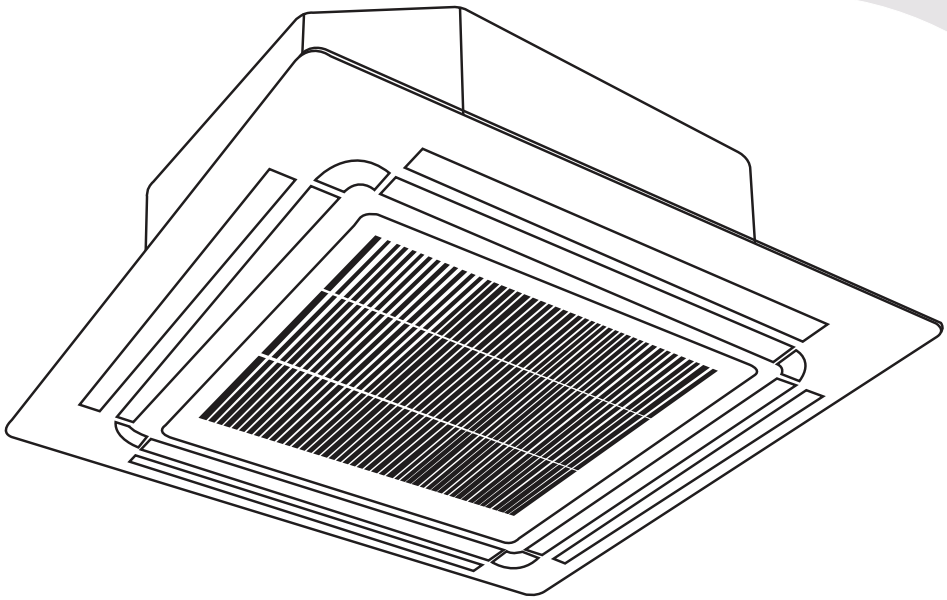
DUCTLESS MINI SPLIT SYSTEM AIR CONDITIONER / HEAT PUMP

PIONEER®

# CYT-24 Inverter Series

## For 9,500-23,000 BTU/hr Systems

*Quantum Ultra (R-454B) - CT Indoor and YN Outdoor*



# Service Manual

| Note |
| --- |
| Intended for use with **Single-Zone Split Systems**. If the indoor sections will be installed as part of a **Multi-Zone System**, refer to the supplemental instructions provided with the Multi-Zone Outdoor Unit for complete and accurate guidance. Certain specifications—such as minimum floor area requirements—may differ, and are outlined in more detail within the **Multi-Zone Section** documentation. |

**IMPORTANT NOTICE**:
Read this manual carefully before installing or operating your new air conditioning system. Be sure to save this manual for future reference.

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# Important Notice

1

This service manual is intended for individuals with adequate electrical, electronic, and mechanical experience. Any attempt to repair the appliance may result in personal injury and property damage. The manufacturer or seller is not responsible for the interpretation of this information, nor does it assume any liability in connection with its use.

Information, specifications, and parameters are subject to change without prior notice due to technical modifications or improvements. Actual specifications are provided on the product nameplate label.

**How to Order Spare Parts**

To ensure your order is accurate, provide the following information:

1. Model numbers of the indoor and outdoor units.
2. Item number in the exploded diagram.
3. Part number.
4. Required quantity.

# Maintenance Notes

2

Carefully read all safety precautions before maintenance. The following information is essential for safe and proper execution.

- Follow all instructions and correct procedures during maintenance to eliminate risks of electrical shock, injury, and equipment accidents.
- Ensure all electrical work is performed by a licensed technician in compliance with national and local electrical codes.
- Ensure an authorized distributor or qualified professional perform all maintenance.
- Observe all warnings and cautions throughout this manual.
- Test the area with a flammable gas detector before unloading and opening the container.
- Keep the area free of open flames and smoking materials.

## A. Electrical Safety Precautions

### Electrical & Power Supply Requirements

- Connect the air conditioner to a dedicated circuit; do not share the circuit with other appliances.
- Install an appropriate circuit breaker (such as a GFCI/RCD) if the indoor unit is located in a humid or damp environment.
- For hardwired systems (without a plug), install a circuit breaker that features all-pole disconnection and a minimum contact separation of 0.1 inches (3 mm).

### Wiring Safeguards

- Ensure all wiring terminals are securely connected during maintenance.
- Properly match the live, neutral, and grounding wires from the power supply to the corresponding air conditioner terminals.
- Adequately ground the unit; the grounding wire must not be used for any other purpose.
- Ensure the power cord and connection wires are not crushed, pinched, or compressed by surrounding components or hard objects.
- Install protective accessories, including protective boards, cable routing loops, and clips to safeguard the wiring.

# Maintenance Notes

2

### Maintenance & Component Replacement

- Turn off the air conditioner's power supply prior to checking the unit or performing maintenance.
- Use only the supplied or specified components during installation to ensure proper system performance.
- If the power cord or connection wire is damaged, it must be replaced by a qualified technician.
- If the power cord length is insufficient, obtain an approved replacement from the manufacturer or distributor; do not splice or extend the wire yourself.
- If a fuse is blown, replace it with a new fuse of the exact same specification; do not use copper wires or jumper wires as a substitute.
- Handle the unit with care during transport; a team lift is required if the unit weighs more than 44 lbs (20 kg).
- Wear a safety harness at all times if the working height exceeds 7 feet (2 m).
- Ensure no foreign objects remain inside the unit upon completion of installation; debris can cause electrical shock, fire, explosion, or personal injury.

### Pre-Start & Commissioning Checks

- Confirm all wiring and piping connections are secure and all valves are open prior to energizing the system.
- Test the unit body for electrical leakage; resolve any faults before allowing the system to operate.

## B. Fire Safety Precautions

### Warning: Risk of fire due to the flammable refrigerant used

- Review all safety precautions in this manual before attempting any product service or repair.
- Handle the equipment carefully in strict compliance with all national regulations.
- Ensure only trained service personnel perform system repairs.
- Avoid puncturing the refrigerant tubing during maintenance.
- Dispose of all materials properly in accordance with national, state, and local regulations.

# Maintenance Notes

2

## C. Relocation Safety Precautions

- Avoid relocation areas where corrosive or flammable gases may leak, as accumulated gas can lead to explosions or other accidents.
- Do not use extension cords or multi-outlet adapters; if the power cord is of insufficient length, contact an authorized service center for an approved replacement to prevent electrical shock or fire hazards.
- Securely clamp all interconnecting wiring between indoor and outdoor units to eliminate external stress on the terminals. Using non-specified wires or insecure connections poses a severe electrical shock or fire hazard.
- Securely attach the connecting pipe before operating the compressor; running the compressor with open valves and disconnected piping will draw in air, causing dangerous pressure spikes, compressor overheating, or gas leaks.
- Charge the unit only with the specific refrigerant listed on the nameplate during installation or relocation; using unapproved or non-specified refrigerants can cause operational failures, mechanical malfunctions, or severe safety hazards.
- When recovering refrigerant (pump down) during relocation or repair:
    - Confirm the indoor unit is running in Cooling mode.
    - Fully close the liquid-side valve (2-way valve).
    - Wait 30 to 40 seconds, then fully close the gas-side valve (3-way valve).
    - Immediately stop the unit and disconnect the power supply.
    - CAUTION: The entire refrigerant recovery process must not exceed 1 minute. Running the process too long will cause the compressor to overheat, risking equipment failure or personal injury.
- Purge the refrigerant circuit during relocation to ensure it is completely free of air and moisture; foreign substances will cause abnormal pressure spikes or compressor failure, resulting in personal injury.
- Ensure both the liquid-side and gas-side valves are fully closed and the power is disconnected before detaching the connecting pipe; disconnecting the pipe while valves are open allows the compressor to suck in air, causing abnormal pressure, compressor overheating, or gas leaks.

# R-454B Refrigerant Notes

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## A. Introduction

This air conditioner uses R-454B, an environmentally friendly refrigerant. Compared to conventional refrigerants, R-454B does not deplete the ozone layer and has a lower global warming potential (GWP). Note that R-454B is odorless and mildly flammable, and may pose a risk of fire or explosion under certain conditions.

## B. Precautions

### General Compliance & Servicing

- Ensure all maintenance is performed exclusively by authorized professionals in strict compliance with the manufacturer's operating manual.
- Contact the nearest authorized service center to arrange professional servicing.
- Comply with all national gas safety laws and regulations.

### Flammable Refrigerant Handling & Worksite Safety

- Conduct a safety inspection prior to servicing any system using combustible refrigerants to minimize fire risks.
- Recover all refrigerant from the system prior to performing maintenance or decommissioning the air conditioner.
- Handle flammable refrigerants with extreme care to eliminate the risk of severe injuries and equipment damage.
- Eliminate all ignition sources and high-temperature hazards from the work area.
- Keep surrounding surfaces and equipment below 745°F (396°C) when handling R-454B refrigerant.
- Wear appropriate anti-static clothing and gloves when installing systems with R-454B refrigerant.

# R-454B Refrigerant Notes

3

## C. Special Tools

| Tool Name | Requirement(s) for Use |
|---|---|
| **Mini Vacuum Pump** | An explosion-proof vacuum pump that ensures high precision. Its vacuum degree must be below 10 Pa. |
| **Filling Device** | A special explosion-proof filling device that ensures precision. Its filling deviation must be below 5g. |
| **Leak Detector** | A detector that it is calibrated regularly. Its annual leak rate should not exceed 10g. |
| **Concentration Detector** | • Equip the maintenance site with a fixed combustible refrigerant concentration detector. Connect this detector to a safeguard alarm system. Its error must not exceed ±5%.<br>• Equip the installation site with a portable combustible refrigerant concentration detector that features a two-level audible and visual alarm. Its error must not exceed ±10%.<br>• Ensure that the concentration detectors are calibrated regularly. Check and confirm their functionality before each use. |
| **Pressure Gauge** | Ensure that the pressure gauges are calibrated regularly. Confirm that the pressure gauges are compatible with R-454B refrigerant. |
| **Fire Extinguisher** | Carry fire extinguishers during installation and maintenance. Ensure that the maintenance site is equipped with two or more types of fire extinguishers (dry powder, carbon dioxide, or foam). These extinguishers must have highly visible labels and be placed in designated locations. |

# R-454B Refrigerant Notes

3

## D. Maintenance

### Inspections for the Maintenance Environment

- Verify the room is free of refrigerant leaks prior to operation.
- Only operate the system in rooms that meet the area requirements specified on the nameplate.
- Ensure that the room is continuously ventilated.
- Do not permit open flames, welding, smoking, drying ovens, or any other ignition sources with temperatures exceeding 745°F (396°C) in the room.
- Ensure that mobile phones and all other electronic devices are turned off while in the room.
- Equip the maintenance area with a functional dry powder or carbon dioxide ($CO_2$) fire extinguisher.

### Inspections for the Maintenance Equipment

- Confirm that the maintenance equipment is compatible with the refrigerant. Use only the professional equipment recommended by the air conditioner manufacturer.
- Verify that the refrigerant leak detector has been calibrated. Ensure its maximum alarm concentration does not exceed 25% of the lower explosion limit (LEL). The leak detector must remain operational during all maintenance procedures.

### Inspections for the Air Conditioner

- Before performing maintenance, ensure the air conditioner is reliably grounded.
- Turn off the power and completely discharge the capacitor before beginning maintenance. If power is required during maintenance, continuously perform leak detection at the highest-risk locations to prevent hazards.
- Verify that all warning labels on the air conditioner are legible and in good condition; immediately replace any that are damaged or obscured.

### Leak Inspection Before Maintenance

- Before starting maintenance, use a manufacturer-recommended leak detector or pump-type concentration detector to ensure there are no active leaks.
- If a leak is suspected:
    - Extinguish or remove all open flames and ignition sources from the area.
    - Turn off the air conditioner immediately.
    - Ensure the workspace is thoroughly ventilated.

# R-454B Refrigerant Notes

3

## Safety Principles During Maintenance

- Ensure the workspace is well-ventilated throughout the maintenance process.
- Do not smoke, weld, use open flames, or operate mobile phones in the work area.
- Wear anti-static clothing and gloves if the relative humidity falls below 40%.
- Immediately initiate forced ventilation and seal the leak source if a combustible refrigerant leak is detected.
- Transport the product back to the service station if the refrigerant system must be opened for maintenance; welding refrigerant pipes or performing similar operations at the customer's site is strictly prohibited.
- Restore the air conditioner to its original state and verify that the refrigerant system is reliably grounded if a follow-up service visit is necessary due to missing spare parts.
- Secure the cylinder vertically when storing it in a vehicle or at the maintenance site, keeping it away from electrical equipment, heat, radiation, and ignition sources.

## Requirements for the Maintenance Location

- Ensure the maintenance location is well-ventilated, located at ground level, and not in a basement.
- Divide and label the maintenance location into separate welding and non-welding areas, ensuring a safe distance between them.
- Equip the maintenance location with proper ventilation and air exhaust systems to prevent refrigerant gas accumulation.
- Install the main power switch outside the maintenance area, and ensure it is equipped with explosion-proof protective devices.
- Maintain an instrument management system for all combustible refrigerant leak detectors, and verify that the detectors are functioning normally prior to maintenance.
- Equip the maintenance area with functional fire extinguishers suitable for electrical fires, such as dry chemical or carbon dioxide ($CO_2$) extinguishers.
- Prohibit the use of temporary wiring or extension sockets within the maintenance location.

# R-454B Refrigerant Notes

3

## Requirements for Filling the Refrigerants

- Purge and vacuum the system for at least 30 minutes using nitrogen before operating the refrigerant system.
- Avoid cross-contamination among different refrigerants when using the charging device.
- Keep the total pipeline length as short as possible to minimize residual refrigerant inside the lines.
- Store and maintain all refrigerant storage tanks in an upright position.
- Ground the refrigeration system securely prior to charging it with refrigerant.
- Charge the system using only the specific refrigerant type and volume indicated on the product nameplate.
- Prohibit overcharging under any circumstances.
- Seal the refrigeration system properly upon completing all maintenance work.
- Verify that no maintenance procedures alter, damage, or reduce the original safety protection grade of the system.

## In-Maintenance Welding

- Ensure the workspace is well-ventilated throughout the maintenance process.
- Confirm the refrigeration system is completely drained and cleaned, ensuring no residual refrigerant remains in the outdoor unit before beginning any welding.
- Close the outdoor unit stop valve before performing any torch-welding or brazing maintenance.

## Maintenance of Electrical Components

- Ensure the workspace is well-ventilated throughout the maintenance process.
- Store refrigerant tanks vertically in a separate, well-ventilated location at a temperature range of 14°F to 122° F (-10°C to 50°C).
- Affix clear hazard warning labels to all refrigerant storage tanks.
- Confirm the refrigeration system is completely drained and cleaned, ensuring no residual refrigerant remains in the outdoor unit before beginning any welding.
- Close the outdoor unit stop valve before performing any torch-welding or brazing maintenance.
- Disconnect the unit's power before removing sealing covers. If power is required during maintenance, perform continuous leak detection at the most critical points to prevent potential hazards.
- Ensure all replacement parts and materials strictly meet the specifications recommended by the manufacturer.

# R-454B Refrigerant Notes

3

- Verify that sealing materials have not degraded due to aging, ensuring they retain their full ability to prevent combustible gas leaks.
- Ensure that the sealing function is not compromised or damaged after performing maintenance.
- Ensure that the maintenance of electrical components does not interfere with the proper reinstallation of the protective cover.
- Inspect the area around the serviced electrical parts using a specialized leak detector to ensure there are no refrigerant leaks.
- Do not modify, remove, or bypass any safety protection components after completing maintenance.
- Verify that the unit has a reliable ground connection and is completely free of refrigerant leaks before performing a trial operation.

## Maintenance of Electrical Components

- Establish an emergency response plan for the maintenance location.
- Implement appropriate safety precautions during all work activities.
- Prohibit ignition sources (such as matches or lighters) and static-producing clothing or footwear within the work area.
- In the event of a large combustible refrigerant leak, follow these emergency procedures:
    - Activate ventilation systems immediately while isolating all other power sources.
    - Evacuate all affected personnel from the area urgently.
    - Inform nearby residents to evacuate to a distance of at least 66 feet (20 m) from the site.
    - Place an immediate emergency alarm call.
    - Set up an emergency boundary and prohibit unauthorized personnel and vehicles from approaching.
    - Ensure responding professional firefighters wear anti-static clothing while handling the emergency on-site.
    - Direct firefighters to locate and cut off the source of the refrigerant leak as soon as possible.
    - Blow nitrogen across the site, focusing specifically on low-lying areas, to clear away any residual combustible refrigerant gas.
    - Use a handheld detector to thoroughly scan the area surrounding the leak source.
    - Do not clear or turn off the emergency alarm until the refrigerant concentration reads exactly zero.

# Product Overview

4

The Quantum Ultra 8-Way Ceiling Cassette (CYT-24) is part of the DC Inverter U-match series, along with the Quantum Ultra Ceiling Concealed (RYT-24) and Quantum Ultra Universal Flex (UYT-24). The U-match series uses adaptive technology that allows a single outdoor unit to work with different types of indoor units, so the system can be matched to the room's interior design and the user's needs. This reduces inventory management and after-sales maintenance costs. The series is suitable for a wide range of settings, including apartments, villas, hotels, office buildings, and small to medium-sized supermarkets.

## Model Numbers

**Note**

The serial number is located behind the electric control box cover on each unit.

| Model | Full System | Indoor Unit | Outdoor Unit |
|---|---|---|---|
| 9.5K | CYT009GLSI24RL | CT009GLSILCFHG | YN009GLSI24RPG |
| 12K | CYT012GLSI24RL | CT012GLSILCFHG | YN012GLSI24RPG |
| 16K | CYT018GLSI24RL | CT018GLSILCFHG | YN018GLSI24RPG |
| 23K | CYT024GLSI24RL | CT024GLSILCFHG | YN024GLSI24RPG |

# Product Overview

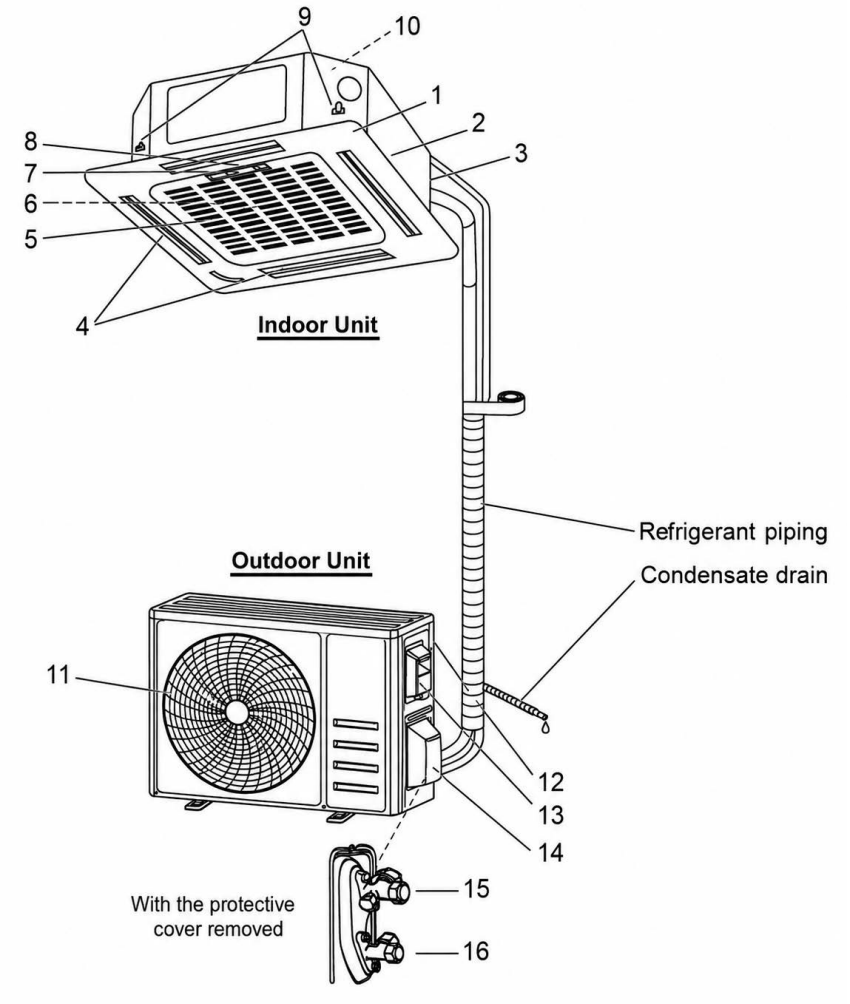
# 4

## Part Names

**Note**

Illustrations in this manual are for explanatory purposes. The actual shape of the indoor unit may be slightly different. The actual shape shall prevail.

The system consists of two units connected by insulated copper pipes and an electrical communication cable. Mount the indoor unit on a wall inside the room selected for air conditioning. Install the outdoor unit on the ground or on the wall using suitable mounting brackets.



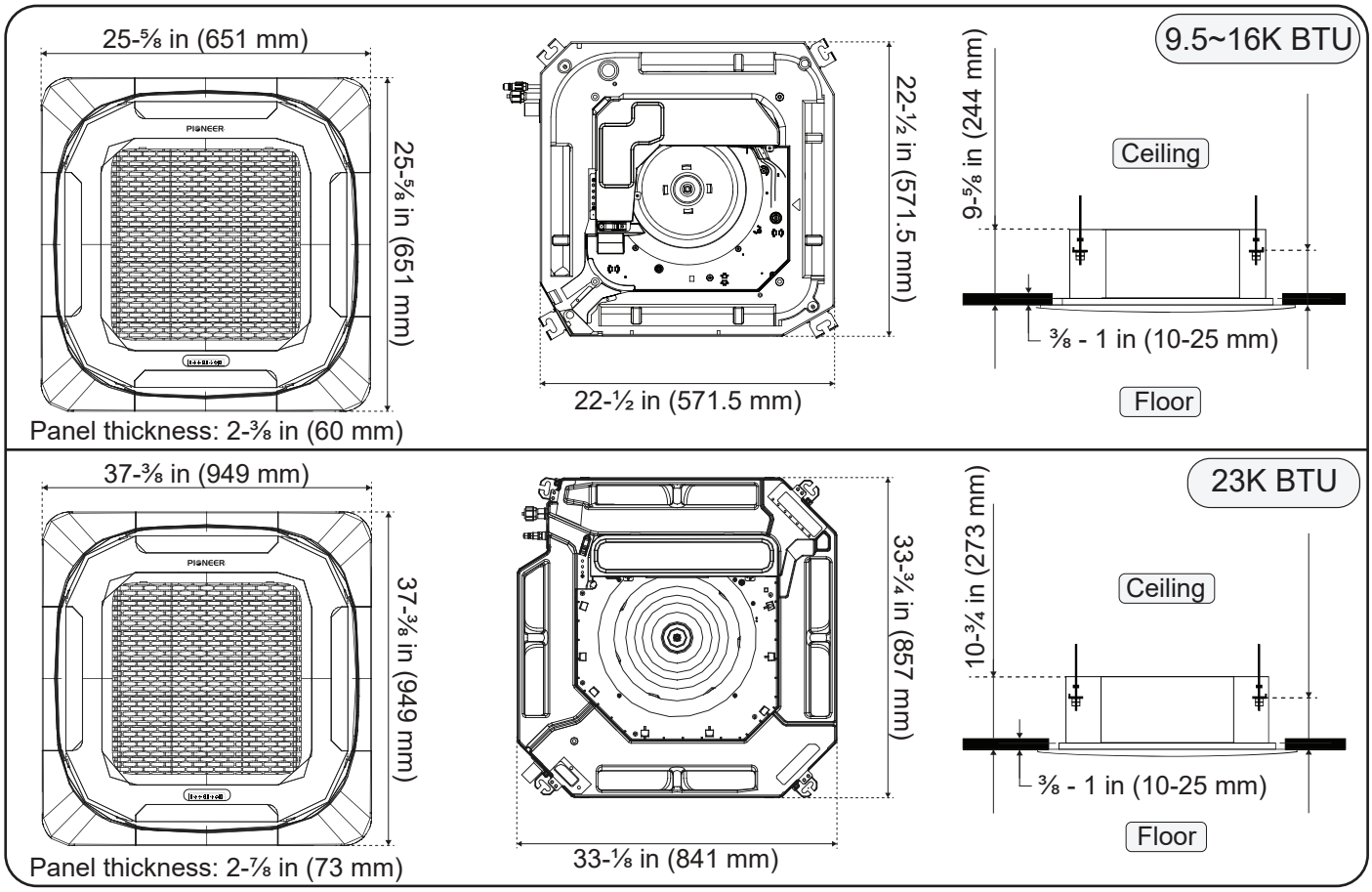

| No. | Description |
|---|---|
| 1 | Decorative panel |
| 2 | Cassette air handler body |
| 3 | Service bundle connections |
| 4 | Air supply outlets |
| 5 | Air return inlet |
| 6 | Filter access panel |
| 7 | Controller signal receiver |
| 8 | LED display |
| 9 | Cassette suspension brackets |
| 10 | Interior condensate pump |
| 11 | Air outlet grille |
| 12 | Outdoor unit nameplate |
| 13 | Terminal block cover |
| 14 | Valve protection cover |
| 15 | Gas (Suction) line valve |
| 16 | Liquid line valve |

# Product Overview

# 4

## Dimensions & Weight

### Indoor Unit:




| Indoor Unit | Dimensions | | |
|---|---|---|---|
| | W | D | H |
| CT009GLSILCFHG | 22-1/2 in | 22-1/2 in | 9-5/8 in |
| | 571.5 mm | 571.5 mm | 244 mm |
| CT012GLSILCFHG | 22-1/2 in | 22-1/2 in | 9-5/8 in |
| | 571.5 mm | 571.5 mm | 244 mm |
| CT018GLSILCFHG | 22-1/2 in | 22-1/2 in | 9-5/8 in |
| | 571.5 mm | 571.5 mm | 244 mm |
| CT024GLSILCFHG | 33-1/8 in | 33-3/4 in | 10-3/4 in |
| | 841 mm | 857 mm | 273 mm |

| Panel Grille | Dimensions | | |
|---|---|---|---|
| | W | D | H |
| CT009GLSILCFHG | 25-5/8 in | 25-5/8 in | 2-3/8 in |
| | 651 mm | 651 mm | 60 mm |
| CT012GLSILCFHG | 25-5/8 in | 25-5/8 in | 2-3/8 in |
| | 651 mm | 651 mm | 60 mm |
| CT018GLSILCFHG | 25-5/8 in | 25-5/8 in | 2-3/8 in |
| | 651 mm | 651 mm | 60 mm |
| CT024GLSILCFHG | 37-3/8 in | 37-3/8 in | 2-7/8 in |
| | 949 mm | 949 mm | 73 mm |

# Product Overview

4

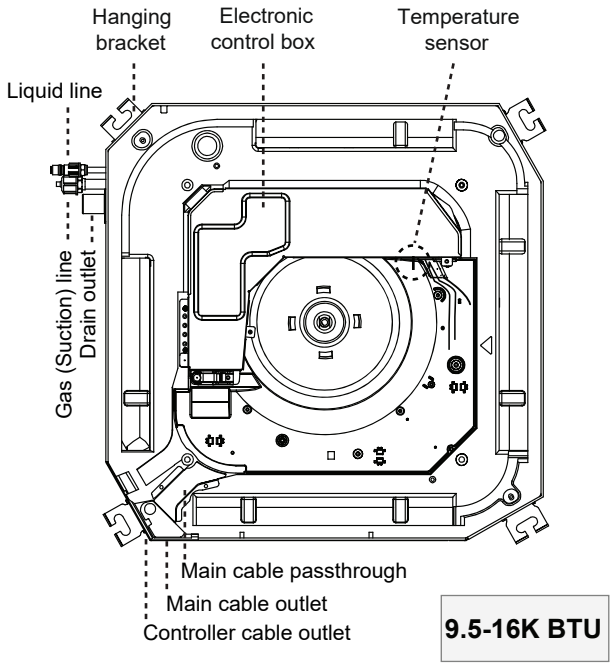
| Indoor Unit | Net Unit Weight |
|---|---|
| CT009GLSILCFHG | 32.0 lbs |
| | 14.5 kgs |
| CT012GLSILCFHG | 32.0 lbs |
| | 14.5 kgs |
| CT018GLSILCFHG | 32.0 lbs |
| | 14.5 kgs |
| CT024GLSILCFHG | 51.8 lbs |
| | 23.5 kgs |

| Panel Grille | Net Unit Weight |
|---|---|
| CT009GLSILCFHG | 6.0 lbs |
| | 2.7 kgs |
| CT012GLSILCFHG | 6.0 lbs |
| | 2.7 kgs |
| CT018GLSILCFHG | 6.0 lbs |
| | 2.7 kgs |
| CT024GLSILCFHG | 13.2 lbs |
| | 6.0 kgs |

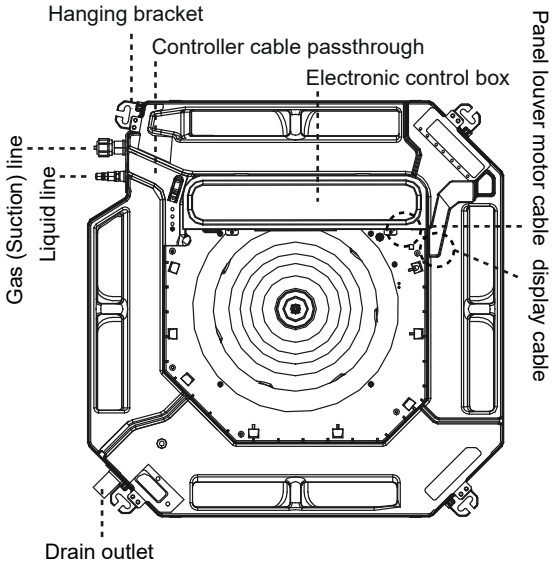
# Product Overview

4

## Indoor Air Handler Cassette Internal Components Layout




**9.5-16K BTU**

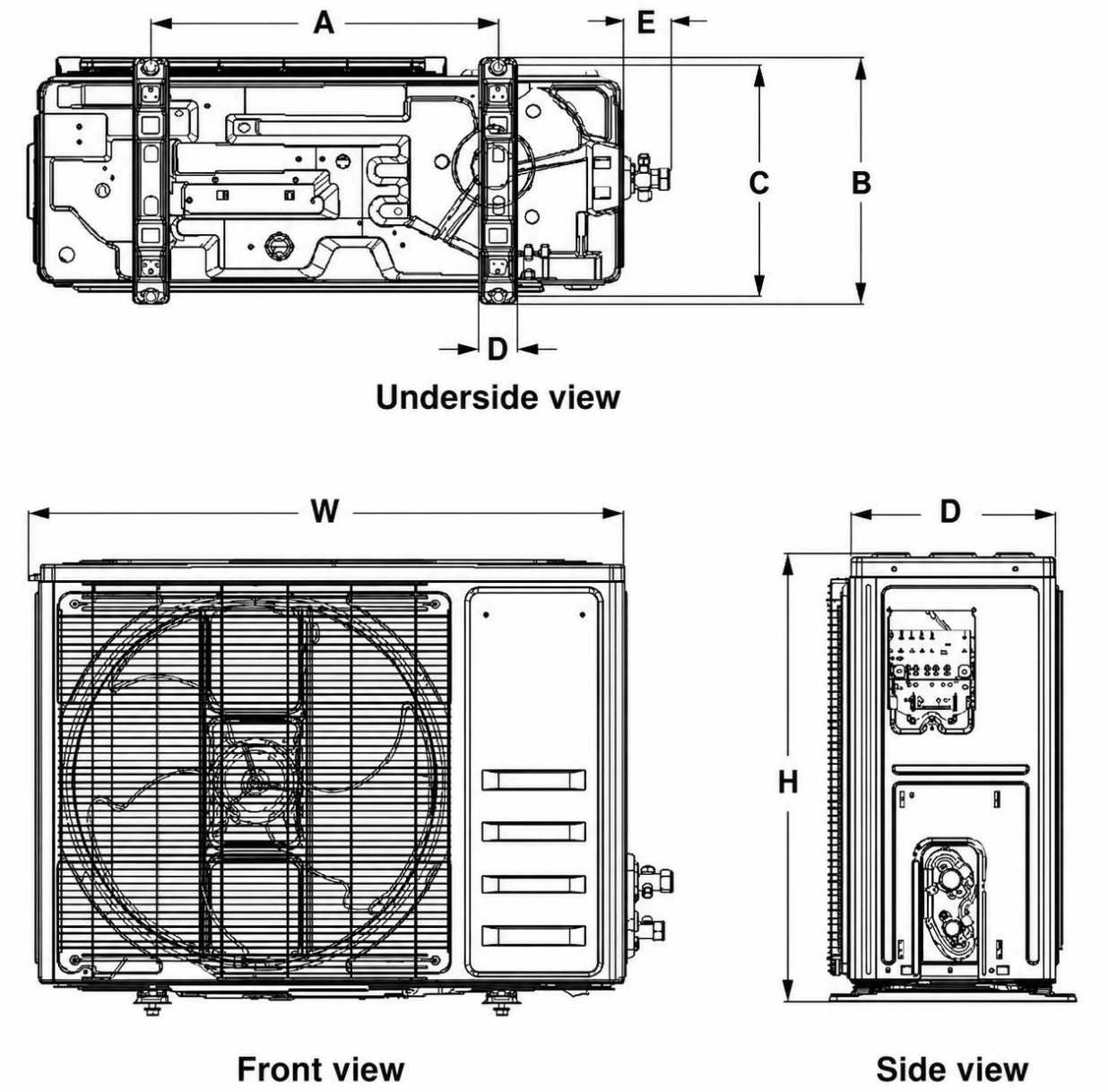



**24K BTU**

# Product Overview

4

## Outdoor Unit:




| Outdoor Unit | Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | W | D | H | A | B | C | D | E |
| YN009GLSI24RPG | 31-7/8 in | 12 in | 21-5/8 in | 17-1/8 in | 12 in | 11-1/4 in | 1-7/8 in | 2-1/4 in |
| | 810 mm | 305 mm | 549 mm | 435 mm | 305 mm | 286 mm | 48 mm | 57 mm |
| YN012GLSI24RPG | 31-7/8 in | 12 in | 21-5/8 in | 17-1/8 in | 12 in | 11-1/4 in | 1-7/8 in | 2-1/4 in |
| | 810 mm | 305 mm | 549 mm | 435 mm | 305 mm | 286 mm | 48 mm | 57 mm |
| YN018GLSI24RPG | 36-1/2 in | 15 in | 27-1/2 in | 23-1/8 in | 14-3/4 in | 13-3/4 in | 2-1/8 in | 2-1/4 in |
| | 927 mm | 381 mm | 698.5 mm | 587 mm | 375 mm | 349 mm | 54 mm | 57 mm |
| YN024GLSI24RPG | 38-1/2 in | 16-5/8 in | 31-5/8 in | 23-7/8 in | 16-5/8 in | 15-3/8 in | 2-3/8 in | 2-1/2 in |
| | 978 mm | 422 mm | 803 mm | 606 mm | 422 mm | 390.5 mm | 60 mm | 63.5 mm |

# Product Overview

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| Outdoor Unit | Net Unit Weight |
|---|---|
| YN009GLSI24RPG | 52.7 lbs |
| | 23.9 kgs |
| YN012GLSI24RPG | 58.4 lbs |
| | 26.5 kgs |
| YN018GLSI24RPG | 90.4 lbs |
| | 41 kgs |
| YN024GLSI24RPG | 104.7 lbs |
| | 47.5 kgs |

# Product Overview

4

## Operating Temperatures

The system is designed to run within a certain range of temperatures, which are listed below. The system has built-in protections that may stop the appliance when the ambient temperatures goes outside of these ranges.

| Operating Temperatures | °F / °C |
|---|---|
| Temperature Setting Range | 62~86°F |
| | 17~30°C |
| Ambient Temperature Range for Cooling | 5~131°F |
| | -15~55°C |
| Ambient Temperature Range for Heating | -13~86°F |
| | -25~30°C |

Testing and rating agencies develop standard rating conditions to obtain full system-rated capacity and efficiency. Within certain limitations, variable speed compressors compensate the deviations from the rating conditions, especially the atmospheric conditions.

Heat pump systems function by exchanging energy between the indoor air and outdoor ambient air (atmospheric) in the form of heat. The system's net cooling or heating capacities and efficiencies change by atmospheric conditions, as well as the indoor air conditions, such as temperatures and humidity levels.

Professional individuals use detailed calculations to determine the capacity of the system required for a specific area or application, which are based on several internal and external factors.

**To further optimize the performance of the unit, complete the following:**

- Keep doors and windows closed.
- Use Timer On and Timer Off functions to limit energy usage.
- Do not block air inlets or outlets.
- Regularly inspect and clean air filters.

# Refrigerant Piping Specifications

# 5

Refer to these tables for refrigerant piping specifications, such as maximum length and drop height.

| CYT-24 | 9.5K BTU | 12K BTU | 16K BTU | 23K BTU |
|---|---|---|---|---|
| Liquid Pipe Diameter | Φ 1/4 in (6.4 mm) | Φ 1/4 in (6.4 mm) | Φ 1/4 in (6.4 mm) | Φ 1/4 in (6.4 mm) |
| Gas Pipe Diameter | Φ 3/8 in (9.5 mm) | Φ 3/8 in (9.5 mm) | Φ 1/2 in (12.7 mm) | Φ 5/8 in (15.9 mm) |
| Max. Length of Pipe with Standard Charge | 25 ft / 7.6 m | | | |
| Max. Length Between Indoor and Outdoor Unit | 50 ft / 15.2 m | 50 ft / 15.2 m | 65 ft / 19.8 m | 65 ft / 19.8 m |
| Adjustment Refrigerant Charge (For each additional foot after 25 ft.) | 0.11oz/ft | | | |
| Max. Drop Height Between Indoor and Outdoor Unit | 33 ft / 10 m | 33 ft / 10 m | 50 ft / 15.2 m | 50 ft / 15.2 m |
| Type of Refrigerant | R-454B | | | |

# Maintenance

# 6

Performing periodic maintenance, such as cleaning the anti-dust filters and the indoor air handler's interior, will ensure the system remains efficient.

**CAUTION**

- Before performing any maintenance, ensure the system's power supply is turned off for more than 5 minutes.
- Wear safety gloves when working on the equipment, due to the coil's sharp aluminum fin edges.
- Do not spray water directly into the indoor unit, as it can damage the insulation and electrical components.

## A. Anti-Dust Filters

Inspect the anti-dust filter once every 2 weeks.

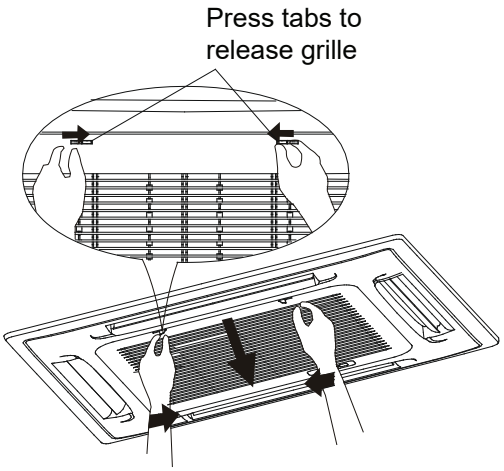
1. Reach for the top area of the interior unit and grasp both the exposed handles.

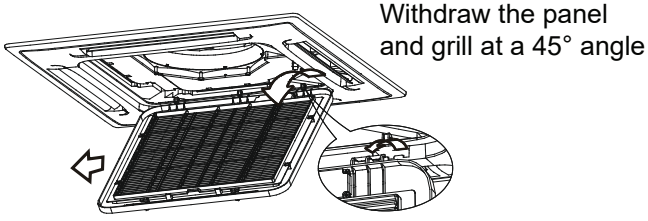
2. Gently remove the single anti-dust filter by pulling upwards and backwards as shown in the illustrations.

3. Clean the washable filters with warm water (under 113°F / 45°C).

4. Leave the filters to dry in a cool, dry place.

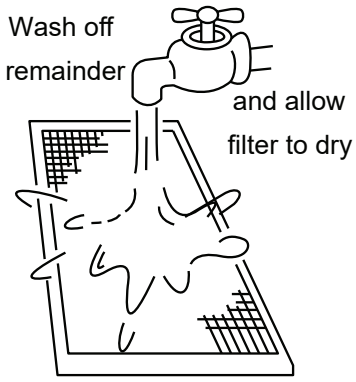
5. Once fully dry, re-insert the filter into its original location.

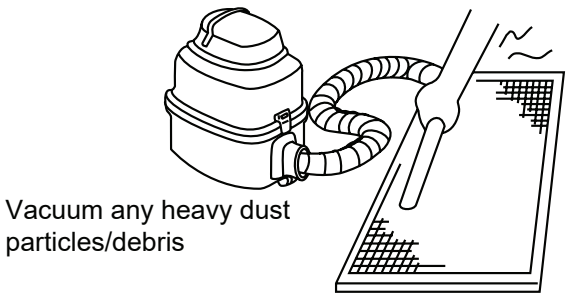



**Note**

Accessorial electrostatic or deodorizing filters are not washable and should be replaced every 6 months.



# Maintenance 6

## B. Interior of the Indoor Air Handler

Inspect the indoor unit's interior as well as the inner coil every season.

1. Disconnect the front panel and remove the top hinge where the pegs connect. This offers easier inspection of the interior and behind the air filters.

2. Clean the interior with a damp, soft cloth and neutral soaps. Do not use any types of aggressive solvents or detergents.

## Maintenance - Long Periods of Non-Use

If the air conditioner won't be used for an extended period of time.



Clean all filters



Turn on the Fan function until the unit dries out completely



Turn off the unit and disconnect the power



Remove the batteries from the remote control

## Maintenance - Pre-Season Inspection

After long periods of non-use or before periods of frequent use, do the following:



Check for damaged wires



Clean all filters



Check for leaks





Make sure nothing is blocking the air inlets and outlets



Replace the batteries

# Troubleshooting

7

## Failures Not Caused By Errors

If your air conditioner does not operate properly, check the following items before requesting service:

| Problem | Cause | Corrective Measure |
|---|---|---|
| The air conditioner can’t operate | If you turn the unit off and then immediately back on, the compressor waits about 3 minutes before starting. This delay protects the compressor and prevents system overload. | Wait for the delay to end. |
| | The wire connection is wrong. | Connect the wires according to the wiring diagram. |
| | The circuit breaker's fuse is broken. | Replace the fuse or turn on the circuit breaker. |
| | Power failure. | Restart system after power returns. |
| | Power plug is loose. | Re-insert the power plug. |
| | The remote control has depleted batteries. | Replace the batteries. |
| Bad cooling effect | The air inlet and outlet of the indoor or outdoor unit is blocked. | Clear the obstacles and keep the indoor and outdoor units well-ventilated. |
| | Improper set temperature. | Set temperature to an appropriate level. |
| | Fan speed operating too low for indoor unit. | Set fan speed to an appropriate level. |
| | Airflow direction is not set correctly | Change the direction of the air louvers. |
| | Doors or windows are opened. | Close any open doors or windows |
| | Exposed under direct sunshine. | Close the curtains or blinds to block direct sunlight. |
| | Too many heat sources in the room. | Remove unnecessary heat sources. |
| | Filter is blocked or too dirty. | Clean the filter. |

# Troubleshooting

7

The following situations are not operation failures:

| Problem | Time of Occurrence | Cause |
|---|---|---|
| Mist comes from the air conditioner | During operation. | When the unit operates in high humidity, the humid air in the room is cooled rapidly. |
| The air conditioner generates some noise | The air conditioner is buzzing at the beginning of operation. | The temperature controller may make a buzzing sound when it starts. The noise decreases after about 1 minute. This is normal. |
| Dust comes from the air conditioner | When the unit is turned on, it purrs. | When the unit first starts, the refrigerant flow has not yet stabilized, which may cause a humming sound. The sound becomes quieter after about 30 seconds. This is normal. |
| | There is a hissing sound when the unit starts or stops, as well as a slight hissing sound during or after operation. | This sound is caused by refrigerant flow stopping or by the drainage system operating. This is normal. |
| | There is a sound of crunching during or after operation. | The front panel and other components may expand or contract due to temperature changes, causing a creaking sound. This is normal. |
| | The unit starts operating after being unused for a long time. | Dust that has collected inside the indoor unit is blown out with the airflow. |
| The air conditioner generates strange odors | During operation. | The indoor unit may absorb odors from the room, such as cigarette smoke, and release them with the airflow. |

# Troubleshooting

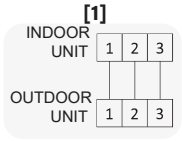
7

## Solutions to Common Issues & Scenarios

### Issue: The indoor air handler does not turn on

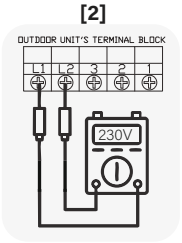
- Solution: Try the manual emergency button on the indoor unit to rule out remote control issues.

[1]




- Solution: Verify that the wiring order is identical between the indoor and outdoor units. The color sequence must match exactly. Check for splices or damage along the control cable. To eliminate variables, temporarily disconnect all accessory items, such as UV lights or condensate pumps, until the problem is resolved.

[2]




- Solution for 230V systems: Use a multimeter to check the AC voltage across terminals L1 and L2 on the outdoor system. Place one probe on L1 and the other on L2. Do not measure each leg to ground. Verify that the reading is between 208~253 VAC.
    - If the reading is between 208~253 VAC, check whether it is the same across terminals 2 and 3 on both the indoor and outdoor units. All readings must match. The system requires a full 230V reading to function.

    - A reading of 0 VAC indicates that the system is not receiving power from the source. Some common reasons are:
        - A fused disconnect is being used, but the fuses are blown and improperly inserted.
        - The disconnect box bus-bar is turned off.
        - A double-pole breaker is not being used. Single or tandem breakers will not operate.

### Issue: The pressure reading does not rise when releasing refrigerant during the leak check

- Solution: Verify that the manifold gauge hose pin fully engages the outdoor unit's service port Schrader valve. A pin that is over-extended or under-extended will block access to the refrigerant circuit, preventing pressure measurement and proper vacuuming. The depressor pin inside the hose connector is adjustable to ensure proper engagement.
    - A telltale sign that this is happening is if the gauge reading goes to an instant vacuum when the pump is first turned on, meaning only the gauge is being vacuumed.

    - If so, vacuuming will need to be re-performed, since only the gauge was vacuumed.

# Troubleshooting 7

### Issue: The system is not holding a vacuum

- Solution: There is likely a leak in the gauge hoses. Repair it and check the vacuum pump.
- Solution: Check the connection points for proper contact and torque, then tighten if necessary.

### Issue: The indoor air handler is leaking water

- Solution: Verify that the indoor unit is level both horizontally and vertically.
- Solution: Confirm that the drain tube pitches continuously downward.
    - Pour a cup of water over the indoor unit's coils to ensure it reaches the drain pan.
    - Verify that water drains freely from the tube. If it does not, find the cause and correct it.

### Issue: The system indicates that a refrigerant leak is present

- Solution: Cut off the power to the system. Prepare a soapy water spray and apply it to the connection points of the lineset. The point where bubbles form is where the leak is located. Tighten the connection and re-test the system. After the leak is repaired, recharge the system.

### Issue: The fan runs in Cooling mode but in Heating mode there is weak or no airflow

- Solution: Fan speed control is typically unavailable in Heating mode. If the coil cannot heat up, the fan will not run at speed. This issue may also indicate low refrigerant.

# Troubleshooting 7

## Error Codes

| Code | Reason | Remark |
|---|---|---|
| bc | PM2.5 sensor error<br>(indoor unit; optional feature) | Use the remote control to check the error code |
| bE | $CO_2$ sensor error<br>(indoor unit; optional feature) | / |
| bf | TVOC sensor error<br>(indoor unit; optional feature) | Use the remote control to check the error code |
| bj | Humidity sensor error<br>(indoor unit) | Use the remote control to check the error code |
| CL | Filter cleaning reminder | Clean the air filter |
| d4 | Drain pan full protection | / |
| d5 | Access control signal protection | / |
| E0 | Indoor and outdoor units communication error | Is the wiring connection between the units correct? |
| E1 | Indoor unit room temperature sensor error<br>(IDU RT sensor) | Indoor unit sensor and PCB |
| E2 | Indoor unit coil temperature sensor error<br>(IDU IPT sensor) | Indoor unit sensor and PCB |
| E3 | Outdoor unit coil temperature sensor error<br>(ODU OPT sensor) | Outdoor unit sensor and PCB |
| E4 | System abnormality / refrigerant shortage | Gas leakage / 2-way or 3-way valve blocked / etc. |
| E5 | Model configuration mismatch<br>(production line testing only) | / |
| E6 | Indoor unit DC fan fault<br>(IDU fan) | Fan blade, fan motor, and indoor unit PCB |

# Troubleshooting

7

| Code | Reason | Remark |
|---|---|---|
| E7 | Outdoor unit ambient temperature sensor error (OAT sensor) | Outdoor unit ambient sensor and PCB |
| E8 | Outdoor unit discharge temperature sensor error (ODT sensor) | Outdoor unit discharge sensor and PCB |
| E9 | Outdoor unit IPM / compressor drive fault | Outdoor unit PCB, compressor, etc. |
| EA | Outdoor unit current sensor error | Is the outdoor unit PCB broken? |
| Eb | Communication error between indoor main PCB and display board (IDU) | Display board and main PCB |
| EC | Outdoor unit module communication error | / |
| EE | Outdoor unit EEPROM error | 1. Is the outdoor unit PCB broken?<br>2. Try to re-power the unit |
| EF | Outdoor unit DC fan motor error | Fan motor and outdoor unit PCB |
| EH | Outdoor unit suction temperature sensor error | / |
| Ej | Outdoor unit mid-coil temperature sensor error | / |
| En | Outdoor unit gas pipe temperature sensor error | / |
| EP | Outdoor unit compressor top temperature sensor error | / |
| EU | Outdoor unit voltage detection circuit abnormality | Outdoor unit PCB |
| Ey | Outdoor unit liquid pipe temperature sensor error | / |

# Troubleshooting

7

| Code | Reason | Remark |
|---|---|---|
| F0 | Indoor unit infrared sensor error | Use the remote control to check the error code |
| F1 | Indoor unit power detection module error | Use the remote control to check the error code |
| F2 | Outdoor unit discharge temperature sensor error protection | Check the troubleshooting for details |
| F3 | Outdoor unit coil temperature sensor error protection | Check the troubleshooting for details |
| F4 | Abnormal refrigerant flow protection | Check the troubleshooting for details |
| F5 | Outdoor unit PFC protection | Check the troubleshooting for details |
| F6 | Compressor phase loss / Phase reversal protection | Check the troubleshooting for details |
| F7 | Outdoor unit IPM abnormal temperature protection | Check the troubleshooting for details |
| F8 | Outdoor unit 4-way valve reversing abnormality | Check the troubleshooting for details |
| F9 | Outdoor unit IPM temperature sensor error | Outdoor unit PCB |
| FA | Outdoor unit compressor phase current detection circuit failure | Outdoor unit PCB |
| Fb | Cooling / Heating overload frequency limit | Use the remote control to check the error code |
| FC | Frequency reduction due to high power consumption | Use the remote control to check the error code |
| Fd | Refrigerant leak sensor communication error | Check the troubleshooting for details |

# Troubleshooting

7

| Code | Reason | Remark |
|---|---|---|
| FE | Outdoor unit IPM / compressor phase overcurrent protection | Use the remote control to check the error code |
| FF | Frequency reduction due to high IPM temperature | Use the remote control to check the error code |
| FH | Frequency reduction due to compressor drive limit | Use the remote control to check the error code |
| Fj | Frequency reduction due to high discharge temperature | Use the remote control to check the error code |
| Fn | Frequency reduction due to high AC input current | Use the remote control to check the error code |
| FP | Frequency reduction to prevent condensation | Use the remote control to check the error code |
| FU | Frequency reduction to prevent coil freezing | Use the remote control to check the error code |
| Fy | Refrigerant deficiency protection | Check the troubleshooting for details |
| H1 | Outdoor unit high-pressure switch error | / |
| H2 | Outdoor unit low-pressure switch error | / |
| Hd | Refrigerant leak protection | / |
| P0 | Outdoor unit IPM protection | Outdoor unit PCB |
| P1 | Overvoltage / undervoltage protection | 1. Is the outdoor unit PCB broken?<br>2. Is the power supply abnormal? |
| P2 | Overcurrent protection | 1. Is the outdoor unit PCB broken?<br>2. Is the power supply abnormal? |

# Troubleshooting

7

| Code | Reason | Remark |
|---|---|---|
| P4 | Outdoor unit high discharge temperature protection | Check the troubleshooting for details |
| P5 | Cooling / Dry mode overcooling protection | Check the troubleshooting for details |
| P6 | Cooling mode overheat protection | Check the troubleshooting for details |
| P7 | Heating mode overheat protection | Check the troubleshooting for details |
| P8 | Outdoor ambient high / low temperature protection | Check the troubleshooting for details |
| P9 | Outdoor unit compressor drive overload protection | Check the troubleshooting for details |
| PA | Mode conflict / Indoor unit upper airflow module communication error | Check the troubleshooting for details |

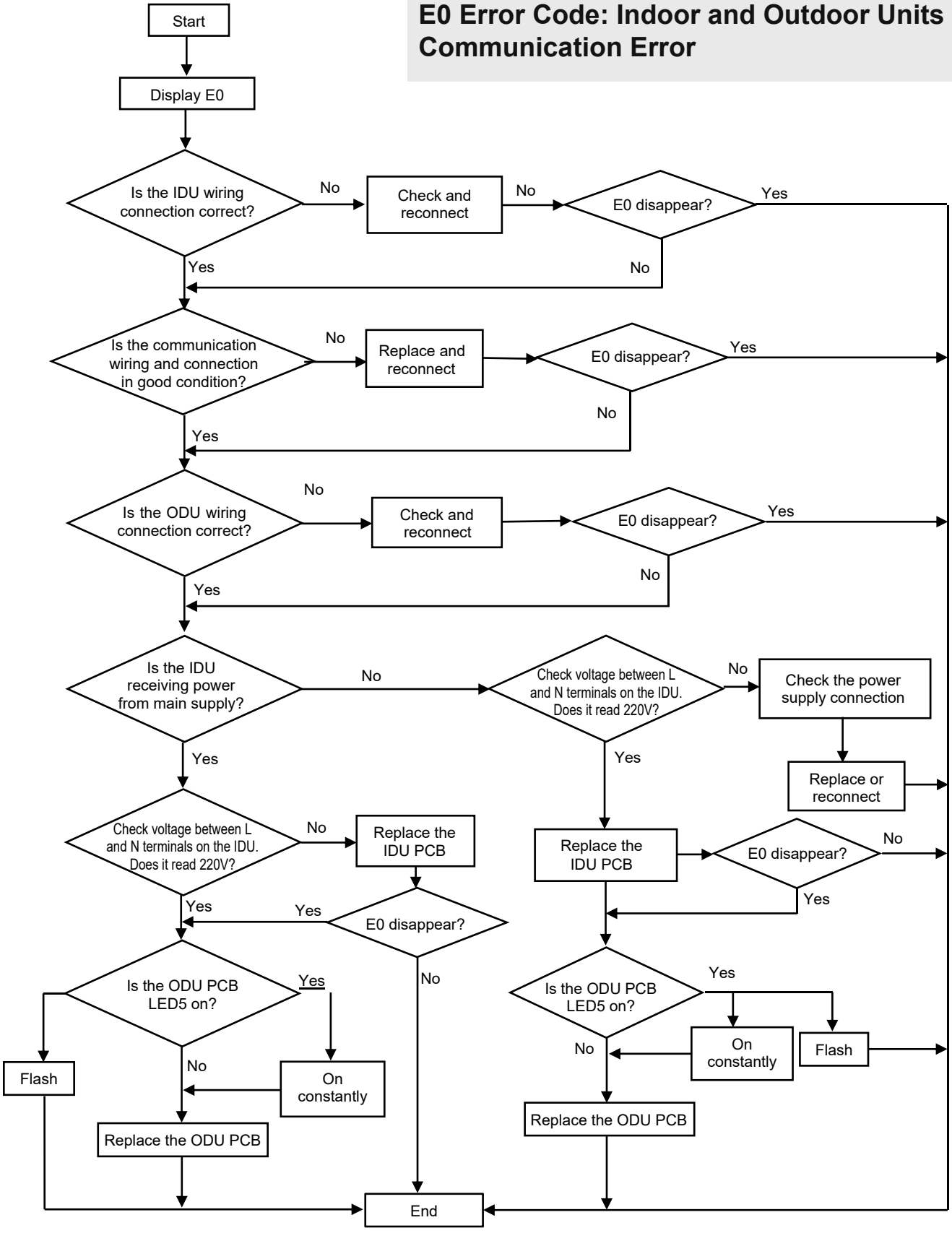
**Note: Remote Controller Failure Code Querying Function**

As shown in the table above, some codes (Fb–bj) can only be viewed using the remote control. To view these codes, press the ECO button on the remote control 8 times within 8 seconds. The buzzer beeps twice to confirm the query.

# Troubleshooting

7

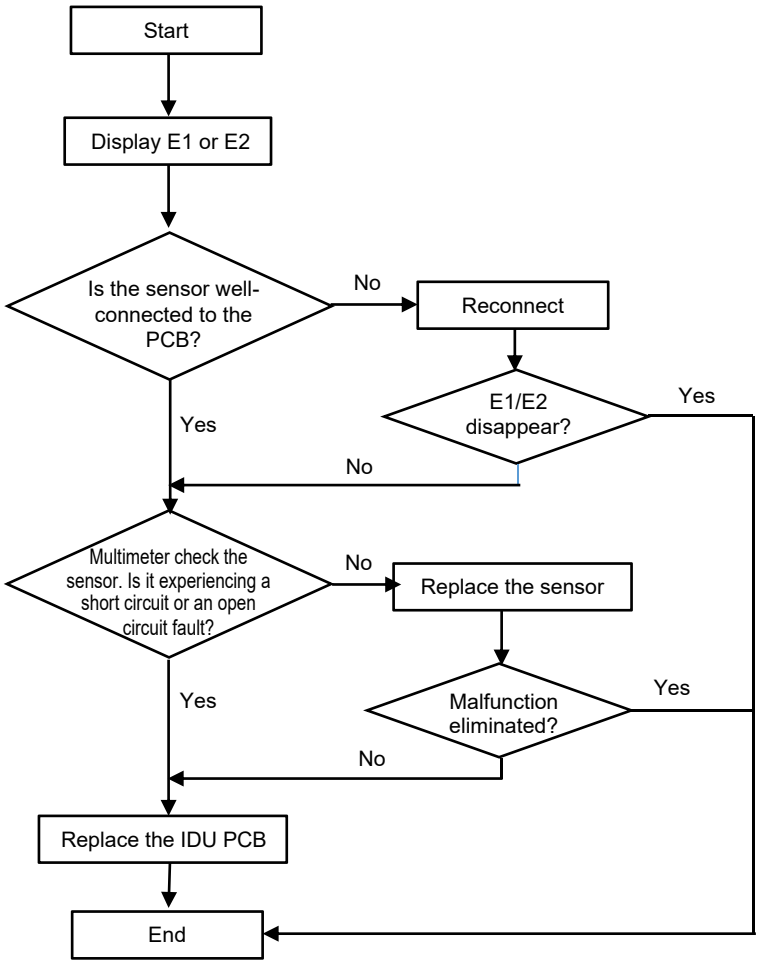
## E0 Error Code: Indoor and Outdoor Units Communication Error



# Troubleshooting

7

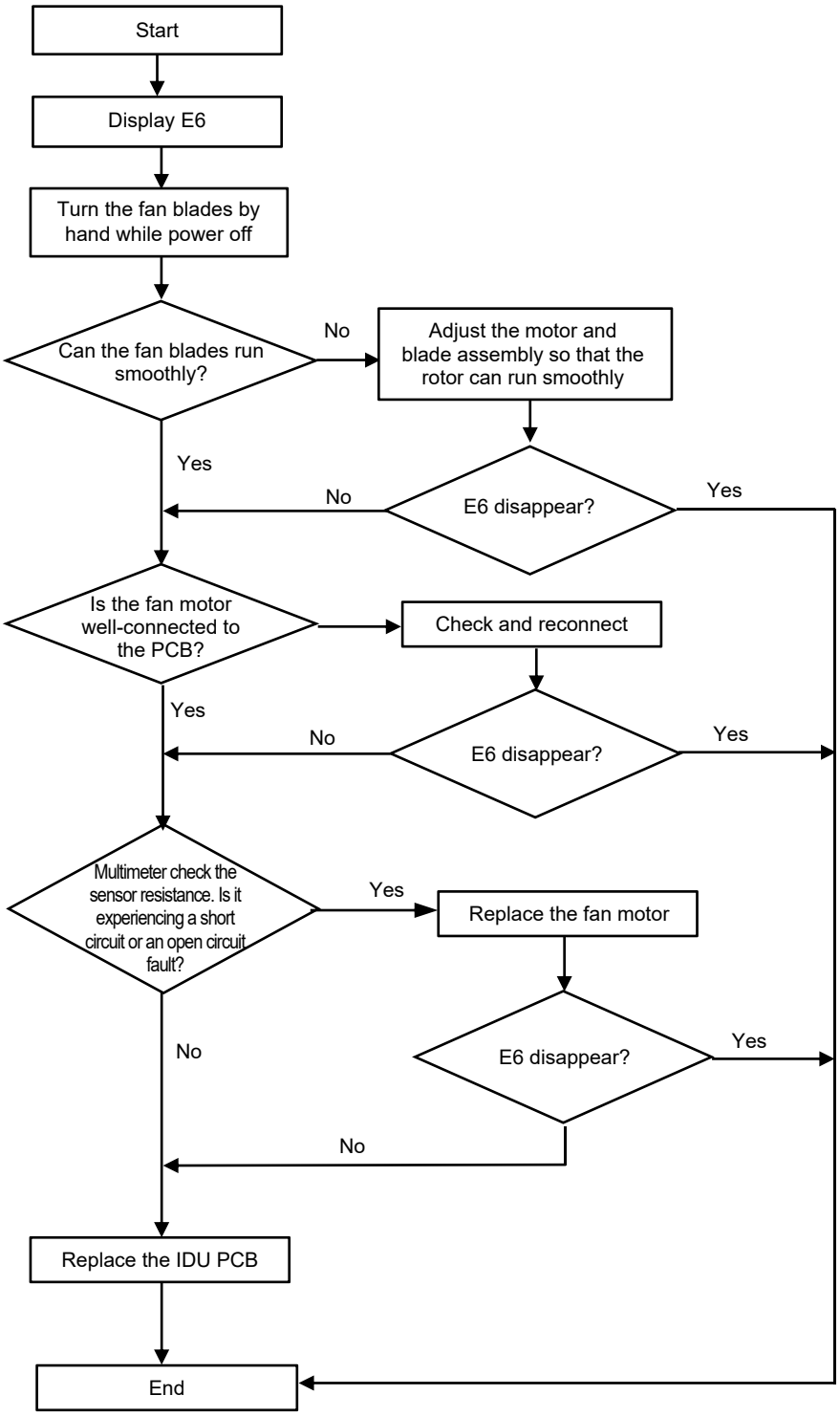
## E1 / E2 Error Codes: Indoor Unit Room Temperature Sensor Error and/or Indoor Unit Coil Temperature Sensor Error



# Troubleshooting

7

## E6 Error Code: Indoor Unit DC Fan Fault



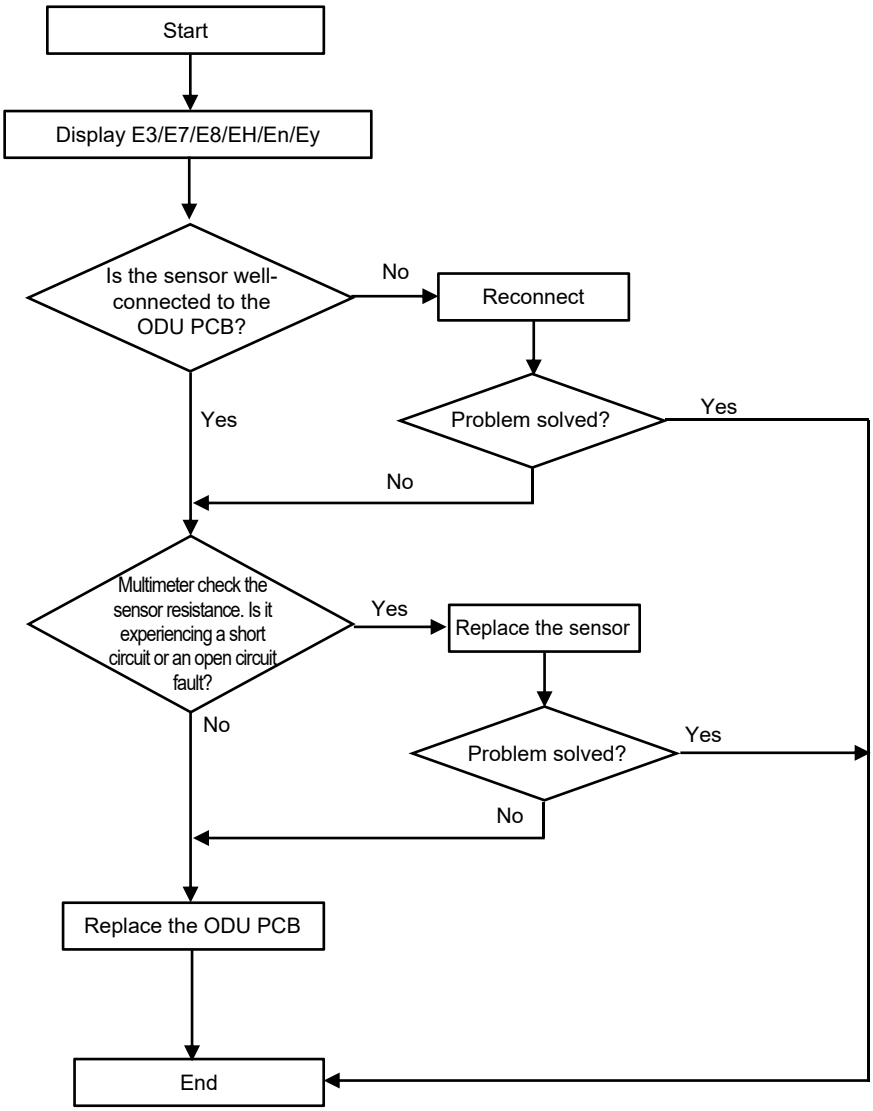
# Troubleshooting

7

## E3 / E7 / E8 / EH / En / Ey Error Codes:

**E3: Outdoor unit coil temperature sensor error**
**E7: Outdoor unit ambient temperature sensor error**
**E8: Outdoor unit discharge temperature sensor error**
**EH: Outdoor unit suction temperature sensor error**
**En: Outdoor unit gas pipe temperature sensor error**
**Ey: Outdoor unit liquid pipe temperature sensor error**

If any temperature sensor has a short circuit or open circuit, the system displays the corresponding error code, and both the indoor and outdoor units turn off. When the sensor returns to normal, the system goes into standby and can be turned on again as usual.

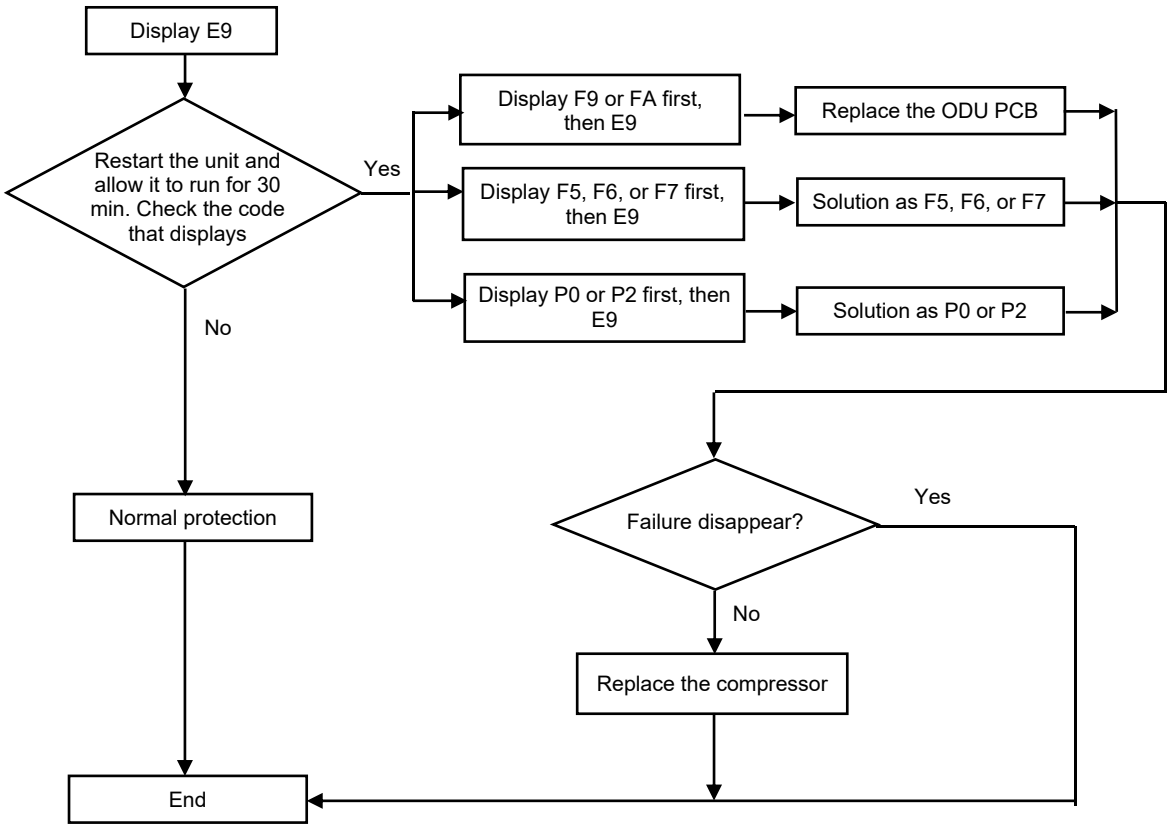


# Troubleshooting

7

## E9 Error Code: Outdoor Unit IPM / Compressor Drive Fault

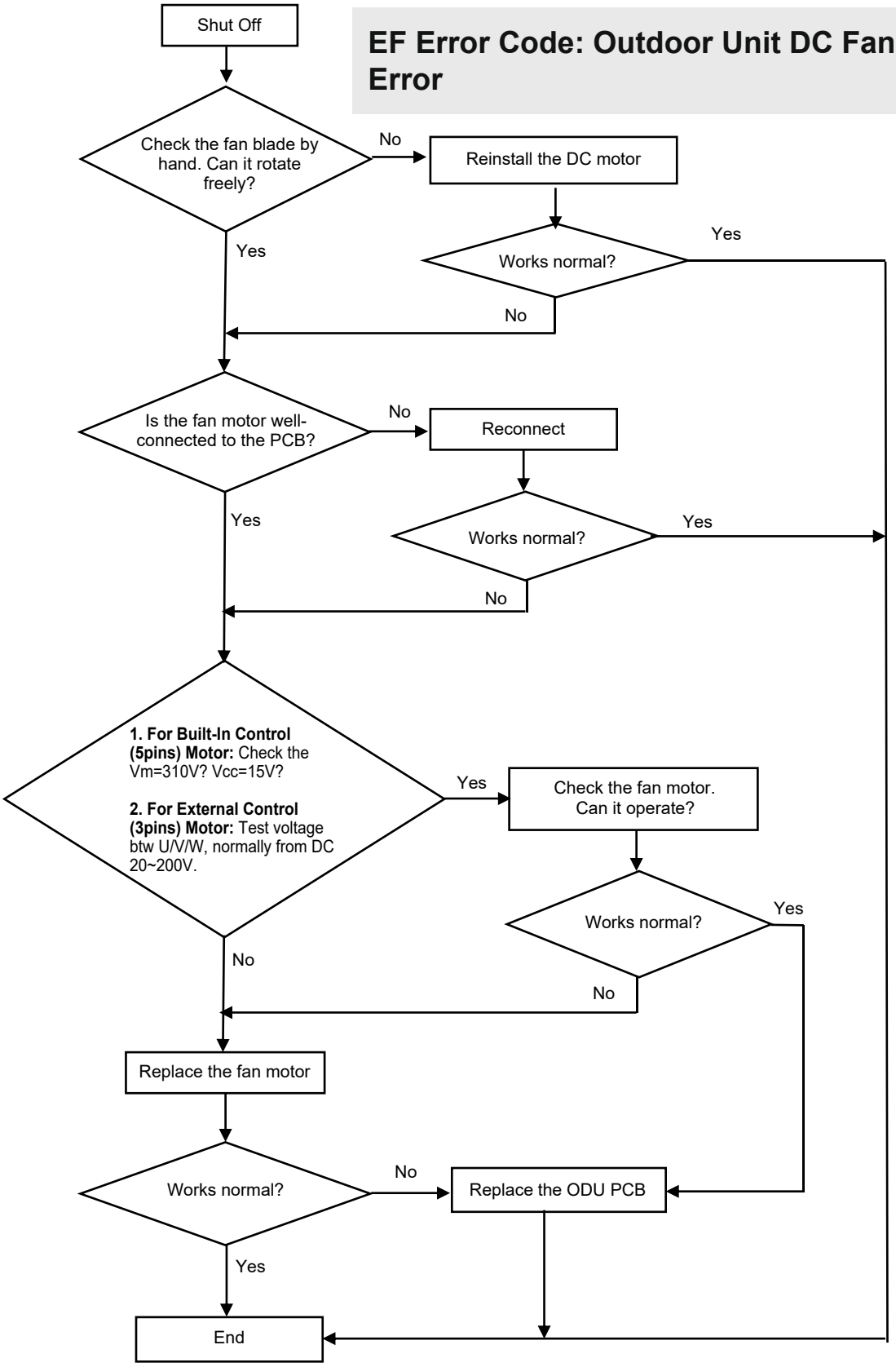
If the IPM protection stops the unit six times in a row, the system displays error code "E9" and will not restart until the Power button is pressed.



# Troubleshooting

7

## EF Error Code: Outdoor Unit DC Fan Motor Error

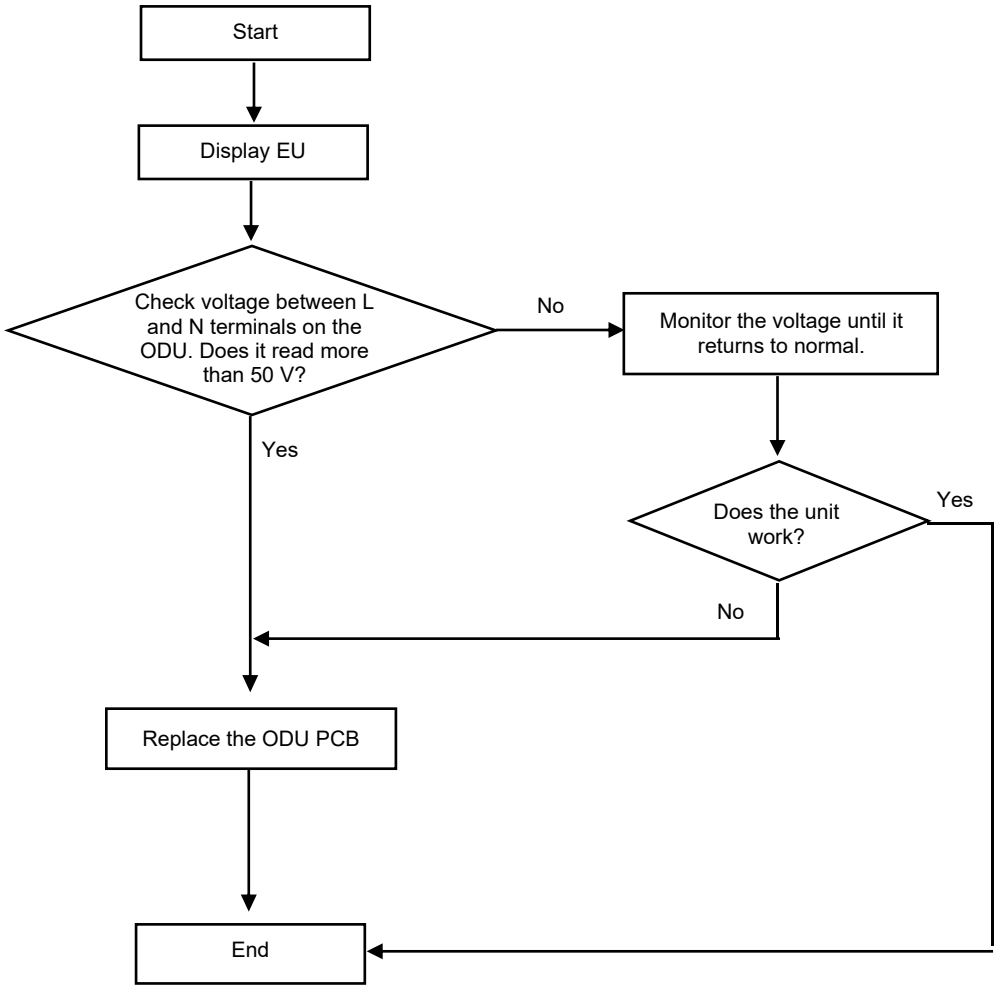


# Troubleshooting

7

## EU Error Code: Outdoor Unit Voltage Detection Circuit Abnormality

After the power relay is energized, if the measured voltage stays below 50 V for 3 consecutive seconds, the system displays error code "EU."

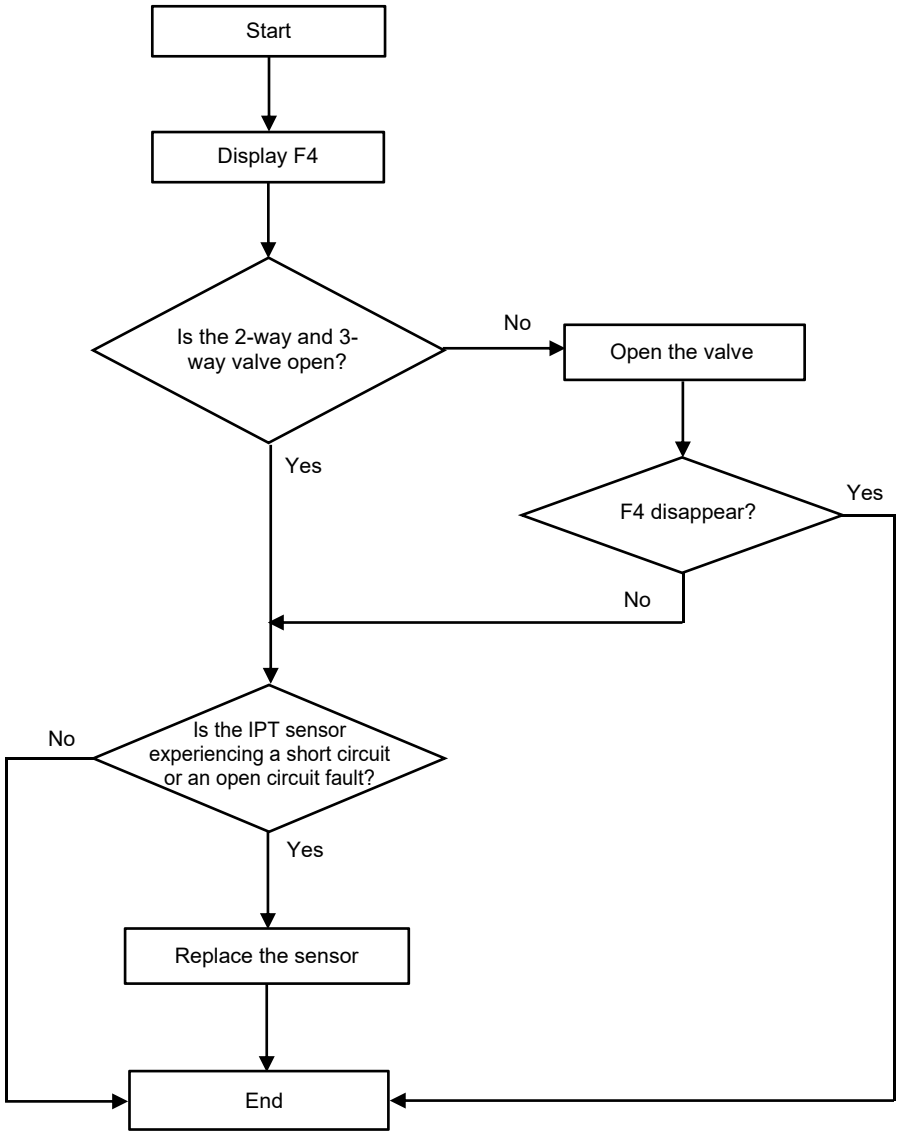


# Troubleshooting

7

## F4 Error Code: Abnormal Refrigerant Flow Protection

When the compressor starts, the system monitors changes in the indoor coil temperature. If the 2-way or 3-way valve on the outdoor unit has not been opened during installation, refrigerant cannot flow through the system. The system then activates refrigerant flow protection, stops, and displays error code "F4."

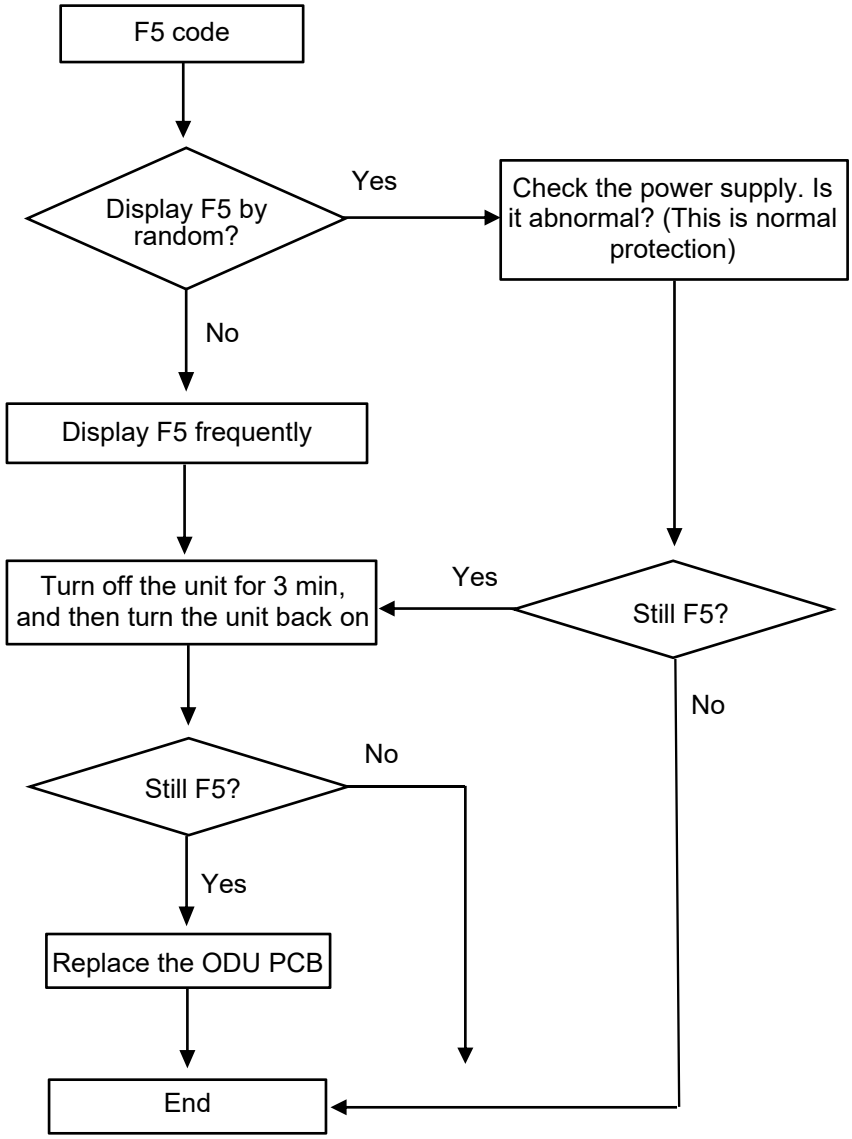


# Troubleshooting

7

## F5 Error Code: Outdoor Unit PFC Protection

If the outdoor unit undergoes PFC protection, the system displays the "F5" error code.

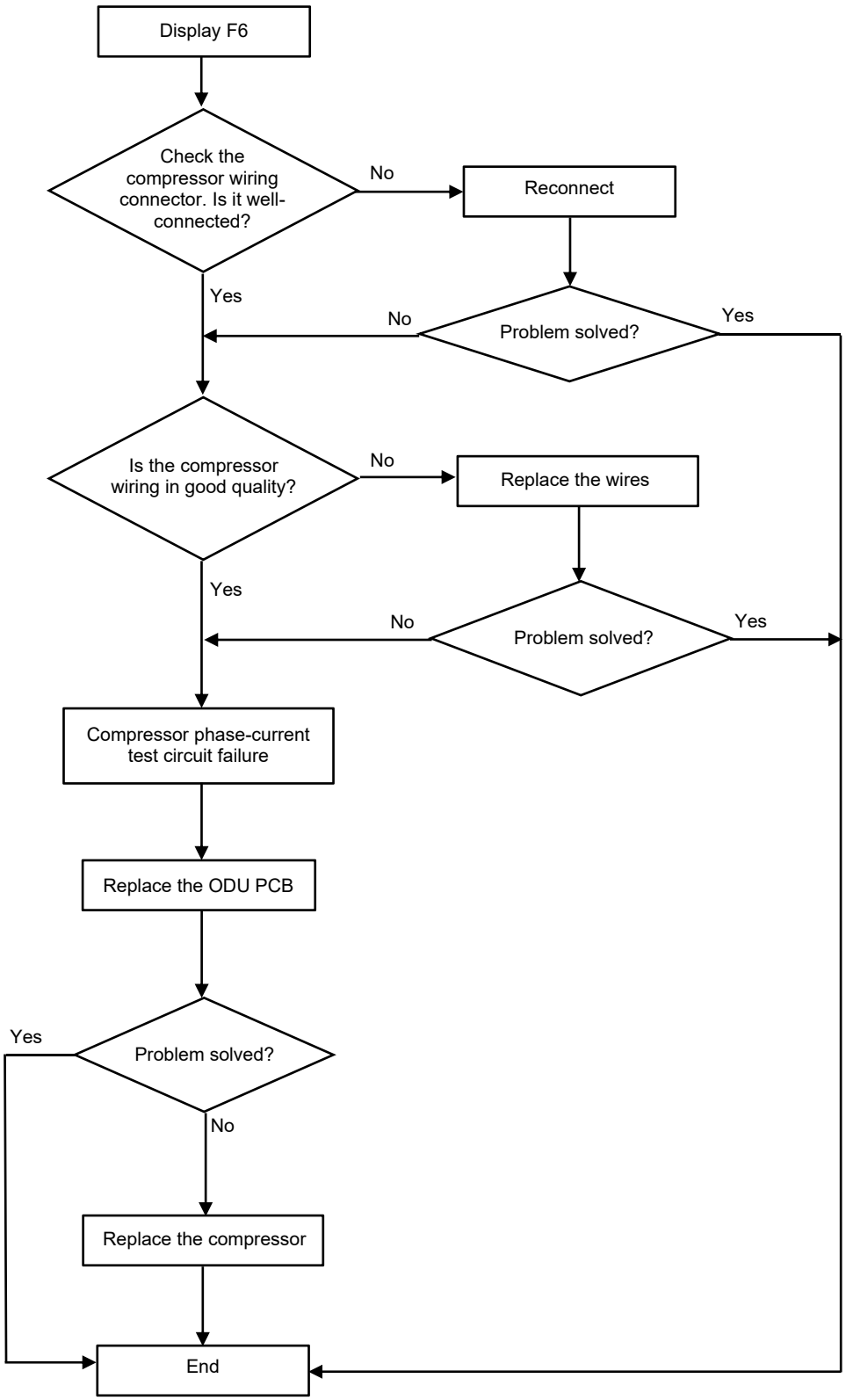


# Troubleshooting

7

## F6 Error Code: Compressor Phase Loss / Phase Reversal Protection

If the outdoor unit PCB cannot detect current in one or more phases of the compressor, the system activates phase loss protection, stops, and displays error code "F6."



# Troubleshooting

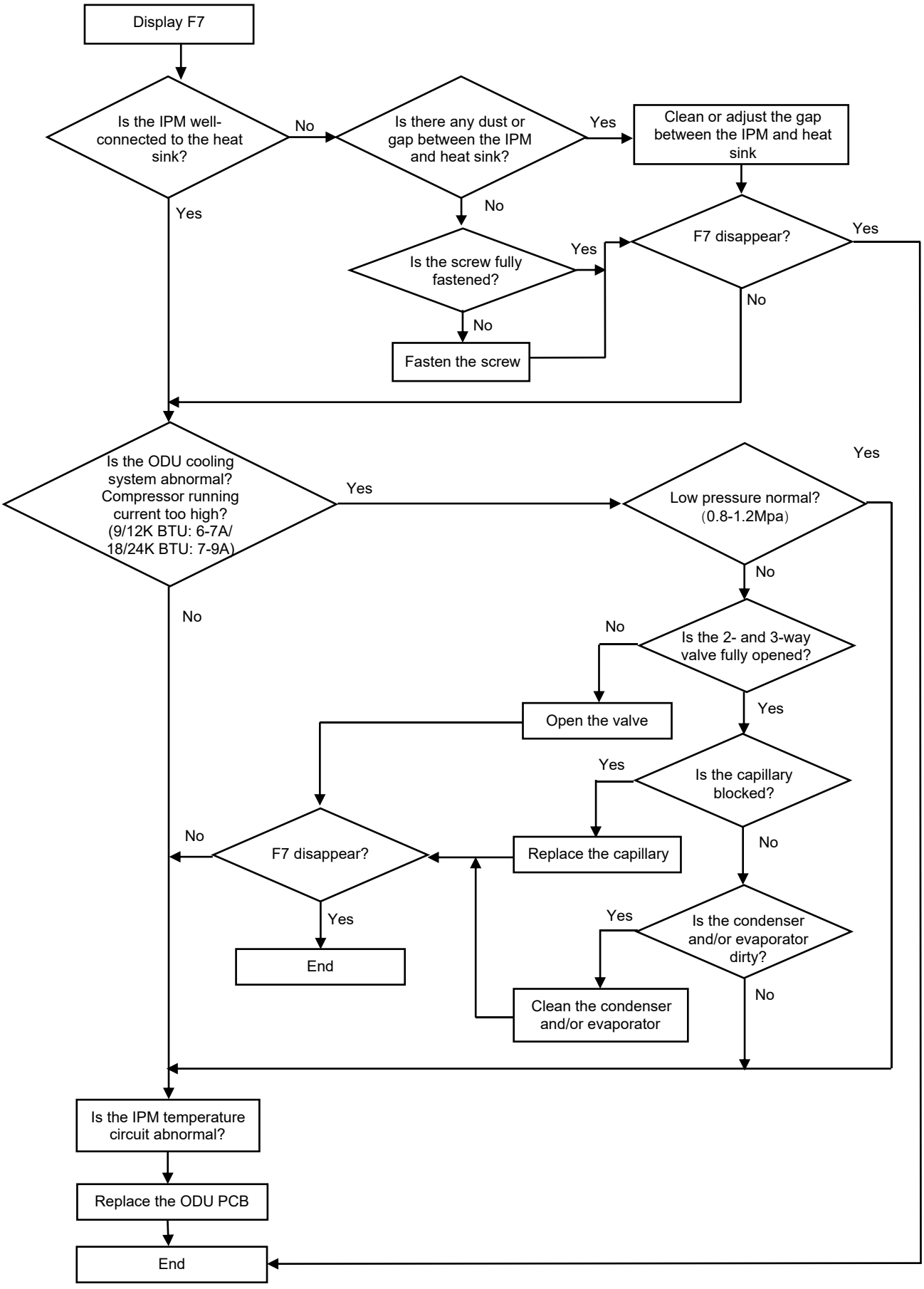
7

## F7 Error Code: Outdoor Unit IPM Abnormal Temperature Protection

If the IPM temperature rises above 203°F (95°C), IPM overheat protection activates and the outdoor unit stops. The system displays error code "F7."

# Troubleshooting

7

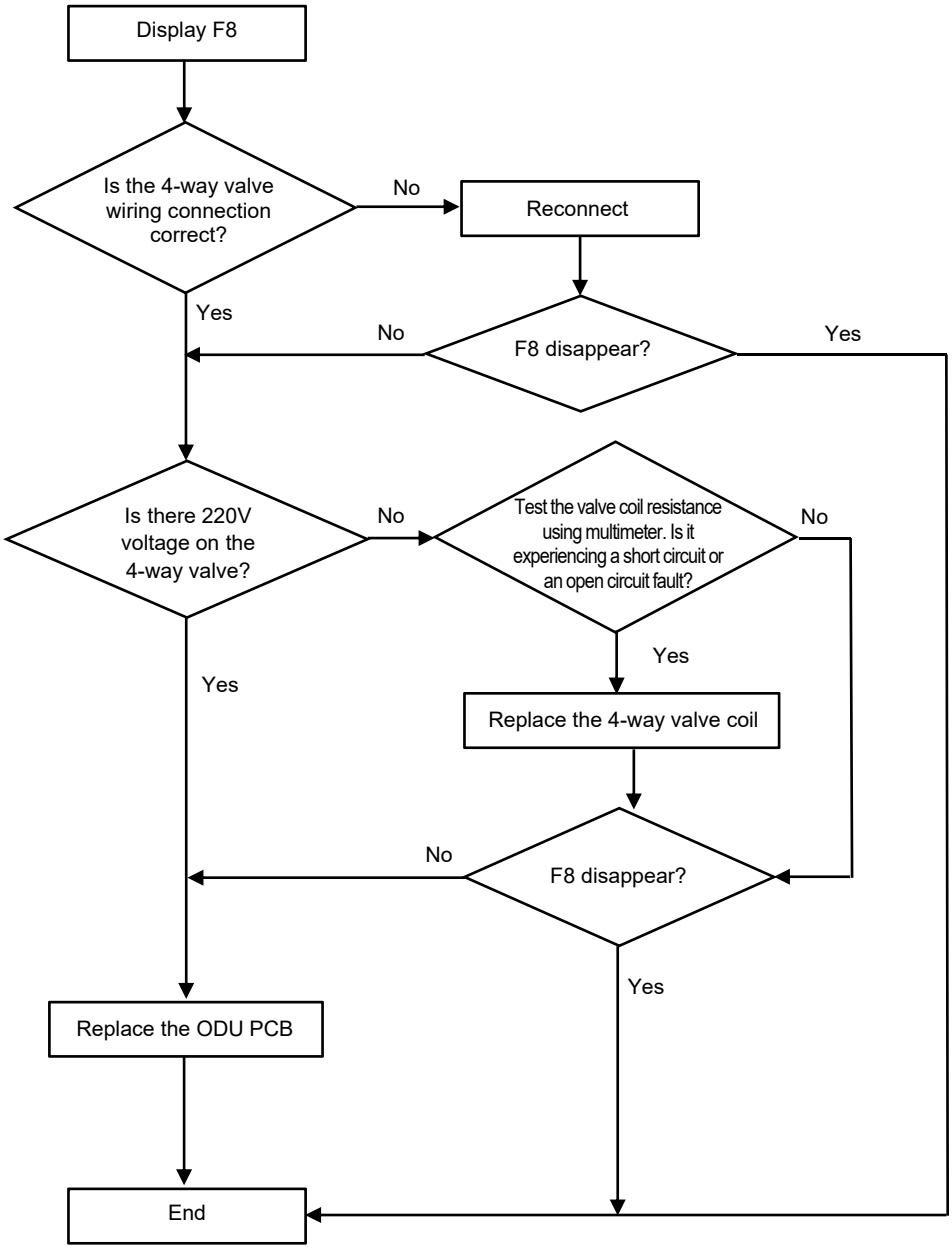


# Troubleshooting

7

## F8 Error Code: Outdoor Unit 4-Way Valve Reversing Abnormality

In Heating mode, if the IPT is 41°F (5°C) or lower after the compressor has run for 8 minutes, the system displays error code "F8."



# Troubleshooting

7

## F9 Error Code: Outdoor Unit IPM Temperature Sensor Error

**Reason:** The IPM module temperature test circuit failure.

**Solution:** Replace the outdoor unit PCB.

## FA Error Code: Outdoor Unit Compressor Phase Current Detection Circuit Failure

**Reason:** The compressor phase-current test circuit failure.

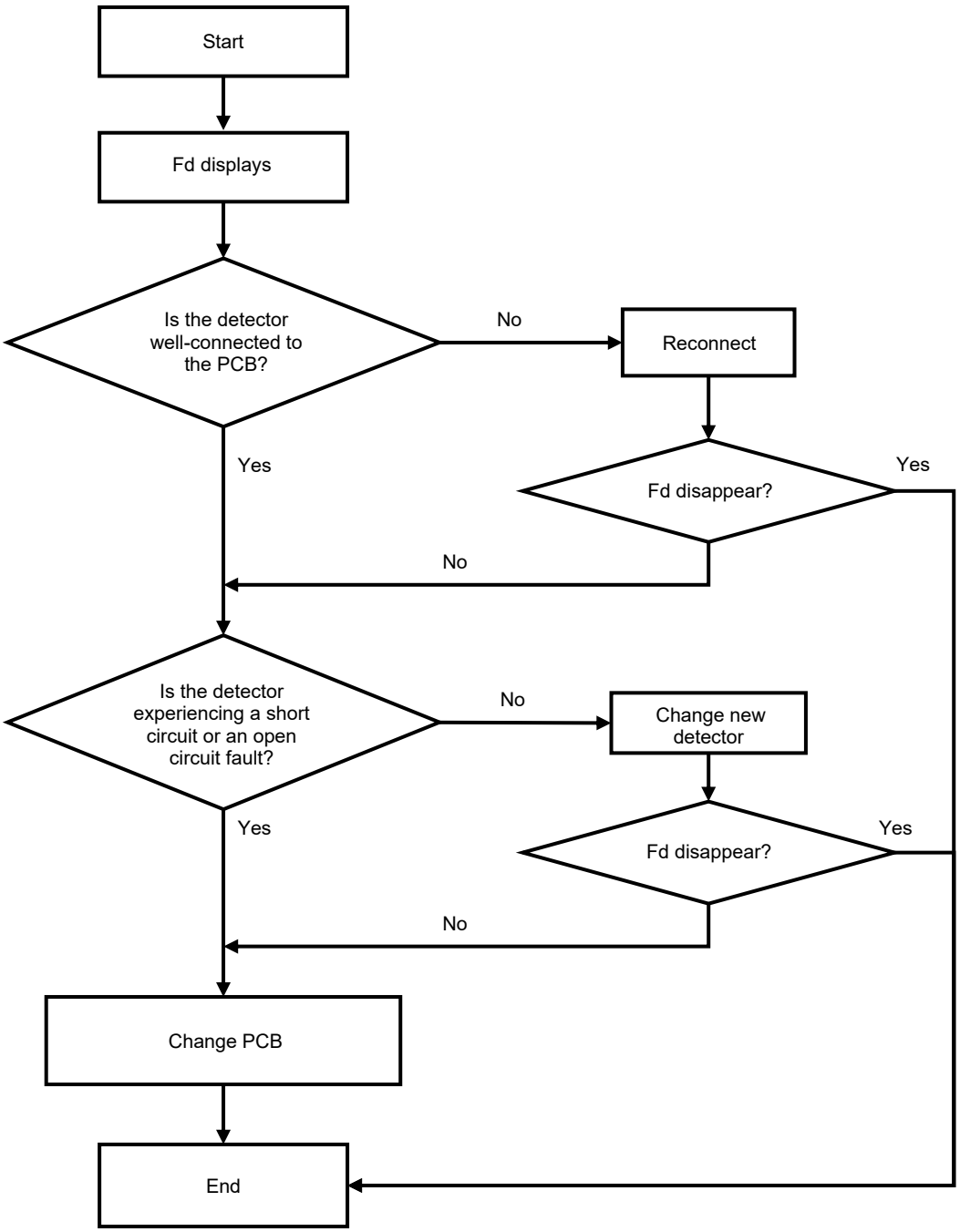
**Solution:** Replace the outdoor unit PCB.

# Troubleshooting

7

## Fd Error Code: Refrigerant Leak Sensor Communication Error

If the system detects a refrigerant leak, it displays error code "Fd." Turn off the system immediately and contact a qualified technician to locate the leak.

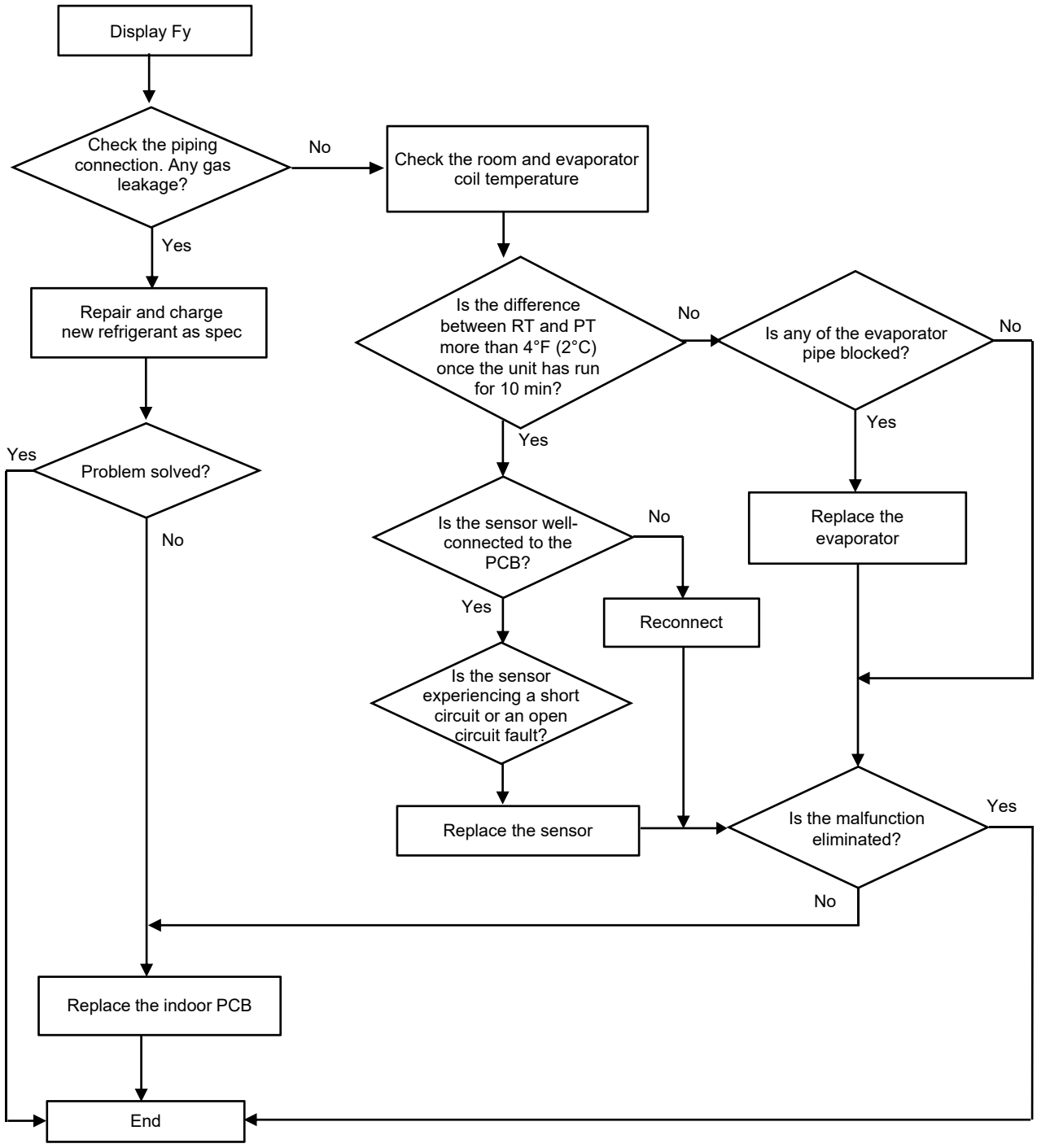


# Troubleshooting

7

## Fy Error Code: Refrigerant Deficiency Protection

After the compressor has run at high frequency for 9 minutes, if the indoor and outdoor coil temperatures have changed very little from their earlier readings but the compressor discharge temperature stays high, the system displays error code "Fy."

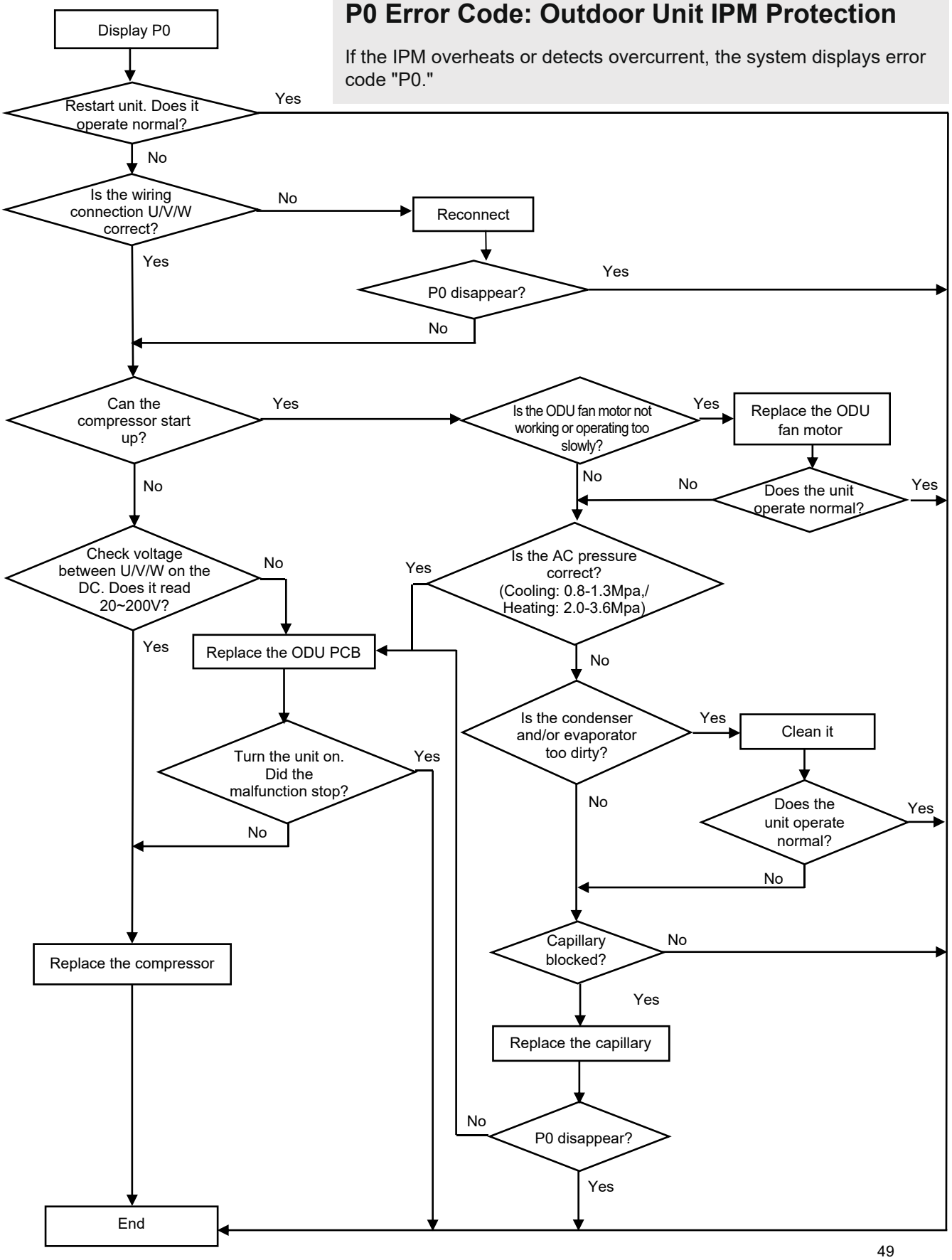


# Troubleshooting

7

## P0 Error Code: Outdoor Unit IPM Protection

If the IPM overheats or detects overcurrent, the system displays error code "P0."



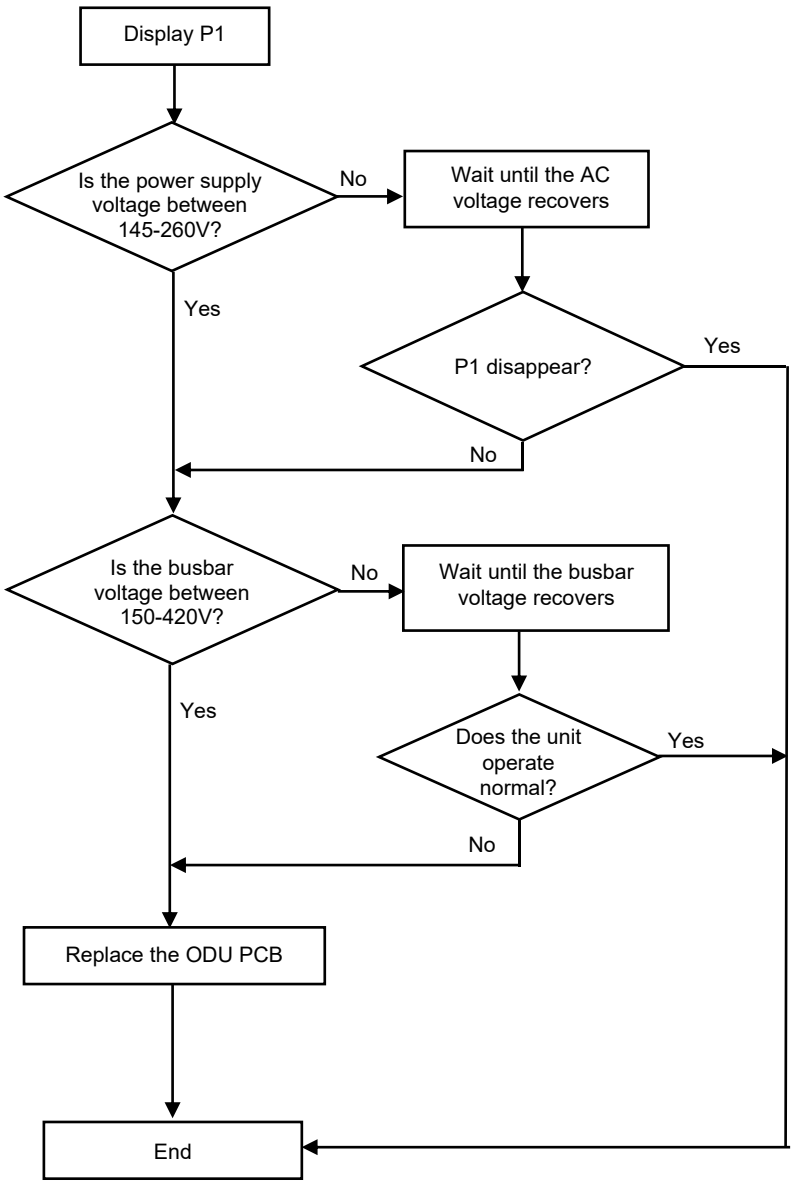
# Troubleshooting

7

## P1 Error Code: Overvoltage / Undervoltage Protection

1. The system monitors the supply voltage between L and N. If the voltage rises above 260 V AC or drops below 150 V AC, it displays error code "P1." The system returns to its previous operating state when the voltage rises above 155 V AC.

2. The system monitors the DC bus voltage across the large electrolytic capacitor on the outdoor unit PCB. If the voltage rises above 420 V DC or drops below 150 V DC, the system stops displaying error code "P1". The system returns to its previous operating state when the voltage is between 190 V DC and 410 V DC.

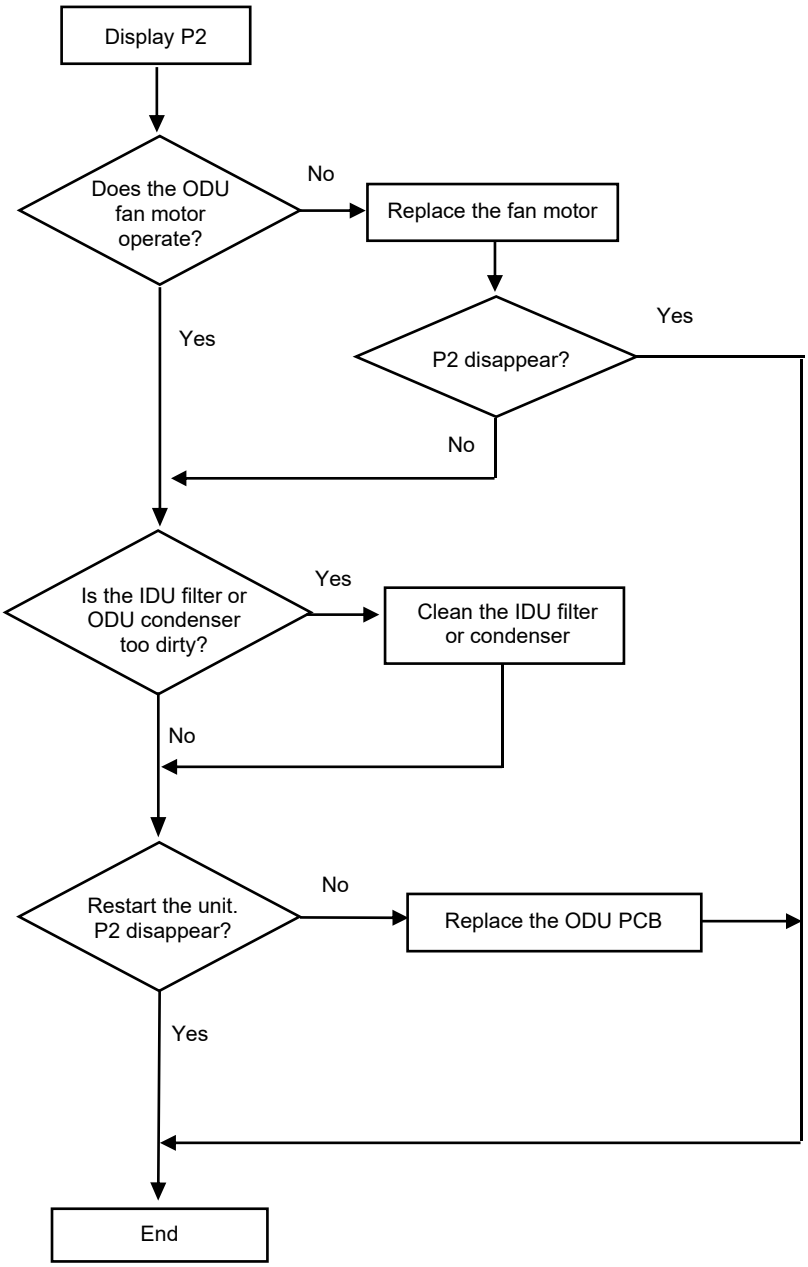


# Troubleshooting

7

## P2 Error Code: Overcurrent Protection

If the system's operating current exceeds Imax, it stops and displays error code "P2." The Imax value varies by model.



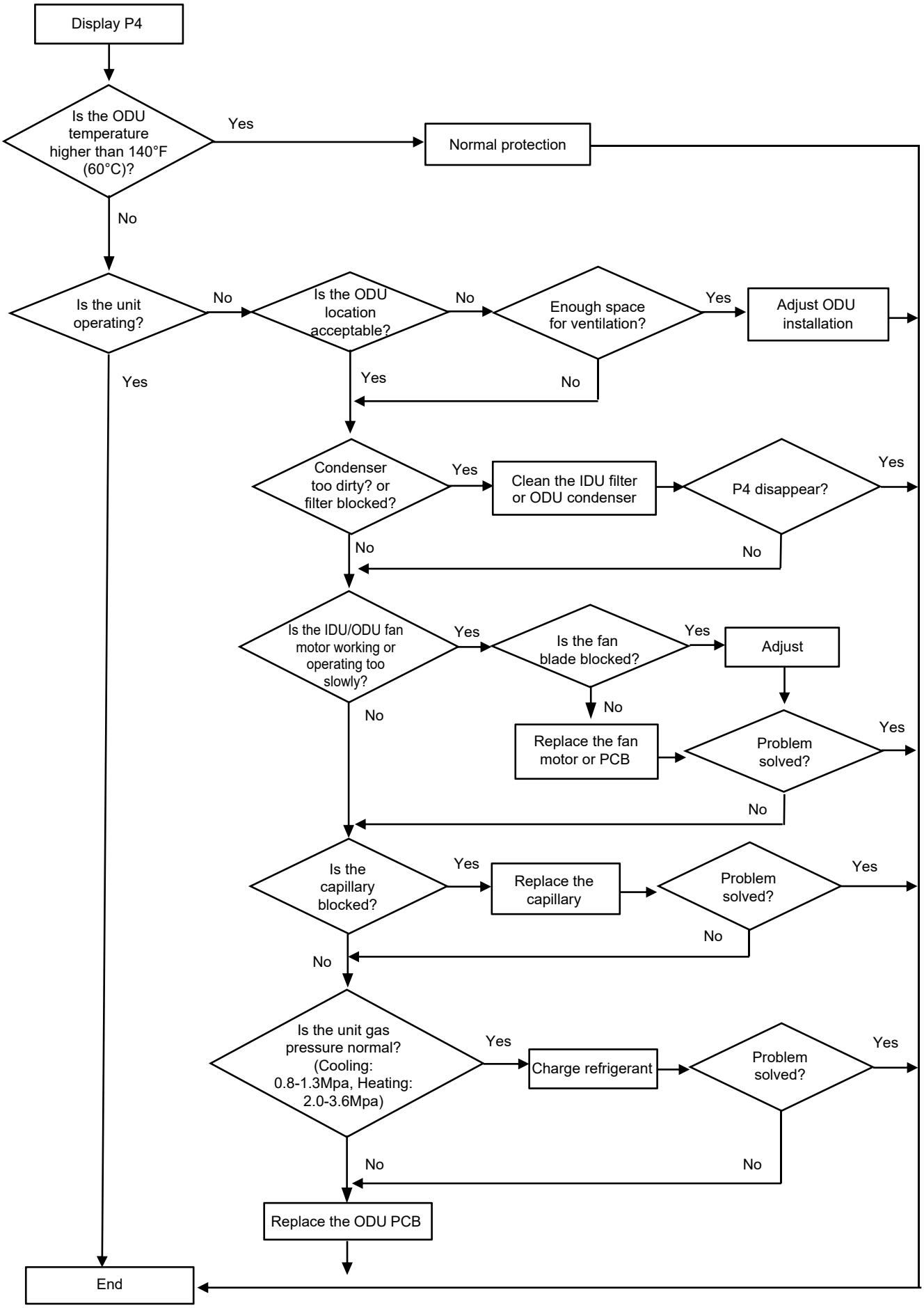
# Troubleshooting

7

## P4 Error Code: Outdoor Unit High Discharge Temperature Protection

# Troubleshooting

7

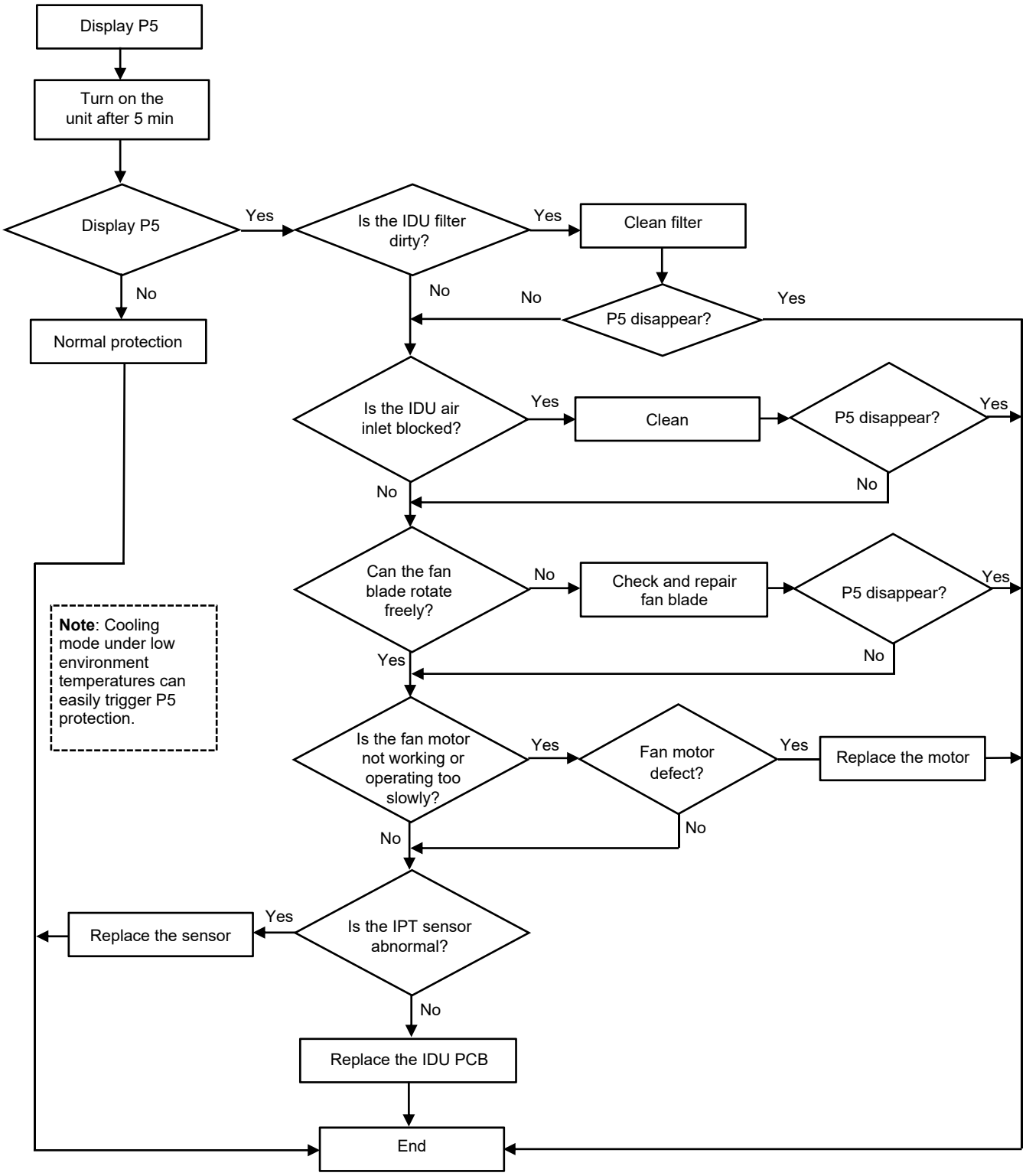


# Troubleshooting

7

## P5 Error Code: Cooling / Dry Mode Overcooling Protection

In Cooling or Dry mode, after the compressor has run for 6 minutes, if the IPT stays below 34°F (1°C) for 3 consecutive minutes, the outdoor unit stops and the system displays error code "P5."

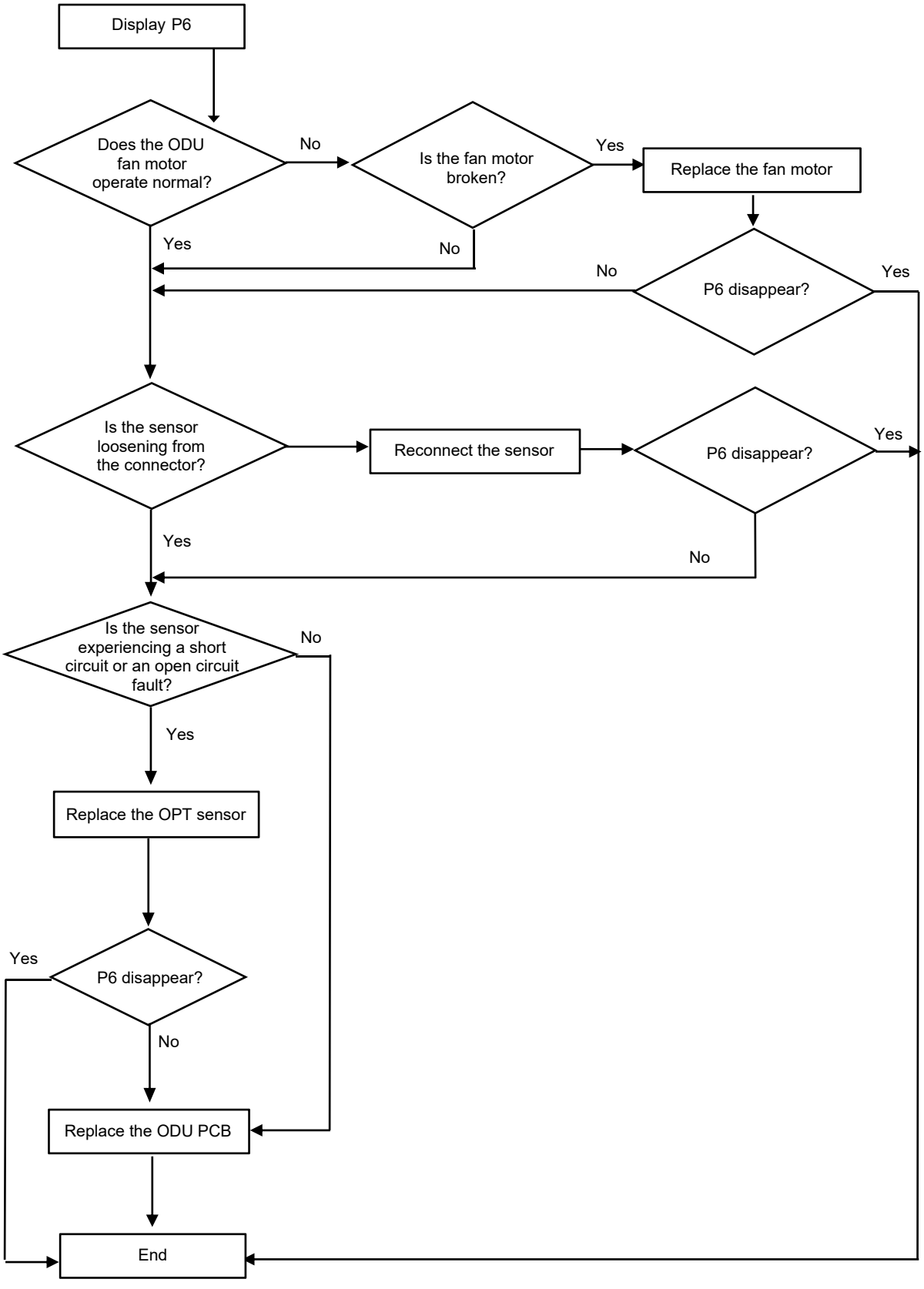


# Troubleshooting

7

## P6 Error Code: Cooling Mode Overheat Protection

In Cooling or Dry mode, if the outdoor coil temperature reaches 144°F (62°C) or higher, the outdoor unit stops and the system displays error code "P6."

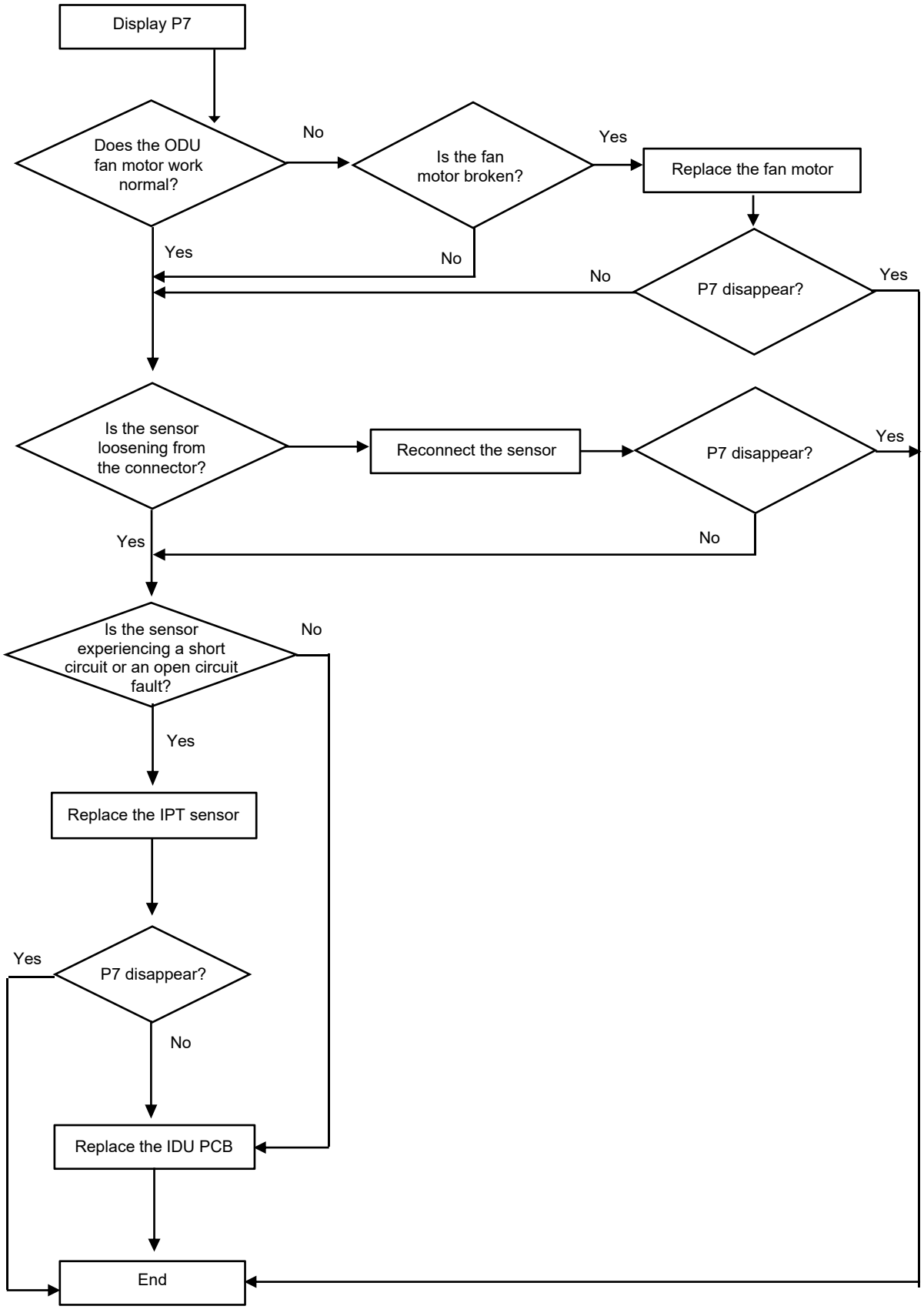


# Troubleshooting

7

## P7 Error Code: Heating Mode Overheat Protection

In Heating mode, if the IPT reaches 144°F (62°C) or higher, the outdoor unit stops and the system displays error code "P7."



# Troubleshooting

7

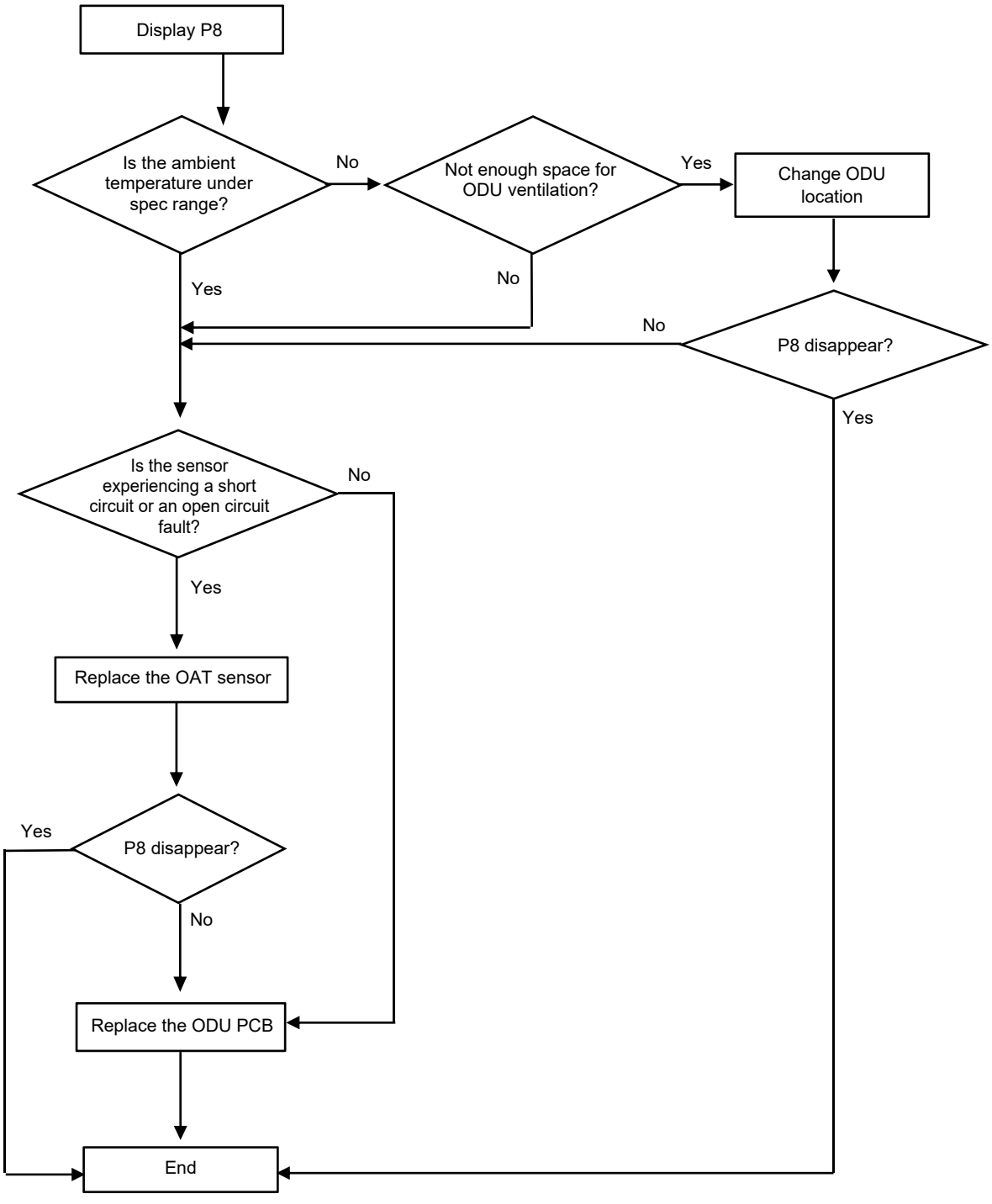
## P8 Error Code: Outdoor Ambient High / Low Temperature Protection

If the outdoor ambient temperature goes outside the following range, the compressor stops. After 200 seconds, the system displays error code "P8."

Cooling or Dry mode: Below -4°F (-20°C) or above 145°F (63°C).

Heating Mode:

A. OAT ≥ 104°F (40°C)
B. 86°F (30°C) < OAT ≤ 104°F (40°C) and RT > 95°F (35°C)



# Troubleshooting

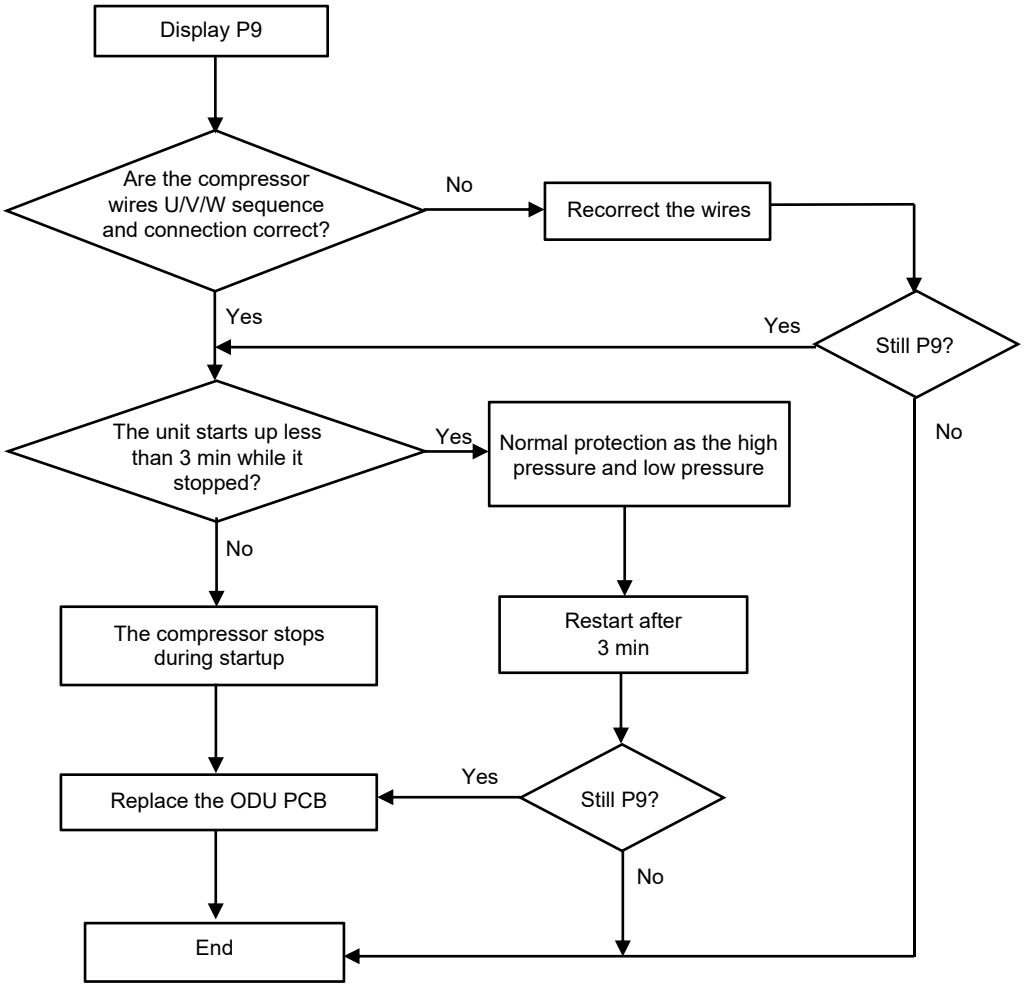
7

## P9 Error Code: Outdoor Unit Compressor Drive Overload Protection

If any of the following occurs while the compressor is starting or running, the outdoor unit stops and the system displays error code "P9":

1. The control board does not receive a feedback signal from the compressor.
2. The control board detects an abnormal signal from the compressor.
3. The compressor fails to start normally.

The system then attempts to restart up to six times. If the compressor still does not operate normally, it displays the error code again.



# Unit Control

8

## A. Introduction

### Abbreviations

RT: Room Temperature
IPT: Indoor Pipe (Coil) Temperature
ST: Indoor Set Temperature
OPT: Outdoor Pipe Temperature
OAT: Outdoor Ambient Temperature
ODT: Outdoor Discharge Temperature
CRT: Compensated Room Temperature
IDU: Indoor Unit (Air Handler)
ODU: Outdoor Unit (Condenser)

### Temperature Variation

The temperature measured at the indoor unit's air inlet may differ from the actual room temperature. Because the temperature sensor is located inside the air inlet rather than in the main area of the room, the unit's control board applies a temperature compensation to make up for this difference.

1. Cooling mode: CRT=RT
2. Heating mode: CRT=RT 27°F (-3°C) - Split AC

# Unit Control

8

## B. Operating Modes & Functions

### Cooling Mode

**Temperature Control:** In Cooling mode, the temperature can be set between 61°F and 88°F (16°C and 31°C). The fan speed and louver position adjust automatically based on the Cooling mode presets.

**Compressor & Unit Control:**

- The compressor starts, and the indoor unit operates according to the customer's preset settings when:
  - RT-ST reaches or exceeds 33°F (1°C)

- The compressor stops operating when:
  - RT-ST reaches or falls below 27°F (-3°C) and the compressor keeps operating for 2 minutes continuously.
  - RT-ST reaches or falls below 28°F (-2°C) and the compressor operates in the lowest frequency for 5 minutes continuously.
  - RT-ST reaches or falls below 30°F (-1°C) and the compressor operates in the lowest frequency for 10 minutes continuously.

**Compressor Frequency Control:**

- Based on the relation of RT and ST and the changing speed of RT.

- The compressor stops operating when the indoor unit is:
  - Switched off
  - Under protection
  - Changed to Fan mode

- During normal operation, the compressor runs for at least 7 minutes before the unit programming stops it.

- During normal operation, once the compressor stops, there is a 3-minute delay before the next procedure begins.

**Outdoor Unit Fan Motor Control:**

- When the unit is:
  - Switched off
  - Under protection
  - At the set temperature

- After the compressor stops operating, the fan motor also turns off based on the OPT and OAT temperatures. The maximum shutdown delay will not exceed 160 seconds.

- When the indoor unit is turned on in Cooling mode, the outdoor unit's fan motor starts 5 seconds after the compressor.

- If the outdoor unit stops operating due to a fault or safety protection, the indoor unit maintains its preset operation.

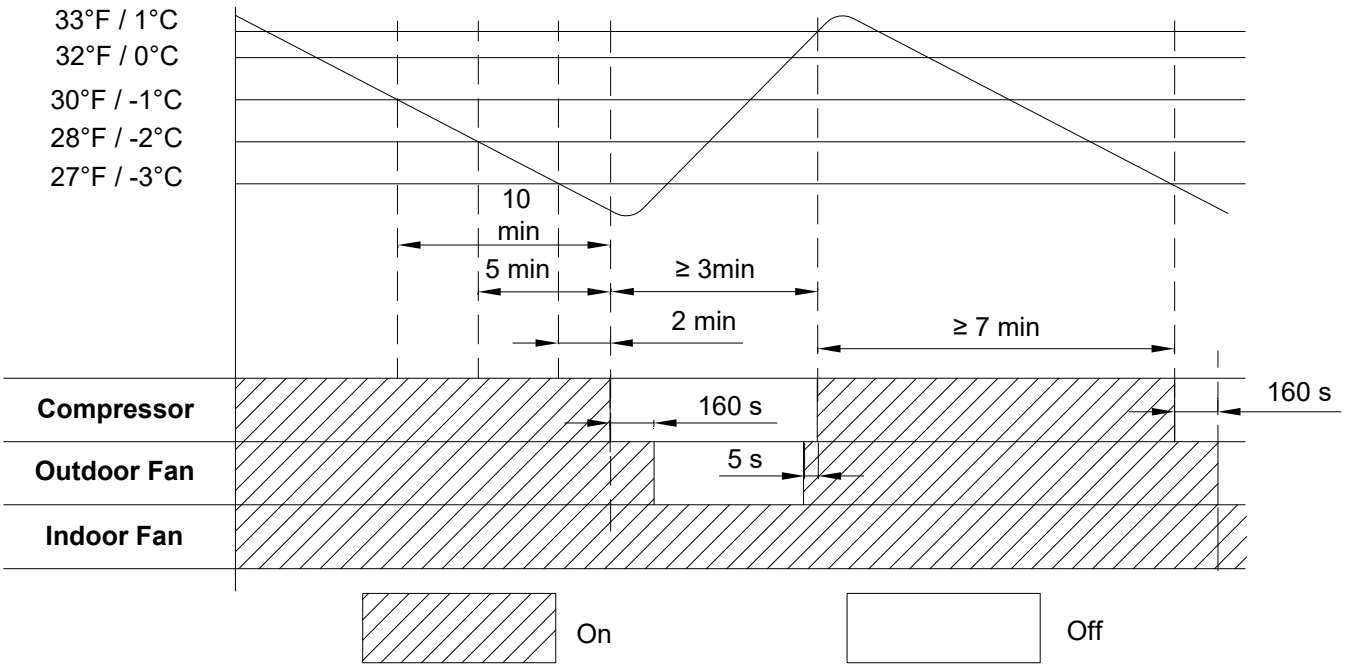
# Unit Control

8

**Anti-Frosting Protection:**

- Control the indoor unit's operating frequency and the rate of frequency change to achieve anti-frost protection.
- Frequency Slowly Increasing (FSI): If the IPT is between 43°F (6°C) and 45°F (7°C), the frequency increases at a rate of 1 Hz per minute, gradually raising the operating speed. Once the IPT reaches or exceeds 45°F (7°C), the indoor unit exits protection mode.
- Frequency Limitation: If the IPT is between 41°F (5°C) and 43°F (6°C), the compressor frequency is prevented from increasing.
- Normal Frequency Decreasing (NFD): If the IPT is between 37°F (3°C) and 39°F (4°C), the frequency decreases by 8 Hz every 90 seconds until it reaches the lower limit.
- Fast Frequency Decreasing (FFD): If the IPT is between 36°F (2°C) and 37°F (3°C), the frequency decreases by 16 Hz every 90 seconds until it reaches the lower limit.
- The indoor unit shuts down if the IPT remains below 34°F (1°C) for 3 continuous minutes. The indoor unit restarts when the IPT exceeds 43°F (6°C) and the compressor has been shut down for at least 3 minutes.

**RT-ST**



# Unit Control

8

## Heating Mode

**Temperature Control:** 61-88°F (16-31°C)

**Compressor & Unit Control:**

- The compressor starts, and the indoor unit operates according to the customer's preset settings when:
  - ST-CRT reaches or exceeds 33°F (1°C).
- The compressor stops operating when:
  - ST-CRT reaches or falls below 27°F (-3°C) and the compressor keeps operating for 2 minutes continuously.
  - ST-CRT reaches or falls below 28°F (-2°C) and the compressor operates in the lowest frequency for 5 minutes continuously.
  - ST-CRT reaches or falls below 30°F (-1°C) and the compressor operates in the lowest frequency for 10 minutes continuously.

**Compressor Frequency Control:**

- The compressor frequency control is based on the relation of RT and ST and the changing speed of RT.
- The compressor stops operating when the indoor unit is:
  - Switched off
  - Under protection
  - Changed to Fan mode
- Once started, the compressor runs for at least 7 minutes before it can stop, whether during normal operation (cooling or heating) or because of an error code.
- During normal operation, once the compressor stops, it waits at least 3 minutes before restarting.

**Indoor Unit Time Delay:**

- In Heating mode, when the compressor stops or the unit is switched off, the indoor unit's fan motor continues to run for a few seconds to dissipate residual heat and prevent overheating.

**Outdoor Unit Fan Motor Control:**

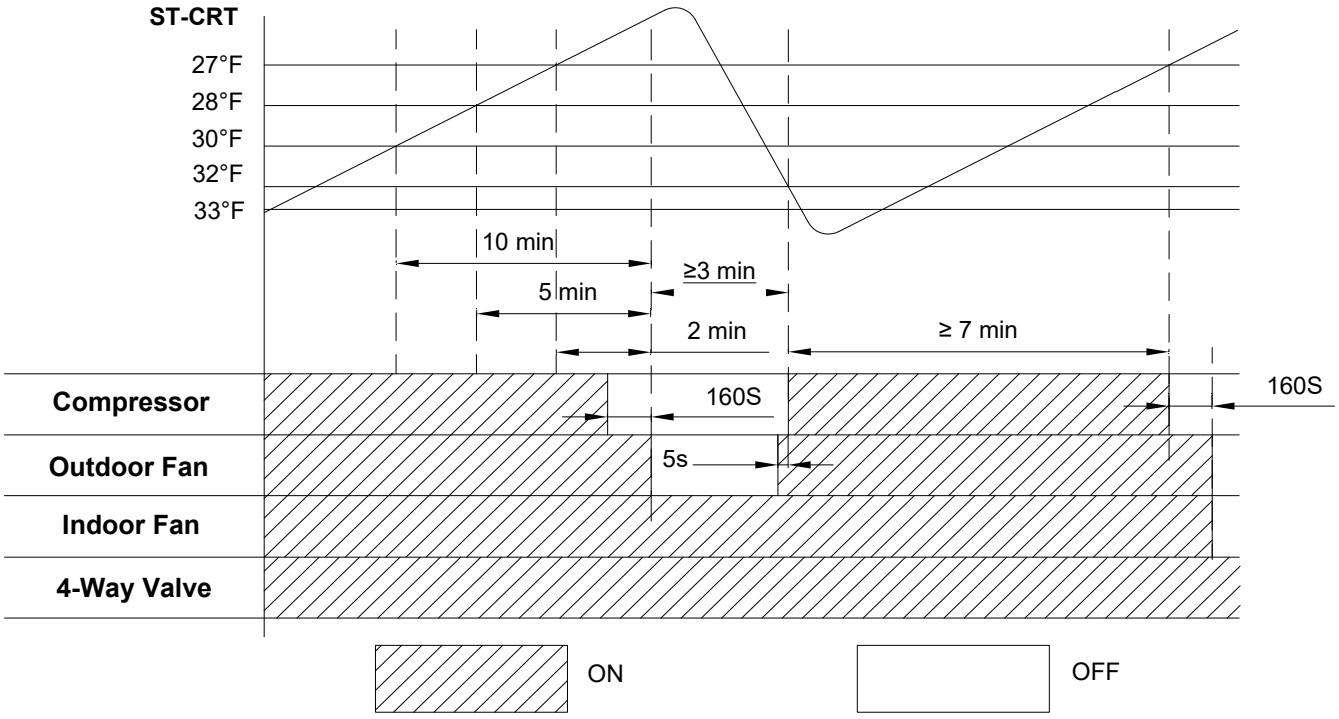
- When the unit is:
  - Switched off
  - Under protection
  - At the set temperature
- When the compressor stops, the outdoor fan motor shuts off after a delay determined by the OPT and OAT. This delay can last up to 160 seconds.
- In Heating mode, the outdoor unit's fan motor starts 5 seconds after the compressor starts.
- During the defrost cycle, the outdoor fan motor starts 48 seconds after the compressor stops.
- When the defrost cycle ends, the compressor turns off, and the outdoor fan motor starts at the same time.

# Unit Control

# 8

**4-Way Valve Control:**

- In Cooling, Dry, or Fan mode, the 4-way valve is de-energized. When the indoor unit switches to Heating mode, the 4-way valve is energized.
- When Heating mode is turned off, switched to another mode, or stops operating due to protection, the 4-way valve turns off 2 minutes after the compressor stops.
- If the indoor unit stops because a protection function is triggered, the 4-way valve turns off for 4 minutes, then turns back on.
- During the defrost cycle, the 4-way valve is de-energized 43 seconds after the compressor stops. When the defrost cycle ends, the compressor stops, and the 4-way valve is energized 43 seconds later.



# Unit Control

8

### Compressor Control

When Cooling or Drying mode is turned on, the indoor fan runs for a short time before the compressor starts. In all modes, once the compressor starts, it runs for a minimum period before it can stop, except in special cases. This protects the compressor from frequent starts and stops. After the compressor stops, it will not restart for a few minutes.

### Oil Return Control

If the unit runs at low frequency for an extended period, the system activates Oil Return control. This function returns oil from the piping to the compressor to prevent oil starvation. During oil return, the compressor frequency increases to the preset oil return frequency. The process typically takes about 5 minutes.

## C. Protection

### Motor Overload Protection & Overcurrent Protection

When the motor's load exceeds its capacity, the motor temperature rises and the current exceeds the rated value. The overload protection threshold is much lower than the over-current protection threshold. Overload protection guards against sustained operation above the rated load, which can cause overheating. Overcurrent protection responds to sudden, much higher currents, such as those caused by a short circuit.

### Overload Protection Function

Overload protection in Cooling and Dehumidification modes.

### Protection Control

When the IPM temperature reaches or exceeds 189°F (87°C), the compressor frequency is limited or reduced to protect the IPM from overheating.

When the IPM temperature reaches or exceeds 203°F (95°C), the system stops operating to protect the IPM.

When the IPM temperature falls below 189°F (87°C) and the compressor has been stopped for at least 3 minutes, the unit can restart.

If IPM over-temperature shutdown protection is triggered six times in a row, the unit will not recover automatically and displays a failure code. Press the On/Off button to reset it. If the compressor runs continuously for more than 6 minutes, the protection counter resets to zero. The failure code and protection count are cleared immediately when the unit is turned off or switched to Fan mode.

If the fault cannot be recovered, changing the operation mode will not clear it.

# Remote Control

# 9

### Notes

- Although button shapes and positions vary by model, their features and functions remain identical.
- The display and functional features of the remote controller may vary depending upon the specific system model.
- The unit beeps to confirm each button command.
- There may be a difference between the number of digits shown on the remote control (3) and the number on the indoor unit (2).

# Remote Control

# 9

## Remote Buttons Overview

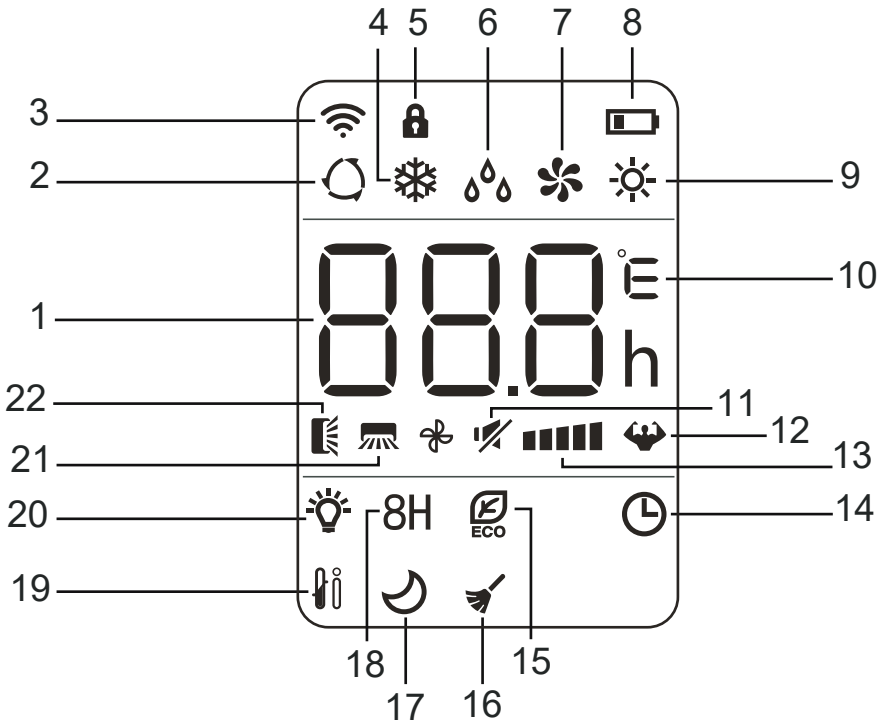
| Button | Description |
|---|---|
| ⏻ | Turn the air conditioner on or off |
| TURBO | Activate/deactivate the Turbo feature to allow the system to rapidly reach set temperatures |
| MUTE | Put the system into Silent mode |
| MODE | Select the mode of operation (Auto, Cool, Dry, Fan, and Heat modes) |
| ECO | Activate/deactivate the ECO feature |
| | Long press to activate the 46°F “Away from Home” freeze protection setting |
| TIMER | Configure the automatic on/off times |
| ∧ | Increase set temperature and timing, as well as navigate the functional menu |
| ∨ | Decrease set temperature and timing, as well as navigate the functional menu |
| FAN | Configure the fan speed (Auto, Low, Mid, and High) |
| | Activate/deactivate the up-down louver motor |
| | Activate/deactivate the left-right louver motor |
| DISPLAY | Turn the LED display on or off |
| SLEEP | Toggle the system’s Sleep mode |
| I FEEL | Activate/deactivate the system’s Follow Me mode |
| MEMORY | Recall saved temperature/mode/fan settings |
| CLEAN | Activate/deactivate Self-Clean mode |
| ACC | Reserved for future usage |
| LOCK | Hold MODE+TIMER for child-lock |



# Remote Control

# 9

## Remote Control LED Screen & Icons




| No. | Icon | Description |
|---|---|---|
| 1 | | Temperature indicator |
| 2 | | Auto mode |
| 3 | | Signal transmit indicator |
| 4 | | Cooling mode |
| 5 | | Child lock indicator |
| 6 | | Dry mode |
| 7 | | Fan Only mode |
| 8 | | Battery level indicator |
| 9 | | Heating mode |
| 10 | | Unit of temperature (°C/°F) |
| 11 | | Mute function |

| No. | Icon | Description |
|---|---|---|
| 12 | | Turbo mode |
| 13 | | Fan speed (Auto or Fixed) |
| 14 | | Timer active indicator |
| 15 | | ECO mode |
| 16 | | Self-Clean function |
| 17 | | Sleep function |
| 18 | 8H | 8°C (46°F) Heating function |
| 19 | | I Feel/Follow Me mode |
| 20 | | LED display on/off |
| 21 | | Left-Right swing indicator |
| 22 | | Up-Down swing indicator |

# Emergency Manual Button

10

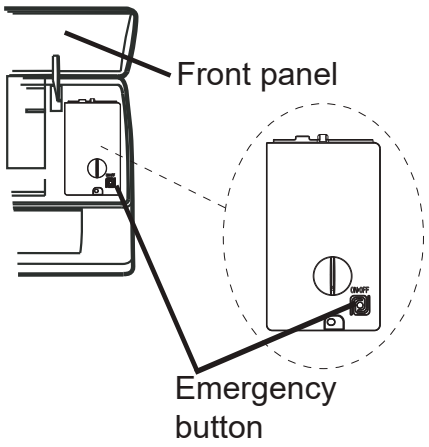
## Emergency Manual Button

The emergency button on the front of the indoor unit can be used for a function test if the remote control is malfunctioning or the batteries have lost power. Do not press the emergency switch during normal operation.

The following are available functions using the Emergency manual button:

- First press: Activates Cooling mode.
- Second press (within 3 seconds): Activates Heating mode.
- Third press: Turns the system off.

The emergency button is under the front panel, on the unit's terminal block cover.




If the remote control fails to operate the system, follow these steps:

1. Open and lift the front panel at an angle to access the emergency button.

2. Press the manual button once to start the unit in Cooling mode.

3. Press the button again within 3 seconds to start the unit in Heating mode.

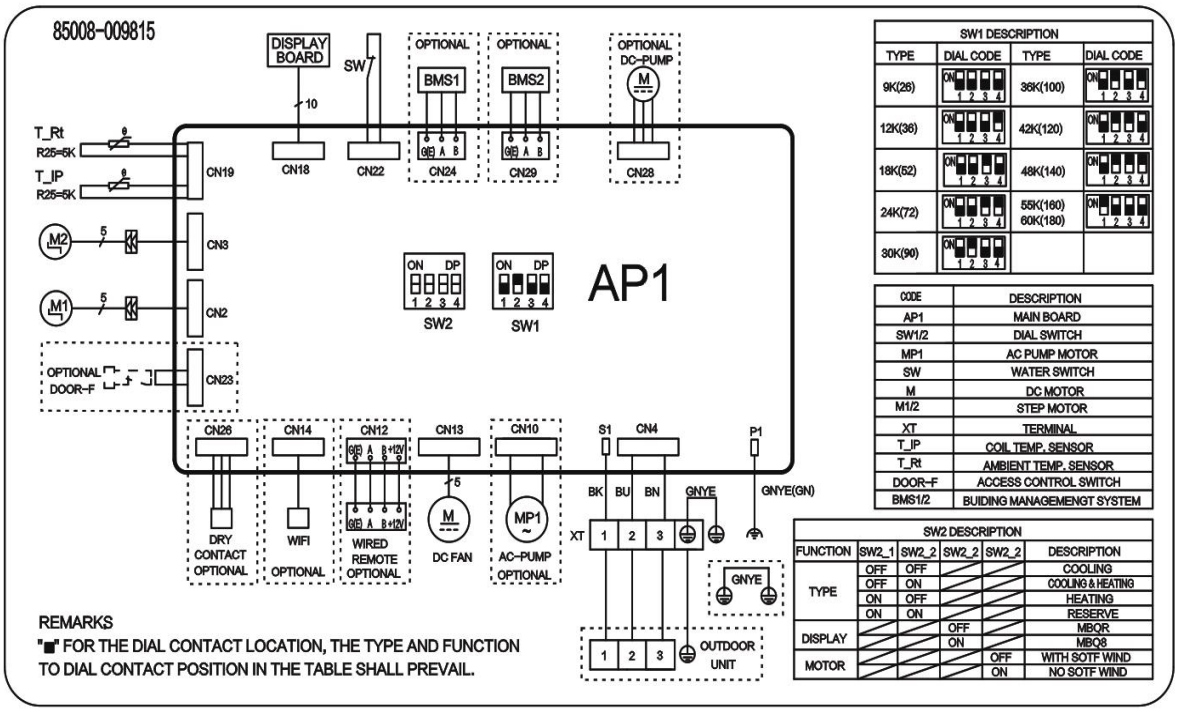
4. Press the button a third time within 5 seconds to turn off the unit.

# Wiring Diagrams

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## Control Board Wiring Diagrams

**Indoor Units:** CT009GLSILCFHG | CT012GLSILCFHG




SW1 DESCRIPTION

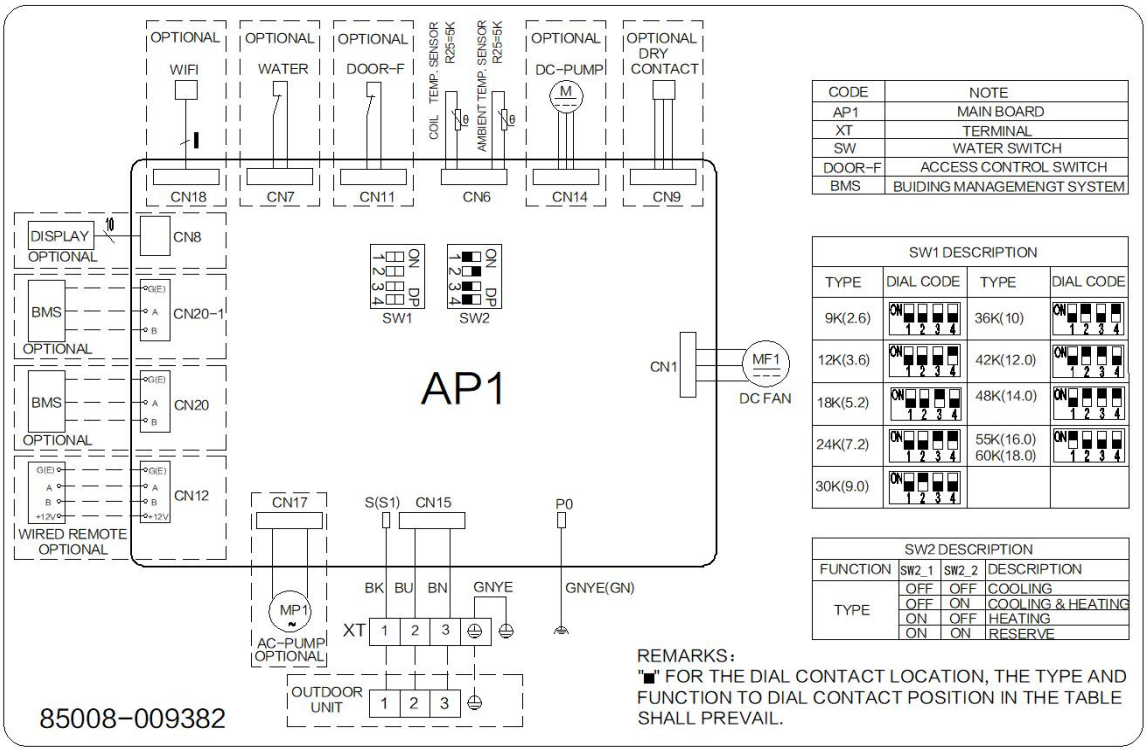
| TYPE | DIAL CODE | TYPE | DIAL CODE |
|---|---|---|---|
| 9K(26) | | 36K(100) | |
| 12K(36) | | 42K(120) | |
| 18K(52) | | 48K(140) | |
| 24K(72) | | 55K(160) 60K(180) | |
| 30K(90) | | | |

| CODE | DESCRIPTION |
|---|---|
| AP1 | MAIN BOARD |
| SW1/2 | DIAL SWITCH |
| MP1 | AC PUMP MOTOR |
| SW | WATER SWITCH |
| M | DC MOTOR |
| M1/2 | STEP MOTOR |
| XT | TERMINAL |
| T_IP | COIL TEMP. SENSOR |
| T_Rt | AMBIENT TEMP. SENSOR |
| DOOR-F | ACCESS CONTROL SWITCH |
| BMS1/2 | BUIDING MANAGEMENGT SYSTEM |

SW2 DESCRIPTION

| FUNCTION | SW2_1 | SW2_2 | SW2_2 | SW2_2 | DESCRIPTION |
|---|---|---|---|---|---|
| TYPE | OFF | OFF | | | COOLING |
| | OFF | ON | | | COOLING & HEATING |
| | ON | OFF | | | HEATING |
| | ON | ON | | | RESERVE |
| DISPLAY | | | OFF | | MBOR |
| | | | ON | | MBQ8 |
| MOTOR | | | | OFF | WITH SOTF WIND |
| | | | | ON | NO SOTF WIND |

**Indoor Units:** CT018GLSILCFHG | CT024GLSILCFHG




| CODE | NOTE |
|---|---|
| AP1 | MAIN BOARD |
| XT | TERMINAL |
| SW | WATER SWITCH |
| DOOR-F | ACCESS CONTROL SWITCH |
| BMS | BUIDING MANAGEMENGT SYSTEM |

SW1 DESCRIPTION

| TYPE | DIAL CODE | TYPE | DIAL CODE |
|---|---|---|---|
| 9K(2.6) | | 36K(10) | |
| 12K(3.6) | | 42K(12.0) | |
| 18K(5.2) | | 48K(14.0) | |
| 24K(7.2) | | 55K(16.0) 60K(18.0) | |
| 30K(9.0) | | | |

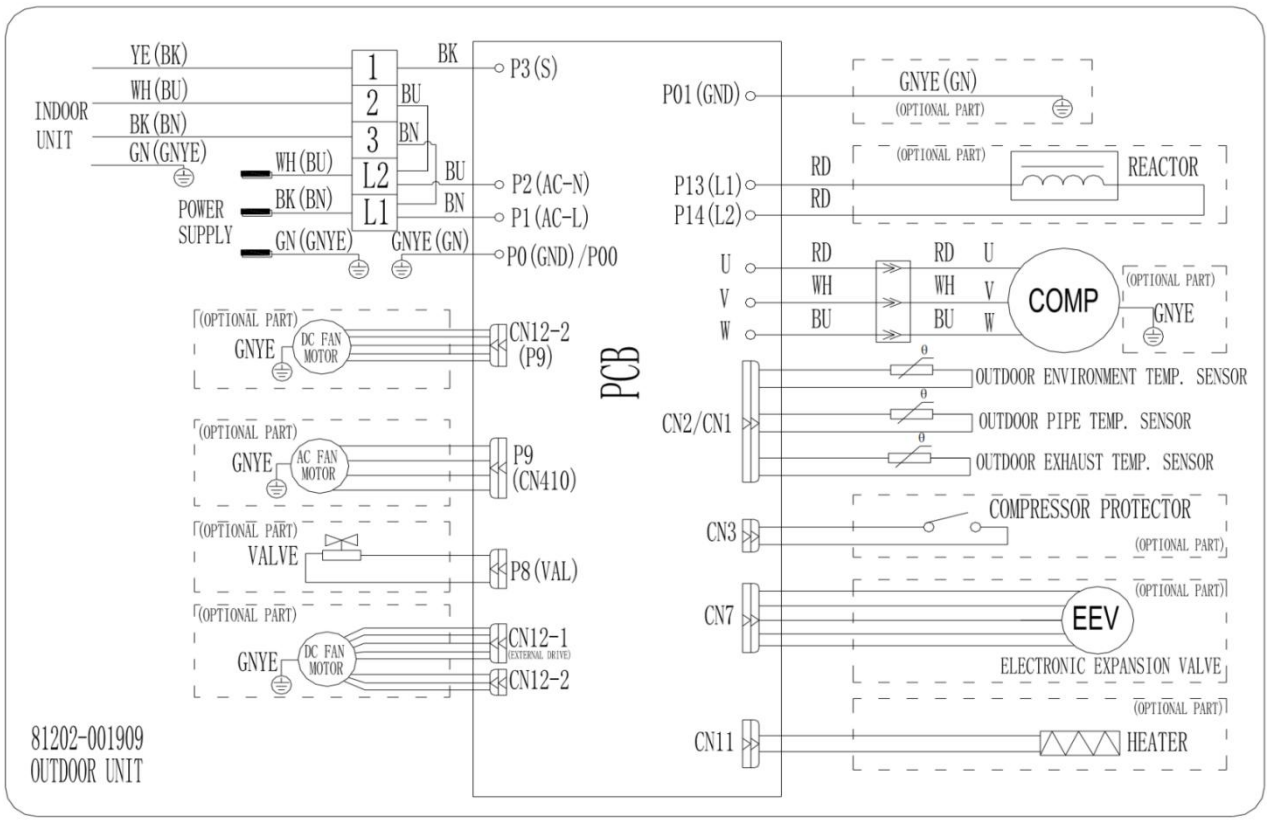
SW2 DESCRIPTION

| FUNCTION | SW2_1 | SW2_2 | DESCRIPTION |
|---|---|---|---|
| TYPE | OFF | OFF | COOLING |
| | OFF | ON | COOLING & HEATING |
| | ON | OFF | HEATING |
| | ON | ON | RESERVE |

# Wiring Diagrams

11

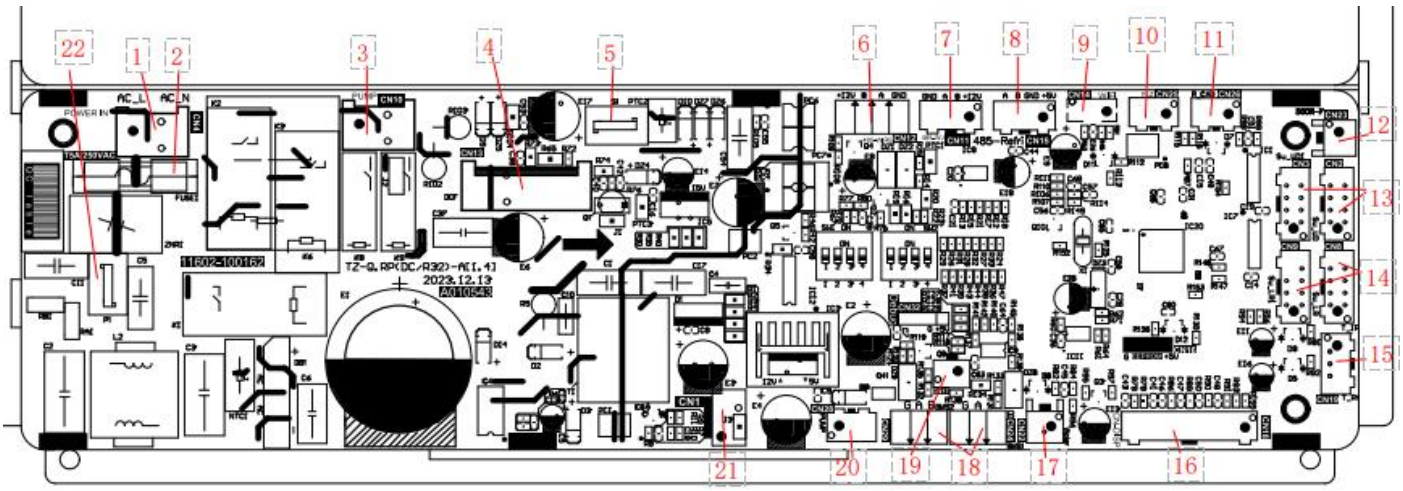
**Outdoor Units:** YN009GLSI24RPG | YN012GLSI24RPG | YN018GLSI24RPG | YN024GLSI24RPG



# PCB Layouts

12

**Indoor Units:** CT009GLSILCFHG | CT012GLSILCFHG | CT018GLSILCFHG | CT024GLSILCFHG



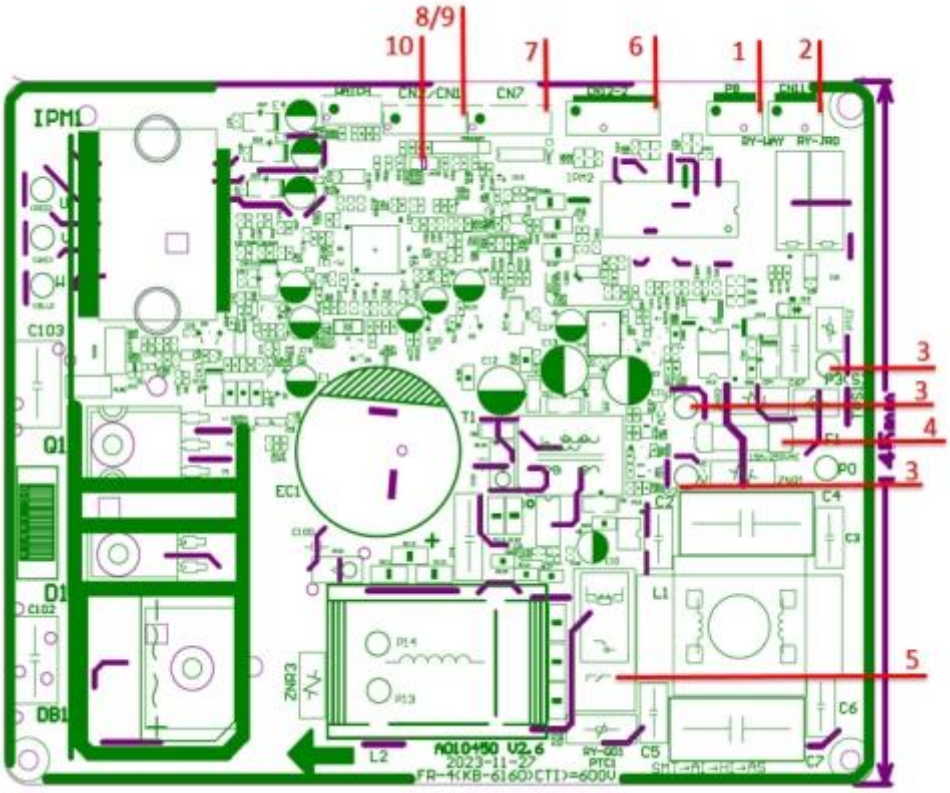

| | | | |
|---|---|---|---|
| 1 | Power supply and L, N connector | 13 | Up-down swing connector |
| 2 | Fuse | 14 | Left-right swing connector |
| 3 | Water pump (AC motor) connector | 15 | Temperature sensor connector |
| 4 | DC fan motor connector | 16 | Display |
| 5 | IDU/ODU communication connector | 17 | Water level test |
| 6 | Wired control connector | 18 | VRF communication port |
| 7 | RS485 communication port | 19 | Jump cap |
| 8 | Refrigerant sensor connector | 20 | Water pump (DC motor) connector |
| 9 | Wi-Fi connector | 21 | E-heater thermostat |
| 10 | Anion connector | 22 | Earth |

# PCB Layouts

12

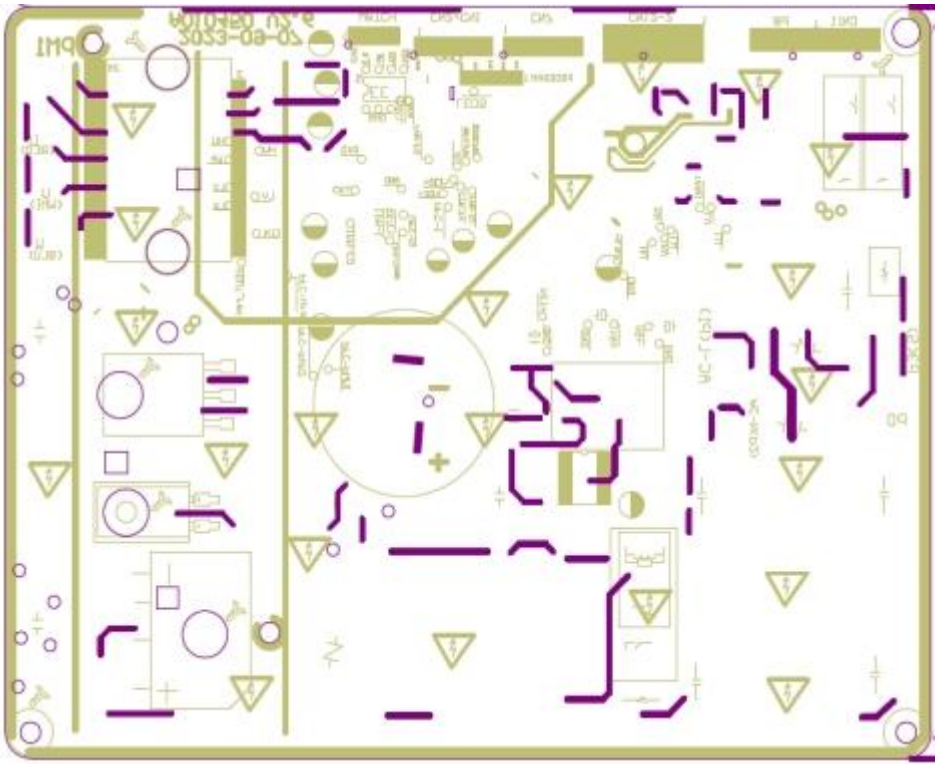
**Outdoor Units:** YN009GLSI24RPG | YN012GLSI24RPG

**Top View**




| | |
|---|---|
| 1 | 4-way valve |
| 2 | Heater |
| 3 | L, N and communication |
| 4 | Fuse |
| 5 | ODU PCB main relay |
| 6 | DC motor connector |
| 7 | Electronic expansion valve |
| 8 | Discharge sensor connector |
| 9 | OAT/OPT sensor connector |
| 10 | LED5 |

**Bottom View**

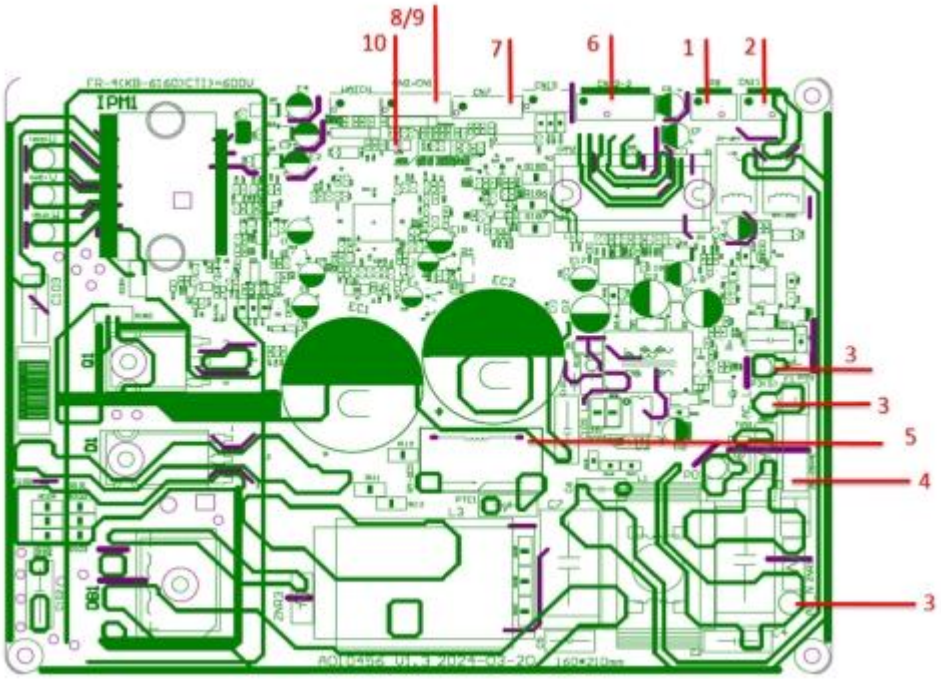


# PCB Layouts

12

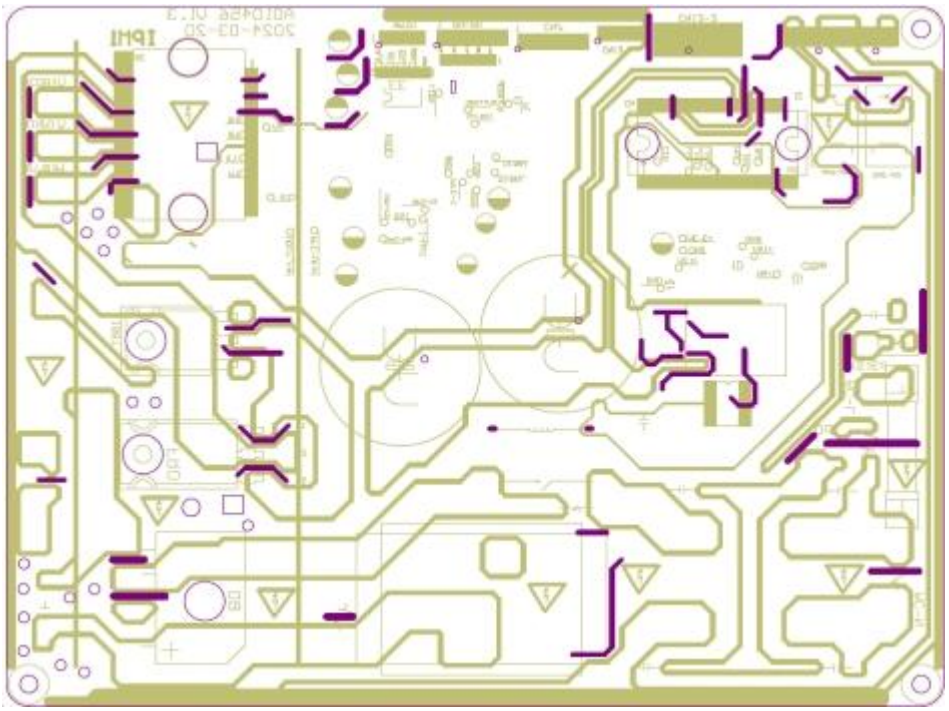
**Outdoor Units:** YN018GLSI24RPG

**Top View**




| | |
|---|---|
| 1 | 4-way valve |
| 2 | Heater |
| 3 | L, N and communication |
| 4 | Fuse |
| 5 | ODU PCB main relay |
| 6 | DC motor connector |
| 7 | Electronic expansion valve |
| 8 | Discharge sensor connector |
| 9 | OAT/OPT sensor connector |
| 10 | LED5 |
| 11 | 4-way valve |
| 12 | Heater |
| 13 | L, N and communication |

**Bottom View**

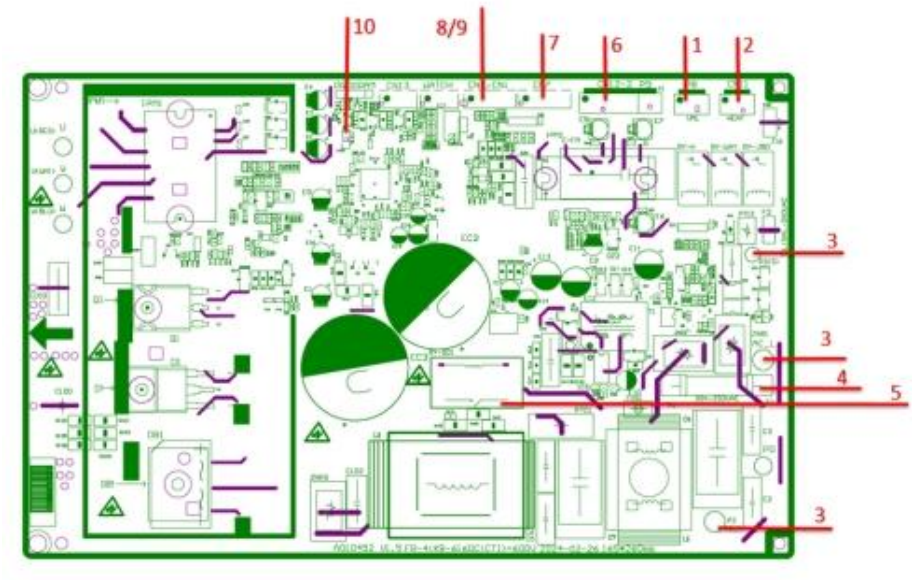


# PCB Layouts

# 12

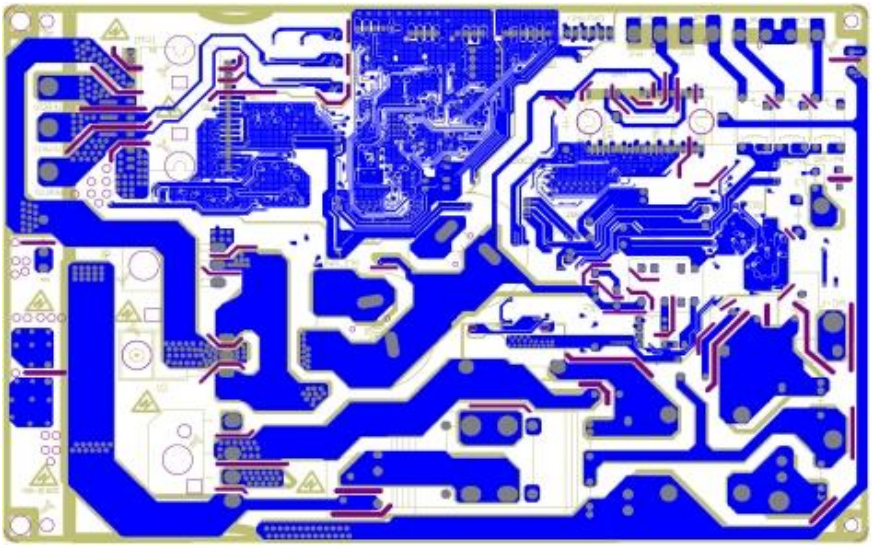
**Outdoor Units:** YN024GLSI24RPG

**Top View**




| | |
|---|---|
| 1 | 4-way valve P8 |
| 2 | Heater CN11 |
| 3 | L, N and communication |
| 4 | Fuse 1 |
| 5 | ODU PCB main relay RY-QD1 |
| 6 | DC motor connector CN12-2 |
| 7 | Electronic expansion valve CN7 |
| 8 | Discharge sensor connector CN2 |
| 9 | OAT/OPT sensor connector CN1 |
| 10 | LED 5 |
| 11 | AC motor connector P9 |
| 12 | LED1-LED4 |

**Bottom View**



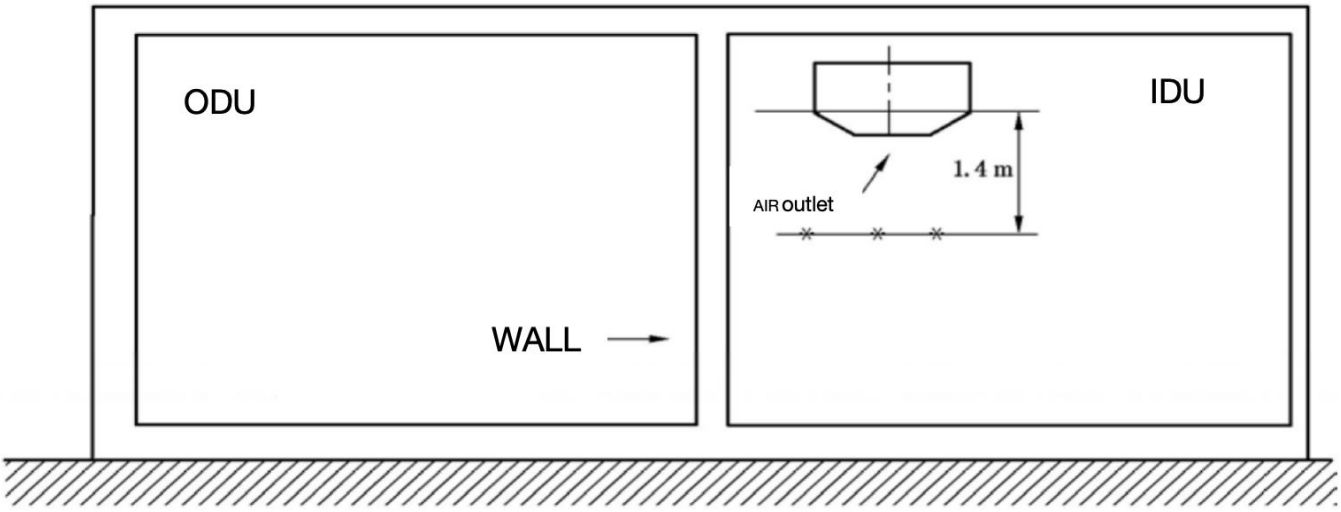
# Noise Levels

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**Notes**

- The above data was measured under standard conditions. Power specification: 230V~60Hz.
- The above data was measured in a semi-anechoic room.
- Noise levels may vary depending on external factors, such as the room structure. Refer to actual measurements.

## Indoor Unit

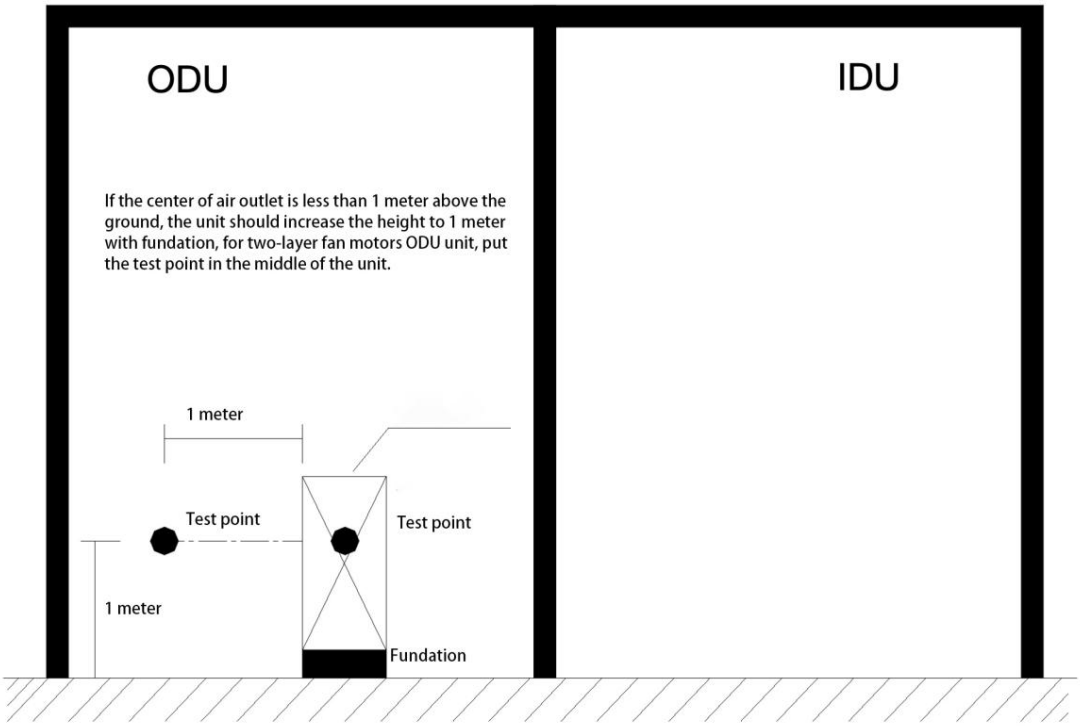


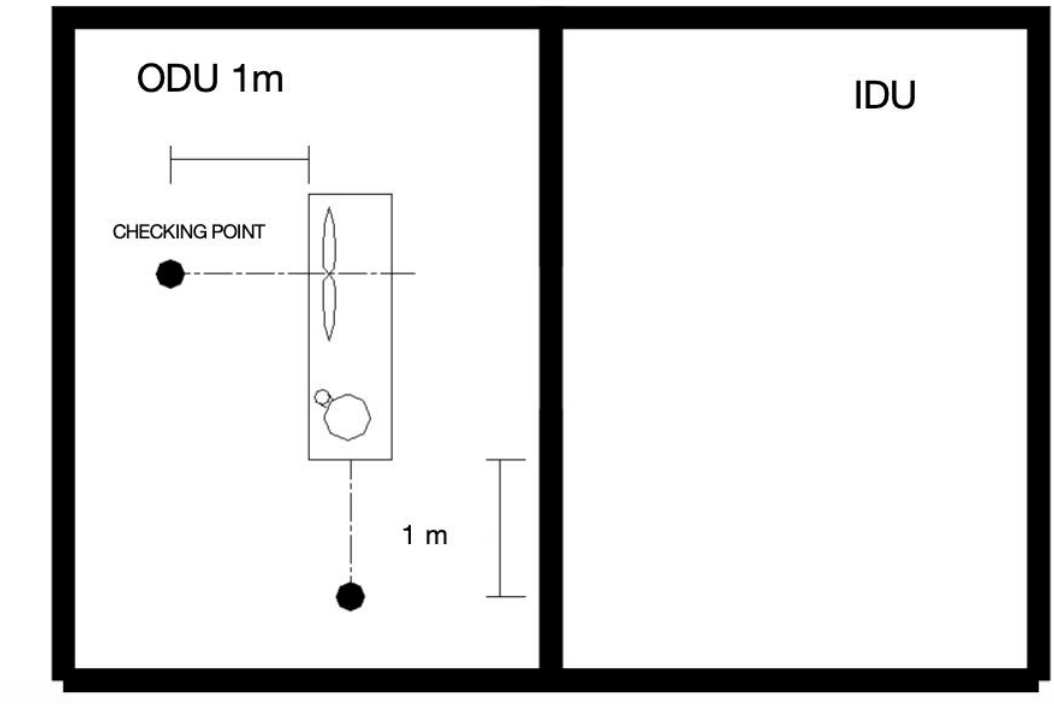

| Model | Turbo dB(A) | High dB(A) | Medium dB(A) | Low dB(A) | Mute dB(A) |
|---|---|---|---|---|---|
| **CT009GLSILCFHG** | 43 | 40 | 33 | 31 | 30 |
| **CT012GLSILCFHG** | 46 | 44 | 36 | 32 | 30 |
| **CT018GLSILCFHG** | 50 | 47 | 43 | 38 | 34 |
| **CT024GLSILCFHG** | 50 | 47 | 43 | 38 | 34 |

# Noise Levels

13

## Outdoor Unit



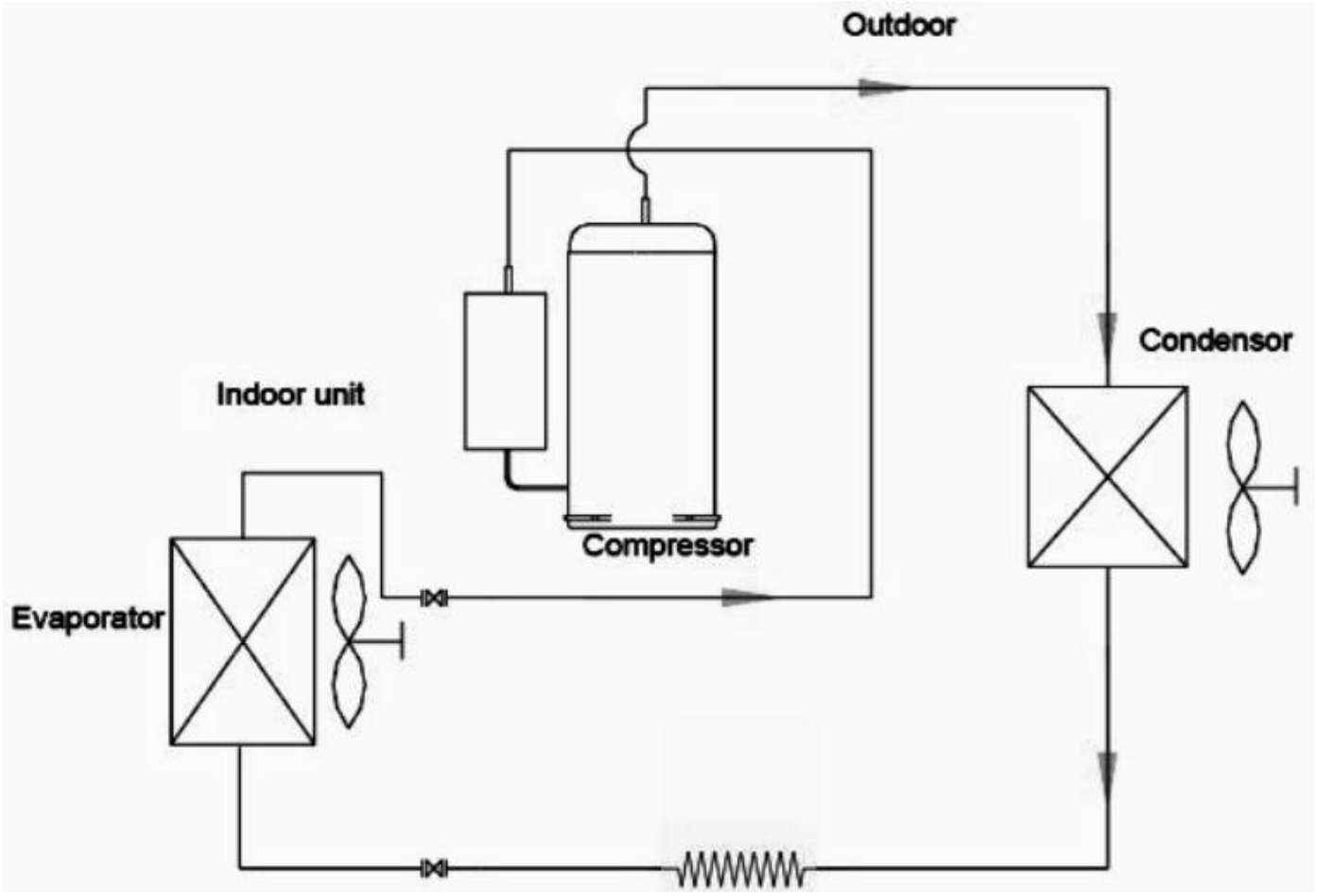
# Noise Levels

13

| Model | Sound Pressure Level dB(A) | Power Supply (V, Ph, Hz) |
|---|---|---|
| **YN009GLSI24RPG** | 50 | 208/230V~/60Hz/1P |
| **YN012GLSI24RPG** | 52 | |
| **YN018GLSI24RPG** | 53 | |
| **YN024GLSI24RPG** | 54 | |

# System Diagram

# 14



# Thermistor Temperature Characteristics

15

## Resistance/Temperature Lists of Temperature Sensors

| Temp. | Resistance (KΩ) | | | Temp. | Resistance (KΩ) | | | Temp. | Resistance (KΩ) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| °F/°C | Rmax | R(t) Normal | Rmin | °F/°C | Rmax | R(t) Normal | Rmin | °F/°C | Rmax | R(t) Normal | Rmin |
| -22°F/-30°C | 68.080 | 64.104 | 60.343 | 68°F/20°C | 6.223 | 6.083 | 5.945 | 158°F/70°C | 1.112 | 1.073 | 1.035 |
| -20°F/-29°C | 64.375 | 60.666 | 57.157 | 70°F/21°C | 5.977 | 5.846 | 5.716 | 160°F/71°C | 1.079 | 1.041 | 1.004 |
| -18°F/-28°C | 60.870 | 57.413 | 54.139 | 72°F/22°C | 5.742 | 5.620 | 5.498 | 162°F/72°C | 1.047 | 1.010 | 0.974 |
| -17°F/-27°C | 57.579 | 54.355 | 51.301 | 74°F/23°C | 5.518 | 5.404 | 5.290 | 163°F/73°C | 1.016 | 0.980 | 0.944 |
| -15°F/-26°C | 54.487 | 51.480 | 48.630 | 75°F/24°C | 5.305 | 5.198 | 5.091 | 165°F/74°C | 0.988 | 0.952 | 0.917 |
| -13°F/-25°C | 51.582 | 48.776 | 46.115 | 77°F/25°C | 5.100 | 5.000 | 4.900 | 167°F/75°C | 0.959 | 0.924 | 0.890 |
| -11°F/-24°C | 48.850 | 46.232 | 43.748 | 79°F/26°C | 4.909 | 4.811 | 4.713 | 169°F/76°C | 0.931 | 0.897 | 0.864 |
| -9°F/-23°C | 46.279 | 43.836 | 41.517 | 81°F/27°C | 4.727 | 4.630 | 4.533 | 171°F/77°C | 0.904 | 0.871 | 0.839 |
| -8°F/-22°C | 43.861 | 41.581 | 39.415 | 82°F/28°C | 4.552 | 4.457 | 4.362 | 172°F/78°C | 0.879 | 0.846 | 0.814 |
| -6°F/-21°C | 41.585 | 39.456 | 37.432 | 84°F/29°C | 4.386 | 4.292 | 4.199 | 174°F/79°C | 0.854 | 0.822 | 0.791 |
| -4°F/-20°C | 39.462 | 37.473 | 35.581 | 86°F/30°C | 4.225 | 4.133 | 4.042 | 176°F/80°C | 0.830 | 0.799 | 0.769 |
| -2°F/-19°C | 37.421 | 35.565 | 33.798 | 88°F/31°C | 4.072 | 3.982 | 3.892 | 178°F/81°C | 0.807 | 0.776 | 0.746 |
| -0°F/-18°C | 35.519 | 33.785 | 32.134 | 90°F/32°C | 3.925 | 3.836 | 3.748 | 180°F/82°C | 0.784 | 0.754 | 0.725 |
| 1°F/-17°C | 33.725 | 32.105 | 30.561 | 91°F/33°C | 3.784 | 3.697 | 3.611 | 181°F/83°C | 0.762 | 0.733 | 0.705 |
| 3°F/-16°C | 32.033 | 30.520 | 29.077 | 93°F/34°C | 3.649 | 3.564 | 3.479 | 183°F/84°C | 0.742 | 0.713 | 0.685 |
| 5°F/-15°C | 30.437 | 29.023 | 27.673 | 95°F/35°C | 3.520 | 3.436 | 3.353 | 185°F/85°C | 0.721 | 0.693 | 0.666 |
| 7°F/-14°C | 28.931 | 27.609 | 26.347 | 97°F/36°C | 3.395 | 3.313 | 3.232 | 187°F/86°C | 0.701 | 0.674 | 0.647 |
| 9°F/-13°C | 27.508 | 26.273 | 25.092 | 99°F/37°C | 3.275 | 3.195 | 3.116 | 189°F/87°C | 0.682 | 0.655 | 0.629 |
| 10°F/-12°C | 26.165 | 25.010 | 23.905 | 100°F/38°C | 3.161 | 3.082 | 3.004 | 190°F/88°C | 0.664 | 0.638 | 0.613 |
| 12°F/-11°C | 24.896 | 23.816 | 22.782 | 102°F/39°C | 3.051 | 2.974 | 2.898 | 192°F/89°C | 0.646 | 0.620 | 0.595 |
| 14°F/-10°C | 23.697 | 22.687 | 21.720 | 104°F/40°C | 2.946 | 2.870 | 2.795 | 194°F/90°C | 0.629 | 0.604 | 0.580 |
| 16°F/-9°C | 22.562 | 21.618 | 20.713 | 106°F/41°C | 2.844 | 2.770 | 2.697 | 196°F/91°C | 0.611 | 0.587 | 0.563 |
| 18°F/-8°C | 21.490 | 20.607 | 19.759 | 108°F/42°C | 2.748 | 2.675 | 2.604 | 198°F/92°C | 0.596 | 0.572 | 0.549 |
| 19°F/-7°C | 20.475 | 19.649 | 18.855 | 109°F/43°C | 2.654 | 2.583 | 2.513 | 199°F/93°C | 0.580 | 0.557 | 0.534 |
| 21°F/-6°C | 19.515 | 18.742 | 17.999 | 111°F/44°C | 2.564 | 2.494 | 2.426 | 201°F/94°C | 0.565 | 0.542 | 0.520 |
| 23°F/-5°C | 18.606 | 17.883 | 17.187 | 113°F/45°C | 2.478 | 2.410 | 2.343 | 203°F/95°C | 0.550 | 0.528 | 0.506 |
| 25°F/-4°C | 17.745 | 17.068 | 16.416 | 115°F/46°C | 2.395 | 2.328 | 2.263 | 205°F/96°C | 0.536 | 0.514 | 0.493 |
| 27°F/-3°C | 16.930 | 16.296 | 15.685 | 117°F/47°C | 2.315 | 2.250 | 2.186 | 207°F/97°C | 0.522 | 0.501 | 0.480 |
| 28°F/-2°C | 16.156 | 15.563 | 14.991 | 118°F/48°C | 2.238 | 2.174 | 2.111 | 208°F/98°C | 0.509 | 0.488 | 0.468 |
| 30°F/-1°C | 15.423 | 14.868 | 14.332 | 120°F/49°C | 2.164 | 2.102 | 2.041 | 210°F/99°C | 0.497 | 0.476 | 0.456 |

# Thermistor Temperature Characteristics

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| Temp. | Resistance (KΩ) | | | Temp. | Resistance (KΩ) | | | Temp. | Resistance (KΩ) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| °F/°C | Rmax | R(t) Normal | Rmin | °F/°C | Rmax | R(t) Normal | Rmin | °F/°C | Rmax | R(t) Normal | Rmin |
| 32°F/0°C | 14.792 | 14.270 | 13.766 | 122°F/50°C | 2.093 | 2.032 | 1.972 | 212°F/100°C | 0.484 | 0.464 | 0.444 |
| 34°F/1°C | 14.069 | 13.582 | 13.111 | 124°F/51°C | 2.025 | 1.965 | 1.906 | 214°F/101°C | 0.472 | 0.452 | 0.433 |
| 36°F/2°C | 13.443 | 12.987 | 12.546 | 126°F/52°C | 1.959 | 1.901 | 1.844 | 216°F/102°C | 0.460 | 0.441 | 0.422 |
| 37°F/3°C | 12.849 | 12.422 | 12.008 | 127°F/53°C | 1.896 | 1.839 | 1.783 | 217°F/103°C | 0.449 | 0.430 | 0.412 |
| 39°F/4°C | 12.284 | 11.885 | 11.497 | 129°F/54°C | 1.835 | 1.779 | 1.724 | 219°F/104°C | 0.437 | 0.419 | 0.401 |
| 41°F/5°C | 11.749 | 11.375 | 11.012 | 131°F/55°C | 1.776 | 1.721 | 1.668 | 221°F/105°C | 0.427 | 0.409 | 0.391 |
| 43°F/6°C | 11.239 | 10.889 | 10.548 | 133°F/56°C | 1.719 | 1.666 | 1.614 | 223°F/106°C | 0.416 | 0.399 | 0.381 |
| 45°F/7°C | 10.756 | 10.428 | 10.109 | 135°F/57°C | 1.665 | 1.613 | 1.562 | 225°F/107°C | 0.406 | 0.388 | 0.372 |
| 46°F/8°C | 10.295 | 9.988 | 9.689 | 136°F/58°C | 1.613 | 1.562 | 1.512 | 226°F/108°C | 0.395 | 0.379 | 0.362 |
| 48°F/9°C | 9.858 | 9.570 | 9.289 | 138°F/59°C | 1.562 | 1.512 | 1.463 | 228°F/109°C | 0.386 | 0.369 | 0.353 |
| 50°F/10°C | 9.441 | 9.172 | 8.909 | 140°F/60°C | 1.514 | 1.465 | 1.417 | 230°F/110°C | 0.376 | 0.360 | 0.344 |
| 52°F/11°C | 9.044 | 8.792 | 8.545 | 142°F/61°C | 1.467 | 1.419 | 1.372 | 232°F/111°C | 0.367 | 0.351 | 0.335 |
| 54°F/12°C | 8.667 | 8.431 | 8.199 | 144°F/62°C | 1.421 | 1.374 | 1.328 | 234°F/112°C | 0.357 | 0.342 | 0.327 |
| 55°F/13°C | 8.308 | 8.087 | 7.870 | 145°F/63°C | 1.378 | 1.332 | 1.287 | 235°F/113°C | 0.349 | 0.333 | 0.319 |
| 57°F/14°C | 7.965 | 7.758 | 7.554 | 147°F/64°C | 1.336 | 1.291 | 1.247 | 237°F/114°C | 0.340 | 0.325 | 0.311 |
| 59°F/15°C | 7.639 | 7.445 | 7.254 | 149°F/65°C | 1.295 | 1.251 | 1.208 | 239°F/115°C | 0.332 | 0.317 | 0.303 |
| 61°F/16°C | 7.329 | 7.147 | 6.968 | 151°F/66°C | 1.256 | 1.213 | 1.171 | 241°F/116°C | 0.324 | 0.309 | 0.296 |
| 63°F/17°C | 7.032 | 6.862 | 6.694 | 153°F/67°C | 1.218 | 1.176 | 1.135 | 243°F/117°C | 0.316 | 0.302 | 0.288 |
| 64°F/18°C | 6.749 | 6.590 | 6.433 | 154°F/68°C | 1.181 | 1.140 | 1.100 | 244°F/118°C | 0.308 | 0.294 | 0.281 |
| 66°F/19°C | 6.480 | 6.331 | 6.183 | 156°F/69°C | 1.146 | 1.106 | 1.067 | 246°F/119°C | 0.301 | 0.287 | 0.274 |
| | | | | | | | | 228°F/120°C | 0.293 | 0.280 | 0.268 |

# Thermistor Temperature Characteristics

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## Outdoor Unit Sensor Temperature Characteristics

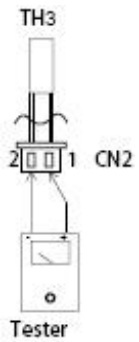
| Temp. °F/°C | R min (k Ohm) | R(t) (k Ohm) | R max (k Ohm) | Temp. °F/°C | R min (k Ohm) | R(t) (k Ohm) | R max (k Ohm) | Temp. °F/°C | R min (k Ohm) | R(t) (k Ohm) | R max (k Ohm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| -22°F/-30°C | 283.3 | 322.9 | 367.7 | 75°F/24°C | 19.36 | 20.89 | 22.52 | 172°F/78°C | 2.563 | 2.654 | 2.745 |
| -20°F/-29°C | 267.4 | 304.4 | 346.3 | 77°F/25°C | 18.55 | 20 | 21.54 | 174°F/79°C | 2.481 | 2.567 | 2.654 |
| -18°F/-28°C | 252.5 | 287.1 | 307.4 | 79°F/26°C | 17.77 | 19.14 | 20.6 | 176°F/80°C | 2.402 | 2.484 | 2.567 |
| -17°F/-27°C | 238.5 | 270.9 | 307.4 | 81°F/27°C | 17.03 | 18.32 | 19.7 | 178°F/81°C | 2.327 | 2.404 | 2.483 |
| -15°F/-26°C | 225.4 | 255.7 | 289.8 | 82°F/28°C | 16.32 | 17.55 | 18.85 | 180°F/82°C | 2.254 | 2.327 | 2.401 |
| -13°F/-25°C | 213.1 | 241.4 | 273.3 | 84°F/29°C | 15.65 | 16.81 | 18.04 | 181°F/83°C | 2.183 | 2.253 | 2.323 |
| -11°F/-24°C | 201.5 | 228 | 257.9 | 86°F/30°C | 15 | 16.1 | 17.27 | 183°F/84°C | 2.115 | 2.182 | 2.248 |
| -9°F/-23°C | 190.6 | 215.5 | 243.4 | 88°F/31°C | 14.39 | 15.43 | 16.54 | 185°F/85°C | 2.05 | 2.113 | 2.176 |
| -8°F/-22°C | 180.3 | 203.6 | 229.8 | 90°F/32°C | 13.81 | 14.79 | 15.34 | 187°F/86°C | 1.985 | 2.047 | 2.109 |
| -6°F/-21°C | 170.7 | 192.5 | 217 | 91°F/33°C | 13.25 | 14.18 | 15.17 | 189°F/87°C | 1.922 | 1.983 | 2.045 |
| -4°F/-20°C | 161.6 | 182.1 | 205 | 93°F/34°C | 12.72 | 13.6 | 14.54 | 190°F/88°C | 1.861 | 1.922 | 1.983 |
| -2°F/-19°C | 153.1 | 172.3 | 193.7 | 95°F/35°C | 12.21 | 13.05 | 13.93 | 192°F/89°C | 1.802 | 1.862 | 1.923 |
| 0°F/-18°C | 145 | 163.1 | 183.2 | 97°F/36°C | 11.72 | 12.52 | 13.36 | 194°F/90°C | 1.746 | 1.805 | 1.865 |
| 1°F/-17°C | 137.5 | 154.4 | 173.2 | 99°F/37°C | 11.26 | 12.01 | 12.81 | 196°F/91°C | 1.692 | 1.75 | 1.809 |
| 3°F/-16°C | 130.3 | 146.2 | 163.9 | 100°F/38°C | 10.82 | 11.53 | 12.29 | 198°F/92°C | 1.639 | 1.697 | 1.755 |
| 5°F/-15°C | 123.6 | 138.5 | 155.1 | 102°F/39°C | 10.29 | 11.07 | 11.78 | 199°F/93°C | 1.589 | 1.646 | 1.703 |
| 7°F/-14°C | 117.3 | 131.3 | 146.8 | 104°F/40°C | 9.986 | 10.63 | 11.31 | 201°F/94°C | 1.54 | 1.596 | 1.653 |
| 9°F/-13°C | 111.3 | 124.4 | 139 | 106°F/41°C | 9.6 | 10.21 | 10.85 | 203°F/95°C | 1.493 | 1.549 | 1.604 |
| 10°F/-12°C | 105.6 | 118 | 131.7 | 108°F/42°C | 9.231 | 9.813 | 10.42 | 205°F/96°C | 1.448 | 1.502 | 1.558 |
| 12°F/-11°C | 100.3 | 111.9 | 124.7 | 109°F/43°C | 8.878 | 9.43 | 10 | 207°F/97°C | 1.404 | 1.458 | 1.512 |
| 14°F/-10°C | 95.24 | 106.2 | 118.2 | 111°F/44°C | 8.54 | 9.064 | 9.612 | 208°F/98°C | 1.362 | 1.415 | 1.469 |
| 16°F/-9°C | 90.49 | 100.8 | 112.1 | 113°F/45°C | 8.217 | 8.714 | 9.233 | 210°F/99°C | 1.321 | 1.373 | 1.426 |
| 18°F/-8°C | 85.99 | 95.68 | 106.3 | 115°F/46°C | 7.908 | 8.38 | 8.872 | 212°F/100°C | 1.284 | 1.335 | 1.387 |
| 19°F/-7°C | 81.75 | 90.86 | 100.8 | 117°F/47°C | 7.612 | 8.06 | 8.526 | 214°F/101°C | 1.245 | 1.296 | 1.348 |
| 21°F/-6°C | 77.74 | 86.31 | 95.74 | 118°F/48°C | 7.328 | 7.754 | 8.196 | 216°F/102°C | 1.209 | 1.258 | 1.309 |
| 23°F/-5°C | 73.94 | 82.01 | 90.88 | 120°F/49°C | 7.057 | 7.461 | 7.88 | 217°F/103°C | 1.173 | 1.222 | 1.272 |
| 25°F/-4°C | 70.35 | 77.95 | 86.29 | 122°F/50°C | 6.797 | 7.18 | 7.578 | 219°F/104°C | 1.139 | 1.187 | 1.236 |
| 27°F/-3°C | 66.96 | 74.11 | 81.96 | 124°F/51°C | 6.548 | 6.912 | 7.289 | 221°F/105°C | 1.105 | 1.153 | 1.202 |
| 28°F/-2°C | 63.74 | 70.48 | 77.87 | 126°F/52°C | 6.309 | 6.655 | 7.013 | 223°F/106°C | 1.073 | 1.12 | 1.168 |

# Thermistor Temperature Characteristics

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| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30°F/-1°C | 60.69 | 67.05 | 74 | 127°F/53°C | 6.08 | 6.409 | 6.748 | 225°F/107°C | 1.042 | 1.089 | 1.136 |
| 32°F/0°C | 57.81 | 63.8 | 70.34 | 129°F/54°C | 5.861 | 6.173 | 6.495 | 226°F/108°C | 1.013 | 1.058 | 1.104 |
| 34°F/1°C | 55.08 | 60.72 | 66.88 | 131°F/55°C | 5.651 | 5.947 | 6.253 | 228°F/109°C | 0.9833 | 1.028 | 1.074 |
| 36°F/2°C | 52.49 | 57.81 | 63.61 | 133°F/56°C | 5.449 | 5.73 | 6.02 | 230°F/110°C | 0.9553 | 0.9997 | 1.045 |
| 37°F/3°C | 50.03 | 55.05 | 60.52 | 135°F/57°C | 5.255 | 5.522 | 5.798 | 232°F/111°C | 0.9283 | 0.9719 | 1.016 |
| 39°F/4°C | 47.71 | 52.44 | 57.59 | 136°F/58°C | 5.07 | 5.323 | 5.585 | 234°F/112°C | 0.9021 | 0.9451 | 0.9892 |
| 41°F/5°C | 45.5 | 49.97 | 54.82 | 138°F/59°C | 4.891 | 5.132 | 5.381 | 235°F/113°C | 0.8765 | 0.9191 | 0.9626 |
| 43°F/6°C | 43.41 | 47.62 | 52.2 | 140°F/60°C | 4.72 | 4.949 | 5.101 | 237°F/114°C | 0.8524 | 0.894 | 0.9367 |
| 45°F/7°C | 41.42 | 45.4 | 49.71 | 142°F/61°C | 4.556 | 4.774 | 4.997 | 239°F/115°C | 0.8087 | 0.8595 | 0.9117 |
| 46°F/8°C | 39.53 | 43.2 | 42.33 | 144°F/62°C | 4.398 | 4.605 | 4.817 | 241°F/116°C | 0.8059 | 0.8461 | 0.8875 |
| 48°F/9°C | 37.74 | 41.29 | 45.12 | 145°F/63°C | 4.247 | 4.448 | 4.644 | 243°F/117°C | 0.7837 | 0.8233 | 0.8641 |
| 50°F/10°C | 36.04 | 39.39 | 43.01 | 147°F/64°C | 4.101 | 4.288 | 4.479 | 244°F/118°C | 0.7623 | 0.8012 | 0.8413 |
| 52°F/11°C | 34.42 | 37.59 | 41 | 149°F/65°C | 3.961 | 4.139 | 4.32 | 246°F/119°C | 0.7415 | 0.7798 | 0.8193 |
| 54°F/12°C | 32.89 | 35.87 | 39.1 | 151°F/67°C | 3.827 | 3.995 | 4.167 | 248°F/120°C | | | |
| 55°F/13°C | 31.43 | 34.25 | 37.29 | 153°F/67°C | 3.698 | 3.858 | 4.021 | 250°F/121°C | 0.702 | 0.7386 | 0.7773 |
| 57°F/14°C | 30.04 | 32.71 | 35.58 | 154°F/68°C | | | | 252°F/122°C | 0.6631 | 0.7195 | 0.7572 |
| 59°F/15°C | 29.72 | 31.24 | 33.95 | 156°F/69°C | | | | 253°F/123°C | 0.6649 | 0.7007 | 0.7378 |
| 61°F/16°C | | | | 158°F/70°C | 3.339 | 3.476 | 3.616 | 255°F/124°C | 0.6472 | 0.6824 | 0.7189 |
| 63°F/17°C | | | | 160°F/71°C | 3.229 | 3.359 | 3.491 | 257°F/125°C | 0.6301 | 0.6647 | 0.7006 |
| 64°F/18°C | 25.13 | 27.26 | 29.55 | 162°F/72°C | 3.122 | 3.246 | 3.372 | 259°F/126°C | 0.6135 | 0.6476 | 0.6829 |
| 66°F/19°C | 24.05 | 26.07 | 28.23 | 163°F/73°C | 3.02 | 3.138 | 3.257 | 261°F/127°C | 0.5974 | 0.6309 | 0.6657 |
| 68°F/20°C | 23.02 | 24.93 | 26.97 | 165°F/74°C | 2.921 | 3.033 | 3.146 | 262°F/128°C | 0.5818 | 0.6148 | 0.649 |
| 70°F/21°C | 22.04 | 23.84 | 25.77 | 167°F/75°C | 2.827 | 2.933 | 3.04 | 264°F/129°C | 0.5667 | 0.5991 | 0.6328 |
| 72°F/22°C | 21.1 | 22.81 | 24.63 | 169°F/76°C | 2.735 | 2.836 | 2.938 | 266°F/130°C | 0.5521 | 0.5839 | 0.6171 |
| 73°F/23°C | 20.21 | 21.83 | 23.55 | 171°F/77°C | 2.647 | 2.743 | 2.84 | | | | |

R—Resistance
Resistance at (77°F) 25°C: 20 kΩ




**TH3:** Outdoor unit discharge pipe sensor

Before measuring resistance, disconnect the connectors as shown above.

The design and specifications of this product are subject to change without prior notice as development continues. Consult with the sales agency or manufacturer for details. Refer to the equipment nameplate for all other applicable specifications.

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