

June 2014

No. OCH562

# SERVICE MANUAL

**R410A**

Outdoor unit  
[Model Name]

PUHZ-W112VHA

Salt proof model

PUHZ-W112VHA-BS

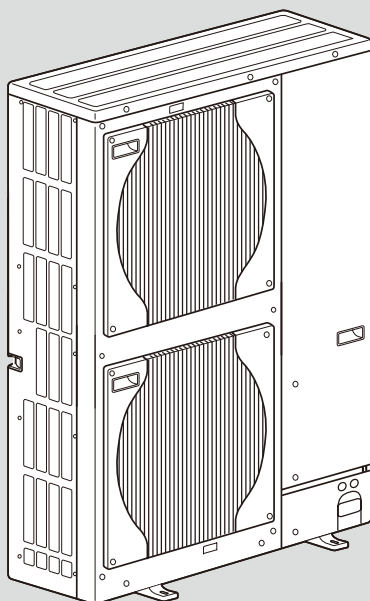
[Service Ref.]

**PUHZ-W112VHA**

**PUHZ-W112VHA-BS**

Note:

- This manual describes service data of outdoor unit only.



## CONTENTS

1. SAFETY PRECAUTION.....	2
2. SPECIFICATIONS.....	5
3. DATA .....	7
4. OUTLINES AND DIMENSIONS.....	9
5. WIRING DIAGRAM.....	10
6. WIRING SPECIFICATIONS .....	11
7. REFRIGERANT SYSTEM DIAGRAM .....	12
8. TROUBLESHOOTING .....	13
9. DISASSEMBLY PROCEDURE .....	41

**PARTS CATALOG (OCB562)**

**1-1. ALWAYS OBSERVE FOR SAFETY**

**Before obtaining access to terminal, all supply circuits must be disconnected.**

**Preparation before the repair service.**

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the air conditioner, turn off the power-supply breaker.
- Discharge the condenser before the work involving the electric parts.

**Precautions during the repair service.**

- Do not perform the work involving the electric parts with wet hands.
- Do not pour water into the electric parts.
- Do not touch the refrigerant.
- Do not touch the hot or cold areas in the refrigerating cycle.
- When the repair or the inspection of the circuit needs to be done without turning off the power, exercise great caution not to touch the live parts.

**1-2. CAUTIONS RELATED TO NEW REFRIGERANT****Cautions for units utilizing refrigerant R410A****Do not use refrigerant other than R410A.**

If other refrigerant (R22 etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil etc.

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

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil etc.

**Use the following tools specifically designed for use with R410A refrigerant.**

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Vacuum pump adaptor
Charge hose	Electronic refrigerant charging scale
Gas leak detector	Torque wrench

**Handle tools with care.**

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

**Do not use a charging cylinder.**

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

**Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.****Charge refrigerant from liquid phase of gas cylinder.**

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

**Use the specified refrigerant only.****Never use any refrigerant other than that specified.**

Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of. Correct refrigerant is specified in the manuals and on the spec labels provided with our products. We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

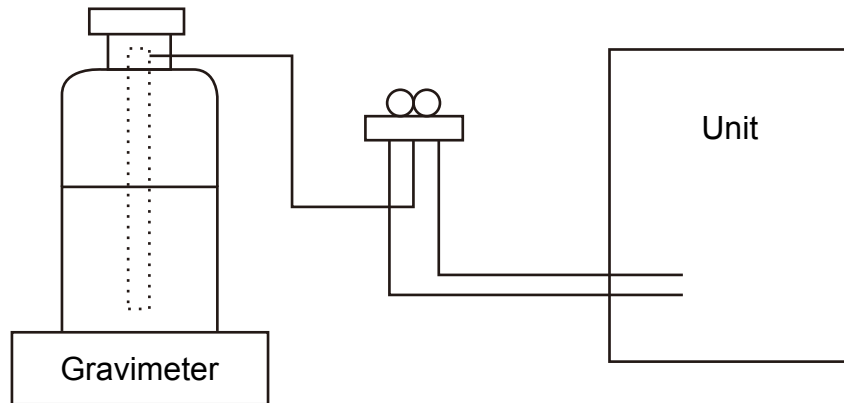
### [1] Cautions for service

- (1) Perform service after recovering the refrigerant left in the unit completely.
- (2) Do not release refrigerant in the air.
- (3) After completing service, charge the cycle with specified amount of refrigerant.

### [2] Additional refrigerant charge

#### When charging directly from cylinder

- Check that cylinder for R410A on the market is syphon type.
- Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



### [3] Service tools

Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	· Only for R410A
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 5.3 MPa·G or over.
②	Charge hose	· Only for R410A
		· Use pressure performance of 5.09 MPa·G or over.
③	Electronic scale	—
④	Gas leak detector	· Use the detector for R134a, R407C or R410A.
⑤	Adaptor for reverse flow check	· Attach on vacuum pump.
⑥	Refrigerant charge base	—
⑦	Refrigerant cylinder	· Only for R410A      · Top of cylinder (Pink)
		· Cylinder with syphon
⑧	Refrigerant recovery equipment	—

### 1-3. CAUTIONS FOR REFRIGERANT PIPING WORK

Tools for R410A (The following table shows whether conventional tools can be used or not.)

Tools and materials	Use	R410A tools	Can R22 tools be used?	Can R407C tools be used?
Gauge manifold	Air purge, refrigerant charge and operation check	Tool exclusive for R410A	×	×
Charge hose		Tool exclusive for R410A	×	×
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Refrigerant recovery	Tool exclusive for R410A	×	×
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R410A	×	×
Safety charger	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Tool exclusive for R410A	×	×
Charge valve	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R410A	×	×
Vacuum pump	Vacuum drying and air purge	Tools for other refrigerants can be used if equipped with adapter for reverse flow check	△ (Usable if equipped with adapter for reverse flow)	△ (Usable if equipped with adapter for reverse flow)
Bender	Bend the pipes	Tools for other refrigerants can be used	○	○
Pipe cutter	Cut the pipes	Tools for other refrigerants can be used	○	○
Welder and nitrogen gas cylinder	Weld the pipes	Tools for other refrigerants can be used	○	○
Refrigerant charging scale	Charge refrigerant	Tools for other refrigerants can be used	○	○
Vacuum gauge or thermistor vacuum gauge and vacuum valve	Check the degree of vacuum. (Vacuum valve prevents back flow of oil and refrigerant to thermistor vacuum gauge)	Tools for other refrigerants can be used	○	○
Charging cylinder	Refrigerant charge	Tool exclusive for R410A	×	—

× : Prepare a new tool. (Use the new tool as the tool exclusive for R410A.)

△ : Tools for other refrigerants can be used under certain conditions.

○ : Tools for other refrigerants can be used.

### 1-4. PRECAUTIONS FOR SALT PROOF TYPE "-BS" MODEL

Although "-BS" model has been designed to be resistant to salt damage, observe the following precautions to maintain the performance of the unit.

1. Avoid installing the unit in a location where it will be exposed directly to seawater or sea breeze.
2. If the cover panel may become covered with salt, be sure to install the unit in a location where the salt will be washed away by rainwater. (If a sunshade is installed, rainwater may not clean the panel.)
3. To ensure that water does not collect in the base of the outdoor unit, make sure that the base is level, not at angle. Water collecting in the base of the outdoor unit could cause rust.
4. If the unit is installed in a coastal area, clean the unit with water regularly to remove any salt build-up.
5. If the unit is damaged during installation or maintenance, be sure to repair it.
6. Be sure to check the condition of the unit regularly.
7. Be sure to install the unit in a location with good drainage.

## 2-1. SPECIFICATIONS

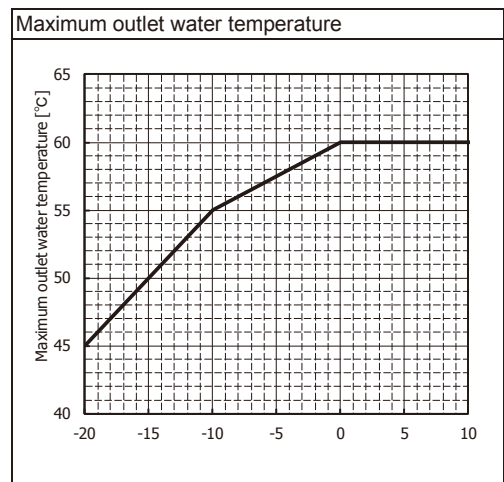
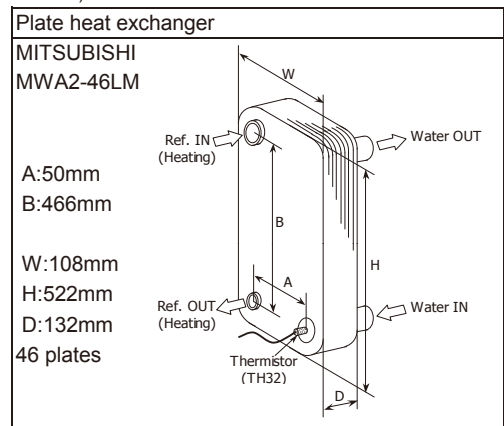
## PUHZ-W112VHA(-BS)

Power supply (Phase, Voltage, Frequency)		1 φ, 230V, 50Hz	
Nominal water flow rate (Heating mode)		L/min	32.1
Heating (A7/W35)	Capacity	kW	11.20
	COP		4.47
	Power input	kW	2.51
Heating (A2/W35)	Capacity	kW	11.20
	COP		3.34
	Power input	kW	3.35
Pressure difference (water circuit)		kPa	6.3
Heating pump input (based on EN14511)		kW	0.01
Nominal water flow rate (Cooling mode)		L/min	28.7
Cooling (A35/W7)	Capacity	kW	10.00
	EER (COP)		2.80
	Power input	kW	3.57
Cooling (A35/W18)	Capacity	kW	10.00
	EER (COP)		4.50
	Power input	kW	2.22
Pressure difference (water circuit)		kPa	5
Cooling pump input (based on EN14511)		kW	0.01

Note: "COP" and "Power input" in the above table are values that contains the "pump input (based on EN 14511)".

Outdoor unit specifications			
Model name		PUHZ-W112VHA(-BS)	
Running current	Heating(A7/W35)	A	11.1
	Cooling(A35/W7)	A	15.8
Power factor	Heating(A7/W35)	%	98
	Cooling(A35/W7)	%	98
Max. current		A	29.5
Breaker size		A	32
Outer casing		Galvanized plate	
External finish		Munsell 3Y 7.8/1.1	
Refrigerant control		Linear expansion valve	
Compressor		Hermetic scroll	
	Model	ANB33FNMMT	
	Motor output	kW	2.5
	Start type	Inverter	
	Protection devices	HP switch/LP switch Discharge thermo Comp.surface thermo	
	Oil (Model)	L	900 (FV50S)
Crankcase heater		W	-
Heat exchanger	Air	Plate fin coil	
	Water	Plate heat exchanger	
Fan	Fan(drive)×No.	Propeller fan × 2	
	Fan motor output	kW	0.074 x 2
	Air flow	m <sup>3</sup> /min	100
(CFM)		(3,530)	
Defrost method		Reverse cycle *1	
Noise level (SPL)	Heating	dB	53 *2 *3
	Cooling	dB	53 *2
Dimensions	Width	mm (in)	1020 (40-3/16)
	Depth	mm (in)	330 +30 *4 (13+1-3/16)
	Height	mm (in)	1350 (53-1/8)
Weight		kg (lb)	133
Refrigerant		R410A	
	Quantity	kg (lb)	4.0 (8.8)
Guaranteed operating range (Outdoor)	Heating	°C	-20 *5 ~ +35
	Cooling	°C	-5 *6 ~ +46
Outlet water temp. (Max in heating, Min in cooling)	Heating	°C	+60
	Cooling	°C	+5
Return water temperature range	Heating	°C	+5 *7 ~ +59
	Cooling	°C	+8 ~ +28
Water flow rate range		L/min	14.4 ~ 32.1

Nominal operating condition	
<b>Heating(A7/W35)</b>	
Outside air temperature (Dry-bulb)	+ 7°C
Outside air temperature (Wet-bulb)	+ 6°C
Water temperature (inlet/outlet)	+30/+35°C
<b>Heating(A2/W35)</b>	
Outside air temperature (Dry-bulb)	+ 2°C
Outside air temperature (Wet-bulb)	+ 1°C
Water temperature (inlet/outlet)	-/+35°C
<b>Cooling(A35/W7)</b>	
Outside air temperature (Dry-bulb)	+35°C
Outside air temperature (Wet-bulb)	+ 24°C
Water temperature (inlet/outlet)	+12/+7°C
<b>Cooling(A35/W18)</b>	
Outside air temperature (Dry-bulb)	+35°C
Outside air temperature (Wet-bulb)	+ 24°C
Water temperature (inlet/outlet)	+23/+18°C



\*1 Hot gas with four-way valve

\*2 at distance of 1m from outdoor unit

\*3 A weighted sound power level in accordance with ISO9614-1 for EN14511 testing is 69 dBA.

\*4 grill

\*5 Lower limit of use is -5°C for EN14511 testing purposes.

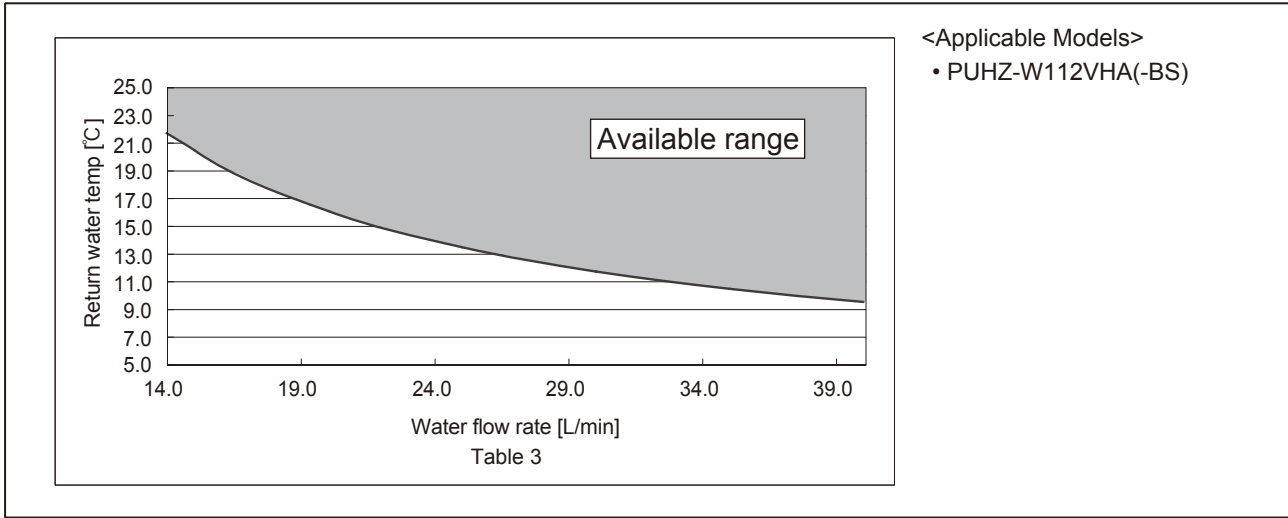
\*6 With the optional air outlet guide, min. operation temperature will be -15°C.

\*7 Lowest entering temperature is 12°C for EN14511 testing purposes.

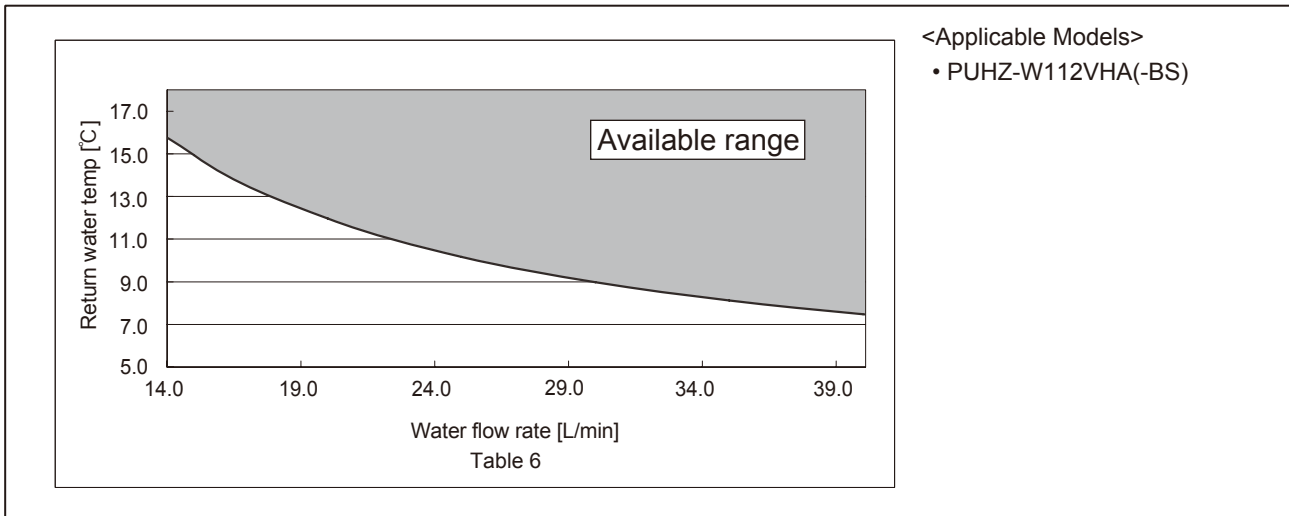
## 2-2. AVAILABLE RANGE (WATER FLOW RATE, RETURN WATER TEMP.)

Note: If using the unit out of the available range, the parts of unit might be damaged.

### <Heating>



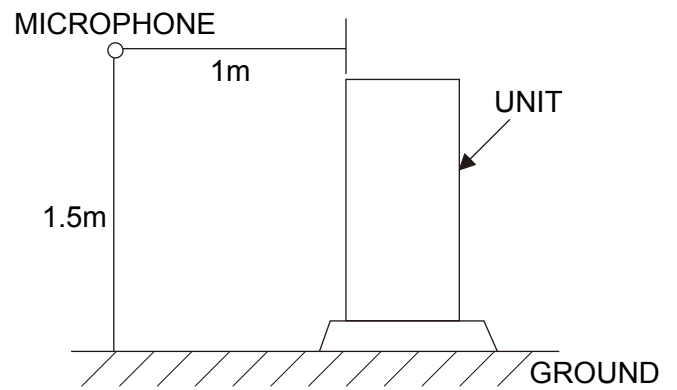
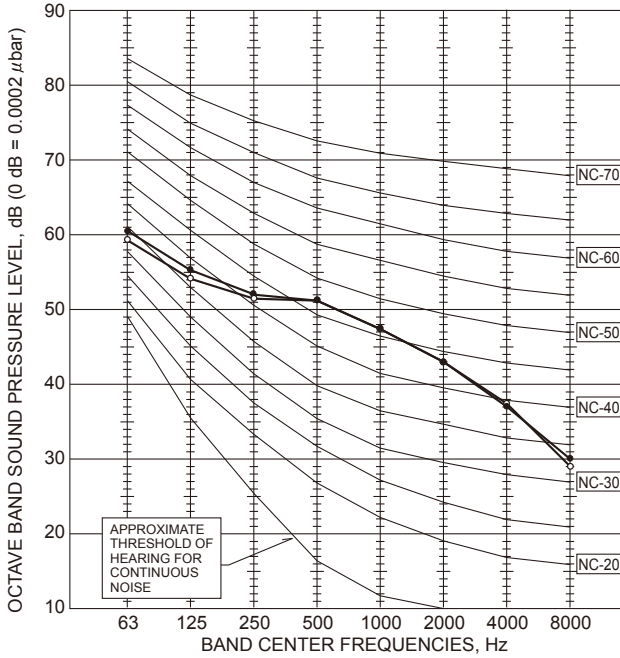
### <Cooling>



3-1. NOISE CRITERION CURVES

PUHZ-W112VHA  
 PUHZ-W112VHA-BS

MODE	SPL(dB)	LINE
COOLING	53	○—○
HEATING	53	●—●



### 3-2. STANDARD OPERATION DATA

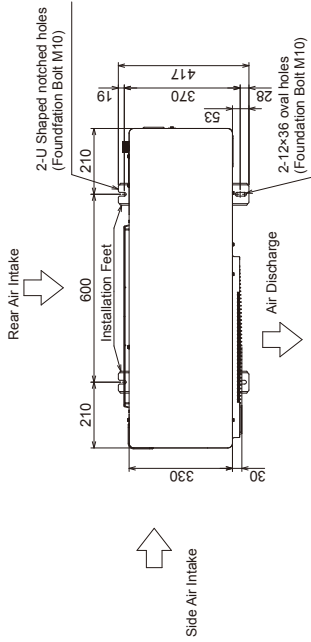
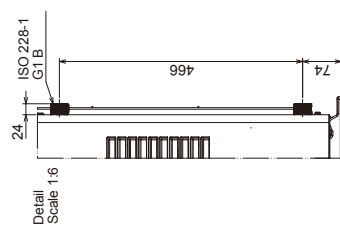
Mode			Cooling (A35/W7)	Heating (A7/W35)
Total	Capacity	W	10,000	11,200
	Input	kW	3.57	2.51
Electrical circuit	Outdoor unit		PUHZ-W112VHA	
	Phase, Hz		1, 50	
	Voltage	V	230	
	Current	A	15.8	11.1
Refrigerant circuit	Discharge pressure	MPa	2.63	2.08
	Suction pressure	MPa	0.83	0.67
	Discharge temperature	°C	69	60
	Condensing temperature	°C	45	36
	Suction temperature	°C	9	6
Water conditions	Flow volume	L/min	28.7	32.1
	Outlet water temperature	°C	7	35
Outdoor conditions	Intake air temperature	D.B. °C	35	7
		W.B. °C	24	6

The unit of pressure has been changed to MPa based on international SI system.  
 The conversion factor is: 1 (MPa) = 10.2 (kgf/cm<sup>2</sup>)



PUHZ-W112VHA  
PUHZ-W112VHA-BS

Unit: mm



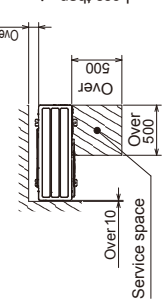
3 FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10) bolts. (Bolts and washers must be purchased locally.)



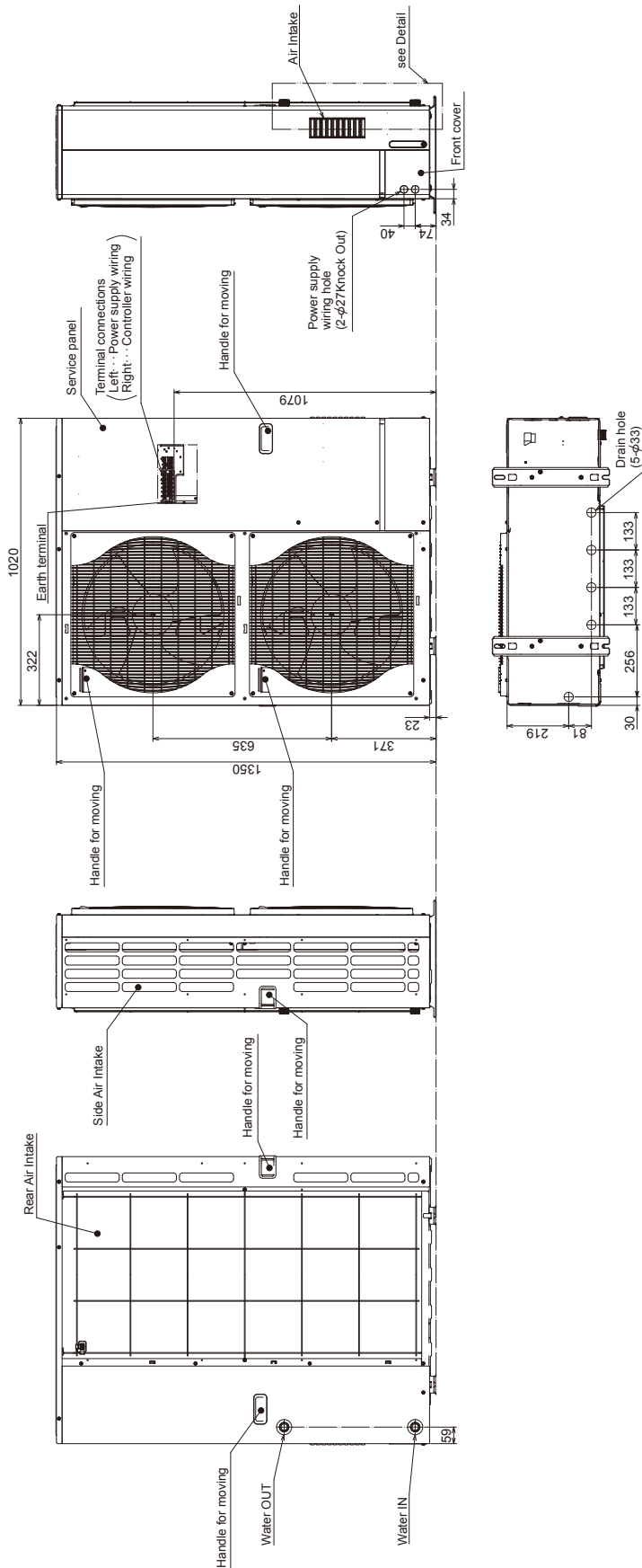
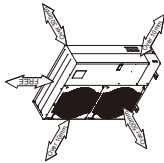
2 SERVICE SPACE

Dimensions of space needed for service access are shown in the below diagram.



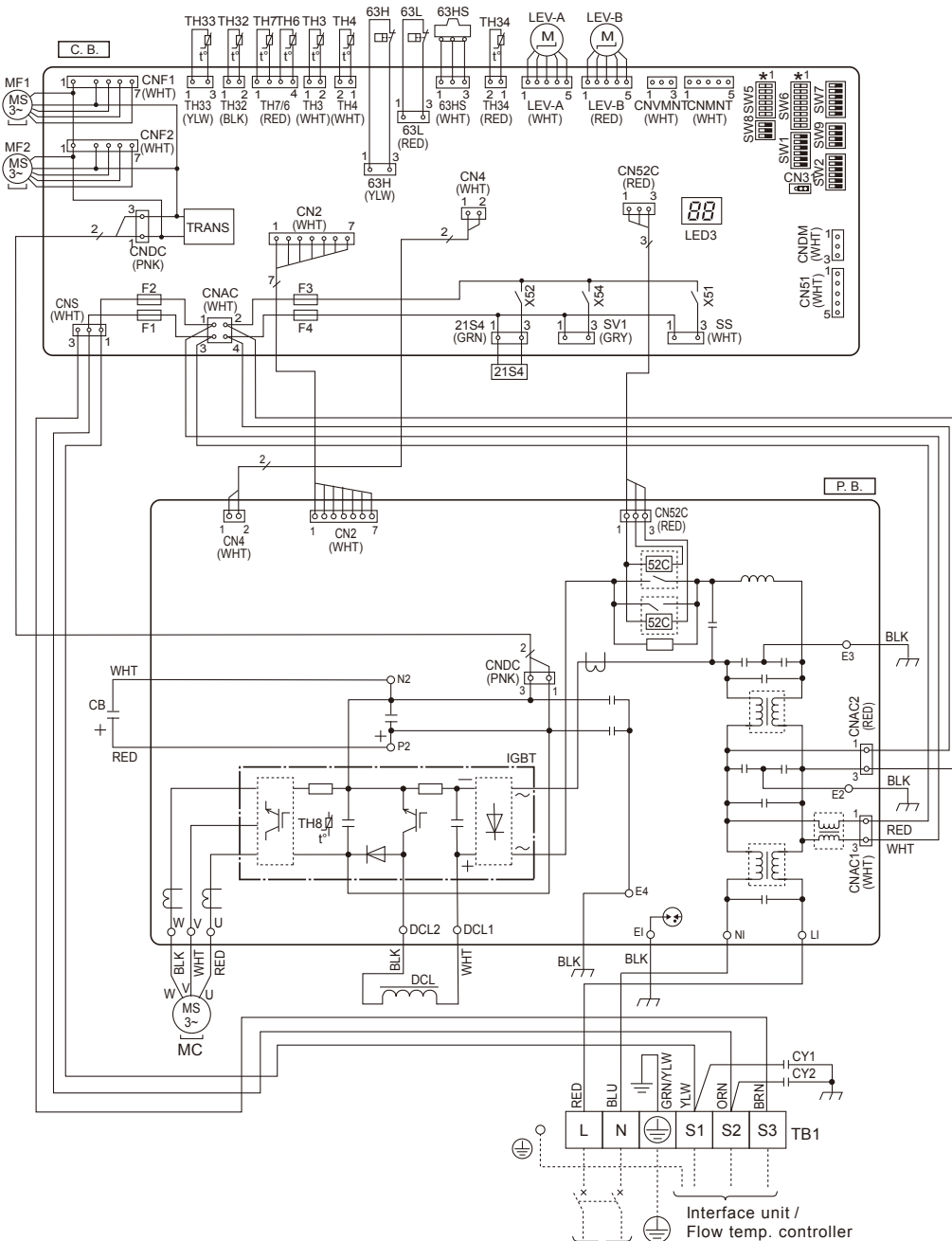
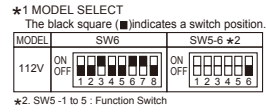
1 FREE SPACE (Around the unit)

The diagram below shows a basic example. Explanation of particular details are given in the installation manuals etc.



**PUHZ-W112VHA**  
**PUHZ-W112VHA-BS**

SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block <Power Supply, Indoor/Outdoor>	NI	Connection Terminal <N-Phase>
MC	Motor for Compressor	DCL1, DCL2	Connection Terminal <Reactor>
MF1, MF2	Fan Motor	IGBT	Power Module
21S4	Solenoid Valve (Four-Way Valve)	E1, E2, E3, E4	Connection Terminal <Ground>
63H	High Pressure Switch	C. B.	Controller Circuit Board
63L	Low Pressure Switch	SW1	Switch <Manual Defrost, Defect History, Record Reset, Function Switch>
63HS	High Pressure Sensor	SW2	Switch <Function Switch>
TH3	Thermistor <Liquid>	SW5	Switch <Function Switch, Model Select>
TH4	Thermistor <Discharge>	SW6	Switch <Model Select>
TH6	Thermistor <Plate HEX Liquid>	SW7	Switch <Function Switch>
TH7	Thermistor <Ambient>	SW8	Switch <Function Switch>
TH8	Thermistor(internal) <Heat Sink>	SW9	Switch <Function Switch>
TH32	Thermistor <Inlet Water>	CN31	Connector <Emergency Operation>
TH33	Thermistor <Suction>	CN51	Connector <Connection for Option>
TH34	Thermistor <Comp. Surface>	SS	Connector <Connection for Option>
LEV-A, LEV-B	Linear Expansion Valve	SV1	Connector <Connection for Option>
DCL	Reactor	CNDM	Connector <Connection for Option>
CB	Main Smoothing Capacitor	LED3	LED <Operation/Inspection Indicators>
CY1, CY2	Capacitor	F1, F2, F3, F4	Fuse <T6.3AL250V>
P. B.	Power Circuit Board	X51, X52, X54	Relay
U, V, W	Connection Terminal <U/V/W-Phase>		
LI	Connection Terminal <L-Phase>		



POWER SUPPLY  
~N 230V 50Hz

## FIELD ELECTRICAL WIRING (power wiring specifications)

Outdoor unit model		112V
Outdoor unit power supply		~N (single), 50 Hz, 230 V
Outdoor unit Circuit Breaker capacity	*1	32A
Wiring Wire No. × Wire size (mm <sup>2</sup> )	Outdoor unit power supply, earth	3 × Min. 6
	Interface unit/Flow temp. controller-Outdoor unit	3 × 1.5 (polar)
	Interface unit/Flow temp. controller-Outdoor unit earth	1 × Min. 1.5
	Remote controller-Interface unit/Flow temp. controller	2 × 0.3 (Non-polar)
Circuit rating	Outdoor unit L-N (single)	*3 AC 230 V
	Outdoor unit L1-N, L2-N, L3-N (3phase)	
	Interface unit/Flow temp. controller-Outdoor unit S1-S2	*3 AC 230 V
	Interface unit/Flow temp. controller-Outdoor unit S2-S3	*3 DC 24 V
	Remote controller-Interface unit/Flow temp. controller	*3 DC 12 V

\*1. A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV).  
Make sure that the current leakage breaker is one compatible with higher harmonics.  
Always use a current leakage breaker that is compatible with higher harmonics as this unit is equipped with an inverter.  
The use of an inadequate breaker can cause the incorrect operation of inverter.

\*2. Max. 80 m

\*3. The figures are NOT always against the ground.

S3 terminal has DC 24 V against S2 terminal. However between S3 and S1, these terminals are NOT electrically insulated by the transformer or other device.

⚠ **Caution: Be sure to install N-line. Without N-line, it could cause damage to the unit.**

**Notes: 1. Wiring size must comply with the applicable local and national codes.**

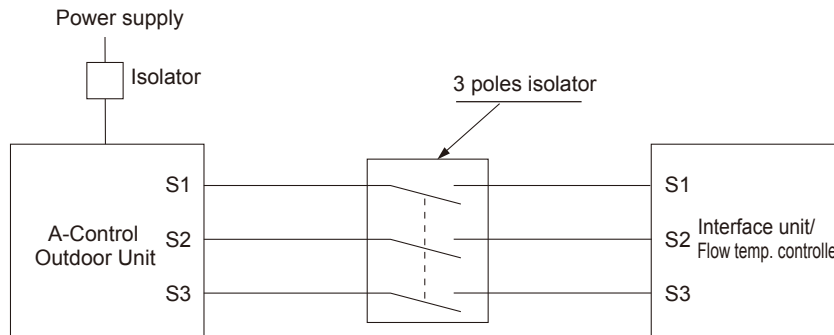
**2. Power supply cables and the cables between Controller and Outdoor unit shall not be lighter than polychloroprene sheathed flexible cables. (Design 60245 IEC 57)**

**3. Be sure to connect the cables between Controller and Outdoor unit directly to the units (no intermediate connections are allowed).**

**Intermediate connections may result in communication errors. If water enters at the intermediate connection point, it may cause insufficient insulation to ground or a poor electrical contact .**

**(If an intermediate connection is necessary, be sure to take measures to prevent water from entering the cables.)**

**4. Install an earth longer than other cables.**

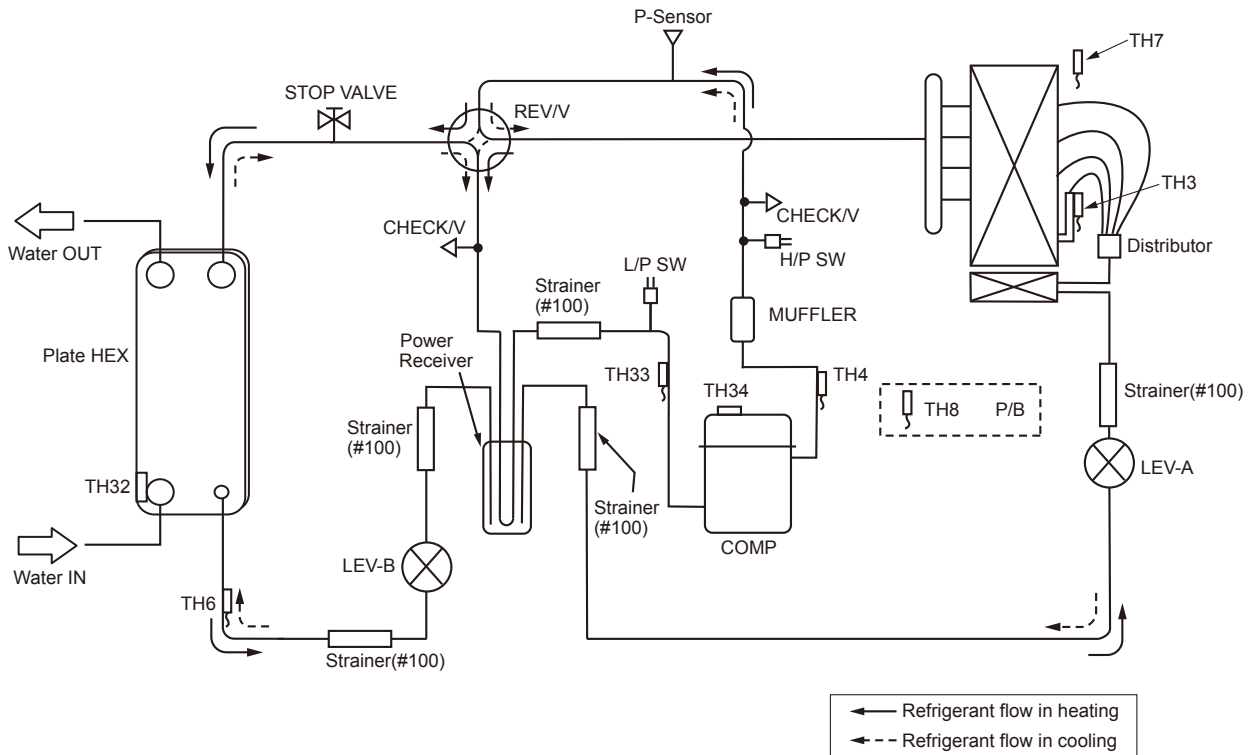


⚠ **Warning:**

**In case of A-control wiring, there is high voltage potential on the S3 terminal caused by electrical circuit design that has no electrical insulation between power line and communication signal line. Therefore, please turn off the main power supply when servicing.**

**And do not touch the S1, S2, S3 terminals when the power is energized. If isolator should be used between Interface unit/Flow temp. controller and outdoor unit, please use 3-pole type.**

PUHZ-W112VHA  
PUHZ-W112VHA-BS



Symbol	Part name	Detail
COMP	Compressor	DC inverter scroll compressor (Mitsubishi Electric Corporation)
H/P SW	High pressure switch (63H)	For protection (OFF:4.15MPa)
L/P SW	Low pressure switch (63L)	For protection (OFF:-0.03MPa)
Plate HEX	Plate Heat Exchanger	MWA2-46LM (MITSUBISHI)
REV/V	Reversing (4-way) valve (21S4)	Change the refrigerant circuit (Heating / Cooling) and for Defrosting
STOP VALVE	Stop valve	For refrigerant charge
CHECK/V	Check valve	High pressure / Low pressure / For production test use
P-Sensor	Pressure sensor (63HS)	For calculation of the condensing temperature from high pressure
P/B	Power board	Inverter power board
LEV-A	Linear expansion valve -A	Heating:Secondary LEV Cooling:Primary LEV
LEV-B	Linear expansion valve -B	Heating:Primary LEV Cooling:Secondary LEV
TH33	Suction temperature thermistor	For LEV control
TH32	Inlet water temperature thermistor	For freeze protection and for compressor frequency control
TH3	Liquid temperature thermistor	Heating:Evaporating temperature Cooling:Sub cool liquid temperature
TH4	Discharge temperature thermistor	For LEV control and for compressor protection
TH6	Plate HEX liquid temperature thermistor	Heating:Sub cool liquid temperature Cooling:Evaporating temperature
TH7	Ambient temperature thermistor	For fan control and for compressor frequency control
TH8	Heatsink temperature thermistor	For power board protection
TH34	Comp. surface temperature thermistor	For compressor protection
Power Receiver	Power Receiver	For accumulation of refrigerant

### 8-1. TROUBLESHOOTING

#### <Check code display by self-diagnosis and actions to be taken for service (summary)>

Present and past check codes are logged and displayed on the control board of outdoor unit. Actions to be taken for service, which depends on whether or not the trouble is reoccurring at service, are summarized in the table below. Check the contents below before investigating details.

Unit conditions at service	Check code	Actions to be taken for service (summary)
The trouble is reoccurring.	Displayed	Judge what is wrong and take a corrective action according to "8-3. SELF-DIAGNOSIS ACTION TABLE".
	Not displayed	Conduct troubleshooting and ascertain the cause of the trouble.
The trouble is not reoccurring.	Logged	① Consider the temporary defects such as the work of protection devices in the refrigerant circuit including compressor, poor connection of wiring, noise, etc. Re-check the symptom, and check the installation environment, refrigerant amount, weather when the trouble occurred, matters related to wiring, etc. ② Reset check code logs and restart the unit after finishing service. ③ There is no abnormality in electrical component, controller board, etc.
	Not logged	① Re-check the abnormal symptom. ② Conduct troubleshooting and ascertain the cause of the trouble. ③ Continue to operate unit for the time being if the cause is not ascertained. ④ There is no abnormality concerning of parts such as electrical component, controller board, etc.

### 8-2. CHECK POINT UNDER TEST RUN

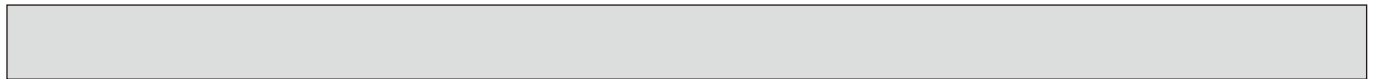
#### Before test run

- After installation of outdoor units, piping work and electric wiring work, re-check that there is no water leakage, loosened connections and incorrect polarity.
- Measure impedance between the ground and the power supply terminal block (L, N) on the outdoor unit by 500 V Megger and check that it is 1.0 MΩ or over.
- Turn on power supply 12 hours before test run in order to protect compressor.
- Make sure to read operation manual before test run. (Especially items to secure safety.)

### 8-3. SELF-DIAGNOSIS ACTION TABLE

<Abnormalities detected when the power is turned on>

Check code	Abnormal point and detection method	Case	Judgment and action
None	—	<p>① No voltage is supplied to terminal block (TB1) of outdoor unit. a) Power supply breaker is turned off. b) Contact failure or disconnection of power supply terminal c) Open phase (L or N phase)</p> <p>② Electric power is not charged to power supply terminal of outdoor power circuit board. a) Contact failure of power supply terminal b) Open phase on the outdoor power circuit board Disconnection of connector LI, NI</p> <p>③ Electric power is not supplied to outdoor controller circuit board. a) Disconnection of connector (CNDC)</p> <p>④ Disconnection of reactor (DCL)</p> <p>⑤ Defective outdoor power circuit board</p> <p>⑥ Defective outdoor controller circuit board</p>	<p>① Check following items. a) Power supply breaker b) Connection of power supply terminal block. (TB1) c) Connection of power supply terminal block. (TB1)</p> <p>② Check following items. a) Connection of power supply terminal block. (TB1) b) Connection of terminal on outdoor power circuit board. Check connection of the connector LI or NI. Refer to "8-6. TEST POINT DIAGRAM".</p> <p>③ Check connection of the connector CNDC on the outdoor controller circuit board. Check connection of the connector CNDC on the outdoor power circuit board. Refer to "8-6. TEST POINT DIAGRAM".</p> <p>④ Check connection of reactor. (DCL) Check connection of "DCL1" and "DCL2" on the outdoor power circuit board.</p> <p>⑤ Replace outdoor power circuit board.</p> <p>⑥ Replace outdoor controller circuit board (When items above are checked but the units can not be repaired.)</p>
F3	<p><b>63L connector open</b> Abnormal if 63L connector circuit is open for 3 minutes continuously from being switched on. 63L: Low-pressure switch</p>	<p>① Disconnection or contact failure of 63L connector on outdoor controller circuit board</p> <p>② Disconnection or contact failure of 63L</p> <p>③ 63L is working due to refrigerant leakage or defective parts.</p> <p>④ Defective outdoor controller circuit board</p>	<p>① Check connection of 63L connector on outdoor controller circuit board. Refer to "8-6. TEST POINT DIAGRAM".</p> <p>② Check the 63L side of connecting wire.</p> <p>③ Check refrigerant pressure. Charge additional refrigerant. Check continuity of 63L. Replace low pressure switch if it is defective.</p> <p>④ Replace outdoor controller circuit board.</p>
F5	<p><b>63H connector open</b> Abnormal if 63H connector circuit is open for 3 minutes continuously from being switched on. 63H: High-pressure switch</p>	<p>① Disconnection or contact failure of 63H connector on outdoor controller circuit board</p> <p>② Disconnection or contact failure of 63H</p> <p>③ 63H is working due to defective parts.</p> <p>④ Defective outdoor controller circuit board</p>	<p>① Check connection of 63H connector on outdoor controller circuit board. Refer to "8-6. TEST POINT DIAGRAM".</p> <p>② Check the 63H side of connecting wire.</p> <p>③ Check for continuity of 63H. Replace high pressure switch if it is defective.</p> <p>④ Replace outdoor controller circuit board.</p>
F9	<p><b>2 connector open</b> Abnormal if both 63H and 63L connector circuits are open for 3 minutes continuously from being switched on. 63H: High-pressure switch 63L: Low-pressure switch</p>	<p>① Disconnection or contact failure of connector (63H,63L) on outdoor controller circuit board.</p> <p>② Disconnection or contact failure of 63H, 63L</p> <p>③ 63H and 63L are working due to defective parts.</p> <p>④ Defective outdoor controller board.</p>	<p>① Check connection of connector (63H,63L) on outdoor controller circuit board. Refer to "8-6. TEST POINT DIAGRAM".</p> <p>② Check the 63H and 63L side of connecting wire.</p> <p>③ Check continuity of 63H and 63L. Replace the pressure switch if it is defective.</p> <p>④ Replace outdoor controller circuit board.</p>

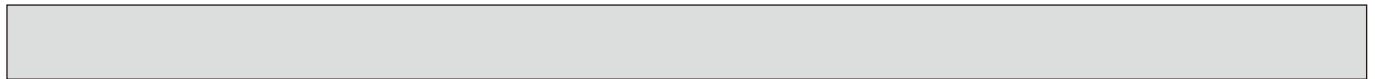


Check code	Abnormal point and detection method	Case	Judgment and action
EA	<p><b>Miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire</b></p> <p>1. Outdoor controller circuit board can automatically check the number of connected Interface unit/Flow temp. controller. Abnormal if the number cannot be checked automatically due to miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire and etc. after power is turned on for 4 minutes.</p> <p>2. Abnormal if outdoor controller circuit board recognizes excessive number of Interface unit/Flow temp. controller.</p>	<p>① Contact failure or miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire</p> <p>② Diameter or length of Interface unit/Flow temp. controller-outdoor unit connecting wire is out of specified capacity.</p> <p>③ Excessive number of Interface unit/Flow temp. controller is connected to 1 outdoor unit. (2 units or more)</p> <p>④ Defective transmitting receiving circuit of outdoor controller circuit board</p> <p>⑤ Defective transmitting receiving circuit of Interface/Flow temp. controller board</p> <p>⑥ Noise has entered into power supply or Interface/Flow temp. controller-outdoor unit connecting wire.</p>	<p>① Check disconnection or looseness or polarity of Interface unit/Flow temp. controller-outdoor unit connecting wire of Interface unit/Flow temp. controller and outdoor units.</p> <p>② Check diameter and length of Interface unit/Flow temp. controller-outdoor unit connecting wire. Total wiring length: 80 m (Including wiring connecting each Interface unit/Flow temp. controller unit and between Interface unit/Flow temp. controller and outdoor unit) Also check if the connection order of flat cable is S1, S2, S3.</p> <p>③ Check the number of Interface unit/Flow temp. controller that is connected to 1 outdoor unit. (If EA is detected.)</p> <p>④~⑤ Turn the power off once, and on again to check. Replace outdoor controller circuit board or Interface/Flow temp. controller board if abnormality occurs again.</p> <p>⑥ Check transmission path, and remove the cause.</p> <p>Note: The descriptions above, ①-⑥, are for EA, Eb and EC.</p>
Eb	<p><b>Miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire (converse wiring or disconnection)</b></p> <p>Outdoor controller circuit board can automatically set the unit number of Interface unit/Flow temp. controller.</p> <p>Abnormal if the Interface unit/Flow temp. controller number cannot be set within 4 minutes after power on because of miswiring (converse wiring or disconnection) of Interface unit/Flow temp. controller-outdoor unit connecting wire.</p>	<p>① Contact failure or miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire</p> <p>② Diameter or length of Interface unit/Flow temp. controller-outdoor unit connecting wire is out of specified capacity.</p> <p>④ Defective transmitting receiving circuit of outdoor controller circuit board</p> <p>⑤ Defective transmitting receiving circuit of Interface/Flow temp. controller board</p> <p>⑥ Noise has entered into power supply or Interface unit/Flow temp. controller-outdoor unit connecting wire.</p>	<p>⑥ Check transmission path, and remove the cause.</p> <p>Note: The descriptions above, ①-⑥, are for EA, Eb and EC.</p>
EC	<p><b>Start-up time over</b></p> <p>The unit cannot finish start-up process within 4 minutes after power on.</p>	<p>① Contact failure of Interface unit /Flow temp. controller-outdoor unit connecting wire</p> <p>② Diameter or length of Interface unit/Flow temp. controller-outdoor unit connecting wire is out of specified capacity.</p> <p>⑥ Noise has entered into power supply or Interface unit/Flow temp. controller-outdoor unit connecting wire.</p>	

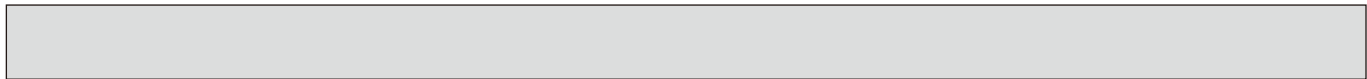
<Abnormalities detected while unit is operating>

Check code	Abnormal point and detection method	Case	Judgment and action
U1	<p><b>High pressure (High-pressure switch 63H operated)</b> Abnormal if high-pressure switch 63H operated ( * ) during compressor operation. *4.15 MPa</p> <p>63H: High-pressure switch</p>	<p>① Decreased water flow ② Clogged filter of water pipe ③ Dirt of plate heat exchanger ④ Locked water pump ⑤ Malfunction of water pump ⑥ Clogged or broken pipe ⑦ Locked outdoor fan motor ⑧ Malfunction of outdoor fan motor ⑨ Short cycle of outdoor unit ⑩ Dirt of outdoor heat exchanger ⑪ Decreased airflow caused by defective inspection of outside temperature thermistor (It detects lower temperature than actual temperature.) ⑫ Disconnection or contact failure of connector (63H) on outdoor controller board ⑬ Disconnection or contact failure of 63H connection ⑭ Defective outdoor controller board ⑮ Defective operation of linear expansion valve ⑯ Malfunction of fan driving circuit</p>	<p>①~⑤ Check water circuit and repair the defect. ⑥ Check piping and repair the defect. ⑦~⑩ Check outdoor unit and repair the defect. ⑪ Check the detected temperature of outside temperature thermistor on LED display. (SW2: Refer to "8-7.OUTDOOR UNIT OPERATION MONITOR FUNCTION".) ⑫~⑭ Turn the power off and check F5 is displayed when the power is turned on again. When F5 is displayed, refer to "Judgment and action" for F5. ⑮ Check linear expansion valve. Refer to "8-5.HOW TO CHECK THE COMPONENTS". ⑯ Replace outdoor controller board.</p>
U2	<p><b>High discharging temperature</b> Abnormal if discharge temperature thermistor (TH4) exceeds 125°C or 110°C continuously for 5 minutes. Abnormal if during defrosting discharge temperature thermistor (TH4) exceeds 110°C continuously for 30 minutes.</p> <p><b>High comp. surface temperature</b> Abnormal if comp. surface temperature (TH34) exceeds 170°C. In the case of high comp. surface temperature error, compressor does not restart unless the thermistor (TH34) becomes less than 95°C.</p>	<p>① Overheated compressor operation caused by insufficient refrigerant ② Defective thermistor ③ Defective outdoor controller board ④ Defective operation of linear expansion valve ⑤ In the case of the unit does not restart : Detection temp. of thermistor (TH34) <math>\geq</math> 95°C</p>	<p>① Check intake super heat. Check leakage of refrigerant. Charge additional refrigerant. ②③ Turn the power off and check if U3 is displayed when the power is turned ON again. When U3 is displayed, refer to "Judgement and action" for U3. ④ Check linear expansion valve. Refer to "8-5.HOW TO CHECK THE COMPONENTS".</p>
U3	<p><b>Open/short circuit of discharge temperature thermistor (TH4)/comp. surface thermistor (TH34)</b> Abnormal if open (3°C or less) or short (217°C or more) is detected during compressor operation. (Open (3°C or less) detection is inoperative for 10 minutes of compressor starting process and for 10 minutes after or during defrosting.)</p>	<p>① Disconnection or contact failure of connector (TH4/TH34) on the outdoor controller circuit board. ② Defective thermistor ③ Defective outdoor controller circuit board</p>	<p>① Check connection of connector (TH4/TH34) on the outdoor controller circuit board. Check the lead wire for thermistor (TH4/TH34). Refer to "8-6. TEST POINT DIAGRAM". ② Check resistance value of thermistor (TH4/TH34) or temperature on LED display. (Thermistor/TH4/TH34: Refer to "8-5.HOW TO CHECK THE COMPONENTS".) (SW2: Refer to "8-7.OUTDOOR UNIT OPERATION MONITOR FUNCTION".) ③ Replace outdoor controller board.</p>

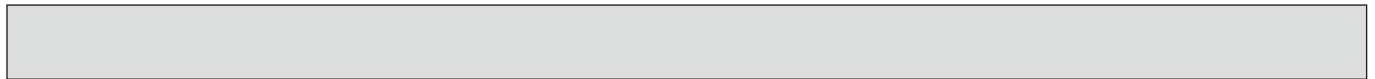




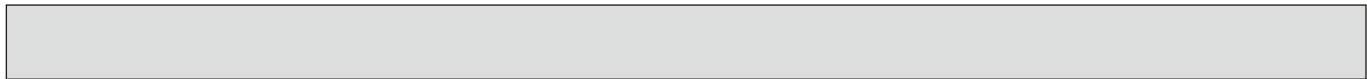
Check code	Abnormal point and detection method	Case	Judgment and action																													
U4	<p><b>Open/short of outdoor unit thermistors (TH3, TH32, TH33, TH6, TH7, and TH8)</b> Abnormal if open or short is detected during compressor operation. Open detection of thermistors TH3, TH32 and TH6 is not detected for 10 seconds to 10 minutes after compressor starting and 10 minutes after and during defrosting. Note: Check which unit has abnormality in its thermistor by switching the mode of SW2. (Refer to "8-7.OUTDOOR UNIT OPERATION MONITOR FUNCTION".) Heatsink thermistor (TH8) is in the power module.</p>	<p>① Disconnection or contact failure of connectors (Outdoor controller circuit board: TH3, TH32, TH33, TH6/TH7) (Outdoor power circuit board: CN3) ② Defective thermistor ③ Defective outdoor controller circuit board</p>	<p>① Check connection of connector (TH3, TH32, TH33, TH6/TH7) on the outdoor controller circuit board. Check connection of connector (CN3) on the outdoor power circuit board. Check the lead wire for thermistor (TH3, TH32, TH33, TH6, TH7, TH8). Refer to "8-6. TEST POINT DIAGRAM". ② Check resistance value of thermistor (TH3, TH32, TH33, TH6, TH7, TH8) or check temperature on LED display. (Thermistor/TH3, TH32, TH33, TH6, TH7, TH8: Refer to "8-5.HOW TO CHECK THE COMPONENTS".) (SW2: Refer to "8-7.OUTDOOR UNIT OPERATION MONITOR FUNCTION".) ③ Replace outdoor controller circuit board.</p>																													
	<table border="1"> <thead> <tr> <th colspan="2">Thermistors</th> <th rowspan="2">Open detection</th> <th rowspan="2">Short detection</th> </tr> <tr> <th>Symbol</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>TH3</td> <td>Thermistor &lt;Liquid temperature&gt;</td> <td>- 40°C or below</td> <td>90°C or above</td> </tr> <tr> <td>TH32</td> <td>Thermistor &lt;Inlet water temperature&gt;</td> <td>- 40°C or below</td> <td>102°C or above</td> </tr> <tr> <td>TH33</td> <td>Thermistor &lt;Suction pipe temperature&gt;</td> <td>- 40°C or below</td> <td>90°C or above</td> </tr> <tr> <td>TH6</td> <td>Thermistor &lt;Plate HEX liquid temperature&gt;</td> <td>- 40°C or below</td> <td>90°C or above</td> </tr> <tr> <td>TH7</td> <td>Thermistor &lt;Ambient temperature&gt;</td> <td>- 40°C or below</td> <td>90°C or above</td> </tr> <tr> <td>TH8</td> <td>Internal thermistor</td> <td>- 35°C or below</td> <td>170°C or above</td> </tr> </tbody> </table>		Thermistors		Open detection	Short detection	Symbol	Name	TH3	Thermistor <Liquid temperature>	- 40°C or below	90°C or above	TH32	Thermistor <Inlet water temperature>	- 40°C or below	102°C or above	TH33	Thermistor <Suction pipe temperature>	- 40°C or below	90°C or above	TH6	Thermistor <Plate HEX liquid temperature>	- 40°C or below	90°C or above	TH7	Thermistor <Ambient temperature>	- 40°C or below	90°C or above	TH8	Internal thermistor	- 35°C or below	170°C or above
Thermistors		Open detection	Short detection																													
Symbol	Name																															
TH3	Thermistor <Liquid temperature>	- 40°C or below	90°C or above																													
TH32	Thermistor <Inlet water temperature>	- 40°C or below	102°C or above																													
TH33	Thermistor <Suction pipe temperature>	- 40°C or below	90°C or above																													
TH6	Thermistor <Plate HEX liquid temperature>	- 40°C or below	90°C or above																													
TH7	Thermistor <Ambient temperature>	- 40°C or below	90°C or above																													
TH8	Internal thermistor	- 35°C or below	170°C or above																													
U5	<p><b>Temperature of heatsink</b> Abnormal if heatsink thermistor (TH8) detects 94°C.</p>	<p>① The outdoor fan motor is locked. ② Failure of outdoor fan motor ③ Air flow path is clogged. ④ Ambient temperature is high. ⑤ Defective thermistor ⑥ Defective input circuit of outdoor power circuit board ⑦ Failure of outdoor fan drive circuit</p>	<p>①② Check outdoor fan. ③ Check air flow path for cooling. ④ Check if there is something which causes temperature rise around outdoor unit. (Upper limit of ambient temperature is 46°C.) Turn off power, and on again to check if U5 is displayed within 30 minutes. If U4 is displayed instead of U5, refer to check code U4. ⑤ Check resistance value of thermistor (TH8) or temperature by microcomputer. (Thermistor/TH8: Refer to "8-5.HOW TO CHECK THE COMPONENTS".) (SW2: Refer to "8-7. OUTDOOR UNIT OPERATION MONITOR FUNCTION".) ⑥ Replace outdoor power circuit board. ⑦ Replace outdoor controller circuit board.</p>																													
U6	<p><b>Power module</b> Check abnormality by driving power module in case overcurrent is detected. (UF or UP error condition)</p>	<p>① Defective outdoor power circuit board ② Decrease of power supply voltage ③ Loosens, disconnection or reverse of compressor wiring connection ④ Defective compressor</p>	<p>① Replace outdoor power circuit board. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to "8-6. TEST POINT DIAGRAM (Outdoor power circuit board)". ④ Check compressor referring to "8-4.HOW TO CHECK THE PARTS".</p>																													
U7	<p><b>Too low superheat due to low discharge temperature</b> Abnormal if discharge superheat is continuously detected -15°C or less for 3 minutes even though linear expansion valve has minimum open pulse after compressor starts operating for 10 minutes.</p>	<p>① Disconnection or loose connection of discharge temperature thermistor (TH4) ② Defective holder of discharge temperature thermistor ③ Disconnection or loose connection of linear expansion valve's coil ④ Disconnection or loose connection of linear expansion valve's connector ⑤ Defective linear expansion valve</p>	<p>①② Check the installation conditions of discharge temperature thermistor (TH4). ③ Check the coil of linear expansion valve. Refer to "8-5.HOW TO CHECK THE COMPONENTS". ④ Check the connection or contact of LEV-A and LEV-B on outdoor controller circuit board. ⑤ Check linear expansion valve. Refer to "8-4.HOW TO CHECK THE PARTS".</p>																													
U8	<p><b>Outdoor fan motor</b> Abnormal if rotational frequency of the fan motor is not detected during DC fan motor operation. Fan motor rotational frequency is abnormal if; • 100 rpm or below detected continuously for 15 seconds at 20°C or more outside air temperature • 50 rpm or below or 1500 rpm or more detected continuously for 1 minute.</p>	<p>① Failure in the operation of the DC fan motor ② Failure in the outdoor circuit controller board</p>	<p>① Check or replace the DC fan motor. ② Check the voltage of the outdoor circuit controller board during operation. ③ Replace the outdoor circuit controller board. (when the failure is still indicated even after performing the remedy ① above.)</p>																													



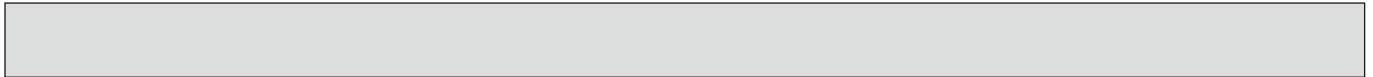
Check code	Abnormal point and detection method	Case	Judgment and action	
U9 (4220)	Detailed codes	To find out the details about U9 error, turn ON SW2-1, 2-2, 2-3, 2-4, 2-5 and 2-6 when U9 error occurs. To find out the detail history (latest) about U9 error, turn ON SW2-1, 2-2 and 2-6. Refer to "8-7.OUTDOOR UNIT OPERATION MONITOR FUNCTION".		
	01	<b>Overvoltage error</b> • Increase in DC bus voltage to 400 V	① Abnormal increase in power source voltage ② Disconnection of compressor wiring ③ Defective outdoor power circuit board ④ Compressor has a ground fault.	① Check the field facility for the power supply. ② Correct the wiring (U·V·W phase) to compressor. Refer to "8-6. TEST POINT DIAGRAM (Outdoor power circuit board)". ③ Replace outdoor power circuit board. ④ Check compressor for electrical insulation. Replace compressor.
	02	<b>Undervoltage error</b> • Instantaneous decrease in DC bus voltage to 200 V	① Decrease in power source voltage, instantaneous stop. ② Disconnection or loose connection of CN52C on the outdoor power circuit board/controller circuit board ③ Defective converter drive circuit in outdoor power circuit board ④ Defective 52C drive circuit in outdoor power circuit board ⑤ Disconnection or loose connection of main smoothing capacitor CB ⑥ Disconnection or loose connection of CN2 on the outdoor power circuit board /controller circuit board ⑦ Power circuit failure on DC supply for 18V DC output on outdoor controller circuit board	① Check the field facility for the power supply. ② Check CN52C wiring. ③ Replace outdoor power circuit board. ④ Replace outdoor power circuit board. ⑤ Check CB wiring. ⑥ Check CN2 wiring. ⑦ Replace outdoor controller circuit board.
	04	<b>Input current sensor error/ L1-phase open error</b> • Decrease in input current through outdoor unit to 0.1A only if operation frequency is more than or equal to 40Hz or compressor current is more than or equal to 6A.	① Defective input current detection circuit in outdoor power circuit board ② Defective outdoor controller circuit board	① Replace outdoor power circuit board. ② Replace outdoor controller circuit board.
	08	<b>Abnormal power synchronous signal</b> • No input of power synchronous signal to power circuit board • Power synchronous signal of 44 Hz or less, or 65 Hz or more is detected on power circuit board.	① Distortion of power source voltage, noise superimposition. ② Disconnection or loose connection of earth wiring ③ Disconnection or loose connection of CN2 on the outdoor power circuit board /controller circuit board ④ Defective power synchronous signal circuit in outdoor controller circuit board ⑤ Defective power synchronous signal circuit in outdoor power circuit board	① Check the field facility for the power supply. ② Check earth wiring. ③ Check CN2 wiring. ④ Replace outdoor controller circuit board. ⑤ Replace outdoor power circuit board.
	10	<b>PFC error (Overvoltage/ Undervoltage/Overcurrent)</b> • PFC detected any of the followings a) Increase of DC bus voltage to 420V. b) Decrease in PFC control voltage to 12V DC or lower c) Increase in input current to 50A peak (For models equipped with single-phase PFC only)	Not applicable for W112VHA models.	Check for the switch settings for Model Select on the outdoor controller circuit board.
20	<b>PFC/IGBT error (Undervoltage)</b> • When Compressor is running, DC bus voltage stays at 310V or lower for consecutive 10 seconds	① Incorrect switch settings on the outdoor controller circuit board for model select ② Defective outdoor power circuit board ③ Defective outdoor controller circuit board	① Correction of a model select ② Replace outdoor power circuit board. ③ Replace outdoor controller circuit board.	



Check code	Abnormal point and detection method	Case	Judgment and action
Ud	<b>Overheat protection</b> Abnormal if outdoor pipe thermistor (TH3) detects 70°C or more or condensing temperature of pressure sensor (63HS) detects 70°C or more during compressor operation.	<ul style="list-style-type: none"> <li>① Defective outdoor fan (fan motor) or short cycle of outdoor unit during cooling operation</li> <li>② Defective outdoor pipe thermistor (TH3)</li> <li>③ Defective outdoor controller board</li> <li>④ Defective pressure sensor</li> </ul>	<ul style="list-style-type: none"> <li>① Check outdoor unit air passage.</li> <li>②③ Turn the power off and on again to check the check code. If U4 is displayed, follow the U4 processing direction.</li> <li>④ Check pressure by microcomputer. (Pressure sensor/ 63HS) (SW2: Refer to "8-7.OUTDOOR UNIT OPERATION MONITOR FUNCTION".)</li> </ul>
UF	<b>Compressor overcurrent interruption (When compressor locked)</b> Abnormal if overcurrent of DC bus or compressor is detected within 30 seconds after compressor starts operating.	<ul style="list-style-type: none"> <li>① Decrease of power supply voltage</li> <li>② Looseness, disconnection or converse of compressor wiring connection</li> <li>③ Defective compressor</li> <li>④ Defective outdoor power board</li> <li>⑤ Decreased water flow</li> <li>⑥ Clogged filter of water pipe</li> <li>⑦ Clogged plate heat exchanger</li> <li>⑧ Locked water pump</li> <li>⑨ Malfunction of water pump</li> </ul>	<ul style="list-style-type: none"> <li>① Check facility of power supply.</li> <li>② Correct the wiring (U·V·W phase) to compressor. Refer to "8-6. TEST POINT DIAGRAM (Outdoor power circuit board)".</li> <li>③ Check compressor. Refer to "8-4.HOW TO CHECK THE PARTS".</li> <li>④ Replace outdoor power circuit board.</li> <li>⑤~⑨ Check water circuit and repair the defect.</li> </ul>
UH	<b>Current sensor error or input current error</b> ·Abnormal if current sensor detects -1.0 A to 1.0 A during compressor operation. (This error is ignored during test run.) ·Abnormal if 38 A of input current is detected or 34 A or more of input current is detected for 10 seconds continuously.	<ul style="list-style-type: none"> <li>① Disconnection of compressor wiring</li> <li>② Defective circuit of current sensor on outdoor power circuit board</li> <li>③ Decrease of power supply voltage</li> </ul>	<ul style="list-style-type: none"> <li>① Correct the wiring (U·V·W phase) to compressor. Refer to "8-6. TEST POINT DIAGRAM (Outdoor power circuit board)".</li> <li>② Replace outdoor power circuit board.</li> <li>③ Check the facility of power supply.</li> </ul>
UL	<b>Low pressure (63L operated)</b> Abnormal if 63L is operated (under -0.03 MPa) during compressor operation. 63L: Low-pressure switch	<ul style="list-style-type: none"> <li>① Stop valve of outdoor unit is closed during operation.</li> <li>② Disconnection or loose connection of connector (63L) on outdoor controller board</li> <li>③ Disconnection or loose connection of 63L</li> <li>④ Defective outdoor controller board</li> <li>⑤ Leakage or shortage of refrigerant</li> <li>⑥ Malfunction of linear expansion valve</li> </ul>	<ul style="list-style-type: none"> <li>① Check stop valve.</li> <li>②~④ Turn the power off and on again to check if F3 is displayed on restarting. If F3 is displayed, follow the F3 processing direction.</li> <li>⑤ Correct to proper amount of refrigerant.</li> <li>⑥ Check linear expansion valve. Refer to "8-5.HOW TO CHECK THE COMPONENTS".</li> </ul>
UP	<b>Compressor overcurrent interruption</b> Abnormal if overcurrent DC bus or compressor is detected after compressor starts operating for 30 seconds.	<ul style="list-style-type: none"> <li>① Decrease of power supply voltage</li> <li>② Looseness, disconnection or converse of compressor wiring connection</li> <li>③ Defective fan of outdoor units</li> <li>④ Short cycle of indoor/outdoor units</li> <li>⑤ Defective input circuit of outdoor controller board</li> <li>⑥ Defective compressor</li> <li>⑦ Decreased water flow</li> <li>⑧ Clogged filter of water pipe</li> <li>⑨ Clogged plate heat exchanger</li> <li>⑩ Locked water pump</li> <li>⑪ Malfunction of water pump</li> </ul>	<ul style="list-style-type: none"> <li>① Check facility of power supply.</li> <li>② Correct the wiring (U·V·W phase) to compressor. Refer to "8-6. TEST POINT DIAGRAM (Outdoor power circuit board)".</li> <li>③ Check outdoor fan.</li> <li>④ Solve short cycle.</li> <li>⑤ Replace outdoor controller circuit board.</li> <li>⑥ Check compressor. Refer to "8-4.HOW TO CHECK THE PARTS".</li> </ul> <p>Note: Before the replacement of the outdoor controller circuit board, disconnect the wiring to compressor from the outdoor power circuit board and check the output voltage among phases, U, V, W, during test run. No defect on board if voltage among phases (U-V, V-W and W-U) is same. Make sure to perform the voltage check with same performing frequency.</p> <ul style="list-style-type: none"> <li>⑦~⑪ Check water circuit and repair the defect.</li> </ul>



Check code	Abnormal point and detection method	Case	Judgment and action
E0 or E4	<p><b>Remote controller transmission error (E0)/signal receiving error (E4)</b></p> <p>① Abnormal if main or sub remote controller cannot receive any transmission normally from Interface unit/Flow temp. controller of refrigerant address "0" for 3 minutes. (Check code: E0)</p> <p>② Abnormal if sub-remote controller could not receive any signal for 2 minutes. (Check code: E0)</p> <p>① Abnormal if Interface/Flow temp. controller board can not receive any data normally from remote controller board or from other Interface/Flow temp. controller board for 3 minutes. (Check code: E4)</p> <p>② Interface/Flow temp. controller board cannot receive any signal from remote controller for 2 minutes. (Check code: E4)</p>	<p>① Contact failure at transmission wire of remote controller</p> <p>② All remote controllers are set as "sub" remote controller. In this case, E0 is displayed on remote controller, and E4 is displayed at LED (LED1, LED2) on the outdoor controller circuit board.</p> <p>③ Miswiring of remote controller</p> <p>④ Defective transmitting receiving circuit of remote controller</p> <p>⑤ Noise has entered into the transmission wire of remote controller.</p>	<p>① Check disconnection or looseness of Interface unit/Flow temp. controller unit or transmission wire of remote controller.</p> <p>② Set one of the remote controllers "main", If there is no problem with the action above.</p> <p>③ Check wiring of remote controller.</p> <ul style="list-style-type: none"> <li>• Total wiring length: max. 500 m (Do not use cable × 3 or more.)</li> <li>• The number of connecting remote controller: Refer to the indoor units service manual.</li> </ul> <p>When it is not the above-mentioned problem of ①~③</p> <p>④ Diagnose remote controllers.</p> <p>a) When "RC OK" is displayed, remote controllers have no problem. Turn the power off, and on again to check. If abnormality generates again, replace Interface/Flow temp. controller board.</p> <p>b) When "RC NG" is displayed, replace remote controller.</p> <p>c) When "RC E3" or "ERC 00-66" is displayed, noise may be causing abnormality.</p>
E1 or E2	<p><b>Remote controller control board</b></p> <p>① Abnormal if data cannot be read normally from the nonvolatile memory of the remote controller control board. (Check code: E1)</p> <p>② Abnormal if the clock function of remote controller cannot be operated normally. (Check code: E2)</p>	<p>① Defective remote controller</p>	<p>① Replace remote controller.</p>
E3 or E5	<p><b>Remote controller transmission error (E3)/signal receiving error (E5)</b></p> <p>① Abnormal if remote controller could not find blank of transmission path for 6 seconds and could not transmit. (Check code: E3)</p> <p>② When remote controller receives the transmitted data same time and compares these data. Abnormal if the data is judged to be different for 30 continuous times. (Check code: E3)</p> <p>① Abnormal if Interface/Flow temp. controller board could not find blank of transmission path. (Check code: E5)</p> <p>② When Interface/Flow temp. controller receives the transmitted data same time and compares these data. Abnormal if the data is judged to be different for 30 continuous times. (Check code: E5)</p>	<p>① 2 remote controllers are set as "main." (In case of 2 remote controllers) Note that some models can only connect 1 remote controller. For more detail, refer to the indoor unit's service manual.</p> <p>② Defective transmitting receiving circuit of remote controller</p> <p>③ Defective transmitting receiving circuit of Interface/Flow temp. controller board</p> <p>④ Noise has entered into transmission wire of remote controller.</p>	<p>① Set a remote controller to main, and the other to sub.</p> <p>②~④ Diagnose remote controller.</p> <p>a) When "RC OK" is displayed, remote controllers have no problem. Turn the power off, and on again to check. When becoming abnormal again, replace indoor controller board.</p> <p>b) When "RC NG" is displayed, replace remote controller.</p> <p>c) When "RC E3" or "ERC 00-66" is displayed, noise may be causing abnormality.</p>
E6	<p><b>Interface unit/Flow temp. controller-outdoor unit communication error (Signal receiving error)</b></p> <p>① Abnormal if Interface/Flow temp. controller board cannot receive any signal normally for 6 minutes after turning the power on.</p> <p>② Abnormal if Interface/Flow temp. controller board cannot receive any signal normally for 3 minutes.</p>	<p>① Contact failure, short circuit or, miswiring (converse wiring) of Interface unit/Flow temp. controller-outdoor unit connecting wire</p> <p>② Defective transmitting receiving circuit of Interface/Flow temp. controller board</p> <p>③ Defective transmitting receiving circuit of Interface/Flow temp. controller board</p> <p>④ Noise has entered into Interface unit/Flow temp. controller-outdoor unit connecting wire.</p>	<p>* Check LED display on the outdoor control circuit board. (Connect A-control service tool, PAC-SK52ST.)</p> <p>① Check disconnection or looseness of Interface unit/Flow temp. controller-outdoor unit connecting wire of Interface unit/Flow temp. controller or outdoor unit.</p> <p>②~④ Turn the power off, and on again to check. If abnormality generates again, replace Interface/Flow temp. controller board or outdoor controller circuit board.</p>
E8	<p><b>Interface unit/Flow temp. controller-outdoor unit communication error (Signal receiving error) (Outdoor unit)</b></p> <p>(1) Abnormal if outdoor controller circuit board could not receive anything normally for 3 minutes.</p>	<p>① Contact failure of Interface unit/Flow temp. controller-outdoor unit connecting wire</p> <p>② Defective communication circuit of outdoor controller circuit board</p> <p>③ Defective communication circuit of Interface/Flow temp. controller board</p> <p>④ Noise has entered into Interface unit/Flow temp. controller-outdoor unit connecting wire.</p>	<p>① Check disconnection or looseness of Interface unit/Flow temp. controller-outdoor unit connecting wire of Interface unit/Flow temp. controller or outdoor unit.</p> <p>②~④ Turn the power off, and on again to check. Replace Interface/Flow temp. controller board or outdoor controller circuit board if abnormality is displayed again.</p>



Check code	Abnormal point and detection method	Case	Judgment and action
E9	<b>Interface unit/Flow temp. controller-outdoor unit communication error (Transmitting error) (Outdoor unit)</b> (1) Abnormal if "0" receiving is detected 30 times continuously through outdoor controller circuit board has transmitted "1". (2) Abnormal if outdoor controller circuit board could not find blank of transmission path for 3 minutes.	① Interface unit/Flow temp. controller-outdoor unit connecting wire has contact failure. ② Defective communication circuit of outdoor controller circuit board ③ Noise has entered power supply. ④ Noise has entered Interface unit/Flow temp. controller-outdoor unit connecting wire.	① Check disconnection or looseness of Interface unit/Flow temp. controller-outdoor unit connecting wire. ②~④ Turn the power off, and on again to check. Replace outdoor controller circuit board if abnormality is displayed again.
EF	<b>Non defined check code</b> This code is displayed when non defined check code is received.	① Noise has entered transmission wire of remote controller. ② Noise has entered Interface unit/Flow temp. controller-outdoor unit connecting wire.	①② Turn the power off, and on again to check. Replace Interface/Flow temp. controller board or outdoor controller circuit board if abnormality is displayed again.
Ed	<b>Serial communication error</b> Abnormal if serial communication between outdoor controller circuit board and outdoor power circuit board is defective.	① Wire disconnection or contact failure of connector CN2 between the outdoor controller circuit board and the outdoor power circuit board ② Wire disconnection or contact failure of connector CN4 between the outdoor controller circuit board and the outdoor power circuit board ③ Defective communication circuit of outdoor power circuit board ④ Defective communication circuit of outdoor controller circuit board for outdoor power circuit board	①② Check connection of each connector CN2 and CN4 between the outdoor controller circuit board and the outdoor power circuit board. ③ Replace outdoor power circuit board. ④ Replace outdoor controller circuit board.
P6	<b>Freezing/overheating protection is working</b> (1) Freezing protection <Cooling mode> Abnormal if plate heat exchanger pipe temperature (TH6) stays at -5°C or lower for 10 seconds or abnormal if plate heat exchanger pipe thermistor (TH6) stays at -2°C or lower and compressor operation frequency is minimum for 5 minutes after compressor starts operating for 6 minutes. <Heating mode> Abnormal if inlet water temperature thermistor (TH32) is 15°C or lower, and the following condition (1 or 2) are detected. 1. 1 minute has passed since defrosting operation started and plate heat exchanger pipe temperature thermistor (TH6) stays at -6°C or lower for continuously 30 seconds. 2. During defrosting operation and plate heat exchanger pipe temperature thermistor (TH6) stays at -16°C or lower for continuously 10 seconds. (2) Overheating protection <Heating mode> Abnormal if condensing temperature of pressure sensor (63HS) detects Tcond. °C or more and compressor operation frequency is less than or equal to 30 Hz. Detection is inoperative during defrosting.	(1) Freezing protection <Cooling mode> ① Reduced water flow · Clogged filter · Leakage of water ② Low temperature · Low-load · Inlet water is too cold. ③ Defective water pump ④ Defective outdoor fan control ⑤ Overcharge of refrigerant ⑥ Defective refrigerant circuit (clogs) ⑦ Malfunction of linear expansion valve <Heating mode> ① Reduced water flow · Clogged filter · Leakage of water ② Low temperature · Low-load · Inlet water is cold. ③ Defective water pump ④ Leakage or shortage of refrigerant ⑤ Malfunction of linear expansion valve (2) Overheating protection <Heating mode> ① Reduced water flow · Clogged filter · Leakage of water ② High temperature · Over-load · Inlet water is too warm. ③ Defective water pump ④ Overcharge of refrigerant ⑤ Defective refrigerant circuit (clogs) ⑥ Malfunction of linear expansion valve	(1) Freezing protection <Cooling mode> ①② Check water piping.  ③ Check water pump. ④ Check outdoor fan motor. ⑤~⑦ Check operating condition of refrigerant circuit. ⑦ Check linear expansion valve.  <Heating mode> ①② Check water piping.  ③ Check water pump. ④ Correct to proper amount of refrigerant. ⑤ Check linear expansion valve. Refer to "8-5. HOW TO CHECK THE COMPONENTS". (2) Overheating protection <Heating mode> ①② Check water piping.  ③ Check water pump. ④⑤ Check operating condition of refrigerant circuit. ⑥ Check linear expansion valve.

	Model	stage-a	stage-b	stage-c	stage-d	stage-e	stage-f	stage-g	stage-x	stage-y
Tcond	W112	63	60	57	53	48	48	48	61	59

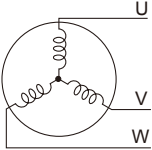
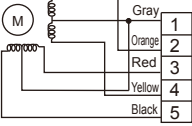


Check code	Abnormal point and detection method	Case	Judgment and action
P8	<p><b>Pipe temperature</b> Abnormal if the following conditions are detected for continuously 3 minutes after compressor starts operating for 10 minutes.</p> <p>1. Cooling mode  <math>T_{63HS}-TH7 \leq 2^{\circ}C</math> and  <math>TH3-TH7 \leq 4^{\circ}C</math> or <math>T_{63HS}-TH3 &lt; 0^{\circ}C</math> and  <math>TH32-TH6 \leq 0^{\circ}C</math> and            Compressor operation frequency is 61Hz or more.</p> <p>2. Heating mode  <math>T_{63HS}-TH32 \leq 2^{\circ}C</math> and  <math>TH6-TH32 \leq 1^{\circ}C</math> and  <math>TH7-TH3 \leq 1^{\circ}C</math> and            Compressor operation frequency is 61Hz or more.</p> <p><math>T_{63HS}</math>: Condensing temperature of pressure sensor (63HS)            Thermistor            TH3: Liquid temperature            TH32: Inlet water temperature            TH6: Plate HEX Liquid temperature            TH7: Ambient temperature</p>	<p>① Leakage or shortage of refrigerant</p> <p>② Malfunction of linear expansion valve</p> <p>③ Refrigerant circuit is clogged with foreign objects.</p> <p>Note: Clogging occurs in the parts which become below freezing point when water enters in refrigerant circuit.</p> <p>④ Disconnection of thermistor holder.</p>	<p>① Check intake superheat. Check leakage of refrigerant.</p> <p>② Check linear expansion valve.</p> <p>③ After recovering refrigerant, remove water from entire refrigerant circuit under vacuum more than 1 hour.</p> <p>④ Check temperature display on outdoor controller circuit board. Temperature display is indicated by setting SW2 of outdoor controller circuit board. Check the holder of thermistor.</p>
UE	<p><b>Abnormal pressure of pressure sensor (63HS)</b> Abnormal if pressure sensor (63HS) detects 0.1 MPa or less. Detection is inoperative for 3 minutes after compressor starting and 3 minutes after and during defrosting.</p>	<p>① Disconnection or contact failure of connector (63HS) on the outdoor controller circuit board</p> <p>② Defective pressure sensor</p> <p>③ Defective outdoor controller circuit board</p>	<p>① Check connection of connector (63HS) on the outdoor controller circuit board. Check breaking of the lead wire for thermistor (63HS).</p> <p>② Check pressure by microcomputer. (Pressure sensor/ 63HS) (SW2: Refer to "8-7. OUTDOOR UNIT OPERATION MONITOR".) FUNCTION".</p> <p>③ Replace outdoor controller board.</p>
PE	<p><b>Inlet water temperature</b> Abnormal if the following conditions are detected for continuously 10 seconds.</p> <p>1. Cooling mode During compressor operation <math>TH32 &lt; 3^{\circ}C</math></p> <p>2. Heating mode (exclude defrosting) During compressor operation <math>TH32 &lt; -10^{\circ}C</math></p> <p>3. Defrosting mode During compressor operation <math>TH32 &lt; 0^{\circ}C</math></p> <p>Thermistor TH32: Inlet water temperature</p>	<p>① Reduced water flow · Clogged filter · Leak of water</p> <p>② Low temperature · Low-load · Low temperature inlet water</p> <p>③ Defective water pump</p> <p>④ Leakage or shortage of refrigerant</p>	<p>①② Check water piping.</p> <p>③ Check water pump.</p> <p>④ Check intake superheat. Check leakage of refrigerant.</p>

## 8-4. HOW TO CHECK THE PARTS

### PUHZ-W112VHA

### PUHZ-W112VHA-BS

Parts name	Check points														
TH3: Liquid pipe temp. TH4: Discharge temp. TH6: Plate Hex liquid pipe temp. TH7: Ambient temp. TH8: Heatsink temp. TH32: Inlet water temp. TH33: Suction pipe temp. TH34: Comp. surface thermistor	Disconnect the connector then measure the resistance with a tester. (At the ambient temperature of 10 to 30°C) <table border="1" data-bbox="619 483 1337 761"> <thead> <tr> <th></th> <th>Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>TH4 TH34</td> <td>160 to 410 kΩ</td> <td rowspan="4">Open or short</td> </tr> <tr> <td>TH3 TH6 TH7 TH33</td> <td>4.3 to 9.6 kΩ</td> </tr> <tr> <td>TH32</td> <td>4.4 to 9.8 kΩ</td> </tr> <tr> <td>TH8</td> <td>39 to 105 kΩ</td> </tr> </tbody> </table>		Normal	Abnormal	TH4 TH34	160 to 410 kΩ	Open or short	TH3 TH6 TH7 TH33	4.3 to 9.6 kΩ	TH32	4.4 to 9.8 kΩ	TH8	39 to 105 kΩ		
	Normal	Abnormal													
TH4 TH34	160 to 410 kΩ	Open or short													
TH3 TH6 TH7 TH33	4.3 to 9.6 kΩ														
TH32	4.4 to 9.8 kΩ														
TH8	39 to 105 kΩ														
Fan motor (MF1)	Refer to the next page.														
Solenoid valve coil <Four-way valve> (21S4)	Measure the resistance between the terminals with a tester. (At the ambient temperature of 20°C) <table border="1" data-bbox="619 909 1307 999"> <thead> <tr> <th>Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>1435 ± 150 Ω</td> <td>Open or short</td> </tr> </tbody> </table>	Normal	Abnormal	1435 ± 150 Ω	Open or short										
Normal	Abnormal														
1435 ± 150 Ω	Open or short														
Compressor (MC) 	Measure the resistance between the terminals with a tester. (Winding temperature 20°C) <table border="1" data-bbox="619 1102 1307 1191"> <thead> <tr> <th>Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>0.188 Ω</td> <td>Open or short</td> </tr> </tbody> </table>	Normal	Abnormal	0.188 Ω	Open or short										
Normal	Abnormal														
0.188 Ω	Open or short														
Linear expansion valve (LEV-A) (LEV-B) 	Disconnect the connector then measure the resistance with a tester. (Winding temperature 20°C) <table border="1" data-bbox="619 1303 1474 1429"> <thead> <tr> <th colspan="4">Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>Gray - Black</td> <td>Gray - Red</td> <td>Gray - Yellow</td> <td>Gray - Orange</td> <td rowspan="2">Open or short</td> </tr> <tr> <td colspan="4">46±3Ω</td> </tr> </tbody> </table>	Normal				Abnormal	Gray - Black	Gray - Red	Gray - Yellow	Gray - Orange	Open or short	46±3Ω			
Normal				Abnormal											
Gray - Black	Gray - Red	Gray - Yellow	Gray - Orange	Open or short											
46±3Ω															

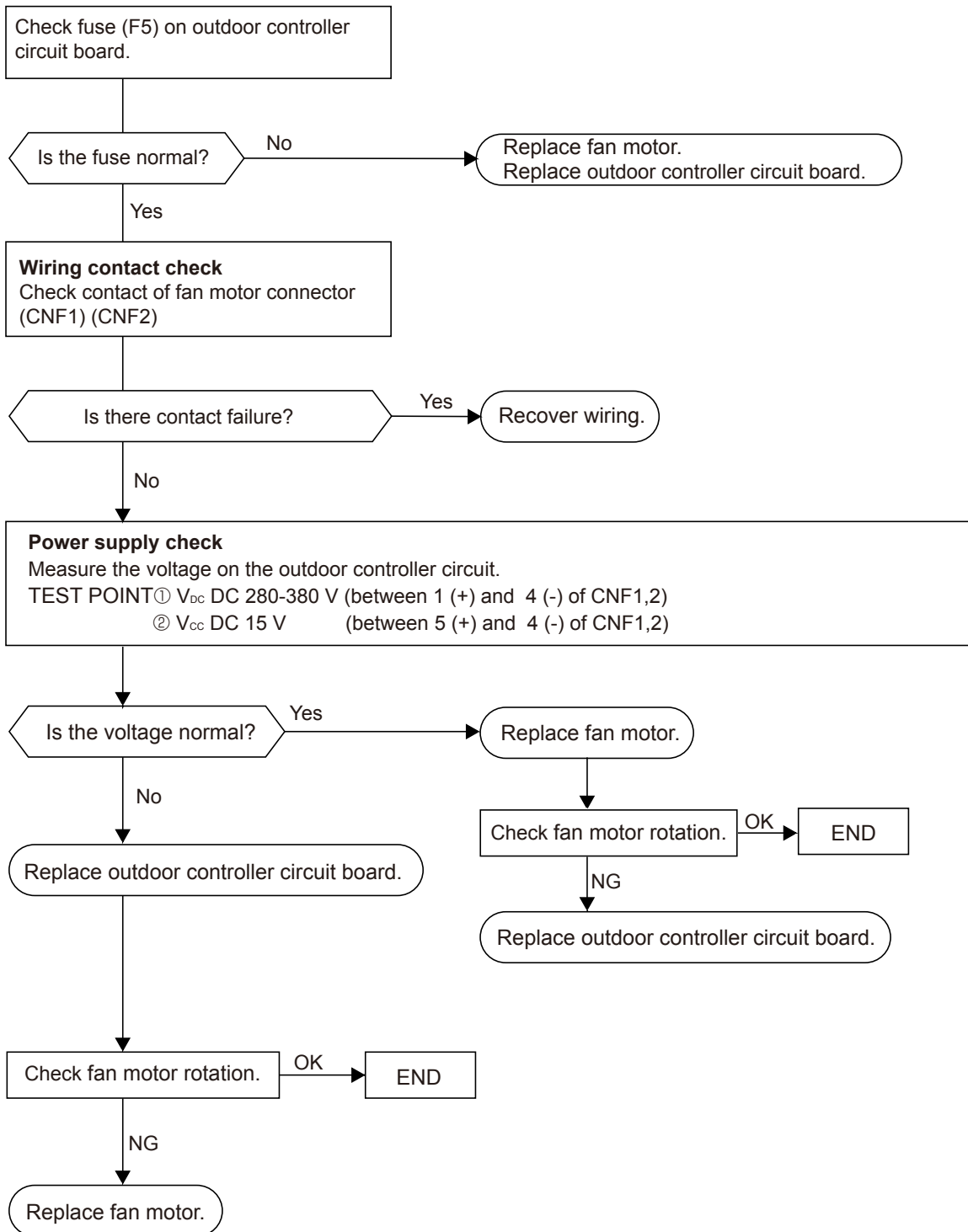
## Check method of DC fan motor (fan motor / outdoor controller circuit board)

### ① Notes

- High voltage is applied to the connector (CNF1, 2) for the fan motor. Pay attention to the service.
- Do not pull out the connector (CNF1, 2) of the motor with the power supply on.  
(It may damage the outdoor controller circuit board and fan motor.)

### ② Self check

Symptom: The outdoor fan does not run.





## 8-5. HOW TO CHECK THE COMPONENTS

### <Thermistor feature chart>

#### Low temperature thermistors

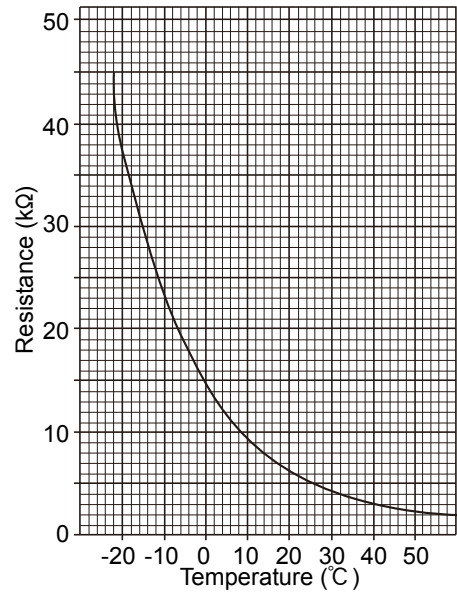
- Thermistor <Liquid pipe> (TH3)
- Thermistor <Plate Hex liquid pipe> (TH6)
- Thermistor <Ambient> (TH7)
- Thermistor <Suction pipe> (TH33)

Thermistor R0 = 15 kΩ ± 3%

B constant = 3480 ± 2%

$$R_t = 15 \exp\left\{3480 \left( \frac{1}{273+t} - \frac{1}{273} \right)\right\}$$

0°C	15 kΩ	30°C	4.3 kΩ
10°C	9.6 kΩ	40°C	3.0 kΩ
20°C	6.3 kΩ		
25°C	5.2 kΩ		



#### Medium temperature thermistor

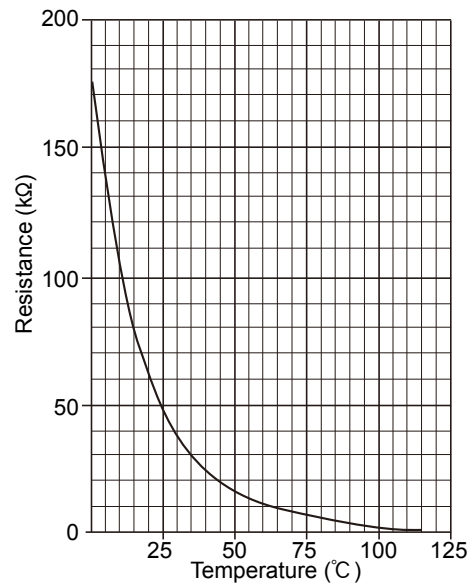
- Thermistor <Heatsink> (TH8)

Thermistor R50 = 17 kΩ ± 2%

B constant = 4150 ± 3%

$$R_t = 17 \exp\left\{4150 \left( \frac{1}{273+t} - \frac{1}{323} \right)\right\}$$

0°C	180 kΩ
25°C	50 kΩ
50°C	17 kΩ
70°C	8 kΩ
90°C	4 kΩ



#### High temperature thermistors

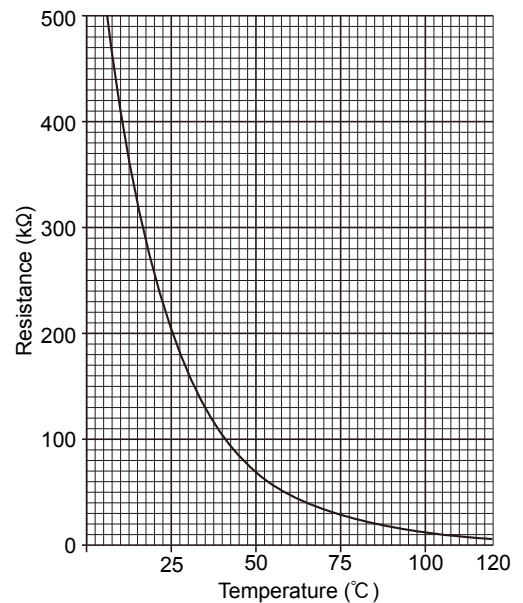
- Thermistor <Discharge pipe> (TH4)
- Thermistor <Comp. surface> (TH34)

Thermistor R120 = 7.465 kΩ ± 2%

B constant = 4057 ± 2%

$$R_t = 7.465 \exp\left\{4057 \left( \frac{1}{273+t} - \frac{1}{393} \right)\right\}$$

20°C	250 kΩ	70°C	34 kΩ
30°C	160 kΩ	80°C	24 kΩ
40°C	104 kΩ	90°C	17.5 kΩ
50°C	70 kΩ	100°C	13.0 kΩ
60°C	48 kΩ	110°C	9.8 kΩ



### Low temperature thermistor

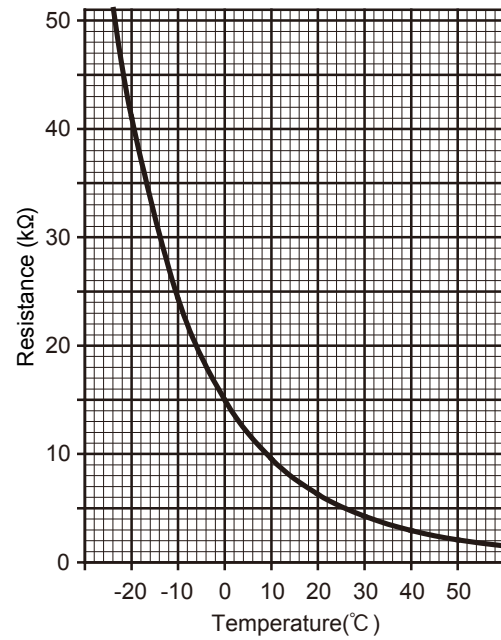
- Thermistor <Inlet water> (TH32)

Thermistor R0 = 15 kΩ ± 2.5%

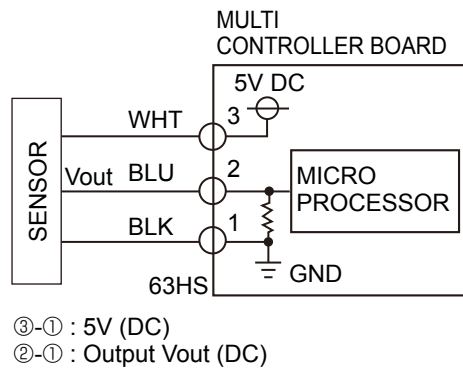
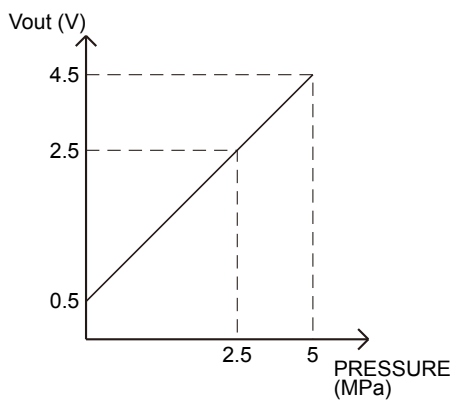
B constant = 3450 ± 2%

$$R_t = 15 \exp\left\{3450 \left( \frac{1}{273+t} - \frac{1}{273} \right)\right\}$$

0°C	15 kΩ	30°C	4.3 kΩ
10°C	9.6 kΩ	40°C	3.0 kΩ
20°C	6.3 kΩ		
25°C	5.2 kΩ		



### <HIGH PRESSURE SENSOR>

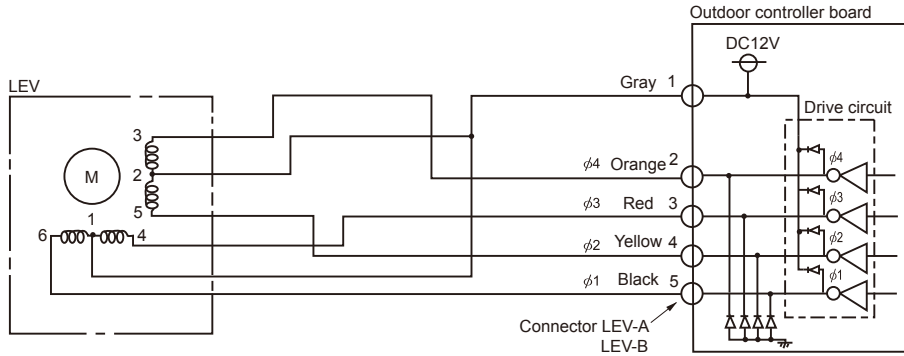


## Linear expansion valve

### (1) Operation summary of the linear expansion valve

- Linear expansion valve opens/closes through stepping motor after receiving the pulse signal from the outdoor controller board.
- Valve position can be changed in proportion to the number of pulse signal.

<Connection between the outdoor controller board and the linear expansion valve>



### <Output pulse signal and the valve operation>

Output (Phase)	Output							
	1	2	3	4	5	6	7	8
$\phi 1$	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
$\phi 2$	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
$\phi 3$	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
$\phi 4$	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

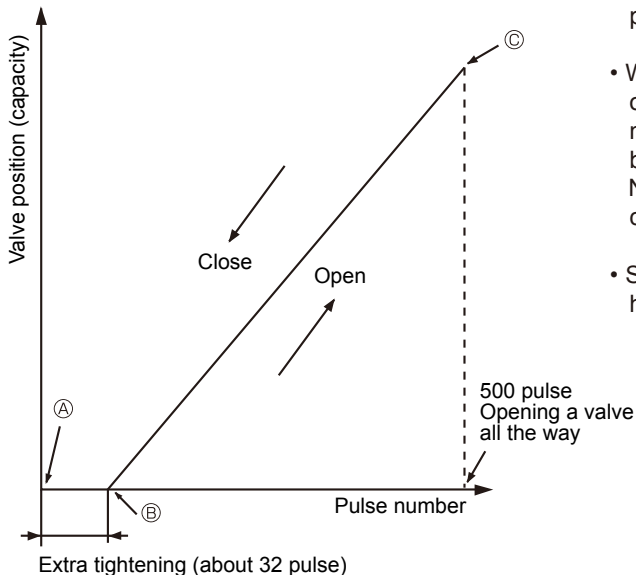
Opening a valve : 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1 → 8

Closing a valve : 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 1

The output pulse shifts in above order.

- When linear expansion valve operation stops, all output phase become OFF.

### (2) Linear expansion valve operation

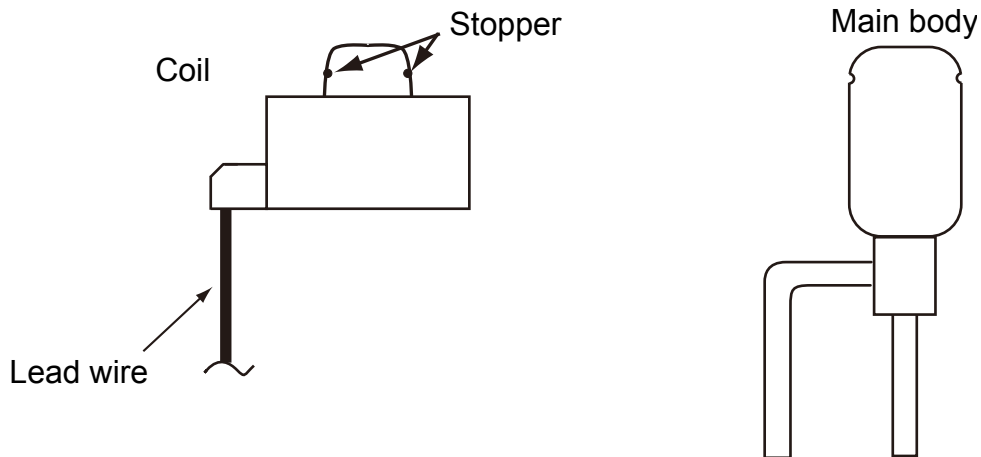


- When the switch is turned on, 700 pulse closing valve signal will be sent till it goes to ① point in order to define the valve position. (The pulse signal is being sent for about 20 seconds.)
- When the valve moves smoothly, there is no sound or vibration occurring from the linear expansion valve: however, when the pulse number moves from ② to ① or when the valve is locked, sound can be heard. No sound is heard when the pulse number moves from ② to ① in case coil is burnt out or motor is locked by open-phase.
- Sound can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

### (3) How to attach and detach the coil of linear expansion valve

<Composition>

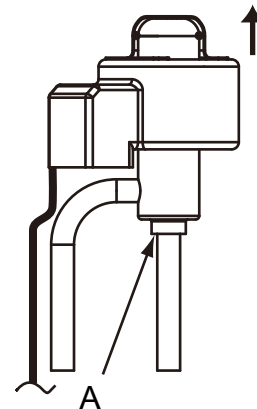
Linear expansion valve is separable into the main body and the coil as shown in the diagram below.



#### <How to detach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and detach the coil by pulling it upward.

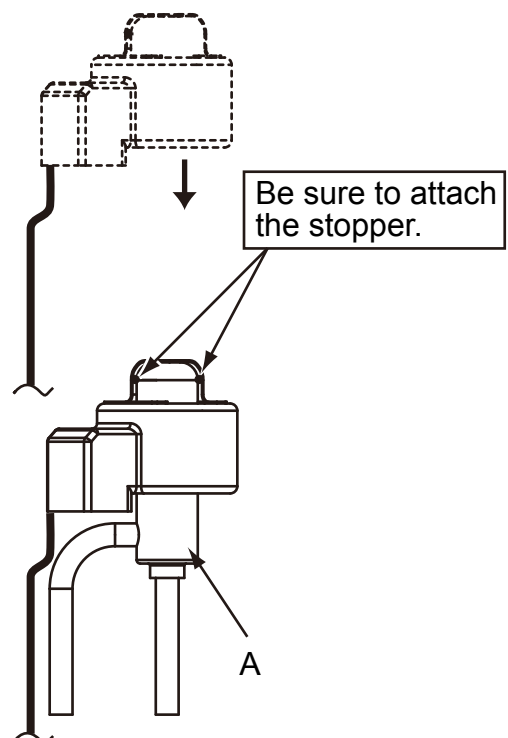
Be sure to detach the coil holding main body firmly. Otherwise pipes can bend due to pressure.



#### <How to attach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and attach the coil by inserting it downward into the main body. Then securely attach the coil stopper to main body. (At this time, be careful that stress is not added to lead wire and main body is not wound by lead wire.) If the stopper is not firmly attached to main body, coil may be detached from the main body and that can cause defective operation of linear expansion valve.

To prevent piping stress, be sure to attach the coil holding the main body of linear expansion valve firmly. Otherwise pipe may break.



<CAUTION> TEST POINT ① is high voltage.

### 8-6. TEST POINT DIAGRAM

#### Outdoor controller circuit board PUHZ-W112VHA PUHZ-W112VHA-BS



**Outdoor power circuit board**  
**PUHZ-W112VHA**  
**PUHZ-W112VHA-BS**

**Brief Check of POWER MODULE**

Usually, they are in a state of being short-circuited if they are broken. Measure the resistance in the following points (connectors, etc.). If they are short-circuited, it means that they are broken.

1. Check of POWER MODULE

① Check of DIODE circuit

**R**-**L1**, **S**-**L1**, **R**-**N1**, **S**-**N1**

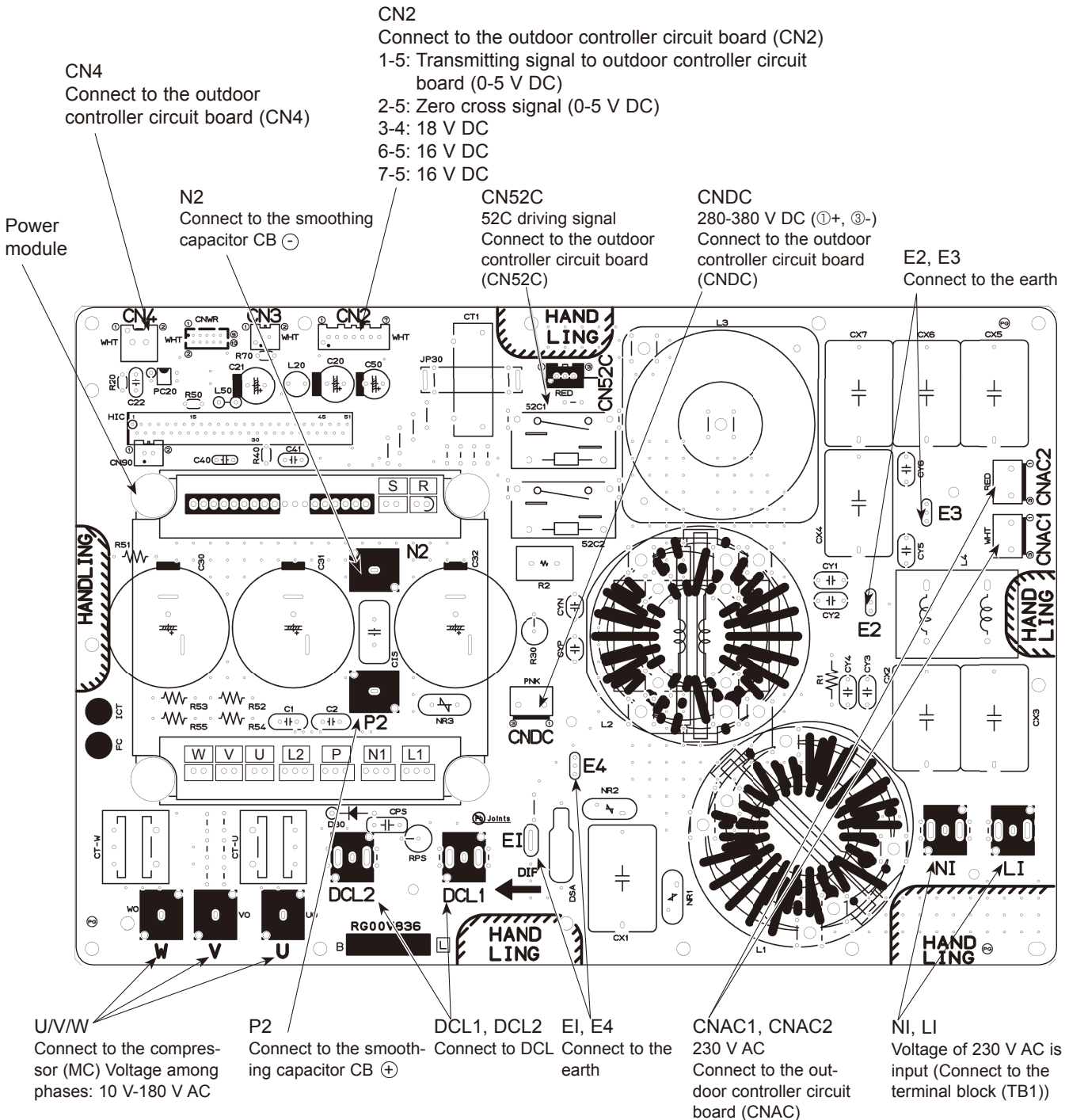
② Check of IGBT circuit

**L2**-**N1**

③ Check of INVERTER circuit

**P**-**U**, **P**-**V**, **P**-**W**, **N1**-**U**, **N1**-**V**, **N1**-**W**


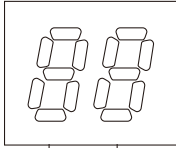
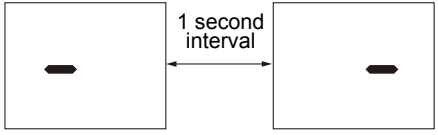
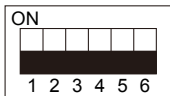
Note: The marks **R**, **S**, **L1**, **L2**, **P**, **N1**, **U**, **V** and **W** shown in the diagram are not actually printed on the board.



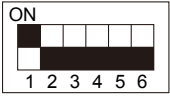

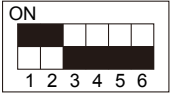

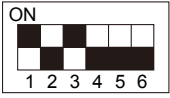

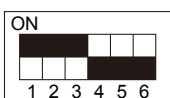
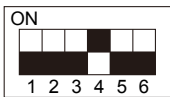
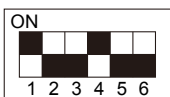

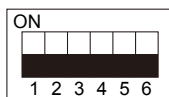
## 8-7. OUTDOOR UNIT OPERATION MONITOR FUNCTION

Operation indicator SW2: Indicator change of self diagnosis

The black square (■) indicates a switch position.


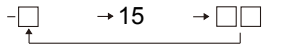

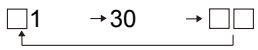



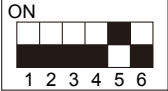
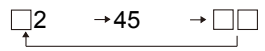

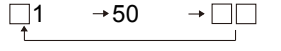
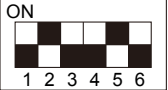
SW2 setting	Display detail	Explanation for display	Unit																																																																	
 <p><b>&lt;Digital indicator LED3 working details&gt;</b> (Be sure that the 1 to 6 in the SW2 are set to OFF.)</p> <p>(1) Display when the power supply is ON. When the power supply is ON, blinking displays by turns. Wait for 10 seconds at the longest.</p> <p>(2) When the display lights (Normal operation)</p> <p>① Operation mode display</p> <div style="display: flex; align-items: center;"> <div style="text-align: center;">  <p>(Lighting)</p> </div> <div style="margin-left: 20px;">  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>(Initial setting)</p> </div> </div>	<p>The tens digit : Operation mode</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Display</th> <th>Operation Model</th> </tr> </thead> <tbody> <tr> <td>O</td> <td>OFF</td> </tr> <tr> <td>C</td> <td>COOLING</td> </tr> <tr> <td>H</td> <td>HEATING</td> </tr> <tr> <td>d</td> <td>DEFROSTING</td> </tr> </tbody> </table> <p>② Display during error postponement Postponement code is displayed when compressor stops due to the work of protection device. Postponement code is displayed while error is being postponed.</p>	Display	Operation Model	O	OFF	C	COOLING	H	HEATING	d	DEFROSTING	<p>The ones digit : Relay output</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Display</th> <th>Warming-up Compressor</th> <th>Compressor</th> <th>4-way valve</th> <th>Solenoid valve</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>1</td> <td>—</td> <td>—</td> <td>—</td> <td>ON</td> </tr> <tr> <td>2</td> <td>—</td> <td>—</td> <td>ON</td> <td>—</td> </tr> <tr> <td>3</td> <td>—</td> <td>—</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>4</td> <td>—</td> <td>ON</td> <td>—</td> <td>—</td> </tr> <tr> <td>5</td> <td>—</td> <td>ON</td> <td>—</td> <td>ON</td> </tr> <tr> <td>6</td> <td>—</td> <td>ON</td> <td>ON</td> <td>—</td> </tr> <tr> <td>7</td> <td>—</td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>8</td> <td>ON</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>A</td> <td>ON</td> <td>—</td> <td>ON</td> <td>—</td> </tr> </tbody> </table>	Display	Warming-up Compressor	Compressor	4-way valve	Solenoid valve	0	—	—	—	—	1	—	—	—	ON	2	—	—	ON	—	3	—	—	ON	ON	4	—	ON	—	—	5	—	ON	—	ON	6	—	ON	ON	—	7	—	ON	ON	ON	8	ON	—	—	—	A	ON	—	ON	—	
Display	Operation Model																																																																			
O	OFF																																																																			
C	COOLING																																																																			
H	HEATING																																																																			
d	DEFROSTING																																																																			
Display	Warming-up Compressor	Compressor	4-way valve	Solenoid valve																																																																
0	—	—	—	—																																																																
1	—	—	—	ON																																																																
2	—	—	ON	—																																																																
3	—	—	ON	ON																																																																
4	—	ON	—	—																																																																
5	—	ON	—	ON																																																																
6	—	ON	ON	—																																																																
7	—	ON	ON	ON																																																																
8	ON	—	—	—																																																																
A	ON	—	ON	—																																																																
	<p>(3) When the display blinks Inspection code is displayed when compressor stops due to the work of protection devices.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Display</th> <th>Contents to be inspected (During operation)</th> </tr> </thead> <tbody> <tr> <td>U1</td> <td>Abnormal high pressure (63H operated)</td> </tr> <tr> <td>U2</td> <td>Abnormal high discharging temperature, shortage of refrigerant</td> </tr> <tr> <td>U3</td> <td>Open/short circuit of discharging thermistor (TH4, TH34)</td> </tr> <tr> <td>U4</td> <td>Open/short of outdoor unit thermistors (TH3, TH32, TH6, TH7, TH8 and TH33)</td> </tr> <tr> <td>U5</td> <td>Abnormal temperature of heatsink</td> </tr> <tr> <td>U6</td> <td>Abnormality of power module</td> </tr> <tr> <td>U7</td> <td>Abnormality of superheat due to low discharge temperature</td> </tr> <tr> <td>U8</td> <td>Abnormality in outdoor fan motor</td> </tr> <tr> <td>U9</td> <td>Voltage fault, Input current sensor error</td> </tr> <tr> <td>Ud</td> <td>Overheat protection</td> </tr> <tr> <td>UF</td> <td>Compressor overcurrent interruption (When Comp. locked)</td> </tr> <tr> <td>UH</td> <td>Current sensor error</td> </tr> <tr> <td>UP</td> <td>Compressor overcurrent interruption</td> </tr> <tr> <td>P6</td> <td>Abnormality of Interface or FTC units</td> </tr> <tr> <td>P8</td> <td>Abnormality of pipe temperature</td> </tr> <tr> <td>UE</td> <td>Abnormality pressure of pressure sensor</td> </tr> <tr> <td>PE</td> <td>Abnormality of inlet water temperature</td> </tr> <tr> <td>Ed</td> <td>Serial communication error</td> </tr> </tbody> </table>	Display	Contents to be inspected (During operation)	U1	Abnormal high pressure (63H operated)	U2	Abnormal high discharging temperature, shortage of refrigerant	U3	Open/short circuit of discharging thermistor (TH4, TH34)	U4	Open/short of outdoor unit thermistors (TH3, TH32, TH6, TH7, TH8 and TH33)	U5	Abnormal temperature of heatsink	U6	Abnormality of power module	U7	Abnormality of superheat due to low discharge temperature	U8	Abnormality in outdoor fan motor	U9	Voltage fault, Input current sensor error	Ud	Overheat protection	UF	Compressor overcurrent interruption (When Comp. locked)	UH	Current sensor error	UP	Compressor overcurrent interruption	P6	Abnormality of Interface or FTC units	P8	Abnormality of pipe temperature	UE	Abnormality pressure of pressure sensor	PE	Abnormality of inlet water temperature	Ed	Serial communication error																													
Display	Contents to be inspected (During operation)																																																																			
U1	Abnormal high pressure (63H operated)																																																																			
U2	Abnormal high discharging temperature, shortage of refrigerant																																																																			
U3	Open/short circuit of discharging thermistor (TH4, TH34)																																																																			
U4	Open/short of outdoor unit thermistors (TH3, TH32, TH6, TH7, TH8 and TH33)																																																																			
U5	Abnormal temperature of heatsink																																																																			
U6	Abnormality of power module																																																																			
U7	Abnormality of superheat due to low discharge temperature																																																																			
U8	Abnormality in outdoor fan motor																																																																			
U9	Voltage fault, Input current sensor error																																																																			
Ud	Overheat protection																																																																			
UF	Compressor overcurrent interruption (When Comp. locked)																																																																			
UH	Current sensor error																																																																			
UP	Compressor overcurrent interruption																																																																			
P6	Abnormality of Interface or FTC units																																																																			
P8	Abnormality of pipe temperature																																																																			
UE	Abnormality pressure of pressure sensor																																																																			
PE	Abnormality of inlet water temperature																																																																			
Ed	Serial communication error																																																																			
	<table border="1" style="width: 100%;"> <thead> <tr> <th>Display</th> <th>Inspection unit</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Outdoor unit</td> </tr> </tbody> </table>	Display	Inspection unit	0	Outdoor unit																																																															
Display	Inspection unit																																																																			
0	Outdoor unit																																																																			
	<table border="1" style="width: 100%;"> <thead> <tr> <th>Display</th> <th>Contents to be inspected (When power is turned on)</th> </tr> </thead> <tbody> <tr> <td>F5</td> <td>63H connector(yellow) is open.</td> </tr> <tr> <td>E8</td> <td>Interface unit/Flow temp. controller-outdoor communication error (Signal receiving error) (Outdoor unit)</td> </tr> <tr> <td>E9</td> <td>Interface unit/Flow temp. controller-outdoor communication error (Transmitting error) (Outdoor unit)</td> </tr> <tr> <td>EA</td> <td>Miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire, excessive number of indoor units (2 units or more)</td> </tr> <tr> <td>Eb</td> <td>Miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire (converse wiring or disconnection)</td> </tr> <tr> <td>EC</td> <td>Startup time over</td> </tr> <tr> <td>E0-E7</td> <td>Communication error except for outdoor unit</td> </tr> </tbody> </table>	Display	Contents to be inspected (When power is turned on)	F5	63H connector(yellow) is open.	E8	Interface unit/Flow temp. controller-outdoor communication error (Signal receiving error) (Outdoor unit)	E9	Interface unit/Flow temp. controller-outdoor communication error (Transmitting error) (Outdoor unit)	EA	Miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire, excessive number of indoor units (2 units or more)	Eb	Miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire (converse wiring or disconnection)	EC	Startup time over	E0-E7	Communication error except for outdoor unit																																																			
Display	Contents to be inspected (When power is turned on)																																																																			
F5	63H connector(yellow) is open.																																																																			
E8	Interface unit/Flow temp. controller-outdoor communication error (Signal receiving error) (Outdoor unit)																																																																			
E9	Interface unit/Flow temp. controller-outdoor communication error (Transmitting error) (Outdoor unit)																																																																			
EA	Miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire, excessive number of indoor units (2 units or more)																																																																			
Eb	Miswiring of Interface unit/Flow temp. controller-outdoor unit connecting wire (converse wiring or disconnection)																																																																			
EC	Startup time over																																																																			
E0-E7	Communication error except for outdoor unit																																																																			

The black square (■) indicates a switch position.




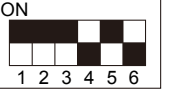

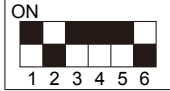
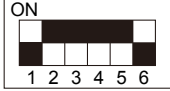
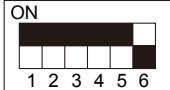
SW2 setting	Display detail	Explanation for display	Unit
	Pipe temperature / Liquid (TH3) - 40 to 90	- 40 to 90 (When the coil thermistor detects 0°C or below, “-” and temperature are displayed by turns.) (Example) When -10°C; 0.5 secs. 0.5 secs. 2 secs. -□ → 10 → □□	°C
	Discharge temperature (TH4) 3 to 217	3 to 217 (When the discharge thermistor detects 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105°C; 0.5 secs. 0.5 secs. 2 secs. □1 → 05 → □□	°C
	Fan steps 0 to 10	0 to 10	Step
	Compressor ON/OFF 0 to 9999	0 to 9999 (When the number of times is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 42500 times (425 × 100 times); 0.5 secs. 0.5 secs. 2 secs. □4 → 25 → □□	100 times
	Compressor accumulated operation hours 0 to 9999	0 to 9999 (When it is 100 hours or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 2450 hours (245 × 10 hours); 0.5 secs. 0.5 secs. 2 secs. □2 → 45 → □□	10 hours
	Compressor running current 0 to 50	0 to 50 (Value after the decimal point will be truncated.)	A
	Compressor running frequency 0 to 255	0 to 255 (When it is 100 Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105 Hz; 0.5 secs. 0.5 secs. 2 secs. □1 → 05 → □□	Hz
	LEV-A opening pulse 0 to 500	0 to 500 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 150 pulse; 0.5 secs. 0.5 secs. 2 secs. □1 → 50 → □□	Pulse
	Deferred error history (1)	Deferred error Blinking: being deferred Lighting: deferment is cancelled “00” is displayed in case of no deferment	Code display
	Operation mode when the error occurred	Operation mode when the unit is stopped due to an error is displayed. The displayed code is when the SW2 is set as below. (SW2) 	Code display



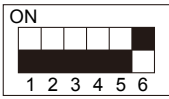
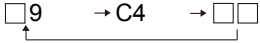
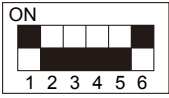
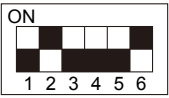
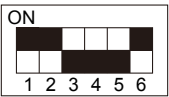
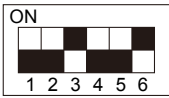
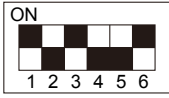
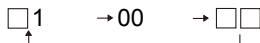
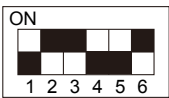
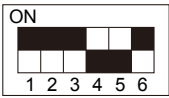
The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit				
	Pipe temperature/Liquid (TH3) when error occurred - 40 to 90	- 40 to 90 (When the coil thermistor detects 0°C or below, “-” and temperature are displayed by turns.) (Example) When - 15°C; 0.5 secs.   0.5 secs.   2 secs. -□   → 15   → □□ 	°C				
	Discharge temperature (TH4) when error occurred 3 to 217	3 to 217 (When the temperature is 100°C or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 130°C; 0.5 secs.   0.5 secs.   2 secs. □1   → 30   → □□ 	°C				
	Compressor current when error occurred 0 to 50	0 to 50	A				
	Error history (1) (latest) Alternate display of faulty unit number and check code	When no error history, “ 0 ” and “ - - ” are displayed by turns.	Code display				
	Error history (2) Alternate display of faulty unit number and check code	When no error history, “ 0 ” and “ - - ” are displayed by turns.	Code display				
	Compressor operation duration 0 to 999	0 to 999 (When it is 100 minutes or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 245 minutes; 0.5 secs.   0.5 secs.   2 secs. □2   → 45   → □□ 	Minute				
	LEV-B opening when error occurred	0 to 500 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 150 pulse; 0.5 secs.   0.5 secs.   2 secs. □1   → 50   → □□ 	Pulse				
	Capacity settings	The outdoor capacity code is shown as below <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Model</td> <td>Code</td> </tr> <tr> <td>PUHZ-W112</td> <td>20</td> </tr> </table>	Model	Code	PUHZ-W112	20	Code display
Model	Code						
PUHZ-W112	20						

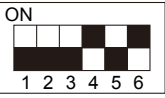
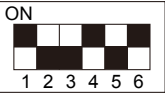

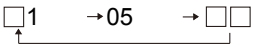
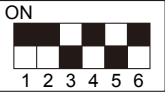

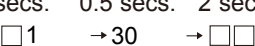
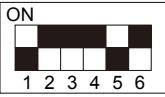
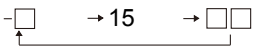
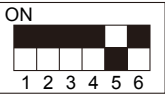
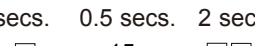
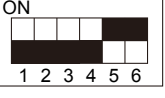
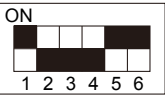
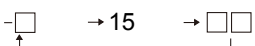
The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit										
	Outdoor unit setting information	<ul style="list-style-type: none"> <li>The tens digit (Total display for applied setting) <table border="1" data-bbox="746 315 1321 434"> <thead> <tr> <th>Setting details</th> <th>Display details</th> </tr> </thead> <tbody> <tr> <td>H·P / Cooling only</td> <td>0 : H·P      1 : Cooling only</td> </tr> <tr> <td>Single phase / 3 phase</td> <td>0 : Single phase    2 : 3 phase</td> </tr> </tbody> </table> </li> <li>The ones digit <table border="1" data-bbox="746 495 1321 573"> <thead> <tr> <th>Setting details</th> <th>Display details</th> </tr> </thead> <tbody> <tr> <td>Defrosting switch</td> <td>0 : Normal    1 : For high humidity</td> </tr> </tbody> </table> </li> </ul> <p>(Example) When heat pump, 3 phase and defrosting (normal) are set up, "20" is displayed.</p>	Setting details	Display details	H·P / Cooling only	0 : H·P      1 : Cooling only	Single phase / 3 phase	0 : Single phase    2 : 3 phase	Setting details	Display details	Defrosting switch	0 : Normal    1 : For high humidity	Code display
Setting details	Display details												
H·P / Cooling only	0 : H·P      1 : Cooling only												
Single phase / 3 phase	0 : Single phase    2 : 3 phase												
Setting details	Display details												
Defrosting switch	0 : Normal    1 : For high humidity												
	Plate HEX liquid pipe temperature (TH6) - 39 to 88	- 39 to 88 (When the temperature is 0°C or less, "-" and temperature are displayed by turns.)	°C										
	Condensing temperature (T <sub>63HS</sub> ) - 39 to 88	- 39 to 88 (When the temperature is 0°C or less, "-" and temperature are displayed by turns.)	°C										
	Calculated maximum frequency 0 to 150	0 to 150 (When it is 100 Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.)  (Example) When 105 Hz; 0.5 secs.    0.5 secs.    2 secs. <table border="0" data-bbox="1010 1339 1265 1379"> <tr> <td style="text-align: center;">□1</td> <td style="text-align: center;">→05</td> <td style="text-align: center;">→□□</td> </tr> <tr> <td style="text-align: center;">↑</td> <td></td> <td style="text-align: center;">↓</td> </tr> </table>	□1	→05	→□□	↑		↓	Hz				
□1	→05	→□□											
↑		↓											
	Water inlet temperature (TH32) 0 to 100	0 to 100	°C										
	Ambient temperature (TH7) - 39 to 88	- 39 to 88 (When the temperature is 0°C or less, "-" and temperature are displayed by turns.)	°C										
	Outdoor heatsink temperature (TH8) - 40 to 200	- 40 to 200 (When the temperature is 0°C or less, "-" and temperature are displayed by turns.) (When the thermistor detects 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C										
	Discharge superheat (SHd) 0 to 255 [Cooling and Heating: SHd = TH4-T <sub>63HS</sub> ]	0 to 255 (When the SHd is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C										

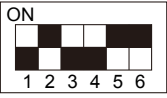
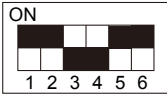
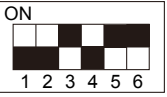

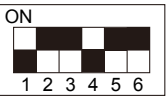
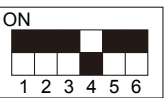
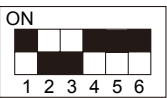

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit																		
	Number of defrost cycles 0 to FFFE	0 to FFFE (in hexadecimal notation) (When more than FF in hex (255 in decimal), the number is displayed in order of 16 <sup>3</sup> 's and 16 <sup>2</sup> 's, and 16 <sup>1</sup> 's and 16 <sup>0</sup> 's places. (Example) When 5000 cycles; 0.5 secs. 0.5 secs. 2 secs. 	2 cycles																		
	Input current of outdoor unit 0 to 500	0 to 500 (When it is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.)	0.1 A																		
	LEV-B opening pulse 0 to 500	0 to 500 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.)	Pulse																		
	U9 error detail history (latest)	<table border="1" data-bbox="837 931 1388 1167"> <thead> <tr> <th>Description</th> <th>Display</th> </tr> </thead> <tbody> <tr> <td>Normal</td> <td>00</td> </tr> <tr> <td>Overvoltage error</td> <td>01</td> </tr> <tr> <td>Undervoltage error</td> <td>02</td> </tr> <tr> <td>Input current sensor error</td> <td></td> </tr> <tr> <td>L<sub>1</sub>-phase open error</td> <td>04</td> </tr> <tr> <td>Abnormal power synchronous signal</td> <td>08</td> </tr> <tr> <td>PFC/IGBT error</td> <td></td> </tr> <tr> <td>Undervoltage</td> <td>20</td> </tr> </tbody> </table> <p>* Display examples for multiple errors: Overvoltage (01) + Undervoltage (02) = 03 Undervoltage (02) + Power-sync signal error (08) = 0A L<sub>1</sub> phase open error (04) + PFC/IGBT error (20) = 24</p>	Description	Display	Normal	00	Overvoltage error	01	Undervoltage error	02	Input current sensor error		L <sub>1</sub> -phase open error	04	Abnormal power synchronous signal	08	PFC/IGBT error		Undervoltage	20	Code display
Description	Display																				
Normal	00																				
Overvoltage error	01																				
Undervoltage error	02																				
Input current sensor error																					
L <sub>1</sub> -phase open error	04																				
Abnormal power synchronous signal	08																				
PFC/IGBT error																					
Undervoltage	20																				
	Direct current bus voltage 150 to 400	150 to 400 (When it is 100V or more, hundreds digit, tens digit and ones digit are displayed by turns.)	V																		
	Capacity save 0 to 100  [ When there is no setting of capacity save, "100" is displayed. ]	0 to 100 (When the capacity is 100%, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 100%; 0.5 secs. 0.5 secs. 2 secs. 	%																		
	Deferred error history (2) of outdoor unit	Deferred check code display Blinking: being deferred Lighting: deferment is cancelled "00" is displayed in case of no deferment.	Code display																		
	Deferred error history (3) of outdoor unit	Deferred check code display Blinking: being deferred Lighting: deferment is cancelled "00" is displayed in case of no deferment.	Code display																		

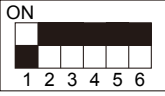
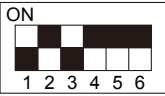
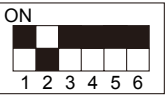
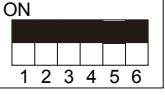
The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Error history (3) (Oldest) Faulty unit number and check code are displayed alternately.	When no error history, "0" and "--" are displayed by turns.	Code display
	Error thermistor display [When there is no error thermistor, "--" is displayed.]	3: Liquid pipe thermistor (TH3) 3: Water inlet temp. thermistor (TH32) 6: Plate HEX liquid pipe thermistor (TH6) 7: Ambient temp. thermistor (TH7) 8: Heatsink thermistor (TH8) 4: Discharge thermistor (TH4) 3: Suction pipe thermistor (TH33) 34: Comp. surface thermistor (TH34)	Code display
	Operation frequency when error occurred. 0 to 225	0 to 225 (When it is 100 Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105 Hz; 0.5 secs. 0.5 secs. 2 secs. 	Hz
	Fan step when error occurred. 0 to 10	0 to 10	Step
	LEV-A opening pulse when error occurred. 0 to 500	0 to 500 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 130 pulse; 0.5 secs. 0.5 secs. 2 secs. 	Pulse
	Plate HEX liquid pipe temperature (TH6) when error occurred. - 39 to 88	- 39 to 88 (When the temperature is 0°C or less, "-" and temperature are displayed by turns.) (Example) When -15°C; 0.5 secs. 0.5 secs. 2 secs. 	°C
	Condensing temperature when error occurred. - 39 to 88	- 39 to 88 (When the temperature is 0°C or less, "-" and temperature are displayed by turns.) (Example) When -15°C; 0.5 secs. 0.5 secs. 2 secs. 	°C
	Water inlet temperature (TH32) when error occurred. 0 to 100	0 to 100	°C
	Ambient temperature (TH7) when error occurred. - 39 to 88	- 39 to 88 (When the temperature is 0°C or less, "-" and temperature are displayed by turns.) (Example) When - 15°C; 0.5 secs. 0.5 secs. 2 secs. 	°C

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit																
	Outdoor heatsink temperature (TH8) when error occurred. - 40 to 200	- 40 to 200 (When the temperature is 0°C or less, “-” and temperature are displayed by turns.) (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C																
	Discharge superheat (SHd) when error occurred. 0 to 255 [Cooling and Heating: SHd=TH4-T <sub>63HS</sub> ]	0 to 255 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 150°C; 0.5 secs.    0.5 secs.    2 secs. □1            → 50            → □□	°C																
	Sub cool (SC) when error occurred. 0 to 130 [Cooling: SC = T <sub>63HS</sub> -TH3] Heating: SC = T <sub>63HS</sub> -TH6	0 to 130 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 115°C; 0.5 secs.    0.5 secs.    2 secs. □1            → 15            → □□	°C																
	Compressor operation duration before the unit stops with error 0 to 999	0 to 999 (When it is 100 minutes or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 415 minutes; 0.5 secs.    0.5 secs.    2 secs. □4            → 15            → □□	Minute																
	Maximum frequency when error occurred 0 to 150	0 to 150 (When it is 100 Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105 Hz; 0.5 secs.    0.5 secs.    2 secs. □1            → 05            → □□	Hz																
	Requested capacity step when error occurred 0 to 7	0 to 7	Step																
	Compressor frequency control status	The following code will be a help to know the operating status of unit. •Ten place (left side): <table border="1" data-bbox="868 1682 1331 1771"> <tr><th>Display</th><th>Compressor frequency control</th></tr> <tr><td>1</td><td>Input current restriction control</td></tr> <tr><td>2</td><td>Compressor current restriction control</td></tr> </table> •First digit (Total figure of the corresponding relays are displayed.) <table border="1" data-bbox="868 1845 1378 1989"> <tr><th>Display</th><th>Compressor frequency control</th></tr> <tr><td>1</td><td>Discharge temp.control(not to over rise).</td></tr> <tr><td>2</td><td>Condensing temp.control(not to over rise).</td></tr> <tr><td>4</td><td>Freezing protection control</td></tr> <tr><td>8</td><td>Heatsink temp.control(not to over rise).</td></tr> </table> When the following 3 points are under control; <span style="float: right;">LED</span> (1) Input current restriction control. (2) Condensing temp. control (not to over rise). (3) Heatsink temp. control (not to over rise). 	Display	Compressor frequency control	1	Input current restriction control	2	Compressor current restriction control	Display	Compressor frequency control	1	Discharge temp.control(not to over rise).	2	Condensing temp.control(not to over rise).	4	Freezing protection control	8	Heatsink temp.control(not to over rise).	Code display
Display	Compressor frequency control																		
1	Input current restriction control																		
2	Compressor current restriction control																		
Display	Compressor frequency control																		
1	Discharge temp.control(not to over rise).																		
2	Condensing temp.control(not to over rise).																		
4	Freezing protection control																		
8	Heatsink temp.control(not to over rise).																		

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit																		
	Comp. surface temperature (TH34) 3 to 217	3 to 217 (When the temperature is 100°C or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 130°C; 0.5 secs. 0.5 secs. 2 secs. □1 → 30 → □□	°C																		
	Outdoor suction pipe temperature (TH33) - 39 to 88	- 39 to 88 (When the temperature is 0°C or less, “-” and temperature are displayed by turns.) (Example) When -15°C; 0.5 secs. 0.5 secs. 2 secs. -□ → 15 → □□	°C																		
	Requested capacity step (Q STEP) 0 to 7	0 to 7	Step																		
	U9 Error details (To be shown while error call is deferred.)	<table border="1" data-bbox="767 943 1318 1178"> <thead> <tr> <th>Description</th> <th>Display</th> </tr> </thead> <tbody> <tr> <td>Normal</td> <td>00</td> </tr> <tr> <td>Overvoltage error</td> <td>01</td> </tr> <tr> <td>Undervoltage error</td> <td>02</td> </tr> <tr> <td>Input current sensor error</td> <td>04</td> </tr> <tr> <td>L-phase open error</td> <td>08</td> </tr> <tr> <td>Abnormal power synchronous signal</td> <td>08</td> </tr> <tr> <td>PFC/IGBT error</td> <td>20</td> </tr> <tr> <td>Undervoltage</td> <td>20</td> </tr> </tbody> </table> <p>* Display examples for multiple errors: Overvoltage (01) + Undervoltage (02) = 03 Undervoltage (02) + Power-sync signal error (08) = 0A L-phase open error (04) + PFC/IGBT error (20) = 24</p>	Description	Display	Normal	00	Overvoltage error	01	Undervoltage error	02	Input current sensor error	04	L-phase open error	08	Abnormal power synchronous signal	08	PFC/IGBT error	20	Undervoltage	20	Code display
Description	Display																				
Normal	00																				
Overvoltage error	01																				
Undervoltage error	02																				
Input current sensor error	04																				
L-phase open error	08																				
Abnormal power synchronous signal	08																				
PFC/IGBT error	20																				
Undervoltage	20																				

### Data Sheet for Air to Water Compact type

Applicable model

PUHZ-W112VHA(-BS)

Model name: [Serial No.: ] Date :

Operation Data	SW2 setting						1:ON / 0:OFF
	1	2	3	4	5	6	
Inlet/Outlet water temperature	/	/	/	/	/	/	/
Outdoor Inlet/Outlet Air temperature	/	/	/	/	/	/	/
Discharge/Suction temperature	/	/	/	/	/	/	/
Discharge/Suction pressure	/	/	/	/	/	/	/
Power supply Voltage/Frequency ( V / Hz )	/	/	/	/	/	/	/
Water flow Volume ( L/min )	/	/	/	/	/	/	/
Inlet water temp.	[TH32]	0	0	1	1	0	
Plate HEX liquid pipe temp.	[TH6]	0	0	1	0	1	
Condensing temp.	[T <sub>63HS</sub> ]	1	0	1	0	1	
Ambient temp.	[TH7]	1	0	1	1	0	
Compressor running frequency (Hz)		1	1	1	0	0	
Fan steps (Step)		1	1	0	0	0	
Liquid pipe temp.	[TH3]	1	0	0	0	0	
Discharge temp.	[TH4]	0	1	0	0	0	
LEV-A opening pulse	[LEV-A]	0	0	1	0	0	
LEV-B opening pulse	[LEV-B]	0	1	0	0	1	
Requested capacity step	[Q <sub>STEP</sub> ]	1	0	1	1	1	
Comp. surface temp.	[TH34]	0	1	1	1	1	
Suction temp.	[TH33]	0	1	0	1	1	
Heat sink temp.	[TH8]	0	1	1	1	0	
Discharge Super Heat	[SHd]	1	1	1	1	0	
Calculated max. frequency (Hz)		1	1	1	0	1	
Compressor operation duration (Min)		0	0	0	1	0	
Number of defrost cycle	[SC]	0	0	0	0	1	
Demand capacity (%)		1	0	1	0	1	
Direct current bus line voltage (V)		0	0	1	0	1	
Compressor running current (A)		0	1	1	0	0	
Input current (0.1A)		1	0	0	0	1	
Compressor frequency control status *		1	0	0	1	1	
Temperature differential code [Δ Tj]		0	0	0	1	1	

Recorded operation status	SW2 setting						1:ON / 0:OFF
	1	2	3	4	5	6	
Operation mode when the error occurred (Mode)	0	1	0	1	0	0	
Error history (1) [Latest] (Code)	0	1	1	1	0	0	
Error history (2) (Code)	1	1	1	1	0	0	
Error history (3) [Oldest] (Code)	0	0	0	1	0	1	
Deferred error history (1) (Code)	1	0	0	1	0	0	
Deferred error history (2) (Code)	0	1	1	0	0	1	
Deferred error history (3) (Code)	1	1	1	0	0	1	
Condensing temp. [T <sub>63HS</sub> ]	1	1	1	1	0	1	
Plate HEX liquid pipe temp. [TH6]	0	1	1	1	0	1	
Compressor running frequency (Hz)	0	1	0	1	0	1	
Fan steps (Step)	1	1	0	1	0	1	
Liquid pipe temp. [TH3]	1	1	0	1	0	0	
Discharge temp. [TH4]	0	0	1	1	0	0	
LEV-A opening pulse [LEV-A]	0	0	1	0	1	0	
LEV-B opening pulse [LEV-B]	1	0	0	1	0	0	
Ambient temp. [TH7]	1	0	0	0	1	1	
Water inlet temp. [TH32]	0	0	0	0	1	1	
Heat sink temp. [TH8]	0	1	0	0	1	1	
Calculated max. frequency (Hz)	0	1	0	1	1	1	
Sub Cool [SC]	0	0	1	0	1	1	
Compressor operation duration (Min)	1	0	1	0	1	1	
Requested capacity step [Q <sub>STEP</sub> ]	1	1	1	0	1	1	
Discharge Super Heat [SHd]	1	1	0	1	0	1	
Compressor running current (A)	1	0	1	1	0	0	
Capacity setting (Code)	0	1	0	0	1	0	
Compressor ON/OFF (×100)	0	0	1	0	0	0	
Compressor accumulated operation hours (×10hours)	1	0	1	0	0	0	
U9 error detail history (latest) (Code)	1	1	0	0	0	1	
* Check sum (Code)	1	1	0	1	1	1	

When error occurred

<b>10ths digit</b>	1:Input current restriction control	<b>1st digit</b>	1:Discharge temp. control
	2:Compressor current restriction control		4:Freeze protection control
			8:Heat sink temp. control

## 8-8. FUNCTION OF SWITCHES

### PUHZ-W112VHA

### PUHZ-W112VHA-BS

Switch		Function	Selection		Initial setting*	Function details	Effective timing													
Mark	No.		ON (with)	OFF (without)																
SW1	1	Forced defrosting	ON to start	usual setting	OFF	Switch ON to force defrosting	Always													
	2	To clear error history	ON to clear	usual setting	OFF	Switch ON to clear (erase) the followings: (1)Check codes and Suspension flags in RAM (2)Check codes and Suspension flags in EEPROM	Always													
	3	No function	Do NOT use	PUHZ-W112VHA	OFF	–	Always													
	4	Abnormal disregard	Disregard	Normal	OFF	Check code (P8,UH): Abnormal detection disregard	–													
	5	No function	Do NOT use	PUHZ-W112VHA	OFF	–	–													
	6	No function	Do NOT use	PUHZ-W112VHA	OFF	–	–													
SW5	1	Silent setting (FAN)	Silent setting (FAN)	usual setting	OFF	Fan speed setting in silent mode	Always													
	2	Silent setting (Hz)	Silent setting (Hz)	usual setting	OFF	Hz setting in silent mode														
	3	No function	Do NOT use	PUHZ-W112VHA	OFF	–	–													
	4	No function	Do NOT use	PUHZ-W112VHA	OFF	–	–													
	5	Defrost control selection	For high humidity	Standard	OFF	Switches to optimal defrosting operation for low-temperature and high-humidity regions.	–													
	6	No function	Do NOT use	PUHZ-W112VHA	OFF	–	–													
SW6	1-3	Model Setting	<table border="1"> <thead> <tr> <th rowspan="2">Model</th> <th colspan="3">SW6</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>W</td> <td>0</td> <td>0</td> <td>1</td> </tr> </tbody> </table> 1=ON, 0=OFF		Model	SW6			1	2	3	W	0	0	1	As shown in the left table	–	–		
	Model	SW6																		
		1	2	3																
W	0	0	1																	
4	Single phase / 3 phase	Do NOT use	Single phase		–	–	–													
5-8	Model Setting 2	<table border="1"> <thead> <tr> <th rowspan="2">Model</th> <th colspan="4">SW6</th> </tr> <tr> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>W112</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table> 1=ON, 0=OFF		Model	SW6				5	6	7	8	W112	0	1	1	0	As shown in the left table	Make sure to set SW6-5 to 8 correctly	–
Model	SW6																			
	5	6	7	8																
W112	0	1	1	0																
SW7	1-6	No function	Do NOT use	PUHZ-W112VHA	OFF	–	–													
SW8	1	Mode selection	Energy saving mode	Powerful mode	OFF	–	Always													
	2	Max. current setting	<table border="1"> <thead> <tr> <th rowspan="2">Model</th> <th colspan="2">Max. current</th> </tr> <tr> <th>OFF</th> <th>ON</th> </tr> </thead> <tbody> <tr> <td>W112</td> <td>29.5A</td> <td>23.0A</td> </tr> </tbody> </table>		Model	Max. current		OFF	ON	W112	29.5A	23.0A	OFF	–	When power supply ON					
	Model	Max. current																		
OFF		ON																		
W112	29.5A	23.0A																		
3	Separate Interface/Flow temp.controller - outdoor unit power supplies	Separate power supply	Outdoor unit power supply		OFF	Power supply connection method selection	When power supply ON													
SW9	1-4	No function	Do NOT use	–	–	–	–													

#### <Important Note>

All these dip switches on PUHZ-W112VHA are set as shown above.

Spare PCBs, however, will be supplied without any settings, which means that all dip switches are switched OFF.

When servicing, please make sure to set all switches correctly, referring to the previous PCB which is removed from the unit.

\*1. Forced defrosting should be done as follows.

① Change the DIP SW1-1 on the outdoor controller board from OFF to ON.

② Forced defrosting will start by the above operation ① if these conditions written below are satisfied.

- Heat mode setting

- 10 minutes have passed since compressor starts operating or previous forced defrosting is finished.

- Pipe temperature is less than or equal to 8°C.

Forced defrosting will finish if certain conditions are satisfied.

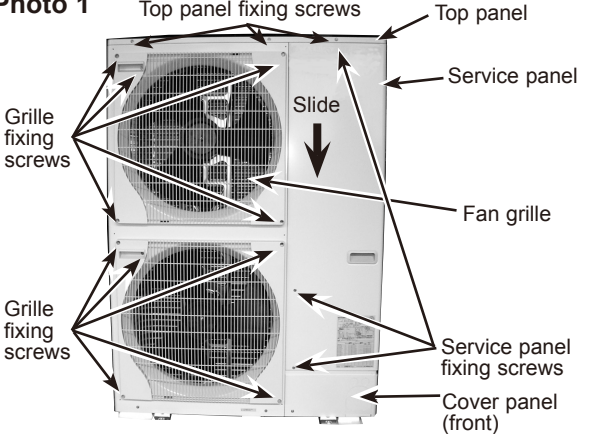
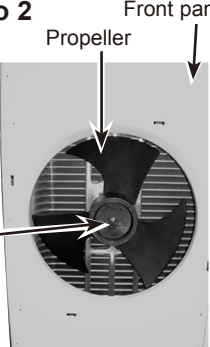
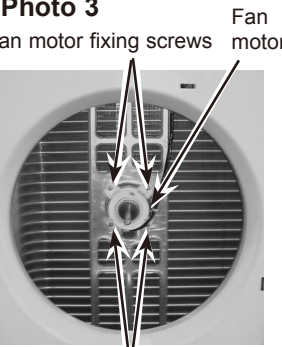
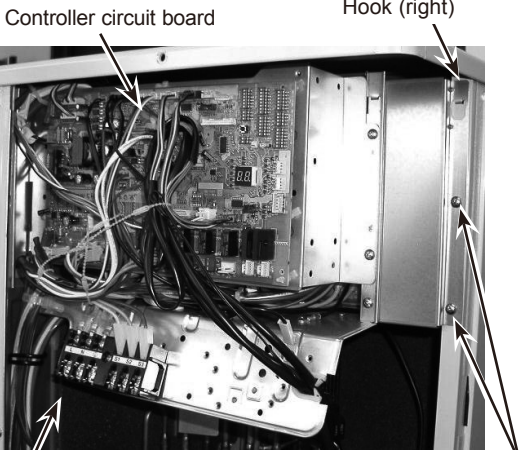
Forced defrosting can be done if above conditions are satisfied when DIP SW1-1 is changed from OFF to ON.

After DIP SW1-1 is changed from OFF to ON, there is no problem if DIP SW1-1 is left ON or changed to OFF again.

This depends on the service conditions.



**PUHZ-W112VHA**  
**PUHZ-W112VHA-BS**

OPERATING PROCEDURE	PHOTOS & ILLUSTRATION
<p><b>1. Removing the service panel and top panel</b></p> <p>(1) Remove 3 service panel fixing screws (5 × 12) and slide the hook on the right downward to remove the service panel.</p> <p>(2) Remove screws (3 for front, 3 for rear/5 × 12) of the top panel and remove it.</p>	<p><b>Photo 1</b></p> 
<p><b>2. Removing the fan motor (MF1, MF2)</b></p> <p>(1) Remove the service panel. (See Photo 1)</p> <p>(2) Remove the top panel. (See Photo 1)</p> <p>(3) Remove 5 fan grille fixing screws (5 × 12) to detach the fan grille. (See Photo 1)</p> <p>(4) Remove a nut (for right handed screw of M6) to detach the propeller. (See Photo 2)</p> <p>(5) Disconnect the connectors, CNF1 and CNF2 on controller circuit board in electrical parts box.</p> <p>(6) Remove 4 fan motor fixing screws (5 × 20) to detach the fan motor. (See Photo 3)</p>	<p><b>Photo 2</b></p>  <p><b>Photo 3</b></p> 
<p><b>3. Removing the electrical parts box</b></p> <p>(1) Remove the service panel. (See Photo 1)</p> <p>(2) Remove the top panel. (See Photo 1)</p> <p>(3) Disconnect the indoor/outdoor connecting wire and power supply wire from terminal block.</p> <p>(4) Disconnect the connectors on the controller circuit board.</p> <p>(5) Remove the terminal cover and disconnect the compressor lead wire.</p> <p>(6) Remove 2 electrical parts box fixing screw (4 × 10) and detach the electrical parts box by pulling it upward. The electrical parts box is fixed with 2 hooks on the left and 1 hook on the right.</p>	<p><b>Photo 4</b></p> 

## OPERATING PROCEDURE

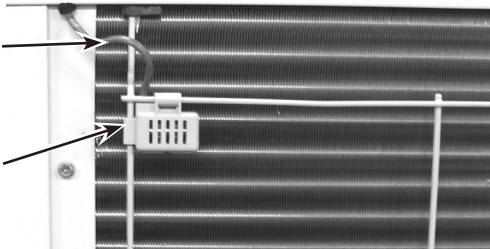
### 4. Removing the thermistor <Plate HEX liquid> (TH6) and thermistor <Ambient> (TH7)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Disconnect the connectors, TH7/6 (red) on the controller circuit board in the electrical parts box.
- (4) Loosen the 2 wire clamps on top of the electrical parts box.
- (5) Loosen the fastener for the lead wire on the controller circuit board in the electrical parts box.
- (6) Loosen the cable strap for the lead wire on the bottom of electrical parts box.
- (7) Pull out the thermistor <Plate HEX liquid> (TH6) and thermistor <Ambient> (TH7) from the sensor holder.

**Note: In case of replacing thermistor <Plate HEX liquid> (TH6) or thermistor <Ambient> (TH7), replace it together.**

#### Photo 6

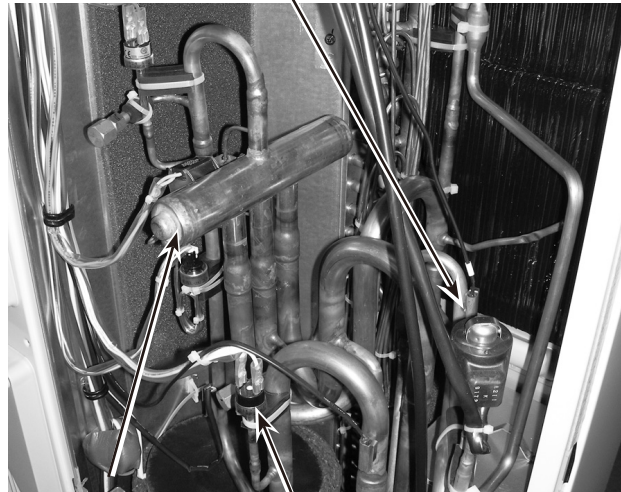
Lead wire of thermistor <Ambient> (TH7)  
Sensor holder



## PHOTOS

### Photo 5

Thermistor <Plate HEX liquid> (TH6)



4-way valve

Low pressure switch (63L)

### 5. Removing the thermistor <Discharge> (TH4) and thermistor <Comp. surface> (TH34)

- (1) Remove the service panel. (See Photo 1)
- (2) Disconnect the connector TH4 (white) on the controller circuit board in the electrical parts box.
- (4) Loosen the wire clamp on separator.
- (5) Loosen the cable strap for the lead wire on the bottom of electrical parts box.
- (6) Pull out the thermistor <Discharge> (TH4) from the sensor holder.

#### [Removing the thermistor <Comp. surface> (TH34)]

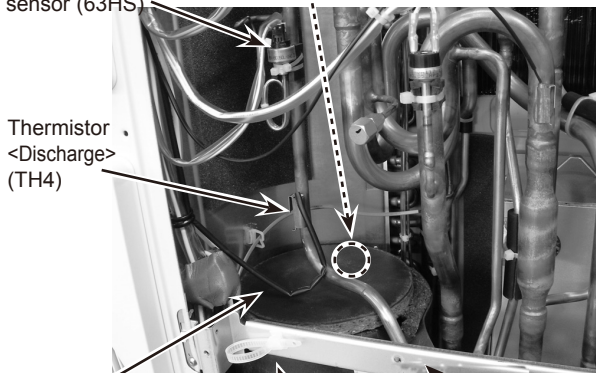
- (7) Remove the top damper, then pull out the thermistor <Comp. surface> (TH34) from the holder of the compressor shell.

### Photo 7

High pressure sensor (63HS)

Thermistor <Comp. surface> (TH34)

Thermistor <Discharge> (TH4)



Top damper

Compressor (MC)

Stay

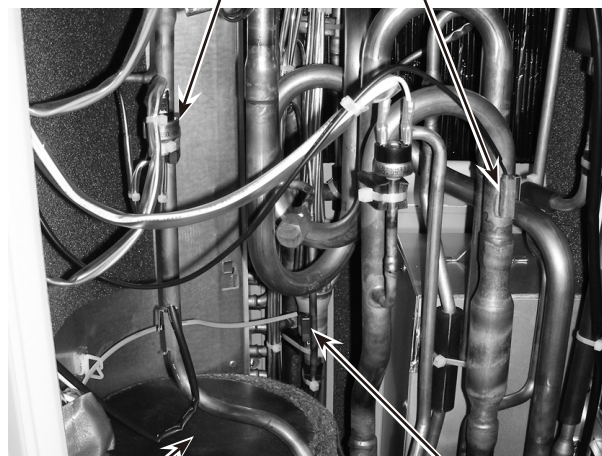
### 6. Removing the thermistor <Liquid> (TH3) and thermistor <suction> (TH33)

- (1) Remove the service panel. (See Photo 1)
- (2) Disconnect the connectors TH3 (white) and TH33 (yellow) on the controller circuit board in the electrical parts box.
- (3) Loosen the fastener for the lead wire on the controller circuit board in the electrical parts box.
- (4) Loosen the wire clamp and wire clip on separator.
- (5) Pull out the thermistor <Liquid> (TH3), <Suction> (TH33) from the sensor holder.

### Photo 8

High pressure sensor (63HS)

Thermistor <Suction> (TH33)



Compressor (MC)

Thermistor <Liquid> (TH3)

## OPERATING PROCEDURE

### 7. Removing the 4-way valve coil (21S4), and linear expansion valve coil (LEV-A, LEV-B)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)

#### [Removing the 4-way valve coil] (See Photo 9)

- (3) Remove 4-way valve solenoid coil fixing screw (M4 × 6).
- (4) Remove the 4-way valve coil by sliding the coil toward you.
- (5) Disconnect the connector 21S4 (green) on the controller circuit board in the electrical parts box.
- (6) Loosen the fastener for the lead wire on the controller circuit board in the electrical parts box.

#### [Removing the LEV coil] (See Photo 10)

- (3) Loosen the lead wires fixed to the pipes with bands.
- (4) Remove the linear expansion valve coil by sliding the coil upward.
- (5) Disconnect the connectors, LEV-A (white) and LEV-B (red) on the controller circuit board in the electrical parts box.

### 8. Removing the 4-way valve

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box. (See Photo 4)
- (4) Remove the cover panel (front). (See Photo 1)
- (5) Remove the stay.
- (6) Remove 5 right side panel fixing screws (5 × 12) (4: rear of the unit/1: right side base) and remove the right side panel.
- (7) Remove the 4-way valve coil. (See Photo 9)
- (8) Recover refrigerant.
- (9) Remove the welded part of 4-way valve.

Refer to the notes below.

### 9. Removing LEV

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box. (See Photo 4)
- (4) Remove the cover panel (front). (See Photo 1)
- (5) Remove 3 stay fixing screws (4 × 10) and remove the stay.
- (6) Remove 5 right side panel fixing screws (5 × 12) (4: rear of the unit/1: right side base) and remove the right side panel.
- (7) Remove the LEV coil.
- (8) Recover refrigerant.
- (9) Remove the welded part of LEV.

Refer to the notes below.

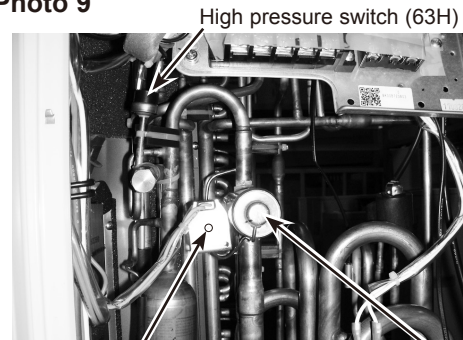
### 10. Removing the high pressure switch (63H) (See Photo 9) and the low pressure switch (63L)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box.
- (4) Remove the cover panel (front). (See Photo 1)
- (5) Remove the stay.
- (6) Remove 5 right side panel fixing screws (5 × 12) (4: rear of the unit/1: right side base) and remove the right side panel.
- (7) Pull out the lead wire of high pressure switch and low pressure switch.
- (8) Recover refrigerant.
- (9) Remove the welded part of high pressure switch and low pressure switch.

Refer to the notes on the right.

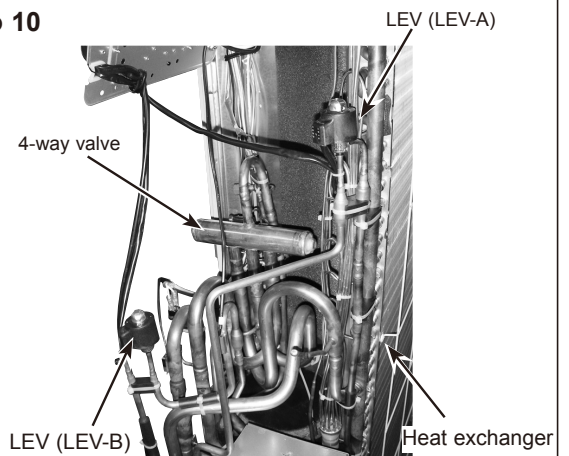
## PHOTOS

Photo 9



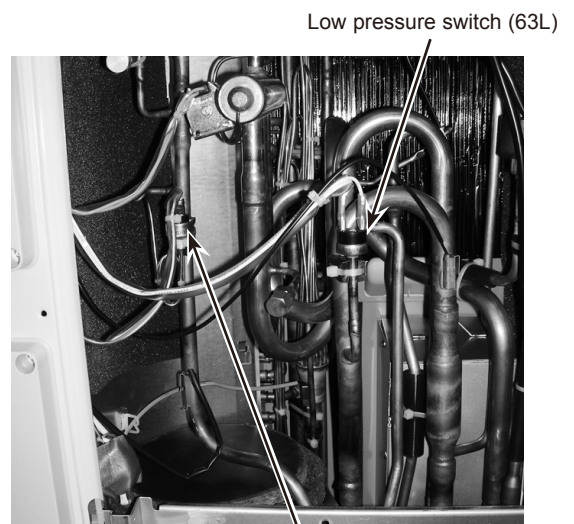
High pressure switch (63H)  
4-way valve coil fixing screw      4-way valve

Photo 10



4-way valve      LEV (LEV-A)  
LEV (LEV-B)      Heat exchanger

Photo 11



Low pressure switch (63L)  
High pressure sensor (63HS)

#### Notes:

1. Recover refrigerant without spreading it in the air.
2. The welded part can be removed easily by removing the right side panel.
3. When installing the following parts, cover it with a wet cloth to prevent it from heating, then braze the pipes so that the inside of pipes are not oxidized;
  - 4-way valve (procedure 8), 120°C or more
  - LEV (procedure 9), 120°C or more
  - High pressure switch and low pressure switch (procedure 10), 100°C or more

## OPERATING PROCEDURE

### 11. Removing high pressure sensor (63HS)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Pull out the lead wire of high pressure sensor.
- (4) Remove the 4-way valve coil. (See Photo 9)
- (5) Recover refrigerant.
- (6) Remove the welded part of high pressure sensor.

**Note 1:** Recover refrigerant without spreading it in the air.

**Note 2:** The welded part can be removed easily by removing the right side panel.

**Note 3:** When installing the high pressure sensor, make sure to cover it with a wet cloth to prevent it from heating (100°C or more), then braze the pipes so that the inside of pipes are not oxidized.

## PHOTOS

Photo 12

Low pressure switch (63L)



High pressure sensor (63HS)

### 12. Removing the plate heat exchanger

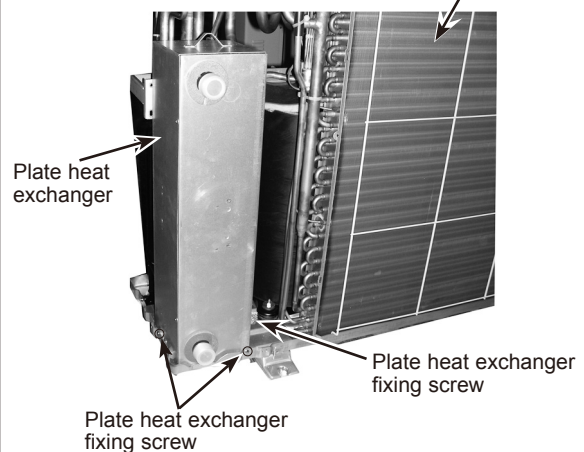
- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove 2 screws (5 × 12) and remove the front cover panel.
- (4) Remove the electrical parts box. (See Photo 4)
- (5) Remove 3 screws (4 × 10) and remove the stay.
- (6) Remove 5 screws (5 × 12) (4: rear of the unit/1: right side base) and remove the right side panel.
- (7) Recover the refrigerant
- (8) Remove 2 welded pipes of plate heat exchanger inlet and outlet.
- (9) Remove 3 plate heat exchanger fixing screws (4 × 10), then remove the plate heat exchanger.

**Note 1:** Recover refrigerant without letting it out in the air.

**Note 2:** Before removing the thermistor <Inlet water> (TH32), recover water in the plate heat exchanger.

Photo 13

Heat exchanger



## OPERATING PROCEDURE

### 13. Removing the compressor (MC)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove 2 front cover panel fixing screws (5 × 12) and remove the front cover panel.
- (4) Remove the electrical parts box. (See Photo 4)
- (5) Remove 3 stay fixing screws (4 × 10) and remove the stay.
- (6) Remove 5 right side panel fixing screws (5 × 12) (4: rear of the unit/1: right side base) and remove the right side panel.
- (7) Remove 3 separator fixing screws (4 × 10) and remove the separator.
- (8) Remove the soundproof cover for compressor.
- (9) Remove the terminal cover and remove the compressor lead wire.
- (10) Recover refrigerant.
- (11) Remove the 3 points of the compressor fixing nut using a spanner or a adjustable wrench.
- (12) Remove the welded pipe of compressor inlet and outlet then remove the compressor.

**Note: Recover refrigerant without spreading it in the air.**

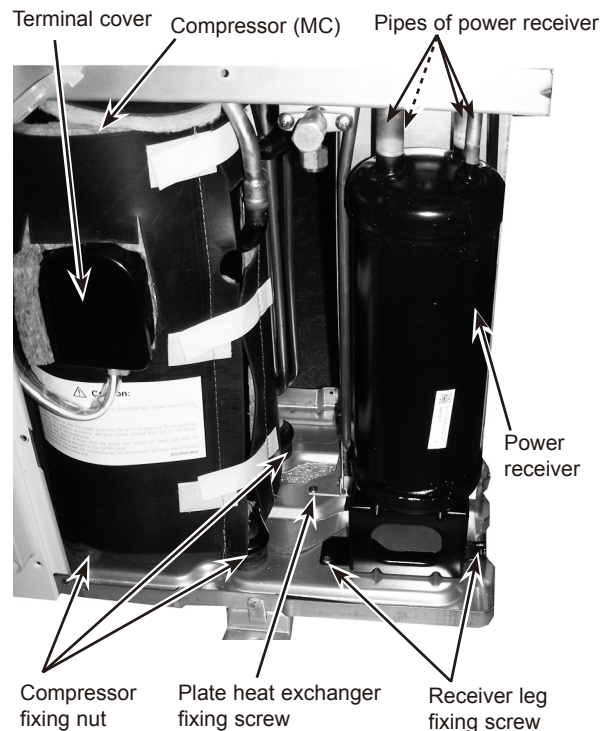
### 14. Removing the power receiver

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove 2 front cover panel fixing screws (5 × 12) and remove the front cover panel.
- (4) Remove the electrical parts box. (See Photo 4)
- (5) Remove 3 stay fixing screws (4 × 10) and remove the stay.
- (6) Remove 5 right side panel fixing screws (5 × 12) (4: rear of the unit/1: right side base) and remove the right side panel.
- (7) Recover refrigerant.
- (8) Remove 4 welded pipes of power receiver inlet and outlet.
- (9) Remove 2 receiver leg fixing screws (4 × 10).

**Note: Recover refrigerant without spreading it in the air.**

## PHOTOS

**Photo 14**



# **mitsubishi electric corporation**

HEAD OFFICE : TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

---