

SERVICE MANUAL R410A

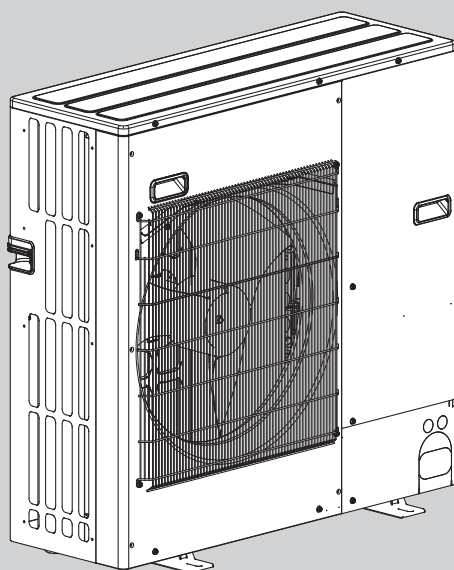
Outdoor unit
[Model name]
PUHZ-FRP71VHA2

[Service Ref.]
PUHZ-FRP71VHA2
PUHZ-FRP71VHA2R1

Note:
• PUHZ-FRP71VHA2R1
has been added in
REVISED EDITION-B.

OCH665 REVISED
EDITION-A is void.

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



PUHZ-FRP71VHA2

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PARTS CATALOG (OCB665)

INDOOR UNIT SERVICE MANUAL
AIR-CONDITIONER system

Model name	Service Ref.	Service Manual No.
PLA-ZM35/71EA	PLA-ZM35/71EA.UK	OCH650/OCB650
PKA-M71KA(L)	PKA-M71KA(L).TH	OCH661/OCB661
PSA-RP71KA	PSA-RP71KA	OCH528/OCB528
PEAD-M71JA(L)Q	PEAD-M71JA(L)Q.UK	—
PCA-M35/71KA	PCA-M35/71KA	OCH659/OCB659

For Air to Water system

Model name	Service ref.	Service manual No. Parts catalog No.
EHST20C-VM2C EHST20C-VM6C EHST20C-YM9C EHST20C-TM9C EHST20C-VM2EC EHST20C-VM6EC EHST20C-YM9EC EHST20C-MEC EHST20C-MHCW	EHST20C-VM2C(R1/R2).UK EHST20C-VM6C(R1/R2).UK EHST20C-YM9C(R1/R2).UK EHST20C-TM9C(R1/R2).UK EHST20C-VM2EC(R1/R2).UK EHST20C-VM6EC(R1/R2).UK EHST20C-YM9EC(R1/R2).UK EHST20C-MEC(R1/R2).UK EHST20C-MHCW(R1/R2).UK	OCH570 OCB570
EHSC-VM2C EHSC-VM2EC EHSC-VM6C EHSC-VM6EC EHSC-YM9C EHSC-YM9EC EHSC-TM9C EHSC-MEC	EHSC-VM2C(R1/R2/R3).UK EHSC-VM2EC(R1/R2/R3).UK EHSC-VM6C(R1/R2/R3).UK EHSC-VM6EC(R1/R2/R3).UK EHSC-YM9C(R1/R2/R3).UK EHSC-YM9EC(R1/R2/R3).UK EHSC-TM9C(R1/R2/R3).UK EHSC-MEC(R1/R2/R3).UK	OCH571 OCB571
EHST20C-VM2D EHST20C-VM6D EHST20C-YM9D EHST20C-TM9D EHST20C-YM9ED EHST20C-MED	EHST20C-VM2D.UK EHST20C-VM6D.UK EHST20C-YM9D.UK EHST20C-TM9D.UK EHST20C-YM9ED.UK EHST20C-MED.UK	OCH714 OCB714
EHSC-VM2D EHSC-VM6D EHSC-YM9D EHSC-YM9ED EHSC-TM9D EHSC-MED	EHSC-VM2D.UK EHSC-VM6D.UK EHSC-YM9D.UK EHSC-YM9ED.UK EHSC-TM9D.UK EHSC-MED.UK	OCH712 OCB712

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

Preparations before the repair service.

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the air conditioner, turn off the power-supply beaker.
- 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 the 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.

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.

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.

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 refrigerant other than R410A.

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

Use a vacuum pump with a reverse flow check valve.

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

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

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Handle tools with care.

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

Do not use a charging cylinder.

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

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.

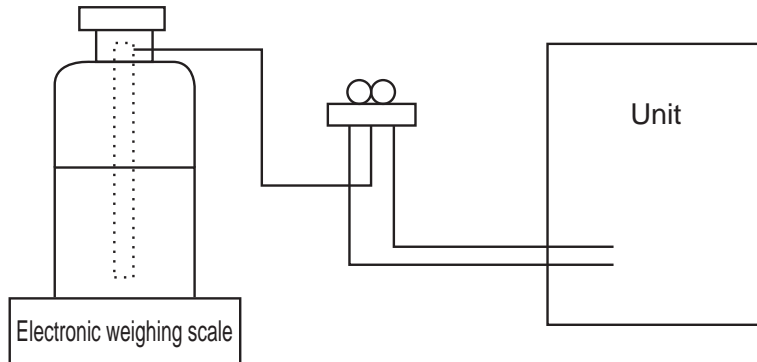
[1] Cautions for service

- (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) If moisture or foreign matter might have entered the refrigerant piping during service, ensure to remove them.

[2] Additional refrigerant charge

When charging directly from cylinder

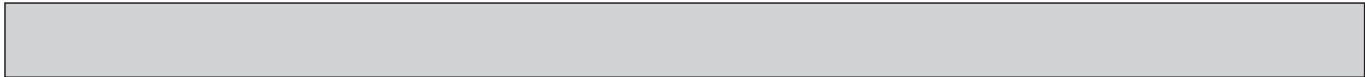
- (1) Check that cylinder for R410A on the market is syphon type.
- (2) Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

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

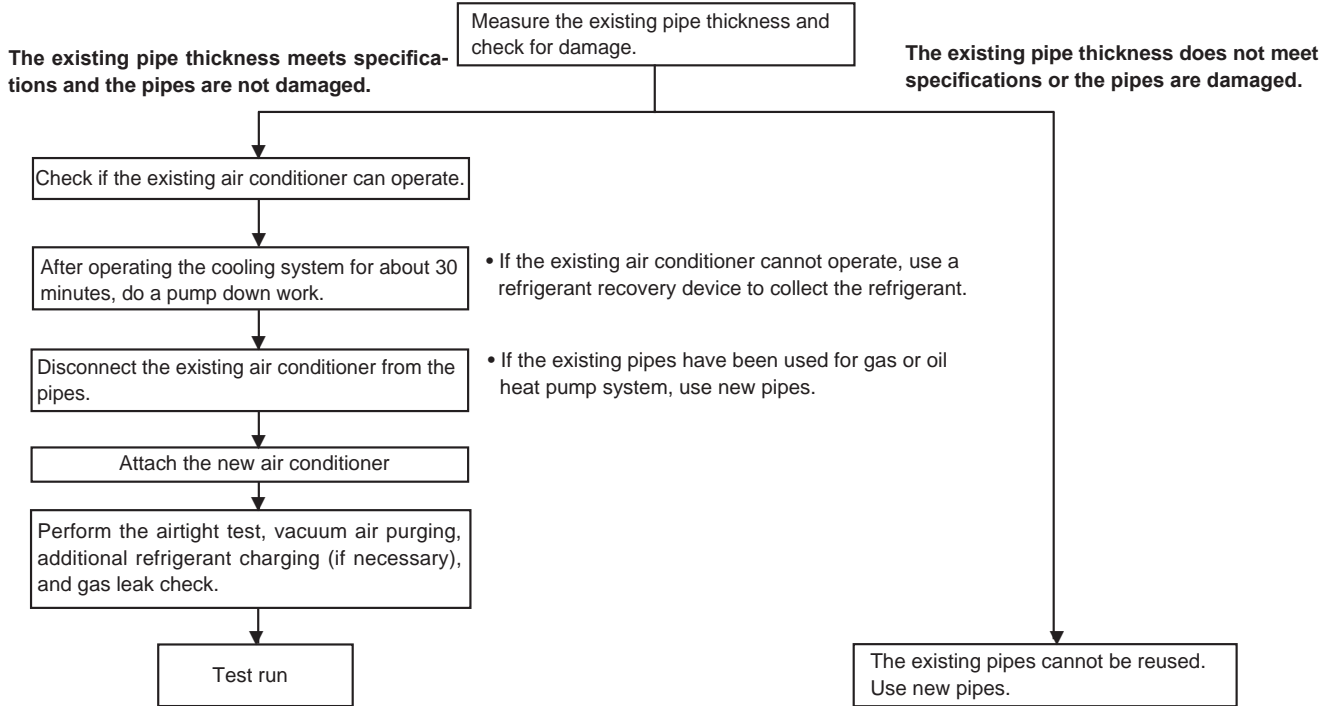
No.	Tool name	Specifications
①	Gauge manifold	· Only for R410A
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 5.3MPa·G or over.
②	Charge hose	· Only for R410A
		· Use pressure performance of 5.09MPa·G or over.
③	Electronic weighing scale	—
④	Gas leak detector	· Use the detector for 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 technical data materials to confirm if the pipes can be used.



(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(inch)	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 ($\begin{smallmatrix} +0 \\ -0.4 \end{smallmatrix}$) (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 A (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

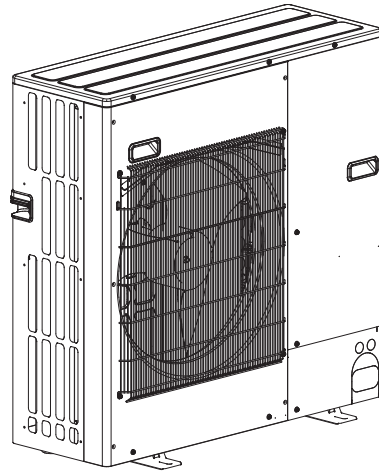
③ Tools for R410A (The following table shows whether conventional tools can be used or not.)

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	Gas leak check	Tool exclusive for R410A	×	×
Gas leak detector	Refrigerant recovery	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Refrigerant charge	Tool exclusive for R410A	×	×
Refrigerant cylinder	Apply to flared section	Tool exclusive for R410A	×	×
Applied oil	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Ester oil, ether oil and alkylbenzene oil (minimum amount)	×	Ester oil, ether oil: ○ Alkylbenzene oil: minimum amount
Safety charger	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R410A	×	×
Charge valve	Vacuum drying and air purge	Tools for other refrigerants can be used if equipped with adapter for reverse flow check	Δ(Usable if equipped with adapter for reverse flow)	Δ(Usable if equipped with adapter for reverse flow)
Vacuum pump	Flaring work of piping	Tools for other refrigerants can be used by adjusting flaring dimension	Δ(Usable by adjusting flaring dimension)	Δ(Usable by adjusting flaring dimension)
Flare tool	Bend the pipes	Tools for other refrigerants can be used	○	○
Bender	Cut the pipes	Tools for other refrigerants can be used	○	○
Pipe cutter	Weld the pipes	Tools for other refrigerants can be used	○	○
Welder and nitrogen gas cylinder	Refrigerant charge	Tools for other refrigerants can be used	○	○
Refrigerant charging scale	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	○	○
Vacuum gauge or thermistor vacuum gauge and vacuum valve	Refrigerant charge	Tool exclusive for R410A	×	-
Charging cylinder				

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

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

○: Tools for other refrigerants can be used.

**PUAZ-FRP71VHA2****CHARGELESS SYSTEM****PRE-CHARGED REFRIGERANT IS SUPPLIED FOR PIPING LENGTH AT SHIPMENT.****Maximum 30m (Air conditioner side and hot water side total)**

The refrigerant circuit with LEV (Linear Expansion Valve) always control the optimal refrigerant level regardless of the length (Total 30 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

Service Ref.				PUHZ-FRP71VHA2 PUHZ-FRP71VHA2R1	
OUTDOOR UNIT	Power source (Phase, cycle, voltage)		Single, 50 Hz, 230 V		
	Max. current	A	19		
	External finish		Munsell 3Y 7.8/1.1		
	Refrigerant control		Linear Expansion Valve		
	Compressor		Hermetic		
	Model	Model		SNB172FSHM1	
		Motor output	kW	1.6	
		Starter type		Inverter	
		Protection devices		HP switch Comp. surface thermo Discharge thermo	
	Crankcase heater		W	—	
	Heat exchanger		Plate fin coil		
	Fan	Fan (drive) x No.		Propeller fan x 1	
		Fan motor output	kW	0.086	
		Airflow	m ³ /min (CFM)	50 (1,760)	
	Defrost method		Reverse cycle		
	Noise level	ATA Cooling	dB	47	
		HR Cooling			
		TA Heating ATW Heating	dB	49	
	Dimensions	W	mm (inch)	950 (37-3/8)	
		D	mm (inch)	330+25 (13-7/8)	
H		mm (inch)	943 (37-1/8)		
Weight		kg(lb)	73 (161)		
Refrigerant		R410A			
Pipe size O.D.	Charge		kg(lb)	3.8 (8.4)	
	Oil (Model)		L	0.70 (FV50S)	
	ATA	Liquid	mm (inch)	9.52 (3/8)	
		Gas	mm (inch)	15.88 (5/8)	
ATW	Liquid	mm (inch)	9.52 (3/8)		
	Gas	mm (inch)	15.88 (5/8)		
Connection method	ATA indoor side		Flared		
	ATW indoor side		Flared		
	Outdoor side		Flared		
Between the indoor & outdoor	Height difference		Maximum 20 m		
	Piping length		Maximum 60 m total, Maximum 30 m for each		

5

DATA

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

Service Ref.	Total piping length (one way)							Initial charged
	10m	20m	30m	40m	50m	60m	75m	
PUHZ-FRP71VHA2 PUHZ-FRP71VHA2R1	3.4	3.6	3.8	4.4	5.0	5.6	—	3.8

Additional charge is required for pipes longer than total 30 m.

5-2. COMPRESSOR TECHNICAL DATA

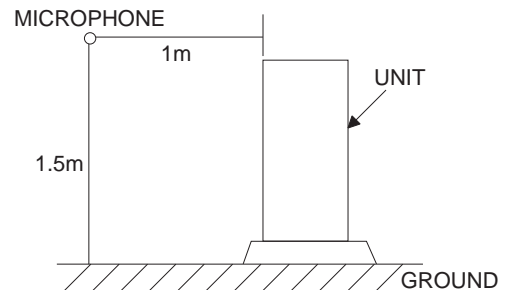
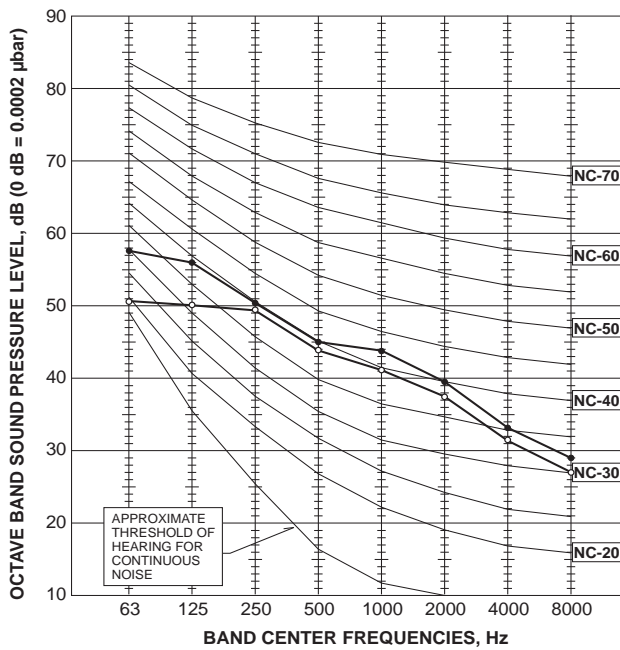
(Winding temperature at 20°C)

Service Ref.	PUHZ-FRP71VHA2 PUHZ-FRP71VHA2R1	
Compressor model	SNB172FSHM1	
Winding Resistance (Ω)	U-V	1.34
	U-W	1.34
	W-V	1.34

5-3. NOISE CRITERION CURVES

PUHZ-FRP71VHA2
PUHZ-FRP71VHA2R1

MODE	SPL(dB)	LINE
ATA Cooling, HR Cooling	47	○—○
ATA Heating, ATW Heating	49	●—●



5-4. STANDARD OPERATION DATA

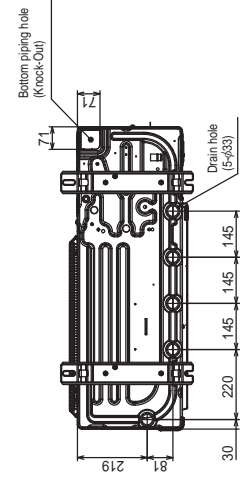
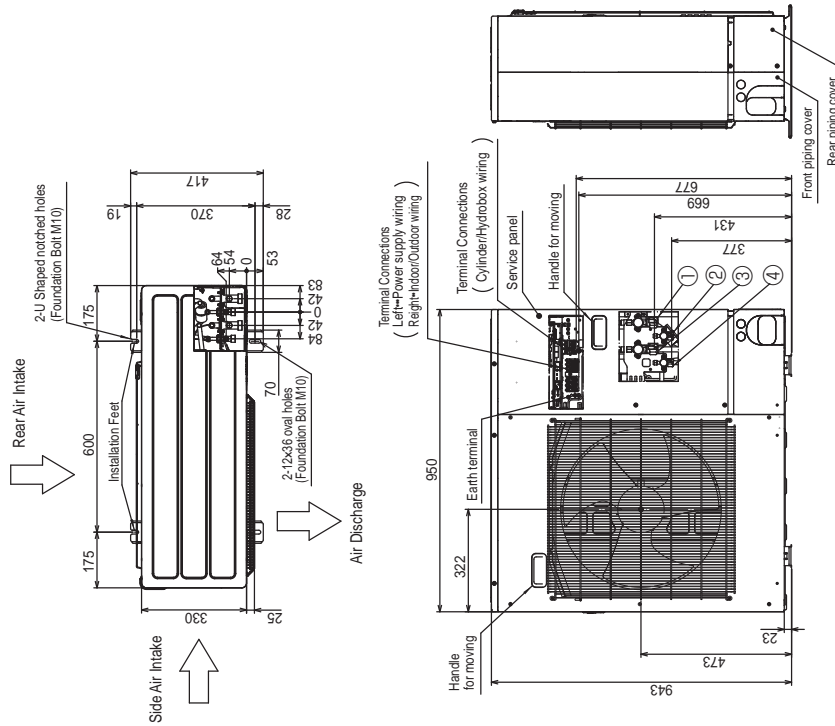
Representative matching				PEAD-M71JAQ				
Plate HEX				ACH70-40				
Mode				ATA Cooling	ATA Heating	ATW Heating	HR Cooling	
Total	ATA capacity	W		7,100	8,000	—	7,100	
	ATW capacity	W		—	—	8,000	9,000	
	Input	kW		2.10	2.11	1.99	3.22	
	COP			3.38	3.79	4.03	5.00	
Electrical circuit	Indoor unit			PEAD-M71JAQ				
	Phase, Hz			1, 50	1, 50	—	1, 50	
	Voltage		V	230	230	—	230	
	Current		A	0.17	0.15	—	0.17	
	Outdoor unit			PUHZ-FRP71VHA2				
	Phase, Hz			1, 50	1, 50	1, 50	1, 50	
	Voltage		V	230	230	230	230	
	Current		A	9.14	9.22	8.81	13.97	
Refrigerant circuit	Discharge pressure		MPa	2.79	2.46	2.13	3.39	
	Suction pressure		MPa	0.96	0.71	0.70	0.94	
	Discharge temperature		°C	71	62	53	80	
	Condensing temperature		°C	47	42	37	57	
	Suction temperature		°C	10	0	0	9	
	Ref. pipe length		m	5 + 5	5 + 5	5 + 5	5 + 5	
ATA indoor side	Intake air temperature		DB	°C	27	20	—	27
			WB	°C	19	15	—	19
	Discharge air temperature		DB	°C	14.5	36	—	14.5
ATW side	Return temperature		°C	—	—	30	50	
	Flow temperature		°C	—	—	35	55	
	Flow rate		L/min	—	—	23	23	
Outdoor side	Intake air temperature		DB	°C	35	7	7	35
			WB	°C	24	6	6	24
SHF				0.81	—	—	0.81	
BF				0.11	—	—	0.11	

The unit of pressure has been changed to MPaG based on international SI system.
The conversion factor is: 1(MPaG)=10.2(kgf/cm²)

PUHZ-FRP71VHA2

PUHZ-FRP71VHA2R1

Unit: mm

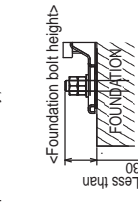


4 PIPING-WIRING DIRECTIONS

Piping and wiring connections can be made from 4 directions: FRONT, Right, Rear and Below.

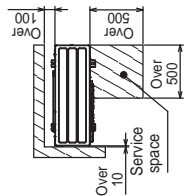
3 FOUNDATION BOLTS

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



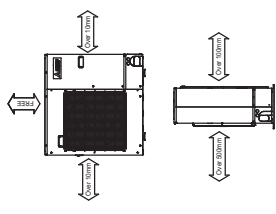
2 SERVICE SPACE

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



1 FREE SPACE (Around the unit)

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



Example of Notes

- ① --Refrigerant GAS pipe connection (FLARE) φ15.88(5/8F)
*Connect to indoor unit.
- ② --Refrigerant LIQUID pipe connection (FLARE) φ9.52(3/8F)
*Connect to indoor unit.
- ③ --Refrigerant GAS pipe connection (FLARE) φ15.88(5/8F)
*Connect to cylinder unit or hydrobox.
- ④ --Refrigerant LIQUID pipe connection (FLARE) φ9.52(3/8F)
*Connect to cylinder unit or hydrobox.

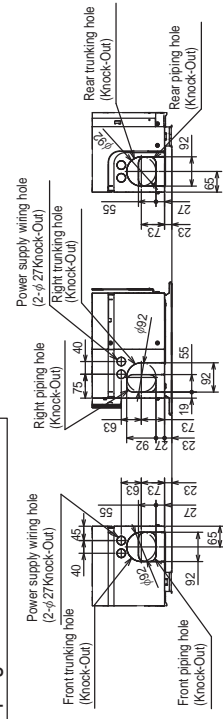
This tap mark indicates the cylinder/hydro unit connection side for the following parts.

*Terminal bed for the connecting cables, S1/S2/S3.

Stop valves, gas and liquid for the refrigerant connection.



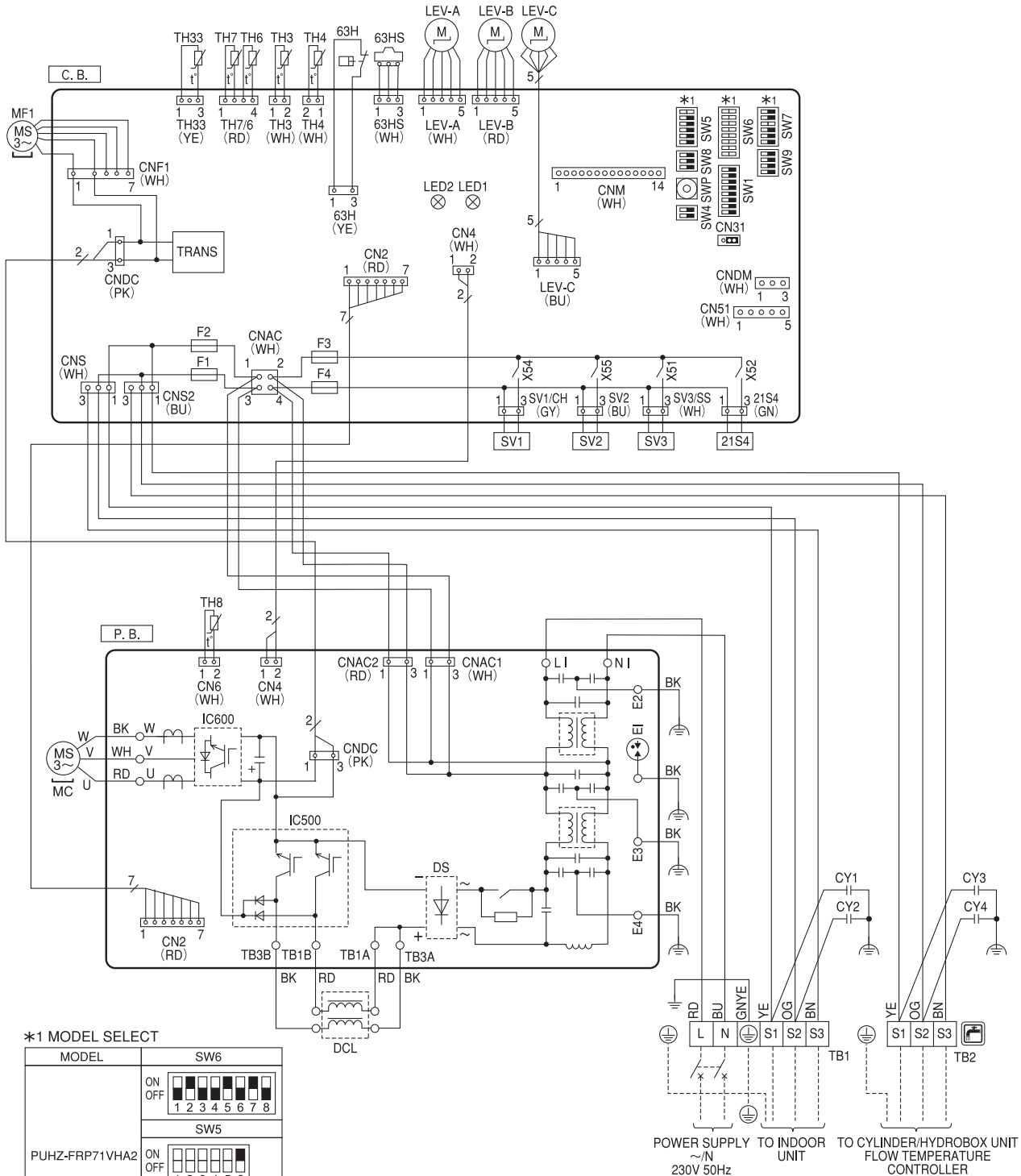
Piping Knock-Out Hole Details



PUHZ-FRP71VHA2

PUHZ-FRP71VHA2R1

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply, Indoor/Outdoor)	SV1	Solenoid Valve 1	SW5	Switch (Function Switch, Model Select)
TB2	Terminal Block (Cylinder/Hydrobox UNIT/Outdoor)	SV2	Solenoid Valve 2	SW6	Switch (Model Select)
MC	Motor for Compressor	SV3	Solenoid Valve 3	SW7	Switch (Function Switch, Model Select)
MF1	Fan Motor	LEV-A, LEV-B, LEV-C	Linear Expansion Valve	SW8	Switch (Function Switch)
21S4	Solenoid Valve (4-Way Valve)	DCL	Reactor	SW9	Switch (Function Switch)
63H	High Pressure Switch	CY1, CY2, CY3, CY4	Capacitor	SWP	Switch (Pump Down)
63HS	High Pressure Sensor	P.B.	Power Circuit Board	CNDM	Connector (Connection for Option)
TH3	Thermistor (Liquid)	C.B.	Controller Circuit Board	CN31	Connector (Emergency Operation)
TH4	Thermistor (Discharge)	F1, F2	Fuse (T10AL250V)	CN51	Connector (Connection for Option)
TH6	Thermistor (2-Phase Pipe)	F3, F4	Fuse (T6.3AL250V)	CNM	Connector (Connection for Option)
TH7	Thermistor (Ambient)	SW1	Switch (Manual Defrost, Defect History Record Reset, Refrigerant Address)	LED1, LED2	LED
TH8	Thermistor (Heat Sink)	SW4	Switch (Test Run Switch)		
TH33	Thermistor (Comp. Surface)				



*1 MODEL SELECT

MODEL	SW6
PUHZ-FRP71VHA2	ON OFF 1 2 3 4 5 6 7 8
	ON OFF 1 2 3 4 5 6
	ON OFF 1 2 3 4 5 6

The black square (■) indicates a switch position.

8-1. FIELD ELECTRICAL WIRING (power wiring specifications)

Outdoor unit power supply		~N (single), 50 Hz, 230 V
Outdoor unit input capacity Main switch (Breaker)		25 A
Wiring Wire No. x size (mm ²)	Outdoor unit power supply	3 x Min. 2.5
	Indoor unit – Outdoor unit Cylinder– or Hydrobox – Outdoor unit	3 x 1.5 (Polar)
	Indoor unit – Outdoor unit earth Cylinder– or Hydrobox – Outdoor unit earth	1 x Min. 1.5
	Remote controller – Indoor unit *3 Cylinder– or Hydrobox-side remote controller – its unit	2 x 0.3 (Non-polar)
	Circuit rating	
	Outdoor unit L – N (single)	230 V AC
	Outdoor unit L1 – N, L2 – N, L3 – N (3 phase)	230 V AC
	Indoor unit – Outdoor unit S1-S2 Cylinder– or Hydrobox – Outdoor unit S1-S2	230 V AC
	Indoor unit – Outdoor unit S2-S3 Cylinder– or Hydrobox – Outdoor unit S2-S3	24 V DC
	Remote controller – Indoor unit Cylinder– or Hydrobox-side remote controller – its unit	12 V DC

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

*2 Maximum 45 m

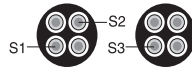
If 2.5 mm² used, maximum 50 m

If 2.5 mm² used and S3 separated, maximum 80 m

*3 Maximum 500 m (When using 2 remote controllers, the maximum wiring length for the remote controller cables is 200 m.)

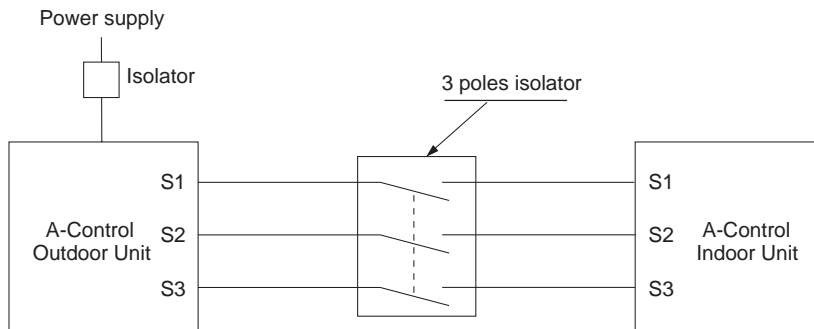
*4 The figures are NOT always against the ground.

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 line longer than power cables.



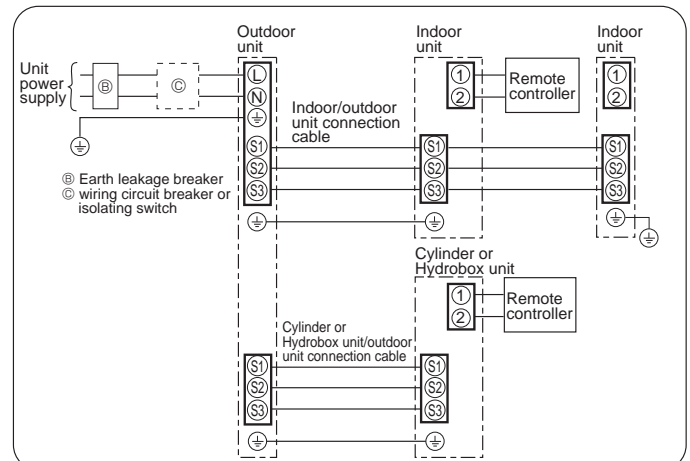
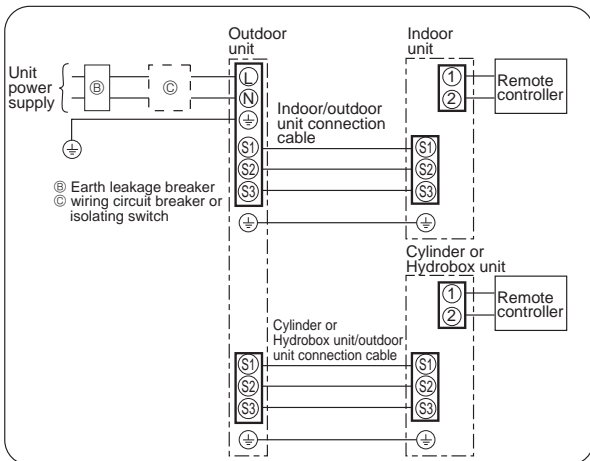
Warning:

In the 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.

1:1 system electrical wiring

Synchronized twin system electrical wiring

• Synchronized twin



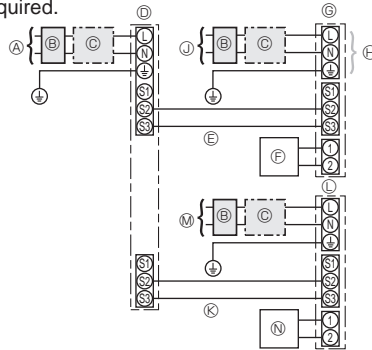
8-2. SEPARATE INDOOR UNIT/OUTDOOR UNIT POWER SUPPLIES

The following connection patterns are available.
The outdoor unit power supply patterns vary on models.

1:1 System

<For models without heater>

The optional indoor power supply terminal kit is required.



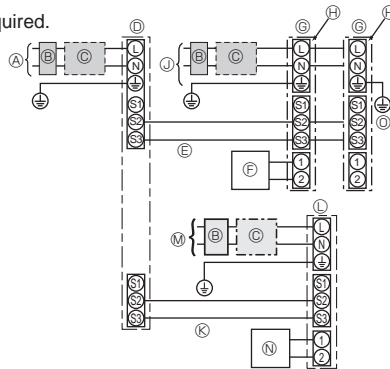
- Ⓐ Outdoor unit power supply
- Ⓑ Earth leakage breaker
- Ⓒ Wiring circuit breaker or isolating switch
- Ⓓ Outdoor unit
- Ⓔ Indoor unit/outdoor unit connecting cords
- Ⓕ Remote controller for indoor unit
- Ⓖ Indoor unit
- Ⓗ Option
- Ⓚ Cylinder unit or Hydrobox/outdoor unit connecting cable
- Ⓛ Cylinder unit or Hydrobox
- Ⓜ Cylinder unit or Hydrobox power supply
- Ⓝ Remote controller for cylinder unit or hydrobox

Affix a label B that is included with the manuals near each wiring diagram for the indoor and outdoor units.

Simultaneous twin system

<For models without heater>

The optional indoor power supply terminal kit is required.



- Ⓐ Outdoor unit power supply
- Ⓑ Earth leakage breaker
- Ⓒ Wiring circuit breaker or isolating switch
- Ⓓ Outdoor unit
- Ⓔ Indoor unit/outdoor unit connecting cords
- Ⓕ Remote controller for indoor unit
- Ⓖ Indoor unit
- Ⓗ Option
- Ⓙ Indoor unit power supply
- Ⓚ Cylinder unit or Hydrobox/outdoor unit connecting cable
- Ⓛ Cylinder unit or Hydrobox
- Ⓜ Cylinder unit or Hydrobox power supply
- Ⓝ Remote controller for cylinder unit or hydrobox
- Ⓞ Indoor unit earth

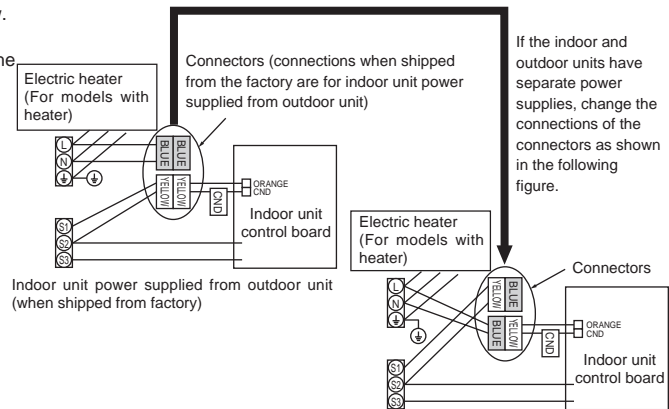
Affix a label B that is included with the manuals near each wiring diagram for the indoor and outdoor units.

If the indoor and outdoor units have separate power supplies, refer to the table below.
If the optional indoor power supply terminal kit is used, change the indoor unit electrical box wiring referring to the figure in the right and the DIP switch settings of the outdoor unit control board.

Indoor unit specifications									
Indoor power supply terminal kit (option)	Required								
Indoor unit electrical box connector connection change	Required								
Label affixed near each wiring diagram for the indoor and outdoor units	Required								
Outdoor unit DIP switch settings (when using separate indoor unit/outdoor unit power supplies only)	<table border="1" style="display: inline-table;"> <tr> <td>ON</td> <td></td> <td></td> <td style="border: 2px solid black;">3</td> </tr> <tr> <td>OFF</td> <td>1</td> <td>2</td> <td></td> </tr> </table> (SW8) Set the SW8-3 to ON.	ON			3	OFF	1	2	
ON			3						
OFF	1	2							

Note: There are 3 types of labels; A, B, and C.

Affix the appropriate labels to the units according to the wiring method.



Separate indoor unit/outdoor unit power supplies

Indoor unit model	RP71	
Indoor unit power supply	~N (single), 50 Hz, 230 V	
Indoor unit input capacity	*1	
Main switch (Breaker)	16 A	
Wiring Wire No. x size (mm)	Indoor unit power supply	2 x Min. 1.5
	Indoor unit power supply earth	1 x Min. 1.5
	Indoor unit-Outdoor unit	*2
	Indoor unit-Outdoor unit earth	2 x Min. 0.3
Circuit rating	Remote controller-Indoor unit	*3
	Indoor unit L-N	*4
	Indoor unit-Outdoor unit S1-S2	*4
	Indoor unit-Outdoor unit S2-S3	*4
	Remote controller-Indoor unit	*4

*1 A breaker with at least 3 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV).
The breaker shall be provided to ensure disconnection of all active phase conductor of the supply.

*2 Maximum 120 m

*3 Maximum 500 m (When using 2 remote controllers, the maximum wiring length for the remote controller cables is 200 m.)

*4 The figures are NOT always against the ground.

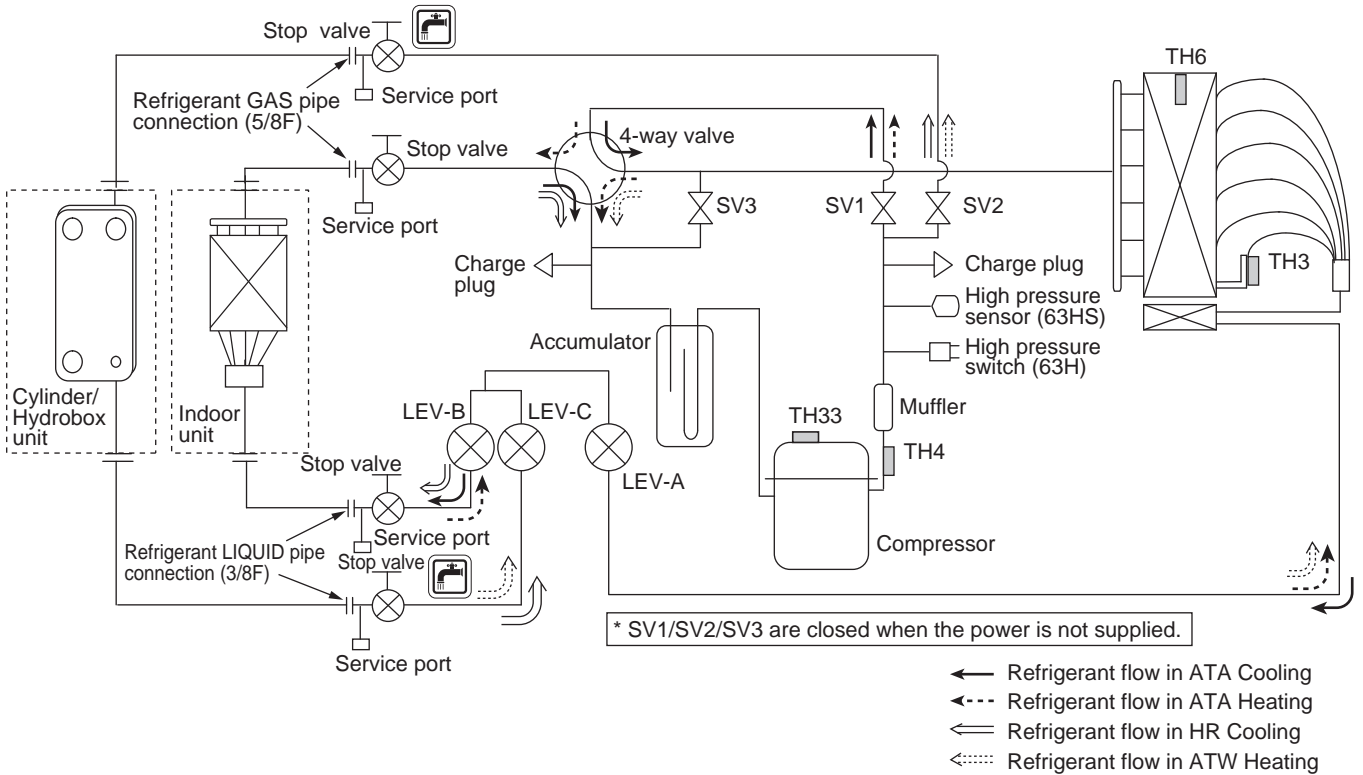
Notes: 1. Wiring size must comply with the applicable local and national code.

2. Power supply cables and indoor unit/outdoor unit connecting cables shall not be lighter than polychloroprene sheathed flexible cable. (Design 60245 IEC 57)

3. Install an earth line longer than power cables.

PUHZ-FRP71VHA2

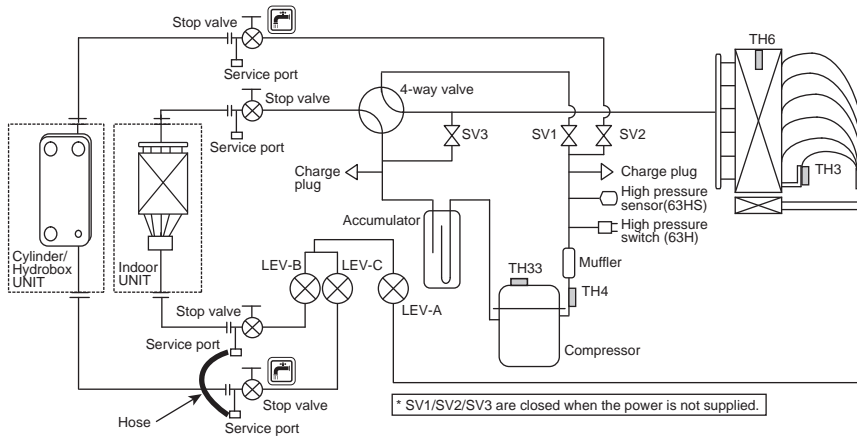
PUHZ-FRP71VHA2R1



9-1. REFRIGERANT COLLECTING (PUMP DOWN)

The refrigerant collecting function is available by performing the following procedure.

- ① Close the 2 liquid stop valves and the cylinder/hydro unit side gas valve.
Only the indoor unit side gas valve remains open.
- ② Connect the 2 liquid stop valve service ports with a hose.
- ③ Turn on the main power and wait for 3-4 minutes.
- ④ Press the SWP button on the outdoor controller board, then the refrigerant collecting operation starts.
- ⑤ After confirming the low pressure is lowered to 0 MPa (gauge), close the indoor unit side gas valve.
The refrigerant collecting operation stops automatically in 5 minutes.
- ⑥ Turn off the main power.



⚠ Warning:

Do not disconnect extension pipes during the refrigerant collecting operation is running.

If you open the stop valves to the air during the compressor is running, the pressure could be abnormal high level and this may cause a rupture of the compressor or other hazardous situation.

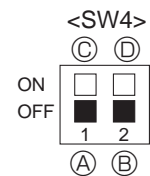
* Use a refrigerant recovery machinery if the refrigerant collecting is not completed in the case of long pipe length or too much refrigerant contained.

9-2. START AND FINISH OF TEST RUN (ATA only)

- Operation from the indoor unit
Execute the test run using the installation manual for the indoor unit.
- Operation from the outdoor unit
By using the DIP switch SW4 on the control board of outdoor unit, test run can be started and finished, and its operation mode (cooling/heating) can be set up.

- ① Set the operation mode (cooling/heating) using SW4-2.
- ② Turn on SW4-1 to start test run with the operation mode set by SW4-2.
- ③ Turn off SW4-1 to finish the test run.

- There may be a faint knocking sound around the machine room after power is supplied, but this is no problem with product because the linear expansion pipe is just moving to adjust opening pulse.
- There may be a knocking sound around the machine room for several seconds after compressor starts operating, but this is no problem with product because the check valve itself, generates the sound because pressure difference is small in the refrigerant circuit.



- Ⓐ Stop Ⓒ Operation
- Ⓑ Cooling Ⓓ Heating

Note:
The operation mode cannot be changed by SW4-2 during test run. (To change test run mode, stop the unit by SW4-1, change the operation mode and restart the test run by SW4-1.)

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 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 the problem and take a corrective action according to "10-4. SELF-DIAGNOSIS ACTION TABLE".
	Not displayed	Conduct troubleshooting and ascertain the cause of the trouble according to "10-5. TROUBLESHOOTING OF PROBLEMS".
The trouble is not reoccurring.	Logged	<p>①Consider 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.</p> <p>②Reset check code logs and restart the unit after finishing service.</p> <p>③There is no abnormality in electrical component, controller board, remote controller, etc.</p>
	Not logged	<p>①Re-check the abnormal symptom.</p> <p>②Conduct troubleshooting and ascertain the cause of the trouble according to "10-5. TROUBLESHOOTING OF PROBLEMS".</p> <p>③Continue to operate unit for the time being if the cause is not ascertained.</p> <p>④There is no abnormality concerning of parts such as electrical component, controller board, remote controller, etc.</p>

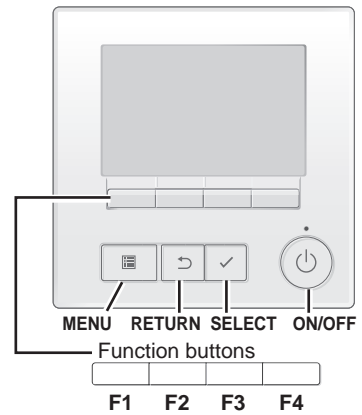
10-2. CHECKPOINT UNDER TEST RUN

10-2-1. Before test run

- After installation of indoor and outdoor units, piping work and electric wiring work, re-check that there is no refrigerant leakage, loosened connections and incorrect polarity.
- Measure impedance between the ground and the power supply terminal block (L, N) on the outdoor unit by 500V Megger and check that it is 1.0MΩ or over.
- Do not use 500V Megger to indoor/outdoor connecting wire terminal block (S1, S2, S3) and remote controller terminal block (1, 2). This may cause malfunction.
- Make sure that test run switch (SW4) is set to OFF before turning on power supply.
- Turn on power supply 12 hours before test run in order to protect compressor.
- For specific models which require higher ceiling settings or auto-recovery feature from power failure, make proper changes of settings referring to the description of "11. FUNCTION SETTING".

Make sure to read operation manual before test run. (Especially items to secure safety.)

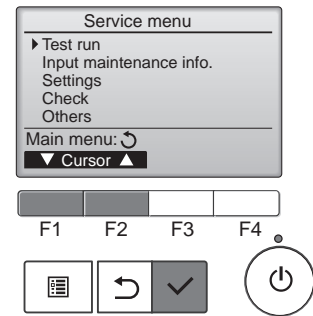
10-2-1. Test run for wired remote controller <PAR-4xMAA ("x" represents 0 or later)>



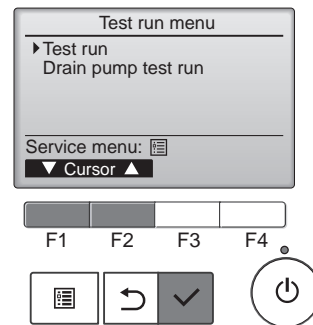
① Select "Service" from the Main menu, and press the [✓] button.



Select "Test run" with the [F1] or [F2] button, and press the [✓] button.



② Select "Test run" with the [F1] or [F2] button, and press the [✓] button.



Test run operation

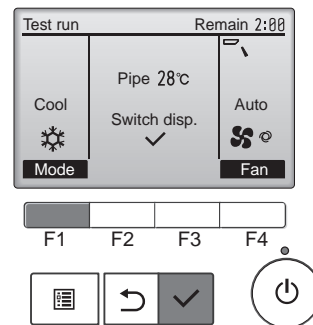
Press the [F1] button to go through the operation modes in the order of "Cool and Heat".

Cool mode: Check the cold air blows out.
Heat mode: Check the heat blows out.

Check the operation of the outdoor unit's fan.



Press the [✓] button and open the Vane setting screen.



Auto vane check

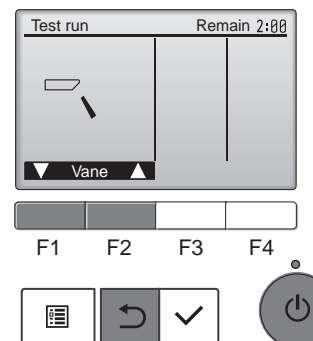
Check the auto vane with the [F1] [F2] buttons.



Press the [↺] button to return to "Test run operation".



Press the [⏻] button.



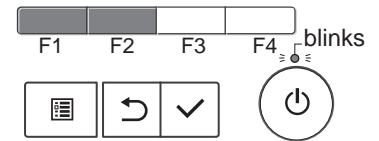
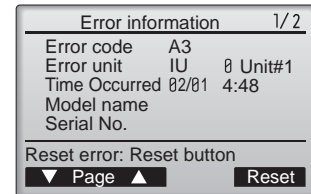
When the test run is completed, the "Test run menu" screen will appear. The test run will automatically stop after 2 hours.

<Error information>

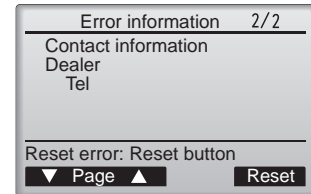
**When an error occurs, the following screen will appear.
Check the error status, stop the operation, and consult your dealer.**

- ① Check code, error unit, refrigerant address, unit model name, and serial number will appear. (Date and time of occurrence of the error will also appear on PAR-4xMAA.)
The model name and serial number will appear only if the information has been registered.

Press the [F1] or [F2] button to go to the next page.

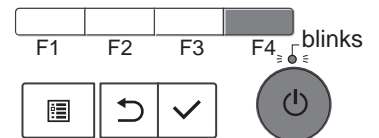
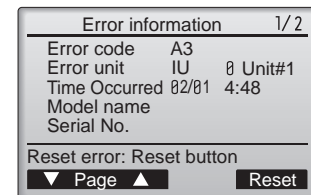


Contact information (dealer's phone number) will appear if the information has been registered.

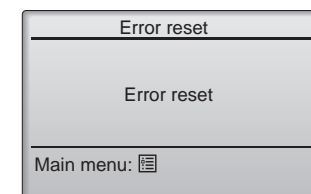
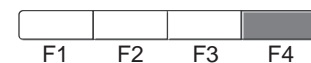
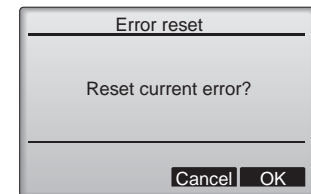


- ② Press the [F4] button or the [Power] button to reset the error that is occurring.

Errors cannot be reset while the ON/OFF operation is prohibited.



Select "OK" with the [F4] button.

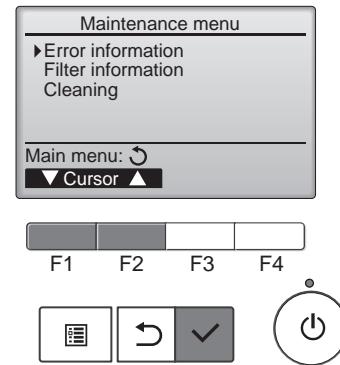


Navigating through the screens

- To go back to the Main menu [List Icon] button

<Checking the error information>

While no errors are occurring, page 2/2 of the error information can be viewed by selecting "Error information" from the Maintenance menu (PAR-4xMAA) or Main menu (PAR-3xMAA). Errors cannot be reset from this screen.

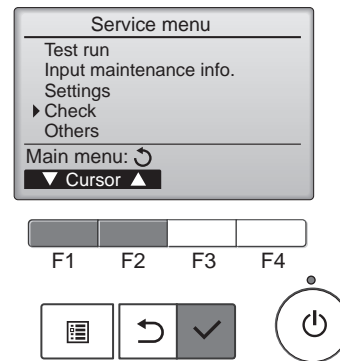


<Error history>

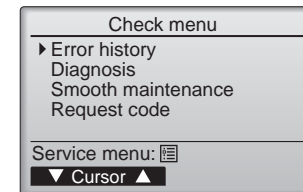
① Select "Service" from the Main menu, and press the [✓] button.



Select "Check" with the [F1] or [F2] button, and press the [✓] button.



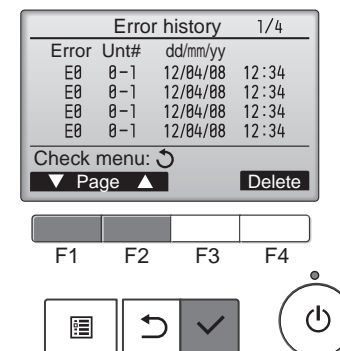
② Select "Error history" with the [F1] or [F2] button, and press the [✓] button.



Error history

③ Select "Error history" from the Check menu, and press the [✓] button to view up to 16 error history records.

4 records are shown per page, and the top record on the first page indicates the latest error record.



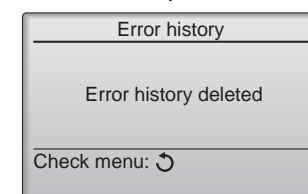
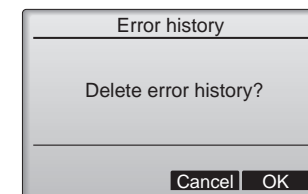
Deleting the error history

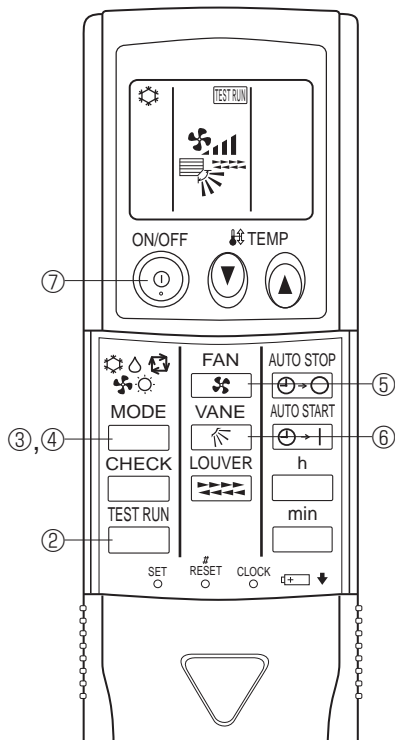
④ To delete the error history, press the [F4] button (Delete) on the screen that shows error history. A confirmation screen will appear asking if you want to delete the error history.

Press the [F4] button (OK) to delete the history.

"Error history deleted" will appear on the screen.

Press the [↶] button to go back to the Check menu screen.





10-2-4. Test run for wireless remote controller

- ① Turn on the main power to the unit.
- ② Press the button twice continuously.
(Start this operation from the status of remote controller display turned off.)
A and current operation mode are displayed.
- ③ Press the () button to activate mode, then check whether cool air blows out from the unit.
- ④ Press the () button to activate mode, then check whether warm air blows out from the unit.
- ⑤ Press the button and check whether strong air blows out from the unit.
- ⑥ Press the button and check whether the auto vane operates properly.
- ⑦ Press the ON/OFF button to stop the test run.

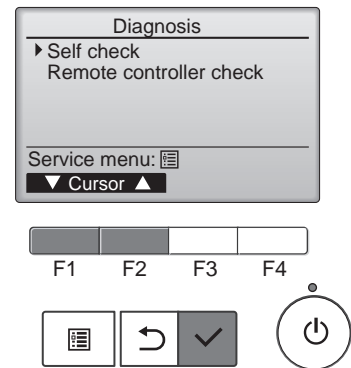
Note:

- Point the remote controller towards the indoor unit receiver while following steps ② to ⑦.
- It is not possible to run in FAN, DRY or AUTO mode.

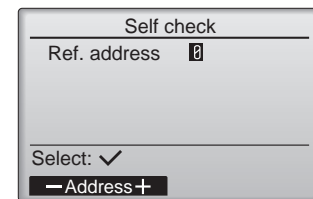
10-3. HOW TO PROCEED "SELF-DIAGNOSIS"

10-3-1. Self-diagnosis <PAR-4xMAA ("x" represents 0 or later)>

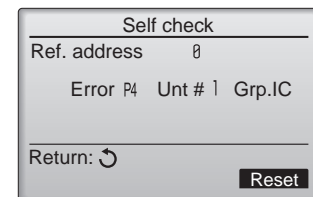
- ① Select "Service" from the Main menu, and press the [✓] button.
- ▼
- Select "Check" from the Service menu, and press the [✓] button.
- ▼
- Select "Diagnosis" from the Check menu, and press the [✓] button.
- ▼
- Select "Self check" with the [F1] or [F2] button, and press the [✓] button.



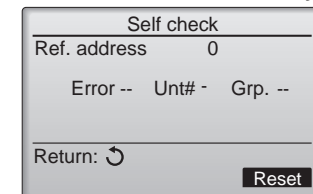
- ② With the [F1] or [F2] button, enter the refrigerant address, and press the [✓] button.



- ③ Check code, unit number, attribute will appear. "-" will appear if no error history is available.



When there is no error history



- ④ Resetting the error history

Press the [F4] button (Reset) on the screen that shows the error history.

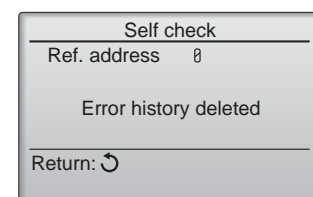
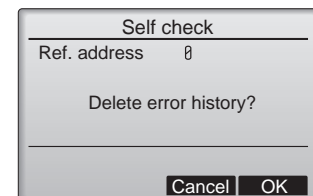


A confirmation screen will appear asking if you want to delete the error history.





Press the [F4] button (OK) to delete the error history.

If deletion fails, "Request rejected" will appear.
"Unit not exist" will appear if no indoor units that are correspond to the entered address are found.



Navigating through the screens

- To go back to the Service menu [] button
- To return to the previous screen..... [] button

10-3-2. Remote controller check <PAR-4xMAA ("x" represents 0 or later)>

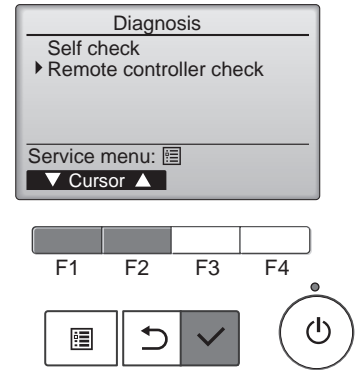
If operations cannot be completed with the remote controller, diagnose the remote controller with this function.

- ① Select "Service" from the Main menu, and press the [✓] button.

Select "Check" from the Service menu,
and press the [✓] button.

Select "Diagnosis" from the Check menu,
and press the [✓] button.

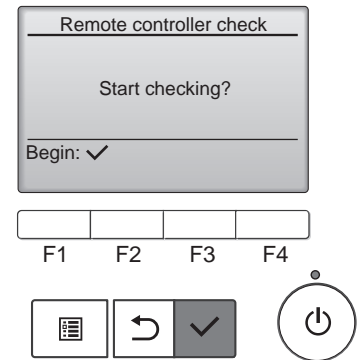
Select "Remote controller check" with the [F1] or [F2] button,
and press the [✓] button.



- ② Select "Remote controller check" from the Diagnosis menu (PAR-4xMAA) or Service menu (PAR-3xMAA), and press the [✓] button to start the remote controller check and see the check results.

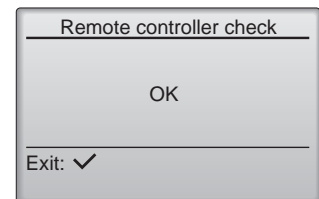
To cancel the remote controller check and exit the "Remote controller check" menu screen, press the [⌂] or the [↺] button.

The remote controller will not reboot itself.



- ③
- OK: No problems are found with the remote controller. Check other parts for problems.
 - E3, 6832: There is noise on the transmission line, or the indoor unit or another remote controller is faulty. Check the transmission line and the other remote controllers.
 - NG (ALL0, ALL1): Send-receive circuit fault. The remote controller needs replacing.
 - ERC: The number of data errors is the discrepancy between the number of bits in the data transmitted from the remote controller and that of the data that was actually transmitted over the transmission line. If data errors are found, check the transmission line for external noise interference.

Remote controller check results screen



If the [✓] button is pressed after the remote controller check results are displayed, remote controller check will end, and the remote controller will automatically reboot itself.

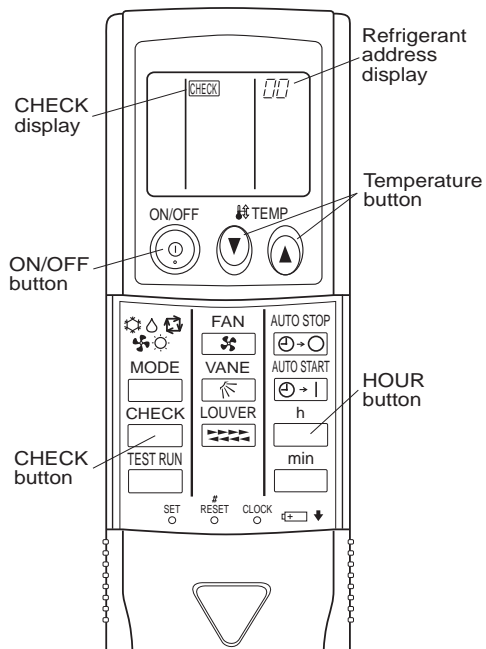
Check the remote controller display and see if anything is displayed (including lines). Nothing will appear on the remote controller display if the correct voltage (8.5–12 VDC) is not supplied to the remote controller. If this is the case, check the remote controller wiring and indoor units.

10-3-6. Self-diagnosis <wireless remote controller>

<In the case of trouble during operation>

When a malfunction occurs to air conditioner, both indoor unit and outdoor unit will stop and operation lamp blinks to inform unusual stop.

<Malfunction-diagnosis method at maintenance service>



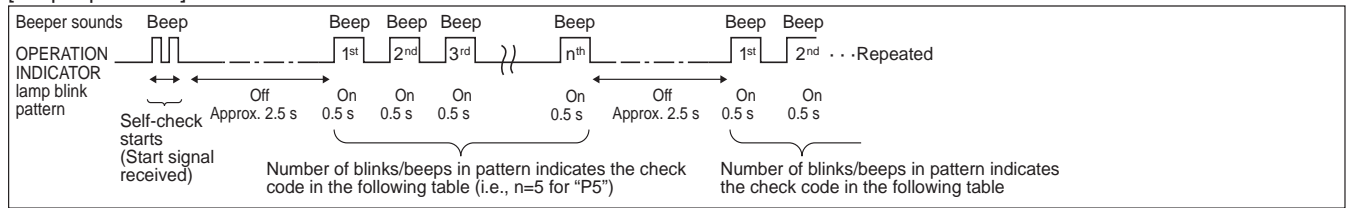
[Procedure]

1. Press the CHECK button twice.
 - "CHECK" lights, and refrigerant address "00" blinks.
 - Check that the remote controller's display has stopped before continuing.
2. Press the TEMP (down) (up) buttons.
 - Select the refrigerant address of the indoor unit for the self-diagnosis.

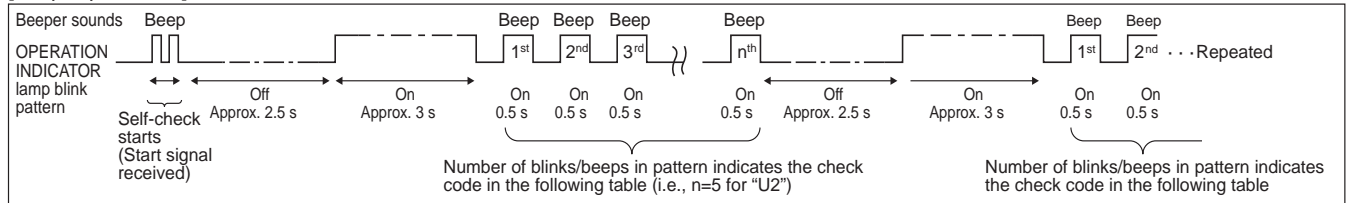
Note: Set refrigerant address using the outdoor unit's DIP switch (SW1). (For more information, see the outdoor unit installation manual.)
3. Point the remote controller at the sensor on the indoor unit and press the HOUR button.
 - If an air conditioner error occurs, the indoor unit's sensor emits an intermittent buzzer sound, the operation light blinks, and the check code is output. (It takes 3 seconds at most for check code to appear.)
4. Point the remote controller at the sensor on the indoor unit and press the ON/OFF button.
 - The check mode is cancelled.

- Refer to the following tables for details on the check codes.

[Output pattern A]



[Output pattern B]



[Output pattern A] Errors detected by indoor unit

Wireless remote controller Beeper sounds/OPERATION INDICATOR lamp blinks (Number of times)	Wired remote controller Check code	Symptom	Remark
1	P1	Intake sensor error	As for indoor unit, refer to indoor unit's service manual.
2	P2	Pipe (TH2) sensor error	
	P9	Pipe (TH5) sensor error	
3	E6, E7	Indoor/outdoor unit communication error	
4	P4	Drain sensor error/Float switch connector (CN4F) open	
5	P5	Drain pump error	
	PA	Forced compressor stop (due to water leakage abnormality)	
6	P6	Freezing/Overheating protection operation	
7	EE	Combination error between indoor and outdoor units	
8	P8	Pipe temperature error	
9	E4, E5	Remote controller signal receiving error	
10	-	-	
11	Pb	Indoor unit fan motor error	
12	Fb	Indoor unit control system error (memory error, etc.)	
14	PL	Abnormality of refrigerant circuit	
-	E0, E3	Remote controller transmission error	
-	E1, E2	Remote controller control board error	

[Output pattern B] Errors detected by unit other than indoor unit (outdoor unit, etc.)

Wireless remote controller Beeper sounds/OPERATION INDICATOR lamp blinks (Number of times)	Wired remote controller Check code	Symptom	Remark
1	E9	Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit)	For details, check the LED display of the outdoor controller board.
2	UP	Compressor overcurrent interruption	
3	U3, U4	Open/short of outdoor unit thermistors	
4	UF	Compressor overcurrent interruption (When compressor locked)	
5	U2	Abnormal high discharging temperature/insufficient refrigerant	
6	U1, Ud	Abnormal high pressure (63H operated)/Overheating protection operation	
7	U5	Abnormal temperature of heatsink	
8	U8	Outdoor unit fan protection stop	
9	U6	Compressor overcurrent interruption/Abnormal of power module	
11	U9, UH	Abnormality such as overvoltage or voltage shortage and abnormal synchronous signal to main circuit/Current sensor error	
12	-	-	
13	-	-	
14	Others	Other errors (Refer to the technical manual for the outdoor unit.)	

- Notes: 1. If the beeper does not sound again after the initial 2 beeps to confirm the self-check start signal was received and the OPERATION INDICATOR lamp does not come on, there are no error records.
 2. If the beeper sounds 3 times continuously "beep, beep, beep (0.4 + 0.4 + 0.4 seconds)" after the initial 2 beeps to confirm the self-check start signal was received, the specified refrigerant address is incorrect.

10-4. SELF-DIAGNOSIS ACTION TABLE

<Abnormalities detected when the power is put on>

(Note 1) Refer to indoor unit section for code P and code E.

Check Code	Abnormal points and detection method	Cause	Judgment and action
None	—	<p>① No voltage is supplied to terminal block (TB1) of outdoor unit. a) Power supply breaker is turned off. b) Contact failure or disconnection of power supply terminal c) Open phase (L or N phase)</p> <p>② Electric power is not 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)</p> <p>③ Electric power is not supplied to outdoor controller circuit board. a) Disconnection of connector (CNDC)</p> <p>④ Disconnection of reactor (DCL)</p> <p>⑤ Defective outdoor power circuit board</p> <p>⑥ Defective outdoor controller circuit board</p>	<p>① Check following items. a) Power supply breaker b) Connection of power supply terminal block. (TB1) c) Connection of power supply terminal block. (TB1)</p> <p>② Check following items. a) Connection of power supply terminal block. (TB1) b) Connection of terminal on outdoor power circuit board.</p> <p>③ Check connection of the connector (CNDC) on the outdoor controller circuit board. Refer to "10-9. TEST POINT DIAGRAM".</p> <p>④ Check connection of reactor. (DCL) Check connection of TB1A, TB3A, TB1B and TB3B on the outdoor power circuit board. Refer to "10-9. TEST POINT DIAGRAM".</p> <p>⑤ Replace outdoor power circuit board.</p> <p>⑥ Replace controller board (When items above are checked but the units cannot be repaired.)</p>
F5 (5201)	<p>63H connector open Abnormal if 63H connector circuit is open for 3 minutes continuously after power supply. 63H: High pressure switch</p>	<p>① Disconnection or contact failure of 63H connector on outdoor controller circuit board</p> <p>② Disconnection or contact failure of 63H</p> <p>③ 63H is working due to defective parts.</p> <p>④ Defective outdoor controller circuit board</p>	<p>① Check connection of 63H connector on outdoor controller circuit board. Refer to "10-9. TEST POINT DIAGRAM".</p> <p>② Check the 63H side of connecting wire.</p> <p>③ Check continuity by tester. Replace the parts if the parts are defective.</p> <p>④ Replace outdoor controller circuit board.</p>



Check Code	Abnormal points and detection method	Cause	Judgment and action
EA (6844)	<p>Miswiring of indoor/outdoor unit connecting wire 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 and etc. after power is turned on for 4 minutes. Abnormal if outdoor controller circuit board recognizes excessive number of indoor units.</p>	<ul style="list-style-type: none"> 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 Noise has entered into power supply or indoor/outdoor unit connecting wire. 	<ul style="list-style-type: none"> 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 one 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 transmission path, and remove the cause.
Eb (6845)	<p>Miswiring of indoor/outdoor unit connecting wire (reverse wiring or disconnection) Outdoor controller circuit board can automatically set the unit number of indoor units. Abnormal if the indoor unit number cannot be set within 4 minutes after power on because of Miswiring (reverse wiring or disconnection) of indoor/outdoor unit connecting wire.</p>	<ul style="list-style-type: none"> 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 Defective transmitting receiving circuit of outdoor controller circuit board ④ Defective transmitting receiving circuit of indoor controller board ⑤ Defective indoor power board ⑥ Noise has entered into power supply or indoor/outdoor unit connecting wire. 	<p>Note: The descriptions above, ①-⑦, are for EA, Eb and EC.</p>
EC (6846)	<p>Startup time over The unit cannot finish startup process within 4 minutes after power on.</p>	<ul style="list-style-type: none"> ① Contact failure of indoor/outdoor unit connecting wire ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ③ Noise has entered into power supply or indoor/outdoor unit connecting wire. 	

<Abnormalities detected while unit is operating>

Check Code	Abnormal points and detection method	Cause	Judgment and action
U1 (1302)	<p>High pressure (High pressure switch 63H operated) Abnormal if high pressure switch 63H operated (4.15 MPa) during compressor operation.</p> <p>63H: High pressure switch</p>	<p>① Short cycle of indoor unit ② Clogged filter of indoor unit ③ Decreased airflow caused by dirt of indoor fan ④ Dirt of indoor heat exchanger ⑤ Locked indoor fan motor ⑥ Malfunction of indoor fan motor ⑦ Defective operation of stop valve (Not full open) ⑧ Clogged or broken pipe ⑨ Locked outdoor fan motor ⑩ Malfunction of outdoor fan motor ⑪ Short cycle of outdoor unit ⑫ Dirt of outdoor heat exchanger ⑬ Decreased airflow caused by defective inspection of outside temperature thermistor (It detects lower temperature than actual temperature.) ⑭ Disconnection or contact failure of connector (63H) on outdoor controller board ⑮ Disconnection or contact failure of 63H connection ⑯ Defective outdoor controller board ⑰ Defective action of linear expansion valve ⑱ Malfunction of fan driving circuit</p>	<p>①-⑥ Check indoor unit and repair defect.</p> <p>⑦ Check if stop valve is fully open.</p> <p>⑧ Check piping and repair defect. ⑨-⑫ Check outdoor unit and repair defect.</p> <p>⑬ Check the detected temperature of outside temperature thermistor on LED display. (SW2 on A-Control Service Tool: "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".)</p> <p>⑭-⑯ Turn the power off and check F5 is displayed when the power is turned again. When F5 is displayed, refer to "Judgment and action" for F5.</p> <p>⑰ Check linear expansion valve. Refer to "10-6. HOW TO CHECK THE PARTS".</p> <p>⑱ Replace outdoor controller board.</p>
U2 (TH4: 1102) (TH33: 1132)	<p>High discharging temperature High comp. surface temperature Abnormal if discharge temperature thermistor (TH4) exceeds 125°C or 110°C continuously for 5 minutes. Abnormal if condenser/evaporator temperature thermistor (TH5) exceeds 40°C during defrosting and discharge temperature thermistor (TH4) exceeds 110°C.</p> <p>Abnormal if comp. surface temperature thermistor (TH33) exceeds 125°C or 110°C continuously for 5 minutes.</p>	<p>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</p>	<p>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 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".</p>
U3 (TH4:5104) (TH33:5132)	<p>Open/short circuit of discharge temperature thermistor (TH4)/comp. surface thermistor (TH33) Abnormal if open (3°C or less) or short (217°C or more) is detected during compressor operation. (Detection is inoperative for 17 minutes of compressor starting process and for 17 minutes after and during defrosting.)</p>	<p>① Disconnection or contact failure of connector (TH4/TH33) on the outdoor controller circuit board ② Defective thermistor ③ Defective outdoor controller circuit board</p>	<p>① Check connection of connector (TH4/TH33) on the outdoor controller circuit board. Check breaking of the lead wire for thermistor (TH4/TH33). Refer to "10-9. TEST POINT DIAGRAM". ② Check resistance value of thermistor (TH4/TH33) or temperature by microprocessor. (Thermistor/TH4/TH33: 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.</p>



Check Code	Abnormal points and detection method	Cause	Judgment and action																								
U4 (TH3: 5105) (TH6: 5107) (TH7: 5106) (TH8: 5110)	<p>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".)</p>	<p>① Disconnection or contact failure of connectors (Outdoor controller circuit board: TH3, TH6/TH7 Outdoor power circuit board: CN6) ② Defective thermistor ③ Defective outdoor controller circuit board</p>	<p>① Check connection of connector (TH3,TH6/TH7) on the outdoor controller circuit board. Check connection of connector (CN6) 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 microprocessor. (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. Note: Emergency operation is available in the case of abnormalities of TH3, TH6 and TH7. Refer to "10-8. EMERGENCY OPERATION (ATA only)".</p>																								
<table border="1"> <thead> <tr> <th colspan="4">Thermistors</th> </tr> <tr> <th>Symbol</th> <th>Name</th> <th>Open detection</th> <th>Short detection</th> </tr> </thead> <tbody> <tr> <td>TH3</td> <td>Thermistor <Liquid></td> <td>- 40°C or below</td> <td>90°C or above</td> </tr> <tr> <td>TH6</td> <td>Thermistor <2-phase pipe></td> <td>- 40°C or below</td> <td>90°C or above</td> </tr> <tr> <td>TH7</td> <td>Thermistor <Ambient></td> <td>- 40°C or below</td> <td>90°C or above</td> </tr> <tr> <td>TH8</td> <td>Thermistor <Heatsink></td> <td>- 35°C or below</td> <td>102°C or above</td> </tr> </tbody> </table>				Thermistors				Symbol	Name	Open detection	Short detection	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 <Heatsink>	- 35°C or below	102°C or above
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TH3	Thermistor <Liquid>	- 40°C or below	90°C or above																								
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TH7	Thermistor <Ambient>	- 40°C or below	90°C or above																								
TH8	Thermistor <Heatsink>	- 35°C or below	102°C or above																								
U5 (4230)	<p>Temperature of heatsink Abnormal if heatsink thermistor (TH8) detects temperature indicated below. FRP71 77°C</p>	<p>① The outdoor fan motor is locked. ② Failure of outdoor fan motor ③ Airflow 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</p>	<p>①② Check outdoor fan. ③ Check airflow path for cooling. ④ Check if there is something which causes temperature rise around outdoor unit. (Upper limit of ambient temperature is 46°C.) Turn off power, and on again to check if U5 is displayed within 30 minutes. If U4 is displayed instead of U5, follow the action to be taken for U4. ⑤ Check resistance value of thermistor (TH8) or temperature by microprocessor. (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. ⑦ Replace outdoor controller circuit board.</p>																								
U6 (4250)	<p>Power module Check abnormality by driving power module in case overcurrent is detected. (UF or UP error condition)</p>	<p>① Outdoor stop valve is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or reverse of compressor wiring connection ④ Defective compressor ⑤ Defective outdoor power circuit board</p>	<p>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.</p>																								
U8 (4400)	<p>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 detected continuously for 15 seconds at 20°C or more outside air temperature. • 50 rpm or below or 1500 rpm or more detected continuously for 1 minute.</p>	<p>① Failure in the operation of the DC fan motor ② Failure in the outdoor circuit controller board</p>	<p>① Check or replace the DC fan motor. ② Check the voltage of the outdoor circuit controller board during operation. ③ Replace the outdoor circuit controller board. (when the failure is still indicated even after performing the action ① above.)</p>																								



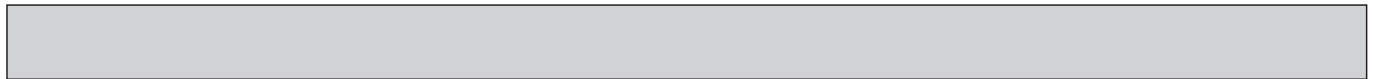
Check Code	Abnormal point and detection method	Cause	Judgment and action
U9 (4220)	Detailed codes	To find out the detail history (latest) about U9 error, turn ON SW2-1, 2-2, 2-6. Refer to "10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".	
	01	Overvoltage error • Increase in DC bus voltage to 430V	① Abnormal increase in power source voltage ② Disconnection of compressor wiring ③ Defective outdoor power circuit board ④ Compressor has a ground fault.
	02	Undervoltage error • Instantaneous decrease in DC bus voltage to 200V	① Decrease in power source voltage, instantaneous stop. ② Defective converter drive circuit of outdoor power circuit board
	04	Input current sensor error/ L-phase open error • Decrease in input current through outdoor unit to 0.1A only if operation frequency is more than or equal to 40Hz or compressor current is more than or equal to 6A.	① Disconnection or loose connection between TB1 and outdoor power circuit board ② Defective DCCT (DC current trans) on the outdoor power circuit board ③ Defective input current detection circuit of outdoor power circuit board ④ Defective 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
10	PFC error (Overvoltage/ Undervoltage/Overcurrent) • PFC detected any of the following: a) Increase in DC bus voltage to 460V b) Decrease in PFC control voltage to 12V DC or lower c) Increase in input current to 36A 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 (DCL) ⑤ Defective outdoor power circuit board ⑥ Defective Reactor (DCL) ⑦ Disconnection or loose connection of CN2 on the outdoor power circuit board/controller circuit board	



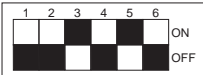
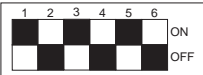


Check Code	Abnormal point and detection method	Cause	Judgment and action
Ud (1504)	Over heat protection Abnormal if outdoor pipe thermistor (TH3) detects 70°C or more during compressor operation.	<ul style="list-style-type: none"> ① Defective outdoor fan (fan motor) or short cycle of outdoor unit during cooling operation ② Defective outdoor pipe thermistor (TH3) ③ Defective outdoor controller board 	<ul style="list-style-type: none"> 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 (1509)	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.	<ul style="list-style-type: none"> ① Disconnection or contact failure of connector (63HS) on the outdoor controller circuit board ② Defective pressure sensor ③ Defective outdoor controller circuit board 	<ul style="list-style-type: none"> 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 (4100)	Compressor overcurrent interruption (When compressor locked) Abnormal if overcurrent of DC bus or compressor is detected within 30 seconds after compressor starts operating.	<ul style="list-style-type: none"> ① Stop valve is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or reverse of compressor wiring connection ④ Defective compressor ⑤ Defective outdoor power board ⑥ Dip switch setting difference of outdoor controller circuit board. 	<ul style="list-style-type: none"> 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. 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 (5300)	Current sensor error or input current error Abnormal if 38A of input current is detected or 34A or more of input current is detected for 10 seconds continuously.	<ul style="list-style-type: none"> ① Defective circuit of current sensor on outdoor power circuit board ② Decrease of power supply voltage 	<ul style="list-style-type: none"> ① Replace outdoor power circuit board. ② Check the facility of power supply.
UP (4210)	Compressor overcurrent interruption Abnormal if overcurrent DC bus or compressor is detected after compressor starts operating for 30 seconds.	<ul style="list-style-type: none"> ① Stop valve of outdoor unit is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or reverse 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 	<ul style="list-style-type: none"> 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 indoor/outdoor fan. ⑤ Solve short cycle. ⑥ Replace outdoor controller circuit board. ⑦ Check compressor. Refer to "10-6. HOW TO CHECK THE PARTS". 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. ⑧ Replace outdoor power circuit board ⑨ Check the dip switch setting of outdoor controller circuit board



Check Code	Abnormal points and detection method	Cause	Judgment and action
E0 or E4 (6831)	<p>Remote controller transmission error (E0)/signal receiving error (E4) 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) Abnormal if sub remote controller could not receive any signal for 2 minutes. (Check code: E0)</p> <p>Abnormal if indoor controller board cannot receive normally any data from remote controller board or from other indoor controller board for 3 minutes. (Check code: E4) Indoor controller board cannot receive any signal from remote controller for 2 minutes. (Check code: E4)</p>	<p>① Contact failure at transmission wire of remote controller 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.</p>	<p>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: max. 500m (Do not use cable × 3 or more.) • The number of connecting indoor units: max. 16 units • The number of connecting remote controller: max. 2 units</p> <p>If the cause of trouble is not any of 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 occurs 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. Note: If the unit is not normal after replacing indoor controller board in group control, indoor controller board of address "0" may be abnormal.</p>
E1 or E2	<p>Remote controller control board Abnormal if data cannot be normally read from the nonvolatile memory of the remote controller control board. (Check code: E1) Abnormal if the clock function of remote controller cannot be normally operated. (Check code: E2)</p>	<p>① Defective remote controller</p>	<p>① Replace remote controller.</p>
E3 or E5 (6831)	<p>Remote controller transmission error (E3)/signal receiving error (E5) Abnormal if remote controller could not find blank of transmission path for 6 seconds and could not transmit. (Check code: E3) 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)</p> <p>Abnormal if indoor controller board could not find blank of transmission path. (Check code: E5) 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)</p>	<p>① 2 remote controllers are set as "main." (When connecting 2 remote controllers) ② Remote controller is connected with 2 indoor units or more. ③ Repetition of refrigerant address ④ Defective transmitting receiving circuit of remote controller ⑤ Defective transmitting receiving circuit of indoor controller board ⑥ Noise has entered into transmission wire of remote controller.</p>	<p>① Set a remote controller to main, and the other to sub. ② Remote controller is connected with only one indoor unit. ③ The address changes to a separate setting. ④–⑥ 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.</p>



Check Code	Abnormal points and detection method	Cause	Judgment and action
E6 (6840)	Indoor/outdoor unit communication error (Signal receiving error) Abnormal if indoor controller board could not receive any signal normally for 6 minutes after turning the power on. Abnormal if indoor controller board could not receive any signal normally for 3 minutes. 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.	<ul style="list-style-type: none"> ① Contact failure, short circuit or miswiring (reverse 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 	<p>Note: Check LED display on outdoor controller circuit board. (Connect A-Control service tool (PAC-SK52ST))</p> <p>Refer to EA-EC item if LED displays EA-AC.</p> <ul style="list-style-type: none"> ① Check disconnecting or looseness of indoor/outdoor unit connecting wire of indoor unit or outdoor unit. Check all the units in the case of twin/triple/quadruple indoor unit system. ②-④ Turn the power off, and on again to check. If abnormality occurs again, replace indoor controller board or outdoor controller circuit board. <p>Note: Other indoor controller board may have defect in the case of twin/triple/quadruple indoor unit system.</p> <ul style="list-style-type: none"> ⑤ Turn the power off, and detach fan motor from connector. 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.
E7 (6842)	Indoor/outdoor unit communication error (Transmitting error) Abnormal if "1" receiving is detected 30 times continuously though indoor controller board has transmitted "0".	<ul style="list-style-type: none"> ① Defective transmitting receiving circuit of indoor controller board ② Noise has entered into power supply. ③ Noise has entered into outdoor control wire. 	<ul style="list-style-type: none"> ①-③ Turn the power off, and on again to check. If abnormality occurs again, replace indoor controller board.
E8 (6843)	Indoor/outdoor unit communication error (Signal receiving error) (Outdoor unit) Abnormal if outdoor controller circuit board could not receive anything normally for 3 minutes.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 (6841)	Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit) Abnormal if "0" receiving is detected 30 times continuously though outdoor controller circuit board has transmitted "1". Abnormal if outdoor controller circuit board could not find blank of transmission path for 3 minutes.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.
EE (7130)	Reverse connection of ATA/ATW communication wire Abnormal if communication wire of ATA side and FTC side are connected in reverse.	<ul style="list-style-type: none"> ① Each S1, S2, S3 of TB1 and TB2 are connected in reverse. ② The connection from TB1 and TB2 to indoor controller board CNS and CNS2 are in reverse. 	<ul style="list-style-type: none"> ① Correct the wiring according to 7. WIRING DIAGRAM. (TB1 — Indoor unit TB2 — Cylinder/Hydrobox unit) ② Correct the wiring according to 7. WIRING DIAGRAM. (TB1 — CNS TB2 — CNS2)
EF (6607 or 6608)	Non defined check code This code is displayed when non defined check code is received.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. ④ Replace remote controller with MA remote controller.

Check Code	Abnormal points and detection method	Cause	Judgment and action
Ed (0403)	<p>Serial communication error Abnormal if serial communication between outdoor controller circuit board and outdoor power circuit board is defective.</p>	<p>① Breaking of wire or contact failure of connector CN2 between the outdoor controller circuit board and the outdoor power circuit board</p> <p>② Breaking of wire or contact failure of connector CN4 between the outdoor controller circuit board and the outdoor power circuit board</p> <p>③ Defective communication circuit of outdoor power circuit board</p> <p>④ Defective communication circuit of outdoor controller circuit board for outdoor power circuit board</p>	<p>①② Check connection of each connector CN2 and CN4 between the outdoor controller circuit board and the outdoor power circuit board.</p> <p>③ Replace outdoor power circuit board.</p> <p>④ Replace outdoor controller circuit board.</p>
	<p>Abnormal if communication between outdoor controller circuit board and M-NET board is not available.</p>	<p>① Breaking of wire or contact failure of connector between outdoor controller circuit board and M-NET board</p> <p>② Contact failure of M-NET board power supply line</p> <p>③ Noise has entered into M-NET transmission wire.</p>	<p>① Check disconnection, looseness, or breaking of connection wire between outdoor controller circuit board (CNMNT) and M-NET board (CN5)</p> <p>② Check disconnection, looseness, or breaking of connection wire between outdoor controller circuit board (CNMNT) and M-NET board (CND)</p> <p>③ Check M-NET transmission wiring method.</p>
P8	<p>Pipe temperature <Cooling mode> Detected as abnormal when the pipe temperature is not in the cooling range 3 minutes after compressor start and 6 minutes after the liquid or condenser/evaporator pipe is out of cooling range. Note 1: It takes at least 9 minutes to detect. Note 2: Abnormality P8 is not detected in drying mode. Cooling range: Indoor pipe temperature (TH2 or TH5) – intake temperature (TH1) $\leq -3^{\circ}\text{C}$ TH: Lower temperature between liquid pipe temperature and condenser/evaporator temperature</p> <p><Heating mode> When 10 seconds have passed after the compressor starts operation and the hot adjustment mode has finished, the unit is detected as abnormal when condenser/evaporator pipe temperature is not in heating range within 20 minutes.</p> <p>Note 3: It takes at least 27 minutes to detect abnormality. Note 4: It excludes the period of defrosting (Detection restarts when defrosting mode is over) Heating range: $3^{\circ}\text{C} \leq$ (Condenser/Evaporator temperature (TH5) – intake temperature (TH1))</p>	<p>① Slight temperature difference between indoor room temperature and pipe <liquid or condenser / evaporator> temperature thermistor</p> <ul style="list-style-type: none"> • Shortage of refrigerant • Disconnected holder of pipe <liquid or condenser / evaporator> thermistor • Defective refrigerant circuit <p>② Reverse connection of extension pipe (on plural units connection)</p> <p>③ Reverse wiring of indoor/outdoor unit connecting wire (on plural units connection)</p> <p>④ Defective detection of indoor room temperature and pipe <condenser / evaporator> temperature thermistor</p> <p>⑤ Stop valve is not opened completely.</p>	<p>①–④ Check pipe <liquid or condenser / evaporator> temperature with room temperature display on remote controller and outdoor controller circuit board. Pipe <liquid or condenser / evaporator> temperature display is indicated by setting SW2 of outdoor controller circuit board as follows.</p> <p>(Conduct temperature check with outdoor controller circuit board after connecting 'A-Control Service Tool (PAC-SK52ST)')</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Temperature display of indoor liquid pipe Indoor 1</p>  </div> <div style="text-align: center;"> <p>Temperature display of indoor condenser/evaporator pipe Indoor 1</p>  </div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Temperature display of indoor liquid pipe Indoor 2</p>  </div> <div style="text-align: center;"> <p>Temperature display of indoor condenser/evaporator pipe Indoor 2</p>  </div> </div> <p style="text-align: center;">A-Control Service Tool SW2 setting</p> <p>②③ Check reverse connection of extension pipe or reverse wiring of indoor/outdoor unit connecting wire.</p>
PL	<p>Abnormal refrigerant circuit During Cooling, Dry, or Auto Cooling operation, when the following are regarded as failures when detected for one second.</p> <p>a) The compressor continues to run for 30 or more seconds.</p> <p>b) The liquid pipe temperature or the condenser/evaporator temperature is 75°C or more.</p> <p><u>These detected errors will not be cancelled until the power source is reset.</u></p>	<p>① Abnormal operation of 4-way valve</p> <p>② Disconnection of or leakage in refrigerant pipes</p> <p>③ Air into refrigerant piping</p> <p>④ Abnormal operation (no rotation) of indoor fan</p> <ul style="list-style-type: none"> • Defective fan motor. • Defective indoor control board. <p>⑤ Defective refrigerant circuit (clogging)</p>	<p>① <u>When this error occurs, be sure to replace the 4-way valve.</u></p> <p>② Check refrigerant pipes for disconnection or leakage.</p> <p>③ After the recovery of refrigerant, vacuum dry the whole refrigerant circuit.</p> <p>④ Refer to section "10-6. HOW TO CHECK THE PARTS".</p> <p>⑤ Check refrigerant circuit for operation. <u>To avoid entry of moisture or air into refrigerant circuit which could cause abnormal high pressure, purge air in refrigerant circuit or replace refrigerant.</u></p>

10-5. TROUBLESHOOTING OF PROBLEMS

Phenomena	Factor	Countermeasure
1. Remote controller display does not work.	<p>① 12 V DC is not supplied to remote controller. (Power supply display ● is not indicated on LCD.)</p> <p>② 12–15 V DC is supplied to remote controller, however, no display is indicated.</p> <ul style="list-style-type: none"> • “PLEASE WAIT” is not displayed. • “PLEASE WAIT” is displayed. 	<p>① Check LED2 on indoor controller board.</p> <p>(1) When LED2 is lit: Check the remote controller wiring for breaking or contact failure.</p> <p>(2) When LED2 is blinking: Check short circuit of remote controller wiring.</p> <p>(3) When LED2 is not lit: Refer to phenomena No.3 below.</p> <p>② Check the following.</p> <ul style="list-style-type: none"> • 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.	<p>① At longest 2 minutes after the power supply “PLEASE WAIT” is displayed to start up.</p> <p>② Communication error between the remote controller and indoor unit</p> <p>③ Communication error between the indoor and outdoor unit</p> <p>④ Outdoor unit protection device connector is open.</p>	<p>① Normal operation</p> <p>② Self-diagnosis of remote controller</p> <p>③ “PLEASE WAIT” is displayed for 6 minutes at most in the case of indoor/outdoor unit communication error. Check LED3 on indoor controller board.</p> <p>(1) When LED3 is not blinking. Check indoor/outdoor connecting wire for Miswiring. (Reverse wiring of S1 and S2, or break of S3 wiring.)</p> <p>(2) When LED3 is blinking. Indoor/outdoor connecting wire is normal.</p> <p>④ Check LED display on outdoor controller circuit board. “10-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS”. Check protection device connector (63H) for contact failure. Refer to “10-9. TEST POINT DIAGRAM”.</p>
3. When pressing the remote controller operation switch, the OPERATION display is appeared but it will be turned off soon.	<p>① After cancelling to select function from the remote controller, the remote controller operation switch will not be accepted for approx. 30 seconds.</p>	<p>① Normal operation</p>
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.	<p>① The pair number settings of the wireless remote controller and indoor controller board are mismatched.</p>	<p>① Check the pair number settings.</p>
5. When operating by the wireless remote controller, beep sound is heard, however, unit does not start operating.	<p>① No operation for 2 minutes at most after the power supply ON.</p> <p>② Local remote controller operation is prohibited.</p> <ul style="list-style-type: none"> • 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. <p>③ Phenomena of No.2.</p>	<p>① Normal operation</p> <p>② Normal operation</p> <p>③ Check the phenomena No.2.</p>



Phenomena	Factor	Countermeasure
<p>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.)</p>	<p>① Refrigerant shortage</p> <p>② Filter clogging</p> <p>③ Heat exchanger clogging</p> <p>④ Air duct short cycle</p>	<p>① • If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening.</p> <ul style="list-style-type: none"> • Check pipe connections for gas leakage. <p>② Open intake grille and check the filter. Clean the filter by removing dirt or dust on it.</p> <p>③ • If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure.</p> <ul style="list-style-type: none"> • Clean the heat exchanger. <p>④ Remove the blockage.</p>
<p>7. Remote controller display works normally and the unit performs heating operation, however, the capacity cannot be fully obtained.</p>	<p>① Linear expansion valve fault Opening cannot be adjusted well due to linear expansion valve fault.</p> <p>② Refrigerant shortage</p> <p>③ Lack of insulation for refrigerant piping</p> <p>④ Filter clogging</p> <p>⑤ Heat exchanger clogging</p> <p>⑥ Air duct short cycle</p> <p>⑦ Bypass circuit of outdoor unit fault</p>	<p>① • Discharging temperature and indoor heat exchanger temperature does not rise. Inspect the failure by checking discharging pressure.</p> <ul style="list-style-type: none"> • Replace linear expansion valve. <p>② • If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening.</p> <ul style="list-style-type: none"> • Check pipe connections for gas leakage. <p>③ Check the insulation.</p> <p>④ Open intake grille and check the filter. Clean the filter by removing dirt or dust on it.</p> <p>⑤ • If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure.</p> <ul style="list-style-type: none"> • Clean the heat exchanger. <p>⑥ Remove the blockage.</p> <p>⑦ Check refrigerant system during operation.</p>
<p>8. For 3 minutes after temperature adjuster turns off, the compressor will not start operating even if temperature adjuster is turned on. 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.)</p>	<p>①② Normal operation (For protection of compressor)</p>	<p>①② Normal operation</p>

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





Diagnosis flow	Cause	Inspection method and troubleshooting
<pre> graph TD Start[Check the display time of "PLEASE WAIT" after turning on the main power.] --> D1{How long is "PLEASE WAIT" kept being displayed on the remote controller?} D1 -- "6 minutes or more" --> Step1[Check the LED display of the outdoor controller circuit board.] D1 -- "2 to 6 minutes" --> D2{Are any check codes displayed on the remote controller?} D1 -- "2 minutes or less" --> Cause1["• "PLEASE WAIT" will be displayed during the startup diagnosis after turning on the main power."] D2 -- YES --> Cause2["• Miswiring of indoor/outdoor connecting wire • Breaking of indoor/outdoor connecting wire (S3) • Defective indoor controller board • Defective outdoor controller circuit board"] D2 -- NO --> Cause1 Step1 --> D3{Are any check codes displayed on the LED?} D3 -- YES --> Cause2 D3 -- NO --> Cause3["• Defective indoor controller board • Defective remote controller"] </pre>	<ul style="list-style-type: none"> • "PLEASE WAIT" will be displayed during the startup 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 	<ul style="list-style-type: none"> • Normal. The startup diagnosis will be over in around 2 minutes. • Refer to "Self-diagnosis action table" in order to solve the trouble. • In the 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
<pre> graph TD Start[Check the voltage between S1 and S2 on the terminal block (TB4) of the indoor unit which is used to connect the indoor unit and the outdoor unit.] --> D1{198 to 264 V AC ?} D1 -- NO --> S1[Check the voltage among L(L3) and N on the terminal block (TB1) of the outdoor power circuit board.] S1 --> D2{198 to 264 V AC ?} D2 -- NO --> C1[• Troubles concerning power supply.] D2 -- YES --> S2[Check the voltage between S1 and S2 on the terminal block (TB1) of the outdoor unit which is used to connect the indoor unit and the outdoor unit.] S2 --> D3{198 to 264 V AC ?} D3 -- NO --> C2[• Bad wiring of the outdoor controller board. • The fuses on the outdoor controller circuit board are blown.] D3 -- YES --> S3[Check the voltage of indoor controller board (CN2D).] S3 --> D4{12 to 16 V DC ?} D4 -- YES --> C3[• Bad wiring of the outdoor controller board. • The fuses on the outdoor controller circuit board are blown.] D4 -- NO --> S4[Check the voltage of the unit after removing the indoor power board (CN2S).] S4 --> D5{12 to 16 V DC ?} D5 -- YES --> C4[• Miswiring, breaking or poor connection of in door/outdoor connecting wire] D5 -- NO --> C5[• Defective indoor power board] </pre>	<ul style="list-style-type: none"> • 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 in door/outdoor connecting wire • Defective indoor power board 	<ul style="list-style-type: none"> • 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.

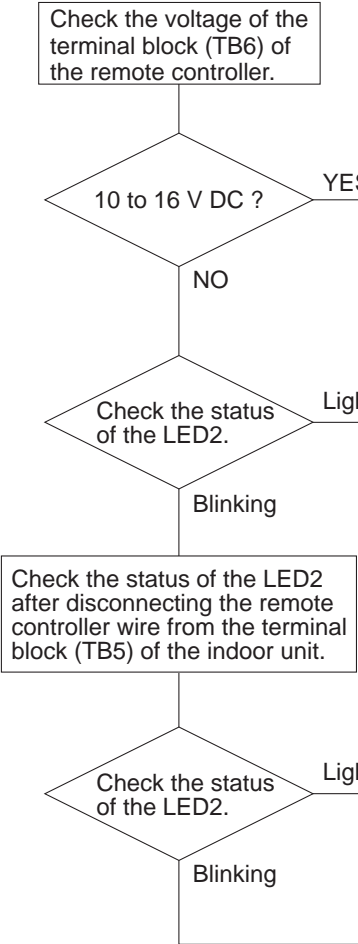
Symptoms: Nothing is displayed on the remote controller ②

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

Diagnosis flow	Cause	Inspection method and troubleshooting
<p>Check the voltage between S1 and S2 on the terminal block (TB4) of the indoor unit which is used to connect the indoor unit and the outdoor unit.</p> <p>198 to 264 V AC ?</p> <p>NO → Check the looseness or disconnection of the indoor/outdoor connecting wire.</p> <p>YES → Check the status of the indoor controller board LED3 display.</p> <p>Not lighting. → Check the looseness or disconnection of the indoor/outdoor connecting wire.</p> <p>Blinking. → Check the refrigerant address of the outdoor unit. (SW1-3 to 1-6)</p> <p>Is the refrigerant address "0"?</p> <p>NO → Defective outdoor controller circuit board</p> <p>YES → Check the LED display of the outdoor unit after turning on the main power again.</p> <p>Is anything displayed?</p> <p>NO → Defective outdoor controller circuit board</p> <p>YES → Is "EA" or "Eb" displayed?</p> <p>NO → Is "E8" displayed?</p> <p>YES → Defective outdoor controller circuit board</p> <p>NO → Can the unit be restarted?</p> <p>Can the unit be restarted? → Can all the indoor unit be operated?</p> <p>NO → Defective indoor controller board</p> <p>YES → Check the voltage between S2 and S3 on the terminal block of the outdoor unit.</p> <p>17 to 28 V DC ?</p> <p>NO → Defective outdoor power circuit board</p> <p>YES → Defective indoor power board</p>	<ul style="list-style-type: none"> • 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. • Defective outdoor controller circuit board • Defective outdoor controller circuit board • Defective indoor controller board • Influence of electromagnetic noise • Defective outdoor power circuit board • Defective indoor power board 	<ul style="list-style-type: none"> • Fix the breaking or poor contact of the indoor/outdoor connecting wire. • Set the refrigerant address to "0". In the case of the multiple grouping system, recheck the refrigerant address again. • Replace the outdoor controller circuit board. • Replace the outdoor controller circuit board. • Replace the indoor controller board of the indoor unit which does not operate. • Not abnormal. There may be the influence of electromagnetic noise. Check the transmission wire and get rid of the causes. • Replace the outdoor power circuit 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
 <pre> graph TD A[Check the voltage of the terminal block (TB6) of the remote controller.] --> B{10 to 16 V DC ?} B -- YES --> C[Defective remote controller] B -- NO --> D{Check the status of the LED2.} D -- Lighting --> E[Breaking or poor contact of the remote controller wire] D -- Blinking --> F[Check the status of the LED2 after disconnecting the remote controller wire from the terminal block (TB5) of the indoor unit.] F --> G{Check the status of the LED2.} G -- Lighting --> H[The remote controller wire short-circuits] G -- Blinking --> I[Defective indoor controller board] </pre>	<ul style="list-style-type: none"> • Defective remote controller • Breaking or poor contact of the remote controller wire • The remote controller wire short-circuits • Defective indoor controller board 	<ul style="list-style-type: none"> • 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 , the indoor controller board must be defective. • Check if the remote controller wire is short-circuited. • Replace the indoor controller board.

• Before repair
Frequent calls from customers

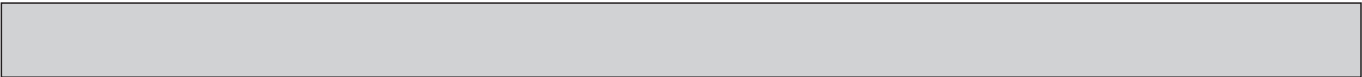
Phone Calls From Customers	How to Respond	Note	
Unit does not operate at all.	① The operating display of remote controller does not come on.	① Check if power is supplied to air conditioner. Nothing appears on the display unless power is supplied.	_____
	② Unit cannot be restarted for a while after it's stopped.	② Wait around 3 minutes to restart unit. The air conditioner is in a state of being protected by the microprocessor directive. Once the compressor is stopped, the unit cannot be restarted for 3 minutes. This control is also applied when the unit is turned on and off by remote controller.	_____
	③ Check code appears and blinks on the display of remote controller.	③ Check code will be displayed if any protection devices of the air conditioner are actuated. What is check code?-----	Refer to "SELF-DIAGNOSIS ACTION TABLE". ▶Check if servicing is required for the error.
Remote controller	① "PLEASE WAIT" is displayed on the screen.	① Wait around 2 minutes. An automatic startup test will be conducted for 2 minutes when power is supplied to the air conditioner. "PLEASE WAIT" will be kept displayed while that time.	_____
	② "FILTER" is displayed on the screen.	② This indicates that it is time to clean the air filters. Clean the air filters. Press the FILTER button on the remote controller twice to clear "FILTER" from the display. See the operation manual that came with the product for how to clean the filters.	Display time of "FILTER" depends on the model. Long life filter: 2500 h Standard filter: 100 h
	③ "STANDBY" is displayed on the screen.	③ This is displayed when the unit starts HEAT operation, when the thermostat puts the compressor in operation mode, or when the outdoor unit ends DEFROST operation and returns to HEAT operation. The display will automatically disappear around 10 minutes later. While "STANDBY" is displayed on the remote controller, the airflow amount will be restricted because the indoor unit's heat exchanger is not fully heated up. In addition to that, the up/down vane will be automatically set to horizontal blow in order to prevent cold air from directly blowing out to human body. The up/down vane will return to the setting specified by the remote controller when "STANDBY" is released.	_____
	④ "DEFROST" is displayed on the screen. (No air comes out of the unit.)	④ The outdoor unit gets frosted when the outside temperature is low and the humidity is high. "DEFROST" indicates the DEFROST operation is being performed to melt this frost. The DEFROST operation ends in around 10 minutes (at most 15 minutes). During the DEFROST operation, the indoor unit's heat exchanger becomes cold, so the fan is stopped. The up/down vane will be automatically set to horizontal blow in order to prevent cold air from directly blowing out to human body. The display will turn into "STANDBY" when DEFROST operation ends.	_____



Phone Calls From Customers		How to Respond	Note
The room cannot be cooled or heated sufficiently.		① Check the set temperature of remote controller. The outdoor unit cannot be operated if the set temperature is not appropriate. The outdoor unit operates in the following modes. COOL: When the set temperature is lower than the room temperature. HEAT: When the set temperature is higher than the room temperature.	_____
		② Check if filters are not dirty and clogged. If filters are clogged, the airflow amount will be reduced and the unit capacity will be lowered. See the instruction manual that came with the product for how to clean the filters.	_____
		③ Check there is enough space around the air conditioner. If there are any obstacles in the air intake or air outlet of indoor/outdoor units, they block the airflow direction so that the unit capacity will be lowered.	_____
Sound comes out from the air conditioner.	① A gas escaping sound is heard sometimes.	① This is not a malfunction. This is the sound when the flow of refrigerant in the air conditioner is switched.	_____
	② A cracking sound is heard sometimes.	② This is not a malfunction. This is the sound when internal parts of units expand or contract when the temperature changes.	_____
	③ A buzzing sound is heard sometimes.	③ This is not a malfunction. This is the sound when the outdoor unit starts operating.	_____
	④ A ticking sound is heard from the outdoor unit sometimes.	④ This is not a malfunction. This is the sound when the fan of the outdoor unit is controlling the airflow amount in order to keep the optimum operating condition.	_____
	⑤ A sound, similar to water flowing, is heard from the unit.	⑤ This is not a malfunction. This is the sound when the refrigerant is flowing inside the indoor unit.	_____
Something is wrong with the blower.....	① The fan speed does not match the setting of the remote controller during DRY operation.(No air comes out sometimes during DRY operation.)	① This is not a malfunction. During the DRY operation, the blower's ON/OFF is controlled by the microprocessor to prevent overcooling and to ensure efficient dehumidification. The fan speed cannot be set by the remote controller during DRY operation.	_____
	② The fan speed does not match the setting of the remote controller in HEAT operation.	② This is not a malfunction. 1) When the HEAT operation starts, to prevent the unit from blowing cold air, the fan speed is gradually increased from zero to the set speed, in proportion to the temperature rise of the discharged air. 2) When the room temperature reaches the set temperature and the outdoor unit stops, the unit starts the LOW AIR operation. 3) During the HEAT operation, the DEFROST operation is performed to defrost the outdoor unit. During the DEFROST operation, the blower is stopped to prevent cold air coming out of the indoor unit.	The up/down vane will be automatically set to horizontal blow in these cases listed up on the left (①~③). After a while, the up/down vane will be automatically moved according to the setting of the remote controller.

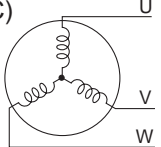
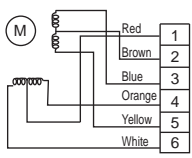


Phone Calls From Customers	How to Respond	Note
Something is wrong with the blower.....	③ This is not a malfunction. The blower is operating just for cooling down the heated-up air conditioner. This will be done within 1 minute. This control is conducted only when the HEAT operation is stopped with the electric heater ON.	However, this control is also applied to the models which has no electric heater.
Something is wrong with the airflow direction.....	① If the up/down vane is set to downward in COOL operation, it will be automatically set to horizontal blow by the microprocessor in order to prevent water from dropping down. "1 Hr." will be displayed on the remote controller if the up/down vane is set to downward with the fan speed set to be less than "LOW".	_____
② The airflow direction is changed during HEAT operation. (The airflow direction cannot be set by remote controller.)	② In HEAT operation, the up/down vane is automatically controlled according to the temperature of the indoor unit's heat exchanger. In the following cases written below, the up/down vane will be set to horizontal blow, and the setting cannot be changed by remote controller. 1) At the beginning of the HEAT operation 2) While the outdoor unit is being stopped by thermostat or when the outdoor unit gets started to operate. 3) During DEFROST operation The airflow direction will be back to the setting of remote controller when the above situations are released.	"STANDBY" will be displayed on the remote controller in the case of ① and ②. "DEFROSTING" will be displayed on the screen in the case of ③.
③ The airflow direction does not change. (Up/down vane, left/right louver)	③ 1) Check if the vane is set to a fixed position. (Check if the vane motor connector is removed.) 2) Check if the air conditioner has a function for switching the air direction. 3) If the air conditioner does not have that function, "NOT AVAILABLE" will be displayed on the remote controller when "AIR DIRECTION" or "LOUVER" button is pressed.	_____
The air conditioner starts operating even though any buttons on the remote controller are not pressed.	① Check if you set ON/OFF timer. The air conditioner starts operating at the time designated if ON timer has been set before.	_____
	② Check if any operations are ordered by distant control system or the central remote controller. While "CENTRALLY CONTROLLED INDICATOR" is displayed on the remote controller, the air conditioner is under the control of external directive.	There might be a case that "CENTRALLY CONTROLLED INDICATOR" will not be displayed.
	③ Check if power is recovered from power failure (black out). The units will automatically start operating when power is recovered after power failure (black out) occurs. This function is called "auto recovery feature from power".	_____
The air conditioner stops even though any buttons on the remote controller are not pressed.	① Check if you set ON/OFF timer. The air conditioner stops operating at the time designated if OFF timer has been set before. ② Check if any operations are ordered by distant control system or the central remote controller. While "CENTRALLY CONTROLLED INDICATOR" is displayed on the remote controller, the air conditioner is under the control of external directive.	There might be a case that "CENTRALLY CONTROLLED INDICATOR" will not be displayed.



Phone Calls From Customers	How to Respond	Note
A white mist is expelled from the indoor unit.	This is not a malfunction. This may occur when the operation is started in the room of high humidity.	_____
Water or moisture is expelled from the outdoor unit.	COOL: When pipes or piping joints are cooled, they sweat and water drips down. HEAT: Water drips down from the heat exchanger. Note: Make use of optional parts "Drain Socket" and "Drain pan" if these water needs to be collected and drained out for once.	_____
The display of wireless remote controller gets dim or does not come on. The indoor unit does not receive a signal from remote controller at a long distance.	Batteries are being exhausted. Replace them and press the reset button of remote controller.	_____

10-6. HOW TO CHECK THE PARTS PUHZ-FRP71VHA2

Parts name	Checkpoints														
Thermistor (TH3) <Liquid> Thermistor (TH4) <Discharge> Thermistor (TH6) <2-phase pipe> Thermistor (TH7) <Ambient> Thermistor (TH8) <Heatsink> Thermistor (TH33) <Comp. surface>	Disconnect the connector then measure the resistance with a tester. (At the ambient temperature 10 to 30°C) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th>Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>TH4, TH33</td> <td>160 to 410 kΩ</td> <td rowspan="4">Open or short</td> </tr> <tr> <td>TH3</td> <td rowspan="3">4.3 to 9.6 kΩ</td> </tr> <tr> <td>TH6</td> </tr> <tr> <td>TH7</td> </tr> <tr> <td>TH8</td> <td>39 to 105 kΩ</td> </tr> </tbody> </table>		Normal	Abnormal	TH4, TH33	160 to 410 kΩ	Open or short	TH3	4.3 to 9.6 kΩ	TH6	TH7	TH8	39 to 105 kΩ		
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TH6															
TH7															
TH8	39 to 105 kΩ														
Fan motor (MF1)	Refer to next page.														
Solenoid valve coil <4-way valve> (21S4)	Measure the resistance between the terminals with a tester. (At the ambient temperature 20°C) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>2350 ± 170Ω</td> <td>Open or short</td> </tr> </tbody> </table>	Normal	Abnormal	2350 ± 170Ω	Open or short										
Normal	Abnormal														
2350 ± 170Ω	Open or short														
Solenoid valve coil (SV1, SV2)	Measure the resistance between the terminals with a tester. (At the ambient temperature 20°C) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>1567 ± 150Ω</td> <td>Open or short</td> </tr> </tbody> </table>	Normal	Abnormal	1567 ± 150Ω	Open or short										
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Motor for compressor (MC) 	Measure the resistance between the terminals with a tester. (Winding temperature 20°C) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>Refer to "5-2. COMPRESSOR TECHNICAL DATA".</td> <td>Open or short</td> </tr> </tbody> </table>	Normal	Abnormal	Refer to "5-2. COMPRESSOR TECHNICAL DATA".	Open or short										
Normal	Abnormal														
Refer to "5-2. COMPRESSOR TECHNICAL DATA".	Open or short														
Linear expansion valve (LEV-A/LEV-B/LEV-C) 	Disconnect the connector then measure the resistance with a tester. (Winding temperature 20°C) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="4">Normal</th> <th>Abnormal</th> </tr> </thead> <tbody> <tr> <td>Red - White</td> <td>Red - Orange</td> <td>Brown - Yellow</td> <td>Brown - Blue</td> <td rowspan="2">Open or short</td> </tr> <tr> <td colspan="4">46 ± 4Ω</td> </tr> </tbody> </table>	Normal				Abnormal	Red - White	Red - Orange	Brown - Yellow	Brown - Blue	Open or short	46 ± 4Ω			
Normal				Abnormal											
Red - White	Red - Orange	Brown - Yellow	Brown - Blue	Open or short											
46 ± 4Ω															

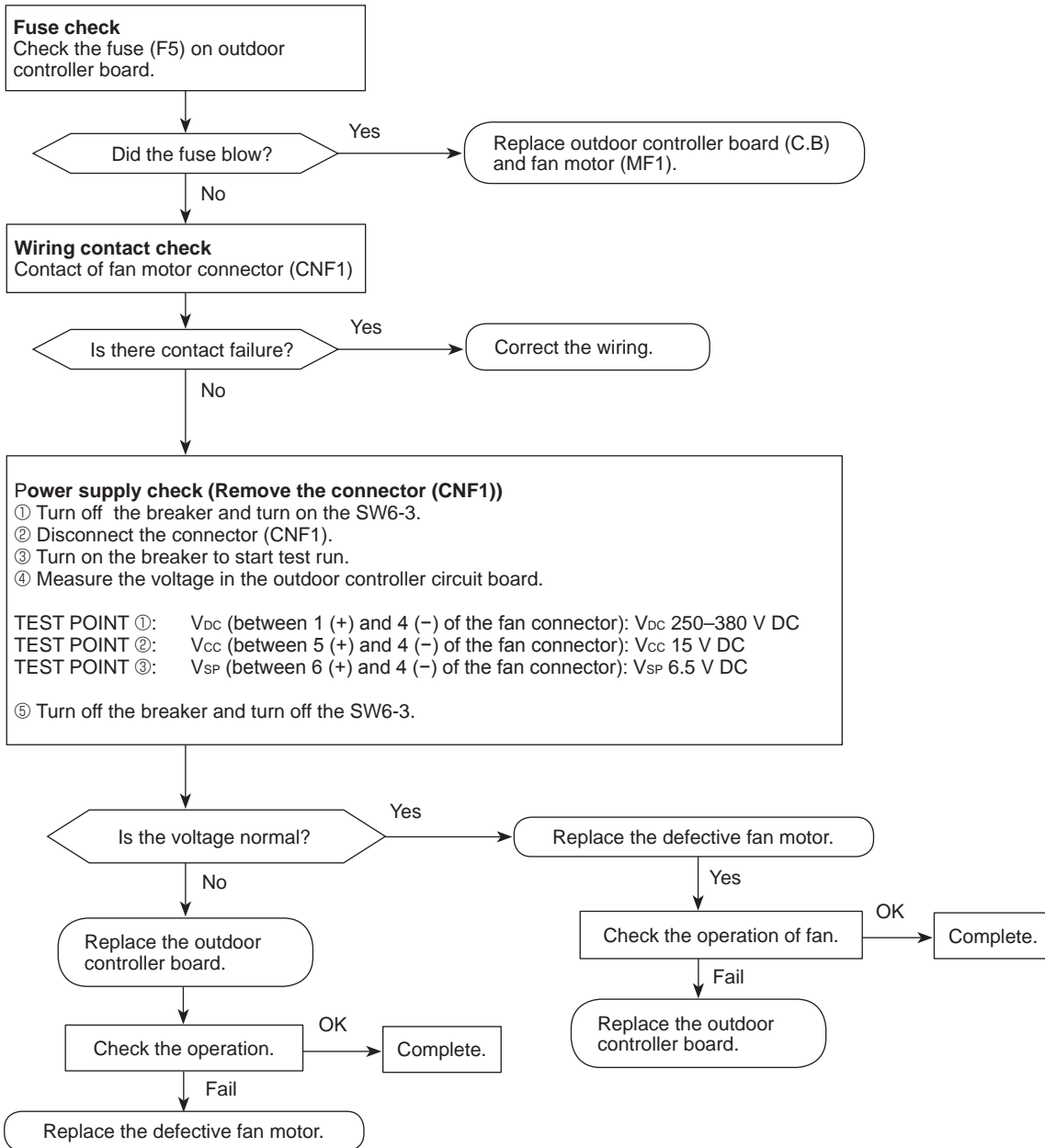
Check method of DC fan motor (fan motor/indoor controller circuit board)

① Notes

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

② Self check

Symptom: The outdoor fan cannot turn around.



10-7. HOW TO CHECK THE COMPONENTS

<Thermistor feature chart>

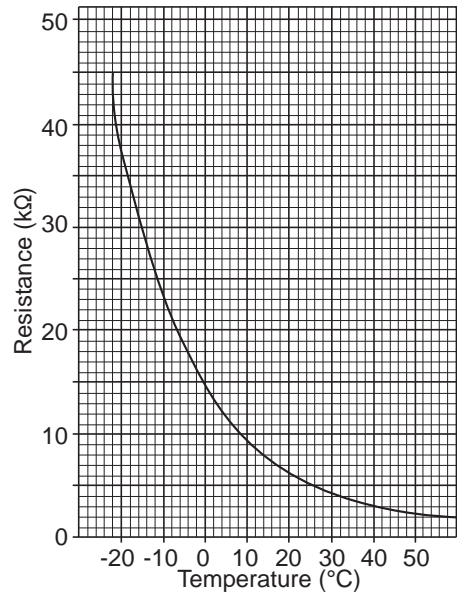
Low temperature thermistors

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

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

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

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



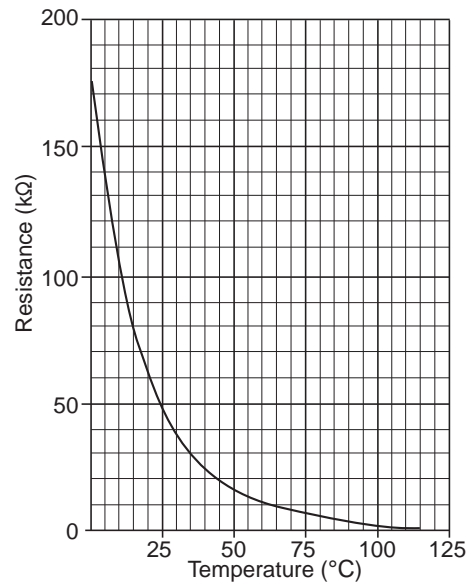
Medium temperature thermistor

- Thermistor <Heat sink> (TH8)

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

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

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



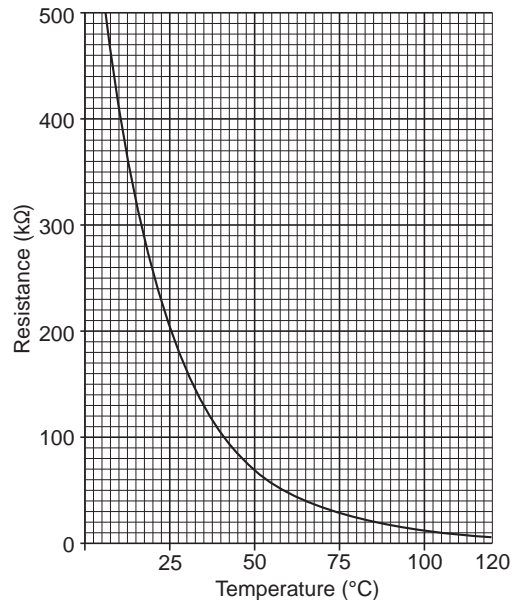
High temperature thermistor

- Thermistor <Discharge> (TH4)
- Thermistor <Comp. surface> (TH33)

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

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

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

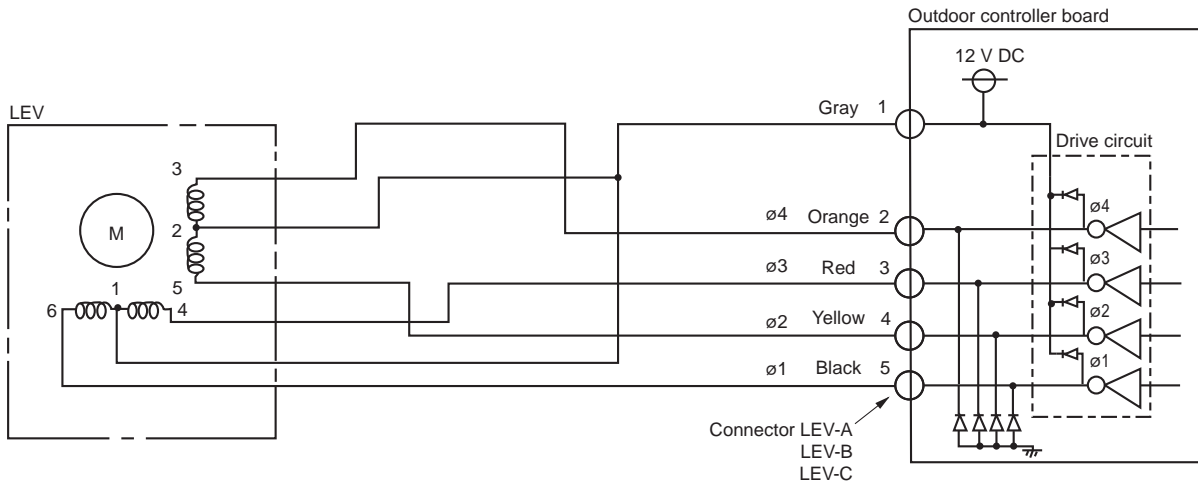


Linear expansion valve

(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
ø1	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
ø2	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
ø3	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
ø4	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

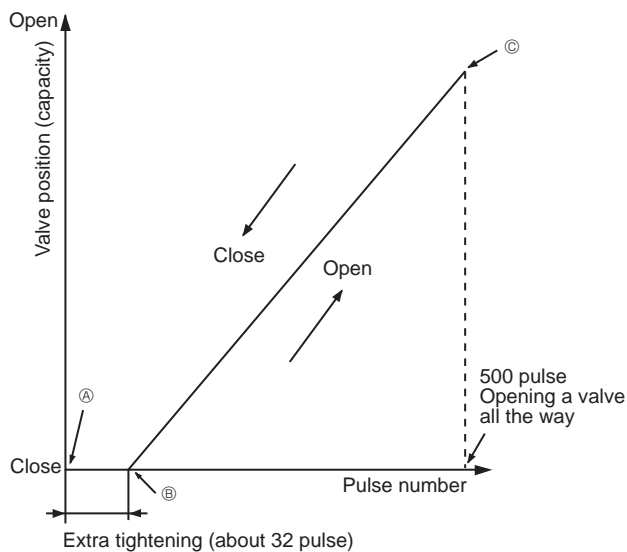
The output pulse shifts in below order.

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

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

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

(2) Linear expansion valve operation

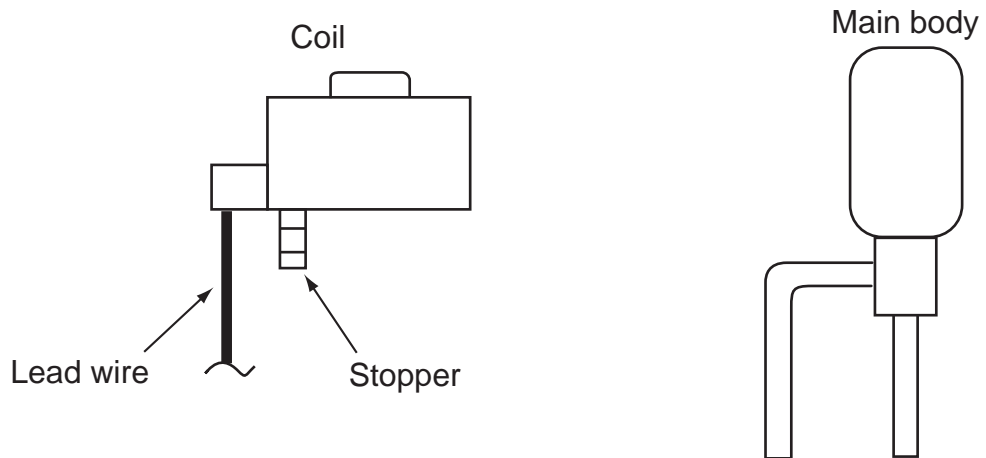


- When the power is turned on, 700 pulse closing valve signal will be sent till it goes to ① point in order to define the valve position. (The pulse signal is being sent for about 20 seconds.)
- When the valve moves smoothly, there is no sound or vibration occurring from the linear expansion valve: however, when the pulse number moves from ② to ① or when the valve is locked, more sound can be heard. No sound is heard when the pulse number moves from ③ to ① in case coil is burnt out or motor is locked by open-phase.
- Sound can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

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

<Composition>

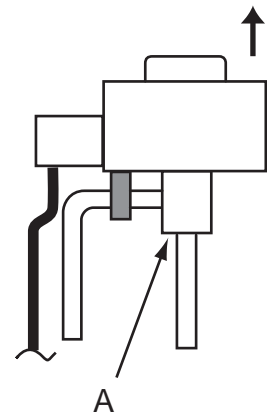
Linear expansion valve is separable into the main body and the coil as shown in the diagram below.



<How to detach the coil>

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

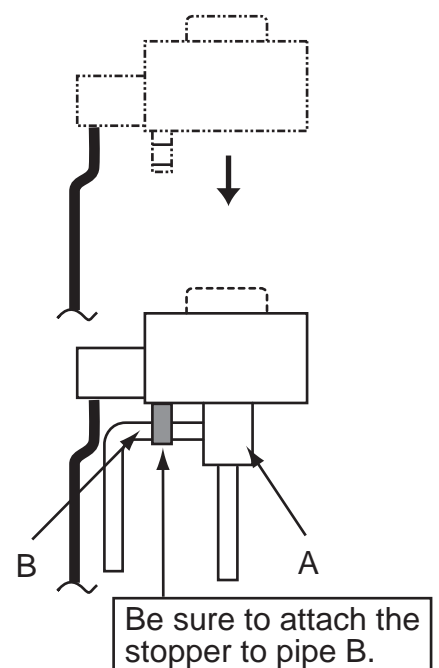
Be sure to detach the coil holding main body firmly. Otherwise pipes can bend due to stress.



<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.



10-8. EMERGENCY OPERATION (ATA only)

(1) When the check codes shown below are displayed on outdoor unit or microprocessor for wired remote controller or indoor unit has a failure, but no other problems are found, emergency operation will be available by setting the emergency operation switch (SWE) on indoor controller board to ON and short-circuiting the connector (CN31) on outdoor controller board.

●When following abnormalities occur, emergency operation will be available.

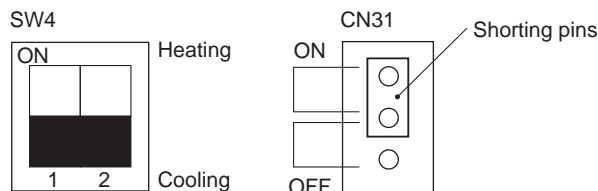
Check code	Inspected content
U4	Open/short of pipe thermistor (TH3/TH6/TH7/TH8)
E8	Indoor/outdoor unit communication error • Signal receiving error (Outdoor unit)
E9	Indoor/outdoor unit communication error • Transmitting error (Indoor unit)
E0 – E7	Communication error other than outdoor unit
Ed	Communication error between outdoor controller board and M-NET board (Serial communication error)

(2) Check the following items and cautions for emergency operation

- ① Make sure that there is no abnormality in outdoor unit other than the above abnormalities. (Emergency operation will not be available when check code other than the above are indicated.)
- ② For emergency operation, it is necessary to set the emergency operation switch (SWE) on indoor controller board. Refer to the electrical wiring diagram of indoor unit for how to set the indoor unit.
- ③ During emergency operation, the air-conditioner will continuously be operated by supplying power and stopping it: It cannot be turned on or off by remote control, and temperature control is not possible.
- ④ Do not perform emergency heating operation for an extended period of time: If the outdoor unit starts defrosting during this period, cold air will blow out from the indoor unit.
- ⑤ Do not perform emergency cooling operation for more than 10 hours: Neglecting this could result in freezing the heat exchanger in indoor unit.

(3) Emergency operation procedure

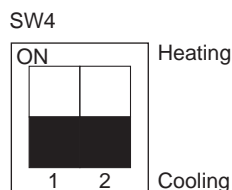
- ① Turn the main power supply off.
- ② Turn on the emergency operation switch (SWE) on indoor controller board.
- ③ Set the shorting pins of emergency operation connector (CN31) on outdoor controller board to ON.
- ④ Use SW4-2 on outdoor controller board to set the operation mode (cooling or heating). (SW4-1 is not used.)
- ⑤ Turning the main power supply on will start the emergency operation.



(4) Releasing emergency operation

- ① Turn the main power supply off.
- ② Set the emergency operation switch (SWE) on indoor controller board to OFF.
- ③ Set the shorting pins of emergency operation connector (CN31) on outdoor controller board to OFF.
- ④ Set SW4-2 on outdoor controller board as shown in the right.

Note: If shorting pins are not set on emergency operation connector (CN31), the setting remains OFF.



(5) Operation data during emergency operation

During emergency operation, no communication is performed with the indoor unit, so the data items needed for operation are set to the following values:

Operation data	Operation mode		Remarks
	COOL	HEAT	
Intake temperature (TH1)	27°C	20.5°C	—
Indoor pipe temperature (TH2)	5°C	45°C	—
Indoor 2-phase pipe temperature (TH5)	5°C	50°C	—
Set temperature	25°C	22°C	—
Outdoor pipe temperature (TH3)	45°C	5°C	*1
Outdoor 2-phase pipe temperature (TH6)	50°C	5°C	*1
Outdoor ambient temperature (TH7)	35°C	7°C	*1
Pressure sensor saturated temperature (63HS)	50°C	50°C	*1
Temperature difference code (room temperature - set temperature) (ΔT)	5	5	—

*1 If the thermistor temperature data is normal (not open/short), that data is loaded into the control as valid data. When the unit enters emergency operation and TH values are mismatched, set the thermistors to open/short. And the unit runs emergency operation with the values listed above.

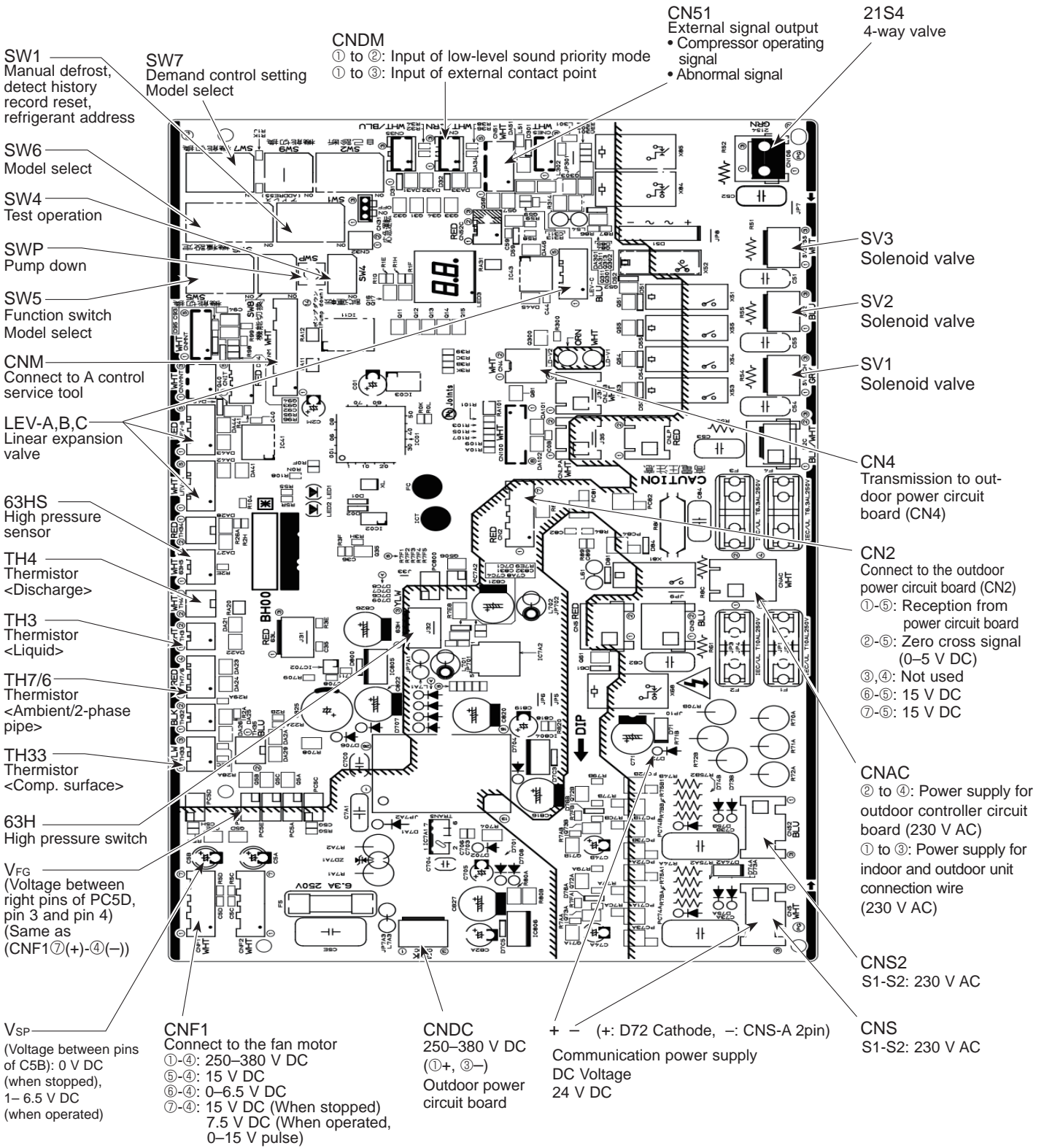
10-9. TEST POINT DIAGRAM

Outdoor controller circuit board

PUHZ-FRP71VHA2

PUHZ-FRP71VHA2R1

<CAUTION> TEST POINT① is high voltage.



Outdoor power circuit board
PUHZ-FRP71VHA2
PUHZ-FRP71VHA2R1

Brief Check of POWER MODULE

If they are short-circuited, it means that they are broken.
 Measure the resistance in the following points (connectors, etc.).

1. Check POWER MODULE

① Check of DIODE circuit

R - P1 S - P1 R - N1 S - N1

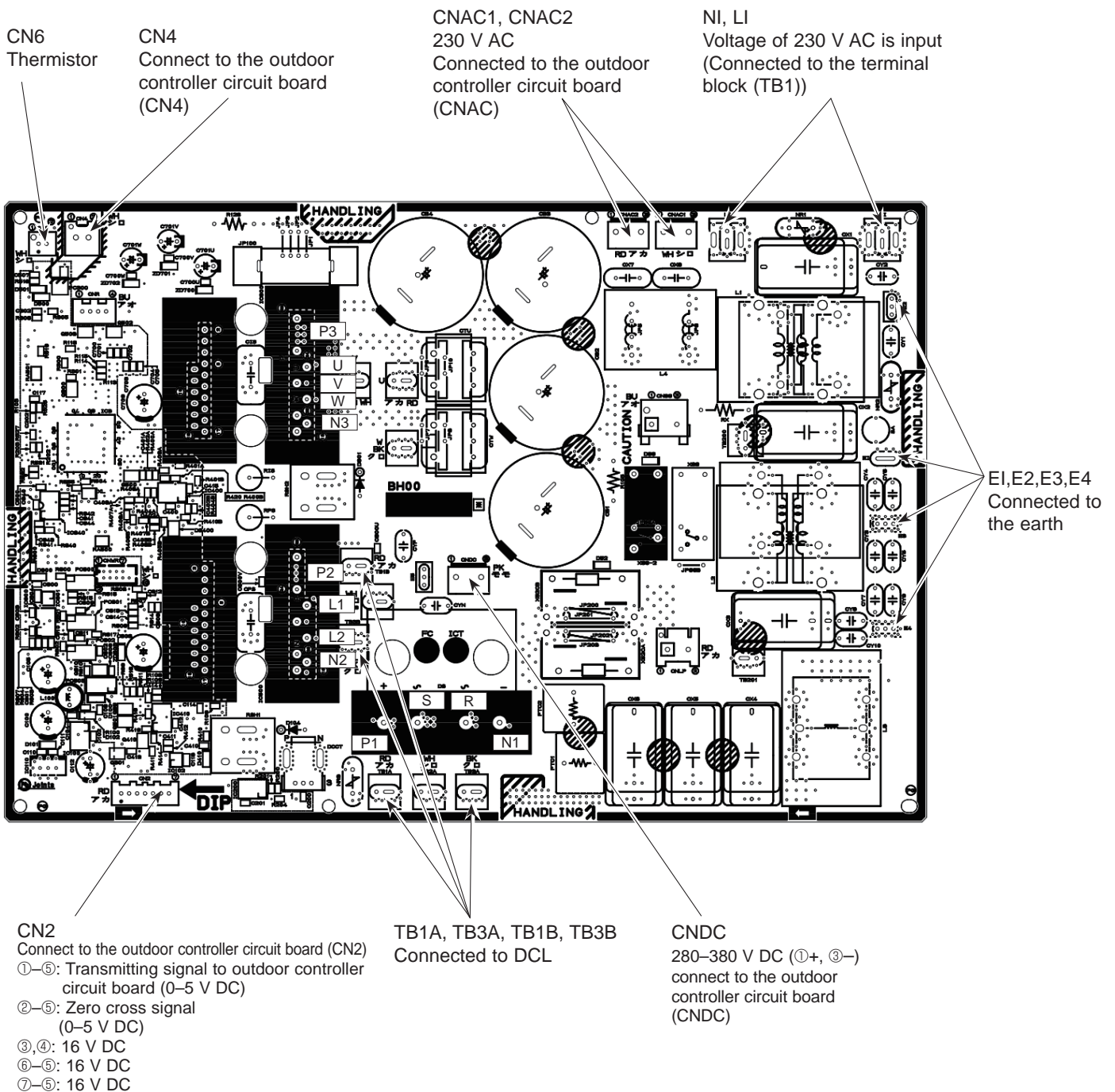
② Check of PFC circuit

P2 - L1 P2 - L2 N2 - L1 N2 - L2

③ Check of INVERTER circuit

P3 - U, P3 - V, P3 - W, N3 - U, N3 - V, N3 - W

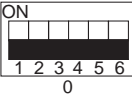
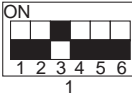
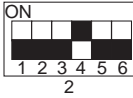
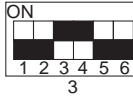
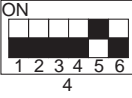
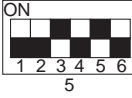
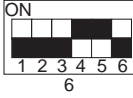
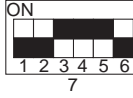
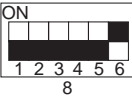
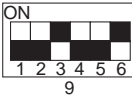
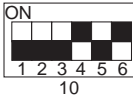
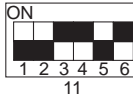
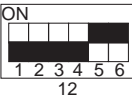
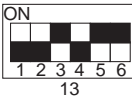
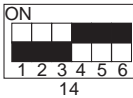
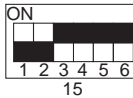
Note: The marks R, S, L1, L2, P1, P2, P3, N1, N2, N3, U, V and W show in the diagram are not actually printed on the board.



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 ATA heating and ATW heating operation. ^{*1}		
		2	Abnormal history clear	Clear	Normal		OFF or operating	
		3	Refrigerant address setting	 0	 1	 2	 3	When power supply ON
		4		 4	 5	 6	 7	
		5		 8	 9	 10	 11	
		6		 12	 13	 14	 15	
	SW4	1	Test run	Operating	OFF	OFF		
		2	Test run mode setting	ATA Heating	ATA Cooling			
	Push switch	SWP		Pump down	Start	Normal	OFF	

^{*1} Manual defrost should be done as follows.

① Change the DIP SW1-1 on the outdoor controller 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°C.

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.

The black square (■) indicates a switch position.

Type of Switch	Switch	No.	Function	Action by the switch operation		Effective timing									
				ON	OFF										
Dip switch	SW5	1	No function	—	—	—									
		2	Power failure automatic recovery *2	Auto recovery	No auto recovery	When power supply ON									
		3,4	No function	—	—	—									
		5	Forced refrigerant recovery	Start	Normal	When compressor is working in ATA cooling, ATA heating and ATW heating.									
	SW7	1	Mode select *3	Demand function	Low noise mode	Always									
		2	No function	—	—	—									
		3	No function	—	—	—									
		5	Operation priority	ATW	ATA	When power supply ON									
		6	Defrost setting	For high humidity	Normal	Always									
	SW8	1	Cooling operation limit	None	16 hr	Always									
		2	Fan table select	2nd table	1st table	Always									
		3	Separate power supply	Separate	Normal	When power supply ON									
	SW9	1	Cooling & DHW simultaneous operation	Comfort	Eco	Always									
		2	No function	—	—	—									
		3,4	No function	—	—	—									
	SW5	6	Model select	<table border="1"> <tr> <td>MODEL</td> <td>SW6</td> </tr> <tr> <td rowspan="3">PUHZ-FRP71VHA2</td> <td>ON OFF </td> </tr> <tr> <td>SW5</td> </tr> <tr> <td>ON OFF </td> </tr> <tr> <td>SW7</td> </tr> <tr> <td>ON OFF </td> </tr> </table>				MODEL	SW6	PUHZ-FRP71VHA2	ON OFF 	SW5	ON OFF 	SW7	ON OFF
	MODEL	SW6													
	PUHZ-FRP71VHA2	ON OFF 													
		SW5													
		ON OFF 													
	SW7														
	ON OFF 														
	SW6	1													
		2													
3															
4															
5															
6															
7															
8															
SW7	4														

*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. Please refer to the indoor unit installation manual.

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

(2) Function of connector

Types	Connector	Function	Action by open/ short operation		Effective timing
			Short	Open	
Connector	CN31	Emergency operation	Start	Normal	When power supply ON

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.

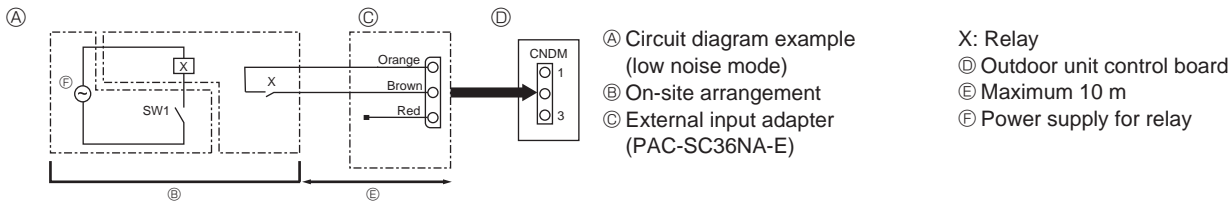
- The ability varies according to the outdoor temperature and conditions, etc.

① Complete the circuit as shown when using the external input adapter (PAC-SC36NA-E). (Option)

② SW7-1 (Outdoor unit control board): OFF

③ SW1 ON: Low noise mode

SW1 OFF: Normal operation



(b) On demand control (Local wiring)

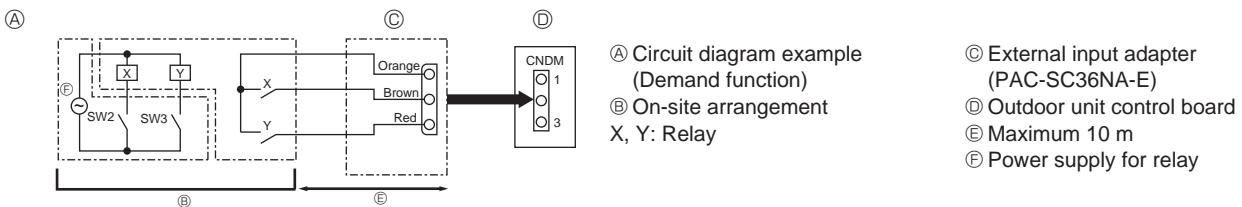
By performing the following modification, energy consumption can be reduced to 0–100% of the normal consumption.

The demand function 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.

① Complete the circuit as shown when using the external input adapter (PAC-SC36NA-E). (Option)

② By setting SW7-1 on the control board of the outdoor unit, the energy consumption (compared to the normal consumption) can be limited as shown below.

	SW7-1	SW2	SW3	Energy consumption
Demand function	ON	OFF	OFF	100%
		ON	OFF	75%
		ON	ON	50%
		OFF	ON	0% (Stop)



<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.

[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	Lit	Lit	— ↔ —	Alternately blinking display
When unit stops	Lit	Not lit	00, etc.	Operation mode
When compressor is warming up	Lit	Not lit	08, etc.	
When unit operates	Lit	Lit	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.26
2 blinking	1 blinking	Miswiring of indoor/outdoor unit connecting wire, excessive number of indoor units (4 units or more)	—	①Check if indoor/outdoor connecting wire is connected correctly. ②Check if 4 or more indoor units are connected to outdoor unit.	P.27 (EA)
		Miswiring of indoor/outdoor unit connecting wire (reverse wiring or disconnection)	—	③Check if noise entered into indoor/outdoor connecting wire or power supply.	P.27 (Eb)
		Startup time over	—	④Re-check error by turning off power, and on again.	P.27 (EC)
2 blinking	2 blinking	Indoor/outdoor unit communication error (signal receiving error) is detected by indoor unit.	E6	①Check if indoor/outdoor connecting wire is connected correctly. ②Check if noise entered into indoor/outdoor connecting wire or power supply.	P.33
		Indoor/outdoor unit communication error (transmitting error) is detected by indoor unit.	E7	③Check if noise entered into indoor/outdoor controller board. ④Re-check error by turning off power, and on again.	P.33
		Indoor/outdoor unit communication error (signal receiving error) is detected by outdoor unit.	—		P.33 (E8)
		Indoor/outdoor unit communication error (transmitting error) is detected by outdoor unit.	—		P.33 (E9)
3 blinking	2 blinking	Remote controller signal receiving error is detected by remote controller.	E0	①Check if connecting wire of indoor 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.32
		Remote controller transmitting error is detected by remote controller.	E3		P.32
		Remote controller signal receiving error is detected by indoor unit.	E4		P.32
		Remote controller transmitting error is detected by indoor unit.	E5		P.32
4 blinking	2 blinking	Check code is not defined.	EF	①Check if remote controller is MA remote controller(PAR-21MAA). ②Check if noise entered into transmission wire of remote controller. ③Check if noise entered into indoor/outdoor connecting wire. ④Re-check error by turning off power, and on again.	P.33
		Reverse connection of ATA/ATW communication wire	EE	①Correct the wiring according to 7 WIRING DIAGRAM. (TB1 — Indoor unit TB2 — Cylinder/Hydrobox unit) ②Correct the wiring according to 7 WIRING DIAGRAM. (TB1 — CNS TB2 — CNS2)	P.33
		Abnormality of refrigerant	PL	①Be sure to replace the 4-way valve. ②Check refrigerant pipes for disconnection or leakage. ③After the recovery of refrigerant, vacuum dry the whole refrigerant circuit. ④Refer to section "10-6 HOW TO CHECK THE PARTS." ⑤Check refrigerant circuit for operation.	P.34
5 blinking	2 blinking	Serial communication error <Communication between outdoor controller board and outdoor power board> <Communication between outdoor controller board and M-NET P.C. board>	Ed	①Check if connector (CN4) on outdoor controller board and outdoor power board is not disconnected. ②Check if there is poor connection of connector on outdoor controller board(CNMNT and CNVMNT). ③Check M-NET communication signal.	P.34

*1 Check code displayed on remote controller



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 (TH33) and discharging temperature (TH4)	U2	①Check if stop valves are open. ②Check if connectors (TH4, TH33, 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.28
	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.28
	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.29
		Protection from overheat operation(TH3)	Ud		P.31
	4 blinking	Compressor overcurrent breaking (Startup locked)	UF	①Check if stop valves are open. ②Check looseness, disconnection, and reverse 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.	P.31
		Compressor overcurrent breaking	UP		P.31
		Abnormality of current sensor (P.B.)	UH		P.31
		Abnormality of power module	U6		P.28
	5 blinking	Open/short of discharge thermistor (TH4) and comp. surface thermistor (TH33)	U3	①Check if connectors(TH3,TH4,TH6 ,TH7 and TH33) on outdoor controller board and connector (CN6) on outdoor power board are not disconnected. ②Measure resistance value of outdoor thermistors.	P.28
		Open/short of outdoor thermistors (TH3, TH6, TH7 and TH8)	U4		P.29
	6 blinking	Abnormality of heatsink temperature	U5	①Check if indoor/outdoor units have a short cycle on their air ducts. ②Measure resistance value of outdoor thermistor(TH8).	P.29
	7 blinking	Abnormality of voltage	U9	①Check looseness, disconnection, and reverse connection of compressor wiring. ②Measure resistance value among terminals on compressor using a tester. ③Check if power supply voltage decreases.	P.30
	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.
Abnormality of pipe temperature thermistor /Liquid (TH2)			P2	*2	
Abnormality of pipe temperature thermistor/Condenser-Evaporator			P9	*2	
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		
		Leakage error (refrigerant system)	PA		
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 reverse connection of extension pipe. (on plural units connection) ④Check if indoor/outdoor connecting wire is connected correctly. (on plural units connection)	*2
5 blinking		Indoor unit fan motor error	PB(Pb)	Defective fan motor winding	*2

*1 Check code displayed on remote controller

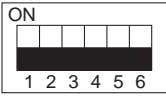
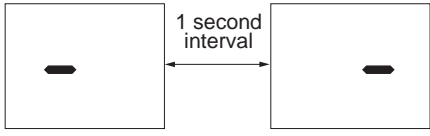
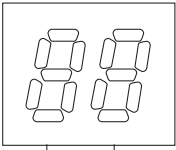
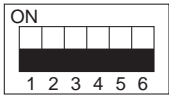
*2 Refer to the indoor unit's service manual.

<Outdoor unit operation monitor function>

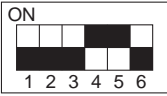
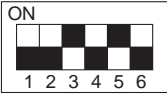

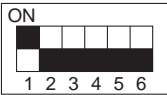
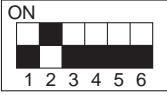
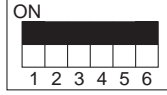
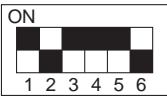
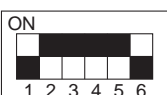
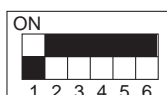
[When optional part 'A-Control Service Tool (PAC-SK52ST)' is connected to outdoor controller board (CNM)]

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																																																																			
	<p><Digital indicator LED1 working details> (Be sure that the 1 to 6 in the SW2 are set to OFF.)</p> <p>(1) Display when the power supply ON When the power supply ON, blinking displays by turns. Wait for 4 minutes at the longest.</p> <p>(2) When the display lights (Normal operation)</p> <p>① Operation mode display.</p>																																																																					
	<p>LED1</p>  <p>(Lighting)</p>	<p>SW2</p>  <p>(Initial setting)</p>																																																																				
	<p>The tens digit: Operation mode</p> <table border="1"> <thead> <tr> <th>Display</th> <th>Operation Model</th> </tr> </thead> <tbody> <tr><td>O</td><td>OFF/FAN</td></tr> <tr><td>C</td><td>ATA COOLING/DRY</td></tr> <tr><td>H</td><td>ATA HEATING/ATW HEATING</td></tr> <tr><td>r</td><td>HR COOLING</td></tr> <tr><td>d</td><td>DEFROSTING</td></tr> </tbody> </table>	Display	Operation Model	O	OFF/FAN	C	ATA COOLING/DRY	H	ATA HEATING/ATW HEATING	r	HR COOLING	d	DEFROSTING	<p>The ones digit: Relay output</p> <table border="1"> <thead> <tr> <th>Display</th> <th>Warming-up Compressor</th> <th>Compressor</th> <th>4-way valve</th> <th>Solenoid valve</th> </tr> </thead> <tbody> <tr><td>0</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>1</td><td>—</td><td>—</td><td>—</td><td>ON</td></tr> <tr><td>2</td><td>—</td><td>—</td><td>ON</td><td>—</td></tr> <tr><td>3</td><td>—</td><td>—</td><td>ON</td><td>ON</td></tr> <tr><td>4</td><td>—</td><td>ON</td><td>—</td><td>—</td></tr> <tr><td>5</td><td>—</td><td>ON</td><td>—</td><td>ON</td></tr> <tr><td>6</td><td>—</td><td>ON</td><td>ON</td><td>—</td></tr> <tr><td>7</td><td>—</td><td>ON</td><td>ON</td><td>ON</td></tr> <tr><td>8</td><td>ON</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>A</td><td>ON</td><td>—</td><td>ON</td><td>—</td></tr> </tbody> </table>	Display	Warming-up Compressor	Compressor	4-way valve	Solenoid valve	0	—	—	—	—	1	—	—	—	ON	2	—	—	ON	—	3	—	—	ON	ON	4	—	ON	—	—	5	—	ON	—	ON	6	—	ON	ON	—	7	—	ON	ON	ON	8	ON	—	—	—	A	ON	—	ON	—	
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A	ON	—	ON	—																																																																		
	<p>② Display during error postponement Postponement code is displayed when compressor stops due to the work of protection device. Postponement code is displayed while error is being postponed.</p>																																																																					
	<p>(3) When the display blinks Inspection code is displayed when compressor stops due to the work of protection devices.</p>																																																																					
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The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Indoor room temperature (TH1) 8–39	8–39	°C
	Indoor pipe temperature/Liquid (TH2) Indoor –39–88	–39–88 (When the temperature is 0°C or less, “–” and temperature are displayed by turns.)	°C
	Indoor pipe temperature/Cond./Eva. (TH5) Indoor –39–88	–39–88 (When the temperature is 0°C or less, “–” and temperature are displayed by turns.)	°C
	Outdoor liquid pipe temperature (TH3) –40–90	–40–90 (When the coil thermistor detects 0°C or below, “–” and temperature are displayed by turns.) (Example) When –10°C; <div style="text-align: center;"> 0.5 s 0.5 s 2 s –□ → 10 → □□ ↑ </div>	°C
	Discharge temperature (TH4) 3–186	3–186 (When the discharge thermistor detects 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105°C; <div style="text-align: center;"> 0.5 s 0.5 s 2 s □1 → 05 → □□ ↑ </div>	°C
	Outdoor 2–phase pipe temperature (TH6)	–40–90 (When the coil thermistor detects 0°C or below, “–” and temperature are displayed by turns.) (Example) When –10°C; <div style="text-align: center;"> 0.5 s 0.5 s 2 s –□ → 10 → □□ ↑ </div>	°C
	Outdoor temperature (TH7) –39–88	–39–88 (When the temperature is 0°C or less, “–” and temperature are displayed by turns.)	°C
	Outdoor heat sink temperature (TH8) –40–186	–40–186 (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
	Comp. surface temperature (TH33)	3–217 (When the discharge thermistor detects 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105°C; <div style="text-align: center;"> 0.5 s 0.5 s 2 s □1 → 05 → □□ ↑ </div>	°C


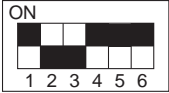
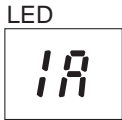


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SW2 setting	Display detail	Explanation for display	Unit
	FTC pipe temperature/liquid (TH2) -39-88	-39-88 (When the temperature is 0°C or less, “-” and temperature are displayed by turns.)	°C
	Outdoor pressure sensor saturated temperature (63HS) -39-88	-39-88 (When the temperature is 0°C or less, “-” and temperature are displayed by turns.)	°C
	Discharge superheat SHd 0-186 [TH4 - 63HS]	0-186 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C
	Sub cool 0-130 [Cooling: 63HS-TH3 Heating: 63HS-TH2 DHW, Cooling & DHW: 63HS-TH34 Heating & DHW: "63HS-TH2" or "63HS-TH34", whichever is lower.]	0-130 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C
	Compressor operating frequency 0-255	0- 255 (When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns. (Example) When 125Hz; 0.5 s 0.5 s 2 s □1 →25 →□□ ↑	Hz
	LEV-A opening pulse 0-480	0-480 (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
	LEV-B opening pulse 0-480	0-480 (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
	LEV-C opening pulse 0-480	0-480 (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
	Compressor operating current 0-50	0-50 Note: Omit the figures after the decimal fractions.	A

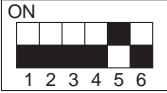
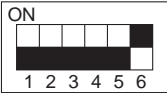

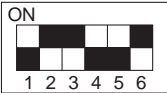
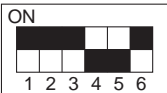



The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit										
	Input current of outdoor unit	0–500 (When it is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.)	0.1 A										
	DC bus voltage 180–380	180–380 (When it is 100 V or more, hundreds digit, tens digit and ones digit are displayed by turns.)	V										
	Output step of outdoor FAN 0–10	0–10	Step										
	Sub cool step	1–5	Step										
	FTC Δt_j	0–99	Code										
	ATA Δt_j	0–99	Code										
	Indoor setting temperature 10–30	10–30	°C										
	The number of connected indoor units	0–2 (The number of connected indoor units are displayed.)	Unit										
	Capacity setting display	Displayed as an outdoor capacity code. <table border="1" style="margin-left: 20px;"> <tr> <td>Capacity</td> <td>Code</td> </tr> <tr> <td>FRP71</td> <td>14</td> </tr> </table>	Capacity	Code	FRP71	14	Code display						
Capacity	Code												
FRP71	14												
	Outdoor unit setting information	<ul style="list-style-type: none"> The tens digit (Total display for applied setting) <table border="1" style="margin-left: 20px;"> <tr> <td>Setting details</td> <td>Display details</td> </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 border="1" style="margin-left: 20px;"> <tr> <td>Setting details</td> <td>Display details</td> </tr> <tr> <td>Defrosting switch</td> <td>0: Normal 1: For high humidity</td> </tr> </table> <p>(Example) When heat pump, 3 phase and defrosting (normal) are set up, “20” is displayed.</p>	Setting details	Display details	H·P/Cooling only	0: H·P 1: Cooling only	Single phase/3 phase	0: Single phase 2: 3 phase	Setting details	Display details	Defrosting switch	0: Normal 1: For high humidity	Code display
Setting details	Display details												
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Setting details	Display details												
Defrosting switch	0: Normal 1: For high humidity												

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SW2 setting	Display detail	Explanation for display	Unit																
	<p>Capacity save 0-100</p> <p>When air conditioner is connected to M-NET and capacity save mode is demanded, "0" - "100" is displayed.</p> <p>[When there is no setting of capacity save "100" is displayed.]</p>	<p>0-100 (When the capacity is 100% hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 100%;</p> <p>0.5 s 0.5 s 2 s □1 → 00 → □□</p>	%																
	<p>Controlling status of compressor operating frequency</p>	<p>The following code will be a help to know the operating status of unit.</p> <ul style="list-style-type: none"> •The tens digit <table border="1" data-bbox="783 792 1256 887"> <thead> <tr> <th>Display</th> <th>Compressor operating frequency control</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Primary current control</td> </tr> <tr> <td>2</td> <td>Secondary current control</td> </tr> </tbody> </table> <ul style="list-style-type: none"> •The ones digit (In this digit, the total number of activated control is displayed.) <table border="1" data-bbox="783 963 1256 1205"> <thead> <tr> <th>Display</th> <th>Compressor operating frequency control</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Preventive control for excessive temperature rise of discharge temperature</td> </tr> <tr> <td>2</td> <td>Preventive control for excessive temperature rise of condensing temperature</td> </tr> <tr> <td>4</td> <td>Frosting preventing control</td> </tr> <tr> <td>8</td> <td>Preventive control for excessive temperature rise of heatsink</td> </tr> </tbody> </table> <p>(Example) The following controls are activated.</p> <ul style="list-style-type: none"> • Primary current control • Preventive control for excessive temperature rise of condensing temperature • Preventive control for excessive temperature rise of heatsink 	Display	Compressor operating frequency control	1	Primary current control	2	Secondary current control	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 heatsink	Code display
Display	Compressor operating frequency control																		
1	Primary current control																		
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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 heatsink																		
	<p>The number of ON/OFF times of compressor 0-9999</p>	<p>0-9999 (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);</p> <p>0.5 s 0.5 s 2 s □4 → 25 → □□</p>	100 times																
	<p>Compressor integrating operation times 0-9999</p>	<p>0-9999 (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);</p> <p>0.5 s 0.5 s 2 s □2 → 45 → □□</p>	10 hours																

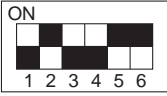
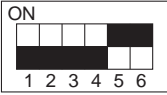
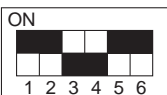


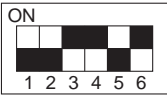
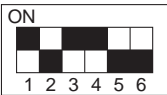

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Thermostat ON time 0–999	0–999 (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 0–120	0–120 (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
	Number of defrost cycles 0–FFFE	0–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
	Error postponement code history (1) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement "00" is displayed in the case of no postponement.	Code display
	Error postponement code history (2) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement "00" is displayed in the 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 the 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
	Error history (1) (latest) Alternate display of abnormal unit number and code	When no error history, "0" and "–" are displayed by turns.	Code display

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Error history (2) Alternate display of error unit number and code	When no error history, "0" and "--" are displayed by turns.	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
	Indoor room temperature (TH1) on error occurring 8-39	8-39	°C
	Indoor pipe temperature/Liquid (TH2) on error occurring -39-88	-39-88 (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 → □□	°C
	Indoor pipe temperature / Cond./Eva. (TH5) on error occurring -39-88	-39-88 (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 → □□	°C
	Pipe temperature/Outdoor pipe (TH3) on error occurring -40-90	-40-90 (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 → □□	°C
	An error has occurred on the discharge temperature (TH4) or the comp. surface temperature (TH33), whichever is higher. 3-186	3-186 (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 → □□	°C
	Outdoor temperature (TH7) on error occurring -39-88	-39-88 (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 → □□	°C

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Outdoor heatsink temperature (TH8) on error occurring -40~186	-40~186 (When the temperature is 0°C or less, "-" and temperature are displayed by turns.) (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C
	Outdoor pressure sensor saturated temperature (63HS) on error occurring -39~88	-39~88 (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 → □□	°C
	Discharge superheat on error occurring SHd 0~186 [TH4 - 63HS]	0~186 (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 → □□	°C
	Sub cool on error occurring SC 0~130 [Cooling: 63HS-TH3 Heating: 63HS-TH2 DHW, Cooling & DHW: 63HS-TH34 Heating & DHW: "63HS-TH2" or "63HS-TH34", whichever is lower.]	0~130 (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 → □□	°C
	Operation frequency on error occurring 0~255	0~255 (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 on error occurring 0~480	0~480 (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
	Compressor operating current on error occurring 0~50	0~50	A
	Fan step on error occurring 0~10	0~10	Step

11-1. UNIT FUNCTION SETTING BY THE REMOTE CONTROLLER

Each function can be set as necessary using the remote controller. The setting of function for each unit can only be done by the remote controller. Select function available from the table 1.

<Table 1> Function selections

(1) Functions available when setting the unit number to 00 (Select 00 referring to ④ setting the indoor unit number.)

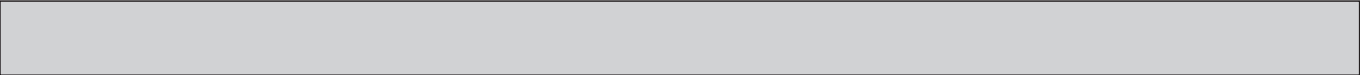
Function	Settings	Mode No.	Setting No.	●: Initial setting (when sent from the factory)	Remarks
Power failure automatic recovery	OFF	01	1		The setting is applied to all the units in the same refrigerant system.
	ON		2	●	
Indoor temperature detection *1	Average data from each indoor unit	02	1	●	
	Data from the indoor unit with remote controller		2		
	Data from main remote controller		3		
LOSSNAY connectivity	Not supported	03	1	●	
	Supported (Indoor unit does not intake outdoor air through LOSSNAY)		2		
	Supported (Indoor unit intakes outdoor air through LOSSNAY)		3		
Frost prevention temperature	2°C (Normal)	15	1	●	
	3°C		2		
Humidifier control	When the compressor operates, the humidifier also operates.	16	1	●	
	When the fan operates, the humidifier also operates.		2		
Change of defrosting control	Standard	17	1	●	
	For high humidity		2		

*1 The functions above are available only when the wired remote controller is used. The functions are not available for floor standing models.

Meaning of "Function setting"

mode02: indoor temperature detecting

No.	Indoor temperature(ta)=	Diagram	Initial setting	ta=(A+B)/2	ta=A	ta=B	ta=C
No.1	Average data of the sensor on all the indoor units		Initial setting	ta=(A+B)/2	ta=A	ta=B	ta=C
No.2	The data of the sensor on the indoor unit that connected with remote controller		Initial setting	ta=A	ta=A	ta=B	ta=C
No.3	The data of the sensor on main remote controller.		Initial setting	ta=C	ta=C	ta=C	ta=C



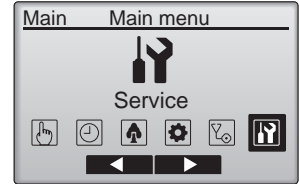
11-1-1. Selecting functions using the wired remote controller <PAR-4xMAA ("x" represents 0 or later)>

<Service menu>

Maintenance password is required

① Select "Service" from the Main menu, and press the [✓] button.

*At the main display, the menu button and select "Service" to make the maintenance setting.



② When the Service menu is selected, a window will appear asking for the password.

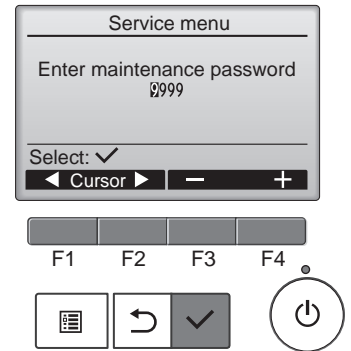
To enter the current maintenance password (4 numerical digits), move the cursor to the digit you want to change with the [F1] or [F2] button.



Set each number (0 through 9) with the [F3] or [F4] button.



Then, press the [✓] button.



Note: The initial maintenance password is "9999". Change the default password as necessary to prevent unauthorized access. Have the password available for those who need it.

: If you forget your maintenance password, you can initialize the password to the default password "9999" by pressing and holding the [F1] button for 10 seconds (PAR-4xMAA) or [F1] and [F2] buttons simultaneously for 3 seconds (PAR-3xMAA) on the maintenance password setting screen.

③ If the password matches, the Service menu will appear.

The type of menu that appears depends on the connected indoor units' type.

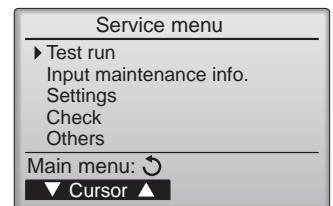
Note: Air conditioning units may need to be stopped to make certain settings. There may be some settings that cannot be made when the system is centrally controlled. (As for PAR-4xMAA, the units need to be stopped only at "Settings".)



A screen will appear that indicates the setting has been saved.

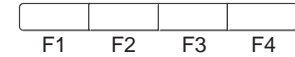
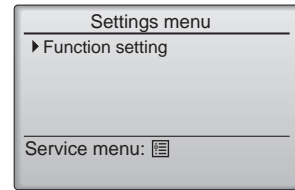
Navigating through the screens

- To go back to the Service menu [Menu] button
To return to the previous screen..... [Back] button



<Function setting>

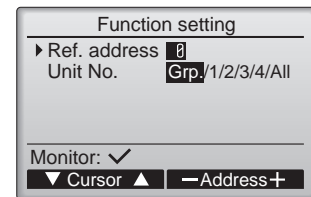
- ① Select "Service" from the Main menu, and press the [✓] button.



Select "Setting" from the Service menu, and press the [✓] button.

Select "Function setting", and press the [✓] button.

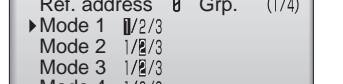
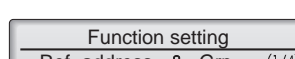
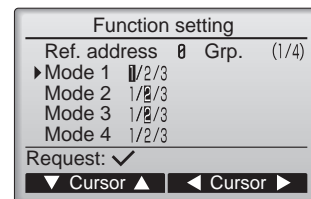
- ② Set the indoor unit refrigerant addresses and unit numbers with the [F1] through [F4] buttons, and then press the [✓] button to confirm the current setting.



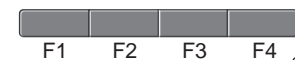
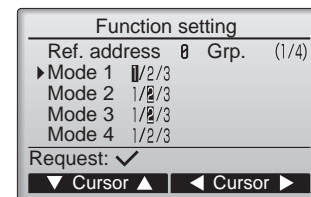
Note: Checking the indoor unit No.

When the [✓] button is pressed, the target indoor unit will start fan operation. If the unit is common or when running all units, all indoor units for the selected refrigerant address will start fan operation.

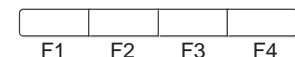
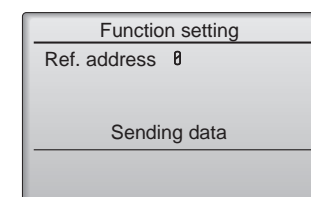
- ③ When data collection from the indoor units is completed, the current settings appears highlighted.
Non-highlighted items indicate that no function settings are made.
Screen appearance varies depending on the "Unit No." setting.



- ④ Use the [F1] or [F2] button to move the cursor to select the mode number, and change the setting number with the [F3] or [F4] button.



- ⑤ When the settings are completed, press the [✓] button to send the setting data from the remote controller to the indoor units.
When the transmission is successfully completed, the screen will return to the Function setting screen.

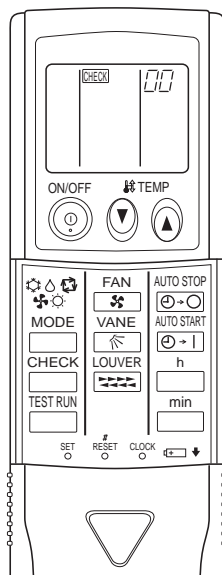


- Note:**
- Make the above settings only on Mr. Slim units as necessary.
 - The above function settings are not available for the CITY MULTI units.
 - Table 1 summarizes the setting options for each mode number. Refer to the indoor unit Installation Manual for the detailed information about initial settings, mode numbers, and setting numbers for the indoor units.
 - Be sure to write down the settings for all functions if any of the initial settings has been changed after the completion of installation work.

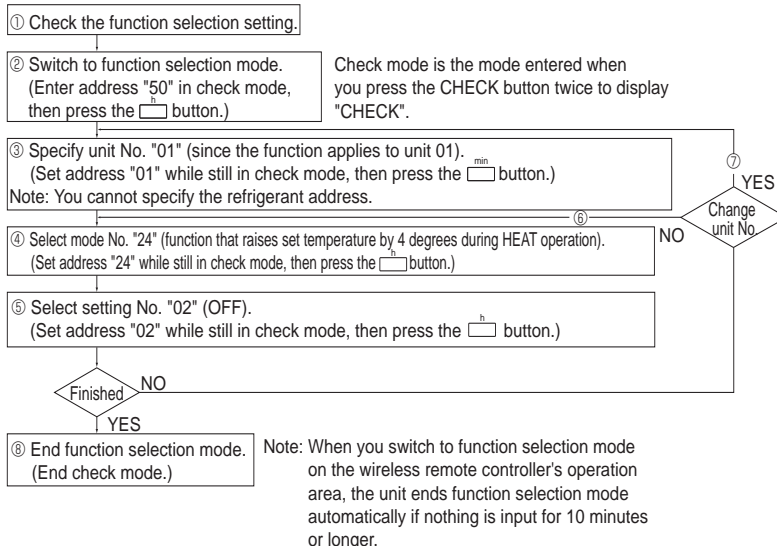
11-1-2. Selecting functions using the wireless remote controller (Type C)

Functions can be selected with the wireless remote controller. Function selection using wireless remote controller is available only for refrigerant system with wireless function. Refrigerant address cannot be specified by the wireless remote controller.

[Flow of function selection procedure]



The flow of the function selection procedure is shown below. This example shows how to turn off the function that raises the set temperature by 4 degrees during HEAT operation. (Mode 24: 2)
The procedure is given after the flow chart.



[Operating instructions]

① Check the function settings.

② Press the **CHECK** button twice continuously. → **CHECK** is lit and "00" blinks.

Press the temp **h** button once to set "50". Direct the wireless remote controller toward the receiver of the indoor unit and press the **h** button.

③ Set the unit number.

Press the temp **min** button to set the unit number. (Press "01" to specify the indoor unit whose unit number is 01.)

Direct the wireless remote controller toward the receiver of the indoor unit and press the **min** button.

(By setting unit number with the **min** button, specified indoor unit starts performing fan operation.

Detect which unit is assigned to which number using this function. If unit number is set to AL, all the indoor units in same refrigerant system start performing fan operation simultaneously.)

Notes:

1. If a unit number that cannot be recognized by the unit is entered, 3 beeps of 0.4 seconds will be heard. Reenter the unit number setting.
2. If the signal was not received by the sensor, you will not hear a beep or a "double beep" may be heard. Reenter the unit number setting.

④ Select a mode.

Press the temp **h** button to set a mode. Press "24" to turn on the function that raises the set temperature by 4 degree during heat operation. Direct the wireless remote controller toward the sensor of the indoor unit and press the **h** button.

→ The sensor-operation indicator will blink and beeps will be heard to indicate the current setting number.

Current setting number: 1 = 1 beep (1 second)
2 = 2 beeps (1 second each)
3 = 3 beeps (1 second each)

Notes:

1. If a mode number that cannot be recognized by the unit is entered, 3 beeps of 0.4 seconds will be heard. Reenter the mode number.
2. If the signal was not received by the sensor, you will not hear a beep or a "double beep" may be heard. Reenter the mode number.

⑤ Select the setting number.

Press the temp **h** button to select the setting number. (02: Not available)

Direct the wireless remote controller toward the receiver of the indoor unit and press the **h** button.
→ The sensor-operation indicator will blink and beeps will be heard to indicate the setting number.

Setting number: 1 = 2 beeps (0.4 seconds each)
2 = 2 beeps (0.4 seconds each, repeated twice)
3 = 2 beeps (0.4 seconds each, repeated 3 times)

Notes:

1. If a setting number that cannot be recognized by the unit is entered, the setting will turn back to the original setting.
2. If the signal was not received by the sensor, you will not hear a beep or a "double beep" may be heard. Reenter the setting number.

⑥ Repeat steps ④ and ⑤ to make an additional setting without changing unit number.

⑦ Repeat steps ③ to ⑤ to change unit number and make function settings on it.

⑧ Complete the function settings

Press **power** button.

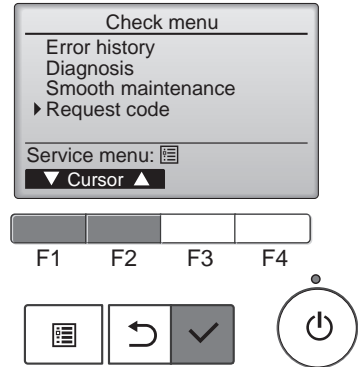
Do not use the wireless remote controller for 30 seconds after completing the function setting.

12-1. HOW TO "MONITOR THE OPERATION DATA"

12-1-1. PAR-4xMAA ("x" represents 0 or later)

Details on the operation data including each thermistor temperature and error history can be confirmed with the remote controller.

① Select "Service" from the Main menu, and press the [✓] button.



Select "Check" with the [F1] or [F2] button, and press the [✓] button.

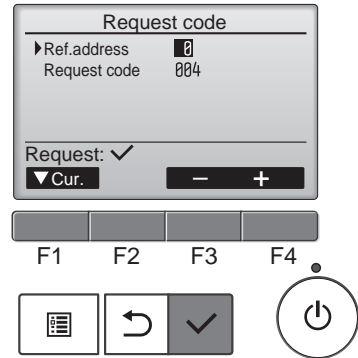
Select "Request code" with the [F1] or [F2] button, and press the [✓] button.

② Set the Refrigerant address and Request code.

Select the item to be changed with the [F1] or [F2] button.

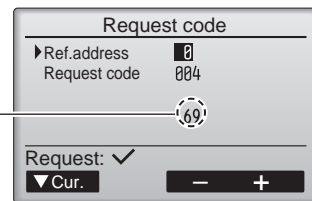
Select the required setting with the [F3] or [F4] button.

- <Ref.address>setting [0] – [15]
- <Request code>setting



Press the [✓] button, Data will be collected and displayed.

Request code: 004
Discharge temperature: 69°C



12-2. Request code list

Certain indoor/outdoor combinations do not have the request code function; therefore, no request codes are displayed.

Request code	Request content	Description (Display range)	Unit	Remarks
0	Operation state	Refer to "12-2-1. 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	°C	
5	Outdoor unit - Liquid pipe 1 temperature (TH3)	–40–90	°C	
6	Outdoor unit - Liquid pipe 2 temperature	–40–90	°C	
7	Outdoor unit-2-phase pipe temperature (TH6)	–39–88	°C	
8				
9	Outdoor unit-Outside air temperature (TH7)	–39–88	°C	
10	Outdoor unit-Heat sink temperature (TH8)	–40–200	°C	
11				
12	Discharge superheat (SHd)	0–255	°C	
13	Sub-cool (SC)	0–130	°C	
14	Pressure saturation temperature (T _{63HS})	–39–88	°C	
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 (Only for air conditioners with DC fan motor)	0–9999	rpm	
20	Outdoor unit-Fan 2 speed (Only for air conditioners with DC fan motor)	0–9999	rpm	"0" is displayed if the air conditioner is a single-fan type.
21				
22	LEV (A) opening	0–500	Pulses	
23	LEV (B) opening	0–500	Pulses	
24	LEV (C) opening	0–500	Pulses	
25	Primary current	0–50	A	
26	DC bus voltage	180–380	V	
27				
28				
29	Number of connected indoor units	0–4	Units	
30	Indoor unit-Setting temperature	17–30	°C	
31	Indoor unit-Intake air temperature <Measured by thermostat>	8–39	°C	
32	Indoor unit-Intake air temperature (Unit No. 1) <Heat mode-4-degree correction>	8–39	°C	"0" is displayed if the target unit is not present.
33	Indoor unit-Intake air temperature (Unit No. 2) <Heat mode-4-degree correction>	8–39	°C	↑
34	Indoor unit-Intake air temperature (Unit No. 3) <Heat mode-4-degree correction>	8–39	°C	↑
35	Indoor unit-Intake air temperature (Unit No. 4) <Heat mode-4-degree correction>	8–39	°C	↑
36				
37	Indoor unit-Liquid pipe temperature (Unit No. 1)	–39–88	°C	"0" is displayed if the target unit is not present.
38	Indoor unit-Liquid pipe temperature (Unit No. 2)	–39–88	°C	↑
39	Indoor unit-Liquid pipe temperature (Unit No. 3)	–39–88	°C	↑
40	Indoor unit-Liquid pipe temperature (Unit No. 4)	–39–88	°C	↑
41				
42	Indoor unit-Cond./Eva. pipe temperature (Unit No. 1)	–39–88	°C	"0" is displayed if the target unit is not present.
43	Indoor unit-Cond./Eva. pipe temperature (Unit No. 2)	–39–88	°C	↑
44	Indoor unit-Cond./Eva. pipe temperature (Unit No. 3)	–39–88	°C	↑
45	Indoor unit-Cond./Eva. pipe temperature (Unit No. 4)	–39–88	°C	↑
46				
47				
48	Thermostat ON operating time	0–999	Minutes	
49	Test run elapsed time	0–120	Minutes	←Not possible to activate maintenance mode during the test run.



Request code	Request content	Description (Display range)	Unit	Remarks
50	Indoor unit-Control state	Refer to "12-2-1. Detail Contents in Request Code".	—	
51	Outdoor unit-Control state	Refer to "12-2-1. Detail Contents in Request Code".	—	
52	Compressor-Frequency control state	Refer to "12-2-1. Detail Contents in Request Code".	—	
53	Outdoor unit-Fan control state	Refer to "12-2-1. Detail Contents in Request Code".	—	
54	Actuator output state	Refer to "12-2-1. Detail Contents in Request Code".	—	
55	Error content (U9)	Refer to "12-2-1. Detail Contents in Request Code".	—	
56				
57				
58				
59				
60	Signal transmission demand capacity	0–255	%	
61	Contact demand capacity	Refer to "12-2-1. Detail Contents in Request Code".	—	
62	External input state (silent mode, etc.)	Refer to "12-2-1. Detail Contents in Request Code".	—	
63				
64				
65				
66				
67				
68				
69				
70	Outdoor unit-Capacity setting display	Refer to "12-2-1. Detail Contents in Request Code".	—	
71	Outdoor unit-Setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
72				
73	Outdoor unit-SW1 setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
74	Outdoor unit-SW2 setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
75				
76	Outdoor unit-SW4 setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
77	Outdoor unit-SW5 setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
78	Outdoor unit-SW6 setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
79	Outdoor unit-SW7 setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
80	Outdoor unit-SW8 setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
81	Outdoor unit-SW9 setting information	Refer to "12-2-1. Detail Contents in Request Code".	—	
82				
83				
84	M-NET adapter connection (presence/absence)	"0000": Not connected "0001": Connected	—	
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	

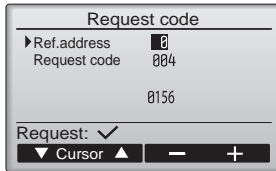


Request code	Request content	Description (Display range)	Unit	Remarks
103	Error history 1 (latest)	Displays the history. (" - - " is displayed if no history is present.)	Code	
104	Error history 2 (second to last)	Displays the history. (" - - " is displayed if no history is present.)	Code	
105	Error history 3 (third to last)	Displays the 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	°C	
112	Outdoor unit - Liquid pipe 1 temperature (TH3) at time of error	-40-90	°C	
114	Outdoor unit-2-phase pipe temperature (TH6) at time of error	-39-88	°C	
115				
116	Outdoor unit-Outside air temperature (TH7) at time of error	-39-88	°C	
117	Outdoor unit-Heat sink temperature (TH8) at time of error	-40-200	°C	
118	Discharge superheat (SHd) at time of error	0-255	°C	
119	Sub-cool (SC) at time of error	0-130	°C	
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 • Fan 1 speed (Only for air conditioners with DC fan)	0-9999	rpm	
123	Outdoor unit at time of error • Fan 2 speed (Only for air conditioners with DC fan)	0-9999	rpm	"0" is displayed if the air conditioner is a single fan type.
124				
125	LEV (A) opening at time of error	0-500	Pulses	
126	LEV (B) opening at time of error	0-500	Pulses	
127	LEV (C) opening at time of error	0-500	Pulses	
128				
129	Pressure saturation temperature (T _{63HS}) at timer of error	-39-88	°C	
130	Thermostat ON time until operation stops due to error	0-999	Minutes	
131				
132	Indoor - Liquid pipe temperature at time of error	-39-88	°C	Average value of all indoor units is displayed if the air conditioner consists of 2 or more indoor units (twin, triple, quad).
133	Indoor - Cond/Eva. pipe temperature at time of error	-39-88	°C	Average value of all indoor units is displayed if the air conditioner consists of 2 or more indoor units (twin, triple, quad).
134	Indoor at time of error • Intake air temperature <Thermostat judge temperature>	-39-88	°C	
135				
136				
137				
138				
139				
140				
~				
147				
148				
149				
150	Indoor - Actual intake air temperature	-39-88	°C	
151	Indoor - Liquid pipe temperature	-39-88	°C	
152	Indoor - Cond/Eva. pipe temperature	-39-88	°C	
153				



Request code	Request content	Description (Display range)	Unit	Remarks
154	Indoor-Fan operating time (After filter is reset)	0-9999	1 hour	
155	Indoor-Total operating time (Fan motor ON time)	0-9999	10 hours	
156				
157	Indoor fan output value (Sj value)	0-255 Fan control data	-	For indoor fan phase control
158	Indoor fan output value (Pulsation ON/OFF)	"00 *** ****" indicates fan control data.	-	For indoor fan pulsation control
159	Indoor fan output value (duty value)	"00 *** ****" indicates fan control data.	-	For indoor DC brushless motor control
160				
161				
162				
163	Indoor unit-Capacity setting information	Refer to "12-2-1. Detail Contents in Request Code".	-	
164	Indoor unit-SW3 information	Undefined	-	
165	Wireless pair No. (indoor control board side) setting	Refer to "12-2-1. Detail Contents in Request Code".	-	
166	Indoor unit-SW5 information	Undefined	-	
167				
~				
189				
190	Indoor unit-Microprocessor version information	Examples) Ver. 5.01 → "0501"	Ver.	
191	Indoor unit-Microprocessor version information (sub No.)	Auxiliary information (displayed after version information) Examples) Ver. 5.01 A000 → "A000"	-	
192				
~				
764				
765	Stable operation (Heat mode)	This request code is not provided to collect data. It is used to fix the operation state.		
766	Stable operation (Cool mode)	This request code is not provided to collect data. It is used to fix the operation state.		
767	Stable operation cancellation	This request code is not provided to collect data. It is used to cancel the operation state that has been fixed by request codes "765" and "766".		

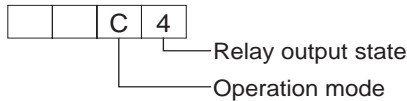
12-2-1. Detail Contents in Request Code



[Example) Request code "004"
Discharge temperature 156°F
Refrigerant address "00"]

[Operation state] (Request code "0")

Data display



Operation mode

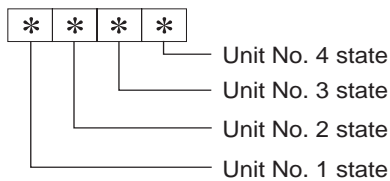
Display	Operation mode
0	STOP • FAN
C	COOL • DRY
H	HEAT
d	DEFROST

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	

[Indoor unit – Control state] (Request code : "50 ")

Data display



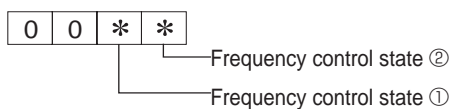
Display	State
0	Normal
1	Preparing for heat operation.
2	—
3	—
4	Heater is ON.
5	Anti-freeze protection is ON.
6	Overheat protection is ON.
7	Requesting compressor to turn OFF.
F	There are no corresponding units.

[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") <Refer to P69.>

Data display

0	0	*	*
---	---	---	---

— Fan step correction value by heatsink temperature overheat prevention control
 — Fan step correction value by cool condensation temperature overheat prevention control

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

[Actuator output state] (Request code : "54") <Refer to P62.>

Data display

0	0	*	*
---	---	---	---

— Actuator output state ①
 — Actuator output state ②

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 (SV3)
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") <Refer to "10-4.SELF-DIAGNOSIS ACTION TABLE".>

Data display

0	0	*	*
---	---	---	---

— Error content ①
 — Error content ②

Error content ①

● : Detected

Display	Overvoltage error	Undervoltage error	L1-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	●	●

[Contact demand capacity] (Request code : "61") <Refer to P59.>

Data display

0	0	0	*
---	---	---	---

 Setting content

Display	Setting value
0	0%
1	50%
2	75%
3	100%

[External input state] (Request code : "62") <Refer to P59.>

Data display

0	0	0	*
---	---	---	---

 Input state

Display	Contact demand input	Silent mode input	Spare 1 input	Spare 2 input
0				
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●
A		●		●
b	●	●		●
C			●	●
d	●		●	●
E		●	●	●
F	●	●	●	●

● : Input present

[Outdoor unit – Capacity setting display] (Request code : "70") <Refer to P58.>

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") <Refer to P58.>

Data display

0	0	*	*
---	---	---	---

 Setting information ①
Setting information ②

Display	Defrost mode
0	Standard
1	For high humidity

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

[Outdoor unit switch setting display (SW1 to SW10, except SW3)] Request codes: 73 to 82

0: Switch OFF 1: Switch ON

SW1, SW2, SW6, SW7						Data display
1	2	3	4	5	6	
0	0	0	0	0	0	00 00
1	0	0	0	0	0	00 01
0	1	0	0	0	0	00 02
1	1	0	0	0	0	00 03
0	0	1	0	0	0	00 04
1	0	1	0	0	0	00 05
0	1	1	0	0	0	00 06
1	1	1	0	0	0	00 07
0	0	0	1	0	0	00 08
1	0	0	1	0	0	00 09
0	1	0	1	0	0	00 0A
1	1	0	1	0	0	00 0B
0	0	1	1	0	0	00 0C
1	0	1	1	0	0	00 0D
0	1	1	1	0	0	00 0E
1	1	1	1	0	0	00 0F
0	0	0	0	1	0	00 10
1	0	0	0	1	0	00 11
0	1	0	0	1	0	00 12
1	1	0	0	1	0	00 13
0	0	1	0	1	0	00 14
1	0	1	0	1	0	00 15
0	1	1	0	1	0	00 16
1	1	1	0	1	0	00 17
0	0	0	1	1	0	00 18
1	0	0	1	1	0	00 19
0	1	0	1	1	0	00 1A
1	1	0	1	1	0	00 1B
0	0	1	1	1	0	00 1C
1	0	1	1	1	0	00 1D
0	1	1	1	1	0	00 1E
1	1	1	1	1	0	00 1F
0	0	0	0	0	1	00 20
1	0	0	0	0	1	00 21
0	1	0	0	0	1	00 22
1	1	0	0	0	1	00 23
0	0	1	0	0	1	00 24
1	0	1	0	0	1	00 25
0	1	1	0	0	1	00 26
1	1	1	0	0	1	00 27
0	0	0	1	0	1	00 28
1	0	0	1	0	1	00 29
0	1	0	1	0	1	00 2A
1	1	0	1	0	1	00 2B
0	0	1	1	0	1	00 2C
1	0	1	1	0	1	00 2D
0	1	1	1	0	1	00 2E
1	1	1	1	0	1	00 2F
0	0	0	0	1	1	00 30
1	0	0	0	1	1	00 31
0	1	0	0	1	1	00 32
1	1	0	0	1	1	00 33
0	0	1	0	1	1	00 34
1	0	1	0	1	1	00 35
0	1	1	0	1	1	00 36
1	1	1	0	1	1	00 37
0	0	0	1	1	1	00 38
1	0	0	1	1	1	00 39
0	1	0	1	1	1	00 3A
1	1	0	1	1	1	00 3B
0	0	1	1	1	1	00 3C
1	0	1	1	1	1	00 3D
0	1	1	1	1	1	00 3E
1	1	1	1	1	1	00 3F

0: Switch OFF 1: Switch ON

SW5				Data display
1	2	3	4	
0	0	0	0	00 00
1	0	0	0	00 01
0	1	0	0	00 02
1	1	0	0	00 03
0	0	1	0	00 04
1	0	1	0	00 05
0	1	1	0	00 06
1	1	1	0	00 07
0	0	0	1	00 08
1	0	0	1	00 09
0	1	0	1	00 0A
1	1	0	1	00 0B
0	0	1	1	00 0C
1	0	1	1	00 0D
0	1	1	1	00 0E
1	1	1	1	00 0F

0: Switch OFF 1: Switch ON

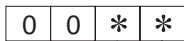
SW8			Data display
1	2	3	
0	0	0	00 00
1	0	0	00 01
0	1	0	00 02
1	1	0	00 03
0	0	1	00 04
1	0	1	00 05
0	1	1	00 06
1	1	1	00 07

0: Switch OFF 1: Switch ON

SW4, SW9, SW10		Data display
1	2	
0	0	00 00
1	0	00 01
0	1	00 02
1	1	00 03

[Indoor unit – Capacity setting information] (Request code : "163")

Data display

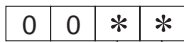


See the table on the right.

Display	Capacity setting state	Display	Capacity setting state
00	12	10	112
01	16	11	125
02	22	12	140
03	25	13	160
04	28	14	200
05	32	15	224
06	35, 36	16	250
07	40	17	280
08	45	18	
09	50	19	
0A	56	1A	
0b	63	1b	
0C	71	1C	
0d	80	1d	
0E	90	1E	
0F	100	1F	

[Wireless pair No. (indoor control board side) setting] (Request code : "165")

Data display



See the table on the right.

Display	Pair No. setting state
00	No. 0
01	No. 1 J41 disconnected
02	No. 2 J42 disconnected
03	No. 3 J41, J42 disconnected

13-1. SMOOTH MAINTENANCE

Maintenance data, such as the indoor/outdoor unit's heat exchanger temperature and compressor operation current can be displayed with "Smooth maintenance".

This cannot be executed during test operation.

Depending on the combination with the outdoor unit, this may not be supported by some models.

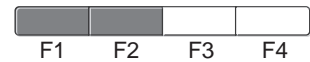
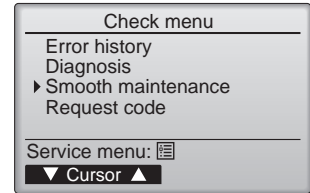
① Select "Service" from the Main menu, and press the [✓] button.



Select "Check" with the [F1] or [F2] button, and press the [✓] button.



Select "Smooth maintenance" with the [F1] or [F2] button, and press the [✓] button.



② Set each item.

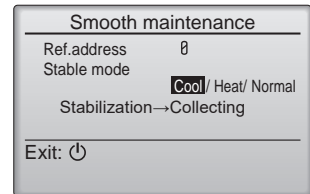
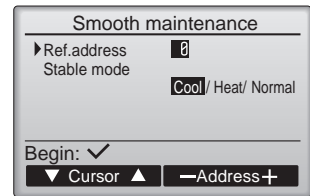
Select the item to be changed with the [F1] or [F2] button.

Select the required setting with the [F3] or [F4] button.

- <Ref.address> setting [0] - [15]
- <Stable mode> setting [Cool] / [Heat] / [Normal]

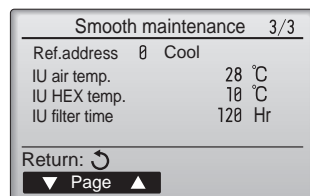
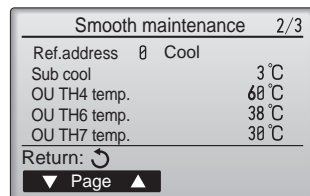
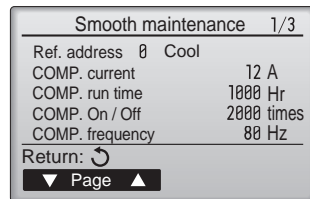
Press the [✓] button, Fixed operation will start.

Note: Stable mode will take approx. 20 minutes.



③ The operation data will appear.

The Compressor-Accumulated operating (COMP. run) time is 10-hour unit, and the Compressor-Number of operation times (COMP. ON/OFF) is a 100-time unit (fractions discarded).



Navigating through the screens

- To go back to the Service menu [Menu] button
- To return to the previous screen [Back] button

<Guide for operation condition>

Checkpoints

Enter the temperature differences between ⑤, ④, ⑦ and ⑧ into the graph given below.

Operation state is determined according to the plotted areas on the graph.

For data measurements, set the fan speed to "Hi" before activating maintenance mode.

Inspection item		Result		
Power supply	Loose connection	Breaker	Good Retightened	
		Outdoor Unit	Good Retightened	
		Indoor Unit	Good Retightened	
		(Insulation resistance)		MΩ
	(Voltage)		V	
Compressor	① Accumulated operating time		Time	
	② Number of ON/OFF times		Times	
	③ Current		A	
Outdoor Unit	Temperature	④ Refrigerant/heat exchanger temperature	COOL °C HEAT °C	
		⑤ Refrigerant/discharge temperature	COOL °C HEAT °C	
		⑥ Air/outside air temperature	COOL °C HEAT °C	
		(Air/discharge temperature)	COOL °C HEAT °C	
	Cleanliness	Appearance	Good	Cleaning required
		Heat exchanger	Good	Cleaning required
	Sound/vibration	None	Present	
Indoor Unit	Temperature	⑦ Air/intake air temperature	COOL °C HEAT °C	
		(Air/discharge temperature)	COOL °C HEAT °C	
		⑧ Refrigerant/heat exchanger temperature	COOL °C HEAT °C	
		⑨ Filter operating time*		Time
	Cleanliness	Decorative panel	Good	Cleaning required
		Filter	Good	Cleaning required
		Fan	Good	Cleaning required
		Heat exchanger	Good	Cleaning required
		Sound/vibration	None	Present

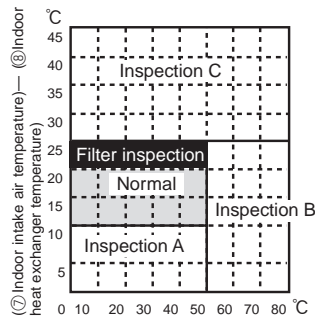
Classification	Item	Result	
Cool	Inspection	Is "D000" displayed stably on the remote controller?	Stable Unstable
	Temperature difference	(⑤ Discharge temperature) – (④ Outdoor heat exchanger temperature) (⑦ Indoor intake air temperature) – (⑧ Indoor heat exchanger temperature)	°C °C
Heat	Inspection	Is "D000" displayed stably on the remote controller?	Stable Unstable
	Temperature difference	(⑤ Discharge temperature) – (⑧ Indoor heat exchanger temperature) (⑧ Indoor heat exchanger temperature) – (⑦ Indoor intake air temperature)	°C °C

Notes:

- Fixed Hz operation may not be possible under the following temperature ranges.
 - In cool mode, outdoor intake air temperature is 40 °C or higher or indoor intake air temperature is 23 °C or lower.
 - In heat mode, outdoor intake air temperature is 20 °C or higher or indoor intake air temperature is 25 °C or lower.
- If the air conditioner is operated at a temperature range other than the ones above but operation is not stabilized after 30 minutes or more have elapsed, carry out inspection.
- In heat mode, the operation state may vary due to frost forming on the outdoor heat exchanger.

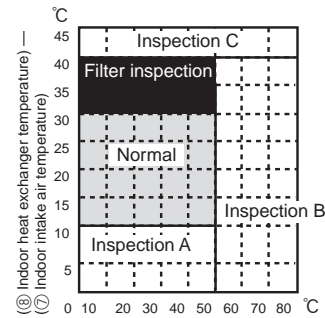
* The filter operating time is the time that has elapsed since the filter was reset.

Cool mode



(⑤ Discharge temperature) – (④ Outdoor heat exchanger temperature)

Heat mode



(⑤ Discharge temperature) – (⑧ Indoor heat exchanger temperature)

Result

Area	Check item	Judgement	
		Cool	Heat
Normal	Normal operation state		
Filter inspection	Filter may be clogged. *1		
Inspection A	Performance has dropped. Detailed inspection is necessary.		
Inspection B	Refrigerant amount is dropping.		
Inspection C	Filter or indoor heat exchanger may be clogged.		

Note:

The above judgement is just guide based on Japanese standard conditions. It may be changed depending on the indoor and outdoor temperature.

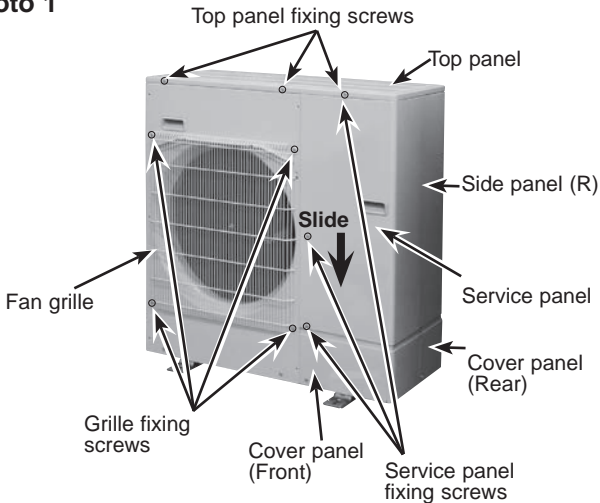
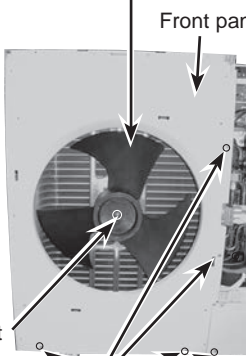
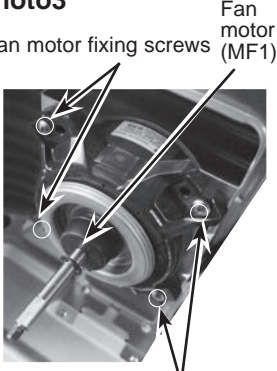
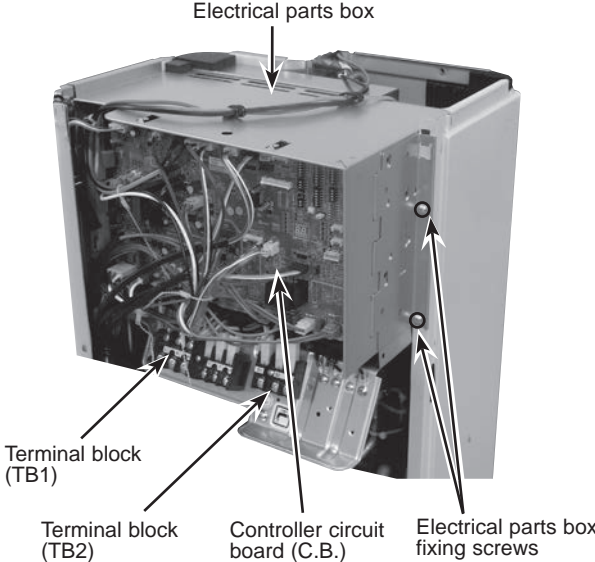
*It may be judged as "Filter inspection" due to the outdoor and indoor temperature, even though it is not clogged.

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PUHZ-FRP71VHA2R1

—————> : Indicates the visible parts in the photos/figures.

-----> : Indicates the invisible parts in the photos/figures.

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>1. Removing the service panel and top panel</p> <p>(1) Remove 3 service panel fixing screws (5 × 12) and slide the hook on the right downward to remove the service panel.</p> <p>(2) Remove screws (3 for front, 3 for rear/5 × 12) of the top panel and remove it.</p>	<p>Photo 1</p> 
<p>2. Removing the fan motor (MF1)</p> <p>(1) Remove the service panel. (See Photo 1)</p> <p>(2) Remove the top panel. (See Photo 1)</p> <p>(3) Remove the fan grille fixing screws (4 for front, 5 × 12) to detach the fan grille. (See Photo 1)</p> <p>(4) Remove a nut (for right handed screw of M6) to detach the propeller. (See Photo 2)</p> <p>(5) Disconnect the connector CNF1 on controller circuit board in electrical parts box.</p> <p>(6) Disconnect the lead wire from 2 clamps on the separator and electrical parts box (on the ceiling, front side).</p> <p>(7) Remove the fan motor fixing screws (4 for front, 5 × 20) to detach the fan motor. (See Photo 3)</p>	<p>Photo 2</p>  <p>Photo3</p> 
<p>3. Removing the electrical parts box</p> <p>(1) Remove the service panel. (See Photo 1)</p> <p>(2) Remove the top panel. (See Photo 1)</p> <p>(3) Disconnect the indoor/outdoor connecting wire and power supply wire from the terminal block.</p> <p>(4) Disconnect the connector CNF1, LEV-A, LEV-B and LEV-C on the controller circuit board.</p> <p><Symbols on the board></p> <ul style="list-style-type: none"> • CNF1: Fan motor • LEV-A, LEV-B, LEV-C: LEV • SV1,SV2,SV3: Bypass valve coil <p>(5) Disconnect the pipe-side connections of the following parts.</p> <ul style="list-style-type: none"> • Thermistor <Liquid> (TH3) • Thermistor <Discharge> (TH4) • Thermistor <2-phase pipe> (TH6) • Thermistor <Ambient> (TH7) • Thermistor <Comp. surface> (TH33) • High pressure switch (63H) • High pressure sensor (63HS) • 4-way valve coil (21S4) <p>(6) Disconnect the lead wires from 2 clamps on the separator.</p> <p>(7) Remove the terminal cover and disconnect the compressor lead wire.</p> <p>(8) Remove the electrical parts box fixing screws (2 for front, 4 × 10) and detach the electrical parts box by pulling it upward.</p> <p>The electrical parts box is fixed with 2 hooks on the left and 1 hook on the right.</p>	<p>Photo 4</p> 

OPERATING PROCEDURE

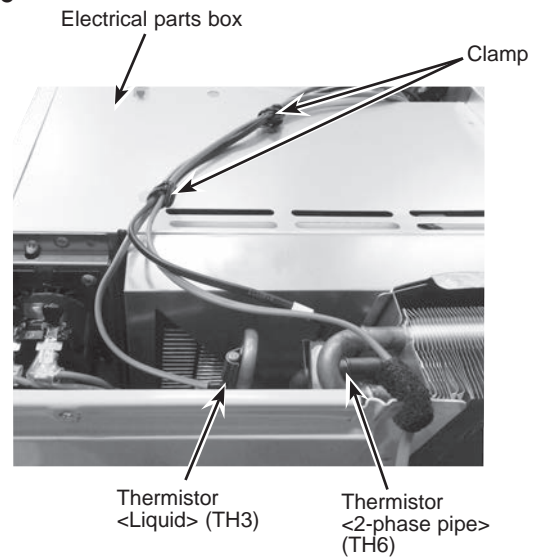
4. Removing the thermistor <Liquid> (TH3) and the thermistor <2-phase pipe> (TH6)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Disconnect the connector TH7/6 (red) and TH3 (white) on the controller circuit board in the electrical parts box.
- (4) Loosen the 2 clamps for the lead wires on the top of the electrical parts box.
- (5) Pull out the thermistor <2-phase pipe> (TH6) and the thermistor <Liquid> (TH3) from each sensor holders.

Note: When replacing thermistor <2-phase pipe> (TH6), replace it together with thermistor <Ambient> (TH7), since they are combined together. Refer to procedure No.5 below to remove thermistor <Ambient>.

PHOTOS/FIGURES

Photo 5

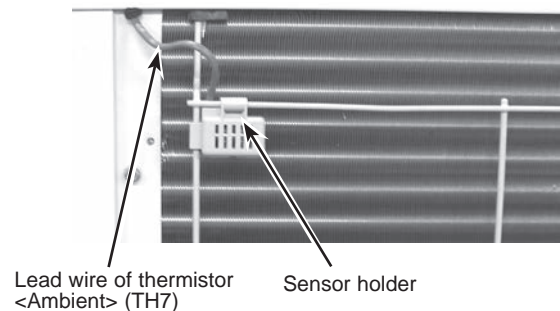


5. Removing the thermistor <Ambient> (TH7)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Disconnect the connector TH7/6 (red) on the controller circuit board in the electrical parts box.
- (4) Disconnect the lead wires from the wire clip on the outdoor controller board in the electrical parts box.
- (5) Loosen the clamp for the lead wire in the rear of the electrical parts box. (See Photo 5)
- (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 procedure No.4 above to remove thermistor <2-phase pipe>.

Photo 6



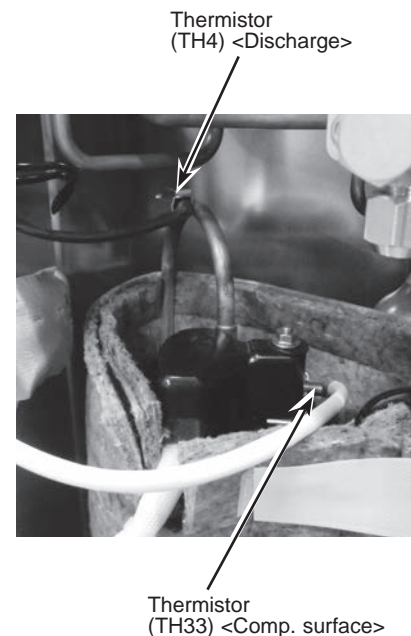
6. Removing the thermistor <Discharge> (TH4) and thermistor <Comp. surface> (TH33)

- (1) Remove the service panel. (See Photo 1)
- (2) Disconnect the connectors TH4 (white) and TH33 (black) on the controller circuit board in the electrical parts box.
- (3) Disconnect the lead wires from the wire clip on the outdoor controller board in the electrical parts box.
- (4) Loosen the clamp for the lead wire in the rear of the electrical parts box. (See Photo 4)
- (5) Pull out the thermistor <Discharge> (TH4) from the sensor holder.

[Removing the thermistor <Comp. surface> (TH33)]

- (6) Remove the compressor cover (upper) and pull out the thermistor <Comp. surface> (TH33) from the holder of the compressor surface. (TH33 : See Figure 1)

Photo 7



OPERATING PROCEDURE

7. Removing the 4-way valve coil (21S4), LEV coil (LEV(A), LEV(B), LEV(C)) and solenoid valve coil (SV1, SV2, SV3)

- (1) Remove the service panel. (See Photo 1)
 - (2) Remove the top panel. (See Photo 1)
 - (3) Remove the electrical parts box. (See Photo 4)
- [Removing the 4-way valve coil]
- (4) Remove 4-way valve coil fixing screw (M4 × 6).
 - (5) Remove the 4-way valve coil by sliding the coil toward you.

[Removing the LEV coil]

- (4) Remove the LEV coil by sliding the coil upward.

[Removing the solenoid valve coil]

- (4) Remove the solenoid valve coil fixing screw.
- (5) Remove the solenoid valve coil by sliding the coil upward.

8. Removing the 4-way valve

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box. (See Photo 4)
- (4) Remove the valve bed. (See Photo 12)
- (5) Remove the side panel (R) fixing screws (3 for front, 5 × 12) in the rear of the unit and then remove the side panel (R).
- (6) Remove the 4-way valve coil. (See Photo 8)
- (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 side panel (R).

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.

9. Removing the LEV

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box. (See Photo 4)
- (4) Remove the valve bed. (See Photo 12)
- (5) Remove the side panel (R).
- (6) Remove the LEV coil.
- (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 side panel (R).

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.

10. Removing the SV

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box. (See Photo 4)
- (4) Remove the valve bed. (See Photo 12)
- (5) Remove the side panel (R).
- (6) Remove the SV coil.
- (7) Recover refrigerant.
- (8) Remove the welded part of SV.

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

Note 2: The welded part can be removed easily by removing the side panel (R).

Note 3: When installing the SV, 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.

PHOTOS/FIGURES

Photo 8

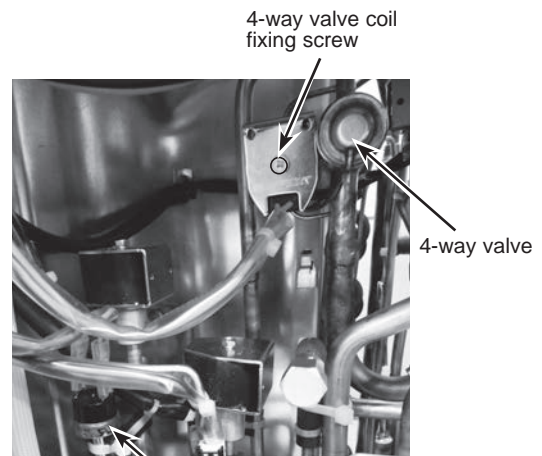


Photo 9

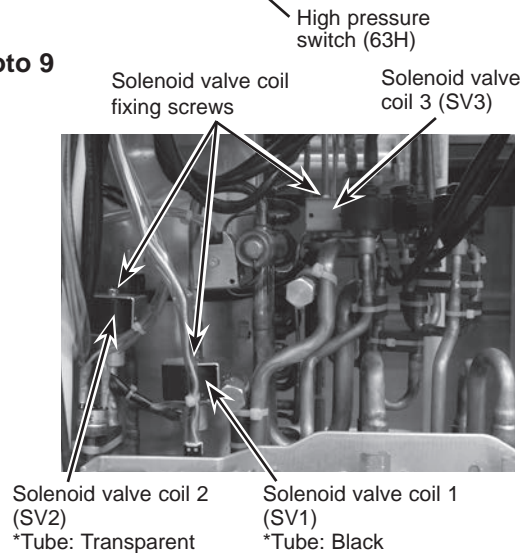
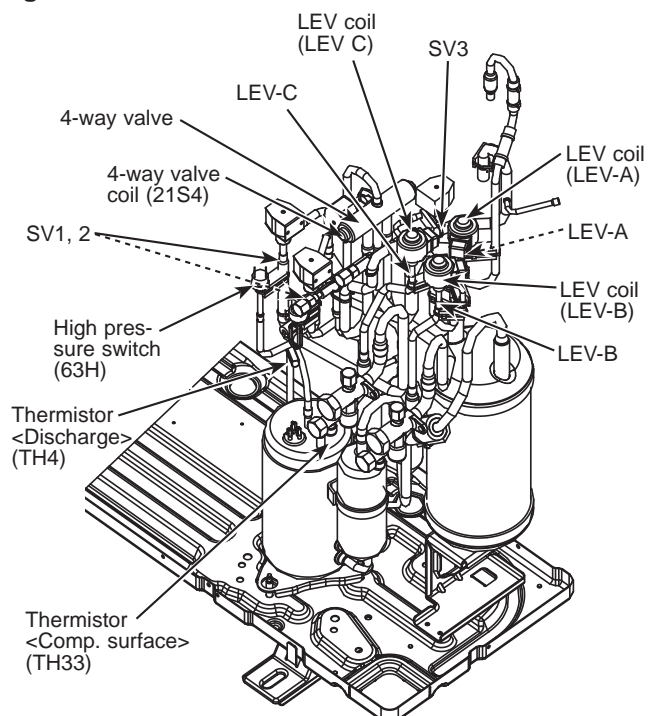


Figure 1



OPERATING PROCEDURE

11. Removing the high pressure switch (63H)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box. (See Photo 4)
- (4) Remove the side panel (R) fixing screws (3 for rear, 5 × 12) in the rear of the unit and remove the side panel (R).
- (5) Pull out the lead wire of high pressure switch.
- (6) Recover refrigerant.
- (7) 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 side panel (R).

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.

12. 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 electrical parts box. (See Photo 4)
- (4) Remove the side panel (R) fixing screws (3 for rear, 5 × 12) in the rear of the unit and remove the side panel (R).
- (5) Pull out the lead wire of high pressure sensor.
- (6) Recover refrigerant.
- (7) 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 side panel (R).

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.

13. Removing the reactor (DCL)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box. (See Photo 4)
- (4) Remove the reactor fixing screws (4 places, 4 × 10) and remove the reactor.

Note: The reactor is attached to the rear of the electrical parts box.

PHOTOS/FIGURES

Photo 10

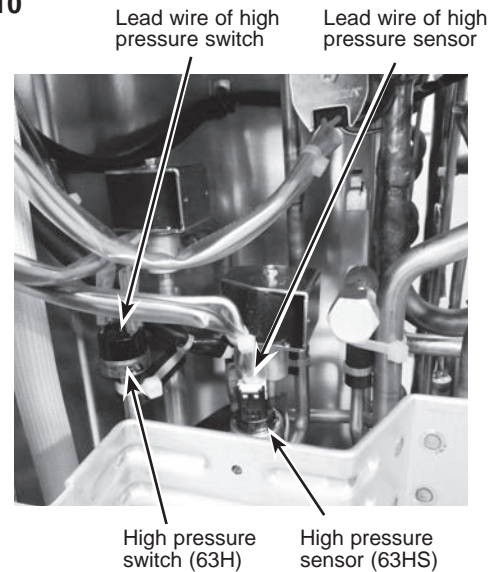
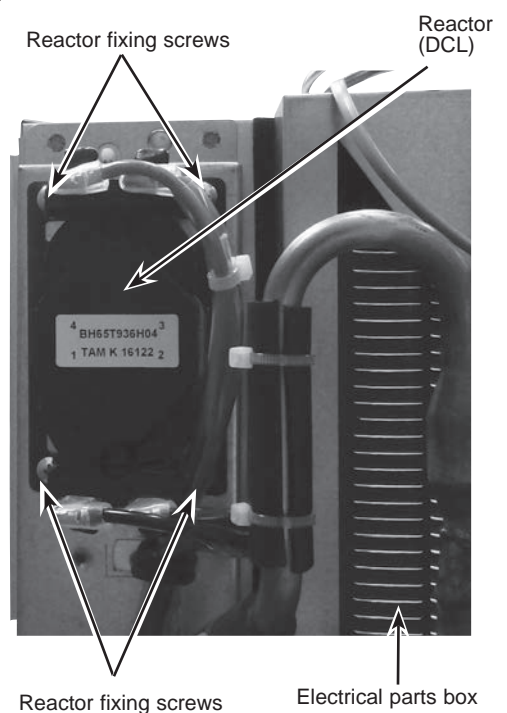


Photo 11



OPERATING PROCEDURE

PHOTOS/FIGURES

14. Removing the compressor (MC)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the cover panel (front) fixing screws (2 for front, 5 × 12) and remove the cover panel (front). (See Photo 13)
- (4) Remove the cover panel (rear) fixing screws (2 for rear, 5 × 12) and remove the cover panel (rear). (See Photo 13)
- (5) Remove the electrical parts box. (See Photo 4)
- (6) Remove the valve bed fixing screws (3 for front, 4 × 10) and the ball valve and stop valve fixing screws (8 for front, 5 × 16) and then remove the valve bed.
- (7) Remove the side panel (R). (See Photo 1)
- (8) Remove the separator fixing screws (3 for front, 4 × 10) and remove the separator.
- (9) Recover refrigerant.
- (10) Remove the 3 points of the compressor fixing nut using a spanner or a adjustable wrench.
- (11) Remove the welded pipe of compressor inlet and outlet then remove the compressor.

Note: Recover refrigerant without spreading it in the air.

Photo 12

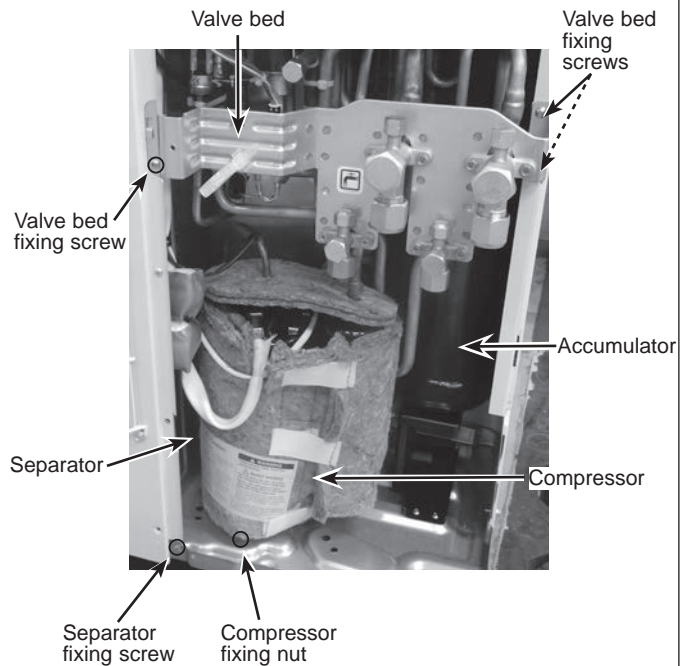
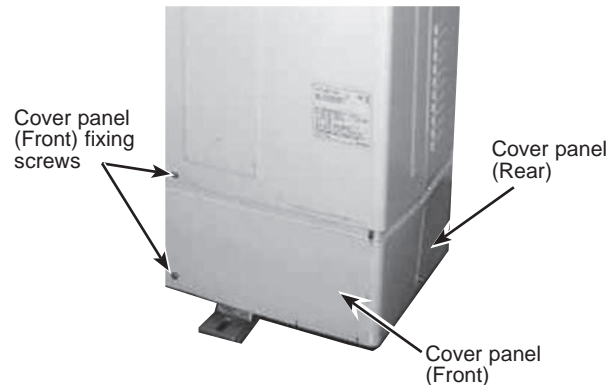


Photo 13

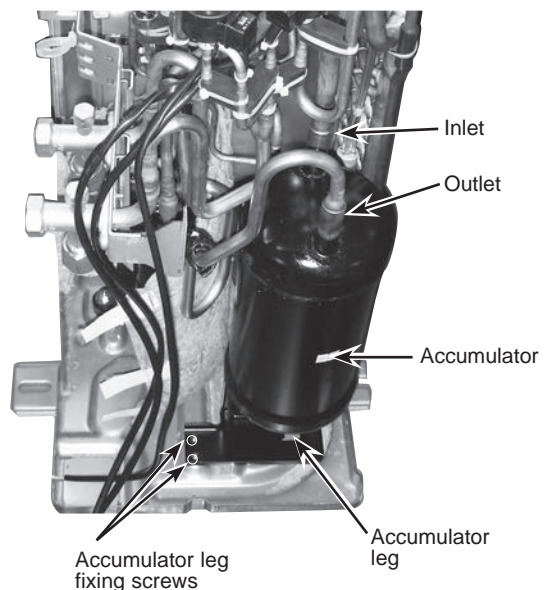


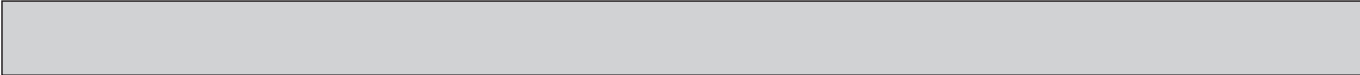
15. Removing the accumulator

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the cover panel (front). (See Photo 13)
- (4) Remove the cover panel (rear). (See Photo 13)
- (5) Remove the electrical parts box. (See Photo 4)
- (6) Remove the valve bed. (See Photo 12)
- (7) Remove the side panel (R). (See Photo 1)
- (8) Recover refrigerant.
- (9) Remove 4 welded pipes of accumulator inlet and outlet.
- (10) Remove the receiver leg fixing screws (2 for front, 4 × 10).

Note: Recover refrigerant without spreading it in the air.

Photo 14





mitsubishi electric corporation

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

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