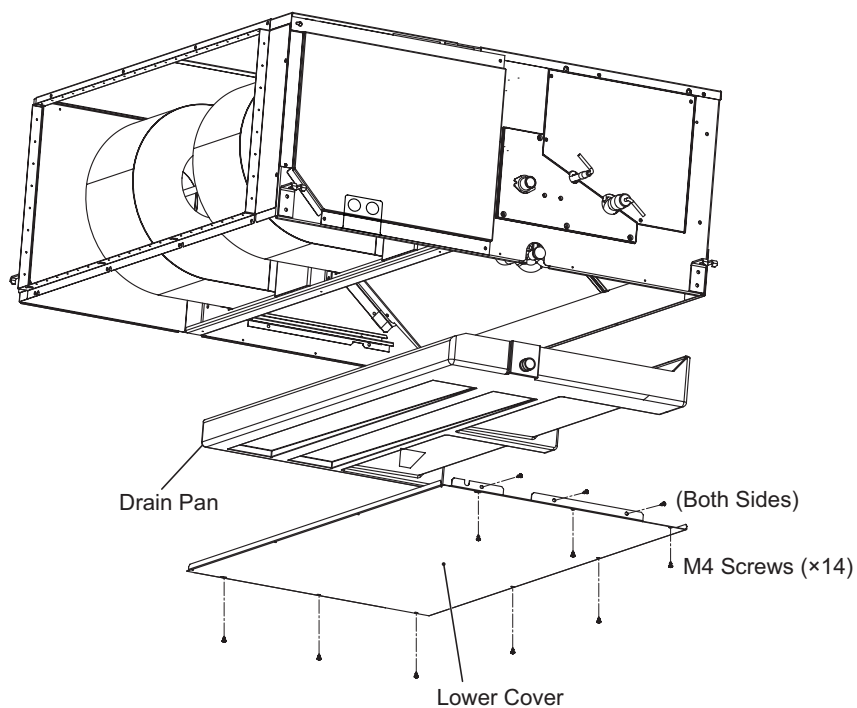
Phillips Screwdriver



! WARNING**TURN OFF all power source switches.****4.2.1.7 Removing Drain Pan**

- (1) Remove four M4 screws securing the inlet flange according to Section 4.2.1.3 (1).
- (2) Remove eleven M4 screws securing the lower cover at the indoor fan side and remove the lower cover according to Section 4.2.1.3 (2).
- (3) Remove fourteen M4 screws securing the lower cover at the indoor heat exchanger side and remove the lower cover.
- (4) Lower the drain pan.

Tool

Phillips Screwdriver,
Bucket approximately 1.3 gal (5 liters)

4.3 Main Parts

4.3.1 for Outdoor Unit

Refer to the Service Manual for Outdoor Unit

4.3.2 for Change-Over Box

Refer to the Service Manual for Outdoor Unit

MAINTENANCE

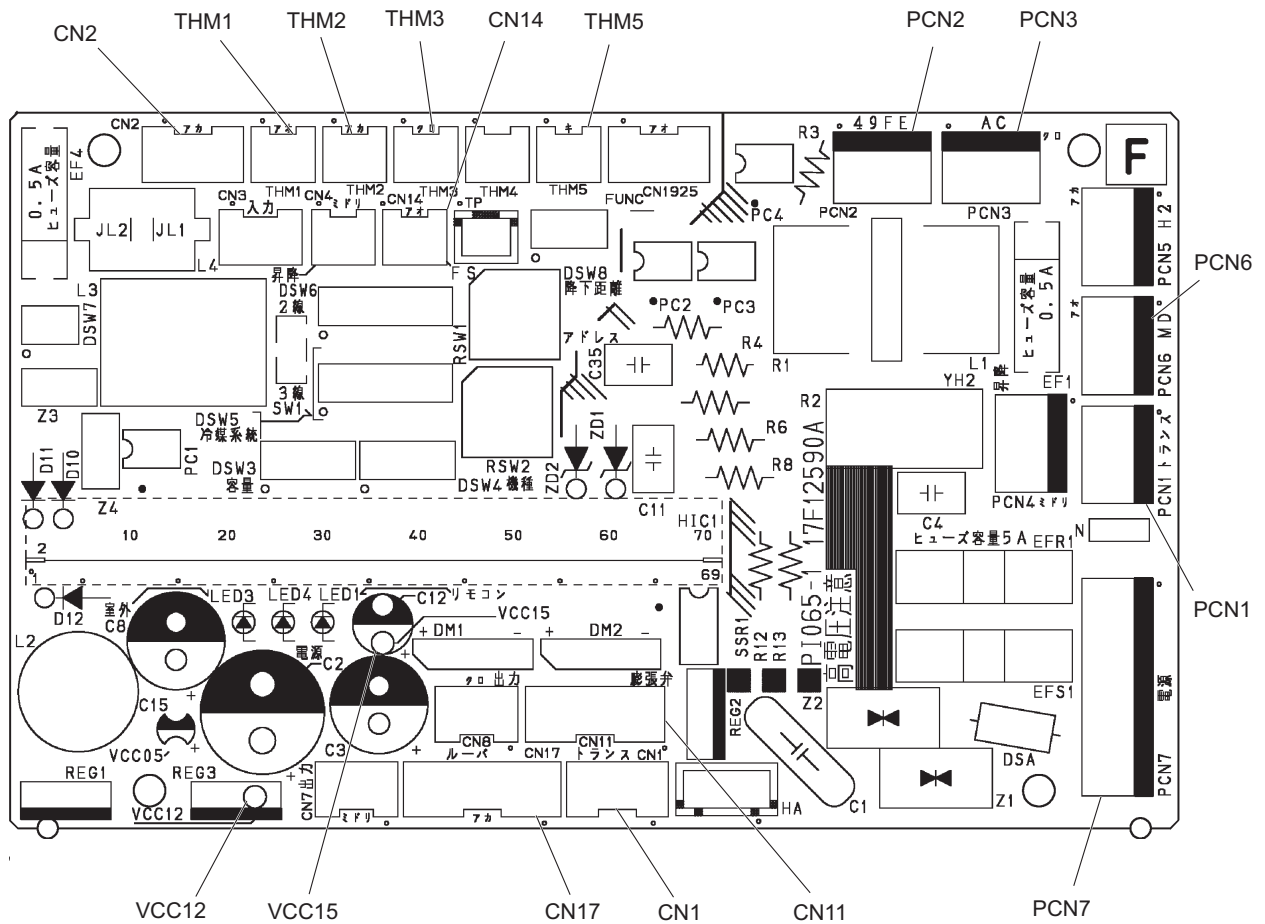
(Main Parts)

4.3.3 for Indoor Units

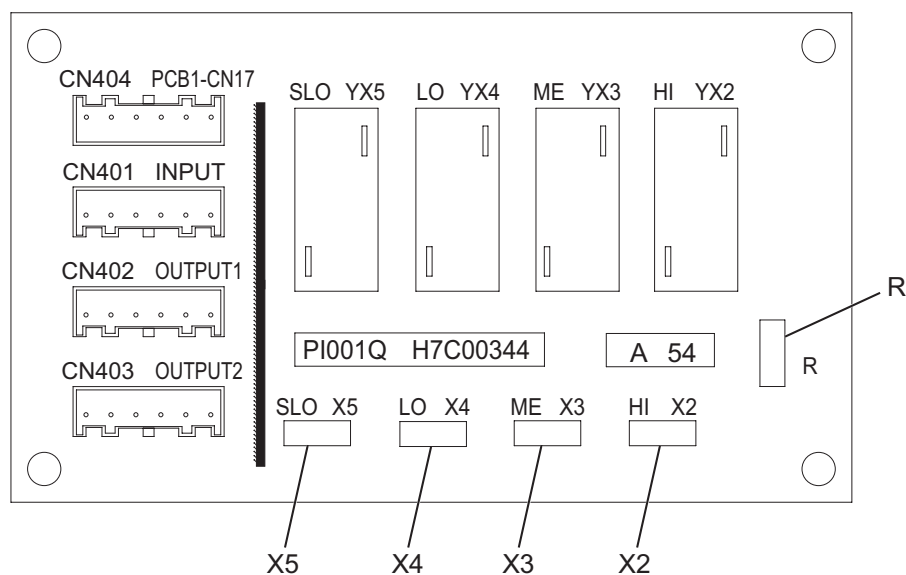
4.3.3.1 Printed Circuit Board

- DOAS

Arrangement of Connectors and Check Points for PCB1 (PI065)



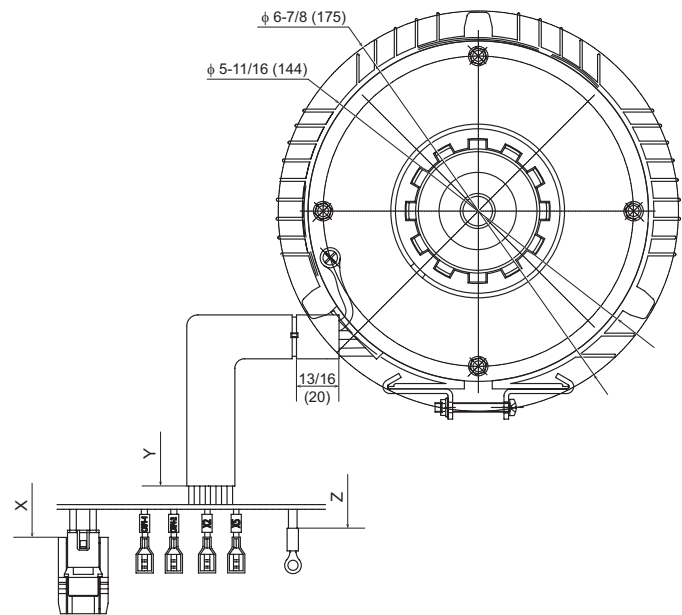
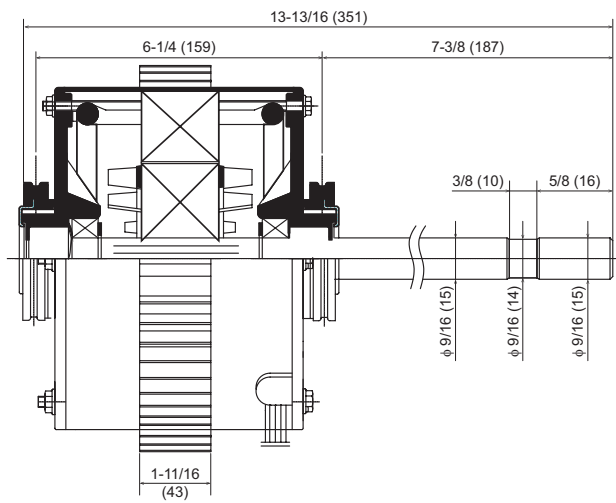
Arrangement of Connectors and Check Points for PCB2 (PI001Q)



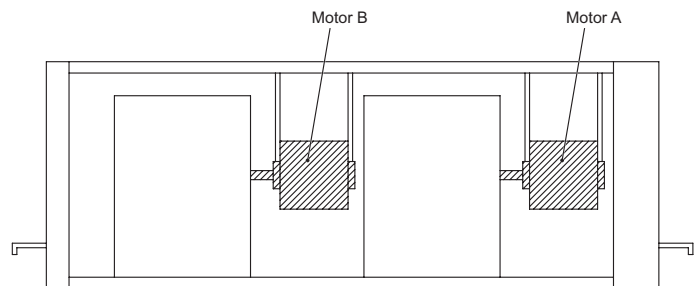
4.3.3.2 Fan Motor

- DOAS

Unit: inch (mm)



Dimension	X	Y	Z
Motor A	39-3/8 (1000)	33-7/16 (850)	43-5/16 (1100)
Motor B	57-1/16 (1450)	51-3/16 (1300)	61 (1550)



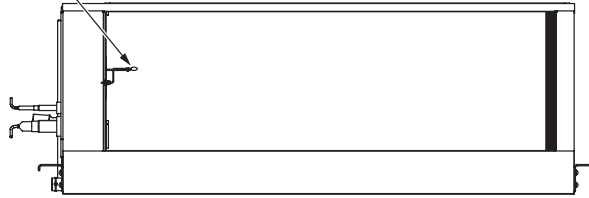
(Main Parts)

4.3.3.3 Thermistor

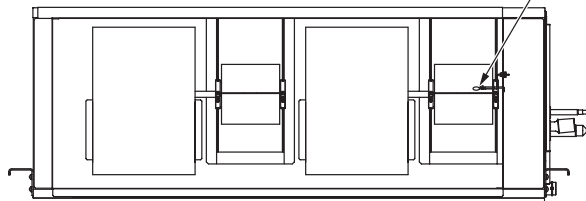
(1) Position of Thermistor

- DOAS

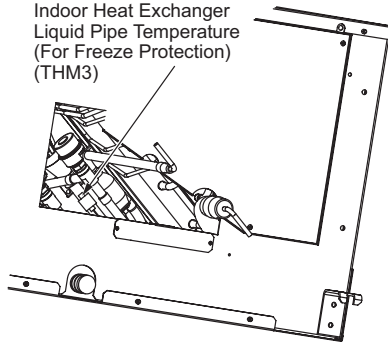
Thermistor for
Air Outlet Temperature (THM2)



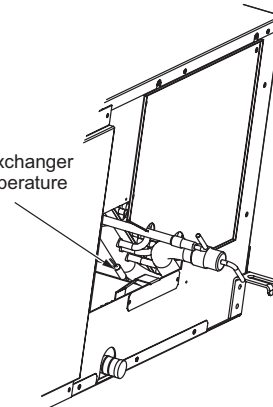
Thermistor for
Air Inlet Temperature (THM1)



Thermistor for
Indoor Heat Exchanger
Liquid Pipe Temperature
(For Freeze Protection)
(THM3)



Thermistor for
Indoor Heat Exchanger
Gas Pipe Temperature
(THM5)



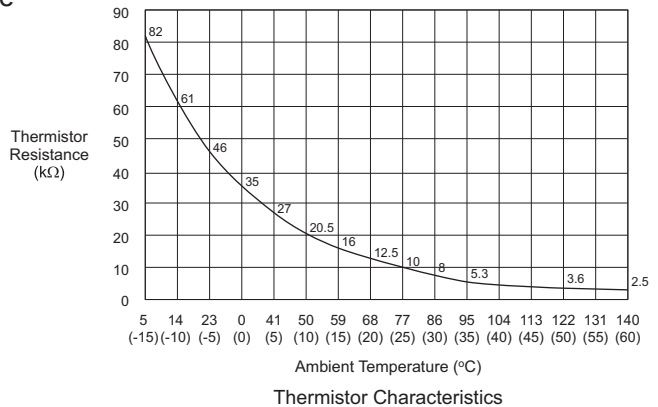
- (2) Thermistor for Indoor Discharge Air Temperature
< Only for Outlet Air Temperature Control >
(For Room Temperature Control)

The room temperature is controlled by the thermistor for indoor discharge air temperature detecting the temperature of heat exchanged outdoor air.

The setting temperature setpoint is indicated on the LCD of the wired controller by number.

Adjust the setting temperature setpoint for prevention from excessive cooling and heating.

The resistance characteristics of thermistor are shown in the above figure.



- (3) Thermistor for Indoor Suction Air Temperature

The resistance characteristics of thermistor are shown in the above figure.

When the temperature of the heat exchanger is below 32°F (0°C), unit becomes thermo-OFF automatically and over 57°F (14°C), unit becomes thermo-ON again.

Prevention from freezing onto the heat exchanger in COOL and DRY operation.

- (4) Thermistor for Liquid Pipe Temperature of Indoor Heat Exchanger

The resistance characteristics of thermistor are shown in the above figure.

When the temperature of the heat exchanger is below 32°F (0°C), unit becomes thermo-OFF automatically and over 57°F (14°C), unit becomes thermo-ON again.

Prevention from freezing onto the heat exchanger in COOL and DRY operation.

- (5) Thermistor for Gas Pipe Temperature of Indoor Heat Exchanger

The evaporating temperature in heating operation is detected.

The resistance characteristics of thermistor are shown in the above figure.

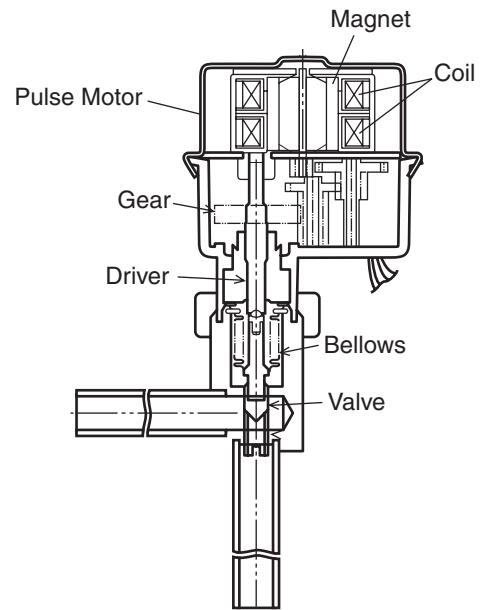
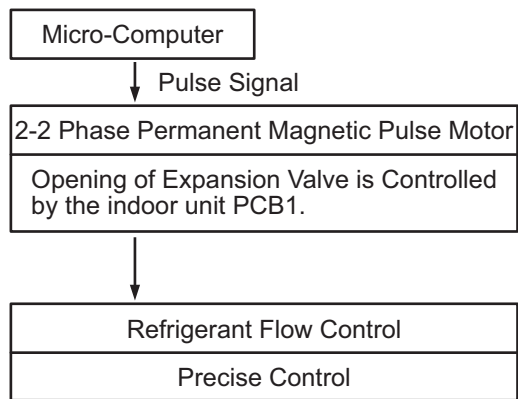
Indoor inlet thermistor is detecting the outdoor temperature.

When the outdoor temperature approaches the setpoint of wired controller unit becomes thermo-OFF.

MAINTENANCE

(Main Parts)

4.3.3.4 Electronic Expansion Valve



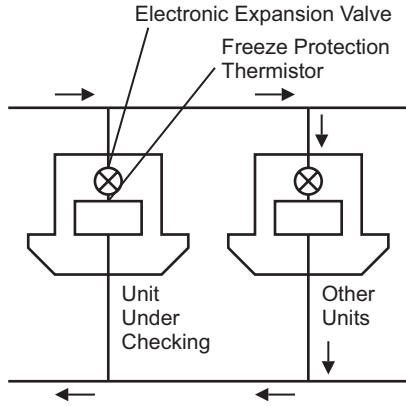
Electronic Expansion Valve

Indoor Unit	Applicable Model	Expansion Valve with Motor
DOAS	(H,Y)DOA096B21S	EFM-A0YPHS-2

Specifications

Working Temperature Range	-22°F to 158°F (-30°C to 70°C)
Refrigerant Used	R410A
Insulation Resistance	Min. 100MΩ (at 500VDC Megger)
Rated Voltage	DC12V±1.2V
Drive Condition	100 - 250 PPS 2-2 Phase Excitation
Coil Resistance	150±15Ω (68°F (20°C))
Wiring Diagram, Drive Circuit and Activation Mode	<div><div><div><div>White</div><div>Red (COM)</div><div>Orange</div></div><div><div>φ1</div><div>φ3</div></div></div><div><div><div>φ2</div><div>φ4</div></div><div><div>Yellow</div><div>Brown</div><div>Blue (COM)</div></div></div><div><div><div><div>Phase</div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>φ1</div><div>ON</div><div>OFF</div><div>OFF</div><div>ON</div></div><div><div>φ2</div><div>ON</div><div>ON</div><div>OFF</div><div>OFF</div></div><div><div>φ3</div><div>OFF</div><div>ON</div><div>ON</div><div>OFF</div></div><div><div>φ4</div><div>OFF</div><div>OFF</div><div>ON</div><div>ON</div></div></div></div><div><div>OPEN: 4 → 3 → 2 → 1 → 4</div><div>CLOSE: 1 → 2 → 3 → 4 → 1</div></div></div>

Checking Method of Electronic Expansion Valve for Indoor Unit

	Indoor Unit Electronic Expansion Valve
Locked (Fully Closed)	Check for the liquid pipe temperature during heating operation. It is abnormal if the temperature does not increase.
Locked (Slightly Open)	It is abnormal under the following conditions. The temperature of freeze protection thermistor becomes lower than the suction air temperature when the unit being checked is stopped and the other units are in cooling operation.
Locked (Fully Open)	 <p>Electronic Expansion Valve</p> <p>Freeze Protection Thermistor</p> <p>Unit Under Checking</p> <p>Other Units</p>

5. External Input/Output and Function Setting

5.1 DIP Switch Settings of Outdoor Unit

Refer to the Service Manual for Outdoor Unit.

5.2 High Static Pressure Setting of Outdoor Unit

Refer to the Service Manual for Outdoor Unit.

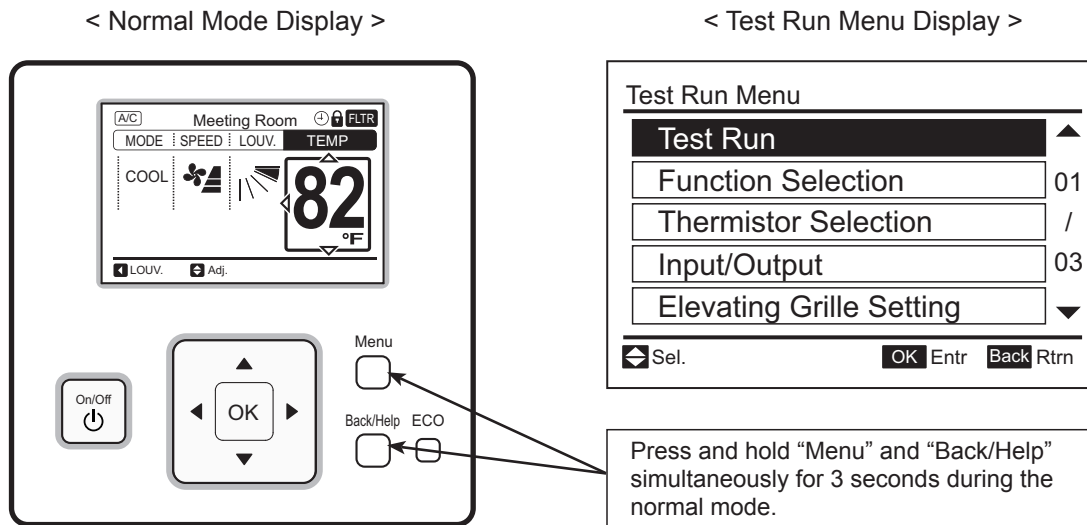
5.3 External Input/Output and Function Setting Mode for Outdoor Unit

Refer to the Service Manual for Outdoor Unit.

5.4 External Input/Output and Function Setting Mode for Indoor Unit

- Setting Method from Wired Controller

The function selection and the input/output setting can be set from the test run menu.



• Function Selection and Input/Output Setting

1. Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds during the normal mode (when unit is not operated). The Test Run menu is displayed.

Test Run Menu

Test Run	▲
Function Selection	01
Thermistor Selection	/
Input/Output	03
Elevating Grille Setting	▼

◀ Sel. OK Entr Back Rtrn

2. Select "Function Selection" or "Input/Output" from the Test Run menu and press "OK".

3. Select the indoor unit by pressing "△ ▽ ◀ ▶" and touch "OK".
(This screen is NOT displayed when the number of an indoor unit connected with the controller is "1". In this case, "4" is displayed.)

Function Selection

All			
01-01			
01-02			
01-03			
01-04			

◀ Sel. OK Entr Back Rtrn

Function Selection

4. Press "△ ▽" and select the item.

Function Selection:01-03

Item	Setting	
b1	◀ 00 ▶	01
b2	00	/
b3	00	23
b4	00	
b5	00	▼

◀ Sel. ▶ Adj. OK Entr Back Rtrn

5. Press "◀ ▶" and change the setting.

Function Selection:01-03

Item	Setting	
b1	00	01
b2	00	/
b3	◀ 01 ▶	23
b4	00	
b5	00	▼

◀ Sel. ▶ Adj. OK Entr Back Rtrn

Input/Output Setting

4. Press "△ ▽" and select the item.

Input/Output:01-03

Item	Setting	Connector
Input 1	◀ 00 ▶	CN3 1-2
Input 2	00	CN3 2-3
Output1	00	CN7 1-2
Output2	00	CN7 1-3
Output3	00	CN8 1-2

◀ Sel. ▶ Adj. OK Entr Back Rtrn

5. Press "◀ ▶" and change the setting.

Input/Output:01-03

Item	Setting	Connector
Input 1	00	CN3 1-2
Input 2	00	CN3 2-3
Output1	◀ 01 ▶	CN7 1-2
Output2	00	CN7 1-3
Output3	00	CN8 1-2

◀ Sel. ▶ Adj. OK Entr Back Rtrn

6. Press "OK" so that the confirmation screen is displayed.

7. Select "Yes" and press "OK".
The Test Run menu is displayed after the setting is confirmed.
If "No" is selected, the screen returns to "4".

8. Press "Back/Help" on the Test Run menu to return to the normal mode.

Function Selection:01-03

Confirm function selection setting?

Yes No

◀ Sel. OK Entr Back Rtrn

(Figure for Function Selection)

To set other units, press "Back/Help" at "4" and "5" so that the screen returns to "3".
(If the number of an indoor unit connected with the controller is "1", the screen returns to "1".)

5.4.1 External Input and Output Settings

On the Indoor Unit Printed Circuit Board (PCB), there are two input terminals (CN3) to receive external signals and three output terminals (CN7, CN8) to send signals out. Functions shown in these tables are available when setting input and output terminals.

Input and Output Number Display and Connectors

Input Number Display	Port	Factory Setting		Setting
Input/Output Indication		Setting Item	Indication	
Input 1	CN3 1-2	Remote ON/OFF 1 (Level)	03	
Input 2	CN3 2-3	Prohibiting Remote Control after Manual Stoppage	06	
Output 1	CN7 1-2	Operation	01	
Output 2	CN7 1-3	Alarm	02	
Output 3	CN8 1-2	Thermo-ON for Heating	06	

Input and Output Settings and Display Codes

Code Indicated	Input	Output
00	Not set	Not set
01	Room Thermostat (for Cooling)	Operation
02	Room Thermostat (for Heating)	Alarm
03	Remote ON/OFF 1 (Level)	Cooling
04	Remote ON/OFF 2 (Operation)	Thermo-ON for Cooling
05	Remote ON/OFF 2 (Stoppage)	Heating
06	Prohibiting Remote Control after Manual Stoppage	Thermo-ON for Heating
07	Remote Cooling / Heating Change	Total Heat Exchanger

NOTES:

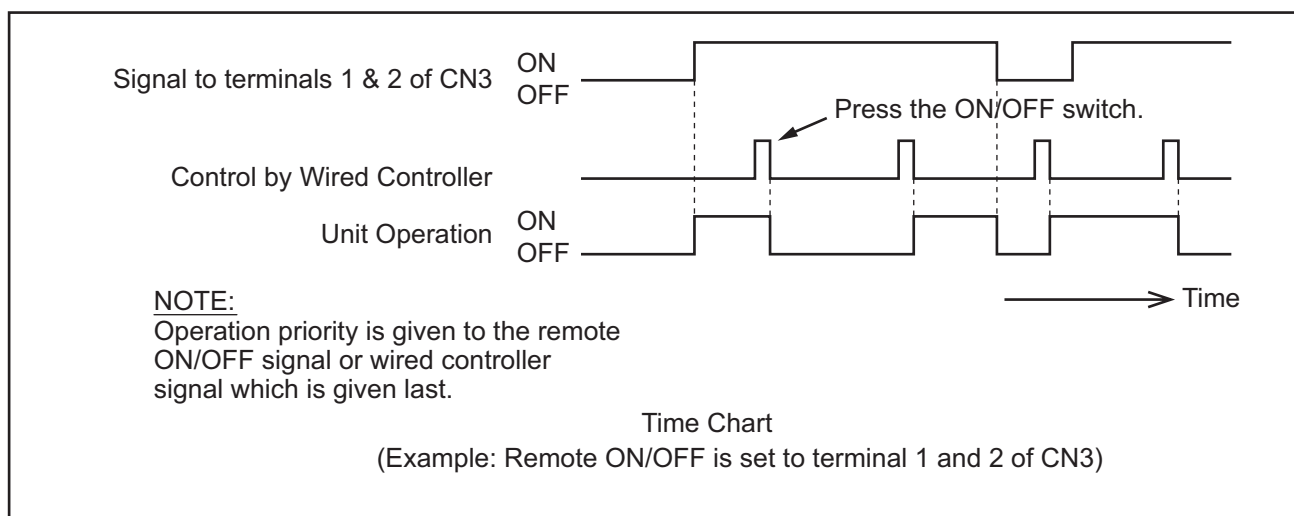
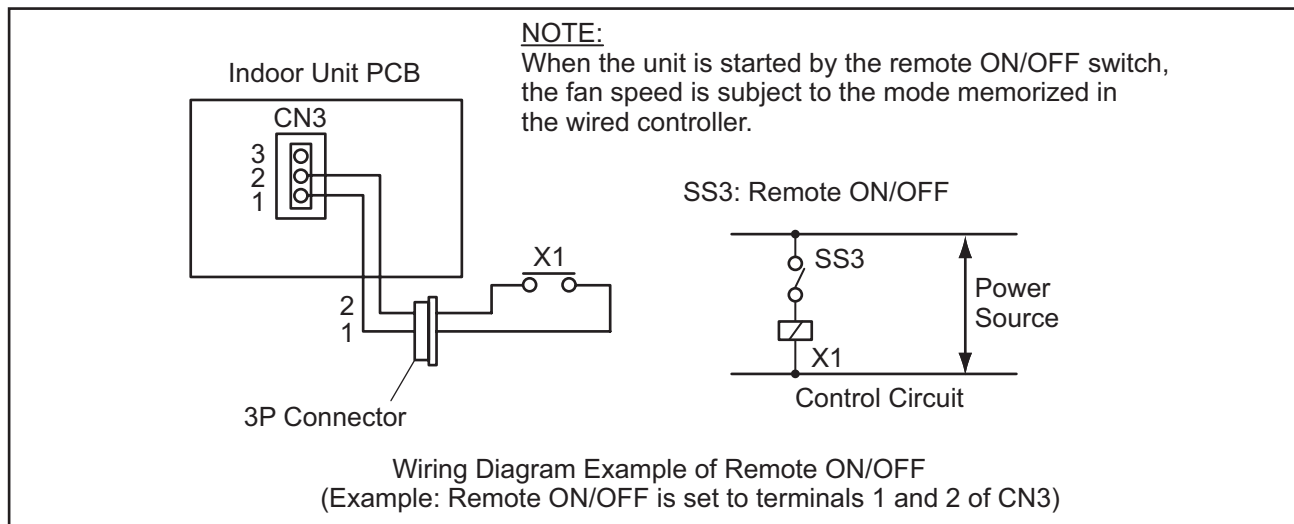
1. Change the optional setting after waiting at least three minutes elapsed time after start-up.
2. Do not set the elevating grille for the total heat exchanger.
3. Record the setting conditions for each input and output in the "Setting" column of the table.

5.4.1.1 Remote Control ON/OFF Function

This function provides a control to stop and start the system automatically from a remote place. Four methods are available by using each signal from a building management system.

(1) Remote ON/OFF 1 (Level Signal Input) [Input Setting: Code (03)]

This is an ON/OFF function from a remote place by using level signals (ON/OFF). An example of basic wiring and time chart is shown below.

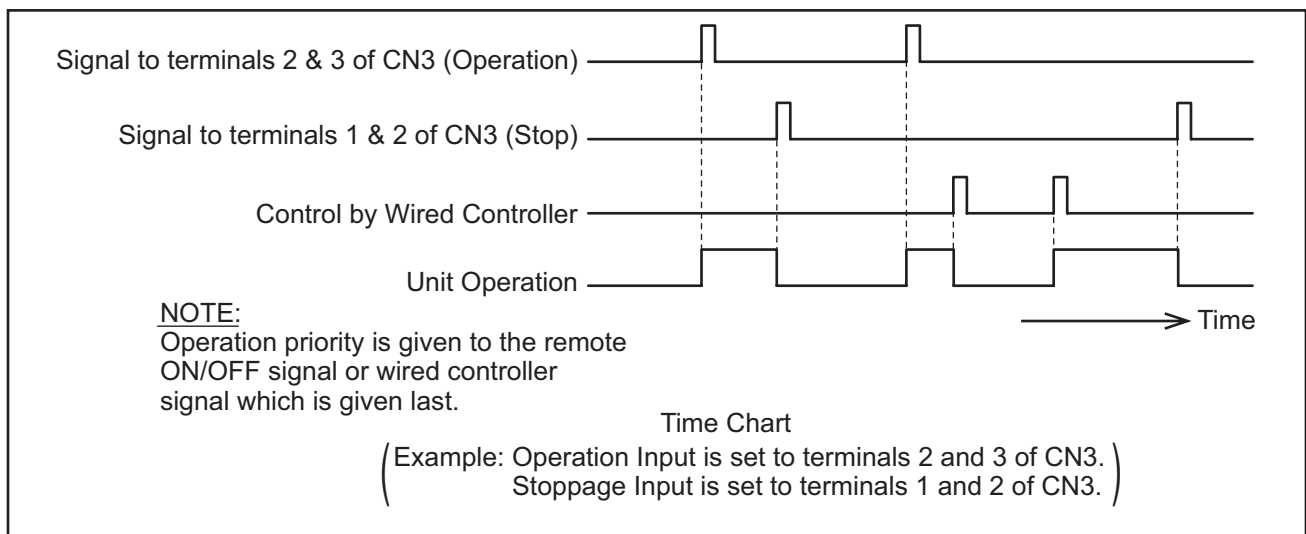
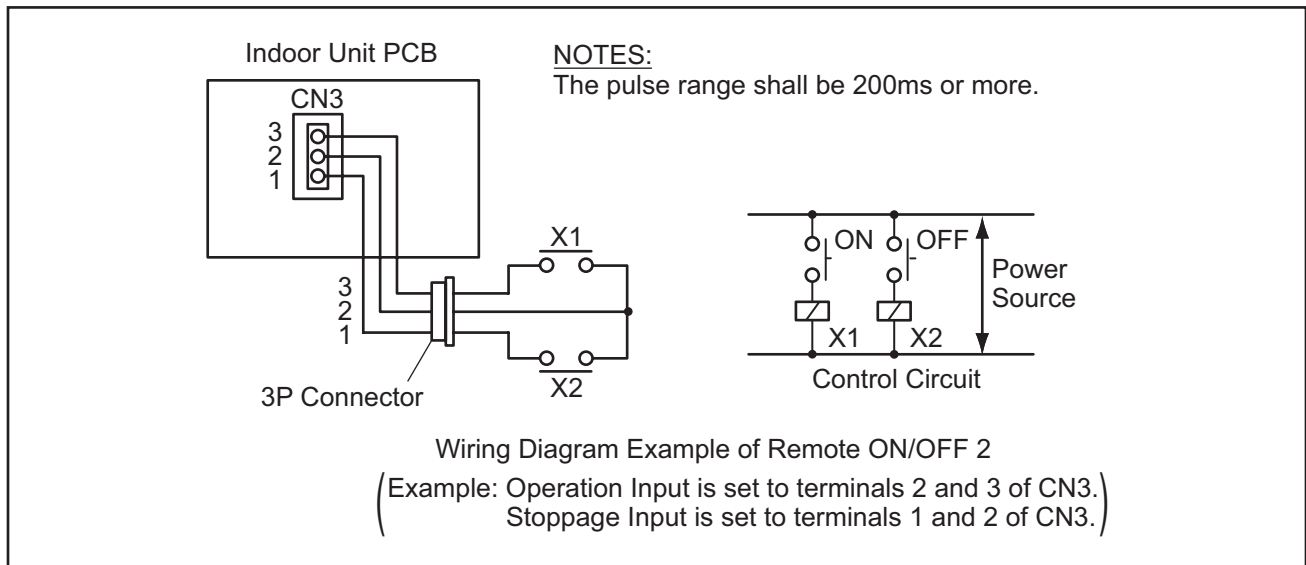


NOTES:

1. Picking up signal within 10 seconds after power supply is turned ON is not possible due to initialization of the components.
Do not change the signal (ON/OFF) in this period.
2. Wired Controller is required for this function.
3. If multiple indoor units are connected to the same communication cable for wired controller, input the signal to any of these indoor units.
4. When the communication cable is not used in the twin, triple and quad combinations for simultaneous operation, input the signal to the main indoor unit.

(2) Remote ON/OFF 2 (Pulse Signal Input) [Input Setting: Code (04)]

This is an ON/OFF function from a remote place by using pulse signals. An example of basic wiring and time chart is shown below.



NOTES:

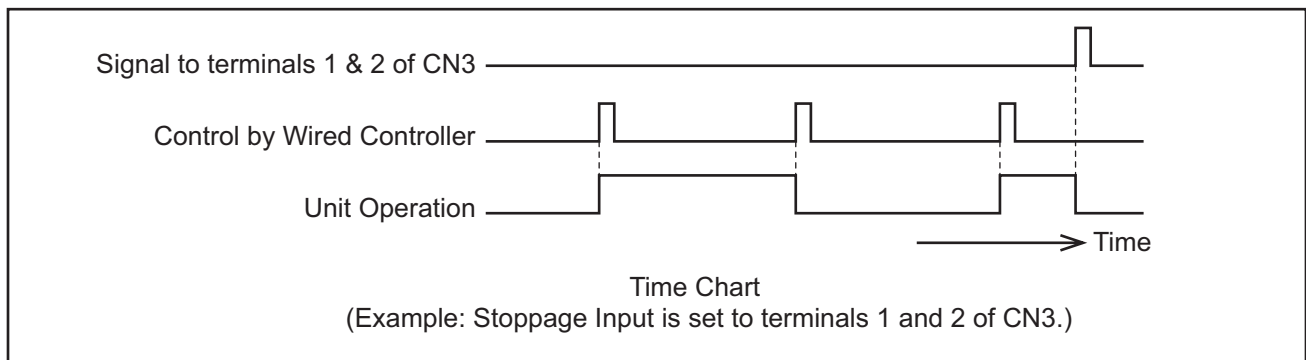
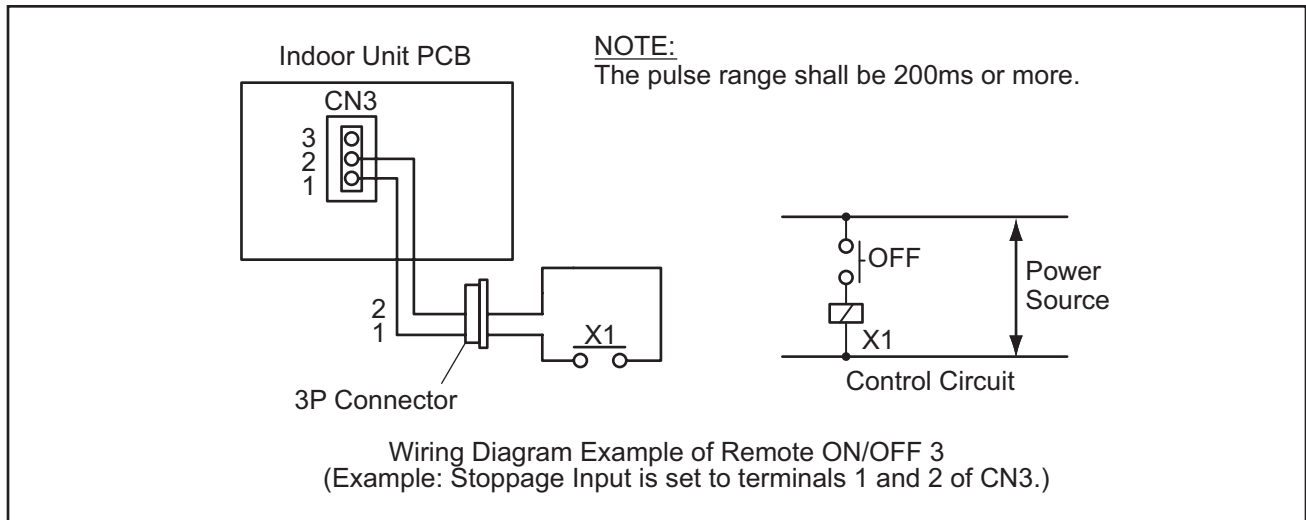
1. Picking up signal within 10 seconds after power supply is turned ON is not possible due to initialization of the components.
Do not change the signal (ON/OFF) in this period.
2. Wired Controller is required for this function.
3. If multiple indoor units are connected to the same communication cable for wired controller, input the signal to any of these indoor units.
4. When the communication cable is not used in the twin, triple and quad combinations for simultaneous operation, input the signal to the main indoor unit.

(3) Remote ON/OFF 3 (Pulse Signal Input) [Input Setting: Code (05)]

The setting for Remote ON/OFF 3 must be the same as that for Remote ON/OFF 2. By using the signal from a building management system, the air conditioners can be stopped.

If a signal is input during the stoppage of the air conditioner, the air conditioner remains unchanged.

An example of basic wiring and time chart is shown below.

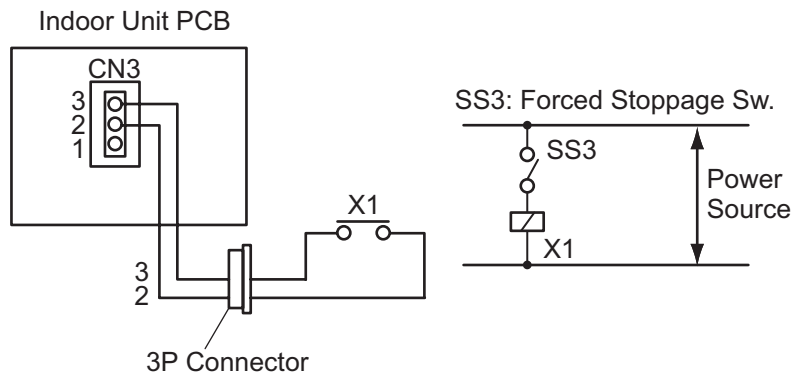


NOTES:

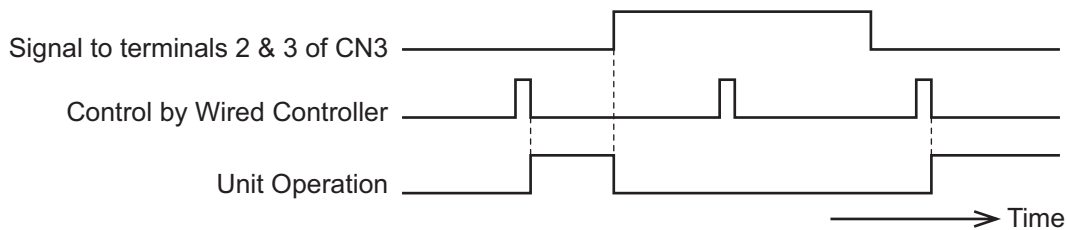
1. Picking up signal within 10 seconds after power supply is turned ON is not possible due to initialization of the components.
Do not change the signal (ON/OFF) in this period.
2. Wired Controller is required for this function.
3. If multiple indoor units are connected to the same communication cable for wired controller, input the signal to any of these indoor units.
4. When the communication cable is not used in the twin, triple and quad combinations for simultaneous operation, input the signal to the main indoor unit.

(4) Prohibiting Remote Control after Manual (Forced) Stoppage (Level Signal Input)
[Input Setting: Code (06)]

By using the signal from a building management system, the indoor units can be stopped and the individual commands from the wired controller are canceled. An example of basic wiring and time chart is shown below.

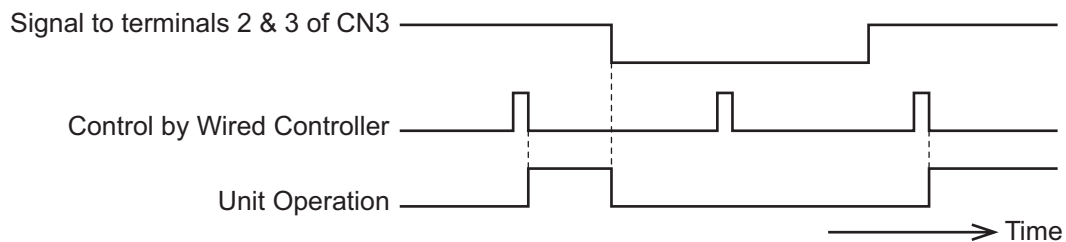


Wiring Diagram Example
(Example: Forbidding Remote Control after Manual (Forced) Stoppage is set to terminals 2 and 3 of CN3.)



Time Chart
(Example: Forbidding Remote Control after Manual (Forced) Stoppage is set to terminals 2 and 3 of CN3.)

This function can be used for B contacts if using "Selection of Forced Stoppage Logic" in the section 5.4.2.1 "Function Selection Item." An example of time chart is shown below.



Time Chart
(Example: Setting for B Contacts)

NOTES:

- Picking up signal within 10 seconds after power supply is turned ON is not possible due to initializing of components.
Do not change the signal (ON/OFF) in this period.
- Wired Controller is required for this function.
- The following ON/OFF functions are not available after the manual (forced) stoppage because commands from the wired controller are cancelled.
 - ON/OFF function from a remote place
 - ON/OFF function by the centralized controller while the wireless wired controller is being used.

Table 5.1 Specifications on Required Components for (1) to (4) Functions

Component		Manufacturer or Specifications	Remarks
Auxiliary Relay (X1, X2)		OMRON Mini Power Relay Model: MY1F/2F or Equivalent	Voltage 220V
Changeover Switch (SS2, SS3)		Manual Type	
3P Connector Cord		Optional Part PCC-1A (Connectable to JST Connector XARP-3), 12V	Five Cords with Connectors as One Set
Cord (Indoor)	Low Voltage	AWG22 (0.3mm ²)	less than 12V
	220V Class	AWG20 or AWG18 (0.5 to 0.75mm ²)	
Cord (Outdoor)	Low Voltage	AWG20 or AWG18 (0.5 to 0.75mm ²)	less than 12V
	220V Class	AWG14 (2mm ²)	

NOTE:

1. Make the wires CN3 as short as possible. Do not install the wires with the 220V power line. Install them more than 12 in. (30cm) away from each other. (Intersecting them is acceptable.)
If the wires are installed along the power line, comply with the following points to prevent noise.
 - a. Pass either of the low voltage wire and 220V power line through a metal conduit tube and ground one end.
 - b. Use a shielded wire for a low voltage wire and ground one end.
The maximum wiring length is 230 ft. (70m).
2. When using this function, it is recommended that safety devices such as an electric leakage breaker or smoke detector, etc. be used because this is an unattended operation.

5.4.1.2 Power Supply ON/OFF 1 (Automatic Operation When Power Supply Is ON)

This function is utilized to run/stop the unit by turning ON/OFF the power supply. When this function is utilized in the condition that there is no person to operate the unit, monitor the system for disaster prevention. When using this function, refer to operation for Wired Controller item (30) "Power Supply ON/OFF (Automatic Operation When Power Supply Is ON) (d1)" for the setting.

NOTE:

1. The unit will be stopped even when the power supply is turned ON/OFF due to power failure. If power failure occurs during the stoppage of the unit, the operation is restarted after the power supply is restored.
2. Wired Controller is required for this function.
3. When the communication cable is not used in the twin, triple and quad combinations for simultaneous operation, set this function only to the main indoor unit.

5.4.1.3 Power Supply ON/OFF 2 (Restarting Function After Power Failure)

This function is utilized to restart the unit operation automatically when the power supply is restored after the power failure over 2 seconds. In case of the power failure for 2 seconds or less, the standard unit memorize all the operation mode and restarts the operation automatically. (The compressor restarts operation after 3 minutes guard in addition to power failure time for up to 2 seconds.)

When this function is utilized in the condition that there is no person to operate the unit, monitor the system for disaster prevention.

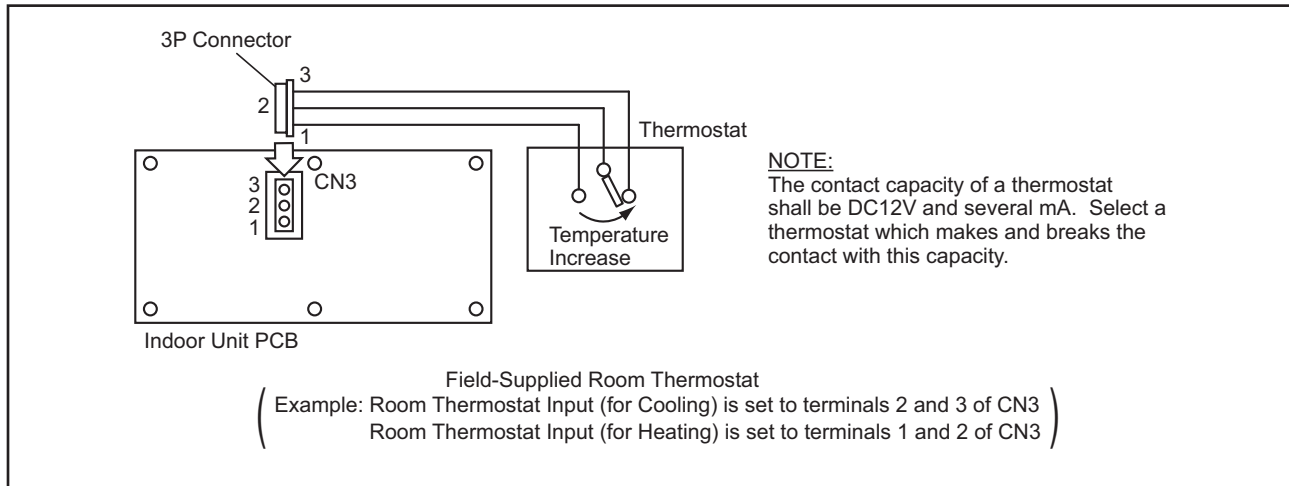
NOTE:

1. If power failure occurs during the stoppage of the unit, the unit remains stopped after the power supply is restored.
2. Wired Controller is required to be connected for setting this function.
3. When the communication cable is not used in the twin, triple and quad combinations for simultaneous operation, set this function only to the main indoor unit.

5.4.1.4 Control by Field-Supplied Room Thermostat

[Input Setting: Code (01) (for Cooling), Code (02) (for Heating)]

In the case that a field-supplied room thermostat is used instead of the inlet thermistor of the indoor unit in order to run/stop the compressor, connect wires as shown below.



Operation

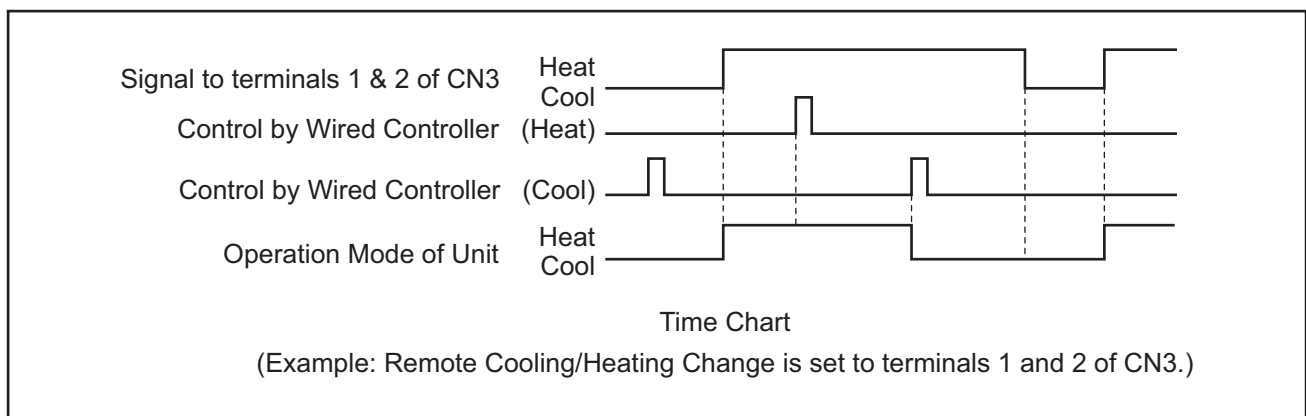
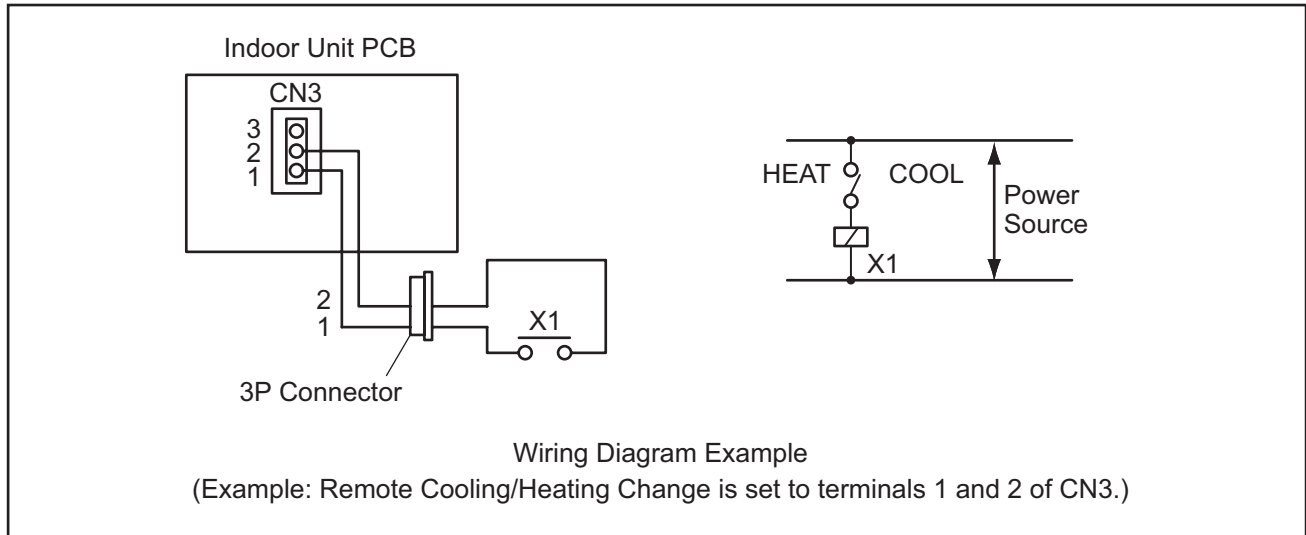
- Cooling Operation: Compressor is ON by closing terminals 2 and 3 of CN3
Compressor is OFF by opening terminals 2 and 3 of CN3
- Heating Operation: Compressor is ON by closing terminals 1 and 2 of CN3
Compressor is OFF by opening terminals 1 and 2 of CN3

NOTE:

- Make the wires CN3 as short as possible. Do not install the wires along the 220V power line. Install them more than 12 in. (30cm) away from each other. (Intersecting them is acceptable.)
If the wires are installed along the power line, comply with the following points to prevent noise.
 - Pass either of the low voltage wire and 220V power line through a metal tube and ground one end.
 - Use a shielded wire for a low voltage wire and ground one end.
 The maximum wiring length is 230 ft. (70m).
- When using this function, it is recommended that safety devices such as an electric leakage breaker or smoke detector, etc. be used because this is an unattended operation.
- For a thermostat, do not use a thermostat which uses mercury for switch, because chattering is likely to occur at ON/OFF.
- Use a thermostat with a differential of 2°F (1.5°C) or more.
- Comply with the following points. If not, a high-voltage circuit breaker is activated or the unit repeats ON/OFF operation.
 - Install a thermostat where air inlet temperature can be detected correctly.
 - Install a thermostat where discharge air from the unit does not blow directly against it.
- When using a room thermostat, set each room thermostat (for cooling and heating) correctly. If any of them are set incorrectly, the other room thermostat does not operate.

5.4.1.5 Remote Cooling/Heating Change [Input Setting: Code (07)]

The cooling or heating operation mode can be changed by giving a contact signal from the outside to the unit. Set this function to CN3 with a wired controller according to the section 5.4.2.1 “Function Selection Item.” This function detects ON to OFF transition and OFF to ON transition. Of the commands by this signal and a wired controller, the command given later is preferentially executed. An example of basic wiring and time chart is shown below.



NOTES:

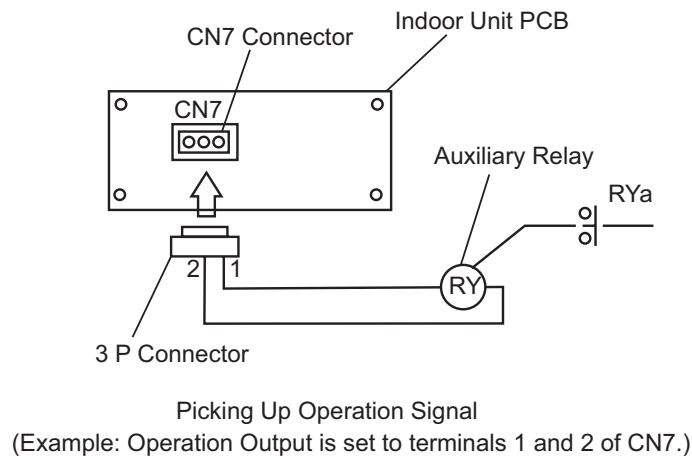
1. Wired Controller is required for this function.
2. Refer to the table 5.1 for details of the required components.
3. If multiple indoor units are connected to the same communication cable for wired controller, input the signal to any of these indoor units.
4. When the communication cable is not used in the twin, triple and quad combinations for simultaneous operation, set this function only to the main indoor unit.

5.4.1.6 Picking Up Operation Signal

Up to 3 of the following 7 signals can be picked up by setting this function to CN7 and CN8 according to the following figures. Make sure to use a field-supplied remote control adopter PSC-5RA for picking up signals. The wiring length shall be 230 ft. (70m) or less. The setting for picking up signals (1), (2) and (4) are already set at the factory.

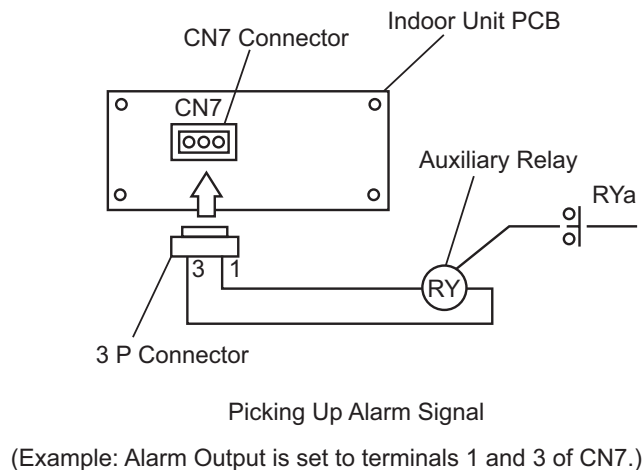
(1) Picking Up Operation Signal [Output Setting: Code (01)]

This function is utilized to pick up an operation signal that has nothing to do with the compressor stoppage by a thermistor. An example of basic wiring is shown below. The contact of the auxiliary relay "RYa" is closed when this operation signal is given. This function enables the signal check during remote control operation and an interlock of the fan for air inlet, etc. The contact of the auxiliary relay "RYa" is opened while the protection devices are activated.



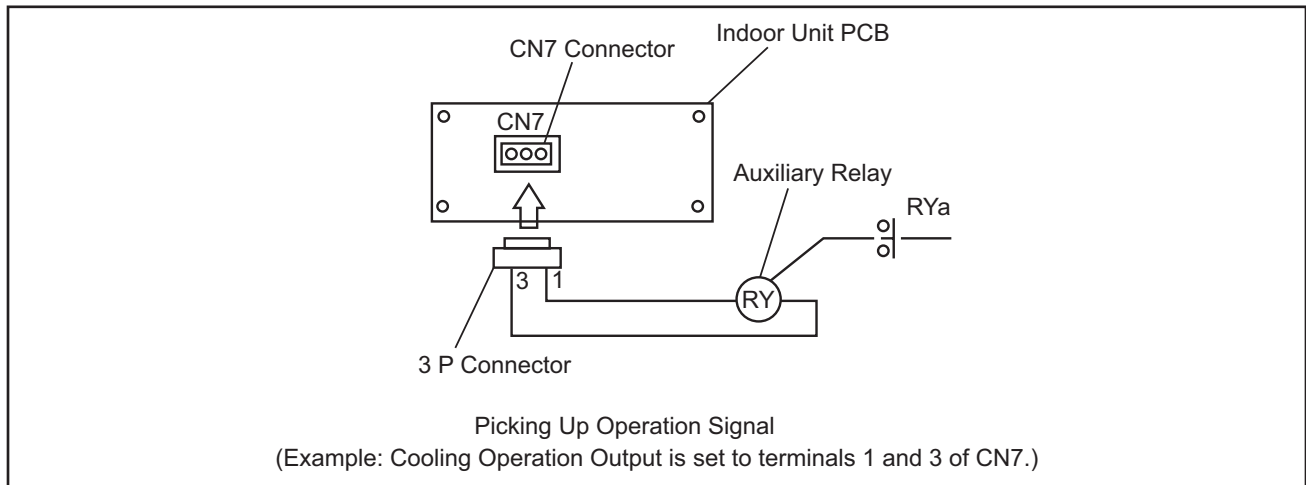
(2) Picking Up Alarm Signal [Output Setting: Code (02)]

This signal is utilized to pick up an alarm signal while safety devices are activated. However, this function is not available during abnormal communication of the wired controller. An example of basic wiring is shown below. The contact of the auxiliary relay "RYa" is closed while the protection devices are activated.



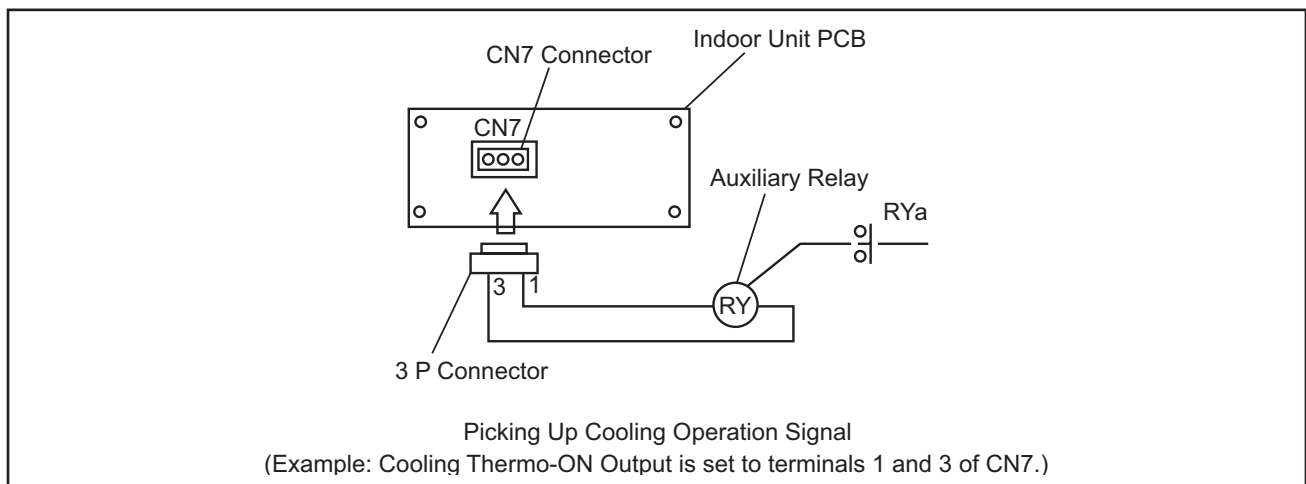
(3) Picking Up Cooling Operation Signal [Output Setting: Code (03)]

This function is utilized to pick up cooling operation signal that has nothing to do with the compressor stoppage by a thermistor. An example of basic wiring is shown below. The contact of the auxiliary relay "RYa" is closed when this operation signal is given.



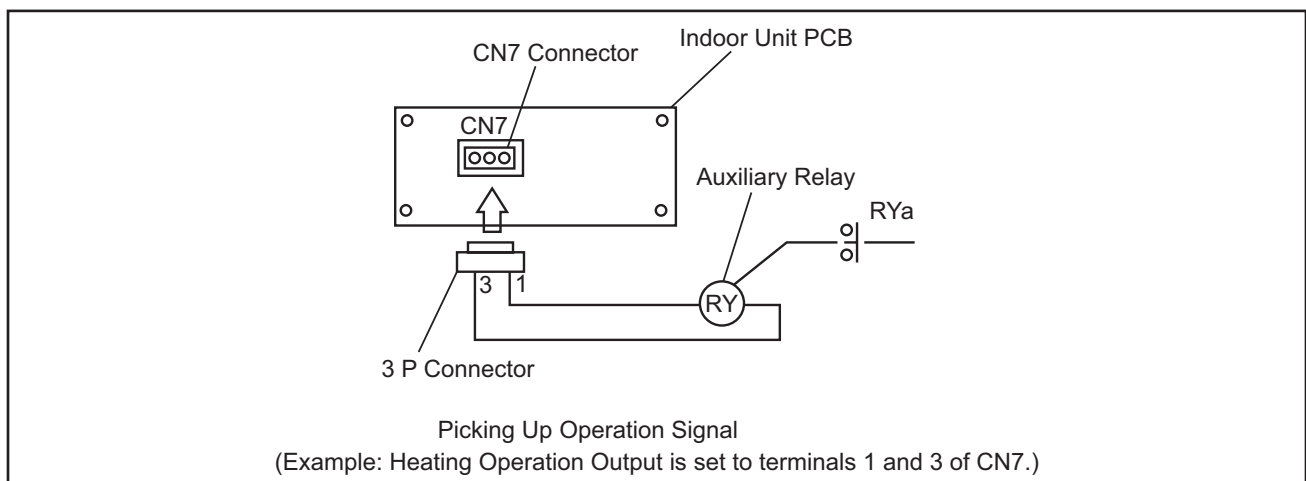
(4) Picking Up Cooling Thermo-ON Signal [Output Setting: Code (04)]

This function is utilized to pick up thermo-ON signal during the cooling operation. An example of basic wiring is shown below. The contact of the auxiliary relay "RYa" is closed during thermo-ON in cooling operation.



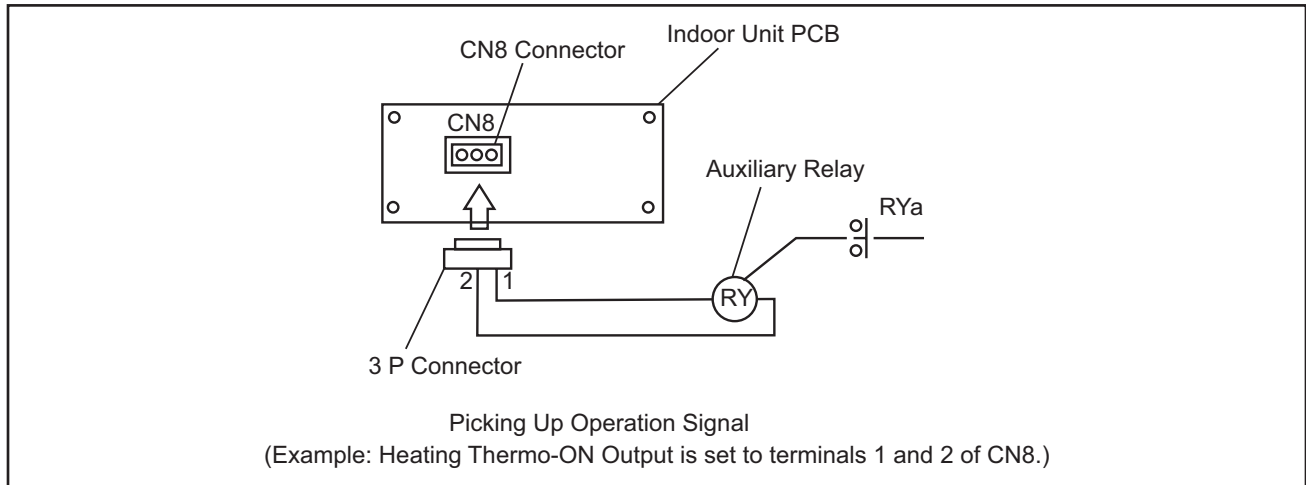
(5) Picking Up Heating Operation Signal [Output Setting: Code (05)]

This function is utilized to pick up heating operation signal that has nothing to do with the compressor stoppage by a thermistor. An example of basic wiring is shown below. The contact of the auxiliary relay "RYa" is closed when this operation signal is given.



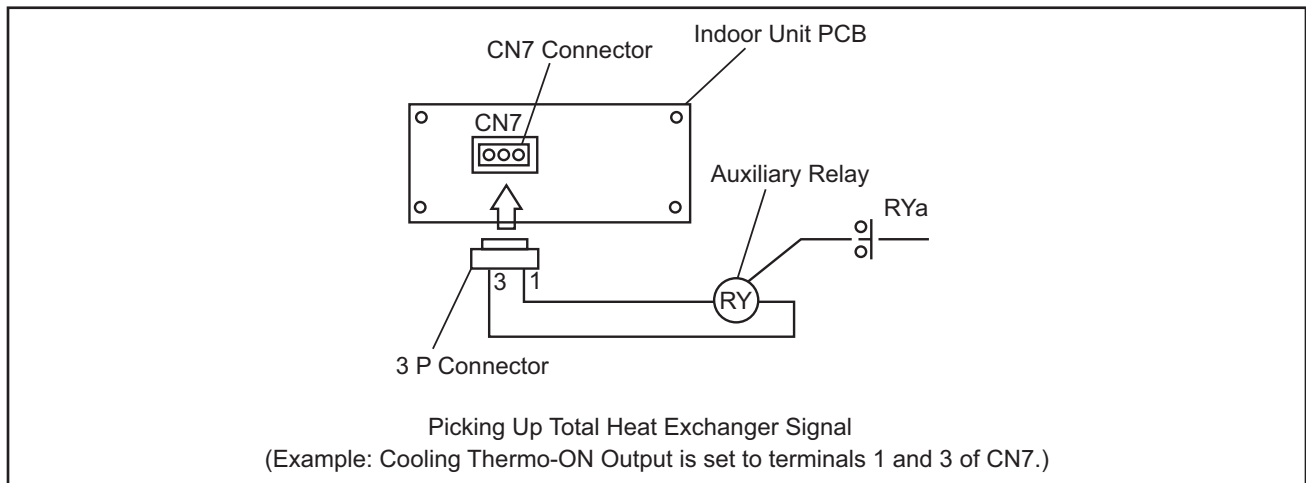
(6) Picking Up Heating Thermo-ON Signal [Output Setting: Code (06)]

This function is utilized to pick up thermo-ON signal during the heating operation. An example of basic wiring is shown below. The contact of the auxiliary relay “RYa” is closed during thermo-ON in heating operation. Use this function for operation of a circulator or a humidifier.



(7) Picking Up Total Heat Exchanger Signal [Output Setting: Code (07)]

This function is utilized to pick up total heat exchanger signal during the ventilation mode selected with a wired controller. An example of basic wiring is shown below.



NOTE:

These are examples using general-purpose relay.

5.4.2 Function Setting

5.4.2.1 Function Selection Item

- for DOAS

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
1	b1	Setting of Connected Outdoor Unit Type	×	00 01 02 03 04	- VRF - - -
2	b2	Constant Air Volume Mode	○	00 01	Not Available Available
3	b3	Not Prepared	-	-	Not Used (Use as 00 conditions)
4	b4	Change of Filter Cleaning Time	○	00 01 02 03 04	Standard 1,200 hrs (Factory-Setting) 100 hrs 1,200 hrs 2,500 hrs No Indication
5	b5	Fixing of Operation Mode	×	00 01	Standard Fixed
6	b6	Fixing of Setting Temperature	×	00 01	Standard Fixed
7	b7	Fixing of Operation as Exclusive Cooling Unit	×	00 01	Standard Fixed
8	b8	Automatic COOL/HEAT Operation	×	00 01	Not Available Available
9	b9	Fixing of Fan Speed	×	00 01	Standard Fixed
10	bA	Not Prepared	-	-	Not Used
11	bb	Cooling Temperature Compensation due to Uneven Heat Load	○	00 01 02	Standard (No Compensation) Set Temp. -2°F (-1°C) Set Temp. -3°F (-2°C)
12	bC	Not Prepared	-	-	Not Used (Use as 00 conditions)
13	bd	Not Prepared	-	-	Not Used (Use as 00 conditions)
14	bE	Not Prepared	-	-	Not Used (Use as 00 conditions)
15	C1	Not Prepared	-	-	Not Used (Use as 00 conditions)
16	C2	Not Prepared	-	-	Not Used
17	C3	Not Prepared	-	-	Not Used (Use as 00 conditions)
18	C4	Not Prepared	-	-	Not Used (Use as 00 conditions)
19	C5	Operation Mode for Outlet Air Temperature Correction (Only for Outlet Air Temperature Control Mode)	○	00 01 02	Cooling and Heating Cooling Heating
20	C6	Not Prepared	-	-	Not Used (Use as 00 conditions)
21	C7	Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Standard Cancelation
22	C8	Selection of Thermistor for Indoor Temperature	○	00 01 02	Remote Sensor Thermistor of Wired Controller Average Value of Remote Sensor and Thermistor of Wired Controller
23	C9	Not Prepared	-	-	Not Used
24	CA	Not Prepared	-	-	Not Used
25	Cb	Selection of Forced Stoppage Logic	×	00 01	Forced Stoppage Input: A Contact Forced Stoppage Input: B Contact
26	CC	Not Prepared	-	-	Not Used (Use as 00 conditions)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
27	Cd	Change of Control Mode	×	00 01	Indoor Temperature Control Outlet Air Temperature Control
28	CE	Not Prepared	-	-	Not Used (Use as 00 conditions)
29	CF	Temperature Correction for Thermo-ON/OFF (Only for Outlet Air Temperature Control Mode)	○	00 01 02	0°F (0°C) 3°F (2°C) 9°F (5°C)
30	d1	Not Prepared	-	-	Not Used
31	d2	Not Prepared	-	-	Not Used
32	d3	Power Supply ON/OFF 2	○	00 01	Not Available Available
33	d4	Prevention for Cooling Discharge Air Temperature Decrease	○	00 01	Not Available Available
34	d5	Not Prepared	-	-	Not Used (Use as 00 conditions)
35	d6	Not Prepared	-	-	Not Used (Use as 00 conditions)
36	d7	Outlet Air Temperature Correction (Only for Outlet Air Temperature Control Mode)	○	00 01 02 03 04 05 06 07	0°F (0°C) +3°F (+2°C) +7°F (+4°C) +11°F (+6°C) -3°F (-2°C) -7°F (-4°C) -11°F (-6°C) -11°F (-6°C)
37	E1	Thermo-ON/OFF Control (Only for Indoor Temperature Control Mode)	○	00 01 02	Inlet Temperature Inlet and Indoor Temperature Indoor Temperature
38	E2	Performance Restraint Control (Only for Indoor Temperature Control Mode)	○	00 01	Not Available Available
39	E3	Hot-Start Control	○	00 01	Not Available Available
40	E4	Not Prepared	-	-	Not Used (Use as 00 conditions)
41	E5	Not Prepared	-	-	Not Used (Use as 00 conditions)
42	E6	Indoor Fan Operation Time After Cooling Operation Stoppage	○	00 01 02	Not Available 60 min. 120 min.
43	E7	Not Prepared	-	-	Not Used (Use as 00 conditions)
44	E8	Not Prepared	-	-	Not Used (Use as 00 conditions)
45	E9	Not Prepared	-	-	Not Used (Use as 00 conditions)
46	EA	Not Prepared	-	-	Not Used (Use as 00 conditions)
47	Eb	Fan Operation Control during Cooling Thermo-OFF	○	00 01 02	Not Available SLOW SLOW
48	EC	Not Prepared	-	-	Not Used (Use as 00 conditions)
49	Ed	Not Prepared	-	-	Not Used (Use as 00 conditions)
50	EE	Not Prepared	-	-	Not Used (Use as 00 conditions)
51	EF	Not Prepared	-	-	Not Used (Use as 00 conditions)
52	F0	Not Prepared	-	-	Not Used

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
53	F1	Automatic OFF Timer Setting * Do not set the functions "0C"~"0F" when 2 (two) wired controllers are used in the same controller group	×	00 01 02 • • 23 24 0A 0B 0C 0D 0E 0F	No Function OFF Timer by 1 hr OFF Timer by 2 hrs • • OFF Timer by 23 hrs OFF Timer by 24 hrs OFF Timer by 30 min. OFF Timer by 90 min. OFF Timer by 40 min. OFF Timer by 45 min. OFF Timer by 50 min. OFF Timer by 55 min. } Do not set them when two wired controllers are used.
54	F2	Wired Controller Main-Sub Setting	×	00 01	Main Sub
55	F3	Automatic Reset of Setting Temperature (*1)	×	00 01	Not Available Available
56	F4	Automatic Reset Time	×	00 01 02 03	30 min. (Factory-Setting) 15 min. 60 min. 90 min.
57	F5	Automatic Reset Temperature for Cooling (*2)	×	66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) (Factory-Setting) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)
58	F6	Automatic Reset Temperature for Heating (*3)	×	62 (17) 64 (18) 66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	62°F (17°C) 64°F (18°C) 66°F (19°C) 68°F (20°C) 70°F (21°C) (Factory-Setting) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)
59	F7	Operation Stoppage Prevention by Wired Controller Operational Error (*4)	×	00 01	Not Available Available
60	F8	Lock Function for Operation Mode Selection	×	00 01	Not Available Available (Factory-Setting)
61	F9	Lock Function for Temperature Setting	×	00 01	Not Available Available (Factory-Setting)
62	FA	Not Prepared	-	-	Not Used (Use as 00 conditions)
63	Fb	Not Prepared	-	-	Not Used (Use as 00 conditions)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
64	FC	Cooling Lower Limit for Setting Temperature (*2)	×	00 01 02 03 04 05 06 07 08 09 10	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C)
65	Fd	Heating Upper Limit for Setting Temperature (*3)	×	00 01 02 03 04 05 06 07 08 09 10 11 12	86°F (30°C) 84°F (29°C) 82°F (28°C) 80°F (27°C) 78°F (26°C) 77°F (25°C) 76°F (24°C) 74°F (23°C) 72°F (22°C) 70°F (21°C) 68°F (20°C) 66°F (19°C) 64°F (18°C)
66	FE	Not Prepared	-	-	Not Used (Use as 00 conditions)
67	FF	Not Prepared	-	-	Not Used (Use as 01 conditions)
68	H1	Not Prepared	-	-	Not Used (Use as 00 conditions)
69	H2	Indication of Hot Start	×	00 01	Indication No Indication
70	H3	Not Prepared	-	-	Not Used (Use as 00 conditions)
71	H4	Not Prepared	-	-	Not Used (Use as 00 conditions)
72	J1	Not Prepared	-	-	Not Used (Use as 00 conditions)
73	J2	Not Prepared	-	-	Not Used (Use as 01 conditions)
74	J3	Run Indicator Color	×	00 01	Green Red
75	J4	Not Prepared	-	-	Not Used (Use as 00 conditions)
76	J5	Not Prepared	-	-	Not Used (Use as 00 conditions)
77	J6	Not Prepared	-	-	Not Used (Use as 00 conditions)
78	J7	Not Prepared	-	-	Not Used (Use as 00 conditions)
79	J8	Eco-operation (*5)	×	00 01	Not Available Available
80	J9	Not Prepared	-	-	Not Used (Use as 00 conditions)
81	JA	Not Prepared	-	-	Not Used (Use as 00 conditions)
82	Jb	Not Prepared	-	-	Not Used (Use as 00 conditions)
83	K1	Not Prepared	-	-	Not Used (Use as 00 conditions)
84	K2	Not Prepared	-	-	Not Used (Use as 00 conditions)
85	K3	Not Prepared	-	-	Not Used (Use as 00 conditions)
86	K4	Not Prepared	-	-	Not Used (Use as 00 conditions)
87	K5	Not Prepared	-	-	Not Used (Use as 00 conditions)
88	K6	Not Prepared	-	-	Not Used (Use as 00 conditions)
89	K7	Not Prepared	-	-	Not Used (Use as 00 conditions)
90	K8	Not Prepared	-	-	Not Used (Use as 00 conditions)
91	K9	Not Prepared	-	-	Not Used (Use as 00 conditions)
92	KA	Not Prepared	-	-	Not Used (Use as 00 conditions)
93	L1	Not Prepared	-	-	Not Used (Use as 00 conditions)
94	L2	Not Prepared	-	-	Not Used (Use as 00 conditions)

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
95	L3	Not Prepared	-	-	Not Used (Use as 00 conditions)
96	L4	Not Prepared	-	-	Not Used (Use as 00 conditions)
97	L5	Not Prepared	-	-	Not Used (Use as 00 conditions)
98	L6	Not Prepared	-	-	Not Used (Use as 00 conditions)
99	L7	Not Prepared	-	-	Not Used (Use as 00 conditions)
100	L8	Not Prepared	-	-	Not Used (Use as 00 conditions)
101	L9	Not Prepared	-	-	Not Used (Use as 00 conditions)
102	LA	Not Prepared	-	-	Not Used (Use as 00 conditions)
103	Lb	Not Prepared	-	-	Not Used (Use as 00 conditions)
104	P1	Setting Temperature	×	00 01	Every 1°F (0.5°C) Every 2°F (1°C)
105	P2	Not Prepared	-	-	Not Used (Use as 00 conditions)
106	P3	Thermistor Selection	×	00 01 02 03	Inlet Air Thermistor Outlet Air Thermistor Thermistor of Wired Controller Remote Sensor
107	P4	Display of Thermistor Temperature	×	00 01	Not Available Available
108	P5	Setting Temperature Display during Fan Operation	×	00 01	Displayed Undisplayed
109	P6	ECO Button Operation	×	00 01	Available Not Available
110	P7	Menu Button Operation	×	00 01	Not Available Available
111	P8	Not Prepared	-	-	Not Used (Use as 00 conditions)
112	P9	Not Prepared	-	-	Not Used (Use as 00 conditions)
113	PA	Not Prepared	-	-	Not Used (Use as 00 conditions)
114	Pb	Not Prepared	-	-	Not Used (Use as 00 conditions)
115	PC	Not Prepared	-	-	Not Used (Use as 00 conditions)

*1): In case that the set temperature is changed and the temperature is kept for a specific time set by "F4", it automatically changes to the temperature set by "F5" or "F6." (In case that the set temperature of "F5" and "F6" is out of range, the upper or lower limit temperature is applied.)

*2): Applicable to fan, cooling and dry operation modes.

*3): Applicable to heating operation mode.

*4): Operation is stopped by pressing the "⏻" (On/Off) button for 3 seconds.

*5): When the unit is restarted by the wired controller, the temperature automatically changes to the setting temperature of "F5" or "F6".

NOTES:

1. Wait at least 3 minutes from initial power ON to change the optional setting.
2. Record the setting conditions for each optional setting in the "Setting" column of the table.
3. The above optional functions with "X" mark at the individual setting can change the condition only when "All Rooms" is selected in the Test Run Menu > Function Selection Menu.

5.4.2.2 Description of Function Selection Item

(1) Setting of Connected Outdoor Unit Type (b1)

This function is utilized to protect compressor from increase of Ps during operation (especially high load cooling operation).

The prevention condition for increase of Ps can be changed depending on the connected outdoor unit type as shown in the table below.

Setting Condition	Outdoor Unit	Contents
00 (Factory Setting)	-	Ps > 160psi (1.1MPa) → Forced increase of compressor frequency Ps ≥ 189psi (1.3MPa) → Indoor unit forced thermo OFF (Restart automatically in 3 minute)
01	VRF ((H,Y)VAH(P,R)***B(3,4)1**)	Ps ≥ 203psi (1.4Mpa) → Indoor unit forced thermo OFF (Restart automatically in 3 minutes)
02 ~ 04	-	Not Available

NOTES:

1. Set "00" or "01" according to the connected outdoor unit to avoid malfunction.
2. The setting condition "02" to "04" is for preliminary setting.
Do not use the setting numbers.

(2) Constant Air Volume Mode (b2)

This function is utilized to intake constant amount of air volume. The supply/exhaust air volume can be balanced without intervention of hot start control during heating operation and fan-stop control during defrosting operation.

Item Code	Setting Condition
b2	01

NOTES:

1. The cold air may be discharged especially in the heating season during defrosting operation and hot start is performed. Pay attention to the direction of the air outlet at the time of installation and explain to the customer why this is necessary.
2. The function of (b2) is different from (b9) "Fixing of Fan Speed".
Pay attention to this difference when you set the function.

(3) Not Prepared (b3)**(4) Change of Filter Cleaning Time (b4)**

The period before filter sign indication is set according to indoor unit model before shipment.

The filter sign ("FLTR" on wired controller) is indicated according to the filter cleaning time (Factory Setting). However, this filter cleaning time can be changed depending on the condition of the filter as shown in the table below.

Period for Filter Sign Indication	Approx. 1,200 hrs.	Approx. 100 hrs.	Approx. 1,200 hrs.	Approx. 2,500 hrs.	No Indication
Liquid Crystal Display on Wired Controller	00 (Factory Setting)	01	02	03	04

NOTE:

While "Control by External Input" is valid, the filter sign is "No Indication" if the external input is disconnected.

(5) Fixing of Operation Mode (b5)

This function is utilized when the operation mode is not required to be changed.

When this function is valid, the set operation mode cannot be changed by the wired controller.

(6) Fixing of Setting Temperature (b6)

This function is utilized when setting temperature is not required to be changed.

When this function is valid, the setting temperature cannot be changed by the wired controller.

(7) Fixing of Operation as Exclusive Cooling Unit (b7)

This function is utilized when exclusive cooling operation is required.

This function invalidates the heating operation and the automatic COOL/HEAT operation, as the operation of exclusive cooling unit.

(8) Automatic COOL/HEAT Operation (b8)

This function is utilized to change cooling and heating operation automatically (the same operation mode for indoor units in the same refrigerant cycle).

This function is invalid when the outdoor unit is cooling-only model or the function of "Fixing of Operation as Exclusive Cooling Unit" is valid.

(9) Fixing of Fan Speed (b9)

This function is utilized to fix the fan speed.

When this function is valid, the fan speed can not be changed by the wired controller.

(10) Not Prepared (bA)**(11) Cooling Temperature Compensation due to Uneven Heat Load (bb)**

This function is utilized to provide the longer cooling operation time than the standard.

When this function is valid, Thermo-ON/OFF is controlled under the lower temperature conditions than the setting temperature (the indicated value) of the wired controller.

Setting Temperature for Room Temperature Control during Cooling

Setting Condition	Actual Control Temperature
00 (Standard)	Wired Controller Setting Temperature (Indicated Value)
01	Wired Controller Setting Temperature (Indicated Value) -2°F (-1°C)
02	Wired Controller Setting Temperature (Indicated Value) -3°F (-2°C)

NOTE:

The minimum setting temperature after correction is 66°F (19°C).

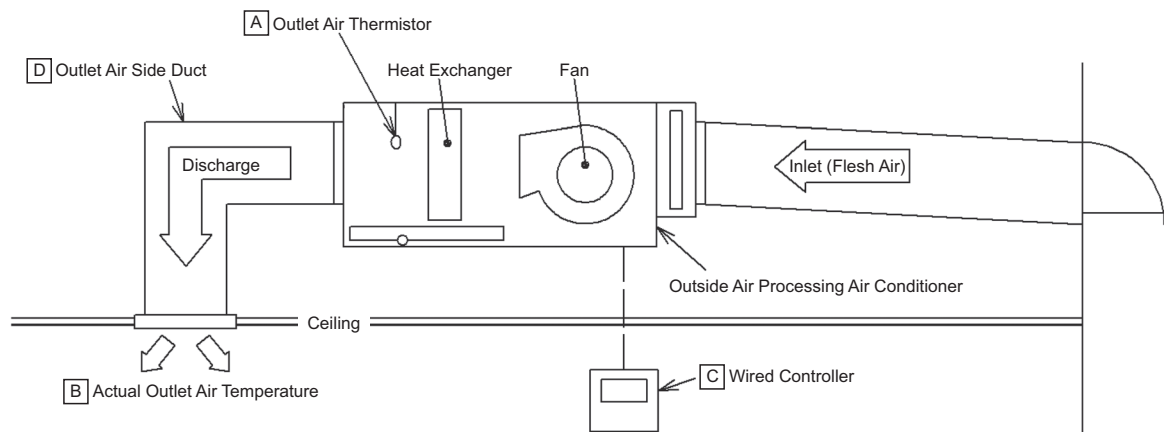
(12) Not Prepared (bC)**(13) Not Prepared (bd)****(14) Not Prepared (bE)****(15) Not Prepared (C1)****(16) Not Prepared (C2)****(17) Not Prepared (C3)****(18) Not Prepared (C4)****(19) Operation Mode for Outlet Air Temperature Correction (Only for Outlet Air Temperature Control Mode) (C5)**

This function is utilized to control [B] actual outlet air temperature closer to setting temperature by [C] wired controller based on detected temperature by [A] outlet air thermistor.

The detected temperature by [A] outlet air thermistor is slightly adjusted at the time of shipping assuming thermal loss at [D] outlet air side duct to bring [B] actual outlet air temperature closer to setting temperature by [C] wired controller.

However [B] actual outlet air temperature may be intervened by actual installation condition ([D] outlet air side duct length, material, etc.). In this case [B] actual outlet air temperature is correctable.

$$[B] \text{ Actual Outlet Air Temperature} + a = [C] \text{ Wired Controller}$$



Operation Mode Selection

Item Code	Setting	Operation Mode to Correct
C5	00 (Factory Setting)	Cooling/Heating (Same correction Value)
	01	Cooling
	02	Heating

NOTE:

The correction value for Cooling and Heating is the same.

Correction Value Selection

Item Code	Setting	a		NOTE
		Cooling	Heating	
d7	00 (Factory Setting)	No Correction	No Correction	-
	01	+3°F (+2°C)	-3°F (-2°C)	Reduce Cooling/Heating Capacity
	02	+7°F (+4°C)	-7°F (-4°C)	
	03	+11°F (+6°C)	-11°F (-6°C)	
	04	-3°F (-2°C)	+3°F (+2°C)	Increase Cooling/Heating Capacity
	05	-7°F (-4°C)	+7°F (+4°C)	
	06	-11°F (-6°C)	+11°F (+6°C)	
	07			

Setting Example

Operation Mode: Cooling

☐ Wired Controller Setting Temperature: 72°F (22°C)

☐ Actual Outlet Air Temperature: 78°F (26°C)

Phenomenon: Temperature ☐ is 7°F (4°C) below the temperature ☐

Assumed Cause: The temperature in the ☐ Outlet Air Side Duct may increase because the temperature above the ceiling increases during summer time.

Setting: Set "01" for item code "C5" and set "05" at item code "d7"

NOTES:

1. This function may not be effective due to outside temperature and operation condition.
2. The Detected Temperature by ☐ Outlet Air Thermistor is slightly adjusted so that the equation $\text{Actual Outlet Air Temperature} = \text{Detected Temperature by } \text{Outlet Air Thermistor}$ is not always the case. Pay attention where and when you check the data.

(20) Not Prepared (C6)**(21) Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor (C7)**

The compressor operation is enabled for a minimum of 3 minutes when operation is started by the "Enforce 3 Minutes Minimum Operation Time of Compressor". This function is utilized to cancel the function "Enforced 3 Minutes Minimum Operation Time of Compressor" (Enforced 3 Minutes Compressor Guard).

NOTE:

The compressor operation is stopped immediately as following conditions.

- The protection device is activated.
- The operation stop button is pressed.

(22) Selection of Thermistor for Indoor Temperature (C8)

For indoor temperature detection, select from (a) ~ (c) listed below according to the installation type.

(a) Remote Sensor

Connect remote sensor (No change for setting is required).

Item Code	Setting
C8	00(Factory Setting)

(b) Remote Thermistor Built in Optional Wired Controller

Connect wired controller to the unit and select "Function Selection" as shown below.

Item Code	Setting
C8	01

(c) Combination of Remote Sensor and Remote Thermistor Built in Optional Wired Controller

Connect remote sensor and optional wired controller to the unit. Select "Function Selection" menu by optional wired controller as shown below.

Item Code	Setting
C8	02

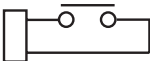
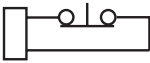
NOTE:

It works by calculating the average of the two different temperatures between the remote thermistor built in optional wired controller and remote sensor.

(23) Not Prepared (C9)**(24) Not Prepared (CA)****(25) Selection of Forced Stoppage Logic (Cb)**

This function is utilized to select the logic of the contact for forced stoppage signal input.

The setting condition and the logic of the contact are as shown below.

Setting Condition	Logic of Contact	Sequence	Activation	
			Contact "Open"	Contact "Close"
00	A Contact	Indoor PCB 	Normal	Forced Stoppage
01	B Contact	Indoor PCB 	Forced Stoppage	Normal

(26) Not Prepared (CC)**(27) Change of Control Mode (Cd)**

Setting for indoor unit and outdoor unit is required for changing the control mode (Indoor temperature control ↔ Outlet air temperature control). Refer the table below for the setting. (Refer to the installation manual for more detail.)

Setting		Contents	
Unit		Indoor Temperature Control (Factory Setting)	Outlet Air Temperature Control
Indoor Unit		Wired Controller Function Selection Cd : 00 and Indoor Unit DIP Switch 8-3 : OFF	Wired Controller Function Selection Cd : 01 or Indoor Unit DIP Switch 8-3 : ON
Outdoor Unit	DOAS Only	Outdoor Unit Function Selection FT : 0	Outdoor Unit Function Selection FT : 2
	DOAS + Other Standard Indoor Unit	No Setting Required	Not Available

NOTE:

If the setting combination between indoor unit and outdoor unit is not correct, the operation fail.

(28) Not Prepared (CE)
(29) Temperature Correction for Thermo-ON/OFF (Only for Outlet Air Temperature Control Mode) (CF)

The correction for Thermo-ON/OFF temperature is available for each usage condition.

This function is utilized to prevent easy shift to thermo-ON operation at the time of inlet temperature getting closer to the wired controller setting temperature and avoid inefficient operation.

Operation Mode	Thermo-ON Condition	Thermo-OFF Condition
Cooling	Inlet Temp. \geq Setting Temp. + 2°F (1°C) + a	Inlet Temp. \leq Setting Temp. - 2°F (1°C) + a
Heating	Inlet Temp. \leq Setting Temp. - 2°F (1°C) + a	Inlet Temp. \geq Setting Temp. + 2°F (1°C) - a

Item Code	Setting	a
CF	00 (Factory Setting)	0°F (0°C)
	01	3°F (2°C)
	02	9°F (5°C)

Example at Cooling Operation (Wired Controller Setting Temperature = 72°F (22°C))

CF Setting	Thermo-On/OFF
00	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Wired Controller Setting Temperature = 72°F (22°C)</div> <p style="text-align: center;">Inlet Air Temperature (°F (°C))</p>
01	<p style="text-align: center;">Inlet Air Temperature (°F (°C))</p>
02	<p style="text-align: center;">Inlet Air Temperature (°F (°C))</p>

NOTE:

Even if the function is set, thermo-OFF or stoppage may happen if the temperature exceeds the range limit for operation.

(30) Not Prepared (d1)
(31) Not Prepared (d2)

(32) Power Supply ON/OFF 2 (Restarting Function After Power Failure) (d3)

This function is utilized to restart the unit operation automatically when the power supply is restored after the power failure over 2 seconds. In case of the power failure for 2 seconds or less, the standard unit retains all the operation functions and restarts the operation automatically. (The compressor restarts operation after 3 minutes guard in addition to power failure time for up to 2 seconds.) When this function is utilized in the condition that there is no person to operate the unit, monitor the system for potential unit failure.

NOTES:

1. If power failure occurs during the stoppage of the unit, the unit remains stopped after the power supply is restored.
2. When the compressor does not reach the fixed temperature, the system may not restart automatically after turning on the power supply by hot-start control.
 *Hot-start Control: The control program that does not operate the compressor even after the power is turned ON if the compressor does not reach the fixed temperature.

(33) Prevention for Cooling Discharge Air Temperature Decrease (d4)

This function is utilized to prevent discharge air temperature decrease during the cooling operation by controlling Thermo-ON/OFF according to the discharge air temperature.

- Thermo-ON:
COOL/DRY operations continue for 3 minutes when discharge air temperature at 52°F (11°C) or lower.
- Thermo-OFF:
The room temperature reaches the setting temperature when discharge air temperature at 56°F (13°C) or higher.

(34) Not Prepared (d5)**(35) Not Prepared (d6)****(36) Outlet Air Temperature Correction (Only for Outlet Air Temperature Control Mode) (d7)**

Refer to Section 5.4.2.2 "(19) Operation Mode for Outlet Air Temperature Correction (C5)" for details.

(37) Thermo-ON/OFF Control (Only for Indoor Temperature Control Mode) (E1)

Thermo-ON/OFF control is available for each installation situation and usage situation.

(a)

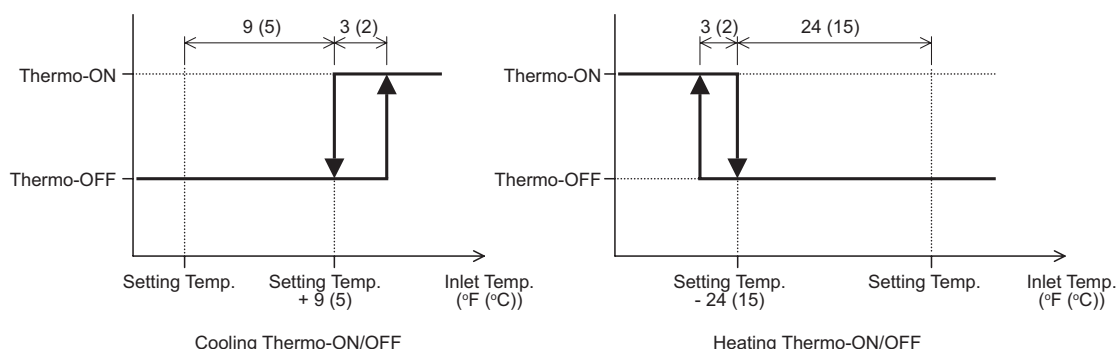
Item Code	Setting
E1	00 (Factory Setting)

Operation Mode	Thermo-ON Condition	Thermo-OFF Condition
Cooling	Inlet Temp. \geq Setting Temp. $+2^{\circ}\text{F}$ ($+1^{\circ}\text{C}$)	Detected Indoor Temp. \leq Setting Temp. and Inlet Temp. \leq Setting Temp.
Heating	Inlet Temp. \geq Setting Temp. -2°F (-1°C)	Detected Indoor Temp. \geq Setting Temp. and Inlet Temp. \geq Setting Temp.

(b)

Item Code	Setting
E1	01

Operation Mode	Thermo-ON Condition	Thermo-OFF Condition
Cooling	Detected Indoor Temp. \geq Setting Temp. or Cooling Condition Shown Below	Detected Indoor Temp. \leq Setting Temp. and Cooling Condition Shown Below
Heating	Detected Indoor Temp. \leq Setting Temp. or Heating Condition Shown Below	Detected Indoor Temp. \geq Setting Temp. and Heating Condition Shown Below



(c)

Item Code	Setting
E1	02

Operation Mode	Thermo-ON Condition	Thermo-OFF Condition
Cooling	Detected Indoor Temp. \geq Setting Temp.	Detected Indoor Temp. \leq Setting Temp.
Heating	Detected Indoor Temp. \leq Setting Temp.	Detected Indoor Temp. \geq Setting Temp.

< Example of Effectiveness > Comparison under Thermo-OFF condition at Cooling Operation

Setting "00" → Thermo-OFF starts after room temperature and inlet air temperature reaches the wired controller setting temperature.

Setting "01" → Thermo-OFF starts after room temperature reaches the wired controller setting temperature and inlet air temperature stays within $+9^{\circ}\text{F}$ ($+5^{\circ}\text{C}$) of wired controller setting temperature.

Setting "02" → Thermo-OFF starts after room temperature reaches the wired controller setting temperature (No intervene by inlet air temperature).

NOTES:

1. The "Detected Indoor Temperature" mentioned above indicates either one of the detected temperature of "Remoter Sensor", "Remote Thermistor Built in Optional Wired Controller" or average of "Remoter Sensor" and "Remote Thermistor Built in Optional Wired Controller" form (22) "Selection of Thermistor for Indoor Temperature (C8)"
2. The frequent compressor ON/OFF may happen depending on the installation position of the sensor especially when set E1 "02". Attention should be paid for the installation location
3. Outside air from air inlet is directly blow during thermo-OFF. Attention should be paid for the installation position of air outlet and direction of airflow.
4. Even if the function is set, thermo-OFF (fan) or stoppage may happen if exceed operation range limit.

(38) Performance Restraint Control (Only for Indoor Temperature Control Mode) (E2)

Control the output transmitting to outdoor unit and restrain cooling operation (operate in lower frequency)*¹.

Setting	Item Code	Setting	Item Code	Setting
Output	E2	00 (Factory Setting)	E2	01
Indoor Inlet Air Temp.	Outlet Air Temp.		Detected Indoor Temp.	
Remote Sensor Detected Temp.	Detected Indoor Temp.		-	
Setting Air Volume	HIGH		HIGH	

The compressor frequency is determined by outdoor unit according to the refrigerating cycle and indoor unit capacity as well as each temperature and setting volume.
Reduce compressor frequency by changing the transmitting output.

$$\text{Compressor Frequency} = \left(\frac{\text{Detected Indoor Temp.} + \text{Outlet Air Temp.}}{2} - \text{Setting Temp.} \right) \times \text{Refrigerating Cycle, Indoor Unit Capacity, Setting Air Volume}$$

This item becomes only the reminder of subtraction of "Setting Temp." from "Detected Indoor Temp." if set E2 "01"

The compressor frequency becomes lower as the indoor temperature becomes satisfied the setting temperature by the other air conditioner. (*1)

(*1): The compressor frequency may not be lower because of refrigerating cycle condition or other factor.

NOTE:

The wired controller checking data does not change even the "Performance Restraint Control" is set. However the outdoor unit seven segment checking data or the service checker data changes. Pay attention at the time of service.

(39) Hot Start Control (E3)

This function is utilized to suppress cold air blowing at the time of heating operation startup by changing the hot start control at the time the heating operation is ON or the defroster operation is OFF.

(Setting E3 to "01" suppresses, the cold air blowing at the time of heating operation startup can be suppressed. However the inlet air blows at the time of thermo-OFF. Pay attention to the installation direction and position at the installation location.)

Setting	Item Code	Setting	Item Code	Setting
Inlet Air Temp.	E3	00 (Factory Setting)	E3	01
~ 50°F (10°C)	Fan Stop		Fan Stop	
50°F (10°C) ~ 59°F (15°C)	SLOW			
59°F (15°C) ~	HIGH		HIGH	

NOTES:

1. If set (2) "Constant Air Volume Mode" (b2) "01", the outlet air volume is always "HIGH".
(Even if the inlet air temperature becomes lower than the heating operation lower limit (20°F (-7°C)).)
2. Air volume does not change even after the outlet air temperature decreases to SLOW or HIGH.

(40) Not Prepared (E4)**(41) Not Prepared (E5)****(42) Indoor Fan Operation Time After Cooling Operation Stoppage (E6)**

This function is utilized to prevent condensation upon cooling operation stoppage by "SLOW" indoor fan operation to dry. "SLOW" operation (for 60 minutes or 120 minutes by setting) continues even when the cooling operation is stopped.

(43) Not Prepared (E7)**(44) Not Prepared (E8)****(45) Not Prepared (E9)****(46) Not Prepared (EA)****(47) Fan Operation Control during Cooling Thermo-OFF (Eb)**

This function is utilized to prevent diffusion of odor and high humidity by reducing the indoor fan speed during cooling Thermo-OFF.

Setting Condition	Fan Operation during Thermo-OFF
00	Operation at Set Fan Speed
01	SLOW
02	SLOW

(48) Not Prepared (EC)

(49) Not Prepared (Ed)

(50) Not Prepared (EE)

(51) Not Prepared (EF)

(52) Not Prepared (F0)

(53) Automatic OFF Timer Setting (F1)

This function is utilized to set the OFF timer function automatically when the unit is operated by the wired controller. During the operation with the automatic OFF timer setting function, the cancellation of the OFF timer and the changing of the setting period for OFF timer can not be performed.

However, the OFF timer function is canceled when the unit is stopped. When the unit is operated again after stoppage, the setting period for OFF timer is set by the optional setting.

The setting condition and the setting period for OFF timer are shown below.

< Example for CIW01 >

Setting Condition	Setting Period for OFF Timer
00	Invalid
01	1 hour
02	2 hours
⋮	⋮
23	23 hours
24	24 hours
0A	30 minutes
0B	90 minutes
0C	40 minutes
0D	45 minutes
0E	50 minutes
0F	55 minutes

NOTES:

1. This function is not available when the unit is controlled by the centralized controller, the remote control connecting with Central Controllers.
2. The range of setting period for OFF timer differs depending on the wired controller model.

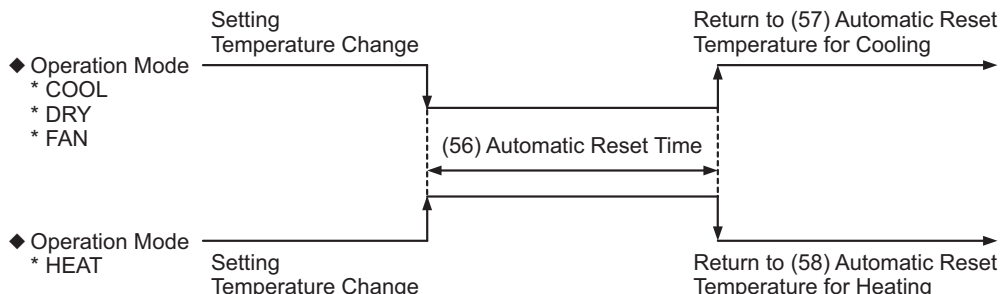
(54) Wired Controller Main-Sub Setting (F2)

This function is utilized when two wired controller are installed in one system.

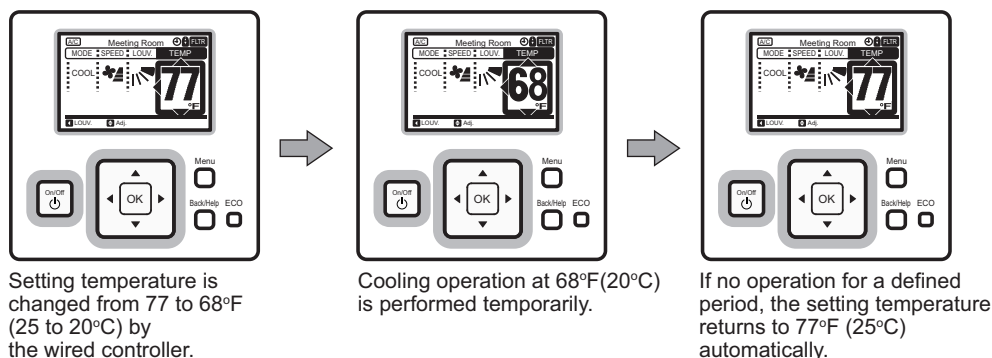
Set one wired controller to main "00", the other wired controller to sub "01".

(55) Automatic Reset of Setting Temperature (F3)

This function is utilized to economize the operation. When this function is valid, in the case that the set temperature is not changed for certain period of time by the function (56) “Automatic Reset Time (F4)”, the set temperature automatically returns to (57/58) “Automatic Reset Temperature for Cooling/Heating (F5/F6)” as following conditions. It is effective to optimize the setting temperature and provide energy saving. However, the setting temperature is not automatically reset in the case that “Automatic COOL/HEAT Operation” mode, or “Prohibiting Operation by Wired Controller” is set by the centralized controller.



<Example> Automatic Reset Temperature for Cooling is 77°F (25°C)


(56) Automatic Reset Time (F4)

This function is utilized to set the automatic reset time with the set temperature. The setting conditions and automatic reset time are as follows:

Setting Condition	Automatic Reset Time of Setting Temperature
00	30 minutes (Factory-Setting)
01	15 minutes
02	60 minutes
03	90 minutes

(57) Automatic Reset Temperature for Cooling (F5)

This function is utilized to set the automatic reset temperature for FAN/COOL/DRY operation. The setting conditions and the automatic reset temperature for cooling are as follows:



Setting Condition	Setting Temperature for Automatic Reset
66 (19)	66°F (19°C)
68 (20)	68°F (20°C)
70 (21)	70°F (21°C)
72 (22)	72°F (22°C)
74 (23)	74°F (23°C)
76 (24)	76°F (24°C)
77 (25)	77°F (25°C) (Factory-Setting)
78 (26)	78°F (26°C)
80 (27)	80°F (27°C)
82 (28)	82°F (28°C)
84 (29)	84°F (29°C)
86 (30)	86°F (30°C)

(58) Automatic Reset Temperature for Heating (F6)

This function is utilized to set the automatic reset temperature for HEAT operation.
The setting conditions and the automatic reset temperature for heating are as follows:

Setting Condition	Setting Temperature for Automatic Reset
62 (17)	62°F (17°C)
64 (18)	64°F (18°C)
66 (19)	66°F (19°C)
68 (20)	68°F (20°C)
70 (21)	70°F (21°C) (Factory-Setting)
72 (22)	72°F (22°C)
74 (23)	74°F (23°C)
76 (24)	76°F (24°C)
77 (25)	77°F (25°C)
78 (26)	78°F (26°C)
80 (27)	80°F (27°C)
82 (28)	82°F (28°C)
84 (29)	84°F (29°C)
86 (30)	86°F (30°C)

(59) Operation Stoppage Prevention by Wired Controller Operational Error (F7)

This function is utilized to prevent the accidental operational stoppage caused by inadvertently pressing “” (ON/OFF) on the wired controller. When this function is valid, the operation is stopped by pressing “” (ON/OFF) button on the wired controller for more than 3 seconds. However, the enabling method is not changed.






Operation Lock (60) and (61)

Four operation lock functions are available as shown below.

These functions are utilized to restrict each switch operation from the wired controller.

When these functions are valid, modification of each function is prohibited.

All operation lock functions are valid (“01” setting) before shipment.

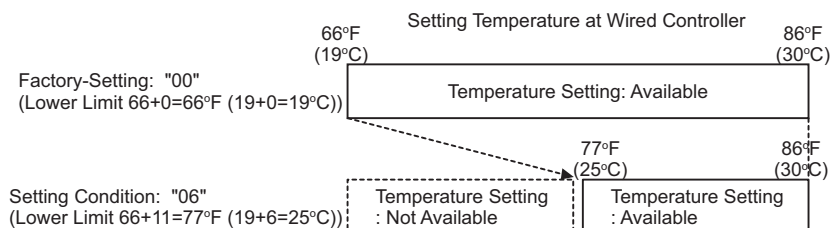
Each switch operation becomes unavailable by pressing “” and “Back/Help” (return) buttons simultaneously for more than 3 seconds when these functions are set as “01”. The indication “” (operation lock indicator) is indicated on the wired controller. If “” and “Back/Help” (return) switches are pressed simultaneously for more than 3 seconds during “” (operation lock indicator) is indicated, “” indication is turned OFF and each switch operation is available. These functions are to restrict the operations of the wired controller only. If operation is performed from the centralized controller, the command from the centralized controller is given priority.

(60) Lock Function for Operation Mode Selection (F8)**(61) Lock Function for Temperature Setting (F9)****(62) Not Prepared (FA)****(63) Not Prepared (Fb)**

(64) Cooling Lower Limit for Setting Temperature (FC)

This function is utilized to limit the lowest setting temperature for FAN/COOL/DRY operations. When this function is valid, it provides the appropriate cooling operation and energy saving. The setting conditions and the minimum setting temperature for cooling are as follows:

Example



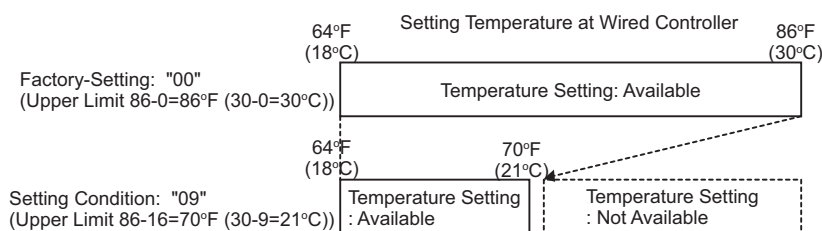
Setting Condition	Details	Minimum Setting Temperature (FAN/COOL/DRY) *
00	Standard Value	66°F (19°C)
01	Lower Limit +2°F (Lower Limit +1°C)	68°F (20°C)
02	Lower Limit +4°F (Lower Limit +2°C)	70°F (21°C)
03	Lower Limit +6°F (Lower Limit +3°C)	72°F (22°C)
04	Lower Limit +8°F (Lower Limit +4°C)	74°F (23°C)
05	Lower Limit +10°F (Lower Limit +5°C)	76°F (24°C)
06	Lower Limit +11°F (Lower Limit +6°C)	77°F (25°C)
07	Lower Limit +12°F (Lower Limit +7°C)	78°F (26°C)
08	Lower Limit +14°F (Lower Limit +8°C)	80°F (27°C)
09	Lower Limit +16°F (Lower Limit +9°C)	82°F (28°C)
10	Lower Limit +18°F (Lower Limit +10°C)	84°F (29°C)

* In case of Standard Unit

(65) Heating Upper Limit for Setting Temperature (Fd)

This function is utilized to limit the highest setting temperature for HEAT operation. When this function is valid, it provides the appropriate heating operation and energy saving. The setting conditions and the heating upper limit for the setting temperature are as follows:

<Example>



Setting Condition	Details	Setting Temperature Upper Limit (HEAT) *
00	Standard Value	86°F (30°C)
01	Upper Limit -2°F (Upper Limit -1°C)	84°F (29°C)
02	Upper Limit -4°F (Upper Limit -2°C)	82°F (28°C)
03	Upper Limit -6°F (Upper Limit -3°C)	80°F (27°C)
04	Upper Limit -8°F (Upper Limit -4°C)	78°F (26°C)
05	Upper Limit -9°F (Upper Limit -5°C)	77°F (25°C)
06	Upper Limit -10°F (Upper Limit -6°C)	76°F (24°C)
07	Upper Limit -12°F (Upper Limit -7°C)	74°F (23°C)
08	Upper Limit -14°F (Upper Limit -8°C)	72°F (22°C)
09	Upper Limit -16°F (Upper Limit -9°C)	70°F (21°C)
10	Upper Limit -18°F (Upper Limit -10°C)	68°F (20°C)
11	Upper Limit -20°F (Upper Limit -11°C)	66°F (19°C)
12	Upper Limit -22°F (Upper Limit -12°C)	64°F (18°C)

* In case of Standard Unit

(66) Not Prepared (FE)

(67) Not Prepared (FF)

(68) Not Prepared (H1)

(69) Indication of Hot Start (H2)

When this function is set as “No Indication” (01), “HOT-ST” is not indicated on the wired controller.

(70) Not Prepared (H3)

(71) Not Prepared (H4)

(72) Not Prepared (J1)

(73) Not Prepared (J2)

(74) Run Indicator Color (J3)

This function is utilized to set the run indicator color.

Setting Condition	Color
00	Green
01	Red

NOTE:

The red run indicator is flashing during the alarm.

(75) Not Prepared (J4)

(76) Not Prepared (J5)

(77) Not Prepared (J6)

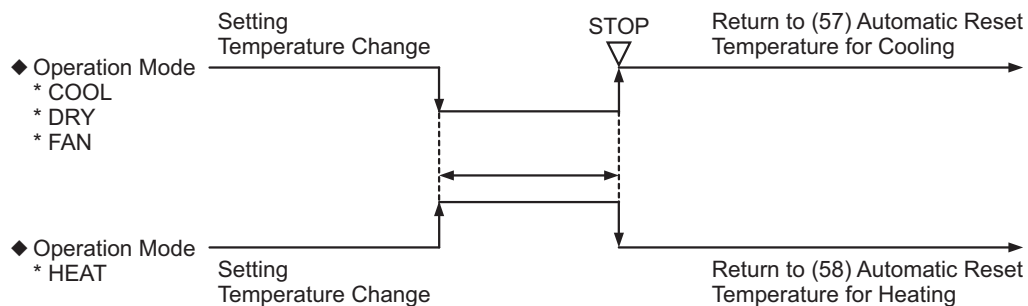
(78) Not Prepared (J7)

(79) Eco-operation (J8)

This function is utilized to effectively optimize the setting temperature and provide energy saving.

When the setting temperature is changed during the air conditioning operation and while the operation is started/stopped by ON/OFF button on the wired controller, the set temperature automatically returns to (57/58) “Automatic Reset Temperature for Cooling/Heating (F5/F6)” as in the following figure.

However, the setting temperature is not automatically reset in the case that “Automatic COOL/HEAT Operation” mode, or “Prohibiting Operation by Wired Controller” is set by the centralized controller.



(80) Not Prepared (J9)

(81) Not Prepared (JA)

(82) Not Prepared (Jb)

(83) Not Prepared (K1)

(84) Not Prepared (K2)

(85) Not Prepared (K3)

(86) Not Prepared (K4)

(87) Not Prepared (K5)

(88) Not Prepared (K6)

(89) Not Prepared (K7)

(90) Not Prepared (K8)

(91) Not Prepared (K9)

(92) Not Prepared (KA)

(93) Not Prepared (L1)

(94) Not Prepared (L2)

(95) Not Prepared (L3)

(96) Not Prepared (L4)

(97) Not Prepared (L5)

(98) Not Prepared (L6)

(99) Not Prepared (L7)

(100) Not Prepared (L8)

(101) Not Prepared (L9)

(102) Not Prepared (LA)

(103) Not Prepared (Lb)

(104) Setting Temperature (P1)

This function is utilized to provide setting temperature for every 1°F (0.5°C) at "00" and every 2°F (1°C) at "01".

Control differential of thermistor also uses the temperature for every 1°F (0.5°C) at "00" and every 2°F (1°C) at "01".

(105) Not Prepared (P2)

(106) Thermistor Selection (P3)

This function is utilized to select the thermistor with function (107).

Setting Condition	Thermistor (Sensor)
00	Inlet Air Thermistor
01	Outlet Air Thermistor
02	Thermistor of Remote Control
03	Remote Sensor

(107) Display of Thermistor Temperature (P4)

This function is utilized to display the temperature of the sensor selected at (106).

(108) Setting Temperature Display during Fan Operation (P5)

This function is utilized to undisplay the setting temperature during fan mode operation.

(109) ECO Button Operation (P6)

This function is prohibiting "ECO" button operation by setting at "01"

(110) Menu Button Operation (P7)

This function is utilized to invalidate the menu button.

(111) Not Prepared (P8)

(112) Not Prepared (P9)

(113) Not Prepared (PA)

(114) Not Prepared (Pb)

(115) Not Prepared (PC)

5.5 Power Saving Functions from Wired Controller

The power saving functions are available from the wired controller CIW01 as follows.

5.5.1 Power Saving Guide

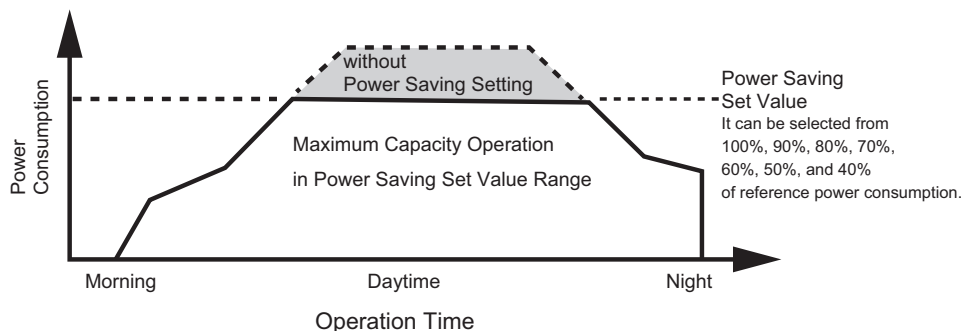
Press “ECO” button then the power saving guide is displayed to support the setting. Easy access to the confirmation and setting screen from the current setting status screen.

5.5.2 Outdoor Unit Capacity Control

The demand function setting can be controlled from wired controller. Select from “Peak Cut Control” and “Moderate Control” according to the situation.

“Peak Cut Control” Function

The peak cut control reduces the power consumption range when it exceeds the value of the power saving setting.

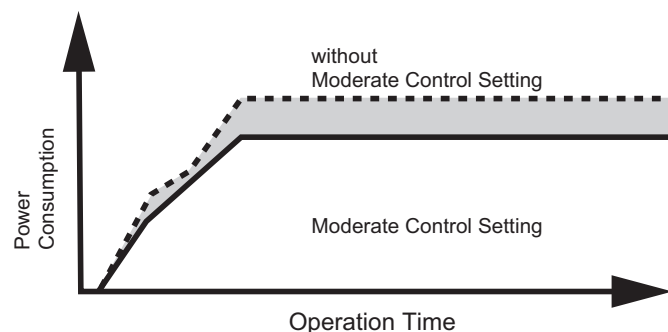


NOTES:

1. The power set value (%) is just a criterion. The power set value for this function is different from the actual power value in precision. Use the demand controller (option) when it is necessary to manage the maximum power correctly.
2. The cooling capacity is decreased according to the power saving setting value for the reducing of compressor motor revolution.
3. The actual electrical power consumption may be higher than the value displayed on the screen under certain operating condition such as protective control.
4. This function is used to inhibit power consumption of the operating. Do not use it for minimize the capacity of current and the voltage for the power circuit, power source wiring, GFCI, transformer, etc. It may cause actuation of interrupter and equipment fault.

“Moderate Control” Function

The moderate control function adjusts the air conditioning capacity not to exceed the value of the power saving setting.

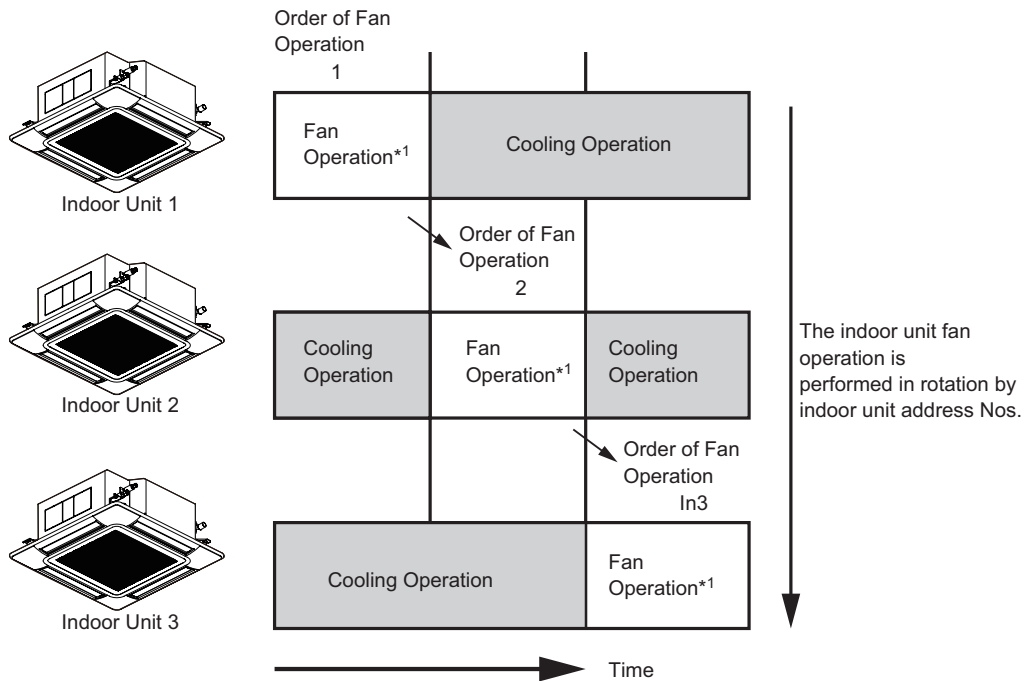


NOTES:

1. The moderate control setting value can be set from 40% to 100% of regular capacity at 10% intervals.
2. The setting value is just a criterion. It might be different according to the actual service condition and operating condition.

5.5.3 Rotation Control Function

The rotation control switches multiple indoor unit operating mode to FAN mode (Thermo-OFF) in order one by one.

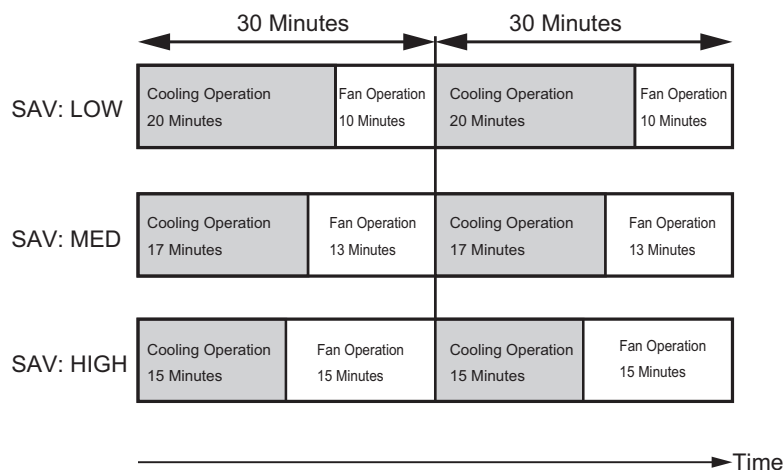


NOTES:

1. The fan mode time can be selected in the interval of three minutes, five minutes and ten minutes.
2. It is possible to change the rotation assigned number according to the minimum differential between the setting temperature and indoor temperature.

5.5.4 Intermittent Control Function

The intermittent control repeats Cooling/Heating and Fan (Thermo-OFF) mode in fixed intervals.

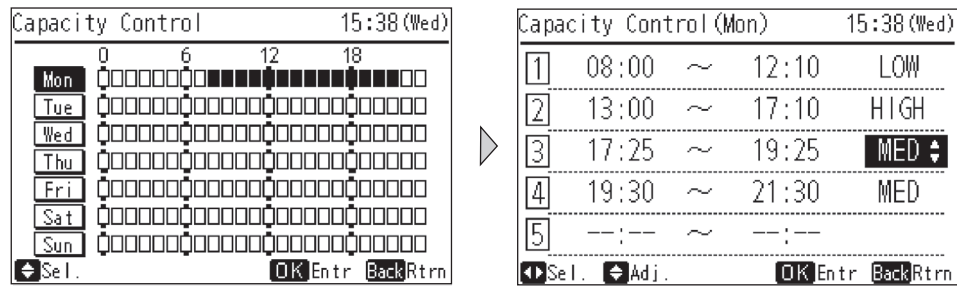


NOTE:

The fan mode is repeated at 5-minute intervals (SAV: LOW), 10-minute intervals (SAV: MED) and 15-minute intervals (SAV: HIGH) during heating operation.

5.5.5 Power Saving Schedule Function

The power saving schedule function is utilized to set the power saving schedule on indoor unit capacity control and intermittent control up to five settings a day each day of the week.



The display of Noise Reduction Schedule is the same.

5.5.6 Operation Noise Reduction Schedule Function

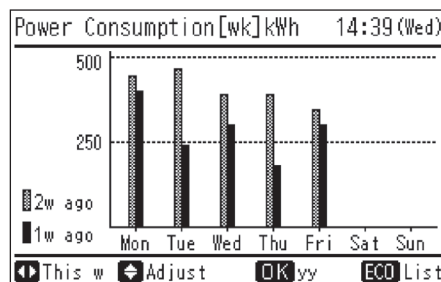
The operation noise reduction schedule function is utilized to set the operation noise reduction schedule up to five settings a day each day of the week.

NOTE:

The operation noise reduction setting may decrease the Cooling/Heating capacity.

5.5.7 Power Consumption Display Function

This function displays the power consumption of the outdoor unit compressor. The value of each displayed in Graph/List format is one day, one week and one year. The display period of consumption comparison can be selected from one day before/Today to 1 year ago/This year.



NOTE:

The power consumption for outdoor unit compressor is displayed.

6. Field Work Instructions

Refer to Section 3 “Troubleshooting” when dealing with problems or difficulties.
If you cannot solve the problem, contact your distributor or contractor.

6.1 Special Attention Regarding Refrigerant Gas Leakage

Make sure that the entire VRF system meets ASHRAE Standard 15, or any local codes, regarding Safety. The ASHRAE Standard 15 provides safeguards for life, limb, health, and property, and prescribes safety requirements.

The standard is recognized as the main guide for personal safety involving refrigeration systems. It strives to ensure a safe application of refrigerant systems by limiting the maximum charge as follows so that a complete discharge due to a leak into a small, occupied, and enclosed room can never exceed the allowable limit for the room.

6.2 Modifications of Charging Refrigerants Other than Those Specified by Johnson Controls

DANGER

Johnson Controls' air conditioners are designed and manufactured based on using specified refrigerants. The applicable refrigerants are specified for each unit's models.

Using any refrigerants besides the specified refrigerants may cause mechanical problems, malfunction, and failure, and **in the worst case, it endangers safety seriously and may cause a fire or an explosion.** Therefore, **Do not charge non-specified refrigerants or any of the following in the refrigerant system of a unit.**

- * Hydrocarbon Refrigerants such as Propane
- * Oxygen, or Flammable Gases such as Acetylene
- * Poisonous Gases

The types of refrigerants are indicated in the Installation and Maintenance Manuals, Engineering Manuals, Service Manuals, and the specification label for each unit. **Be aware that Johnson Controls does not take any responsibility for unit failure, malfunction, or any accidents caused by charging non-specified refrigerants or others as noted above.**

6.3 Pre-start Inspection Work

(1) For Outdoor Unit and Indoor Unit

(a) Fan and Fan Motor

- Lubrication - All fan motors are pre-lubricated and sealed at the factory. Therefore, no lubricating maintenance is required.
- Sound and Vibration - Inspect for abnormal sounds or vibration.
- Rotation - Check that the fan rotates counterclockwise and inspect the rotating speed.
- Insulation - Inspect for electrical insulation resistance.

(b) Heat Exchanger

- Clogging - Inspect for any accumulated dirt and dust and remove any at regular intervals. As for an outdoor unit, other obstacles such as growing grass and pieces of paper, which might intercept air flow, should also be removed.

(c) Piping Connection

- Leakage - Inspect for refrigerant leakage at piping connections.

(d) Cabinet

- Stain and Lubricant - Inspect for any stain or lubricant and remove it, if any.
- Securing Screw - Inspect for loose or missing screws and secure or replace as required.
- Insulation - Inspect for peeling thermal insulation material on the cabinet and repair it, if any.

(e) Electrical Equipment

- Activation - Inspect for abnormal activation of the magnetic contactor, auxiliary relay, or printed circuit board (PCB).
- Line Condition - Pay attention to working voltage, amperage and phase balance. Inspect for faulty contact caused by loosened terminal connections, oxidized contacts, foreign matter, and other items. Inspect for electrical insulation resistance.

(f) Control and Protective Devices

- Setting - Do not readjust the setting in the field.

(2) For Outdoor Unit Only

(a) Compressor

- Sound and Vibration - Inspect for abnormal sounds or vibration.
- Activation - Check that the voltage drop of the power supply line is within 16% at start and within 2% during operation.

(b) Reversing Valve

- Activation - Inspect for any abnormal activating sound.

(c) Strainer

- Clogging - Check that there is no temperature difference between the ends.

(d) Ground Wiring

- Ground Line - Inspect for continuity to the earth ground.

(e) Crankcase Heater

- Activation - Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.

(3) For Indoor Unit Only

(a) Air Filter

- Cleaning - Inspect for, and remove, any accumulated dirt and dust and remove according to the "Engineering Manual".

(b) Drain Pan, Drain-Up Mechanism and Drain Pipe

- Drain Line - Inspect and clean the drain line at least twice a year.
- Drain-Up Mechanism - Inspect for activation of drain-up mechanism.

(c) Float Switch

- Activation - Inspect for activation of float switch.

6.4 Service and Maintenance Record by 7-Segment Display

Service checker is an optional tool that can be used to record following information.

Customer's Name _____

DATE: - -

Outdoor Unit Model (Serial No. _____)		(Serial No. _____)								(Serial No. _____)								
(1) Operation Mode																		
(2) Test Run Start Time																		
(3) Data Collect Start Time																		
(4) Read Out Data from 7-Segment in Outdoor Unit																		
Protection Control Code																		
Operating Capacity																		
Outdoor Total Connecting Capacity		oCP																
Outdoor Connecting Quantity		oAA																
Indoor Total Connecting Capacity		iCP																
Indoor Connecting Quantity		iAA																
Refrigerant System Address		GA																
Indoor Operating Capacity		oP																
Total Frequency		Hz																
Accumulated Operation Time of Unit		UJ																
Outdoor Unit Information																		
Outdoor Capacity		CA																
Outdoor Microcomputer Output		SC	52C ₁	52C ₂	CH ₁	CH ₂	20A ₁	20A ₂	21 ₁	21 ₂	52C ₁	52C ₂	CH ₁	CH ₂	20A ₁	20A ₂	21 ₁	21 ₂
			FAN	20B	20C	20F ₁	20F ₂	20CHG	X ₁	X ₂	FAN	20B	20C	20F ₁	20F ₂	20CHG	X ₁	X ₂
Inverter Frequency		H1																
Compressor Running Quantity		CC																
Outdoor Fan Step		Fo																
Outdoor Expansion Valve Opening		E1																
		Eb																
Discharge Pressure		Pd																
Suction Pressure		Ps																
Outdoor Temperature		To																
Discharge Gas Temperature		Td1																
		Td2																
Heat Exchanger Liquid Temperature		TE																
Heat Exchanger Gas Temperature		TG																
Automatic Refrigerant Charge Temperature		TCH																
Gas Bypass Temperature		TbG																
Inverter Fin Temperature		TFi																
Fan Controller Temperature		TFF																
Compressor Running Current		A1																
		A2																
Fan Running Current		AF																
Accumulated Operation Time of Compressor		UJ1																
		UJ2																
Accumulated Operation Time of Compressor (Available for Timer Reset)		cU1																
		cU2																
Inverter Stoppage Cause Code		iT																
Fan Controller Stoppage Cause Code		FT																
Indoor Unit Information																		
Indoor Capacity		CA																
Indoor Expansion Valve Opening		iE																
Heat Exchanger Liquid Temperature		TL																
Heat Exchanger Gas Temperature		TG																
Intake Air Temperature		Ti																
Outlet Air Temperature		To																
Indoor Unit Stoppage Cause Code		d1																

Mark	Description of Mark	Parts Mark in Wiring Diagram	Mark	Description of Mark	Parts Mark in Wiring Diagram
52C ₁	Contact of Relay (Y _{52C1}) on O.U. PCB for Inverter Compressor	CMC1	FAN	-	-
52C ₂	Contact of Relay (Y _{52C2}) on O.U. PCB for Constant Speed Compressor	CMC2	20B	-	-
			20C	-	-
CH ₁	Contact of Relay (Y _{CH1}) on O.U. PCB for Crankcase Heater	CH1	20F ₁	Contact of Relay (Y _{20F1}) on O.U. PCB for Solenoid Valve	SVF1
CH ₂	Contact of Relay (Y _{CH2}) on O.U. PCB for Crankcase Heater	CH2	20F ₂	Contact of Relay (Y _{20F2}) on O.U. PCB for Solenoid Valve	SVF2
20A ₁	Contact of Relay (Y _{20A1}) on O.U. PCB for Solenoid Valve	SVA	20CHG	-	-
20A ₂	-	-	X ₁	Contact of Relay (Y _{X1}) on O.U. PCB for Solenoid Valve	SVG
21 ₁	Contact of Relay (Y ₂₁₁) on O.U. PCB for Reversing Valve	RVR1	X ₂	-	-
21 ₂	Contact of Relay (Y ₂₁₂) on O.U. PCB for Reversing Valve	RVR2			

*PCB = Printed Circuit Board

6.5 Service and Maintenance Record by Wired Controller

Data Sheet for Checking by Remote Control Switch

Time				:	:	:	:	:
I.U. Model								
I.U. Serial No.								
I.U. No. / Alarm Code								
	Check Mode 1	Check Mode 2		1 • 2	1 • 2	1 • 2	1 • 2	1 • 2
B Temp. Indication								
	Set Temp.	b1	--					
	Inlet Air Temp.	b2	g1					
	Discharge Air Temp.	b3	g2					
	Liquid Pipe Temp.	b4	g3					
	Remote Thermistor Temp.	b5	--					
	Outdoor Air Temp.	b6	g4					
	Gas Pipe Temp.	b7	g5					
	Evaporating Temp. at Heating	b8	g6					
	Control Information	b9	g7					
	Comp. Top Temp.	bA	g8					
	Thermo Temp. of Remote Control Switch	bb	--					
	Control Information	bC	--					
C Micro-Computer State Indication								
	I.U. Micro-Computer	C1	--					
	O.U. Micro-Computer	C2	--					
D Stopping Cause State Indication								
	Stopping Cause State Indication	d1	--					
E Alarm Occurrence								
	Times of Abnormality	E1	--					
	Times of Power Failure	E2	--					
	Times of Abnormal Transmitting	E3	--					
	Times of Inverter Tripping	E4	--					
F Automatic Louver State								
	Louver Sensor State	F1	--					
H Pressure, Frequency State Indication								
	Discharge Pressure	H1	g9					
	Suction Pressure	H2	gA					
	Control Information	H3	gB					
	Operating Frequency	H4	gC					
J I.U. Capacity Indication								
	I.U. Capacity	J1	--					
	O.U. Code	J2	--					
	Refrigerant Cycle Number	J3	--					
	Refrigerant Cycle Number	J4	--					
L Opening of Expansion Valve								
	I.U. Expansion Valve	L1	gd					
	O.U. Expansion Valve 1	L2	gE					
	O.U. Expansion Valve 2	L3	--					
	O.U. Expansion Valve B	L4	--					

P	Compressor Condition Indication (Reference)							
	Comp. Current	P1	gF					
	Accumulated Operation Time of Comp.	P2	--					
g	Sensor Condition Indication							
	Motion Sensor Response Rate	g1	--					
	Radiation Sensor Temp.	g2	--					
	Motion Sensor1 Response Rate	g3	--					
	Motion Sensor2 Response Rate	g4	--					
	Motion Sensor3 Response Rate	g5	--					
	Motion Sensor4 Response Rate	g6	--					
	Correcting Set Temp.	g7	--					

Client: _____
 Installation Date: _____
 System No.: _____
 Date Checked: _____
 Checked by: _____

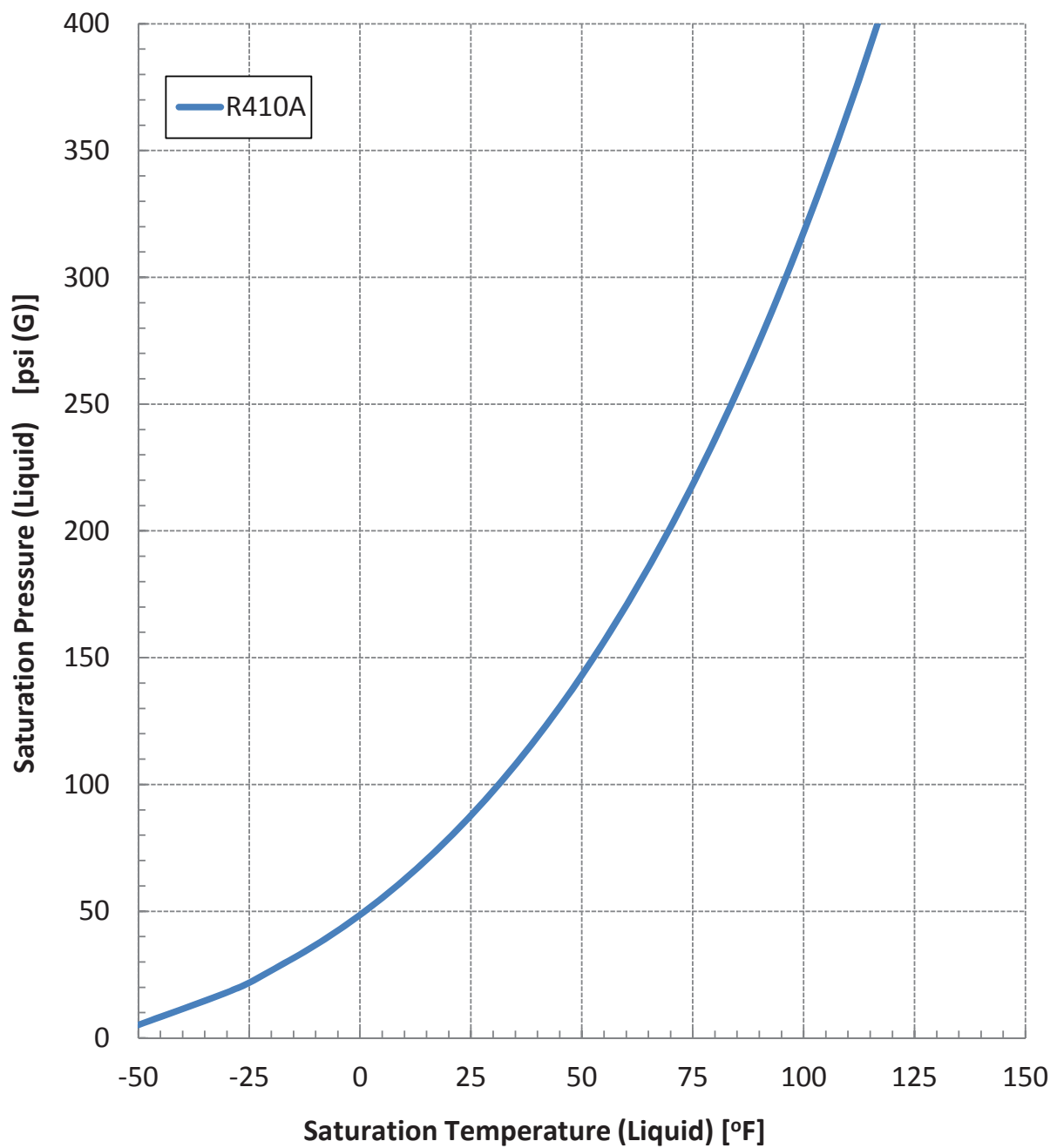
Result	

6.6 Service and Maintenance Record

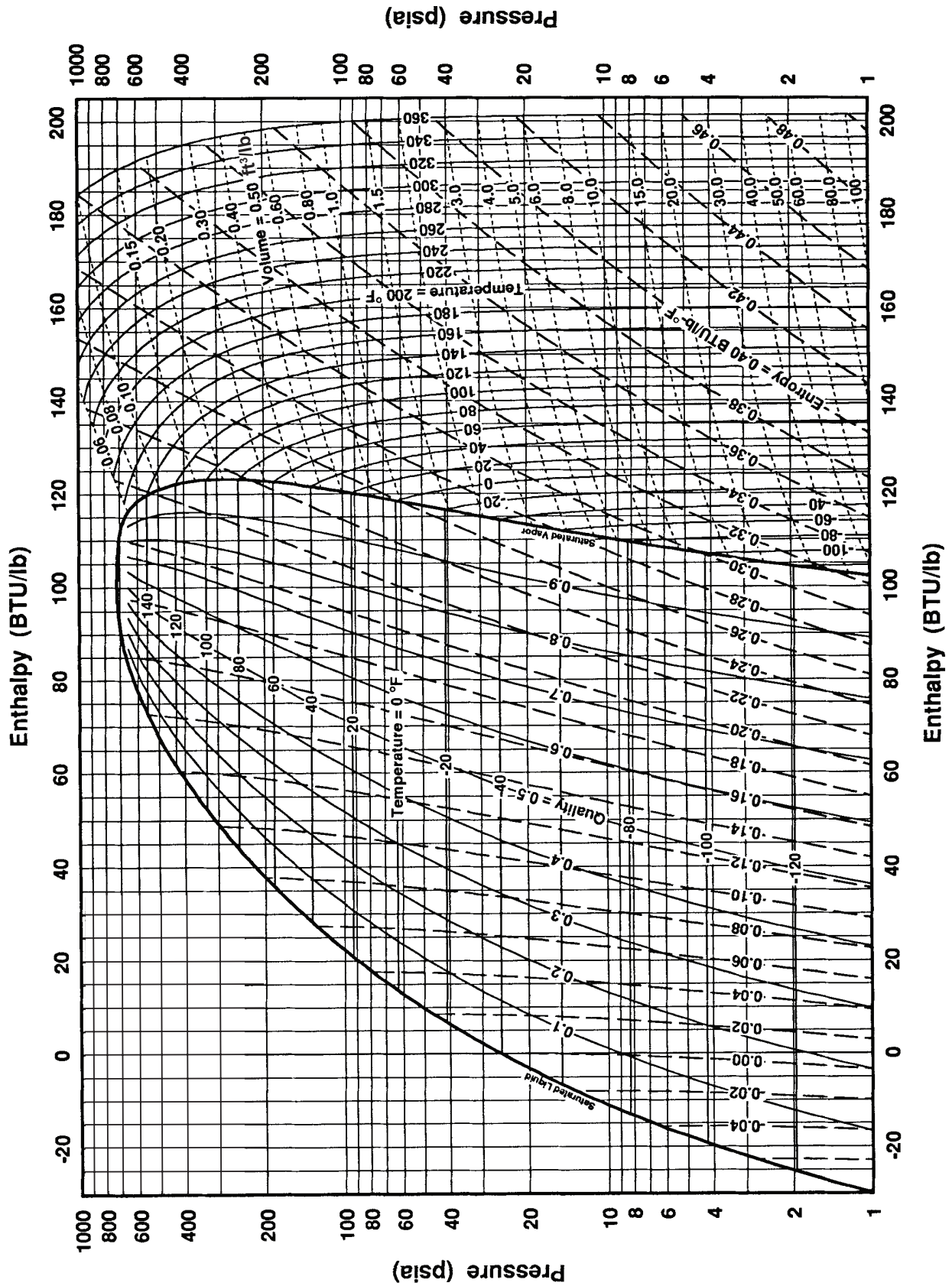
Service and Maintenance Record

No.	Check Item	Action	Judgment
1	Is service space sufficient?		YES or NO
2	Short Circuit of Discharged Air?		YES or NO
3	Any Heat Influence?		YES or NO
4	Is ground wiring connected?		YES or NO
5	Refrigeration Piping		GOOD or NOT GOOD
6	Fixing of Units		GOOD or NOT GOOD
7	Any Damage on External or Internal Surface?		YES or NO
8	Checking of Screws and Bolts	Tighten them if they are loosened.	TIGHTENED or NOT TIGHTENED
9	Tightening of Terminal Screws	Tighten all terminal screws with a Phillips screwdriver.	TIGHTENED or NOT TIGHTENED
10	Are compressor terminals tightly fixed?	Check all compressor terminals are tightly fixed.	GOOD or NOT GOOD
11	Insulation Resistance	Measure insulation resistance with insulation resistance-meter. Comp. and Fan Motor: greater than 1MΩ Others: greater than 1MΩ	GOOD (GREATER) or NOT GOOD (LESSER)
12	Does drain water smoothly flow?	Check for smooth flow by pouring water.	GOOD or NOT GOOD
13	Check for leakage at compressor.	Check for any leakage.	GOOD or NOT GOOD
14	Check for leakage at outdoor heat exchanger.	Check for any leakage	GOOD or NOT GOOD
15	Check for leakage at indoor heat exchanger.	Check for any leakage	GOOD or NOT GOOD
16	Check for leakage at reversing valve.	Check for any leakage	GOOD or NOT GOOD
17	Check for leakage at check valve.	Check for any leakage	GOOD or NOT GOOD
18	Check for leakage at accumulator.	Check for any leakage	GOOD or NOT GOOD
19	Check for leakage at strainer.	Check for any leakage	GOOD or NOT GOOD
20	Check for leakage at electronic expansion valve.	Check for any leakage	GOOD or NOT GOOD
21	Check for leakage at piping.	Check for any leakage	GOOD or NOT GOOD
22	Check direction of fans.	by Viewing or Airflow Volume	GOOD or NOT GOOD
23	Voltage among each phase.	Check the voltage is within the specified range.	GOOD or NOT GOOD
24	Vibration and Sound	Check fan, compressor, piping.	GOOD or NOT GOOD
25	Activation of Each Operation Mode	Check activation of COOL or HEAT, STOP and TEMP. switches.	GOOD or NOT GOOD
26	High Pressure Cut-out Switch	Check actual activation value.	GOOD or NOT GOOD
27	Check activation of drain-up mechanism.	Check it during cooling operation.	GOOD or NOT GOOD
28	Indoor Inlet Air Temp. (DB/WB)		°F DB/ °F WB
29	Indoor Outlet Air Temp. (DB/WB)		°F DB/ °F WB
30	Outdoor Inlet Air Temp. (DB/WB)		°F DB/ °F WB
31	Outdoor Outlet Air Temp. (DB/WB)		°F DB/ °F WB
32	High Pressure Switch		psi(G)
33	Low Pressure Switch		psi(G)
34	Operating Voltage		V
35	Operating Current		A
36	Instruction for Cleaning of Air Filter to Client		DONE or NOT YET
37	Instruction for Cleaning Method to Client		DONE or NOT YET
38	Instruction for Operation to Client		DONE or NOT YET

6.7 Saturation Curve for Refrigerant



6.8 Mollier Chart for R410A



7. Service Parts List

SERVICE PARTS LIST

Refer to the Service Parts List for DOAS.

