

Service Manual

CO₂ Hot water heat pump system RQWX-Z Series



Introduction	1
1. Safety Cautions.....	2
1.1 Warnings and Cautions Regarding Safety of Workers.....	2
1.2 Warnings and Cautions Regarding Safety of Users.....	5
2. Icons Used	9
3. Revision History	10
Part 1 General Information	11
1. Applicable Models	12
2. Functions.....	13
2.1 Operation Schedule.....	13
2.2 Heating Operation Level.....	14
2.3 Heat Boost.....	16
2.4 Legionella Control Operation.....	16
2.5 Vacation	16
2.6 Anti-Freezing Operation	16
2.7 Defrost Control	17
Part 2 Specifications.....	19
1. Specifications	20
1.1 Hot Water Storage Unit	20
1.2 Heat Pump Unit	21
2. Operation Area and Capacity	22
2.1 Operation Area	22
2.2 Performance Characteristics	22
3. Wiring Diagrams.....	23
4. Piping Diagrams	24
5. Field Wiring	25
5.1 Typical Wiring Pattern	25
5.2 Electrical Work Materials.....	25
Part 3 Installation.....	26
1. Construction Malfunction Examples.....	27
Part 4 Remote Controller	30
1. Operating the Controller	31
2. Controller Screen Display	32
3. Mode Transition	33
4. Service Mode	34
5. Field Settings Mode	35
6. Trial Operation	36
6.1 Preparation for Trial Operation.....	36
6.2 Trial Operation.....	39













Part 5 Service Diagnosis	47
1. Symptom-based Troubleshooting	49
1.1 No heating operation	50
1.2 Heating operation takes place but water is not heated	51
1.3 Upon heating operation, wiring circuit breaker activates	52
1.4 Loud noise/high vibration during heating operation	53
1.5 Water leakage from hot water storage unit	54
1.6 Low hot water level in hot water storage unit	56
1.7 Water cannot be drained from hot water storage unit	57
1.8 No display on remote controller	58
1.9 Low water pressure from tap on site	59
2. Troubleshooting	60
2.1 Error Codes and Description	60
2.2 Controller transmission defect	62
2.3 RTC read abnormality	63
2.4 Tank water temperature thermistor abnormality	64
2.5 Water pump abnormality	65
2.6 Air vent defect	66
2.7 Heat pump PCB defect	68
2.8 Abnormality due to compressor overload	69
2.9 Compressor lock	71
2.10 Fan lock abnormality	72
2.11 Stop due to input overcurrent detection	74
2.12 Electronic expansion valve abnormality	76
2.13 Stop due to outlet temperature abnormality	77
2.14 Stop due to discharge pipe temperature control	79
2.15 Stop due to peak cut abnormality	80
2.16 Compressor system sensor abnormality	82
2.17 HPS (high-pressure switch) defect	84
2.18 Stop due to position detection sensor defect (compressor protection) ..	85
2.19 Thermistor abnormality	86
2.20 Circulating water system defect	88
2.21 Temperature rise inside electrical box	90
2.22 Fin temperature increase	91
2.23 Stop due to output overcurrent (shunt resistance) detection (OCP)	92
2.24 Stop due to detection of shortage of refrigerant gas	94
2.25 Stop due to low voltage detection/overvoltage detection	96
2.26 Transmission abnormality (between hot water storage and heat pump unit)	97
2.27 Piping error detected (between hot water storage and heat pump unit)	99
3. Check	101
3.1 Protection function set values	101
3.2 Thermistor resistance value check	102
3.3 Installation status check	103
3.4 Power waveform check (noise)	103
3.5 Capacitor voltage check	104
3.6 Electronic expansion valve check	104
3.7 Main circuit short-circuit check	105
3.8 How to measure connector/terminal block	105
3.9 Water pump output voltage check	106






Introduction









1. Safety Cautions.....	2
1.1 Warnings and Cautions Regarding Safety of Workers.....	2
1.2 Warnings and Cautions Regarding Safety of Users.....	5
2. Icons Used	9
3. Revision History	10









1. Safety Cautions

1.1 Warnings and Cautions Regarding Safety of Workers

 Warning	
DO NOT join cables to extend. DO NOT bundle power supply wires. DO NOT twist cables. DO NOT use an extension cord. DO NOT overload the electrical circuit. (Heat may be generated, which may cause a fire.)	
DO NOT install the heat pump unit indoors. (In the event of a refrigerant leakage, oxygen deficiency may result.)	
DO NOT place any gas or flammable materials close to the system. (Fire hazard)	
DO NOT install the system in humid environments, for example, areas with high levels of ambient steam. (May short the electrical circuit resulting in fire.)	
Please use accessories supplied with the system and only use parts specified in this manual to complete the installation. Make sure to follow this installation maintenance manual. (Failure to observe may result in injury due to the unit toppling, water leakage, electrical shock, fire or burns.)	
Make sure to install in a location that can fully withstand the weight of the system when it is full of water. (Failure to observe may result in injury due to the unit toppling.)	
Electrical work may only be carried out by a licensed electrician. Install in accordance with the relevant local and national regulations (AS/NZS 3000), and these installation instructions. Always use a dedicated circuit.	
Be sure to install an earth leakage circuit breaker, RCD, or RCBO. (Failure to observe may result in an electric shock or fire.) Refer to AS/NZS 3000.	
Before carrying out any work, make sure to turn off the earth leakage circuit breaker and isolation switch. (Touching electrical parts may cause electric shock.)	
Check the operation of the earth leakage circuit breaker, RCD or RCBO. (May cause electric shock or fire in case of electrical leakage.)	
Make sure to secure the power supply wires using the cable clamp located in the electrical box of the heat pump unit. Ensure the cable is firmly clamped to avoid the possibility of external force being applied to the cable connection points. (Electrical leakage may lead to electric shock or fire.)	

 Warning	
For power supply wires selection, use the correct cable size and type as per AS/NZS 3000. (Heat may be generated leading to electric shock or fire.)	
For power supply wires, ensure the cables are not obstructing any part of the unit that needs to be disassembled and reassembled as a part of the wiring process. (Heat may be generated around the terminal from stress, resulting in electric shock or fire.)	
The system must be directly connected to the water supply and the water piping must be installed by a licensed plumber using specified piping materials and in accordance with AS/NZS 3500. (Failure to observe may result in pipes bursting and water leakage.)	
Ensure that earthing work is carried out on the heat pump unit. Do not connect earth wires to gas pipes, water pipes, lightning rods, or the earth wires of telephones etc. (Failure to observe may result in electric shock or fire.)	













 Caution	
DO NOT touch the aluminium fins located at the back of the heat pump unit. (Risk of injury)	
Please DO NOT install the heat pump unit in locations where small animals are likely to inhabit. (If small animals manage to enter the unit and touch the electrical components inside, it may cause failure, smoke or fire.) Please ask the user to maintain the area around the heat pump unit.	
DO NOT install in areas at risk of flooding from rain/snow. (Fire/electric shock hazard)	
Please do not install the heat pump unit where air will blow on animals/plants directly. (It may have a negative impact on animals/plants.)	
Wear gloves while working. (Risk of injury)	
When unpacking the heat pump unit and hot water storage unit outdoors, temporarily place the units where they will not be blown over by the wind. (Risk of the unit toppling over.)	
In Australia it is not mandatory to strap the hot water storage unit to provide stability during seismic events. In New Zealand, please follow the New Zealand Building Code.	







 Caution	
Be sure to follow this installation maintenance manual when installing the drain pipework for the hot water storage unit and the condensate drain pipework for the heat pump unit. (Incomplete or incorrect installation may result in flooding and damage to furniture etc.)	
The units are heavy. Please be careful when carrying or installing. (Risk of injury)	
Perform waterproofing and drainage work on the floor or install a safety tray that has adequate drainage underneath the hot water storage unit. (When installed indoors, significant damage to the property may result in the event of water leakage.)	
Provide anti-freezing measures. (Insulate all water pipes that are exposed to minus temperatures, install a locally sourced anti-freeze heater around pipes to prevent the pipes freezing in extreme cold temperatures etc.) (Pipes may burst and cause burns.)	
Install a drain trap. (Sewage gas may flow back and cause odours to rise, and the unit and piping may corrode, causing damage or water leakage.)	
Install the units where operation noise is imperceptible especially if installing near bedrooms and always consider how noise will affect neighbors. (Sound levels at the property boundaries must comply with local council rules)	
In coastal areas or other places with an atmosphere high in salt or sulfate gas, corrosion may shorten the service lives of both the heat pump unit and hot water storage unit. (The unit and piping may corrode, resulting in damage or water leakage.)	







**Note(s)**











- The hot water storage unit must be connected to the dedicated heat pump unit.
- Do not climb on top of the unit. (May be deformed.)
- Do not turn ON the power until all the installation work is completed.
- Do not connect the hot water from a solar water heater to the water supply.
- This appliance may deliver water at a high temperature. Refer to the Plumbing Code of Australia (PCA), local requirements, and installation instructions to determine if additional delivery temperature control is required.
- Tap water should meet drinking water guidelines set by Australia and New Zealand.
- Even if tap water is used, product service life may be shorter than normal if the product is used in a region with particularly hard water, or due to other water quality issues. In particular, do not use well, ground, or spring water as normal service life cannot be guaranteed. If the use of well, ground, or spring water is unavoidable, please consult the installer.

1.2 Warnings and Cautions Regarding Safety of Users

 Warning	
Do not touch hot water or parts that get hot. (May cause burns.) – Do not touch the tap (mixing tap) when supplying hot water.	
At the beginning of use, do not touch the hot water for a while. (May cause burns.) Hot water mixed with air may splash out.	
Check the temperature of the hot water. (May cause burns.) – When bathing or using hot water, first check the temperature of the hot water with your fingertips, etc.	
Keep the tap closed if the mains water is turned off or there are water supply works in progress. (May cause burns.) If the tap is left open, hot water may come out.	
Do not attempt to install by yourself. (May cause water leakage, electric shock, or fire.)	
Do not disassemble, repair, or modify the product. (May cause electric shock or fire.)	
Check that earthing work is complete. (May result in electric shock if incomplete.)	
Do not operate the earth leakage circuit breaker with wet hands. (May cause electric shock.)	
Do not open the terminal cover of the hot water storage unit or the pipe cover of the heat pump unit. (May cause electric shock.)	
When draining the hot water storage unit or inspecting the PTRV and ECV, do not touch the drain pipe, drain hose, PTRV* or ECV*. *Do not touch the main body. You may touch the lever. (May cause burns.) – Hot water may come out when draining, so do not touch the hot water.	
Regularly check that the earth leakage circuit breaker is working properly. (May cause electric shock or fire in case of electrical leakage.) – If it is not working, please consult your dealer.	

 Warning	
<p>Malfunction and abnormality cases</p> <ul style="list-style-type: none"> - Water drains/leaks from the PTRV or ECV even though heating operation is not active. - Water leaks from the main unit or piping. - The earth leakage circuit breaker automatically turns "OFF". - There is a burning smell, unusual noise or vibration. <p>(Damage, electric shock, smoke, fire, etc., may result if the abnormality is not addressed and the unit continues to be used.) Immediately turn the earth leakage circuit breaker of the hot water storage unit "OFF" and consult your dealer.</p>	
<p>Do not touch the piping. (May cause burns.)</p>	
<p>Do not climb on or apply excessive force to the piping. (May cause damage to joints.)</p>	
<p>Do not place gas containers or flammable materials nearby. (If gas leaks and accumulates around the unit, it may ignite a fire.)</p>	
<p>Do not insert fingers, sticks, etc., into the air inlet. (May cause injury.) The fan may be rotating at a high speed.</p>	

 Caution	
<p>In the case of New Zealand, the hot water storage unit is secured to a wall. (As specified in New Zealand building standards.) If it is not secured, contact your dealer or a specialist.</p>	
<p>If the hot water storage unit is installed indoors, it is placed on a floor with waterproofing and drain pipework. Alternatively, it is installed above a safety tray. (If water leaks, it may cause damage to the building structure or building contents.) Consult and ask your dealer or a specialist.</p>	
<p>Check for anti-freeze measures (piping thermal insulation work, anti-freeze heaters, etc.). (If pipes freeze and break, it may cause burns and water leaks.) Consult and ask your dealer or a specialist.</p>	
<p>Do not wash with water. (May cause electric shock or fire in case of electrical leakage.)</p>	
<p>Turn the earth leakage circuit breaker "OFF". (May cause injury.) The fan may be rotating at a high speed.</p>	

 Caution	
Regularly check that the PTRV and ECV are functioning correctly. (Malfunctioning may result in water leakage.) If they are not functioning correctly, please consult your dealer or a specialist.	
(May cause burns and damage to water pipes.) Only drain water after flushing the hot water out from the hot water tap or mixing tap.	
Do not touch the aluminium part. (May result in cuts to the hand.)	
Do not climb on it or place objects on it. (If the unit is installed on a balcony or other high place, there is a risk of injury from falling.)	
Do not place items that must not get wet nearby. (When heating, condensate comes out from the condensate drain hole, which may result in stains or damage.)	
Do not leave the mounting frame in a damaged state. (May cause injury from the unit falling or tipping over.)	
Avoid direct airflow onto plants and animals. (May cause adverse effects on animals and plants.)	
Water quality may change due to the accumulation of solids and mineral build up. When drinking, be careful of the following, and be sure to boil the water in a kettle or similar before drinking. – Be sure to use water that meets water quality standards. – If you notice any solids, discoloration, cloudiness or unusual odor, do not drink the water and request an inspection immediately. – Treat the water that comes out before hot water (the water accumulated in the pipes) as non-potable water.	
Avoid placing objects around unit, or allowing fallen leaves etc. to accumulate. (Insects, etc., may enter, causing malfunctions, ignition or smoke.)	

■ **Use tap water**

Tap water should meet drinking water guidelines set by Australia and New Zealand. Even if tap water is used, product service life may be shorter than normal if the product is used in a region with particularly hard water, or due to other water quality issues. In particular, do not use well, ground, or spring water as the service life cannot be guaranteed. If the use of well, ground, or spring water is unavoidable, please consult the installer.

■ When there is a risk of freezing

In some areas, pipes may freeze in winter, causing water leakage. In addition, even in areas where there is normally little risk of freezing, freezing can occur due to cold weather and other factors. Take steps to prevent freezing in advance.

■ Hot water may run out

The water heater heats up water according to a set operation schedule and stores the water in the hot water storage unit.

● To avoid running out of hot water





- ◆ When the operation schedule is set to “CONTINUOUS”, the hot water storage unit performs heating whenever there is a fall in hot water volume, thereby preventing hot water from running out.
- ◆ Heating volume is determined according to the set heating volume level, but if there is a risk of insufficient hot water, increase the heating volume level setting.

■ Do not use the product for any purpose other than general household use

Insufficient capacity, unexpected electricity costs, reduced product performance and quality, and shortened service life may result.

2. Icons Used

The following icons are used to attract the attention of the reader to specific information.

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

3. Revision History

Month/Year	Version	Revised contents
10 / 2025	SiAU732517E	First edition

Part 1

General Information

1. Applicable Models	12
2. Functions.....	13
2.1 Operation Schedule.....	13
2.2 Heating Operation Level.....	14
2.3 Heat Boost.....	16
2.4 Legionella Control Operation.....	16
2.5 Vacation	16
2.6 Anti-Freezing Operation	16
2.7 Defrost Control	17

1. Applicable Models

Hot Water Storage Unit

Heat Pump Unit

TU25SSZA

RQWX60ZV1A

TU35SSZA

2. Functions

2.1 Operation Schedule

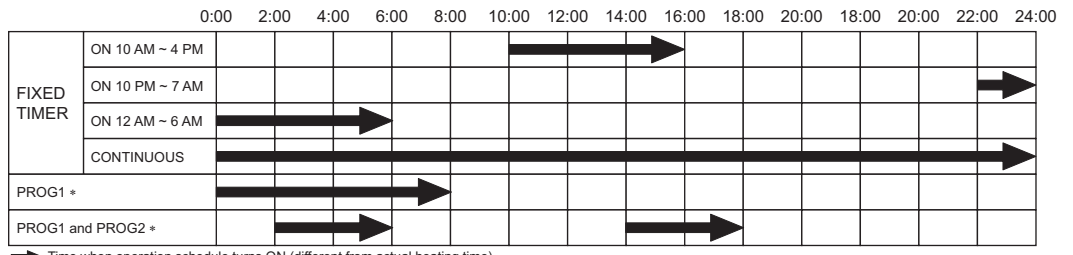
Heating operation by the heat pump unit starts when the amount of hot water in the hot water storage unit is low (when tank water temperature thermistor detects 40°C or below) during the operation schedule ON time period.

The heat pump unit may operate for protective purposes even during times when heating operation by the heat pump unit is not permitted (during the operation schedule OFF time period).

Select one of the operation schedules. The operation will automatically start once the ON time is met, providing the water temperature inside the tank requires heating. Options include “PROG1” and “PROG1 and PROG2”.

- When selecting FIXED TIMER, because heating may not be completed, set the operation schedule ON duration to at least 4 hours.
- By setting the field settings extended heating setting (3-03) to “1”, heating operation can be extended past the operation OFF time if the heating cycle has not been completed. (See “Field setting mode” for how to make changes)

The operation schedule ON times for the respective settings are as below.



→ Time when operation schedule turns ON (different from actual heating time)
 * When PROG1 TIMER ON is set to 0:00 and TIMER OFF to 8:00
 When, in PROG1 and PROG 2, the PROG1 TIMER ON is set to 2:00 and TIMER OFF to 6:00, and the PROG2 TIMER ON is set to 14:00 and TIMER OFF to 18:00.

2.2 Heating Operation Level

The heating volume level determines the amount of hot water to be heated during the operation schedule ON time period.

Here, you can set "AUTO ADAPTIVE", which automatically adjusts the appropriate amount of hot water based on daily water usage.

2.2.1 Manual Heating Operation Level (Set Level 1 to 6)

Manual heating operation level performs heating daily until the heating operation end conditions for each level are met.

At SET LEVEL 1, heating operation stops when the tank water temperature thermistor (installed at the storage unit volume halfway point) temperature is detected at 61°C or above continuously for 1 minute (condition 1).

When set from SET LEVEL 2 to 5, heating operation stops after continuing for the time in the table below from completion of condition 1, in accordance with manual heating operation level and outdoor air temperature.

When set to SET LEVEL 6, operation stops when the inlet temperature in the heat pump exceeds the temperature in the table below.

Because the time heating operation is based on the storage tank volume, if the field settings storage volume (4-00) is not set correctly, heating volume cannot be correctly controlled.

250L Tank [min]

		Ambient temperature (DOA)						
		DOA ≤ -5	-5 < DOA ≤ 4	4 < DOA ≤ 13	13 < DOA ≤ 18	18 < DOA ≤ 23	23 < DOA ≤ 28	28 < DOA
SET LEVEL	2	25	21	20	20	18	17	16
	3	50	42	40	39	36	34	32
	4	75	63	60	58	54	50	47
	5	100	84	80	77	72	67	63

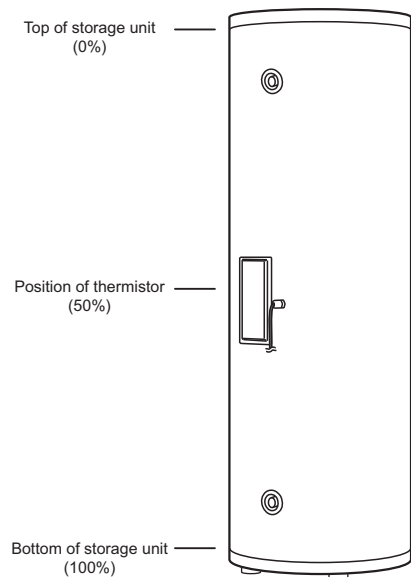
315L Tank

		Ambient temperature (DOA)						
		DOA ≤ -5	-5 < DOA ≤ 4	4 < DOA ≤ 13	13 < DOA ≤ 18	18 < DOA ≤ 23	23 < DOA ≤ 28	28 < DOA
SET LEVEL	2	32	27	26	25	23	21	20
	3	63	53	51	49	45	42	40
	4	95	79	76	73	68	63	60
	5	126	105	101	97	90	84	79

Choice	On-screen display
SET LEVEL 1	SET LEVEL ▸
SET LEVEL 2	SET LEVEL ▸▸
SET LEVEL 3	SET LEVEL ▸▸▸
SET LEVEL 4	SET LEVEL ▸▸▸▸
SET LEVEL 5	SET LEVEL ▸▸▸▸▸
SET LEVEL 6	SET LEVEL ▸▸▸▸▸▸

[°C]

		Ambient temperature (DOA)	
		DOA < 23	23 ≤ DOA
SET LEVEL	6	55	50



2.2.2 Auto Adaptive Mode

Auto adaptive mode is a function which adjusts the heating operation level from 1 to 6 depending on the household water heating status.

It is set to SET LEVEL 3 upon purchase.

In accordance with daily heating status, the heating operation level 1 week later is set to -1, no change, or +1.

The heating operation level adjustment conditions are as below.

- When operation schedule is CONTINUOUS
 - (1) When there is no heat-up operation at all from 8:00 to 8:00 the following day, the heating operation level is set to -1.
 - (2) When heat-up operation takes place 3 or more times from 8:00 to 8:00 the following day, or when the HEAT BOOST function is used, the heating operation level is set to +1.
- When operation schedule is not CONTINUOUS
 - (1) When there is no heat-up operation at all from 8:00 to 8:00 the following day, or when the remaining hot water judgment timer < TAUTODL in the first heat-up operation after operation schedule ON, the heating operation level is set to -1.
 - (2) When the HEAT BOOST function is used, or when the when the remaining hot water judgment timer \geq TAUTODH in the first heat-up operation after operation schedule ON, the heating operation level is set to +1.

The remaining hot water judgment timer estimates the amount of hot water left in the top part of the storage unit before heat-up operation start, using the time from heat-up operation start until tank water temperature thermistor reaches 50°C.

TAUTODL and TAUTODH are the values in the table below, depending on the outdoor air temperature.

250L Tank		Ambient temperature (DOA)						[min]
	DOA \leq -5	-5 < DOA \leq 4	4 < DOA \leq 13	13 < DOA \leq 18	18 < DOA \leq 23	23 < DOA \leq 28	28 < DOA	
TAUTODL	25	21	20	20	18	17	16	
TAUTODH	95	80	76	74	68	64	60	

315L Tank		Ambient temperature (DOA)					
	DOA \leq -5	-5 < DOA \leq 4	4 < DOA \leq 13	13 < DOA \leq 18	18 < DOA \leq 23	23 < DOA \leq 28	28 < DOA
TAUTODL	33	27	26	26	23	22	21
TAUTODH	153	129	123	119	110	103	97

Even when the conditions for setting the heating operation level to -1 or +1 have been met, when the following conditions are met from 8:00 over the day until 8:00 the following day, the heating operation level is not changed.

OR	Day when a power outage took place
	Day when legionella control operation took place
	Day when heating operation level setting was changed to auto adaptive mode
	Day when operation schedule was changed from CONTINUOUS to anything else
	Day when heating was suspended
	Day when an abnormality took place



Note(s)

When setting AUTO ADAPTIVE, ensure that the setting is maintained for at least 1 week. Otherwise, daily usage cannot be correctly estimated. During the 1st week, heating operation is carried out at level 3, so there is a risk that there may be too much or too little hot water.

2.3 Heat Boost

When operation schedule is OFF and the tank water temperature thermistor is below 40°C, press the controller HEAT BOOST button to start heating operation. The end of heating operation is determined by the heating operation level.

Also, HEAT BOOST cannot be used during the VACATION setting.

2.4 Legionella Control Operation

Weekly Legionella control operation is a function which raises 90% or more of the storage tank volume to 60°C, by conducting heating operation from the day when tank water temperature thermistor temperature did not reach 60°C and half the storage unit volume could not be raised to 60°C or higher until 23:00 5 days later when the SET LEVEL 6 condition of maximum outlet temperature 72°C is met.

Because the controller contains the time information, in the case of a communications failure (error code **U5**) between the controller and the main unit, the main unit will make a judgment once every 24 hours on an emergency basis and will perform legionella control operation.

2.5 Vacation

VACATION is a setting which suspends heating operation for a given period, such as a long trip away. It can be set up to 90 days; heating operation will not take place until the set number of days has passed.

However, legionella control operation and anti-freezing operation (for product protection) will take place during the VACATION setting.

It cannot be used when the controller real-time clock has malfunctioned (error code **U7**).

2.6 Anti-Freezing Operation

Water pump or compressor operates in the following conditions to prevent damage of piping due to freezing of water piping, water heat exchanger and field piping.

■ Start conditions

- (1) Initial settings complete
- (2) No heating request from remote controller
- (3) Inlet temperature $\leq 3^{\circ}\text{C}$ or outside air thermistor abnormality
- (4) Inlet temperature $\leq 3^{\circ}\text{C}$
- (5) Outlet temperature $\leq 3^{\circ}\text{C}$
- (6) No errors prohibiting anti-freezing mode I (*1)
 - Of the above, anti-freezing mode I (water pump operation) is launched with [(1) and (2) and (3) and (4) and (6)] or [(1) and (2) and (3) and (5) and (6)]. Also,
- (7) 140 seconds passed from anti-freezing mode start
- (8) No errors prohibiting anti-freezing mode II (*2)
- (9) Inlet temperature $< 3.01^{\circ}\text{C} < \text{inlet T} < 6^{\circ}\text{C}$
- (10) Outlet temperature $< 6^{\circ}\text{C}$
 - Of the above, anti-freezing mode II (warm up circulation operation) is launched with [(7) and (8) and (9)] or [(7) and (8) and (10)].

■ End conditions

- (11) Outdoor air temperature $\geq 6^{\circ}\text{C}$ and outside air thermistor without abnormality
- (12) Error prohibiting anti-freezing mode II detected (*2)
- (13) Inlet temperature $\geq 6^{\circ}\text{C}$
- (14) Outlet temperature $\geq 6^{\circ}\text{C}$
- (15) Error prohibiting anti-freezing mode I detected (*1)
 - Of the above, anti-freezing mode ends with [(11)] or [(13) and (14) continuing for 120 seconds] or [(15)]. Also, the mode shifts to anti-freezing mode I with [(12)].



Note(s)

*1 Errors prohibiting anti-freezing mode I: **A6, AE**

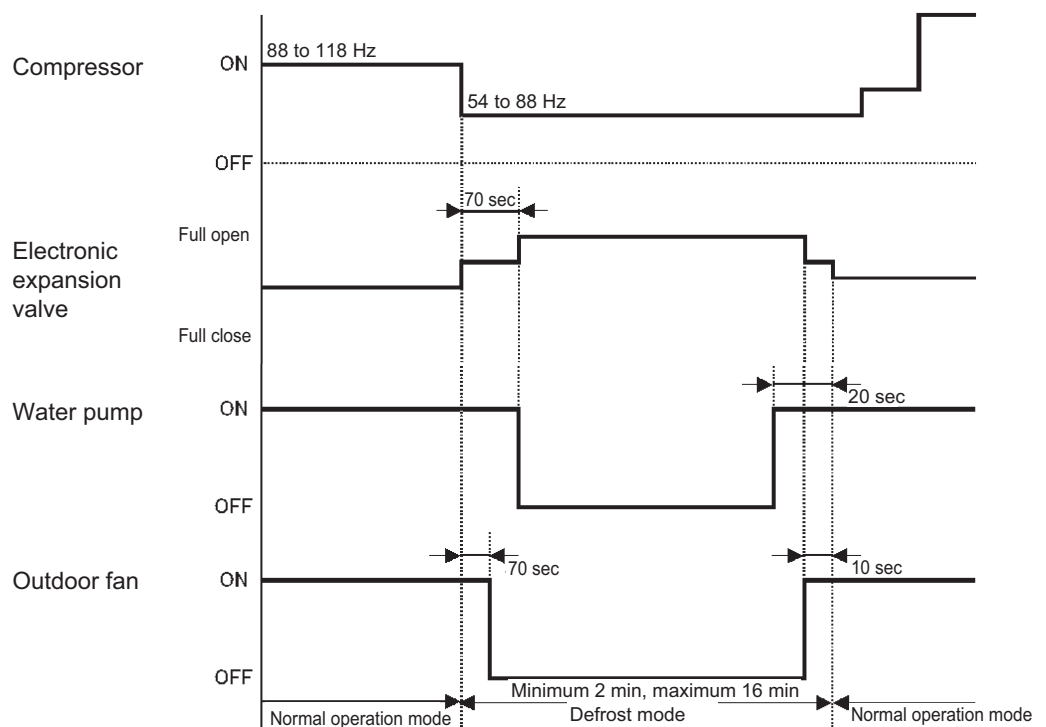
*2 Errors prohibiting anti-freezing mode II: **U4, A6, AE, HC, J8**

2.7 Defrost Control

■ Function overview (normal cycle defrosting method)

- Frost on the air heat exchanger reduces heating capacity, therefore defrost is required to restore capacity order to restore capacity.
- When the outdoor heat exchanger temperature falls below the defrosting operation start temperature during heating operation, defrosting begins. Defrosting operation ends about 15 minutes after it starts, or when the temperature exceeds the defrost operation end temperature.
- Defrosting operation start and end heat exchanger temperature vary according to operation status, for the sake of effective defrosting.
- When heating operation ends, if there is frost on the outdoor heat exchanger, defrosting takes place in order to prepare for the next heating operation. Operation stops after defrosting. (Clean defrosting)

■ Operation time chart



R1000216

(1) Defrosting operation prohibited periods (do not defrost at the following times)

- Approx. 28 minutes after heating operation starts (*)
 - Approx. 28 minutes after defrosting operation recovery (*)
- *For clean defrosting, approx. 12 minutes

(2) During defrosting operation

- Operation frequency has 4 stages, which vary depending on time. (Depending on the settings, the frequency may remain the same even in different stages.)
- Electronic expansion valve changes according to operation frequency. (Depending on the settings, the opening degree may remain the same even when the frequency changes.)
- Outdoor fan stops during defrosting.
- When the outdoor heat exchanger temperature reaches the defrosting operation end temperature, defrosting operation is canceled.
- Approx. 2 to 16 minutes are required for operation. (Operation time varies according to the nature of the frost.)
- The display remains at "Heating" even during defrosting.

- "RUN" remains lit on the display even during defrosting.

(3) Normal operation after defrosting operation

- Electronic expansion valve control is in normal operation mode.
- Outdoor fan begins operation 10 seconds in advance.
- Normal operation frequency, as at startup, increases in stages in accordance with "defrosting operation recovery frequency limit."

■ **Defrosting operation starts and end temperatures**

(1) Defrosting operation start temperature

- When previous defrosting operation time was less than 15 minutes
Outdoor air heat exchanger temperature = outdoor air temperature -9°C (*)
- Other than the above
Outdoor air heat exchanger temperature = outdoor air temperature $+1^{\circ}\text{C}$ (*)
*Upper limit -4°C , lower limit -27°C
When capacity is judged unaffected, even at the defrosting operation start temperature, entry may be delayed.

(2) Clean defrosting operation start temperature

- When previous defrosting operation time was less than 15 minutes
Outdoor air heat exchanger temperature = outdoor air temperature -5°C (*)
- Other than the above
Outdoor air heat exchanger temperature = outdoor air temperature $+5^{\circ}\text{C}$ (*)
*Upper limit -4°C , lower limit -27°C
Entry judgment is made only when the outdoor air temperature is 1°C or below.

(3) Defrosting operation end temperature (including clean defrosting)

Outdoor air heat exchanger temperature = 6°C - outdoor air temperature
(Upper limit 11°C , lower limit 4°C)

Part 2

Specifications

1. Specifications	20
1.1 Hot Water Storage Unit	20
1.2 Heat Pump Unit	21
2. Operation Area and Capacity	22
2.1 Operation Area	22
2.2 Performance Characteristics	22
3. Wiring Diagrams	23
4. Piping Diagrams	24
5. Field Wiring	25
5.1 Typical Wiring Pattern	25
5.2 Electrical Work Materials	25

1. Specifications

1.1 Hot Water Storage Unit

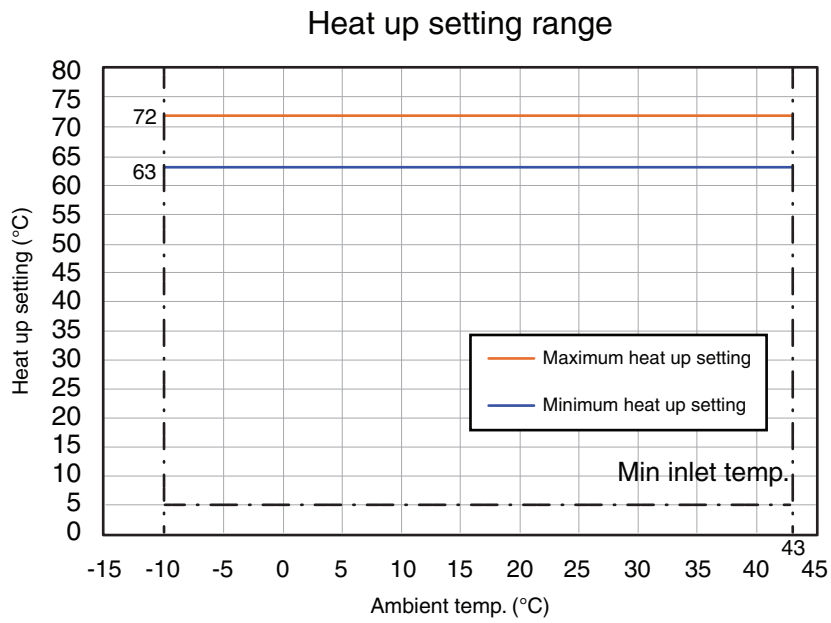
Tank Model Name		TU25/32SSZA
Tank volume	ltr	250 & 315
Installation location		Outdoor/Indoor
Ambient temperature		-10 ~ 43 (*1)
Inner tank material		Duplex 2205
Inner tank material thickness	mm	1.2
Outer tank casing		Primed & Painted Galvanize
Max. water pressure	kPa	700
Outer casing material thickness	mm	0.5
Tank color		Body Ivory White 5Y7.5/1 & Lid + base Silver RAL9006
Insulation type		Polyurethane
Insulation thickness	mm	50
Note(s)		(*1) Tank should be installed inside the house if ambient temperature below -6°C

1.2 Heat Pump Unit

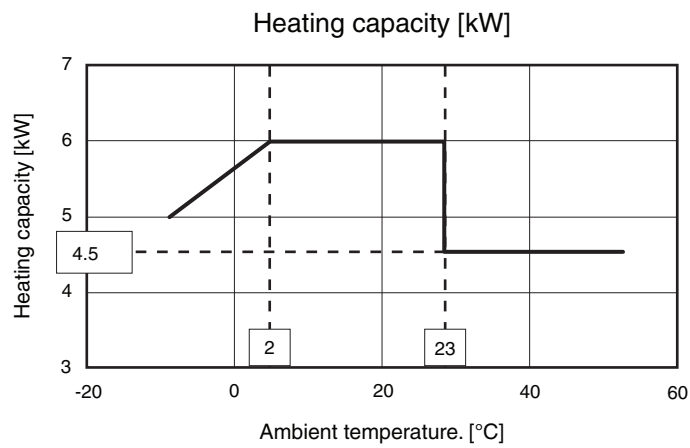
Outdoor unit Model Name		RQWX60ZV1A
Exterior color		Ivory white (5Y7.5/1)
Ambient temperature	°C	-10 ~ 43
Heat up temperature	°C	63
Nominal thermal output (*1)	kW	5.11
Nominal power consumption (*1)	kW	0.83
Nominal COP		6.15
Max. heat output	kW	6.0
Max. operation current	A	10
Heat up time (*2)	hr	4
Breaker size	A	15
Power supply		1 phase, 230~240 V 50 Hz
Compressor type		Swing
Compressor name		1Y042CKAX1S
Design pressure	MPa	13.7/9.5 (Gauge)
Sound level	dB(A)	38 (*3)
Dimensions (H × W × D)	mm	735 × 825(+113) × 300(+15)
Weight	kg	61
Max. water pressure	kPa	700
Refrigerant		CO ₂ (R744)
Refrigerant charge	kg	1.12
Max. water piping length	m	15
Max. difference in elevation	m	5
Field piping (in/out)	mm	12.7
Installation location		Outdoor
Note(s)		(*1) Nominal point: Ambient temperature 33.0°CDB/26.0°CWB (DP23.5°C), Inlet and outlet water temperature 21.0°C/63°C (*2) Heating conditions: Ambient temperature 5.0°C or higher, HP inlet water temperature 7.0°C or higher, outlet water temperature 63°C, tank 315L (*3) Operation noise value was measured in test laboratory conditions. Operation noise in the actual installed condition will vary depending on the surrounding environment.

2. Operation Area and Capacity

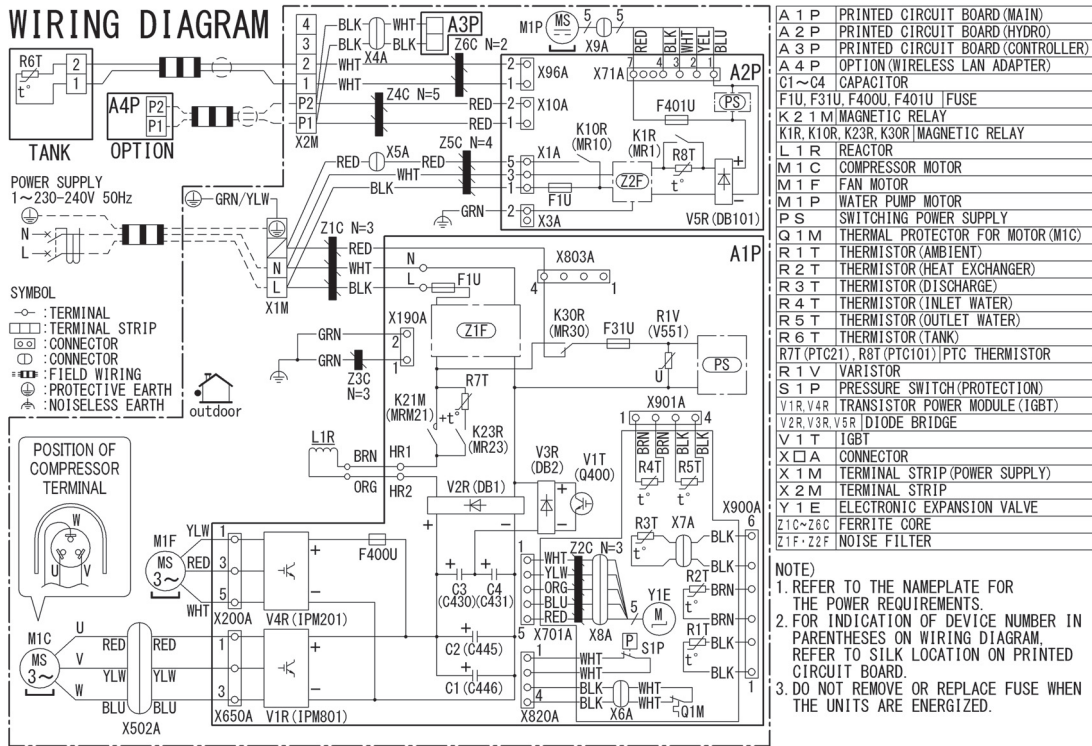
2.1 Operation Area



2.2 Performance Characteristics

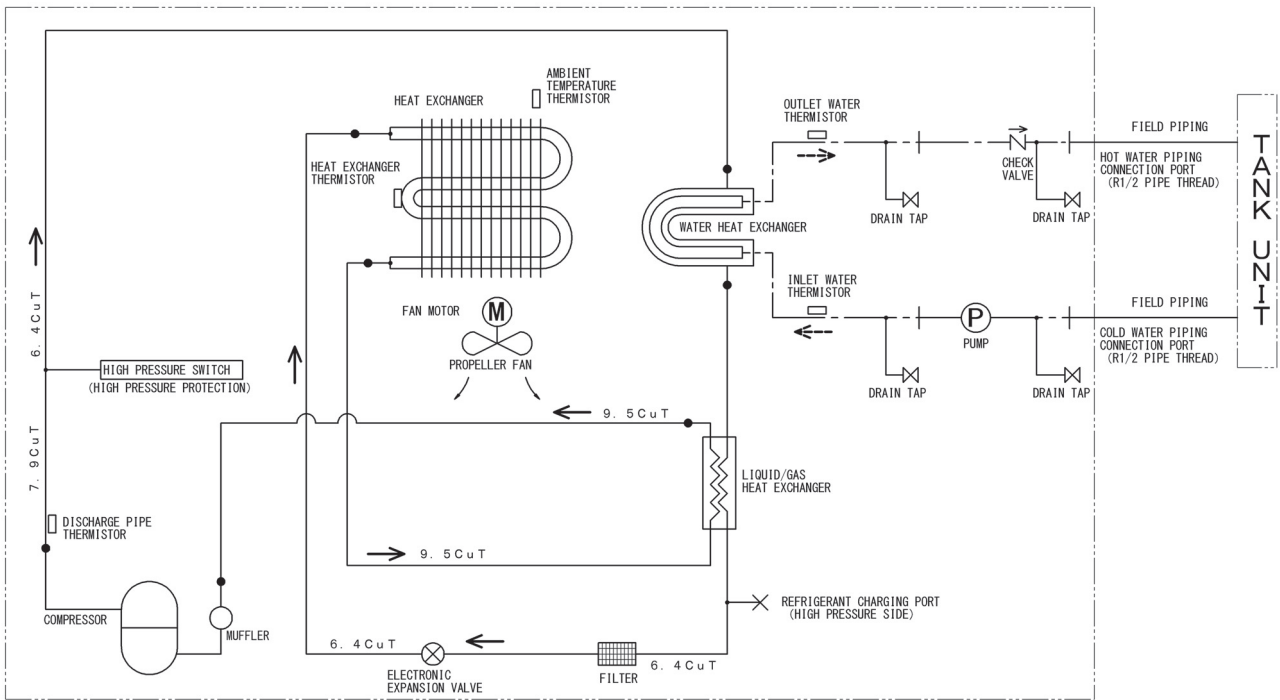


3. Wiring Diagrams



3D156895B

4. Piping Diagrams

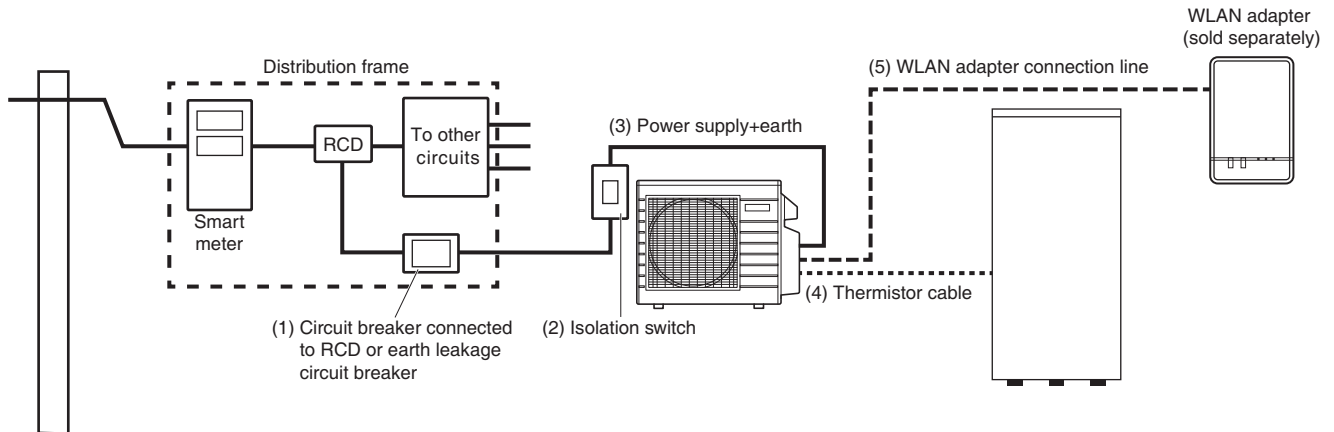


← REFRIGERANT FLOW
 ←-- HOT AND COLD WATER FLOW

3D154816

5. Field Wiring

5.1 Typical Wiring Pattern



5.2 Electrical Work Materials

	Part name	Remarks
(1)	Wiring circuit breakers (circuit breakers or RCBO)	System requirements: Single-phase 230 V-240 V, 15 A
(2)	Isolation switch	Isolation switch is a requirement according to AS/NZS 3000
(3)	Power supply wires including earth	For further information, please refer to AS/NZS 3000 and 60245 IEC 57.
(4)	Thermistor cable	AWG22 (6 m) (included with hot water storage unit)
(5)	WLAN adapter with special cable	When using Daikin Airbase (smartphone application) Dedicated cable

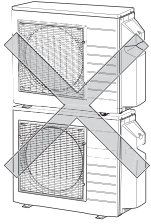
Part 3 Installation

1. Construction Malfunction Examples27

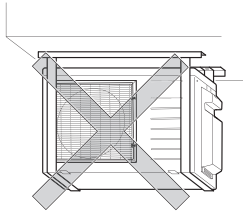
1. Construction Malfunction Examples

Example 1 Heat pump unit installation standards not observed

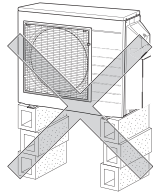
- Never stack units directly on top of each other.



- Ceiling hanging makes it difficult to remove the main unit for repair or maintenance.



- ☆ Insufficient foundation construction may lead to complaints of operating sound or vibration.

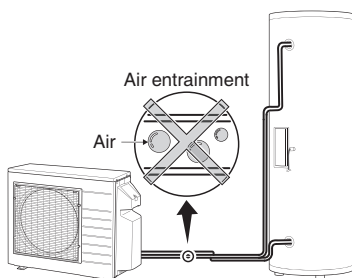


Points

- ★ Be sure to install the heat pump unit horizontally on a solid foundation or base.
- ★ Ensure the space required and install in a location where operating sound and vibration will not cause problems.

Example 3 Air vent malfunction (test operation error)

- When air cannot be vented, air entrainment will occur in the water pump, leading to an abnormal stop.

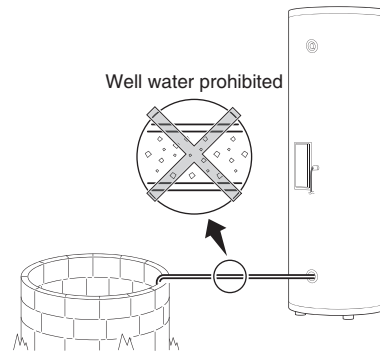


Points

- ★ Vent air according to the installation manual.
- ★ When the heat pump unit is installed on top, mount an air vent valve at its outlet (hot water side).

Example 2 Problems due to use of well water (clogged water supply filter)

- Clogged heat exchanger/piping
Well water is of poor quality with many impurities, which adhere to the heat exchanger and piping.
- No hot water.
- No operation with "EC" display (outlet temperature abnormality).
- Clogged water supply filter/pressure reducing valve.
Impurities in well water (such as sand and debris) clog the water supply filter and/or pressure reducing valve. (This may also lead to can body damage.)

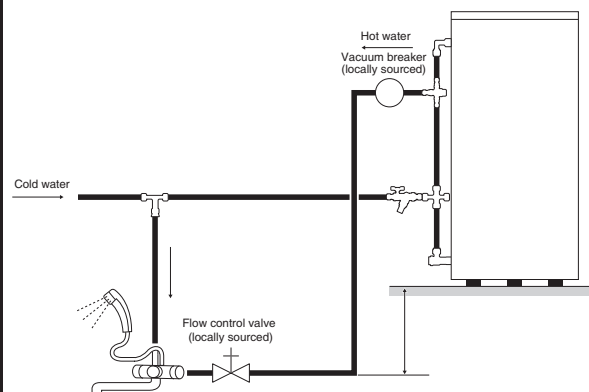


Point

- ★ Because well water contains many impurities, its use leads to filter clogging and other malfunctions, requiring a water quality inspection upon installation.
If the use of well water is unavoidable, please consult the installer.

Example 4 Hot water storage unit can body damage due to the downstairs hot water supply

- Negative pressure in the can body leads to cracks or damage.
Negative pressure occurs in the can body when the hot water supply and output become imbalanced due to clogging of the pressure reducing valve.

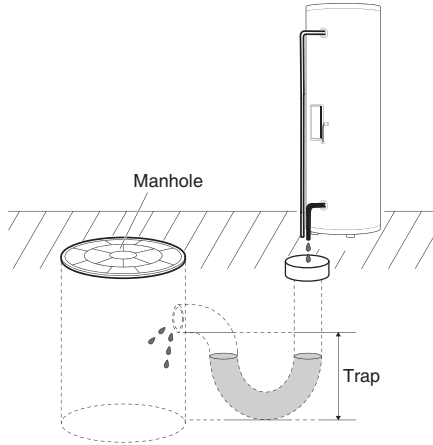


Points

- For downstairs hot water supply
- ★ Do not supply downstairs hot water over 5m.
- ★ Be sure to mount an air vent valve with negative pressure valve (optional accessory) and flow rate adjustment valve (locally procured) on the hot water supply piping.

Example 5 Drain piping leakage

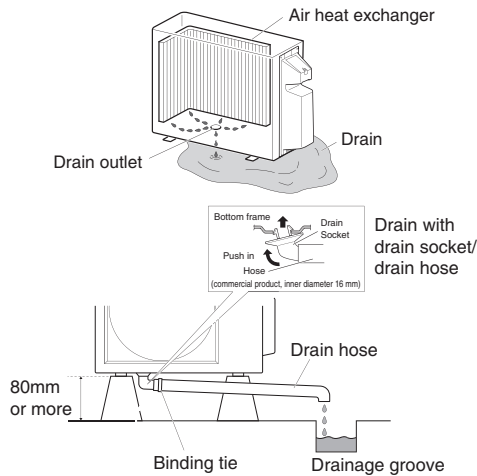
- Steam and smell from the drain outlet can surround the hot water storage unit, condense, and lead to corrosion, shortening the hot water storage unit and electrical equipment service life.
- Also, inert gas from the drain outlet leads to corrosion of the piping, etc.



Point
 ★ Install a drain trap in the drain piping.

Example 7 Water leakage from heat pump unit (1)

- Water accumulates at the bottom of the heat pump unit due to incomplete drain installation. In normal operation, drainage from the heat pump unit adheres to its air heat exchanger and flows out throughout the year. In winter, because frost adheres to the air heat exchanger, water also flows out when frost melts during defrosting operation.

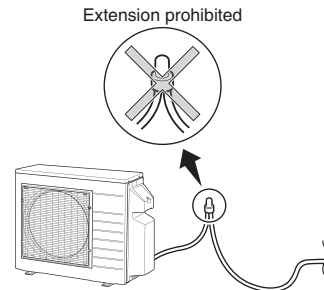


Points

- ★ Using the drain socket, drain water through a drain hose or drain directly by installing a drainage groove or drain hopper below.
- ★ When mounting the drain socket to the bottom frame, first connect the drain hose and then mount.
- ★ Be sure to mount the drain hose on a downward slope.
- ★ In regions at risk of freezing, instead of mounting a drain socket, install a drainage groove or hopper underneath.

Example 6 Wiring extension prohibited

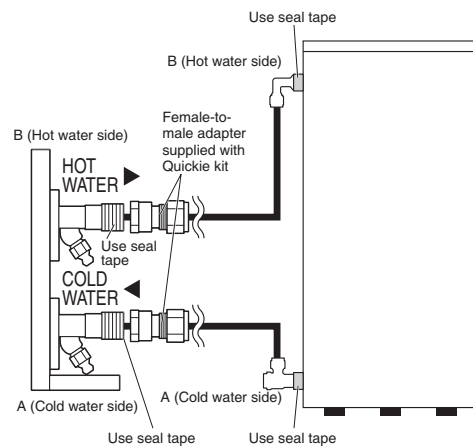
- Extended connection of electrical wiring may cause transmission malfunctions or overheating at the connection point, leading to the risk of fire.
- Corrosion may also occur due to aging, etc., leading to poor contact.



Point
 ★ Never extend electrical wiring or power lines at intermediate points.

Example 7 Water leakage from heat pump unit (2)

- Water leakage due to insufficient tightening torque at the piping adapter connection point
- Failure to apply sealing tape
- Fitting damage due to excessive tightening

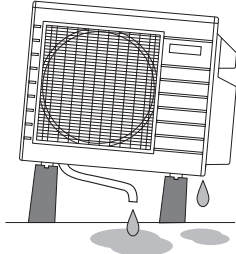


Points

- ★ Confirm tightening and water level.
- ★ Thoroughly confirm any water leakage after test operation. (confirmation with the installation manual checklist)
- ★ Initially tighten by hand to avoid damaging the threaded part of the fitting.
- ★ To avoid damaging the sheet metal, use 2 spanners when tightening.
- ★ When sealing with tape, ensure not to overtighten.

Example 7 Water leakage from heat pump unit (3)

- Water leakage from elsewhere than the drain outlet, due to main unit installation at the wrong slope. Water leaks from elsewhere than the drain outlet because of a failure to confirm main unit horizontality. Water leaks from elsewhere than the drain outlet because of a tilt caused by weakness in the main unit installation ground.

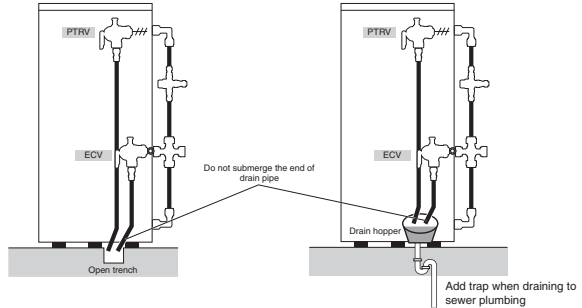


Point

- ★ When installing the main unit, check that it is level and reinforce the installation ground surface.

Example 8 Water leakage from hot water storage unit

- Water leakage due to insufficient tightening torque at the piping adapter connection point
- Failure to apply sealing tape
- Fitting damage due to excessive tightening

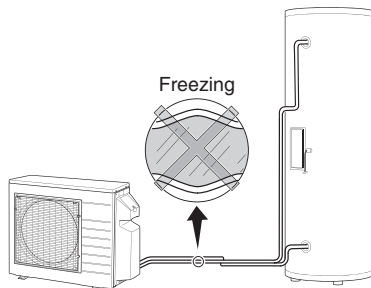


Point

- ★ Do not submerge the end of the drain pipe.

Example 9 No hot water/insufficient water

- Frozen water supply system.
 - Frozen water supply stopcock
 - Frozen water supply piping
 - Frozen pressure reducing valve
- Clogged water supply system.
 - Water supply filter clogged with debris
 - Insufficient water supply pressure
 - Water supply stopcock open
 - Water supply piping clogged with debris
- Freezing or clogging in the hot water supply piping.
- Poor water supply pressure adjustment in the tap.

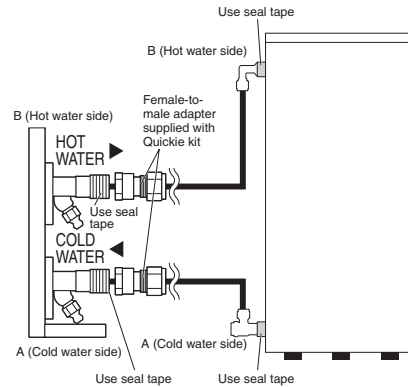


Points

- ★ Identify the frozen location. Conduct anti-freezing measures suited to the situation Reinforce piping insulation/mount anti-freezing heater
- ★ Remove the cause of the clogging in the water supply system.
- ★ After confirming the above, check hot water at all taps.
- ★ When the product is normal but water supply pressure is high, hot water may not be supplied. When there is no check valve in the piping path to supply hot water to the tap, or when the check valve is damaged, symptoms such as hot water leaking from the relief valve even when the heat pump unit is not engaged in heating operation may occur.

Example 10 Water does not heat up

- No operation with "UF" display (piping error detected).
 - Due to crossed water piping between heat pump unit and hot water storage unit
- No operation with "FA" (peak cut stop) or "EC" display (outlet temperature abnormality).
 - Outlet temperature rises due to insufficient air venting or clogged water heat exchanger with well water in use, leading to abnormal stop
 - Outlet temperature rises due to frozen pipes, leading to abnormal stop



Points

- ★ Judge by the heat pump unit feed/return piping temperature and correct any crossed piping.
- ★ Confirm air venting and pipe freezing; if there is no problem, check whether city water or well water is in use, and if the latter, clean the water heat exchanger.

Example 11 Constant operation

- Tank water thermistor is not connected.

Example 12 Legionella control operation takes place weekly

- Check piping insulation
- Adjust heating correction temperature

Part 4

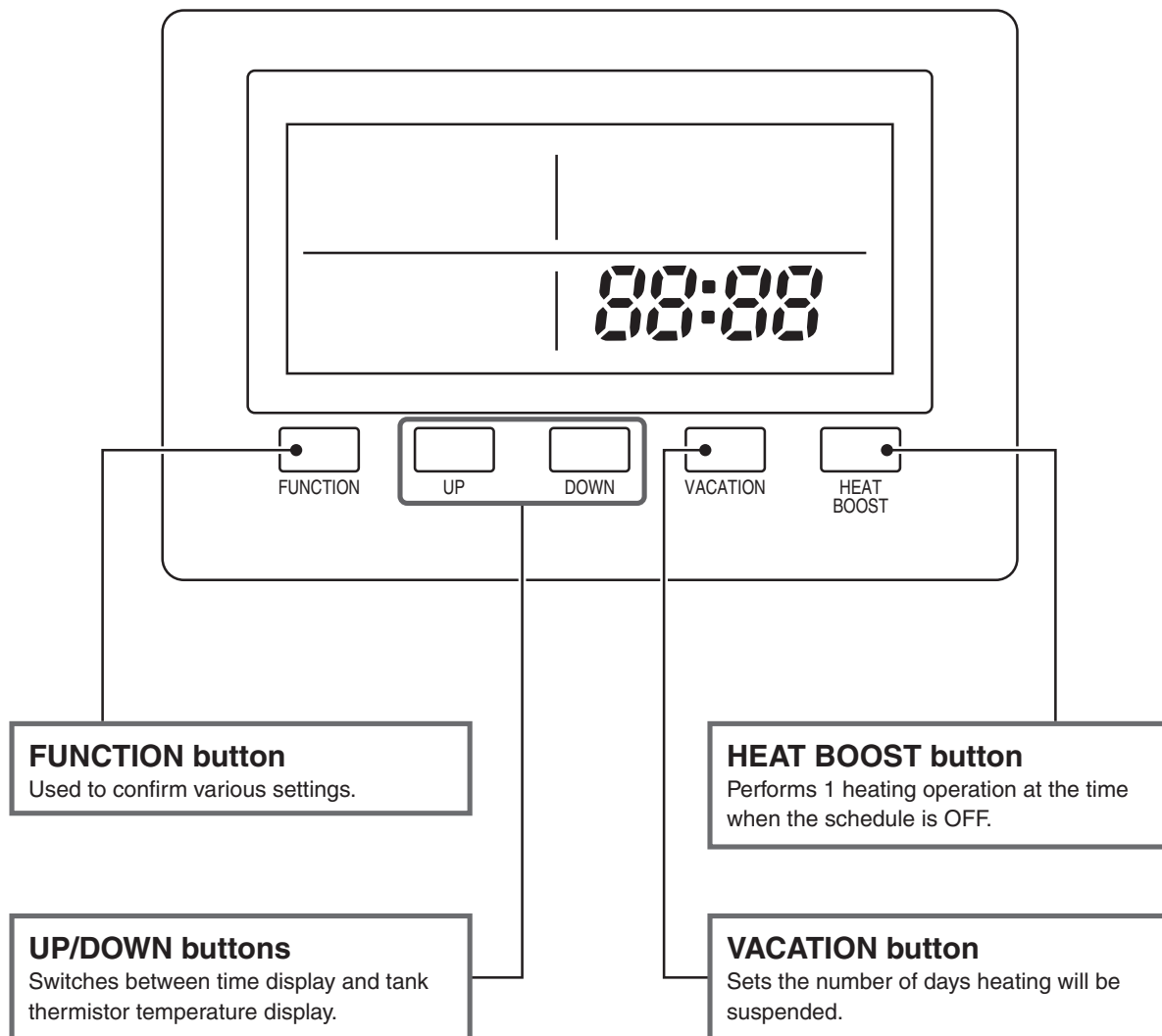
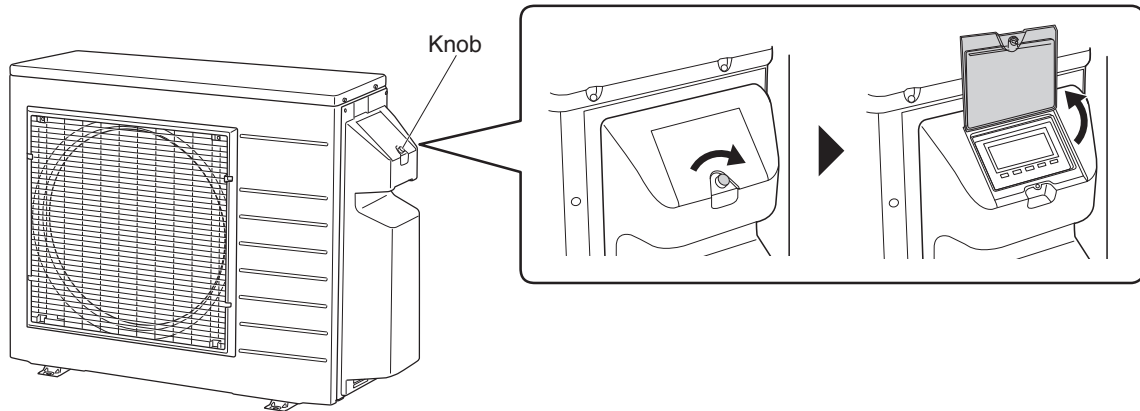
Remote Controller

1. Operating the Controller	31
2. Controller Screen Display	32
3. Mode Transition	33
4. Service Mode	34
5. Field Settings Mode	35
6. Trial Operation	36
6.1 Preparation for Trial Operation	36
6.2 Trial Operation	39

1. Operating the Controller

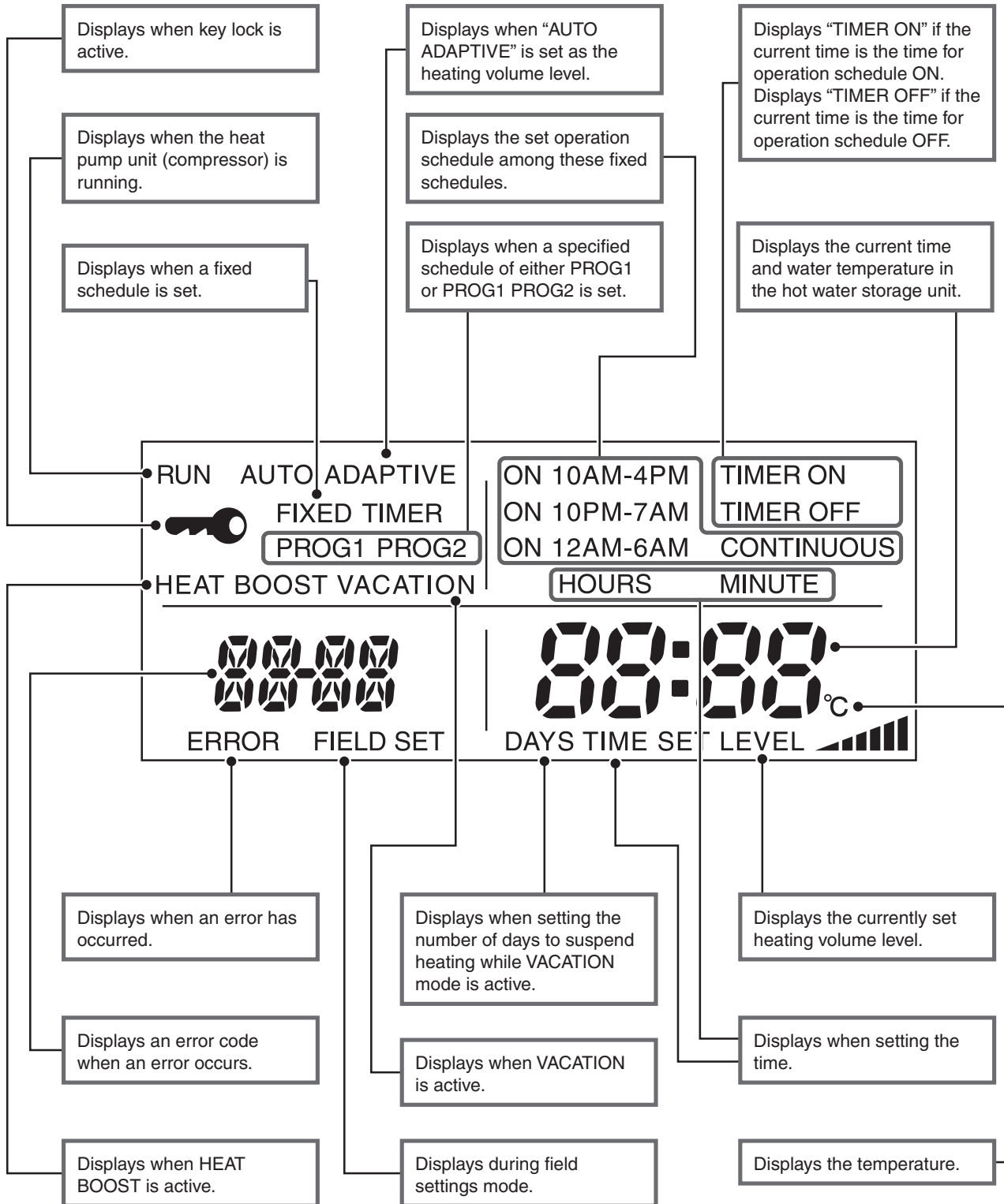
The controller is built into the pipe cover. You can access the controller by unscrewing the knob on the lid at the top of the pipe cover and lifting the lid upwards. Close the lid and then firmly screw the knob clockwise to secure the lid when you are not using the controller.

Although the controller is waterproof, do not splash water onto it or operate it with wet hands.

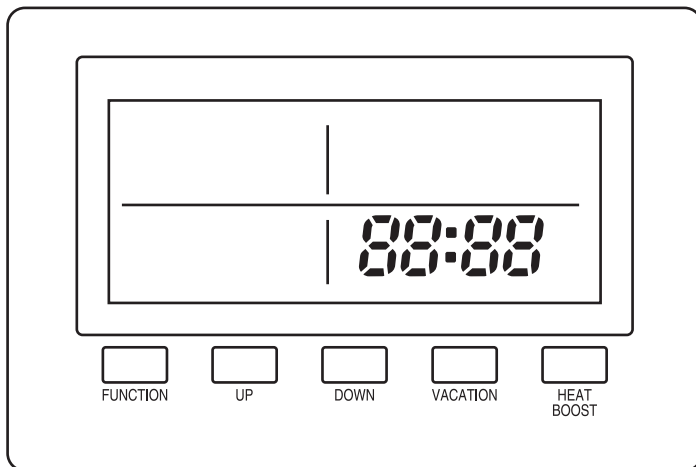




2. Controller Screen Display



When you are not using the controller, the backlight turns off after approximately 30 seconds. Icons and segments light up, blink or turn off depending on the current settings and the status of the heat pump unit.







3. Mode Transition







 Hold down for 5 sec
 → Air venting operation
 ← Press any button on the controller



 Hold down for 5 sec
 → Service mode (*)
 ←



 Hold down for 5 sec
 or no operation for 5 minutes



 Hold down for 5 sec
 → Field settings mode



 Hold down for 5 sec
 or no operation for 5 minutes

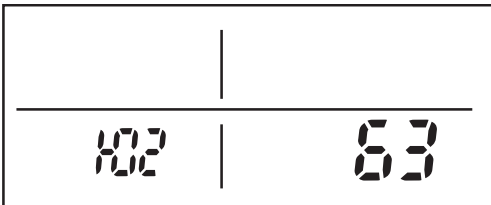
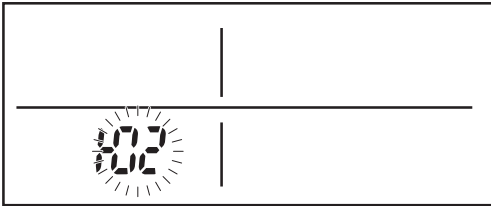
*Service mode is company confidential.
 In addition, because the service manual contains control operation specifications, etc.,
 it is in principle company confidential.

R4004251

4. Service Mode



Service mode



- 1.) Hold down for 5 seconds to enter the service mode; as in the figure at left, the first code will blink.
 - 2.) Select the first code item to be confirmed with , and press .
 - 3.) The second code will be displayed blinking, so select the second code to be confirmed with , and press .
 - 4.) The target current value will be displayed.
- To end service mode display, hold down for 5 seconds. (Service mode will also end when the controller is not operated for 5 minutes.)
 - When misoperating or to confirm another item, press .

List of selection codes and displayed items

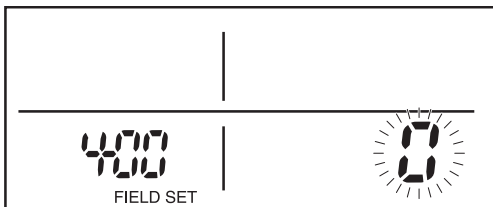
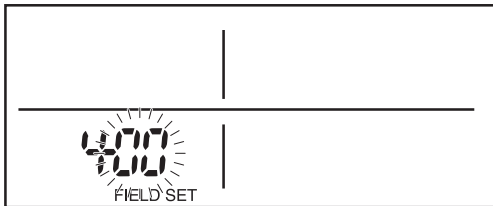
First code	Second code	Item
0	01	Outdoor air temperature °C
	02	Discharge pipe temperature °C
	03	Air heat exchanger temperature °C
1	01	Inlet temperature °C
	02	Outlet temperature °C
	03	Tank water temperature °C
2	01	Pump rotation speed rpm
	02	Electronic expansion valve opening degree pulse
	03	Fan rotation speed rpm
	04	Compressor rotation speed rps
3	01	Hydroelectric equipment ID
	02	Hydro check ID
	03	Controller software ID
	04	Controller software version












R4004252




5. Field Settings Mode



Field settings mode



- 1.) Hold down   for 5 seconds to enter the service mode; as in the figure at left, the first code will blink.
- 2.) Select the first code item to be confirmed with   and press  to select the first code.
- 3.) The second code will be displayed blinking, so select the second code to be confirmed with  , and press .
- 4.) The setting values blink, so select a setting value with  , and press  to select the setting value. When field settings mode change write succeeds, the FIELD SET icon will blink twice.

- To end service mode display, hold down   for 5 seconds. (Field settings mode will also end when the controller is not operated for 5 minutes.)
- When misoperating or to confirm another item, press  to return to first code selection.
- If not able to enter field settings mode, initial settings are not complete.

List of selection codes and displayed items

First code	Second code	Item	Default	Range	Details
1	03	Learning reset request	0	0/1	When set to 1, the heating level set in auto adaptive mode will be initialized.
3	03	Extended heating setting	0	0/1	0: Disabled 1: Enabled With the function enabled, when schedule ON changes to schedule OFF during heating operation, operation continues until completion conditions are reached, without stopping immediately.
4	00	Hot water storage unit volume	0	0/1	0: 250L 1: 315L Displays the volume of the connected storage unit on the product.

- Upon an auto adaptive initialization request, after initialization is complete, the FIELD SET icon will blink. When next entering field settings mode, the setting value will have returned to 0.

R4004253

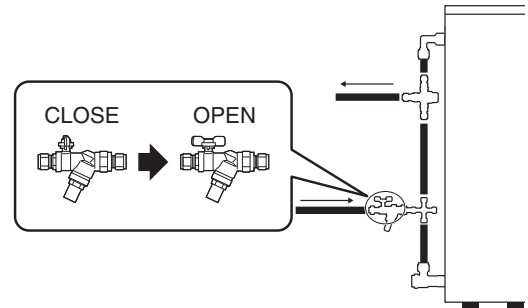
6. Trial Operation

6.1 Preparation for Trial Operation

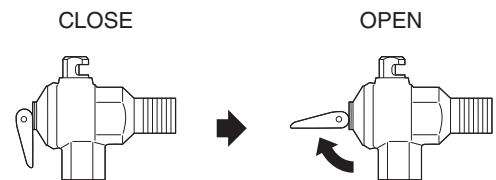
1. Checking the hot water storage unit for water retention and leaks

1-1. Open the water supply stop valve in the cold water supply piping.

Since the water supply stop valve is not included with the hot water storage unit, the installation location and shape will vary from home to home. Please check with your dealer.

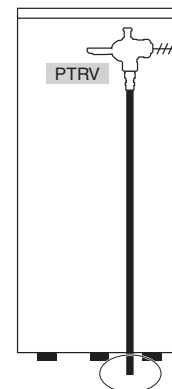


1-2. Operate the lever on the PTRV to open it.



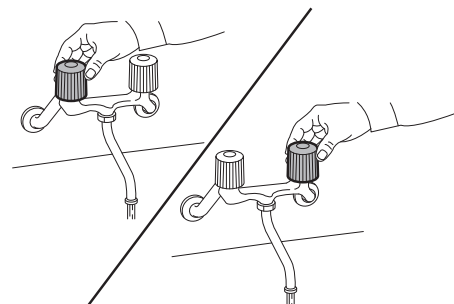
1-3. Ensure that a steady, continuous stream of water comes out of the drain pipe continuously. (Water should not be mixed with air.)

It takes about 20-30 minutes for the hot water storage unit to fill up and for the water to come out from the drainage point.



1-4. Operate the lever on the PTRV to close it.

1-5. Open hot and cold water taps (mixing taps) to ensure that air is completely expelled from piping between the hot water system and taps.



1-6. Check that there are no water leaks from the pipe connections.

2. Checking for water retention and leaks in the heat pump unit

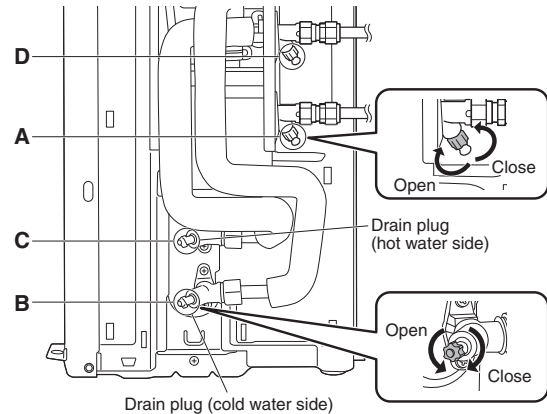
2-1. Open and close the drain plugs of the heat pump unit in the specified order.

Open drain plug A.

Once it is confirmed that water is flowing out in a steady, continuous stream, close the drain plug.

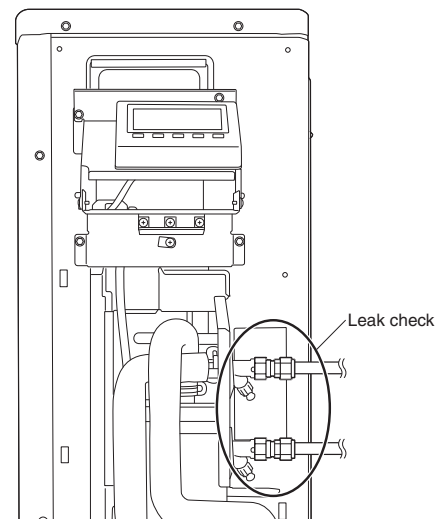
- Water should not be mixed with air.
- Long pipe lengths and bends in the heat pump pipework may make it difficult for air to escape. In this case, remove the drain plug completely to allow a steady, continuous stream of water to flow.
- Ensure that sufficient water is passed through the system so that water comes out continuously and all air is removed from the system.

Repeat this process for the remaining drain plugs B, C and D in that order.



2-2. Check that there are no water leaks in the pipe connections.

2-3. Install the pipe cover



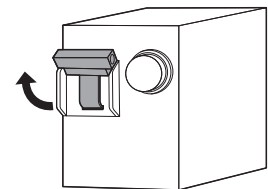
3. Power on (energisation)

3-1. Check that the supply voltage is 230-240 V single-phase.

Turn the isolation switch and circuit breaker or RCBO "ON".

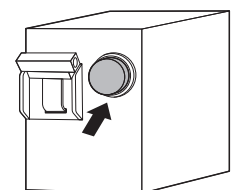
NOTE

Always fill the hot water storage unit with water before switching on the power. If the equipment is damaged due to the hot water storage unit not being filled, the warranty will be voided.



3-2. Press the test button to check if the RCBO or earth leakage circuit breaker operates correctly.

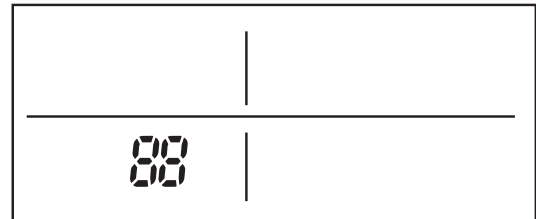
If the circuit breaker switches "OFF", it is operating correctly. After checking, switch it "ON" again.



4. Initial communication

4-1. Initial communication.

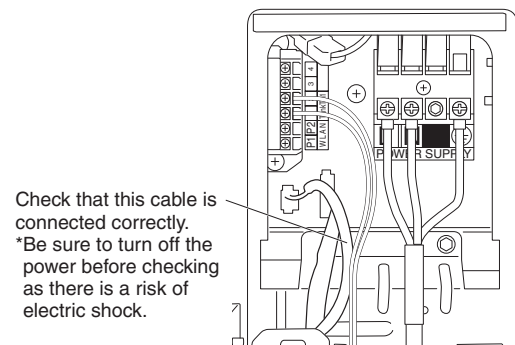
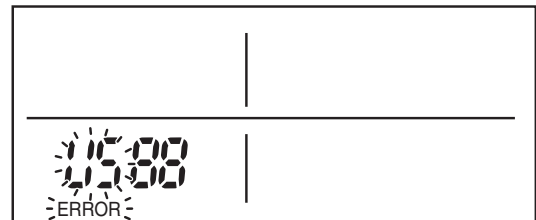
- Initial communication starts automatically after power-on. Initial communication can take up to 2 minutes.
- If initial communication is successful, go to step 4-3.
- If initial communication fails, go to step 4-2.



4-2. If initial communication fails...

Communication error (error code: U5) will be displayed.

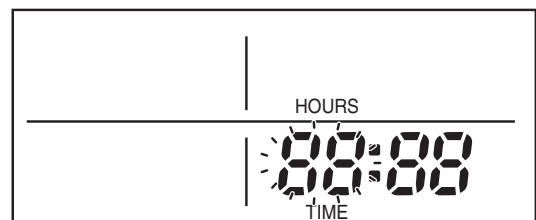
Initial communication will automatically resume once the problem has been resolved.



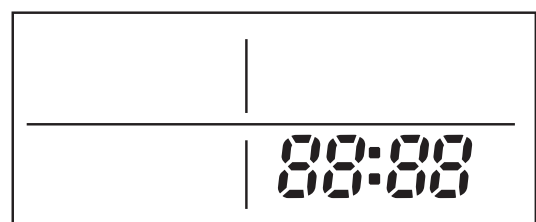
Check that this cable is connected correctly.
*Be sure to turn off the power before checking as there is a risk of electric shock.

4-3. You will be redirected to the initial setup screen.

- When the power is switched on for the first time, the initial settings screen will be displayed.
- If there is a record of initial settings being made, the main screen will be displayed.
- Do not quit operation midway through initial setup. Heating operation will not be possible.
- **When the power is switched on for the first time, carry out "Trial operation" steps 1 to 4, 6, and 7.**
- **If initial settings have been completed already and the main screen is displayed immediately after the power is turned on, perform "5. Air venting operation", as necessary.**
- After transition to the main screen, if the current time falls within the operation schedule ON time period, heating operation will start.





Initial settings screen



Main screen (Time display)

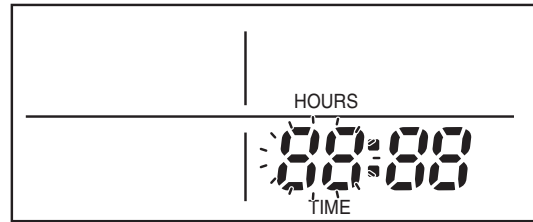
6.2 Trial Operation

1. Air venting operation (at initial power on)

- 1-1. Press and hold  and  simultaneously for 5 seconds on the initial settings screen.

After the above operation, the controller screen will change. Air venting operation will start. Wait 5 minutes.

*In addition to the icons shown in the figure on the right, other icons also may be lit depending on the initial settings.



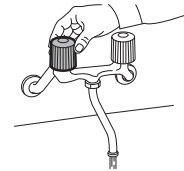
Initial settings screen (time setting screen)
(Other icons also display depending on various settings.)

- 1-2. Complete the air venting operation.

After 5 minutes, press any button on the controller. Display will return to the initial settings screen.




- 1-3. Vent the hot water storage unit.

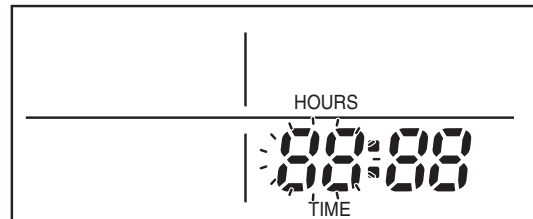
Open the hot water tap (mixing tap) for 60 seconds or longer, and then close it.







2. Setting the time

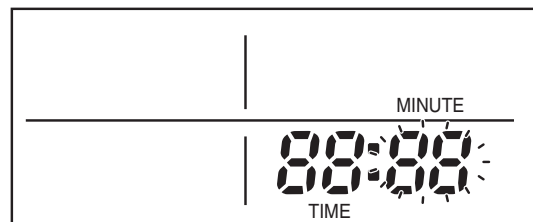
- 2-1. Set the time (hours).

- Press  advances the current time by 1 hour.
- Press  sets back the current time by 1 hour.
*Press and hold each to advance or set back the time 4 hours.
- Press  to go to “2-2. Set the time (minute)”.



- 2-2. Set the time (minute).

- Press  advances the current time by 1 minute.
- Press  sets back the current time by 1 minute.
*Press and hold each to advance or set back by 10 minutes.
- Press  to go to “3. Setting of the operation schedule”.
- Press  to return to “2-1. Set the time (hours)”.



3. Setting of the operation schedule

The system will begin heating the water in the hot water storage unit when the amount of hot water in the hot water storage unit is low when the operation schedule is ON.

3-1. Set either a fixed schedule or a specified schedule.

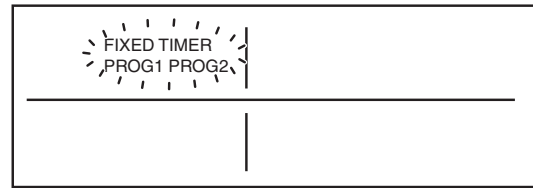
- Broadly, there are 2 types of operation schedule:
 - Fixed schedule: operation schedule according to predetermined times ("FIXED TIMER")
 - Specified schedule: operation schedule according to user-specified times ("PROG1" or "PROG1 PROG2")
- PROG1: Set the desired operation time range for 1 operation schedule (PROG1).
- PROG1 PROG2: Set the desired operation time ranges for 2 operation schedules (PROG1 and PROG2).
- To reset any parameters of the operation schedule, press to return to the initial screen for setting the operation schedule.

Press or to change between "FIXED TIMER", "PROG1", and "PROG1 PROG2".

Whichever is currently selected will blink.

■ To select a fixed schedule

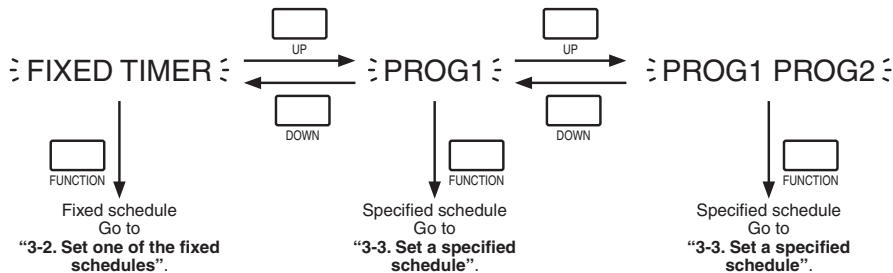
Press while "FIXED TIMER" is blinking.
 This will go to "3-2. Set one of the fixed schedules" to continue set up.



Initial screen for setting the operation schedule

■ To select a specified schedule

Press while "PROG1" or "PROG1 PROG2" is blinking.
 This will go to "3-3. Set a specified schedule" to continue set up.



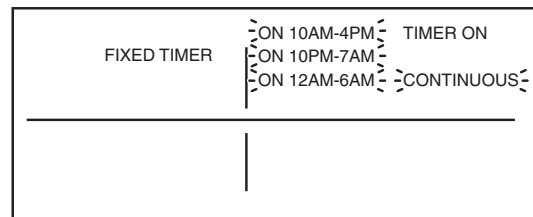
3-2. Set one of the fixed schedules.

- Press or to change between the set times. Whichever time is currently selected will blink.

ON 10AM-4PM: Operation schedule ON is set to the time period from 10 a.m. to 4 p.m. (6 hours).
 ON 10PM-7AM: Operation schedule ON is set to the time period from 10 p.m. to 7 a.m. (9 hours).
 ON 12AM-6AM: Operation schedule ON is set to the time period from 12 a.m. to 6 a.m. (6 hours).
 CONTINUOUS: Operation schedule ON is set to 1 whole day (24 hours).

- Once the desired time is blinking, press to select that time.
 The time is now set as the operating schedule.

Go to "4. Setting the heating volume level".



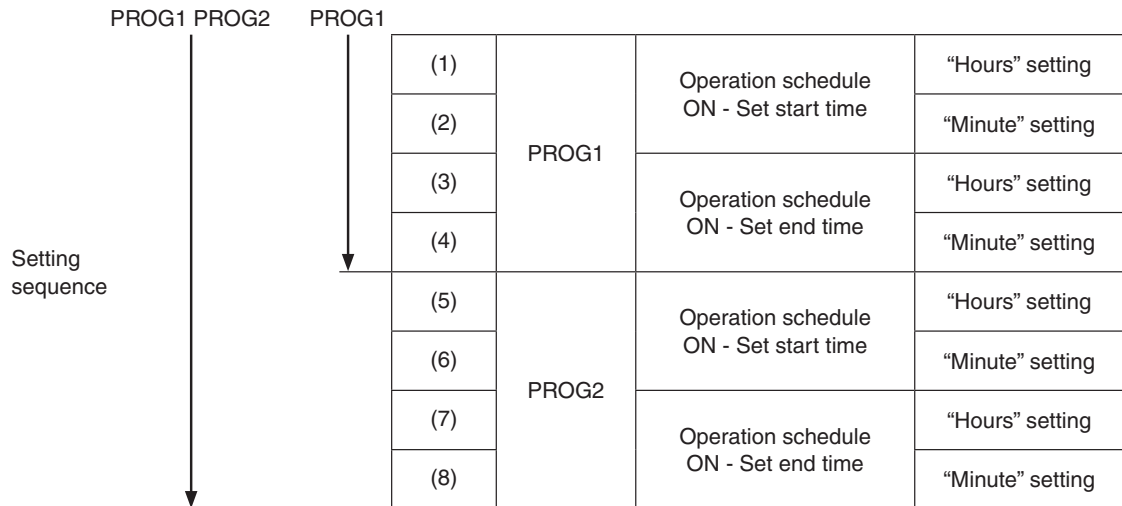
3-3. Set a specified schedule.

If "PROG1" was selected in step 3-1, it is only necessary to set "PROG1".

If "PROG1 PROG2" was selected in step 3-1, it is necessary to set both "PROG1" and "PROG2".

Attention

- Do not set the same time for the start and end times of the operation schedule ON. This will result in a setting where the heat pump unit does not perform heating operation. It is also recommended that the start and end times of the operation schedule ON are set with a time difference of at least 4 hours. Otherwise, the heating operation by the heat pump unit may not be completed in the operation schedule ON time period.



Example) When PROG1 is set

1. Set PROG1 time:

Set 01:30 a.m. at steps (1) and (2), and then set 06:30 a.m. at steps (3) and (4).

From 01:30 a.m. to 06:30 a.m. (5 hours) PROG1 operation schedule is ON.

The heat pump unit will be in operation during this time range.

Example) When PROG1 PROG2 is set

1. Set PROG1 time:

Set 01:30 a.m. at steps (1) and (2), and then set 06:30 a.m. at steps (3) and (4).

2. Set PROG2 time:

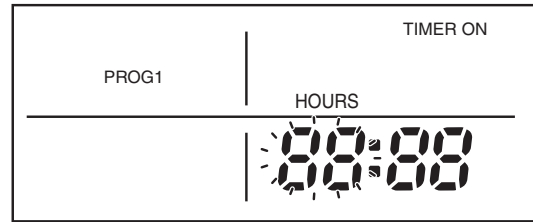
Set 07:30 a.m. at steps (5) and (6), and then set 11:30 a.m. at steps (7) and (8).

From 01:30 a.m. to 06:30 a.m. (5 hours) PROG1 operation schedule is ON, and

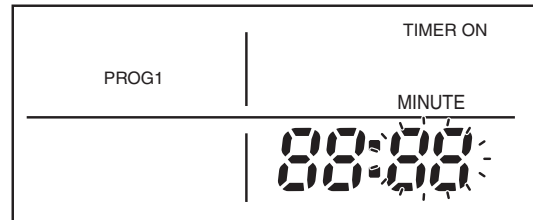
From 07:30 a.m. to 11:30 a.m. (4 hours) PROG2 operation schedule is ON.

The heat pump unit will be in operation during these time ranges.

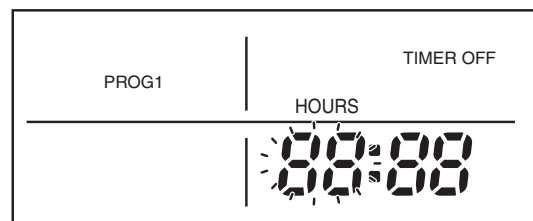
- (1) Press to advance the current time by 1 hour.
 Press to set the current time back 1 hour.
 • Press and hold each to advance or set back the time 4 hours.
 Press to confirm. Go to (2).



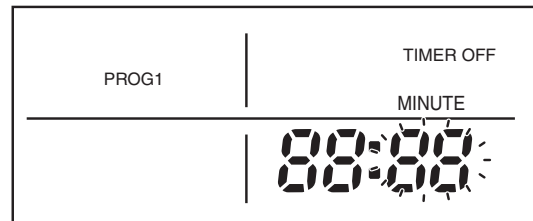
- (2) Press to advance the current time by 30 minutes.
 Press to set the current time back by 30 minutes.
 Press to confirm. Go to (3).



- (3) Press to advance the current time by 1 hour.
 Press to set the current time back 1 hour.
 • Press and hold each to advance or set back the time 4 hours.
 Press to confirm. Go to (4).



- (4) Press to advance the current time by 30 minutes.
 Press to set the current time back by 30 minutes.
 Once you have set "PROG1", press and follow the steps in "4. Setting the heating volume level".



Once you have set "PROG1 PROG2", press and continue to step (5).

(5) to (8) Repeat steps (1) to (4) for PROG2.

After step (8), press and follow the steps in "4. Setting the heating volume level".

4. Setting the heating volume level







4-1. SET LEVEL.



It is recommended that during the commissioning phase the Installer selects the hot water storage level to “LEVEL 1” as this provides the most efficient operation. LEVEL 1 heats half of the total hot water storage unit volume. It is possible to set the level from 1 to 6 or “AUTO ADAPTIVE” mode.

In the “AUTO ADAPTIVE” mode the volume of water for users’ daily consumption will automatically be determined through learning the users’ daily pattern over a period of one week.

NOTE

- When setting AUTO ADAPTIVE, ensure that the setting is maintained for at least one week. Otherwise, the daily usage cannot be correctly estimated. During the 1st week, heating operation is carried out at level 3, so there is a risk that there may be too much or too little hot water.

Choice	On-screen display	Remarks
SET LEVEL 1	SET LEVEL 	Heats half of total hot water storage unit volume.
SET LEVEL 2	SET LEVEL 	Heats approx. 60% of total hot water storage unit volume.
SET LEVEL 3	SET LEVEL 	Heats approx. 70% of total hot water storage unit volume.
SET LEVEL 4	SET LEVEL 	Heats approx. 80% of total hot water storage unit volume.
SET LEVEL 5	SET LEVEL 	Heats approx. 90% of total hot water storage unit volume.
SET LEVEL 6	SET LEVEL 	Heats the entire hot water storage unit volume.
AUTO ADAPTIVE	AUTO ADAPTIVE	The heating volume is determined based on the user’s hot water consumption.

Press  or  to change the set level. Whichever set level is currently selected will blink.

Once the desired level is blinking, press  to select it as the chosen set level.

This completes the initial setup and the screen will automatically transition to the main screen.

- After transition to the main screen, if the current time falls within the operation schedule ON time period, heating operation will start.

5. Air venting operation

If “1. Air venting operation (at initial power on)” has already been performed, this step is not necessary.

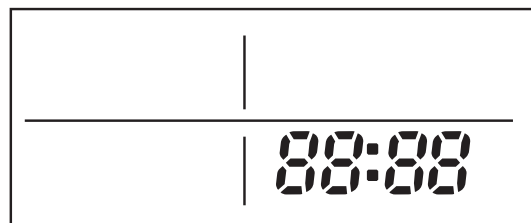
5-1. Start air venting operation.

Press and hold  and  simultaneously for 5 seconds.

- After the above operation, the controller screen will change. This starts the air venting operation.
- Wait for 5 minutes.

NOTE

In addition to the icons shown in the diagram on the right, other icons may also be illuminated.



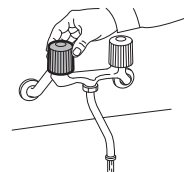
Main screen (time display)

5-2. End air venting operation.

- End the air venting operation by pressing any button on the controller. Display will return to the main screen.

5-3. Vent the hot water storage unit.

- Open the hot water tap (or turn mixing tap to hot and open tap) for at least 60 seconds, or until all air is removed from the pipes and a constant stream of water flows from the tap.
- After this, close the tap.



6. Setting the hot water storage unit size

6-1. Confirm hot water storage unit size.

The hot water storage unit size must be confirmed to ensure proper operation of the set level selected in section “4. Setting the heating volume level”.

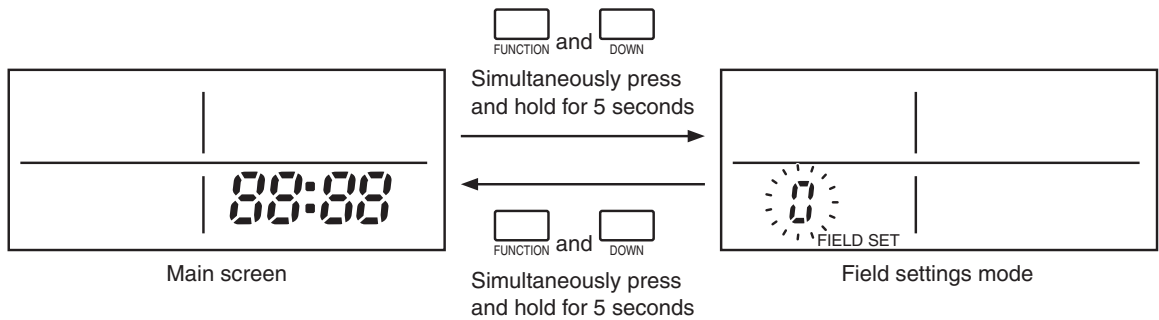
NOTE


250 L is the default hot water storage unit size. If a 250 L is installed, this step can be skipped. If a 315 L is installed, proceed with the following steps.



- On the main screen, press and hold  and  simultaneously for 5 seconds.


This opens the field settings mode.

Operate the buttons as follows until “4-00” displays in the left quadrant.




- Pressing  during field settings mode returns the display to the field settings mode initial screen, allowing you to start again.

- Press  or  to change the number in the field settings. Whichever number is currently selected will blink. Select number 4.

Press  to confirm number 4.
Proceed to the next code selection.





- “00” will begin to blink next to the number 4.

Press  to confirm the number 00.
Proceed to the next code selection.




The number in the bottom right section of the control screen will begin to blink.

- Press  or  to change the number in the bottom right section.

For a 250 L: 0
For a 315 L: 1



Set the relevant number for the hot water storage unit

size installed, and then press .
(If the setting is completed correctly, the FIELD SET icon will blink twice and the display will return to the initial screen of the field settings mode.)

7. Heating trial operation

- In the following cases, a heating trial operation will be performed.

When the current time falls within the operation schedule ON time period...


heating operation will start automatically.
(It is highly likely that heating operation has already started.)

When the current time does not fall within the operation schedule ON time period...

Press  to begin HEAT BOOST Operation.

About the HEAT BOOST function

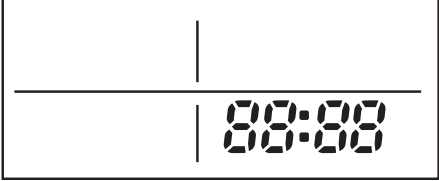
When the main screen is displayed on the controller (time is displayed)...

If you press , heating operation can be performed once, even when current time falls outside of the operation schedule ON time period.

Cases when HEAT BOOST function is not available:

- When the current time falls within the operation schedule ON time period.
- When there is enough hot water in the hot water storage unit.

For details, see “When there is not enough hot water: HEAT BOOST” in the operation manual.

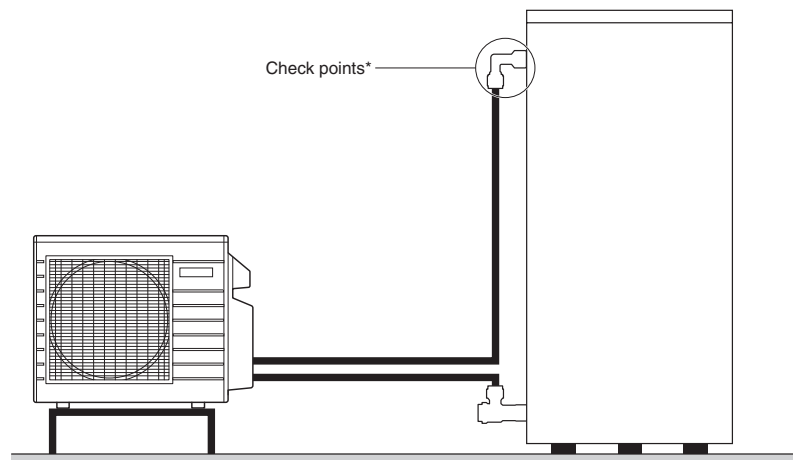


Main screen
(Other icons also display depending on various settings.)

- Check that heating operation is functioning normally.
Touch the pipes or joints at the top of the hot water storage unit to see if they are hot.
If they are hot, heating operation is normal.
If not, check the following:
 - Is the heat pump piping connected correctly?
 - Are there any water leaks?
 - Has operation stopped due to an abnormality? (Is the controller displaying an error code?).

CAUTION

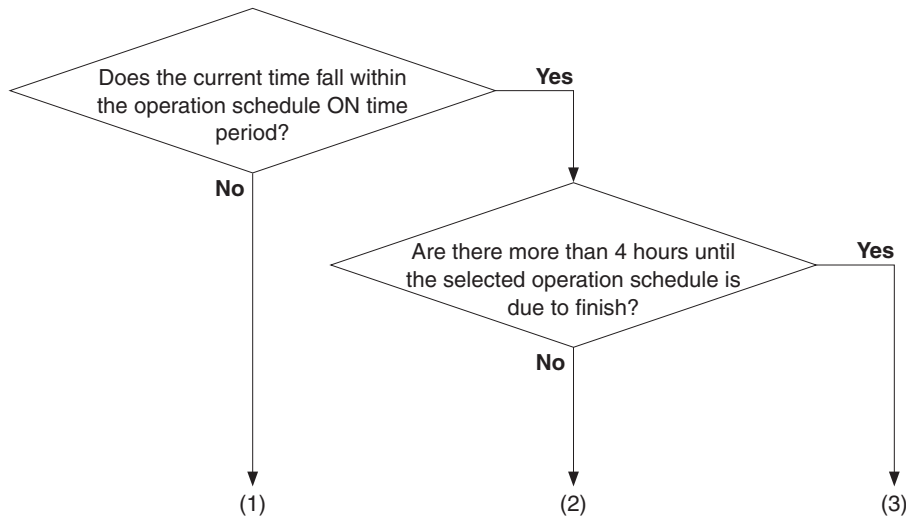
Be careful to avoid burns when checking piping or joints.
Wearing gloves is recommended to prevent burns.



8. After trial operation

Check the unit is working correctly

- Check the operation schedule set in “3. Setting of the operation schedule” against the current time.



- (1) Heat the water using the HEAT BOOST function.
(If it is already in progress, as per “7. Heating trial operation”, continue with HEAT BOOST as is.)
- (2) Although operation has been ongoing since the heating trial operation, it may not be possible to prepare the required amount of hot water within the operation schedule time.

Approximate heat pump unit heating volume (at outdoor temperature of 5 °C or higher)
1 hour: approx. 80 L

If there is not enough hot water, inform the user to use the HEAT BOOST function for heating. (Refer to “When there is not enough hot water: HEAT BOOST” in the operation manual.)
(The HEAT BOOST function cannot be used during the operation schedule ON time period.)

- (3) No additional action is required.

9. After completing the trial operation

- When handover to the user is at a later date

⚠ CAUTION

Do not turn the power “OFF”.
If the power is turned off, water in the unit may freeze in winter, resulting in damage to the pipes.

Heating operation may be suspended for a period of time (up to 90 days) before handover to the user. Please configure with reference to “Suspending heating during absence: VACATION” in the operation manual.
*When heating suspension days have been set (VACATION is enabled), normal heating operation is disabled, but protective operation (in-tank sterilization operation and freeze protection operation) may be enabled.

If it is necessary to turn off the power, contact your dealer and drain the water.

Part 5

Service Diagnosis

1. Symptom-based Troubleshooting	49
1.1 No heating operation	50
1.2 Heating operation takes place but water is not heated	51
1.3 Upon heating operation, wiring circuit breaker activates	52
1.4 Loud noise/high vibration during heating operation.....	53
1.5 Water leakage from hot water storage unit	54
1.6 Low hot water level in hot water storage unit	56
1.7 Water cannot be drained from hot water storage unit	57
1.8 No display on remote controller.....	58
1.9 Low water pressure from tap on site	59
2. Troubleshooting	60
2.1 Error Codes and Description	60
2.2 Controller transmission defect.....	62
2.3 RTC read abnormality	63
2.4 Tank water temperature thermistor abnormality.....	64
2.5 Water pump abnormality	65
2.6 Air vent defect	66
2.7 Heat pump PCB defect.....	68
2.8 Abnormality due to compressor overload.....	69
2.9 Compressor lock	71
2.10 Fan lock abnormality	72
2.11 Stop due to input overcurrent detection	74
2.12 Electronic expansion valve abnormality	76
2.13 Stop due to outlet temperature abnormality	77
2.14 Stop due to discharge pipe temperature control	79
2.15 Stop due to peak cut abnormality.....	80
2.16 Compressor system sensor abnormality	82
2.17 HPS (high-pressure switch) defect.....	84
2.18 Stop due to position detection sensor defect (compressor protection) ..	85
2.19 Thermistor abnormality.....	86
2.20 Circulating water system defect	88
2.21 Temperature rise inside electrical box.....	90
2.22 Fin temperature increase	91
2.23 Stop due to output overcurrent (shunt resistance) detection (OCP)	92
2.24 Stop due to detection of shortage of refrigerant gas	94
2.25 Stop due to low voltage detection/overvoltage detection	96
2.26 Transmission abnormality (between hot water storage and heat pump unit)	97
2.27 Piping error detected (between hot water storage and heat pump unit)	99
3. Check	101
3.1 Protection function set values	101
3.2 Thermistor resistance value check.....	102
3.3 Installation status check	103

3.4	Power waveform check (noise)	103
3.5	Capacitor voltage check	104
3.6	Electronic expansion valve check	104
3.7	Main circuit short-circuit check	105
3.8	How to measure connector/terminal block	105
3.9	Water pump output voltage check.....	106

1. Symptom-based Troubleshooting

Fault content	Page	
	TU25/32SSZA	RQWX60ZV1A
1. No heating operation	50	50
2. Heating operation takes place, but water is not heated	51	51
3. Upon heating operation, wiring circuit breaker activates	52	52
4. Loud noise/high vibration during heating operation	53	53
5. Water leakage from hot water storage unit	54	—
6. Low hot water level in hot water storage unit	56	—
7. Water cannot be drained from hot water storage unit	57	—
8. No display on remote controller	58	—
9. Low water pressure from tap on site	59	—

Be sure to check before conducting diagnosis.

Symptom		Measures	Fault content Relevant No.
Electrical issues	Printed circuit board connector disconnection or connection failure?	Adjust connection	—
	Wire harness disconnection?	Adjust connection	—
	Power voltage check: single phase 230~240 V within $\pm 10\%$?	Adjust power setup	1, 2, 3, 6, 8
	Wiring circuit breaker and earth leakage circuit breaker ON?	Turn wiring circuit breaker ON (inside distribution panel) Turn earth leakage circuit breaker ON (inside hot water storage unit)	1
	Fuse/thermal fuse blown?	Replace fuse/thermal fuse	1
	Within 3 minutes from power ON or heating stop?	Waiting 3 minutes Start operation after 3 minutes	1
	Remote controller cable disconnected or short-circuited?	Replace remote controller cable	8
Installation/piping issues	Piping connection error between hot water storage unit and heat pump unit?	Adjust connection	2
	Piping length/insulation appropriate?	Adjust	—
Other	Water/power outage in process?	Wait until recovery	9

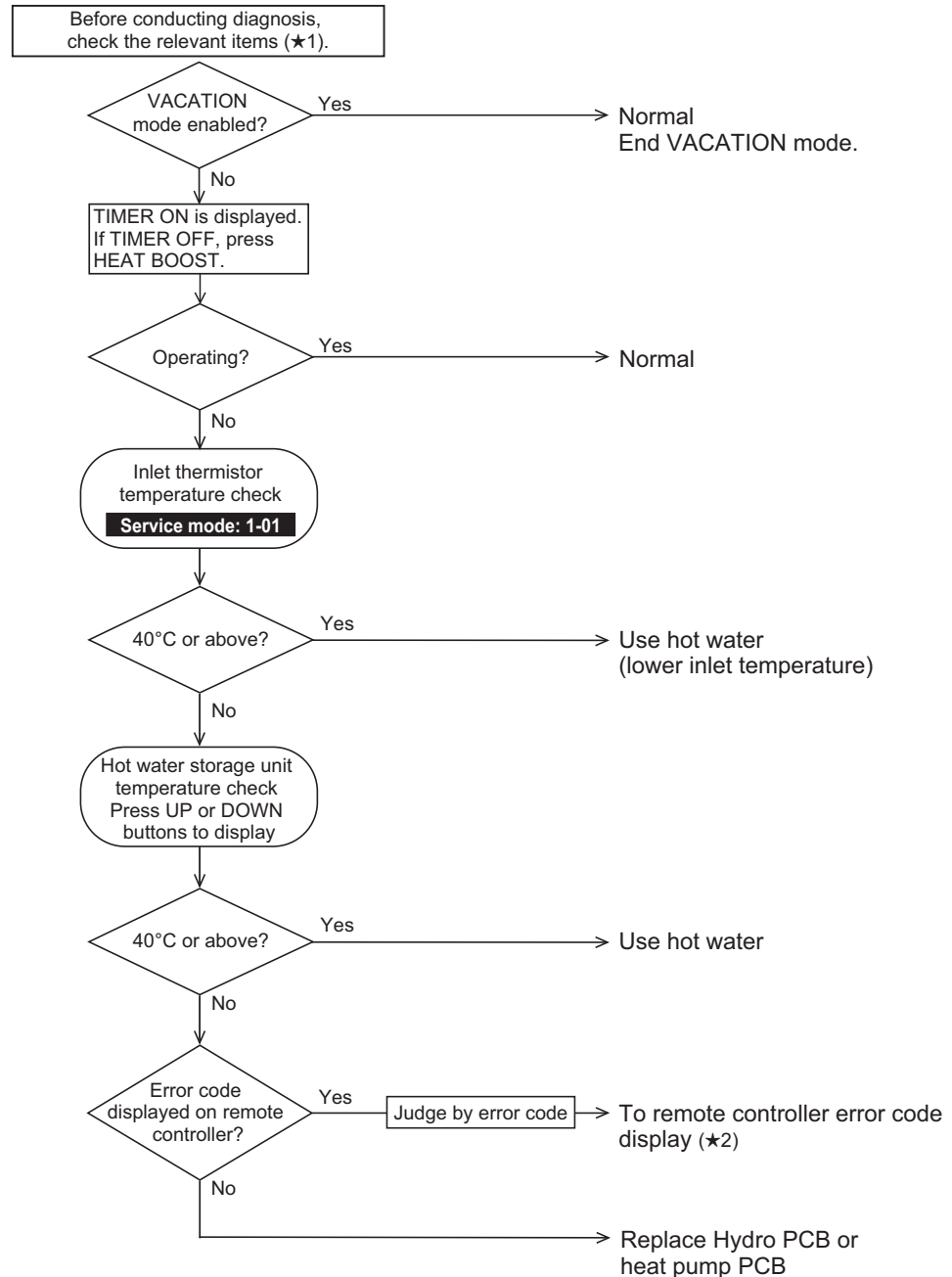
1.1 No heating operation

Applicable Models RQWX60ZV1A

Supposed causes

- Inlet temperature is high
- Tank water temperature is high

Troubleshooting



R5000507



Reference

★1 Refer to P. 49.

★2 Refer to P. 61.

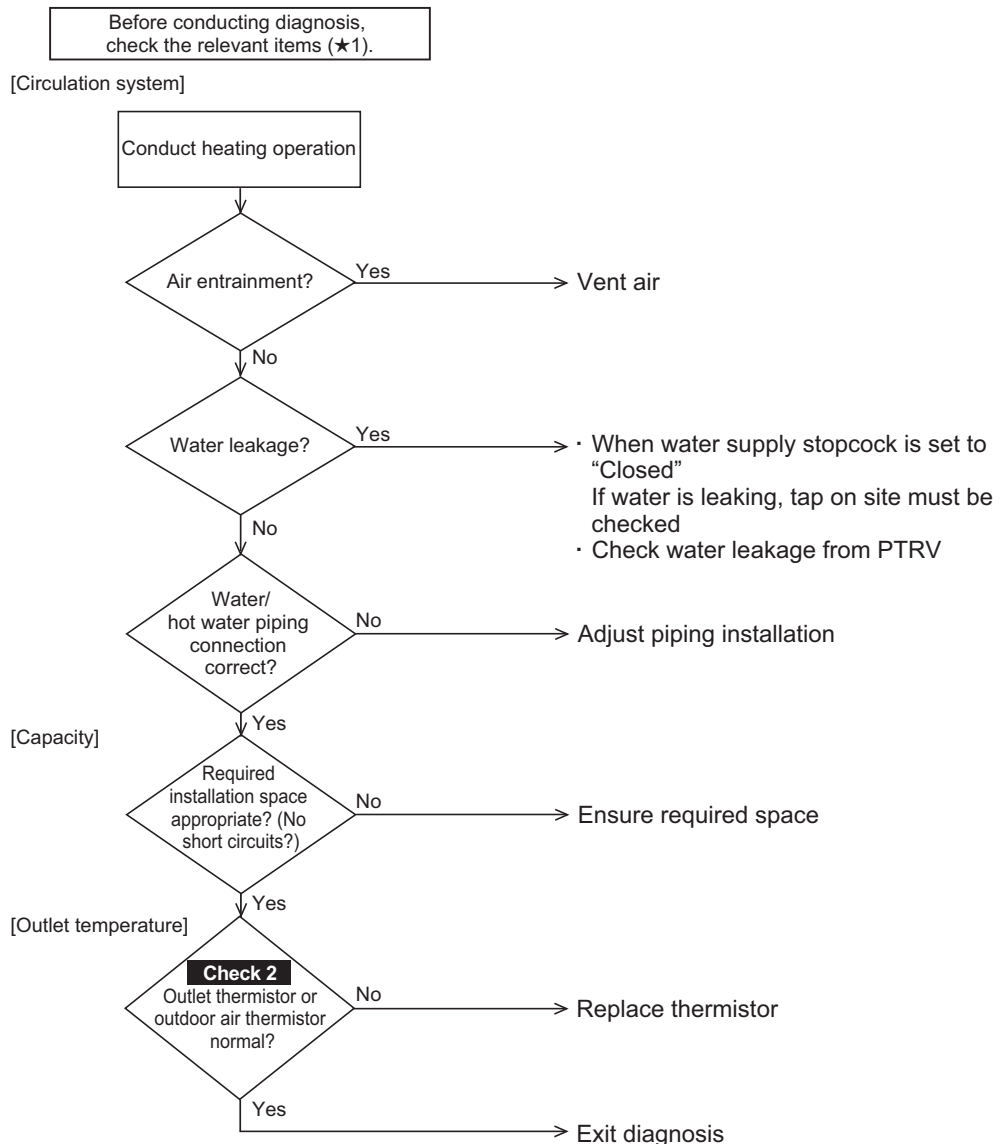
Service mode: 1-01 Refer to P. 34.

1.2 Heating operation takes place but water is not heated

Applicable Models RQWX60ZV1A

- Supposed causes**
- Hot water supply piping (onsite) leakage
 - Relief valve (PTRV) defect
 - Outlet thermistor/outdoor air thermistor defect
 - Air entrainment
 - Installation error of water/hot water piping

Troubleshooting



R5000508



Reference

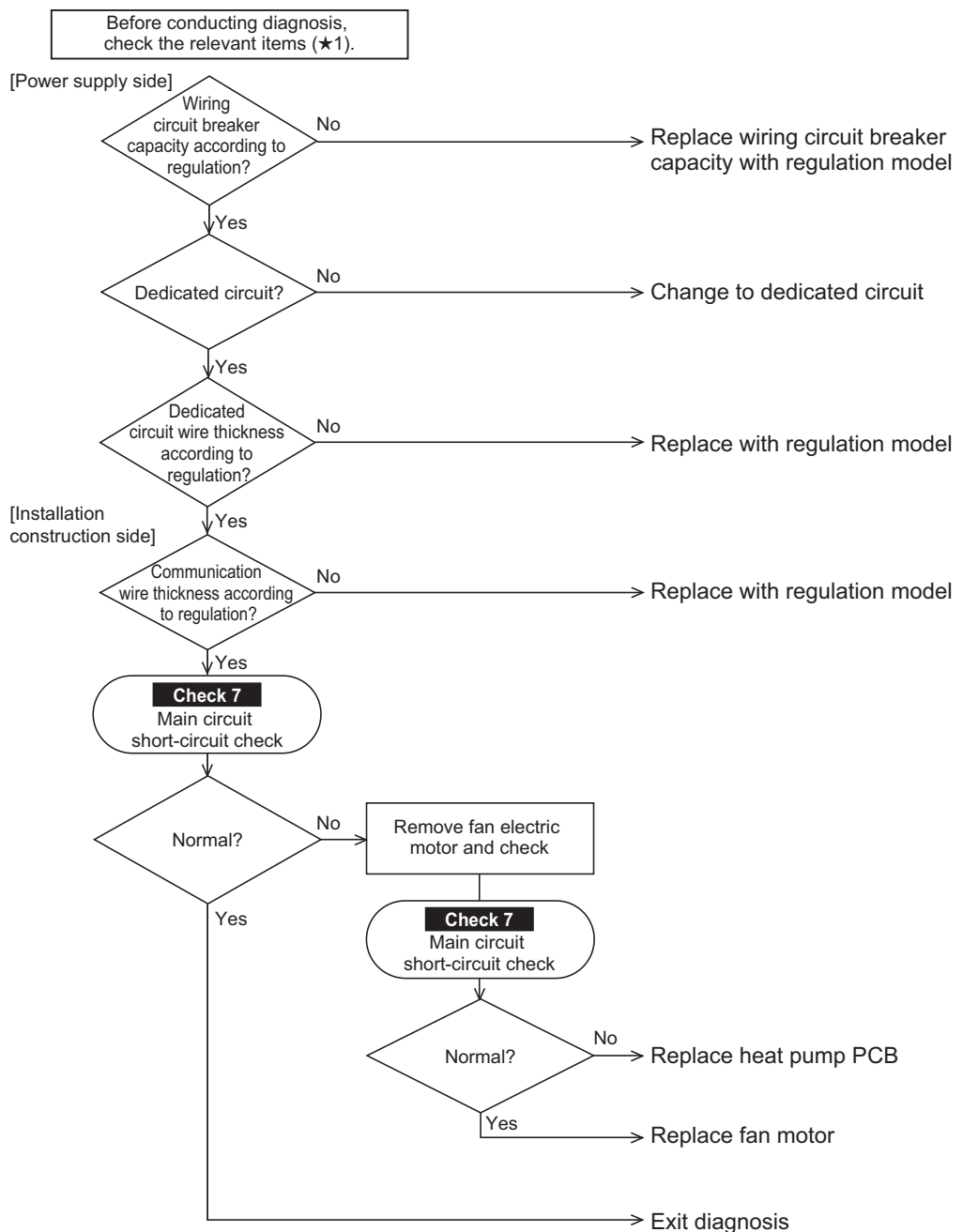
- ★1 Refer to P. 49.
Check 2 Refer to P. 102.

1.3 Upon heating operation, wiring circuit breaker activates

Applicable Models RQWX60ZV1A

- Supposed causes**
- Wiring circuit breaker capacity defect
 - Non-dedicated circuit
 - Wire too thin
 - Heat pump PCB damage (short circuit)
 - Fan motor defect
 - Main circuit short-circuit

Troubleshooting



R5000509



Reference

★1 Refer to P. 49.

Check 7 Refer to P. 105.

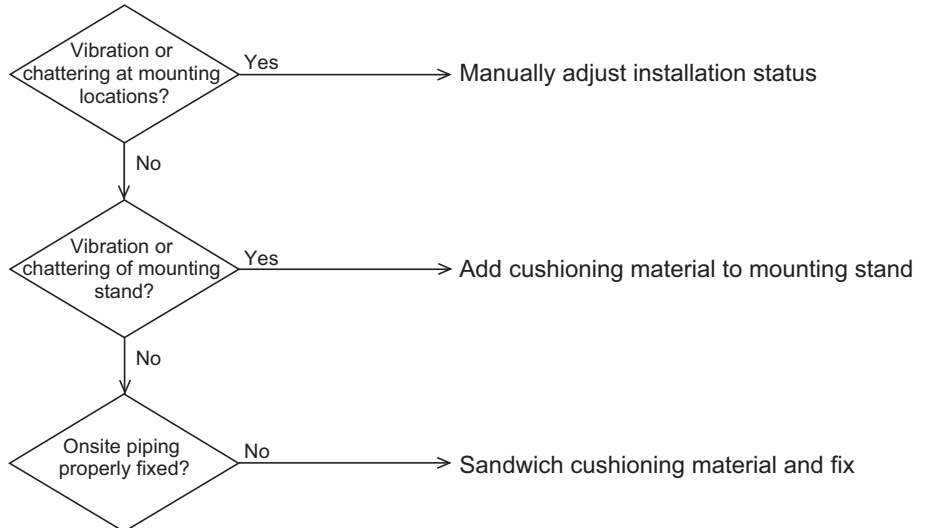
1.4 Loud noise/high vibration during heating operation

Applicable Models RQWX60ZV1A

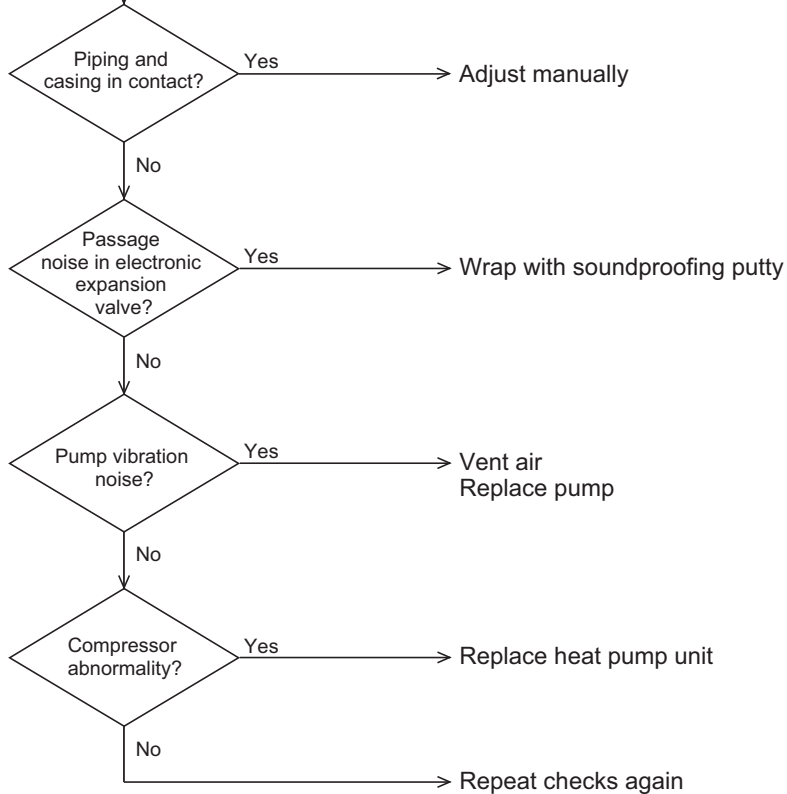
- Supposed causes**
- Weak mounting location
 - Poor anti-vibration measures
 - Product deformation

Troubleshooting

[Installation construction side]



[Product side]



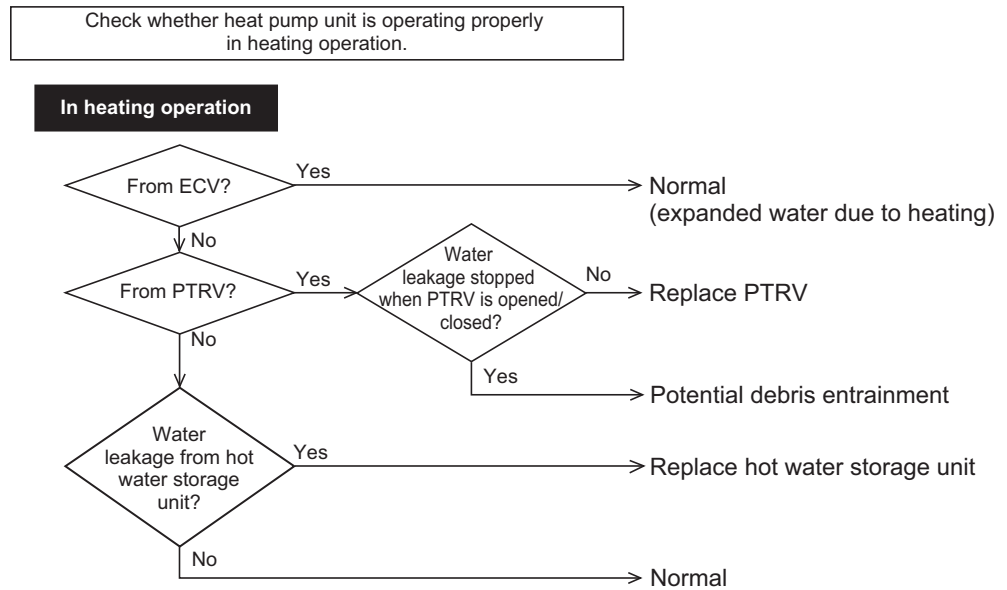
R5000510

1.5 Water leakage from hot water storage unit

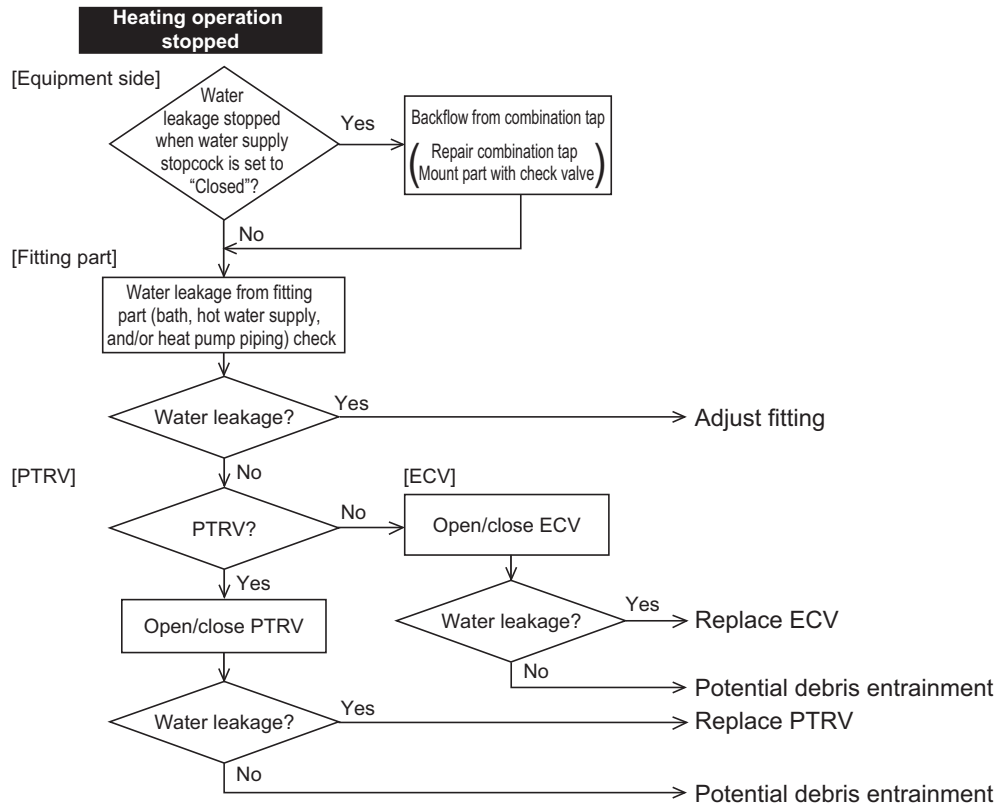
Applicable Models RQWX60ZV1A

- Supposed causes**
- Backflow from other system
 - PTRV defect
 - ECV defect
 - Debris entrainment

Troubleshooting



R5000511



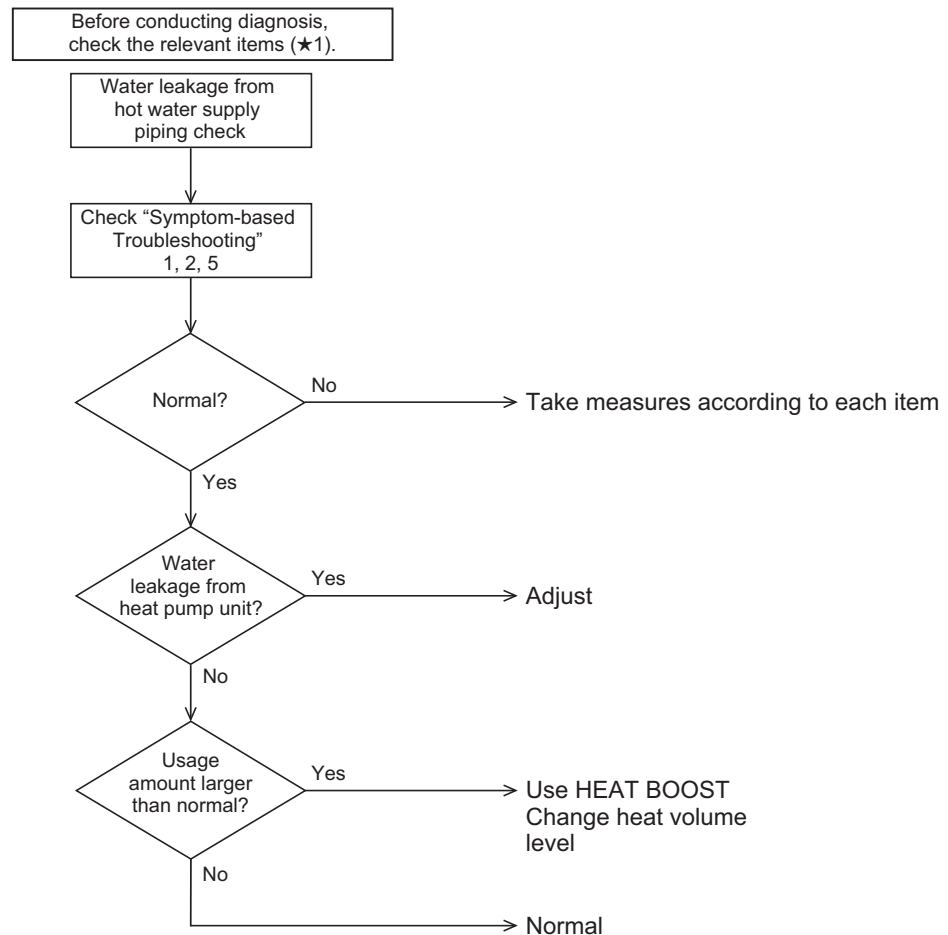
R5000512

1.6 Low hot water level in hot water storage unit

Applicable Models RQWX60ZV1A

- Supposed causes**
- Water leakage from hot water supply piping system
 - Causes 1, 2, 5 in “Symptom-based Troubleshooting”
 - Water leakage from heat pump unit
 - Low heating volume level

Troubleshooting



R5000513



Reference

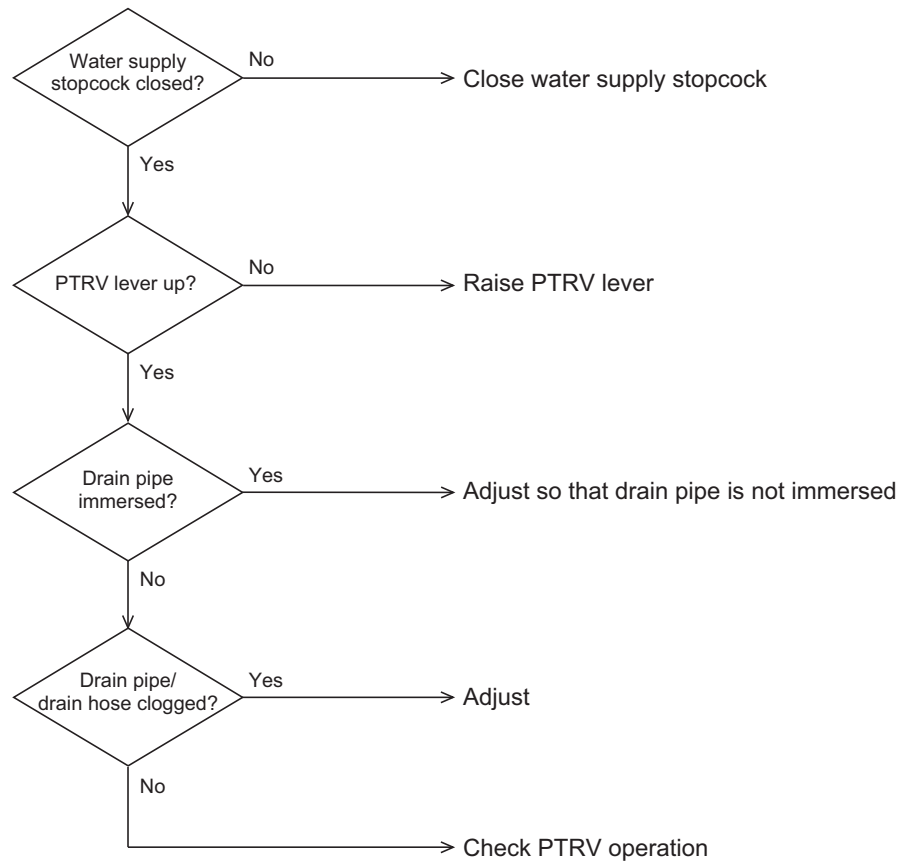
★1 Refer to P. 49.

1.7 Water cannot be drained from hot water storage unit

Applicable Models RQWX60ZV1A

- Supposed causes**
- Water supply stopcock left open
 - Drain plug (ECV) left closed
 - Mis operation due to PTRV being left closed
 - Clogged drain pipe system

Troubleshooting



R5000514

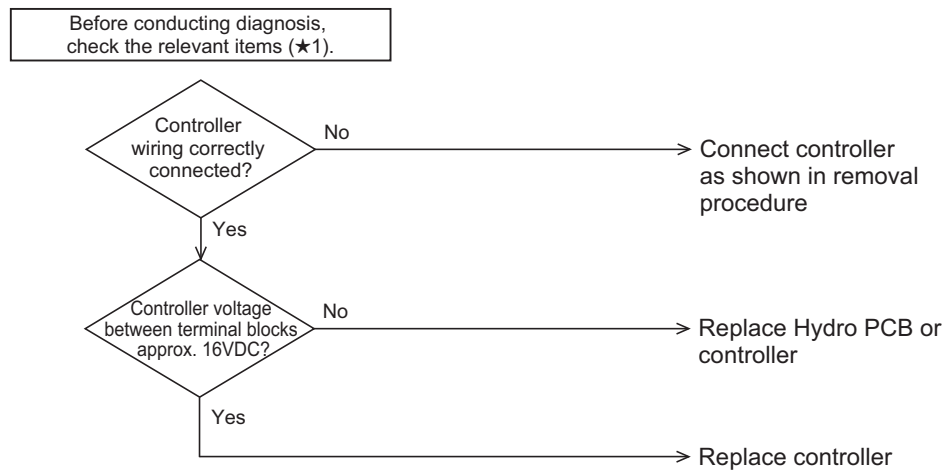
1.8 No display on remote controller

Applicable Models RQWX60ZV1A

Supposed causes

- Controller defect
- Hydro PCB defect
- Controller wiring defect

Troubleshooting



R5000515

**Reference**

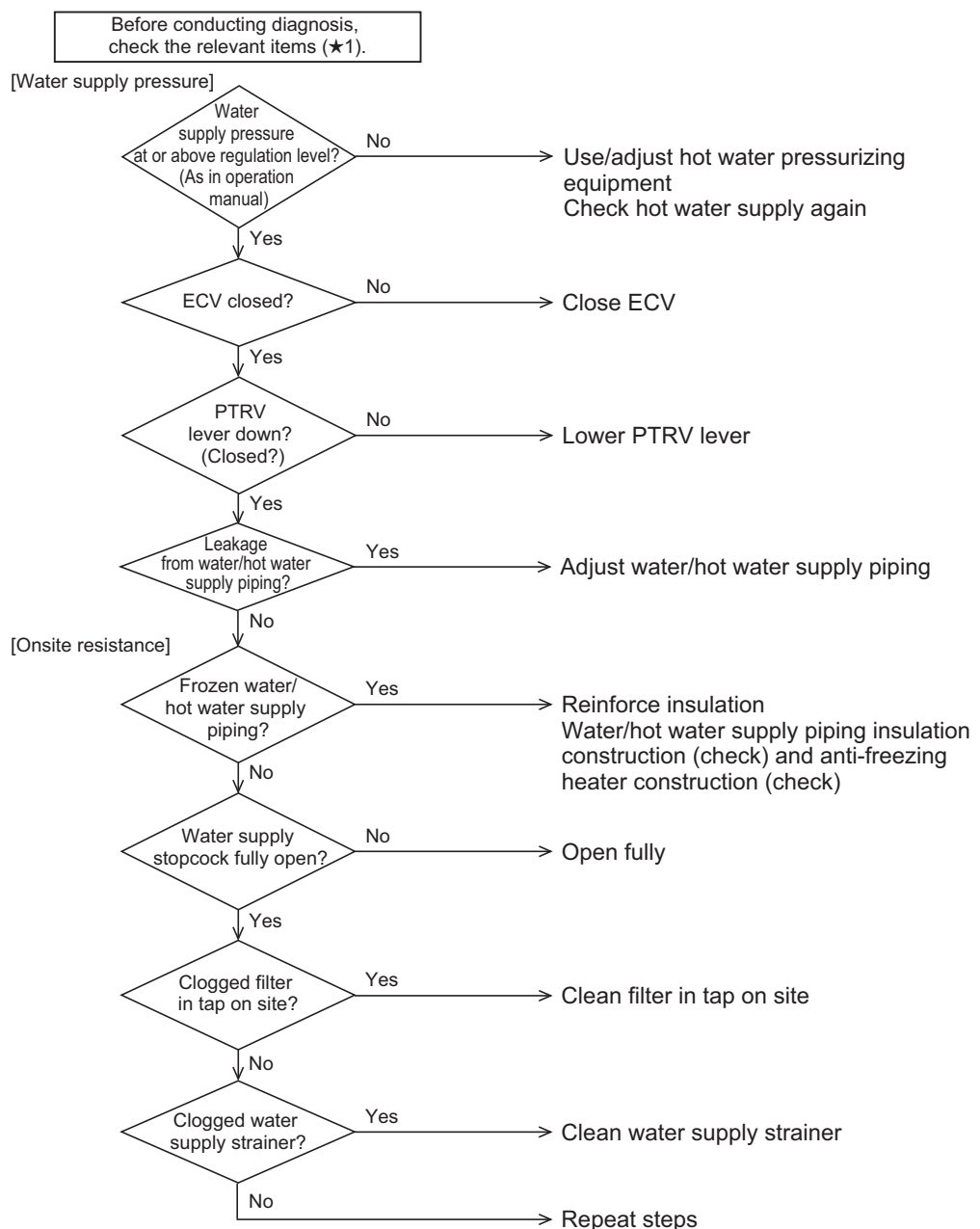
★1 Refer to P. 49.

1.9 Low water pressure from tap on site

Applicable Models RQWX60ZV1A

- Supposed causes**
- Frozen piping
 - Water supply filter clogged
 - Clogged filter in tap on site
 - Water supply stopcock closed
 - ECV set to "Open"
 - PTRV lever position
 - Leakage from water/hot water supply piping
 - Onsite thermostat-type combination tap defect
 - Low water supply pressure on site

Troubleshooting



R5000516



Reference

★1 Refer to P. 49.

2. Troubleshooting

2.1 Error Codes and Description

2.1.1 Hot Water Storage Unit

Controller display	Description	RQWX60ZV1A	
		Reference Page	Recovery method
A6	Water pump abnormality	65	B
AE	Air vent defect	66	B
CA	Tank water temperature thermistor abnormality	64	A
U4	In/out transmission abnormality	97	A
U5	Controller transmission defect	62	A
U7	RTC read abnormality	63	B

- Recovery method (deal with cause before starting recovery)
 - A: Automatic recovery (in normal operation)
 - B: Power reset (power OFF for at least 2 minutes)

2.1.2 Heat Pump Unit

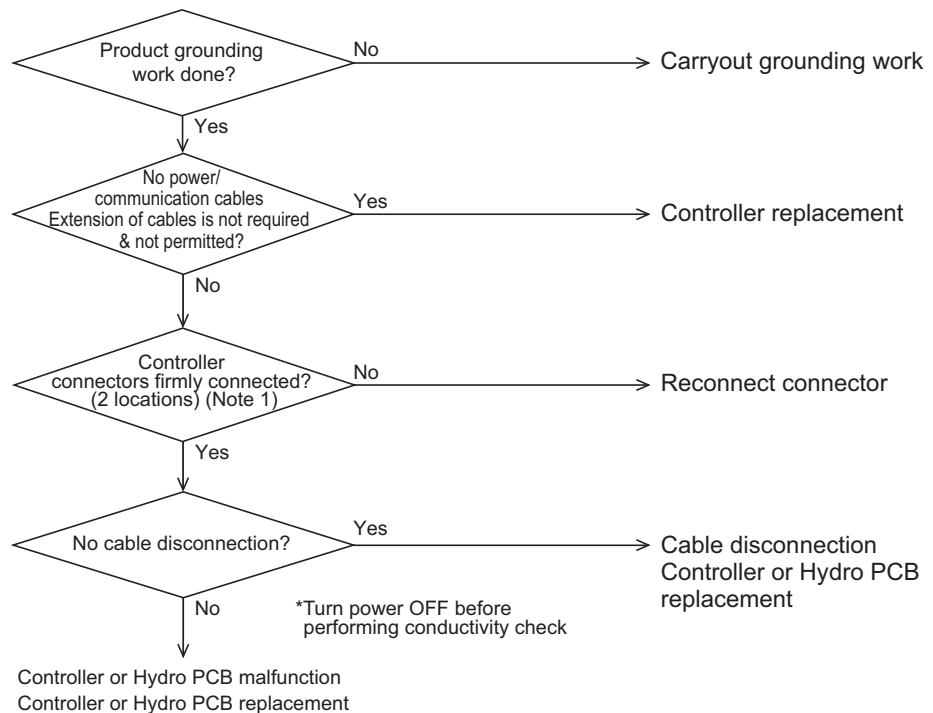
Controller display	Description	RQWX60ZV1A	
		Reference Page	Recovery method
E1	Heat pump PCB defect	68	H
E5	Abnormality due to compressor overload	69	H
E6	Compressor lock	71	H
E7	Fan lock abnormality	72	H
E8	Stop due to input overcurrent detection	74	H
E9	Electronic expansion valve abnormality	76	G/H
EC	Stop due to outlet temperature abnormality	77	H
F3	Stop due to discharge pipe temperature control	79	H
FA	Stop due to peak cut abnormality	80	H
H0	Compressor system sensor abnormality	82	H
H3	HPS (high-pressure switch) defect	84	G
H6	Stop due to position detection sensor defect (compressor protection)	85	H
H9	Outdoor air thermistor abnormality	86	G
HC	Outlet thermistor abnormality	86	G
HJ	Circulating water system defect	88	H
J3	Discharge pipe thermistor abnormality	86	G/H
J6	Heat exchanger thermistor abnormality	86	G
J8	Inlet thermistor abnormality	86	G
L3	Temperature rise inside electrical box	90	G
L4	Fin temperature increase	91	H
L5	Stop due to output overcurrent (shunt resistance) detection (OCP)	92	H
P4	Fin thermistor abnormality	86	G
U0	Stop due to detection of shortage of refrigerant gas	94	H
U2	Stop due to low voltage detection/overvoltage detection	96	H
U4	Transmission abnormality (between hot water storage and heat pump unit)	97	G
UF	Piping error detected (between hot water storage and heat pump unit)	99	H

- Recovery method (deal with cause before starting recovery)
 - G: Automatic recovery (in normal operation)
 - H: Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)

2.2 Controller transmission defect

Applicable Models	RQWX60ZV1A
Error Code	U5
Method of Error Detection	Controller communication status
Error Decision Conditions	When communication with Hydro PCB failed Recovery method <ul style="list-style-type: none"> ■ Automatic recovery (in normal operation)
Supposed Causes	<ul style="list-style-type: none"> ■ Grounding work done incorrectly ■ Power supply/communication cables connection defect ■ Controller defect ■ Hydro PCB defect

Troubleshooting

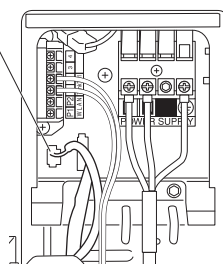


R5000519

i Note(s)

Controller connectors

Check connector connection at the side of terminal block.



R5000549

2.3 RTC read abnormality

Applicable ModelsRQWX60ZV1A

Error Code**U7**

Supposed Causes

- Real time clock (RTC) in the controller malfunction
-

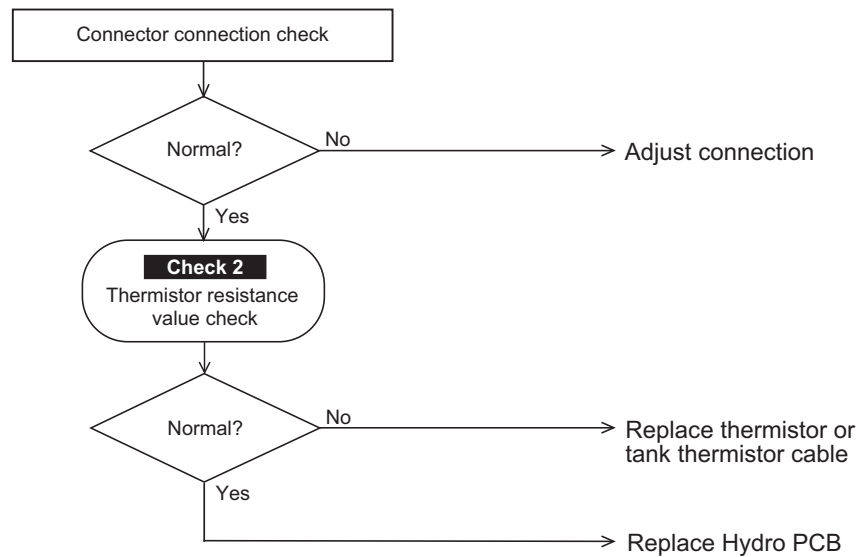
Troubleshooting

For a U7 abnormality, replace the controller.

2.4 Tank water temperature thermistor abnormality

Applicable Models	RQWX60ZV1A
Error Code	CA
Method of Error Detection	Tank water temperature thermistor abnormalities are detected from the input value detected with the thermistor.
Error Decision Conditions	<p>Detected through wiring short-circuit or disconnection.</p> <p>Recovery method</p> <ul style="list-style-type: none"> ■ Automatic recovery (in normal operation)
Supposed Causes	<ul style="list-style-type: none"> ■ Connector connection defect ■ Thermistor defect ■ Hydro PCB defect

Troubleshooting



R5000520

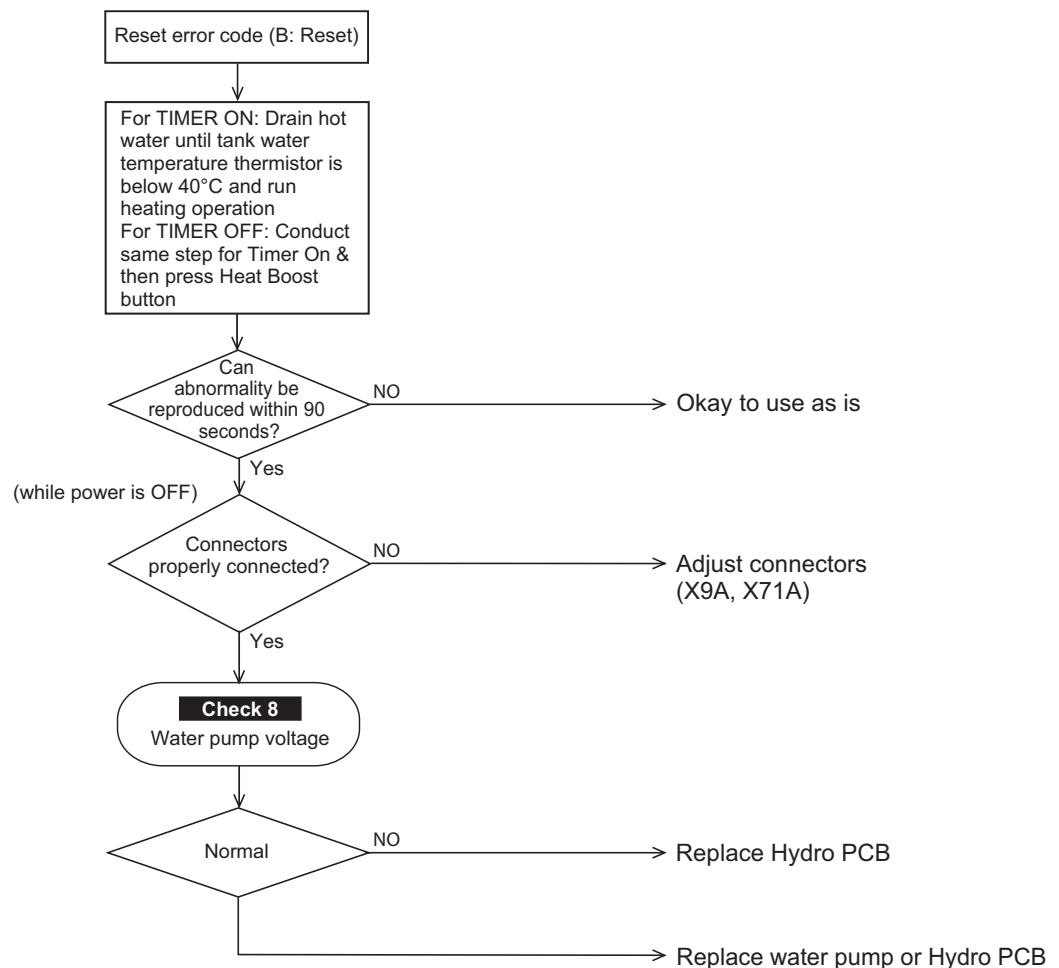


Reference Check 2 (Appendix 1) Refer to P. 102.

2.5 Water pump abnormality

Applicable Models	RQWX60ZV1A
Error Code	A6
Method of Error Detection	Abnormalities are detected based on the rotation speed detected with the hall IC when the water pump is operating.
Error Decision Conditions	When the pump does not operate even when given operation instructions (When pump rotation speed < 100 rpm has been detected 4 times in a row for 30 continuous seconds. Normal rotation speed is 1000 rpm or above; retry standby period is 10 seconds) Recovery method <ul style="list-style-type: none"> ■ Power reset
Supposed Causes	<ul style="list-style-type: none"> ■ Water pump malfunction ■ Connector connection defect ■ Air inside pump due to frozen water supply piping

Troubleshooting



*In some cases, frozen piping may prevent pump drive, leading to **A6**.
This cannot be reproduced when the pipes thaw.
→ Check piping insulation work.

R5000521



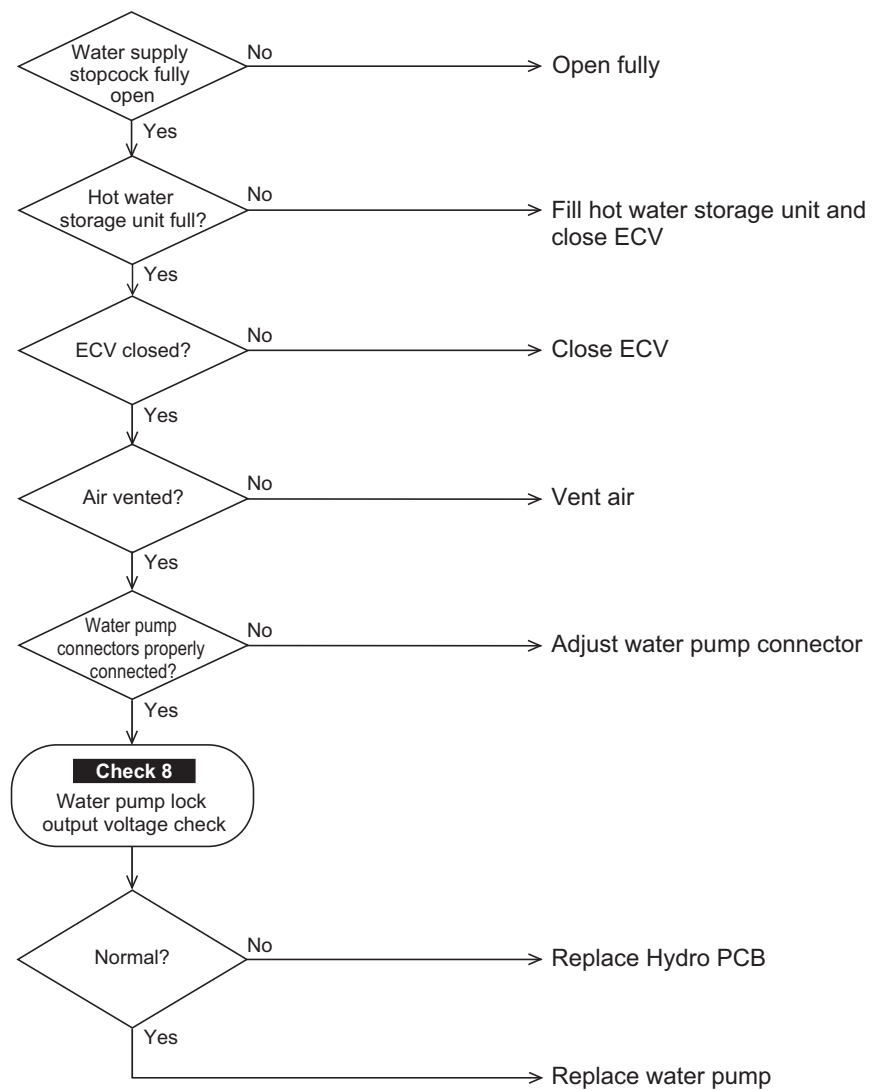
Reference

Check 8 Refer to P. 105.

2.6 Air vent defect

Applicable Models	RQWX60ZV1A
Error Code	AE
Method of Error Detection	Pump interior dry status is detected from the pump rotation speed. When dry, the friction resistance during rotation rises and the rotation speed will not increase. As the target rotation speed cannot be reached, the pump voltage rises.
Error Decision Conditions	When rotation speed is low even though pump voltage is high (= high rotation speed instructions) (When $100 \text{ rpm} \leq \text{rotation speed} < 3000 \text{ rpm}$ has been detected for 5 continuous seconds) Recovery method <ul style="list-style-type: none">■ Power reset
Supposed Causes	<ul style="list-style-type: none">■ Heat pump unit air vent defect■ Hot water storage unit air vent defect■ Water pump air vent defect■ ECV open■ Water supply stopcock closed■ Water pump malfunction■ Water pump connector connection defect

Troubleshooting



*In some cases, frozen piping may prevent pump drive, leading to **A6**.
 This cannot be reproduced when the pipes thaw.
 → Check piping insulation work.

R5000522



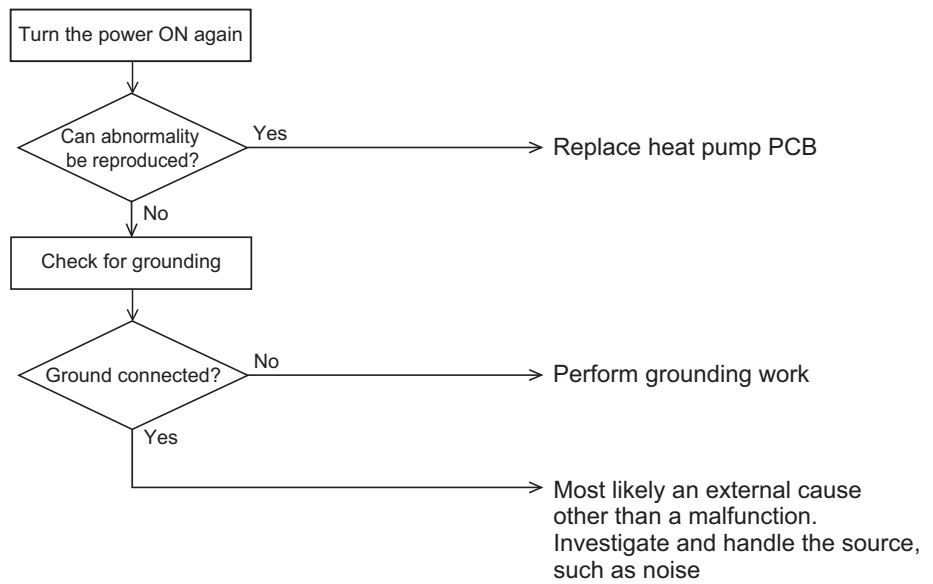
Reference

Check 8 Refer to P. 105.

2.7 Heat pump PCB defect

Applicable Models	RQWX60ZV1A
Error Code	E1
Method of Error Detection	Microcomputer program detects normal operation within program.
Error Decision Conditions	When microcomputer program no longer operates normally Recovery method <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes “OFF”, turn “ON” again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Microcomputer wild operation due to external factors <ul style="list-style-type: none"> ● Noise ● Instantaneous voltage drop ● Instantaneous power outage, etc. ■ Heat pump PCB defect

Troubleshooting



R5000523

2.8 Abnormality due to compressor overload

Applicable Models RQWX60ZV1A

Error Code **E5**

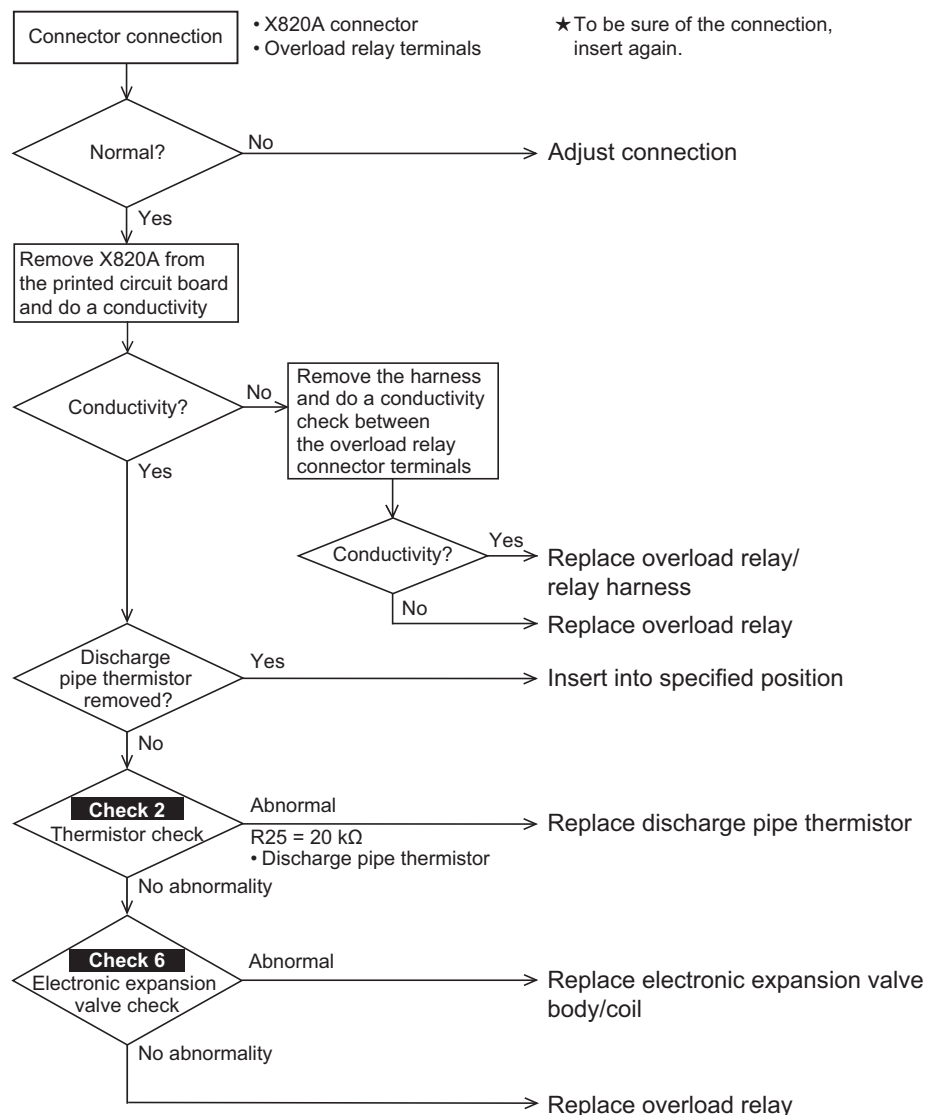
Method of Error Detection Compressor overloading is detected by the compressor overload.

Error Decision Conditions System goes down when 2 stops due to compressor overload are confirmed.
Conditions for clearing: Approx. 60 minutes of continuous operation (normal)

Supposed Causes

- Refrigerant shortage
- Outdoor printed circuit board defect
- Electronic expansion valve defect
- Connector connection defect
- Overload relay/harness defect

Troubleshooting



R5000524

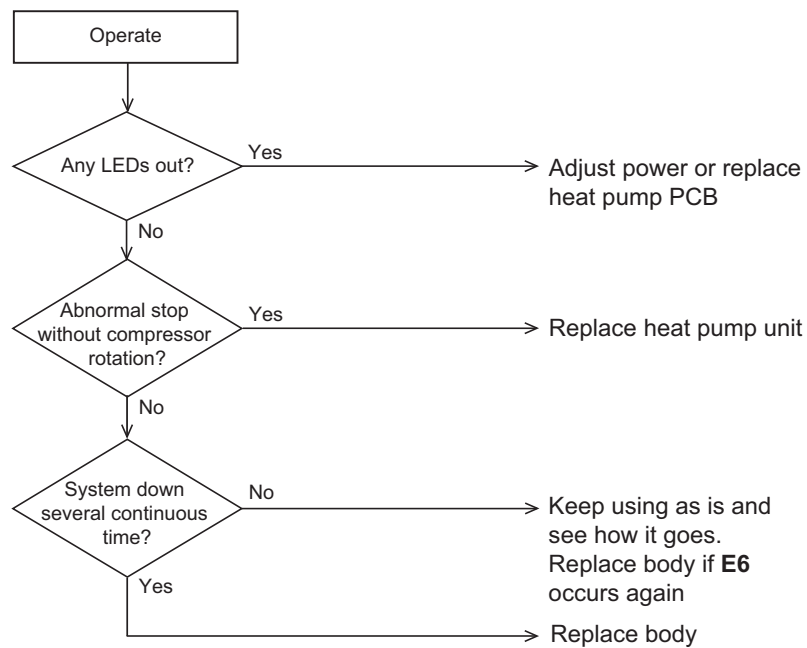
**Reference**

Check 2 (Appendix 1) Refer to P. 102.
Check 6 Refer to P. 104.

2.9 Compressor lock

Applicable Models	RQWX60ZV1A
Error Code	E6
Method of Error Detection	Position detection signal generated only when locked <ul style="list-style-type: none"> ■ Compressor rotation status through position detection sensor ■ Detected when position detection is impossible
Error Decision Conditions	<ul style="list-style-type: none"> ■ System goes down when detected 16 times ■ Conditions for clearing detection times: Approx. 5 minutes of normal operation Recovery method <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Compressor startup defect

Troubleshooting

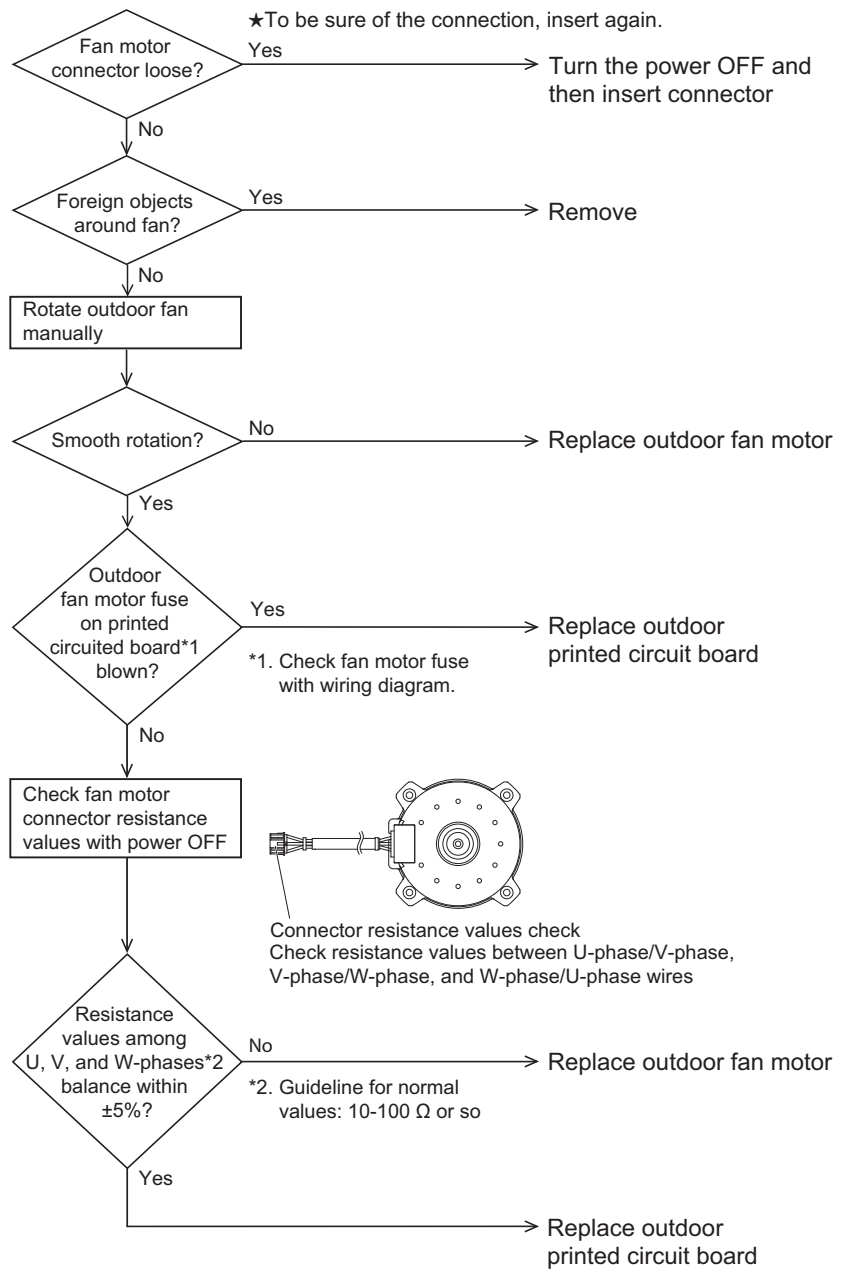


R5000525

2.10 Fan lock abnormality

Applicable Models	RQWX60ZV1A
Error Code	E7
Method of Error Detection	Fan motor system abnormalities are detected based on the rotation speed detected with the hall IC when the fan motor is operating. (Detected when position detection is impossible)
Error Decision Conditions	<ul style="list-style-type: none"> ■ Under fan motor rotation conditions, when fan does not rotate for approx. 15 to 60 seconds or more ■ System goes down when detected 16 times ■ Conditions for clearing detection times: Approx. 5 minutes of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes “OFF”, turn “ON” again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Fan motor malfunction ■ Fan motor - printed circuit board harness/connector not connected or malfunctioning ■ Foreign matter in fan preventing rotation ■ Snow preventing fan rotation ■ Fan motor fuse on printed circuited board blown ■ Printed circuit board defect

Troubleshooting



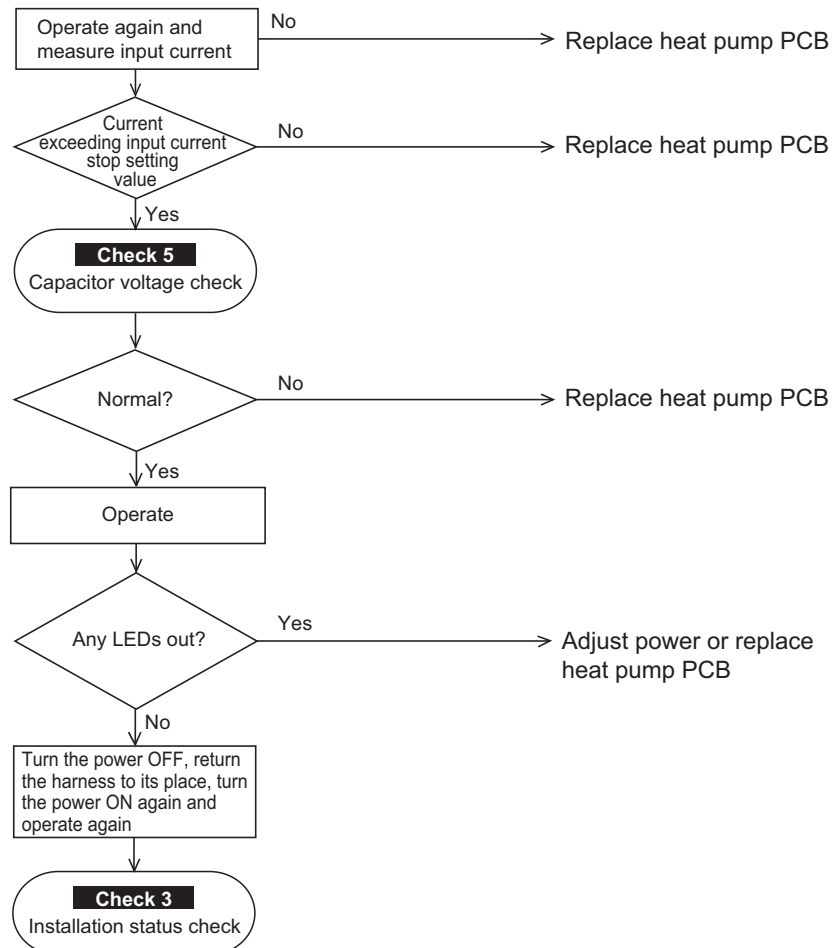
R5000526

2.11 Stop due to input overcurrent detection

Applicable Models	RQWX60ZV1A
Error Code	E8
Method of Error Detection	Input overcurrent is detected through input current value during compressor operation.
Error Decision Conditions	<ul style="list-style-type: none"> ■ When input current value of 14.5 A or above continues for 2.6 seconds during compressor operation ■ System goes down when detected 6 times ■ Conditions for clearing detection times: 60 minutes (cumulative) of normal operation Recovery method <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes “OFF”, turn “ON” again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Overcurrent due to compressor defect ■ Overcurrent due to power transistor defect ■ Overcurrent due to inverter main circuit electrolytic capacitor defect ■ Overcurrent due to printed circuit board defect ■ False detection due to printed circuit board defect

Troubleshooting

*Input overcurrent may occur due to miswiring inside the equipment.
 For input overcurrent stops after reconnecting the wiring, such as when replacing a component, check the wiring again.

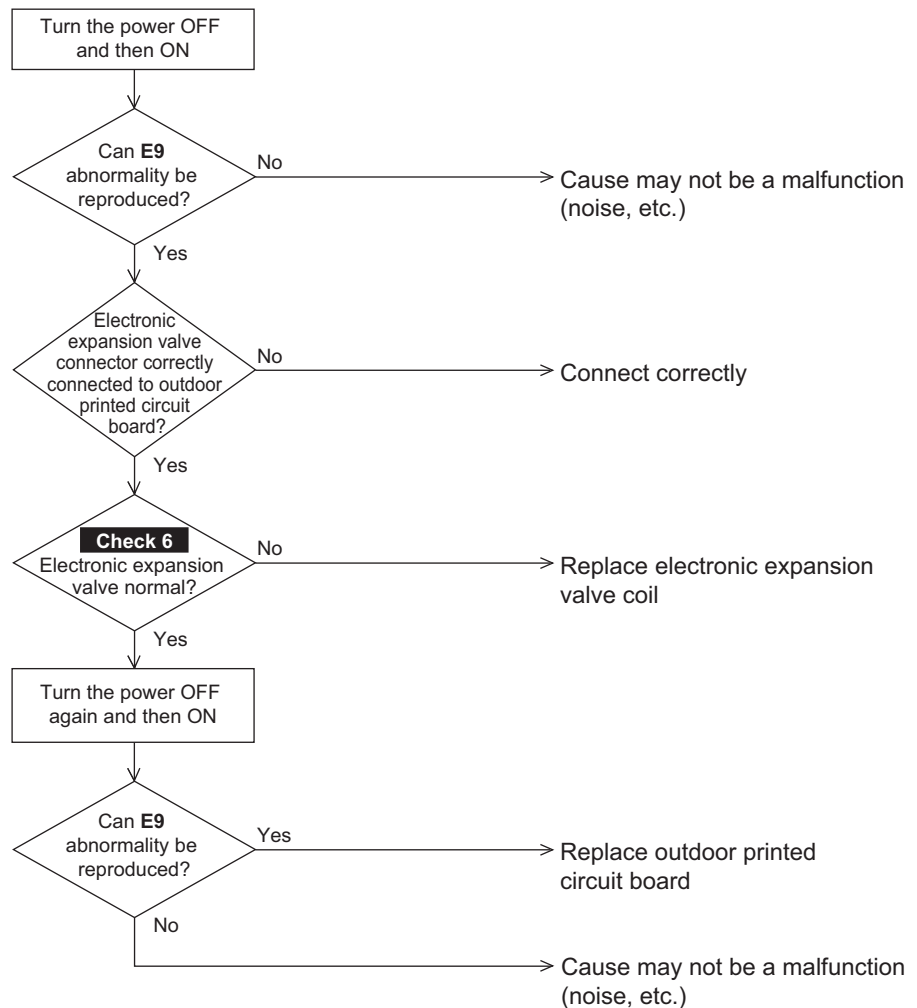


**Reference****Check 3** Refer to P. 103.**Check 5** Refer to P. 104.

2.12 Electronic expansion valve abnormality

Applicable Models	RQWX60ZV1A
Error Code	E9
Method of Error Detection	Abnormality detected through electronic expansion valve conductivity.
Error Decision Conditions	When input voltage from electronic expansion valve to microcomputer is high due to overcurrent When input voltage from electronic expansion valve to microcomputer is low due to connector disconnection
Supposed Causes	<ul style="list-style-type: none"> ■ Electronic expansion valve connector connection defect ■ Electronic expansion valve harness disconnection ■ Electronic expansion valve defect ■ Outdoor printed circuit board defect

Troubleshooting



R5000528

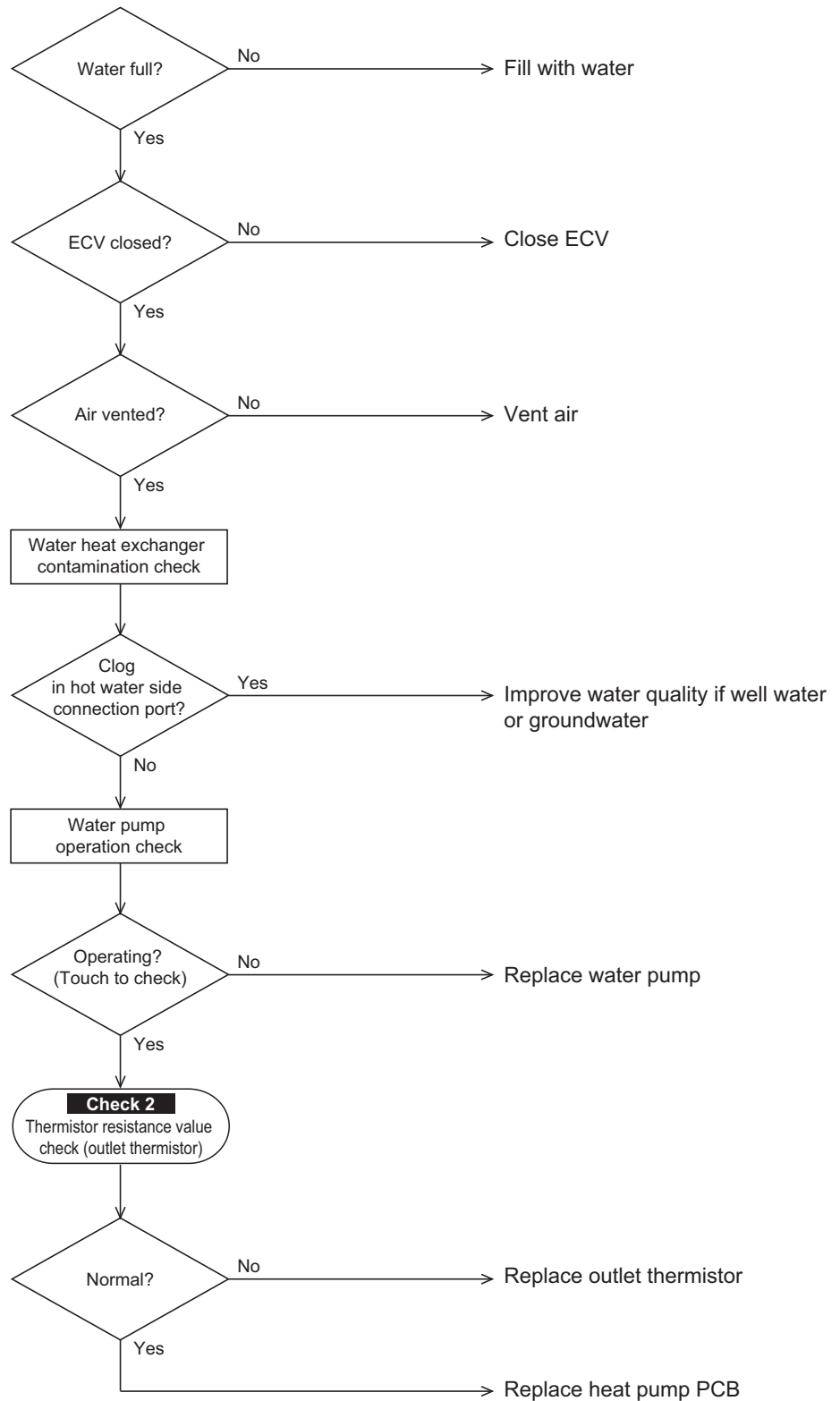


Reference Check 6 Refer to P. 104.

2.13 Stop due to outlet temperature abnormality

Applicable Models	RQWX60ZV1A
Error Code	EC
Method of Error Detection	Outlet temperature is detected with outlet thermistor.
Error Decision Conditions	<ul style="list-style-type: none"> ■ High temperature: When circulating flow cannot be ensured and outlet temperature is too high (98°C or above) ■ Scale: When outlet temperature is 95°C or above and 10 minutes have passed ■ System goes down when either high temperature or scale is detected 12 times ■ Conditions for clearing detection times: 60 minutes (cumulative) of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Water supply stopcock closed ■ Test operation defect (No water supply, ECV closed, air entrainment) ■ Water pump lock ■ Outlet thermistor defect ■ Heat pump PCB defect ■ Use of groundwater (well water)

Troubleshooting



R5000529

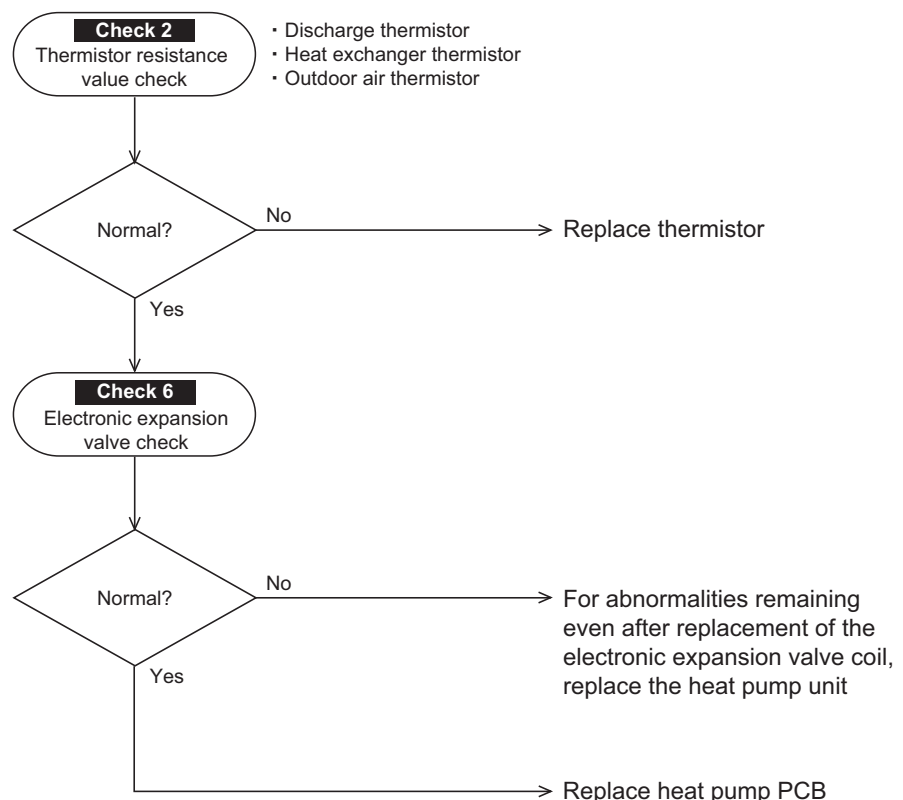


Reference Check 2 (Appendix 1) Refer to P. 102.

2.14 Stop due to discharge pipe temperature control

Applicable Models	RQWX60ZV1A
Error Code	F3
Method of Error Detection	Discharge pipe temperature control (stop, frequency droop, etc.) is conducted based on the temperature detected by the discharge thermistor. (Detected when discharge pipe temperature rises)
Error Decision Conditions	<ul style="list-style-type: none"> ■ Compressor stops when discharge thermistor detects temperatures of 127°C or above. (Abnormality canceled at temperature below 85°C) ■ System goes down when detected 6 times ■ Conditions for clearing detection times: 60 minutes (cumulative) of normal operation Recovery method <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Refrigerant shortage ■ Discharge thermistor defect (Heat exchanger/outdoor air thermistor defect) ■ Heat pump PCB defect ■ Electronic expansion valve defect

Troubleshooting



R5000530



Reference

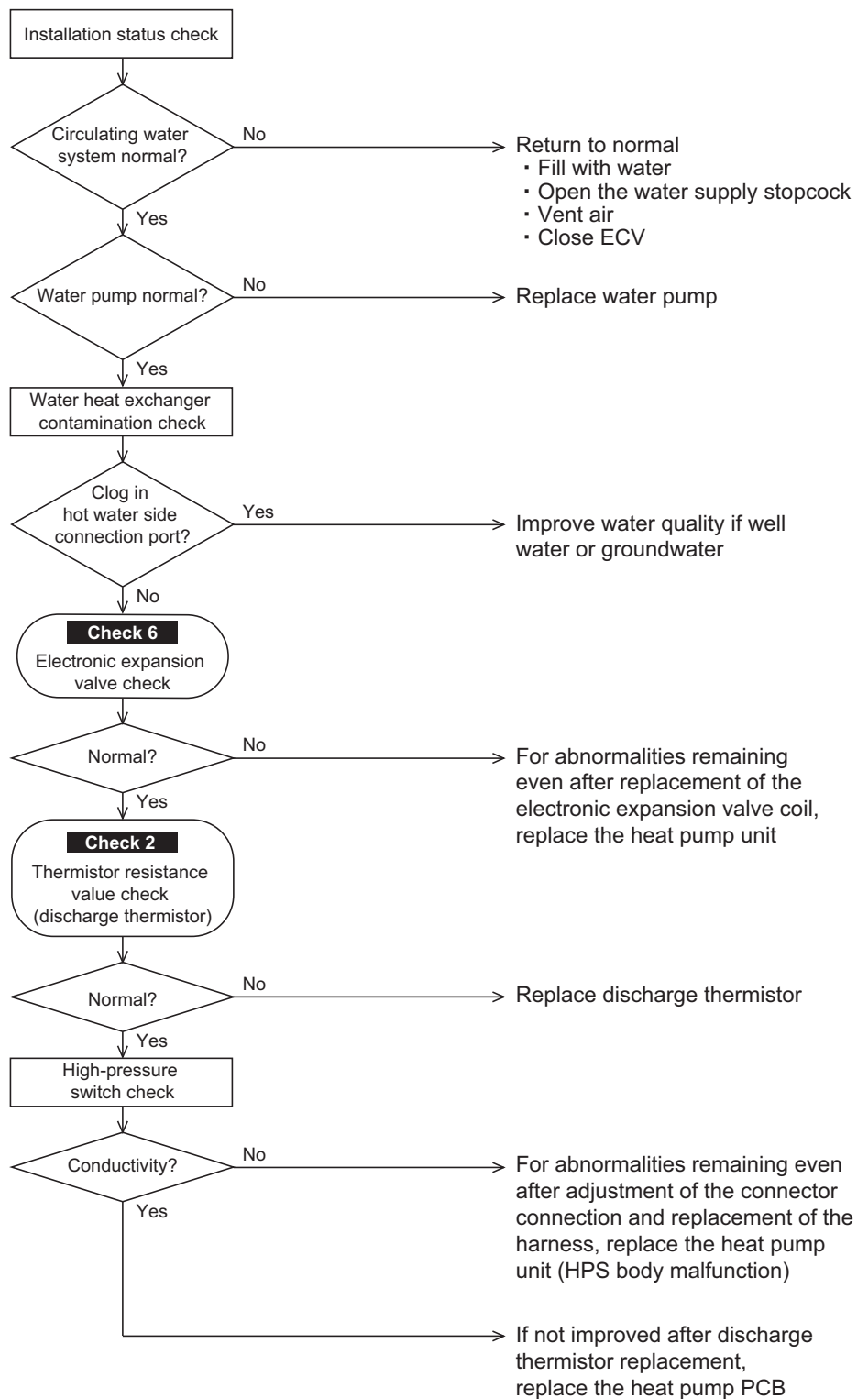
Check 2 (Appendix 1) Refer to P. 102.

Check 6 Refer to P. 104.

2.15 Stop due to peak cut abnormality

Applicable Models	RQWX60ZV1A
Error Code	FA
Method of Error Detection	When the refrigerant pressure increases, the high-pressure switch activates. After activation, the main circuit relay turns OFF.
Error Decision Conditions	<ul style="list-style-type: none"> ■ When the high-pressure switch activates (activation pressure 13.7⁺⁰_{-0.9} MPaG) ■ System goes down when detected 1 time ■ Conditions for clearing detection times: 60 minutes (cumulative) of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes “OFF”, turn “ON” again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Test operation defect (No water supply, drain plug opened, air entrainment) ■ Water pump defect ■ Connector connection defect ■ Electronic expansion valve activation defect ■ High-pressure switch defect ■ Heat pump PCB defect ■ Water heat exchanger clog ■ Discharge thermistor defect

Troubleshooting



R5000531



Reference

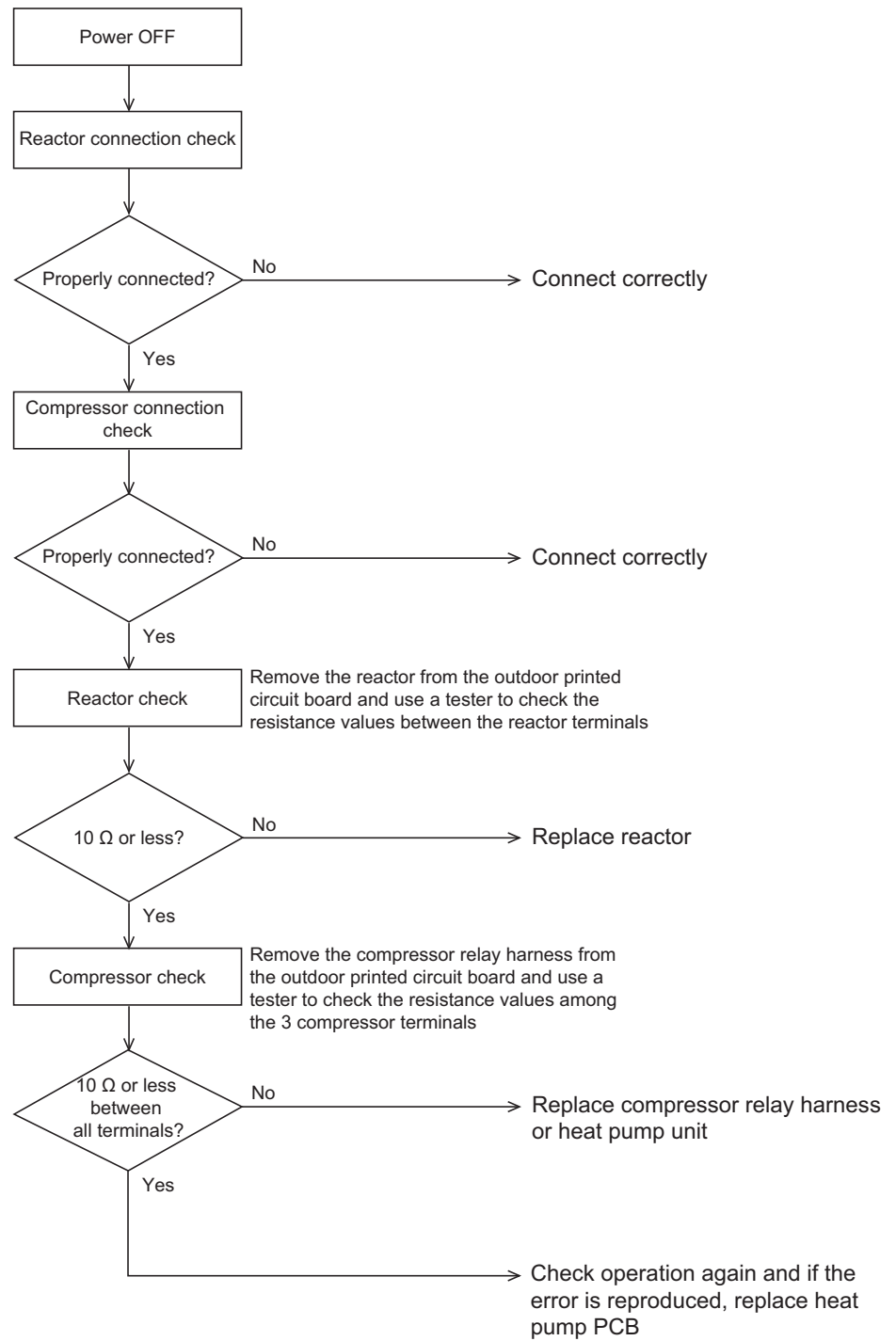
Check 2 (Appendix 1) Refer to P. 102.

Check 6 Refer to P. 104.

2.16 Compressor system sensor abnormality

Applicable Models	RQWX60ZV1A
Error Code	H0
Method of Error Detection	<ul style="list-style-type: none"> ■ Detected from power voltage/DC voltage before compressor startup. ■ Detected from compressor current just after compressor startup.
Error Decision Conditions	<ul style="list-style-type: none"> ■ When power voltage/DC voltage are obviously high or low ■ When compressor current does not flow even after starting compressor ■ System goes down when detected 16 times ■ Conditions for clearing detection times: Approx. 5 minutes of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Reactor not connected ■ Compressor not connected ■ Heat pump PCB defect ■ Compressor defect

Troubleshooting

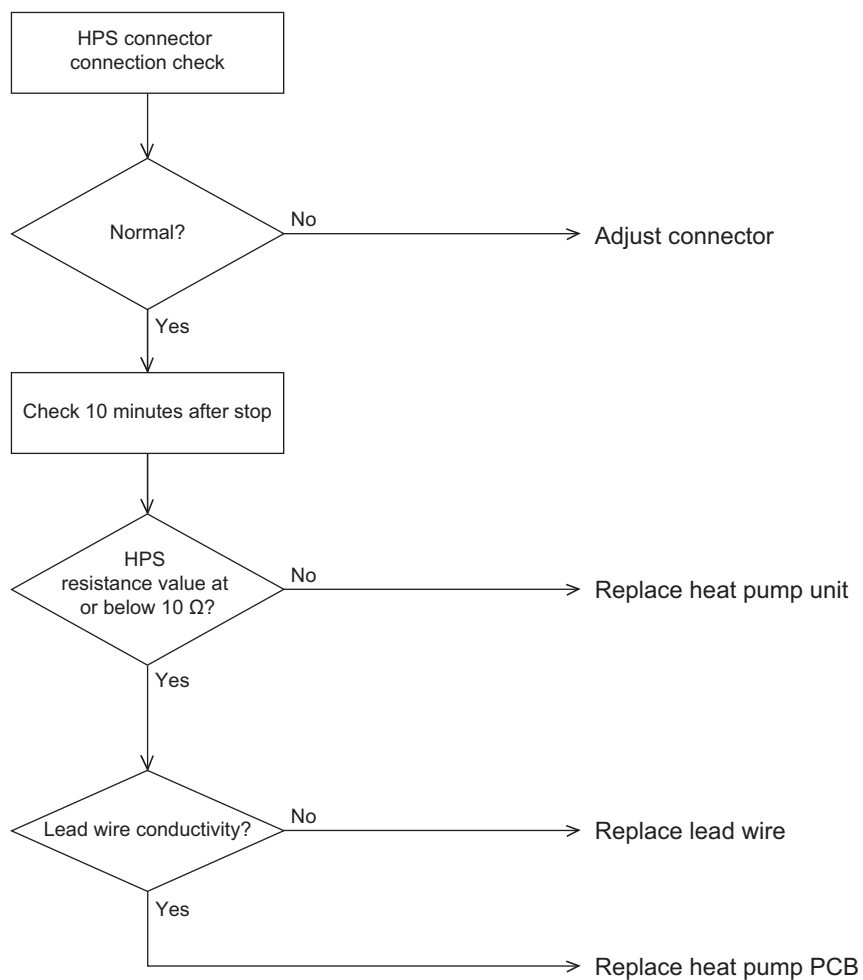


R5000532

2.17 HPS (high-pressure switch) defect

Applicable Models	RQWX60ZV1A
Error Code	H3
Method of Error Detection	High-pressure switch conductivity is detected with protection device circuit.
Error Decision Conditions	When there is no high-pressure switch conductivity at compressor stop Recovery method <ul style="list-style-type: none"> ■ Automatic recovery (in normal operation)
Supposed Causes	<ul style="list-style-type: none"> ■ High-pressure switch defect ■ High-pressure switch harness disconnection ■ High-pressure switch connector connection defect ■ Heat pump PCB defect ■ Lead wire disconnection

Troubleshooting

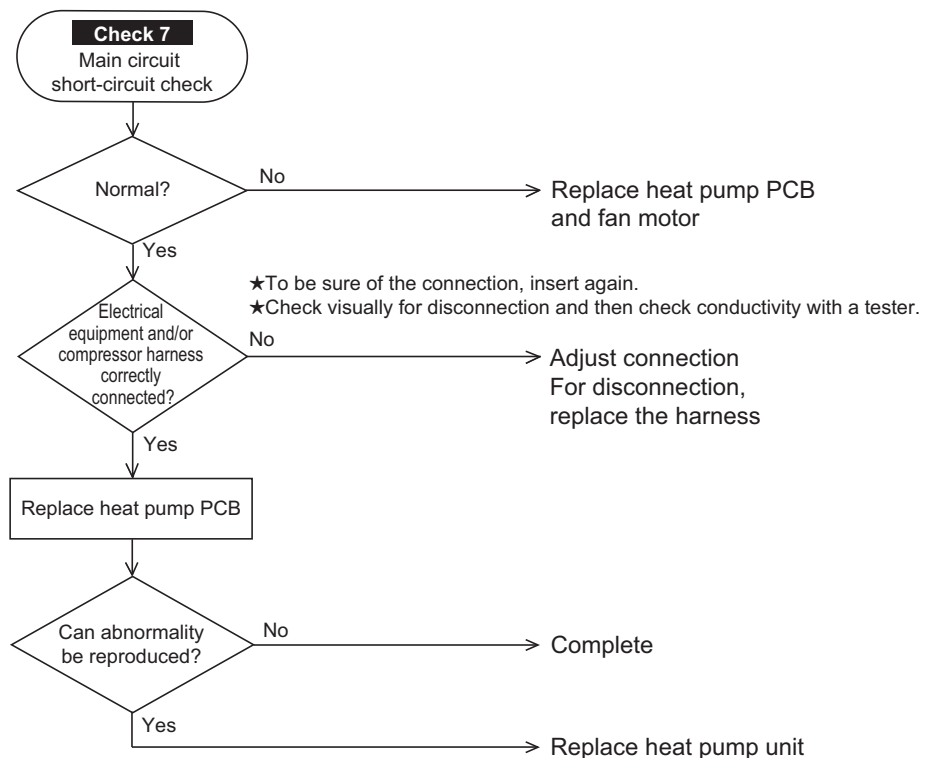


R5000533

2.18 Stop due to position detection sensor defect (compressor protection)

Applicable Models	RQWX60ZV1A
Error Code	H6
Method of Error Detection	Compressor startup defect is detected by checking compressor rotation information through electric equipment position detector.
Error Decision Conditions	<ul style="list-style-type: none"> ■ When the compressor does not rotate for about 15 seconds after operation start (with compressor operation command) ■ System goes down when detected 16 times ■ Conditions for clearing detection times: Approx. 5 minutes of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ False detection due to disconnected compressor relay ■ Startup defect due to compressor defect ■ Startup defect due to heat pump PCB defect ■ Input voltage abnormality

Troubleshooting



R5000534



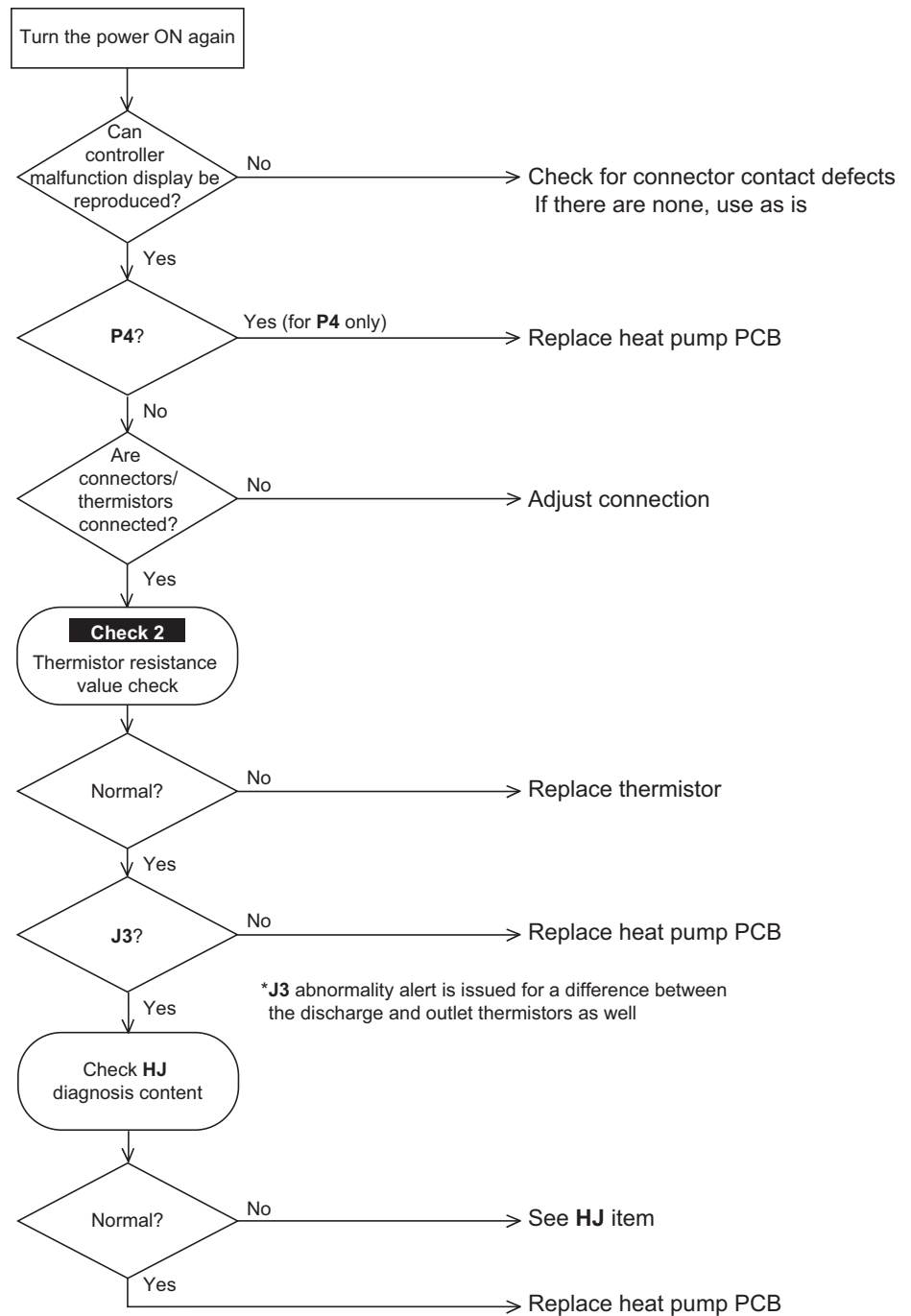
Reference

Check 7 Refer to P. 105.

2.19 Thermistor abnormality

Applicable Models	RQWX60ZV1A
Error Code	H9, HC, J3, J6, J8, P4
Method of Error Detection	Abnormality is detected from the thermistor input voltage to the microcomputer. With regard to the discharge thermistor, abnormality is also detected from comparison with the outlet thermistor temperature detection value.
Error Decision Conditions	<ul style="list-style-type: none"> ■ When thermistor input voltage is 0 V or 5 V during power supply (common for all thermistors) Recovery method: Automatic recovery (in normal operation) ■ Confirmed as well in the following situation for J3. When temperature detection value is lower than outlet temperature 10 minutes after compressor operation Recovery method: <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes “OFF”, turn “ON” again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Connector connection defect ■ Thermistor defect ■ Heat pump PCB defect ■ For J3, an outlet thermistor defect is possible ■ For J3, a circulating water system defect is possible (Confirm as with circulating water system defect HJ.)

Troubleshooting



- H9: Outdoor air thermistor
- HC: Outlet thermistor
- J3: Discharge thermistor
- J6: Heat exchanger thermistor
- J8: Inlet thermistor
- P4: Fin thermistor

R5000535



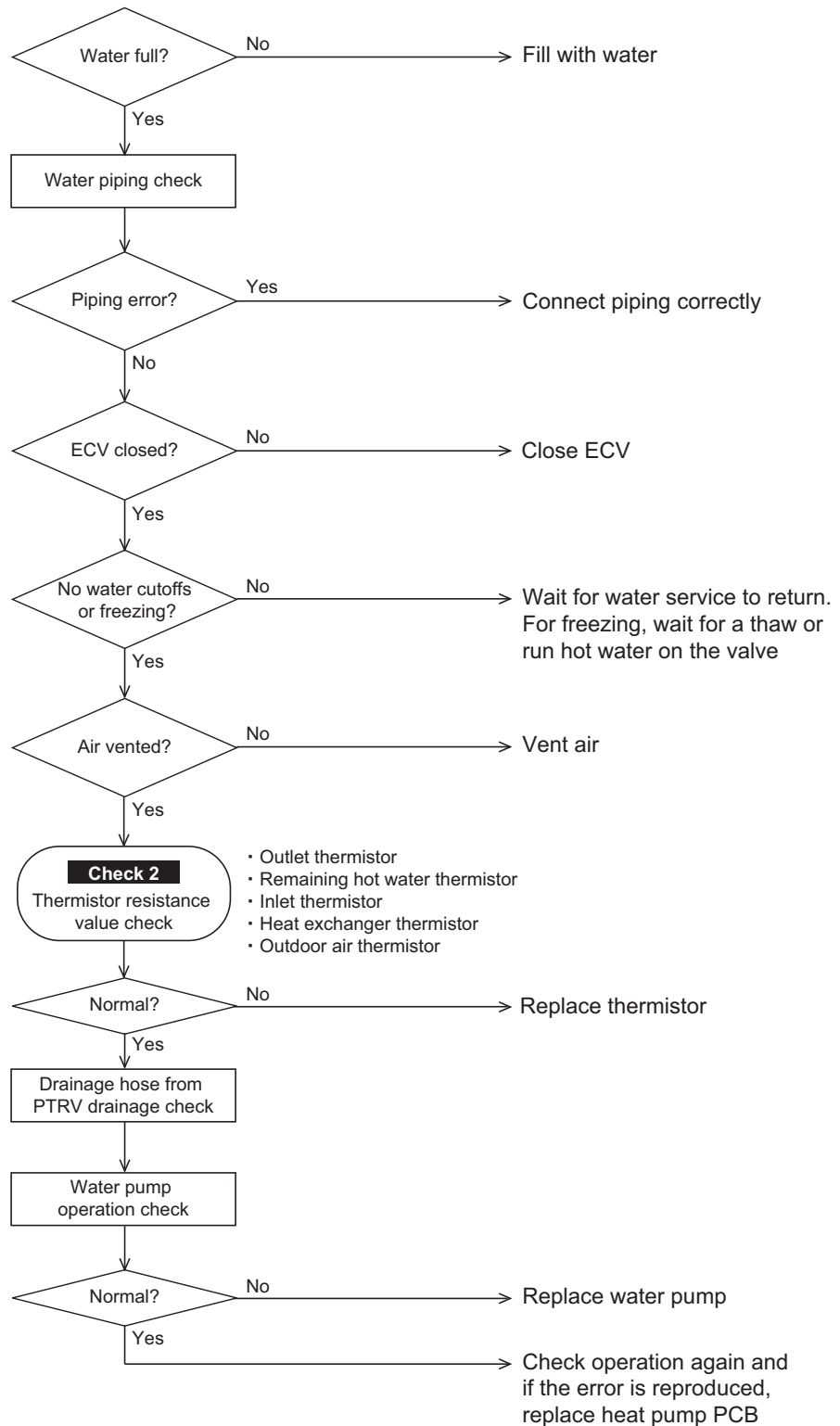
Reference Check 2 (Appendix 1) Refer to P. 102.

2.20 Circulating water system defect

Applicable Models	RQWX60ZV1A
Error Code	HJ
Method of Error Detection	<ul style="list-style-type: none"> ■ Detected through temperature difference after compressor operation, with the outlet thermistor. ■ Detected through tank water temperature thermistor and inlet thermistor temperature difference. ■ Detected through heat exchanger thermistor and outdoor air thermistor temperature difference.
Error Decision Conditions	<ul style="list-style-type: none"> ■ When outlet temperature rise is less than 7°C about 25 minutes after compressor operation start ■ When inlet temperature is higher than tank water temperature thermistor for 20 continuous minutes after operation ■ When heat exchanger temperature is higher than outdoor air temperature for 25 continuous minutes after operation ■ System goes down when detected 6 times ■ Conditions for clearing detection times: 60 minutes (cumulative) of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Water supply stopcock closed ■ Test operation defect (No water supply, ECV closed, air entrainment) ■ Water pump lock ■ Outlet thermistor defect ■ Tank water temperature thermistor defect ■ Inlet thermistor defect ■ Heat exchanger thermistor defect ■ Outdoor air thermistor defect ■ Heat pump PCB defect ■ ECV closed

Troubleshooting

Possible false detection due to water piping misconnection between hot water storage unit and heat pump unit. Check connection piping again.



R5000536

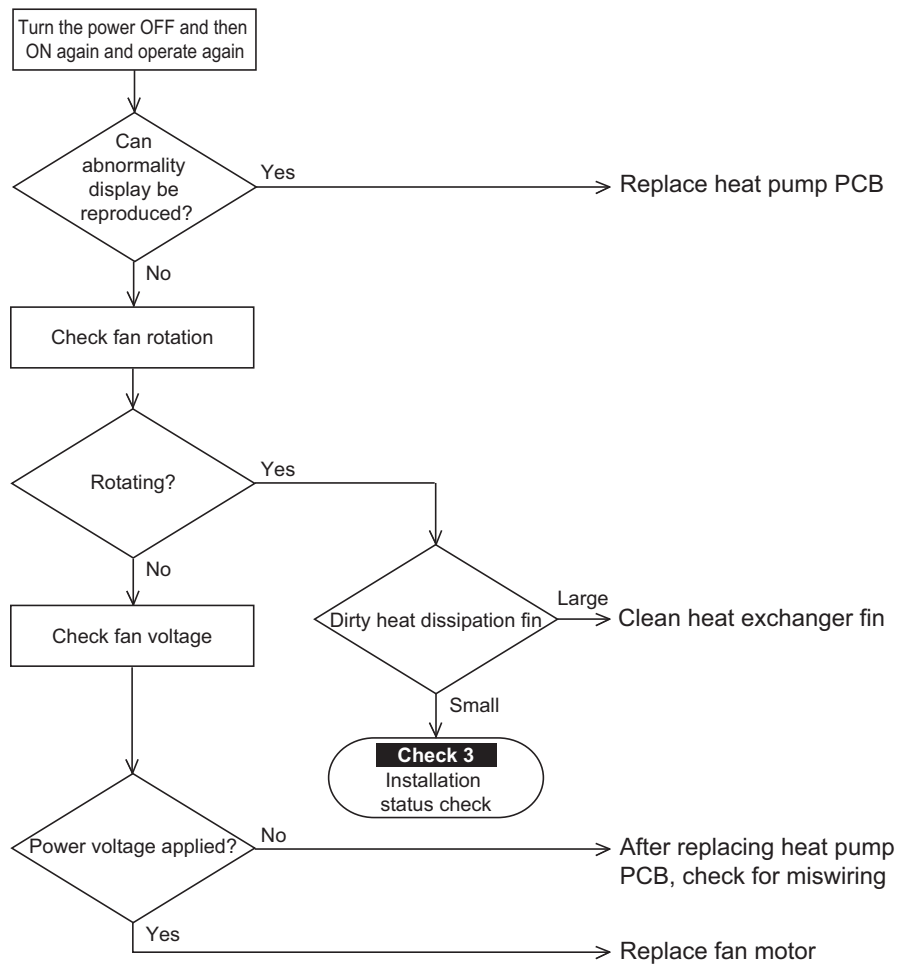


Reference Check 2 (Appendix 1) Refer to P. 102.

2.21 Temperature rise inside electrical box

Applicable Models	RQWX60ZV1A
Error Code	L3
Method of Error Detection	Detected from the electrical box interior temperature with fin thermistor during compressor operation. (Excluding 3-minute wait)
Error Decision Conditions	When fin thermistor temperature is as below while compressor is stopped <ul style="list-style-type: none"> ● Stop temperature 76°C or above ● Recovery temperature below 69°C Recovery method <ul style="list-style-type: none"> ■ Automatic recovery (in normal operation)
Supposed Causes	<ul style="list-style-type: none"> ■ Fin temperature increase due to fan malfunction ■ False detection due to fin thermistor defect (built into power module) ■ False detection due to connector connection defect ■ False detection due to heat pump PCB defect

Troubleshooting



R5000537



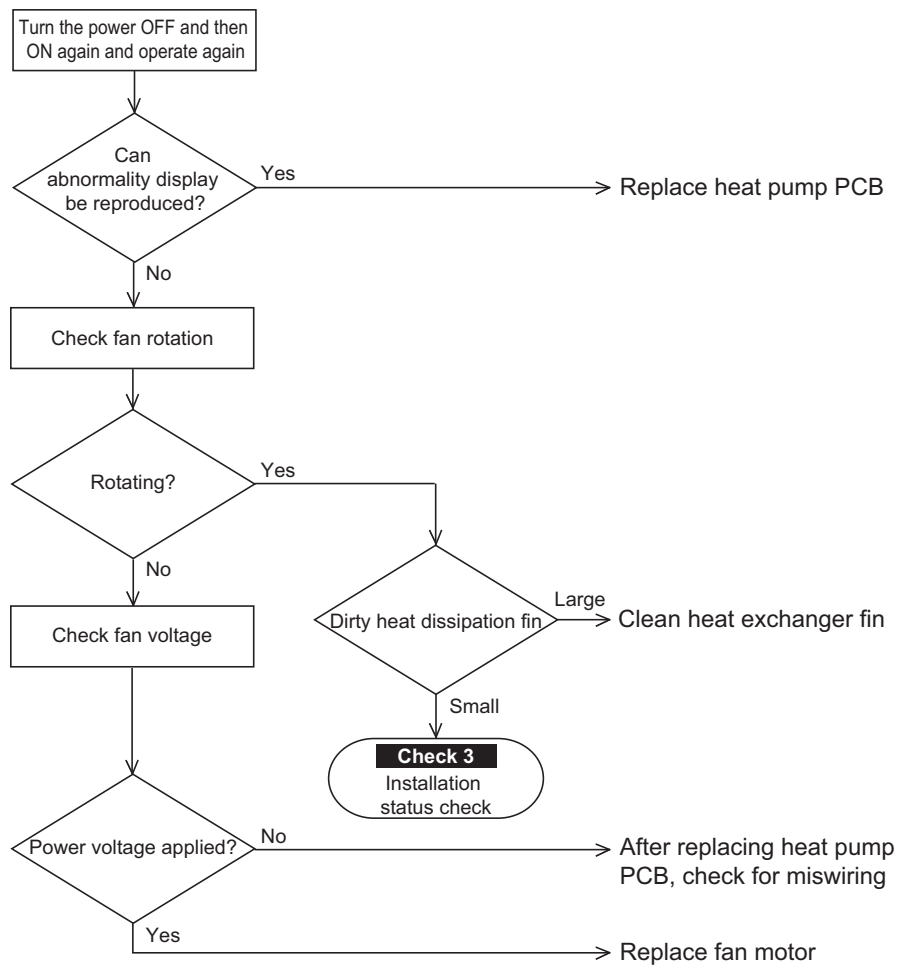
Reference

Check 3 Refer to P. 103.

2.22 Fin temperature increase

Applicable Models	RQWX60ZV1A
Error Code	L4
Method of Error Detection	Detected from fin temperature increase due to temperature detected with fin thermistor installed in printed circuit board during compressor operation. (built into power module)
Error Decision Conditions	<ul style="list-style-type: none"> ■ When fin thermistor detected temperature is as below while compressor is operating <ul style="list-style-type: none"> ● Stop temperature 90°C ● Recovery temperature 75°C ■ System goes down when detected 16 times ■ Conditions for clearing detection times: 60 minutes (cumulative) of normal operation Recovery method <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes “OFF”, turn “ON” again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Fin temperature increase due to fan malfunction ■ Fin temperature increase due to outdoor fan motor connector connection defect ■ False detection due to heat pump PCB defect (fin thermistor defect)

Troubleshooting



R5000538



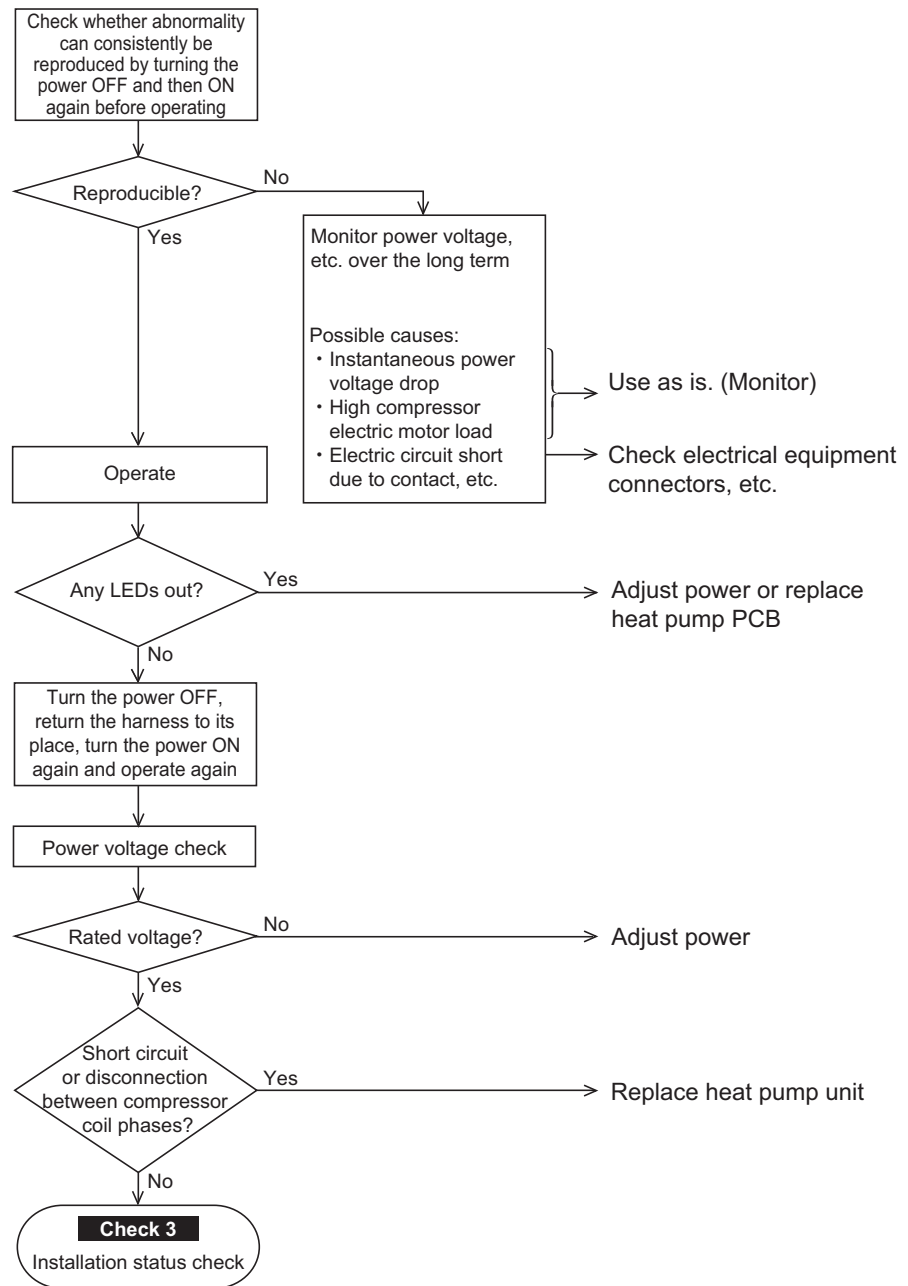
Reference Check 3 Refer to P. 103.

2.23 Stop due to output overcurrent (shunt resistance) detection (OCP)

Applicable Models	RQWX60ZV1A
Error Code	L5
Method of Error Detection	Output overcurrent is detected through current value flowing in inverter DC part.
Error Decision Conditions	<ul style="list-style-type: none"> ■ When output overcurrent value from output overcurrent detection circuit is input into the microcomputer ■ System goes down when detected 16 times ■ Conditions for clearing detection times: Approx. 5 minutes of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Overcurrent due to power transistor defect ■ Overcurrent due to interior wiring defect ■ Overcurrent due to power voltage abnormality ■ Overcurrent due to heat pump PCB defect ■ False detection due to heat pump PCB defect ■ Overcurrent due to compressor defect ■ Overcurrent due to on-site installation status defect

Troubleshooting

*Output overcurrent may occur due to miswiring inside the equipment.
 For output overcurrent stops after reconnecting the wiring, such as when replacing a component, check the wiring again.



R5000539



Reference

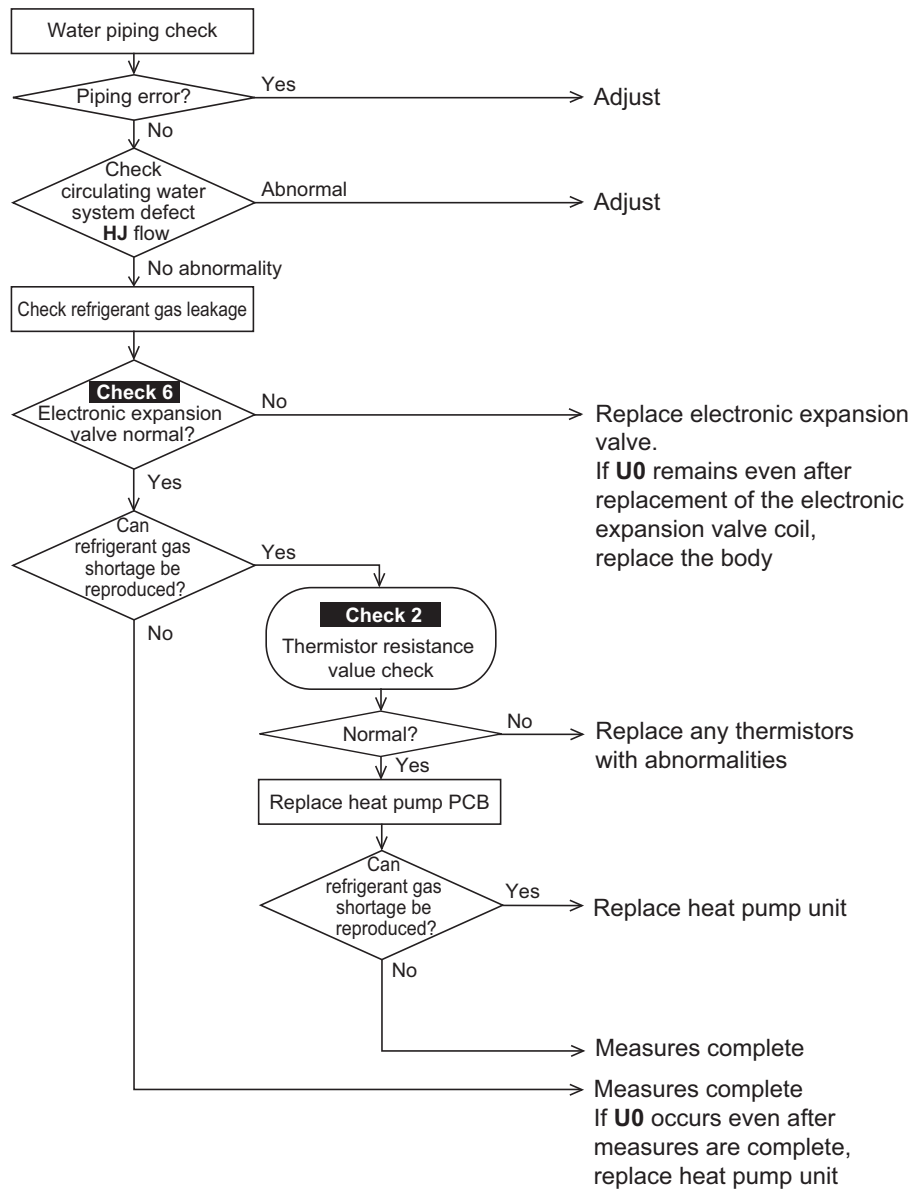
Check 3 Refer to P. 103.

2.24 Stop due to detection of shortage of refrigerant gas

Applicable Models	RQWX60ZV1A
Error Code	U0
Method of Error Detection	<ul style="list-style-type: none"> ■ Refrigerant gas shortage is detected through input current value and compressor operation frequency. ■ Refrigerant gas shortage is detected when discharge pipe temperature does not decrease during operation even with electronic expansion valve fully open. ■ Pressure estimated value is detected when at or below outdoor air temperature equivalent pressure.
Error Decision Conditions	<ol style="list-style-type: none"> 1. Secondary side power $\leq 1792/256 \times$ compressor operation frequency - 260 (W) 2. Compressor operation frequency > 52Hz <ul style="list-style-type: none"> ■ When 5 minutes or more have passed in (1) and (2) status 3. Electronic expansion valve fully open 4. Discharge pipe temperature > target discharge pipe temperature + 22°C <ul style="list-style-type: none"> ■ When 45 minutes or more have passed in (3) and (4) status ■ System goes down when detected 4 times ■ Conditions for clearing detection times: 60 minutes (cumulative) of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Refrigerant shortage (refrigerant leakage) ■ Compressor compression defect ■ Electronic expansion valve defect

Troubleshooting

Possible false detection due to misconnection between hot water storage unit and heat pump unit. Check connection piping again. Also, circulating water system defects are also possible, so confirm as with circulating water system defect **HJ**.



R5000540



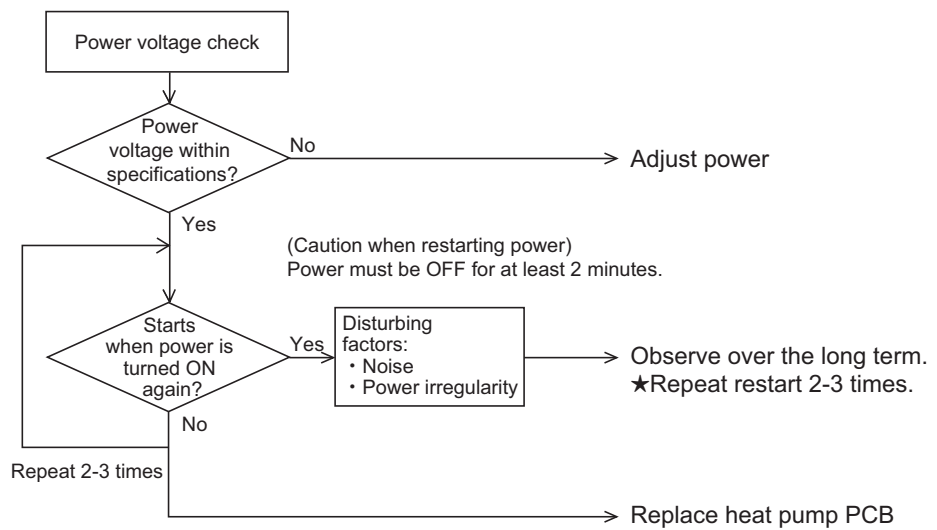
Reference

Check 2 (Appendix 1) Refer to P. 102.
Check 6 Refer to P. 104.

2.25 Stop due to low voltage detection/overvoltage detection

Applicable Models	RQWX60ZV1A
Error Code	U2
Method of Error Detection	Abnormal voltage increase or abnormal voltage drop is detected in detection circuit or DC voltage detection circuit.
Error Decision Conditions	<p>When an overvoltage signal is input from overvoltage detection circuit to the microcomputer, or when the voltage detected by the DC voltage detection circuit is less than 170V.</p> <ul style="list-style-type: none"> ■ For low voltage detection (LVP): System goes down when detected 16 times ■ For overvoltage detection (OVP): System goes down when detected 255 times ■ Conditions for clearing detection times: Approx. 5 minutes of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Power voltage abnormality ■ Overvoltage detection part malfunction or DC voltage detection circuit malfunction ■ Heat pump PCB defect

Troubleshooting

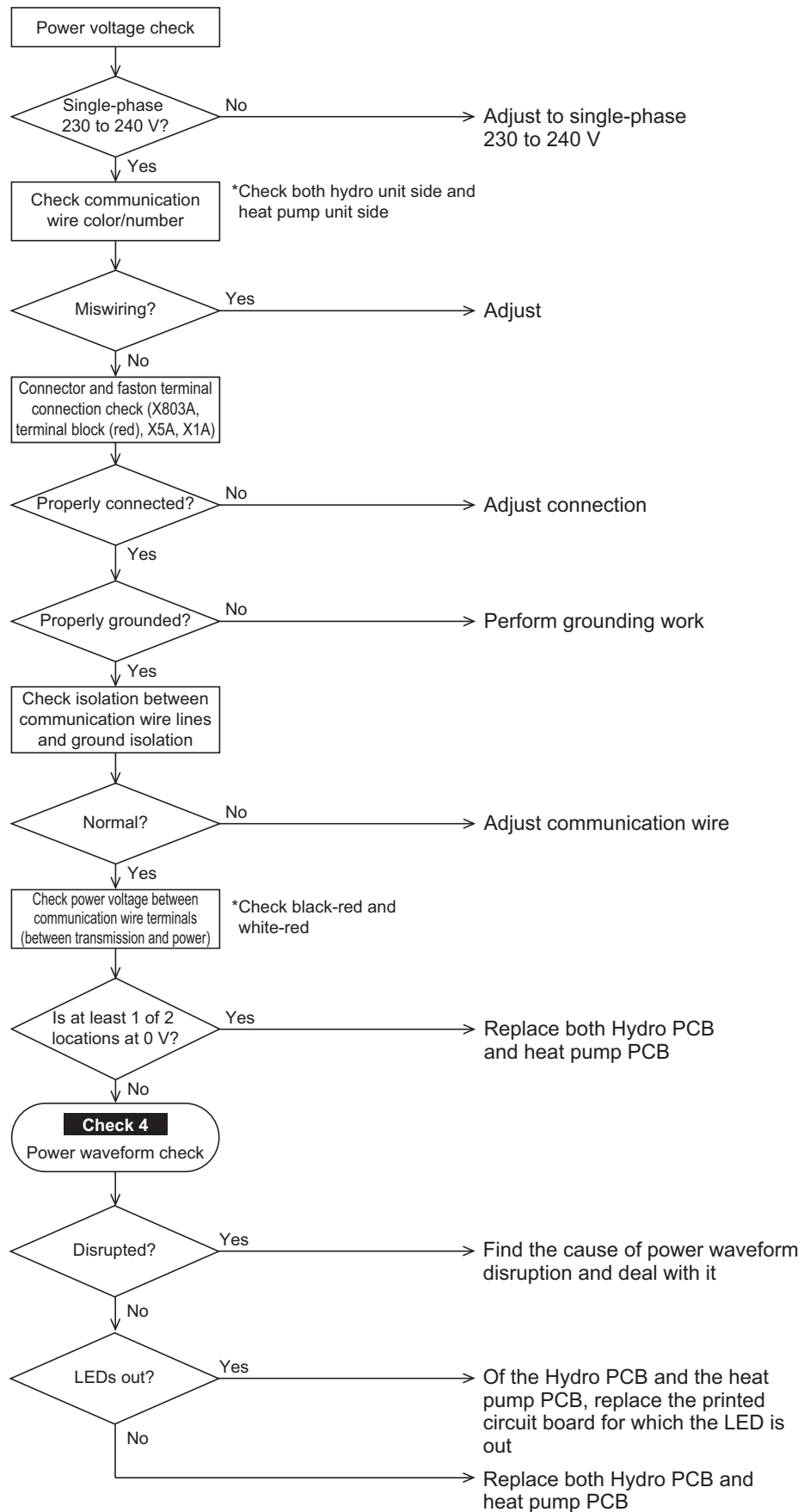


R5000541

2.26 Transmission abnormality (between hot water storage and heat pump unit)

Applicable Models	RQWX60ZV1A
Error Code	U4
Method of Error Detection	Judges whether reception data from heat pump unit through transmission wiring is normal.
Error Decision Conditions	Data sent from heat pump unit cannot be received normally. Or when data content is abnormal Recovery method <ul style="list-style-type: none">■ Automatic recovery (in normal operation)
Supposed Causes	<ul style="list-style-type: none">■ Transmission wiring transmission defect due to miswiring■ Transmission wiring transmission defect due to power waveform disruption■ Transmission defect due to transmission wiring disconnection (transmission line)■ Printed circuit board defect (heat pump or hydro)■ Voltage abnormality■ Thermal fuse defect

Troubleshooting



R5000542



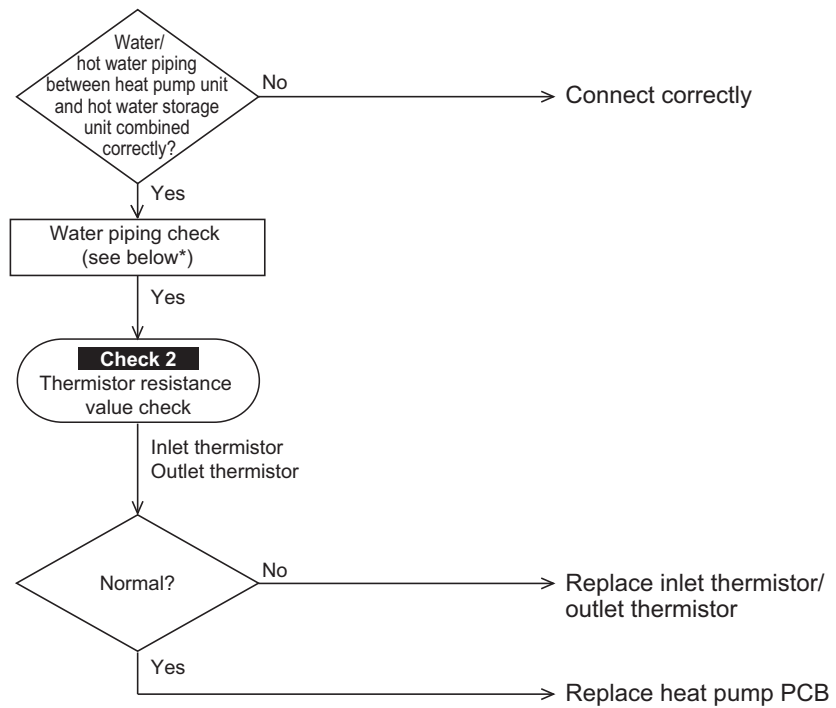
Reference

Check 4 Refer to P. 103.

2.27 Piping error detected (between hot water storage and heat pump unit)

Applicable Models	RQWX60ZV1A
Error Code	UF
Method of Error Detection	Abnormality detected from temperature difference between inlet temperature and outlet temperature.
Error Decision Conditions	<ol style="list-style-type: none"> 1. At startup <ul style="list-style-type: none"> ● Approx. 90 seconds after operation start When inlet temperature > outlet temperature + 11°C, and outdoor air temperature > 15.5°C ● Approx. 15 minutes after operation start When inlet temperature > outlet temperature +5°C 2. When heating is complete When inlet temperature has more or less reached completed temperature, and inlet temperature > outlet temperature +5°C <p>Judgment is made only when tank water temperature thermistor is at least 5°C lower than inlet temperature for both (1) and (2), and discharge pipe temperature is higher than inlet temperature.</p> <ul style="list-style-type: none"> ■ System goes down when detected 16 times ■ Conditions for clearing detection times: 60 minutes (cumulative) of normal operation <p>Recovery method</p> <ul style="list-style-type: none"> ■ Earth leakage circuit breaker operation (after at least 2 minutes "OFF", turn "ON" again to recover)
Supposed Causes	<ul style="list-style-type: none"> ■ Piping error ■ Inlet thermistor defect ■ Outlet thermistor defect ■ ECV open

Troubleshooting



R5000543

* When air venting is insufficient and air mixes with water inside the heat pump, a piping error may in rare cases be detected depending on the ratio thereof.

- ◆ Water full?
- ◆ Stop valve open?
- ◆ No water cutoffs?
- ◆ Check whether air has been vented.



Reference

Check 2 (Appendix 1) Refer to P. 102.

3. Check

3.1 Protection function set values

Check 1

Item		Model
		RQWX60ZV1A
Refrigerant gas shortage	Judgment frequency	52 Hz
	A	1792/256
	B	-260 [W]
	Detection time	5 minutes
Compressor startup defect	Judgment frequency	(Position detection sensor)
	Input voltage value	(Position detection sensor)
CT abnormality	Judgment frequency	52 Hz
	Voltage value	Less than 0.1 A
Stop due to input overcurrent		14.5 A
Electrical equipment temperature increase		76°C

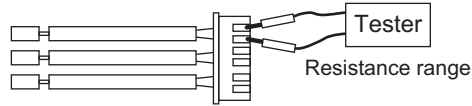
- Judgment formula for refrigerant gas shortage
 $\text{Secondary power} < A \times \text{compressor operation frequency} + B \text{ [W]}$
 (only when operation frequency > judgment frequency status has continued for a certain period)
- Position detection sensor: Direct compressor lock status is detected with the sensor.
- Electrical equipment temperature is substituted with fin thermistor part temperature.

3.2 Thermistor resistance value check

Check 2

Remove the thermistor connectors on the printed circuit board and use a tester to measure the thermistor resistance values.

The normal relationship between temperature and resistance is shown in Appendix 1.



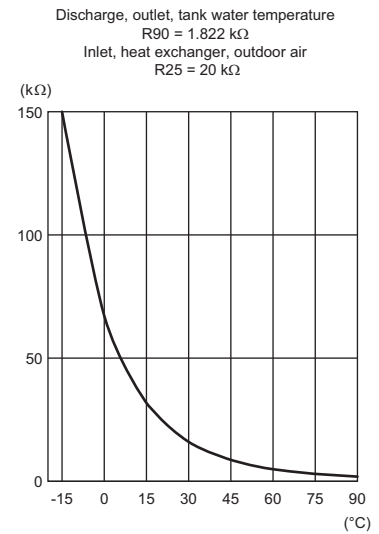
R5000552

Appendix 1

Heat pump unit side thermistor

Temperature characteristics (common)

Thermistor temperature (°C)	Resistance value (kΩ)	Thermistor temperature (°C)	Resistance value (kΩ)
□ 50	1,860	55	5.9
□ 20	198	60	5.0
□ 15	148	65	4.1
□ 10	112	70	3.5
□ 5	86	75	3
0	66	80	2.5
5	51	85	2.1
10	40	90	1.8
15	31.5	95	1.6
20	25	100	1.3
25	20	105	1.2
30	16	110	1
35	13	115	0.9
40	10.6	120	0.8
45	8.7	212	0.12
50	7.2		

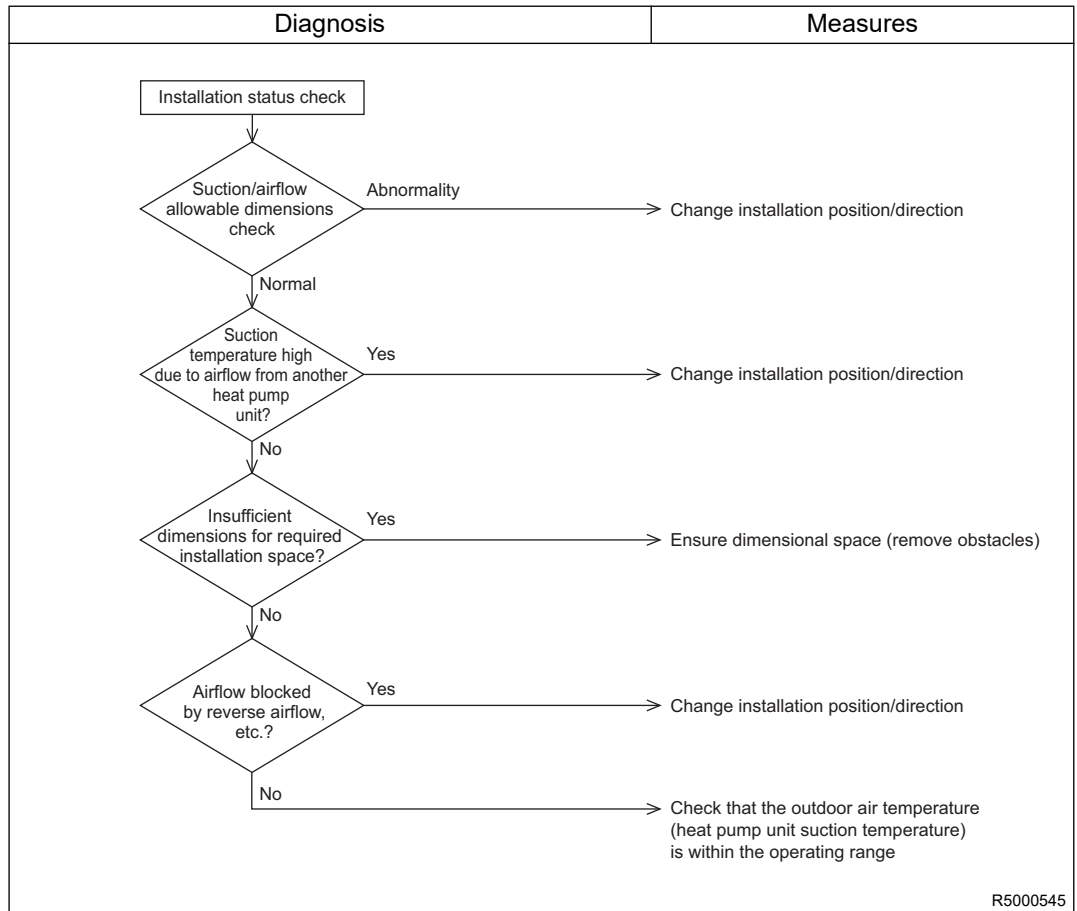


Short-circuit detection

R5000544

3.3 Installation status check

Check 3



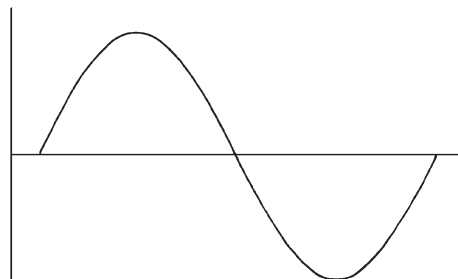
3.4 Power waveform check (noise)

Check 4

Measure the power supply waveform between No. 1 and No. 2 on the terminal strip, and check the waveform disturbance.

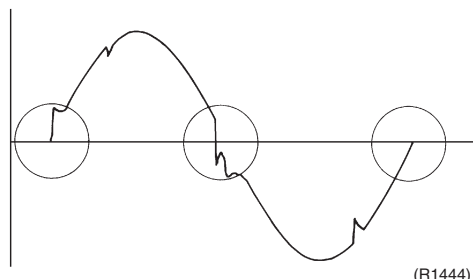
- Check if the power supply waveform is a sine wave (Fig.1).
- Check if there is waveform disturbance near the zero-cross (sections circled in Fig.2).

[Fig.1]



(R1736)

[Fig.2]



(R1444)

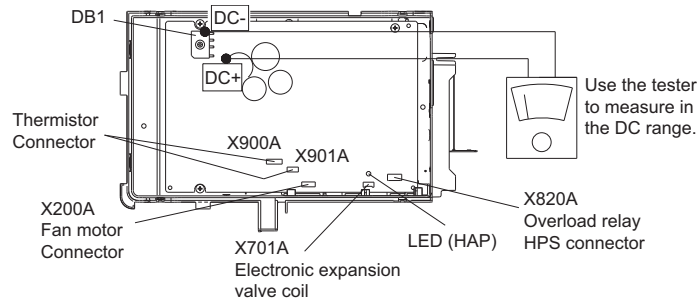
3.5 Capacitor voltage check

Check 5

Before checking, be sure to conduct a main circuit short-circuit check (Check 7).

■ Capacitor voltage check

Without turning off the breaker, follow the figure below and be sure never to touch the charging part while measuring. Normal if 320 to 340 VDC ±30 V at relay ON.



R5000546

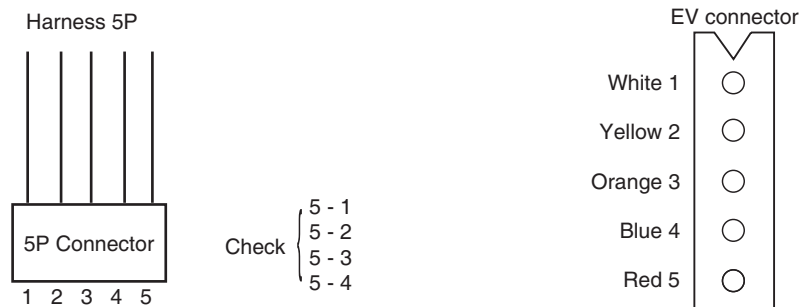
3.6 Electronic expansion valve check

Check 6

Check the following items for the electronic expansion valves.

1. Are the electronic expansion valve connectors and relay connectors correctly plugged into the control printed circuit board? (no disconnections or incomplete insertion) Check the electronic expansion valve bodies against the connector numbers.
2. Check whether the electronic expansion valves make a rattling latch noise when the power is turned off and on again.
3. If any of the electronic expansion valves do not make a sound in check (2), remove the connector and check conductivity with a tester.
4. For electronic expansion valves in check (2) above, no sound means an outdoor printed circuit board or electronic expansion valve coil defect.
5. When conductivity has been confirmed in check (3) above, install a coil with latch noise into the electronic expansion valves without latch noise and check the latch sound again. If there is a latch sound, the problem is an electronic expansion valve coil defect. If there is no latch sound, the problem is an electronic expansion valve body defect.

[Normal resistance value]
46 ±3 Ω (at ambient temperature 20°C)



R5000547

R6001104

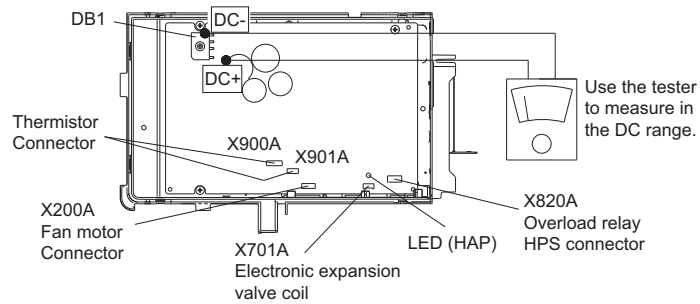


Note(s) Be aware that the latch sound varies by valve.

3.7 Main circuit short-circuit check

Check 7

- Measure resistance between pins at ends of DB1. (See figure below for DB1 pin positions)



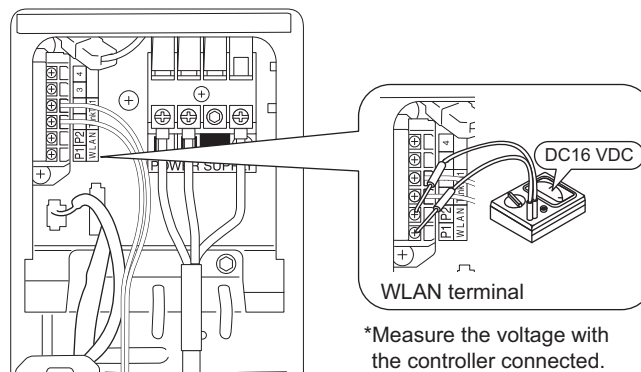
R5000546

- Failed if ∞ or $1k\Omega$ or less.

Tester (+) (for analog method, (-))	(~)	(+)	(~)	(-)
Tester (-) (for analog method, (+))	(+)	(~)	(-)	(~)
Normal resistance	several $k\Omega$ ~ several $M\Omega$	∞	∞	several $k\Omega$ ~ several $M\Omega$
Abnormal resistance	0Ω or ∞	0	0	0Ω or ∞

3.8 How to measure connector/terminal block

Check 8



R5000551

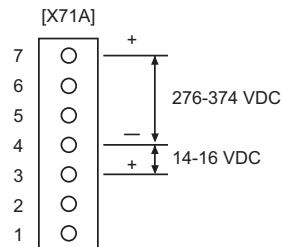
3.9 Water pump output voltage check

Check 9

- Use a tester to check for Hydro PCB output voltage abnormalities.

Output

1. With operation OFF and power OFF, remove the connector
2. Turn power ON
3. Check voltage



R5000548

Warning



- Daikin products are manufactured for export to numerous countries throughout the world. Prior to purchase, please confirm with your local authorized importer, distributor and/or retailer whether this product conforms to the applicable standards, and is suitable for use, in the region where the product will be used. This statement does not purport to exclude, restrict or modify the application of any local legislation.
- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorized parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the user's manual carefully before using this product. The user's manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any inquiries, please contact your local importer, distributor and/or retailer.

Cautions on product corrosion

1. Hot water heat pump system should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.

© All rights reserved