MITSUBISHI ELECTRIC

SPLIT-TYPE, AIR TO WATER HEAT PUMP

July 2015

No. OCH525
REVISED EDITION-C

SERVICE MANUAL

R410A

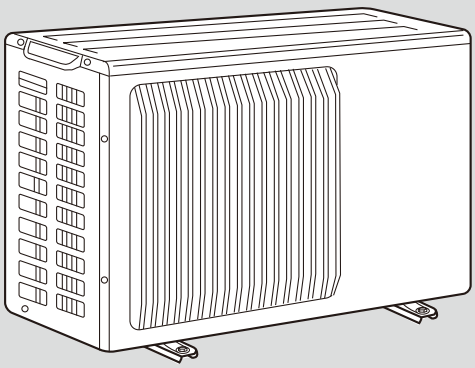
Outdoor unit

[Model Name]	[Service Ref.]
PUHZ-SW40VHA	PUHZ-SW40VHA
	PUHZ-SW40VHAR1
PUHZ-SW50VHA	PUHZ-SW50VHA
	PUHZ-SW50VHAR1
PUHZ-SW50VKA	PUHZ-SW50VKA
Salt proof model	
PUHZ-SW40VHA-BS	PUHZ-SW40VHA-BS
	PUHZ-SW40VHAR1-BS
PUHZ-SW50VHA-BS	PUHZ-SW50VHA-BS
	PUHZ-SW50VHAR1-BS
PUHZ-SW50VKA-BS	PUHZ-SW50VKA-BS

Revision:
- Added PUHZ-SW50VKA and PUHZ-SW50VKA-BS in REVISED EDITION-C.
- Some descriptions have been modified.

- Please void OCH525 REVISED EDITION-B.

Note:
- This manual describes service data of the outdoor units only.



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PARTS CATALOG (OCB525)

TECHNICAL CHANGES

Service ref. have been changed as follows.

PUHZ-SW40VHA	→	**PUHZ-SW40VHAR1**
PUHZ-SW50VHA	→	**PUHZ-SW50VHAR1**
PUHZ-SW40VHA-BS	→	**PUHZ-SW40VHAR1-BS**
PUHZ-SW50VHA-BS	→	**PUHZ-SW50VHAR1-BS**

1. Added a new function "Energy Monitor" which allows remote controller to display power consumption and heat output.

1 REFERENCE MANUAL

INDOOR UNIT SERVICE MANUAL

PUHZ-SW40VHA(-BS) PUHZ-SW50VHA(-BS)

Model Name	Service ref.	Service manual No.
EHST20C-VM6HB EHST20C-YM9HB EHST20C-TM9HB EHST20C-VM2/6B EHST20C-YM9B EHST20C-VM6EB EHST20C-YM9EB EHST20C-VM6SB	EHST20C-VM6HB.UK EHST20C-YM9HB.UK EHST20C-TM9HB.UK EHST20C-VM2/6B.UK EHST20C-YM9B.UK EHST20C-VM6EB.UK EHST20C-YM9EB.UK EHST20C-VM6SB.UK	OCH531
EHSC-VM2/6B EHSC-YM9B EHSC-TM9B EHSC-VM6EB EHSC-YM9EB ERSC-VM2B	EHSC-VM2/6B.UK EHSC-YM9B.UK EHSC-TM9B.UK EHSC-VM6EB.UK EHSC-YM9EB.UK ERSC-VM2B.UK	OCH532

PUHZ-SW40VHAR1(-BS) PUHZ-SW50VHAR1(-BS) PUHZ-SW50VKA(-BS)

Model Name	Service ref.	Service manual No.
EHST20D-VM2C EHST20D-MEC EHST20D-MHC EHST20D-MHCW EHST20D-VM2EC EHST20D-YM9C ERST20D-VM2C ERST20D-MEC	EHST20D-VM2C(R1).UK EHST20D-MEC(R1).UK EHST20D-MHC(R1).UK EHST20D-MHCW(R1).UK EHST20D-VM2EC(R1).UK EHST20D-YM9C(R1).UK ERST20D-VM2C(R1).UK ERST20D-MEC(R1).UK	OCH570
EHSD-MEC EHSD-MC EHSD-VM2C EHSD-YM9C ERSD-VM2C	EHSD-MEC(R1).UK EHSD-MC(R1).UK EHSD-VM2C(R1).UK EHSD-YM9C(R1).UK ERSD-VM2C(R1).UK	OCH571

2 SAFETY PRECAUTION

2-1. ALWAYS OBSERVE FOR SAFETY

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

2-2. CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Preparation before the repair service.

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of heat pump, 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.

Use new refrigerant pipes.

In case of using the existing pipes for R22, be careful with the following;

· Be sure to clean the pipes and make sure that the insides of the pipes are clean.
· Change flare nut to the one provided with this product. Use a newly flared pipe.
· Avoid using thin pipes.

Make sure that the inside and outside of refrigerant piping is clean and it has no contaminants such as sulfur, oxides, dirt, shaving particles, etc, which are hazard to refrigerant cycle. In addition, use pipes with specified thickness.

Contamination inside refrigerant piping can cause deterioration of refrigerant oil etc.

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.

Store the piping indoors, and both ends of the piping sealed until just before brazing. (Leave elbow joints, etc. in their packaging.)

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

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	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

The refrigerant oil applied to flare and flange connections must be ester oil, ether oil or alkylbenzene oil in a small amount.

If large amount of mineral oil enters, that can cause deterioration of refrigerant oil, etc.

Handle tools with care.

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

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.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of refrigerant will change 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.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

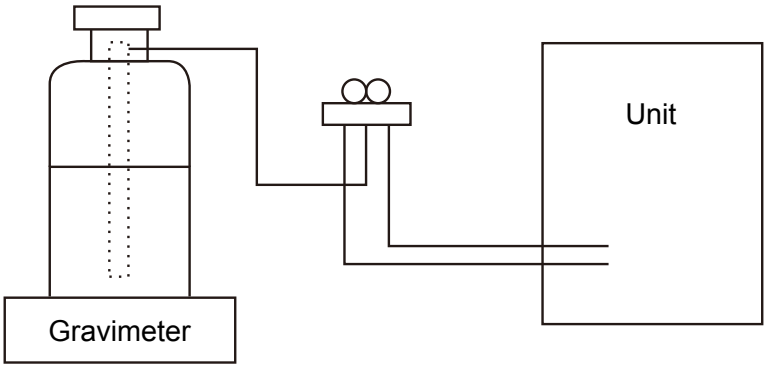
[1] Cautions for service

(1) Perform service after recovering the refrigerant left in unit completely.
(2) Do not release refrigerant in the air.
(3) After completing service, charge the cycle with specified amount of refrigerant.
(4) When performing service, install a filter drier simultaneously.
Be sure to use a filter drier for new refrigerant.

[2] Additional refrigerant charge

When charging directly from cylinder

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



[3] Service tools

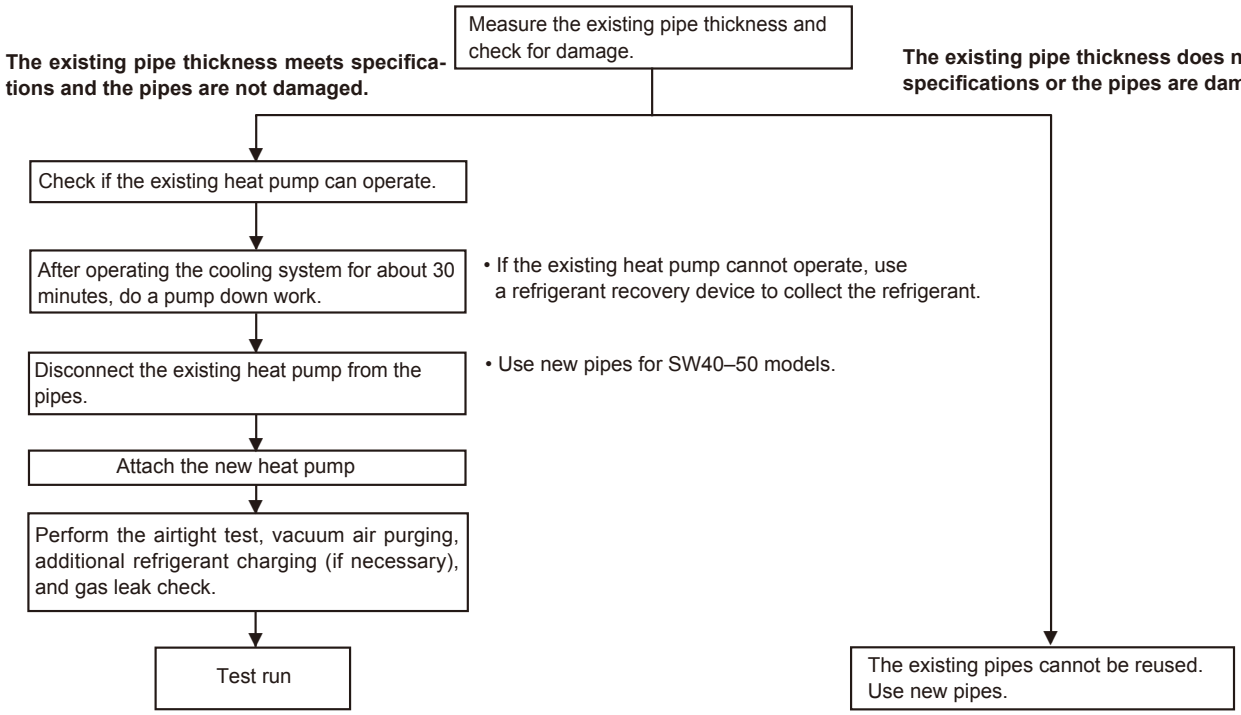
Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	· Only for R410A
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 5.3MPa·G or over.
②	Charge hose	· Only for R410A
		· Use pressure performance of 5.09MPa·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	——

2-3. PRECAUTIONS WHEN REUSING EXISTING R22 REFRIGERANT PIPES

(1) Flowchart

- Refer to the flowchart below to determine if the existing pipes can be used and if it is necessary to use a filter dryer.
- If the diameter of the existing pipes is different from the specified diameter, refer to technological data materials to confirm if the pipes can be used.



2-4. 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) Cautions for refrigerant piping work

New refrigerant R410A is adopted for replacement inverter series. Although the refrigerant piping work for R410A is same as for R22, exclusive tools are necessary so as not to mix with different kind of refrigerant. Furthermore as the working pressure of R410A is 1.6 times higher than that of R22, their sizes of flared sections and flare nuts are different.

① Thickness of pipes

Because the working pressure of R410A is higher compared to R22, be sure to use refrigerant piping with thickness shown below. (Never use pipes of 0.7 mm or below.)

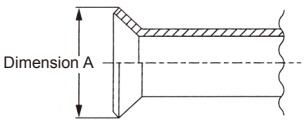
Diagram below: Piping diameter and thickness

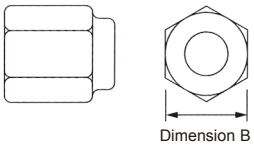
Nominal dimensions (in)	Outside diameter (mm)	Thickness (mm)	
		R410A	R22
1/4	6.35	0.8	0.8
3/8	9.52	0.8	0.8
1/2	12.70	0.8	0.8
5/8	15.88	1.0	1.0
3/4	19.05	—	1.0

② Dimensions of flare cutting and flare nut

The component molecules in HFC refrigerant are smaller compared to conventional refrigerants. In addition to that, R410A is a refrigerant, which has higher risk of leakage because its working pressure is higher than that of other refrigerants. Therefore, to enhance airtightness and strength, flare cutting dimension of copper pipe for R410A has been specified separately from the dimensions for other refrigerants as shown below. The dimension B of flare nut for R410A also has partly been changed to increase strength as shown below. Set copper pipe correctly referring to copper pipe flaring dimensions for R410A below. For 1/2 and 5/8 inch pipes, the dimension B changes.

Use torque wrench corresponding to each dimension.





Flare cutting dimensions

Nominal dimensions (in)	Outside diameter (mm)	Dimension A ($^{+0}_{-0.4}$) (mm)	
		R410A	R22
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	—	23.3

Flare nut dimensions

Nominal dimensions (in)	Outside diameter (mm)	Dimension B (mm)	
		R410A	R22
1/4	6.35	17.0	17.0
3/8	9.52	22.0	22.0
1/2	12.70	26.0	24.0
5/8	15.88	29.0	27.0
3/4	19.05	—	36.0

③ Tools for R410A (The following table shows whether conventional tools can be used or not.)

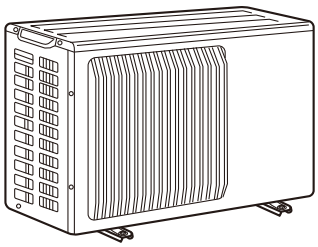
Tools and materials	Use	R410A tools	Can R22 tools be used?	Can R407C tools be used?
Gauge manifold	Air purge, refrigerant charge and operation check	Tool exclusive for R410A	×	×
Charge hose		Tool exclusive for R410A	×	×
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Refrigerant recovery	Tool exclusive for R410A	×	×
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R410A	×	×
Applied oil	Apply to flared section	Ester oil and alkylbenzene oil (minimum amount)	×	Ester oil: ○ Alkylbenzene oil: minimum amount
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)
Flare tool	Flaring work of piping	Tools for other refrigerants can be used by adjusting flaring dimension	△ (Usable by adjusting flaring dimension)	△ (Usable by adjusting flaring dimension)
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	Refrigerant charge	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.

3 FEATURES



PUHZ-SW40VHA
PUHZ-SW40VHA-BS
PUHZ-SW40VHAR1
PUHZ-SW40VHAR1-BS
PUHZ-SW50VHA
PUHZ-SW50VHA-BS
PUHZ-SW50VHAR1
PUHZ-SW50VHAR1-BS
PUHZ-SW50VKA
PUHZ-SW50VKA-BS

CHARGELESS SYSTEM
PRE-CHARGED REFRIGERANT IS SUPPLIED FOR PIPING LENGTH AT SHIPMENT maximum 10 m (PUHZ-SW40/SW50)

The refrigerant circuit with LEV (Linear Expansion Valve) and power receiver always control the optimal refrigerant level regardless of the length (10 m maximum and 5 m minimum) of piping. The additional refrigerant charging work during installation often causes problems. It is completely eliminated by chargeless system. This unique system improves the quality and reliability of the work done. It also helps to speed up the installation time.

4 SPECIFICATIONS

PUHZ-SW40VHA **PUHZ-SW40VHAR1**
PUHZ-SW40VHA-BS **PUHZ-SW40VHAR1-BS**
PUHZ-SW50VHA **PUHZ-SW50VHAR1** **PUHZ-SW50VKA**
PUHZ-SW50VHA-BS **PUHZ-SW50VHAR1-BS** **PUHZ-SW50VKA-BS**

<Reference data> Plate heat exchanger (ACH70-40 plates)

(SW40)

Nominal water flow		L/min	11.8
Heating (A7/W35)	Capacity	kW	4.10
	COP		4.80
	Power input	kW	0.85
Heating (A7/W45)	Capacity	kW	4.10
	COP		3.63
	Power input	kW	1.13
Heating (A2/W35)	Capacity	kW	4.00
	COP		3.24
	Power input	kW	1.24
Heating (A2/W45)	Capacity	kW	4.00
	COP		2.68
	Power input	kW	1.49
Nominal water flow		L/min	10.3
Cooling (A35/W7)	Capacity	kW	3.60
	EER		2.71
	Power input	kW	1.33
Cooling (A35/W18)	Capacity	kW	3.60
	EER		4.65
	Power input	kW	0.77

(SW50)

			VHA	VKA
Nominal water flow		L/min	17.2	15.8
Heating (A7/W35)	Capacity	kW	6.00	5.50
	COP		4.42	4.42
	Power input	kW	1.36	1.24
Heating (A7/W45)	Capacity	kW	6.00	5.50
	COP		3.32	3.32
	Power input	kW	1.81	1.66
Heating (A2/W35)	Capacity	kW	5.00	5.00
	COP		2.97	2.97
	Power input	kW	1.68	1.68
Heating (A2/W45)	Capacity	kW	5.00	5.00
	COP		2.47	2.47
	Power input	kW	2.02	2.02
Nominal water flow		L/min	12.9	12.9
Cooling (A35/W7)	Capacity	kW	4.50	4.50
	EER		2.38	2.76
	Power input	kW	1.89	1.63
Cooling (A35/W18)	Capacity	kW	5.00	5.00
	EER		3.96	4.60
	Power input	kW	1.26	1.09

Note: "COP" and "Power input" in the table above do **NOT** include the "pump input (based on EN 14511)".

Rating conditions

Nominal operating condition	
Heating (A7/W35)	
Outside air temperature (Dry-bulb)	+ 7°C
Outside air temperature (Wet-bulb)	+ 6°C
Water temperature (inlet/outlet)	+ 30°C/+ 35°C
Heating (A7/W45)	
Outside air temperature (Dry-bulb)	+ 7°C
Outside air temperature (Wet-bulb)	+ 6°C
Water temperature (inlet/outlet)	+ 40°C/+ 45°C
Heating (A2/W35)	
Outside air temperature (Dry-bulb)	+ 2°C
Outside air temperature (Wet-bulb)	+ 1°C
Water temperature (inlet/outlet)	+ 30°C/+ 35°C
Heating (A2/W45)	
Outside air temperature (Dry-bulb)	+ 2°C
Outside air temperature (Wet-bulb)	+ 1°C
Water temperature (inlet/outlet)	+ 40°C/+ 45°C
Cooling (A35/W7)	
Outside air temperature (Dry-bulb)	+ 35°C
Outside air temperature (Wet-bulb)	+ 24°C
Water temperature (inlet/outlet)	+ 12°C/+ 7°C
Cooling (A35/W18)	
Outside air temperature (Dry-bulb)	+ 35°C
Outside air temperature (Wet-bulb)	+ 24°C
Water temperature (inlet/outlet)	+ 23°C/+ 18°C

Service Ref.				**PUHZ-SW40VHA PUHZ-SW40VHA-BS PUHZ-SW40VHAR1 PUHZ-SW40VHAR1-BS**	**PUHZ-SW50VHA PUHZ-SW50VHA-BS PUHZ-SW50VHAR1 PUHZ-SW50VHAR1-BS**	**PUHZ-SW50VKA PUHZ-SW50VKA-BS**
OUTDOOR UNIT	Power supply (phase, cycle, voltage)			Single, 50Hz, 230V		
	Max. current		A	13		
	External finish			Munsell 3Y 7.8/1.1		
	Refrigerant control			Linear Expansion Valve		
	Compressor			Hermetic scroll		
	Model			SNB130FGCM2		SNB130FTCM2
	Motor output		kW	0.9		
	Starter type			Inverter		
	Protection devices			HP switch Comp. surface thermo Discharge thermo Overcurrent detection		
	Crankcase heater		W	—		
	Heat exchanger			Plate fin coil		
	Fan	Fan(drive) × No.		Propeller fan × 1		
		Fan motor output	kW	0.040		0.046
		Airflow	m³/min(CFM)	35 (1,240)		45 (1,590)
	Defrost method			Reverse cycle		
	Noise level	Cooling	dB	45	46	
		Heating	dB	45	46	
	Dimensions	W	mm (in)	800 (31-1/2)		809+62 (31-13/16+2-7/16)
		D	mm (in)	300+23 (11-13/16+7/8)		300 (11-3/16)
		H	mm (in)	600 (23-5/8)		630 (24-13/16)
	Weight		kg (lb)	42 (93)		43 (95)
	Refrigerant			R410A		
	Charge		kg (lb)	2.1 (4.6)		1.4 (3.1)
	Oil (Model)		L	0.50 (FV50S)		
REFRIGERANT PIPING	Pipe size O.D.	Liquid	mm (in)	6.35 (1/4)		
		Gas	mm (in)	12.7 (1/2)		
	Connection method	Indoor side		Flared		
		Outdoor side		Flared		
	Between the indoor & outdoor unit	Height difference		Maximum 10 m		Maximum 30 m
		Piping length		2 to 40 m		

5 DATA

5-1. REFILLING REFRIGERANT CHARGE (R410A: kg)

Service Ref.	Piping length (one way)							Initial charged
	10 m	20 m	30 m	40 m	50 m	60 m	75 m	
PUHZ-SW40VHA PUHZ-SW40VHA-BS PUHZ-SW40VHAR1 PUHZ-SW40VHAR1-BS	2.1	2.3	2.5	2.7	—	—	—	2.1
PUHZ-SW50VHA PUHZ-SW50VHA-BS PUHZ-SW50VHAR1 PUHZ-SW50VHAR1-BS	2.1	2.3	2.5	2.7	—	—	—	2.1
PUHZ-SW50VKA PUHZ-SW50VKA-BS	1.4	1.6	1.8	2.0	—	—	—	1.4

Additional charge is required for pipes longer than 10 m.

5-2. COMPRESSOR TECHNICAL DATA

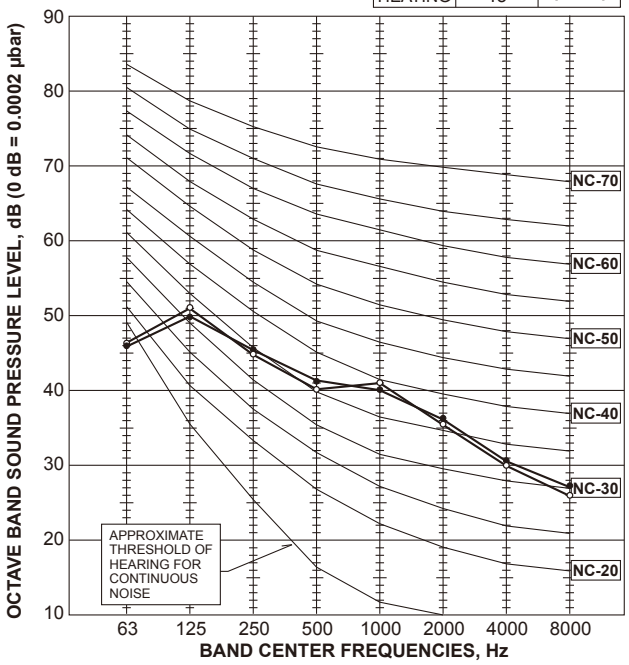
(at 20°C)

Service Ref.		**PUHZ-SW40VHA(-BS) PUHZ-SW40VHAR1(-BS) PUHZ-SW50VHA(-BS) PUHZ-SW50VHAR1(-BS)**	**PUHZ-SW50VKA(-BS)**
Compressor model		**SNB130FGCM2**	**SNB130FTCM2**
Winding Resistance (Ω)	**U-V**	**0.64**	**0.64**
	U-W	**0.64**	**0.64**
	W-V	**0.64**	**0.64**

5-3. NOISE CRITERION CURVES

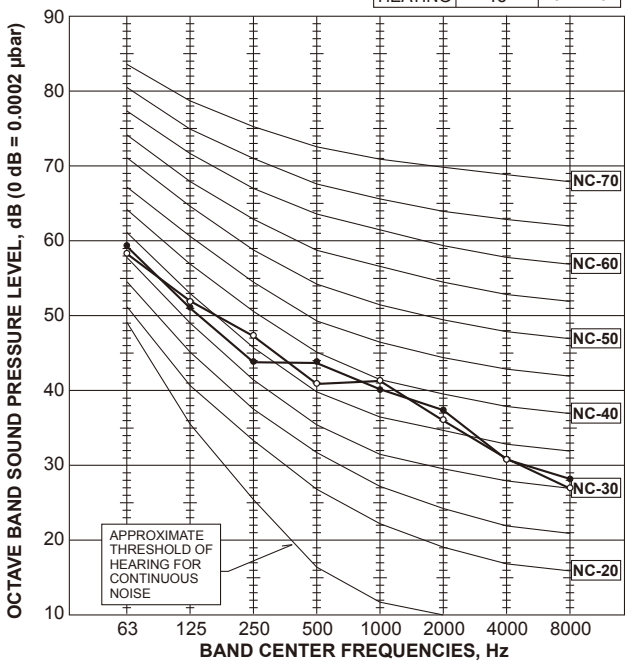
PUHZ-SW40VHA(-BS)
PUHZ-SW40VHAR1(-BS)

MODE	SPL(dB)	LINE
COOLING	45	○—○
HEATING	45	●—●



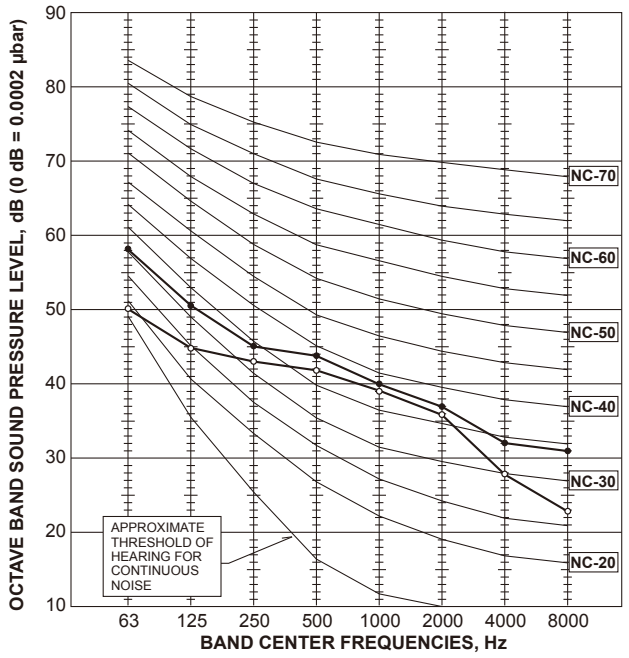
PUHZ-SW50VHA(-BS)
PUHZ-SW50VHAR1(-BS)

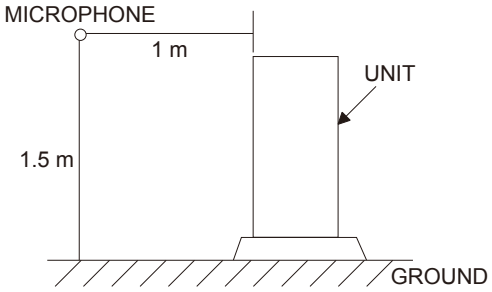
MODE	SPL(dB)	LINE
COOLING	46	○—○
HEATING	46	●—●



PUHZ-SW50VKA(-BS)

MODE	SPL(dB)	LINE
COOLING	46	○—○
HEATING	46	●—●

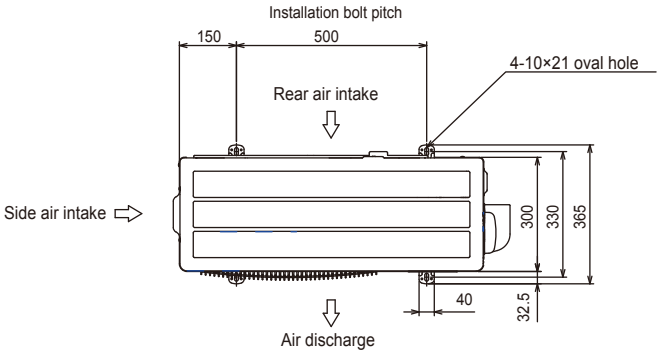


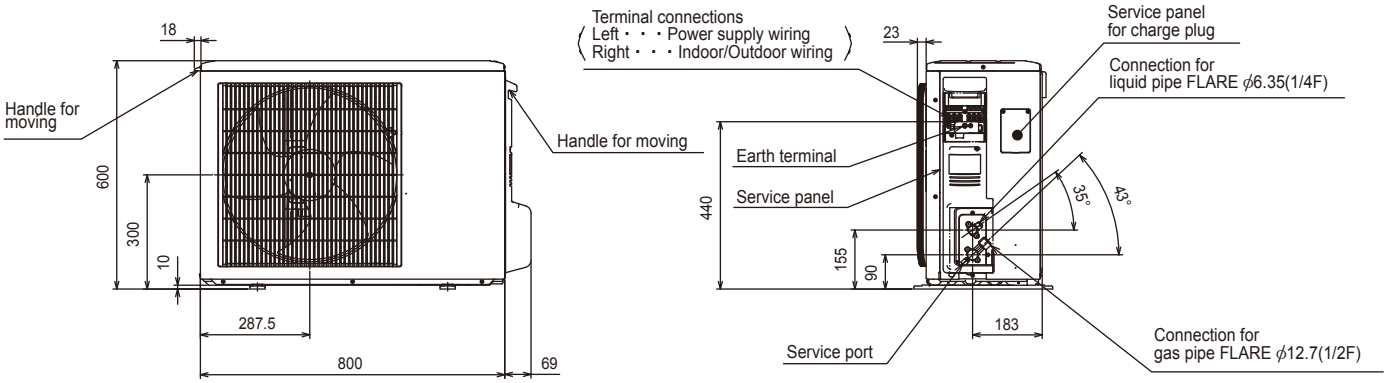


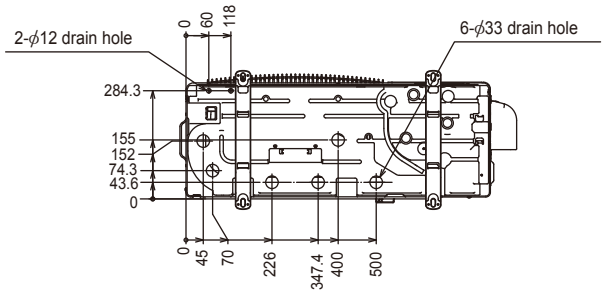
6 OUTLINES AND DIMENSIONS

PUHZ-SW40VHA PUHZ-SW40VHAR1 PUHZ-SW50VHA PUHZ-SW50VHAR1
PUHZ-SW40VHA-BS PUHZ-SW40VHAR1-BS PUHZ-SW50VHA-BS PUHZ-SW50VHAR1-BS

Unit: mm

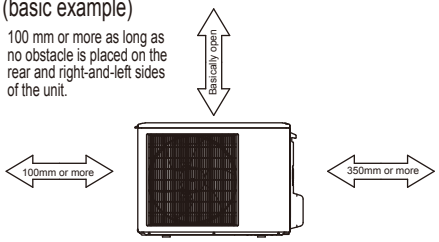




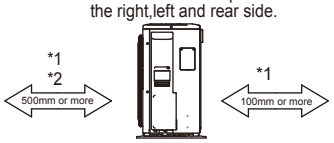


Free space around the outdoor unit (basic example)

100 mm or more as long as no obstacle is placed on the rear and right-and-left sides of the unit.



2 sides should be open in the right,left and rear side.



Minimum installation space for outdoor unit

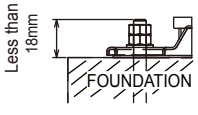
*1 In the place where short cycle tends to occur,cooling and heating capacity and power consumption might get lowered 10%. Air outlet guide (optional PAC-SG58SG) will help them improve.

*2 If air discharges to the wall, the surface might det stained.

FOUNDATION BOLTS

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

<Foundation bolt height>

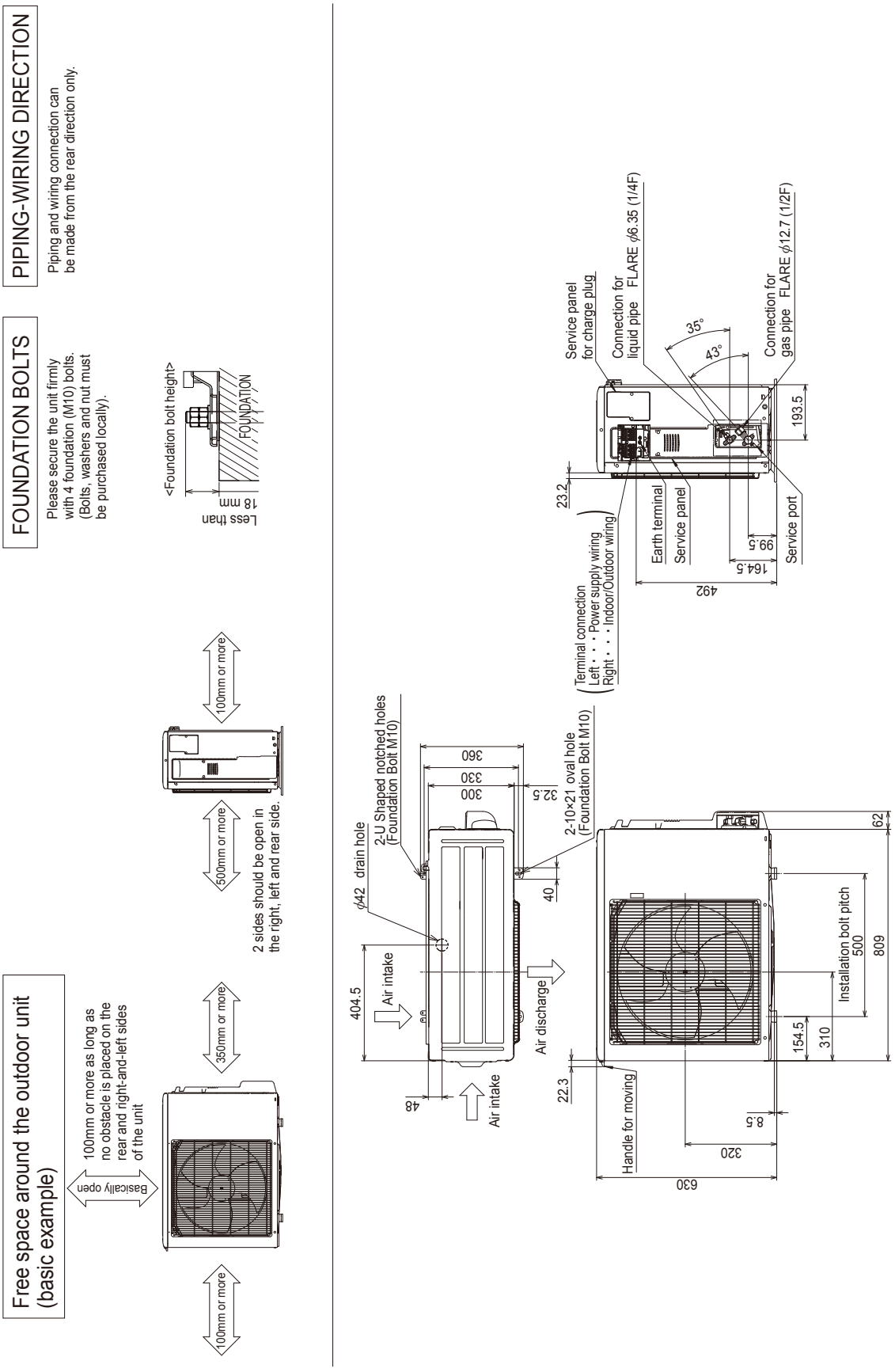


PIPING-WIRING DIRECTION

Piping and wiring connection can be made from the rear direction only.

PUHZ-SW50VKA
PUHZ-SW50VKA-BS

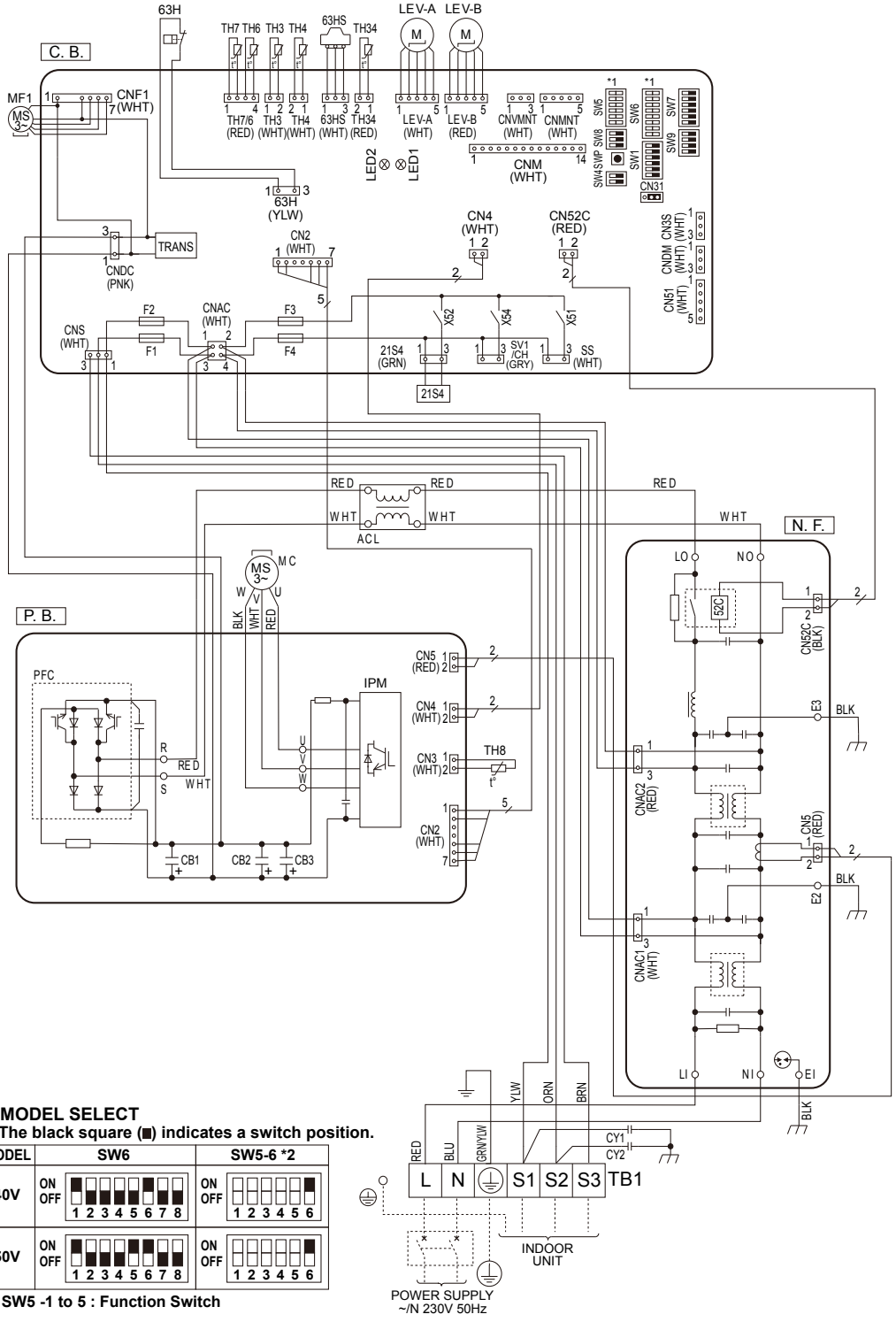
Unit: mm



7 WIRING DIAGRAM

PUHZ-SW40VHA PUHZ-SW40VHAR1 PUHZ-SW50VHA PUHZ-SW50VHAR1
PUHZ-SW40VHA-BS PUHZ-SW40VHAR1-BS PUHZ-SW50VHA-BS PUHZ-SW50VHAR1-BS

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block <Power Supply, Indoor/Outdoor>	P. B.	Power Circuit Board	SW5	Switch <Function Switch, Model Select>
MC	Motor for Compressor	R, S	Connection Terminal <L/N-Phase>	SW6	Switch <Model Select>
MF1	Fan Motor	U, V, W	Connection Terminal <U/V/W-Phase>	SW7	Switch <Function Switch>
21S4	Solenoid Valve (Four-Way Valve)	IPM	Power Module	SW8	Switch <Function Switch>
63H	High Pressure Switch	PFC	Converter	SW9	Switch <Function Switch>
63HS	High Pressure Sensor	CB1, CB2, CB3	Main Smoothing Capacitor	SWP	Switch <Pump Down>
TH3	Thermistor <Liquid>	N. F.	Noise Filter Circuit Board	CN31	Connector <Emergency Operation>
TH4	Thermistor <Discharge>	LI, LO	Connection Terminal <L-Phase>	CNDM	Connector <Connection for Option>
TH6	Thermistor <2-Phase Pipe>	NI, NO	Connection Terminal <N-Phase>	CN51	Connector <Connection for Option>
TH7	Thermistor <Ambient>	EI, E2, E3	Connection Terminal <Ground>	SV1/CH	Connector <Connection for Option>
TH8	Thermistor <Heat Sink>	52C	52C Relay	SS	Connector <Connection for Option>
TH34	Thermistor <Comp. Surface>	C. B.	Controller Circuit Board	CNM	Connector <Connection for Option>
LEV-A, LEV-B	Linear Expansion Valve	SW1	Switch <Manual Defrost, Defect History, Record Reset, Refrigerant Address>	LED1, LED2	LED<Operation Inspection Indicators>
ACL	Reactor			F1, F2, F3, F4	Fuse <T6.3AL250V>
CY1, CY2	Capacitor	SW4	Switch <Test Operation>	X51, X52, X54	Relay



***1 MODEL SELECT**
The black square (■) indicates a switch position.

MODEL	SW6	SW5-6 *2
40V	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6
50V	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6

***2 SW5 -1 to 5 : Function Switch**

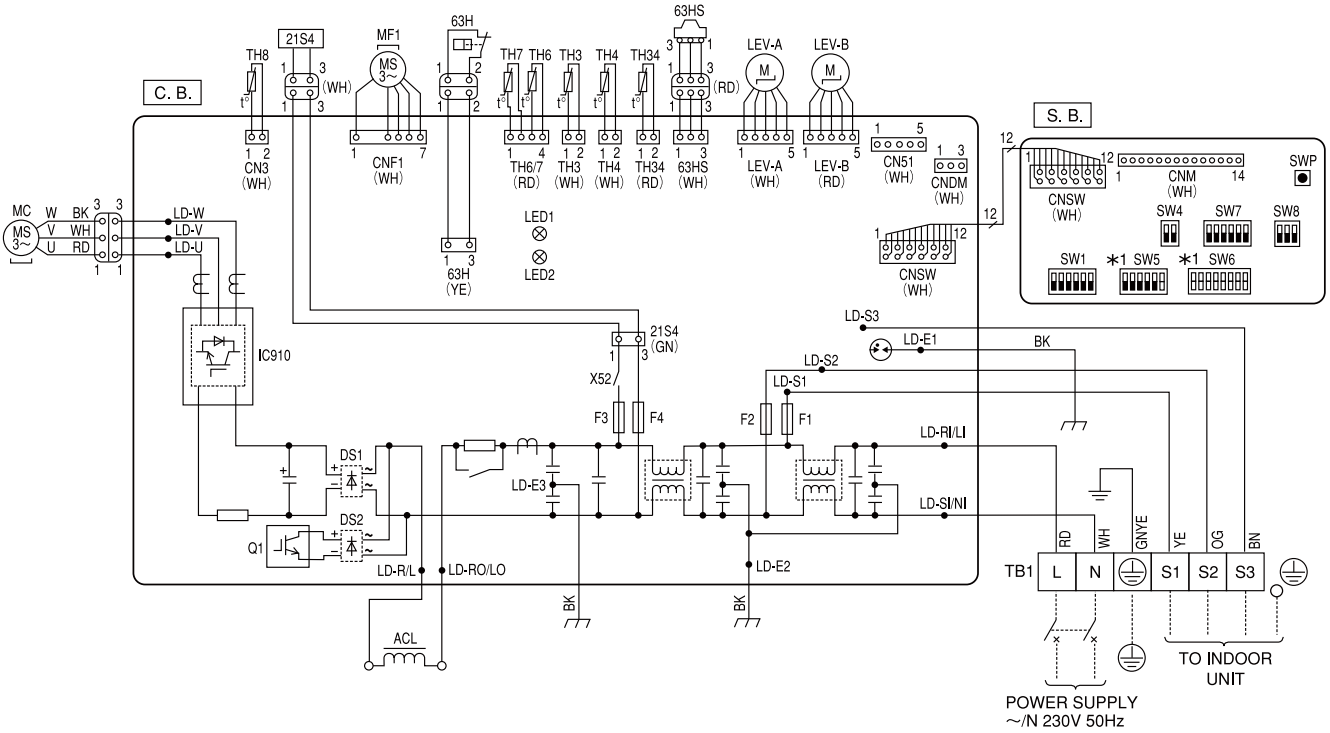
PUHZ-SW50VKA
PUHZ-SW50VKA-BS

SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block<Power Supply, Indoor/Outdoor>	C. B.	Controller Circuit Board
MC	Motor for Compressor	F1, F2	Fuse<T10AL250V>
MF1	Fan Motor	F3, F4	Fuse<T3.15AL250V>
21S4	Solenoid Valve (4-Way Valve)	CNDM	Connector<Connection for Option>
63H	High Pressure Switch	CN51	Connector<Connection for Option>
63HS	High Pressure Sensor	S. B.	Switch Board
TH3	Thermistor<Liquid>	SW1	Switch<Manual Defrost, Defect History Record Reset, Refrigerant Address>
TH4	Thermistor<Discharge>	SW4	Switch<Function Switch>
TH6	Thermistor<2-Phase Pipe>	SW5	Switch<Function Switch, Model Select>
TH7	Thermistor<Ambient>	SW6	Switch<Model Select>
TH8	Thermistor<Heat Sink>	SW7	Switch<Function Switch>
TH34	Thermistor<Comp. Surface>	SW8	Switch<Function Switch>
LEV-A, LEV-B	Linear Expansion Valve	SWP	Switch<Pump Down>
ACL	Reactor	CNM	Connector<Connection for Option>

∗1 MODEL SELECT
The black square (■) indicates a switch position.

MODEL	SW6	SW5-6 ∗2
50V	ON / OFF 1 2 3 4 5 6 7 8	ON / OFF 1 2 3 4 5 6

∗2 SW5 -1 to 5 : Function Switch



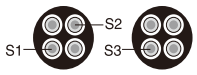
8 WIRING SPECIFICATIONS

FIELD ELECTRICAL WIRING (power wiring specifications)

Outdoor unit model			SW40, 50V
Outdoor unit power supply			~/N (single), 50 Hz, 230 V
Outdoor unit input capacity Main switch (Breaker)		*1	16 A
Wiring Wire No. × size (mm²)	Outdoor unit power supply		3 × Min. 1.5
	Indoor unit-Outdoor unit	*2	3 × 1.5 (Polar)
	Indoor unit-Outdoor unit earth	*2	1 × Min. 1.5
	Remote controller-Indoor unit	*3	2 × 0.3 (Non-polar)
Circuit rating	Outdoor unit L-N (single) Outdoor unit L1-N, L2-N, L3-N (3 phase)	*4	230 V AC
	Indoor unit-Outdoor unit S1-S2	*4	230 V AC
	Indoor unit-Outdoor unit S2-S3	*4	24 V DC
	Remote controller-Indoor unit	*4	12 V DC

*1. A breaker with at least 3.0 mm contact separation in each poles 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 inadequate breaker can cause the incorrect operation of inverter.

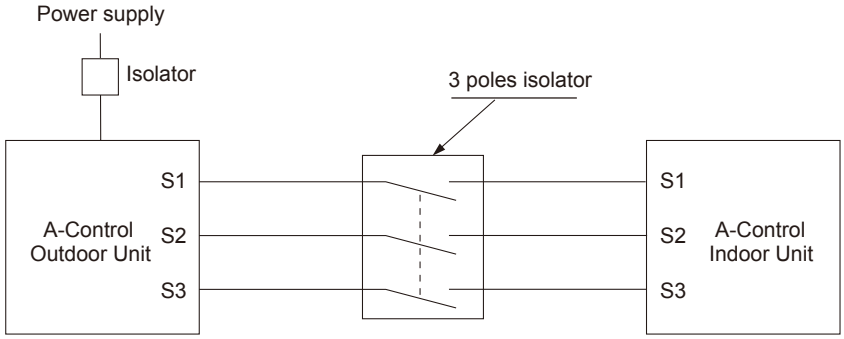
*2. Maximum 45 m
If 2.5 mm² is used, maximum 50 m.
If 2.5 mm² is used and S3 is separated, maximum 80 m.



*3. The 10 m wire is attached in the remote controller accessory.
*4. The figures are NOT always against the ground.
S3 terminal has 24 V DC 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.**

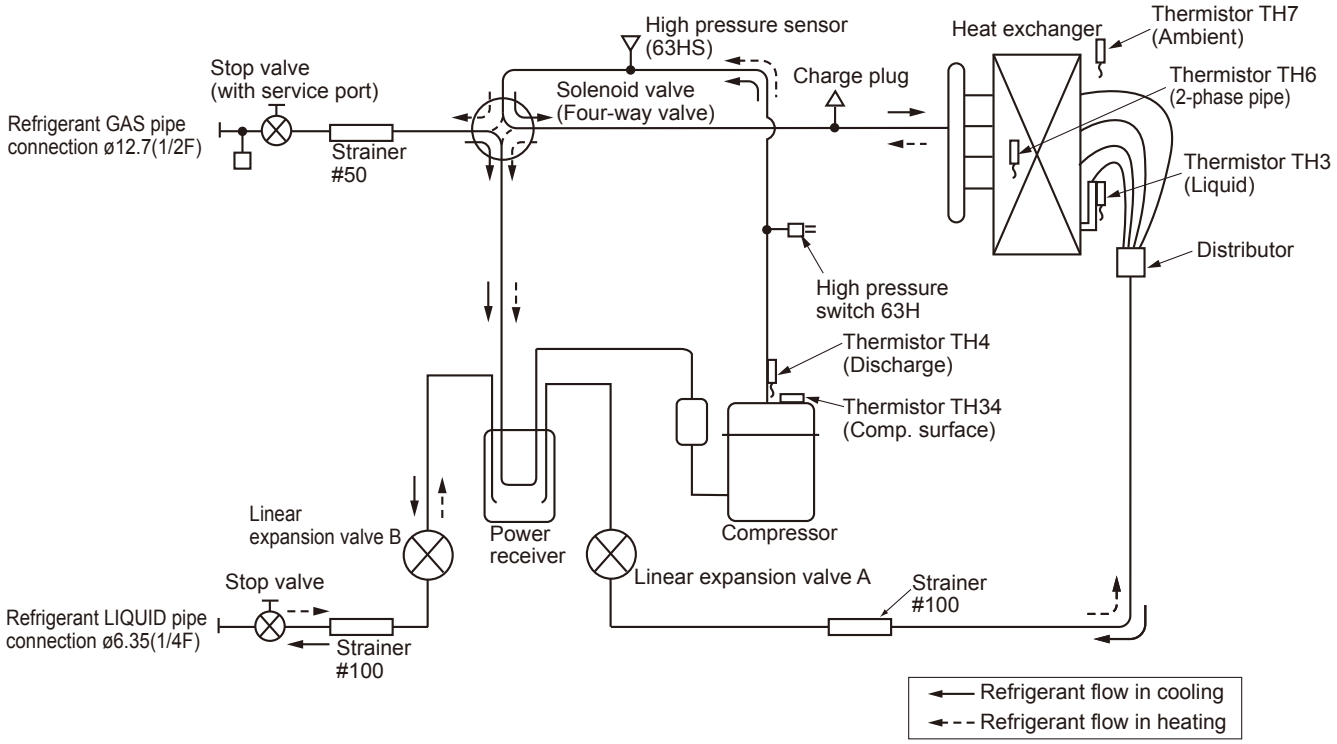
Notes: 1. Wiring size must comply with the applicable local and national code.
2. Power supply cables and Indoor/Outdoor unit connecting cables shall not be lighter than polychloroprene sheathed flexible cable. (Design 60245 IEC 57)
3. Install an earth longer than other cables.



⚠ **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 indoor unit and outdoor unit, please use 3-pole type.

9 REFRIGERANT SYSTEM DIAGRAM

PUHZ-SW40VHA **PUHZ-SW40VHAR1**
PUHZ-SW40VHA-BS **PUHZ-SW40VHAR1-BS**
PUHZ-SW50VHA **PUHZ-SW50VHAR1** **PUHZ-SW50VKA**
PUHZ-SW50VHA-BS **PUHZ-SW50VHAR1-BS** **PUHZ-SW50VKA-BS** **Unit: mm (in)**



Symbol	Part name	Detail
COMP	Compressor	DC inverter twin rotary compressor (Mitsubishi Electric Corporation)
H/P SW	High pressure switch (63H)	For protection (OFF: 4.15MPa)
REV/V	Reversing (4-way) valve (21S4)	Change the refrigerant circuit (Heating / Cooling) and for Defrosting
Charge plug	Charge plug	High pressure/Low pressure/For production test use
P-Sensor	High pressure sensor (63HS)	For calculation of the condensing temperature from high pressure
LEV-A	Linear expansion valve -A	Heating: Secondary LEV Cooling: Primary LEV
LEV-B	Linear expansion valve -B	Heating: Primary LEV Cooling: Secondary LEV
TH3	Liquid temperature thermistor	Heating: Evaporating temperature Cooling: Sub cool liquid temperature
TH4	Discharge temperature thermistor	For LEV control and for compressor protection
TH6	2-phase pipe temperature thermistor	Outdoor 2-phase pipe temperature
TH7	Ambient temperature thermistor	For fan control and for compressor frequency control
TH34	Comp.surface temperature thermistor	For compressor protection
Power Receiver	Power Receiver	For accumulation of refrigerant

9-1. REFRIGERANT COLLECTING (PUMP DOWN)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.

①Supply power (circuit breaker).

- When power is supplied, make sure that “CENTRALLY CONTROLLED” is not displayed on the remote controller. If “CEN TRALLY CONTROLLED” is displayed, the refrigerant collecting (pump down) cannot be completed normally.
- Start-up of the indoor-outdoor communication takes about 3 minutes after the power (circuit breaker) is turned on. Start the pump-down operation 3 to 4 minutes after the power (circuit breaker) is turned ON.
- In the case of multi-units control, before powering on, disconnect the wiring between the master indoor unit and the slave indoor unit. For more details refer to the installation manual for the indoor unit.

②After the liquid stop valve is closed, set the SWP switch on the control board or switch board of the outdoor unit to ON. The compressor (outdoor unit) and ventilators (indoor and outdoor units) start operating and refrigerant collecting operation begins. LED1 and LED2 on the control board or switch board of the outdoor unit are lit.

- Only set the SWP switch (push-button type) to ON if the unit is stopped. However, even if the unit is stopped and the SWP switch is set to ON less than 3 minutes after the compressor stops, the refrigerant collecting operation cannot be performed. Wait until compressor has been stopped for 3 minutes and then set the SWP switch to ON again.

③Because the unit automatically stops in about 2 to 3 minutes when the refrigerant collecting operation is completed (LED1 off, LED2 lit), be sure to quickly close the gas stop valve. If LED1 is lit and LED2 is off and the outdoor unit is stopped, refrigerant collection is not properly performed. Open the liquid stop valve completely, and then repeat step ② after 3 minutes have passed.

- If the refrigerant collecting operation has been completed normally (LED1 off, LED2 lit), the unit will remain stopped until the power supply is turned off.

④Turn off the power supply (circuit breaker).

- Note that when the extension piping is very long with large refrigerant amount, it may not be possible to perform a pump-down operation. When performing the pump-down operation, make sure that the low pressure is lowered to near 0 MPa (gauge).

⚠ **Warning:**

When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes. The compressor may burst if air, etc. enters the system.

10 TROUBLESHOOTING

10-1. TROUBLESHOOTING

<Check code displayed by self-diagnosis and actions to be taken for service (summary)>
Present and past check codes are logged, and they can be displayed on the control board or switch board of outdoor unit. Actions to be taken for service, which depends on whether or not the trouble is reoccurring in the field, 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 "10-3. 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.

10-2. CHECK POINT UNDER TEST RUN

Before test run
- After installation of outdoor unit, 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.)

Warning:
Do not use the system if the insulation resistance is less than 1.0 MΩ.

Caution:
Do not carry out this test on the control wiring (low voltage circuit) terminals.

10-3. SELF-DIAGNOSIS ACTION TABLE

<Abnormalities detected when the power is put on>

Note: Refer to indoor unit section for code P and code E.

Check Code	Abnormal points and detection method	Case	Judgment and action
None	—	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) ② Electric power is not supplied 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 terminal on outdoor power circuit board) ③ Electric power is not supplied to outdoor controller circuit board. a) Disconnection of connector (CNDC) ④ Disconnection of reactor (ACL) ⑤ Disconnection of outdoor noise filter circuit board or parts failure in outdoor noise filter circuit board (SW40/50VHA(R1) only) ⑥ Defective outdoor power circuit board (SW40/50VHA(R1) only) ⑦ Defective outdoor controller circuit board	① Check following items. a) Power supply breaker b) Connection of power supply terminal block. (TB1) c) Connection of power supply terminal block. (TB1) ② Check following items. a) Connection of power supply terminal block (TB1) b) Connection of terminal on outdoor power circuit board ③ Check connection of the connector (CNDC) on the outdoor controller circuit board. Check connection of the connector, LD1 and LD2 for SW40/50VHA on the outdoor power circuit board. Refer to "10-9. TEST POINT DIAGRAM". ④ Check connection of reactor (ACL). Check connection of “LO” and “NO” on the outdoor noise filter circuit board for SW40/50VHA. Check connection of “R” and “S” on the outdoor power circuit board for SW40/50VHA. Refer to "10-9. TEST POINT DIAGRAM". Check connection of reactor for SW50VKA. Refer to "7. WIRING DIAGRAM". ⑤ a) Check connection of outdoor noise filter circuit board for SW40/50VHA. b) Replace outdoor noise filter circuit board for SW40/50VHA. Refer to "10-9. TEST POINT DIAGRAM". ⑥ Replace outdoor power circuit board. ⑦ Replace outdoor controller circuit board (When items above are checked but the units cannot be repaired).
F5	**63H connector open** Abnormal if 63H connector circuit is open for 3 minutes continuously after power supply. 63H: High-pressure switch	① Disconnection or contact failure of 63H connector on outdoor controller circuit board ② Disconnection or contact failure of 63H ③ 63H is working due to defective parts. ④ Defective outdoor controller circuit board	① Check connection of 63H connector on outdoor controller circuit board. Refer to "10-9. TEST POINT DIAGRAM". ② Check the 63H side of connecting wire. ③ Check continuity by tester. Replace the parts if the parts are defective. ④ Replace outdoor controller circuit board.

Check Code	Abnormal points and detection method	Case	Judgment and action
EA	**Miswiring of indoor/outdoor unit connecting wire** 1. Outdoor controller circuit board can automatically check the number of connected indoor units. Abnormal if the number cannot be checked automatically due to miswiring of indoor/outdoor unit connecting wire, etc. after power is turned on for 4 minutes. 2. Abnormal if outdoor controller circuit board recognizes excessive number of indoor units.	① Contact failure or miswiring of indoor/outdoor unit connecting wire ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ③ Excessive number of indoor units are connected to 1 outdoor unit. (4 units or more) ④ Defective transmitting receiving circuit of outdoor controller circuit board ⑤ Defective transmitting receiving circuit of indoor controller board ⑥ Defective indoor power board ⑦ 2 or more outdoor units have refrigerant address “0”. (In case of group control) ⑧ Noise has entered into power supply or indoor/outdoor unit connecting wire.	① Check disconnection or looseness or polarity of indoor/outdoor unit connecting wire of indoor and outdoor units. ② Check diameter and length of indoor/outdoor unit connecting wire. Total wiring length: 80 m (including wiring connecting each indoor unit and between indoor and outdoor unit) Also check if the connection order of flat cable is S1, S2, S3. ③ Check the number of indoor units that are connected to 1 outdoor unit (If EA is detected). ④–⑥ Turn the power off once, and on again to check. Replace outdoor controller circuit board, indoor controller board or indoor power board if abnormality occurs again. ⑦ Check if refrigerant addresses (SW1-3 to SW1-6 on outdoor controller circuit board) are overlapping in case of group control system. ⑧ Check transmission path, and remove the cause. Note: The descriptions above ①–⑧, are for EA, Eb and EC.
Eb	**Miswiring of indoor/outdoor unit connecting wire (converse wiring or disconnection)** Outdoor controller circuit board can automatically set the unit number of indoor units. Abnormal if the indoor unit number can not be set within 4 minutes after power on because of Miswiring (converse wiring or disconnection) of indoor/outdoor unit connecting wire.	① Contact failure or miswiring of indoor/outdoor unit connecting wire ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ④ Defective transmitting receiving circuit of outdoor controller circuit board ⑤ Defective transmitting receiving circuit of indoor controller board ⑥ Defective indoor power board ⑦ 2 or more outdoor units have refrigerant address “0” . (In case of group control) ⑧ Noise has entered into power supply or indoor/outdoor unit connecting wire.	
EC	**Start-up time over** The unit cannot finish start-up process within 4 minutes after power on.	① Contact failure of indoor/outdoor unit connecting wire ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ⑦ 2 or more outdoor units have refrigerant address “0” . (In case of group control) ⑧ Noise has entered into power supply or indoor/outdoor unit connecting wire.	
EE	**Incorrect connection** The outdoor unit does not receive the signals of I/F or FTC.	① A device other than Interface unit or Flow temp. controller unit is connected to the unit.	① Connect I/F or FTC to the unit.

<Abnormalities detected while unit is operating>

Check Code	Abnormal points and detection method	Case	Judgment and action
U1	**High pressure (High-pressure switch 63H operated)** Abnormal if high-pressure switch 63H operated (*) during compressor operation. *SW40,50 (63H): 4.15 MPa 63H: High-pressure switch	① Decreased water flow ② Clogged filter of water pipe ③ Locked water pump ④ Malfunction of water pump ⑤ Dirt of indoor heat exchanger ⑥ Defective operation of stop valve (Not full open) ⑦ Clogged or broken pipe ⑧ Locked outdoor fan motor ⑨ Malfunction of outdoor fan motor ⑩ Short cycle of outdoor unit ⑪ Dirt of outdoor heat exchanger ⑫ Decreased airflow caused by defective inspection of outside temperature thermistor (It detects lower temperature than actual temperature.) ⑬ Disconnection or contact failure of connector (63H) on outdoor controller board ⑭ Disconnection or contact failure of 63H connection ⑮ Defective outdoor controller board ⑯ Defective action of linear expansion valve ⑰ Malfunction of fan driving circuit	①−⑤ Check water circuit and repair defect. ⑥ Check if stop valve is fully open. ⑦ Check piping and repair defect. ⑧−⑪ Check outdoor unit and repair defect. ⑫ Check the detected temperature of outside temperature thermistor on LED display. (SW2 on A-Control Service Tool : Refer to "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".) ⑬−⑮ Turn the power off and check if F5 is displayed when the power is turned on again. When F5 is displayed, refer to “Judgment and action” for F5. ⑯ Check linear expansion valve. Refer to "10-6. HOW TO CHECK THE PARTS". ⑰ Replace outdoor controller board.
U2	**High discharge temperature** (1) Abnormal if discharge temperature thermistor (TH4) exceeds 125℃ or 110℃ continuously for 5 minutes. Abnormal if discharge temperature thermistor (TH4) exceeds 110℃ or more continuously for 30 seconds after 90 seconds have passed since the defrosting operation started. (2) Abnormal if discharge superheat (Cooling: TH4−T_{63HS}/ Heating: TH4−T_{63HS}) exceeds 70℃ continuously for 10 minutes. **High comp. surface temperature** Abnormal if comp. surface temperature (TH34) exceeds 125℃. In the case of high comp. surface temperature error, compressor does not restart unless the thermistor (TH34) becomes less than 95℃.	① Overheated compressor operation caused by shortage of refrigerant ② Defective operation of stop valve ③ Defective thermistor ④ Defective outdoor controller board ⑤ Defective action of linear expansion valve ⑥ Clogging with foreign objects in refrigerant circuit Note: Clogging occurs in the parts which become below freezing point when water enters in refrigerant circuit.	① Check intake superheat. Check leakage of refrigerant. Charge additional refrigerant. ② Check if stop valve is fully open. ③④ Turn the power off and check if U3 is displayed when the power is turned on again. When U3 is displayed, refer to “Judgment and action” for U3. ⑤ Check linear expansion valve. Refer to "10-6. HOW TO CHECK THE PARTS". ⑥ After recovering refrigerant, remove water from entire refrigerant circuit under vacuum more than 1 hour.
U3	**Open/short circuit of discharge temperature thermistor (TH4)/comp. surface thermistor (TH34)** Abnormal if open (3℃ or less) or short (217℃ or more) is detected during compressor operation. (Detection is inoperative for 10 minutes of compressor starting process and for 10 minutes after and during defrosting.)	① Disconnection or contact failure of connector (TH4/TH34) on the outdoor controller circuit board ② Defective thermistor ③ Defective outdoor controller circuit board	① Check connection of connector (TH4/TH34) on the outdoor controller circuit board. Check breaking of the lead wire for thermistor (TH4/TH34). Refer to "10-9. TEST POINT DIAGRAM". ② Check resistance value of thermistor (TH4/TH34) or temperature by microprocessor. (Thermistor/TH4/TH34: Refer to "10-6. HOW TO CHECK THE PARTS".) (SW2 on A-Control Service Tool: Refer to "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".) ③ Replace outdoor controller board.

Check Code	Abnormal points and detection method	Case	Judgment and action
U4	**Open/short of outdoor unit thermistors (TH3, TH6, TH7, and TH8)** Abnormal if open or short is detected during compressor operation. Open detection of thermistors TH3 and TH6 is inoperative 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. (PAC-SK52ST) (Refer to "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".)	① Disconnection or contact failure of connectors (Outdoor controller circuit board: TH3, TH6/TH7; Outdoor power circuit board: CN3) ② Defective thermistor ③ Defective outdoor controller circuit board	① Check connection of connector (TH3,TH6/TH7) on the outdoor controller circuit board. Check connection of connector (CN3) on the outdoor power circuit board. Check breaking of the lead wire for thermistor (TH3,TH6,TH7,TH8). Refer to "10-9.TEST POINT DIAGRAM". ② Check resistance value of thermistor (TH3,TH6,TH7,TH8) or check temperature by microcomputer. (Thermistor/TH3,TH6,TH7,TH8: Refer to "10-6. HOW TO CHECK THE PARTS".) (SW2 on A-Control Service Tool: Refer to "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".) ③ Replace outdoor controller circuit board.
U5	**Temperature of heat sink** Abnormal if heat sink thermistor (TH8) detects temperature indicated below. SW40/50····· 84℃	① The outdoor fan motor is locked. ② Failure of outdoor fan motor ③ Air flow path is clogged. ④ Rise of ambient temperature ⑤ Defective thermistor ⑥ Defective input circuit of outdoor power circuit board ⑦ Failure of outdoor fan drive circuit	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℃.) Turn off power, and on again to check if U5 is displayed within 30 minutes. If U4 is displayed instead of U5, follow the action to be taken for U4. ⑤ Check resistance value of thermistor (TH8) or temperature by microcomputer. (Thermistor/TH8: Refer to "10-6. HOW TO CHECK THE PARTS".) (SW2 on A-Control Service Tool: Refer to "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".) ⑥ Replace outdoor power circuit board. (SW40/50VHA(R1) only) ⑦ Replace outdoor controller circuit board.
U6	**Power module** Check abnormality by driving power module in case overcurrent is detected. (UF or UP error condition)	① Outdoor stop valve is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or converse of compressor wiring connection ④ Defective compressor ⑤ Defective outdoor power circuit board	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to "10-9.TEST POINT DIAGRAM" (Outdoor power circuit board). ④ Check compressor referring to "10-6. HOW TO CHECK THE PARTS". ⑤ Replace outdoor power circuit board. (SW40/50VHA only) Replace outdoor controller circuit board. (SW50VKA only)
U7	**Too low superheat due to low discharge temperature** Abnormal if discharge superheat is continuously detected less than or equal to −15℃ for 3 minutes even though linear expansion valve has minimum open pulse after compressor starts operating for 10 minutes.	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 connector ⑤ Defective linear expansion valve	①② Check the installation conditions of discharge temperature thermistor (TH4). ③ Check the coil of linear expansion valve. Refer to "10-8. 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. (SW40/50VHA only) Refer to "10-6. HOW TO CHECK THE PARTS".
U8	**Outdoor fan motor** 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 is detected continuously for 15 seconds at 20℃ or more outside air temperature. • 50 rpm or below, or 1500 rpm or more is detected continuously for 1 minute.	① Failure in the operation of the DC fan motor ② Failure in the outdoor circuit controller board	① Check or replace the DC fan motor. ② Check the voltage of the outdoor circuit controller board during operation. ③ Replace outdoor controller circuit board. (when the failure is still indicated even after performing the action ① above.)

Thermistors		Open detection	Short detection
Symbol	Name		
TH3	Thermistor <Liquid>	−40°C or below	90°C or above
TH6	Thermistor <2-phase pipe>	−40°C or below	90°C or above
TH7	Thermistor <Ambient>	−40°C or below	90°C or above
TH8	Thermistor <Heat sink>	−27°C or below	102°C or above

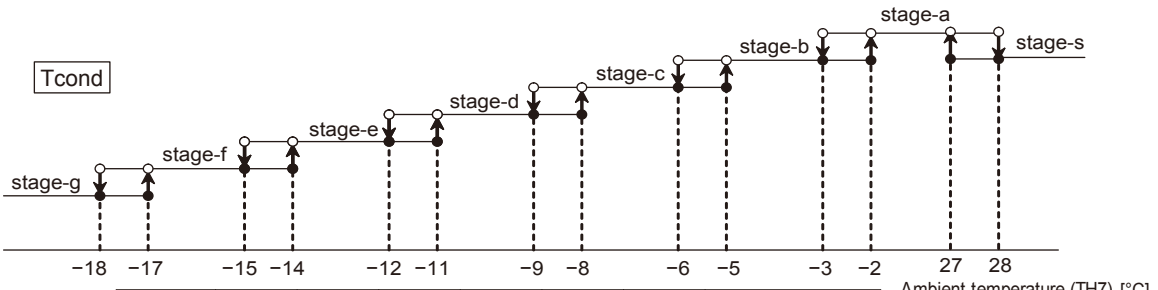
Check Code	Abnormal points and detection method		Case	Judgment and action
U9	Detailed codes	To find out the details about U9 error, turn ON SW2-1, 2-2, 2-3, 2-4, 2-5 and 2-6 when U9 error occurs. To find out the detail history (latest) about U9 error, turn ON SW2-1, 2-2 and 2-6. Refer to "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".		
	01	**Overvoltage error** • Increase in DC bus voltage to SW40/50VHA(R1): 420 V SW50VKA: 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 "10-9. TEST POINT DIAGRAM" (Outdoor power circuit board). ③ Replace outdoor power circuit board. ④ Check compressor for electrical insulation. Replace compressor.
	02	**Undervoltage error** • 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 noise filter circuit board/controller circuit board ③ Defective converter drive circuit in outdoor power circuit board ④ Defective 52C drive circuit in outdoor noise filter circuit board	① Check the field facility for the power supply. ② Check CN52C wiring. (SW40/50VHA(R1) only) ③ Replace outdoor power circuit board. (SW40/50VHA(R1) only) ④ Replace outdoor noise filter circuit board. (SW40/50VHA(R1) only) Replace outdoor controller circuit board. (SW50VKA only)
	04	**Input current sensor error** • Decrease in input current through outdoor unit to 0.1 A only if operation frequency is more than or equal to 40 Hz or compressor current is more than or equal to 6 A.	① Disconnection or loose connection of CN5 on the outdoor power circuit board/CNCT on the outdoor noise filter board ② Defective ACCT (AC current trans) on the outdoor noise filter circuit board ③ Defective input current detection circuit in outdoor power circuit board ④ Defective outdoor controller circuit board	① Check CN5/CNCT wiring. (SW40/50VHA(R1) only) ② Replace outdoor noise filter circuit board. (SW40/50VHA(R1) only) ③ Replace outdoor power circuit board. (SW40/50VHA(R1) only) ④ Replace outdoor controller circuit board.
	08	**Abnormal power synchronous signal** • 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. (SW40/50VHA(R1) only) ④ Replace outdoor controller circuit board. ⑤ Replace outdoor power circuit board. (SW40/50VHA(R1) only)
	10	**PFC error (Overvoltage/ Undervoltage/Overcurrent)** • PFC detected any of the following a) Increase of DC bus voltage to 420 V. b) Decrease in PFC control voltage to 12 V DC or lower (SW40/50VHA(R1) only) c) Increase in input current to 50A peak	① Abnormal increase in power source voltage ② Decrease in power source voltage, instantaneous stop ③ Disconnection of compressor wiring ④ Misconnection of reactor (ACL) ⑤ Defective outdoor power circuit board ⑥ Defective reactor (ACL) ⑦ Disconnection or loose connection of CN2 on the outdoor power circuit board/controller circuit board	①② Check the field facility for the power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to "10-9. TEST POINT DIAGRAM". ④ Correct the wiring of reactor (ACL). (SW40/50VHA(R1) only) ⑤ Replace outdoor power circuit board. ⑥ Replace reactor (ACL). ⑦ Check CN2 wiring.(SW40/50VHA(R1) only)
	20	**PFC/IGBT error (Undervoltage)** • When compressor is running, DC bus voltage stays at 310 V or lower for consecutive 10 seconds (SW40/50VHA(R1) only)	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 points and detection method	Case	Judgment and action
Ud	**Over heat protection** Abnormal if liquid thermistor (TH3) detects 70℃ or more during compressor operation.	① Defective outdoor fan (fan motor) or short cycle of outdoor unit during cooling operation ② Defective liquid thermistor (TH3) ③ Defective outdoor controller board	① Check outdoor unit air passage. ②③ Turn the power off and on again to check the check code. If U4 is displayed, follow the U4 processing direction.
UE	**Abnormal pressure of pressure sensor (63HS)** 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.	① Disconnection or contact failure of connector (63HS) on the outdoor controller circuit board ② Defective pressure sensor ③ Defective outdoor controller circuit board	① Check connection of connector (63HS) on the outdoor controller circuit board. Check breaking of the lead wire for thermistor (63HS). ② Check pressure by microprocessor. (Pressure sensor/ 63HS) (SW2: Refer to "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".) ③ Replace outdoor controller board.
UF	**Compressor overcurrent interruption (When compressor is locked)** Abnormal if overcurrent of DC bus or compressor is detected within 30 seconds after compressor starts operating.	① Stop valve is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or converse of compressor wiring connection ④ Defective compressor ⑤ Defective outdoor power board ⑥ DIP switch setting difference of outdoor controller circuit board.	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to "10-9. TEST POINT DIAGRAM" (Outdoor power circuit board for SW40/50VHA and outdoor controller board for SW50VKA). ④ Check compressor. Refer to "10-6. HOW TO CHECK THE PARTS". ⑤ Replace outdoor power circuit board. ⑥ Check the DIP switch setting of outdoor controller circuit board. Refer to "Model Select" in "(1) Function of switches" in "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".
UH	**Current sensor error or input current error** • Abnormal if current sensor detects −1.0A to 1.0A during compressor operation. (This error is ignored in case of test run mode.) • Abnormal if 40A of input current is detected or 37A or more of input current is detected for 10 seconds continuously.	① Disconnection of compressor wiring ② Defective circuit of current sensor on outdoor power circuit board ③ Decrease of power supply voltage ④ Leakage or shortage of refrigerant	① Correct the wiring (U·V·W phase) to compressor. Refer to "10-9. TEST POINT DIAGRAM" (Outdoor power circuit board for SW40/50VHA and outdoor controller board for SW50VKA). ② Replace outdoor power circuit board. ③ Check the facility of power supply. ④ Check leakage of refrigerant.
UP	**Compressor overcurrent interruption** Abnormal if overcurrent DC bus or compressor is detected after compressor starts operating for 30 seconds.	① Stop valve of outdoor unit is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or converse of compressor wiring connection ④ Defective fan of indoor/outdoor units ⑤ Short cycle of indoor/outdoor units ⑥ Defective input circuit of outdoor controller board ⑦ Defective compressor ⑧ Defective outdoor power circuit board ⑨ DIP switch setting difference of outdoor controller circuit board	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to "10-9. TEST POINT DIAGRAM" (Outdoor power circuit board for SW40/50VHA and outdoor controller circuit board for SW50VKA). ④ Check indoor/outdoor fan. ⑤ Solve short cycle. ⑥ Replace outdoor controller circuit board. 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. ⑦ Check compressor. Refer to "10-6. HOW TO CHECK THE PARTS". ⑧ Replace outdoor power circuit board. ⑨ Check the DIP switch setting of outdoor controller circuit board.

Check Code	Abnormal points and detection method	Case	Judgment and action
E0 or E4	**Remote controller transmission error (E0)/ signal receiving error (E4)** ① Abnormal if main or sub remote controller cannot receive normally any transmission from indoor unit of refrigerant address “0” for 3 minutes. (Check code: E0) ② Abnormal if sub remote controller could not receive any signal for 2 minutes. (Check code: E0) ① Abnormal if indoor controller board can not receive normally any data from remote controller board or from other indoor controller board for 3 minutes. (Check code: E4) ② Indoor controller board cannot receive any signal from remote controller for 2 minutes. (Check code: E4)	① Contact failure at transmission wire of remote controller 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. ③ Miswiring of remote controller ④ Defective transmitting receiving circuit of remote controller ⑤ Defective transmitting receiving circuit of indoor controller board of refrigerant address “0” ⑥ Noise has entered into the transmission wire of remote controller.	① Check disconnection or looseness of indoor unit or transmission wire of remote controller. ② Set one of the remote controllers “main” if there is no problem with the action above. ③ Check wiring of remote controller. • Total wiring length: Maximum 500 m (Do not use cable × 3 or more.) • The number of connecting indoor units: Maximum 16 units • The number of connecting remote controller: Maximum 2 units If the cause of trouble is not in ①–③ above, ④ Diagnose remote controllers. 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 indoor controller board. b) When “RC NG” is displayed, Replace remote controller. c) When "RCE3" or "ERC00-66" is displayed, noise may be causing abnormality. Note: If the unit is not normal after replacing indoor controller board in group control, indoor controller board of address “0” may be abnormal.
E1 or E2	**Remote controller control board** ① Abnormal if data cannot be normally read from the nonvolatile memory of the remote controller control board. (Check code: E1) ② Abnormal if the clock function of remote controller cannot be normally operated. (Check code: E2)	① Defective remote controller	① Replace remote controller.
E3 or E5	**Remote controller transmission error (E3)/ signal receiving error (E5)** ① Abnormal if remote controller could not find blank of transmission path for 6 seconds and could not transmit. (Check code: E3) ② Remote controller receives transmitted data at the same time, compares the data, and when detecting it, judges different data to be abnormal 30 continuous times. (Check code: E3) ① Abnormal if indoor controller board could not find blank of transmission path. (Check code: E5) ② Indoor controller board receives transmitted data at the same time, compares the data, and when detecting it, judges different data to be abnormal 30 continuous times. (Check code: E5)	① Repetition of refrigerant address ② Defective transmitting receiving circuit of remote controller ③ Defective transmitting receiving circuit of indoor controller board ④ Noise has entered into transmission wire of remote controller. Refer to the indoor unit's Installation Manual for remote controller connection.	① The address changes to a separate setting. ②–④ Diagnose remote controller. 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. b) When “RC NG” is displayed, replace remote controller. c) When “RC E3” or “ERC 00–66” is displayed, noise may be causing abnormality.

Check Code	Abnormal points and detection method	Case	Judgment and action
E6	**Indoor/outdoor unit communication error (Signal receiving error)** ① Abnormal if indoor controller board could not receive any signal normally for 6 minutes after turning the power on. ② Abnormal if indoor controller board could not receive any signal normally for 3 minutes. ③ Consider the unit as abnormal under the following condition. When 2 or more indoor units are connected to an outdoor unit, indoor controller board could not receive a signal for 3 minutes from outdoor controller circuit board, a signal which allows outdoor controller circuit board to transmit signals.	① Contact failure, short circuit or miswiring (converse wiring) of indoor/outdoor unit connecting wire ② Defective transmitting receiving circuit of outdoor controller circuit board ③ Defective transmitting receiving circuit of indoor controller board ④ Noise has entered into indoor/outdoor unit connecting wire. ⑤ Defective fan motor ⑥ Defective rush current resistor of outdoor power circuit board	Note: Check LED display on the outdoor controller circuit board. (Connect A-control service tool, PAC-SK52ST.) Refer to EA–EC item if LED displays EA–AC. ① Check disconnecting or looseness of indoor/outdoor unit connecting wire of indoor unit or outdoor unit. Check all the units in case of twin/triple/quadruple indoor unit system. ②–④ Turn the power off, and on again to check. If abnormality generates again, replace indoor controller board or outdoor controller circuit board. Note: Other indoor controller board may have defect in case of twin/triple/quadruple indoor unit system. ⑤ Turn the power off, and detach fan motor from connector (CNF1, 2). Then turn the power on again. If abnormality is not displayed, replace fan motor. If abnormality is displayed, replace outdoor controller circuit board. ⑥ Check the rush current resistor on outdoor power circuit board with tester. If open is detected, replace the power circuit board.
E8	**Indoor/outdoor unit communication error (Signal receiving error) (Outdoor unit)** Abnormal if outdoor controller circuit board could not receive anything normally for 3 minutes.	① Contact failure of indoor/outdoor unit connecting wire ② Defective communication circuit of outdoor controller circuit board ③ Defective communication circuit of indoor controller board ④ Noise has entered into indoor/outdoor unit connecting wire.	① Check disconnection or looseness of indoor/outdoor unit connecting wire of indoor or outdoor units. ②–④ Turn the power off, and on again to check. Replace indoor controller board or outdoor controller circuit board if abnormality is displayed again.
E9	**Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit)** ① Abnormal if “0” receiving is detected 30 times continuously though 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 Indoor/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 indoor/outdoor unit connecting wire.	① Check disconnection or looseness of indoor/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	**Non defined check code** This code is displayed when non defined check code is received.	① Noise has entered transmission wire of remote controller. ② Noise has entered indoor/outdoor unit connecting wire. ③ Outdoor unit is not a series of power-inverter.	①② Turn the power off, and on again to check. Replace indoor controller board or outdoor controller circuit board if abnormality is displayed again. ③ Replace outdoor unit with power-inverter type outdoor unit.
Ed	**Serial communication error** ① Abnormal if serial communication between outdoor controller circuit board and outdoor power circuit board is defective.	① Breaking of wire or contact failure of connector CN2 between the outdoor controller circuit board and the outdoor power circuit board ② Breaking of wire 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. (SW40/50VHA(R1) only) ③ Replace outdoor power circuit board. (SW40/50VHA(R1) only) ④ Replace outdoor controller circuit board.

Check Code	Abnormal points and detection method	Case	Judgment and action
P6	**Freezing/overheating protection is operating** 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 25 Hz. Detection is inoperative during defrosting.	① Overcharge of refrigerant ② Defective refrigerant circuit (clogs) ③ Malfunction of linear expansion valve ④ Reduced water flow · Clogged filter · Leakage of water ⑤ High temperature · Over-load · Inlet water is too warm. ⑥ Defective water pump	①② Check operating condition of refrigerant circuit. ③ Check linear expansion valve. ④⑤ Check water piping. ⑥ Check water pump.
P9	**Actual tank temperature thermistor (TH5/THW5)** ① The unit is 3-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after 3 minutes. (The unit returns to normal operation, if it has been reset normally.) ② Constantly detected during cooling, heating, heating ECO, anti freeze and hot water operation.	① Defective thermistor characteristics ② Breaking of wire or contact failure of thermistor wiring ③ Defective PCB of interface unit/ Flow temp. controller	①–② Check resistance value of thermistor. 0℃ 15.0 kΩ 10℃ 9.6 kΩ 20℃ 6.3 kΩ 30℃ 4.3 kΩ 40℃ 3.0 kΩ If you put force on (draw or bend) the lead wire with measuring resistance value of thermistor, breaking of wire or contact failure can be detected. ③ Check actual tank temperature display on remote controller. Replace PCB of Interface unit/Flow temp. controller if there is abnormal difference with actual tank temperature. Turn the power off, and on again to operate after check. Refer to the indoor unit's Installation Manual for TH5 connection.



Tcond	stage-a	stage-b	stage-c	stage-d	stage-e	stage-f	stage-g	stage-s
SW40/50	63	61	60	58	56	53	50	61

10-4. TROUBLESHOOTING

A flowing water sound or occasional hissing sound is heard.	■ These sounds can be heard when refrigerant and/or water is (are) flowing in the indoor unit or refrigerant pipe, or when the refrigerant and/or water is (are) chugging.
Water does not heat or cool well.	■ Clean the filter of water piping. (Flow is reduced when the filter is dirty or clogged.) ■ Check the temperature adjustment and adjust the set temperature. ■ Make sure that there is plenty of space around the outdoor unit.
Water or vapor is emitted from the outdoor unit.	■ During cooling mode, water may form and drip from the cool pipes and joints. ■ During heating mode, water may form and drip from the heat exchanger of outdoor unit. ■ During defrosting mode, water on the heat exchanger of outdoor unit evaporates and water vapor may be emitted.
The operation indicator does not appear in the remote controller display.	■ Turn on the power switch. "◉" will appear in the remote controller display.
"⊠" appears in the remote controller display.	■ During external signal control, "⊠" appears in the remote controller display and FTC operation cannot be started or stopped using the remote controller.
When restarting the outdoor unit soon after stopping it, it does not operate even though the ON/OFF button is pressed.	■ Wait approximately 3 minutes. (Operation has stopped to protect the outdoor unit.)
FTC operates without the ON/OFF button being pressed.	■ Is the ON timer set? Press the ON/OFF button to stop operation. ■ Is the FTC connected to a external signal? Consult the concerned people who control the FTC. ■ Does "⊠" appear in the remote controller display? Consult the concerned people who control the FTC. ■ Has the auto recovery feature from power failures been set? Press the ON/OFF button to stop operation.
FTC stops without the ON/OFF button being pressed.	■ Is the off timer set? Press the ON/OFF button to restart operation. ■ Is the heat pump connected to a central remote controller? Consult the concerned people who control the FTC. ■ Does "⊠" appear in the remote controller display? Consult the concerned people who control the FTC.
Remote controller timer operation cannot be set.	■ Are timer settings invalid? If the timer can be set, (WEEKLY) , (SIMPLE) , or (AUTO OFF) appears in the remote controller display.
"PLEASE WAIT" appears in the remote controller display.	■ The initial settings are being performed. Wait approximately 3 minutes. ■ If the remote controller is not only for FTC, change it.
An check code appears in the remote controller display.	■ The protection devices have operated to protect the FTC and outdoor unit. ■ Do not attempt to repair this equipment by yourself. Turn off the power switch immediately and consult your dealer. Be sure to provide the dealer with the model name and information that appeared in the remote controller display.

• If the unit cannot be operated properly after test run, refer to the following table to find the cause.

Symptom			Cause
Wired remote controller		LED 1, 2 (PCB in outdoor unit)	
PLEASE WAIT	For about 2 minutes after power-on	After LED 1, 2 are lighted, LED 2 is turned off, then only LED 1 is lighted. (Correct operation)	• For about 2 minutes following power-on, operation of the remote controller is not possible due to system start-up. (Correct operation)
PLEASE WAIT → Check code	Subsequent to about 2 minutes after power-on	Only LED 1 is lighted. → LED 1, 2 blink.	• Connector for the outdoor unit's protection device is not connected. • Reverse or open phase wiring for the outdoor unit's power terminal block (L1, L2, L3)
Display messages do not appear even when operation switch is turned ON (operation lamp does not light up).		Only LED 1 is lighted. → LED 1 blinks twice, LED 2 blinks once.	• Incorrect wiring between FTC and outdoor (incorrect polarity of S1, S2, S3) • Remote controller wire short

Note: Operation is not possible for about 30 seconds after cancellation of function selection. (Correct operation)

For description of each LED (LED1, 2, 3) provided on the FTC, refer to the following table.

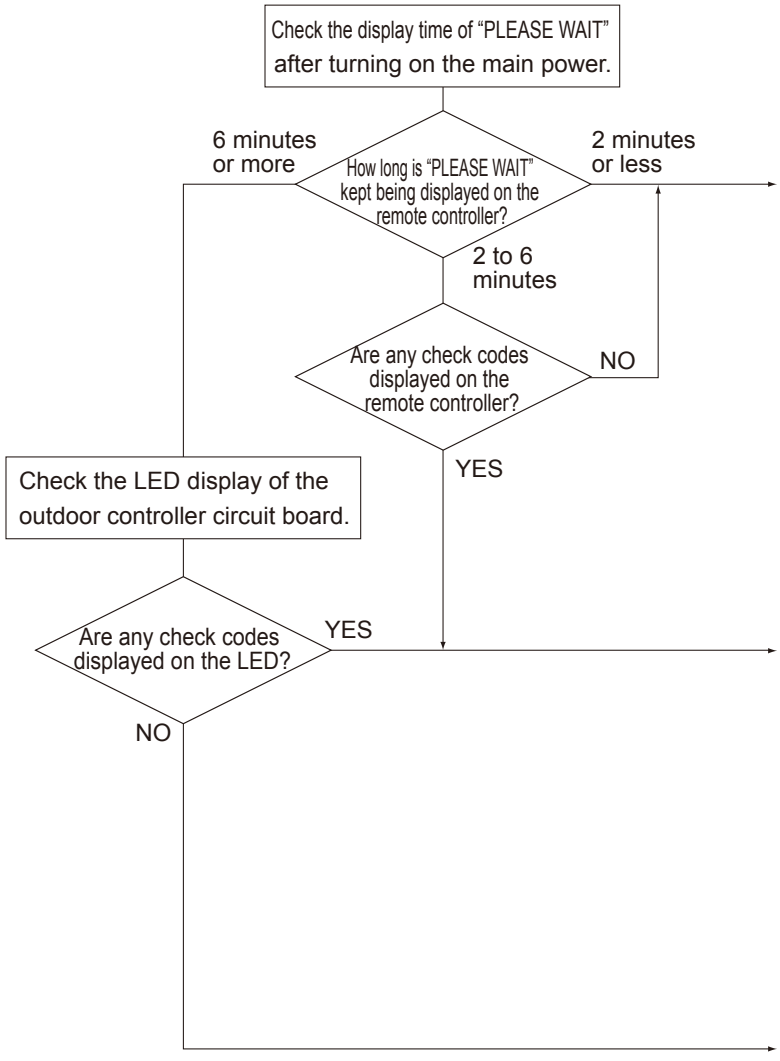
LED1 (power for microprocessor)	Indicates whether control power is supplied. Make sure that this LED is always lit.
LED2 (power for remote controller)	Indicates whether power is supplied to the remote controller. This LED lights only in the case of the FTC which is connected to the outdoor unit refrigerant addresses "0".
LED3 (communication between FTC and outdoor units)	Indicates state of communication between the FTC and outdoor units. Make sure that this LED is always blinking.

10-5. TROUBLESHOOTING OF PROBLEMS

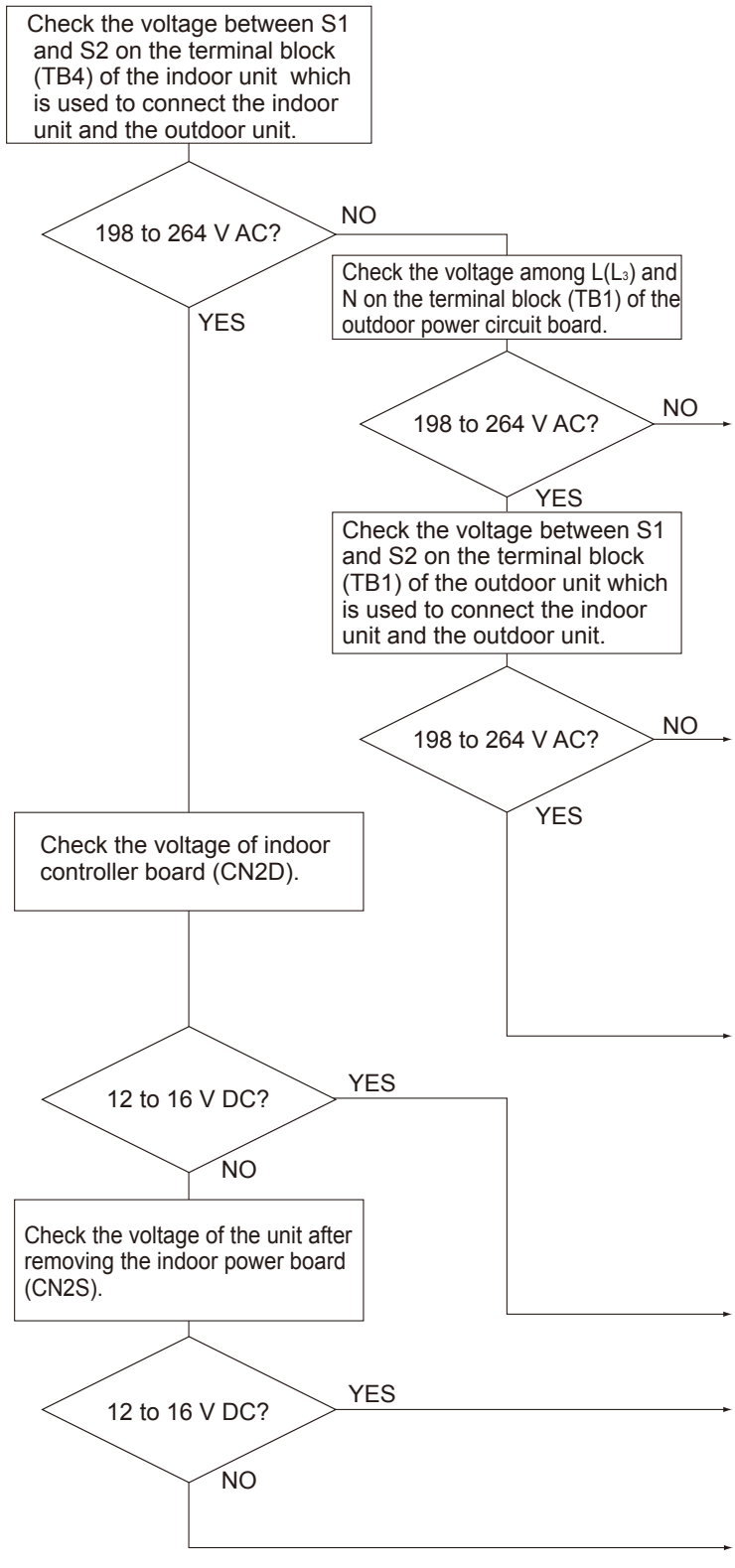
Phenomena	Factor	Countermeasure
1. Remote controller display does not work.	① 12 V DC is not supplied to remote controller. (Power supply display ⦿ is not indicated on LCD.) ② 12 to 15 V DC is supplied to remote controller, however, no display is indicated. • "PLEASE WAIT" is not displayed. • "PLEASE WAIT" is displayed.	① Check LED2 on indoor controller board. (1) When LED2 is lit. Check the remote controller wiring for breaking or contact failure. (2) When LED2 is blinking. Check short circuit of remote controller wiring. (3) When LED2 is not lit. Refer to phenomena No.3 below. ② Check the following. • Failure of remote controller if "PLEASE WAIT" is not displayed • Refer to phenomena No.2 below if "PLEASE WAIT" is displayed.
2. "PLEASE WAIT" display is remained on the remote controller.	① At longest 2 minutes after the power supply "PLEASE WAIT" is displayed to start up. ② Communication error between the remote controller and indoor unit ③ Communication error between the indoor and outdoor unit ④ Outdoor unit protection device connector is open.	① Normal operation ② Self-diagnosis of remote controller ③ "PLEASE WAIT" is displayed for 6 minutes at most in case of indoor/outdoor unit communication error. Check LED3 on indoor controller board. (1) When LED3 is not blinking. Check indoor/outdoor connecting wire for miswiring. (Converse wiring of S1 and S2, or break of S3 wiring.) (2) When LED3 is blinking. Indoor/outdoor connecting wire is normal. ④ Check LED display on outdoor controller circuit board. Refer to "10-9. TEST POINT DIAGRAM". Check protection device connector (63H) for contact failure. Refer to "10-9. TEST POINT DIAGRAM".
3. When pressing the remote controller operation switch, the OPERATION display is appeared but it will be turned off soon.	① After cancelling to select function from the remote controller, the remote controller operation switch will be not accepted for approx. 30 seconds.	① Normal operation
4. Even controlling by the wireless remote controller, no beep is heard and the unit does not start operating. Operation display is indicated on wireless remote controller.	① The pair number settings of the wireless remote controller and indoor controller board are mismatched.	① Check the pair number settings.
5. When operating by the wireless remote controller, beep sound is heard, however, unit does not start operating.	① No operation for 2 minutes at most after the power supply ON. ② Local remote controller operation is prohibited. • Remote controlling adaptor is connected to CN32 on the indoor controller board. • Local remote controller operation is prohibited by centralized controller, etc. since it is connected to MELANS. ③ Phenomena of No.2.	① Normal operation ② Normal operation ③ Check the phenomena No.2.
6. Remote controller display works normally and the unit performs cooling operation, however, the capacity cannot be fully obtained. (The air does not cool well.)	① Refrigerant shortage ② Filter clogging ③ Heat exchanger clogging ④ Air duct short cycle	① • If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening. • Check pipe connections for gas leakage. ② Open intake grille and check the filter. Clean the filter by removing dirt or dust on it. ③ • If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. • Clean the heat exchanger. ④ Remove the blockage.

Phenomena	Factor	Countermeasure
7. Remote controller display works normally and the unit performs heating operation, however, the capacity cannot be fully obtained.	① Linear expansion valve fault Opening cannot be adjusted well due to linear expansion valve fault. ② Refrigerant shortage ③ Lack of insulation for refrigerant piping ④ Filter clogging ⑤ Heat exchanger clogging ⑥ Air duct short cycle ⑦ Bypass circuit of outdoor unit fault	① • Discharging temperature and indoor heat exchanger temperature does not rise. Inspect the failure by checking discharging pressure. • Replace linear expansion valve. ② • If refrigerant leaks, discharging tempera ture rises and LEV opening increases. Inspect leakage by checking the temperature and opening. • Check pipe connections for gas leakage. ③ Check the insulation. ④ Open intake grille and check the filter. Clean the filter by removing dirt or dust on it. ⑤ • If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. • Clean the heat exchanger. ⑥ Remove the blockage. ⑦ Check refrigerant system during operation.
8. ① For 3 minutes after temperature adjuster turns off, the compressor will not start operating even if temperature adjuster is turned on. ② For 3 minutes after temperature adjuster turns on, the compressor will not stop operating even if temperature adjuster is turned off. (Compressor stops operating immediately when turning off by the remote controller.)	①② Normal operation (For protection of compressor)	①② Normal operation

Symptoms: “PLEASE WAIT” is kept being displayed on the remote controller.

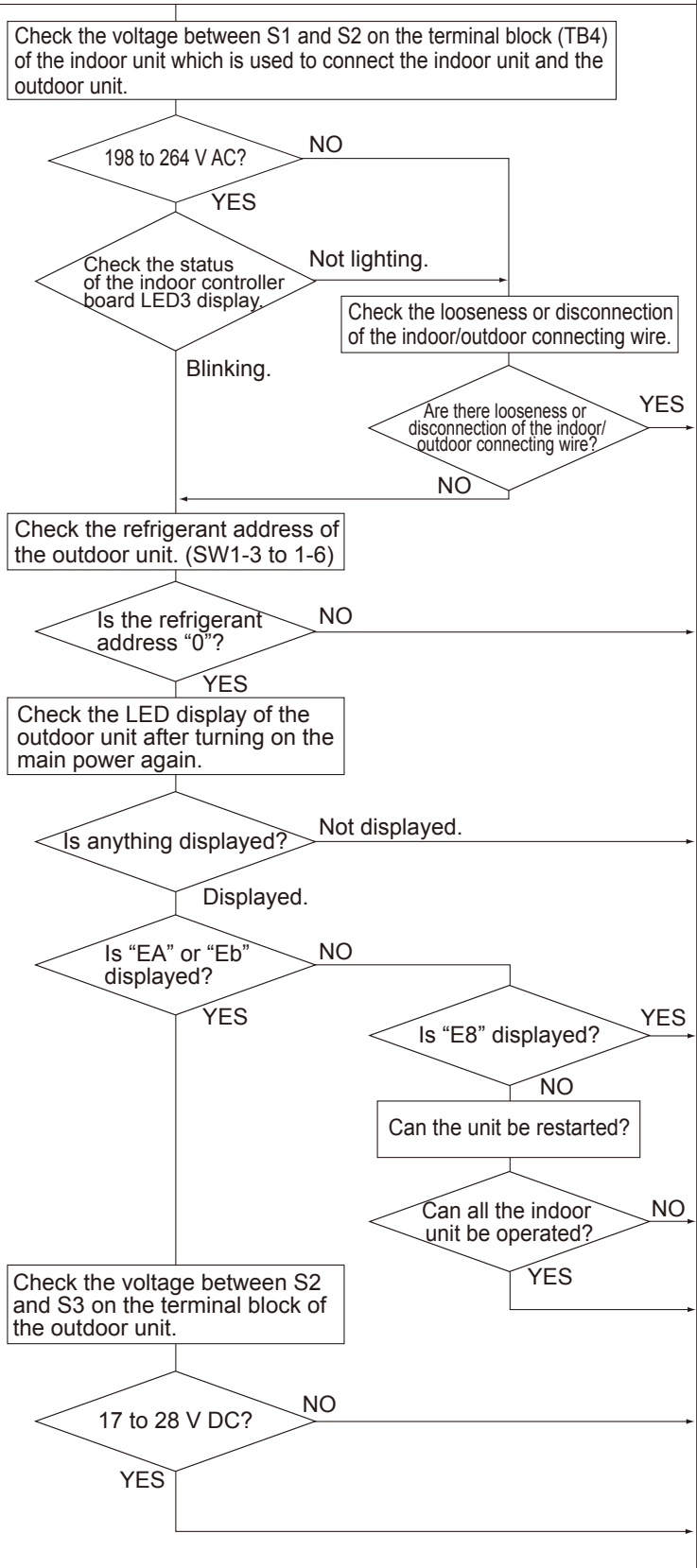
Diagnosis flow	Cause	Inspection method and troubleshooting
	• “PLEASE WAIT” will be displayed during the start-up diagnosis after turning on the main power. • Miswiring of indoor/ outdoor connecting wire • Breaking of indoor/ outdoor connecting wire (S3) • Defective indoor controller board • Defective outdoor controller circuit board • Defective indoor controller board • Defective remote controller	• Normal The start-up diagnosis will be over in around 2 minutes. • Refer to “Self-diagnosis action table” in order to solve the trouble. • In case of communication errors, the display of remote controller may not match the LED display of the outdoor unit.

Symptoms: Nothing is displayed on the remote controller. ①	LED display of the indoor controller board LED1 : ○ LED2 : ○ LED3 : ○

Diagnosis flow	Cause	Inspection method and troubleshooting
	• Troubles concerning power supply • Bad wiring of the outdoor controller board • The fuses on the outdoor controller circuit board are blown • Bad wiring of the outdoor controller board • The fuses on the outdoor controller circuit board are blown. • Defective indoor controller board • Miswiring, breaking or poor connection of indoor/outdoor connecting wire • Defective indoor power board	• Check the power wiring to the outdoor unit. • Check the breaker. • Check the wiring of the outdoor unit. • Check if the wiring is bad. Check if the fuses are blown. The fuses on the outdoor controller circuit board will be blown when the indoor /outdoor connecting wire short-circuits. • Check if miswiring, breaking or poor contact is causing this problem. Indoor/outdoor connecting wire is polarized 3-core type. Connect the indoor unit and the outdoor unit by wiring each pair of S1, S2 and S3 on the both side of indoor/outdoor terminal blocks. • Replace the indoor controller board. • Check if there is miswiring or breaking of wire. • Replace the indoor power board.

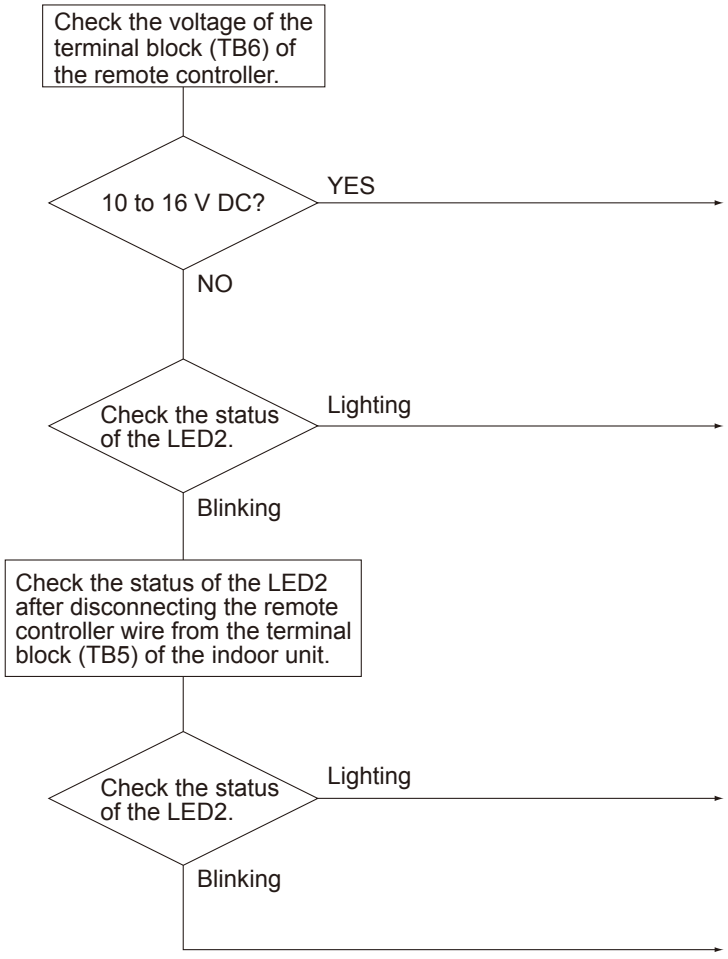
Symptoms: Nothing is displayed on the remote controller. ②

LED display of the indoor controller board
LED1 : ☀
LED2 : ○
LED3 : ○ or ◐



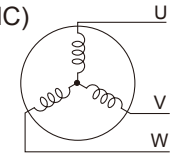
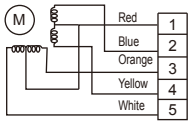
Cause	Inspection method and troubleshooting
• Breaking or poor contact of the indoor/outdoor connecting wire	• Fix the breaking or poor contact of the indoor/outdoor connecting wire.
• Normal Only the unit which has the refrigerant address “0” supplies power to the remote controller.	• Set the refrigerant address to “0”. In case of the multiple grouping system, recheck the refrigerant address again.
• Defective outdoor controller circuit board	• Replace the outdoor controller circuit board.
• Defective outdoor controller circuit board	• Replace the outdoor controller circuit board.
• Defective indoor controller board	• Replace the indoor controller board of the indoor unit which does not operate.
• Influence of electromagnetic noise	• Not abnormal There may be the influence of electromagnetic noise. Check the transmission wire and get rid of the causes.
• Defective outdoor power circuit board (SW40/50VHA) or controller board (SW50VKA)	• Replace the outdoor power circuit board (SW40/50VHA), or controller board (SW50VKA)
• Defective indoor power board	• Replace the indoor power board.

Symptoms: Nothing is displayed on the remote controller. ③	LED display of the indoor controller board LED1 : ☀ LED2 : ◐ or ☀ LED3 : —

Diagnosis flow	Cause	Inspection method and troubleshooting
	• Defective remote controller • Breaking or poor contact of the remote controller wire • The remote controller wire short-circuits • Defective indoor controller board	• Replace the remote controller. • Check if there is breaking or poor contact of the remote controller wire. Check the voltage of the terminal block (TB5) connecting the remote controller wire. If it is not between 10 and 16 V DC, the indoor controller board must be defective. • Check if the remote controller wire is short-circuited. • Replace the indoor controller board.

10-6. HOW TO CHECK THE PARTS

PUHZ-SW40VHA **PUHZ-SW40VHAR1**
PUHZ-SW40VHA-BS **PUHZ-SW40VHAR1-BS**
PUHZ-SW50VHA **PUHZ-SW50VHAR1** **PUHZ-SW50VKA**
PUHZ-SW50VHA-BS **PUHZ-SW50VHAR1-BS** **PUHZ-SW50VKA-BS**

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Thermistor (TH3)
<Liquid>
Thermistor (TH4)
<Discharge>
Thermistor (TH6)
<2-phase pipe>
Thermistor (TH7)
<Ambient>
Thermistor (TH8)
<Heat sink>
Thermistor (TH34)
<Comp. Surface></td><td>Disconnect the connector then measure the resistance with a tester.
(At the ambient temperature 10 to 30℃)
<table>
<tr><th></th><th>Normal</th><th>Abnormal</th></tr>
<tr><td>TH4
TH34</td><td>160 to 410 kΩ</td><td rowspan="3">Open or short</td></tr>
<tr><td>TH3
TH6
TH7</td><td>4.3 to 9.6 kΩ</td></tr>
<tr><td>TH8</td><td>39 to 105 kΩ</td></tr>
</table></td></tr>
<tr><td>Fan motor(MF1)</td><td>Refer to the next page.</td></tr>
<tr><td>Solenoid valve coil
<4-way valve>
(21S4)</td><td>Measure the resistance between the terminals with a tester.
(At the ambient temperature 20℃)
<table>
<tr><th>Normal</th><th>Abnormal</th></tr>
<tr><td>2350±170 Ω</td><td>Open or short</td></tr>
</table></td></tr>
<tr><td>Motor for compressor
(MC)
 
</td><td>Measure the resistance between the terminals with a tester.
(Winding temperature 20℃)
<table>
<tr><th>Normal</th><th>Abnormal</th></tr>
<tr><td>0.64 Ω</td><td>Open or short</td></tr>
</table></td></tr>
<tr><td>Linear expansion valve
(LEV-A/LEV-B)
 
</td><td>Disconnect the connector then measure the resistance with a tester.
(Winding temperature 20℃)
<table>
<tr><th colspan="4">Normal</th><th>Abnormal</th></tr>
<tr><td>Red - White</td><td>Red - Orange</td><td>Red - Yellow</td><td>Red - Blue</td><td rowspan="2">Open or short</td></tr>
<tr><td colspan="4">46±4 Ω</td></tr>
</table></td></tr>
</table>

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

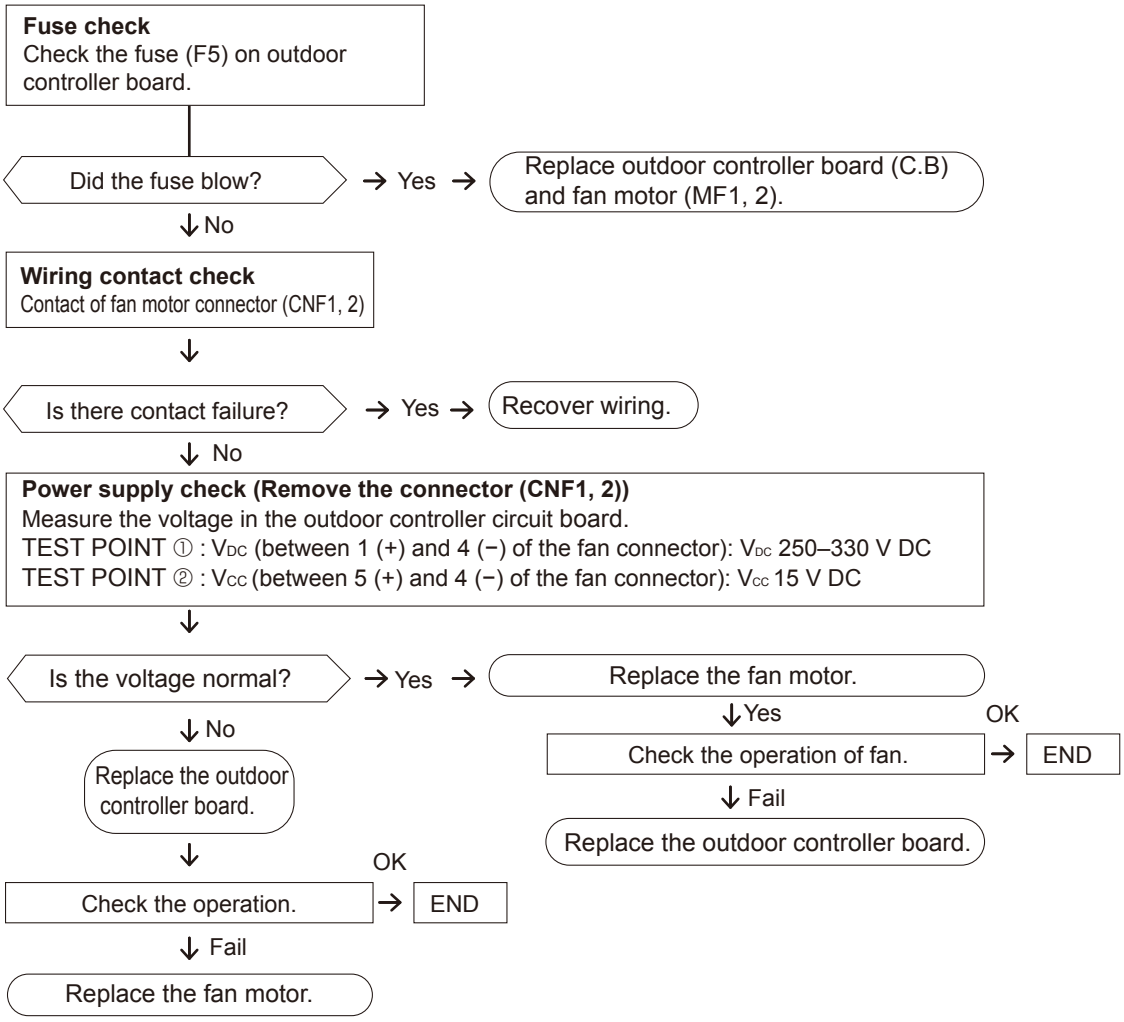
① Notes

· High voltage is applied to the connecter (CNF1, 2) for the fan motor. Pay attention to the service.

· Do not pull out the connector (CNF1, 2) for the motor with the power supply on.
(It causes trouble of the outdoor controller circuit board and fan motor.)

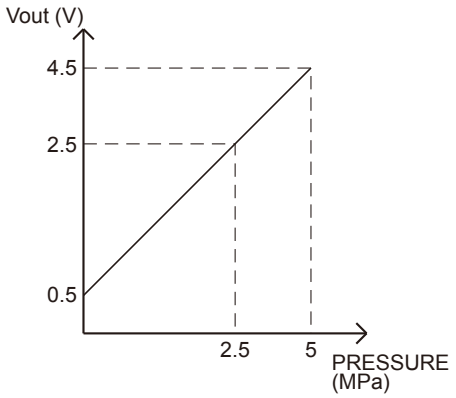
② Self check

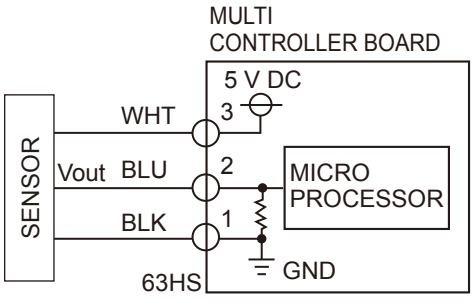
Symptom : The outdoor fan cannot rotate.



10-7. HOW TO CHECK THE COMPONENTS

<HIGH PRESSURE SENSOR>





③–①: 5 V (DC)

②–①: Output Vout (DC)

10-8. HOW TO CHECK THE COMPONENTS

<Thermistor feature chart>

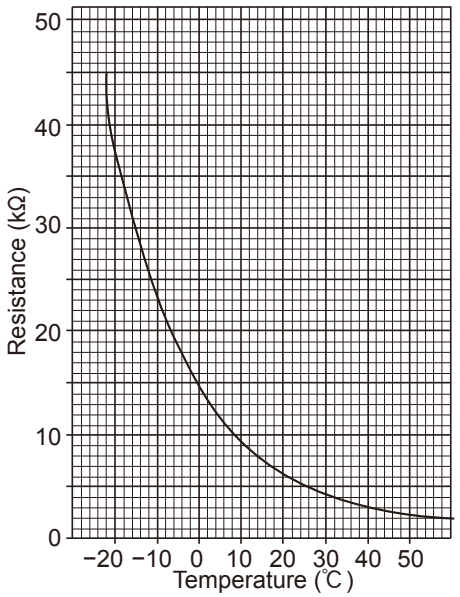
Low temperature thermistors

- Thermistor <Liquid> (TH3)
- Thermistor <2-phase pipe> (TH6)
- Thermistor <Ambient> (TH7)

Thermistor R0 = 15kΩ ± 3%
B constant = 3480 ± 2%

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

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



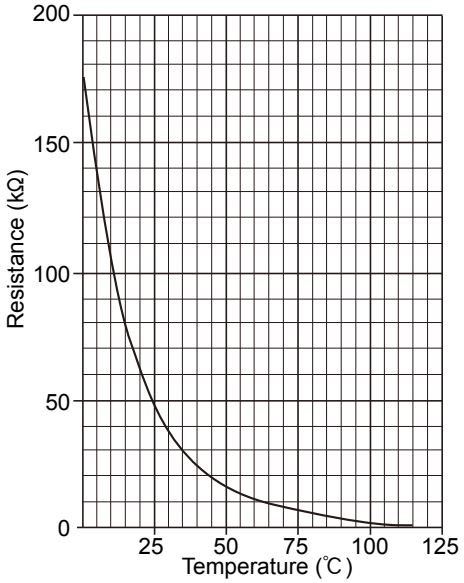
Medium temperature thermistor

- Thermistor <Heat sink> (TH8)

Thermistor R50 = 17 kΩ ± 2%
B constant = 4150 ± 3%

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

0℃	180 kΩ
25℃	50 kΩ
50℃	17 kΩ
70℃	8 kΩ
90℃	4 kΩ



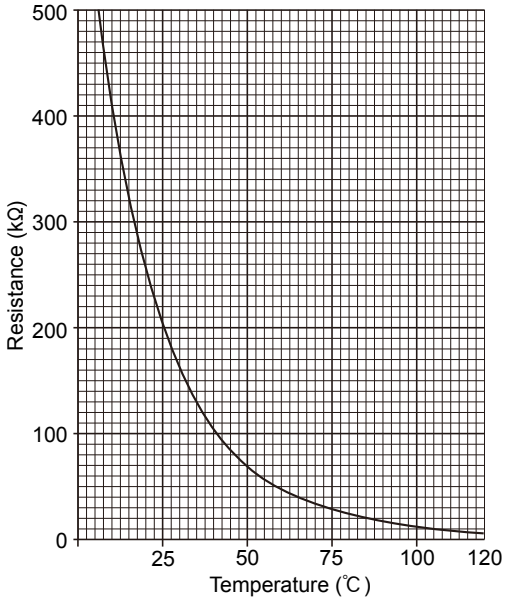
High temperature thermistor

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

Thermistor R120 = 7.465kΩ ± 2%
B constant = 4057 ± 2%

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

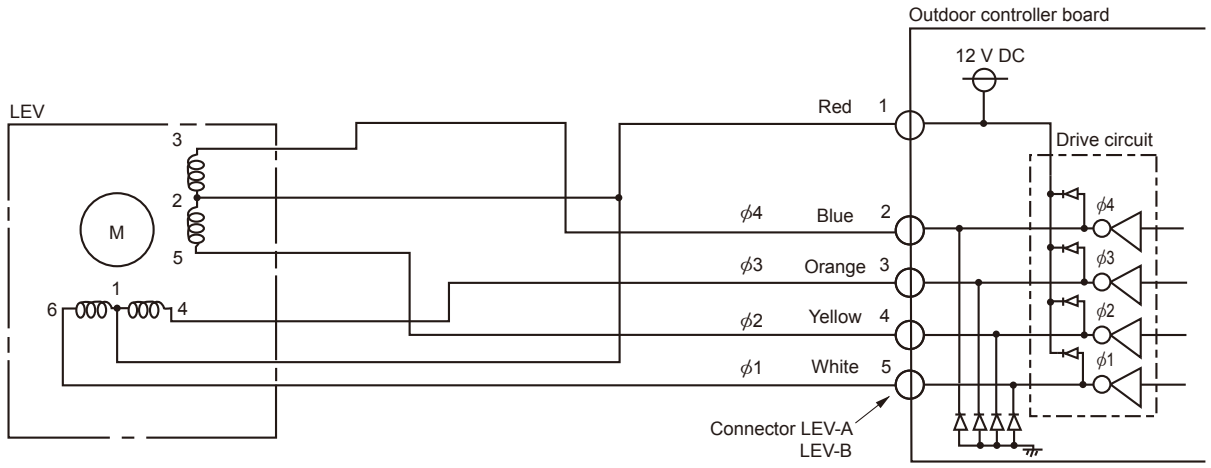
20℃	250 kΩ	70℃	34 kΩ
30℃	160 kΩ	80℃	24 kΩ
40℃	104 kΩ	90℃	17.5 kΩ
50℃	70 kΩ	100℃	13.0 kΩ
60℃	48 kΩ	110℃	9.8 kΩ



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>



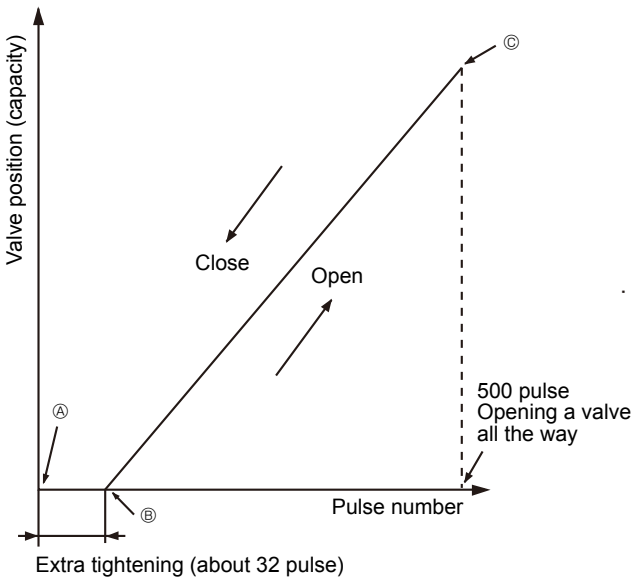
<Output pulse signal and the valve operation>

Output (Phase)	Output							
	1	2	3	4	5	6	7	8
ϕ1	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
ϕ2	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
ϕ3	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
ϕ4	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 phases become OFF.

(2) Linear expansion valve operation



· When the power is turned on, 700 pulse closing valve signal will be sent till it goes to Ⓐ point in order to define the valve position. (The pulse signal is being sent for about 20 seconds.)

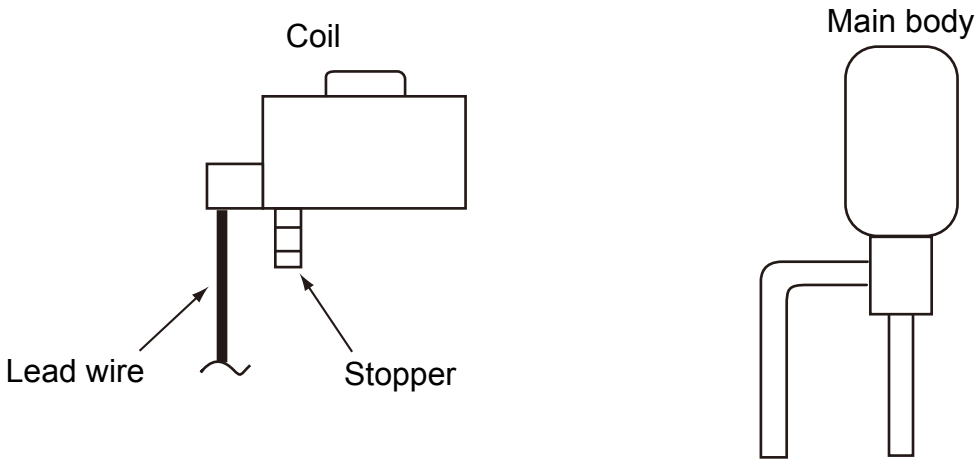
When the valve moves smoothly, there is no sound or vibration occurring from the linear expansion valve : however, when the pulse number moves from Ⓑ to Ⓐ or when the valve is locked, more sound can be heard.
No sound is heard when the pulse number moves from Ⓑ to Ⓐ in case coil is burnt out or motor 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>

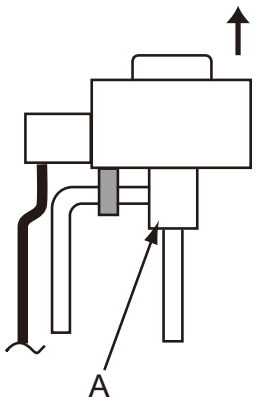
Linear expansion valve is separable into the main body and the coil as shown in the diagram below.



<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.

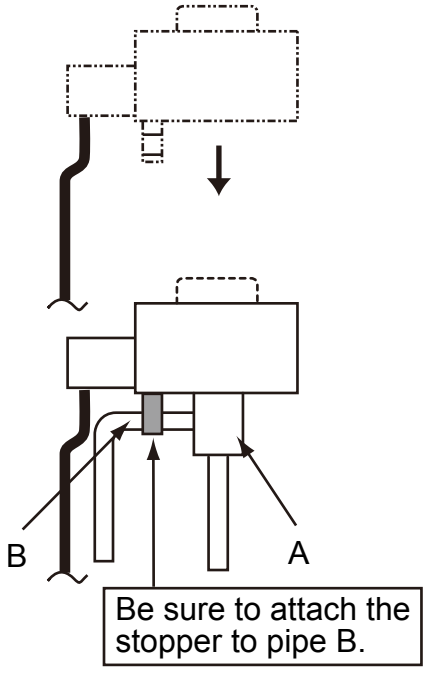
Be sure to detach the coil holding main body firmly. Otherwise pipes can bend due to stress.



<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 pipe B. (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 pipe B, 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.

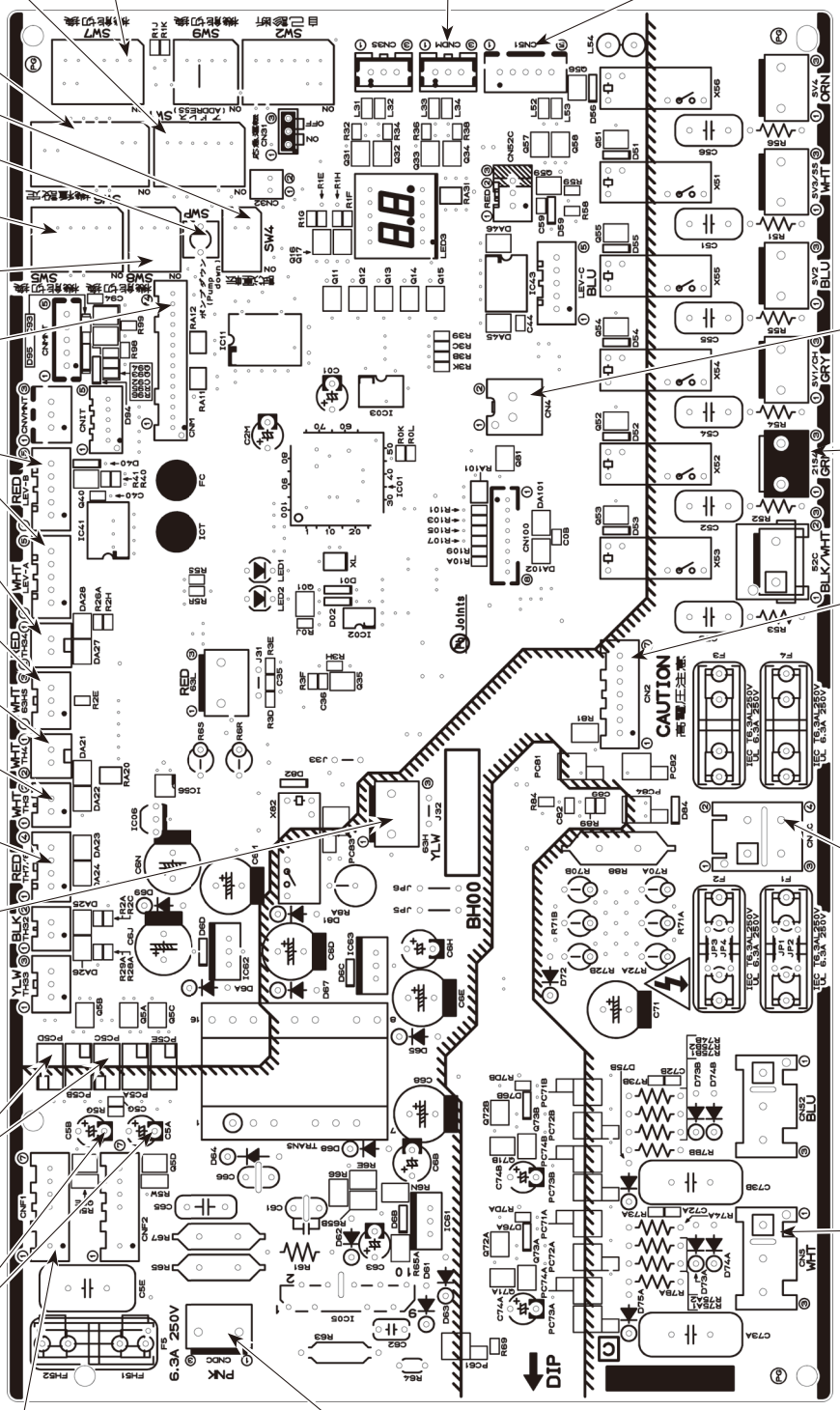


10-9. TEST POINT DIAGRAM

<CAUTION> TEST POINT① is high voltage.

Outdoor controller circuit board

PUHZ-SW40VHA PUHZ-SW40VHAR1 PUHZ-SW50VHA PUHZ-SW50VHAR1
PUHZ-SW40VHA-BS PUHZ-SW40VHAR1-BS PUHZ-SW50VHA-BS PUHZ-SW50VHAR1-BS



Outdoor controller circuit board
PUHZ-SW50VKA
PUHZ-SW50VKA-BS

Note: PUHZ-SW50VKA checks solder side.

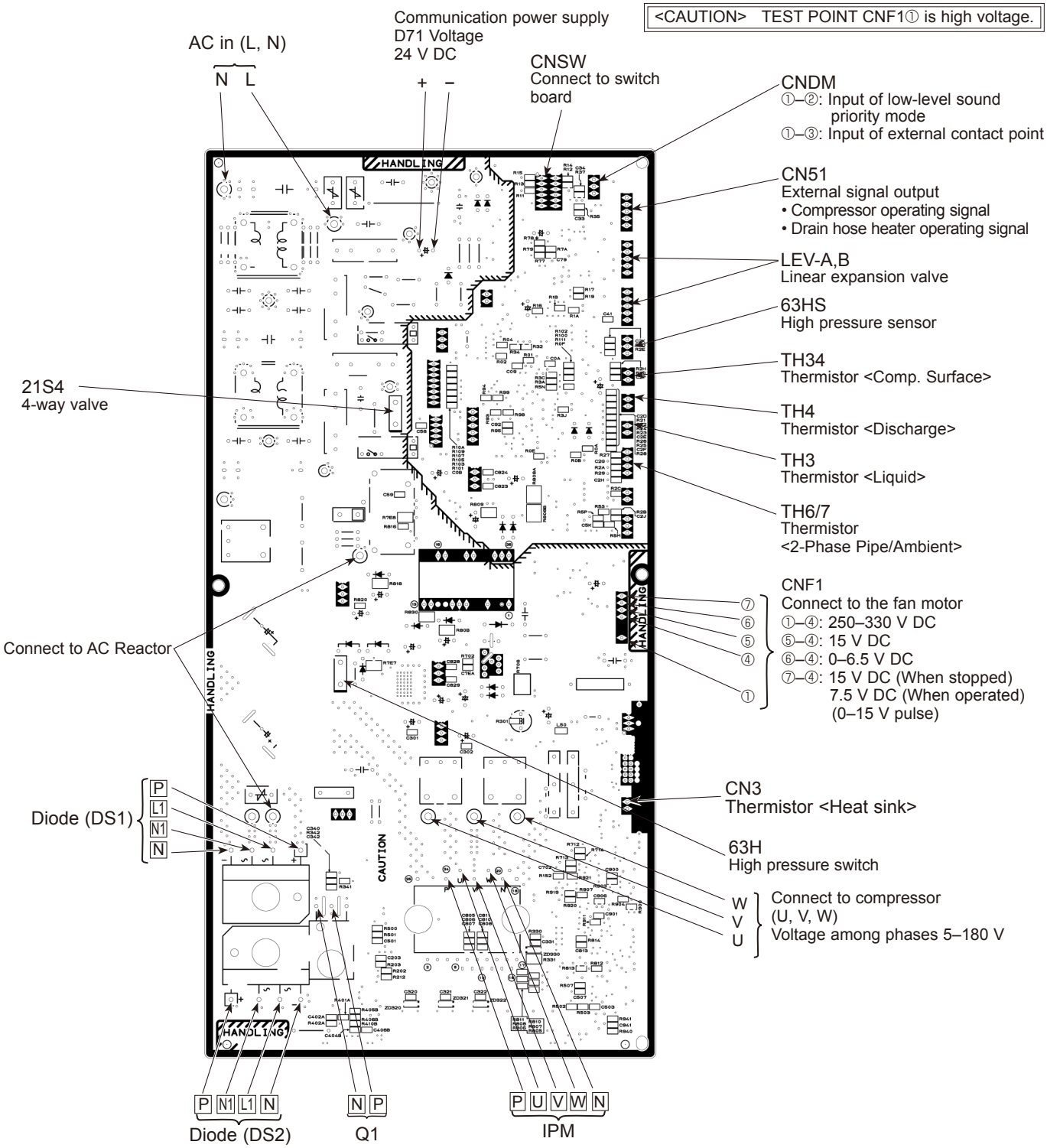
Brief Check of POWER MODULE

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 Diode (DS1, DS2)
   P - L1, P - N1, N - L1, N - N1
2. Check of Q1
   P - N
3. Check of IPM
   P - N , P - U , P - V , P - W , N - U , N - V , N - W
   P-N keeps being shirt-circuited until the smoothing condenser is charged by a tester.

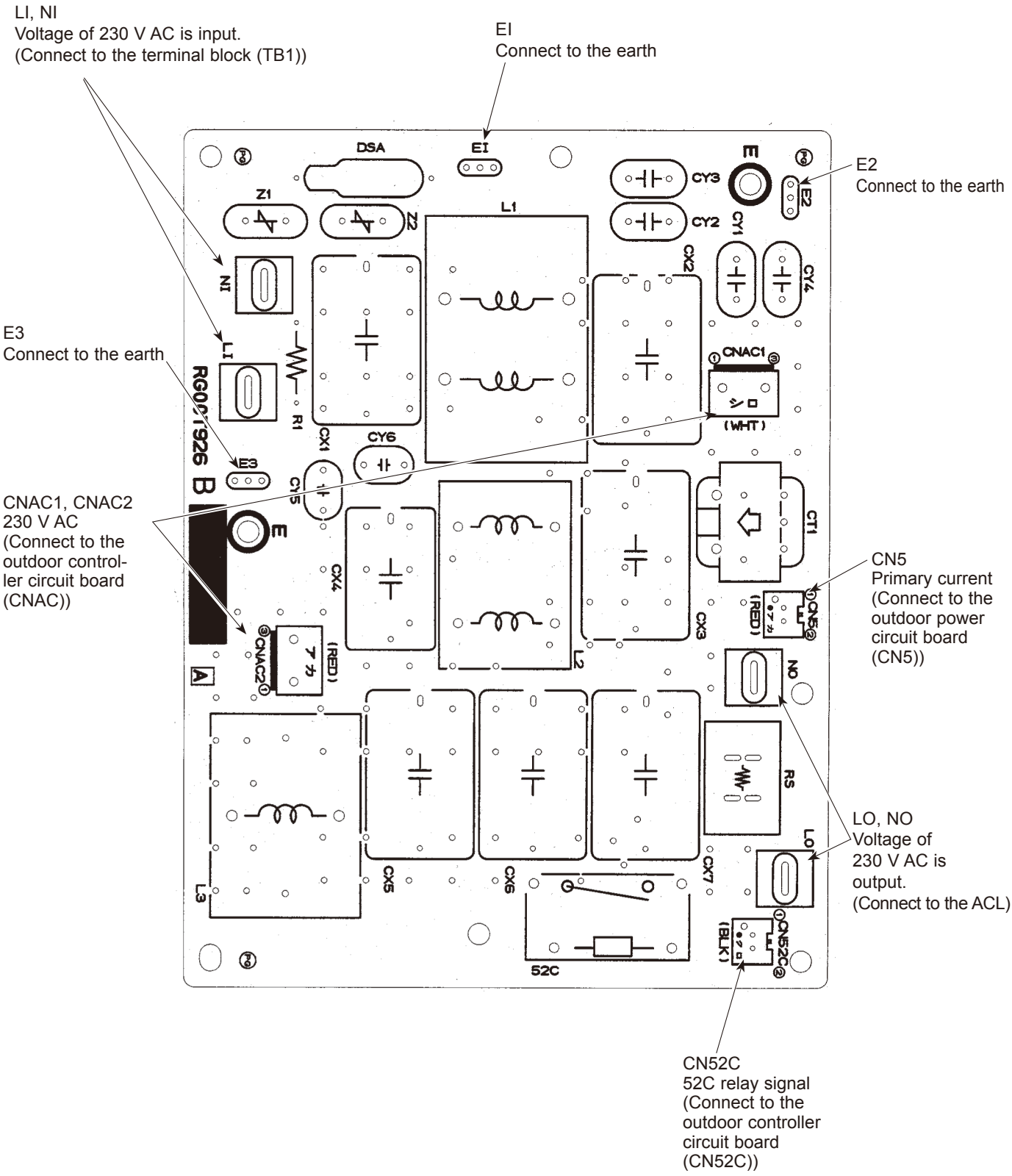
Note: The marks, P, N, L, L1, N1, U, V and W shown in the diagram are not actually printed on the board.

<CAUTION> TEST POINT CNF1① is high voltage.



Outdoor noise filter circuit board

PUHZ-SW40VHA PUHZ-SW40VHAR1 PUHZ-SW50VHA PUHZ-SW50VHAR1
PUHZ-SW40VHA-BS PUHZ-SW40VHAR1-BS PUHZ-SW50VHA-BS PUHZ-SW50VHAR1-BS



Outdoor power circuit board
PUHZ-SW40VHA
PUHZ-SW40VHA-BS
PUHZ-SW40VHAR1
PUHZ-SW40VHAR1-BS
PUHZ-SW50VHA
PUHZ-SW50VHA-BS
PUHZ-SW50VHAR1
PUHZ-SW50VHAR1-BS

Brief Check of DIP-IPM and DIP-PFC

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 DIP-IPM
   P2 - U , P2 - V , P2 - W , N2 - U , N2 - V , N2 - W
2. Check of DIP-PFC
   P1 - L , P1 - N , L - N1 , N - N1

Note: The marks, L , N , N1 , N2 , P1 , P2 , U , V and W shown in the diagram are not actually printed on the board.

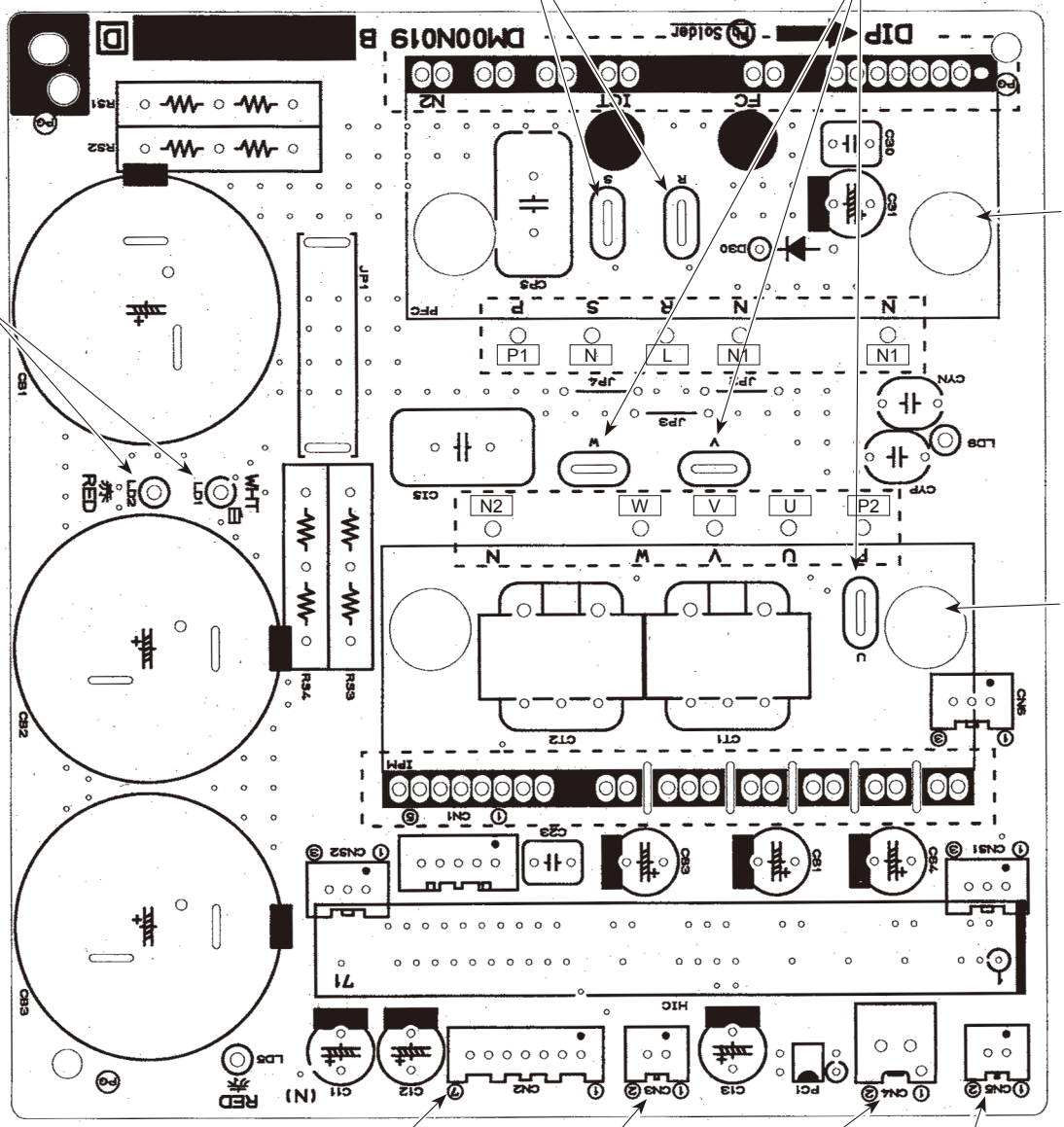
R, S
Connect to the ACL
230 V AC

U, V, W
Connect to the compressor (MC)
Voltage among phases: 5 to 180 V AC

LD1-LD2
280–380 V DC
Connect to the outdoor controller circuit board (CNDC)

DIP-PFC

DIP-IPM



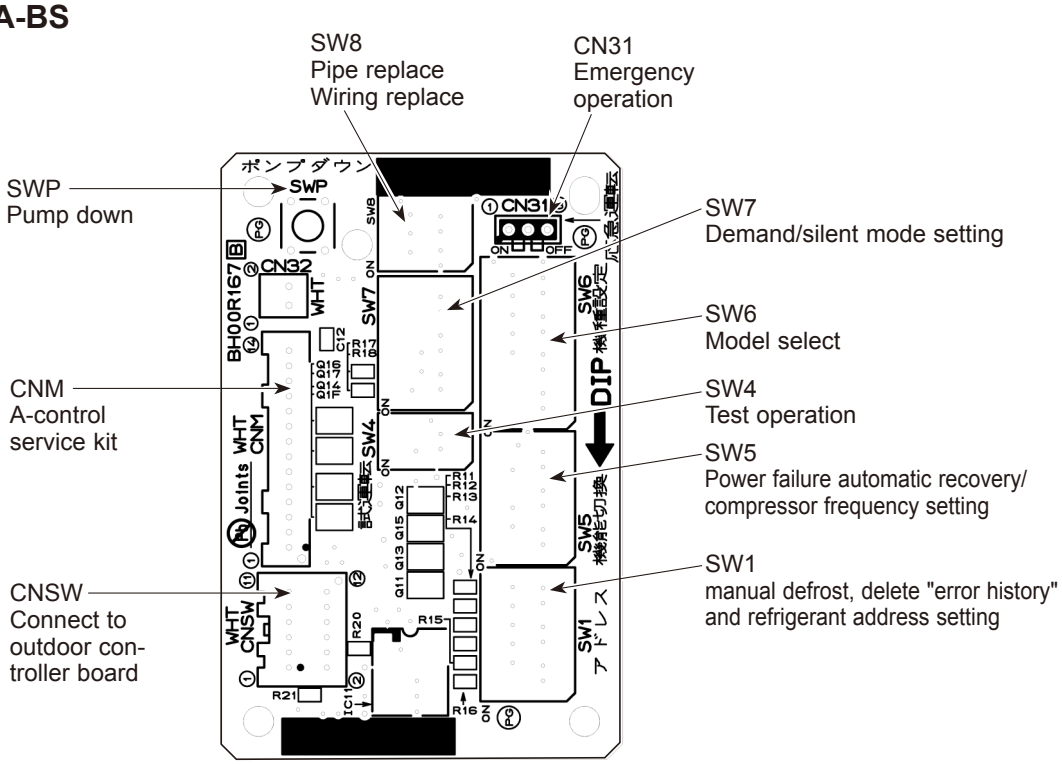
CN2
Connect to the outdoor controller circuit board (CN2)
①–⑤: Outdoor power circuit board → Transmitting signal to the outdoor controller circuit board (0–5 V DC)
②–⑤: Zero cross signal (0–5 V DC)
③–④: Not used
⑥–⑤: 16 V DC
⑦–⑤: 16 V DC
[①, ②, ⑥, ⑦ : ⊕ ⑤ : ⊖]

CN3
Thermistor <Heat sink> (TH8)

CN4
Connect from the outdoor controller circuit board (CN4)

CN5
Primary current detection (Connect to the outdoor noise filter circuit board (CN5))

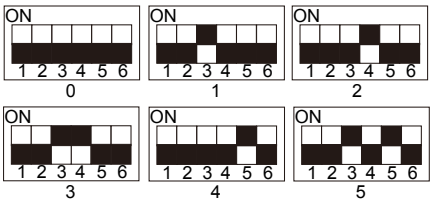
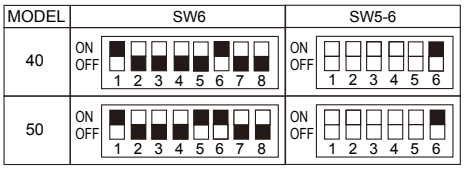
Switch board
PUHZ-SW50VKA
PUHZ-SW50VKA-BS



10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS

(1) Function of switches

The black square (■) indicates a switch position.

Type of Switch	Switch	No.	Function	Action by the switch operation		Effective timing
				ON	OFF	
DIP switch	SW1	1	Manual defrost *1	Start	Normal	When compressor is working in heating operation. *1
		2	Abnormal history clear	Clear	Normal	OFF or operating
		3	Refrigerant address setting			When power supply ON
		4				
		5				
		6				
	SW4	1	No function	—	—	—
		2	No function	—	—	
Push switch	SWP		Pump down	Start	Normal	Under suspension
DIP switch	SW5	1	No function	—	—	—
		2	Power failure automatic recovery *2	Auto recovery	No auto recovery	When power supply ON
		3,4,5	No function	—	—	—
		6	Model select	Following SW5-6 reference		
	SW7*4	1	Mode select *3	Demand function	Low noise mode	Always
		2	No function	—	—	—
		3	Max Hz setting (cooling)	Max Hz (cooling) × 0.8	Normal	Always
		4	Max Hz setting (heating)	Max Hz (heating) × 0.8	Normal	Always
		5	Breaker capacity setting *5	16A	25A	When power supply ON
		6	Defrost setting	For high humidity	Normal	Always
	SW8	1	No function	—	—	—
		2	No function	—	—	—
		3	No function	—	—	—
	SW9*6	1	No function	—	—	—
		2	Function switch	Valid	Normal	Always
		3,4	No function	—	—	—
	SW6	1	Model select	 The black square (■) indicates a switch position.		
		2				
		3				
		4				
		5				
		6				
		7				
		8				
	SW5	6				

*1 Manual defrost should be done as follows.
① Change the DIP SW1-1 on the outdoor controller board or switch board from OFF to ON.
② Manual defrost will start by the above operation ① if all these conditions written below are satisfied.
• Heat mode setting
• 10 minutes have passed since compressor started operating or previous manual defrost is finished.
• Pipe temperature is less than or equal to 8℃.
Manual defrost will finish if certain conditions are satisfied.
Manual defrost 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.

*2 'Power failure automatic recovery' can be set by either remote controller or this DIP SW. If one of them is set to ON, 'Auto recovery' activates. Please set 'Auto recovery' basically by remote controller because all units do not have DIP SW.
Also, once it is set, 'Auto recovery' will not be deactivated even setting the DIP SW to OFF. To deactivate, set the DIP SW to OFF, and turn the power OFF and ON again, then also set "NO FUNCTION" on remote controller. Please refer to the indoor unit installation manual.

*3 SW7-1 is setting change over of Demand/Low noise. It is effective only in case of external input.
(Local wiring is necessary. Refer to the next page: Special function)

*4 Please do not use SW7-3 to SW7-6 usually. Trouble might be caused by the usage condition.

*5 With this switch setting, the capacity decreases up to 30% under peak load condition. Thus this setting is recommended only for Air to water purposes.

*6 SW40/50VHA ONLY

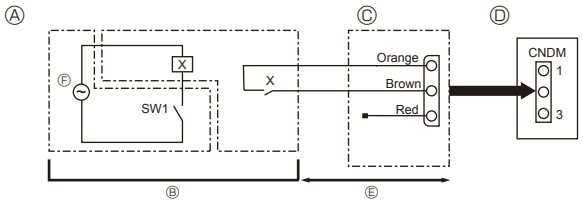
Special function

(a) Low-level sound priority mode (Local wiring)

By performing the following modification, operation noise of the outdoor unit can be reduced by about 3-4 dB.
The low noise mode will be activated when a commercially available timer or the contact input of an ON/OFF switch is added to the CNDM connector (option) on the control board of the outdoor unit.

- The ability varies according to the outdoor temperature and conditions, etc.

①Complete the circuit as shown when using the external input adapter (PAC-SC36NA-E). (Option)
②SW7-1 (Outdoor unit control board): OFF
③SW1 ON: Low noise mode
SW1 OFF: Normal operation



Ⓐ Circuit diagram example (low noise mode)
Ⓑ On-site arrangement
Ⓒ External input adapter (PAC-SC36NA-E)

X: Relay
Ⓓ Outdoor unit control board
Ⓔ Maximum 10 m
Ⓕ Power supply for relay

<Display function of inspection for outdoor unit>

The blinking patterns of both LED1 (green) and LED2 (red) indicate the types of abnormality when it occurs. Types of abnormality can be indicated in details by connecting an optional part 'A-Control Service Tool (PAC-SK52ST)' to connector CNM on outdoor controller board or switch board.

[Display]

(1)Normal condition

Unit condition	Outdoor controller board		A-Control Service Tool	
	LED1 (Green)	LED2 (Red)	Check code	Indication of the display
When the power is turned on	Lighted	Lighted	—⇔—	Alternately blinking display
When unit stops	Lighted	Not lighted	00, etc.	Operation mode
When compressor is warming up	Lighted	Not lighted	08, etc.	
When unit operates	Lighted	Lighted	C5, H7, etc.	

(2)Abnormal condition

Indication		Error			
Outdoor controller board		Contents	Check code *1	Inspection method	Detailed reference page
LED1 (Green)	LED2 (Red)				
1 blinking	2 blinking	Connector (63H) is open.	F5	①Check if connector (63H) on the outdoor controller board is not disconnected. ②Check continuity of pressure switch (63H) by tester.	P.20
2 blinking	1 blinking	Miswiring of I/F or FTC, or outdoor unit connecting wire, excessive number of indoor units (4 units or more)	—	①Check if I/F or FTC, or outdoor connecting wire is connected correctly. ②Check if 4 or more I/F or FTC units are connected to outdoor unit. ③Check if noise entered into I/F or FTC, or outdoor connecting wire or power supply. ④Re-check error by turning off power, and on again.	
		Miswiring of I/F or FTC, or outdoor unit connecting wire (converse wiring or disconnection)	—		
		Startup time over	—		
	2 blinking	I/F or FTC, or outdoor unit communication error (signal receiving error) is detected by FTC unit.	E6	①Check if I/F or FTC, or outdoor connecting wire is connected correctly. ②Check if noise entered into I/F or FTC, or outdoor connecting wire or power supply. ③Check if noise entered into I/F or FTC, or outdoor controller board. ④Re-check error by turning off power, and on again.	P.27
		I/F or FTC, or outdoor unit communication error (signal receiving error) is detected by outdoor unit.	— (E8)		
		I/F or FTC, or outdoor unit communication error (transmitting error) is detected by outdoor unit.	— (E9)		
	3 blinking	Remote controller signal receiving error is detected by remote controller.	E0	①Check if connecting wire of I/F or FTC unit, or remote controller is connected correctly. ②Check if noise entered into transmission wire of remote controller. ③Re-check error by turning off power, and on again.	P.26
		Remote controller transmitting error is detected by remote controller.	E3		
		Remote controller signal receiving error is detected by I/F or FTC unit.	E4		
		Remote controller transmitting error is detected by I/F or FTC unit.	E5		
	4 blinking	Check code is not defined.	EF	①Check if noise entered into transmission wire of remote controller. ②Check if noise entered into I/F or FTC, or outdoor connecting wire. ③Re-check error by turning off power, and on again.	P.27

*1 Check code displayed on remote controller

*2 Refer to Technical manual of ATW, I/F or FTC.

Indication		Error			
Outdoor controller board		Contents	Check code *1	Inspection method	Detailed reference page
LED1 (Green)	LED2 (Red)				
3 blinking	1 blinking	Abnormality of comp.surface thermistor(TH34) and discharging temperature (TH4)	U2	①Check if stop valves are open. ②Check if connectors (TH4, TH34, LEV-A, and LEV-B) on outdoor controller board are not disconnected. ③Check if unit is filled with specified amount of refrigerant. ④Measure resistance values among terminals on indoor valve and outdoor linear expansion valve using a tester.	P.22
		Abnormality of superheat due to low discharge temperature	U7		P.23
	2 blinking	Abnormal high pressure (High pressure switch 63H operated.)	U1	①Check if indoor/outdoor units have a short cycle on their air ducts. ②Check if connector (63H) on outdoor controller board is not disconnected. ③Check if heat exchanger and filter is not dirty. ④Measure resistance values among terminals on linear expansion valve using a tester.	P.22
	3 blinking	Abnormality of outdoor fan motor rotational speed	U8	①Check the outdoor fan motor. ②Check if connector (TH3) on outdoor controller board is disconnected.	P.23
		Protection from overheat operation(TH3)	Ud		P.25
	4 blinking	Compressor overcurrent breaking(Start-up locked)	UF	①Check if stop valves are open. ②Check looseness, disconnection, and converse connection of compressor wiring. ③Measure resistance values among terminals on compressor using a tester. ④Check if outdoor unit has a short cycle on its air duct. ⑤Check leakage of refrigerant.	P.25
		Compressor overcurrent breaking	UP		
		Abnormality of current sensor (P.B.)	UH		
		Abnormality of power module	U6		P.26
	5 blinking	Open/short of discharge thermistor (TH4) and comp.surface thermistor (TH34)	U3	①Check if connectors(TH3,TH4,TH6 ,TH7 and TH34)on outdoor controller board and connector (CN3) on outdoor power board are not disconnected. ②Measure resistance value of outdoor thermistors.	P.22
		Open/short of outdoor thermistors (TH3, TH6, TH7 and TH8)	U4		P.23
	6 blinking	Abnormality of heat sink temperature	U5	①Check if indoor/outdoor units have a short cycle on their air ducts. ②Measure resistance value of outdoor thermistor(TH8).	P.23
	7 blinking	Abnormality of voltage	U9	①Check looseness, disconnection, and converse connection of compressor wiring. ②Measure resistance value among terminals on compressor using a tester. ③Check the continuity of contactor (52C). ④Check if power supply voltage decreases. ⑤Check the wiring of CN52C. ⑥Check the wiring of CNAF.	P.24
4 blinking	1 blinking	Abnormality of room temperature thermistor (TH1)	P1	①Check if connectors (CN20, CN21, CN29 and CN44) on indoor controller board are not disconnected. ②Measure resistance value of indoor thermistors.	*2
		Abnormality of pipe temperature thermistor/Liquid (TH2)	P2		
		Abnormality of pipe temperature thermistor/Condenser-Evaporator	P9		
	2 blinking	Abnormality of drain sensor (DS) Float switch (FS) connector open	P4	①Check if connector (CN31)(CN4F) on indoor controller board is not disconnected. ②Measure resistance value of indoor thermistors. ③Measure resistance value among terminals on drain pump using a tester. ④Check if drain pump works. ⑤Check drain function.	*2
		Indoor drain overflow protection	P5		
	3 blinking	Freezing (cooling)/overheating (heating) protection	P6	①Check if indoor unit has a short cycle on its air duct. ②Check if heat exchanger and filter is not dirty. ③Measure resistance value on indoor and outdoor fan motors. ④Check if the inside of refrigerant piping is not clogged.	*2
	4 blinking	Abnormality of pipe temperature	P8	①Check if indoor thermistors(TH2 and TH5) are not disconnected from holder. ②Check if stop valve is open. ③Check converse connection of extension pipe. (on plural units connection) ④Check if indoor/outdoor connecting wire is connected correctly. (on plural units connection)	*2

*1 Check code displayed on remote controller

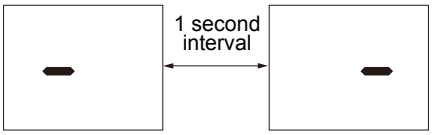
*2 Refer to service manual for indoor unit.

<Outdoor unit operation monitor function>
[When optional part 'A-Control Service Tool (PAC-SK52ST)' is connected to outdoor controller board or switch board (CNM)]
Digital indicator LED1 displays 2 digit number or code to inform operation condition and the meaning of check code by controlling DIP SW2 on 'A-Control Service Tool'.

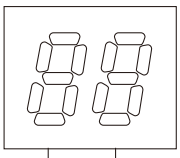
Operation indicator SW2 : Indicator change of self diagnosis

SW2 setting	Display detail	Explanation for display	Unit
ON 1 2 3 4 5 6			

<Digital indicator LED1 working details>
(Be sure that the 1 to 6 in the SW2 are set to OFF.)
(1) Display when the power supply ON
When the power supply ON, blinking displays by turns.
Wait for 4 minutes at the longest.



(2) When the display lights (Normal operation)
①Operation mode display.

LED1  (Lighting)

SW2
ON 1 2 3 4 5 6 (Initial setting)

The tens digit : Operation mode

Display	Operation Model
O	OFF/FAN
C	COOLING/DRY*
H	HEATING
d	DEFROSTING

* C5 is displayed during replacement operation.

The ones digit : Relay output

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	—

②Display 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.

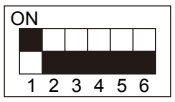
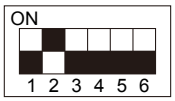
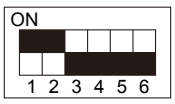
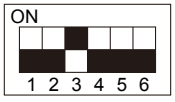
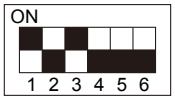
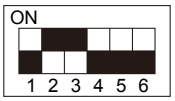
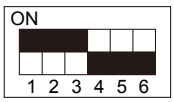
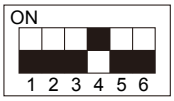
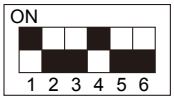
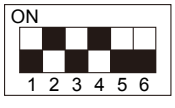
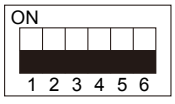
(3) When the display blinks
Check code is displayed when compressor stops due to the work of protection devices.

Display	Inspection unit
0	Outdoor unit
1	Indoor unit 1
2	Indoor unit 2
3	Indoor unit 3
4	Indoor unit 4

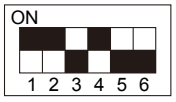
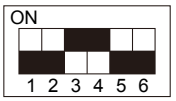
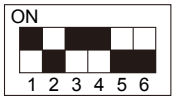
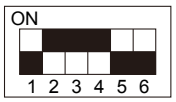
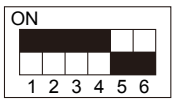
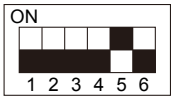
Display	Contents to be inspected (During operation)
U1	Abnormal high pressure (63H operated)
U2	Abnormal high discharging temperature and shell thermistor, shortage of refrigerant
U3	Open/short circuit of discharging thermistor (TH4) and comp.surface thermistor (TH34)
U4	Open/short of outdoor unit thermistors (TH3, TH6, TH7 and TH8)
U5	Abnormal temperature of heat sink
U6	Abnormality of power module
U7	Abnormality of superheat due to low discharge temperature
U8	Abnormality in outdoor fan motor
Ud	Overheat protection
UF	Compressor overcurrent interruption (When Comp. locked)
UH	Current sensor error
UL	Abnormal low pressure
UP	Compressor overcurrent interruption
P1–P8	Abnormality of indoor units
A0–A7	Communication error of M-NET system

Display	Contents to be inspected (When power is turned on)
F3	63L connector (red) is open.
F5	63H connector (yellow) is open.
F9	2 connectors (63H) are open.
E8	Indoor/outdoor communication error (Signal receiving error) (Outdoor unit)
E9	Indoor/outdoor communication error (Transmitting error) (Outdoor unit)
EA	Miswiring of indoor/outdoor unit connecting wire, excessive number of indoor units (4 units or more)
Eb	Miswiring of indoor/outdoor unit connecting wire (converse wiring or disconnection)
EC	Startup time over
E0–E7	Communication error except for outdoor unit

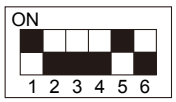
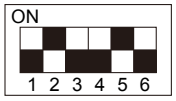
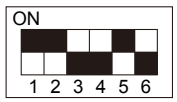
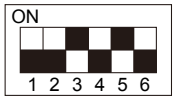
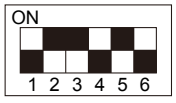
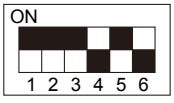
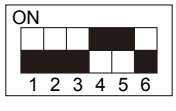
The black square (■) indicates a switch position.

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 s 0.5 s 2 s −□ →10 →□□	℃
	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 s 0.5 s 2 s □1 →05 →□□	℃
	Output step of outdoor FAN 0 to 10	0 to 10	Step
	The number of ON/OFF times of compressor 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 s 0.5 s 2 s □4 →25 →□□	100 times
	Compressor integrating operation times 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 s 0.5 s 2 s □2 →45 →□□	10 hours
	Compressor operating current 0 to 50	0 to 50 Note: Omit the figures after the decimal fractions.	A
	Compressor operating 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 125 Hz; 0.5 s 0.5 s 2 s □1 →25 →□□	Hz
	LEV-A opening pulse 0 to 480	0 to 480 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns. (Example) When 150 pulse; 0.5 s 0.5 s 2 s □1 →50 →□□	Pulse
	Error postponement code history (1) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement "00" is displayed in case of no postponement.	Code display
	Operation mode on error occurring	Operation mode of when operation stops due to error is displayed by setting SW2 like below. (SW2) 	Code display

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Pipe temperature/Liquid (TH3) on error occurring −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 s 0.5 s 2 s -□ →15 →□□	℃
	Discharge temperature (TH4) on error occurring 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 s 0.5 s 2 s □1 →30 →□□	℃
	Compressor operating current on error occurring 0 to 50	0 to 50	A
	Error history (1) (latest) Alternate display of abnormal unit number and code	When no error history, " 0 " and "– –" are displayed by turns.	Code display
	Error history (2) Alternate display of error unit number and code	When no error history, " 0 " and "– –" are displayed by turns.	Code display
	Thermostat ON time 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 s 0.5 s 2 s □2 →45 →□□	Minute
	Test run elapsed time 0 to 120	0 to 120 (When it is 100 minutes or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105 minutes; 0.5 s 0.5 s 2 s □1 →05 →□□	Minute

The black square (■) indicates a switch position.

<table>
<tr><th>SW2 setting</th><th>Display detail</th><th>Explanation for display</th><th>Unit</th></tr>
<tr><td>  </td><td>The number of connected indoor units</td><td>0 to 4
(The number of connected indoor units is displayed.)</td><td>Unit</td></tr>
<tr><td>  </td><td>Capacity setting display</td><td>Displayed as an outdoor capacity code.<table><tr><th>Capacity</th><th>Code</th></tr><tr><td>SW40V</td><td>9</td></tr><tr><td>SW50V</td><td>10</td></tr></table></td><td>Code display</td></tr>
<tr><td>  </td><td>Outdoor unit setting information</td><td>• The tens digit (Total display for applied setting)<table><tr><th>Setting details</th><th>Display details</th></tr><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></table>• The ones digit<table><tr><th>Setting details</th><th>Display details</th></tr><tr><td>Defrosting switch</td><td>0: Normal 1: For high humidity</td></tr></table>(Example) When heat pump, 3 phase and defrosting (normal) are set up, “20” is displayed.</td><td>Code display</td></tr>
<tr><td>  </td><td>Indoor pipe temperature/Liquid (TH2(1))
Indoor 1
−39 to 88</td><td>−39 to 88
(When the temperature is 0°C or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor pipe temperature/Cond./Eva. (TH5(1))
Indoor 1
−39 to 88</td><td>−39 to 88
(When the temperature is 0°C or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor pipe temperature/Liquid (TH2(2))
Indoor 2
−39 to 88</td><td>−39 to 88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor pipe temperature/Cond./Eva. (TH5(2))
Indoor 2
−39 to 88</td><td>−39 to 88
(When the temperature is 0°C or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor room temperature (TH1)
8 to 39</td><td>8 to 39</td><td>℃</td></tr>
</table>

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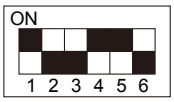
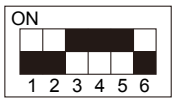
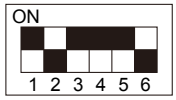
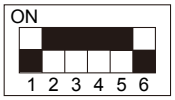
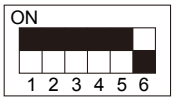
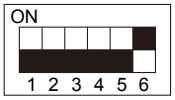
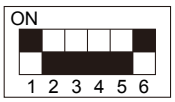
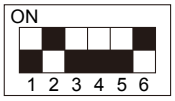
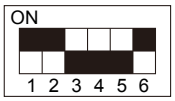
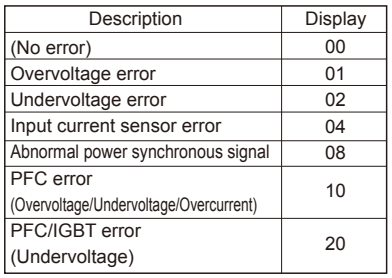
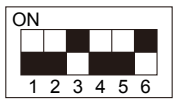
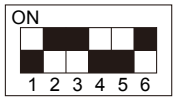
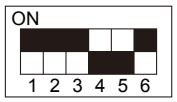
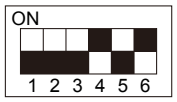
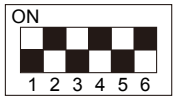
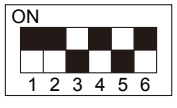
SW2 setting	Display detail	Explanation for display	Unit
	Indoor setting temperature 17 to 30	17 to 30	°C
	Pressure saturation temperature (T_{63HS}) −39 to 88	−39 to 88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.)	°C
	Outdoor ambient temperature (TH7) −39 to 88	−39 to 88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.)	°C
	Outdoor heat sink 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 = TH4−T_{63HS} Heating = TH4−T_{63HS}]	0 to 255 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C
	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 16^3's and 16^2's, and 16^1's and 16^0's places. (Example) When 5000 cycles; 0.5 s 0.5 s 2 s □9 → C4 → □□	2 cycles
	Input current of outdoor unit	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 480 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.)	Pulse
	U9 error detail history (latest)	 Display examples for multiple errors: Overvoltage (01) + Undervoltage (02) = 03 Undervoltage (02) + Power-sync signal error (08) = 0A Input current sensor error (04) + PFC error (10) = 14	Code display

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	DC bus voltage 180 to 370	180 to 370 (When it is 100 V or more, hundreds digit, tens digit and ones digit are displayed by turns.)	V
	Error postponement code history (2) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement “00” is displayed in case of no postponement.	Code display
	Error postponement code history (3) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement “00” is displayed in case of no postponement.	Code display
	Error history (3) (Oldest) Alternate display of abnormal unit number and code.	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 thermistor (TH3) 4: Discharge thermistor (TH4) 6: 2-phase pipe thermistor (TH6) 7: Ambient thermistor (TH7) 8: Heat sink thermistor (TH8) 34: Comp. surface thermistor (TH34)	Code display
	Operation frequency on error occurring 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 125 Hz; 0.5 s 0.5 s 2 s □1 →25 →□□	Hz
	Fan step on error occurring 0 to 10	0 to 10	Step

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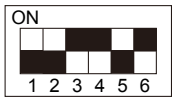
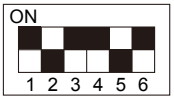
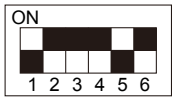
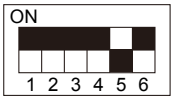
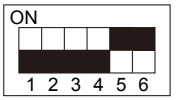
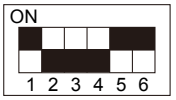
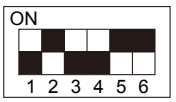
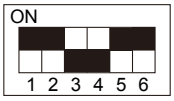
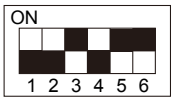
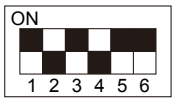
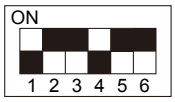
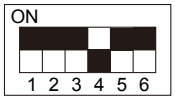
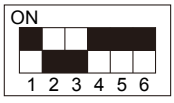
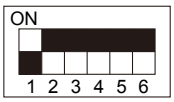
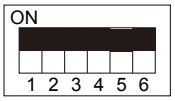
SW2 setting	Display detail	Explanation for display	Unit
	LEV-A opening pulse on error occurring 0 to 480	0 to 480 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 130 pulse; 0.5 s 0.5 s 2 s □1 → 30 → □□	Pulse
	Indoor room temperature (TH1) on error occurring 8 to 39	8 to 39	℃
	Indoor pipe temperature/Liquid (TH2) on error occurring −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 s 0.5 s 2 s -□ → 15 → □□	℃
	Pressure saturation temperature (T_{63HS}) on error occurring −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 s 0.5 s 2 s -□ → 15 → □□	℃
	Outdoor pipe temperature/2-phase (TH6) on error occurring −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 s 0.5 s 2 s -□ → 15 → □□	℃
	Outdoor ambient temperature (TH7) on error occurring −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 s 0.5 s 2 s -□ → 15 → □□	℃
	Outdoor heat sink temperature (TH8) on error occurring −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.)	℃

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Discharge superheat on error occurring SHd 0 to 255 [Cooling = TH4−T_{63HS} Heating = TH4−T_{63HS}]	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 s 0.5 s 2 s □1 →50 →□□	℃
	Sub cool on error occurring SC 0 to 130 [Cooling = T_{63HS}−TH3 Heating = T_{63HS}−TH2]	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 s 0.5 s 2 s □1 →15 →□□	℃
	Thermo-ON time until error stops 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 s 0.5 s 2 s □4 →15 →□□	Minute
	Indoor pipe temperature/Liquid (TH2 (3)) Indoor 3 −39 to 88	−39 to 88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.)	℃
	Indoor pipe temperature/Cond./ Eva. (TH5 (3)) Indoor 3 −39 to 88	−39 to 88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.) When there is no indoor unit, "00" is displayed.	℃
	Controlling status of compressor operating frequency	The following code will be a help to know the operating status of unit. •The tens digit Display | Compressor operating frequency control 1 | Primary current control 2 | Secondary current control •The ones digit (In this digit, the total number of activated control is displayed.) Display | Compressor operating frequency control 1 | Preventive control for excessive temperature rise of discharge temperature 2 | Preventive control for excessive temperature rise of condensing temperature 4 | Frosting preventing control 8 | Preventive control for excessive temperature rise of heat sink (Example) The following controls are activated. • Primary current control • Preventive control for excessive temperature rise of condensing temperature • Preventive control for excessive temperature rise of heat sink LED 	Code display

The black square (■) indicates a switch position.

<table>
<tr><th>SW2 setting</th><th>Display detail</th><th>Explanation for display</th><th>Unit</th></tr>
<tr><td> 
</td><td>Comp. surface temperature (TH34)
−52 to 221</td><td>−52 to 221
(When the comp. surface thermistor detects 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)
(Example) When 105°C;
0.5 s 0.5 s 2 s
□1 →05 →□□</td><td>℃</td></tr>
<tr><td> 
</td><td>U9 Error details (To be shown while error call is deferred.)</td><td><table><tr><th>Description</th><th>Display</th></tr><tr><td>(No error)</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>Abnormal power synchronous signal</td><td>08</td></tr><tr><td>PFC error
(Overvoltage/Undervoltage/Overcurrent)</td><td>10</td></tr><tr><td>PFC/IGBT error
(Undervoltage)</td><td>20</td></tr></table>Display examples for multiple errors:
Overvoltage (01) + Undervoltage (02) = 03
Undervoltage (02) + Power-sync signal error (08) = 0A
Input current sensor error (04) + PFC error (10) = 14</td><td></td></tr>
</table>

10-11. Request code list

Certain indoor/outdoor combinations do not have the request code function; therefore, no request codes are displayed.
Refer to indoor unit service manual for how to use the controllers and request codes for indoor unit.

Request code	Request content	Description (Display range)	Unit	Remarks
0	Operation state	Refer to 10-11-1. Detail Contents in Request Code.	–	
1	Compressor-Operating current (rms)	0–50	A	
2	Compressor-Accumulated operating time	0–9999	10 hours	
3	Compressor-Number of operation times	0–9999	100 times	
4	Discharge temperature (TH4)	3–217	℃	
5	Outdoor unit -Liquid pipe 1 temperature (TH3)	−40–90	℃	
6				
7	Outdoor unit-2-phase pipe temperature (TH6)	−39–88	℃	
8				
9	Outdoor unit-Outside air temperature (TH7)	−39–88	℃	
10	Outdoor unit-Heat sink temperature (TH8)	−40–200	℃	
11				
12	Discharge superheat (SHd)	0–255	℃	
13	Sub-cool (SC)	0–130	℃	
14	Condensing temperature (T_{63HS})	−39–88	℃	
15				
16	Compressor-Operating frequency	0–255	Hz	
17	Compressor-Target operating frequency	0–255	Hz	
18	Outdoor unit-Fan output step	0–10	Step	
19	Outdoor unit-Fan 1 speed	0–9999	rpm	
20				
21				
22	LEV (A) opening	0–500	Pulses	
23	LEV (B) opening	0–500	Pulses	
24				
25	Primary current	0–50	A	
26	DC bus voltage	180–370	V	
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48	Thermostat ON operating time	0–999	Minutes	
49				

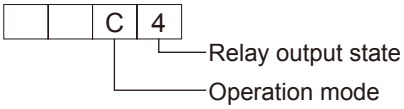
Request code	Request content	Description (Display range)	Unit	Remarks
50				
51	Outdoor unit-Control state	Refer to 10-11-1.Detail Contents in Request Code.	–	
52	Compressor-Frequency control state	Refer to 10-11-1.Detail Contents in Request Code.	–	
53	Outdoor unit-Fan control state	Refer to 10-11-1.Detail Contents in Request Code.	–	
54	Actuator output state	Refer to 10-11-1.Detail Contents in Request Code.	–	
55	Error content (U9)	Refer to 10-11-1.Detail Contents in Request Code.	–	
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70	Outdoor unit-Capacity setting display	Refer to 10-11-1.Detail Contents in Request Code.	–	
71	Outdoor unit-Setting information	Refer to 10-11-1.Detail Contents in Request Code.	–	
72				
73				
74				
75				
76				
77				
78				
79				
80				
81				
82				
83				
84				
85				
86				
87				
88				
89				
90	Outdoor unit-Microprocessor version information	Examples) Ver 5.01 → "0501"	Ver	
91	Outdoor unit-Microprocessor version information (sub No.)	Auxiliary information (displayed after version information) Examples) Ver 5.01 A000 → "A000"	–	
92				
93				
94				
95				
96				
97				
98				
99				
100	Outdoor unit - Error postponement history 1 (latest)	Displays postponement code. (" - - " is displayed if no postponement code is present)	Code	
101	Outdoor unit - Error postponement history 2 (previous)	Displays postponement code. (" - - " is displayed if no postponement code is present)	Code	
102	Outdoor unit - Error postponement history 3 (last but one)	Displays postponement code. (" - - " is displayed if no postponement code is present)	Code	

Request code	Request content	Description (Display range)	Unit	Remarks
103	Error history 1 (latest)	Displays error history. ("--" is displayed if no history is present.)	Code	
104	Error history 2 (second to last)	Displays error history. ("--" is displayed if no history is present.)	Code	
105	Error history 3 (third to last)	Displays error history. ("--" is displayed if no history is present.)	Code	
106	Abnormal thermistor display (TH3/TH6/TH7/TH8)	3 : TH3 6 : TH6 7 : TH7 8 : TH8 0 : No thermistor error	Sensor number	
107	Operation mode at time of error	Displayed in the same way as request code "0".	–	
108	Compressor-Operating current at time of error	0–50	A	
109	Compressor-Accumulated operating time at time of error	0–9999	10 hours	
110	Compressor-Number of operation times at time of error	0–9999	100 times	
111	Discharge temperature at time of error	3–217	℃	
112	Outdoor unit -Liquid pipe 1 temperature (TH3) at time of error	−40–90	℃	
113				
114	Outdoor unit-2-phase pipe temperature (TH6) at time of error	−39–88	℃	
115				
116	Outdoor unit-Outside air temperature (TH7) at time of error	−39–88	℃	
117	Outdoor unit-heat Sink temperature (TH8) at time of error	−40–200	℃	
118	Discharge superheat (SHd) at time of error	0–255	℃	
119	Sub-cool (SC) at time of error	0–130	℃	
120	Compressor-Operating frequency at time of error	0–255	Hz	
121	Outdoor unit at time of error • Fan output step	0–10	Step	
122	Outdoor unit at time of error	0–9999	rpm	
123				
124				
125	LEV (A) opening at time of error	0–500	Pulses	
126	LEV (B) opening at time of error	0–500	Pulses	
127				
128				
129	Condensing temperature (T_{63HS}) at the time of error	−39–88	℃	
130	Thermostat ON time until operation stops due to error	0–999	Minutes	

10-11-1. Detail Contents in Request Code

[Operation state] (Request code: "0")

Data display



Operation mode

Display	Operation mode
0	STOP • FAN
C	COOL • DRY
H	HEAT
d	DEFROST

Relay output state

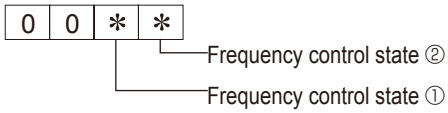
Display	Power currently supplied to compressor	Compressor	4-way valve	Solenoid valve
0	–	–	–	–
1				ON
2			ON	
3			ON	ON
4		ON		
5		ON		ON
6		ON	ON	
7		ON	ON	ON
8	ON			
A	ON		ON	

[Outdoor unit – Control state] (Request code: "51")

Data display				State
0	0	0	0	Normal
0	0	0	1	Preparing for heat operation
0	0	0	2	Defrost

[Compressor – Frequency control state] (Request code: "52")

Data display



Frequency control state ①

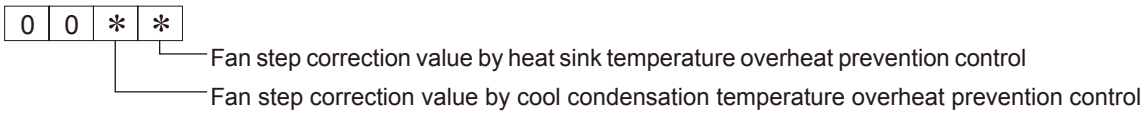
Display	Current limit control
0	No current limit
1	Primary current limit control is ON.
2	Secondary current limit control is ON.

Frequency control state ②

Display	Discharge temperature overheat prevention	Condensation temperature overheat prevention	Anti-freeze protection control	Heat sink temperature overheat prevention
0				
1	Controlled			
2		Controlled		
3	Controlled	Controlled		
4			Controlled	
5	Controlled		Controlled	
6		Controlled	Controlled	
7	Controlled	Controlled	Controlled	
8				Controlled
9	Controlled			Controlled
A		Controlled		Controlled
b	Controlled	Controlled		Controlled
C			Controlled	Controlled
d	Controlled		Controlled	Controlled
E		Controlled	Controlled	Controlled
F	Controlled	Controlled	Controlled	Controlled

[Fan control state] (Request code: "53")

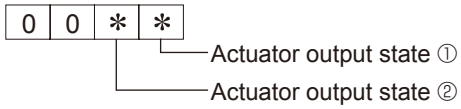
Data display



Display	Correction value
− (minus)	−1
0	0
1	+1
2	+2

[Actuator output state] (Request code: "54")

Data display



Actuator output state ①

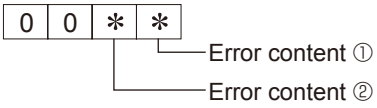
Display	SV1	Four-way valve	Compressor	Compressor is warming up
0				
1	ON			
2		ON		
3	ON	ON		
4			ON	
5	ON		ON	
6		ON	ON	
7	ON	ON	ON	
8				ON
9	ON			ON
A		ON		ON
b	ON	ON		ON
C			ON	ON
d	ON		ON	ON
E		ON	ON	ON
F	ON	ON	ON	ON

Actuator output state ②

Display	52C	SV2	SS
0			
1	ON		
2		ON	
3	ON	ON	
4			ON
5	ON		ON
6		ON	ON
7	ON	ON	ON

[Error content (U9)] (Request code: "55")

Data display



Error content ① ●: Detected

Display	Overvoltage error	Undervoltage error	L_1-phase open error	Power synchronizing signal error
0				
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●
A		●		●
b	●	●		●
C			●	●
d	●		●	●
E		●	●	●
F	●	●	●	●

Error content ② ●: Detected

Display	Converter Fo error	PAM error
0		
1	●	
2		●
3	●	●

[Outdoor unit – Capacity setting display] (Request code: "70")

Data display	Capacity
9	35
10	50
11	60
14	71
20	100
25	125
28	140
40	200
50	250

[Outdoor unit – Setting information] (Request code: "71")

Data display

0	0	*	*

Setting information ①

Setting information ②

Setting information ①

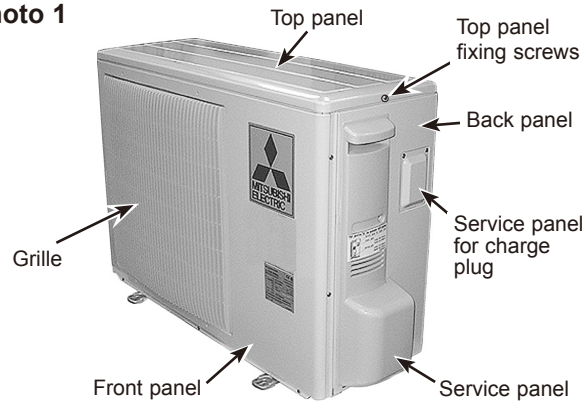
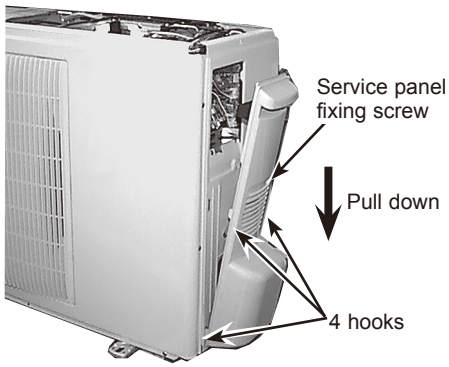
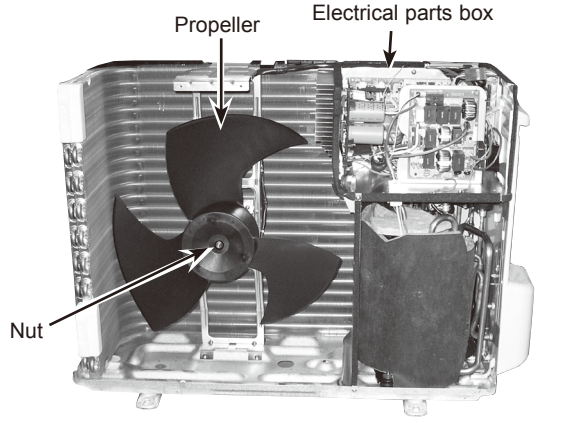
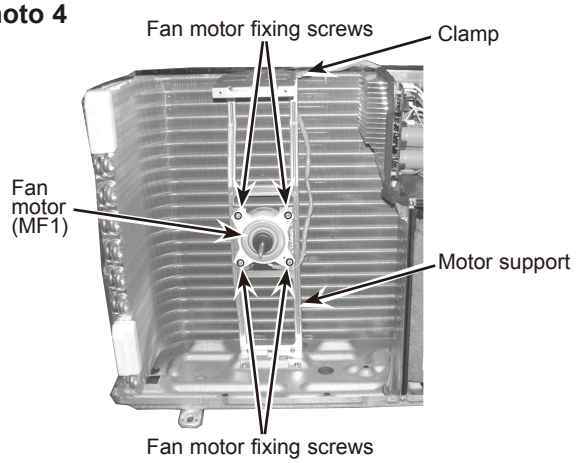
Display	Defrost mode
0	Standard
1	For high humidity

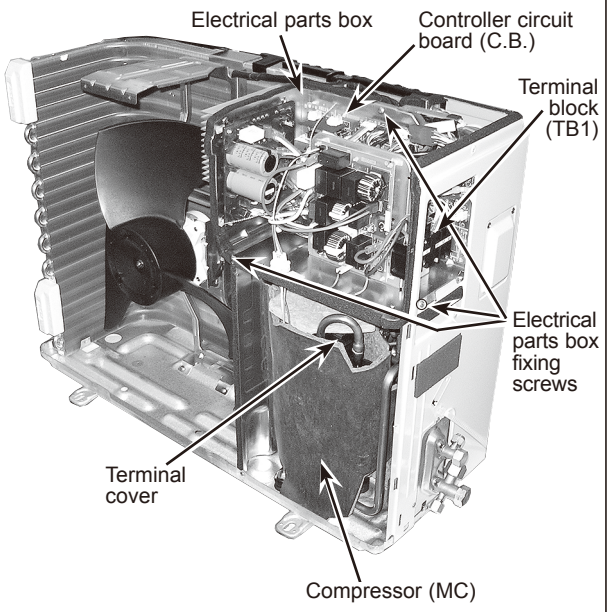
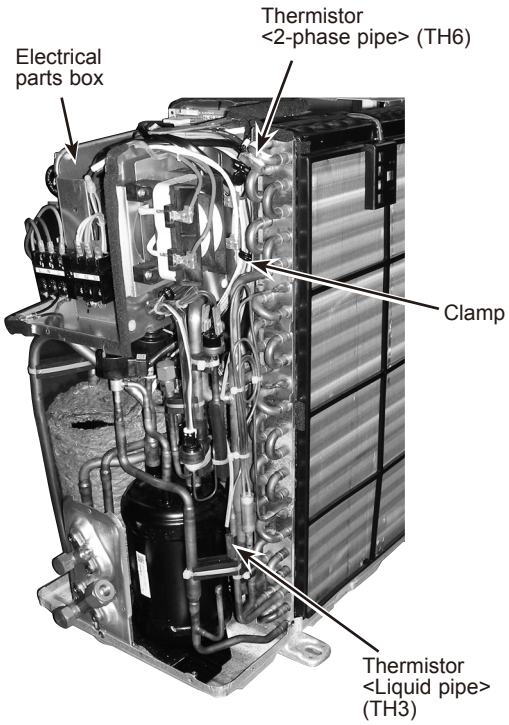
Setting information ②

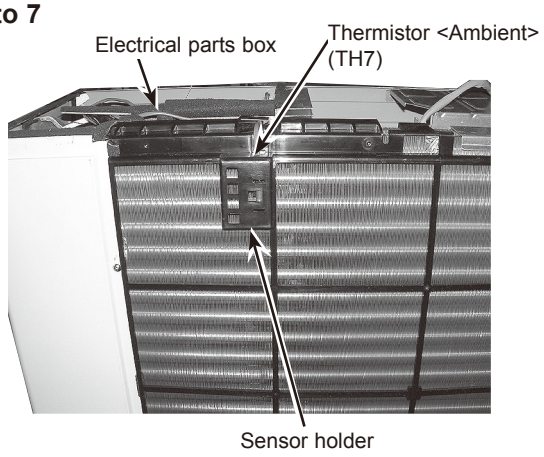
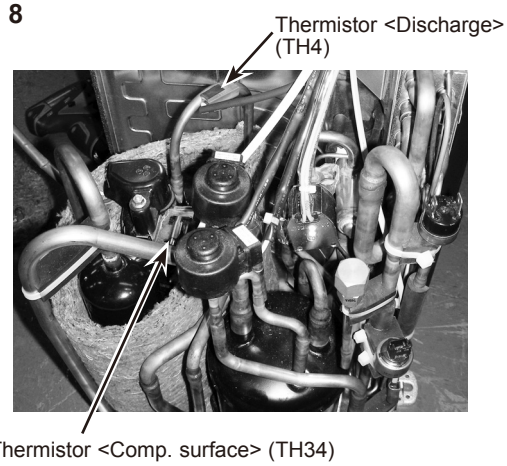
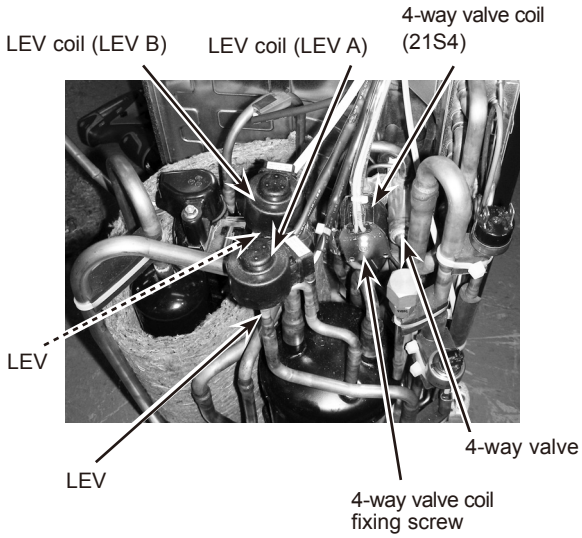
Display	Single-/ 3-phase	Heat pump/ cooling only
0	Single-phase	Heat pump
1		Cooling only
2	3-phase	Heat pump
3		Cooling only

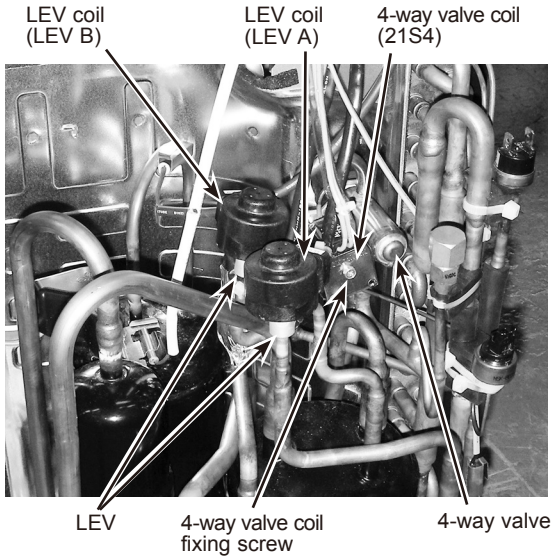
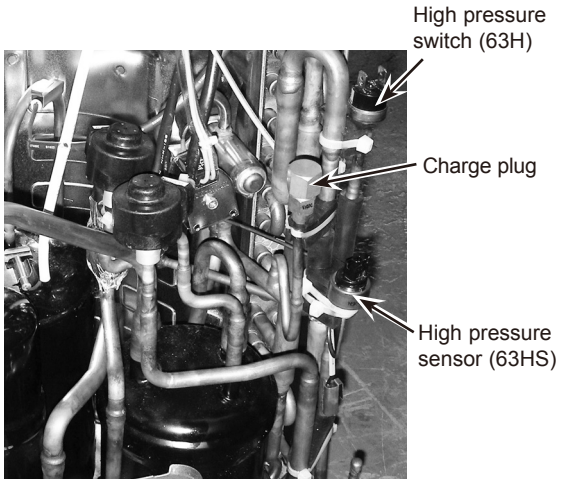
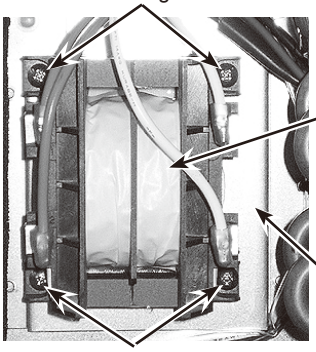
11 DISASSEMBLY PROCEDURE

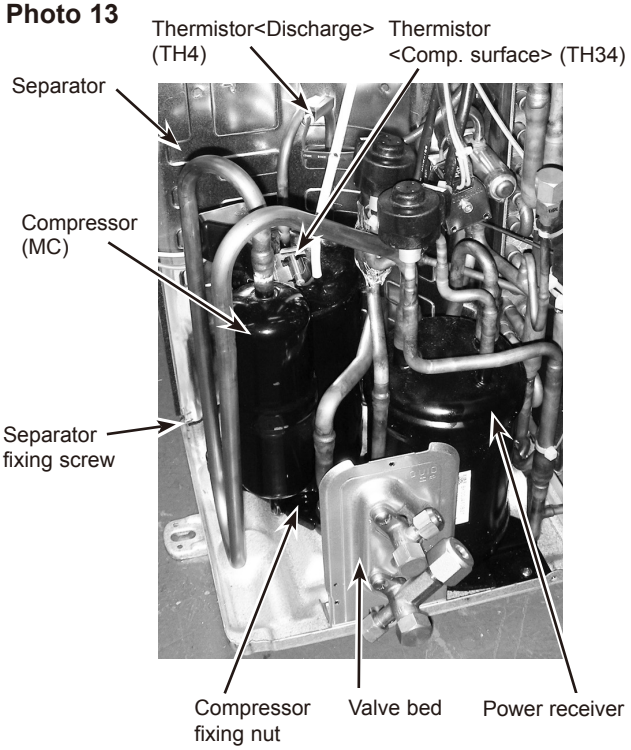
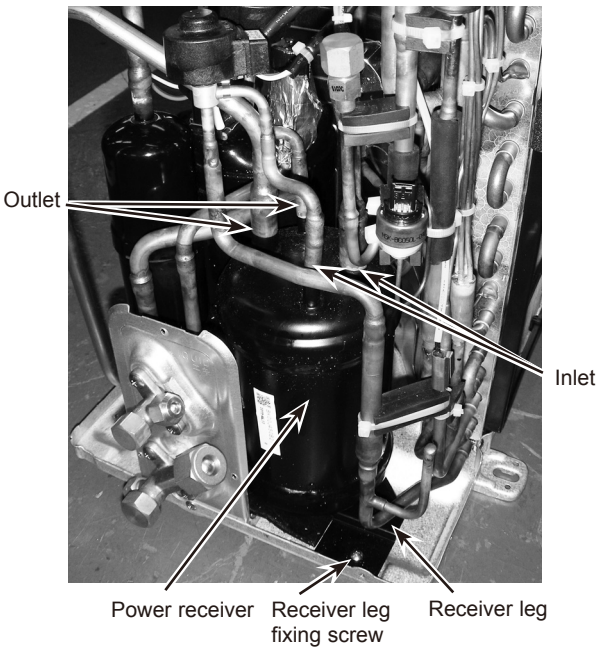
PUHZ-SW40VHA PUHZ-SW40VHAR1 PUHZ-SW50VHA PUHZ-SW50VHAR1
PUHZ-SW40VHA-BS PUHZ-SW40VHAR1-BS PUHZ-SW50VHA-BS PUHZ-SW50VHAR1-BS

OPERATING PROCEDURE	PHOTOS
1. Removing the top panel, service panel, front panel and back panel (1) Remove the top panel fixing screws (4 × 10), 1 from the right and 2 from the left side, and detach the top panel. (2) Remove 1 service panel fixing screw (4 × 10) and detach the service panel by pulling it downward. (See Photo 2.) (3) Remove the front panel fixing screws (4 × 10), 5 from the front, 2 from the right and 2 from the left side, and detach the front panel. (4) Remove the back panel fixing screws (4 × 10), 4 from the right and 3 from the rear side, and detach the back panel.	**Photo 1**  **Photo 2** 
2. Removing the fan motor (1) Remove the top panel. (See Photo 1) (2) Remove the front panel. (See Photo 1) (3) Remove 1 nut (M6, left-screw) and detach the propeller. (4) Disconnect the connector CNF1 on the controller circuit board in the electrical parts box. (5) Loosen the clamp for the lead wire in the motor support. (6) Remove 4 fan motor fixing screws (4 × 18) and detach the fan motor. (See Photo 3)	**Photo 3**  **Photo 4** 

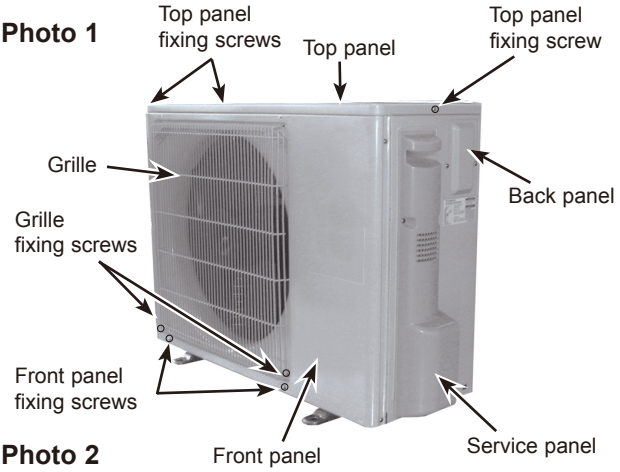
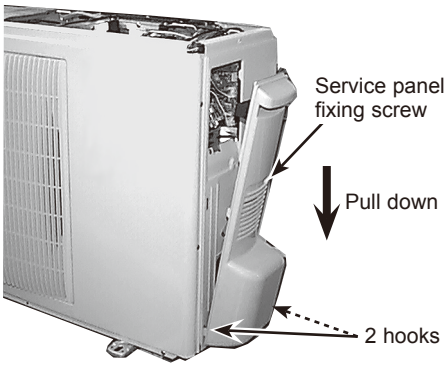
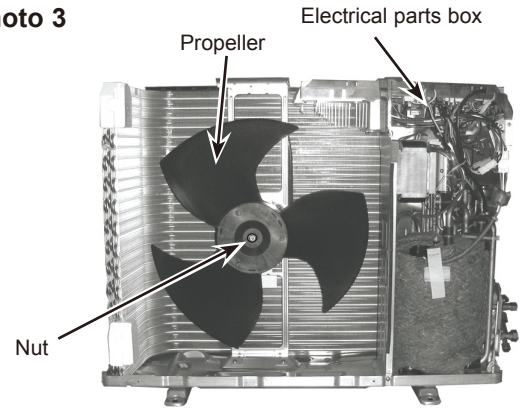
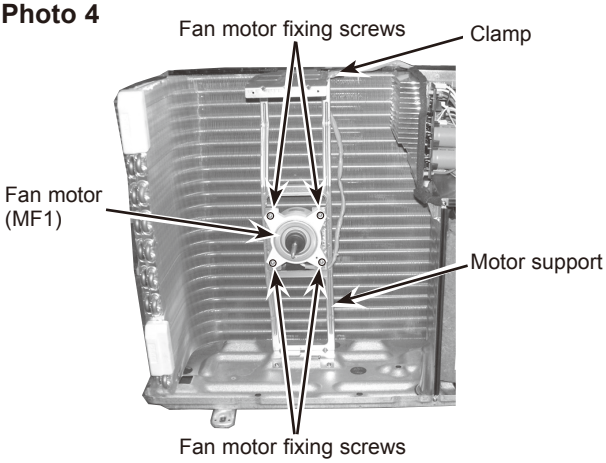
OPERATING PROCEDURE	PHOTOS
3. Removing the electrical parts box (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Disconnect the indoor/outdoor connecting wire from terminal block. (5) Disconnect the connector CNF1, LEV-A and LEV-B on the controller circuit board. <Symbols on the board> • CNF1 : Fan motor • LEV-A, LEV-B : LEV (6) Disconnect the pipe-side connections of the following parts. • Thermistor <Liquid>(TH3) • Thermistor <Discharge>(TH4) • Thermistor <2-phase pipe, Ambient>(TH6/7) • Thermistor <Comp. surface> (TH34) • High pressure switch (63H) • High pressure sensor (63HS) (7) Remove the terminal cover and disconnect the compressor lead wire. (8) Remove the electrical parts box fixing screws, 1 from the front, the right and the rear side, and detach the electrical parts box by pulling it upward.	**Photo 5** 
4. Removing the thermistor <2-phase pipe> (TH6) and thermistor <Liquid> (TH3) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel fixing screws, 4 from the right and 3 from the rear side, and detach the back panel. (See Photo 1) (5) Disconnect the connector TH3 (white) or TH6/7 (red) on the controller circuit board in the electrical parts box. (6) Loosen the clamp for the lead wire in the rear of the electrical parts box. (7) Pull out the thermistor <Liquid> (TH3) and thermistor <2-phase pipe> (TH6) from the sensor holder. **Note: Replace the thermistor <2-phase pipe> (TH6) and the thermistor <Ambient> (TH7) together since they are combined.** **Refer to No. 5. to remove the thermistor <Ambient> (TH7).**	**Photo 6** 

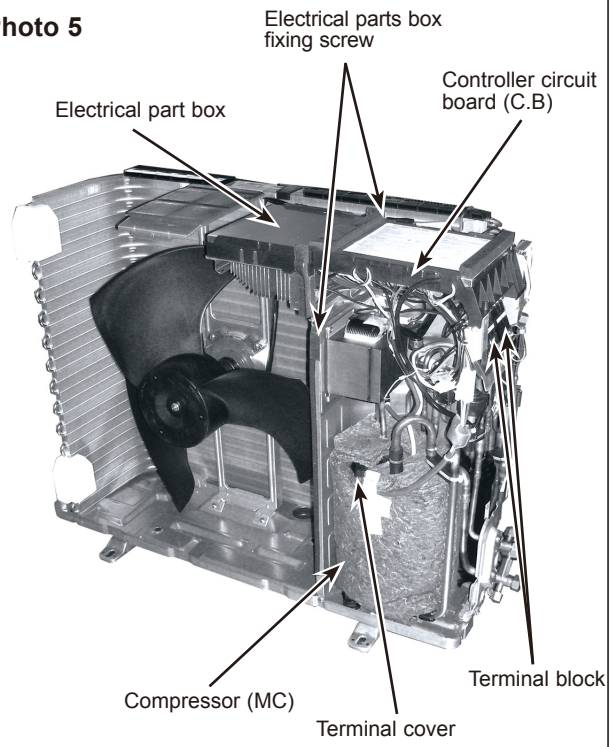
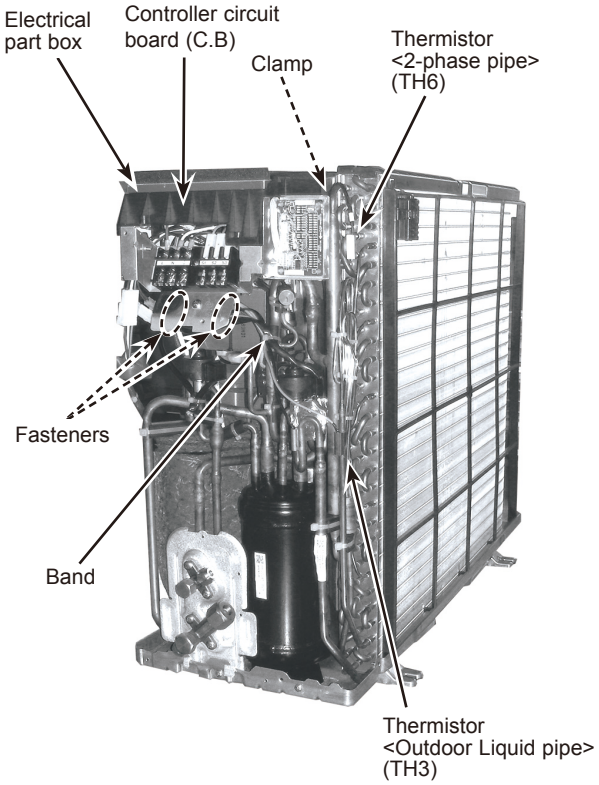
OPERATING PROCEDURE	PHOTOS
5. Removing the thermistor <Ambient> (TH7) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Disconnect the connector TH7 (red) on the controller circuit board in the electrical parts box. (5) Loosen the clamp for the lead wire in the rear of the electrical parts box. (See Photo 6) (6) Pull out the thermistor <Ambient> (TH7) from the sensor holder. **Note: When replacing thermistor <Ambient> (TH7), replace it together with thermistor <2-phase pipe> (TH6), since they are combined together. Refer to No.4. to remove thermistor <2-phase pipe>.**	**Photo 7** 
6. Removing the thermistor <Discharge> (TH4) and thermistor <Comp. surface> (TH34) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) [Thermistor <Discharge> (TH4)] (6) Pull out the thermistor <Discharge> (TH4) from the sensor holder. [Thermistor <Comp. surface> (TH34)] (6) Pull out the thermistor <Comp. surface> (TH34) from the sensor holder.	**Photo 8** 
7. Removing the 4-way valve (21S4) and LEV coil (LEV (A), LEV (B)) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) [Removing the 4-way valve (21S4)] (6) Remove 4-way valve fixing screw (M4 × 6). (7) Remove the 4-way valve by sliding the coil to the right. [Removing the LEV coil (LEV (A), LEV (B))] (6) Remove the LEV coil by sliding the coil upward.	**Photo 9** 

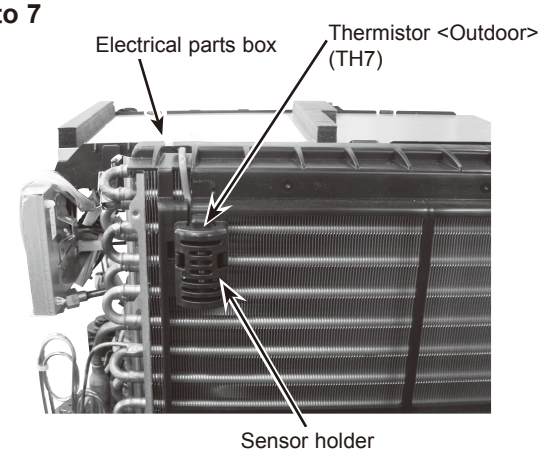
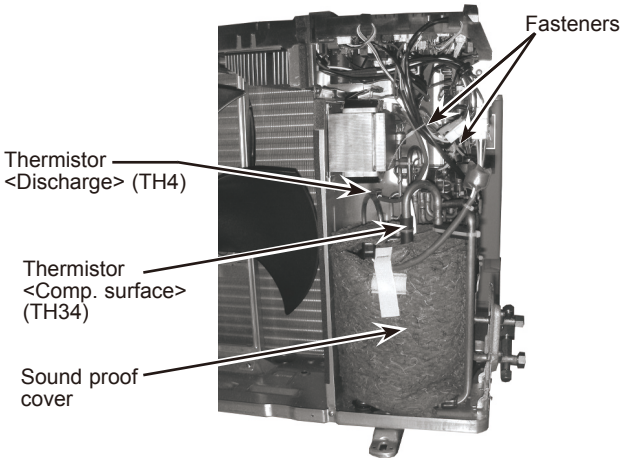
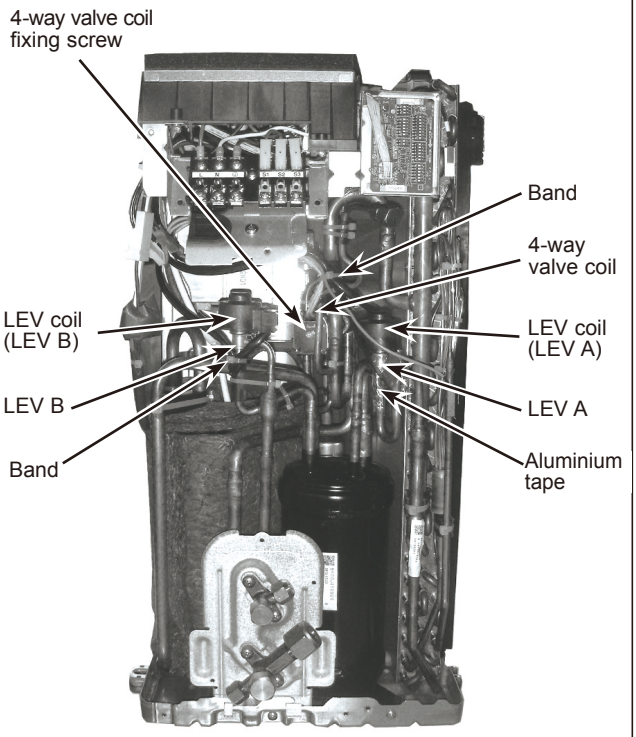
OPERATING PROCEDURE	PHOTOS
8. Removing the 4-way valve (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Remove the 4-way valve (See Photo 9) (7) Recover refrigerant. (8) Remove the welded part of 4-way valve. **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 4-way valve, cover it with a wet cloth to prevent it from heating (120°C or more), then braze the pipes so that the inside of pipes are not oxidized.**	**Photo 10** 
9. Removing LEV (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Remove the LEV coil. (See Photo 9) (7) Recover refrigerant. (8) Remove the welded part of LEV. **Note 1: Recover refrigerant without spreading it in the air.** **Note 2: The welded part can be removed easily by removing the back panel.** **Note 3: When installing the 4-way valve or LEV, cover it with a wet cloth to prevent it from heating (120°C or more), then braze the pipes so that the inside of pipes are not oxidized.**	
10. Removing the high pressure switch (63H) and high pressure sensor (63HS) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) [Removing the high pressure switch (63H)] (6) Pull out the lead wire of high pressure switch. (7) Recover refrigerant. (8) Remove the welded part of high pressure switch. [Removing the high pressure sensor (63HS)] (6) Pull out the lead wire of high pressure sensor. (7) Recover refrigerant. (8) 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 back panel.** **Note 3: When installing the high pressure switch, 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.**	**Photo 11** 
11. Removing the reactor (ACL) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove 3 reactor fixing screws (4 × 20) and remove the reactor. **Note: The reactor is attached to the rear of the electrical parts box.**	**Photo 12** 

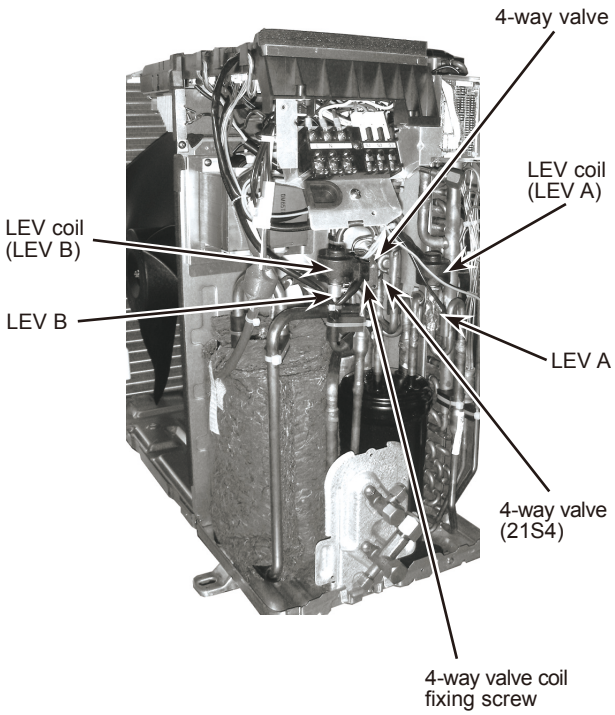
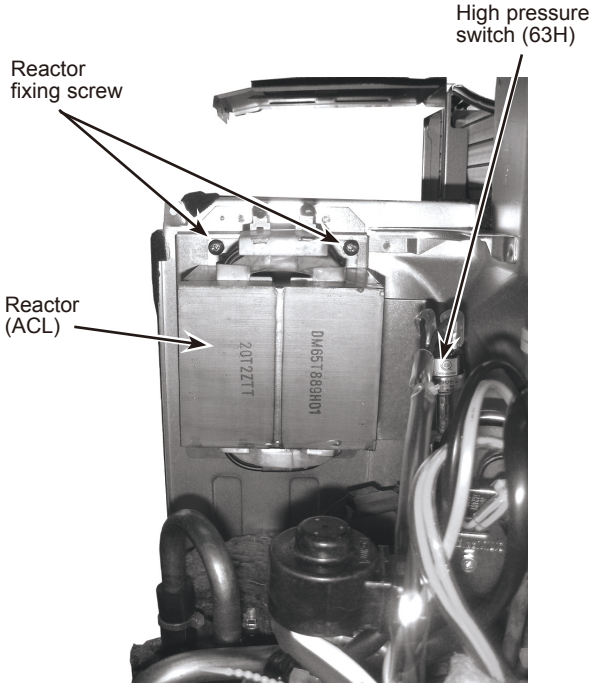
OPERATING PROCEDURE	PHOTOS
12. Removing the compressor (MC) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Remove the thermistor <Discharge> (TH4) and thermistor <Comp. surface> (TH34). (See Photo 13) (7) Remove 3 separator fixing screws (4 × 10) and remove the separator. (8) Recover refrigerant. (9) Remove 3 compressor fixing nuts by using a spanner or an adjustable wrench. (10) Remove the welded pipe of motor for compressor inlet and outlet. **Note: Recover refrigerant without spreading it in the air.**	**Photo 13** 
13. Removing the power receiver (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Recover refrigerant. (7) Remove 4 welded pipes of power receiver inlet and outlet. (8) Remove 2 receiver leg fixing screws (4 × 10). (9) Remove the power receiver together with the receiver leg. **Note: Recover refrigerant without spreading it in the air.**	**Photo 14** 

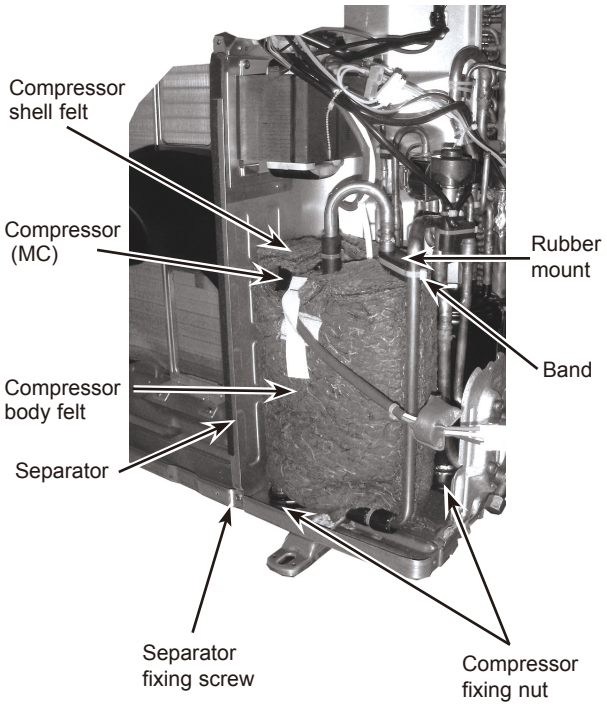
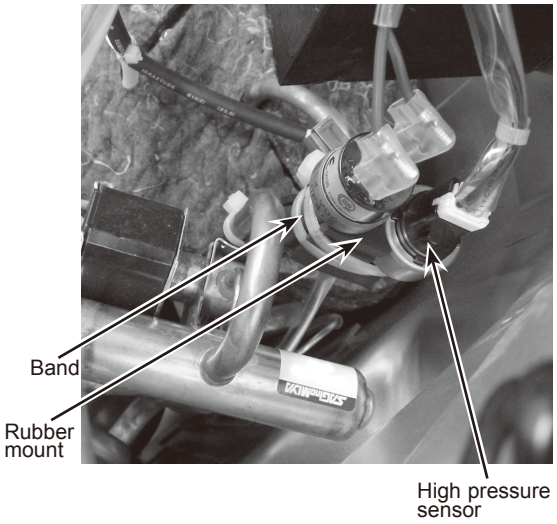
PUHZ-SW50VKA
PUHZ-SW50VKA-BS

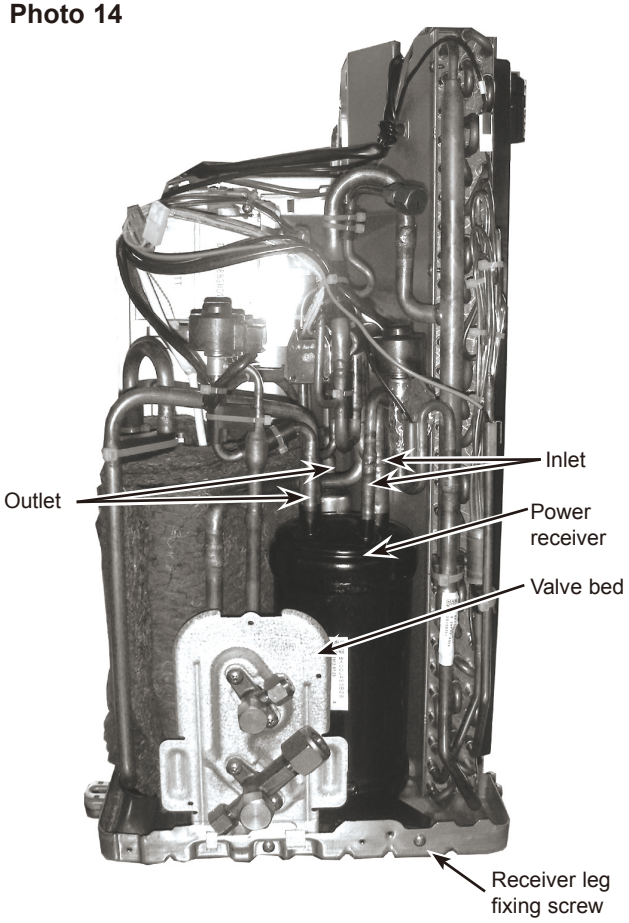
OPERATING PROCEDURE	PHOTOS
1. Removing the top panel, service panel, front panel, back panel and grille (1) Remove the top panel fixing screws (4 × 10), one from the right and two from the left side, and detach the top panel. (2) Remove 2 service panel fixing screws (4 × 10) and detach the service panel by pulling it downward. (See Photo 2) (3) Remove the front panel fixing screws (4 × 10), 3 from the front, 2 from the right and 2 from the left side, and detach the front panel. (4) Remove the back panel fixing screws (4 × 10), 5 from the right and 2 from the rear side, and detach the back panel. (5) Remove 2 grille fixing screws (4 × 10) and detach the grille.	**Photo 1**  **Photo 2** 
2. Removing the fan motor (1) Remove the top panel. (See Photo 1) (2) Remove the front panel. (See Photo 1) (3) Remove 1 nut (M6, left-screw) and detach the propeller. (4) Disconnect the connector CNF1 on the controller circuit board in the electrical parts box. (5) Loosen the clamp for the lead wire in the motor support. (6) Remove 4 fan motor fixing screws (5 × 20) and detach the fan motor. (See Photo 4)	**Photo 3**  **Photo 4** 

OPERATING PROCEDURE	PHOTOS
3. Removing the electrical parts box (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Disconnect the indoor/outdoor and power supply cable connecting wire from terminal block. (6) Disconnect the connector CNF1, LEV-A and LEV-B on the controller circuit board. <Symbols on the board> • CNF1: Fan motor • LEV-A, LEV-B: LEV (7) Disconnect the pipe-side connections of the following parts. • 4-way valve (21S4) • Thermistor <Outdoor pipe> (TH3) • Thermistor <Comp. surface> (TH32) • Thermistor <Discharge> (TH4) • Thermistor <Outdoor 2-phase pipe, Outdoor> (TH6/7) • High pressure switch (63H) • High pressure sensor (63HS) (8) Remove the terminal cover and disconnect the compressor lead wire. (9) Remove the electrical parts box fixing screws, 1 from the front, and 1 from the top side, and detach the electrical parts box by pulling it upward.	**Photo 5** 
4. Removing the thermistor <2-phase pipe> (TH6) and thermistor <Liquid> (TH3) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Disconnect the connector TH3 (white) or TH6/7 (red) on the controller circuit board in the electrical parts box. (6) Loosen the clamp for the lead wire in the rear of the electrical parts box. (7) Cut the band which fixes the lead wires to the rubber tube. (8) Loosen 2 fasteners which bundles the lead wires under the electrical parts box. [Thermistor <2-phase pipe> (TH6)] (9) Pull out the thermistor <Outdoor 2-phase pipe> (TH6) from the sensor holder. [Thermistor <Liquid> (TH3)] (9) Pull out the thermistor <Liquid> (TH3) from the sensor holder. **Note: Replace the thermistor <2-phase pipe> (TH6) and the thermistor <Ambient> (TH7) together since they are combined.** **Refer to procedure No. 5. to remove the thermistor <Ambient> (TH7).**	**Photo 6** 

OPERATING PROCEDURE	PHOTOS
5. Removing the thermistor <Ambient> (TH7) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connector TH7 (red) on the controller circuit board in the electrical parts box. (4) Loosen the clamp for the lead wire in the rear of the electrical parts box. (See Photo 6) (5) Pull out the thermistor <Ambient> (TH7) from the sensor holder. **Note: When replacing thermistor <Ambient> (TH7), replace it together with thermistor <2-phase pipe> (TH6), since they are combined together. Refer to procedure No.4. to remove thermistor <2-phase pipe>.**	**Photo 7** 
6. Removing the thermistor <Discharge> (TH4) and thermistor <Comp. surface> (TH34) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Remove the sound proof cover from the compressor. (7) Loosen 2 fasteners which bundles the lead wires under the electrical parts box. (See Photo 8) [Thermistor <Discharge> (TH4)] (8) Pull out the thermistor <Discharge> (TH4) from the sensor holder. (See Photo 8) [Thermistor <Comp. surface> (TH34)] (8) Pull out the thermistor <Comp. surface> (TH34) from the sensor holder. (See Photo 8)	**Photo 8** 
7. Removing the 4-way valve coil (21S4) and LEV coil (LEV(A), LEV(B)) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) [Removing the 4-way valve coil (21S4)] (6) Remove 1 4-way valve coil fixing screw (M4 × 6). (7) Remove the 4-way valve coil by sliding the coil to the right. [Removing the LEV coil (LEV A)] (6) Cut the band which fixes the lead wires to the rubber tube. (7) Loosen 2 fasteners which bundles the lead wires under the electrical parts box. (See Photo 6) (8) Remove the aluminium tape applied on the piping. (9) Cut the band which fixes the lead wires to the piping. (10) Remove the LEV coil (LEV A) by sliding the coil upward. [Removing the LEV coil (LEV B)] (6) Loosen 2 fasteners which bundles the lead wires under the electrical parts box. (See Photo 6) (7) Cut the band which fixes the lead wires to the piping. (8) Remove the LEV coil (LEV B) by sliding the coil upward.	**Photo 9** 

OPERATING PROCEDURE	PHOTOS
8. Removing the 4-way valve (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Remove the 4-way valve coil. (See Photo 9) (7) Recover refrigerant. (8) Remove the welded part of 4-way valve. **Note 1: Recover refrigerant without spreading it in the air.** **Note 2: The welded part can be removed easily by removing the back panel.** **Note 3: When installing the 4-way valve, cover it with a wet cloth to prevent it from heating (120°C or more), then braze the pipes so that the inside of pipes are not oxidized.**	**Photo 10** 
9. Removing LEV (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Remove the LEV coil. (See Photo 9) (7) Recover refrigerant. (8) Remove the welded part of LEV. **Note 1: Recover refrigerant without spreading it in the air.** **Note 2: The welded part can be removed easily by removing the back panel.** **Note 3: When installing the LEV, cover it with a wet cloth to prevent it from heating (120°C or more), then braze the pipes so that the inside of pipes are not oxidized.** **Note 4: Refer to "(3) How to attach and detach the coil of linear expansion valve" in "10-8. HOW TO CHECK THE COMPONENTS".**	
10. Removing the high pressure switch (63H) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Cut the band to remove the rubber mount. (7) Recover refrigerant. (8) Remove the welded part of high pressure switch. **Note 1: Recover refrigerant without spreading it in the air.** **Note 2: The welded part can be removed easily by removing the back panel.** **Note 3: When installing the high pressure switch, 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.**	**Photo 11** 
11. Removing the reactor (ACL) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove 2 reactor fixing screws (4 × 10) and remove the reactor. Note: The reactor is attached under the electrical parts box.	

OPERATING PROCEDURE	PHOTOS
12. Removing the compressor (MC) (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Remove the thermistor <Discharge> (TH4) and thermistor <Comp. surface> (TH32). (See Photo 8) (7) Remove 3 separator fixing screws (4 × 10) and remove the separator. (8) Remove the compressor body felt and compressor shell felt. (9) Cut the band to remove the rubber mount. (10) Recover refrigerant. (11) Remove 3 compressor fixing nuts by using a spanner or a adjustable wrench. (12) Remove the welded pipe of compressor inlet and outlet. **Note: Recover refrigerant without spreading it in the air.**	**Photo 12** 
13. Removing the high pressure sensor (63HS) (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Remove the compressor. (See Photo 12) (7) Cut the band to remove the rubber mount. (8) Recover refrigerant. (9) 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, 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.**	**Photo 13** 

OPERATING PROCEDURE	PHOTOS
14. Removing the power receiver (1) Remove the service panel. (See Photo 2) (2) Remove the top panel. (See Photo 1) (3) Remove the front panel. (See Photo 1) (4) Remove the back panel. (See Photo 1) (5) Remove the electrical parts box. (See Photo 5) (6) Recover refrigerant. (7) Remove 4 welded pipes of power receiver inlet and outlet. (8) Remove 2 receiver leg fixing screws (4 × 10). (9) Remove the power receiver together with the receiver leg. **Note: Recover refrigerant without spreading it in the air.**	**Photo 14** 

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