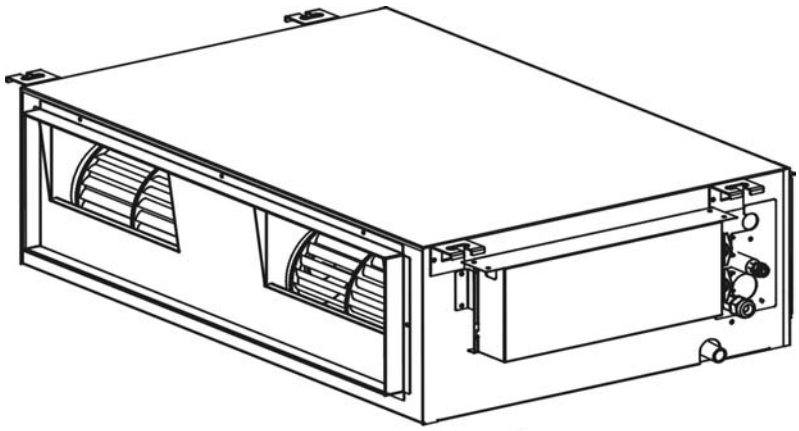
TECHNICAL DATA
& SERVICE MANUAL

SANYO

SPLIT SYSTEM AIR CONDITIONER

Model No.	Product Code No.
SPW-UMR74EXH56	854.0.2263
SPW-UMR94EXH56	854.0.2264
SPW-UMR124EXH56	854.0.2265
SPW-UMR164EXH56	854.0.2301
SPW-UMR184EXH56	854.0.2266
SPW-UMR224EXH56	854.0.2267



SM940046

0.8180.439.0 June 2005

IMPORTANT!
Please read before installation

This air conditioning system meets strict safety and operating standards.
For the installer or service person, it is important to install or service the system so that it operates safely and efficiently.

For safe installation and trouble-free operation, you must:
- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.

•The unit must be supplied with a dedicated electrical line.

WARNING

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

CAUTION

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If necessary, get help
These instructions are all you need for most installation sites and maintenance conditions.
If you require help for a special problem, contact our sale/service outlet or your certified dealer for additional instructions.

In case of improper installation
The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

- During installation, connect before the refrigerant system and then the wiring one; proceed in the reverse orden when removing the units.

WARNING **When wiring**

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY QUALIFIED, EXPERIENCED ELECTRICIANS SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked, to ensure the grounding.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring.
  Improper connections and inadequate grounding can cause **accidental injury and death**.
- **Ground the unit** following local electrical codes.
- The Yellow/Green wire cannot be used for any connection different from the ground connection.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.
- Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- Do not use multi-core cable when wiring the power supply and control lines. Use separate cables for each type of line.

When transporting
Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminium fins on the air conditioner can cut your fingers.

When installing...

… In a ceiling
Make sure the ceiling is strong enough to hold the unit-weight.
It may be necessary to build a strong wooden or metal frame to provide added support.

… In a room
Properly insulate any tubing run inside a room to prevent "sweating", which can cause dripping and water damage to walls and floors.

... In moist or uneven locations
Use a raised concrete base to provide a solid level foundation for the outdoor unit. This prevents damage and abnormal vibrations.

... In area with strong winds
Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

... In a snowy area (for heat pump-type systems)
Install the outdoor unit on a raised platform that is higher then drifting snow. Provide snow vents.

When connecting refrigerant tubing

- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them; screw by hand and then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

NOTE:
Depending on the system type, liquid and gas lines may be either narrow or wide. Therefore, to avoid confusion, the refrigerant tubing for your particular model is specified as narrow tube for liquid, wide tube for gas.

When servicing
- Turn the power OFF at the main power board before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after the work, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.
- Ventilate the room during the installation or testing the refrigeration system; make sure that, after the installation, no gas leaks are present, because this could produce toxic gas and dangerous if in contact with flames or heat-sources.

Table of Contents

1. SPECIFICATIONS

1-1 Unit Specifications

SPW-UMR74/94/124EXH56

Power source	220 - 240V ~ 50Hz

Voltage rating	230V

Performance		Cooling	Heating
Capacity		See catalogue with the requested matching	
Air circulation (High/Med./Low)	m³/h	600/510/440	

Features			
Controls/Temperature controls			Microprocessor/ I.C. thermostat
Remote Controller (Option)		wired	RCS-SH80AG / RCS-KR1AG
		wireless	RCS-BH80AG.WL
Fan speed			3 and Auto
Air Filter			Washable
Sound pressure level (*)	high/med/low	dB(A)	54/52/49
Refrigerant tubing connections			Flare type
Refrigerant	Narrow tube	mm(in.)	6,35 (1/4)
tube diameter	Wide tube	mm(in.)	12,7 (1/2)
Refrigerant			R410A
Refrigerant control			Electronic expansion valve

Dimensions & Weight			
Dimensions	Height	mm	266
	Width	mm	571
	Depth	mm	852
Package dimensions	Height	mm	365
	Width	mm	745
	Depth	mm	1086
	Volume	m3	0,3
Weight	Net	kg	30,0
	Shipping	kg	34

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(*) Power noise level measured at operating conditions (5mmH20 external static pressure)

SPW-UMR164/184EXH56

Power source	220 - 240V ~ 50Hz

Voltage rating	230V

Performance		Cooling	Heating
Capacity		See catalogue with the requested matching	
Air circulation (High/Med./Low)	m³/h	875/600/400	

Features			
Controls/Temperature controls			Microprocessor/ I.C. thermostat
Remote Controller (Option)		wired	RCS-SH80AG / RCS-KR1AG
		wireless	RCS-BH80AG.WL
Fan speed			3 and Auto
Air Filter			Washable
Sound pressure level (*)	high/med/low	dB(A)	54/47/42
Refrigerant tubing connections			Flare type
Refrigerant	Narrow tube	mm(in.)	6,35 (1/4)
tube diameter	Wide tube	mm(in.)	12,7 (1/2)
Refrigerant			R410A
Refrigerant control			Electronic expansion valve

Dimensions & Weight			
Dimensions	Height	mm	266
	Width	mm	571
	Depth	mm	1058
Package dimensions	Height	mm	365
	Width	mm	745
	Depth	mm	1292
	Volume	m3	0,35
Weight	Net	kg	35
	Shipping	kg	39

DATA SUBJECT TO CHANGE WITHOUT NOTICE

SPW-UMR224EXH56

Power source	220 - 240V ~ 50Hz

Voltage rating	230V

Performance		Cooling	Heating
Capacity		See catalogue with the requested matching	
Air circulation (High/Med./Low)	m³/h	1000/700/600	

Features			
Controls/Temperature controls			Microprocessor/ I.C. thermostat
Remote Controller (Option)		wired	RCS-SH80AG / RCS-KR1AG
		wireless	RCS-BH80AG.WL
Fan speed			3 and Auto
Air Filter			Washable
Sound pressure level (*)	high/med/low	dB(A)	57/49/46
Refrigerant tubing connections			Flare type
Refrigerant	Narrow tube	mm(in.)	9,52 (3/8)
tube diameter	Wide tube	mm(in.)	15,88 (5/8)
Refrigerant			R410A
Refrigerant control			Electronic expansion valve

Dimensions & Weight			
Dimensions	Height	mm	266
	Width	mm	571
	Depth	mm	1058
Package dimensions	Height	mm	365
	Width	mm	745
	Depth	mm	1292
	Volume	m3	0,35
Weight	Net	kg	35
	Shipping	kg	39

DATA SUBJECT TO CHANGE WITHOUT NOTICE

1-2 Major Component Specifications

SPW-XMR74/94/124EXH56

Controller PCB		
Part No.		CR-CRP50A-B
Controls		Microprocessor

Fan & Fan Motor			
Type			Centrifugal fan
Q'ty ……. Dia. and lenght		mm	2…. Ø 160 / L 240
Fan motor model…Q'ty			3RGB-CO-45-30 5V/1….1
No. Of poles…rpm (230 V, High)			4 … 1060
Running Amps		A	0,45
Power input		W	110
Coil resistance (Ambient temp. 20 °C)		Ω	BLU-BRN: 95 BRN-BLK: 37 BLK-GRY: 15 GRY-VLT: 15 WLT-RED: 30 RED-YEL: 101
Safety devices	Type		Internal thermal protector - 7AM 037 A 5
	Operating temp. Open	°C	150 ± 5K
Run capacitor		µF	1,8
		VAC	450

Electronic expansion valve		
Coil		UKV-U030E
Valve body		UKV-18D31

Heat Exch. Coil		
Coil		Aluminium plate fin / Copper tube
Rows		2
Fin pitch	mm	1,6
face area	m2	0,126

DATA SUBJECT TO CHANGE WITHOUT NOTICE

SPW-XMR164/184EXH56

Controller PCB		
Part No.		CR-CRP50A-B
Controls		Microprocessor

Fan & Fan Motor				
Type				Centrifugal fan
Q'ty ……. Dia. and lenght			mm	2…. Ø 160 / L 240
Fan motor model…Q'ty				3FGB-CO-65-38 5V/1….1
No. Of poles…rpm (230 V, High)				4 … 1106
Running Amps			A	0,6
Power input			W	138
Coil resistance (Ambient temp. 20 °C)			Ω	BLU-BRN: 68 BRN-BLK: 9 BLK-GRY: 36 GRY-VLT: 18 VLT-RED: 18 BRN-YEL: 105
Safety devices	Type			Internal thermal protector - 7AM 037 A 5
	Operating temp.	Open	°C	150 ± 5K
		Close	°C	
Run capacitor			µF	2,0
			VAC	450

Electronic expansion valve		
Coil		UKV-U030E
Valve body		UKV-25D32

Heat Exch. Coil		
Coil		Aluminium plate fin / Copper tube
Rows		3
Fin pitch	mm	1,6
face area	m2	0,168

DATA SUBJECT TO CHANGE WITHOUT NOTICE

SPW-XMR224EXH56

Controller PCB		
Part No.		CR-CRP50A-B
Controls		Microprocessor

Fan & Fan Motor				
Type				Centrifugal fan
Q'ty ……. Dia. and lenght			mm	2…. Ø 160 / L 240
Fan motor model…Q'ty				3FGB-CO-65-38 5V/1….1
No. Of poles…rpm (230 V, High)				4 … 1161
Running Amps			A	0,57
Power input			W	136
Coil resistance (Ambient temp. 20 °C)			Ω	BLU-BRN: 68 BRN-BLK: 9 BLK-GRY: 36 GRY-VLT: 18 VLT-RED: 18 BRN-YEL: 105
Safety devices	Type			Internal thermal protector - 7AM 037 A 5
	Operating temp.	Open	°C	150 ± 5K
		Close	°C	
Run capacitor			µF	3
			VAC	450

Electronic expansion valve		
Coil		UKV-U030E
Valve body		UKV-25D32

Heat Exch. Coil		
Coil		Aluminium plate fin / Copper tube
Rows		3
Fin pitch	mm	1,6
face area	m2	0,168

DATA SUBJECT TO CHANGE WITHOUT NOTICE

1-3 Other Component Specifications

Trasformer		**ATR-IIJ225A**
Rating	Primary	VAC 230V, 50Hz
	Secondary 1	AC 20V - 0.2A
	Secondary 2	AC 14V - 0.3A
	Secondary 3	AC 10,2V - 1.4A
Thermal cut-off temp.		136°C

Thermistor (Coil sensor E1, E2)		**PBC-41E-S26**
Resistance	kΩ	0 °C 15,0 ± 5%

Thermistor (Coil sensor E3)		**PBC-41E-S42-2**
Resistance	kΩ	0 °C 15,0 ± 4,42%

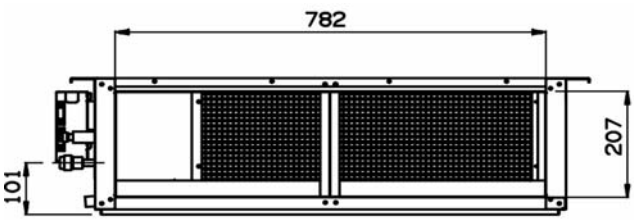
Thermistor (Room sensor TA, TF/BL)		**DHKTEC-35-S85N**
Resistance	kΩ	25 °C 5,0 ± 4%

Drain pump		
Model		PC 309564003
Rating	Voltage	220/240V - 50Hz
	Input	14W
Flow rate		0,4 l/min

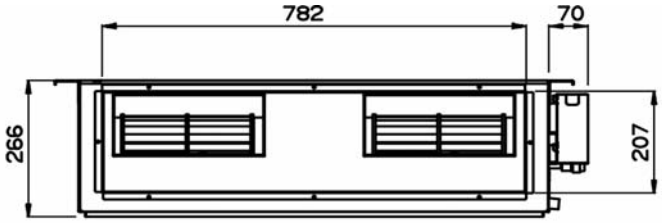
Safety float switch	
Model	BI 1300 2725
Contact rating	230V AC/DC - 0,5A

2. DIMENSIONAL DATA

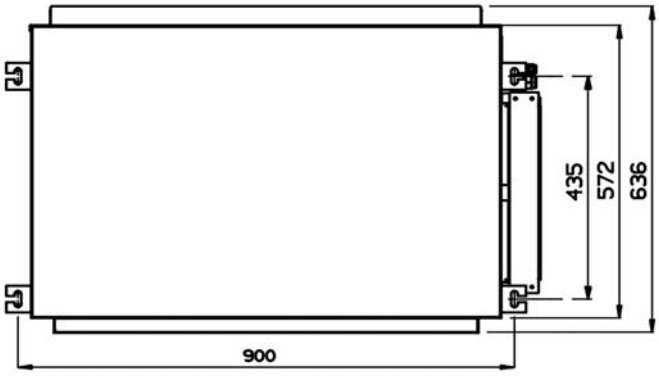
SPW-UMR74/94/124EXH56



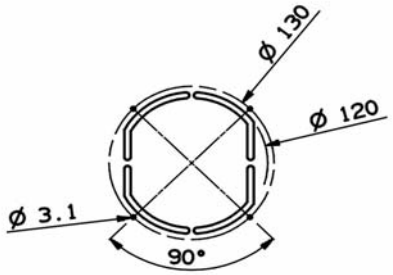
REAR VIEW



FRONT VIEW

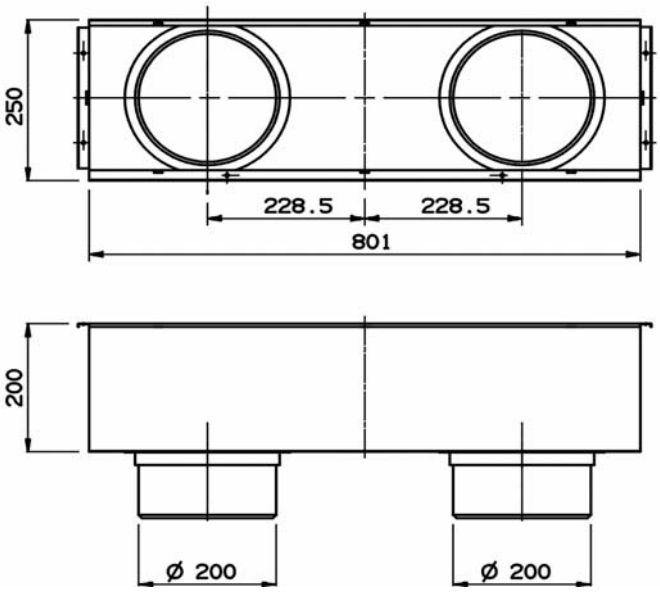


TOP VIEW

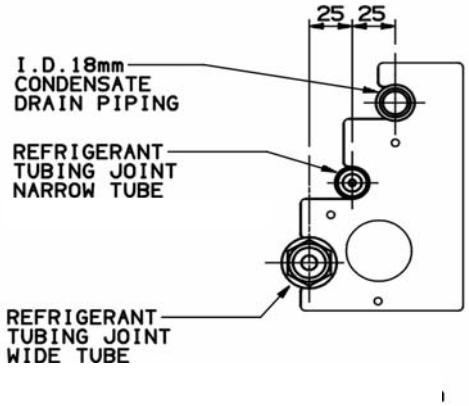


FRESH AIR INTAKE PORT

AIR CONVEYOR
(OPTIONAL PART)



REFRIGERANT TUBING SIDE



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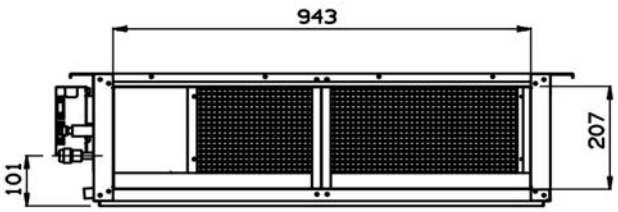

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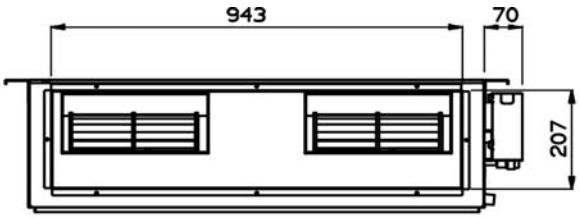
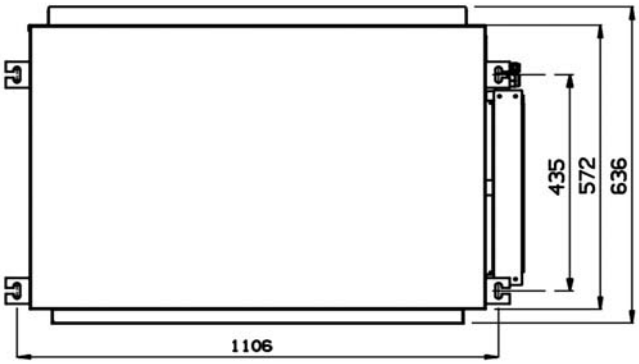
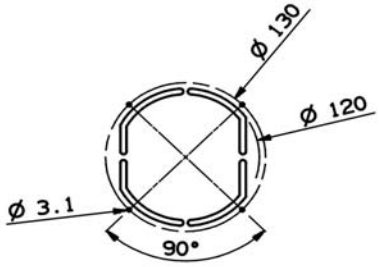


FRONT VIEW

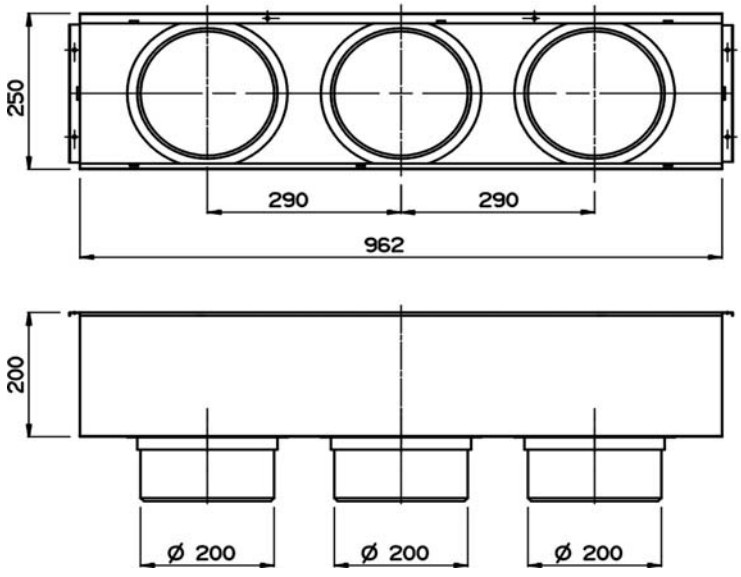


TOP VIEW

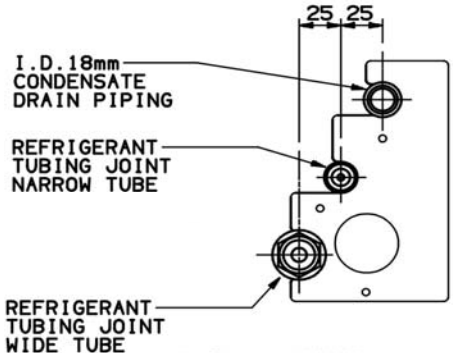


FRESH AIR INTAKE PORT

AIR CONVEYOR
(OPTIONAL PART)

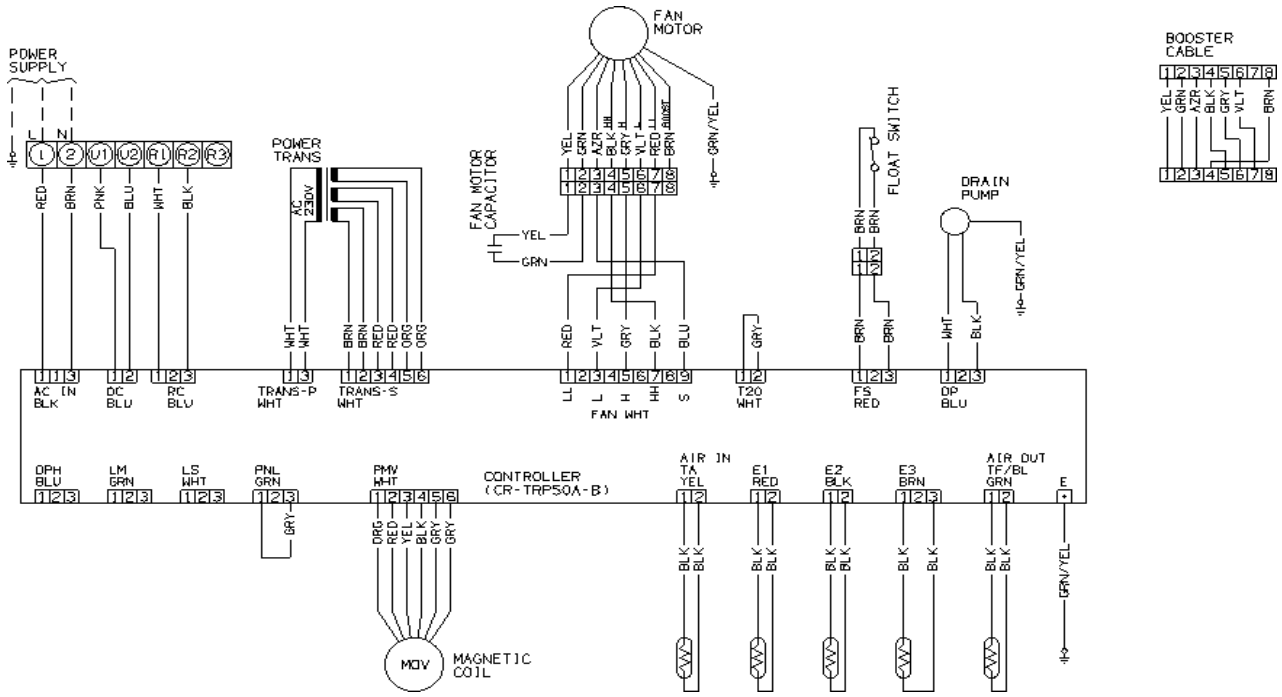


REFRIGERANT TUBING SIDE

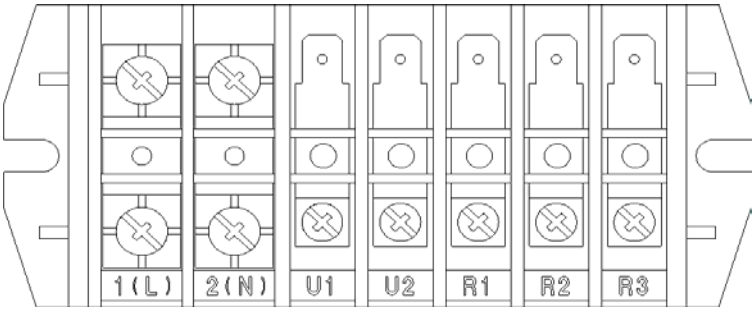


3. ELECTRICAL DATA

3-1 Electric Wiring Diagram



7P terminal board



1(L) 2(N) U1 U2 R1 R2

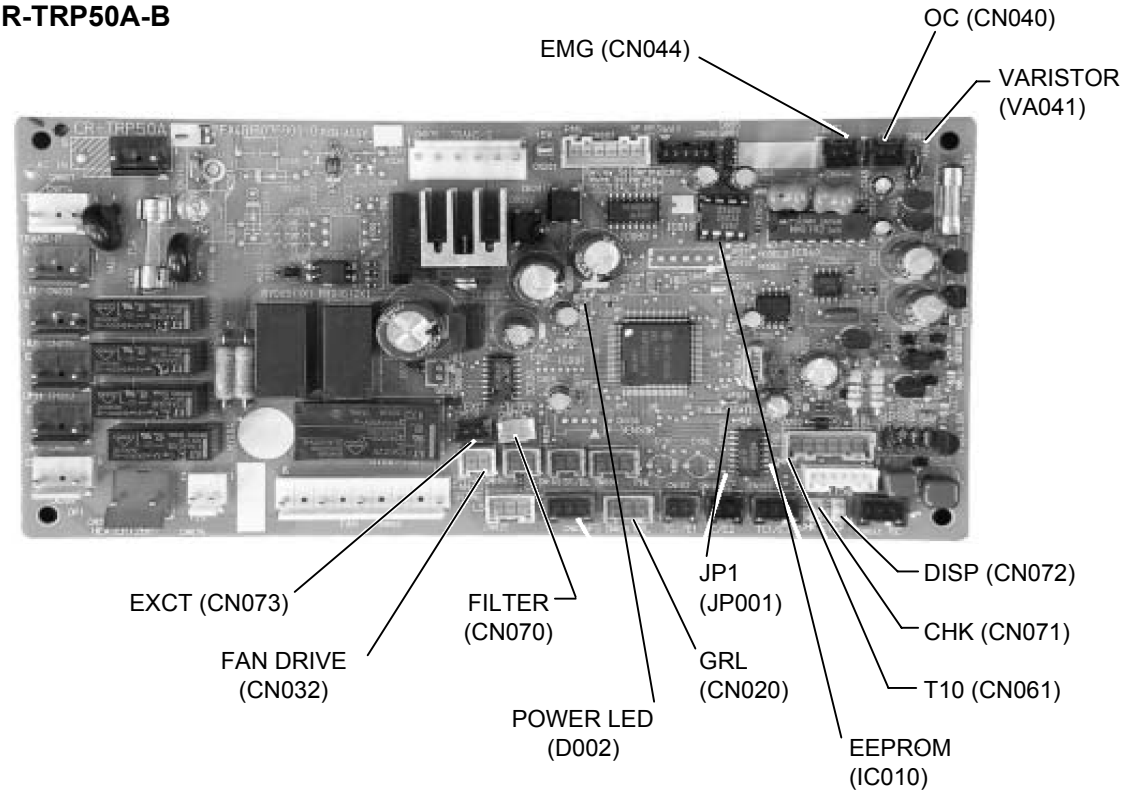
power supply

inter-unit control wiring

remote controller

3-2 Control PCB switches and functions

CR-TRP50A-B



T10: (CN061)
6 plug (yellow): used for remote control. (Refer to the remote control section)
1- start/stop input
2- COM
3- remote control prohibit/release input
4- start signal output
5- COM (+DC12v)
6- alarm signal output T10

EXCT: (CN073)
2P plug (red): Can be used for demand control. When imput is present, forces the unit to operate with the termostat OFF.

DISP: (CN072)
2P plug (white): Short-circuiting this plug allows the unit to be operated by the remote controller, even if it is not connected to an outdoor unit. (In this case, alarm "E04", which indicates trouble in the serial communication between the indoor and outdoor unit, does not occur.)

CHK: (CN071)
2P plug (white): Test pin. Short-circuiting this pin allows the indoor FM (H fan speed), drain pump, flap motor (F1 position), and electronic expansion valve full-open position to checked. However this function turns OFF if the indoor unit protection mechanism is activated. The unit can be operated even if the remote controller and outdoor unit are not connected. However even if the remote controller cannot is connected, it cannot be used to operate the unit. This function can be used for short-term tests.

JP1: (JP001)
Jumper wire: Allows selection of the T10 terminal

4. FUNCTIONS

4-1 Room temperature control

The thermostat is turned ON/OFF according to ▲T as shown below.

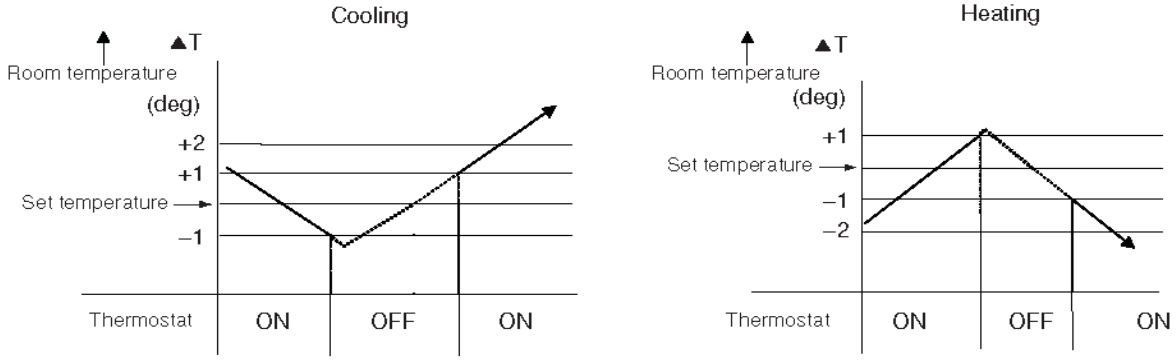
▲T = Room temperature - Set temperature	
When remote controller sensor is used	Room temperature = Temperature detected by the remote controller sensor
When body sensor is used	Room temperature = Temperature detected by the body sensor - *Intake shift temperature

* Intake shift temperature (enabled only during heating)

During heating, a difference in temperature occurs between the top and bottom of a room. This value is set in consideration for the difference between the temperature detected by the body sensor and the temperature at the bottom of the room.

<Value set for intake shift temperature at time of shipment>: 4°C

Note: The shift temperature can be selected in the range of 0 – 10°C, by using the remote controller simplified setting mode.



(1) After the thermostat turns ON, it will not turn OFF again as a result of ▲T for 5 minutes.

(2) After the thermostat turns OFF, it will not turn ON again for 3 minutes. (It also will not turn ON for 3 minutes after the power is switched ON.)

(3) The compressor turns OFF if the mode is changed cooling → heating (or heating → cooling) while the compressor is ON.

(4) If "test run" mode is selected, the thermostat will not turn OFF as a result of ▲T for 60 minutes. (The thermostat is forced ON.)

4-2 Automatic control for heating and cooling

(1) When operation starts, heating or cooling is selected according to the set temperature and the room temperature.

- Room temperature ≥ Set temperature + 1 → Cooling
- Set temperature – 1 < Room temperature ≤ Set temperature + 1 → Monitoring mode (*1)
- Room temperature < Set temperature – 1 → Heating

*1: If the difference between the room temperature and set temperature is small when operation starts, the cooling thermostat remains in standby status (OFF) until the temperature difference increases. When the temperature difference increases, either cooling operation or heating operation is selected. This standby status is known as "monitoring mode."

(2) After operation starts in the selected operating mode, the set temperature is automatically shifted by +2°C (cooling operation) or –2°C (heating operation).

Example: Temperature set on the remote controller is 20°C.

	Selected operating mode	Shifted set temp.	Remote controller display
1	Cooling	22°C	20°C
2	Heating	18°C	20°C

(3) Operating mode changes (heating → cooling, cooling → heating) which occur during operation as a result of temperature changes are handled as shown below.

- Heating → cooling: Room temperature ≥ Shifted set temperature (set temperature + 2°C) + 0.5°C
- Cooling → heating: Room temperature ≤ Shifted set temperature (set temperature – 2°C) – 1.0°C

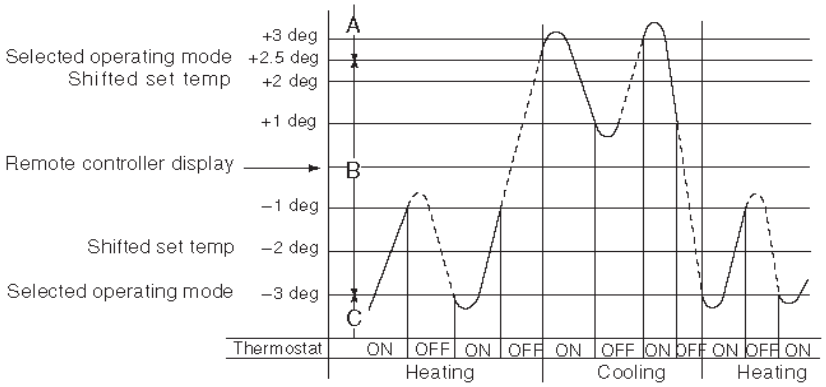
Example: Temperature set on the remote controller is 20°C.

	Operating mode change	Shifted set temp.
1	Heating → Cooling	20 + 2 0.5 = 22.5°C or higher (*2)
2	Cooling → Heating	20 – 2 – 1.0 = 17°C or lower

*2: During heating operation when the body sensor is used, a temperature shift is applied to the intake temperature detected by the sensor, in consideration for the difference in temperature at the top and bottom of the room. (Refer to the "Room Temperature Control" item.) If this intake shift temperature is 4°C, then the heating → cooling change occurs when the temperature detected by the body sensor is 26.5°C or higher.

(4) Cooling (heating) operation does not change if the room temperature changes from area C → A (or A → C) within 10 minutes after the compressor turns OFF. (Monitoring mode is excepted.)

(5) When the heating/cooling change occurs, the 4-way valve switches approximately 30 to 50 seconds after the compressor turns ON.



5. REPLACING PCB

5-1 Replacing PCB

Replace the PCB by following the instructions "How to Replace Indoor Unit Control PCB" on the next page. Pay special attention to the following points:

(1) Before replacing the indoor unit PCB, be sure to turn off the power source (at mains).

(2) When replacing the PCB for an indoor unit, be sure to install the EEPROM that was attached to the original indoor unit PCB.

(3) Some connectors (such as PNL and FS) on the PCB may include jumper wires. When removing the PCB of a malfunctioning indoor unit, disconnect these wires together with the EEPROM, and install them onto the new PCB.

(4) Be careful when handling the EEPROM, as its pins are easily bent.

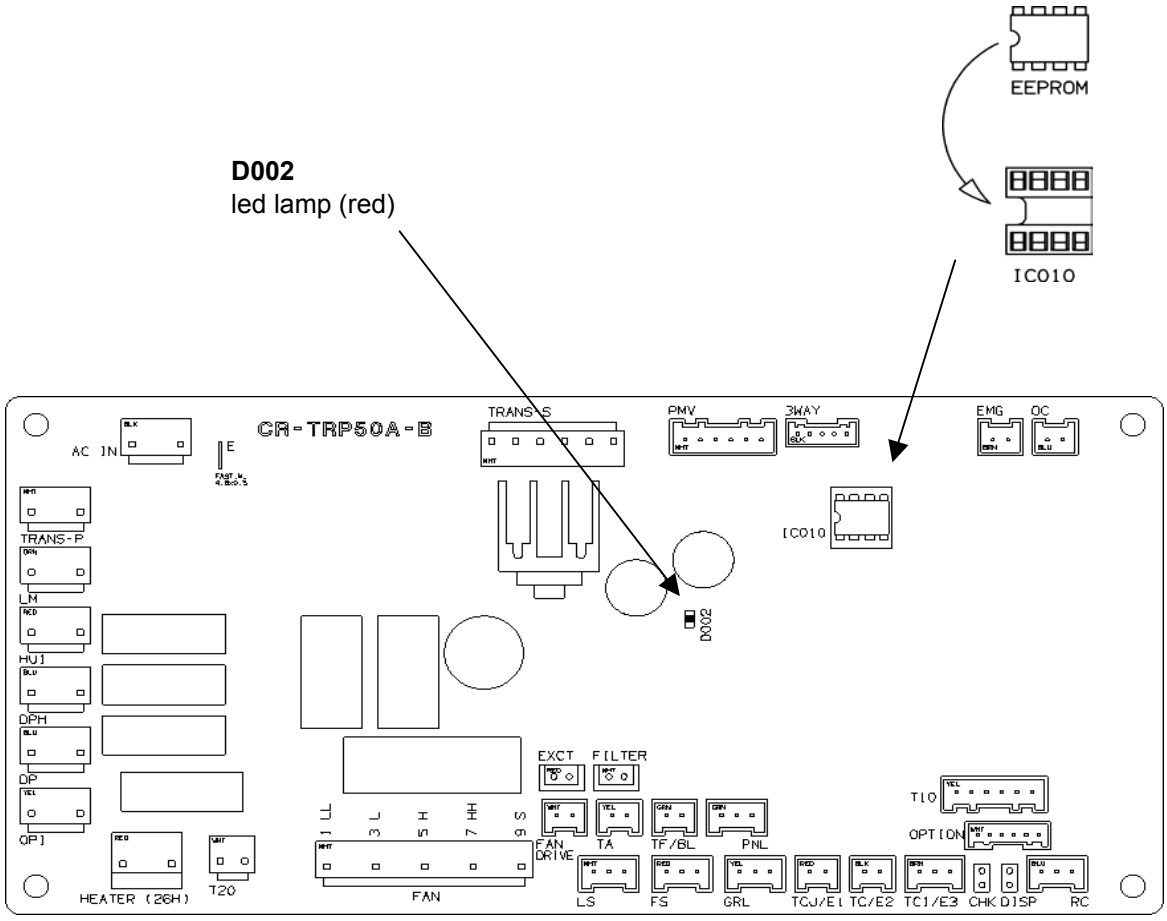
(5) Securely install the EEPROM in the location and orientation shown in the figure below.

(6) The alarm message (F29) may not necessarily appear immediately in cases of malfunctions in the EEPROM. Please monitor for a while after turning it on.

About EEPROM

(Erasable Programmable Read-Only Memory)

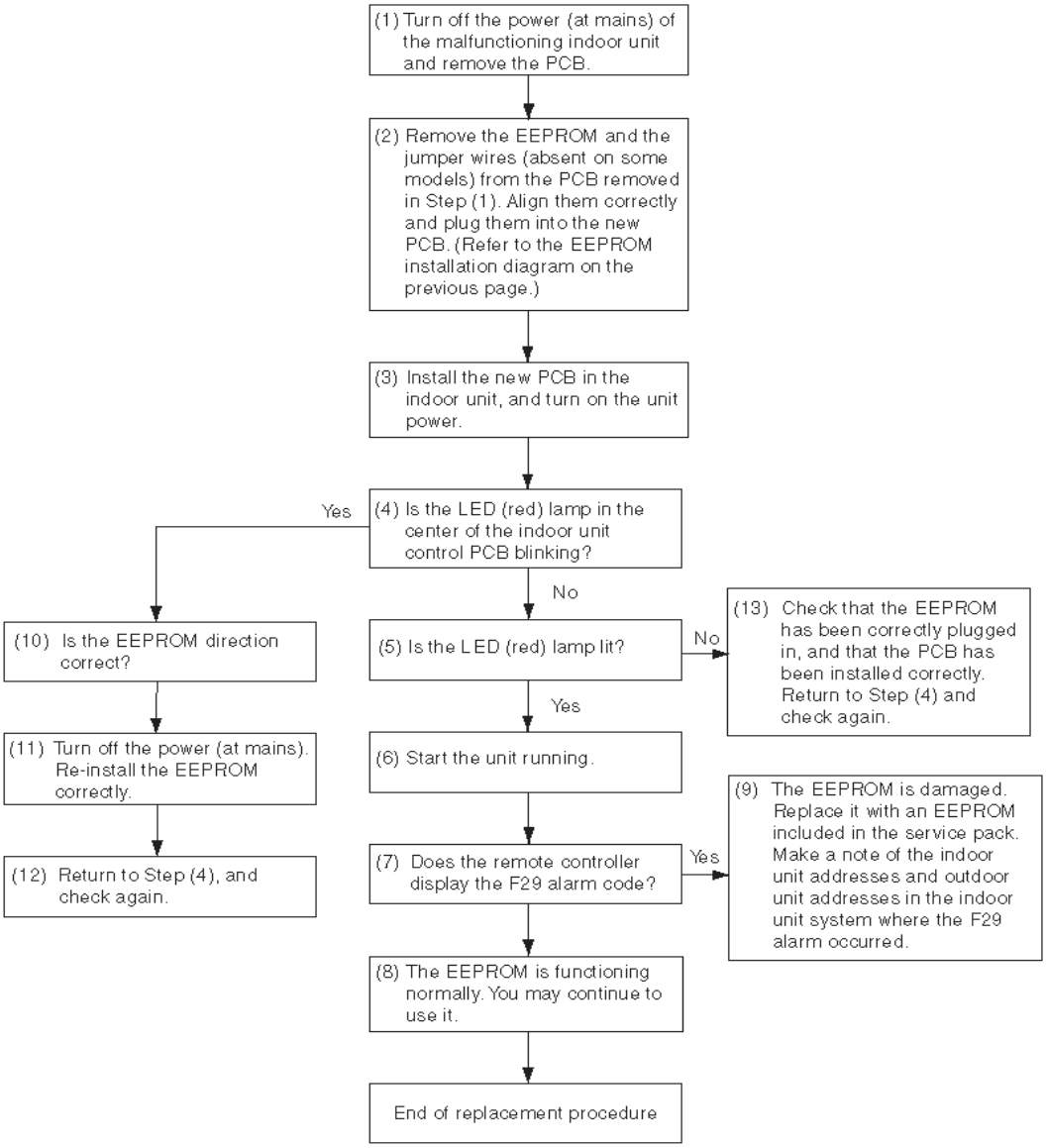
EEPROM is a component in which the various information necessary for functionning can be electronically written or erased. This component holds informations that is essential for the running of the unit, and must be handled with care.



5-2 How to replace PCB

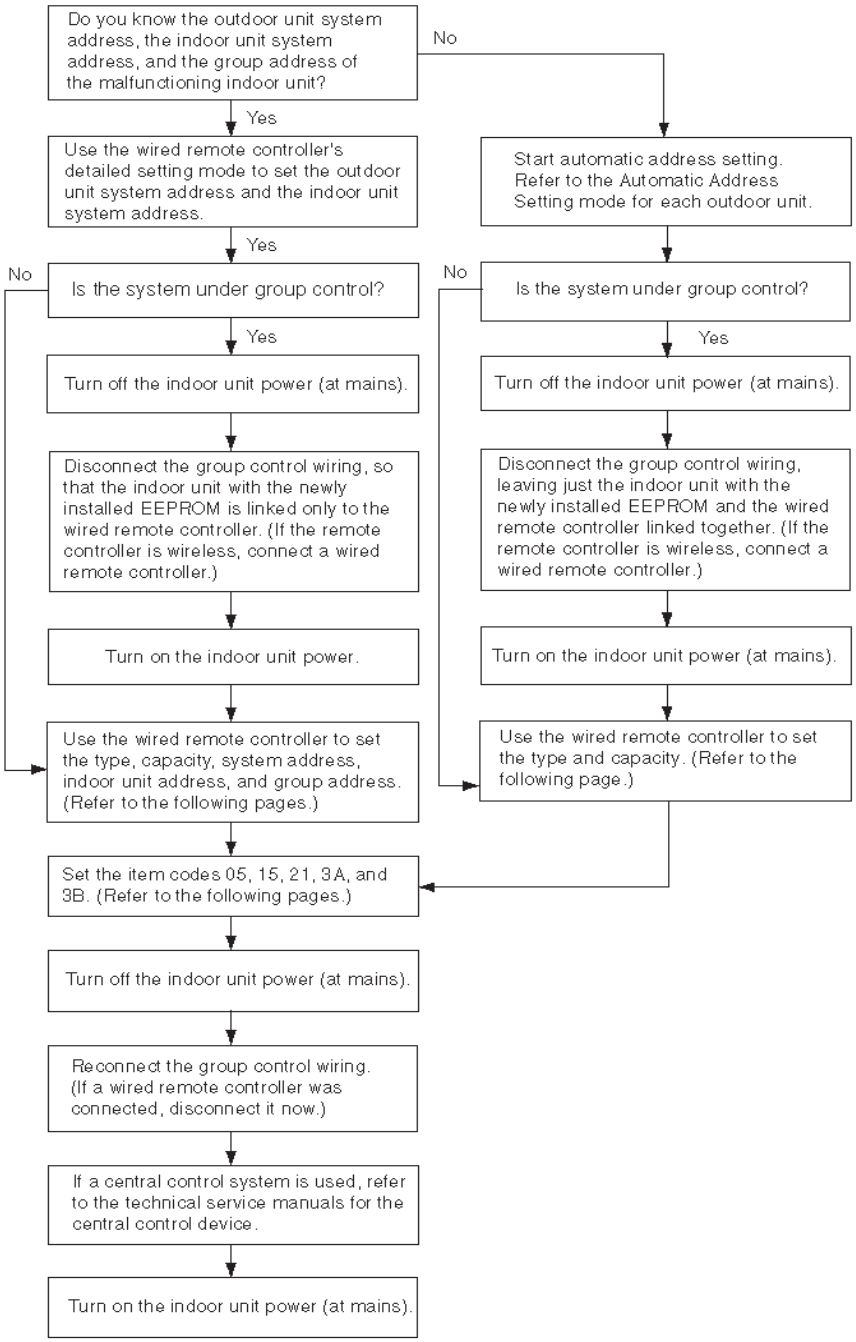
The settings data for the indoor unit are stored in the EEPROM (IC010) on the indoor unit control PCB.
When replacing a PCB, remove the EEPROM from the malfunctioning PCB and re-install it on the new PCB.

In some cases the EEPROM itself may be damaged. Check the EEPROM using the procedure below.
In addition, depending on the model, some connectors (such as PNL and FS) on the original PCB may include jumper wires. Disconnect these wires together with the EEPROM, and install them onto the new PCB.



5-3 How to replace EEPROM with EEPROM included in PCB service pack

It is necessary to store the address, type (model type), and capacity into the new EEPROM if you have replaced the old one with the EEPROM in this PCB service pack. You can program the memory settings through the remote controller. In some cases the EEPROM may be damaged. Additionally check the EEPROM using the procedure below.

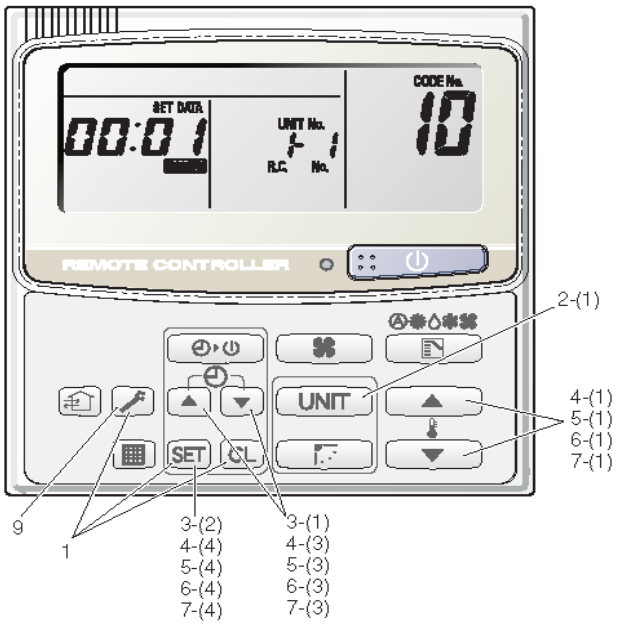


Using the Remote Controller to Manually Set the Type, Capacity, System Address, and Group Address (Detailed Setting Mode)

[Function] Set up the indoor unit with the newly installed EEPROM so that it is linked only to the wired remote controller. Then in Detailed Setting Mode, set the type, capacity, system address, indoor unit address, and group address.

[Procedure] Stop operation of the unit before following these steps.

1. Press and hold the SET , CL , and buttons simultaneously for 4 seconds or longer. Check that the remote controller display shows **SETTING** blinking.
2. The remote controller display shows "CODE No. 10" and "SET DATA 0001" blinking.
   (1) When group control is engaged, press the UNIT button, and select the indoor unit address.
   (The indoor unit fan that corresponds to the address displayed in the "UNIT No." section will then start up.)
3. Set the indoor unit type.
   (1) Using the Timer Setting ▲ or ▼ button, change the setting so that it matches the indoor unit type. (Refer to the "Table of Settings" on the next page.)
   (2) Press the SET button. (The display stops blinking then lights. The setting procedure is completed.)
4. Set the indoor unit capacity.
   (1) Using the Temperature Setting ▲ or ▼ button, change the display to "CODE No. 11."
   (2) "SET DATA 0099" is displayed.
   (3) Using the Timer Setting ▲ or ▼ button, change the setting so that it matches the indoor unit capacity.
   (4) Press the SET button. (The display stops blinking then lights. The setting procedure is completed.)
5. Set the system address.
   (1) Using the Temperature Setting ▲ or ▼ button, change the display to "CODE No. 12."
   (2) "SET DATA 0099" is displayed.
   (3) Using the Timer Setting ▲ or ▼ button, change the setting so that it is the same as the system address of the outdoor units in the same refrigerant system.
   (4) Press the SET button. (The display stops blinking then lights. The setting procedure is completed.)
6. Set the indoor unit address.
   (1) Using the Temperature Setting ▲ or ▼ button, change the display to "CODE No. 13."
   (2) "SET DATA 0099" is displayed.
   (3) Using the Timer Setting ▲ or ▼ button, change the setting so that it is the same as the address number of that indoor unit before the PCB was replaced. (Caution: No two units may have the same address numbers.)
   (4) Press the SET button. (The display stops blinking then lights. The setting procedure is completed.)
7. Set the group settings.
   (1) Using the Temperature Setting ▲ or ▼ button, change the display to "CODE No. 14."
   (2) "SET DATA 0099" is displayed.
   (3) Using the Timer Setting ▲ or ▼ button, change the setting so that it matches the group address number before the PCB was replaced.
   (4) Press the SET button. (The display stops blinking then lights. The setting procedure is completed.)
8. Adjust the settings for other item codes in the same way. (Refer to the "Table of Settings.")
9. Press ! to return to normal unit stopped status.



5-4 Table of settings

Item Code	Item	Setting Data					
		No.	Meaning	No.	Meaning	No.	Meaning
10	Type	0000	1-Way Air Discharge Semi-Concealed	0001	4-Way Air Discharge Semi-Concealed	0002	2-Way Air Discharge Semi-Concealed
		0003	1-Way Air Discharge Semi-Concealed Slim	0005	Concealed-Duct	0006	Concealed-Duct High Static Pressure
		0007	Ceiling-Mounted	0008	Wall-Mounted	0010	Floor-Standing
		0011	Concealed-Floor-Standing				
11	Indoor Unit Capacity kW	0000	Invalid	0001	2.2 (Type 74)	0003	2.8 (Type 94)
		0005	3.6 (Type 124)	0007	4.5 (Type 164)	0009	5.6 (Type 184)
		0010	6.3 (Type 224)	0012	7.3 (Type 254)	0015	10.6 (Type 364)
		0017	14.0 (Type 484)				
12	(Outdoor Unit) System Address	0001	Unit No. 1				
		0002	Unit No. 2				
		:	:				
		0030	Unit No. 30				
13	Indoor Unit Address	0001	Unit No. 1				
		0002	Unit No. 2				
		:	:				
		0064	Unit No. 64				
14	Group Address	0000	Individual Unit				
		0001	Main Unit				
		0002	Sub Unit				
05	Fan Speed (Heater Thermostat off)	0002	Compressor On: Fan speed LL Compressor Off: Fan speed LL				
15	Temperature Sensor Setting	0031	All Sensors Set to "On"				
21	Maximum Temperature Setting for Heating	0030	30°C				
3A	Air Outlet Temperature Control Feature	0000	No				
		0001	Yes				
3B	RAP Valve Feature	0000	No				
		0001	Yes (invalid)				

6. SERVICING AND MAINTENANCE FUNCTIONS

The below functions are available, and are selected by the outdoor unit EEPROM settings.

6-1. Indoor Unit Refrigerant Noise Countermeasures

Refrigerant noise that occurs during heating operation

(1) For indoor units where the heating thermostat is ON: EEPROM 09 (set only on the main unit)

Can be set from 1 (5 pulses) to 96 (480 pulses). (Setting is applied to all indoor units.)

Because distribution control between indoor units is stopped when this function is used (the mechanical valve position becomes fixed), avoid using it if at all possible when there is a height difference between indoor units.

(2) For indoor units where the heating thermostat is OFF: EEPROM 0A (set only on the main unit)

Can be set from 1 (5 pulses) to 96 (480 pulses). (Setting must apply to all indoor units.)

Ordinarily, refrigerant noise will be reduced if this is set to 50 – 65 pulses. If at all possible, avoid setting to below 50 pulses. Doing so may result in symptoms of insufficient refrigerant gas, caused by refrigerant accumulation between distribution joints and indoor units where the heating thermostat is OFF.

(3) For stopped indoor units: EEPROM 0B (set only on the main unit)

Can be set from 1 (5 pulses) to 96 (480 pulses). (Setting must apply to all indoor units.)

Ordinarily, refrigerant noise will be reduced if this is set to 50 – 65 pulses. If at all possible, avoid setting to below 50 pulses. Doing so may result in symptoms of insufficient refrigerant, caused by refrigerant accumulation between distribution joints and indoor units where the heating thermostat is OFF.

6-2. Outdoor Unit Noise Countermeasure: EEPROM 05 (set at each outdoor unit)

This unit includes 3 types of Quiet modes. (However, when they are engaged, operation is in Quiet mode 24 hours a day.) Selecting one of the Quiet modes results in operation that gives priority to reduced noise. Because these modes involve restrictions on outdoor unit fan modes and the operation frequency, the operating capacity will be somewhat reduced.

EEPROM setting	Max. fan mode	Effect	Amount of operating capacity reduction
0	14	Normal operation (setting at time of factory shipment)	0
1	12	Noise reduced by approx. 1 – 2 dB from the catalog value.	Approx. 0.5 hp
2	11	Noise reduced by approx. 2 – 3 dB from the catalog value.	Approx. 1.2 hp
3	10	Noise reduced by approx. 5 dB from the catalog value.	Approx. 1.8 hp

* If Quiet mode is set, the capacity will begin to decrease during Heating mode operation when the outdoor air temperature is below the standard conditions.
* It is possible to set Quiet mode only for nighttime use by using the snowfall sensor input terminal and a timer for quiet operation. In this case, operation is in Quiet mode as determined by the above setting

7. TROUBLE DIAGNOSIS

7-1 Contents of remote controller switch alarm display

ON: ○ Blinking: ☼ OFF: ●

Possible cause of malfunction			Wired remote control display	Wireless remote controller receiver display		
				Operation	Timer	Standby for heating
Serial communication errors Mis-setting	Remote controller is detecting error signal from indoor unit.	Error in receiving serial communication signal. (Signal from main indoor unit in case of group control) Ex: Auto address is not completed.	<E01>	☼	●	●
		Error in transmitting serial communication signal.	<E02>			
	Indoor unit is detecting error signal from remote controller (and system controller).		<<E03>>			
	Indoor unit is detecting error signal from main outdoor unit.	Error in receiving serial communication signal. When turning on the power supply, the number of connected indoor units does not correspond to the number set. (Except R.C. address is "0.")	E04	●	●	☼
		Error of the main outdoor unit in receiving serial communication signal from the indoor unit.	<E06>			
	Improper setting of indoor unit or remote controller.	Indoor unit address setting is duplicated.	E08			
		Remote controller address connector (RCU. ADR) is duplicated. (Duplication of main remote controller)	<<E09>>	☼	●	●
		Error in driver communication signal for DC Inverter Fan.	E10			
	During auto. address setting, number of connected units does not correspond to number set. When turning on the power supply, number of connected units does not correspond to number set. (Except R.C. address is "0.")	Starting auto. address setting is prohibited. This alarm message shows that the auto address connector CN100 is shorted while other RC line is executing auto address operation.	E12			
		Error in auto. address setting. (Number of connected indoor units is less than the number set)	E15	●	●	☼
		Error in auto. address setting. (Number of connected indoor units is more than the number set)	E16			
		No indoor unit is connected during auto. address setting.	E20			
		Main outdoor unit is detecting error signal from sub outdoor unit.	E24			
		Error of outdoor unit address setting.	E25			
		The number of connected main and sub outdoor units do not correspond to the number set at main outdoor unit P.C.B.	E26			
		Error of sub outdoor unit in receiving serial communication signal from main outdoor unit.	E29			
	Indoor unit communication error of group control wiring.	Error of main indoor unit in receiving serial communication signal from sub indoor units.	E18	☼	●	●
	Improper setting.	This alarm message shows when the indoor unit for multiple-use is not connected to the outdoor unit.	L02	☼	●	☼
		Duplication of main indoor unit address setting in group control.	<L03>			
		There are 2 or more indoor units controllers which have operation mode priority in 1 refrigerant circuit. — Priority set remote controller	L05			
		There are 2 or more indoor units controllers which have operation mode priority in 1 refrigerant circuit. — Non-priority set remote controller	L06			
		Group control wiring is connected to individual control indoor unit.	L07			
		Indoor unit address is not set.	L08			
		Capacity code of indoor unit is not set.	<<L09>>			
		Mis-match connection of outdoor units which have different kind of refrigerant.	L17			
		4-way valve operation failure	L18			
		Duplication of outdoor R.C. address setting.	L04	☼	○	●
		Capacity code of outdoor unit is not set.	L10			
Activation of protective device	Protective device in indoor unit is activated.	Thermal protector in indoor unit fan motor is activated.	<<P01>>	●	☼	☼
		Improper wiring connections of ceiling panel.	<<P09>>			
		Float switch is activated.	<<P10>>			
		Error in indoor unit DC Inverter Fan.	P12			

Continued

ON: ○ Blinking: ☼ OFF: ●

Possible cause of malfunction			Wired remote control display	Wireless remote controller receiver display		
				Operation	Timer	Standby for heating
Activation of protective device	Protective device in outdoor unit is activated.	Compressor thermal protector is activated. Power supply voltage is unusual. (The voltage is more than 260 V or less than 160 V between L and N phase.)	P02	☼	●	☼
		Incorrect discharge temperature. (Comp. No. 1)	P03			
		High pressure switch is activated.	P04			
		Negative (Defective) phase.	P05			
		Incorrect discharge temperature. (Comp. No. 2)	P17			
		Outdoor unit fan motor is unusual.	P22			
		Compressor running failure resulting from missing phase in the compressor wiring, etc. (Start failure not caused by IPM or no gas.) Negative (defective) N phase.	P16			
		Overcurrent at time of compressor runs more than 80Hz (DCCT secondary current or ACCT primary current is detected at a time other than when IPM has tripped.)	P26			
		Inverter for compressor is unusual. (DC compressor does not operate.)	P29			
		IPM trip (IPM current or temperature)	H31	●	☼	●
Thermistor fault	Indoor thermistor is either open or damaged.	Indoor coil temp. sensor (E1)	<<F01>>	☼	☼	●
		Indoor coil temp. sensor (E2)	<<F02>>			
		Indoor coil temp. sensor (E3)	<<F03>>			
		Indoor suction air (room) temp. sensor (TA)	<<F10>>			
		Indoor discharge air temp. sensor (BL)	<<F11>>			
	Outdoor thermistor is either open or damaged.	Comp. No. 1 discharge gas temp. sensor (DISCH1)	F04	☼	☼	○
		Comp. No. 2 discharge gas temp. sensor (DISCH2)	F05			
		Outdoor No. 1 coil gas temp. sensor (EXG1)	F06			
		Outdoor No. 1 coil liquid temp. sensor (EXL1)	F07			
		Outdoor air temp. sensor (AIR TEMP)	F08			
		Compressor intake port temperature sensor (RDT)	F12			
		High pressure sensor	F16			
		Outdoor No. 2 coil gas temp. sensor (EXG2)	F23			
		Outdoor No. 2 coil liquid temp. sensor (EXL2)	F24			
EEP ROM on indoor unit P.C.B. failure			F29	☼	☼	●
Protective device for compressor is activated	Protective device for compressor No. 1 is activated.	EEP ROM on the main or sub outdoor unit P.C.B. is a failure.	F31	☼	☼	○
		Overload current is detected.	H01	●	☼	●
		Lock current is detected.	H02			
		Current is not detected when comp. No. 1 is ON.	H03			
		Discharge gas temperature of the comp. No. 1 is not detected. Temp. sensor is not seated at the sensor holder.	H05			
	Protective device for compressor No. 2 is activated.	Overload current is detected.	H11			
		Lock current is detected.	H12			
		Current is not detected when comp. No. 2 is ON.	H13			
		Discharge gas temperature of the comp. No. 2 is not detected.	H15			
		Low pressure switch is activated.	H06			
	Low oil level.		H07			
	Oil sensor fault. (Disconnection, etc.)	Comp. No. 1 oil sensor	H08			
		Comp. No. 2 oil sensor	H27			

7-2 Outdoor unit control panel LED display

(○ : ON ☼ : Blinking ● : OFF)

LED		Display meaning
1	2	
○	○	After the power is turned ON (and automatic address setting is not in progress), no communication with the indoor units in that system is possible.
(Both ON)		
●	○	After power is turned ON (and automatic address setting is not in progress), 1 or more indoor units are confirmed in that system; however, the number of indoor units does not match the number that was set.
(OFF)	(ON)	
●	●	Automatic address setting was completed successfully. (After the power is turned ON, and automatic address setting is not in progress, the number of detected indoor units connected to that system matches the number that was set, and regular communications are occurring.)
(Both OFF)		
☼	☼	Automatic address setting is in progress.
(Blinking alternately)		
☼	☼	At time of automatic address setting, the number of indoor units did not match the number that was set.
(Both blinking)		
☼	☼	Alarm display LED 1 blinks M times, then LED 2 blinks N times. The cycle then repeats. M = 2: P alarm 3: H alarm 4: E alarm 5: F alarm 6: L alarm N = Alarm No. Example: LED 1 blinks 2 times, then LED 2 blinks 17 times. The cycle then repeats. Alarm is "P17."
(Blinking alternately)		

7-3 Trouble indications and inspection points

In an INV outdoor unit, compressor 1 is the INV compressor, and compressor 2 is the constant speed compressor.
In a constant speed outdoor unit, compressor 1 is constant speed compressor 1, and compressor 2 is constant speed compressor 2.

Display	Alarm indication	Probable cause	Inspection points and method	Correction
P02	Compressor protective thermostat activated.	Power trouble (voltage, missing phase, reversed phase)	Measure the power voltage. Check the connections at the power terminal plate and power breakers.	Repair.
		Contact failure in the protective thermostat circuit	Connection terminals on PCB Compressor terminals	Repair the connections.
		Insufficient refrigerant gas	Tubing connections (welded parts) Measure high and low pressures.	Repair locations where leakage occurred, then charge with additional refrigerant.
		Clogging of outdoor unit heat exchanger (cooling)	Outdoor unit heat exchanger	Clean and repair.
		Air blockage in outdoor unit (cooling)	Outdoor unit intake port	Remove obstruction or other cause of trouble.
		Clogging of indoor unit air filter (heating)	Indoor unit air filter	Clean and repair.
		Air blockage in outdoor unit	Indoor unit intake port	Remove obstruction or other cause of trouble.
		Indoor unit fan failure (heating) Outdoor unit fan failure (cooling)	Fan looseness	Tighten.
			Fan motor control circuit (PCB terminals, relays, and connectors)	Repair connections.
		Clogging of refrigerant circuit	Service valve position	Open all the way.
			Tubing connections, welded parts	Repair.
		Operation failure of indoor/outdoor electronic control valve	Electronic control valves, control circuit, coils	Repair or replace.
		RAP valve operation failure	Solenoid valves, locations where wires cross indoor unit wires, coils	Repair or replace.
		Liquid valve operation failure	Liquid valves, control circuit, coils, capillary tubes	Repair or replace.
		Refrigerant control valve operation failure	Refrigerant control valves	Repair or replace.
P03 P17	Compressor discharge temperature is abnormal. P03: INV compressor 1 P17: Constant speed compressor 2	Insufficient refrigerant gas	* Same as P02 alarm.	
		Clogging of outdoor unit heat exchanger (cooling)		
		Clogging of indoor unit air filter (heating)		
		Air blockage in outdoor unit (heating)		
		Indoor unit fan failure (heating) Outdoor unit fan failure (cooling)		
		Clogging of refrigerant circuit		
		Operation failure of indoor/outdoor electronic control valve		
		RAP valve operation failure		
		Liquid valve operation failure		
		Refrigerant control valve operation failure		

Display	Alarm indication	Probable cause	Inspection points and method	Correction
H04	High pressure switch activated.	Clogging of outdoor unit heat exchanger (cooling)	* Same as P02 alarm.	
		Air blockage in outdoor unit (cooling)		
		Clogging of indoor unit air filter (heating)		
		Air blockage in indoor unit (heating)		
		・Indoor unit fan failure (heating) ・Outdoor unit fan failure (cooling)		
		Clogging of refrigerant circuit		
		Operation failure of indoor/outdoor electronic control valve		
		RAP valve operation failure		
		Refrigerant over-charge	Measure the high and low pressure.	Adjust the amount of refrigerant charge.
P05	Reversed phase or missing phase detected.	Power trouble (voltage, missing phase, reversed phase)	* Same as P02 alarm.	
		・Failure of power supply to outdoor unit PCB ・Clogging of outdoor unit heat exchanger	Connection terminals on PCB	Repair connections.
P22	Outdoor unit fan trouble	Locked fan motor	Check whether fan is restrained or obstructed by a foreign object.	Remove the cause of the trouble.
		Failure of power supply to fan motor	Connection terminals on DC fan PCB	Repair connections.
		Fan motor coil layer short circuit	Measure for abnormal coil resistance.	Replace fan motor.
L18	RAP valve tubing and wiring are crossed.	RAP valve operation failure	* Same as P02 alarm.	
H01 H11	Compressor overload current detected. H01: Compressor 1 H11: Compressor 2	Insufficient power voltage	Measure the power voltage.	Repair.
		Missing phase	Measure the current.	Repair.
		Refrigerant over-charge	* Same as P02 alarm.	

Display	Alarm indication	Probable cause	Inspection points and method	Correction
H02 H12	Compressor lock current detected. H02: Compressor 1 H12: Compressor 2	Insufficient power voltage	* Same as H01/H11 alarm	
		Missing phase		
		Locked compressor	Compressor, crank case heater, indoor/outdoor electronic control valves, liquid valves	・Repair or replace location of trouble. ・Repair or replace.
H03 H13	Compressor current detection circuit failure H03: Compressor 1 H13: Compressor 2	Disconnected power wiring T-phase wire	Power terminal plate, electromagnetic contactor connection	Repair connections.
		Current detection circuit failure	Control circuit, wiring connections	Repair or replace.
		Electromagnetic contactor failure	Electromagnetic contactor	Replace.

7-4 Remote controller servicing functions

Sensor temperature display function (displayed both when unit is running and stopped)

- Use the following check procedure to display the sensor temperatures from the remote controller, indoor unit, and outdoor unit sensors on the remote controller display.

<Check procedure>

(1) Press and hold the CANCEL button and TEST / CHK button simultaneously for 4 seconds or longer.

(2) The following appea rs on the remote controller LCD display: unit No. X – X (master unit No.), item code XX (sensor address), and service monitor 00XX (sensor temperature).
(See figure at right.)

(3) Press the temperature setting ▲ and ▼ buttons to change the item code to the sensor address of the sensor you wish to monitor.
(For the relationship between the sensor address and sensor type, refer to the sensor temperature relationship table below.)

(4) If group control is in effect, press the UNIT SELECT button to change to the unit you wish to monitor.

(5) Press the TEST / CHK button to return to normal remote controller operation.

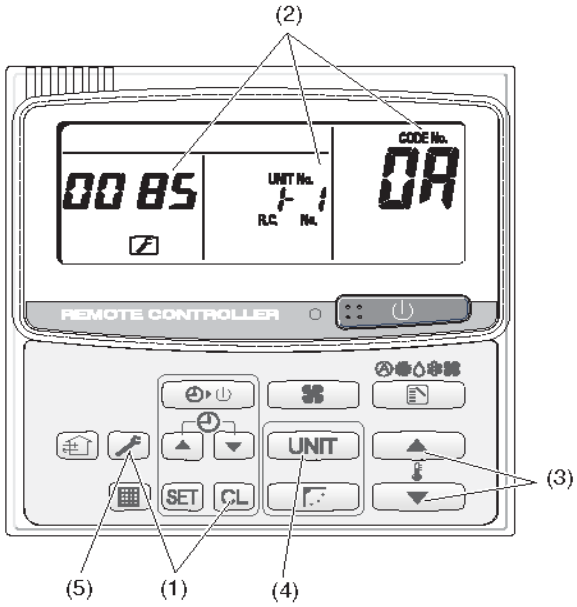


Fig.: Sample display when discharge temperature of unit No. 1-1 is 85°C.

<Note> The temperature display for units that are not connected appears as "- - - -."

● If monitor mode is engaged during normal operation, only the part of the LCD display indicated in the figure changes.
The other parts remain unchanged during normal operation.

Sensor Temperature Relationship Table

Location where sensor is installed	Sensor address	Sensor type	Sensor address	Sensor type
Indoor unit	01	Remote controller temperature	06	Discharge temperature sensor
	02	Indoor unit intake temperature	07	—
	03	Indoor unit heat exchanger temperature (E1)	08	Indoor unit electronic expansion valve position
	04	—	09	—
	05	Indoor unit heat exchanger temperature (E3)		
Outdoor unit	0A	Discharge temperature 1	12	Input power current
	0b	Discharge temperature 2	13	CT1
	0C	High-pressure sensor temperature	14	CT2
	0d	Heat exchanger gas 1	15	—
	0E	Heat exchanger liquid 1	16	—
	0F	Heat exchanger gas 2	17	Detected reservoir tank temperature
	10	Heat exchanger liquid 2	18	Detected oil temperature
	11	Outside air temperature	19	—

7-5 Super W-Multi alarm codes

Alarm Code	Alarm Meaning	Page
E06	Outdoor unit failed to receive serial communication signals from indoor unit.	IX-10
E12	Automatic address setting start is prohibited.	IX-10
E15	Automatic address setting alarm (too few units)	IX-10
E16	Automatic address setting alarm (too many units)	IX-11
E20	No indoor units at automatic address setting.	IX-11
E24	Outdoor unit (INV) failed to receive communications from another outdoor unit (constant-speed).	IX-12
E25	Outdoor unit address setting failure (duplication)	IX-12
E26	Mismatch in outdoor unit quantity	IX-12
E29	Outdoor unit failed to receive communication from an outdoor unit (INV).	IX-12
F04	Compressor 1 discharge temperature sensor trouble	IX-13
F05	Compressor 2 discharge temperature sensor trouble	IX-13
F06	Gas temperature sensor trouble at outdoor heat exchanger 1	IX-14
F07	Liquid temperature sensor trouble at outdoor heat exchanger 1	IX-14
F08	Outdoor air temperature sensor trouble	IX-15
F12	Compressor intake temperature sensor trouble	IX-15
F16	High-pressure sensor trouble	IX-16
F23	Gas temperature sensor trouble at outdoor heat exchanger 2	IX-14
F24	Liquid temperature sensor trouble at outdoor heat exchanger 2	IX-14
F31	Outdoor unit non-volatile memory (EEPROM) trouble	IX-17
H01	Constant speed compressor 1 overcurrent alarm	IX-18
H02	Constant speed compressor 1 lock current alarm	IX-18
H03	Compressor 1 CT sensor disconnected or short-circuit	IX-19
H05	Compressor 1 discharge temperature sensor disconnected	IX-19
H06	Low-pressure switch activated	IX-20
H07	No-oil alarm	IX-21
H08	Oil sensor (connection) trouble (open)	IX-21
H11	Constant speed compressor 2 overcurrent alarm	IX-18
H12	Constant speed compressor 2 lock current alarm	IX-18
H13	Compressor 2 CT sensor disconnected or short-circuit	IX-19
H15	Compressor 2 discharge temperature sensor disconnected	IX-19
H27	Oil sensor (connection) trouble (short circuit)	IX-22
H31	HIC trouble alarm	IX-23
L04	Outdoor unit address duplication	IX-23
L05	Indoor unit priority duplication (at priority indoor units)	IX-24
L06	Indoor unit priority duplication (at non-priority indoor units) and outdoor unit	IX-24
L10	Outdoor unit capacity not set	IX-24
L17	Outdoor unit model mismatch	IX-24
L18	4-way valve operation failure	IX-25
P02	Compressor 1 or compressor 2 motor winding overheating alarm	IX-25
P03	Compressor 1 discharge temperature trouble	IX-26
P04	High-pressure switch activated	IX-28
P05	Reverse phase (or missing phase) detected, capacity mismatch	IX-29
P16	Inverter compressor overcurrent alarm	IX-29
P17	Compressor 2 discharge temperature trouble	IX-26
P22	Fan motor trouble	IX-29
P26	Inverter compressor high-frequency overcurrent alarm	IX-30
P29	Inverter compressor missing phase or lock alarm	IX-30
Blinking Inspection Display on the Remote Controller	Blinking inspection display (1)	IX-30
	Blinking inspection display (2)	IX-31

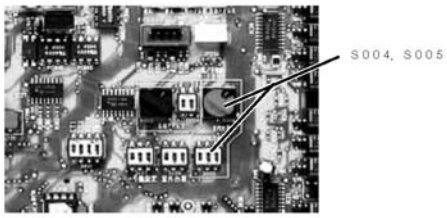
E06 alarm

Alarm code	E06
Alarm meaning	Outdoor unit failed to receive serial communication signals from indoor unit.
Alarm conditions	No serial communications from indoor unit.
Probable cause	(1) The indoor unit power was cut OFF after initial communications were completed. (2) An open circuit or short circuit occurred in the inter-unit control wiring after initial communications were completed.
Check	Check the power at the indoor and outdoor units, and check the inter-unit control wiring.
Correction	—
Example	—
Notes	This alarm is detected after initial communications are completed. Therefore, it does not occur in cases of "disconnected serial connector," "no terminal unit set," or other trouble that occurs before initial communications are completed. If initial communications have not been completed, alarm E04 occurs.

E12 alarm

Alarm code	E12
Alarm meaning	Automatic address setting start is prohibited.
Alarm conditions	Automatic address setting was started when automatic address setting was in progress at another outdoor unit in the same link.
Probable cause	Automatic address setting is in progress at another outdoor unit.
Check	This alarm is not displayed on the remote controller. Therefore check the blinking LED display on the outdoor unit PCB.
Correction	Wait for automatic address setting to be completed at the outdoor unit where it is currently in progress. Then start automatic address setting again.
Example	—
Notes	—

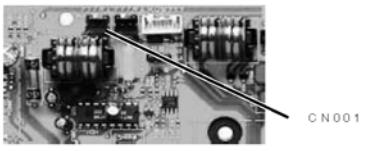
E15 alarm

Alarm code	E15
Alarm meaning	Automatic address setting alarm (too few units)
Alarm conditions	The number of indoor units was too few when automatic address setting was performed.
Probable cause	(1) The number of indoor units set at the indoor unit quantity setting SW (S004, S005) on the outdoor unit PCB is too many. (2) The inter-unit control wiring between indoor units has been cut.
Check	(1) Refer to the test run servicing materials and check the indoor unit quantity setting SW (S004, S005). (2) Check the inter-unit control wiring at the indoor and outdoor units.
Correction	After correcting the indoor unit quantity setting or the inter-unit control wiring, perform automatic address setting again.
Example	—
Notes	Super W Multi (INV) switch position 

E16 alarm

Alarm code	E16
Alarm meaning	Automatic address setting alarm (too many units)
Alarm conditions	• The number of indoor units was too many when automatic address setting was performed. • After initial communications were completed, an unrecognized unit was detected.
Probable cause	(1) The indoor unit quantity setting SW on the outdoor unit PCB is set incorrectly. (2) The inter-unit control wiring is wired incorrectly.
Check	(1) Refer to the test run servicing materials and check the number of indoor units that is set. (2) Check the inter-unit control wiring at the indoor and outdoor units.
Correction	After correcting the indoor unit quantity setting or the inter-unit control wiring, perform automatic address setting again.
Example	—
Notes	—

E20 alarm

Alarm code	E20
Alarm meaning	No indoor units at automatic address setting.
Alarm conditions	When automatic address setting was performed, no indoor units were recognized.
Probable cause	(1) The inter-unit control wiring from the outdoor unit to the indoor units has been cut. (2) Serial connector 1 (CN001) is disconnected at the outdoor unit. (3) The power is OFF at all indoor units in the system.
Check	(1) Check whether the inter-unit control wiring from the outdoor unit to the indoor units is cut. (2) Check whether serial connector 1 (CN001) is disconnected at the outdoor unit. (3) Check the power at the indoor units.
Correction	(1) Begin by checking at the outdoor unit.
Example	—
Notes	Position of serial connector 1 on Super W Multi (INV) 

E24 alarm

Alarm code	E24
Alarm meaning	Outdoor unit (INV) failed to receive communications from another outdoor unit (constant-speed).
Alarm conditions	After initial communications were completed, communications from an outdoor unit stopped.
Probable cause	(1) After initial communications were completed, the control wiring between main and sub outdoor units was cut. (2) After initial communications were completed, the outdoor unit power was turned OFF.
Check	—
Correction	—
Example	—
Notes	—

E25 alarm

Alarm code	E25
Alarm meaning	Outdoor unit address setting failure (duplication)
Alarm conditions	Communication by outdoor unit main-sub control wiring was received that contained the same address as that unit 5 times or more within 3 minutes.
Probable cause	The unit number is set incorrectly.
Check	Check the unit number again.
Correction	Correct the incorrect unit number setting.
Example	—
Notes	Recovery from this alarm occurs automatically (when communication that contains the same address is not received for 3 minutes).

E26 alarm

Alarm code	E26
Alarm meaning	Mismatch in outdoor unit quantity.
Alarm conditions	After power initialization, the set outdoor unit quantity did not match the number of outdoor units detected on the outdoor unit main-sub control wiring for 3 minutes or longer.
Probable cause	(1) The outdoor unit quantity is set incorrectly. (2) The outdoor unit main-sub control wiring is cut.
Check	(1) Check the outdoor unit quantity setting again. (2) Check the outdoor unit main-sub control wiring.
Correction	(1) Correct the incorrect outdoor unit quantity setting. (2) Repair the outdoor unit main-sub control wiring.
Example	—
Notes	Recovery from this alarm occurs automatically (when the set outdoor unit quantity matches the number of outdoor units detected on the outdoor unit main-sub control wiring).

E29 alarm

Alarm code	E29
Alarm meaning	Outdoor unit failed to receive communication from an outdoor unit (INV).
Alarm conditions	Communication from an outdoor unit (INV) stopped for 3 minutes or longer.
Probable cause	(1) After initial communications were completed, the outdoor unit main-sub control wiring was cut. (2) After initial communications were completed, the RC connector became disconnected. (3) The power at the outdoor unit is turned OFF.
Check	(1) Check the outdoor unit main-sub control wiring. (2) Check the RC connectors. (3) Check the power at the outdoor units (INV).
Correction	(1) Repair the outdoor unit main-sub control wiring. (2) Correct the RC connector connection. (3) Turn ON the outdoor unit (INV) power.
Example	—
Notes	—

F04, F05 alarm

Alarm code	F04, F05
Alarm meaning	Compressor 1 discharge temperature sensor trouble, compressor 2 discharge temperature sensor trouble
Alarm conditions	(1) A temperature of 100°C or higher was detected 20 minutes or longer after that compressor stopped running. (2) Temperature is **°C or higher when the outdoor unit has been stopped for 60 minutes or longer. * Rotary: 80°C Scroll: 90°C Details are given in the servicing technical materials. (3) A/D step is 10 steps or less (short circuit).
Probable cause	(1) Sensor malfunction • Sensor element malfunction • Sensor wiring is partially disconnected, resulting in increased electrical resistance. ☆This alarm does not occur when the wiring is cut or when the connector is not connected to the outdoor unit PCB. (2) Crossed wiring or installation error • The discharge temperature sensor of that compressor is connected to the discharge tube of the other compressor. • The connector for the discharge temperature sensor of the problem compressor is connected to the outdoor unit **PCB connector for the other compressor**. (3) Outdoor unit PCB failure (4) The check valve on the discharge tube for that compressor is wet. (5) An air short blockage in the area around the outdoor unit has increased the outdoor unit ambient temperature, reducing the cooling effects after the compressor stops. (6) There is a cause that results in P03, P16, or P02 alarm. (7) Electrical noise
Check	(1) Sensor malfunction and outdoor unit PCB failure Trouble: • Constantly indicates a high temperature. • When monitoring software or other means are used for monitoring, the discharge temperature at times fluctuates suddenly and wildly. • In some cases, the precise temperature may not be known, even when monitoring software is used. Check: • Wiggle the sensor and check whether the trouble continues. • Check whether the connector is partially disconnected from the PCB. ☆An F04 alarm will not result if the connector is completely disconnected (circuit is open). • If the cause is still uncertain, check the following to determine whether a sensor or PCB failure has occurred. Step 1: Connect the other compressor discharge sensor, or a discharge sensor where the F04 alarm has not occurred, to the connector for this compressor on the PCB. Measure the temperature at the same point (a location where temperature fluctuations are small), and check whether there is a temperature difference. Difference: A PCB or sensor failure is possible. No difference: PCB and sensor are normal. Step 2: If an abnormality was found at Step 1, connect the problem compressor sensor to the other compressor connector on the PCB, or to the PCB connector of a device where the F04 alarm has not occurred. Measure the temperature at the same point (a location where temperature fluctuations are small), and check whether there is a temperature difference. Difference: Sensor failure. No difference: PCB failure. ☆ **It is convenient at this time to have a discharge temperature sensor on hand.** (2) Crossed wiring or installation error Trouble: Although the other compressor is operating and this compressor is stopped, the discharge temperature of the other compressor does not increase and the discharge temperature of this compressor rises. * The discharge temperature remains high immediately after the compressor stops. Wait for some time after the compressor stops and observe. Check: Check for crossed wiring and installation errors.
	Check: Check for crossed wiring and installation errors. (3) Leakage from the discharge tube check valve Trouble: Although the other compressor is operating and this compressor is stopped, the discharge temperature of this compressor rises together with the temperature of the other compressor. (4) The ambient temperature around the outdoor unit when it is stopped is 43°C or higher. (5) If the cause is still unknown after checking the above, then it is possible that electrical noise is the cause of the trouble. It is necessary to provide a line filter or carry out other noise countermeasures.
Correction	(1) Replace the sensor. (2) Replace the outdoor unit PCB. (3) Carry out noise countermeasures. (4) Repair the refrigerant tubing. (5) Adjust the amount of refrigerant. (6) Correct the trouble.
Example	(1) Sensor wiring is partially cut.
Notes	This alarm does not indicate that the sensor is disconnected. In order to prevent overheating during operation, the outdoor units in this system will not allow a compressor to start if the discharge temperature does not decrease while the compressor is stopped. If a sensor malfunction results in continuous detection of a high discharge temperature, then the compressor may stop for no apparent reason. The purpose of this alarm is to facilitate identification of the problem in this case.

F06, F23 alarm

Alarm code	F06, F23
Alarm meaning	Gas temperature sensor trouble at outdoor heat exchanger 1; Gas temperature sensor trouble at outdoor heat exchanger 2
Alarm conditions	(1) A/D step is 10 steps or less (short circuit). (2) A/D step is 1014 steps or more (open circuit).
Probable cause	(1) Sensor malfunction (including connector) (2) PCB malfunction
Check	(1) Measure the sensor resistance. Check that the sensor is operating normally. (2) Use a remote controller monitor or PC monitor to check the temperature that is recognized by the microcomputer.
Correction	—
Example	—
Notes	—

F07, F24 alarm

Alarm code	F07, F24
Alarm meaning	Liquid temperature sensor trouble at outdoor heat exchanger 1; Liquid temperature sensor trouble at outdoor heat exchanger 2
Alarm conditions	(1) A/D step is 10 steps or less (short circuit). (2) A/D step is 1014 steps or more (open circuit).
Probable cause	(1) Sensor malfunction (including connector) (2) PCB malfunction
Check	(1) Measure the sensor resistance. Check that the sensor is operating normally. (2) Use a remote controller monitor or PC monitor to check the temperature that is recognized by the microcomputer.
Correction	—
Example	—
Notes	—

F08 alarm

Alarm code	F08
Alarm meaning	Outdoor air temperature sensor trouble
Alarm conditions	(1) A/D step is 10 steps or less (short circuit). (2) A/D step is 1014 steps or more (open circuit).
Probable cause	(1) Sensor malfunction (including connector) (2) PCB malfunction
Check	(1) Measure the sensor resistance. Check that the sensor is operating normally. (2) Use a remote controller monitor or PC monitor to check the temperature that is recognized by the microcomputer.
Correction	—
Example	—
Notes	—

F12 alarm

Alarm code	F12
Alarm meaning	Compressor intake temperature sensor trouble
Alarm conditions	(1) A/D step is 10 steps or less (short circuit). (2) A/D step is 1014 steps or more (open circuit).
Probable cause	(1) Sensor malfunction (including connector) (2) PCB malfunction
Check	(1) Measure the sensor resistance. Check that the sensor is operating normally. (2) Use a remote controller monitor or PC monitor to check the temperature that is recognized by the microcomputer.
Correction	—
Example	—
Notes	—

F16 alarm

Alarm code	F16
Alarm meaning	High-pressure sensor trouble (abnormal rise in high pressure) (In some cases this may not be the result of a high-pressure sensor malfunction.)
Alarm conditions	• High-pressure SW activated although the detected pressure was lower (3.36 MPa or below) than the high-pressure SW activation pressure: Undershift • High-pressure SW failed to activate although the detected pressure was higher (4.13 MPa or above) than the high-pressure SW activation pressure: Overshift • The saturation temperature at the detected pressure is 5°C or more below the highest indoor-unit E1 temperature continuously for 30 minutes. • The high-pressure sensor temperature is less than –35°C AND the outdoor heat exchanger minimum temperature is –40°C or higher AND the low-pressure switch has not activated.
Probable cause	(1) High-pressure sensor malfunction (2) Failure to connect the connector to the outdoor unit PCB (3) Failure to open the service valve (4) Clogged tubing (5) Valve leakage (6) Over-charging (7) Outdoor unit PCB failure (8) Electrical noise
Check	(1) High-pressure sensor failure • Check for out wiring. • Connect a gauge to the high-pressure pressure outlet and check for changes in the value displayed by the monitoring software, and for large deviation of the gauge pressure. • During heating, check whether the temperature is lower than the highest indoor-unit E1 temperature. * The pressure detected by the high-pressure sensor is the highest pressure in the system. Therefore during heating the converted saturation temperature will never be lower than any indoor-unit E1 temperature. During cooling this temperature will never be lower than the outdoor unit liquid temperature. (2) Failure to open the service valve, clogged tubing, valve leakage, over-charging In all of these cases, an alarm occurs when there are rapid pressure fluctuations and tracking of the detected pressure is poor. • Check the open/closed status of the valve. • Check for clogging of the tubing. To check for clogging, disconnect the high-pressure sensor from the PCB and check whether the high-pressure SW activates. • Check for valve leakage and over-charging. When valve leakage or over-charging occurs, refrigerant is likely to accumulate in the outdoor units or indoor units, resulting in a sudden rise in pressure at start that occurs before the refrigerant in the heat exchanger is discharged. * The representative valves to check are the liquid valves and mechanical valves. (3) Outdoor unit PCB failure • The check items are the same as for a high-pressure sensor malfunction. A normal PCB is needed to determine whether the problem is a PCB failure or a pressure sensor malfunction. If an abnormality was found at the check items for a high-pressure sensor malfunction, first try replacing the PCB and check again. Trouble is corrected: Outdoor unit PCB failure Trouble is not corrected: High-pressure sensor malfunction.

Correction	(1) Replace the high-pressure sensor. Caution: Because the high-pressure sensor connection includes a Schrader-type valve, it can be removed and replaced. However, the high-pressure sensor can be easily damaged by high voltage; therefore use sufficient caution with regard to static electricity. (2) Replace the PCB. (3) Correct the locations of problems in the refrigeration cycle. • Correct locations where clogging or leakage has occurred. • In the case of over-charging, recover refrigerant. (Adjust the amount of refrigerant) *Guide for over-charging Be sure to connect the gauge to the high-pressure pressure outlet when checking for over-charging. During cooling: The following does not apply when outdoor air temperature is low or when fan speed is controlled. When both compressor 1 and compressor 2 are operating, and the fan mode is 14 (maximum fan speed), then the high pressure saturation temperature should be approximately 15°C above the outdoor air temperature. If it is 5°C or more above this level, then it is possible that over-charging may have occurred. During heating: There is an indoor unit where refrigerant flow is poor (E1 temperature and discharge temperature are low), and the mechanical valve of that unit is opened to 300 pulses or more, and the E1 temperature is close to room temperature. However be aware that this kind of data results often when there is a height difference between indoor units. Reducing the amount of refrigerant will improve the refrigerant flow, however reducing it too much will increase the likelihood of alarms related to low oil level (scroll-side), the low pressure SW, and discharge temperature. Use caution.
Example	This alarm may result when the service valve is closed or when valve leakage (particularly from the mechanical valve) occurs.

F31 alarm

Alarm code	F31
Alarm meaning	Outdoor unit non-volatile memory (EEPROM) trouble
Alarm conditions	(1) Non-volatile memory is not present when power initialization occurs. (2) Read values do not match after writing to non-volatile memory is complete.
Probable cause	(1) Memory was not inserted after the PCB was replaced. (2) The lifetime of the non-volatile memory has been reached. (3) Non-volatile memory is installed incorrectly (wrong direction, bent pins, etc.).
Check	(1) Check the non-volatile memory on the PCB.
Correction	—
Example	—
Notes	—

H03, H13 alarm

Alarm code	H03, H13
Alarm meaning	Compressor 1 CT sensor disconnected or short-circuit; Compressor 2 CT sensor disconnected or short-circuit
Alarm conditions	Alarm occurs if the current value is 1.5 A or less when 2 seconds or longer have elapsed after output from that compressor started. * No current is detected even though the compressor is operating.
Probable cause	(1) CT circuit failure (including cut wiring, etc.) (2) Disconnected CT circuit connector (3) Missing phase where CT circuit is connected (4) This CT circuit is connected to the connector of the other CT circuit. (5) PCB failure (6) Noise
Check	(1) CT circuit failure, PCB failure Trouble: • Current value during compressor operation is below the threshold value. Check: • Check that the connector is not disconnected. • Check the continuity of the CT circuit. Install a normal CT in place of this CT and check. If current is detected, then the PCB can be judged OK. →CT circuit failure • Check that current is flowing in the phase where the CT circuit is connected. → Check voltage and current. (2) Crossed wiring or installation error Trouble: When the compressor is stopped, the current value at the other compressor is high. ☆ When this type of condition occurs, seizing-detection control takes priority. (3) If the cause is still unknown after checking the above, then it is possible that noise is the cause of the trouble. It is necessary to connect a PC or other instrument.
Correction	(1) Replace the CT circuit. (2) Replace the outdoor unit PCB. (3) Correct the problem.
Example	(1) The connector was not inserted after the PCB was replaced.
Notes	Use a normal CT as a tool to determine whether the trouble is a PCB failure or CT failure.

H05, H15 alarm

Alarm code	H05, H15
Alarm meaning	Compressor 1 discharge temperature sensor disconnected; Compressor 2 discharge temperature sensor disconnected
Alarm conditions	• This alarm occurs when the discharge sensor temperature detector is not inserted into the tube's sensor holder, or when the sensor itself has suffered some kind of malfunction other than a cut wire. • When outdoor air temperature is 0°C or higher: Alarm occurs if the temperature detected by the discharge sensor has changed by less than 2°C when the compressor has operated for 10 minutes immediately after start. • When outdoor air temperature is below 0°C: Alarm occurs if the temperature detected by the discharge sensor has changed by less than 2°C when the compressor has operated for 30 minutes immediately after start.
Probable cause	(1) Discharge sensor temperature detector is not inserted into the tube's sensor holder. (2) Discharge sensor itself has suffered some kind of malfunction other than a cut wire.
Check	(1) Check that the discharge temperature sensor is inserted into the sensor holder. (2) Check that sufficient heat-conducting putty is applied. (3) Remove the discharge sensor from the sensor holder and expose the sensor to the outside air for approximately 5 minutes. Check that the temperature detected by the sensor changes to match the outside air temperature. (However the sensor cannot detect temperatures at or below 0°C.)
Correction	(1) Install the sensor into the holder, and apply sufficient heat-conducting putty. (2) If the sensor is malfunctioning, replace it.
Example	—
Notes	The discharge temperature sensor is generally a sensor intended for accurate detection of high temperatures. Therefore, it will not accurately detect the temperature if the temperature at the measurement point is 20°C or below.

H01, H02, H11, H12 alarm

Alarm code	H01, H02, H1, H12
Alarm meaning	H01: Constant speed compressor 1 overcurrent alarm H02: Constant speed compressor 1 lock current alarm H11: Constant speed compressor 2 overcurrent alarm H12: Constant speed compressor 2 lock current alarm
Alarm conditions	Hx1: During operation, the compressor current value exceeded the value shown below for 30 seconds or longer. However this alarm is not detected for 4 seconds after the compressor starts. 4 HP: 23.0 A 5 HP: 31.6 A 6 HP: 34.8 A 7 HP: 34.8 A Hx2: During operation, the compressor current value exceeded the value shown below for 2 seconds or longer. However this alarm is not detected for 2 seconds after the compressor starts. 4 HP: 27.2 A 5 HP: 37.3 A 6 HP: 41.1 A 7 HP: 41.1 A
Probable cause	(1) Compressor failure (locked or partially locked) (2) CT circuit failure (including cut wiring) (3) Missing power phase (4) Low power voltage (5) PCB failure
Check	(1) Compressor failure (partially locked) Trouble: Current value during operation greatly exceeds the value shown in the table at right. Check: When the current for each phase is measured with a clamp meter or similar instrument, check that the current value for all phases is not high. If MG was forced ON (use caution), check that compressor noise will not occur or the compressor will not run with a groaning sound. (2) CT circuit failure, PCB failure Trouble: Check: • Check for poor connector contact. • Check the continuity of the CT circuit. • Install a normal CT in place of this CT and check. If current is detected, then the • PCB can be judged OK. →CT circuit failure • Check that current is flowing in the phase where the CT circuit is connected. →Check voltage and current. (3) Missing power phase Trouble: This alarm primarily occurs when the T-phase is missing. When the R-phase or S-phase is missing, CT trouble or PCB continuity trouble occur. However this may not be true in the case of a missing phase caused by magnet SW trouble. Check: There is the possibility of a magnet SW failure. Therefore, check the phase voltage at a location that is as close to the compressor as possible. (4) Low power voltage Trouble: In most cases, this occurs when another constant-speed compressor (including compressors in other units) or other device starts. It also occurs when the power wiring is extremely long. Check: Check the voltage between each of the phases. However if this trouble occurs when other devices or compressors start, then an oscilloscope is required. (5) PCB failure Trouble: Check: Check that the current value measured with the clamp meter is not lower than the value measured with the PC or remote controller. (6) If the cause is still unknown after checking the above, then it is possible that noise is the cause of the trouble. It is necessary to connect a PC or other instrument.
Correction	(1) Replace the compressor. (2) Replace the CT circuit. (3) Repair the power circuit. (4) Adjust the primary-side power. Repair the power wiring. (5) Replace the outdoor unit PCB. (6) Correct the trouble. * In the case of a compressor failure, it is likely that steps must be taken to correct the cause of the compressor failure (such as liquid back-up) in order to prevent recurrence. Be sure to check that there is no cause which may result in compressor locking.
Example	—

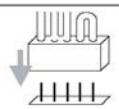
H06 alarm

Alarm code	H06
Alarm meaning	Low-pressure switch activated.
Alarm conditions	This alarm occurs when the low-pressure switch (installed at locations where pressure is always low) activated during A/C operation. (It indicates abnormal low pressure which may damage the compressor.) Because transient pressure decreases may occur, the A/C unit stops only if the low-pressure switch is activated continuously for 90 seconds. No alarm results the first 4 times the above acton occurs. The outdoor unit is stopped and conditions are observed. When the above action occurs for the fifth time, an alarm results. The 4 occurrences before the alarm results are known as "pre-trip." If the low-pressure switch recovers for 120 seconds continually during pre-trip, then the pre-trip count is reset to 0.
Probable cause	The A/C unit low pressure has dropped to a level that does not occur under ordinary conditions. (1) The absolute amount of gas in the system is too low (as a result of insufficient refrigerant charge or leak). (2) The refrigerant has accumulated in the circuit and has not returned to the compressor. Refrigerant has accumulated in a location of one-way flow and cannot escape. High-pressure level is low, resulting in poor flow of refrigerant in the circuit. (A lower high-pressure level results in a smaller difference between low pressure and high pressure, that may be insufficient to cause refrigerant flow.) (3) The refrigerant circuit has become closed, and refrigerant has not returned to the compressor. In some cases when moisture enters the refrigerant circuit, it can freeze at the low-pressure locations and the resulting ice can block the circuit.) ☆If the alarm occurs when there is sufficient refrigerant in the system ((2) and (3)), liquid refrigerant has definitely accumulated somewhere in the system. Liquid refrigerant generally accumulates in high-pressure locations. In this case the high pressure gradually increases (however it may not increase if the location where the liquid accumulates is sufficiently large). Depending on the refrigerant saturation temperature, it may also accumulate in low-pressure locations. In this case the high pressure is unlikely to increase.
Check	(1) Check that the service valve is open. (2) Check that none of the valves (4-way valves, mechanical valves) in the main refrigerant circuit is closed due to an operation failure. (3) Check that there is no possibility of foreign objects or water having entered the refrigerant circuit. (4) Check that valve leakage at a stopped sub unit has not resulted in accumulation of refrigerant at that sub unit. (5) Check that no refrigerant leakage has occurred.
Correction	(1) If there was a valve operation failure, in general it is necessary to replace the valve. (2) If a foreign object or moisture has entered the circuit, install a strainer or dry core (depending on the degree of the problem). (3) If refrigerant has leaked into stopped sub units, it is likely that valve leakage has occurred. The valve must be replaced.
Example	—
Notes	Low-pressure switch activation pressure: 0.048 ± 0.03 MPa Low-pressure switch recovery pressure: 0.147 ± 0.03 MPa

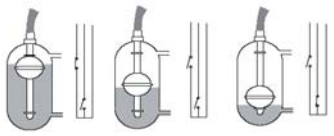
H07 alarm

Alarm code	H07
Alarm meaning	No-oil alarm
Alarm conditions	With a scroll compressor, this alarm occurs when the float-type oil sensor detects no oil. (This occurs when there is no oil and also when the float is stuck.) With an inverter compressor, this alarm occurs when there is no oil flow for a set period of time in the tubes where oil constantly flows. (The actual presence or absence of oil is detected by a temperature sensor. When oil is present, the temperature sensor indicates a temperature that is at or above the outdoor air temperature.)
Probable cause	Insufficient amount of oil in the system (1) The length of system tubing exceeds the allowable tubing length. (2) The difference in height between system units exceeds the allowable value. (3) A large amount of oil was drained when a compressor was replaced. (4) Oil has accumulated in a stopped outdoor unit and has not returned, as a result of refrigerant circuit clogging or valve leakage at the stopped outdoor unit. (5) A valve (ORVR, BALV, BPB) in the oil circuit has malfunctioned, or there is clogging of the circuit (capillaries) which returns oil from the oil separator to the compressor. (6) If an excessive amount or liquid returns to the compressor, oil foaming may increase oil discharge. The same occurs when the refrigerant proportion in the compressor is high at start, due to an open circuit in the crank case heater.
Check	(1) Check the tubing length and height differences. (2) Check the operation of system circuit valves. (3) Check that there is not an excessive amount of liquid return. (Check that there is no mechanical valve leakage.) (4) Check the crank case heater (wintertime).
Correction	(1) If insufficient oil is a possibility, then charge with additional oil. (2) If it is clear that a valve failure has occurred, replace the valve.
Example	—
Notes	—

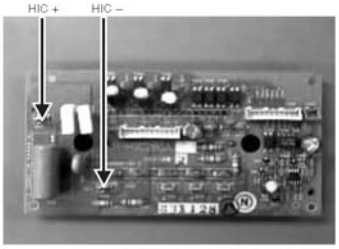
H08 alarm

Alarm code	H08
Alarm meaning	Oil sensor (connection) trouble (open circuit)
Alarm conditions	Pins 4 and 5 of the oil sensor connector are short-circuited to the jumper wire. When the connector becomes disconnected, the terminals that should be short-circuited become open. In this way, the disconnected connector is detected.
Probable cause	Disconnected connector
Check	Check that the connector is securely connected.
Correction	(1) Connect the connector. (2) Correct the connection at connector pins 4 and 5.
Example	—
Notes	 The shape of the oil sensor connector is as shown in the figure at left.

H27 alarm

Alarm code	H27
Alarm meaning	Oil sensor (connection) trouble (short circuit)
Alarm conditions	The oil sensor turns 2 switches ON/OFF by means of magnets inside the float. This sensor notifies the PCB of the oil level. For this reason, there are only three possibilities when this switch is functioning normally. (1) When the top switch is OFF and bottom switch is OFF, the oil level is within the normal range. (2) When the top switch is ON and the bottom switch is OFF, the oil level is too high. (3) When the top switch is OFF and the bottom switch is ON, the oil level is too low. In all other cases (i.e., when both the top switch and bottom switch are ON), there is a problem with the oil sensor or its wiring.
Probable cause	(1) There is a malfunction in the oil sensor itself. (2) There is a short circuit in the wiring that leads to the oil sensor.
Check	(1) Check that the connector is securely connected. (2) Check that the wiring is not crushed at any point. (3) If no problems are found at the above checks, then in order to determine the location of the short circuit, cut the wiring at a point approximately 10 cm from the sensor. If the alarm ceases, there is a short circuit inside the sensor. If the same alarm occurs, there is a short circuit prior to the point where the cut was made.
Correction	If the short circuit is in the wiring, repair the wiring. The connection must be sealed so that rainwater cannot enter it. If the short circuit is inside the oil sensor, the oil sensor must be replaced. Follow the instructions in the servicing technical materials to replace the sensor.
Example	—
Notes	The structure of the oil sensor is as shown below. 

H31 alarm

Alarm code	H31
Alarm meaning	HIC trouble alarm
Alarm conditions	This alarm occurs when the microcomputer identifies a trouble signal (indicating abnormal HIC temperature or other trouble) from the HIC.
Probable cause	The HIC judges the current and temperature, and outputs the trouble signal. In general this indicates trouble with the HIC itself.
Check	Check the power wiring and connector wiring. If the wiring and connectors are normal, use a tester to measure the resistance between the compressor HIC power (HIC+) and ground (HIC–). If there is a short circuit, there is an HIC malfunction. (The photo below shows a Super Espacio HIC.)  HIC PCB * In the Super W Multi, the fan circuit PCB is integrated with the outdoor unit PCB; however, the layout is the same as in the photo above.
Correction	If an HIC failure is found, replace the PCB.
Example	—
Notes	Turn OFF the power, and check the continuity of HIC+ and HIC– on the HIC PCB. In the Super W Multi, the HIC is integrated with the outdoor unit PCB. Therefore it is necessary to replace the outdoor unit PCB.

L04 alarm

Alarm code	L04
Alarm meaning	Outdoor system address duplication
Alarm conditions	Communication by inter-unit control wiring was received that contained the same address as that unit 5 times or more within 3 minutes.
Probable cause	Incorrect outdoor system address settings
Check	Check the system address settings again.
Correction	Correct the system address settings.
Example	—
Notes	Recovery from this alarm occurs automatically (when communication that contains the same address as that unit is not received for 3 minutes after detection).

L05 alarm

Alarm code	L05
Alarm meaning	Indoor unit priority duplication (at priority indoor units)
Alarm conditions	More than 1 indoor unit set for priority was detected.
Probable cause	More than 1 indoor unit is set for priority.
Check	From the wired remote controller, use the indoor unit EEPROM simple setting mode and check that the value of item code 04 is "0001."
Correction	Use the wired remote controller and correct the setting if the value of indoor EEPROM item code 04 is incorrect.
Example	—
Notes	This alarm is displayed at the indoor units that are set for priority. Alarm L06 is displayed at the indoor units that are not set for priority.

L06 alarm

Alarm code	L06
Alarm meaning	Indoor unit priority duplication (at non-priority indoor units) and outdoor unit
Alarm conditions	More than 1 indoor unit set for priority was detected in the system.
Probable cause	More than 1 indoor unit is set for priority in the system.
Check	Find the indoor units where alarm L05 has occurred in the system.
Correction	Refer to the alarm L05 correction.
Example	—
Notes	Alarm L06 occurs as a result of alarm L05. When the duplicated priority settings are corrected, alarm L06 is also corrected.

L10 alarm

Alarm code	L10
Alarm meaning	Outdoor unit capacity not set
Alarm conditions	The outdoor unit capacity has not been set, or the setting is not allowed by the system.
Probable cause	This alarm occurs because the capacity has not been set.
Check	Connect the outdoor unit maintenance remote controller. On the outdoor unit EEPROM detailed setting mode screen, check the value for the outdoor unit capacity (item code 81). Check that it is not set to "0" or to a capacity that is not allowed.
Correction	If item code 81 is incorrect, use the outdoor unit maintenance remote controller and set it correctly. * After changing the setting, be sure to reset both the indoor and outdoor power.
Example	—
Notes	The outdoor unit maintenance remote controller is required in order to set the capacity in the outdoor unit EEPROM.

L17 alarm

Alarm code	L17
Alarm meaning	Outdoor unit model mismatch
Alarm conditions	This alarm occurs when a unit other than a R410A refrigerant model is connected.
Probable cause	(1) A unit that uses R407C refrigerant, or a R22 model unit, was connected by mistake. (2) The connected unit is correct, however the refrigerant type setting in the outdoor unit EEPROM (item code 80) is incorrect.
Check	(1) Check the refrigerant type at the connected unit. (2) Use the outdoor unit maintenance remote controller and check the item code 80 refrigerant type. If the setting is incorrect, change it to R410A.
Correction	—
Example	—
Notes	The outdoor unit maintenance remote controller is required in order to set the refrigerant type in the outdoor unit EEPROM.

L18 alarm

Alarm code	L18
Alarm meaning	4-way valve operation failure
Alarm conditions	During heating, when 2 minutes and 30 seconds elapsed after compressor operation started, the temperature difference between the outdoor air temperature sensor and the heat exchanger 2 liquid temperature sensor was 40°C or higher.
Probable cause	(1) The 4-way valve connector (20S CN005) has become disconnected from the control PCB. (2) The 4-way valve circuit is locked (malfunctioning).
Check	(1) Check the 4-way valve connector (20S CN005). (2) If the connector is normal, check the 4-way valve wiring and the PCB circuit.
Correction	If the connector is normal, correct or replace the problem locations.
Example	—
Notes	—

P02 alarm

Alarm code	P02
Alarm meaning	Compressor 1 or compressor 2 motor winding overheating alarm
Alarm conditions	In an inverter compressor, pre-trip stop occurs when the bimetal thermostat inside the terminal reaches 115±3°C or higher. In a constant speed compressor, pre-trip stop occurs when an open circuit occurs in the compressor protective thermostat at a temperature of 130 – 140°C or higher. The protective detection circuit in an inverter compressor or constant speed compressor is installed in series with the compressor MG control circuit, so that it is in a position to control this circuit directly. It is not possible to identify which compressor the pre-trip (or alarm) has occurred at. An alarm occurs when the pre-trip count reaches 3. The condition for clearing the count is the recovery of the bimetal thermostat. (Recovery occurs at 95±5°C in an inverter compressor, and at 70°C in a constant speed compressor.)
Probable cause	(1) Insufficient gas • Insufficient refrigerant charge at the time of the test run • Refrigerant leakage (2) Leakage of refrigerant into a stopped unit (malfunction of the liquid valve, mechanical valve, defrost valve, or other valve at the stopped unit) (3) Disconnected discharge thermistor • The discharge temperature sensor of that compressor is connected to the discharge tube of the other compressor. • The connector for the discharge temperature sensor of that compressor is connected to the outdoor unit PCB connector of the other compressor. (4) Outdoor unit PCB failure, looseness of protective circuit terminals (5) Liquid valve, mechanical valve, or other valve failure or connection error (6) Operation at a super-high compression ratio that is outside the service range (in particular, heating operation when the outdoor air temperature is extremely cold, or faulty defrost operation) (7) Intrusion of moisture (refrigerant circuit blocked due to freezing at the strainer or mechanical valve), intrusion of foreign objects
Check	Check methods are fundamentally the same as those for P03 and P17. (1) In the case of operation at a super-high compression ratio, this alarm may have been caused by operation at a low pressure of 0.1 MPa or less for a long period of time. Check that there is no large deviation of the detected outdoor air temperature, and that defrost is being performed normally. (2) It is extremely difficult to identify cases of moisture intrusion, however based on previous experience, it is possible to detect it from the differing frost conditions before and after the strainer.
Correction	(1) Adjust the amount of refrigerant. (2) Investigate the stopped outdoor units. (3) Check the thermistor. (4) Check for looseness or other problems with functional parts, wiring, and connectors. (5) Use a PC to monitor the operating conditions over a long period of time. (6) Monitor the operating conditions. Check for moisture, attach a dry core, repeat vacuum application, and take other similar steps.
Example	(1) Moisture choking: If the evaporation temperature (refrigerant temperature) is below 0°C, clogging occurs at the strainer near the service valve. (2) Leakage at the valve of a stopped unit results in refrigerant accumulating to fill the stopped unit. Symptoms of insufficient gas continue even after an additional charge of 30 kg is performed.
Notes	When the bimetal thermostat trips, the pre-trip counter is set to 1 and the compressor stops. If the bimetal thermostat has not recovered after the compressor is stopped for 3 minutes, then the pre-trip counter is set to 2 and the compressor remains stopped. This alarm occurs if the bimetal thermostat has not recovered after the compressor is stopped for another 3 minutes.

Continued

P03, P17 alarm

Alarm code	P03, P17
Alarm meaning	Compressor 1 discharge temperature trouble; Compressor 2 discharge temperature trouble
Alarm conditions	Inverter compressor: Temperature is 110°C or higher and pre-trip stop has occurred. Constant speed compressor: Temperature is 130°C or higher and pre-trip stop has occurred.
Probable cause	(1) Liquid valve operation failure (2) Clogging of liquid valve capillaries (3) Crossing of liquid valves (4) Insufficient amount of refrigerant (including trouble resulting from an insufficient initial charge and from gas leakage) Blocking of low-pressure parts caused by intrusion of foreign objects (moisture, scale, etc.) (5) Crossing (tubing or PCB connectors) with the other compressor thermistor (6) Expansion valve operation failure (7) Accumulation of refrigerant at stopped outdoor units (8) Compressor discharge sensor failure (9) PCB failure (A/D conversion failure) (10) Electrical noise
Check	(1) Liquid valve operation failure. Trouble: Compressor discharge temperature does not decrease even when the liquid valve is ON. Check: • Check that 220 – 240 V is supplied to the coil when liquid valve ON signal is output. • Check that a click sound occurs when the liquid valve changes from OFF → ON. • Check that the coil becomes warm when some amount of current is applied. ☆A liquid valve failure may be the result of a malfunction in the valve itself or in the coil. (2) Clogging of capillaries Trouble: Compressor discharge temperature does not decrease even when the liquid valve is ON. Check: When the liquid valve is operating and the liquid valve is ON, check that the secondary side of the liquid capillaries is cold. (3) Crossing of liquid valves Trouble: The discharge temperature of the other compressor decreases when the liquid valve at this compressor turns ON. (The other compressor must be operating.) Check: • Check that the liquid valve of the other compressor is not ON when the liquid valve at this compressor is turned ON. → It is possible that the coil is reversed. (4) Insufficient refrigerant Trouble: Liquid effectiveness is poor. Check: Check whether or not the superheating temperature is declining if the evaporator mechanical valve is opened to 300 pulses or more (after checking for foreign object intrusion). (5) Foreign object intrusion Trouble: Liquid valve effectiveness is poor. Check: Check that there is no difference in the condensation or frost conditions between the strainer primary-side and secondary-side tubing. (6) Crossed thermistor Trouble: The discharge temperature of the other compressor is high although only this compressor is operating. When the liquid valve turns ON, the discharge temperature of the other compressor decreases.

Continued

	(7) Accumulation of refrigerant in stopped outdoor units Trouble: • System is OK when all outdoor units are operating, however symptoms of insufficient gas occur when a certain outdoor unit is stopped. • Condensation or frost is visible up to the top of the accumulator of the stopped outdoor unit. • After an outdoor unit stops, there is the sound of refrigerant flowing into an outdoor unit that was stopped for a long time. • When an outdoor unit starts after being stopped for a long time, the start is accompanied by much vibration. Check: • Representative parts include the liquid capillaries (secondary side of capillaries will be cool during cooling operation), mechanical valve, mechanical valve bypass check valve (sound of refrigerant flow can be heard, and stops when the liquid valve is closed), hot gas defrost valve (if valve secondary side remains hot even after much time has passed, be careful not to mistake transmitted heat for a valve failure). • Ice is growing on the lower parts of some outdoor unit heat exchangers but not on others. ☆ Because this trouble may occur even in outdoor units with a high operating rate under conditions of insufficient gas, caution is needed. (8) Sensor failure Check: • This alarm is likely to occur when wiring is partially cut. (It is difficult to identify, even when continuity is checked.) The detected discharge temperature is high. • Although such conditions rarely occur, a P02 alarm is likely if the detected discharge temperature is low. • Replace the sensor with another discharge sensor and compare the temperature conditions. (9) If the cause is still unknown after checking the above, then it is possible that electrical noise is the cause of the trouble.
Correction	(1) Replace the sensor. (2) Replace the outdoor unit PCB. (3) Correct the problem locations.
Example	All of the probable causes
Notes	Operates continuously for a set length of time. Indicates 25 minutes or longer for an inverter unit and 30 minutes or longer for a constant-speed unit.

P04 alarm

Alarm code	P04
Alarm meaning	High-pressure switch activated
Alarm conditions	Activation of the electronic circuit inside the high-pressure switch causes a short-circuit at the terminal, as determined by the pressure. The terminal is short-circuited when the pressure is 3.8 MPa or higher. After the short-circuit is activated, the terminal remains short-circuited until the pressure drops to 3.15 MPa.
Probable cause	(1) The check valve installed in the compressor discharge tubing has malfunctioned. (2) The service valve is closed. (3) The outdoor unit heat exchanger became clogged during cooling operation. (4) An air short-circuit occurred in the outdoor unit during cooling operation. (5) The outdoor unit fan malfunctioned during cooling operation. (6) The indoor unit air filter became clogged during heating operation. (7) An air short-circuit occurred in the indoor unit during heating operation. (8) The indoor unit fan malfunctioned during heating operation. (9) The refrigerant circuit has become clogged. (10) The mechanical valve has malfunctioned. (11) The solenoid valve kit has malfunctioned. (12) The amount of refrigerant charge is too large. (13) The high-pressure switch has malfunctioned.
Check	(1) Check that the high-pressure switch connector is securely connected. (2) If the connection is secure, attach a pressure gauge to the high-pressure outlet and monitor the high pressure value during operation. Check the pressure at which the high-pressure switch activates. If it is less than 3.8 MPa, the cause of the trouble may be a check valve malfunction. The following apply to cases when the high-pressure level really is too high. (3) If operation is cooling operation, check that the outdoor unit heat exchanger is not clogged. Remove any objects that impede the flow of air. (4) If operation is cooling operation, check that an air short-circuit has not occurred at the outdoor unit. Conditions are OK if the air temperature around the outdoor unit is not abnormally high during operation. (5) If operation is cooling operation, check that the outdoor unit fan has not malfunctioned. Check that the fan installation screws are not loose. Check that the fan connector is securely inserted into the outdoor unit PCB. (6) If operation is heating operation, check that the indoor unit air filter has not become clogged. If it is clogged, clean it. (7) If operation is heating operation, check that an air short-circuit has not occurred at the indoor unit. Conditions are OK if the air temperature at the indoor unit air intake is not abnormally high. (8) If operation is heating operation, check that the indoor unit fan has not malfunctioned. (9) Check that the refrigerant circuit has not become clogged. Check that all of the service valves are open. Check that welded portions are not blocked. (10) Check that the mechanical valve has not malfunctioned. Check whether or not the mechanical valve produces a scraping noise. The location of the indoor unit mechanical valve makes it difficult to hear noise. Therefore check electrically. Check that 4 V is output to the mechanical valve connector pin on the PCB. Also, check that the resistance of the mechanical valve coil windings is several 10s of +Ω. (11) Check that the solenoid valve has not malfunctioned. When the coil is removed at a time when the switch should be ON, there should be a click sound. When the coil is removed at a time when the switch should be OFF, there should be no sound. (12) Check that the amount of refrigerant charge is not too large. If the sub-cool temperature at the condenser discharge port is 15°C or higher, over-charging has occurred.
Correction	Replace the malfunctioning parts or correct the amount of refrigerant charge.
Example	—
Notes	—

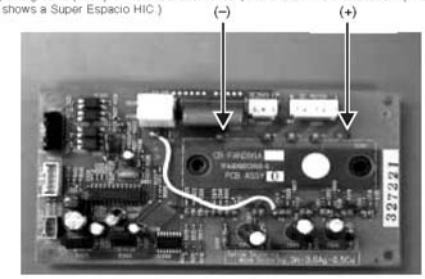
P05 alarm

Alarm code	P05
Alarm meaning	Reverse phase (or missing phase) detected
Alarm conditions	This alarm occurs when a reverse phase or missing phase is detected in the R-S-T phases.
Probable cause	Reverse phase or missing phase in the R-S-T phases
Check	Check the wiring at the power terminal plate.
Correction	Switch the phases and reinsert. Check if the result is OK.
Example	—
Notes	—

P16 alarm

Alarm code	P16
Alarm meaning	Inverter compressor overcurrent alarm
Alarm conditions	This alarm occurs when current trouble or current detection trouble occur at an inverter frequency of less than 80 Hz after start (when trouble judgment current is detected in the primary or secondary current, or when an instantaneous secondary current of 48 A or higher is detected.
Probable cause	There is a strong possibility of a compressor failure. An alarm occurs for current detection trouble when it is judged that no current is flowing after start (DCCT is damaged). In this case, the cause is a DCCT failure.
Check	Check the power wiring and connector wiring.
Correction	It is possible to resolve this trouble by limiting the maximum frequency.
Example	—
Notes	—

P22 alarm

Alarm code	P22
Alarm meaning	Fan motor trouble
Alarm conditions	Fan motor start failure, fan motor Hall IC input failure
Probable cause	Possible causes are a Hall IC input circuit failure and a fan HIC failure.
Check	Check the fan motor wiring, the Hall IC wiring, and the connector connections. If the wiring and connectors are normal, then check that the capacitor of the Hall IC input circuit is securely soldered onto the PCB. Also use a tester and measure the resistance between fan HIC power (HIC+) and ground (HIC–). If there is a short circuit, there is an HIC malfunction. (The photo below shows a Super Espacio HIC.)  Fan circuit PCB * In the Super W Multi, the fan circuit PCB is integrated with the outdoor unit PCB; however, the layout is the same as in the photo above.
Correction	If the fan does not start, the below corrections may be effective. (1) If there is a fan HIC failure or circuit failure, replace the PCB. (2) If the fan motor is locked, replace the fan motor.
Example	—
Notes	Turn OFF the power, and check the continuity of "+" and "-" on the fan circuit PCB.

Blinking inspection display (2) (compressor magnet SW seizing detection)

Alarm code	(Blinking inspection display)
Alarm meaning	Compressor magnet SW seizing detected Status: Although an outdoor unit exists where the outdoor unit fan is running, no compressors in the system are operating. ☆ Because the fan is running only at the outdoor unit where seizing was detected, check the corresponding outdoor unit. * The fan may also run on its own when fan cracking prevention control is in effect or when snowfall sensor input is present. Therefore monitor for approximately 10 minutes if the outdoor unit fans are operating at multiple units.
Alarm conditions	Current is detected in the CT circuit when the compressor is stopped. (1) This control is not engaged for the first 30 seconds after the compressor turns ON →OFF. (2) For 1 minute following the first 30 seconds after the compressor turned ON →OFF, the threshold for the detected current is 10 A or more continuing for 2 seconds. (3) All times other than the above: • If the low-pressure SW has not activated, the threshold for the detected current is 7A or more continuing for 5 seconds. • If the low-pressure switch has activated, the threshold for the detected current is 7A or more continuing for 2 seconds.
Probable cause	(1) Magnet SW malfunction • The magnet SW has seized, and the compressor is continuing to run. → Even when the power is turned OFF, the primary side and secondary side contacts remain together. • The conditions of magnet SW operation are poor (difficult to open). → When a magnet SW is used in a DC circuit, it may be difficult for the SW to open at times. In an AC circuit the magnet SW should open instantaneously as long as the current is within the allowable range. However, this kind of trouble can occur if excessive current flows, and may prevent the SW from opening. (2) CT circuit failure or PCB failure (A/D failure) • CT circuit contact failure → Check that the connector is not partially disconnected. Wiggle the connector to check the connection.* * These symptoms will not occur if the connector is completely disconnected or the wire is cut. In these cases alarm Hx3 occurs. • Current of 7A or higher was detected although the compressor was stopped, or a higher current was detected at occasional intervals. • The compressor continues to operate at a time when the outdoor unit should be stopped (such as when all indoor units are stopped). → Check whether or not 200 V is output from the PCB to the magnet SW. If the voltage is output, there is a PCB failure. (3) Installation error • CT1 connector is connected to the compressor 2 side • CT1 circuit is connected to the compressor 2 side. • CT2 connector is connected to the compressor 1 side • CT2 circuit is connected to the compressor 1 side. (4) Electrical noise
Correction	(1) Replace the CT circuit. (2) Replace the magnet SW. (3) Replace the PCB.
Notes	The effects of electrical noise are difficult to identify unless a PC is connected and the conditions are monitored for a long period of time.

P26 alarm

Alarm code	P26
Alarm meaning	Inverter compressor high-frequency overcurrent alarm
Alarm conditions	This alarm occurs when current trouble or current detection trouble occurs at an inverter frequency of 80 Hz or higher after start (when trouble judgment current is detected in the primary or secondary current, or when an instantaneous secondary current of 48 A or higher is detected).
Probable cause	The detection methods are the same as for P16. However the fact that operation up to high frequencies is possible does not necessarily mean that a compressor failure is the cause of the trouble. Start the compressor several times. If alarm P26 occurs every time and alarm P16 does not occur at all, then the possibility of a compressor failure is low.
Check	Check the power wiring and connector wiring.
Correction	It is possible to resolve this trouble by limiting the maximum frequency.
Example	—
Notes	—

P29 alarm

Alarm code	P29
Alarm meaning	Inverter compressor missing phase or lock alarm
Alarm conditions	This alarm may occur at start, and occurs when missing phase or lock is detected, and when a DCCT failure occurs.
Probable cause	Generally this alarm occurs when the refrigerant pressure balance is uneven at start, or when inverter compressor lock occurs, there is a missing phase in the inverter compressor wiring, or a DCCT failure occurs. This can be judged to be starting trouble which is not caused by HIC.
Check	Check the power wiring and connector wiring.
Correction	DCCT failure (replace PCB) or compressor failure
Example	—
Notes	Use a tester to measure the voltage between the DCCT output terminal on the rear of the PCB and the ground. If the voltage is not within 2 – 3 V, then the DCCT has malfunctioned.

Blinking Inspection Display on the Remote Controller

Caution: Currently the blinking inspection display can be displayed only on the wired remote controller and system remote controller.

Blinking inspection display (1) (Automatic backup)

Alarm code	(Blinking inspection display)
Alarm meaning	Automatic backup of Alarm meaning is in progress. A/C units can be operated. Status: The compressor at one of the outdoor units where the outdoor unit fan is running should be operating. * Blinking inspection display also occurs when seizing of the compressor magnet SW is detected. Because this may also be the case, refer to "Blinking inspection display (2) (compressor magnet SW seizing detection)."
Alarm conditions	When alarm P16, P22, P26, P29, Hx1, Hx2, or H31 has occurred, correcting the control device (remote controller, etc.) input engages this mode.
Probable cause	Because alarm P16, P22, P26, P29, Hx1, Hx2, or H31 has occurred, check the alarm history then refer to the corresponding items.
Correction	Follow the instructions in the corresponding items to correct the trouble.
Recovery	After repairing the malfunctioning locations, reset the power for the system (all outdoor units). Caution: Automatic backup mode will not be canceled until the power is reset.
Notes	Automatic backup mode is not engaged in cases of alarms other than those listed above. Reasons: • There is no need for automatic backup if recovery is possible by correcting the remote controller input. • With alarms for which automatic recovery is possible (such as sensor alarms), the presence of electrical noise may result in a new alarm. However, it is believed that this occurs for a comparatively short time only. In these cases, a mode (automatic backup mode) that limits operation may be engaged. • Control is not possible when a communications system alarm has occurred. Automatic backup mode is not engaged in order to avoid causing secondary damage.

7-6 Inspection of parts

7-6.1. Main Unit

(1) Compressor protective thermostat (49C1)

- Disconnect the CN046 connector (3P, black) from the outdoor unit control PCB. Check the continuity between socket pins 1 and 3. The continuity is OK if the result is 0 Ω.

(2) High-pressure switch (63PH1, 2)

- 63PH1: Disconnect the CN042 connector (3P, white) from the outdoor unit control panel. Measure the resistance between socket pins 1 and 3. The resistance is OK if the result is 0 Ω.
- 63PH2: Disconnect the CN044 connector (3P, red) from the outdoor unit control panel. Measure the resistance between socket pins 1 and 3. The resistance is OK if the result is 0 Ω.

(3) Low-pressure switch (63PL)

- 63PL: Disconnect the CN045 connector (3P, yellow) from the outdoor unit control panel. Measure the resistance between socket pins 1 and 3. The resistance is OK if the result is 0 Ω.

(4) Electronic control valve (MOV1, 2)

- MOV1: Measure the voltage between plug pin 5 and pins 1 through 4 at the CN015 connector (6P, white) on the outdoor unit control PCB. (Because of the pulse output, a simplified measurement method is used. Set the tester to the 12 V range; if the value displayed is approximately 4 V, then the voltage is normal.)

  If the voltage is normal, measure the resistance between connector pin 5 and pins 1 through 4.

  Resistance between pin 5 and pins 1 through 4 should be approximately 46 Ω for all. (If the result is 0 Ω or ∞, then replace the coil.)
- MOV2: Measure the voltage between plug pin 5 and pins 1 through 4 at the CN016 connector (6P, red) on the outdoor unit control PCB. (Because of the pulse output, a simplified measurement method is used. Set the tester to the 12 V range; if the value displayed is approximately 4 V, then the voltage is normal.)

  If the voltage is normal, measure the resistance between connector pin 5 and pins 1 through 4.

  Resistance between pin 5 and pins 1 through 4 should be approximately 46 Ω for all. (If the result is 0 Ω or ∞, then replace the coil.)

(5) Crank case heater

- Connect a clamp meter to 1 of the 2 crank case heater wires and measure the current. The current is normal if the result is 0.15 A or higher. (As a guide, the current should be 0.14 A (180 V) – 0.17 A (220 V).)

7-6.2. Sub Unit

(1) Compressor protective thermostat (49C)

- Disconnect the CN046 connector (3P, black) from the outdoor unit control PCB. Check the continuity between socket pins 1 and 3. The continuity is OK if the result is 0 Ω.

(2) High-pressure switch (63PH1, 2)

- 63PH1: Disconnect the CN042 connector (3P, white) from the outdoor unit control panel. Measure the resistance between socket pins 1 and 3. The resistance is OK if the result is 0 Ω.
- 63PH2: Disconnect the CN044 connector (3P, red) from the outdoor unit control panel. Measure the resistance between socket pins 1 and 3. The resistance is OK if the result is 0 Ω.

(3) Low-pressure switch (63PL)

- 63PL: Disconnect the CN045 connector (3P, yellow) from the outdoor unit control panel. Measure the resistance between socket pins 1 and 3. The resistance is OK if the result is 0 Ω.

(4) Electronic control valve (MOV1, 2)

- MOV1: Measure the voltage between plug pin 5 and pins 1 through 4 at the CN015 connector (5P, white) on the outdoor unit control PCB. (Because of the pulse output, a simplified measurement method is used. Set the tester to the 12 V range; if the value displayed is approximately 4 V, then the voltage is normal.)

  If the voltage is normal, measure the resistance between connector pin 5 and pins 1 through 4.

Resistance between pin 5 and pins 1 through 4 should be approximately 46 Ω for all. (If the result is 0 Ω or ∞, then replace the coil.)

- MOV2: Measure the voltage between plug pin 5 and pins 1 through 4 at the CN016 connector (5P, red) on the outdoor unit control PCB. (Because of the pulse output, a simplified measurement method is used. Set the tester to the 12 V range; if the value displayed is approximately 4 V, then the voltage is normal.)

  If the voltage is normal, measure the resistance between connector pin 5 and pins 1 through 4.

  Resistance between pin 5 and pins 1 through 4 should be approximately 46 Ω for all. (If the result is 0 Ω or ∞, then replace the coil.)

(5) Crank case heater

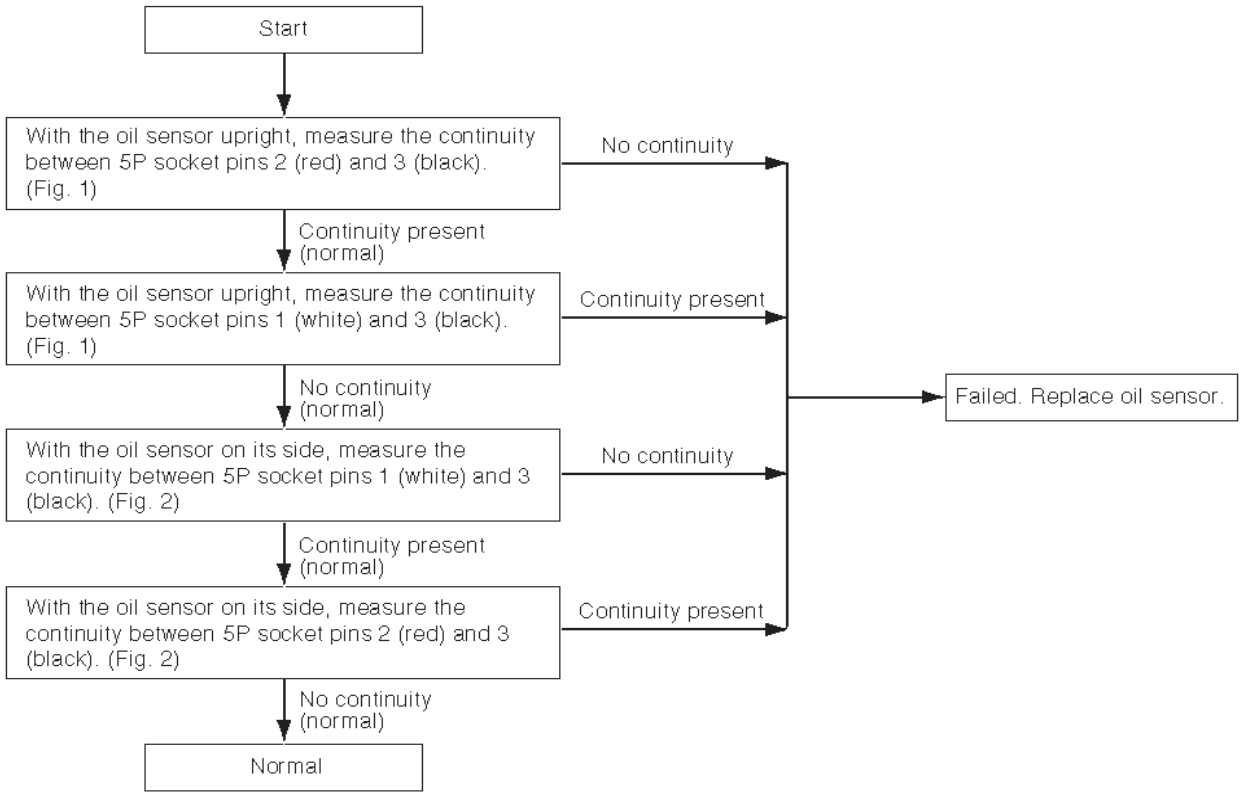
- Connect a clamp meter to 1 of the 2 crank case heater wires and measure the current. The current is normal if the result is 0.10 A or higher. (As a guide, the current should be 0.149A (180 V) – 0.23 A (220 V).)

* Two crank case heaters are attached. Each one must be checked individually.

7-6.3. Oil Sensor

Outdoor unit repair procedure

Follow the instructions under the removal item in "10. Oil Sensor" and remove the oil sensor. Turn the oil sensor unit upside-down, and drain the oil out from the higher of the 2 tubes.



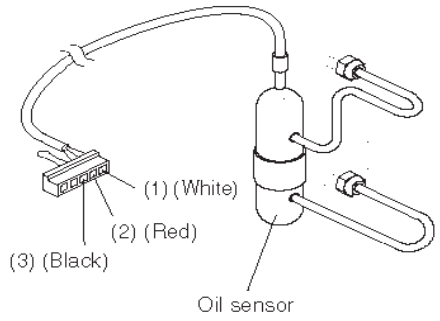


Fig. 1

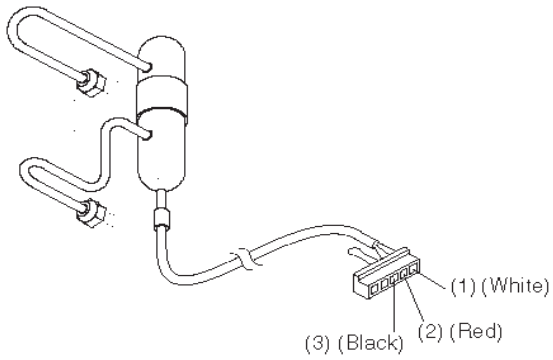


Fig. 2

Test Pin

When the test pin on the outdoor unit control PCB is short-circuited, each part can be operated individually.

(1) Main unit

- After turning OFF the main unit power, short circuit the test pin (CN022, white), then turn the power back ON. Output is performed in the sequence shown in the table below, for 0.5 seconds each.

	Output	Operation		Output	Operation
1	Relay RY006	Balance valve (BALV)	10	Relay RY018	SC valve (SCV1)
2	Relay RY004	4-way valve (2OS)	11	Relay RY017	Refrigerant balance valve (RBV)
3	Relay RY012	Oil detection valve (ORVI)	12	Relay RY016	Refrigerant adjustment valve (RCV)
4	Relay RY011	Pump-down valve (optional)	13	Relay RY013	O_2 output (O2)
5	Relay RY010	Defrost valve (DFV)	14	Relay RY002	Crank case 2 (CH2)
6	Relay RY008	Liquid valve 2 (LIVA)	15	Relay RY003	Crank case 1 (CH1)
7	Relay RY009	Liquid valve 1 (LIVI)			
8	Relay RY005	Bypass valve (BPV)			
9	Relay RY007	Recovery valve (ORVR)			

(2) Sub unit

- After turning OFF the sub unit power, short circuit the test pin (CN022, white), then turn the power back ON. Output is performed in the sequence shown in the table below, for 0.5 seconds each.

	Output	Operation		Output	Operation
1	Relay RY006	Balance valve (BALV)	7	Relay RY007	Recovery valve (ORVR)
2	Relay RY004	4-way valve (2OS)	8	Relay RY018	SC valve (SCV1)
3	Relay RY011	Pump-down valve (optional)	9	Relay RY013	O_2 output (O2)
4	Relay RY010	Defrost valve (DFV)	10	Relay RY002	Crank case 2 (CH2)
5	Relay RY008	Liquid valve 2 (LIVA)	11	Relay RY003	Crank case 1 (CH1)
6	Relay RY009	Liquid valve 1 (LIVI)			

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