Refrigerant R410A
INVERTER

AIRSTAGE J-IV

Small VRF system

for light commercial
and home use

SERVICE MANUAL

FUJITSU GENERAL LIMITED

208/230V 60Hz

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Refrigerant R410A INVERTER

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1. TEST RUN

1. TEST RUN

1-1 EXECUTION PROCEDURE AND EXECUTION PRECAUTIONS

	Execution procedure and precautions	Reason
Before execution		
Location decision	Do not install the units in the place not recommended in the installation manual.	• The performance may drop significantly due to the protection controlling
Confirmation of Refrigerant used	Check the characteristics of the refrigerant used and grasp the special features of the refrigerant. If refrigerant must be charged, always charge the refrigerant specified for the product. *Confirm the product design pressure. < R410A 597psi (4.12MPa) >	• Use of a refrigerant other than the specified refrigerant will invite equipment trouble
Preparation of execution drawings	Prepare the design for the system	
Confirmation of installation site Preparation before execution	① Use new refrigerant piping of the thickness specified by the D&T manual. ② Since R410A dedicated tools are necessary, prepare them in advance. ③ Absolutely avoid use of existing piping. If use of existing piping is unavoidable, the piping must be cleaned.	• Secure the necessary pressure resistance.
Execution 1/2		
Sleeve and insert work Indoor unit installation	Always use a level and keep the indoor unit level. If the equipment is tilted toward the drain port, install it so that the tilt is within 13/32in.(10mm). Excessive tilt will cause water leakage.	• Prevention of water leakage
Refrigerant piping work	When performing piping work, observe the following items so that the inside of the piping is clean and air tight. ① Use pipe that is not dirty inside. ② Confirm the design for the piping (Diameter, Thickness) ③ When the pipe is left standing, protect it. ④ Confirm the angle of separation tube and header correctly. ⑤ Finish flaring exactly. ⑥ Confirm the width across flats dimension and shape of flare nuts. ⑦ Always blow nitrogen while brazing. ⑧ Perform flushing before connecting the equipment.	• Foreign matter, water, etc. in the piping will cause faulty cooling and compressor trouble. • Incorrect pipe diameter will cause faulty cooling • Incorrect angle of separation tube or header will be cause poor cooling or refrigerant noise problem • Refrigerant leakage will cause low performance and abnormal stopping
Drain piping work Duct work Heat insulation work	① Always make the downward slope of the drain pipe 1/100 or greater and make the horizontal length within 66ft. (20m). ② Use hard polyvinyl chloride pipe as the drain pipe. ③ Support the drain pipe between 59-1/16 in (1.5m) to 6-3/4 in (2.0m). ④ Use pipe of 1 rank up (VP30 or greater) as central piping.	• Prevention of water leakage
Electrical work Outdoor unit foundation work	Select the size of the heat insulating material according to the ambient temperature and relative humidity of the refrigerant. Use a heat insulating material having a heat conductivity of 0.043W/(m.k) or less.	• Prevention of water leakage
Outdoor unit installation	When making flare connections always use a torque wrench and tighten the flare nut positively to the specified torque.	• Refrigerant leakage will cause low performance and abnormal stopping.
Refrigerant piping connection work	Pressurize the product with nitrogen gas up to the design pressure and conduct a 24Hr air tightness test.	• Refrigerant leakage will cause low performance and abnormal stopping.
Air tightness test Vacuum drying	① Install a vacuum pump with reverse flow check mechanism or a reverse flow check adapter to a conventional vacuum pump and use. ② Pump down sufficiently. Approximately 1 hour or longer after -14.5psi (-0.10MPa) reached. Allow to stand for approximately 1 hour after stopping the vacuum pump and confirm that the needle does not return. ③ Air purging using refrigerant is strictly prohibited.	• Mixing in of vacuum pump oil by reverse flow will cause equipment trouble. • recommend the vacuuming mode

*Vaccuming mode

This function is used for vacuuming the indoor unit and the connection piping.

Note: For starting Vacuuming mode, the refrigerant address setting has to be finished.

When the [vacuuming mode] is set, <Push switch setting, F3:21>
EEV of connected all indoor units opens.
So, the vacuuming indoor unit and piping becomes easier.

When the vacuuming ends, please turn off the power supply for all of the indoor units and the outdoor unit, [vacuuming mode] is released.

Execution 2/2

	Execution procedure and precautions	Reason
Addition refrigerant charging	① Confirm the additional refrigerant amount with the installation manual, etc. ② Always take the R410A refrigerant from the cylinder liquid phase and charge it using the gas phase. (Do not lay a cylinder with siphon pipe on its side.) ③ Use an R410A dedicated gauge manifold and charging hose. ④ Charge refrigerant using the liquid pipe. ⑤ When the defined amount of refrigerant cannot charge using the liquid pipe, charge refrigerant using the gas pipe while opearting the cooling test run. Charge refrigerant bit by bit with cautious operation of valve for the liquid refrigerant back prevention.	• If taken from the air phase, since the composition of the refrigerant which is charged will change, low performance and abnormal stop will occur easily. • Prevent erroneous sealing in of refrigerant.
Gas leak test	Use an R410A dedicated leak tester to check for gas leaks.	• A leak tester for other than R410A cannot detect leaks.
Initial setting	① Set the refrigerant circuit address. ROTARY SW: REF ADX10, X1 ② Confirm the DIP SW setting SET 1: Factory setting, SET 2 : Factory setting, SET 3 : All OFF, SET 4: Factory setting ③ Confirm the Terminal resister setting SET 5-4 OFF: Disable, ON: Enable	• Dual address setting No. is not allowed in one network. • If the DIP SW setting is wrong, the system may not work correctly • If the Terminal resister setting is wrong, the system may detect transmission error
	[Note] Perform in the power OFF state.	
Piping length setting	Set according to the length of the connection piping. Set to "Standard 131ft. to 213ft. (40 to 65m)" at the factory. Set using the push button SW on the outdoor unit main PCB. < Refer to the Page 01-17 Setting mode F2-00 > Set the pipe length to be the nearest indoor unit from the outdoor unit	• When the setting is not same as the real piping length, the system may not work correctly. • If the pipe length is set as the farthest indoor unit, the nearest operating indoor unit may be stopped the operation by the icing up protection as by over cooling.
	[Note] Perform in the power ON state after all indoor units have stopped operation	
Address setting for Signal Amp - When using signal Amps -	When setting the address of Signal amplifier, please refer to the installation manual of the signal amplifier. The address setting can be set by automatically from 1 outdoor unit on the network. < Refer to the Page 01-06 Setting mode F3-10 >	• Dual address setting No. is not allowed in one network.
	[Note] Manual setting: Set the rotary SW on the PCB in the power OFF state. Automatic address setting: Perform setting by push button SW on the outdoor unit Main PCB in the power ON state after all indoor units have stopped operation.	
Address setting for Indoor unit	Set the refrigerant circuit address and indoor unit address. Can be set by rotary SW on the indoor unit PCB (Main PCB or Switch PCB) or from a remote controller or from a push button SW on the outdoor unit Main PCB < Automatic address setting, Refer to the Page 01-07 Setting mode F3-11>	• Dual address setting No. is not allowed in one network.
	[Note] Manual setting: Set the rotary SW on the PCB in the power OFF state. Automatic address setting: Perform setting by push button SW on the outdoor unit Main PCB in the power ON state after all indoor units have stopped operation.	
Indoor unit connection check	Before starting the system, check on the number of indoor units and the total capacity. < Refer to the Page 01-08 Setting mode F3-12 >	• Normal operation will not be possible without performing the indoor unit connection check.
Test run & adjustment	[Note] Perform setting by push button SW on the outdoor unit Main PCB in the power ON state after all indoor units have stopped operation.	
Turnover & explanation of operation		

1-2 TEST RUN METHOD

1-2-1 Check Items Before Power ON

Procedure	Check contents	Judgement standard	Check
Power source	Circuit breaker capacity	Outdoor unit: 30A (AOU36,48RLAVM4) / 40A (AOU60RLAVM4)	
		Indoor unit: 15A	
		Leakage current: 30mA 0.1sec or less	
		Install a breaker (Included with Earth Leakage Circuit Breaker) in accordance with the related laws and regulations.	
	Type of power source wiring	Outdoor unit: Select the power cable type and size in accordance with relevant local regulations.	
		Indoor unit: Select the power cable type and size in accordance with relevant local regulations.	
	Supply power source	Outdoor unit side: AC 208 - 230V	
		Indoor unit side: AC 208 - 230V	
	Wiring on terminal blocks	Use crimp-type terminals with insulating sleeves for stranded conductor cable	

Outdoor unit	Appearance	Shall be no scratches, deformation, etc. (Be careful of deformation of the front panel)	
	Serial No.	Shall be checked and entered in the check sheet.	
	Outside air temperature	Shall be checked and entered in the check sheet.	
	Power source wiring connection	Connection points check & loose terminal block screws check	
	Type of communication line	22 AWG (0.33mm^2), shielded wire used	
	Communication line connection	Connection points check & loose terminal panel screws check	
	Connection piping	Check whether or not the heat insulation material is installed without a gap.	
	DIP-SW setting	DIP SW SET1, SET2, SET4 : Factory setting, SET3, SET5-1,2,3: ALL OFF	
		Terminal resistor setting SET5 - 4 OFF: Disable, ON: Enable Check the resistance value for each network segment Refer to the installation manual 7.7	
	Rotary SW setting	Refrigerant circuit address setting (SET : REF AD x10 and REF AD x1)	
	Additional refrigerant amount	Comparison of calculated value and value written on electrics box. Entered in check sheet. Refer to the installation manual 8.3.2	
	3-way valve	Gas pipe: fully open	
		Liquid pipe: fully open	

[Note] If operated with the 3-way valve closed, the oil discharged from the compressor will not be returned and will lead to trouble.

Indoor unit	Appearance	There shall be no scratches, deformation, tilting, etc.	
	Serial No.	Shall be checked and entered in the check sheet.	
	Drain cap installation	Shall be installed positively.	
	Power source wiring connection	Connection points check & loose terminal panel screws check	
	Type of communication line	22 AWG (0.33mm^2), shielded wire used	
	Communication line connection	Connection points check & loose terminal panel screws check	
	Type of remote controller wiring	2 wire type : 16 to 22AWG (0.33 to 1.25mm^2) 3 wire type : 22AWG (0.33mm^2)	
	Remote controller wiring connection	Connection points check & loose terminal panel screws check	
	Connection piping	Check whether or not the heat insulation material is installed without a gap.	
	Rotary SW setting	Refrigerant circuit address (REF AD)	
		Indoor unit address (IU AD)	
		At automatic address setting, IU AD/REF AD shall be [0].	
		Remote controller address (RC AD)	
	DIP-SW setting	Function setting (Remote controller custom code/ external input switching/ auxiliary heater ON-OFF)	

1-2-2 Check Items After Power ON

[Note]
Cooling test run for each refrigerant circuit.
If multiple refrigerant circuits are test run at the same time, refrigerant circuit address setting errors cannot be detected.

Procedure	Check contents	Judgement standard	Check
Power ON	Outdoor unit circuit breaker ON	Check lighting of Main PCB LED101 and 7-segment display.	
	Indoor unit circuit breaker ON	Check whether or not indoor unit OPERATION and TIMER lamps flash alternately.	

[Note] Turn on all indoor units power in the same refrigerant circuit address.
When the system operates with the indoor units remaining no power, it is cause of malfunction.

Outdoor unit Main PCB push button SW setting/check	Function setting	Are the necessary functions set ? < For the setting, Refer to the page 01-16 ～ 19 >	

Address setting/ check	Automatic address setting	Addresses shall be assigned to all indoor units / Signal amps. Check for unset or duplicated addresses. < For the setting, Refer to the page 01-06, 07 >	
	Address read	All the indoor units and outdoor units of the same refrigerant circuit can be checked on the service tool.	
	Address record	Enter the set addresses in the check sheet.	
	Address hold check	Check whether or not the address setting is held by the service tool after indoor/outdoor circuit breakers were turned OFF to ON.	
Indoor unit connection check	Indoor unit connection check	Are the number of connecting indoor units correct ? Is the total capacity of indoor units correct ? < For the checking, Refer to the page 01-08 >	

[Note] Before connecting service tool, the address setting has to be completed.

Cooling test run	Outdoor unit push button SW operation	All the indoor units in the same refrigerant circuit shall enter the cooling test run state. The outdoor units corresponding to the operation capacity of the indoor units shall operate. < Test operation procedure, Refer to the page 01-09,10 >	
All of the indoor units operation (after 30 mins)	<On service tool>		
	High pressure	HPS: 391.5psi (2.7 MPa) ＊	
	Low pressure	LPS: 130.5psi (0.9 MPa) ＊	
	Discharge pipe temperature (outdoor unit)	TH1: 177.8°F (81°C) ＊	
	Suction pipe temperature (outdoor unit)	TH4: 59°F (15°C) ＊	
	Inlet air temperature (indoor unit)	TH21: 80.6°F (27°C) ＊	
	Heat exchange inlet temperature (indoor unit)	TH22: 51.8°F (11°C) ＊	
	Heat exchange outlet temperature (indoor unit)	TH24: 55.4°F (13°C) ＊	
	Compressor operation	Shall operate corresponding to the operation capacity of the indoor units.	
	Data output	Service tool used, output (CSV ⇒ Excel)	
	<Outdoor unit>		
	Outdoor Main PCB 7-seg. display	There shall be no Error information on the 7-segment display on the Main PCB.	
	Operation voltage	Between L - N AC 208 - 230V	
	Abnormal sound/ abnormal vibration	These shall be no abnormal sound or abnormal vibration.	
		The outdoor fan shall not make a moaning sound. There shall be no discharge air leaking from the outdoor duct.	
		There shall be no pipe chattering sound or flute sound generated.	
	<Indoor unit service tool + actual measurement>		
	Outlet air temperature	Inlet air temperature and outlet air temperature difference shall be 50°F (10°C) or greater.	
	Abnormal sound/abnormal vibration	There shall be no abnormal sound or abnormal vibration.	
	Water leakage check	There shall be no water leakage. There shall be no condensation on the drain, cabinet, piping, and discharge port.	
	Remote controller operation	Shall operate according to the settings. (ON-OFF, set temperature change)	

Procedure	Check contents	Judgement standard	Check
Indoor unit individual operation	<Indoor unit service tool + actual measurement>		
	Fan operation	Shall be switched to all fan speeds in the cooling mode.	
	Louver operation (except duct)	Louver shall be switched to all positions. Shall also swing.	
	Outlet air temperature	Inlet air temperature and outlet air temperature difference shall be 50°F (10°C) or greater.	
	Abnormal sound/abnormal vibration	There shall be no abnormal sound or abnormal vibration.	
	Water leakage check	There shall be no water leakage. There shall be no condensation on the drain, cabinet, piping, and discharge port.	
	Remote controller operation	Shall operate according to the settings. (ON-OFF, set temperature change)	

*
These are representative figures of AOU60RLAVM4 at the standard condition. (Indoor : 80.5°F (27°C), Outdoor : 95°F (35°C))
If conditions are different from those above mentioned, the figures will be changed slightly.
It depends on following conditions.

- Outdoor unit capacity
- Indoor and outdoor temperature
- Indoor unit capacity
- Pipe length
- etc

Trouble shooting on Test run operation

1. Error occured

- Check on the Error code on the Remote controller or Indoor unit or Outdoor unit or Service tool and check the description of the Error code.
  < Refer to the Trouble shooting in the Service manual.>
  < Refer to the Execution of precautions 1-1 and Check item Before power ON 1-2-1>

2. No good performance without error code

- Check if the protection controlling is operating or not
  Evaporator Icing up protection, High discharge temperature protection,etc.
  < Refer to the part of protection controlling in the Service manual >

- Check on the refrigerant circuit
  Refrigerant amount, Pipe blockage, Wrong position of separation pipes etc.
  < Refer to the Execution of precautions 1-1 and Check item Before power ON 1-2-1>
  < Refer to the regulation of installation in the Installation manual>

1-2-3 Automatic address setting for signal amplifiers When using signal amplifiers

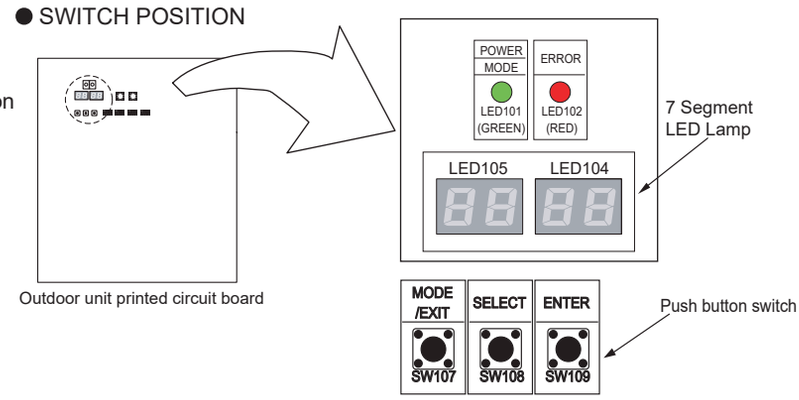
When setting the address of the signal amplifier, please use the factory setting.
(See the installation manual of the signal amplifier)

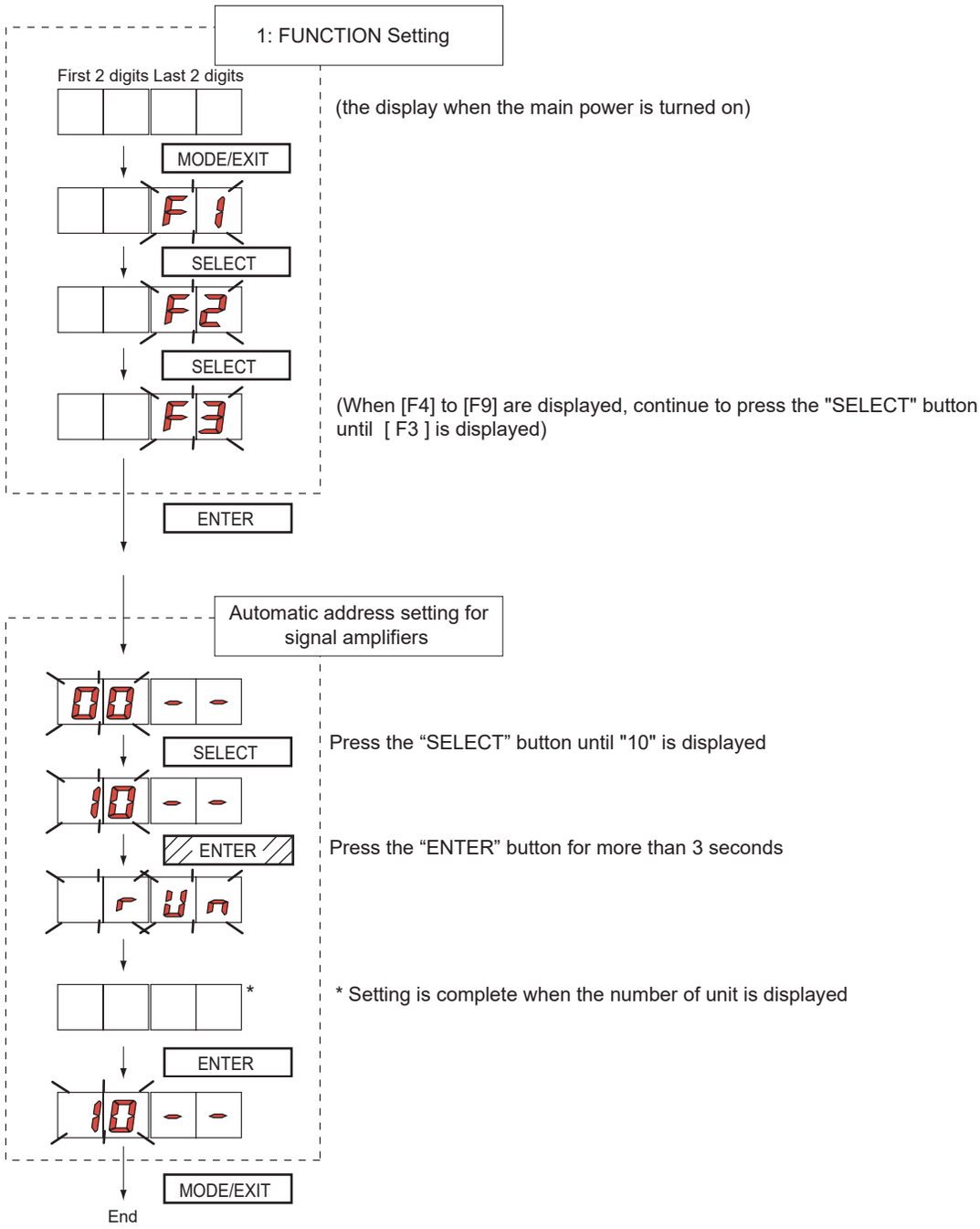
When the system is normal, nothing will be displayed on the 7 segment display.

When ERROR is displayed, inspect the units.

Use the “MODE/EXIT”, “SELECT”, and “ENTER” buttons on the outdoor unit Main PCB to configure settings according to the procedures below.

● SWITCH POSITION





1-2-4 Automatic address setting for Indoor units

Check that the rotary switch IU AD on the indoor unit Main PCB is set to “00”. If it is not set to “00”, it means the address of that device is not set. (Factory default is “00”).

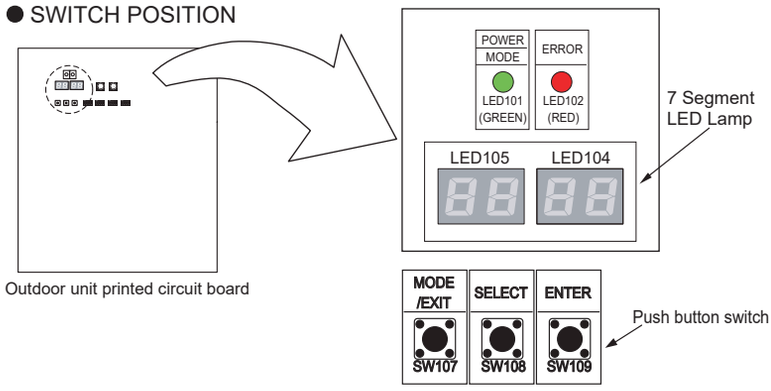
Turn on the power of the indoor and outdoor units.

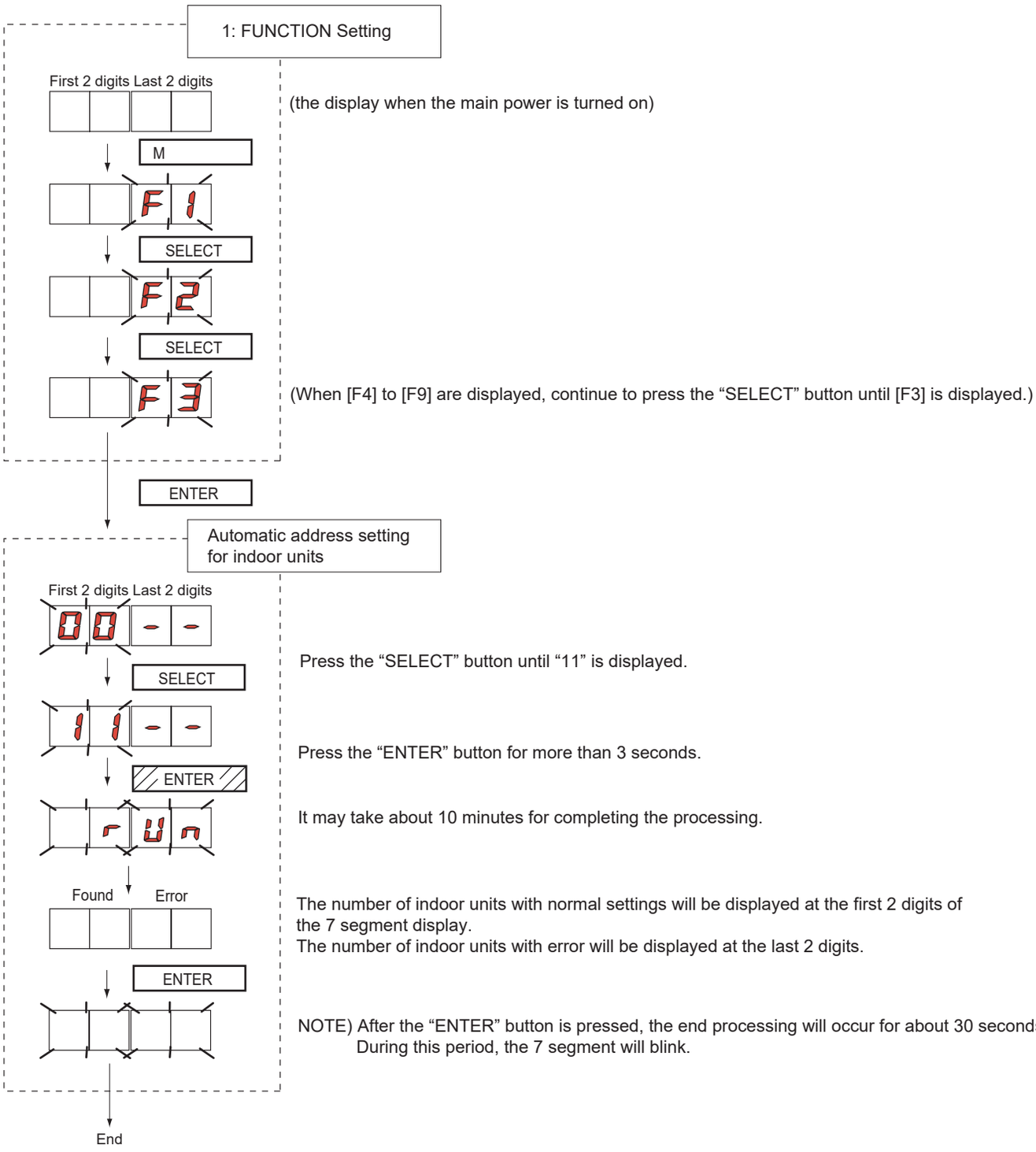
When the system is normal, nothing will be displayed on the 7 segment display.

When ERROR is displayed, inspect the units.

Use the “MODE/EXIT”, “SELECT”, and “ENTER” buttons on the outdoor unit Main PCB to configure settings according to the procedures below.

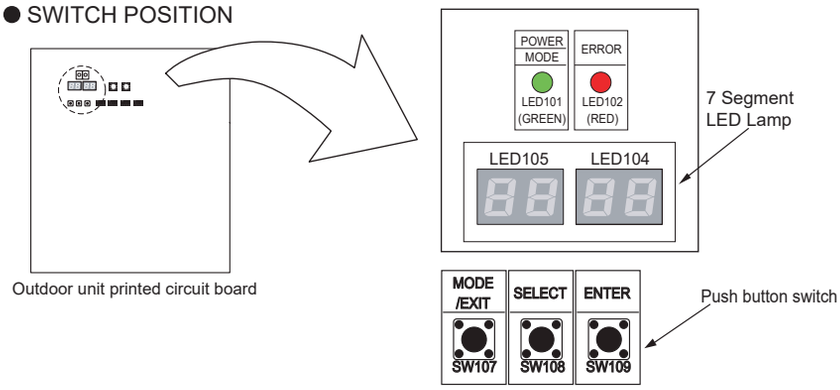
● SWITCH POSITION





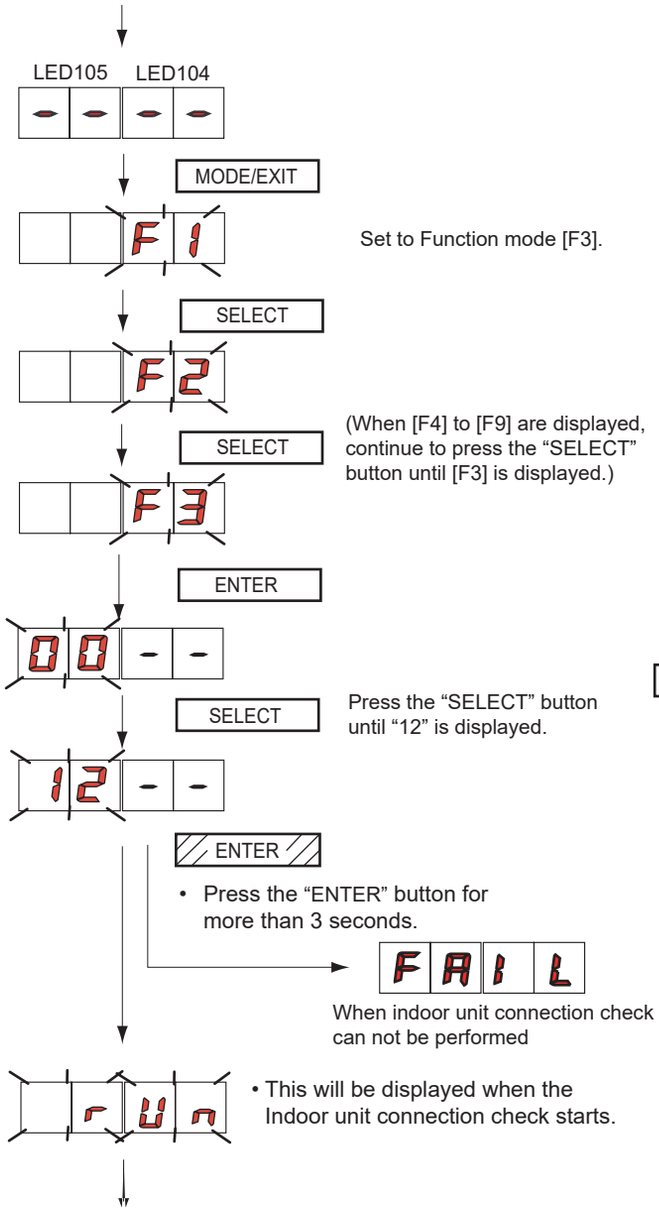
1-2-5 Indoor unit connection check

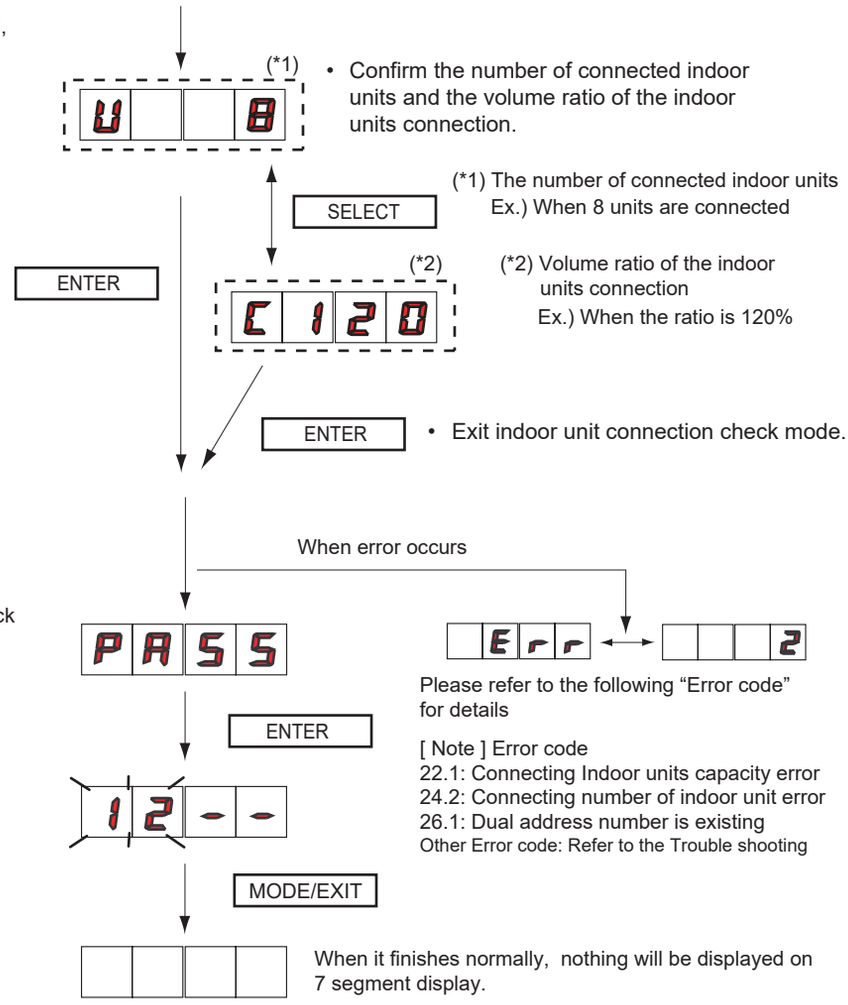
● SWITCH POSITION



Please perform the indoor unit connection check according to following procedures.

• Turn on the powerof indoor unit and outdoor unit.

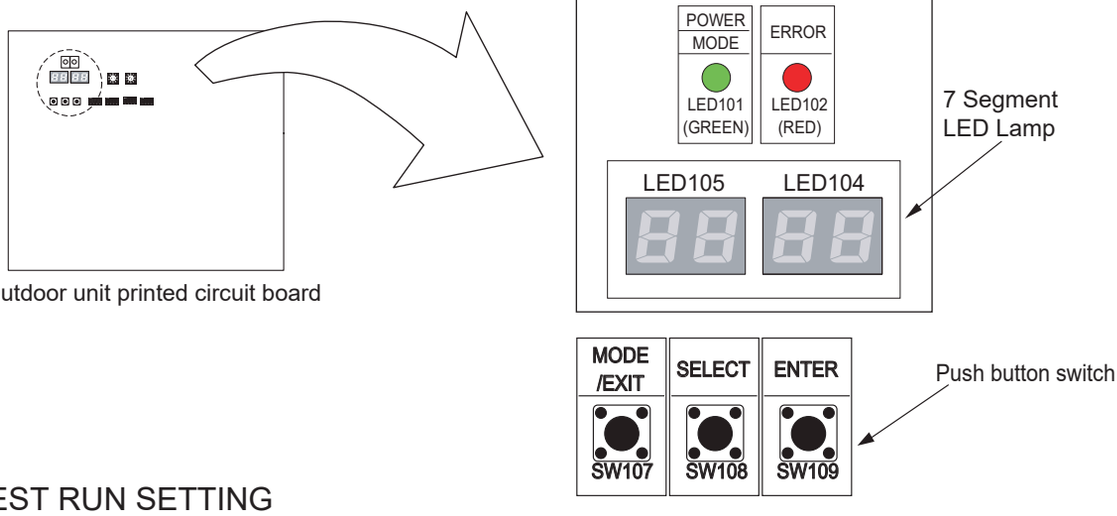




1-2-6 Test Run From Outdoor Main PCB

All the indoor units connected to the outdoor unit can be test-operated by push button setting.

● SWITCH POSITION



● TEST RUN SETTING

For a detailed description of push button operation, refer to the [D&T manual Chapter 6. SYSTEM DESIGN]

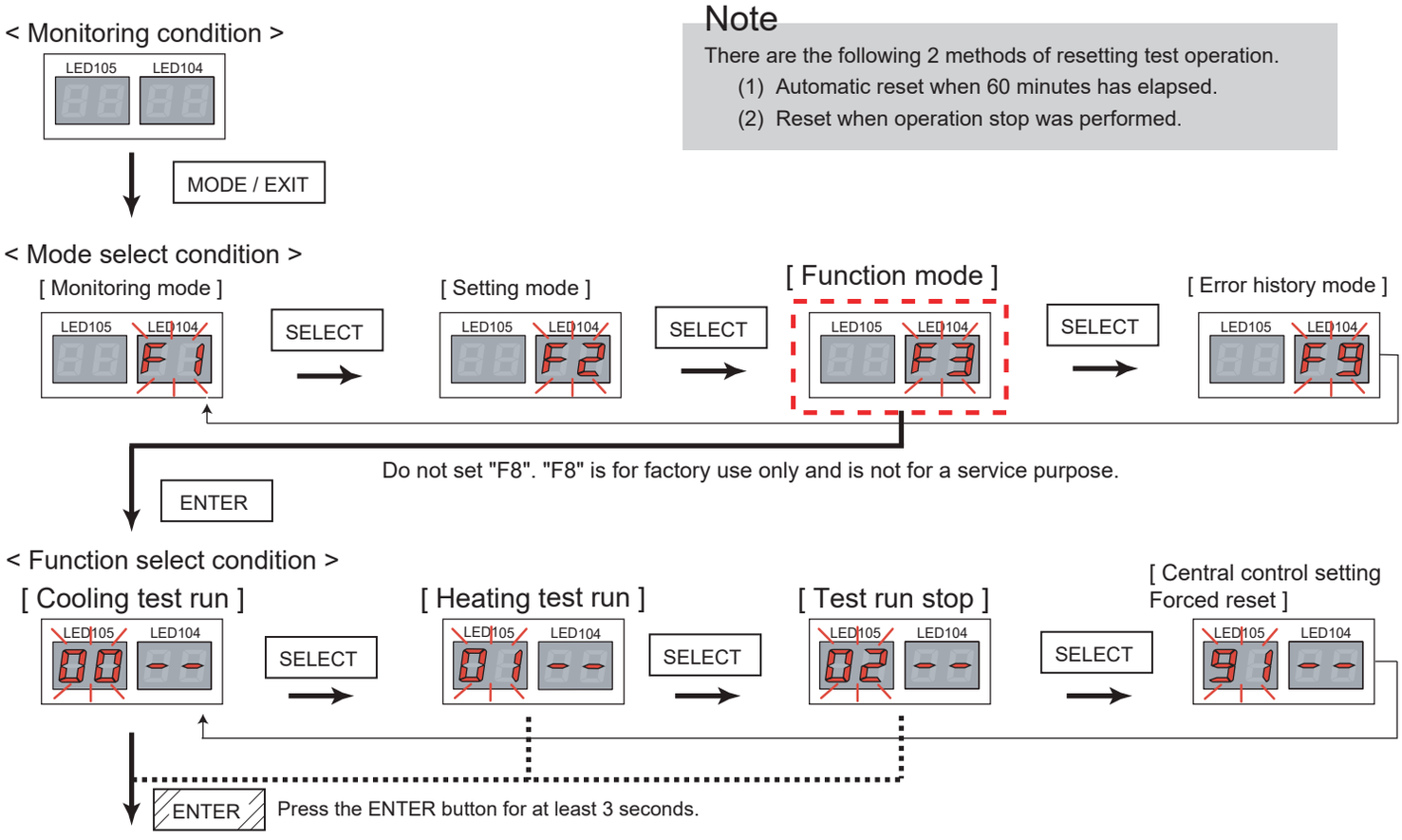
Note

There are the following 2 methods of resetting test operation.

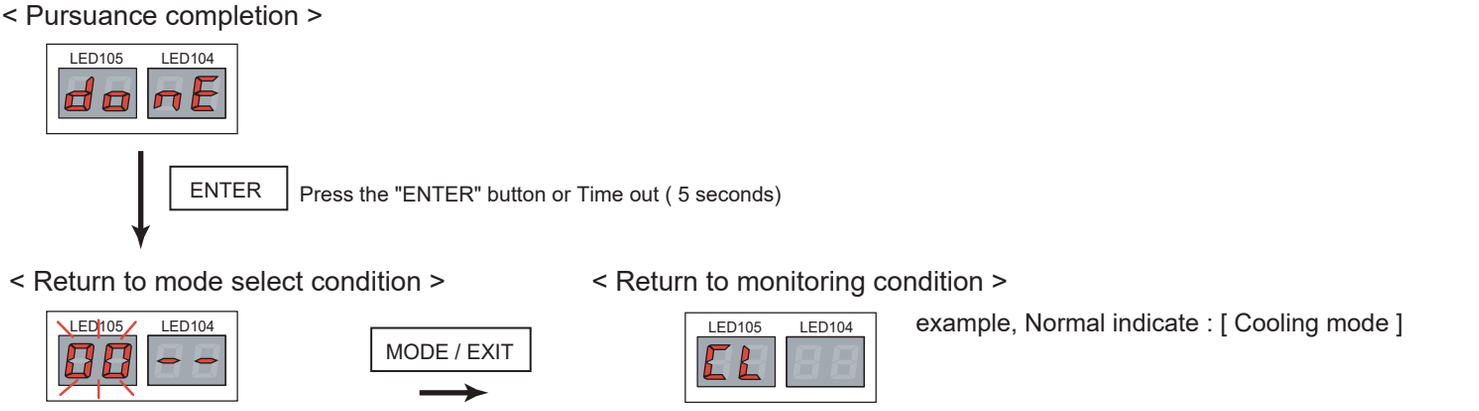
(1) Automatic reset when 60 minutes has elapsed.

(2) Reset when operation stop was performed.

< Monitoring condition >



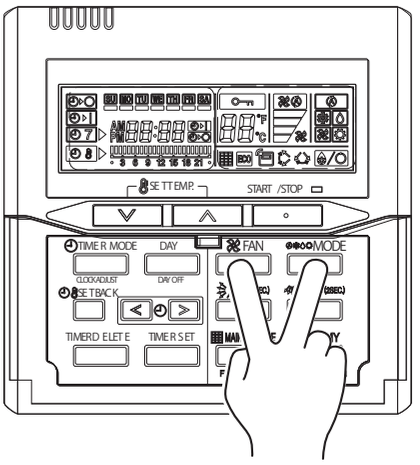
< Pursuance completion >



1-2-7 Test Run From Remote Controller

1. Standard wired remote controller

UTY - RNK ∗

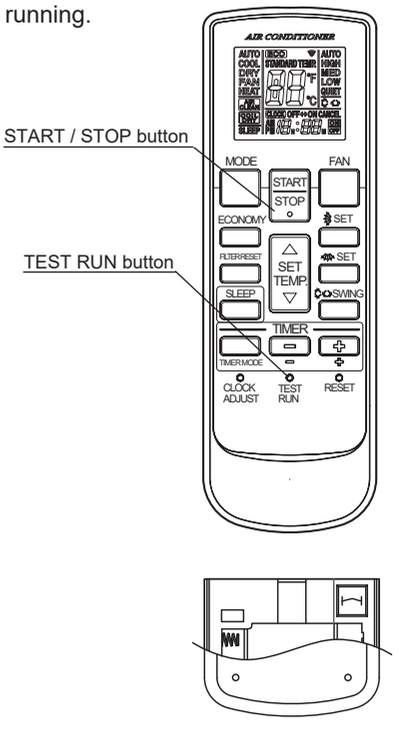


Stop the indoor unit. Push the button and button simultaneously for more than two seconds.
The air conditioner will start to conduct a test run and "01" will display on the remote controller display.
However, the ∨, ∧ setting button does not have function, but all other buttons, displays, and protection functions will operate.

- Perform the test operation for 60 minutes.
- To stop test run, push the START / STOP button of the standard wired remote controller.
- For the operation method, refer to the operating manual and perform operation check.
- Check that there are no abnormal sounds or vibration sounds during test run operation.

2. Standard wireless remote controller

UTY - LNH ∗

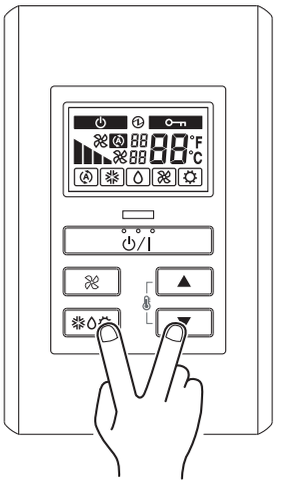


- Press the TEST RUN button on the remote controller, while the air conditioner is running.
- To end test run operation, press the remote controller START / STOP button.

When the air conditioner is being test run, the OPERATION and TIMER lamps of indoor unit flash slowly at the same time.

3. Simple remote controller

UTY - RSK ∗



Stop the indoor and outdoor units. Push the remote controller ▼ button and button simultaneously for more than three seconds. The air conditioner will start to conduct a test run and "01" will display on the temperature display.
However the ▲ ▼ setting button does not have function but all other buttons, displays and protection functions will operate.

- To stop test running press the ⏻/I button of the simple remote controller.
- For the operation method refer to the operating manual and perform operation check.
- Check that there are no abnormal sounds or vibration sounds during test run operation.

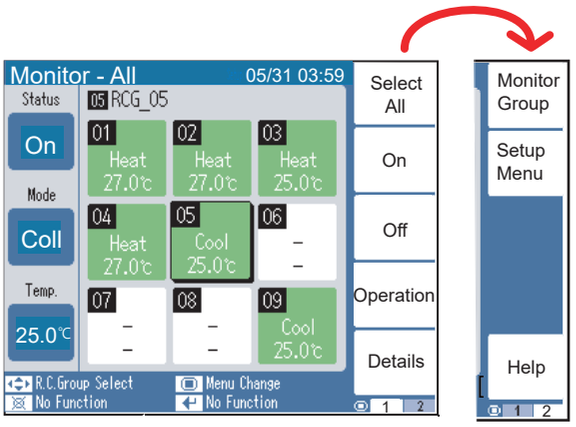
4. Central remote controller

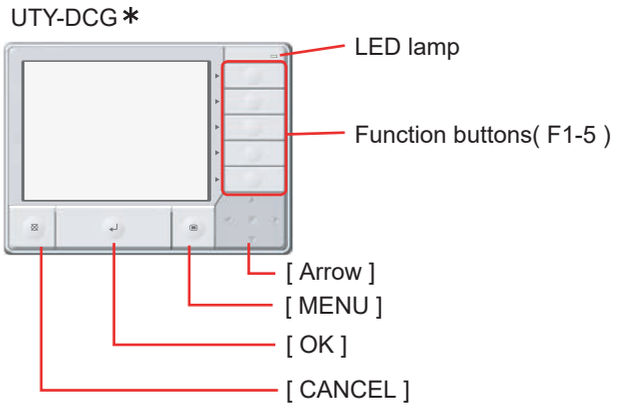
Test run operating procedure

< Monitor screen : 9 units display >

1) Press Button

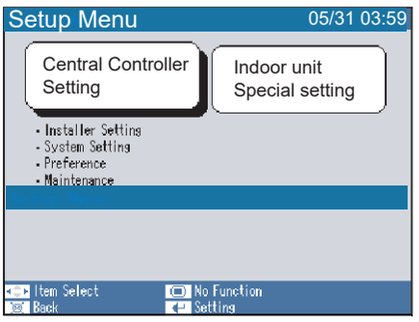
2) Press the [Setup Menu (F2)] button



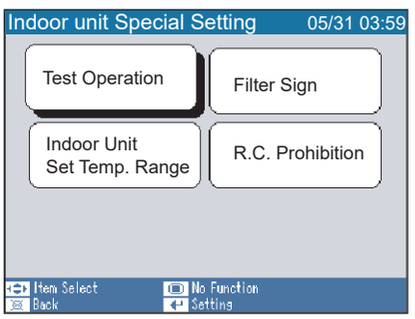


< Password verification >

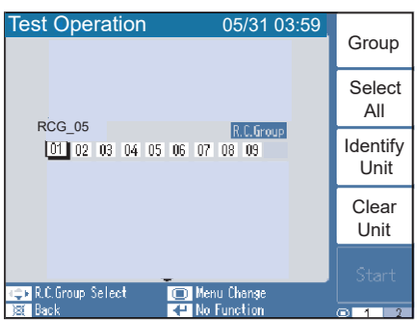
3) Shift Indoor unit special setting by pressing the [ ] button and [ ] button



4) Shift the Test Operation by pressing the [ ] button and [ ] button



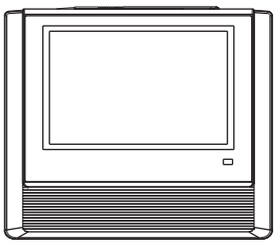
5) Press the [Select All (F2)] button or [Identify Unit (F3)] button



[Select All (F2)]: All of R.C.Group (Indoor units)
[Identify Unit (F3)] : Specific R.C.Group (Indoor unit)

6) Press the [Start (F5)] button

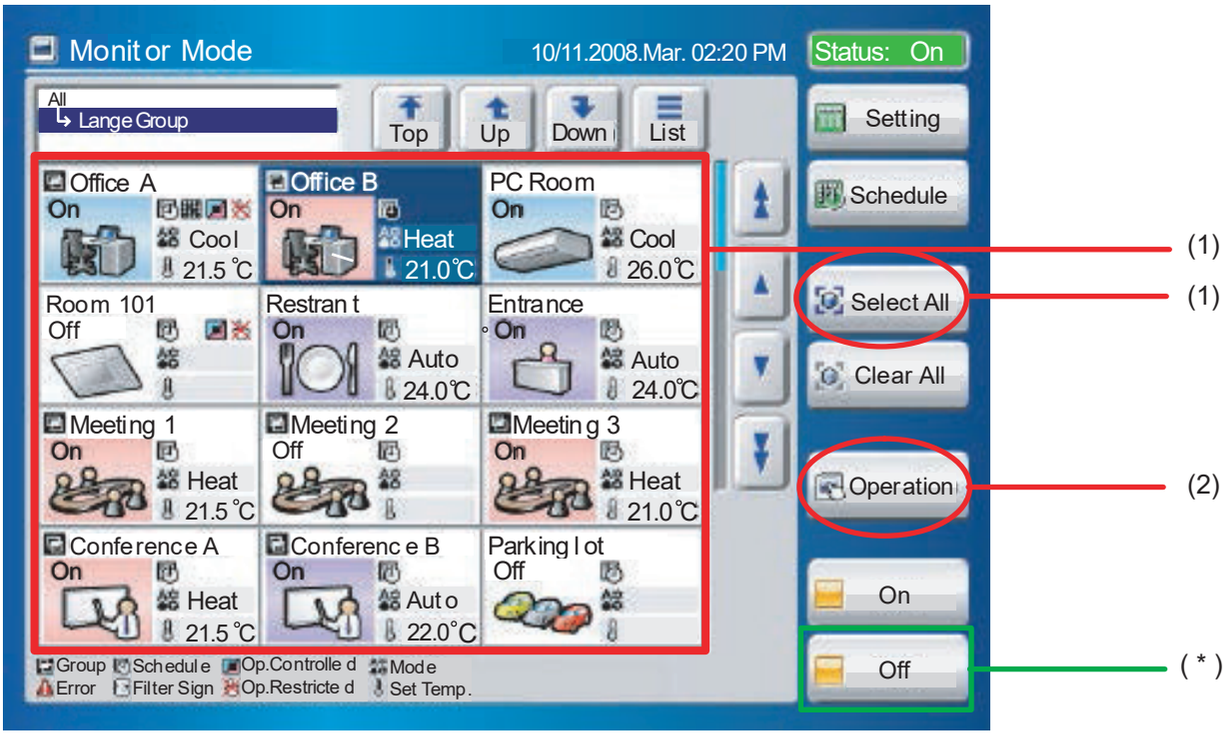
UTY - DTG∗



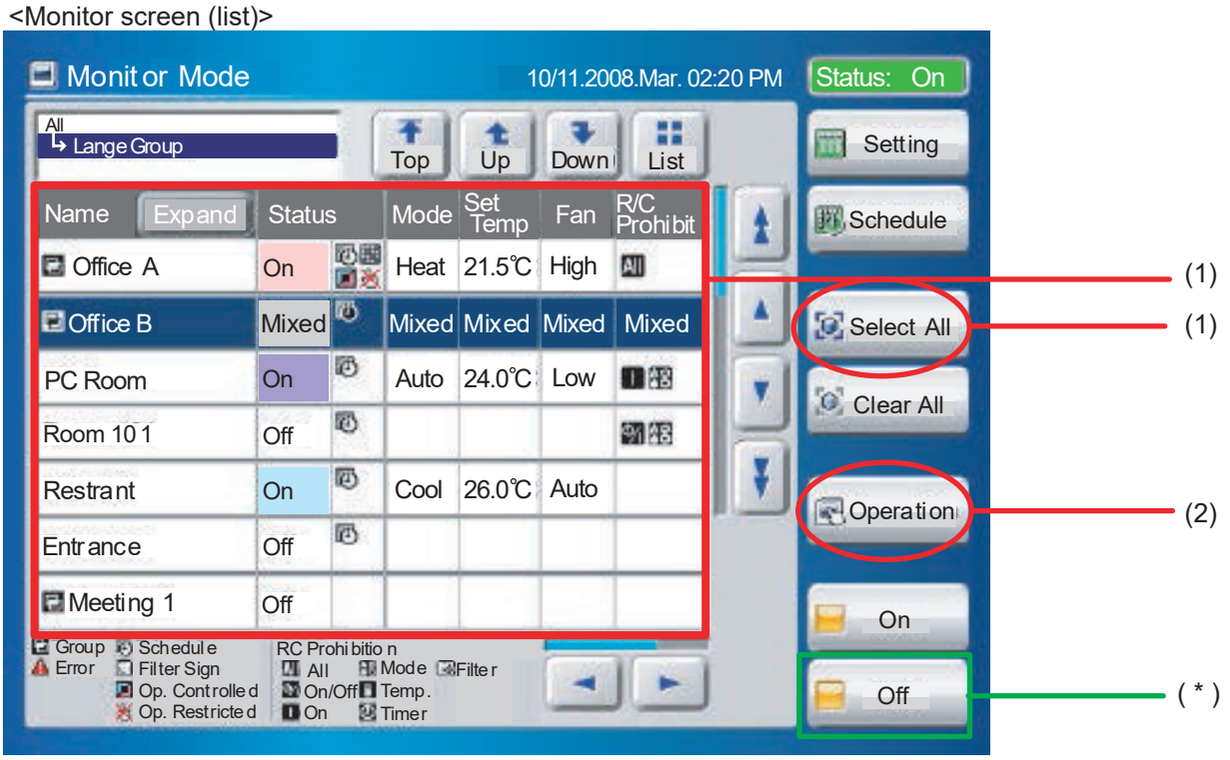
5. Touch panel controller

Test run operating procedure

<Monitor screen (icon)>



<Monitor screen (list)>



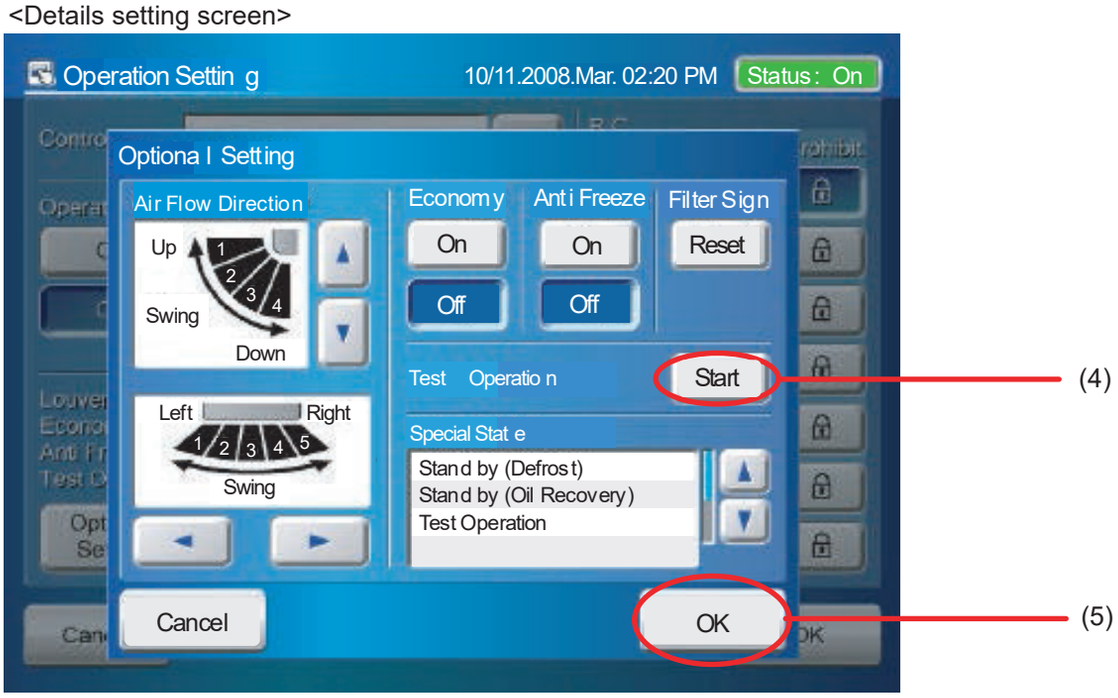
(1) Select the objective you want to test run.
Select the objective icon or list at the monitor screen. (Multiple selections is possible)
Select all the devices registered as objectives by pressing "Select All" on the monitor screen.

(2) After objective selection at (1), switch to the <Setting screen> by pressing "Operation".

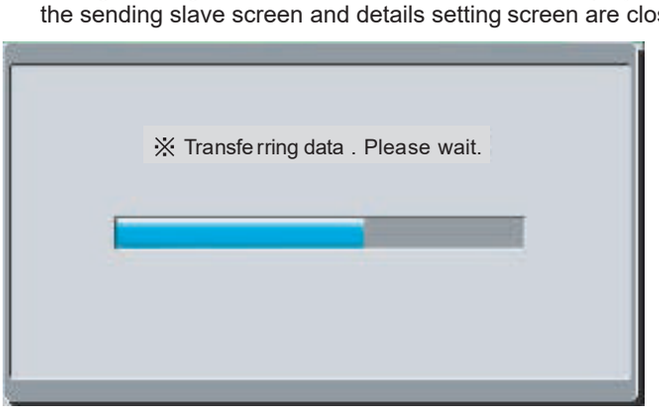
<Setting screen>

(3) Switch to the <Details setting screen> by pressing "Optional Setting" on the setting screen.

<Details setting screen>



(4) Send (start) test run by pressing "Start" and then pressing "OK" on the details setting screen.
Test run continues for 60 minutes.
During sending, the slave screen shown below is displayed. When sending is completed, the sending slave screen and details setting screen are closed.



To interrupt test run, select the device being test run and execute an operation stop command.

(*) At the monitor screen, test run is reset by stopping operation of the objective devices by pressing "OFF".

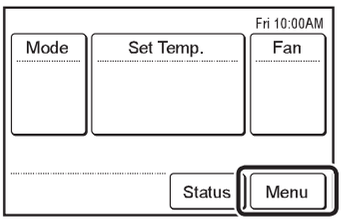
(*) Or test operation is reset by stopping operation of the objective devices by pressing "Off" of Operation and then pressing "OK" on the setting screen.

6. 2-Wire type wired remote controller

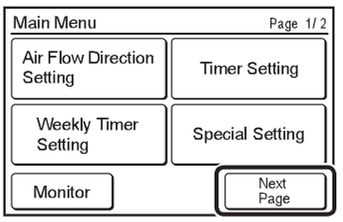
UTY - RNR∗

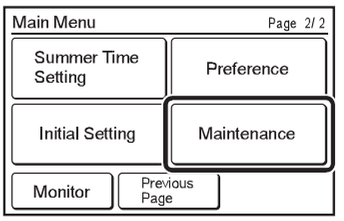
(1) Press "Menu" on the monitor screen. the < Main Menu screen > is displayed.
(2) Press "Next Page" and press "Maintenance"
(3) Press "Next Page" and press "Test Run". the <Test run screen > is displayed.
(4) Press "OK"
The test run continues for 60 minutes.
To interrupt test run before it is complet, return to the "Monitor Mode Screen", and press ON/ OFF.

< Monitor Mode Screen >

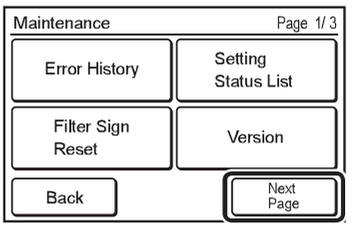


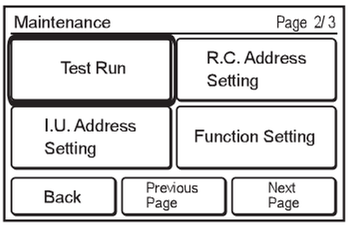
< Main Menu Screen >



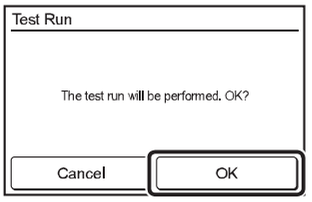


< Maintenance Screen >





< Test Run Screen >



1-3 TEST RUN CONTROL

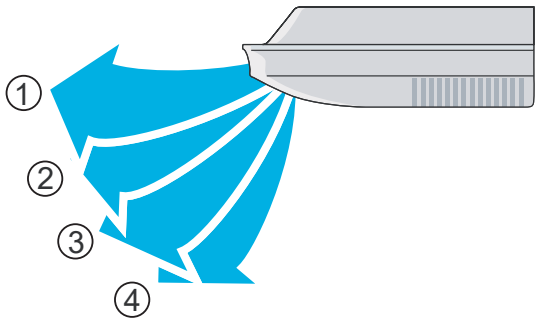
1. When the test run signal is transmitted from standard wired, wireless remote controller, simple remote controller, transmitted network, and outdoor unit.

(1) The test run operation starts and the electric expansion valve is controlled to a maximum flow, regardless of the temperature condition.
(2) Frost prevention operation has priority over item(1).
(3) Whether state of the indoor unit operates or stops, All units in the same refrigerant circuit will start to conduct a test run in accordance with the operation mode set by push switch of outdoor unit (see 1 - 2 - 3).
(4) After 60 minutes passes, the test run stops.
(5) Test running initialization is shown below.

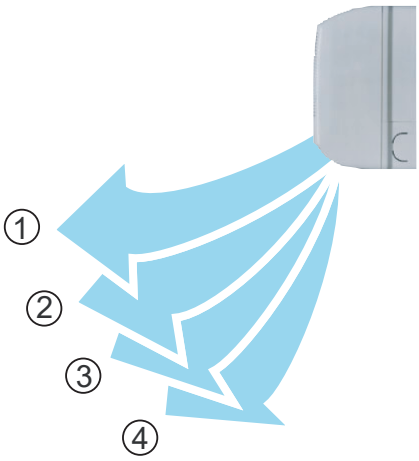
Operating Mode	EXCEPT FOR THE DUCT MODEL		DUCT TYPE	
	Cooling	Heating	Cooling	Heating
Fan speed	Hi	Hi	Hi	Hi
Room Temperature Indication	64 °F (18℃)	86 °F (30℃)	64 °F (18℃)	86 °F (30℃)
Vertical Air Direction Panel	Position ①	Position ④	————	————
Swing	OFF	OFF	————	————

***Example**

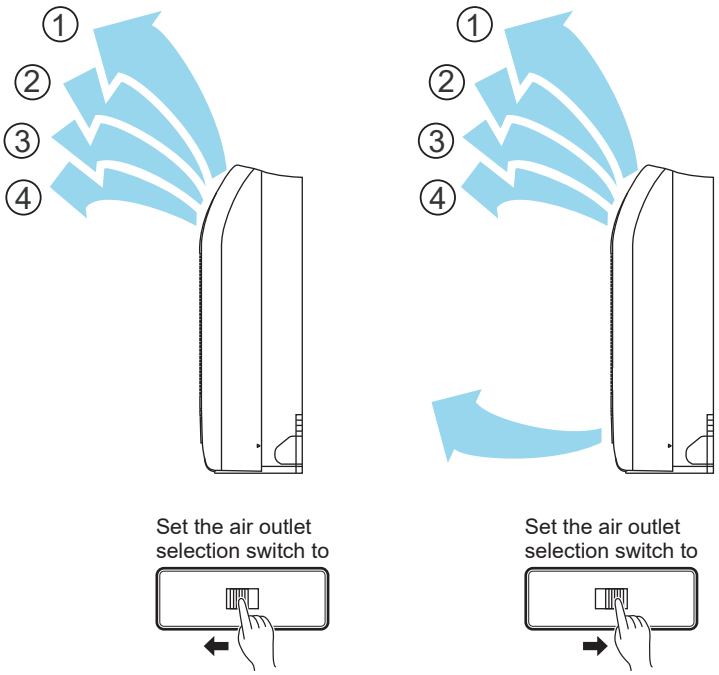
■ **COMPACT CASSETTE TYPE**
CIRCULAR FLOW CASSETTE



■ **CEILING TYPE**
FLOOR/CEILING



■ **WALL MOUNTED TYPE**



■ **COMPACT FLOOR**
FLOOR/CEILING

1-4 FIELD SETTING AND MONITOR MODE LIST FOR OUTDOOR UNIT

	Classification	ITEM CODE No.	Setting Mode	Information contents
Push switch on outdoor unit PCB Monitoring mode [F1]	Device and system	00	Connected number of indoor unit	The number of the communicating unit is displayed
		01	Software version of outdoor unit	Software version : E●●●V○○☆■□L△△-◎
		02	Software version of INV PCB	[E●●●] [V○○] [☆■□] [L△△] [-◎] displays by five items
		03	Software version of communication PCB	It skips when there is no suffix「-◎」
	Operation of each part	10	Rotational speed of outdoor unit fan motor	The rotational speed of the outdoor unit fan motor is displayed [rpm]
		11	Rotational speed of INV compressor	The rotational speed of the compressor is displayed [rps]
		12	Current value of INV compressor	Current value of INV compressor is displayed [A]
		13	Forbidden	
		14	Pulse of EEV1	Pulse of EEV1 is displayed [pls]
		15	Pulse of EEV2	Pulse of EEV2 is displayed [pls]
	Time guard	20	Accumulated current time	Accumulated current time is displayed [×10 hour]
		21	INV compressor accumulated time [Cooling]	Accumulated time is displayed in the cooling operation of the INV compressor [×10 hour]
		22	INV compressor accumulated time [Heating]	Accumulated time is displayed in the heating operation of the INV compressor [×10 hour]
		23	Forbidden	
	Refrigerant cycle data 1	30	Information on Thermistor 1 (INV compressor discharge temperature sensor)	The value of the Thermistor 1 is displayed [°C] or [°F]
		31	Forbidden	
		32	Information on Thermistor 3 (Outdoor temperature sensor)	The value of the Thermistor 3 is displayed [°C] or [°F]
		33	Information on Thermistor 4 (Suction temperature sensor)	The value of the Thermistor 4 is displayed [°C] or [°F]
		34	Information on Thermistor 5 (Heat-exchanger (outlet) temperature sensor)	The value of the Thermistor 5 is displayed [°C] or [°F]
		35	Forbidden	
	Refrigerant cycle data 2	36	Information on Thermistor 7 (Liquid temperature sensor 2)	The value of the Thermistor 7 is displayed [°C] or [°F]
		37	Information on Thermistor 8 (Sub-cool heat-exchanger (inlet) temperature sensor)	The value of the Thermistor 8 is displayed [°C] or [°F]
		38	Information on Thermistor 9 (Sub-cool heat-exchanger (outlet) temperature sensor)	The value of the Thermistor 9 is displayed [°C] or [°F]
		39	Information on Thermistor 10 (INV compressor temperature sensor)	The value of the Thermistor 10 is displayed [°C] or [°F]
	Refrigerant cycle data 3	40	Forbidden	
	Refrigerant cycle data 4	50	Information on pressure sensor 1 (High pressure sensor)	The value of the pressure sensor 1 is displayed [MPa] or [psi]
		51	Information on pressure sensor 2 (Low pressure sensor)	The value of the pressure sensor 2 is displayed [MPa] or [psi]

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Information contents	Default
Push switch on outdoor unit PCB Setting mode [F2]	Install	00	Pipe length setting	00	131-213ft.(40-65m)	○
				01	0-131ft.(0-40m)	
				02	213-295ft.(65-90m)	
				03	295-394ft.(90-120m)	
	Correction	10	Forbidden	00	Factory defalt	○
		11	Cooling capacity shift	00	Normal mode	○
				01	Save energy mode +4°F (+2°C)	
				02	High power mode 1 -4°F (-2°C)	
				03	High power mode 2 -7°F (-4°C)	
				04	Forbidden	
		12	Heating capacity shift	00	Normal mode	○
				01	Save energy mode -4°F (-2°C)	
				02	High power mode 1 +4°F (+2°C)	
				03	High power mode 2 +7°F(+4°C)	
		13,14	Forbidden	00	Factory default	○
		16,17	Forbidden	00	Factory default	○
		18,19	Forbidden	00		○
				01		
	Change of function 1	20	Switching between forced stop or emergency stop	00	Forced stop	○
				01	Emergency stop	
		21	Operation mode selecting method	00	Priority given to the first command	○
				01	Priority given to the external input of outdoor unit	
				02	Priority given to the master indoor unit	
		22,23,24	Forbidden	00	Factory default	○
		25,26,27	Forbidden	00	Factory default	○
		28	Change of unit (Temperature)	00	Celsius (°C)	○
				01	Disable (°F)	
		29	Change of unit (Pressure)	00	MPa	○
				01	psi	
	Change of function 2	30	Energy saving level setting	00	Level 1 (stop)	○
				01	Level 2 (operated at 40% capacity)	
				02	Level 3 (operated at 60% capacity)	
				03	Level 4 (operated at 80% capacity)	
				04	Level 5 (operated at 100% capacity)	
		31,34	Forbidden	00	Factory default	○
		35	Presence of heater selection control using outdoor temperature*1	00	Invalid	○
				01	Valid	
		36	Outdoor temperature zone boundary temperature A*1	00	-4.0°F (-20°C)	○
				01	-0.4°F (-18°C)	
				02	3.2°F (-16°C)	
				03	6.8°F (-14°C)	
				04	10.4°F (-12°C)	
				05	14.0°F (-10°C)	
				06	17.6°F (-8°C)	
				07	21.2°F (-6°C)	
				08	24.8°F (-4°C)	
		37	Outdoor temperature zone boundary temperature B*1	00	42.8°F (6°C)	○
				01	14.0°F (-10°C)	
				02	17.6°F (-8°C)	
				03	21.2°F (-6°C)	
				04	24.8°F (-4°C)	
				05	28.4°F (-2°C)	
				06	32°F (0°C)	
				07	35.6°F (2°C)	
				08	39.2°F (4°C)	
				09	42.8°F (6°C)	
				10	46.4°F (8°C)	
				11	50.0°F (10°C)	
				12	53.6°F (12°C)	
				13	57.2°F (14°C)	
				14	60.8°F (16°C)	
				15	64.4°F (18°C)	
	Low noise setting 1	40	Capacity priority setting	00	Off (quiet priority)	○
				01	On (capacity priority)	
		41	Low noise mode setting	00	Off (Normal)	○
				01	On (Low noise mode operation is always done)	
		42	Forbidden	00	Factory defalut	○
	Change of function 3	53	Forbidden	00		○
				01		
		55	Breaker capacity setting	00	Standard (according to specifications)	○
				01	20A setting	
				02	30A setting	
	Abnormal corresponding	60,61	Forbidden	00	Factory defalut	○
	External device setting	70	Electricity meter No. setting 1 (Set the ones digit and tens digit of the No. of the electricity meter connected to CN135)*2	00~99	Setting number x00~x99 (Refer to Design & Technical Manual for details.)	00
		71	Electricity meter No. setting 2 (Set the ones digit and tens digit of the No. of the electricity meter connected to CN135)*2	00~02	Setting number 0xx~2xx (Refer to Design & Technical Manual for details.)	00
		72	Electricity meter pulse setting 1 (Set the ones digit and tens digit of the No. of the electricity meter pulse setting connected to CN135)*3	00~99	Setting number xx00~xx99 (Refer to Design & Technical Manual for details.)	00
		73	Electricity meter pulse setting 2 (Set the ones digit and tens digit of the No. of the electricity meter pulse setting connected to CN135)*3	00~99	Setting number 00xx~99xx (Refer to Design & Technical Manual for details.)	00
	Uncategorized	92	Forbidden	00		○
				01		
		96	Forbidden	00		○
				01		

*1 : Do not set this for outdoor units with Slave setting.

*2 : When electricity meter No. is set to "000" and "201 to 299", the pulses input to CN135 become ineffective.
Available setting number is "001" to "200"

*3 : When the electricity meter pulse setting is set to "0000", the pulses input to CN135 become ineffective.
Available setting number is "0001" to "9999"

	Classification	ITEM CODE No.	Setting Mode	Setting Function
Push switch on outdoor unit PCB Function mode [F3]	Forced operation	00	Cooling test run	Forced thermostat-ON in Cooling.
		01	Heating test run	Forced thermostat-ON in Heating.
		02	Test run stop	Test run is stopped.
		03,04	Forbidden	
	Install and maintenance 1	10	Signal amplifier automatic address	Automatic address setting operates for signal amplifier.
		11	Indoor unit automatic address	Automatic address setting operates for indoor unit of same refrigerant circuit.
		12	Indoor unit connection check	The number of indoor units and the total capacity of indoor units of same refrigerant circuit.
	Install and maintenance 2	20	Forbidden	
		21	Vacuuming mode	Vacuuming mode operates Refer to page 01-01 for the function.
	Clear	30	Error history clear	All the abnormal code histories are cleared.
		31	Forbidden	
		32	Current time clear	Accumulated current time becomes [0]
		33	INV compressor accumulated time clear	Accumulated time of the INV compressor becomes [0]
		35	Field setting all clear	Return to default the all set items.
		36	Clear memorized information of “F3 - 12” (Indoor unit connection check)	The information of the number of indoor units and the total capacity of indoor units are cleared.
		37	Forbidden	
	Reset	40	Abnormal reset	It was displayed when abnormality occurs, and the total code is reset. This is a function that uses to clear abnormal display after the repair is completed. Please operate the switch after power off or power on the outdoor unit.
		41	Maximum memorized indoor unit number reset	Maximum memorized indoor unit number is reset “E14.5 : Indoor unit number shortage ” error is cleared.
	Specialty function	91	Forced Central control function release	When the centralized control device failure, and the centralized control setting cannot be released, this function is used. All the limitations set with the centralized control device are released.

	Classification	ITEM CODE No.	Meaning of Error History Number	Information contents
Push switch on outdoor unit PCB Error history mode [F9]	Error history	00	1 time ago (Newest)	When the error occurred, the error code is memorized up to 10 on Main PCB.
		01	2 time ago	
		02	3 time ago	If the memorized error code becomes over 10, the oldest one will be erased.
		03	4 time ago	
		04	5 time ago	
		05	6 time ago	
		06	7 time ago	
		07	8 time ago	
		08	9 time ago	
		09	10 time ago	

Refer to Chapter 4.TROUBLE SHOOTING

4-2-3 Error Code List for Outdoor unit

*< Reset Error Item List By Abnormal Reset Setting >

- Compressor Motor Loss of Synchronization
- Compressor 1 Temperature Abnormal
- Inverter Compressor Start Up Error
- Discharge Temperature 1 Abnormal
- Low Pressure Abnormal
- Current Sensor 1 Error
- Trip Detection
- Rush Current Limiting Resistor Temp Rise Protection
- Outdoor Unit FAN motor 1 Lock Error
  Outdoor Unit FAN motor 2 Lock Error

1-5 FIELD SETTING / FUNCTION SETTING FOR INDOOR UNIT

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Information contents	Default
Indoor unit field setting setting by remote controller	Address	01	Indoor unit address	00~63	00~63	00
		02	Refrigerant circuit address	00~99	00~99	00
	Filter	11	Filter indicator Interval	00	Default	○
				01	Longer	
				02	Shorter	
		13	Filter sign display	00	Enable	○
				01	Disable	
				02	Display only on central remote control	
	Airflow	20	Ceiling airflow (Cassette type only)	00	Default	○
				01	High ceiling	
		23	Vertical airflow direction (Cassette type only)	00	Default	○
				01	Raise	
		24	Horizontal swing airflow direction (For horizontal swing equipped models)	00	Default	○
				01	Left half	
				02	Right half	
		26 *1 **(Note)**	Static Pressure setting - Slim Duct type - The Range of static pressure is different from one model to other.	00	SP mode 00 [0 in.WG (0 Pa)]	
				01	SP mode 01 [0.04 in.WG (10 Pa)]	
				02	SP mode 02 [0.08 in.WG (20 Pa)]	
				03	SP mode 03 [0.12 in.WG (30 Pa)]	
				04	SP mode 04 [0.16 in.WG (40 Pa)]	
				05	SP mode 05 [0.20 in.WG (50 Pa)]	
				06	SP mode 06 [0.24 in.WG (60 Pa)]	
				07	SP mode 07 [0.28 in.WG (70 Pa)]	
				08	SP mode 08 [0.32 in.WG (80 Pa)]	
				09	SP mode 09 [0.36 in.WG (90 Pa)]	
				31	Normal SP [0.10 in.WG (25 Pa)]	○
			Static Pressure setting *2*3 - Duct (middle pressure) type - The Range of static pressure is different from one model to other.	00	SP mode 00 [0 in.WG (0 Pa)]	
				01	SP mode 01 [0.04 in.WG (10 Pa)]	
				02	SP mode 02 [0.08 in.WG (20 Pa)]	
				03	SP mode 03 [0.12 in.WG (30 Pa)]	
				04	SP mode 04 [0.16 in.WG (40 Pa)]	
				05	SP mode 05 [0.20 in.WG (50 Pa)]	
				06	SP mode 06 [0.24 in.WG (60 Pa)]	
				07	SP mode 07 [0.28 in.WG (70 Pa)]	
				08	SP mode 08 [0.32 in.WG (80 Pa)]	
				09	SP mode 09 [0.36 in.WG (90 Pa)]	
				10	SP mode 10 [0.40 in.WG (100 Pa)]	
				11	SP mode 11 [0.44 in.WG (110 Pa)]	
				12	SP mode 12 [0.48 in.WG (120 Pa)]	
				13	SP mode 13 [0.52 in.WG (130 Pa)]	
				14	SP mode 14 [0.56 in.WG (140 Pa)]	
				31	Normal SP [0.16 in.WG (40 Pa)]	○
	Correction	30	Cool air temperature trigger	00	Default 0°F(0°C)	○
				01	Temperature overshoot setting+4°F(+2°C)	
				02	Temperature undershoot setting-4°F(-2°C)	
		31	Heat air temperature trigger	00	Default 0°F(0°C)	○
				01	Temperature undershoot setting-11°F(-6°C)	
				02	Temperature slightly undershoot setting -7°F(-4°C)	
				03	Temperature overshoot setting+7°F(+4°C)	
	Change of function 1	40	Auto restart *4	00	Enable	
				01	Disable	○
		43	Cool air prevention	00	Super low	○
				01	Follow the setting on the remote controller	
		46	External control	00	Start / Stop	○
				01	Emergency stop	
				02	Forced stop (Start/Stop by RC is restricted)	
		47	Error report target	00	All	○
				01	Display only for central remote control	
		49	FAN Setting when cooling thermo-stat OFF *5	00	Follow the setting on the remote controller	○
				01	Forced stop	
	Change of function 2	60	Switching functions for external inputs and external outputs terminals	00	Mode 0	○
				01	Mode 1	
				02	Mode 2	
				03	Mode 3	
				04	Mode 4	
				05	Mode 5	
				06	Mode 6	
				07	Mode 7	
				08	Mode 8	
		61	Control switching of external heaters (Except Compact wall mounted and Wall mounted)	00	Auxiliary heater control 1	○
				01	Auxiliary heater control 2	
				02	Heat pump prohibition control	
				03	Heater selection control using outdoor temperature 1	
				04	Heater selection control using outdoor temperature 2	
		62	Operating temperature switching of external heaters (Except Compact wall mounted and Wall mounted)	00	Setting 0	○
				01	Setting 1	
				02	Setting 2	
				03	Setting 3	
				04	Setting 4	
				05	Setting 5	

*1: Please refer to FAN PERFORMANCE CURVE within Design and Technical manual for the features of each setting.

*2: If the Setting Number in ARUM30TLAV is configured to “12 to 14”, the operation is the same as that in “11 (SP mode 11)”.

*3: If the Setting Number in ARUM36TLAV is configured to “10 to 14”, the operation is the same as that in “09 (SP mode 09)”.

*4: Auto restart is an emergency function such as for power failure etc.
Do not start and stop the indoor unit by this function in normal operation.
Be sure to operate by the control unit, converter or external input device.

*5: Fan Setting when cooling thermostat OFF, Connection of the wired remote controller (2-wire type or 3-wire type) and switching its thermistor are necessary.

(Note)

Range of static pressure mode varies on the indoor unit models (See next page).

Range of static pressure mode by model

Model name	Range of static pressure mode	Normal static pressure
ARUL4TLAV2	SP mode 00 to 03	0.04 inWG (10 Pa)
ARUL7TLAV2	SP mode 00 to 09	0.10 inWG (25 Pa)
ARUL9TLAV2		
ARUL12TLAV2		
ARUL14TLAV2		
ARUL18TLAV2		
ARUM24TLAV2	SP mode 00 to 14	0.16 inWG (40 Pa)
ARUM30TLAV2	SP mode 00 to 11	
ARUM36TLAV2	SP mode 00 to 09	
ARUH36TLAV	Setting prohibited because of AC motor	0.40 inWG (100 Pa)
ARUH48TLAV		
ARUH60TLAV		

1-6 FIELD SETTING / FUNCTION SETTING FOR OUTDOOR AIR UNIT

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Setting Function	Default
Indoor unit field setting setting by remote controller Monitor mode [F1]	Address	00	Indoor unit address	00~63	00~63	00
		02	Refrigerant circuit address	00~99	00~99	00
	Filter	11	Filter indicator Interval	00	Default	○
				01	Longer	
				02	Shorter	
		13	Filter sign display	00	Enable	
				01	Disable	○
				02	Display only on central remote control	
	Airflow	26	Static Pressure setting - Outdoor air unit Only - The Range of static pressure is different from one model to other.	05	SP mode 05 [0.20 in.WG (50 Pa)]	
				06	SP mode 06 [0.24 in.WG (60 Pa)]	
				07	SP mode 07 [0.28 in.WG (70 Pa)]	
				08	SP mode 08 [0.32 in.WG (80 Pa)]	
				09	SP mode 09 [0.36 in.WG (90 Pa)]	
				10	SP mode 10 [0.40 in.WG (100 Pa)]	
				11	SP mode 11 [0.44 in.WG (110 Pa)]	
				12	SP mode 12 [0.48 in.WG (120 Pa)]	
				13	SP mode 13 [0.52 in.WG (130 Pa)]	
				14	SP mode 14 [0.56 in.WG (140 Pa)]	
				15	SP mode 15 [0.60 in.WG (150 Pa)]	
				16	SP mode 16 [0.64 in.WG (160 Pa)]	
				17	SP mode 17 [0.68 in.WG (170 Pa)]	
				18	SP mode 18 [0.72 in.WG (180 Pa)]	
				19	SP mode 19 [0.74 in.WG (185 Pa)]	
				31	Normal SP [0.74 in.WG (185 Pa)]	○
	Change of function 1	40	Auto restart *1	00	Enable	
				01	Disable	○
		43	Cool air prevention	00	Super low	
				01	Follow the setting on the remote controller	○
		46	External control	00	Start / Stop	○
				01	Emergency stop	
				02	Forced stop (Start/Stop by RC is restricted)	
		47	Error report target	00	All	○
				01	Display only for central remote control	
	Change of function 2	60,61,62	Forbidden	00		○
		63	Humidifier control *2	00	mode 00	○
				01	mode 01	
				02	mode 02	
		65	Threshold temperature setting for cool / heat switch over*3	00	mode 0 ±10°F (±5°C)	○
				01	mode 1 +4°F (±2°C)	
				02	mode 2 ±6°F (±3°C)	
				03	mode 3 ±8°F (±4°C)	
				04	mode 4 ±10°F (±5°C)	
				05	mode 5 ±12°F (±6°C)	
				06	mode 5 ±14°F (±7°C)	

*1: Auto restart is an emergency function such as for power failure etc.
Do not start and stop the indoor unit by this function in normal operation.
Be sure to operate by the control unit, converter or external input device.

*2: Select control conditions of external output.
"Mode 00" is output when heating thermostat is ON, "Mode 01" is output in heating operation, "Mode 02" is output in heating operation and in fan operation.

*3: Threshold temperature setting for cool / heat mode under auto operation ; Set temperature ±4°F (±2°C) to ±14°F (±7°C)
*Cool / heat mode tends to be switched as the threshold temperature range gets smaller,
and cool / heat mode becomes difficult to be switched as the threshold temperature range gets larger.
Set the proper value according to use conditions.

Refrigerant R410A INVERTER

AIRSTAGE J-IV

2. OUTDOOR UNIT OPERATION CONTROL

2. OUTDOOR UNIT

2-1 INPUT / OUTPUT LIST

		Input / output or kind of detail	Control range
INPUT	Discharge pressure sensor <HIGH> Suction pressure sensor <LOW> Discharge temperature sensor <TH1> Outdoor temperature sensor <TH3> Suction temperature sensor <TH4> Heat exchanger temperature sensor <TH5> Liquid temperature sensor <TH7> Sub-cool heat exchanger (inlet) sensor <TH8> Sub-cool heat exchanger (outlet) sensor<TH9> Compressor temperature sensor <TH10> Operation current sensor Pressure switch	Pressure sensor Pressure sensor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Current transformer Pressure switch	Measure range 0 to 725psi (0 to 5.0MPa) Measure range 0 to 25psi (0 to 1.7MPa) Measure range 50 to 266°F (10 to 130°C) Measure range -22 to 136°F (-30 to 58°C) Measure range -31 to 158°F (-35 to 70°C) Measure range -31 to 158°F (-35 to 70°C) Measure range -31 to 158°F (-35 to 70°C) Measure range -31 to 158°F (-35 to 70°C) Measure range -31 to 158°F (-35 to 70°C) Measure range 50 to 266°F (10 to 130°C) Open 609psi (4.2MPa) Short 464psi (3.2MPa)
	Rotary SW & DIP-SW & Push SW	Address and function setting	
OUTPUT	Compressor Electronic expansion valve 1 (Main) Electronic expansion valve 2 (SC-Hex) Fan motor 1 (Upper) Fan motor 2 (Lower) 4-way valve Solenoid valve Crank case heater Base heater	Magnetic relay EV coil EEV coil DC Brushless motor DC Brushless motor 4-way valve coil Comp pressure equalizing valve For Inverter Compressor Standard equipment	Operation coil AC208-230V, 60Hz Operating voltage DC12V Operating voltage DC12V AC208-230V, 50/60Hz 6/5 W AC208-230V, 60Hz, 6W AC230V, 25W AC208-230V, 150W
Communication Input / Output	LON WORKS Inverter communication	Indoor unit ←→ Outdoor unit	
External Input / Output	External input 1 (CN131) (Low noise mode operation) External input 2 (CN132) (Cooling / Heating priority) External input 3 (CN133) (Outdoor unit operation peak control) External input 4 (CN134) (Emergency stop operation)	Dry contact input	
	External output 1 (CN136) (Error display) External output 2 (CN137) (Operation display)	ON (Error) / OFF (Normal) ON (Operation) / OFF (Stop)	Control output: DC 0/12-24V, Max.30mA Control output: DC 0/12-24V, Max.30mA
LED display	Single LED 101 Single LED 102 7 Segment LED	Display the information on operation, error and setting with single LED and 7 segment LED.	

2-2 COMPRESSOR OPERATION

2-2-1 Operation / Stop Condition

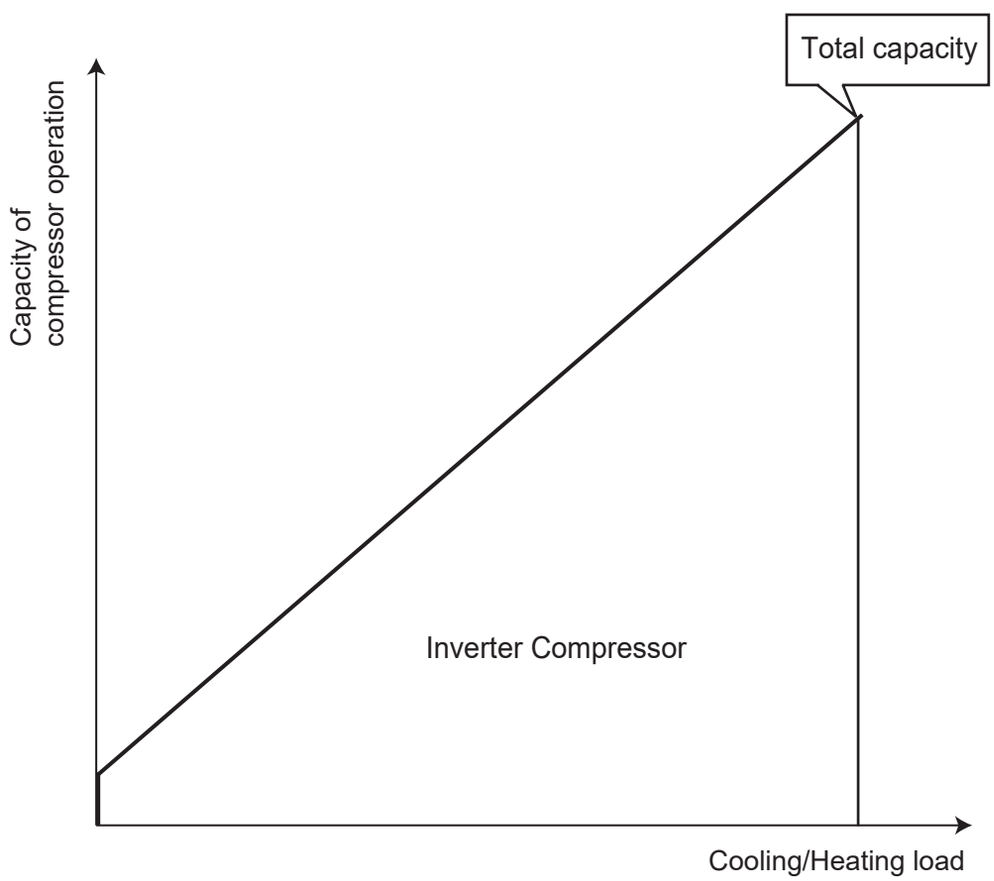
When cooling requirement capacity or heating requirement capacity from either of the indoor units in the same refrigerant circuit is input, the compressor operates.
When all the indoor units in no "cooling requirement capacity" or "heating requirement capacity", the compressor is stopped.
But in the following case, the compressor operates in accordance with operation of each mode.

- During 3 minute restart prevention operation
- Icing protection
- Failure (Refer to chapter 4, TROUBLE SHOOTING)
- Oil recovery
- Under expansion valve initialization
- At protective operation
- Emergency stop
- Defrost operation
- Peak cut stop operation

2-2-2 Capacity Control

(1) Capacity of compressor operation

By the operation of DC inverter rotary compressor, the amount of required refrigerant circulation acceding to cooling and heating load can be supplied from compressor efficiently.
DC inverter rotary compressor is able to control the amount of required refrigerant circulation in details.



(2) Target low-pressure and high-pressure control

<Cooling>

In order to make the evaporation pressure of the indoor unit at the proper pressure on a variety of operations, capacity of the compressor will be controlled by low-pressure sensor of the outdoor unit.

<Heating>

In order to make the condensation pressure of the indoor unit at the proper pressure on a variety of operations, capacity of the compressor will be controlled by high-pressure sensor of the outdoor unit.

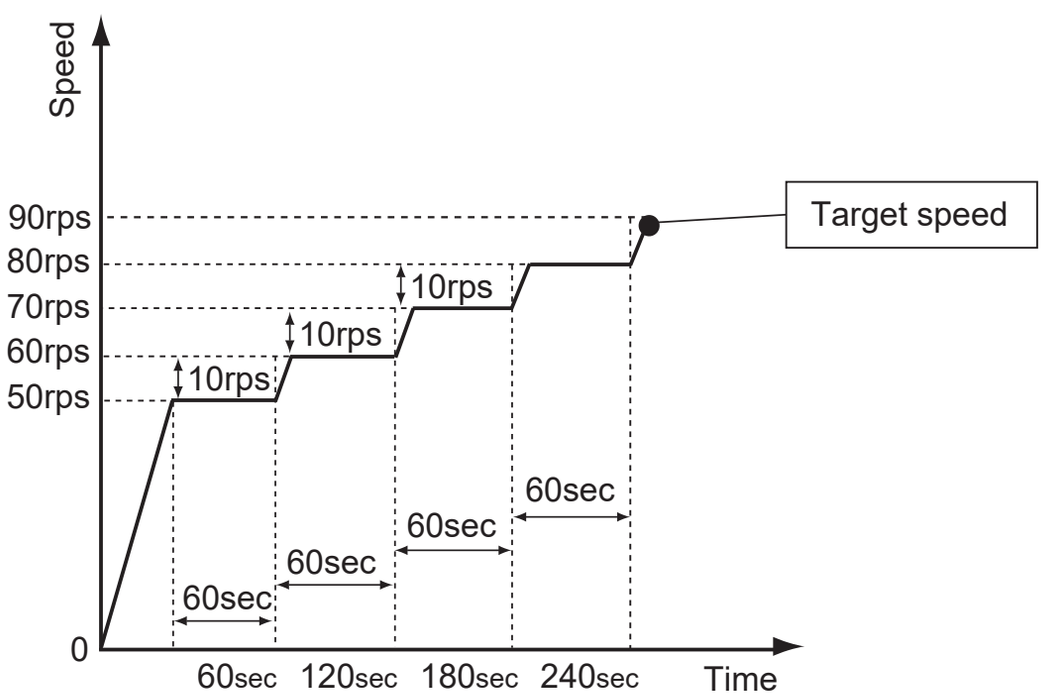
Target low-pressure and high pressure temperature depends on system capacity, capacity of compressor operation, pipe length, and capacity shift switch settings.

2-2-3 Speed Range of Start, Stop, And Operation

- On stop mode : 0 rps
- On operating mode : 20 - 100 rps

(1) Cooling starting process

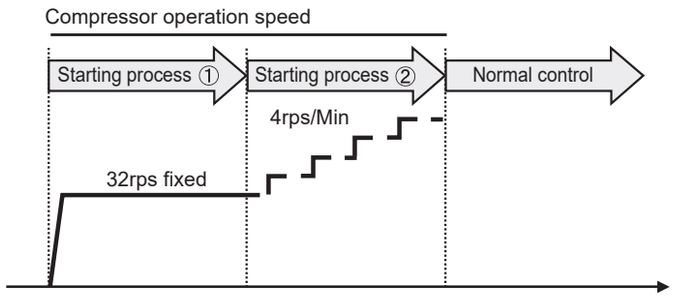
- For cooling operation only, the upper limit speed at starting is made 50rps and is raised in +10rps increments every 60 seconds.
- The compressor operates at the upper limit speed if the target speed is higher than the upper limit speed.
- The compressor operates at the target speed if the target speed is lower than the upper limit speed.



(2) Heating starting process

At the start of heating, the compressor is started by the following process. Compressor start-up to change the 4 way valve. Capacity control returns to normal control after the end of the starting process. (target high-pressure control)

< Starting process >



	Cancel conditions
Starting process ①	3 minutes elapsed from start of process ① or High-pressure > 381.4psi (2.63MPa)
Starting process ②	20 minutes elapsed from start of process ② or High-pressure ≧ 381.4psi (2.63MPa) or Discharge SH ≧ 50°F (10°C) and Discharge temperature >50°F (10°C)

*However, when the following condition (A) or (B) are satisfied, starting process is not performed.

< Conditions under which starting process is not performed >

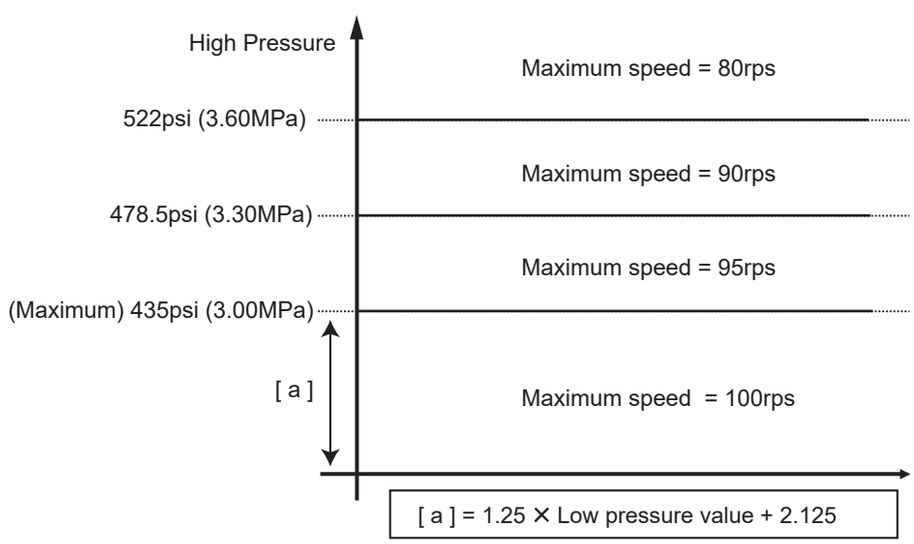
(A) The compressor temperature ≧ 89.6°F (32°C), when the room temperature reached to the setting temperature (Thermostat - OFF controlling)

(B) The compressor temperature ≧ 89.6°F (32°C), when the system keeps heating mode with stop condition

< Operation >

Compressor operates based on the required capacity at the start up, after that the target high-pressure control begins.

(3) Limits the upper limit speed of the INV compressor according to the present high-pressure value.



2-3 FAN CONTROL

2-3-1 Cooling Operation

Fan step	Fan speed (rpm)		
	AOU36RLAVM4	AOU48RLAVM4	AOU60RLAVM4
11	780	780	890
	700	700	800
10	660	660	690
	660	660	690
9	670	670	670
	590	590	590
8	540	540	540
	540	540	540
7	450	450	450
	410	410	410
6	340	340	340
	340	340	340
5	270	270	270
	250	250	260
4	390	390	390
	0	0	0
3	340	340	340
	0	0	0
2	290	290	280
	0	0	0
1	250	250	260
	0	0	0
0	0	0	0
	0	0	0

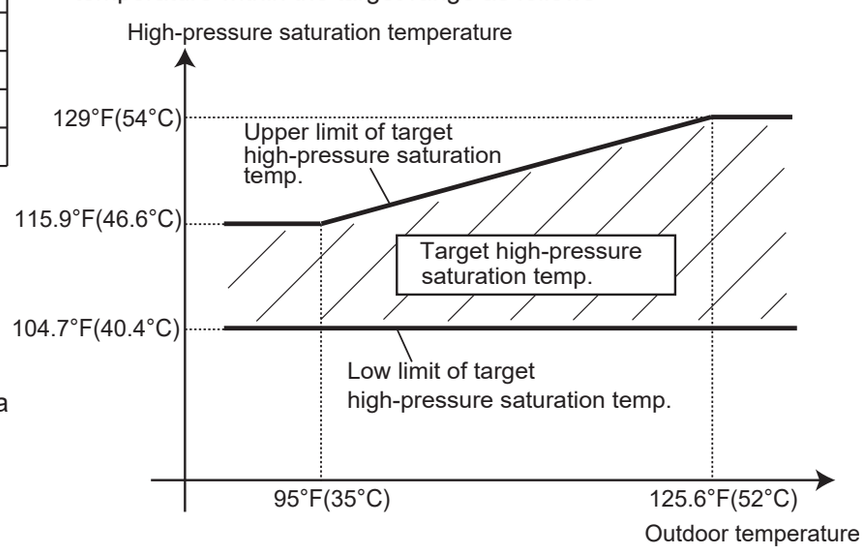
Step	Upper FAN
	Lower FAN

● Switching conditions of step

The initial speed of the outdoor unit is detected by outdoor temperature sensor.

Outside air temperature sensor detected value	Fan step
TAOUT > 86°F(30°C)	7
68°F(20°C) ≧ TAOUT > 86°F(30°C)	5
68°F(20°C) ≧ TAOUT > 50°F(10°C)	2
50°F(10°C) ≧ TAOUT	0

The fan is controlled to keep high pressure saturation temperature within the target range as follows



There after, thehigh-pressure is monitoring at a set time interval and the fan speed is changed by the following conditions.

(Conditions which lower the fan speed)
High-pressure saturation < low limit of target high-pressure saturation range and heat sink temperature ≦ 176°F(80°C)

(Conditions which raise the fan speed)
High-pressure saturation > upper limit of target high-pressure saturation or heat sink temperature ≧ 185°F(85°C)

2-3-2 Heating Operation

Fan step	Fan speed (rpm)		
	AOU36RLAVM4	AOU48RLAVM4	AOU60RLAVM4
11	800	800	890
	700	700	800
10	660	660	690
	660	660	690
9	670	670	670
	590	590	590
8	540	540	540
	540	540	540
7	450	450	450
	410	410	410
6	340	340	340
	340	340	340
5	270	270	270
	250	250	260
4	0	0	0
	0	0	0
3	0	0	0
	0	0	0
2	290	290	280
	0	0	0
1	0	0	0
	290	290	280
0	0	0	0
	0	0	0

● Switching conditions of step

The initial speed of the first boot outdoor unit is detected by outdoor air temperature sensor value (TAOUT).

Outside air temperature sensor detected value	Fan step
TAOUT ＜ 50°F(10°C)	11
50°F(10°C) ≦ TAOUT ＜ 59°F(15°C)	8
59°F(15°C) ≦ TAOUT ＜ 68°F(20°C)	5
68°F(20°C) ≦ TAOUT	5

There after, the high-pressure is monitoring at a set time interval and the fan speed is changed by the following conditions.

(Condition which lowers the fan speed)

High-pressure ≧ 478.5psi (3.30MPa) and heat sink temperature ≦ 176°F (80°C)

(Condition which raises the fan speed)

High-pressure saturation ≦ 464psi (3.20MPa) or heat sink temperature ≧ 185°F (85°C)

2-3-3 Low noise mode

When the low noise mode setting ON from PUSH SW or EXTERNAL INPUT, the outdoor unit operates in the low noise mode as follows.

《Settings and corresponding operations》

Capacity priority setting (PUSH SW)	Low noise level setting (PUSH SW)	Operation mode
OFF	ON	LOW NOISE MODE
ON	ON	* Automatic switching

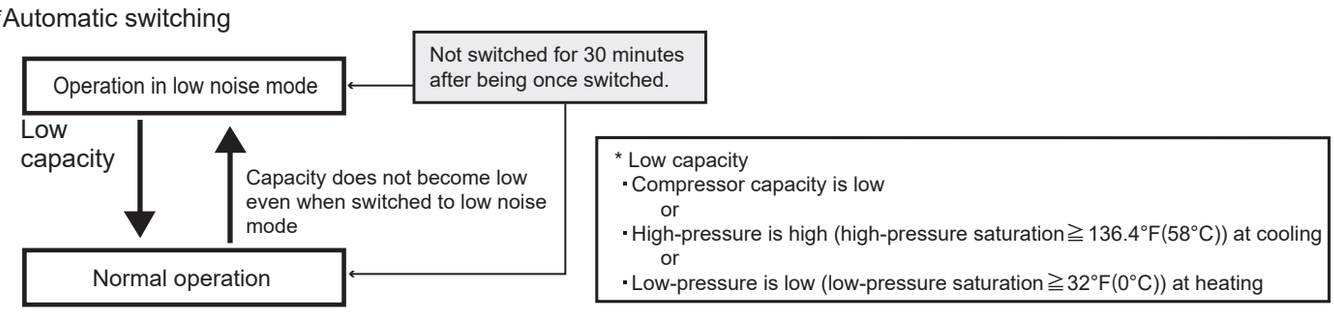
《Low noise mode and operation contents》

			3ton AOU36RLAVM4	4ton AOU48RLAVM4	5ton AOU60RLAVM4
Low Noise Mode	COOL	Max FAN Step	7	7	7
		Upper FAN Lower FAN	450 410	450 410	450 410
		Max Compressor Speed	40	45	52
	HEAT	Max FAN Step	7	7	7
		Upper FAN Lower FAN	450 410	450 410	450 410
		Max Compressor Speed	60	60	60

The operating noise is reduced by limiting the rotational speed of the compressor and fan motor.

LOW NOISE MODE ・・・The operating sound lowers from about 3 to 5 dB more than the rated value

*Automatic switching



2-3-4 Other Control

To accurately detect the outside air temperature, the fan is operated while the outdoor unit is stopped.

2-4 EXPANSION VALVE CONTROL

	Initialization conditions	Operation mode	Control range	
			operation	stop
EEV 1	①When power turned on ②When operation stopped	Cooling	500 pulses	0 pulses
		Heating	40 - 500 pulses	
EEV 2		Cooling	55 - 500 pulses	0 pulses
		Heating		

< Cooling mode >
500 pulses basically.

< Heating mode >
EEV is controlled so that the system reaches closer to the target discharge temperature that is calculated from high and low pressure.

2-5 SPECIAL OPERATION

2-5-1 Oil Recovery Operation

Purpose of the operation

The amount of refrigerant lubricant oil which has been transported to the indoor units
and the connection pipe with the refrigerant will become large as the operation time of compressor increases.
It is necessary to recover the oil back into the outdoor unit for a certain time interval
in order to prevent compressors from damaging due to lack of lubrication oil.

1. Oil Recovery in Cooling operation

< Start condition >

Compressor accumulated operation time since last cooling oil recovery operation exceeds 3 hours (first time : an hour)

< End condition >

30 seconds have elapsed since the start and "suction temperature - low pressure saturation temperature ≦ 41°F(5°C)
at all outdoor units or 6 minutes have elapsed since the start.

< Operation >

COMPRESSOR: The rotation speed varies depending on the operation state.
EEV Opening (Indoor/Outdoor unit): Controlled pulse (as normal operation mode).
FAN speed (Indoor/Outdoor unit): Controlled fan speed (as normal operation mode).

2. Oil Recovery in Heating operation

< Start condition >

Compressor accumulated operation time since the last heating oil recovery exceeds 8 hours (first time : 1 hour)

< End condition >

After 4 minutes have elapsed

< Operation >

COMPRESSOR: The rotation speed varies depending on the operation state.
EEV Opening (Indoor/Outdoor unit): Controlled pulse (as normal operation mode)
FAN speed (Indoor/Outdoor unit): Controlled fan speed (as normal operation mode)

Others

During the oil recovery operation, appears on the display of wired and central remote controller,
and appears on the simple remote controller.
The operation indicators (LED) of the indoor units flash slowly.

2-5-2 Pre-heat Operation

This pre-heat operation protects the start up failure by preventing the refrigerant from soaking into the oil in compressor.

Crank case heater ON : 30 minutes elapsed since installed compressors stopped.
(However, ON when power turned on)

OFF : Compressor starts.

*It doesn't control according to the temperature.

2-5-3 Defrost Operation Control

Defrost Operation Start Condition 1

Outdoor temperature <35.6°F(2°C) and Compressor stop count exceed 20 times at less than 10 minutes of accumulated heating operation time

Defrost Operation Start Condition 2

Accumulated heating operation time is 40 minutes or longer
[Accumulated heating operation time is reset at the end of cooling operation or defrosting operation.]
and
an outdoor unit satisfies condition ① or ② below

Condition①: "Heat exchange temperature ≦ 28.4°F(-2°C)" accumulated operating time is 180 minutes or longer

Condition②: After the following all condition satisfied, "heat exchange temperature ≦ defrosting start judgment temperature and during heat exchange liquid temperature drop" accumulated time:10 minutes

(a) accumulated heating operation time ≧ 30 minutes
(b) 10 minutes have elapsed after outdoor unit starting
(c) 5 minutes have elapsed since oil recovery

* Defrosting start and end judgment temperature are determined by the outdoor temperature.

⇒ **Defrosting start judgment temperature = 0.8 x outdoor temperature - 11.6**
(However, -26.3°F(-32.4°C) to 21.2°F(- 6°C))

If the calculated result is lower than -26.3°F(-32.4°C) , the judgment temperature is defined as -26.3°F(-32.4°C)
If the calculated result is higher than 21.2°F(-6°C) , the judgment temperature is defined as 21.2°F(-6°C)

Defrost Operation End Condition

① At all outdoor units, heat exchange liquid temperature ≧ end judgment temperature
or
② when 15 minutes have elapsed from the start

⇒ **Defrosting end judgment temperature = 0.39 x outdoor temperature + 12.7**
(However, 41°F(5°C) to 53.6°F(12°C))

If the calculated result is lower than 41°F(5°C), the judgment temperature is defined as 41°F(5°C)
If the calculated result is higher than 53.6°F(12°C), the judgment temperature is defined as 53.6°F(12°C)

2-6 PROTECTIVE FUNCTION

2-6-1 Protective Function List

Protective Function	Detect Parts	COOL	HEAT	DISPLAY	Operating Condition	Operation
Discharge Temp Protection 1	Discharge Temp Thermistor	○		—	<Starting conditions> 3 minutes have elapsed since the start of operation and (discharge temperature ≧ 212°F(100°C) or suction SH ≧ 50°F(10°C) accumulated time 30 minutes) <Reset conditions> Discharge temperature ≦ 203°F(95°C) and suction SH ≦ 44.6°F(7°C)	EEV of operating indoor unit gradually opened
Discharge Temp Protection 2	Discharge Temp Thermistor	○	○	—	<Starting conditions> Cooling: Discharge temperature ≧ 203°F (95°C) Heating: Discharge temperature ≧ 215.6°F (102°C) <Reset conditions> Discharge temperature ＜ 194°F (90°C) Discharge temperature ＜ 206.6°F (97°C)	EEV2 + 30pls/30 secs
Discharge Temp Protection 4	Discharge Temp Thermistor	○	○	—	<Starting condition> Discharge temperature ≧ 221°F(105°C) <Pattern reset condition> Discharge temperature ≦ 212°F(100°C)	Compressor speed -6rps every 30 secs Speed rise prohibited, when discharge temperature becomes lower than 221°F(105°C), prohibit the rotational speed rise of the compressor.
Discharge Temp Protection 5	Discharge Temp Thermistor		○	—	<Starting conditions> Discharge temperature ≧ 203°F(95°C) and EEV1=500pls <Reset conditions> 2 minutes have elapsed and (discharge temperature ≦ 194°F(90°C) or EEV1 ≦ 400pls)	Expansion valve of stopped indoor unit gradually opened (upper limit 200pls)
Discharge Temp Protection Stop	Discharge Temp Thermistor	○	○	P1	<Pattern ① starting condition> Discharge temperature ≧ fixed value (239°F(115°C)) <Pattern ① reset condition> 3 minutes have elapsed and discharge temperature ≦ 176°F(80°C)	Compressor stopped
				EA11	<Pattern ② starting condition> Pattern ① generated 2 times within 40 minutes <Pattern ② reset condition> Error reset (push button SW) executed after power turned on again	Compressor stopped (permanent stop) Error display
High Pressure Protection 1	High Pressure Sensor	○		—	<Starting conditions> COMP < 25 rps ---- HP ≧ 478.5psi (3.3 MPa) 25 rps ≦ COMP < 30 rps ---- HP ≧ 507.5psi (3.5 MPa) 30 rps ≦ COMP ---- HP ≧ 551psi (3.8 MPa) <Reset conditions> Fixed time has elapsed and Fixed time when SV2: ON 30 secs COMP < 25 rps ---- HP ≦ 478.5psi (3.3 MPa) 25 rps ≦ COMP < 30 rps ---- HP ≦ 507.5psi (3.5 MPa) 30 rps ≦ COMP ---- HP ≦ 551psi (3.8 MPa)	SV2 ON
High Pressure Protection 2	High Pressure Sensor		○	—	<Starting conditions> COMP ≧ 25 rps ---- HP ≧ 507.5psi (3.5 MPa) COMP < 25 rps ---- HP ≧ 478.5psi (3.3 MPa) <Reset conditions> 3 minutes have elapsed and high-pressure ≦ 406psi (2.8MPa)	SV2 ON
High Pressure Protection 3	High Pressure Sensor	○		—	<Starting conditions> Fixed time has elapsed and high-pressure ≧ 507.5psi (3.5 MPa) (* Fixed time at start of operation: 10 secs, after operation execution: 20 secs) <Reset conditions> Operation (fan speed 1 step increase) complete	Fan speed 1 step increase
High Pressure Protection 4	High Pressure Sensor		○	—	<Pattern ① starting condition> High-pressure ≧ 478.5pis (3.3MPa) <Pattern ① reset condition> High-pressure ≦ 464psi (3.2MPa)	Fan speed lowered/every 30 secs
				—	<Pattern ② starting condition> High-pressure ≧ 507.5psi (3.5 MPa) <Pattern ② reset condition> High-pressure ＜ 507.5psi (3.5 MPa)	Fan lowest speed Upper 270 rpm Lower 250 rpm
High Pressure Protection 5	High Pressure Sensor		○	—	<Starting conditions> High-pressure ≧ 464psi (3.2MPa) <Reset conditions> High-pressure ＜ 464psi (3.2MPa)	Compressor capacity lowered/every 15 secs
Abnormal High Pressure Protection Control	High Pressure Sensor	○		—	<Pattern ① starting condition> COMP ＜ 30 rps ---- HP ≧ 461.1psi (3.18 MPa) COMP ≧ 30 rps ---- HP ≧ 533.6psi (3.68 MPa) <Pattern ①reset condition> After 25 seconds have elapsed and, COMP ＜ 30 rps ---- HP ＜ 449.5psi (3.1 MPa) COMP ≧ 30 rps ---- HP ＜ 522psi (3.6 MPa)	Compressor capacity rise prohibited
				—	<Pattern ② starting condition> COMP ＜ 30 rps ---- HP ≧ 478.5psi (3.3 MPa) COMP ≧ 30 rps ---- HP ≧ 551psi (3.8 MPa) <Pattern ② reset condition> After 25 seconds have elapsed and, COMP ＜ 30 rps ---- HP ＜ 461.1psi (3.18 MPa) COMP ≧ 30 rps ---- HP ＜ 533.6psi (3.68 MPa)	Compressor capacity lowered every 30 secs

Protective Function	Detect Parts	COOL	HEAT	DISPLAY	Operating Condition	Operation
High Pressure Protection Stop 1	High Pressure Sensor	○	○	P2	<Pattern ① starting condition> High-pressure ≧ 580psi (4.0MPa) <Pattern ① reset condition> 5 minutes have elapsed and high-pressure ≦ 507.5psi (3.5MPa)	Compressor stopped
				EA41	<Pattern ② starting condition> Pattern ① generated 3 times within 60 minutes. <Pattern ② reset condition> 10 minutes have elapsed and high-pressure ≦ 507.5psi (3.5MPa)	Compressor stopped
High Pressure Protection Stop 2	Pressure Switch	○	○	P2	<Pattern ①starting condition> Pressure SW operated (Operated by high-pressure ≧ 609psi (4.20MPa) <Pattern ①reset condition> 5 minutes have elapsed and pressure SW operation reset (Reset by high-pressure ≦ 464psi (3.2MPa))	Compressor stopped
				EA42	<Pattern② starting condition> Pattern ① generated 3 times within 60 minutes. <Pattern② reset condition> 10 minutes have elapsed and pressure SW operation reset (Reset by high-pressure ≦ 464psi (3.2MPa))	Compressor stopped Error display
Low Pressure Protection 1	Low Pressure Sensor	○		—	<Starting conditions> Low-pressure ≦ 29psi (0.2MPa) <Reset conditions> 5 minutes have elapsed and low-pressure ≧ 43.5psi (0.3MPa)	SV2 ON
Low Pressure Protection 2	Low Pressure Sensor		○	—	<Starting conditions> Low-pressure ≦ 14.5psi (0.1MPa) <Reset conditions> 3 minutes have elapsed and low-pressure ≧ 24.7psi (0.17MPa)	SV2 ON
Low Pressure Protection 4	Low Pressure Sensor		○	—	<Starting conditions> 3 minutes have elapsed and low-pressure ≦ 26.1psi (0.18MPa) <Reset conditions> 3 minutes have elapsed and low-pressure ≧ 31.9psi (0.22MPa)	EEV of stopped indoor unit opened quickly (450pls)
Abnormal Low Pressure Protection Control	Low Pressure Sensor		○	—	<starting condition> Low-pressure ≦ 23.2psi (0.16MPa) <reset condition> 3 minutes have elapsed and low-pressure ≧ 26.1psi (0.18MPa)	Compressor capacity lowered every 180 secs, when the Low-pressure becomes more than 24.7psi (0.17MPa), prohibit compressor capacity rise.
Low Pressure Protection Stop	Low Pressure Sensor	○	○	P3	<Pattern ① starting condition> Low-pressure ≦ 7.3psi (0.05MPa) or low-pressure ≦ 14.5psi (0.10MPa) continues for 10 mins <Pattern ① reset condition> 3 minutes have elapsed and low-pressure ≧ 24.7psi (0.17MPa)	Compressor stopped
				EA51	<Pattern ② starting condition> Pattern ① generated 5 times within 180 minutes. <Pattern ② reset condition> Error reset (push button SW) executed after power turned on again.	Compressor stopped (permanent stop) Error display
Compressor Temp Protection Stop	Compressor Temp Thermistor	○	○	P4	<Pattern ① starting condition> Compressor temperature ≧ fixed value 230°F(110°C) <Pattern ① reset condition> 3 minutes have elapsed and discharge temperature ≦ 176°F(80°C)	Compressor stopped
				EA31	<Pattern ② starting condition> Pattern ① generated 2 times within 40 minutes <Pattern ② reset condition> Error reset (push button SW) executed after power turned on again	Compressor stopped (permanent stop) Error display
Compression Ratio Protection Stop	High Pressure Sensor Low Pressure Sensor	○	○	P7	<Starting condition> When the compressor is operating at the minimum rotation speed and the compression ratio exceeds 8.0 and the operation continues for 3 minutes or more. <Reset condition> When the compression ratio is 8.0 or less and 3 minutes have passed.	Compressor stopped

Protective Function	Detect Parts	COOL	HEAT	DISPLAY	Operating Condition	Operation
Over current Break Stop (Compressor)	Over current Protection Circuit	○	○	E941 (permanent stop)	Compressor is stopped when the over currernt protection circuit in the inverter PC Board detects an abnormal current during the operation. If it repeated 5 times, the compressor becomes permanent stop.	Compressor stopped
				E931 (permanent stop)	Compressor is stopped when the over current protection circuit in the inverter PC Board detects an abnormal current at the time of start up. Compressor becomes permanent stop if it repeated over the number of set time.	
				—	<Reset condition> Error reset (push button SW) executed after power turned on again.	
Heat sink Temp Protection Stop	Heat sink Temp Thermistor	○	○	—	<Pattern ① starting condition> Heat sink temperature ≧ 212°F(100°C) <Pattern ① reset condition> 3 minutes have elapsed and heat sink temperature ≦ 185°F(85°C)	Compressor stopped
				EAC4	<Pattern ② starting condition> Pattern ① generated 3 times within 60 minutes. <Pattern ② reset condition> 10 minutes have elapsed and heat sink temperature ≦ 185°F(85°C)	Compressor stopped Error display
Frequency Maximum Setting Protection (Compressor)	Current Detector Circuit	○	○	—	<Pattern ① starting condition> Current value ≧ 20.5A (AOU36,48RLAVM4) 26.5A (AOU60RLAVM4) <Pattern ① reset condition> Current value < 20.5A (AOU36,48RLAVM4) 26.5A (AOU60RLAVM4)	Compressor speed rise prohibited
				—	<Pattern ② starting condition> Current value ≧ 21.0A (AOU36,48RLAVM4) 27.0A (AOU60RLAVM4) <Pattern ② reset condition> Current value < 21.0A (AOU36,48RLAVM4) 27.0A (AOU60RLAVM4) • Pattern ① and ② start current value changed by outside temperature	Compressor speed lowered

Refrigerant R410A INVERTER

AIRSTAGE J-IV

3. INDOOR UNIT OPERATION

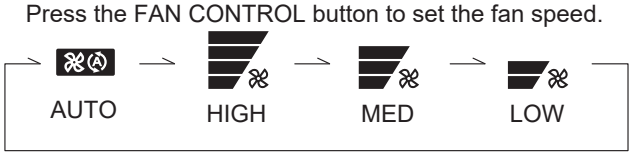
3. INDOOR UNIT OPERATION

3-1 FAN CONTROL

3-1-1 Fan Speed Setting

Fan speed setting

Press the FAN CONTROL button to set the fan speed.

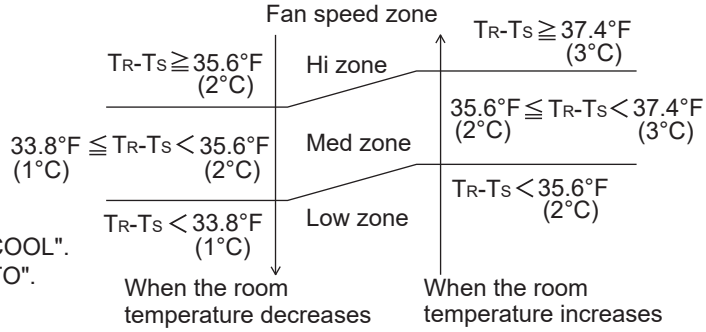


3-1-2 "AUTO" Position

1. COOLING OPERATION

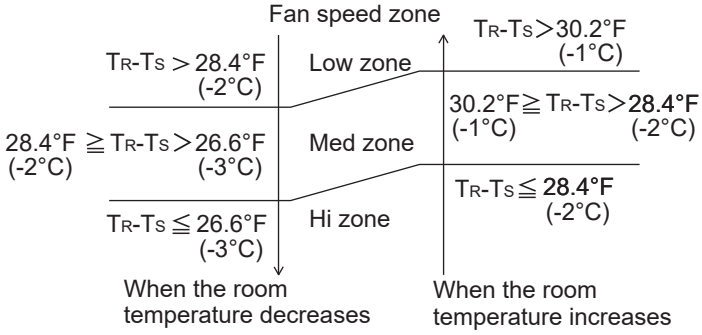
The fan speed is determined automatically in accordance with the condition "(TR(corrected room temperature) - TS (corrected set temperature)" as shown on the right. However, the fan speed zone is determined in the manner as the room temperature increases for the following cases.

(1) When the T_S is changed.
(2) When the operation mode is changed from other mode to "COOL".
(3) When the fan control is changed from other position to "AUTO".



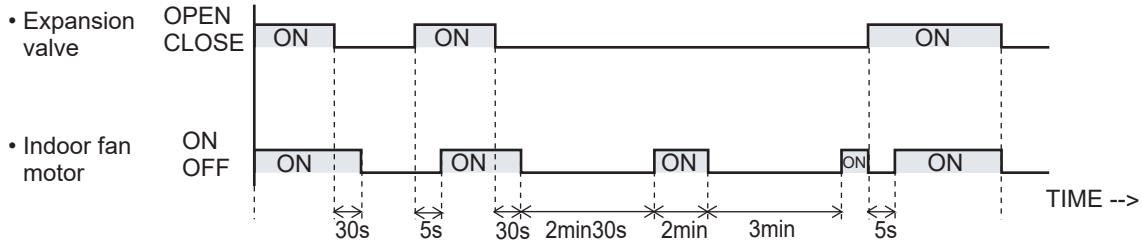
2. HEAT OPERATION

Same as Cooling operation, fan speed is decided by the difference between the room temperature and the set temperature.



3. DRY OPERATION

The indoor fan always rotates at "Lo" speed.



(1) The indoor fan starts operation 5 seconds after the electric expansion valve opens. However, when the indoor unit just starts its operation or the operation mode is changed from other to "DRY" and the refrigerant circulation is not stopped, the fan will rotate immediately without a delay time of 5 seconds.

(2) The indoor fan will stop in 30 seconds when the refrigerant circulation stops.

(3) The indoor fan will stop immediately when the indoor unit is stopped by pushing the stop button or by a setting of ON timer.

(4) When the refrigerant circulation is stopped due to a lower room temperature for more then 3 minutes, the fan will rotate 2 minutes at intervals of 3 minutes.

(5) When the indoor unit just starts its operation or the operation mode is changed from other to "DRY" and the refrigerant circulation is stopped, the fan will rotate for 1 minute and then it will operate according to the statement (4).

3-2 MASTER CONTROL

3-2-1 Operation Mode Control

Each operation mode is controlled as below.

(1) Stop mode

Indoor fan motor : OFF
Electric expansion valve : Stop pulse
Drain pump : Turns ON-OFF by the drain pump control function

(2) Cool, Dry and Heat Mode

	Cool	Dry	Heat
Indoor fan motor	Operates according to the AIR FLOW-MODE setting.	See the fan control page.	Operates according to the AIR FLOW-MODE setting, and besides cold air prevention operation
Drain pump	Turns ON-OFF by the drain pump control function		
Electrical expansion valve	Pulse controlled by the temperature differ-ence calculation and frost prevent function	Pulse controlled by the temperature dif-ference calculation and frost prevent function	Pulse controlled by the temperature dif-ference.

(3) Priority mode

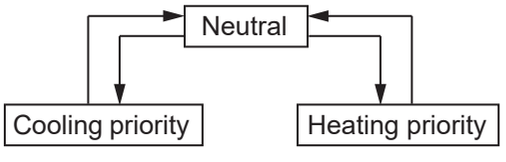
The purpose of the priority mode is to restrict operation commands (heating, cooling, dry) from the connected indoor units.
There are 3 priority modes of Neutral, Cooling Priority, and Heating Priority.
The operation modes restricted by each of these modes are as follows:

Priority mode	Restricted operation mode
Neutral	No restrictions
Cooling priority	Heating
Heating priority	Cooling, dry

1. Priority mode decision methods

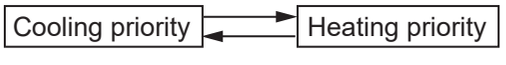
Method 1. (Default value)

The initial priority mode is made Neutral and is shifted to Cooling Priority when cooling and to Heating Priority when heating depending on which operation mode (cooling, heating) was input first.
After shifting to Cooling Priority or Heating Priority, the priority mode shifts to Neutral only when there was a Stop input from all the indoor units.



Method 2. (Management by outdoor unit)

Operation mode management is made "Management by outdoor unit" by outdoor unit PUSH-SW (field setting).
The priority mode shifts to Cooling Priority or Heating Priority in accordance with input from the outdoor unit regardless of the current mode.



Method 3. (Management by indoor unit)

Operation mode management is made "Management by indoor unit" by outdoor unit PUSH-SW (field setting).
Then the master indoor unit is set by wired remote controller.
Thereupon the priority mode shifts to Cooling Priority or Heating Priority in accordance with input from the master indoor unit regardless of the current priority mode.
The priority mode is fixed at either cooling or heating even if the master indoor unit stops
Cooling/heating switching can be performed by the master indoor unit only.

(4) Opposite operation mode

When the operation mode commanded from an indoor unit (remote controller) and the operation mode allowed by the system (cooling and dry operation for cooling only type and operation mode allowed by priority mode for heat pump type) do not match, it is indicated by blinking of an LED.

Timer lamp: 3 secs ON/1 sec OFF repeated

3-2-1 Operation Mode Control for Outdoor air unit

Each operation mode is controlled as below.

(1) Stop mode

Outdoor air unit fan motor : OFF
Electric expansion valve : Stop pulse
Drain pump : Turns ON-OFF by the drain pump control function
Solenoid valve : Closed

(2) Cool and Heat Mode

Each operation mode is controlled as below.

	Cool	Heat	Fan
Outdoor air unit fan motor	Operates according to the HIGH MODE setting.	Operates according to the HIGH MODE setting.	Operates according to the HIGH MODE setting.
Drain pump	Turns ON-OFF by the drain pump control function		
Electrical expansion valve	Pulse controlled by the temperature difference calculation and freeze prevention control	Pulse controlled by the temperature difference.	Stop pulse
Solenoid valve	Closed at all times	Opened at thermo stat off and compressor on. Closed at other operation.	Closed at all times

(3) Priority mode

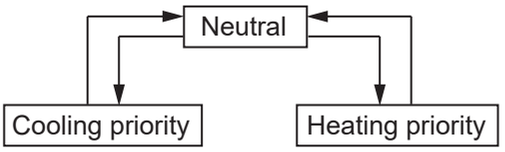
The purpose of the priority mode is to restrict operation commands (heating,cooling) from the connected outdoor air units.
There are 3 priority modes of Neutral, Cooling Priority, and Heating Priority.
The operation modes restricted by each of these modes are as follows:

Priority mode	Restricted operation mode
Neutral	No restrictions
Cooling priority	Heating
Heating priority	Cooling

1.Priority mode decision methods

Method1. (Default value)

The initial priority mode is made Neutral and is shifted to Cooling Priority when cooling and to Heating Priority when heating depending on which operation mode (cooling, heating) was input first.
After shifting to Cooling Priority or Heating Priority, the priority mode shifts to Neutral only when there was a Stop input from all the indoor units.



Method 2. (Management by Outdoor unit)

Operation mode management is made "Management by Outdoor unit" by Outdoor unit PUSH-SW (field setting).
The priority mode shifts to Cooling Priority or Heating Priority in accordance with input from the Outdoor unit regardless of the current mode.

Method 3. (Management by indoor unit)

Operation mode management is made "Management by indoor unit" by Outdoor unit PUSH-SW (field setting).
Then the master indoor unit is set by wired remote controller.
Thereupon the priority mode shifts to Cooling Priority or Heating Priority in accordance with input from the master indoor unit regardless of the current priority mode.
The priority mode is fixed at either cooling or heating even if the master indoor unit stops
Cooling/Heating switching can be performed by the master indoor unit only.

(4) Opposite operation mode

When the operation mode commanded from an indoor unit (remote controller)and the operation mode allowed by the system (cooling and dry operation for cooling only type and operation mode allowed by priority mode for heat pump type) do not match, it is indicated by blinking of an LED.

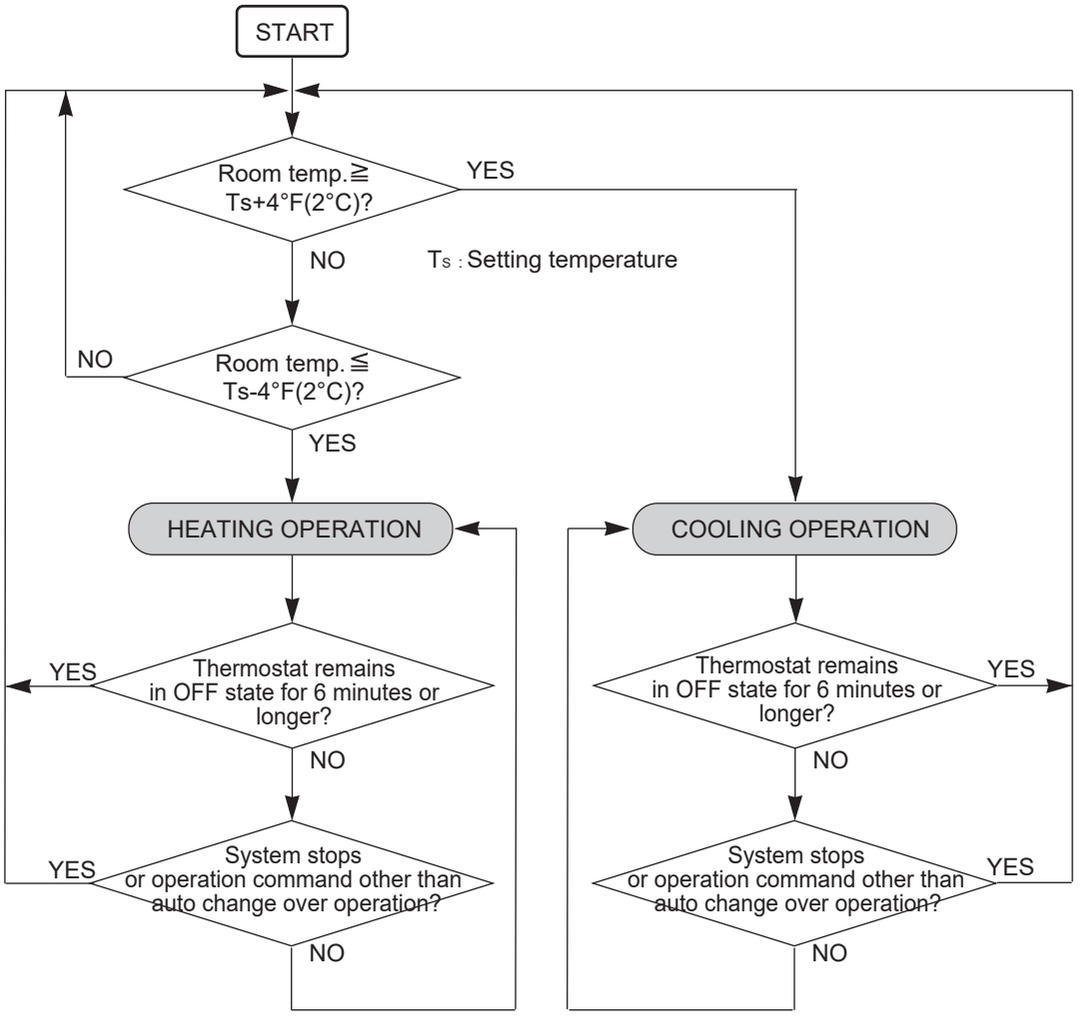
Timer lamp: 3 secs ON/1 sec OFF repeated

3-2-2 Auto Changeover

[Method]
1. Switch operation mode management to "Management by indoor unit" by outdoor unit DIP-SW.
2. Set the master indoor unit by wired remote controller.
3. Judge cooling/heating by the difference between the master indoor unit's setting temperature and the room temperature.

■ AUTO CHANGEOVER operation

Operation flow chart



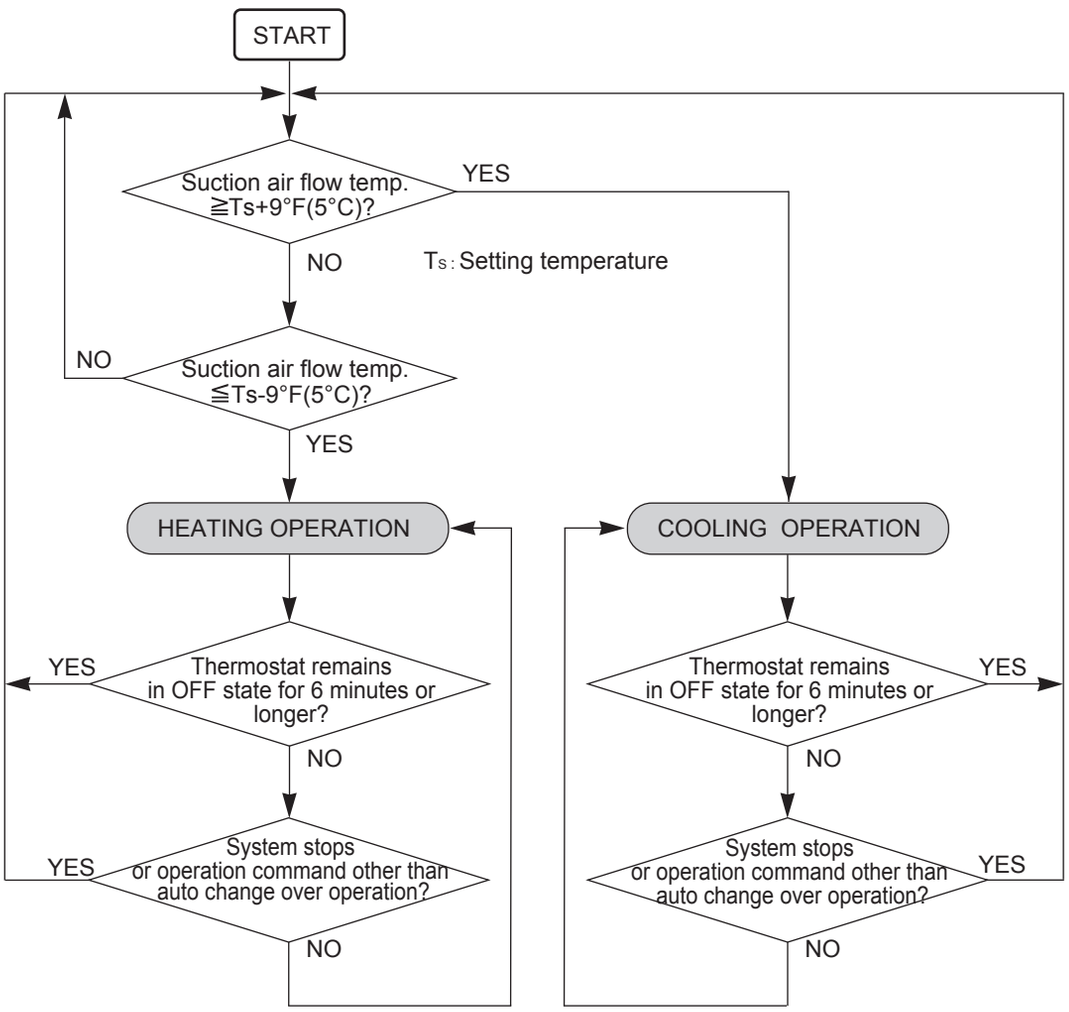
3-2-2 Auto Changeover Heating / Cooling Operation for Outdoor air unit

Function is available when an outdoor air unit set as the administrative indoor unit (Management Outdoor air unit). Refer to the setting Method

Setting Method
1. Switch operation mode management to "Management by outdoor air unit" by Outdoor unit PUSH-SW.
2. Set the master outdoor air unit by wired remote controller.
3. Judge cooling/heating by the difference between the master outdoor air unit's setting temperature and the suction air flow temperature

■ AUTO CHANGE OVER operation

Operation flow chart



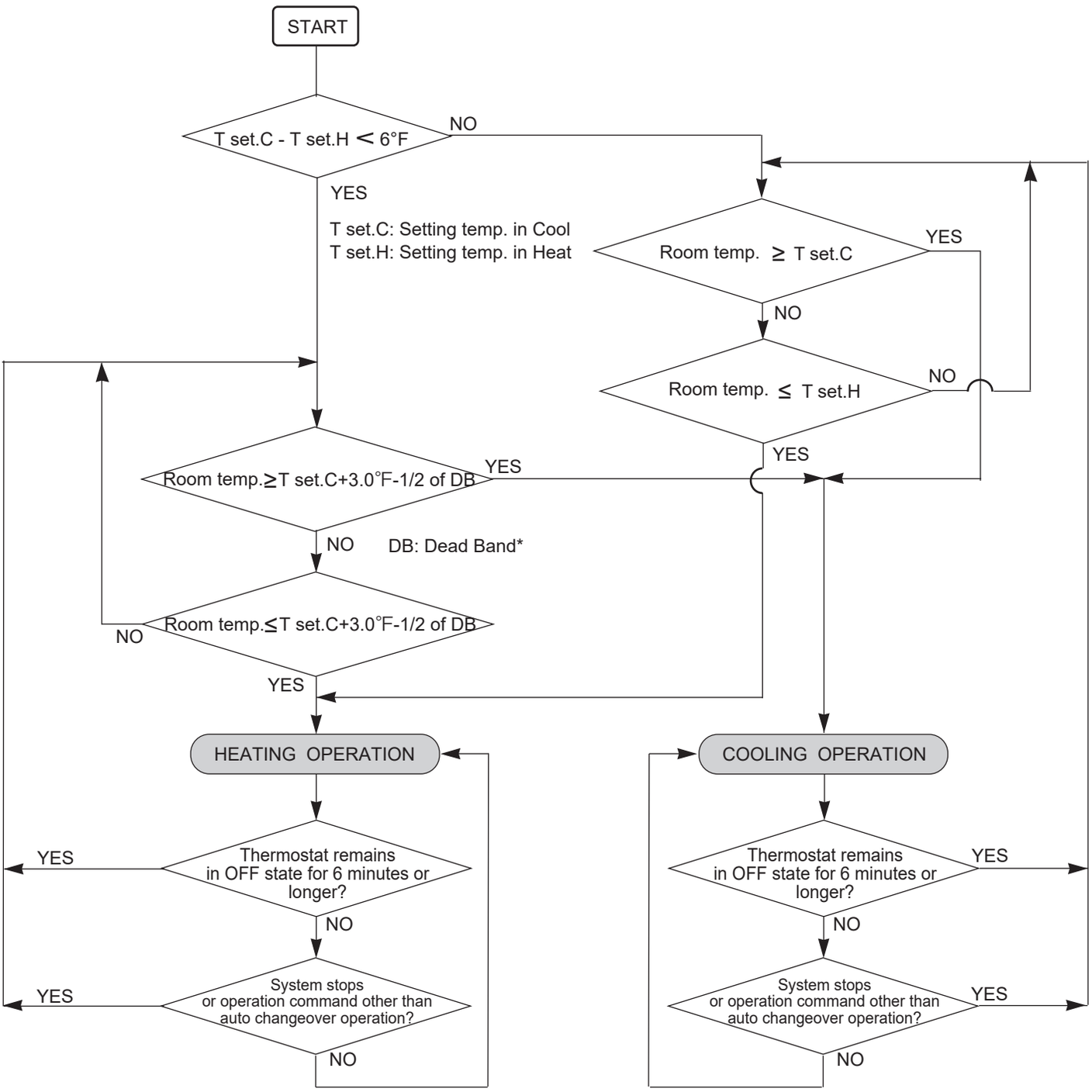
3-2-3 Custom Auto Heating / Cooling Operation (FN68-00)

[Function available in following conditions]

- Remote controller type: UTY-RNRU
- Remote sensor in use
- Prohibit the central function from the Central controller *Reccomend

■ CUSTOM AUTO Operation

Operation flow chart



*Dead Band(DB) means between T set.C and T set.H, however the setting paramater of Dead Band always has a priolity.
Ex) T set. C: 82°F, T set. H : 78°F DB setting: 6°F => T set. C: 82°F, T set. H: 76°F (DB will be kept from Tset.C basis)

*When the outdoor unit(s) selected the operation mode at once, the selected operation mode will be kept for 12minutes minimum.

3-2-3 Custom Auto Heating / Cooling Operation (FN68-01)

[Function available Indoor unit(s)]

Administrative indoor unit (Management Indoor unit). Refer to the setting method.

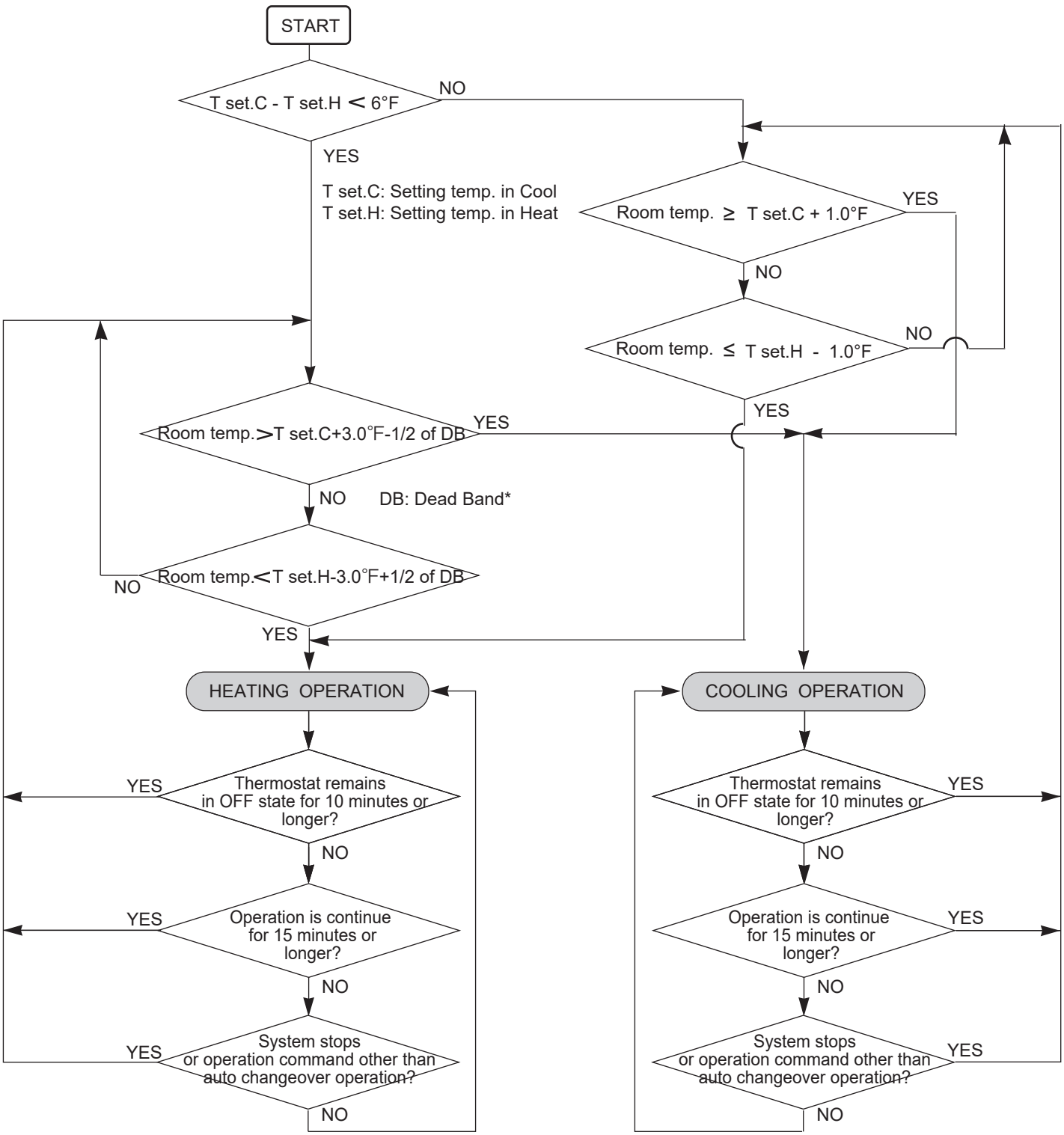
Setting method

1. Switch operation mode management to "Management by indoor unit" by outdoor unit DIP-SW.
2. Set the master indoor unit by wired remote controller.
3. Judge cooling/heating by the difference between the master indoor unit's setting temperature and the room temperature.

To use this function, a controller with custom auto mode function is necessary. (e.g. touch panel controller [UTY-RNRUZ2], system controller [version 3.1 or later], central remote controller)

■ Custom auto mode operation

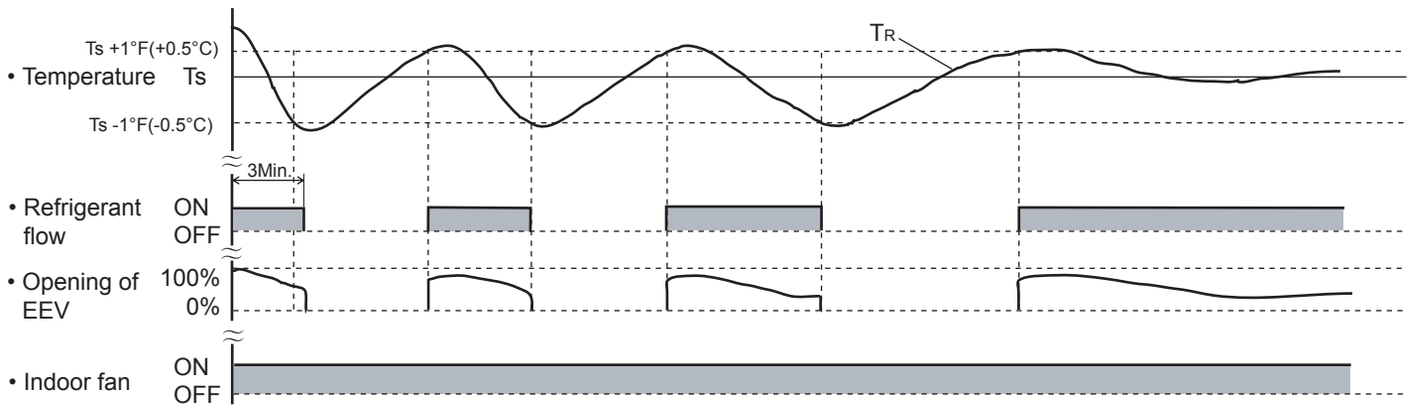
Operation flow chart



3-2-4 "COOL" Position

When using the cooling mode, set the temperature to a value lower than the current room temperature, otherwise the indoor unit will not start the cooling operation and only the fan will rotate.

An example for COOLING TEMPERATURE CONTROL time chart (Manual setting)



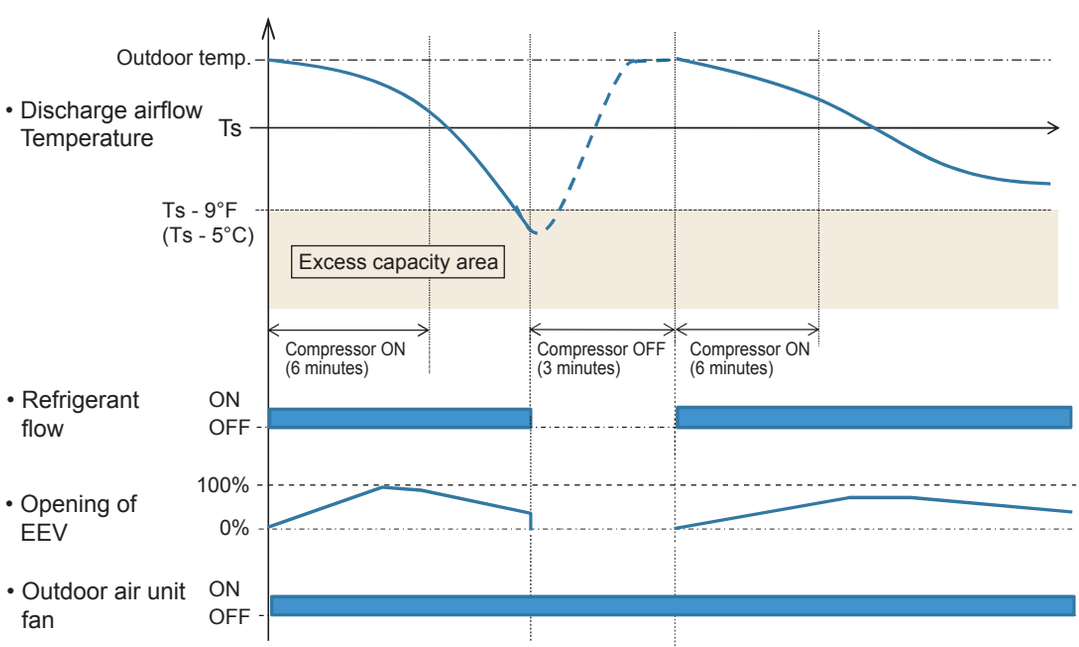
Ts : Corrected setting temperature
TR : Corrected room temperature

Ts +1°F(+0.5°C): The threshold temperature of start of refrigrant flow
Ts -1°F(-0.5°C) : The threshold temperature of stop of refrigrant flow

3-2-4 "COOL" Position for Outdoor air unit

When using the cooling mode, set the temperature to a value lower than the discharge airflow temperature, otherwise the outdoor air unit will not start the cooling operation and only the fan will rotate.

An example for COOLING TEMPERATURE CONTROL time chart (Manual setting)



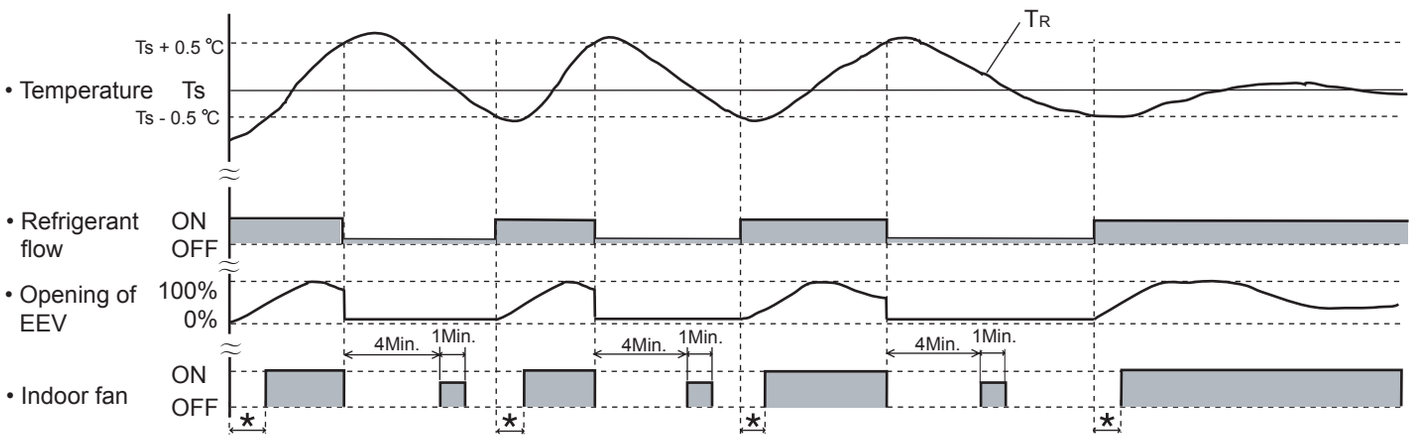
Ts : Corrected setting temperature

Ts + 1°F (Ts + 0.5°C) : The threshold temperature of start of refrigerant flow
Ts - 9°F (Ts - 5°C) : The threshold temperature of stop of refrigerant flow

3-2-5 "HEAT" Position

(1) When using the heating mode, set the temperature to a value higher than the current room temperature, otherwise the indoor unit will not start the heating operation.
(2) After the start of heating operation, the fan of indoor unit will not rotate until the heater exchange is warmed up to blow out warm air.
(3) During defrosting, the OPERATION indicator lamp flashes 6 sec. ON and 2 sec. OFF, and repeat. The heating operation will be temporarily interrupted.

An example for HEATING TEMPERATURE CONTROL time chart (Manual setting)



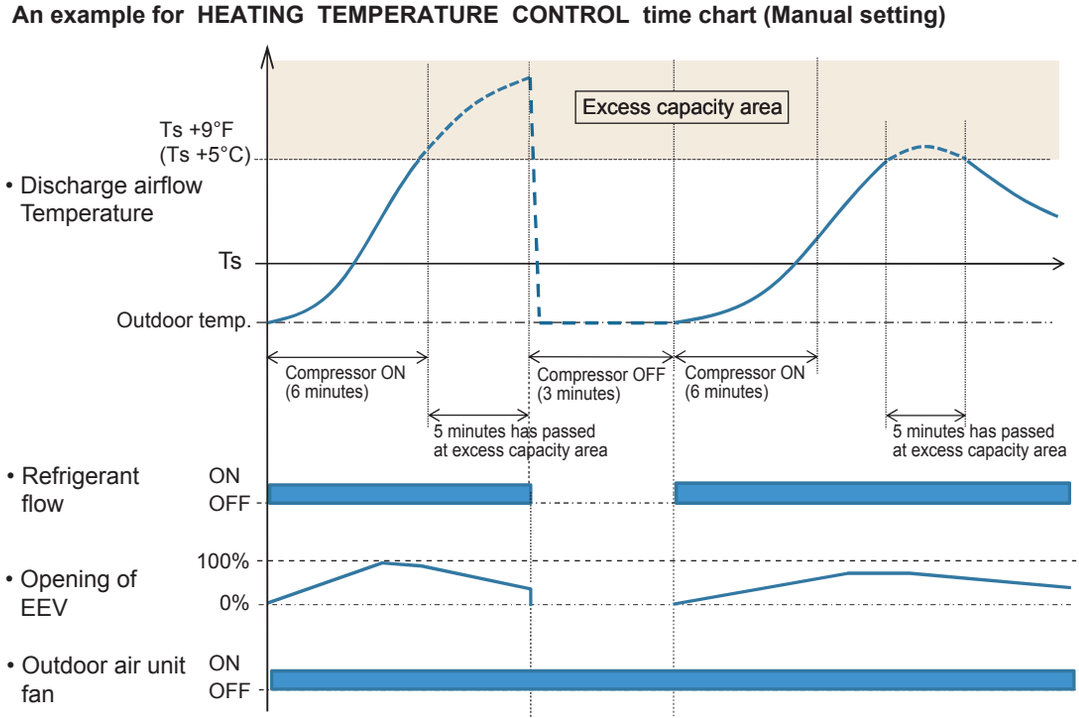
Ts : Corrected setting temperature
TR : Corrected room temperature
* : Duration of cold air prevention

Ts +1°F(+0.5°C): The threshold temperature of start of refrigrant flow
Ts -1°F(-0.5°C) : The threshold temperature of stop of refrigrant flow

3-2-5 "HEAT" Position for Outdoor air unit

(1) When using the heating mode, set the temperature to a value higher than the discharge airflow temperature, otherwise the outdoor air unit will not start the heating operation.
(2) During defrosting, the OPERATION indicator lamp flashes 6 sec. ON and 2 sec. OFF, and repeat. The heating operation will be temporarily interrupted.

An example for HEATING TEMPERATURE CONTROL time chart (Manual setting)

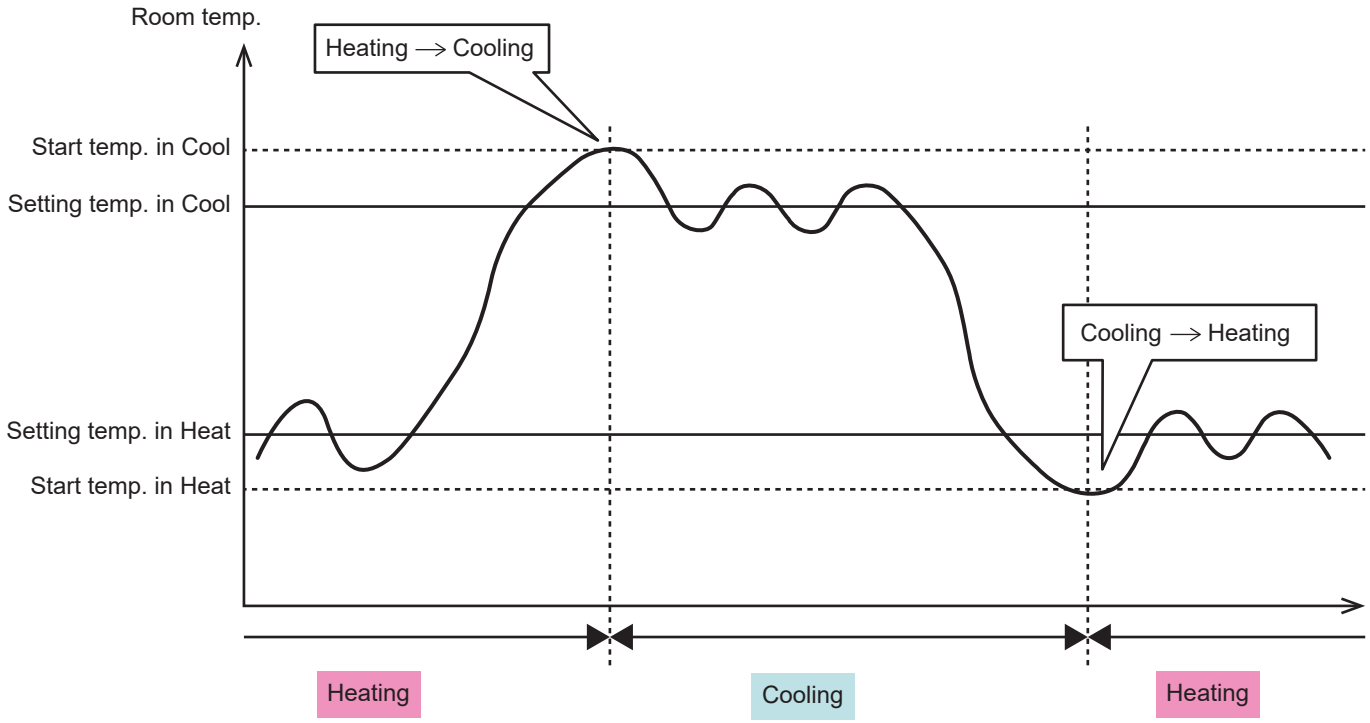


Ts : Corrected setting temperature

Ts - 1°F (Ts - 0.5°C) : The threshold temperature of start of refrigerant flow
Ts + 9°F (Ts + 5°C) for 5 minutes or more
: The threshold temperature of stop of refrigerant flow

3-2-6 Custom auto mode

When using the custom auto mode, operation mode is switching as follows.



Cooling operation starts when the room temperature rises higher than the cooling operation starting temperature.
Heating operation starts when the room temperature drops lower than the heating operation starting temperature.
For the conditions of switching operation, refer to the flowchart on Chapter 3-2-4.

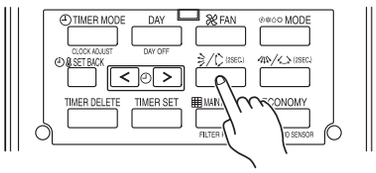
3-3 LOUVER CONTROL

(1) ADJUSTING THE DIRECTION OF AIR CIRCULATION

Instructions relating to heating (∗) are applicable only to heat pump type outdoor unit.
Begin air conditioner operation before performing this procedure.

Vertical Air Direction Adjustment

This instructions are applicable to "COMPACT CASSETTE TYPE", "CIRCULAR FLOW CASSETTE TYPE", "CASSETTE TYPE", "COMPACT FLOOR TYPE", "FLOOR/CEILLING TYPE" "CEILLING TYPE", and "WALL MOUNTED TYPE"



Example : When set to vertical air direction.

Press the VERTICAL AIR FLOW DIRECTION SET button.

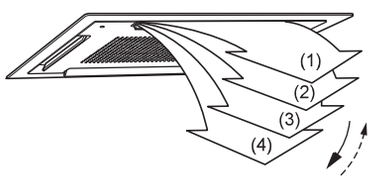
- Press the VERTICAL AIRFLOW DIRECTION button.
  The temperature display will change to the vertical airflow direction setting display.
- Press the VERTICAL AIRFLOW DIRECTION button to change the vertical louvre position.
  The position number will appear on the display.

Cooling & Dry : (1) , (2) , (3) , (4)

Heating : (1) , (2) , (3) , (4)

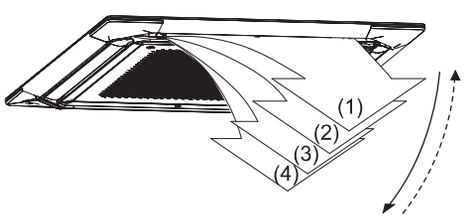
■ COMPACT CASSETTE TYPE CASSETTE TYPE

The vertical wind direction can be controlled with the control unit.



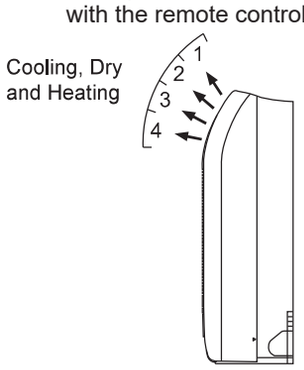
■ CIRCULAR FLOW CASSETTE TYPE

The vertical wind direction can be controlled with the remote controller.

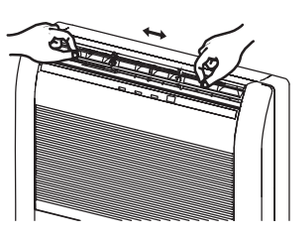


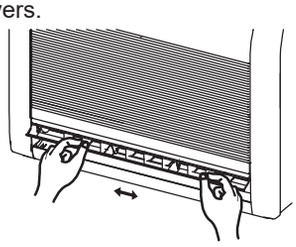
■ COMPACT FLOOR TYPE

The up/down airflow direction can be controlled with the remote controller.



The left/right airflow direction can be manually set by adjusting the vertical louvers.



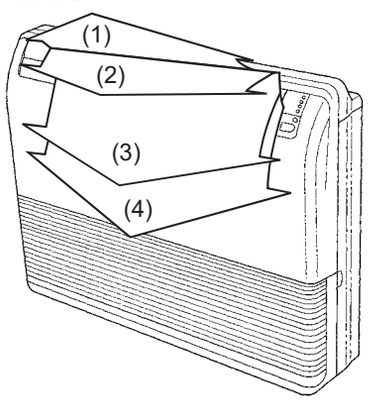


■ FLOOR/CEILLING TYPE CEILLING TYPE

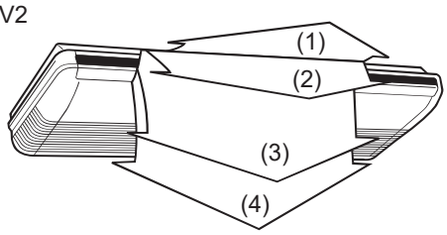
The vertical wind direction can be controlled with the control unit. The horizontal wind direction can also be controlled in the same manner.

(Vertical direction)

ABUA12/14/18/24TLAV2



ABUA30/36TLAV2



⚠ CAUTION

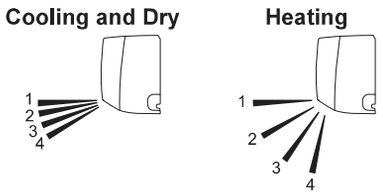
Always adjust the vertical louvers when the damper is open. Opening the damper forcibly with hands can cause damper to malfunction.

■ WALL MOUNTED TYPE

ASUA4/7/9/12/14TLAV2

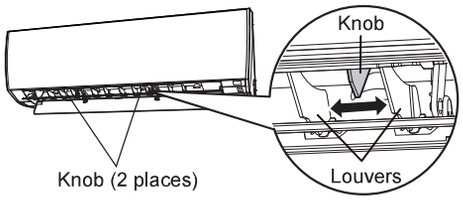
(Up/down airflow direction)

The up/down airflow direction can be controlled with the remote controller.



(Left/right airflow direction)

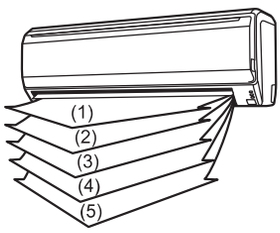
The left/right airflow direction can be manually set by adjusting the vertical louvers.



ASUB18/24TLAV1

The vertical wind direction can be controlled with the control unit.
The horizontal wind direction can be controlled in the same manner.

(Vertical direction)



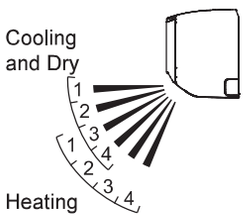
Cooling & Dry: (1), [(2)], (3), (4), (5)
Heating: (1), [(2)], (3), (4), (5)

[ ]: Can only be set with the wireless remote controller

ASUA30/36TLAV2

(Vartical airflow direction)

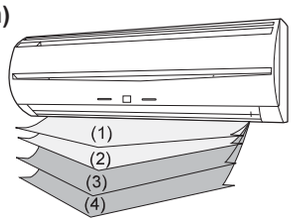
The vartical wind direction can be controlled with the remote controller.



ASUA7/9/12/14TLAV

The vertical wind direction can be controlled with the control unit.
The horizontal wind direction can be manually set by adjusting right-left louvers.

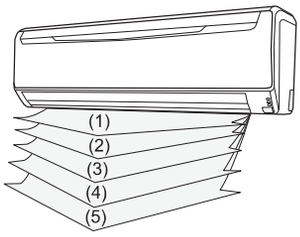
(Vertical direction)



ASUB18/24TLAV

The vertical wind direction can be controlled with the control unit.
The horizontal wind direction can also be controlled in the same manner.

(Vertical direction)



Cooling & Dry : (1), [(2)], (3), (4), (5)
Heating : (1), [(2)], (3), (4), (5)
[ ] : Can only be set with the wireless remote controller

⚠ DANGER!

Never place fingers or foreign objects inside the outlet ports, since the internal fan opertes at high speed and could cause personal injury.

- Always use the remote control umit's AIR FLOW DIRECTION button to adjust the UP/DOWN air direction flaps or RIGHT/LEFT air direction louvers. At tempting to move them manually could result in improper operation; in this case, stop operation and restart.
  The louvers should begin to operate properly again.
- When used in a room with infants, children, elderly or sick persons, the air direction and room temperature should be considered carefully when making settings.

- Use the air direction adjustments within the ranges shown above.
- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.

  During Cooling mode : Horizontal flow (1)
  ∗ During Heating mode : Downward flow (4) *Some wall-mounted types : (5)
- During AUTO mode operation, for the first minute after beginning operation, airflow will be horizontal (1), the air direction cannot be adjusted during this period.

Horizontal Air Direction Adjustment

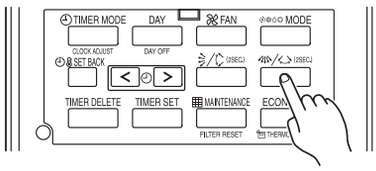
This instructions are applicable to "CEILING TYPE", "FLOOR/CEILING TYPE" and "WALL MOUNTED TYPE".

Press the HORIZONTAL AIR FLOW DIRECTION SET button.

- Press the HORIZONTAL AIRFLOW DIRECTION button. The temperature display will change to the horizontal airflow direction setting display.
- Press the HORIZONTAL AIRFLOW DIRECTION button to change the horizontal louvre position. The position number will appear on the display.

Cooling & Dry : ①, ②, ③, ④, ⑤

Heating : ①, ②, ③, ④, ⑤



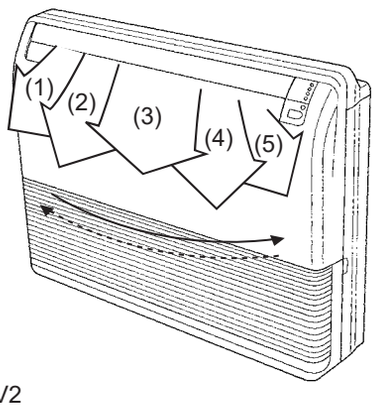
Example : When set to horizontal air direction.

■ FLOOR/CEILING TYPE
CEILING TYPE

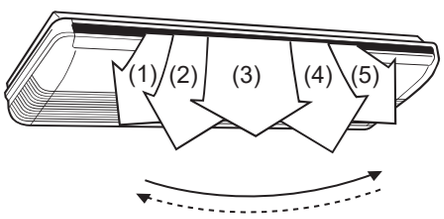
The horizontal wind direction can also be controlled in the same manner.

(Horizontal direction)

ABUA12/14/18/24TLAV2



ABUA30/36TLAV2

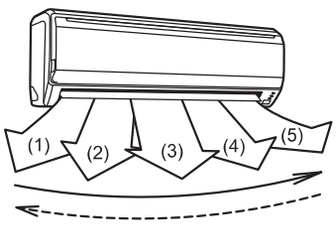


■ WALL MOUNTED TYPE

ASUB18/24TLAV1

The horizontal wind direction can be controlled in the same manner.

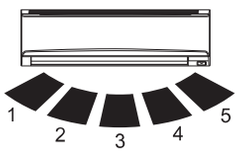
(Horizontal direction)



ASUA30/36TLAV2

(Horizontal airflow direction)

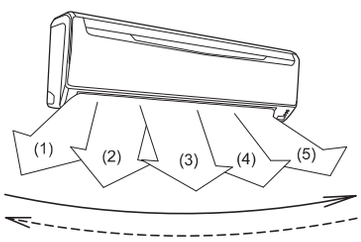
The horizontal airflow direction can be controlled with the remote controller.



ASUB18/24TLAV

(Horizontal direction)

The horizontal wind direction can also be controlled in the same manner.



(2) SWING OPERATION

Instructions are applicable to "CEILING TYPE", "FLOOR/CEILING TYPE", "COMPACT CASSETTE TYPE", "CIRCULAR FLOW CASSETTE TYPE", "WALL MOUNTED TYPE" and "COMPACT FLOOR TYPE".

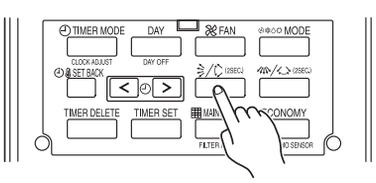
Begin air conditioner operation before performing this procedure.

To select Vertical airflow SWING Operation

This instructions are applicable to "CEILING TYPE", "FLOOR/CEILING TYPE", "COMPACT CASSETTE TYPE", "CIRCULAR FLOW CASSETTE TYPE", "WALL MOUNTED TYPE" and "COMPACT FLOOR TYPE".

Press the VERTICAL SWING button for more than two seconds.

The remote controller's Vertical Swing Display will light up.
In this mode, the UP/DOWN air direction flaps will swing automatically to direct the air flow both up and down.



Example : When set to vertical swing.

To Stop Vertical airflow SWING Operation

Press the VERTICAL SWING button for more than two seconds once and again.

The remote controller's Vertical Swing Display will go out.
Airflow direction will return to the setting before swing was begun.

Instructions are applicable to "CEILING TYPE", "FLOOR/CEILING TYPE", "COMPACT CASSETTE TYPE", "CIRCULAR FLOW CASSETTE TYPE", "WALL MOUNTED TYPE" and "COMPACT FLOOR TYPE".

About Vertical Airflow SWING Operation

- The SWING operation may stop temporarily when the air conditioner's fan is not operating, or when operating at very low speeds.
- The swing operation is not available depending on the model. Please refer to the operating manual for the indoor unit.

Air swing range

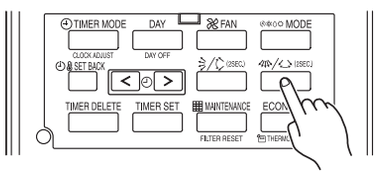
Air flow direction set	Range of swing
①	① to ④ (All range)
②	
③	
④	

To select Horizontal Airflow SWING Operation

This instructions are applicable to "CEILING TYPE", "FLOOR/CEILING TYPE" and "WALL MOUNTED TYPE",

Press the HORIZONTAL SWING button for more than two seconds.

The remote controller's Horizontal Swing Display will light up.
In this mode, the RIGHT/LEFT air direction louvers will swing automatically to direct the airflow both right and left.



Example : When set to horizontal swing.

To stop Horizontal airflow SWING Operation

Press the HORIZONTAL SWING button for more than two seconds once and again.

The remote controller's Horizontal Swing Display will go out.
Airflow direction will return to the setting before swing was begun.

About Horizontal Airflow Swing Operation

- Left and right swing range can be changed in 3 steps by field setting.
- The SWING operation may stop temporarily when the air conditioner's fan is not operating, or when operating at very low speeds.
- The swing operation is not available depending on the model. Please refer to the operating manual for the indoor unit.

Left and right swing range (◆ . . . Factory setting)

	Range of swing	Function Number	Setting Value
◆	① to ⑤ (All range)	24	00
	① to ③		01
	③ to ⑤		02

3-4 ELECTRONIC EXPANSION VALVE CONTROL

3-4-1 Electronic Expansion Valve Control

1. Initialization

- When the power is turned ON.
- When it has passed the limited time since the last initialization.

2. Operation Control

- When indoor unit stopping

Outdoor unit Condition	EEV Condition
OFF	Fully closed
Cooling	Fully closed
Heating	Slightly open

- When starting up
  (Cooling) Move to the cooling control base pulse in steps.
  (Heating) Move to the heating control base pulse in steps.

- Automatic operatic control
  Automatic PI control is performed based on the indoor unit heat exchanger outlet temp and inlet temp.

- Room temperature control
  The room temperature is controlled so that it reaches to the set-up temperature based on the difference between the room temperature and the set-up temperature, and the change of indoor unit temperature.

  if the room temperature becomes 1°F (0.5°C) lower than the set-up temperature, EEV is fully closed.

3. Special Control

- Oil recovery operation : Controlled pulse.
- Test run operation : Controlled pulse.
- Icing protection control : Fully closed.
- Pump down operation : Fully open.
- Defrost operation : Controlled pulse

3-4-1 Electronic Expansion Valve Control for Outdoor air unit

1. Initialization

- When the power is turned ON.
- When it has passed the limited time since the last initialization.

2. Operation Control

- When indoor unit stopping by Thermo-OFF condition.

Outdoor unit Condition	EEV Condition
OFF	Fully closed
Cooling	Fully closed
Heating	Fully closed

- When starting up
  (Cooling) Move to the cooling control base pulse in steps.
  (Heating) Move to the heating control base pulse in steps.

- Automatic operatic control
  Automatic PI control is performed based on the indoor unit heat exchanger outlet temp and inlet temp.

- Discharge airflow temperature control
  The discharge airflow temperature is controlled so that it reaches to the set-up temperature based on the difference between the discharge airflow temperature and the set-up temperature.
  Cooling operation: 1) If the discharge airflow temperature becomes 9°F (5°C) lower than the set-up temperature, EEV is fully closed.
  2) If the suction airflow temperature becomes 1°F (0.5°C) lower than the set-up temperature, EEV is fully closed.
  Heating operation: 1) If the discharge airflow temperature becomes 9°F (5°C) higher than the set-up temperature for 5 minutes or more, EEV is fully closed.
  2) If the suction airflow temperature becomes 1°F (0.5°C) higher than the set-up temperature, EEV is fully closed.

3. Special Control

- Oil recovery operation : Controlled pulse(Maximum 1400 puls)
- Test run operation : Controlled pulse.
- Freeze prevention control : Fully closed.
- Vacuuming operation : Fully open.
- Defrost operation : Controlled pulse(Maximum 1400 puls)

3-5 DRAIN PUMP OPERATION

3-5-1 Drain Pump Operation

(1) When cooling and refrigerant circulation starts, the drain pump starts simultaneously.
(2) The drain pump operates continuously for 3 minutes after the refrigerant circulation stopped.
(3) When the refrigent circulation is stopped by a start of indoor heat exchanger frost prevention operation, the drain pump will turn off in 1 hour after the end of indoor heat exchanger frost prevention operation.
(4) When the water level in the drain pan rises up and then the float switch functions:
① Microcomputer stops the refrigerant circulation and indoor fan motor operation.
② Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)
(5) When the float switch turns ON continuously for 3 minutes, 'FAILURE INDICATION' operates.
(6) When the float switch turns OFF within 3 minutes, the unit starts cooling operation.

3-5-1 Drain Pump Operation for Outdoor air unit

(1) When cooling and refrigerant circulation starts, the drain pump starts simultaneously.
(2) The drain pump operates continuously for 3 minutes after the refrigerant circulation stopped.
(3) When the refrigent circulation is stopped by a start of indoor heat exchanger frost prevention operation, the drain pump will turn off in 1 hour after the end of indoor heat exchanger frost prevention operation.
(4) When the water level in the drain pan rises up and then the float switch functions:
① Microcomputer stops the refrigerant circulation and indoor fan motor operation.
② Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)
(5) When the float switch turns ON continuously for 3 minutes, 'FAILURE INDICATION' operates.
(6) When the float switch turns OFF within 3 minutes, the unit starts cooling operation.

3-6 FUNCTION

3-6-1 Auto Restart

The air conditioner restarts with the previous setting operation.

3-6-2 Icing Protection Control

The icing of the indoor heat exchanger is prevented during the cooling and dry mode operation.

(1) Starting Condition
- Compressor is operation more than 3 minutes.
  When "Heat exchanger inlet temperature≦TA" continues *4 minutes or more.
- Compressor is operation more than 3 minutes.
  When "Heat exchanger outlet temperature≦TA" continues 4 minutes or more.

(2) Operation
EEV is closed.
Fan is at the setting amount.

(3) Completing Condition
Heat exchanger inlet and middle temperature ≧ T_B
After more than 5 minutes

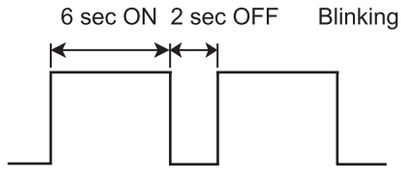
* Drain pump turns off at 60 minutes past the completion of the icing protection operation.

T_A	T_B
34°F(1°C)	45°F(7°C)

3-6-3 Oil Recovery Operation

[Oil recovery operation] : It periodically returns the residual refrigerant ion oil in the indoor unit and the connection piping back to the outdoor unit , and prevents the compressor oil level from decreasing.

Indoor unit LED : Operation LED



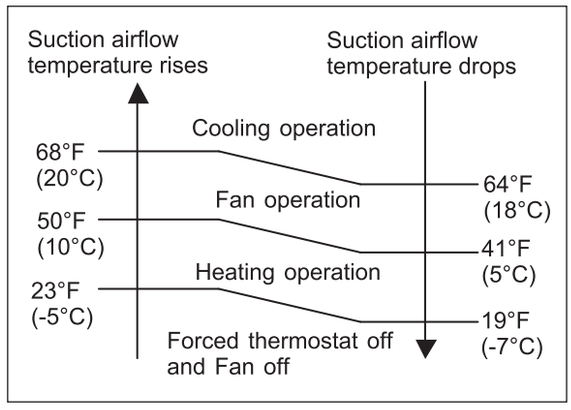
Indoor fan : Same operation before oil recovery operation.
Indoor EEV : Control pulse
* During the above operation, a refrigerant noise may be from the indoor unit.

3-6-4 Outdoor temperature protected operation for Outdoor air unit

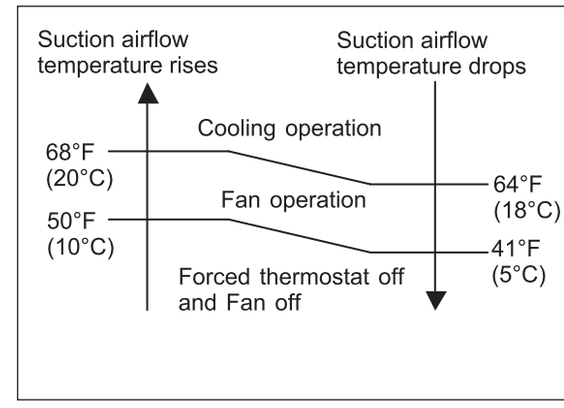
1. COOL OPERATION

The contents of operation is controlled as following based on the suction airflow temperature.

a) Operation mode management is made "Management by indoor unit", and outdoor air unit is master indoor unit.

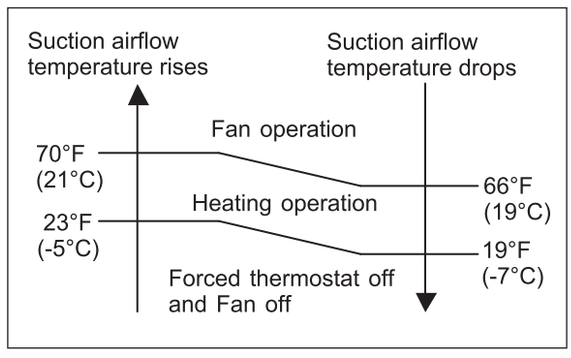


b) Cases Other than (a)



2. HEAT OPERATION

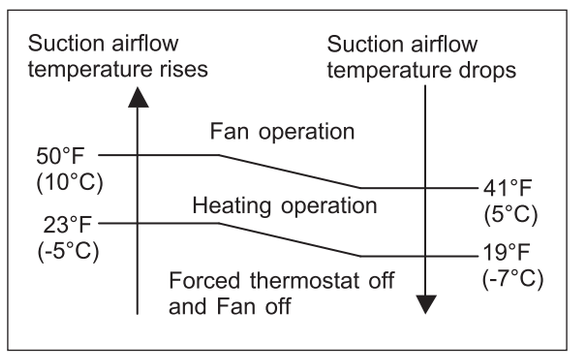
The contents of operation is controlled as following based on the suction airflow temperature.



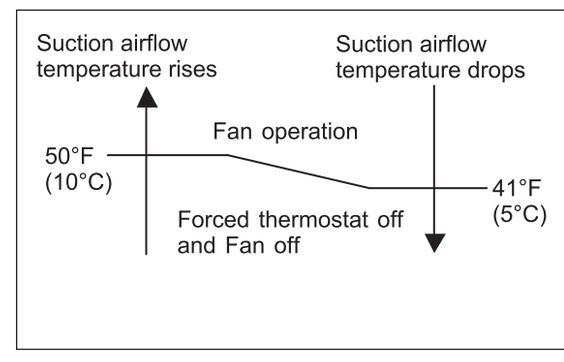
3. FAN OPERATION

The contents of operation is controlled as following based on the suction airflow temperature.

a) Operation mode management is made "Management by indoor unit", and outdoor air unit is master indoor unit.



b) Cases Other than (a)



3-6-5 Human Sensor for Energy Saving

If no one enters the room for the set time, the set temperature is automatically controlled. (When someone comes back into the room, the human sensor detect this, and automatically revert to the original settings.)

Operation mode	Operation details (If there is no one in the room for a while)
Cooling/Dry	The setting temperature is increased by maximum 2°C. (Maximum setting temperature: 30°C)
Heating	The setting temperature is decreased by maximum 2°C. (Minimum setting temperature: 16°C)
Auto	Energy saving function is performed automatically for the selected mode (cooling/heating/dry).

Details about detection with the human sensor:

The human sensor detects whether there are people in the room by looking for movement by people in the room.

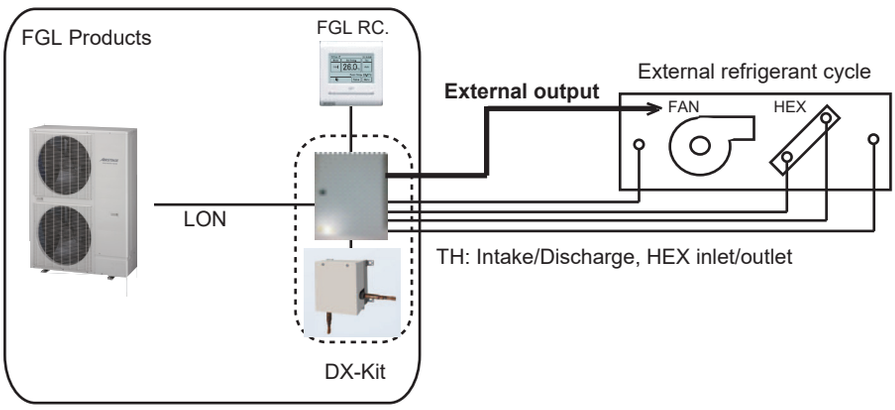
3-7 DX-KIT

3-7-1 SYSTEM CONFIGURATION

1. FGL remote/controller connection

The DX kit is controlled by a VRF operation device and use the external output of the DX kit to perform the AHU (Air Handling Unit) operation indirectly.

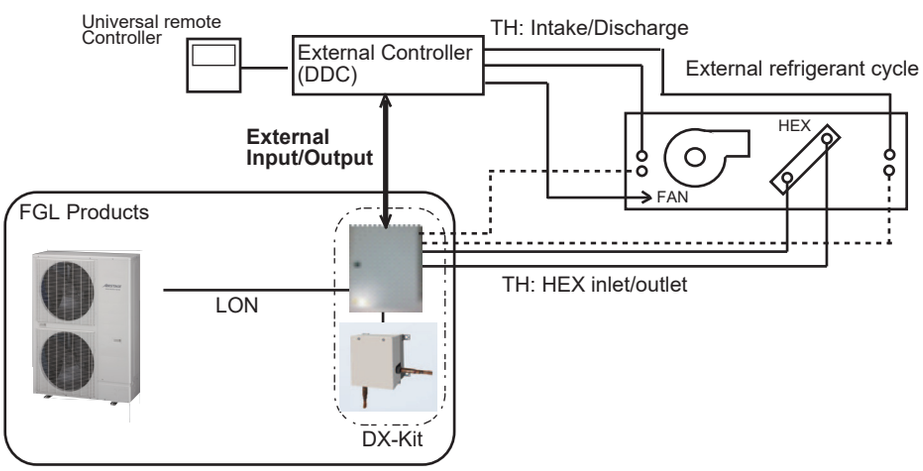
Control devices can be unified with FGL devices.



Interface	Contents
External input	Fan abnormal intput
External output	Fan ON/OFF
	Thermostat ON/OFF

2. External controller connection

Air conditioning control (thermostat-control) can be designed on-site.
(Air conditioning control by DX is also possible.)
Control equipment suited to the application can be connected.



Interface	Contents	Remarks
External input	Operation ON/OFF	
	Operation mode Cool/Heat	Typical indoor unit is required for mode changing.
	Set temperature or capacity request (Analog input)	Temperature setting: When thermo-control is performed by DX kit. Capacity request: When the thermo-control is performed by external controller.
	Error	Information on error occurred at external controller
External output	Operation ON/OFF	
	Error	Information on error occurred at VRF system
	Special operation (defrost)	The Fan operation can be stopped with the communication siginal of special operation

3-7-2 FUNDAMENTAL FUNCTIONS

1. FGL remote/controller connection

Air conditioning control system (SET3-3)	Intake temperature control	Discharge temperature control
Set temperature objective	Intake temperature (Room temperature) Cooling: 64 to 86°F (18 to 30℃) Heating: 50 to 86°F (10 to 30℃)	Discharge temperature Cooling: 57 to 77°F (14 to 25℃) Heating: 63 to 82°F (17 to 28℃)
Thermostat OFF conditions	Cooling Intake temperature < Setting temperature - 1°F (-0.5℃) Heating Intake temperature > Setting temperature +1°F (+0.5℃)	Cooling Discharge temperature < Setting temperature - 9°F (-5.0℃) Heating Discharge temperature > Setting temperature +9°F (+5.0℃) for 5 minutes
Operation (ON/OFF/Mode/ Set temperature	FGL controller	
Fan control	Fan control commands are output from the DX kit external output terminal	

2. External controller connection

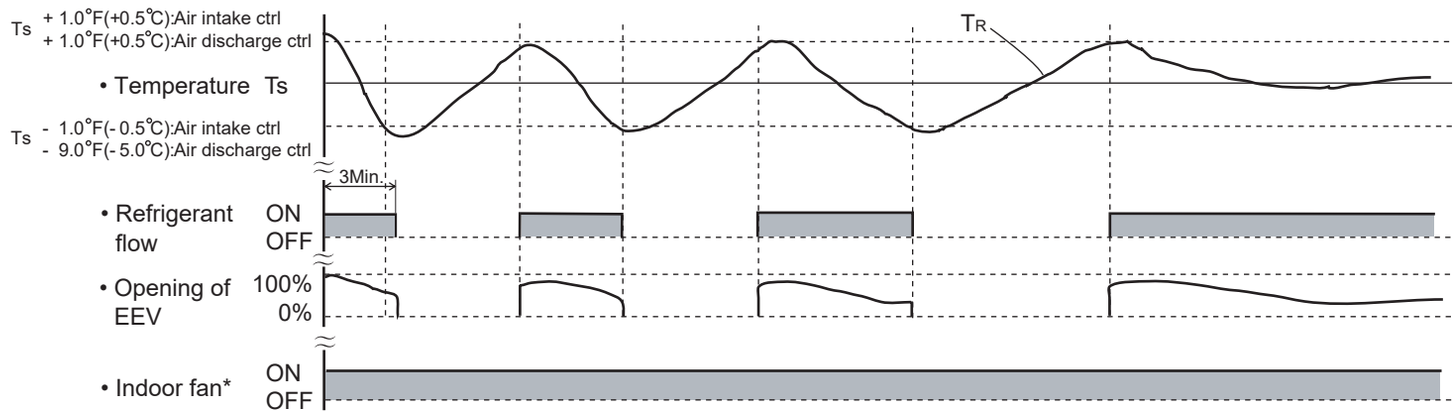
Air conditioning control system (SET3-3)		Intake temperature control	Outlet temperature control
Analog input system (SET3-2)		Set temperature input / Capacity input Selection	Set temperature input / Capacity input Selection
Temperature setting	Temperature Setting range	Intake temperature (Room temperature) Cooling: 64 to 86°F (18 to 30℃) Heating: 50 to 86°F (10 to 30℃)	Discharge temperature Cooling: 57 to 77°F (14 to 25℃) Heating: 63 to 82°F (17 to 28℃)
Temperature setting	Thermostat OFF conditions	Cooling Intake temperature < Setting temperature - 1°F (-0.5℃) Heating Intake temperature > Setting temperature +1°F (+0.5℃)	Cooling Discharge temperature < Setting temperature - 9°F (-5.0℃) Heating Discharge temperature > Setting temperature +9°F (+5.0℃) for 5 minutes
Capacity input	Capacity input range	0%, 5% to 100%	
Capacity input	Thermostat OFF conditions	Controlled by external controller and EEV closed by making the capacity input 0% in cooling mode. EEV slightly opened when the Compressor operating in heating mode	
Operation (ON/OFFMode/ Set temperature		Controlled by external controller, input to DX Kit external input terminal *Operation from FGL controller is disabled. (Only monitoring is possible)	
When error generated at external equipment		When fanmotor locked or another error was generated at the external equipment, the refrigerant cycle is stopped by inputting an error signal to the DX Kit external input terminal. (EEV is Closed)	
Fan control		Control is perfomed by external equipment, but when you want to stop the fan during defrosting, use the defrost signal that is output from the DX Kit external output terminal.	

3-7-3 FUNDAMENTAL FUNCTIONS

Cooling operation

When using the cooling mode, set the temperature to a value lower than the target controlling temperature, otherwise the External refrigeration cycle equipment will not start the cooling operation.

An example for COOLING TEMPERATURE CONTROL time chart



TR: Target controlling temperature (Air intake temperature or Air discharge temperature)
Ts: Corrected Setting temperature

Air intake temp controlling

Ts + 1.0 ˚F(+0.5 ℃): The threshold temperature of start of refrigerant flow
Ts - 1.0 ˚F(- 0.5 ℃): The threshold temperature of stop of refrigerant flow

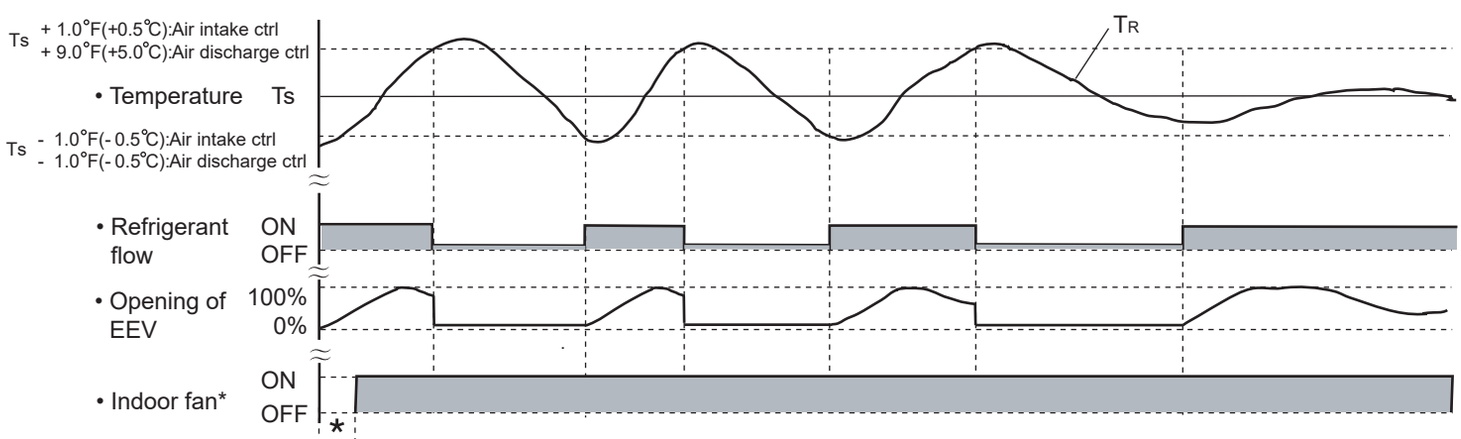
Air discharge temp controlling

Ts + 1.0 ˚F(+0.5 ℃): The threshold temperature of start of refrigerant flow
Ts - 9.0 ˚F(- 5.0 ℃): The threshold temperature of stop of refrigerant flow

Heating operation

(1) When using the heating mode, set the temperature to a value higher than the current room temperature, otherwise the indoor unit will not start the heating operation.
(2) After the start of heating operation, the fan of indoor unit will not rotate until the heater exchange is warmed up to blow out warm air.
(3) During defrosting, the OPERATION indicator lamp flashes 6 sec. ON and 2 sec. OFF, and repeat. The heating operation will be temporarily interrupted.

An example for HEATING TEMPERATURE CONTROL time chart



Ts : Corrected Setting temperature * : Duration of cold air prevention
TR : Target controlling temperature (Air intake temperature or Air discharge temperature)

Air intake temp controlling

Ts - 1.0 ˚F(- 0.5 ℃): The threshold temperature of start of refrigerant flow
Ts + 1.0 ˚F(+0.5 ℃): The threshold temperature of stop of refrigerant flow

Air discharge temp controlling

Ts - 1.0 ˚F(- 0.5 ℃): The threshold temperature of start of refrigerant flow
Ts + 9.0 ˚F(+5.0 ℃): The threshhold temperature of stop of refrigerant flow

*When the EEV operates with the minimum pulse, and it keeps for 5 minutes.

3-7-4 ELECTRICAL EXPANSION VALVE CONTROL for DX-KIT

1. Initialization

- When the power is turned ON.
- When it has passed the limited time since the last initialization.

2. Operation Control

- When indoor unit stopping by Thermo-OFF condition.

Outdoor unit Condition	EEV Condition
OFF	Fully closed
Cooling	Fully closed
Heating	Fully closed

- When starting up
  (Cooling) Move to the cooling control base pulse in steps.
  (Heating) Move to the heating control base pulse in steps.

- Automatic operatic control
  Automatic PI control is performed based on the indoor unit heat exchanger outlet temp and inlet temp.

- Discharge airflow temperature control
  The discharge airflow temperature is controlled so that it reaches to the set-up temperature based on the difference between the discharge airflow temperature and the set-up temperature.
  Cooling operation: 1) If the discharge airflow temperature becomes 9°F (5°C) lower than the set-up temperature, EEV is fully closed.
  2) If the suction airflow temperature becomes 1°F (0.5°C) lower than the set-up temperature, EEV is fully closed.
  Heating operation: If the suction airflow temperature becomes 1°F (0.5°C) higher than the set-up temperature, EEV is fully closed.

3. Special Control

- Oil recovery operation : Controlled pulse(Maximum 1400 puls)
- Test run operation : Controlled pulse.
- Freeze prevention control : Fully closed.
- Vacuuming operation : Fully open.
- Defrost operation : Controlled pulse(Maximum 1400 puls)

3-7-5 DARIN PUMP OPERATION for DX-KIT

(1) When cooling and refrigerant circulation starts, the drain pump starts simultaneously.
(2) The drain pump operates continuously for 3 minutes after the refrigerant circulation stopped.
(3) When the refrigent circulation is stopped by a start of indoor heat exchanger frost prevention operation, the drain pump will turn off in 1 hour after the end of indoor heat exchanger frost prevention operation.
(4) When the water level in the drain pan rises up and then the float switch functions:
① Microcomputer stops the refrigerant circulation and indoor fan motor operation.
② Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)
(5) When the float switch turns ON continuously for 3 minutes, 'FAILURE INDICATION' operates.
(6) When the float switch turns OFF within 3 minutes, the unit starts cooling operation.

3-7-6 FUNCTION

Auto Restart

The air conditioner restarts with the previous setting operation.

Freeze Prevention Control

The icing of the indoor heat exchanger is prevented during the cooling and dry mode operation.

(1) Starting Condition
- Compressor is operation more than 3 minutes.
  When "Heat exchanger inlet temperature ≦ T_A" continues *4 minutes or more.
- Compressor is operation more than 3 minutes.
  When "Heat exchanger outlet temperature ≦ T_A" continues 4 minutes or more.

(2) Operation
EEV is closed.
Fan is at the setting amount.

(3) Completing Condition
Heat exchanger inlet and middle temperature ≧ T_B
After more than 5 minutes

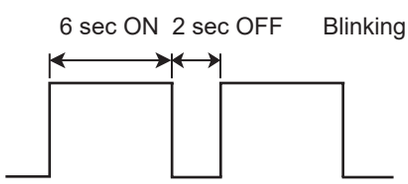
* Drain pump turns off at 60 minutes past the completion of the icing protection operation.

T_A	T_B
34°F(1°C)	45°F(7°C)

Oil Recovery Operation / Defrost Operation

[Oil recovery operation / Defrost operation] :
It periodically returns the residual refrigerantion oil in the indoor unit and the connection piping back to the outdoor unit, and prevents the compressor oil level from decreasing.

IR Receiver Unit LED: Operation LED



FAN output: Same operation before oil recovery operation in cooling operation or dry operation.(Heating operation: Stop)

DX-KIT EEV: Control pulse

* During the above operation, a refrigerant noise might hear from the EEV Kit.

Refrigerant R410A INVERTER

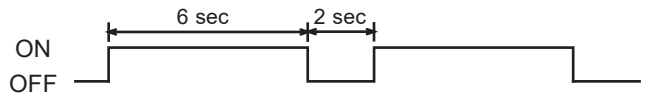
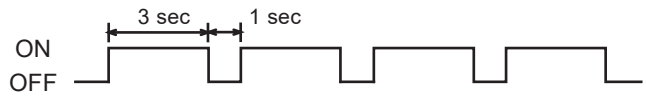
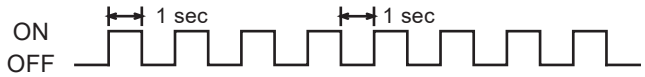
AIRSTAGE J-IV

4. TROUBLE SHOOTING

4. TROUBLESHOOTING

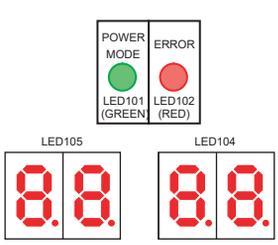
4-1 NORMAL OPERATION

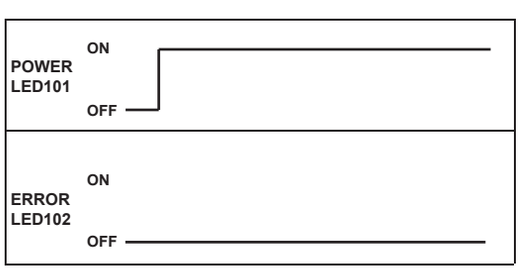
4-1-1 Indoor Unit Display

Indication type	Indication Lamp	Flashing Pattern
Operation	Operation LED	Continuous lighting
Anti Freeze		Continuous lighting(lowered light)
Timer	Timer LED	Continuous lighting(lowered light)
Filter	Filter LED	Continuous lighting
Power Failure	Operation LED	
	Timer LED	
Test Operation	Operation LED Timer LED	
Defrosting	Operation LED	
Oil Recovery		
Opposite Operation Mode	Timer LED	
Maintenance Mode	Operation LED Timer LED Filter LED	

4-1-2 OUTDOOR UNIT DISPLAY

Indication type	7 Segment LED Pattern	Description
Idling(stop)	Blank	
Cooling Mode	"C" OO "L"	
Heating Mode	"H" EA "T"	
Oil Recovery Operation	"O" IL "R" ECOVERY	Refer to 02-10 page for operation.
Defrost Operation	"D" E "F" ROST	Refer to 02-11 page for operation.
Discharge Temp. Protection is stopped	"P" ROTECT "1"	<Starting condition> Discharge temp ≧ fixed value 239°F (115°C) <Release condition> 3 minutes have elapsed and discharge temperature ≦ 176°F (80°C)
High Pressure Protection is stopped	"P" ROTECT "2"	<Starting condition> High pressure ≧ 580 psi (4.00MPa) <Release condition> 5 minutes have elapsed and high pressure ≦ 508 psi (3.50MPa)
Low Pressure Protection is stopped	"P" ROTECT "3"	<Starting condition> Low pressure ≦7psi (0.05MPa) or low pressure ≦ 15 psi (0.10MPa) continues for 10 mins <Release condition> 3 minutes have elapsed and low pressure ≧ 25 psi (0.17MPa)
Compressor Temperature Protection is stopped	"P" ROTECT "4"	<Starting condition> Compressor temp ≧ fixed value 230°F (110°C) <Release condition> 3 minutes have elapsed and discharge temperature ≦176°F (80°C)
Compression Ratio Protection is stopped	"P" ROTECT "7"	<Starting condition> When the compressor is operating at the minimu rotation speed and the compression ratio exceeds 8.0 and the operation continues for 3 minutes or more. <Reset condition> When the compression ratio is 8.0 or less and 3 minutes have passed.
Peak Cut Mode	"P" eak "C" ut	
Low Noise Mode	"L" OW "N" OISE	Refer to 02-08 page for operation.
Inverter Compressor Operation Indication	Blinking	ON / OFF — 1 sec, 1 sec





4-2 ABNORMAL OPERATION

4-2-1 Error Code List for Indoor Unit

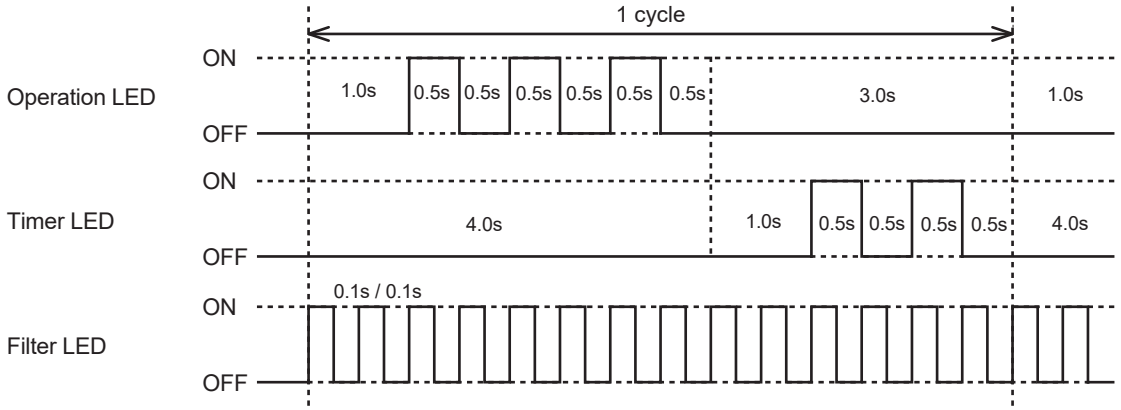
Please refer the flashing pattern as follows.

Error Contents	Operation LED	Timer LED	Filter LED	Trouble shooting
Remote controller communication error	1 times flash	2 times flash	Continuous flash	9
Network communication error	1 times flash	4 times flash	Continuous flash	11
Indoor unit parallel communication error	1 times flash	6 times flash	Continuous flash	10
Address setting error	2 times flash	6 times flash	Continuous flash	12
Connection unit number error in wired remote controller system	2 times flash	9 times flash	Continuous flash	13
Indoor unit power frequency abnormal	3 times flash	1 times flash	Continuous flash	2
Indoor unit main PCB error	3 times flash	2 times flash	Continuous flash	1, 3
Indoor unit power supply error for fan motor 1	3 times flash	9 times flash	Continuous flash	14
Indoor unit power supply error for fan motor 2			Continuous flash	14
Indoor unit communication circuit (WRC) error	3 times flash	10 times flash	Continuous flash	15
Room temperature sensor error	4 times flash	1 times flash	Continuous flash	4
Indoor unit heat ex. sensor error	4 times flash	2 times flash	Continuous flash	5, 6
Indoor unit suction air temp. thermistor error	4 times flash	10 times flash	Continuous flash	16
Indoor unit discharge air temp. thermistor error			Continuous flash	17
Indoor unit fan motor error	5 times flash	1 times flash	Continuous flash	8
Indoor unit coil (EEV) error	5 times flash	2 times flash	Continuous flash	18
Water drain abnormal	5 times flash	3 times flash	Continuous flash	7
Damper error	5 times flash	7 times flash	Continuous flash	19,20
Speed error (Outdoor air unit)	5 times flash	9 times flash	Continuous flash	21
Outdoor unit error	9 times flash	15 times flash	Continuous flash	25,30-33,35-62
Poor refrigerant circulation	10 times flash	8 times flash	Continuous flash	22

Depending on contents of Outdoor unit, it may not indicate. (Refer to "TROUBLE LEVEL OF SYSTEM")

Error Indication Flashing Pattern

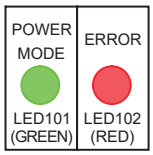
Example : Indoor Unit Main PCB Error (Operation LED : 3 times, Timer LED : 2 times)



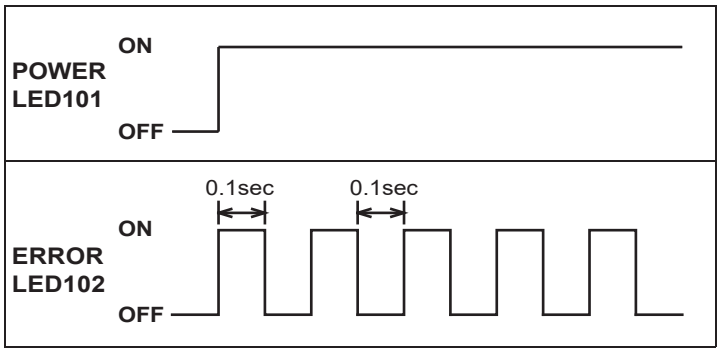
* LED Display when Option receiver unit installed.

4-2-2 Outdoor Unit Display

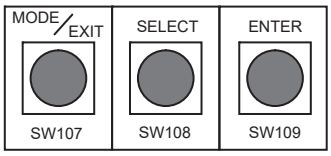
LED display



POWER MODE LED : on
ERROR LED : blink

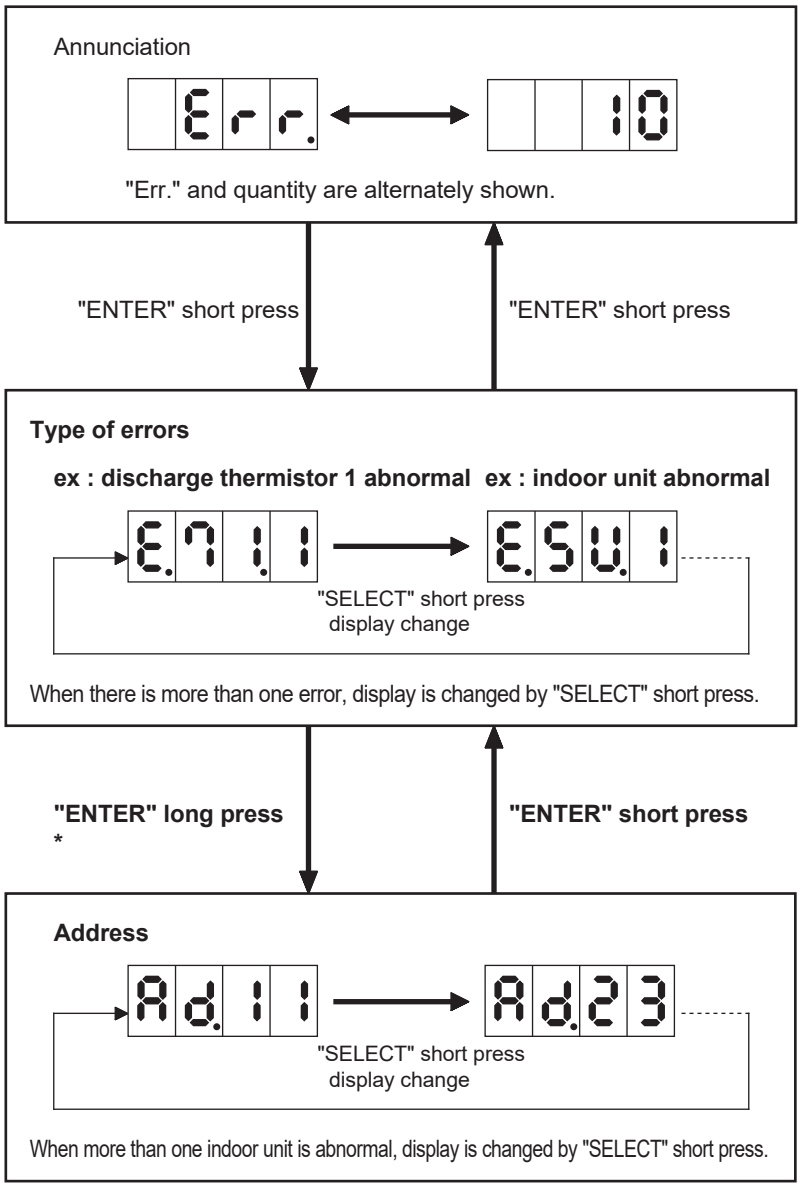


Operation button



ERROR transition

Short press : less than 3 seconds
Long press : more than 3 seconds



If some error is newly occured or resolved during transition, it is reflected after going back to "Annunciation".

* Only in the case of "indoor unit abnormal (E.5U.1)", indoor unit address is shown by ENTER long press.

4-2-3 Error Code List for Outdoor Unit

Error Code	Error Contents	Trouble shooting
- - - -	Initial Setting Error	23
1 4 . 1	Outdoor unit Network communication 1 Error	24
1 4 . 2	Outdoor unit Network communication abnormal 2	25
1 4 . 5	The number of Indoor unit shortage	26
2 2 . 1	Connecting indoor units capacity error Error at indoor unit connection check	27
2 4 . 2	Connecting number of indoor unit error Error at indoor unit connection check	
2 6 . 1	Dual address number is existing Error at indoor unit connection check	
2 8 . 1	Auto Address Setting Error	28
2 8 . 4	Signal Amplifier Auto Address Setting Error	29
5 U . 1	Indoor Unit Error	1～9, 12～22
6 2 . 3	Outdoor unit EEPROM access error	30
6 2 . 6	Inverter communication error	31
6 2 . 8	EEPROM data corrupted error	32
6 3 . 1	Inverter error	33
6 7 . 2	Inverter PCB short interruption detection	34
6 8 . 2	Rush current limiting resistor temp. rise protection	35
6 9 . 1	Outdoor unit transmission PCB parallel communication error	36
7 1 . 1	Discharge temp. sensor error < TH1 >	37
7 2 . 1	Compressor temp. sensor error < TH10 >	38
7 3 . 3	Heat ex. liquid pipe temp. sensor error < TH5 >	39
7 4 . 1	Outdoor temp. sensor error < TH3 >	40
7 5 . 1	Suction gas temp. sensor error < TH4 >	41
7 7 . 1	Heat sink temp. sensor error < IPM built in >	42
8 2 . 1	SC HE. gas inlet temp. sensor error < TH8 >	43
8 2 . 2	SC HE. gas outlet temp. sensor error < TH9 >	44
8 3 . 2	SC HE. liquid outlet temp sensor error < TH7 >	45
8 4 . 1	Current sensor error	46
8 6 . 1	Discharge pressure sensor error	47
8 6 . 3	Suction pressure sensor error	48
8 6 . 4	High pressure switch error	49

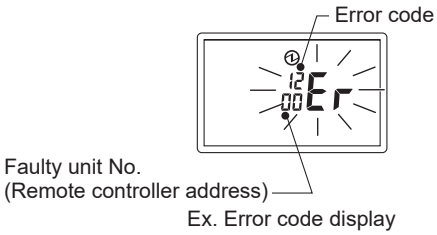
Error Code	Error Contents	Trouble shooting
9 3 . 1	Inverter compressor start up error	50
9 4 . 1	Trip detection	51
9 5 . 5	Compressor motor loss of synchronization	52
9 7 . 1	Outdoor unit fan motor lock error (Start up error)	53
9 7 . 4	Outdoor unit fan motor under voltage (Lack of DC voltage)	54
9 7 . 5	Outdoor unit fan motor 1 temperature abnormal	55
9 8 . 1	Outdoor Unit Fan Motor Lock Error (Start up error)	53
9 8 . 5	Outdoor unit fan motor 2 temperature abnormal	55
9 A . 1	Coil (Expansion valve 1) error	56
9 A . 2	Coil (Expansion valve 2) error	
A 1 . 1	Discharge temperature abnormal	57
A 3 . 1	Compressor temperature abnormal	58
A 4 . 1	High pressure abnormal	59
A 4 . 2	High pressure protection 1	60
A 5 . 1	Low pressure abnormal	61
A C . 4	Outdoor unit heat sink temp. abnormal	62

4-2-4 Remote Controller Display

<< SIMPLE REMOTE CONTROLLER >> UTY-RSKU , UTY-RHKU

ERROR CODE DISPLAY

If an error occurs, the following display will be shown.
(“ Er“ will appear in the set room temperature display.)
If “ Er“ is displayed, immediately contact authorized service personnel.

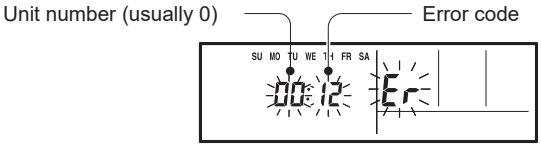


Ex. Error code display

<< WIRED REMOTE CONTROLLER 3 wire type >> UTY-RNKU

ERROR CODE DISPLAY

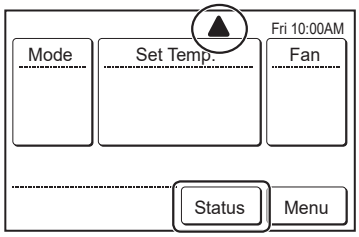
If an error occurs, the following display will be shown.
(“ Er“ will appear in the set room temperature display.)
If “ Er“ is displayed, immediately contact authorized service personnel.



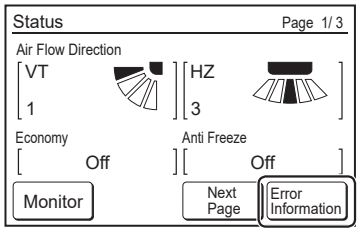
Ex. Error code display

<< WIRED REMOTE CONTROLLER 2 wire type >> UTY-RNRU

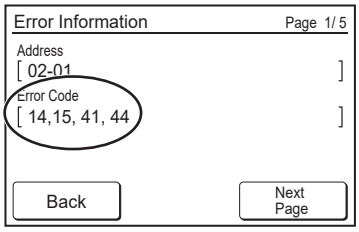
If an error occurred, an error icon appears on the Monitor mode screen.



1. Touch the [Status] on the Monitor mode screen.



2. Touch the [Error Information] on the Status screen.

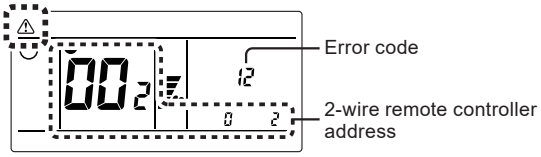


2-digit numbers are corresponding to the error code

<< WIRED REMOTE CONTROLLER 2 wire type >> UTY-RNRU

This appears automatically on the display if an error occurs.

If an error occurs, the following display will be shown. (" ⚠ " will appear in the "Monitor Mode Screen")



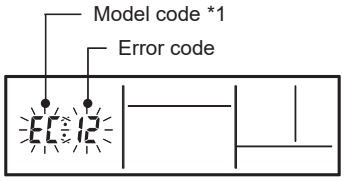
Ex. Error code display

<< GROUP REMOTE CONTROLLER >> UTY-CGGY

ERROR CODE DISPLAY

The air conditioning system must be inspected if “ E : “ (error code) appears on the timer and Clock Display, or the operation lamp is flashing.

*1 ; Model code
- 0 : Outdoor unit
- 1 : Indoor unit
- C : Group remote controller
- A : Convertor



Ex. Error code display

4-2-5 Error Code List for Simple and Wired Remote Controller

Error Code	Error Contents	Trouble shooting
1 2	Remote Controller Communication Error	9
1 4	Network Communication Error	11
1 6	Indoor Unit Parallel Communication Error	10,11
22,24,26,28	Address Setting Error	27,28,29
2 9	Connection Unit Number Error in Wired Remote Controller System	13
3 1	Indoor Unit Power Frequency Abnormal	2
3 2	Indoor Unit Main PCB Error	1, 3
3 9	Indoor Unit Power Supply Error	14
3 A	Indoor Unit Communication circuit (WRC) Error	15

Error Code	Error Contents	Trouble shooting
4 1	Room Temperature Sensor Error	4
4 2	Indoor Unit Heat Ex. Sensor Error	5, 6
4 A	Indoor Unit Suction/Discharge Air Temp. Thermistor Error	16,17
5 1	Indoor Unit Fan Motor Error	8
5 2	Indoor Unit Coil (EEV) Error	18
5 3	Water Drain Abnormal	7
5 7	Damper error	19,20
5 9	Speed error (Outdoor air unit)	21
8 A	Poor refrigerant circulation	22
9 U	Outdoor Unit Error	11,25

4-2-6 Error Code List for Group Remote Controller

Error Code	Error Contents	Trouble shooting
- -	Initial setting error	19
1 2	Remote controller communication error	9,12,82,87, 93,98
1 4	Network communication error	11,24,25,96
1 5	System error	95, 99
1 6	Indoor unit parallel communication error	10,11,88
2 2	Connecting indoor unit capacity error	27
2 4	Connecting number of indoor unit error	27
2 6	Address setting error	12,27,76,84, 89,94
2 8	Other setting error	28, 29
2 9	Connection unit number error in wired remote controller system	13
3 1	Indoor unit power frequency abnormal	2
3 2	Indoor unit main PCB error	1, 3
3 9	Indoor unit power supply error	14
3 A	Indoor unit communication circuit (WRC) error	15
4 1	Room temperature sensor error	4
4 2	Indoor unit heat ex. sensor error	5, 6
4 A	Indoor unit suction/discharge air temp. thermistor error	16,17
5 1	Indoor unit fan motor error	8
5 2	Indoor unit coil (EEV) error	18
5 3	Water drain abnormal	7
5 7	Damper error	19,20
5 9	Speed error (Outdoor air unit)	21
6 2	Outdoor unit main PCB error	30～32
6 3	Inverter error	33
6 7	Inverter PCB short interruption detection	34
6 8	Rush current limiteing resistor temp. rise protection	35
6 9	Outdoor unit transmission PCB error	36

Error Code	Error Contents	Trouble shooting
7 1	Discharge temperature sensor error	37
7 2	Compressor temperature sensor error	38
7 3	Heat ex. liquid pipe temperature sensor error	39
7 4	Outdoor temperature sensor error	40
7 5	Suction gas temperature sensor error	41
7 7	Heat sink temperature sensor error	42
8 2	Sub-cool heat ex. gas temperature sensor error	43, 44
8 3	Liquid pipe temperature sensor error	45
8 4	Current sensor error	46
8 6	Pressure sensor error	47～49
9 3	Compressor start up error	50
9 4	Trip detection	51
9 5	Compressor motor loss of synchronization	52
9 7	Outdoor unit fan motor 1 error	53～55
9 8	Outdoor unit fan motor 2 error	53～55
9 A	Coil (Expansion valve) error	56
A 1	Discharge temperature abnormal	57
A 3	Compressor temperature abnormal	58
A 4	High pressure abnormal	59, 60
A 5	Low pressure abnormal	61
A 8	Poor refrigerant circulation	22
A C	Outdoor unit heat sink temp. abnormal	62
C 1	PCB error 1	77,81,86
C 4	PCB error	92
C A	Software error	83,90

4-2-7 Error Code List for External Switch Controller (UTY-TEKX, UTY-TERX)

Error Code	Error Contents	Trouble shooting
- -	Power supply error	70
- -	The abnormality in connection of remote controller cable	71
- -	Transmission error	72
- -	Switch operation error	73

4-2-8 Error Code List for Signal Amplifier (UTY-VSGXZ1)

Error Code	Error Contents	Trouble shooting
- -	Power supply error	74
- -	Communication error	75
2 6	Address setting error	76
C 1	Parallel communication error	77
- -	Communication error B	78
- -	Communication error A	79

4-2-9 Error Code List for Network Convertor (UTY-VGGXZ1)

1. When connecting a group remote controller to a network convertor

Error Code	Error Contents	Trouble shooting
- -	Power supply error	80
C 1	PCB error 1	81
1 2	Communication error with group remote controller	82
C A	Software error	83
2 6	Refrigerant circuit address setting error	84

2. When connecting a single split type indoor unit to a network convertor

Error Code	Error Contents	Trouble shooting
- -	Power supply error	85
C 1	PCB error 1	86
1 2	Communication error with standard remote controller	87
1 6	Communication error with indoor unit	88
2 6	Communication error with indoor unit	89
C A	Software error	90
5 U	Indoor unit error	91

4-2-10 TROUBLE LEVEL OF SYSTEM

<< System Condition when Outdoor Unit Error is occurred >>

System Condition	Outdoor unit Condition	Trouble Level	
		1	2
		(1) Not indicated on Indoor Unit. Not indicated on Peripheral Unit. Indicated on Service Tool.	(2) ● Indicated on Indoor Unit. Indicated on Peripheral. Indicated on Service Tool.
System is not stopped compulsorily	>Abnormal >LED indication >Outdoor unit does not stop	(Not available)	> Suction gas Temp sensor error > Outdoor Temp sensor error > Sub-cool heat Ex. gas inlet Temp sensor error > Sub-cool heat Ex. gas outlet Temp sensor error
	>Abnormal >LED indication >Outdoor unit does not stop	>Temporary blackout detection protection (Inverter compressor stop)	> Discharge temperature abnormal (Inverter compressor stops) > Compressor temperature abnormal (Inverter compressor stops) > High pressure switch error (Inverter compressor stops) > High pressure switch error (Constant speed compressor stops) > Discharge Temp sensor error (Inverter compressor stops) > Compressor Temp sensor error (Inverter compressor stop) > Heat sink Temp sensor error (Inverter compressor stop) > Current sensor error (Inverter compressor stop) > High pressure switch error (Inverter compressor stop) > Inverter error (Inverter compressor stop) > Heat sink temperature abnormal (Inverter compressor stop) > Inverter compressor start up error (Inverter compressor stop) > Trip detection (Inverter compressor stops) > Rush current limiting resister Temp rise protection (Inverter compressor stop) > Comp. motor loss of synchronization (Inverter compressor stop) > Inverter communication error (Inverter compressor stop) > Outdoor unit EEPROM access error > Outdoor unit EEPROM data corrupted > Indoor unit number shortage

● **This will not be displayed on indoor unit which Error Report Target(function setting 47 of indoor unit) is set "for administrator".**

System Condition	Outdoor unit Condition	Trouble Level	
		1	2
		(1) Not indicated on Indoor Unit. Not indicated on Peripheral Unit. Indicated on Service Tool.	(2) Indicated on Indoor Unit. Indicated on Peripheral. Indicated on Service Tool.
System is compulsorily stopped.	>Abnormal >LED indication >Outdoor unit stops >Need to repair >secondary accident is possible.	(Not available)	>High pressure abnormal >Low pressure abnormal >Fan motor 1 lock error >Fan motor 2 lock error >Fan motor 1 temp. abnormal >Fan motor 2 temp. abnormal >Heat Ex. liquid Temp sensor error >Discharge pressure sensor error >Suction pressure sensor error >Outdoor unit communication PCB parallel communication error >Outdoor unit network communication 2 error >Lack of DC Voltage >Indoor unit number shortage >SC HE. Liquid Outlet Temp Sensor Error

<Important>

Even if power is reset, the following Error cannot release.
- Discharge temperature abnormal
- Compressor temperature abnormal
- Current sensor error
- Inverter compressor start up error
- Trip detection
- Rush current limiting resister Temp rise protection
- Comp. motor loss of synchronization
- Low pressure abnormal
- Fan motor 1 lock error
- Fan motor 2 lock error

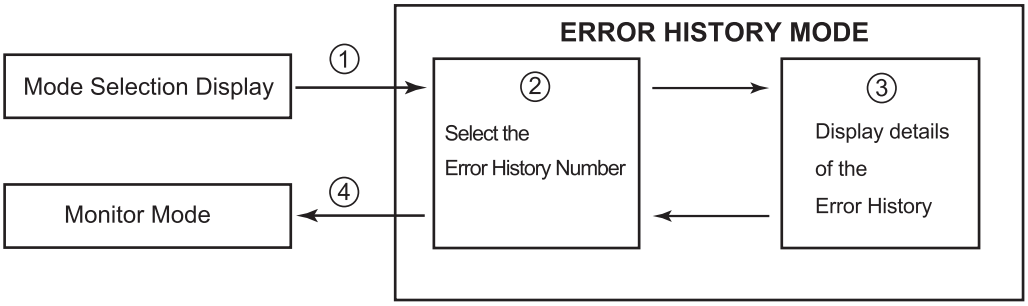
These errors can not be judged without operating the system, and the serviceman would not be able to check it if the system power is turned off before visiting the site for repair.
In Error release, you need to operate push switch and apply "Error reset" (F3-40) after power restart.

4-2-11 ERROR HISTORY MODE

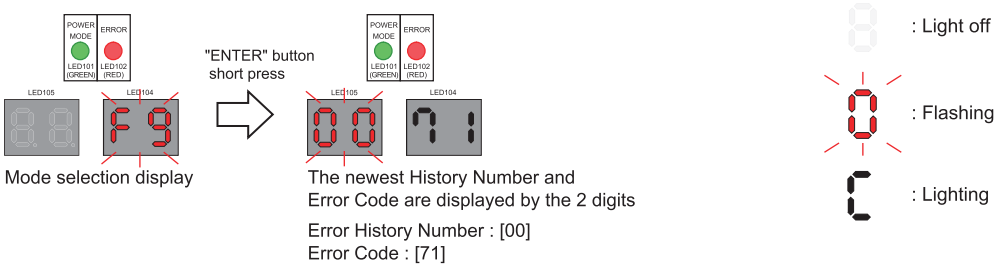
When the abnormality occurred, the J2 system memorizes the history of error codes up to 10 and it can be displayed on 7 segments LED.
It is an effective means to examine abnormality that occurred in the past.

*The error history can be cleared by setting to F3-30.

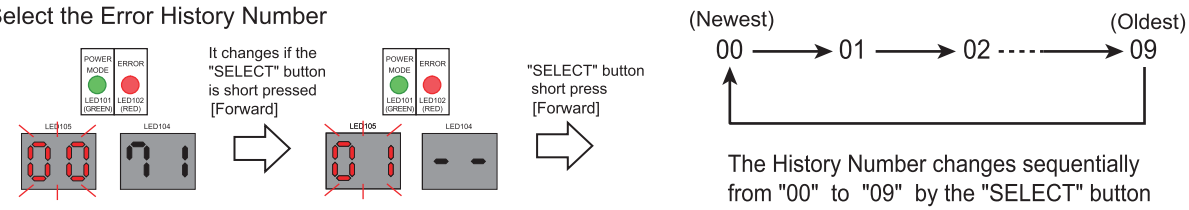
Refer to the following for the procedure.



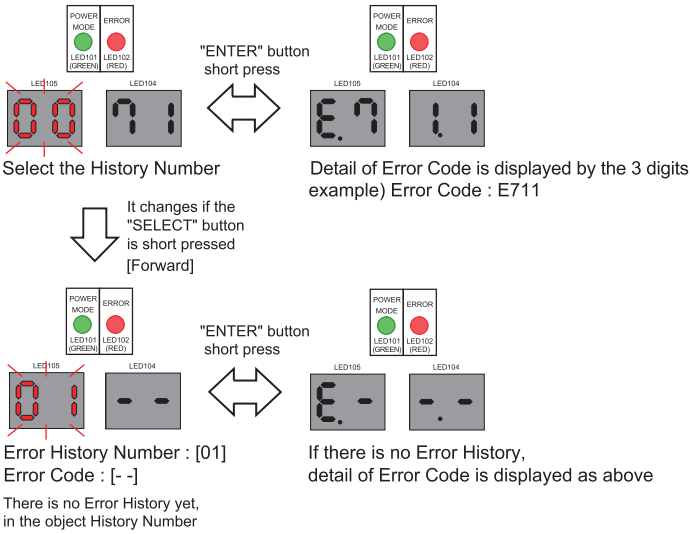
① Change to the Error History Mode from the Mode Selection Display



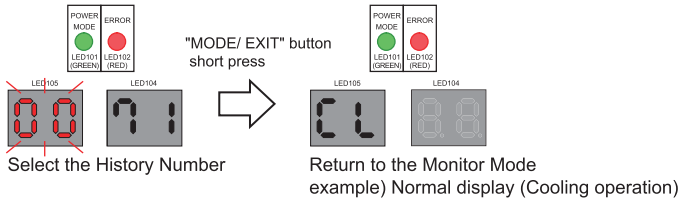
② Select the Error History Number



③ Check the detail of the Error History



④ End of the Error History mode



4-3 TROUBLE SHOOTING

4-3-1 Trouble shooting with error code (INDOOR UNIT)

Troubleshooting 1 **INDOOR UNIT Error Method:** **Model Information Error** **(Indoor Unit Main PCB Error)**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 3 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash.** **Error Code : 3 2**

Detective Actuators: Indoor Unit Controller PCB Circuit	**Detective details:** 3 continuous failure of read test of EEPROM at Power ON, or Apparent Model information error from EEPROM. Also, Error on Model information upon model information test of EEPROM, or Model information of EEPROM not possible to recover.

Forecast of Cause :

1. Outside cause 2. Connection failure of electric components 3. Controller PCB defective

Check Point 1-1 : Reset Power Supply

Does abnormal LED indication show again?

NO → **Check Point 1-2 : Check outside cause (Voltage drop or noise, etc.)**

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave). Check the complete insulation of grounding.

YES ↓

Check Point 2 : Check Indoor Unit electric components

- ☐ Check all connectors (loose connector or incorrect wiring)
- ☐ Check any shortage or corrosion on PCB.

OK ↓

Check Point 3 : Replace Controller PCB

▶**Change Controller PCB and set up the original address.**

Note : EEPROM

EEPROM(Electronically Erasable and Programmable Read Only Memory) is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically.
To change the contents, it uses higher voltage than normal, and it can not change a partial contents. (Rewriting shall be done upon erasing the all contents.)
There is a limit in a number of rewriting.

Troubleshooting 2 **INDOOR UNIT Error Method:** **Power Frequency Abnormal**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 3 times Flash, Timer LED 1 Times Flash, Filter LED Continuous Flash.** **Error Code : 3 1**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit	When 5 continuous failures occurred at Power frequency test.

Forecast of Cause : 1. Outside cause 2. Installation failure 3. Defective connection of electric components 4.Controller PCB defective

Check Point 1-1 : Reset Power Supply

Does abnormal LED indication show again?

NO → **Check Point 1-2 : Check outside cause (Voltage drop or noise, etc.)**

- Instant drop ----- Check if there is a large load electric apparatusin the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave). Check the complete insulation of grounding.
- Wrong power supply installation ----- Check if the power supply frequency is stable or not.

YES ↓

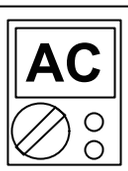
Check Point 2 : Check Installation condition

- ☐ Check Cable/Breaker
- ☐ Check loose or removed connection
  >> If Installation defect is found, correct it by referring to Installation Manual.

OK ↓

Check Point 3 : Check connection of electric components

- ☐ Check power supply voltage (AC230V between Indoor unit terminal 1 and 2)
- ☐ Check connection of Connector (any lose connector or incorrect wiring)
- ☐ Check any shortage or corrosion on PCB.



OK ↓

Check Point 4 : Replace Controller PCB

► **Change Controller PCB and set up the original address.**

Troubleshooting 3 **INDOOR UNIT Error Method:** **EEPROM Access Abnormal** **(Indoor Unit Main PCB Error)**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 3 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash.** **Error Code : 3 2**
Detective Actuators: Indoor Unit Controller PCB Circuit	**Detective details:** When 3 continuous failure occurred on read test of EEPROM.

Forecast of Cause : 1. Outside cause 2. Defective connection of electric component 3. Controller PCB defective

Check Point 1-1 : Reset Power Supply

Does abnormal LED indication show again?

NO → Check Point 1-2 :
Check outside cause (Voltage drop or noise, etc.)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave). Check the complete insulation of grounding.

YES ↓

Check Point 2 : Check Indoor Unit electric components

- ☐ Check all connectors (loose connector or incorrect wiring)
- ☐ Check any shortage or corrosion on PCB.

OK ↓

Check Point 3 : Replace Controller PCB

► **Change Controller PCB and set up the original address.**

Troubleshooting 4 **INDOOR UNIT Error Method:** **Room Temperature Sensor Error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 4 times Flash, Timer LED 1 Times Flash, Filter LED Continuous Flash.** **Error Code : 4 1**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Indoor Temperature Thermistor	When Indoor thermistor open or shortage is detected at power ON.

Forecast of Cause :

1. Connector defective connection 2. Thermistor defective 3. Controller PCB defective

Check Point 1 : Check connection of Connector

- ☐ Check if connector is loose or removed
- ☐ Check erroneous connection
- ☐ Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Rough value)

Temperature (°C)	-20	-10	0	10	20	30	40	50	60	70	80
Temperature (°F)	-4	14	32	50	68	86	104	122	140	158	176
Resistance Value (kΩ)	105.4	58.3	33.6	20.2	12.5	8.0	5.3	3.6	2.5	1.8	1.3
Voltage value (V)	1.6	2.3	3.0	3.6	4.0	4.3	4.5	4.7	4.8	4.8	4.9

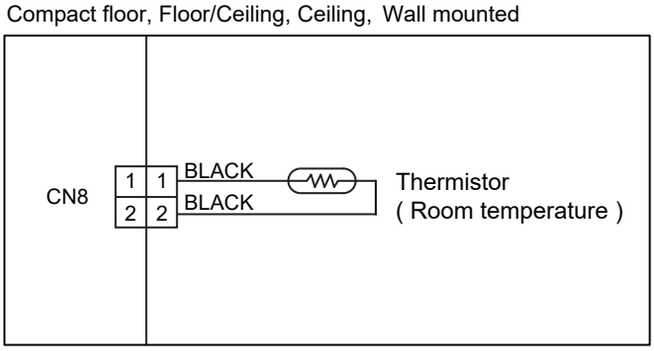
► **If Thermistor is either open or shorted, replace it and reset the power.**

OK

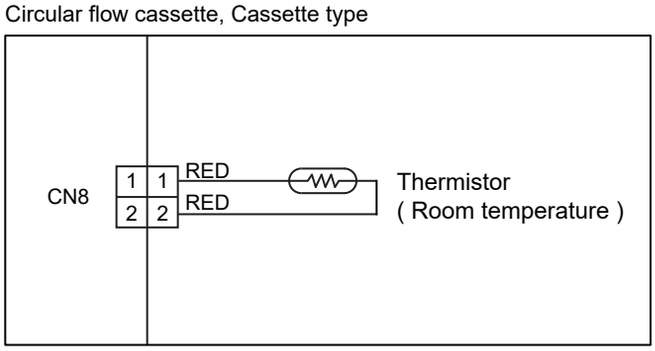
Check Point 3 : Check voltage of Controller PCB (DC5.0V)

Make sure circuit diagram of each indoor unit and check terminal voltage at Thermistor (DC5.0V)

Compact cassette, Mini duct, Slim duct/Slim consealed floor, Medium static pressure duct, High static pressure duct, Compact floor, Floor/Ceiling, Ceiling, Wall mounted



Circular flow cassette, Cassette type



► **If the voltage does not appear, replace Controller PCB and set up the original address.**

Troubleshooting 5 **INDOOR UNIT Error Method:** **Heat Exchanger Inlet Sensor Error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 4 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash.** **Error Code : 4 2**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Heat Exchanger Inlet Thermistor	When open or shorted Heat Exchanger Inlet Thermistor is detected at Power ON.

Forecast of Cause :

1. Connector defective connection 2. Thermistor defective 3. Controller PCB defective

Check Point 1 : Check connection of Connector

- ☐ Check if connector is loose or removed
- ☐ Check erroneous connection
- ☐ Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Rough value)

Temperature (°C)	-20	-10	0	10	20	30	40	50	60	70
Temperature (°F)	-4	14	32	50	68	86	104	122	140	158
Resistance Value (kΩ)	531.6	292.9	168.6	100.9	62.6	40.0	26.3	17.8	12.3	8.7
Voltage value (V)	0.4	0.7	1.1	1.7	2.2	2.8	3.3	3.7	4.0	4.3

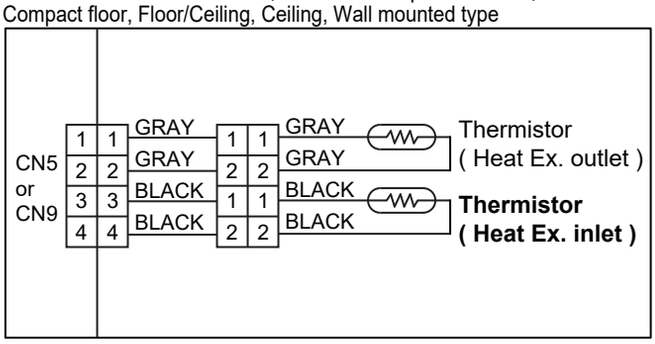
► **If Thermistor is either open or shorted, replace it and reset the power.**

OK

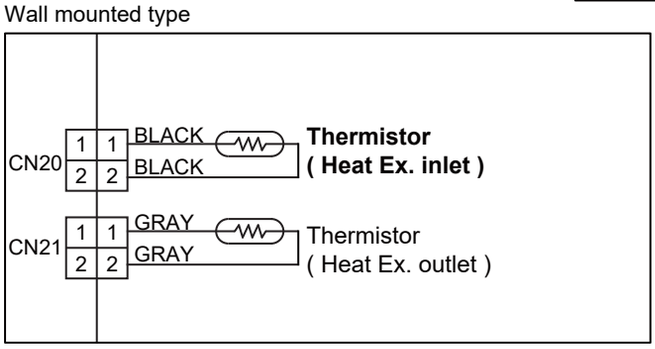
Check Point 3 : Check voltage of Controller PCB (DC5.0V)

Make sure circuit diagram of each indoor unit and check terminal voltage at Thermistor (DC5.0V)

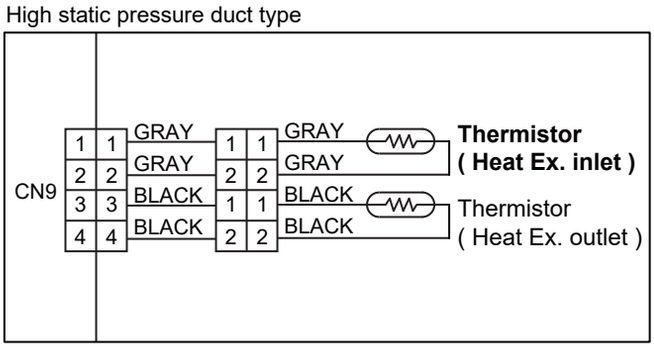
Compact cassette, Circular flow cassette, Cassette,
Slim duct/Slim concealed floor, Medium static pressure duct,
Compact floor, Floor/Ceiling, Ceiling, Wall mounted type



Wall mounted type



High static pressure duct type



► **If the voltage does not appear, replace Controller PCB and set up the original address.**

Troubleshooting 6 **INDOOR UNIT Error Method:** **Heat Exchanger Outlet Sensor Error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 4 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash.** **Error Code : 4 2**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Heat Exchanger Outlet Thermistor	When open or shorted Heat Exchanger outlet Thermistor is detected at Power ON.

Forecast of Cause :

1. Connector defective connection 2. Thermistor defective 3. Controller PCB defective

Check Point 1 : Check connection of Connector

- ☐ Check if connector is loose or removed
- ☐ Check erroneous connection
- ☐ Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Rough value)

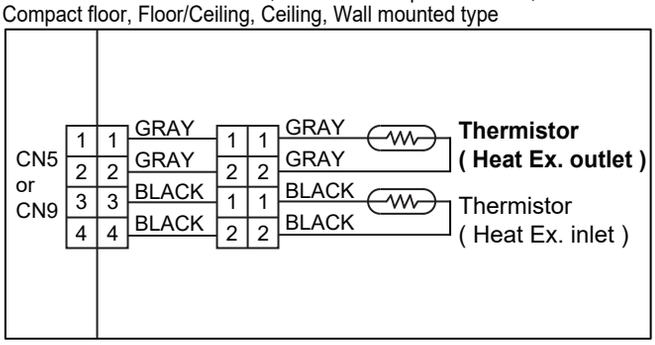
Temperature (°C)	-20	-10	0	10	20	30	40	50	60	70
Temperature (°F)	-4	14	32	50	68	86	104	122	140	158
Resistance Value (kΩ)	531.6	292.9	168.6	100.9	62.6	40.0	26.3	17.8	12.3	8.7
Voltage value (V)	0.4	0.7	1.1	1.7	2.2	2.8	3.3	3.7	4.0	4.3

▶**If Thermistor is either open or shorted, replace it and reset the power.**

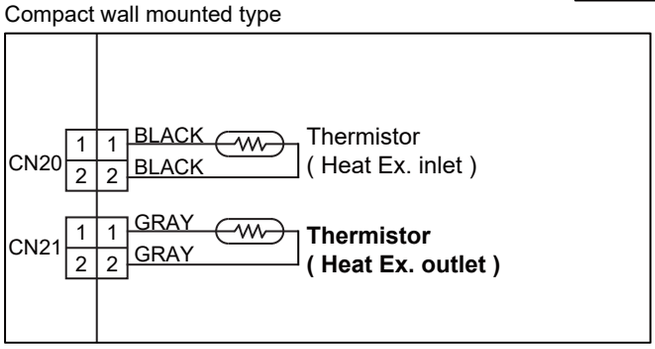
OK

Check Point 3 : Check voltage of Controller PCB (DC5.0V)

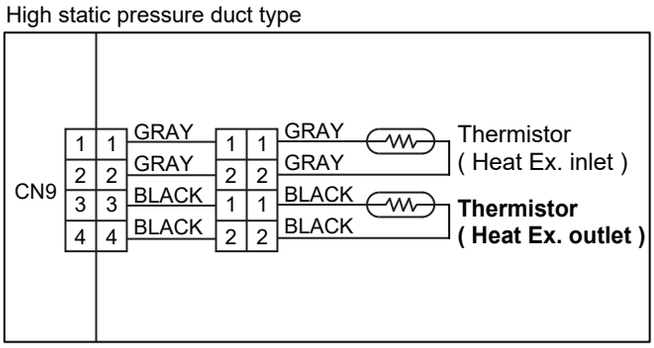
Make sure circuit diagram of each indoor unit and check terminal voltage at Thermistor (DC5.0V)
Compact cassette, Circular flow cassette, Cassette,
Slim duct/Slim concealed floor, Medium static pressure duct,
Compact floor, Floor/Ceiling, Ceiling, Wall mounted type



Compact wall mounted type



High static pressure duct type



▶**If the voltage does not appear, replace Controller PCB and set up the original address.**

Troubleshooting 7 **INDOOR UNIT Error Method:** **Water Drain Abnormal**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 5 times Flash, Timer LED 3 Times Flash, Filter LED Continuous Flash.** **Error Code : 5 3**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Float Switch	When Float switch is ON for more than 3 minutes.

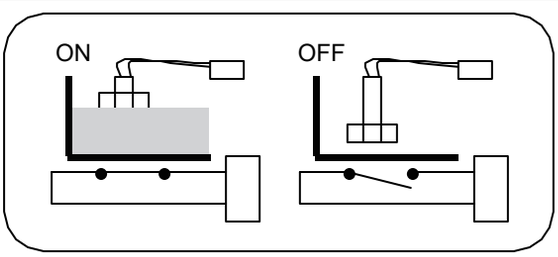
Forecast of Cause :

1. Float switch defective 2. Shorted connector/wire 3. Controller PCB defective 4. Drain pump defective

DC

Check Point 1 : Check Float Switch

- ☐ Check operation of float switch. (any blocking by dust, etc.)
- ☐ Remove Float switch and check ON/OFF switching operation by using a meter.
  >>If Float switch is defective, replace it.



OK

Check Point 2 : Check Connector (CNA5 or CNA05) / Wire

- ☐ Check loose contact of CNA5 or CNA05 shorted wire (pinched wire).
  >>Replace Float switch if the wire is abnormal

OK

Check Point 3 : Check Controller PCB

- **If Check Point 1 & 2 do not improve the symptom, change Controller PCB and set up the original address.**

Attention!!
Small size wall mount type does not have a float switch. In this case, replace Controller PCB and set up the original address. Please refer to.

Troubleshooting 8 **INDOOR UNIT Error Method:** **Indoor Unit Fan Motor Error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 5 times Flash, Timer LED 1 Times Flash, Filter LED Continuous Flash.** **Error Code : 5 1**
Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Fan Motor	**Detective details:** When Indoor fan control is either phase control or DC control and rotation feed back control is ON, the feed back rotation value becomes 0 and lasts for more than 1 minute at motor operation condition. Or, the feed back rotation value continues at 1/3 of target value for more than 1 minute.

Forecast of Cause : 1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by surrounding temp. increase 4.Capacitor failure 5. Control PCB failure

Check Point 1 : Check rotation of Fan

- ☐ Rotate the fan by hand when operation is off.
  (Check if fan is caught, dropped off or locked motor)
  >>If Fan or Bearing is abnormal, replace it.

OK

Check Point 2 : Check Motor winding

- ☐ Check Indoor Fan motor
  Refer to the Service parts information 13, 14.

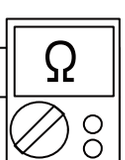
OK

Check Point 3 : Check ambient temp. around motor

- ☐ Check excessively high temperature around the motor.
  (If there is any surrounding equipment that causes heat)
  >>Upon the temperature coming down, restart operation.

OK

Check Point 4 : Check Motor Capacitor



- ☐ Check continuity of motor capacitor
  >>If it is shorted, replace the capacitor.

OK

Check Point 5 : Replace Controller PCB

- ☐ Change Controller PCB and set up the original address.

Attention!!
In case of Duct type, replace Controller PCB and set up the original address, since it is a tapping control.

Troubleshooting 9-1 **INDOOR UNIT Error Method:** **Wired Remote Controller Communication Error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 1 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash.** **Error Code : 1 2**
Detective Actuators: Indoor unit controller PCB circuit Wired Remote Control (3 wire / 2 wire type)	**Detective details:** Upon receiving the signal more than 1 time from Wired Remote or other Indoor unit, but the same signal has not been received more than 1 minute.

Forecast of Cause :

1. Terminal connection abnormal 2. Wired Remote Control failure 3. Controller PCB failure

Check Point 1 : Check the connection of terminal

After turning off the power, check & correct the followings.

- ☐ Indoor Unit - Check the connection of terminal between remote control and Indoor unit, or between Indoor units, and check if there is a disconnection or short of the cable.

OK

Check Point 2 : Check Remote and Controller PCB

- ☐ Check terminal voltage of controller PCB Connector CNC1 or CNC01. (Power supply for Remote)
  If DC12V, Remote Control failure (Controller PCB is OK) >>> Replace Remote
  If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB
- ▶ **In case of re-installation is done due to removed connector or incorrect wiring,turn on the power again.**

Troubleshooting 9-2 **INDOOR UNIT Error Method:** **Wired Remote Controller Token Error**	**Indicate or Display:** **Indoor Unit : Operation LED 1 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash.** **Outdoor Unit : E.5 U.1, Error LED Continuous Flash.** **Remote Controller : 1 2**
Detective Actuators: Indoor unit Controller PCB circuit Wired Remote Control (3 wire type)	**Detective details:** More than 1 time of Token (Communication between wired remote controllers) is received, but it was not received more than 1 minute.

Forecast of Cause :

1. Terminal connection abnormal 2. Mis-setting 3. Wired Remote Control failure 4. Controller PCB failure

Check Point 1 : Check the connection of terminal

After turning off the power, check & correct the followings.

- ☐ Indoor Unit - Check the connection of terminal between remote control and Indoor unit, or between Indoor units, and check if there is a disconnection or short of the cable.

OK

Check Point 2 : Check Remote and Controller PCB

- ☐ Check terminal voltage of controller PCB Connector CNC1 or CNC01. (Power supply for Remote)
  If DC12V, Remote Control failure (Controller PCB is OK) >>> Replace Remote
  If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB
- ▶ **In case of re-installation is done due to removed connector or incorrect wiring,turn on the power again.**

Troubleshooting 10 **INDOOR UNIT Error Method:** **Indoor Unit Parallel Communication Error**	**Indicate or Display:** **Outdoor Unit : E.1 4.1, 1 4.2 *** **Indoor Unit : Operation LED 1 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash.** **Error Code : 1 6 ***

*** Outdoor unit indicates 1 4.1 or 14.2 (No communication from Indoor unit)**
Peripheral device indicates 1 6 (1 6.4 Error)
Service Tool indicates 14.3 (Missing Error Indoor unit)

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB circuit Indoor unit Communication PCB	When Parallel communication error (Communication reset occurs continuously more than specified times) is detected.

Forecast of Cause :

1. Connection failure 2. Outside cause 3. Communication PCB failure 4. Controller PCB failure

Check Point 1-1 : Reset the power

Does LED error indication reappear?

NO → Check Point 1-2 : Check outside cause such as noise

- ☐ Check the complete insulation of the grounding.
- ☐ Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).

YES ↓

Check Point 2 : Check Connection

- ☐ Check if Indoor Communication PCB is removed.

OK ↓

Check Point 3 : Replace Communication PCB

- **Replace Communication PCB**
  (If the symptom does not change, replace Controller PCB and set up the original address.)

Troubleshooting 11 **INDOOR UNIT Error Method:** **Network Communication Error**	**Indicate or Display:** **Outdoor Unit : E.1 4. 1 / 1 4. 2 *** **Indoor Unit : Operation LED 1 times Flash, Timer LED 4 Times Flash, Filter LED Continuous Flash.** **Error Code : 1 4 / 1 6 / 9 U / 14.1 / 14.2 / 14.3 ***

*** Outdoor unit indicates 1 4.1 or 1 4.2 (No communication from 14.3 Error Indoor unit)**
Peripheral device indicates 1 4 or 1 6

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB circuit Indoor unit Communication PCB	When the cut-off of network communication is detected (more than 90 seconds passed since the last receipt of Outdoor unit signal).

Forecast of Cause :

1. Connection failure 2. Outside cause 3. Communication PCB failure 4. Controller PCB failure

Check Point 1 : Check the connection

After turning off the power, check and correct followings.

- ☐ Is Indoor Communication PCB loose?
- ☐ Check loose or removed connection of communication line between Indoor and Outdoor unit.
- ☐ When the signal amplifier is connected , is it failure of signal amplifier?

OK

Check Point 2 : Check if any outside cause such as voltage drop or noise

- Instant voltage drop ----- Check if there is any electric equipment with a large load within the same circuit.
- Momentary power failure ----- Check contact failure or leak current in power supply circuit
  >>Check Outdoor Unit as well.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave). And check the complete insulation of grounding.
  >>If the same symptom does not reappear after resetting the power, possibility of noise is high.

OK

Check Point 3 : Check Communication PCB and Controller PCB

- ☐ If some of Indoor units have errors, replace Communication PCB of the Indoor units that have the error.
  >>If the symptom does not change, replace Indoor unit Controller PCB.
- ☐ If all the Indoor units have error, check if the Outdoor Unit Communication PCB has a loose connection.
  >>If the symptom does not change, replace Outdoor unit Communication PCB (Replace Controller PCB if it does not change).

Troubleshooting 12 **INDOOR UNIT Error Method:** **Address setting Error in Wired remote controller system**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 2 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash.** **Error Code : 2 6**

Detective Actuators:	**Detective details:**
Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	When the address number set by auto setting and manual setting are mixed in one RC group. When the duplicated address number exists in one RC group.

Forecast of Cause : 1. Wrong wiring of RC group 2. Wrong remote address setting 3. Indoor unit controller PCB failure 4. Remote controller failure

Check Point 1 : Wire installation

- ☐ Wrong wire connection in RC group (Please refer to the installation manual)

↓

Check Point 2 : Wrong RC group setting

- ☐ The given address number by auto setting (00) and the manual set number (Except 00) were not existing in one RCG.
- ☐ The remote controller address setting by U.I. were not existing same address.
- ☐ The duplicated address number is not existing in one RC group

↓

Check Point 3 : Check Indoor unit controller PCB

- ☐ Check if controller PCB damage
- ☐ Change controller PCB and check the Error after setting remote controller address

Troubleshooting 13 **<u>INDOOR UNIT Error Method:</u>** **Connection unit number error in Wired remote controller system**	**<u>Indicate or Display:</u>** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 2 times Flash, Timer LED 9 Times Flash, Filter LED Continuous Flash.** **Error Code : 2 9**
Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	**Detective details:** When the number of connecting indoor units are out of specified rule.

Forecast of Cause :

1. Wrong wiring/ Number of I.U, RC in RCgroup 2. Indoor unit controller PCB defective

Check Point 1 : Wire installation
☐ Wrong number of connceting indoor unit

↓

Check Point 2 : Check Indoor unit controller PCB
☐ Check if controller PCB damage ☐ Change controller PCB and check the Error after setting remote controller address

Troublshooting 14 **INDOOR UNIT Error Method:** **Indoor Unit power supply error for FAN motor 1 (2) (Outdoor Air Unit)**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Error Code : 3 9 , 3 9 . 1 (2)**
Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Unit filter PCB Circuit	**Detective details:** When the DC power input for Fan motor < W500 - W501 (W530 - W531) on the Filter PCB> becomes lower voltage than the specified voltage.

Forecast of Cause : 1. Noise momentary open, voltage drop 2. Wire connection 3. Fan motor 4. Peripheral electric devices 5. Filter PCB 6. Controller PCB

Check Point 1 : Check if any outside cause such as voltage drop or noise

- Instant voltage drop ----- Check if there is any electric equipment with a large load within the same circuit.
- Momentary power failure ----- Check contact failure or leak current in power supply circuit
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave). And check the complete insulation of grounding.

>>If the same symptom does not reappear after resetting the power, possibility of noise is high.

OK

Check Point 2 : Check wire connection

- Wire lose connection / damage between the CN21on the Controller PCB and CN250 on the Filter PCB
  In case of Model 72, between W530 (W531) on the filter PCB and capacitor.
  >>If there is abnormal on the wire, replace it

OK

Check Point 3 : Check rotation of Fan / wire resistance

- Rotate the applicable fan by hand when operation is off.
- Disconnect the connector from the controller PCB and Check resistance value of Motor connector (Refer to the SERVICE PARTS INFORMATION 14)

OK

Check Point 4 : Check peripheral devices, Posistor, Capacitor, Diode bridge

- Check resistance value, short circuit, visible damage
  >>If there is abnormal , replace it

OK

Check Point 5 : Replace Filter PCB

- Change filter PCB

NG

Check Point 6 : Replace Controller PCB

- Change Controller PCB and set up the original address.

Troubleshooting 15 **INDOOR UNIT Error Method:** **Indoor unit communication circuit (WRC) error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 3 times Flash, Timer LED 10 Times Flash, Filter LED Continuous Flash.** **Error Code : 3 A**
Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	**Detective details:** When the indoor unit(s) detects the configuration of RCG abnormal or the indoor unit detects lack of primaly -remote controller.

Forecast of Cause : 1. Terminal connection abnormal 2. Wired remote controller failure
3. Indoor unit controller PCB defective

Check Point 1 : Check the connection of terminal

After turning off the power supply, check & correct the followings

- ☐ Indoor unit - Check the connection of terminal between remote control and indoor unit, or between Indoor units and check if there is a disconnection or short of the cable

↓

Check Point 2 , 3: Check Indoor unit controller PCB

- ☐ Check terminal voltage of controller PCB connector CNC01 or CNC1 (Power supply for remote)
  If DC12V, Remote control failure (Controller PCB is OK) >>> Replace Remote controller
  If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB

  In case of re-installation is done due to remobed connector or incorrect wiring, turn on the power again.

Troublshooting 16 **INDOOR UNIT Error Method:** **Indoor unit suction air temp. thermistor error (Outdoor Air unit)**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Error Code : 4 A, 4 A. 1**
Detective Actuators: Indoor Unit Controller PCB Circuit Suction air temp. Sensor	**Detective details:** When Indoor unit suction air temp. thermistor open or shortage is detected

Forecast of Cause : 1. Connector defective connection 2. Thermistor defective 3. Controller PCB defective

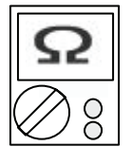
Check Point 1 : Check connection of Connector

- ☐ Check if connector is loose or removed
- ☐ Check erroneous connection
- ☐ Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.

OK

Check Point 2 : Remove connector and check sensor resistance value



Sensor Characteristics (Rough value)

Temperature (°F)	32	41	50	59	68	77	86	95
Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	33.6	25.2	20.1	15.8	12.5	10.0	8.0	6.5

Temperature (°F)	104	113	122
Temperature (°C)	40	45	50
Resistance Value (kΩ)	5.3	4.3	3.5

▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage CN8 of Controller PCB (DC5.0V)

▶ **If the voltage does not appear, replace Controller PCB and set up the original address.**

Troublshooting 17 **INDOOR UNIT Error Method:** **Indoor unit discharge air temp. thermistor error (Otudoor Air unit)**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Error Code : 4 A, 4 A. 2**
Detective Actuators: Indoor Unit Controller PCB Circuit Discharge air temp. Sensor	**Detective details:** When Indoor unit discharge air temp. thermistor open or shortage is detected

Forecast of Cause : 1. Connector defective connection 2. thermistor defective 3. Controller PCB defective

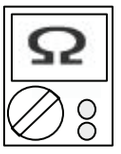
Check Point 1 : Check connection of Connector

- ☐ Check if connector is loose or removed
- ☐ Check erroneous connection
- ☐ Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.

OK

Check Point 2 : Remove connector and check sensor resistance value



Sensor Characteristics (Rough value)

Temperature (°F)	32	41	50	59	68	77	86	95
Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	33.6	25.2	20.1	15.8	12.5	10.0	8.0	6.5

Temperature (°F)	104	113	122
Temperature (°C)	40	45	50
Resistance Value (kΩ)	5.3	4.3	3.5

▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage CN20 of Controller PCB (DC5.0V)

▶ **If the voltage does not appear, replace Controller PCB and set up the original address.**

Troubleshooting 18 **INDOOR UNIT Error Method:** Coil 1 (Expansion valve) Error	**Indicate or Display:** Outdoor Unit : E.5U.1 Indoor Unit : Operation LED 5 Times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. Error Code : 5 2

Detective Actuators:	**Detective details:**
Indoor unit controller PCB	When the EEV1 drive circuit is open circuit

Forecast of Cause :
1. Wrong capacity setting
2. EEV1 coil lose connection
3. EEV1 wire(s) cut or pinched
4. Defective EEV1 coil
5. Controller PCB (DC 12V) output abnormal
6. Noise momentary open, voltage drop

Check Point 1 : Check if the capacity setting was wrong.

- ☐ Check if the capacity setting of transmission PCB was not selected as 40kW or 50kW by using of one EEV unit. <Refer to the installation manual>

↓ **OK**

Check Point 2 : Check the connection of EEV1 connector

- ☐ Check If the connector CN 10 is lose connection wrong wiring or not

↓ **OK**

Check Point 3 : Check the EEV1 wire

- ☐ Check if the wire of EEV 1 has damage or not (Slash, Braking of wire, Pinching, etc.)

→ **NG** → Replace EEV1 unit

↓ **OK**

Check Point 4 : Check the EEV1 Coil

- ☐ Check if the circuit of EEV coil winding is good or not (Refer to the SERVICE PARTS INFORMATION 8)

→ Replace EEV1 unit

↓ **OK**

Check Point 5 : Check the output of EEV1 on the Main PCB

- ☐ Check if the DC 12 is on between the pin No. 1 of CN10 or CN750 and Pin No.6 of CNB01 (GND) (Disconnect the wire of EEV1.)

→ **NG** → Replace Main PCB

↓ **OK**

Check Point 6 : Noise, momentary open, voltage drop

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if momentary open was not generated.
- ☐ Check if ground is connection correctly or there are no related cables near the power line.

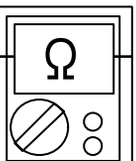
Troubleshooting 19 **INDOOR UNIT Error Method:** **Damper(OPEN/CLOSE) Detection Limit Switch Error**	**Indicate or Display:** **Outdoor Unit : E. 5U. 1** **Indoor Unit : Operation LED 5 times Flash, Timer LED 7 Times Flash, Economy LED Continuous Flash.** **Error Code : 57**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Circuit Limit switch Damper	When limit switch were not able to detect the close though the damper close. (Upper air flow) When limit switch were not able to detect the open though the damper open. (Upper & Lower air flow)

Forecast of Cause :

1. Limit switch failure
2. Shorted connector/ wire
3. Damper faulure
4. Controller PCB failure

Check Point 1 : Check Limit switch



・Check operation of limit switch. (any blocking by dust, etc.)
・Remove Limit switch and check ON/OFF switching operation by using a meter.

>>If Limit switch is detective, replace it.

OK

Check Point 2 : Check Connector (CN51) / Wire

・Check loose contact of CN51 /shorted wire (pinched wire).

>>Replace Limit switch if the wire is abnormal

OK

Check Point 3 : Check Damper

・Check the obstruction of damper movement.
・Check the damper movement.

>>Replace Damper if the damper is abnormal

OK

Check Point 4 : Replace Controller PCB

▶ **If Check Point 1～3 do not improve the symptom, change Controller PCB.**

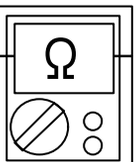
Troubleshooting 20 **INDOOR UNIT Error Method:** **Damper(OPEN/CLOSE) Simultaneous Detection Limit Switch Error**	**Indicate or Display:** **Outdoor Unit : E. 5U. 1** **Indoor Unit : Operation LED 5 times Flash, Timer LED 7 Times Flash, Economy LED Continuous Flash.** **Error Code : 57**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Circuit Limit switch	When the limit switch detects open and close at the simultaneous.

Forecast of Cause :

1. Limit switch failure
2. Shorted connector/ wire
3. Controller PCB failure

Check Point 1 : Check Limit switch



・Check operation of limit switch. (any blocking by dust, etc.)
・Remove Limit switch and check ON/OFF switching operation by using a meter.

>>If Limit switch is detective, replace it.

OK

Check Point 2 : Check Connector (CN51) / Wire

・Check loose contact of CN51 /shorted wire (pinched wire).

>>Replace Limit switch if the wire is abnormal

OK

Check Point 3 : Replace Controller PCB

▶ **If Check Point 1 & 2 do not improve the symptom, change Controller PCB.**

Trouble shooting 21 **INDOOR UNIT Error Method:** speed Error (Outdoor Air unit)	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Error Code : 5 9, 5 9. 2**
Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Fan Motor 2	**Detective details:** When the FAN motor feed back rotation value which is detecting on the controller PCB becomes 0 and lasts for more than 1 minute at motor opera tion condition. Or, when the feed back rotation value contimues at 1/ 3 of target value for more than 1 minute.

Forecast of Cause : 1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by ambient temp. increase 4. Capacitor failure 5. Controller PCB failure

Check Point 1 : Check rotation of Fan

- ☐ Rotate the fan by hand when operation is off.
  (Check if fan is caught, dropped off or locked motor)
  >>If Fan or Bearing is abnormal, replace it.

OK

Check Point 2 : Check Motor winding / Internal PCB circuit

- ☐ Check Indoor Fan motor**(Refer to the PARTS INFORMATION 14)**
  >>If Fan motor is abnormal, replace it.

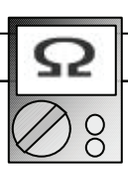
OK

Check Point 3 : Check ambient temp. around motor

- ☐ Check excessively high temperature around the motor.
  (If there is any surrounding equipment that causes heat)
  >>Upon the temperature coming down, restart operation..

OK

Check Point 4 : Check Motor Capacitor



- ☐ Check continuity of motor capacitor
  >>If it is shorted, replace the capacitor.

OK

Check Point 5 : Replace Controller PCB

- ☐ Change Controller PCB and set up the original address.

Troubleshooting 22 **INDOOR UNIT Error Method:** **Poor refrigerant circulation**	**Indicate or Display:** **Indoor unit : Operation lamp (Green) : 10 times flash Outdoor unit : E.5U.1** **Timer lamp (Orange) : 8 times flash** **Filter lamp (Red) : Fast blink** **Error code : A8**

Detective Actuators:	**Detective details:**
Refrigerant leak detection device	Refrigerant leak detector (optional or locally purchased) operates to notify the refrigerant leak.

Forecast of Cause:

1. Refrigerant leak 2. Connection failure 3. Refrigerant leak detector failure
4. Controller PCB failure

Check Point 1 : Check for refrigerant leaks

Check if there is no refrigerant leak from the heat exchanger and the surrounding pipe connection.

OK

Check Point 2 : Check refrigerant leak detector

Check the connection wiring (omission or disconnection) of the refrigerant leak detector.
Check the power of the refrigerant leak detector.
Check if the refrigerant leak detector is faulty.

OK

Replace controller PCB

4-3-2 Trouble Shooring With Error Code (OUTDOOR UNIT)

Troubleshooting 23 **OUTDOOR UNIT Error Method:** **Initial Setting Error**	**Indicate or Display:** **Outdoor Unit : - - - - (Flashing 0.5 sec. ON and OFF)** **Indoor Unit : No Display** **Error Code : No Display**
Detective Actuators: Outdoor unit main PCB	**Detective details:** When the DIP SW setting was wrong, after turned on the power supply

Forecast of Cause :

1. Wrong DIP SW setting
2. Power supply defective
3. Main PCB defective

Check Point 1 : Check the power supply

- ☐ Main power ON/OFF state check
- ☐ Power cable connection, open check

↓ **OK**

Check Point 2 : Check the outdoor unit address/number of connected slave units setting

- ☐ Setting check of outdoor unit address of each outdoor unit

Outdoor unit address	SET 3-1	SET 3-2
Master	OFF	OFF

↓ **OK**

Check Point 3 : Replace Main PCB

- ☐ Change Main PCB and set up the original address.

Troubleshooting 24 **OUTDOOR UNIT Error Method:** Outdoor Unit Network Communication 1 Error	**Indicate or Display:** Outdoor Unit : E. 14. 1 Indoor Unit : No display Error Code : 14
Detective Actuators: Outdoor unit Main PCB Outdoor unit communication PCB	**Detective details:** ▪No communication for 180 seconds or more from an indoor unit which received communication once and no outdoor network communication error 2.

Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Indoor unit power off
3. Communication line connection defective 4. Terminal resistor setting mistake
5. Communication PCB mounting defective, Communication PCB defective 6. Main PCB defective

Check Point 1 : Noise, momentary open, voltage drop

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if momentary open was not generated.
- ☐ Check if ground is connection correctly or there are no related cables near the power line.

↓ **OK**

Check Point 2 : Check the indoor unit power supply

- ☐ Main power ON check
- ☐ Power cable connection and open check

↓ **OK**

Check Point 3 : Check the communication line connection

- ☐ Communication line connection, open check

↓ **OK**

Check Point 4 : Check the Terminal resistor setting

- ☐ Terminal resistor setting check

↓ **OK**

Check Point 5 : Check the communication PCB (outdoor unit/indoor unit)

- ☐ Communication PCB connection check
- ☐ Communication PCB check

↓ **OK**

Check Point 6 : Replace Main PCB (outdoor unit / indoor unit)

- ☐ Change Main PCB and set up the original address.

Trouble shooting 25 **OUTDOOR UNIT Error Method :** Outdoor Unit Network Communication 2 Error	**Indicate or Display:** Outdoor Unit : E. 14. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 14
Detective Actuators: Outdoor unit Main PCB Outdoor unit communication PCB	**Detective details:** ▪No communication for 180 seconds or more from all indoor units that once received communication

Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Indoor unit power off
3. Communication line connection defective 4. Terminal resistor setting mistake
5. Communication PCB mounting defective, Communication PCB defective 6. Main PCB defective

Check Point 1 : Noise, momentary open, voltage drop

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if momentary open was not generated.
- ☐ Check if ground is connection correctly or there are no related cables near the power line.

↓ **OK**

Check Point 2 : Check the indoor unit power supply

- ☐ Main power ON check
- ☐ Power cable connection and open check

↓ **OK**

Check Point 3 : Check the communication line connection

- ☐ Communication line connection, open check

↓ **OK**

Check Point 4 : Check the Terminal resistor setting

- ☐ Terminal resistor setting check

↓ **OK**

Check Point 5 : Check the communication PCB (outdoor unit/indoor unit)

- ☐ Communication PCB connection check
- ☐ Communication PCB check

↓ **OK**

Check Point 6 : Replace Main PCB (outdoor unit / in door unit)

- ☐ Change Main PCB and set up the original address.

Troubleshooting 26 OUTDOOR UNIT Error Method: The number of Indoor unit shortage	**Indicate or Display:** Outdoor Unit : E.1 4.5 Indoor Unit : No display Error Code : No display
Detective Actuators: Indoor unit Controller PCB circuit Indoor unit Communication PCB	**Detective details:** When the indoor unit number decreases for 180 seconds from the memorized maximum indoor units number after power(Breaker) ON.

Forecast of Cause : 1. Indoor unit power off 2. Noise, momentary open, voltage drop
3. Communication line connection defective 4. Terminal resistor setting mistake
5. Communication PCB mounting defective, Communication PCB defective 6. Controller PCB defective

Check Point 1 : Find the indoor unit that the communication is lost.

- ☐ Check system drawing and service tool.

↓ OK

Check Point 2 : Check the indoor unit power supply

- ☐ Main power ON check
- ☐ Power cable connection and open check

↓ OK

Check Point 2 : Noise, momentary open, voltage drop

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if momentary open was not generated.
- ☐ Check if ground is connection correctly or there are no related cables near the power line.

↓ OK

Check Point 3 : Check the communication line connection

- ☐ Communication line connection, open check.

↓ OK

Check Point 4 : Check the Terminal resistor setting

- ☐ Terminal resistor setting check.

↓ OK

Check Point 5 : Check the communication PCB (indoor unit / outdoor unit)

- ☐ Communication PCB connection check.
- ☐ Communication PCB check.

↓ OK

Check Point 6 : Replace Main PCB and Communication PCB (indoor unit / outdoor unit)

- ☐ Change Main PCB and Communication PCB, and set up the original address.

Attention!!
Even if this error occurs, system does not stop.
If the failure indoor unit is pinpointed and it needs to erase the error indication, it can be reset by function setting (F3-41: Maximum memorized indoor unit number reset).

Troubleshooting 27-1 **OUTDOOR UNIT Error Method:** **Connecting indoor units capacity error** **Error at Indoor unit connection check**	**Indicate or Display:** **Outdoor Unit : E. 2 2. 1** **Operation LED 2 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash.** **Error Code : 9 U / 2 2**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	▪ When error occurs during Indoor unit connection check

Forecast of Cause :
1. Indoor unit power supply defective
2 Indoor unit over connected
3.Communication line incorrect connection
4. Wrong Indoor unit address setting
5. Noise, momentary open

Check Point 1 : Check the indoor unit power supply

☐ Check the indoor unit power supply

↓ **OK**

Check Point 2 : Check the connectable number of Indor unit / connectable total capacity against the outdoor unit

☐ Check the each limitations in the Design and Technical manual.

↓ **OK**

Check Point 3 : Check the communication line connection

Check if communication line is correctly connected
☐ Is it uncoupled or cut halfway ?
☐ Connecting terminal position is correct as the installation manual shows ?

↓ **OK**

Check Point 4 : Check indoor unit address setting

☐ Check if the same indoor unit address number are not existing in the same refrigerant address number.

↓ **OK**

Check Point 5 : Check noise, momentary open, voltage drop

☐ Check if power supply temporarily stops by outages or if strong noise is generated from surrounding environment during auto address

↓ **OK**

Retry Indoor unit connection check

Refer to P.04-43

Troubleshooting 27-2 **OUTDOOR UNIT Error Method:** **Connecting number of indoor unit error** **Error at indoor unit connection check**	**Indicate or Display:** **Outdoor Unit : E. 2 4. 2** **Operation LED 2 times Flash, Timer LED 4 Times Flash, Filter LED Continuous Flash.** **Error Code : 9 U / 2 4**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	▪ When error occurs during Indoor unit connection check

Forecast of Cause :
1. Indoor unit power supply defective
2 Indoor unit over connected
3.Communication line incorrect connection
4. Wrong Indoor unit address setting
5. Noise, momentary open

Check Point 1 : Check the indoor unit power supply

☐ Check the indoor unit power supply

↓ **OK**

Check Point 2 : Check the connectable number of Indor unit / connectable total capacity against the outdoor unit

☐ Check the each limitations in the Design and Technical manual.

↓ **OK**

Check Point 3 : Check the communication line connection

Check if communication line is correctly connected
☐ Is it uncoupled or cut halfway ?
☐ Connecting terminal position is correct as the installation manual shows ?

↓ **OK**

Check Point 4 : Check indoor unit address setting

☐ Check if the same indoor unit address number are not existing in the same refrigerant address number.

↓ **OK**

Check Point 5 : Check noise, momentary open, voltage drop

☐ Check if power supply temporarily stops by outages or if strong noise is generated from surrounding environment during auto address

↓ **OK**

Retry Indoor unit connection check

Refer to P.04-43

Troubleshooting 27-3 **OUTDOOR UNIT Error Method:** **Dual address number is existing.** **Error at indoor unit connection check.**	**Indicate or Display:** **Outdoor Unit : E. 2 6. 1** **Operation LED 2 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash.** **Error Code : 9 U / 2 6**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	▪ When error occurs during Indoor unit connection check

Forecast of Cause :
1. Indoor unit power supply defective
2 Indoor unit over connected
3.Communication line incorrect connection
4. Wrong Indoor unit address setting
5. Noise, momentary open

Check Point 1 : Check the indoor unit power supply

☐ Check the indoor unit power supply

↓ **OK**

Check Point 2 : Check the connectable number of Indor unit / connectable total capacity against the outdoor unit

☐ Check the each limitations in the Design and Technical manual.

↓ **OK**

Check Point 3 : Check the communication line connection

Check if communication line is correctly connected
☐ Is it uncoupled or cut halfway ?
☐ Connecting terminal position is correct as the installation manual shows ?

↓ **OK**

Check Point 4 : Check indoor unit address setting

☐ Check if the same indoor unit address number are not existing in the same refrigerant address number.

↓ **OK**

Check Point 5 : Check noise, momentary open, voltage drop

☐ Check if power supply temporarily stops by outages or if strong noise is generated from surrounding environment during auto address

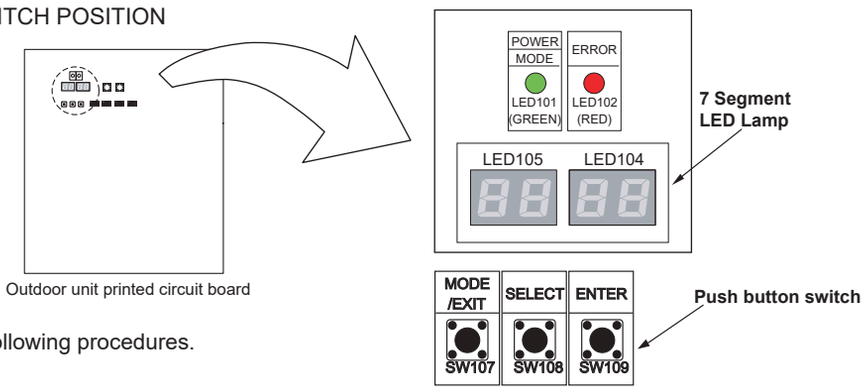
↓ **OK**

Retry Indoor unit connection check

Refer to P.04-43

Indoor unit connection check

● SWITCH POSITION



Please perform the indoor unit connection check according to following procedures.

- Turn on the power of indoor unit and outdoor unit.

LED105 LED104

MODE/EXIT

F 1

Set to Function mode [F3].

SELECT

F 2

SELECT

(When [F4] to [F9] are displayed, continue to press the "SELECT" button until [F3] is displayed.)

F 3

ENTER

0 0 - -

SELECT

Press the "SELECT" button until "12" is displayed.

1 2 - -

ENTER

- Press the "ENTER" button for more than 3 seconds.

F A I L

When indoor unit connection check can not be performed

r U n

- This will be displayed when the Indoor unit connection check starts.

(*1)

U 8

- Confirm the number of connected indoor units and the volume ratio of the indoor units connection.

SELECT

(*1) The number of connected indoor units
Ex.) When 8 units are connected

ENTER

(*2)

C 1 2 0

(*2) Volume ratio of the indoor units connection
Ex.) When the ratio is 120%

ENTER

- Exit indoor unit connection check mode.

When error occurs

P A S S

E r r ↔ 2

Please refer to the following “Error code” for details

[Note] Error code
22.1: Connecting Indoor units capacity error
24.2: Connecting number of indoor unit error
26.1: Dual address number is existing
Other Error code: Refer to the Trouble shooting

ENTER

1 2 - -

MODE/EXIT

When it finishes normally, nothing will be displayed on 7 segment display.

Troublshooting 28 **OUTDOOR UNIT Error Method:** **Auto Address Setting Error**	**Indicate or Display:** **Outdoor Unit : E. 28. 1** **Indoor Unit : No Display** **Error Code : 28**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	▪ When none of the connected indoor units answers during auto address And when abnormal answer signal is input.

Forecast of Cause : 1. Indoor unit power supply defective 2 Indoor unit overconnected 3.Communication line incorrect connection 4. Noise, momentary open

Check Point 1 : Check the indoor unit power supply

- ☐ Check the indoor unit power supply

↓ **OK**

Check Point 2 : Check the indoor unit number connection

- ☐ Check if each indoor units are connected in a refrigerant circuit

↓ **OK**

Check Point 3 : Check the communication line connection

Check if communication line is correctly connected
- ☐ Is it uncoupled or cut halfway ?
- ☐ Connecting terminal position is correct as the installation manual shows ?

↓ **OK**

Check Point 4 : Check noise, momentary open, voltage drop

- ☐ Check if power supply temporarily stops by outages or if strong noise is generated from surrounding environment during auto address

Trouble shooting 28 **OUTDOOR UNIT Error Method:** **Signal Amplifier Auto Address Error**	**Indicate or Display:** **Outdoor Unit : E. 28. 4** **Indoor Unit : No Display** **Error Code : 28**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	▪ When abnormal answer signal is input during signal amplifier auto address

Forecast of Cause : 1. Signal amplifier power supply defective 2. Signal amplifier overconnected 3. Signal amplifier auto address wrong setting 4. Noise, momentary open.

Check Point 1 : Check signal amplifier unit power supply

- ☐ Check signal amplifier unit power supply

↓ **OK**

Check Point 2 : Check the signal amplifier number connection

- ☐ Check if more than 8 signal amplifiers are connected in a network

↓ **OK**

Check Point 3 : Check the operation of signal amplifier auto address setting

- ☐ Check if signal amplifier auto address is set at the same time from multiple outdoor units (master unit)

↓ **OK**

Check Point 4 : Check noise, momentary open, voltage drop

- ☐ Check if power supply temporarily stops by outages or if strong noise is generated from surrounding environment during signal amplifier auto address

Troubleshooting 29 E. 28. 4 **OUTDOOR UNIT Error Method:** **Signal Amplifier Auto Address Error**	**Indicate or Display:** **Outdoor Unit : E. 28. 4** **Indoor Unit : No Display** **Error Code : 28**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	▪ When abnormal answer signal is input during signal amplifier auto address

Forecast of Cause : 1. Signal amplifier power supply defective 2. Signal amplifier overconnected 3. Signal amplifier auto address wrong setting 4. Noise, momentary open.

Check Point 1 : Check signal amplifier unit power supply

- ☐ Check signal amplifier unit power supply

↓ **OK**

Check Point 2 : Check the signal amplifier number connection

- ☐ Check if more than 8 signal amplifiers are connected in a network

↓ **OK**

Check Point 3 : Check the operation of signal amplifier auto address setting

- ☐ Check if signal amplifier auto address is set at the same time from multiple outdoor units (master unit)

↓ **OK**

Check Point 4 : Check noise, momentary open, voltage drop

- ☐ Check if power supply temporarily stops by outages or if strong noise is generated from surrounding environment during signal amplifier auto address

Trouble shooting 30 **OUTDOOR UNIT Error Method:** Outdoor Unit EEPROM Access Error	**Indicate or Display:** Outdoor Unit : E. 62. 3 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 62

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	▪Access to EEPROM failed due to some cause after outdoor unit started.

Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Main PCB defective

Check Point 1-1 : Turn the power on agaun.

Error displayed again?

NO →

Check Point 1-2 : Noise, momentary open, voltage drop

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if momentary open was not generated.
- ☐ Check if ground is connection correctly or there are no related cables near the power line.

YES ↓

Check Point 2 : Replace Main PCB

- ☐ Change Main PCB and set up the original address.

Troubleshooting 31 **OUTDOOR UNIT Error Method:** Inverter Communication Error	**Indicate or Display:** Outdoor Unit : E. 62. 6 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 62

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Outdoor unit Inverter PCB	▪Communication not received from Inverter PCB for 10 seconds or more

Forecast of Cause : 1. Noise 2. Main to Inverter PCBs wiring connection defective
3. Main PCB defective 4. Inverter PCB defective

Check Point 1-1 : Turn the power on again.

Error displayed again?

NO →

Check Point 1-2 : Noise

- ☐ Check if ground is connection correctly or there are no related cables near the power line.

↓ **YES**

Check Point 2 : Check the main to Inverter PCB wiring

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

Check Point 3 : Check Main PCB

- ☐ Chack Main PCB. (Refer to "Sarvise Parts Information 3,4")

↓ **OK**

Check Point 4 : Replace Inverter PCB

- ☐ Replace Inverter PCB.

Troubleshooting 32 **OUTDOOR UNIT Error Method:** **EEPROM Data corrupted Error**	**Indicate or Display:** **Outdoor Unit : E. 62. 8** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 62**
Detective Actuators: Outdoor unit Main PCB	**Detective details:** ▪ Set contents sum value memorized in EEPROM and sum value calculated based on the set contents read from EEPROM do not match * Regarding the sum value, only the contents set in the push button SW setting mode (F2) shall be the objective.

Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Main PCB defective

Check Point 1-1 : Turn the power on again.

Error generated again after Field setting all clear (push button SW F3 (function mode) -35 execution) and the power was turned back on?

YES → Check Point 2

NO →

Check Point 1-2 : Noise, momentary open, voltage drop

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if momentary open was not generated.
- ☐ Check if ground is connection correctly or there are no related cables near the power line.

Reset the setting of F2 (setting mode) by push button SW.
* To clear the setting of F2 by Field setting all clear.

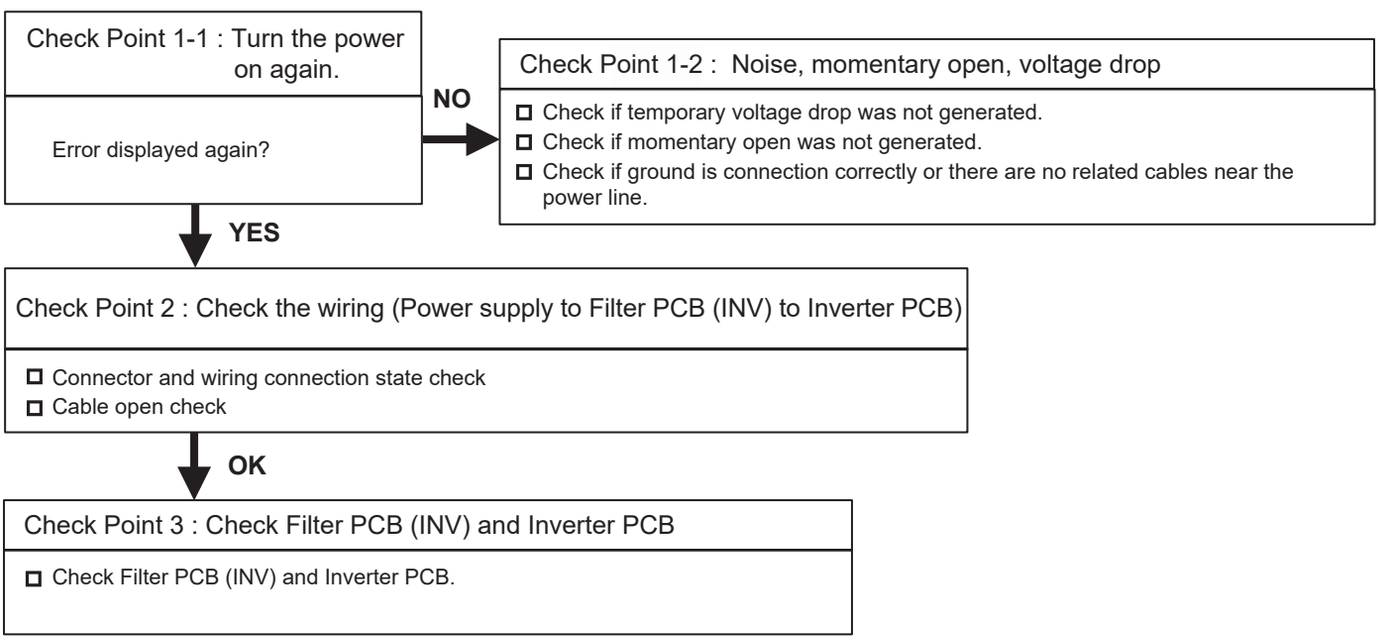
Check Point 2 : Replace Main PCB

- ☐ Change Main PCB and set up the original address.

Troubleshooting 33 **OUTDOOR UNIT Error Method:** Inverter Error	**Indicate or Display:** Outdoor Unit : E. 63. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 63

Detective Actuators:	**Detective details:**
Inverter PCB Filter PCB	▪Error information received from Inverter PCB

Forecast of Cause : 1. Noise, momentary open, voltage drop. 2. Power supply to Filter PCB (INV) to Inverter PCB wiring disconnection, open 3. Filter PCB (INV) defective 4. Inverter PCB defective



Troublshooting 34 **OUTDOOR UNIT Error Method:** **Inverter PCB short interruption detection**	**Indicate or Display:** **Outdoor Unit : E. 67. 2** **Indoor Unit : No Display** **Error Code : 67**

Detective Actuators:	**Detective details:**
Inverter PCB	・ "Momentary power failure" received from Inverter PCB

Forecast of Cause :
1. Noise, momentary power failure, voltage drop
2. Power supply to Filter PCB (INV) to Inverter PCB wiring disconnection, open
3. Main PCB defective 4. Inverter PCB defective

Check Point 1 : Noise, momentary power failure, voltage drop

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if momentary power failure was not generated.
- ☐ Check if ground is connection correctly or there are no related cables near the power line.

↓ **OK**

Check Point 2 : Check the wiring (Power supply to Filter PCB (INV) to Inverter PCB)

- ☐ Connector and wiring connection state check
- ☐ Cable open check

↓ **OK**

Check Point 3 : Check Main PCB

- ☐ Check Main PCB Power supply

↓ **OK**

Check Point 4 : Replace Inverter PCB

- ☐ Replace Inverter PCB.

Troubleshooting 35 **OUTDOOR UNIT Error Method:** **Rush Current Limiting Resistor Temp Rise Protection**	**Indicate or Display:** **Outdoor Unit : E. 6 8. 2** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 9 U / 6 8**

Detective Actuators:	**Detective details:**
Inverter PCB	▪ "Protection stop by "Rush current limiting resistor temperature rise detection" of inverter PCB" was generated 2 times.

Forecast of Cause :
1. Magnetic relay (for INV) coil side wiring disconnection, open
2. Power supply to Filter PCB (INV) to Inverter PCB wiring disconnection, open
3. Magnetic relay activation circuit defective
4. Main PCB to Inverter PCB wiring disconnection, open
5. Main PCB output AC208 - 230V on CN130 defective
   Main PCB defective (output AC208 - 230V on CN130 for Magnetic relay (INV) defective)

Check Point 1 : Check the magnetic relay (for inverter) coil side wiring
- ☐ Connector and wiring connection state check
- ☐ Cable open check

↓ **OK**

Check Point 2 : Check Power supply to Filter PCB (INV) to inverter PCB wiring
- ☐ Connector and wiring connection state check
- ☐ Cable open check

↓ **OK**

Check Point 3-1 : Magnetic relay activation circuit
- ☐ Check the DC Voltage (12V) of CN330 on INVERTER PCB

→ **NG** → Replace Inverter PCB

↓ **OK**

Check Point 4 : Check the wiring (Main PCB to Inverter PCB)
- ☐ Check the wiring connection.
  (CN138 on Main PCB to CN330 on Inverter PCB)

↓ **OK**

Check Point 5 : Main PCB output AC208 - 230V for Magnetic relay
- ☐ Check the AC208 - 230V of CN130 on Main PCB

↓ **OK**

Check Point 6 : Replace Main PCB
- ☐ Change Main PCB and set up the original address.

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Troubleshooting 36 **OUTDOOR UNIT Error Method:** Outdoor Unit transmission PCB Parallel Communication Error	**Indicate or Display:** Outdoor Unit : E. 69. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 69

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Communication PCB	▪Parallel communication (communication between main CPU and communication PCB) failed 5 times.

Forecast of Cause : 1. Noise 2. Communication PCB connection defective
3. Communication PCB defective 4. Main PCB defective

Check Point 1-1 : Turn the power on again.

Error displayed again?

NO →

Check Point 1-2 : Noise

☐ Check if ground is connection correctly or there are no related cables near the power line.

↓ **YES**

Check Point 2 : Check the communication PCB connection

☐ Communication PCB connection check

↓ **OK**

Check Point 3 : Check the communication PCB

☐ Communication PCB check

↓ **OK**

Check Point 4 : Replace Main PCB

☐ Change Main PCB and set up the original address.

Troubleshooting 37 **OUTDOOR UNIT Error Method:** **Discharge Temp Sensor Error**	**Indicate or Display:** **Outdoor Unit : E. 71. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 71**

Detective Actuators:	**Detective details:**
Discharge temperature thermistor 1	・ Discharge temperature thermistor 1 short detected ・ Discharge thermistor 1 open detected after compressor 1 operated continuously for 5 minutes or more

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

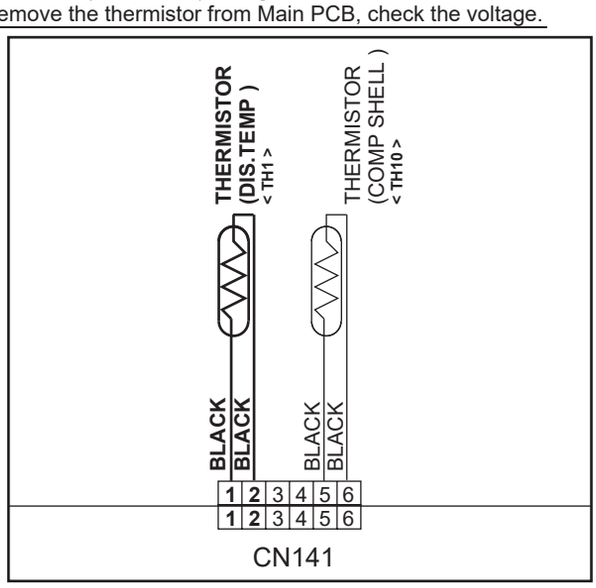
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 18".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN141:1-2) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Discharge temperature sensor 1 (CN141:1-2)

►**If the voltage does not appear, replace Main PCB and set up orignal address.**

Troubleshooting 38 **OUTDOOR UNIT Error Method:** **Compressor Temp Sensor Error**	**Indicate or Display:** **Outdoor Unit : E. 72. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 72**

Detective Actuators:	**Detective details:**
Compressor temperature thermistor 1	▪ Compressor temperature thermistor 1 short detected ▪ Compressor thermistor 1 open detected after compressor 1 operated continuously for 5 minutes or more

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

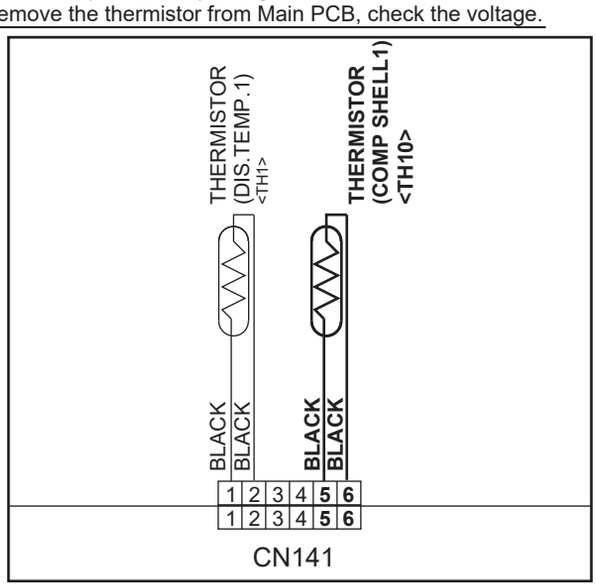
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 18".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN141:5-6) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Compressor temperature sensor 1 (CN141:5-6)

►**If the voltage does not appear, replace Main PCB and set up orignal address.**

Troubleshooting 39 **OUTDOOR UNIT Error Method:** Outdoor Unit Heat Ex. Liquid Temp. Sensor Error	**Indicate or Display:** Outdoor Unit : E. 73. 3 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 73

Detective Actuators:	**Detective details:**
Heat exchanger liquid temperature thermistor	▪ Heat exchanger liquid temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

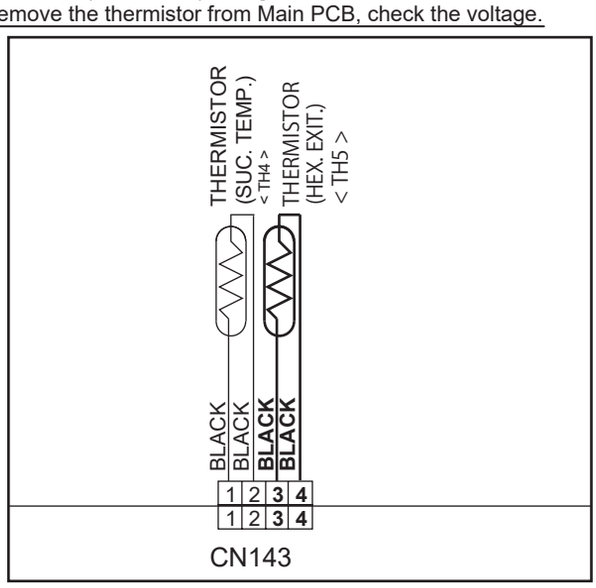
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 18".

↓ **OK**

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN143:3-4) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Heat exchanger liquid temperature sensor (CN143:3-4)

►**If the voltage does not appear, replace Main PCB and set up orignal address.**

Troubleshooting 40 **OUTDOOR UNIT Error Method:** **Outdoor Temp Sensor Error**	**Indicate or Display:** **Outdoor Unit : E. 74. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 74**

Detective Actuators:	**Detective details:**
Outdoor temperature thermistor	・ Outdoor temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

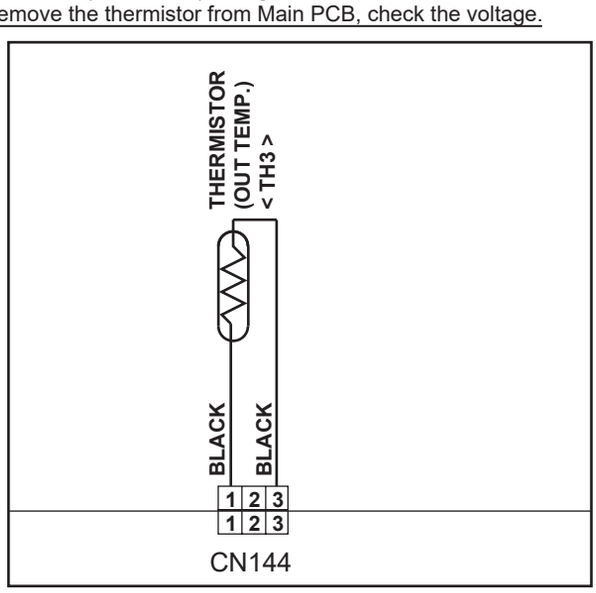
Check Point 2: Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 18".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN144:1-3) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Outdoor temperature sensor (CN144:1-3)

►**If the voltage does not appear, replace Main PCB and set up orignal address.**

Troubleshooting 41 **OUTDOOR UNIT Error Method:** **Suction Gas Temp Sensor Error**	**Indicate or Display:** **Outdoor Unit : E. 75. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 75**

Detective Actuators:	**Detective details:**
Suction gas temperature thermistor	・ Suction gas temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

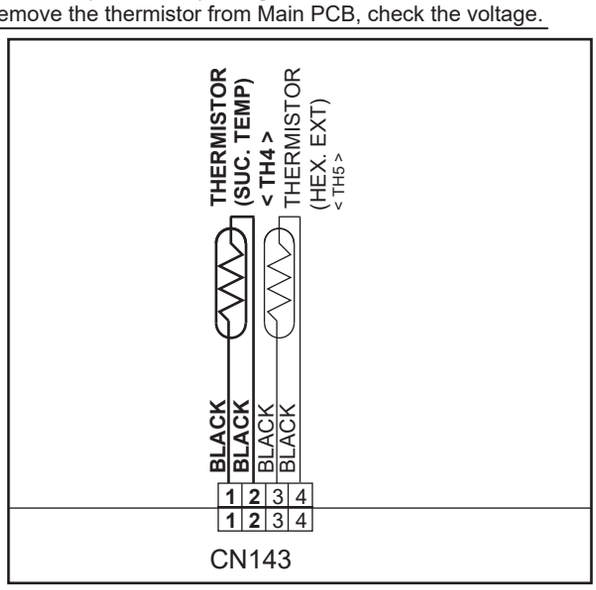
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 18".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN143:1-2) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Suction gas temperature sensor (CN143:1-2)

►**If the voltage does not appear, replace Main PCB and set up orignal address.**

Troublshooting 42 **OUTDOOR UNIT Error Method:** **Heat Sink Temp Sensor Error**	**Indicate or Display:** **Outdoor Unit : E. 77. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 77**

Detective Actuators:	**Detective details:**
Inverter PCB	・ Heat sink temperature thermistor (Inside IPM) open/short circuit detected

Forecast of Cause : 1. Inverter PCB failure

►**If this error is displayed, replace Inverter PCB**

Troubleshooting 43 **OUTDOOR UNIT Error Method:** Sub-cool Heat EX. Gas Inlet Temp Sensor Error	**Indicate or Display:** Outdoor Unit : E. 82. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 82

Detective Actuators:	**Detective details:**
Sub-cooling heat exchanger gas inlet temperature thermistor	・ Sub-cooling heat exchanger gas inlet temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

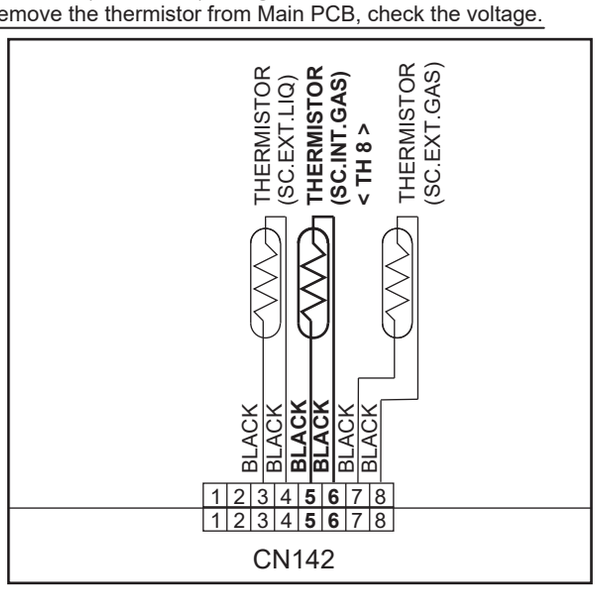
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 18".

↓ **OK**

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN142:5-6) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Sub-cooling heat exchanger gas inlet temperature sensor (CN142:5-6)

Troublshooting 44 **OUTDOOR UNIT Error Method:** **Sub-cool Heat EX. Gas outlet Temp Sensor Error**	**Indicate or Display:** **Outdoor Unit : E. 82. 2** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 82**

Detective Actuators:	**Detective details:**
Sub-cooling heat exchanger gas outlet temperature thermistor	・ Sub-cooling heat exchanger gas outlet temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

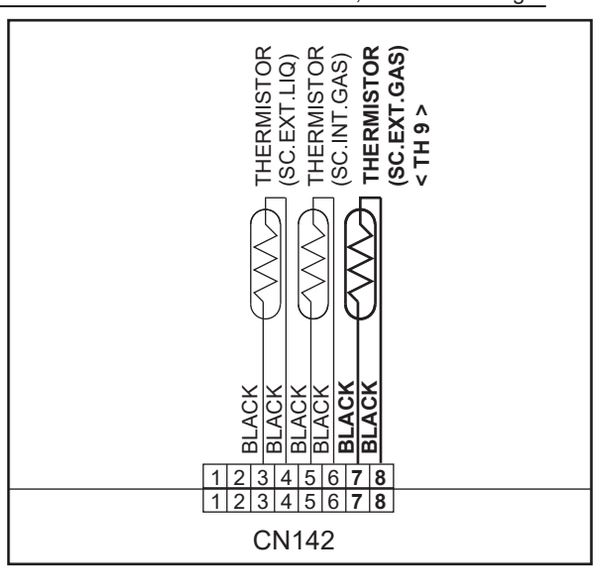
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 18".

↓ **OK**

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN142:7-8) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Sub-cooling heat exchanger gas outlet temperature sensor (CN142:7-8)

Troublshooting 45 **OUTDOOR UNIT Error Method:** SC.HE. Liquid Outlet Sensor Error	**Indicate or Display:** Outdoor Unit : E. 83. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 83

Detective Actuators:	**Detective details:**
Liquid pipe temperature thermistor	・ SC.HE.Liquid Outlet temperature thermistor 2 short or open detected

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

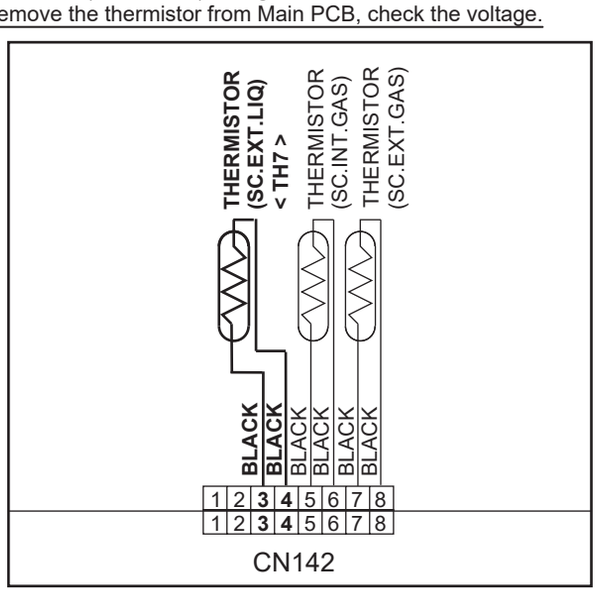
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 18".

↓ **OK**

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN142:3-4) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Liquid pipe temperature sensor 2 (CN142:3-4)

Troublshooting 46 **OUTDOOR UNIT Error Method:** Current Sensor Error	**Indicate or Display:** Outdoor Unit : E. 84. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 84

Detective Actuators:	**Detective details:**
Judgment from value sensed by current sensor 1 (current sensor for inverter) * Current sensor 1 is mounted on Filter PCB (INV)	・ "Protection stop by "inverter speed ≧20rps and sensor value less than 0.5A continued for 1 min"" was generated 2 times ・ Sensor value while inverter stopped = maximum was detected

Forecast of Cause :
1. Filter PCB to Inverter PCB current sensor wiring connector disconnection, open
2. Power supply to Filter PCB to Inverter PC wiring disconnection, open
3. Filter PCB defective (Power supply section, current sensor section)
4. Inverter PCB defective

Check Point 1 : Filter PCB to Inverter PCB current sensor wiring connection state

- ☐ Connector and wiring connection state check
- ☐ Cable open check

↓ **OK**

Check Point 2 : Check the wiring (Power supply to Filter PCB to Inverter PCB)

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

☐ Check Filter PCB and INV PCB
Refer to the “service parts information 3,4”

Troubleshooting 47 OUTDOOR UNIT Error Method: Discharge Pressure Sensor Error	**Indicate or Display:** Outdoor Unit : E. 86. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 86

Detective Actuators:	**Detective details:**
Discharge pressure sensor	・When any of the following conditions is satisfied, a discharge pressure sensor error is generated. 1. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value ＜0.3V continued for 30 seconds or more 2. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value ≧ 5.0V was detected.

Forecast of Cause :
1. Discharge pressure sensor connector disconnection, open
2. Discharge pressure sensor defective
3. Main PCB defective

Check Point 1 : Check the discharge pressure sensor connection state

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

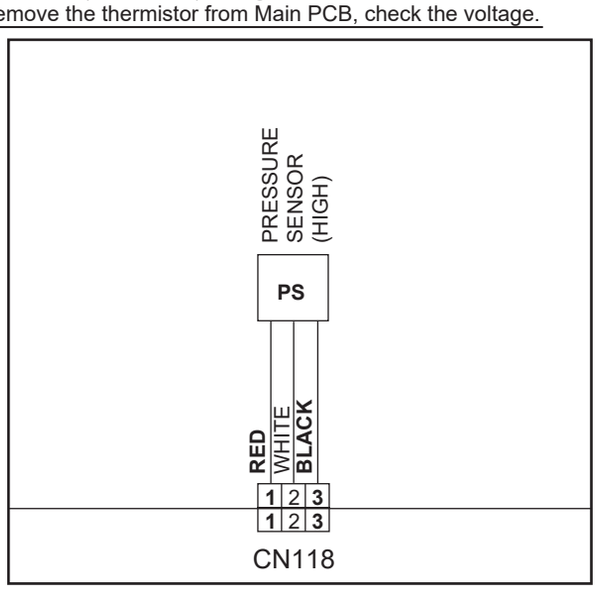
Check Point 2 : Check the discharge pressure sensor

- ☐ Sensor characteristics check
  * For the characteristics of the discharge pressure sensor, refer to the "Service Parts Information 16".

↓ **OK**

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN118:1-3) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Discharge pressure sensor (CN118:1-3)

Troubleshooting 48 **OUTDOOR UNIT Error Method:** Suction Pressure Sensor Error	**Indicate or Display:** Outdoor Unit : E. 86. 3 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 86

Detective Actuators:	**Detective details:**
Suction pressure sensor	・When any of the following conditions is satisfied, a suction pressure sensor error is generated. 1. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value ＜ 0.06V continued for 30 seconds or more. 2. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value ≧ 5.0V was detected.

Forecast of Cause :
1. Suction pressure sensor connector disconnection, open
2. Suction pressure sensor defective
3. Main PCB defective

Check Point 1 : Check the suction pressure sensor connection state

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

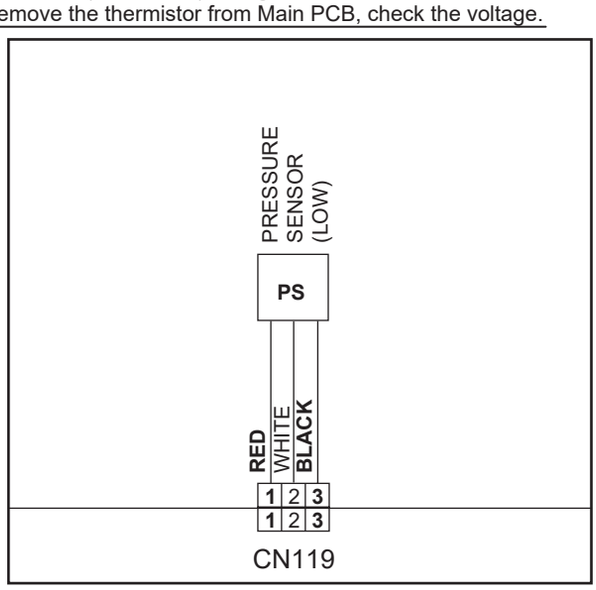
Check Point 2 : Check the suction pressure sensor

- ☐ Sensor characteristics check
  * For the characteristics of the suction pressure sensor, refer to the "Service Parts Information 16".

↓ **OK**

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (CN119:1-3) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Suction pressure sensor (CN119:1-3)

Troubleshooting 49 **OUTDOOR UNIT Error Method:** **High Pressure Switch Error**	**Indicate or Display:** **Outdoor Unit : E. 86. 4** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 86**

Detective Actuators:	**Detective details:**
High pressure switch	・ When the power was turned on, "high pressure switch : open" was detected.

Forecast of Cause :
1. High pressure switch connector disconnection, open
2. High pressure switch characteristics defective
3. Main PCB defective

Check Point 1 : Check the high pressure switch connection state

- ☐ Connector and wiring connection state check
- ☐ Cable open check

↓ **OK**

Check Point 2 : Check the high pressure switch characteristics

- ☐ Switch characteristics check
  * For the characteristics of high pressure switch, refer to the "Service Parts Information 16".

↓ **OK**

Check Point 3 : Replace Main PCB

- ☐ Change Main PCB and set up the original address.

Troublshooting 50 **OUTDOOR UNIT Error Method:** **Inverter Compressor Start UP Error**	**Indicate or Display:** **Outdoor Unit : E. 93. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 93**

Detective Actuators:	**Detective details:**
Inverter PCB Inverter Compressor	▪ "Protection stop by "overcurrent generation at inverter compressor starting" ⇒ restart" generated consecutively 60 times x 2 sets (total 120 times) * The shortest time up to error generation is about 100 minutes * Restart is not performed if an indoor unit in the same refrigerant system is not turned ON by thermostat. * After the end of the 1st set, the 2nd set is not started if all the compressors in the same refrigerant system are not temporarily stopped.

Forecast of Cause :
1. Inverter PCB to inverter compressor wiring disconnection, open
2. Inverter PCB defective
3. Inverter compressor defective (lock, winding short)

Check Point 1 : Check the Inverter PCB to inverter compressor connection state

- ☐ Wiring connection state check
- ☐ Cable open check

↓ **OK**

Check Point 2 : Check the Inverter PCB

- ☐ Inverter PCB check (Refer to “Service Parts Information 4”)

↓ **OK**

Check Point 3 : Check the Inverter compressor

- ☐ Inverter compressor check (Refer to “Service Parts Information 1,2”)

Troublshooting 51 **OUTDOOR UNIT Error Method:** Trip Detection	**Indicate or Display:** Outdoor Unit : E. 94. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 94

Detective Actuators:	**Detective details:**
Inverter PCB Inverter Compressor SV 2 coil	▪ "Protection stop by "overcurrent generation after inverter compressor start processing completed"" generated consecutively 5 times. * The number of generations is reset if protection stop is not generated again within 40 seconds after restarting.

Forecast of Cause :

1. Outdoor unit fan operation defective, foreign matter on hear exchanger, excessive rise of ambient temperature
2. Inverter PCB defective
3. Inverter compressor defective (lock, winding short)
4. SV2 Coil Abnormal

Check Point 1 : Check the outdoor unit fan operation, heat exchanger, ambient temperature

- ☐ No obstructions in air passages?
- ☐ Heat exchange fins clogged
- ☐ Outdoor unit fan motor check
- ☐ Ambient temperature not raised by the effect of other heat sources?
- ☐ Discharged air not sucked in?

↓ **OK**

Check Point 2 : Check the Inverter PCB

- ☐ Inverter PCB check (Refer to “Service Parts Information 4”)

↓ **OK**

Check Point 3 : Check the Inverter compressor

- ☐ Check Inverter compressor (Refer to “Service Parts Information 1,2”)

↓ **OK**

Check Point 4: Check the SV2, Coil

- ☐ Check the connector of SV2 connected on the Main PCB surely.
- ☐ Check the Coil installed on the Valve surely (Fixed condition, direction, depth)
- ☐ Check the resistance of wires (Not open circuit)
- ☐ Check the valve are operating surely

Troublshooting 52 **OUTDOOR UNIT Error Method:** Compressor Motor Loss of Synchronization	**Indicate or Display:** Outdoor Unit : E. 95. 5 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 95

Detective Actuators:	**Detective details:**
Inverter PCB Inverter Compressor	▪ "Protection stop by "loss of synchronization detection"" generated consecutively 5 times * The number of generations is reset if protection stop is not generated again within 40 seconds after restarting.

Forecast of Cause :
1. Inverter PCB defective
2. Inverter compressor defective (lock)

Check Point 1 : Check the Inverter PCB
☐ Inverter PCB check (Refer to “Service Parts Information 4”)

↓ **OK**

Check Point 2 : Check the Inverter compressor
☐ Inverter compressor check (Refer to “Service Parts Information 1,2”)

Troublshooting 53 **OUTDOOR UNIT Error Method:** **Outdoor Unit Fan Motor Lock Error** **- Start up Error -**	**Indicate or Display:** **Outdoor Unit : E. 97. 1 (FAN 1) , E. 98. 1 (FAN 2)** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 97 (FAN 1) , 98 (FAN 2)**

Detective Actuators:	**Detective details:**
Outdoor unit fan	▪ "Protection stop by "fan speed ≦ 100rpm" 20 seconds after fan operation command issued" was generated consecutively 15 times * The compressor is protection stopped every time fan protection stop has been generated 3 times.

Forecast of Cause :
1. Rotation obstruction by foreign matter
2. Motor wiring, connector disconnection, open
3. Fan motor defective (winding open, lock)
4. Main PCB defective (drive circuit, speed detection circuit)

Check Point 1 : Fan rotation state check

- ☐ Check for the absence of foreign matter around the fan

↓ **OK**

Check Point 2 : Check the motor wiring, connector disconnection, open

- ☐ Check for motor wiring connector disconnection, open.

↓ **OK**

Check Point 3 : Fan motor defective

- ☐ Check if fan can be rotated by hand.
- ☐ Motor winding resistance check
- ☐ Motor operation check

↓ **OK**

Check Point 4 : Check Main PCB

- ☐ Drive circuit output check (Between Pin No.4 and Pin No.5 on CN102/CN150 : DC 13.6 - 16.5 V)
- ☐ Check if speed can be detected.

>>If replace Main PCB and and set up orignal address,

Troublshooting 54 **OUTDOOR UNIT Error Method:** **Outdoor unit Fan motor undervoltage - Lack of DC Voltage -**	**Indicate or Display:** **Outdoor Unit : E. 97. 4** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 97**

Detective Actuators:	**Detective details:**
Outdoor unit main PCB	▪ Low DC power supply (DC voltage 180V or less) detected

Forecast of Cause :
1. Power OFF, voltage drop, momentary open
2. Power supply wiring connection defective, open
3. Main PCB defective (electrolytic capacitor, DC voltage detection circuit)

Check Point 1 : Check the Power supply

- ☐ Power ON?
- ☐ Temporary voltage drop not generated?
- ☐ Momentary open circuit not generated?

↓ **OK**

Check Point 2 : Check the power line

- ☐ Power supply wiring connection check
- ☐ Power supply wiring open check

↓ **OK**

Check Point 3 : Replace Main PCB

- ☐ Electrolytic capacitor check
- ☐ DC voltage detection circuit check

>>If replace Main PCB and and set up orignal address,

Troublshooting 55 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor 1 Temp. Abnormal Outdoor Unit Fan Motor 2 Temp. Abnormal	Indicate or Display: Outdoor Unit : E. 97. 5 (FAN1), E. 98. 5 (FAN2) Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 97 (FAN1), 98 (FAN2)

Detective Actuators:	Detective details:
Outdoor unit fan	▪ Protection stop by speed ≦ 220rpm after 60 seconds have elapsed after fan operation command issued generated 3 times within 3 hours.

Forecast of Cause :
1. Rotation obstructed by foreign matter
2. Ventilation obstructed by heat exchange foreign matter
3. Excessive ambient temperature rise
4. Static pressure setting incorrect, specifled static pressure value exceeded
5. Fan motor defective (internal PCB defective)

Check Point 1 : Check fan rotation state

- ☐ Check for the absence of foreign matter around the fan

↓ **OK**

Check Point 2 : Check for obstruction of ventilation by heat exchange foreign matter

- ☐ Check for foreign matter on heat exchanger

↓ **OK**

Check Point 3 : Check the ambient temperature

- ☐ Ambient temperature not raised by the effect of other heat sources?
- ☐ Discharged air not sucked in?

↓ **OK**

Check Point 4 : Check the static pressure

- ☐ Check if static pressure is set correctly.
- ☐ Check if static pressure is not higher than the specified value.

↓ **OK**

Check Point 5 : Replace the fan motor

- ☐ Check if fan can be rotated by hand.
- ☐ Motor winding resistance check
- ☐ Motor operation check

Troublshooting 56 **OUTDOOR UNIT Error Method:** Coil EEV1 Error Coil EEV2 Error	**Indicate or Display:** Outdoor Unit : E. 9A. 1 (EEV1), E. 9A. 2 (EEV2) Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9A

Detective Actuators:	**Detective details:**
Main PCB	▪ When the EEV input on the Main PCB (CN116, CN117) was open circuit or short circuit.

Forecast of Cause :

1. EEV coil lose connection
2. EEV wire(s) cut or pinched
4. Defective EEV coil
3. Main PCB (DC 12V) output abnormal

Check Point 1 : Check the connection of EEV connector

- ☐ Check If the connector CN 116, CN117 is lose connection or not

↓ OK

Check Point 2 : Check the EEV wire

- ☐ Check if the wire of EEV has damege or not (Slash, Braking of wire, Pinching, etc.)

→ NG → Replace EEV coil

↓ OK

Check Point 3 : Check the EEV Coil

- ☐ Check if the circuit of EEV coil winding is good or not (Refer to the “service parts Information 9,10”)

→ NG → Replace EEV coil

↓ OK

Check Point 4 : Check the output of EEV on the Main PCB

- ☐ Check if there is a short circuit of CN116 CN117 on the Main PCB or not
- ☐ Check if the DC 12 is on between the pin No. 1 of CN116/CN117 and Pin No.2 of CN132 (GND) (Disconnect the wire of EEV when you check the output of EEV)

→ NG → Replace Main PCB

↓ OK

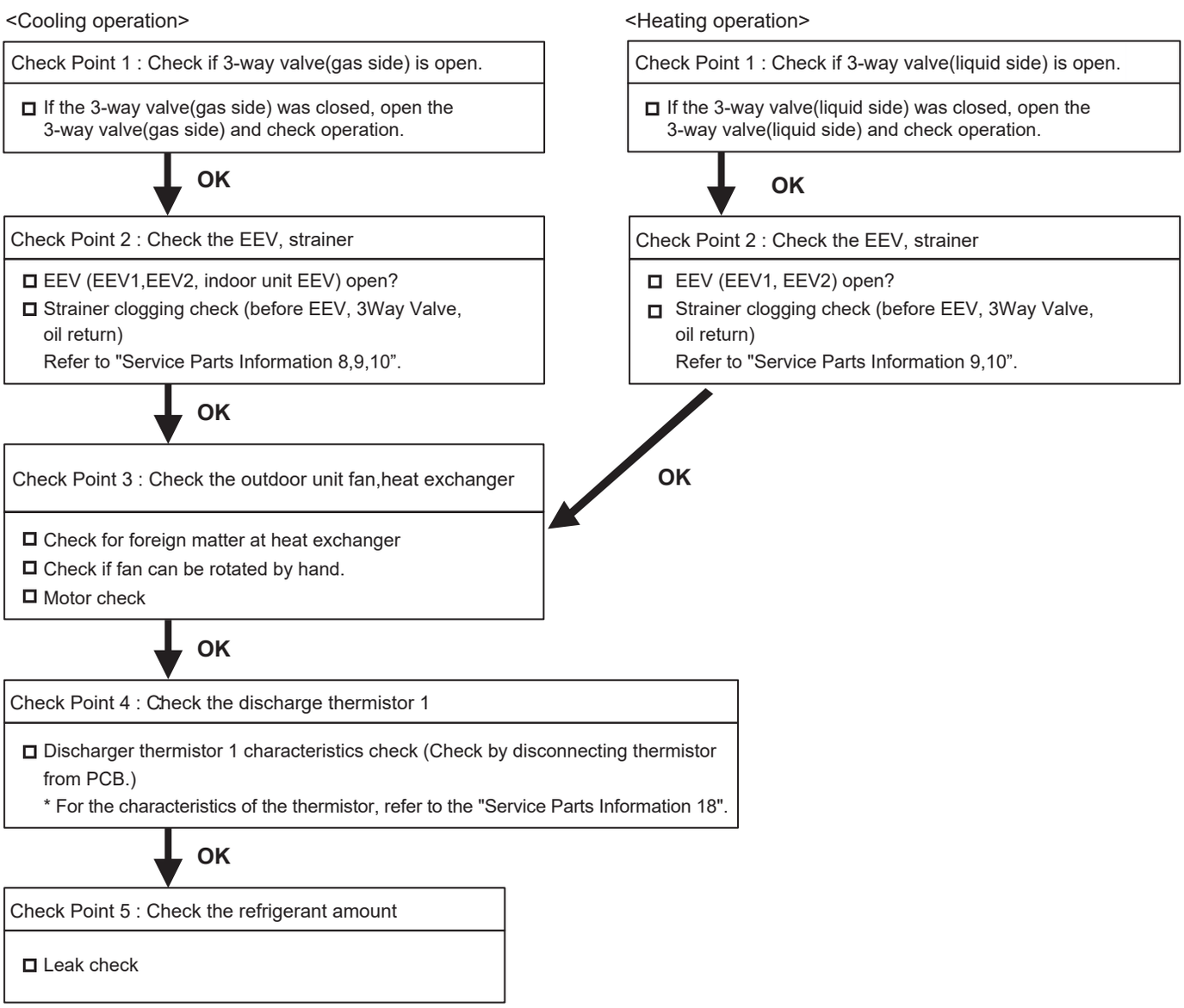
Check Point 5 : Noise, momentary open, voltage drop

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if momentary open was not generated.
- ☐ Check if ground is connection correctly or there are no related cables near the power line.

Troublshooting 57 **OUTDOOR UNIT Error Method:** Discharge Tempreture Abnormal	**Indicate or Display:** Outdoor Unit : E. A1. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : A1

Detective Actuators:	**Detective details:**
Discharge temperature thermistor	▪ "Protection stop by "discharge temperature1 ≧239°F(115°C) during compressor 1 operation" generated 2 times within 40 minutes

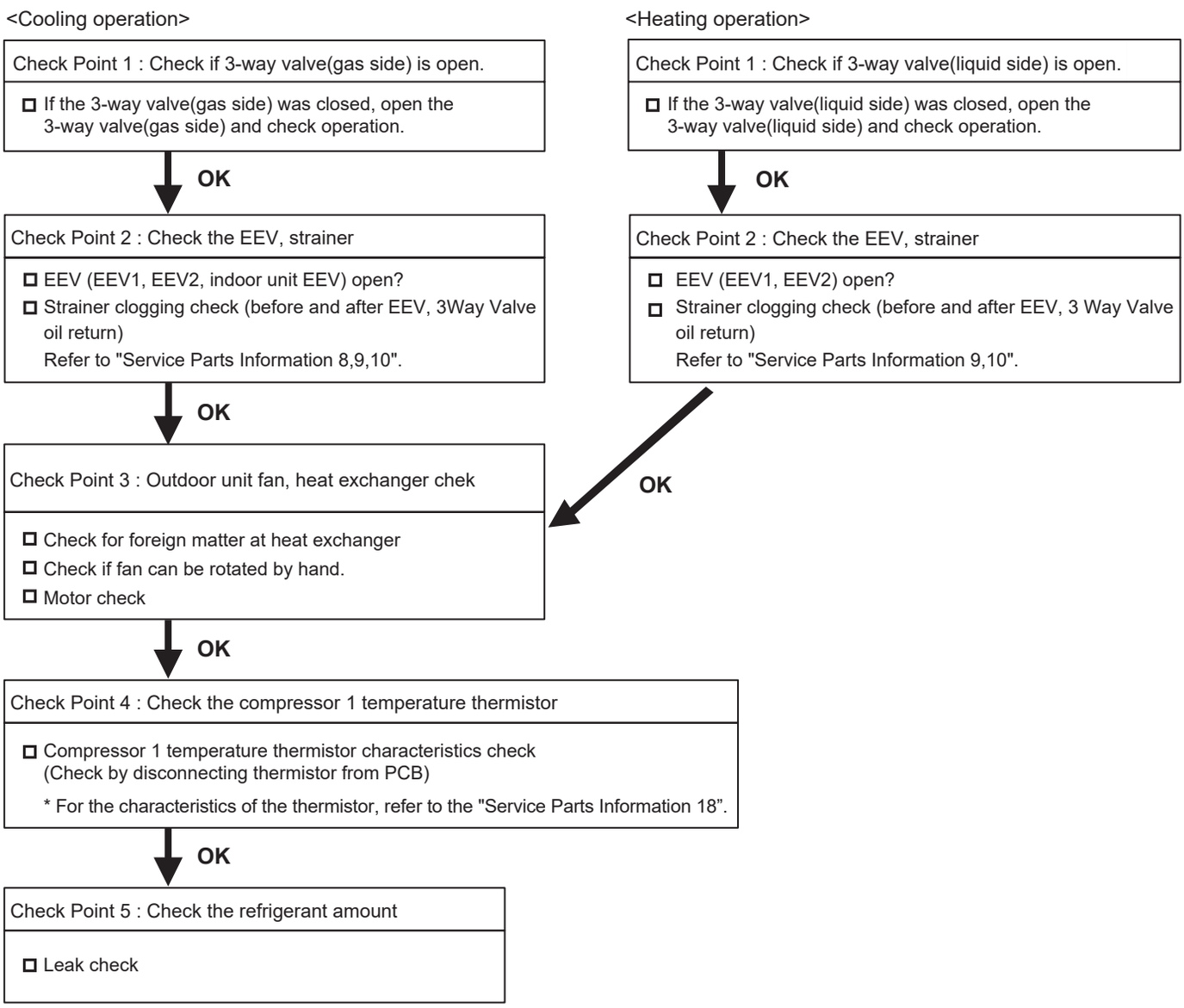
Forecast of Cause :
1. 3-way valve not opened
2. EEV defective, strainer clogged
3. Outdoor unit operation defective, foreign matter on heat exchanger
4. Discharge temperature thermistor 1 defective
5. Insufficient refrigerant



Trouble shooting 58 **OUTDOOR UNIT Error Method:** **Compressor Tempreture Abnormal**	**Indicate or Display:** **Outdoor Unit : E. A3. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : A3**

Detective Actuators:	**Detective details:**
Compressor temperature thermistor	▪"Protection stop by "compressor tempreture"≧ 230°F(110°C) during compressor operation""generated 2 times within 40 minutes

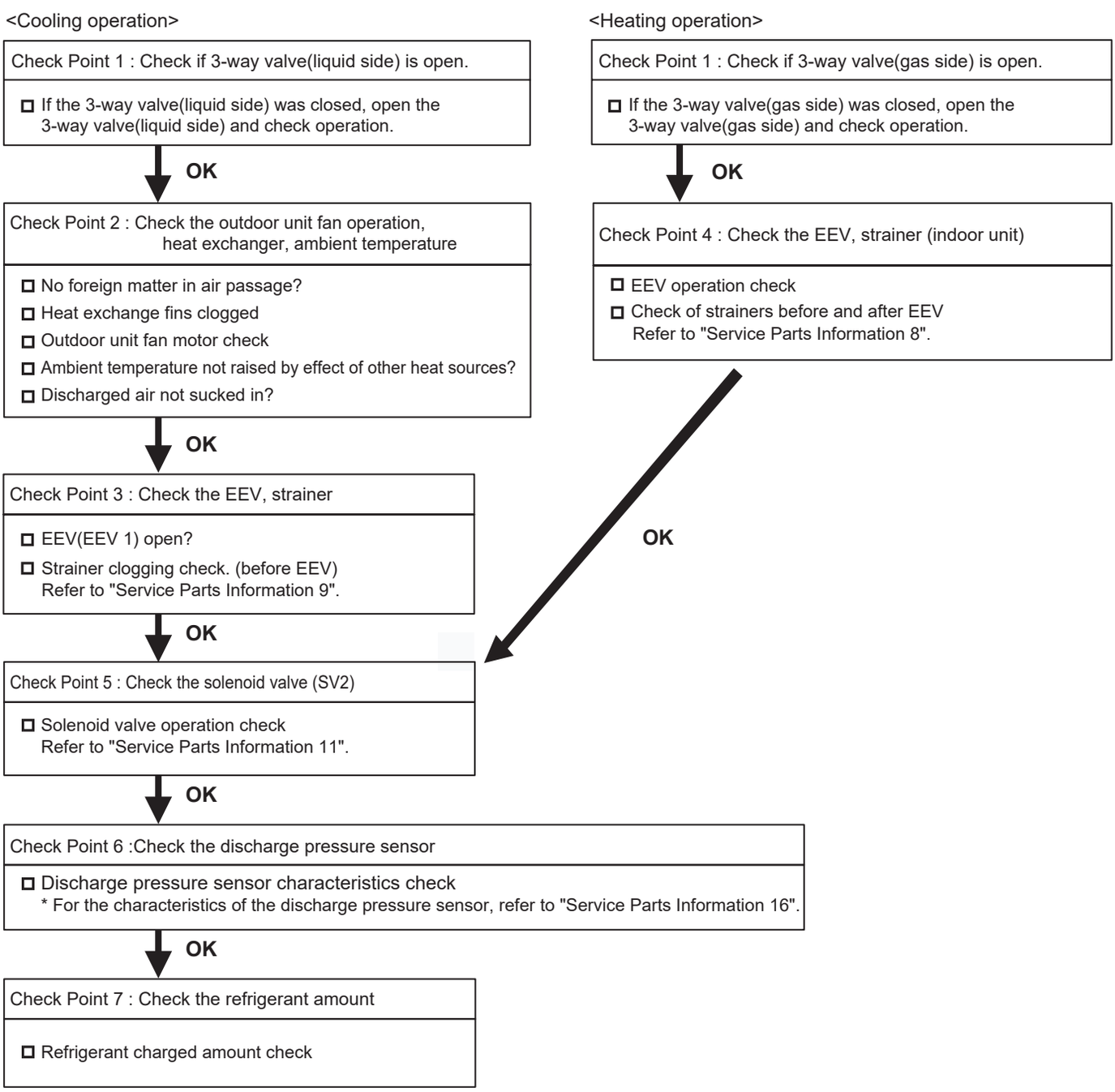
Forecast of Cause :
1. 3-way valve not opened
2. EEV defective, strainer clogged
3. Outdoor unit operation defective, foreign matter on heat exchanger
4. Compressor 1 temperature thermistor defective
5. Insufficient refrigerant



Troublshooting 59 **OUTDOOR UNIT Error Method:** High Pressure Abnormal	**Indicate or Display:** Outdoor Unit : E. A4. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : A4

Detective Actuators:	**Detective details:**
Judgment from value sensed by discharge pressure sensor	▪ "Protection stop by "discharge pressure ≧ 580PSI (4.00MPa) during operation of any compressor"" generated 3 times within 60 minutes

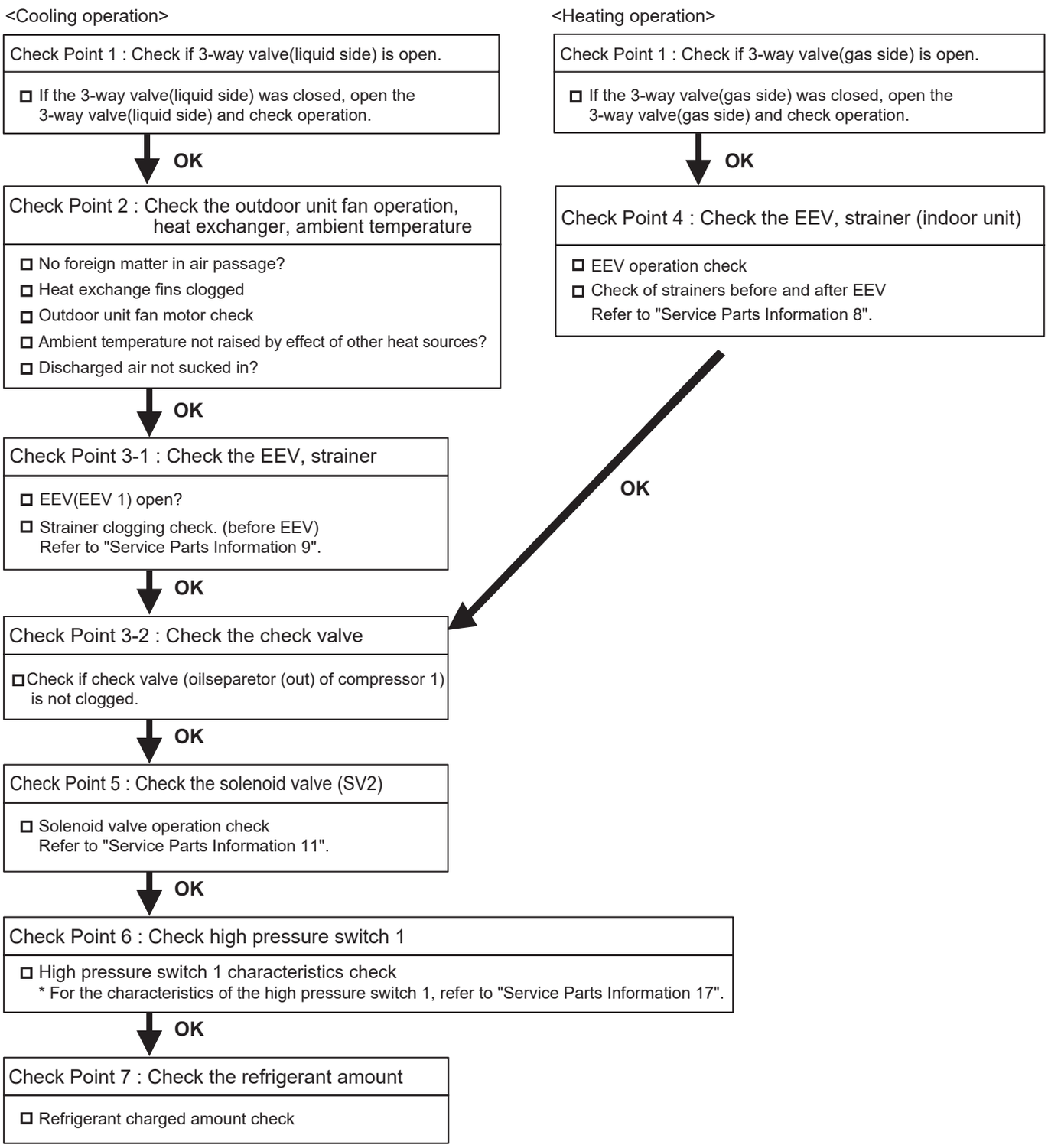
Forecast of Cause : 1. 3-way valve not opened 2. Outdoor unit fan operation defective, foreign matter at heat exchanger, excessive ambient temperature rise 3. Check valve clogged
4. EEV defective, strainer clogged 5. Solenoid valve defective
6. Discharge pressure sensor defective 7. Refrigerant overcharged



Troublshooting 60 OUTDOOR UNIT Error Method: High Pressure Protection 1	Indicate or Display: Outdoor Unit : E. A4. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : A4

Detective Actuators:	Detective details:
High pressure switch 1	▪ "Protection stop by "high pressure switch 1 operated during compressor 1 operation"" generated 3 times within 60 minutes

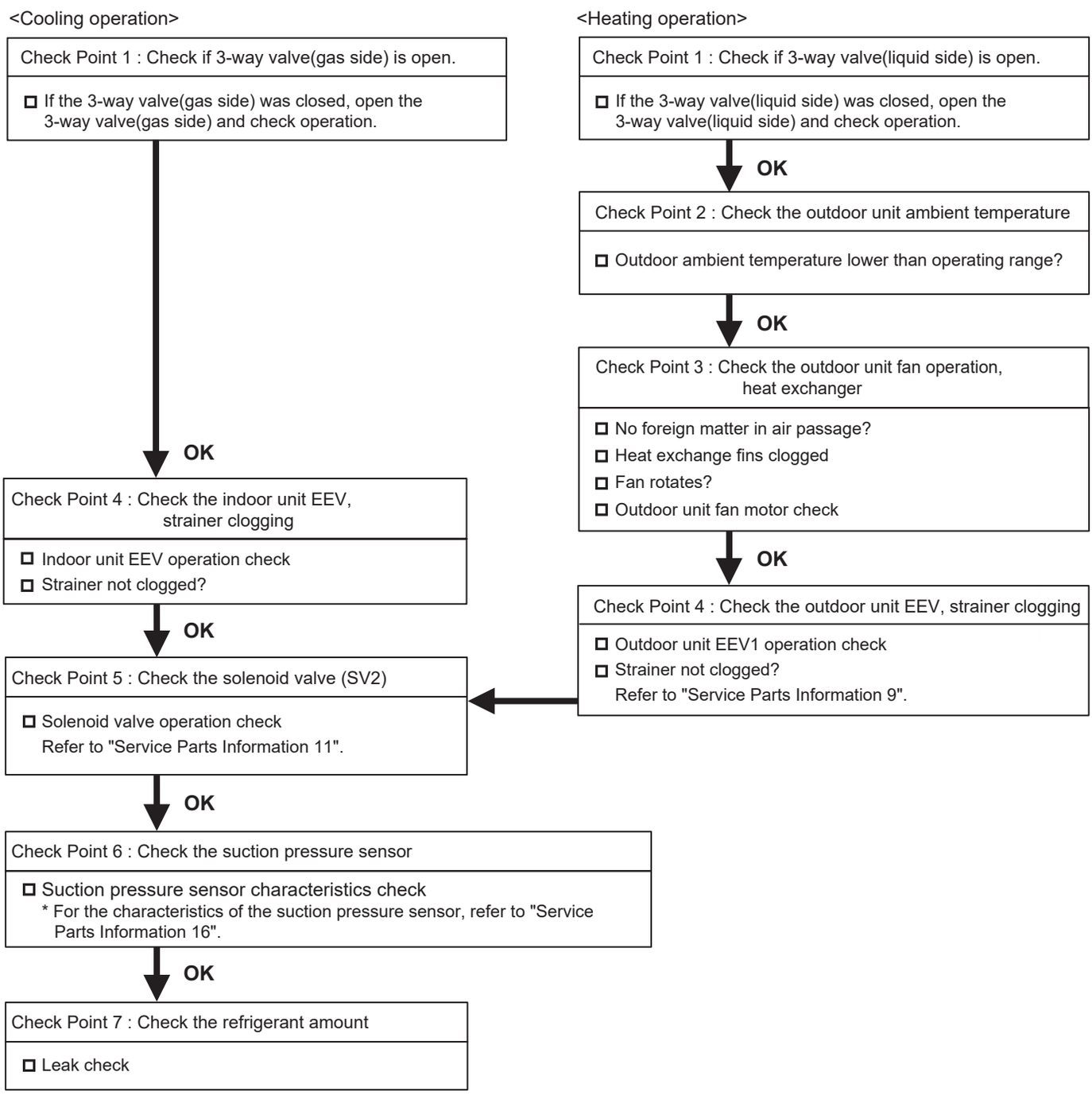
Forecast of Cause : 1. 3-way valve not opened 2. Outdoor unit fan operation defective, foreign matter at heat exchanger, excessive ambient temperature rise 3. Check valve clogged
4. EEV defective, strainer clogged 5. Solenoid valve defective
6. High pressure switch 1 defective 7. Refrigerant overcharged



Troubleshooting 61 **OUTDOOR UNIT Error Method:** **Low Pressure Abnormal**	**Indicate or Display:** **Outdoor Unit : E. A5. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : A5**

Detective Actuators:	**Detective details:**
Suction pressure sensor	・"Protection stop by "suction pressure ≦14.5PSI (0.10MPa) continued for 10 minutes" or "suction pressure ≦ 7.2PSI (0.05MPa)" during operation of any compressor"" was generated 5 times within 3 hours

Forecast of Cause : 1. 3-way valve not opened 2. Outdoor unit ambient temperature too low
3. Outdoor unit fan operation defective, foreign matter at heat exchanger
4. EEV defective, strainer clogged 5. Solenoid valve defective
6. Low pressure sensor characteristics defective 7. Insufficient refrigerant



Troubleshooting 62 **OUTDOOR UNIT Error Method:** Outdoor unit Heat Sink Tempreture Abnormal	**Indicate or Display:** Outdoor Unit : E. AC. 4 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : AC

Detective Actuators:	**Detective details:**
Inverter PCB	▪ "Protection stop by "heat sink temp. ≧ 212°F (100°C) generated 3 times within 60 minutes.

Forecast of Cause :

1. Foreign matter on heat sink, heat sink dirty
2. Foreign matter on heat exchanger, excessive ambient temperature rise
3. Heat sink temp. sensor (Inside IPM) defective

Check Point 1 : Check the heat sink state

- ☐ Heat sink foreign matter, soiling check

↓ **OK**

Check Point 2 : Check the foreign matter and ambient temperature of heat exchanger

- ☐ Heat exchange foreign matter check
- ☐ Ambient temperature not raised by effect of other heat sources?
- ☐ Discharged air not sucked in?

↓ **OK**

Check Point 3 : Replace Inverter PCB

- ☐ Replace Inverter PCB

4-3-3 TROUBLE SHOOTING WITH NO ERROR CODE

Troubleshooting 63

Indoor Unit - No Power

Forecast of Cause :

1. Power Supply failure 2. Outside cause 3. Electrical Component defective

Check Point 1 : Check Installation Condition

- ☐ Is not the breaker down?
- ☐ Check loose or removed connection cable.

>>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.

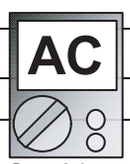
OK

Check Point 2 : Check Outside Cause such as Voltage drop or Noise

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
  Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components



☐ Check Voltage of power supply.
>> Check AC208 - 230V appears at Indoor Unit Terminal 1 - 2 (Power Supply).

NG

OK

☐ Check the fuse and thermal fuse.

OK

NG

☐ Replace the fuse or thermal fuse.
☐ Check if the power supply terminals section is shorted.

OK

NG

☐ For AS model, advance to OK without checking.
☐ For models other than the AS model, disconnect the cable connecting the Power Supply PCB and controller PCB and recheck if the power supply terminals section is not shorted.
(Note) Always check in the power off state.

OK

☐ Replace the controller PCB.
(Refer to 06-03 page Main PCB removal.)

NG

☐ Replace the Power Supply PCB.

OK

NG

☐ Replace the Display PCB.

NG

► **If the symptom does not change by above Check 3, replace Controller PCB or Power Supply PCB.**

Troubleshooting 64

Outdoor Unit - No Power

Forecast of Cause :

1. Power Supply failure 2. Outside cause 3. Electrical Components defective

Check Point 1 : Check Installation Condition

- ☐ Isnt the breaker down?
- ☐ Check loose or removed connection cable.

>>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.

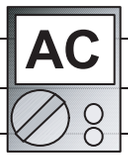
OK

Check Point 2 : Check Outside Cause such as Voltage drop or Noise

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
  Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components



☐ Check the voltage of power supply.
>> Check if the reted voltage appears at Outdoor Unit Terminal L - N

NO

OK

☐ Check the fuse on the Filter PCB.

NG

☐ Replace the fuse.
☐ Recheck if the power supply terminals section is shorted.
(Note) Always check in the power off state.

NG

☐ Disconnect connecting cable of the Filter PCB and Main PCB and recheck.
if the power supply terminals section is not shorted.
(Note) Always check in the power off state.

OK

☐ Check If the FAN motor PCB has a damage or not. (Check short circuit)

OK

☐ Check if the circuit between pin No. 1 and pin No.2 of CN102 / CN150 on the Main PCB has short circuit or not (Short circuit : NG)
* Disconnect FAN motor when check the circuit

NG

☐ Replace the Inverter PCB

NG

☐ Replace the FAN Motor

NG

☐ Replace the Filter PCB.

NG

☐ **If the symptom does not change by above Check 3, replace Main PCB or Filter PCB**

Troubleshooting 65

No Operation (Power is ON)

Forecast of Cause :
1. Setting/Connection failure 2. Outside cause
3. Electrical Component defective

Check Point 1 : Check indoor and outdoor installation condition

- ☐ Indoor Unit - Check incorrect wiring between Indoor Unit– Remote Control, or terminals between Indoor Units. Or, check if there is an open cable connection.
- ☐ Check address setting (Are all the address of Indoor and Outdoor correct?)
- ☐ Are these Indoor Unit, Outdoor Unit, and Remote Control suitable model numbers to connect?

>> If there is some abnormal condition, correct it by referring to Installation manual and Data & Technical Manual.

OK

Turn off Power and check/correct followings.
- ☐ Isn't Communication PCB of Indoor Unit removed?
- ☐ Is there loose or removed communication line of Indoor Unit and Outdoor Unit?
- ☐ Check Terminator (DIP-SW SET 5) is installed on Outdoor Main PCB.
- ☐ Check loose or removed communication line between each Outdoor Unit.
- ☐ Check loose Communication PCB of each Outdoor Unit.

OK

Check Point 2 : Check outside cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop -----Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
  Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components at Indoor and Outdoor

☐ Indoor Unit - Check the voltage between pins 1-3 of the connector (on the control PCB) for connection with the remote controller.
>> If it is DC12V, Remote Control is defective (Controller PCB is normal) >> Replace Remote Control
>> If it is DC 0V, Controller PCB is defective (Check Remote Control once agein) >> Replace Controller PCB

☐ If some of Indoor unit does not operate, replace the Communication PCB of the non-operative Indoor Unit.
>> If the symptom does not change, replace Controller PCB of Indoor Unit.

☐ If all of Indoor Units do not operate, check the connection between Main PCB and Communication PCB of Outdoor Unit (Main Unit).
>> If the symptom does not change, replace Communication PCB of Outdoor Unit (Main Unit).
(If it did not work, replace Main PCB.)

Troubleshooting 66

No Cooling

Forecast of Cause :
1. Indoor Unit error 2. Outdoor Unit error 3. Effect by Surrounding environment
4. Connection Pipe / Connection Wire failure 5. Refrigeration cycle failure

Check Point 1 : Check Indoor Unit

- ☐ Does Indoor Unit FAN run on HIGH FAN?
- ☐ Is Air Filter dirty?
- ☐ Is Heat Exchanger clogged?

OK

Check Point 2 : Check Outdoor Unit Operation

- ☐ Check if Outdoor Unit is operating
- ☐ Check any objects that obstruct the air flow route.
- ☐ Check clogged Heat Exchanger.
- ☐ Is the pipe length setting (Push Switch "MODE/EXIT", "SELECT", "ENTER") suitable?
- ☐ Is the Valve open?

OK

Check Point 3 : Check Site Condition

- ☐ Is capacity of Indoor Unit fitted to Room size?
- ☐ Any windows open? Or direct sunlight ?

OK

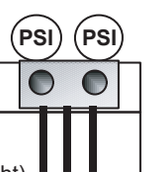
Check Point 4 : Check Indoor/Outdoor Installation Condition

- ☐ Check connection pipe (specified pipe length & Pipe diameter?)
- ☐ Check any loose or removed communication line.

>> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.

OK

Check Point 5 : Check Refrigeration Cycle

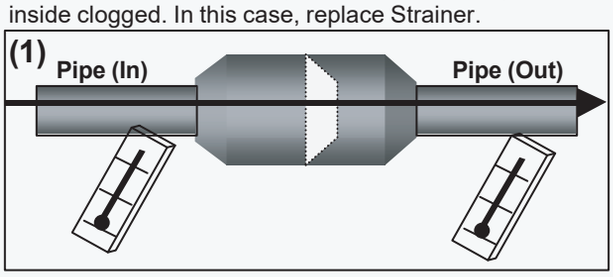


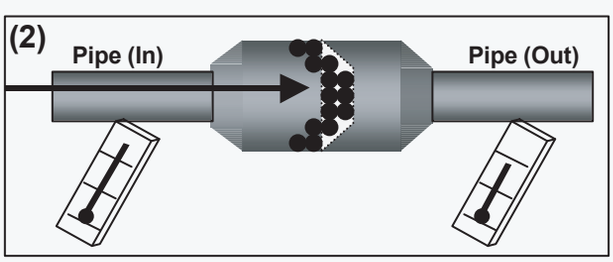
- ☐ Check if Strainer is clogged (Refer to the figure at right).
- ☐ Measure Gas Pressure and if there is a leakage, correct it.

>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

- ►Check EEV (Refer to Service Parts Information 8)
- ►Check Solenoid Valve (Refer to Service Parts Information 10)
- ►Check Compressor (Refer to Service Parts Information 1,2)

Attention!!
Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference like shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.





Troubleshooting 67

Abnormal Noise

Forecast of Cause :
1. Abnormal installation (Indoor/Outdoor) 2. Fan failure(Indoor/Outdoor)
3. EEV failure (Indoor) 4. Compressor failure (Outdoor)

Diagnosis method when Abnormal Noise is occurred

Abnormal noise is coming from Indoor Unit
(Check and correct followings)

- ☐ Is Main Unit installed in stable condition?
- ☐ Is the installation of Air suction grille and front panel normal?
- ☐ In case of Duct type : Is Static Pressure range normal? (Refer to Data & Technical Manual)

OK

- ☐ Is Fan broken or deformed?
- ☐ Is the screw of Fan loose?
- ☐ Is there any object which obstruct the Fan rotation?

Attention!!
- If Refrigerant Noise is occurring, Check if the Indoor and Outdoor Thermistor is wrongly installed. Check and correct the thermistor.
- Check the refrigerant additional charging amount. When the refrigerant is not enough, add the refrigerant. However, the total refrigerant amount is prevented from more than 15.7kg.

Abnormal noise is coming from Outdoor Unit
(Check and correct followings)

- ☐ Is Main Unit installed in stable condition?
- ☐ Is Bell Mouth installed normally?

OK

- ☐ Is Fan broken or deformed?
- ☐ Is the screw of Fan loose?
- ☐ Is there any object which obstruct the Fan rotation?

OK

- ☐ Check if vibration noise by loose bolt or contact noise of piping is happening.

OK

- ☐ Is Compressor locked?
>> Check Compressor (Refer to Service Parts Information)

Troubleshooting 68

Water Leaking

Forecast of Cause :

1. Erroneous installation 2. Drain hose failure 3. Float Switch failure

Diagnosis method when water leak occurs

- ☐ Is Main Unit installed in stable condition?
- ☐ Is Main Unit broken or deformed at the time of transportation or maintenance?

OK

- ☐ Is Drain Hose connection loose?
- ☐ Is there a trap in Drain Hose?
- ☐ Is Drain Hose clogged?

OK

- ☐ Is Fan rotating?
>> Check Fan Motor (Refer to Service Parts Information)

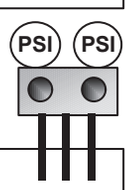
OK

- ☐ Is Float Switch defective?
>> Check Float Switch (Refer to Trouble Shooting)

Diagnosis method when water is spitting out

- ☐ Is the filter clogged?

OK



- ☐ Check Gas Pressure and correct it if there was a gas leak.

Attention!!
If water is leaking from the Indoor Unit that is not in operation, there is a possibility of Indoor EEV is not closed.
=> Check EEV (Refer to Service Parts Information)

Troublshooting 69

Outdoor air unit - No Power

Forecast of Cause :

1. Power Supply failure 2. Outside cause 3. Electrical Component defective

Check Point 1 : Power supply

- ☐ Is not the breaker down?
- ● Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- ● Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- ● Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
  Check the complete insulation of grounding.

OK

Check Point 2 : Check Protector (20A)

- ☐ Check protector open / short
  If the protector is open circuit, replace it.

OK (No short circuit)

Check Point 3 : Check AC line

- ☐ Check AC line (L-N) open / short

NG (Short circuit)

Check Point 4 : Check short circuit Filter PCB

- ☐ Disconnect the wire between Filter PCB and reactor, check short circuit of AC line.
  If there is short circuit, replace the Filter PCB.

OK (No short circuit)

Check Point 5 : Check short circuit Diode bridge

- ☐ Connect the disconnected wire(s) on the check point 4, disconnect the wire between Diode bridge and Capacitor, check short circuit of AC line.
  If there is short circuit, replace the Diode bridge.

OK (No short circuit)

Check Point 6 : Check short circuit Capacitor

- ☐ Connect the disconnected wire(s) on the check point 5, disconnect the wire between Capacitor and Filter PCB, check short circuit of AC line.
  If there is short circuit, replace the Capacitor.

OK (No short circuit)

Check Point 7 : Check short circuit Power supply PCB

- ☐ Connect the disconnected wire(s) on the check point 6, disconnect the wire of Fan motor, check short circuit of AC line.
  If there is short circuit, replace the Power supply PCB.

OK (No short circuit)

Check Point 8 : Check Fan Motor

- ☐ Check open / short of FAN motor
  Refer to the Service Parts Information 14-2
  If there is short circuit, replace FAN motor.

OK (No short circuit)

Check Point 9 : Short circuit check on DC circuit

Disconnect the connector (CN200) on the Power supply PCB and check the short circuit

1. DC12V line (CN200 Pin 1- 5)
2. DC 5V Line (CN200 Pin 1 - 3)
3. DC 15V-1 Line (CN500 Pin 3 - 4)
4. DC 15V-2 Line (CN530 Pin 3 - 4)

If one of them is short circuit, replace the Power supply PCB

OK (No short circuit)

Check Point 10 : Check short circuit of actuators (for DC12V)

- ☐ Disconnect the CN10 (EEV1) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
  If the short circuit disappears, replace the EEV coil.
- ☐ Disconnect the CNC01 (WRC) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
  If the short circuit disappears, check the WRC wire, WRC.
- ☐ Disconnect the CNB01 (Ext.Out) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
  If the short circuit disappears, check the Ext. device or wiring.
- ☐ Disconnect the CN2 (TransmissionPCB) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
  If the short circuit disappears, replace the Transmission PCB.
- ☐ Disconnect the CN22 (Interconnecting wire) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
  If the short circuit disappears, replace the Filter PCB.
- ☐ If the short circuit appears after disconnecing actuators, replace the Main PCB.

OK (No short circuit)

Check Point 11 : Check short circuit of actuators (for DC5V)

- ☐ Disconnect the CN14 (SW PCB) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 3.
  If the short circuit disappears, replace the SW PCB.
- ☐ Disconnect the CN18 (Receiver unit *Option) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 3.
  If the short circuit disappears, check the wire, Receiver unit.
- ☐ Disconnect the CN2 (Transmission PCB) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 3.
  If the short circuit disappears, replace the Transmission PCB.
- ☐ Disconnect the CN21 (Interconnecting wire) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 3.
  If the short circuit disappears, replace the Power supply PCB.
- ☐ If the short circuit appears after disconnecing actuators, replace the Main PCB.

4-3-4 Trouble Shooting for Optional Parts

1. External Switch Controller (UTY-TEKX)

Troubleshooting 70

Error Contents :	**Symptom :**
Power Supply Error	**No operation & LED does not light up.**

Condition :

1. No power supply.
   Voltage error between red and black terminals of External Switch Controller. (Normal voltage: 12V plus minus 10%)
2. Electric circuit error.
   Voltage is normal between red and black terminals of External Switch Controller (Normal voltage: 12V plus minus 10%)

Cause 1 : Indoor unit defective

- ☐ Refer to Indoor unit trouble shooting.

↓ **OK**

Cause 2 : Connection cable is defective or open.

- ☐ Check installation of connection cable.
- ☐ Check if connection cable is open.

OK →

Cause 3 : Defective insertion or open connection of the cable between External Switch Controller terminal and PCB.

- ☐ Check connector insertion.
- ☐ Check if connection cable is open.

↓ **OK**

Cause 4 : Ext. Switch Controller is defective.

- ►**Replace External Switch Controller.**

Troubleshooting 71

Error Contents :	**Symptom :**
The abnormality in connection of remote controller cable	**LED repeats flashing 0.5sec ON & 0.5sec OFF.**

Condition :

Communication with Indoor unit has been cut off for longer than 1 minute.

Cause 1 :
Communication cable is defective or open.

- ☐ Check installation of connection cable.
- ☐ Check if connection cable is open.

↓ **OK**

Cause 2 : Defective insertion or open connection of the cable between External Switch Controller terminal and PCB.

- ☐ Check connector insertion.
- ☐ Check if connection cable is open.

↓ **OK**

Cause 3 : DIP switch setting defective

- ☐ Check setting of DIP-SW1-4, 1-5, 1-6.

OK →

Cause 4 : External noise

- ☐ Remove or shut out external noise source.

↓ **OK**

Cause 5 : Ext. Switch Controller is defective.

- ►**Replace External Switch Controller.**

Troubleshooting 72

Error Contents :	**Symptom :**
Transmission Error	**LED repeats flashing 0.5sec ON & 1.0sec OFF.**

Condition :
Normal communication with Indoor unit has been suspended for longer than 1 minute.

Cause 1 : DIP switch setting defective
- ☐ Check setting of DIP-SW1-4, 1-5, 1-6.

↓ **OK**

Cause 2 : External noise
- ☐ Remove or shut out external noise source.

→ **OK**

Cause 3 : Ext. Switch Controller is defective.
- ► **Replace External Switch Controller.**

Troubleshooting 73

Error Contents :	**Symptom :**
Switch Operation Error	**LED is lighting but Switch (SW1 or SW2) does not operate.**

Condition :
Switch input can not be detected.

Cause 1 : Connection cable is defective or open.
- ☐ Check installation of connection cable.
- ☐ Check if connection cable is open.

↓ **OK**

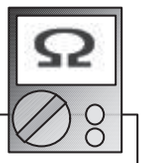
Cause 2 : Defective insertion or open connection of the cable between External Switch Controller terminal and PCB.
- ☐ Check connector insertion.
- ☐ Check if connection cable is open.

↓ **OK**

Cause 3 : DIP switch setting defective
- ☐ Check DIP Switch setting.

→ **OK**

Cause 4 : External Switch is defective



- ☐ Check any short or switch operation failure.
- ☐ Check resistance value between the terminals, at the time of input.
- ► **OPEN :** More than 50 kΩ
- ► **SHORT :** Less than 1 kΩ

↓ **OK**

Cause 5 : Ext. Switch Controller is defective.
- ► **Replace External Switch Controller.**

2. Signal Amplifier (UTY-VSGXZ1)

Troubleshooting 74

Error Contents :	**Symptom :**
Power Supply Error	**No display**

Details :

Condition of occurrence : Normal power is not supplied. 7 segment indicator is defective.

Release condition : Normal power is supplied. 7 segment indicator is normal.

Cause 1 :
Power supply cable installation is defective or open.

☐ Check following installation and reset the power supply.
(1) Installation of power cable on power supply terminal.
(2) Connection between Power PCB and Terminal.
(3) Connector condition between power PCB and Main PCB.

OK

Cause 2 : Signal Amplifier is defective.

If normal voltage (Rated Voltage) is applied to power supply terminal of Signal Amplifier, there is a possibility of defective PCB. Proceed as follows.
►**Replace Signal Amplifier.**

Troubleshooting 75

Error Contents :	**Symptom :**
Communication Error	**Error code does not appear [_]** **Communication error occurs at connected equipment side.**

Details :

Condition of occurrence : Network cable defective. External noise is applied.
Overlapping of Signal Amplifier address setting. System design mistake.

Release condition : Network cable is connected. External noise is removed.
Overlapping of Signal Amplifier has been corrected. System design is normal.

Cause 1 :
Network cable installation is defective or open.

☐ Check Network cable installation.

OK

Cause 2 : External noise

☐ Remove external noise around Signal Amplifier or Network cable. (Keep enough distance)

OK

Cause 3 :
Overlapped address of Signal Amplifier.

☐ Set up address again which does not overlap on system. After set up again, reset the power supply.

OK

Cause 4 : System Design mistake

☐ Check following items.(Refer to Installation Manual)
(1) Installation location of Terminal Resistor.
(Only 1 location on NS*)
(2) Cable length. (Within 500m maximum on NS*)
(3) Number of units connected
(Up to 64 units maximum on NS*)
(4) Communication cable specification.
(Use specified type.)
(5) Number of Signal Amplifier installed.
(Up to 8 units max. on system)
(6) Network cable shall not be connected in loop.

*NS : Network Segment

Troubleshooting 76

Error Contents : **Address Setting Error**	**Symptom :** **Error display [2 6]** **No operation.**

Details :
Condition of occurrence : Address is not set at Signal Amplifier.
Release condition : Address setting mode is started up, and desired address has been set up.

Cause 1 : External noise

- ☐ Upon pressing RESET button (SW7) or turning on power, proceed as follows.

(1) If error did not appear, it is not a defect of PCB. Remove the surrounding noise source.
(2) If error occurs again, check followings other than removing surrounding noise source.

OK →

Cause 2 : Address is not set at Signal Amplifier.

- ☐ Set up address again. After set up again, reset the power supply.

OK ↓

Cause 3 : Signal Amplifier is defective.

► **Replace Signal Amplifier.**

Troubleshooting 77

Error Contents : **Parallel Communication Error**	**Symptom :** **Error display [C 1]** **No operation.**

Details :
Condition of occurrence : Communication error between CPU and Network Driver IC
Release condition : Communication is normal between CPU and Network Driver IC

Cause 1 : External noise

- ☐ Upon pressing RESET button (SW7) or turning on power, proceed as follows.

(1) If error did not appear, it is not a defect of PCB. Remove the surrounding noise source.
(2) If error occurs again, check followings other than removing surrounding noise source.

OK ↓

Cause 2 : Signal Amplifier is defective.

► **Replace Signal Amplifier.**

Troubleshooting 78

Error Contents : **Communication Error B**	**Symptom :** **Error display [D9 (Flashing or Lighting)]** **No operation.**

Details :

Condition of occurrence : Communication error between CPU and Network Driver IC (CH_B side).
Network Driver IC is defective.

Release condition : Communication is normal between CPU and Network Driver IC (CH_B side).
Network Driver IC operation is normal.

Cause 1 : External noise

☐ Upon pressing RESET button (SW7) or turning on power, proceed as follows.

(1) If error did not appear, it is not a defect of PCB. Remove the surrounding noise source.

(2) If error occurs again, check followings other than removing surrounding noise source.

OK →

Cause 2 :Signal Amplifier is defective.

► **Replace Signal Amplifier.**

Troubleshooting 79

Error Contents : **Communication Error A**	**Symptom :** **Error display [D14 (Flashing or Lighting)]** **No operation.**

Details :

Condition of occurrence : Communication error between CPU and Network Driver IC (CH_A side).
Network Driver IC is defective.

Release condition : Communication is normal between CPU and Network Driver IC (CH_A side).
Network Driver IC operation is normal.

Cause 1 : External noise

☐ Upon pressing RESET button (SW7) or turning on power, proceed as follows.

(1) If error did not appear, it is not a defect of PCB. Remove the surrounding noise source.

(2) If error occurs again, check followings other than removing surrounding noise source.

OK →

Cause 2 : Signal Amplifier is defective.

► **Replace Signal Amplifier.**

3. Network Convertor (UTY-VGGXZ1)

1. When connecting a group remote controller to a network convertor

Troubleshooting 80

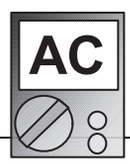
Error Contents :	**Symptom :**
Power Supply Error	**No display**

Details :
Condition of occurrence : Normal power is not supplied. 7 segment indicator is defective.
Release condition : Normal power is supplied. 7 segment indicator is normal.

Cause 1 :
Power supply cable installation is defective or open.

☐ Check following installation and reset the power supply.
(1) Installation of power cable on power supply terminal.
(2) Connection between Power PCB and Terminal.
(3) Connector condition between power PCB and Main PCB.

OK



Cause 2 : Network Convertor is defective.

If normal voltage (Rated Voltage) is applied to power supply terminal of Network Convertor, there is a possibility of defective PCB. Proceed as follows.
►**Replace Nerwork Convertor.**

Troubleshooting 81

Error Contents :	**Symptom :**
PCB Error 1	**Error Code display [C 1]** **All the control items do not operate.**

Details :
Condition of occurrence : Synchronization of Network Device was not normally done.
Release condition : When the synchronization of the device is normally done.

Cause 1 : External noise

☐ After pressing SW104 of Network Convertor PCB for 5 seconds or turning on power.
Does error code display reappear?

YES
● Remove the surrounding noise source.

NO
● It is not a defect of PCB. Remove the surrounding noise source.

OK

Cause 2 : Network Convertor is defective.

►**Replace Network Convertor.**

Troubleshooting 82

Error Contents :	**Symptom :**
Communication Error with Group Remote Controller	**Error Code display [1 2] Control/Display from Group Remote is not available.**

Details :

Condition of occurrence : The communication between Group Remote and Network Convertor was not normally performed.
Release condition : When the communication between Group Remote and Network Convertor resumes normal operation.

Cause 1 : External noise

☐ After pressing SW104 of Network Convertor PCB for 5 seconds or turning on power.
Does error code display reappear?

YES → ● Remove the surrounding noise source.

NO → ● It is not a defect of PCB. Remove the surrounding noise source.

OK ↓

Cause 2 : Defective or open connection of cable wire between Network Convertor and Connected Remote Controller.

After the following are checked, the power supply is reset.
☐ Check connection cable wire between Network Convertor and Connected Remote Controller.
☐ Check connection between Control PCB and Terminal.

OK ↓

Cause 3 : Incorrect setting of Network Convertor's DIP-SW103[1 to 4] (For Convertor setting of Group Remote Controller)

☐ Check Network Convertor PCB DIP-SW103[1 to 4] ON.

OK ↓

Cause 4 : Defective Remote Controller or Network Convertor.

► **Replace Remote Controller or Network Convertor.**

Troubleshooting 83

Error Contents :	**Symptom :**
Software Error	**Error Code display [C A]** **All the control items do not operate.** **Other Controls are left they are.**

Details :

Condition of occurrence : Micon program performed an abnormal control.
Error of inside information of EEPROM.
initial setting of Network Converor PCB was not normally performed.

Release condition : Micon has been reset, and the control of Network Convertor became normal.
When error disappeared and Network Convetor becomes available to control.

Cause 1 : External noise

☐ Check continuation of error.
(1) If error is released automatically, it is not a defect of PCB. Remove the surrounding noise source around Network Convertor.
(2) If error is not released automatically, check followings.

↓ **OK**

☐ After pressing SW104 of Network Convertor PCB for 5 seconds or turning on power.
Does error code display reappear?

↓ **YES**

● Remove the surrounding noise source.

↓ **OK**

↓ **NO**

● It is not a defect of PCB. Remove the surrounding noise source.

Cause 2 : Network Convertor is defective.

► **Replace Network Convertor.**

Troubleshooting 84

Error Contents :	**Symptom :**
Refrigerant circuit address setting error	**Error Code display [2 6]**

Details :

Condition of occurrence : Indoor unit registration is 3 refrigerant circuits or more.
Release condition : Indoor unit registration is 2 refrigerant circuits or less.

Cause 1 : Check of number of indoor unit registration refrigerant circuits

☐ Check indoor unit registration.
(1) Number of refrigerant circuits of indoor unit registered at Replace Group Remote Controller is 3 refrigerant circuits or more even though connected to one converter.

↓ **YES**

☐ Make 2 refrigerant circuits or less and wait 2 minutes

↓ **NO**

☐ Replace Network Convertor
Replace Group Remote Controller

3. Network Convertor (UTY-VGGXZ1)

2. When connecting a single split type indoor unit to a network convertor

Troubleshooting 85

Error Contents :	**Symptom :**
Power Supply Error	**No display**

Details :
Condition of occurrence : Normal power is not supplied. 7 segment indicator is defective.
Release condition : Normal power is supplied. 7 segment indicator is normal.

Cause 1 :
Power supply cable installation is defective or open.

☐ Check following installation and reset the power supply.
(1) Installation of power cable on power supply terminal.
(2) Connection between Power PCB and Terminal.
(3) Connector condition between power PCB and Main PCB.

OK

Cause 2 : Network Convertor is defective.

If normal voltage (AC 208-220V) is applied to power supply terminal of Network Convertor, there is a possibility of defective PCB. Proceed as follows.
► **Replace Network Convertor.**

Troubleshooting 86

Error Contents :	**Symptom :**
PCB Error 1	**Error Code display [C 1]** **All the control items do not operate.**

Details :
Condition of occurrence : Synchronization of Network Device was not normally done.
Release condition : When the synchronization of the device is normally done.

Cause 1 : External noise

☐ After pressing SW104 of Network Convertor PCB for 5 seconds or turning on power.
Does error code display reappear?

YES

● Remove the surrounding noise source.

OK

NO

● It is not a defect of PCB. Remove the surrounding noise source.

Cause 2 : Network Convertor is defective.

► **Replace Network Convertor.**

Troubleshooting 87

Error Contents :	**Symptom :**
Communication Error with Standard Remote Controller	**Error Code display [1 2] Control/Display from Standard Remote is not available. Other controls are left as they are.**

Details :

Condition of occurrence : The communication between Standard Remote Controller and Network Convertor was not normally performed.

Release condition : When the communication between Standard Remote Controller and Network Convertor resumes normal operation.

Cause 1 : External noise

☐ After pressing SW104 of Network Convertor PCB for 5 seconds or turning on power. Does error code display reappear?

YES → ● Remove the surrounding noise source.

NO → ● It is not a defect of PCB. Remove the surrounding noise source.

OK ↓

Cause 2 :
Defective or open connection of cable wire between Network Convertor and Connected Remote Controller.

After the following are checked, the power supply is reset.
☐ Check connection cable wire between Network Convertor and Connected Remote Controller.
☐ Check connection between Control PCB and Terminal.

OK ↓

Cause 3 : Incorrect setting of Network Convertor's DIP-SW107[2] (Wired RC Validity setting)

☐ Check Network Convertor PCB DIP-SW107[2].

OK ↓

Cause 4 : Incorrect selection of Remote Controller

☐ Check connection Remote Controller. (Is it specified with the Installation Manual of Network Convertor?)

OK ↓

Cause 5 :
Incorrect setting of Remote Controller's DIP-SW (Number of connected remote controllers)

☐ Check DIP-SW of Remote Controller.

OK ↓

Cause 6 : Defective Remote Controller or Network Convertor.

► **Replace Remote Controller or Network Convertor.**

Troubleshooting 88

Error Contents :	**Symptom :**
Communication Error with Indoor Unit	**Error Code display [1 6]** **All the control items do not operate.**

Details :

Condition of occurrence : The communication between Indoor unit and Network Convertor was not performed normally.

Release condition : When the communication with Indoor unit is resumed normally.

Cause 1 : External noise

☐ After pressing SW104 of Network Convertor PCB for 5 seconds or turning on power.
Does error code display reappear?

YES ↓

● Remove the surrounding noise source.

OK ↓

NO ↓

● It is not a defect of PCB. Remove the surrounding noise source.

Cause 2 : Defective or open connection of Remote Control cable between Network Convertor and Indoor Unit.

After the following are checked, the power supply is reset.

☐ Check connection cable wire between Network Convertor and Indoor unit.

☐ Check connection between Control PCB and Terminal.

OK ↓

Cause 3 : Power to Indoor unit is shut down.

☐ Check the power to Indoor unit.

OK ↓

Cause 4 : Incorrect setting of main unit address of Indoor unit.

☐ Check main unit address setting of Indoor unit.

OK ↓

Cause 5 : Incorrect setting of DIP-SW of Network Convertor. Mis-read of Indoor unit type and RC type.

☐ Check DIP-SW103[1 to 8] of Network Convertor (Indoor unit type, RC type, number of Indoor units connected.)

☐ Check Indoor unit type and RC type of all Indoor units connected to Network Convertor.

OK ↓

Cause 6 : Defective PCB of Indoor unit or Network Convertor.

► **Replace PCB of Controller PCB or Network Convertor.**

Troubleshooting 89

Error Contents :	**Symptom :**
Communication Error with Indoor Unit	**Error Code display [2 6]** **All the control items do not operate.**

Details :

Condition of occurrence : The communication between Indoor unit and Network Convertor was not performed normally.
Release condition : When the communication with Indoor unit is resumed normally.

Cause 1 : External noise

☐ After pressing SW104 of Network Convertor PCB for 5 seconds or turning on power.
Does error code display reappear?

YES ↓

● Remove the surrounding noise source.

NO ↓

● It is not a defect of PCB. Remove the surrounding noise source.

OK ↓

Cause 2 : Defective or open connection of Remote Control cable between Network Convertor and Indoor Unit.

After the following are checked, the power supply is reset.
☐ Check connection cable wire between Network Convertor and Indoor unit.
☐ Check connection between Control PCB and Terminal.

OK ↓

Cause 3 : Power to Indoor unit is shut down.

☐ Check the power to Indoor unit.

OK ↓

Cause 4 : Incorrect setting of main unit address of Indoor unit.

☐ Check main unit address setting of Indoor unit.

OK ↓

Cause 5 : Incorrect setting of DIP-SW of Network Convertor. Mis-read of Indoor unit type and RC type.

☐ Check DIP-SW103[1 to 8] of Network Convertor (Indoor unit type, RC type, number of Indoor units connected.)
☐ Check Indoor unit type and RC type of all Indoor units connected to Network Convertor.

OK ↓

Cause 6 : Defective PCB of Indoor unit or Network Convertor.

► **Replace PCB of Controller PCB or Network Convertor.**

Troubleshooting 90

Error Contents :	Symptom :
Software Error	**Error Code display [C A]** **All the control items do not operate.** **Other Controls are left they are.**

Details :

Condition of occurrence : Micon program performed an abnormal control.
Error of inside information of EEPROM.
initial setting of Network Converor PCB was not normally performed.

Release condition : Micon has been reset, and the control of Network Convertor became normal.
When error disappeared and Network Convetor becomes available to control.

Cause 1 : External noise

☐ Check continuation of error.
(1) If error is released automatically, it is not a defect of PCB. Remove the surrounding noise source around Network Convertor.
(2) If error is not released automatically, check followings.

↓ **OK**

☐ After pressing SW104 of Network Convertor PCB for 5 seconds or turning on power.
Does error code display reappear?

↓ **YES**

● Remove the surrounding noise source.

↓ **NO**

● It is not a defect of PCB. Remove the surrounding noise source.

↓ **OK**

Cause 2 : Network Convertor is defective.

► **Replace Network Convertor.**

Troubleshooting 91

Error Contents :	Symptom :
Indoor / Outdoor Unit Error	**Error Code display [5 U]** **Other controls are left as they are.**

Details :

Condition of occurrence : When error occurred on Indoor/Outdoor unit that is connected to Network Convertor.

Release condition : When the error of Indoor/Outdoor unit that is connected to Network Convertor is released.

Cause 1 : Error occurred in Indoor unit

► **Refer to Indoor Unit trouble shooting.**
(Removal of error of indoor unit connected to network converter)

↓ **OK**

Cause 2 : Error occurred in Outdoor unit

► **Refer to Outdoor Unit trouble shooting.**
(Removal of error of outdoor unit connected to network converter)

4. Group Remote Controller (UTY-CGGGU)

Troubleshooting 92

Error Contents : **PCB Error**	**Symptom :** **Error Code display [C 4]** **OPERATION LED is flashing.**

Details :
Condition of occurrence : When EEPROM can not be written, or the control port does not operate.
Release condition : Power is reset.

Cause 1 : Remote Controller is defective.

► **Replace Group Remote Controller.**

Troubleshooting 93

Error Contents : **Connection Error**	**Symptom :** **Error Code display [1 2]** **OPERATION LED is flashing.**

Details :

Condition of occurrence :

The valid signal has not been received from the convertor more than 90 seconds after the communication line became valid.

Release condition : Valid signal is received from Convertor.

Cause 1 : Connection failure

- ☐ Check power to the convertor.
- ☐ Check connection of remote control line between controller and convertor.

OK

Cause 2 : Check outside cause (Voltage drop or noise, etc.)

- ● Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- ● Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- ● Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).

OK

Cause 3 : Remote Controller is defective.

► **Replace Group Remote Controller.**

Troubleshooting 94

Error Contents : **Address Setting Error**	**Symptom :** **Error Code display [2 6]** **OPERATION LED is flashing.**

Details :

Condition of occurrence :

1. No Indoor unit is registered.

Release condition :

1. The key to enter the function selection process is pressed.
   TIME< key and TIME> key are simultaneously kept pressed.
2. It automatically initializes by itself. After that, it is released by pressing the key to enter the function selection process.

Cause 1 : Setting failure

- ☐ Register Indoor units again by entering to the function selection mode.
  (Keep pressing TIME< key and TIME> key.
  (Refer to the installation manual for the remote controller.)

Troubleshooting 95

Error Contents : **System Error**	**Symptom :** **Error Code display [1 5]** **OPERATION LED is flashing.**

Details :

Condition of occurrence :

1. Registration started within 4 minutes after power ON
2. Indoor unit refrigerant system registered at controller connected to converter reached 3 or more ([26] error generated at converter)
3. Only the slave unit is registered. (Main unit is not registered.)
4. Indoor unit which is not existing was registered.
5. Outdoor unit is not set in the same refrigerant circuit as the indoor unit.

Release condition : Registered contents have been changed by SELECT key, DAY key, Timer Mode key (DELETE key).

Cause 1 : Conditions check

- ☐ Check if 4 minutes or more after starting
- ☐ Clear when [26] error generated at converter.
- ☐ Check if refrigerant systems do not become 3 or more by this indoor unit registration.

↓ **OK**

Cause 2 : Setting failure

- ☐ Recheck the registered contents.(Register the main unit.)
- ☐ Check Indoor unit DIP-SW, R-SW
- ☐ Check outdoor unit R-SW.

↓ **OK**

Cause 3 : Connection failure

- ☐ Check transmission cable
- ☐ Check if Indoor or Outdoor unit power line is disconnected.
- ☐ Check if the convertor power line is disconnected.
- ☐ Check connection between controller and the convertor.

↓ **OK**

Cause 4 : Check outside cause (Voltage drop or noise, etc.)

- ● Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- ● Momentary power failure ----- Check if there is a defective contact or leak current in the power supplycircuit.
- ● Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).

↓ **OK**

Cause 5 : Remote Controller is defective.

► **Replace Group Remote Controller.**

Troubleshooting 96

Error Contents : **Transmission Error**	**Symptom :** **Error Code display [1 4]** **OPERATION LED is flashing.**

Details :

Condition of occurrence :

When the signal is cut off for more than 10 minutes from the registered Indoor unit (not including Slave unit).

Release condition : 1. The signal has been received from the Indoor units that was creating the error.

2. MPU has been booted up. (Release from the reset operation, the power failure stand-by operation.

Cause 1 : Connection failure

- ☐ Check transmission cable
- ☐ Check disconnected power line for Indoor unit.
- ☐ Check if convertor power line is disconnected.

↓ **OK**

Cause 2 : Check outside cause (Voltage drop or noise, etc.)

- ● Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- ● Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- ● Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).

↓ **OK**

Cause 3 : Remote Controller is defective.

► **Replace Group Remote Controller.**

5. Wired Remote Controller (UTY-RNKU)

Troubleshooting 97

Error Contents : **Thermo Sensor Error**	**Symptom :** **Thermostat Sensor display is flashing.**

Details :

Condition of occurrence : Thermistor in remote controller is open or shorted.

Release condition : Thermistor in remote controller is not open or shorted.

Cause 1 : Remote Controller internal thermistor trouble

- ☐ Replace remote controller.

6. Wired(UTY-RNKU) and Simple Remote Controller (UTY-RSKU, RHKU)

Troubleshooting 98

Error Contents :	**Symptom :**
Indoor Unit ⇔ Remote Controller Communication Error	**Error Code display [1 2]**

Details :
Condition of occurrence : When signal from indoor unit does not enter
Release condition : When signal from indoor unit entered

Cause 1 : Check connection

- ☐ Check cable
- ☐ Check indoor unit power supply

↓ **OK**

Cause 2 : Check indoor unit remote controller address.

- ☐ Check if the indoor unit remote controller addresses are sequentially set from 0.

↓ **OK**

Cause 3 : Noise

- ☐ Remove the surrounding noise.

↓ **OK**

Cause 4 : Remote controller trouble

- ☐ Replace remote controller.

↓ **OK**

Cause 5 : Indoor unit PCB trouble

- ☐ Change Controller PCB and set up the original address.

Troubleshooting 99

Error Contents :	**Symptom :**
Incompatible Indoor Unit is Connected	**Error Code display [1 5]**

Details :
Condition of occurrence : When information was not obtained from indoor unit
Release condition : When information was obtained from indoor unit

Cause 1 : Check remote controller master/slave setting.

- ☐ For the check and modification methods, refer to the remote controller (including external SW) installation manual.
- ☐ When there is 1 remote controller, check whether or not it is set as the master remote controller.
- ☐ When there are 2 remote controllers, check if one side is the master remote controller and the other side is the slave remote controller.
- ☐ When there are 1 remote controller and 1 external switch controller, check if the remote controller is master controller and the external switch controller is slave controller.

↓ **OK**

Cause 2 : Check connection

- ☐ Check cable
- ☐ Check indoor unit power supply

↓ **OK**

Cause 3 : Noise

- ☐ Source around cable

↓ **OK**

Cause 4 : Remote controller trouble

- ☐ Replace remote controller.

↓ **OK**

Cause 5 : Indoor unit PCB trouble

- ☐ Change Controller PCB and set up the original address.

7. System Controller (UTY-APGXZ1) / Service Tool (UTY-ASGXZ1) / Web Monitoring Tool (UTY-AMGXZ1)
(Referred to as "Service Tool" hereafter)

Troubleshooting 100

Error Contents : **Unit Not Detected**	**Symptom :** **1 or more units (but not all) are not detected after Scan.** **1 or more units (but not all) are not listed in the system list after Scan.**

Details :

Condition of occurrence:
- Unit address is not set correctly.
- Network cable is not connected correctly.
- System design is mistaken.
- Unit transmission board is defective.

Recovery condition:
- Unit address is set correctly.
- Network cable is connected as designed.
- System design and work is corrected.
- Unit transmission board is normal.

Cause 1 : Unit address is not set correctly.

- ☐ Check the unit address setting of the undetected unit and correct it if mistaken.

OK

Cause 2 : Network cable is not connected as designed.

- ☐ Check that the network cables are connected according to the site design drawing.
  Check specifically the network segment where the undetected unit exists.
- ☐ Check and fix the loose cable connection to the terminal of the undetected unit.
- ☐ Using Service Tool, perform scan changing the network segment where the Service Tool is connected and localize the mistaken network segment. Start from the network segment where the undetected unit exists.
  Specify priority scan when possible.

OK

Cause 3 : System design work is mistaken.

- ☐ Check the following items and fix appropriately if mistaken.
  (1) 1 (and only 1) Terminal Resistor is connected for each network segment.
  (2) Cable length is within 500m for each network segment.
  (3) Number of units connected within a network segment does not exceed 64.
  (1 connected port of Signal Amplifier is counted as 1).
  (4) Network cable specification is as specified in the Design & Technical Document.
  (5) Total number of Signal Amplifiers does not exceed 8 per system.
  (6) Network cable is not connected in loop.
  (7) Both ends of the network cable are grounded.
  (8) Network cables are not bundled together with power cables to prevent noise induction.

OK

Cause 4 : Unit transmission board is defective.

- ☐ Replace transmission board of the undetected unit if none of the above cause applies.

Note :
A Network Segment is a portion of the network connected directly by network cables and is separated by Signal Amplifiers. If no Signal Amplifier exits, there is only 1 network segment.

4-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If Outdoor Unit 7 segment LED displays Error, refer to Trouble shooting)

Does not start up

- Is any Indoor Unit in operation?

* If it is operated right after stopping operation, 3 minutes start-up protection by differential pressure is kicked on.

- Check power supply voltage,open fuse.
- Is there open or loose connection cable?

- In case of inverter compressor, check Filter PCB, Inverter PCB, connection of Compressor, and winding resistance (Refer to the next page).

>> If there is no failure, the defect of Compressor is considered (Locked compressor due to clogged dirt or less oil)

Replace Compressor

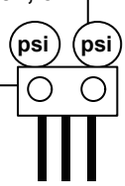
Stops soon after starting up

- Check power supply voltage,open fuse.
- Is there open or loose connection cable?

- Is Gas Pipe Valve open? (Low Pressure is too low)

- Isn't it Liquid Compression?

>> Check Low pressure value and if it too high, check Indoor Unit. (Indoor Unit EEV too much open, or Indoor unit EEV that is not in operation open.



- Check if Refrigerant is leaking. (Recharge Refrigerant)

- Check if Strainer is clogged.

- In case of inverter compressor, check Filter PCB, Inverter PCB, connection of Compressor, and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor can be considered. (Compression part broken or valve defective.)

Replace Compressor

Abnormal noise

- Check power supply voltage,open fuse. Is there open or loose connection cable?

▶ **Defective Compressor can be considered. (due to inside dirt clogging or broken component)**

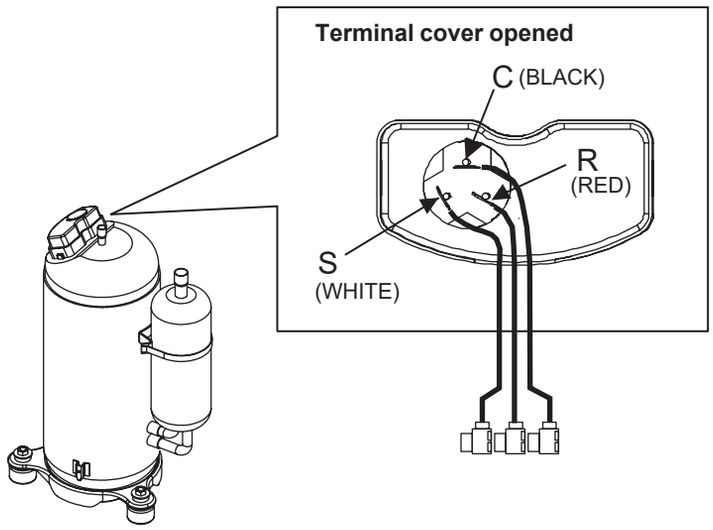
Replace Compressor

SERVICE PARTS INFORMATION 2

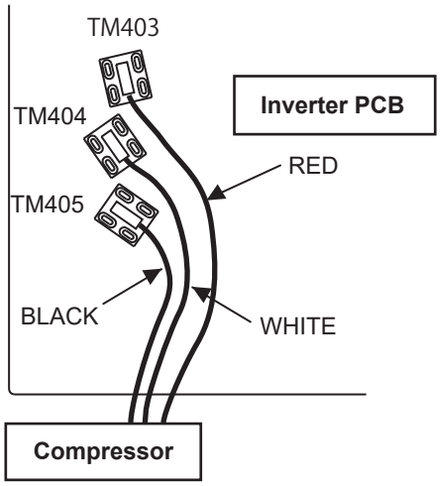
Inverter Compressor

Check Point 1 : Check Connection

☐ Check terminal connection of Compressor (loose or incorrect wiring)



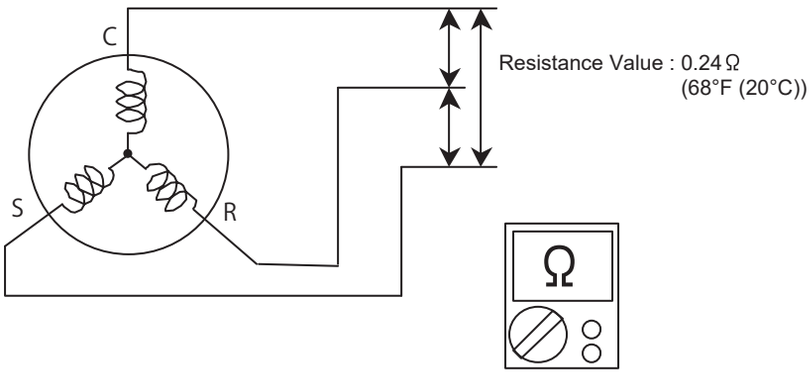
☐ Check connection of Inverter PCB
(Loose or incorrect wiring)



Check Point 2 : Check Winding Resistance

☐ Check winding resistance of each terminal

► **If the resistance value is 0Ω or infinite, replace Compressor.**



Attention!!

If Check 1, 2 are normal, make sure the following points.

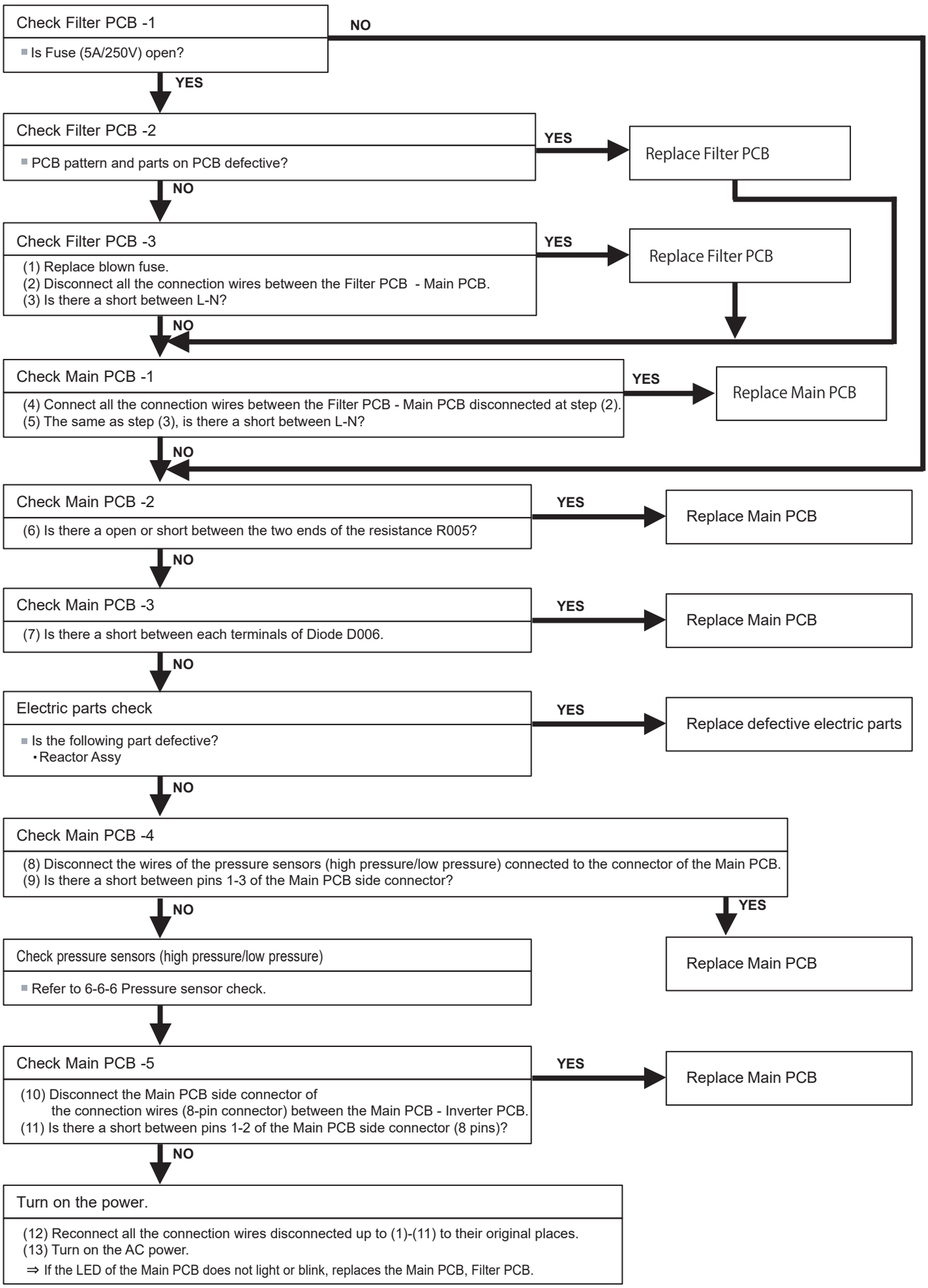
(1) Check AC voltage among each terminals from filter PCB(INV) to Diode Bridge.
(Rated voltage among L and N).
► **If it does not appear, check the power supply terminal.**

(2) Check Voltage from Main PCB to Inverter PCB.
(DC13.5 - 16.5V between terminals of CN126 (1-2) connector
and DC (-12.0) - (-8.0)V between terminals of CN126 (3-2) connector of Main PCB).
► **If it does not appear, replace Main PCB.**

◆ **If both of above voltages appear, it is considered to be Inverter PCB circuit failure.**
Replace Inverter PCB and check operation.

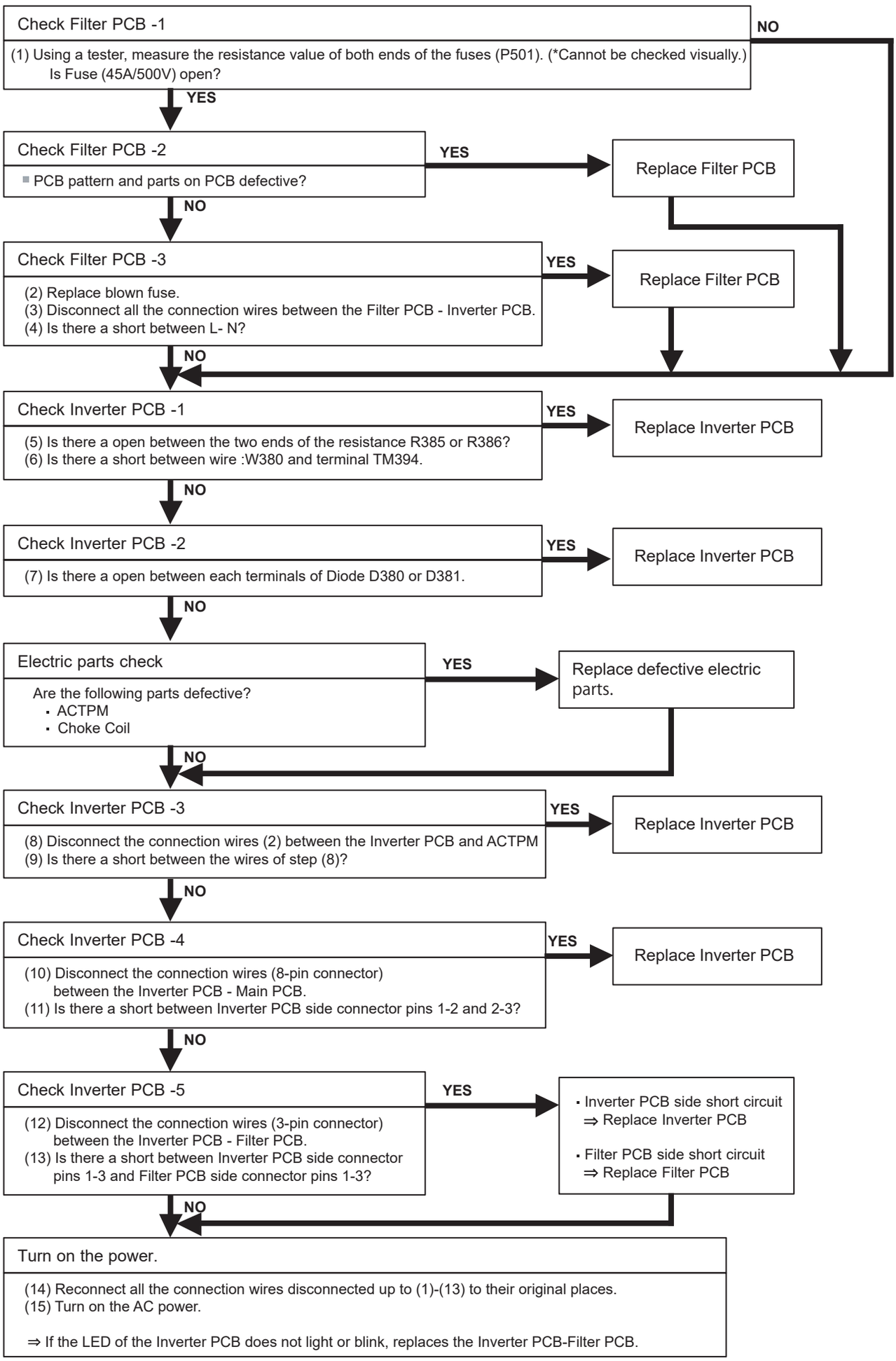
SERVICE PARTS INFORMATION 3

Main PCB
Filter PCB



SERVICE PARTS INFORMATION 4

Inverter PCB
Filter PCB



SERVICE PARTS INFORMATION 5

IPM
(Mounted on Inverter PCB)

Check Point 1

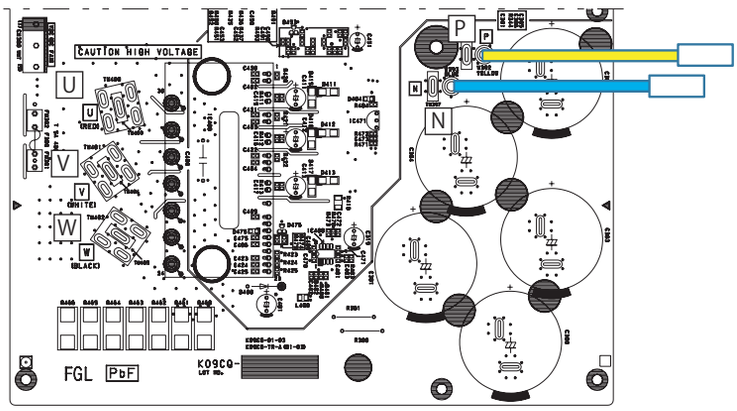
①Disconnect the connection wires between the Inverter PCB - ACTPM and Inverter PCB - Inverter Compressor.

②Set the tester to the "Resistance" mode, and measure the resistance between the following terminals.

Yellow wire (P) - Fasten terminals U/V/W
Blue wire (N) - Fasten terminals U/V/W

③Judge the result of ②as follows:

All 6 points several MΩ or greater	: Normal
1 or more points several kΩ to short	: Defective



Inverter PCB

Check Point 2

④ Set the tester to the "Diode" mode, and measure the voltage value between the following terminals.

Tester +side (red)	Tester - side (black)	Tester display [V]
Terminal U	Yellow wire (P)	
Terminal V		
Terminal W		
Blue wire (N)	Terminal U	
	Terminal V	
	Terminal W	

⑤Judge the result of ④ as follows:

All 6 points several 0.3V to 0.7V	: Normal
1 or more points under 0.1V or over load	: Defective

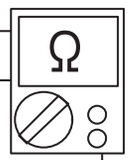
SERVICE PARTS INFORMATION 6

Choke Coil (INV)
Reactor assy (DC Fan)

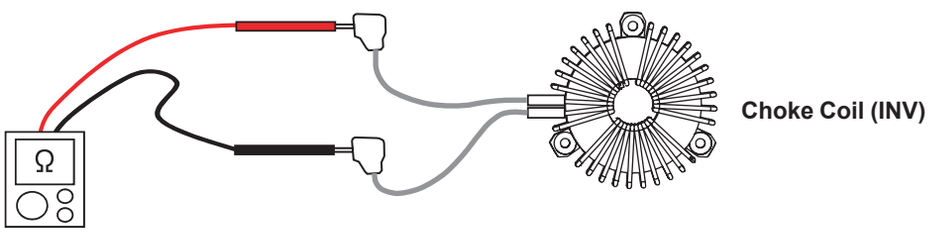
Check Point 1 : Appearance check

□ No fissures, breaks, damage, etc. at the body and winding section, terminals section?

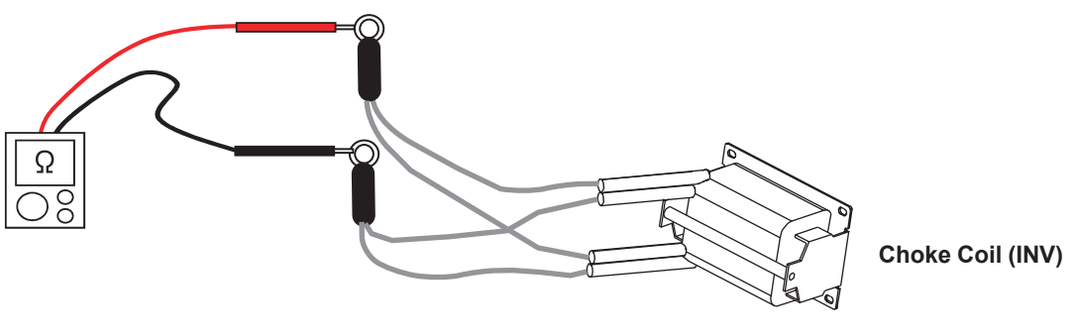
Check Point 2 : Electric check

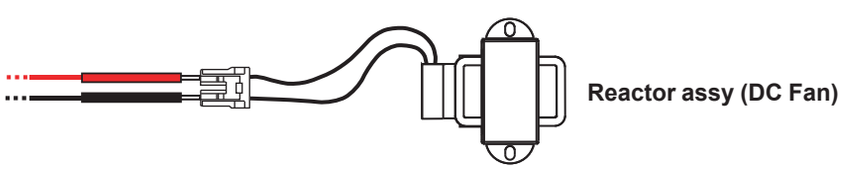


For AOU36, 48RLAVM4



For AOU60RLAVM4





① Set the tester to the "Resistance" mode, and check for open/short between both ends of the reactor wire (or connector).

② Judge the result of ① as follows:

Short	: Normal
Open	: Abnormal (open)

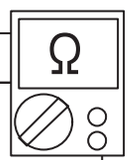
SERVICE PARTS INFORMATION 7

Terminal

Check Point 1 : Appearance check

- ☐ No fissures, breaks, damage, etc. at the body and terminals section?
- ☐ Not clogged with foreign matter?
- ☐ Are there no abnormalities at threaded parts (Stripped threads, deformation, damage, etc.) ?

Check Point 2 : Electric check



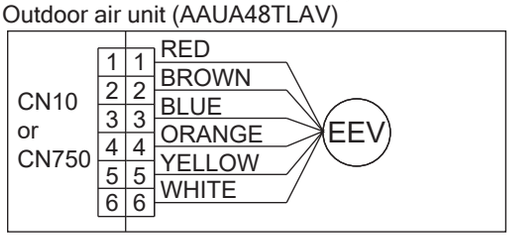
- ☐ No short between adjacent terminals?
- ☐ Conducts before and after same terminal?

SERVICE PARTS INFORMATION 8-1

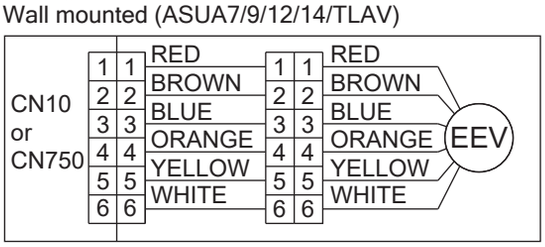
Indoor unit electronic expansion valve
(EEV)

Check Point 1 : Check Connections

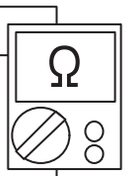
☐ Check Connectors (Loose connector or open cable.)
Compact cassette (AUUA4/7/9/12/14/18/24TLAV2)
4-way flow cassette (AUUB18/24/30/36TLAV)
Mini duct (ARUL4TLAV2)
Medium static pressure duct (ARUM24/30/36TLAV2)
High static pressure duct (ARUH36/48/60TLAV)
Wall mounted (ASUA4/7/9/12/14TLAV2)
Wall mounted (ASUB18/24TLAV1)
Wall mounted (ASUB18/24TLAV)
Outdoor air unit (AAUA48TLAV)



Floor/ Ceiling (ABUA12/14/18/24TLAV2)
Ceiling (ABUA30/36TLAV2)
Wall mounted (ASUA7/9/12/14/TLAV)



Check Point 2 : Check Coil of EEV



☐ Remove connector, check each winding resistance of Coil.

Read wire	Resistance value 68°F(20°C)
White - Red	**200 ±10% Ω**
Yellow - Brown	
Orange - Red	
Blue - Brown	

▶ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Noise at start up

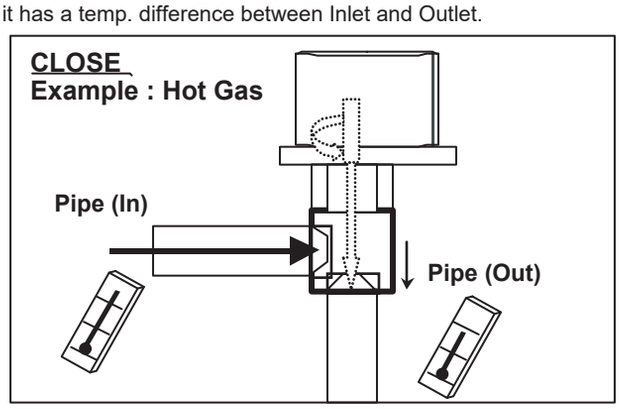
Turn on Power and check operation noise.
>> If an abnormal noise does not show, replace Controller PCB.

Check Point 4 : Check Voltage from Controller PCB

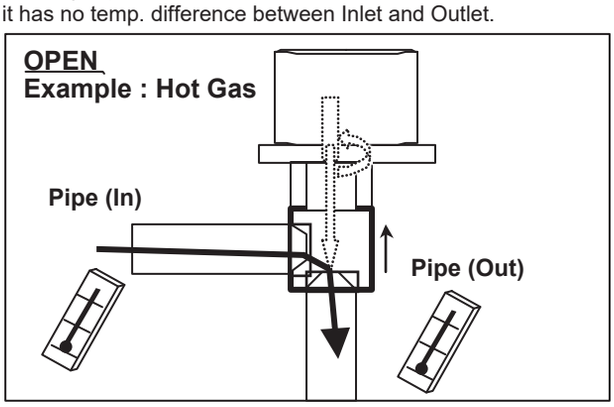
☐ Remove Connector and check Voltage (DC12V).
>> If it does not appear, replace Controller PCB.

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

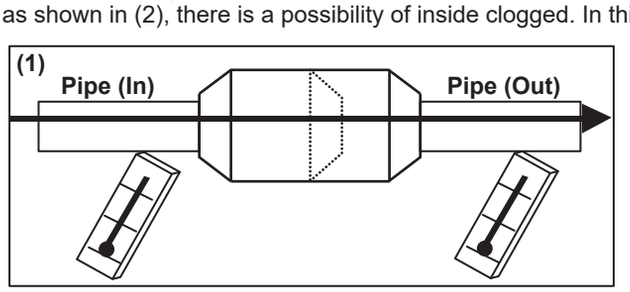


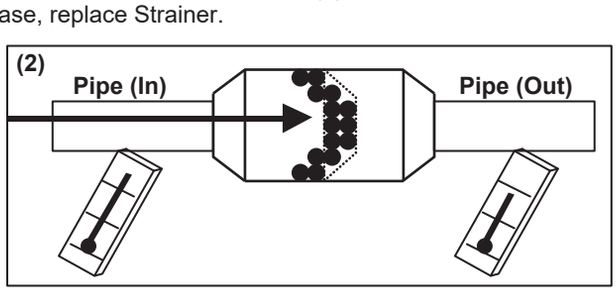
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.





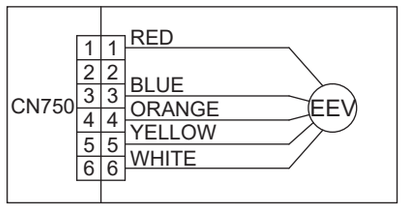
SERVICE PARTS INFORMATION 8-2

Indoor Unit Electronic Expansion Valve (EEV)

Check Point 1 : Check Connections

☐ Check Connectors (Loose connector or open cable.)

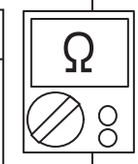
Circular Flow Cassette (AUUB18/24/30TLAV2)
Wall mounted (ASUA30TLAV2)



Check Point 2 : Check Coil of EEV

☐ Remove connector, check each winding resistance of Coil.

Read wire	Resistance value 68°F(20°C)
White - Red	**46 ± 10%** Ω
Yellow - Red	
Orange - Red	
Blue - Red	



▶ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Noise at start up

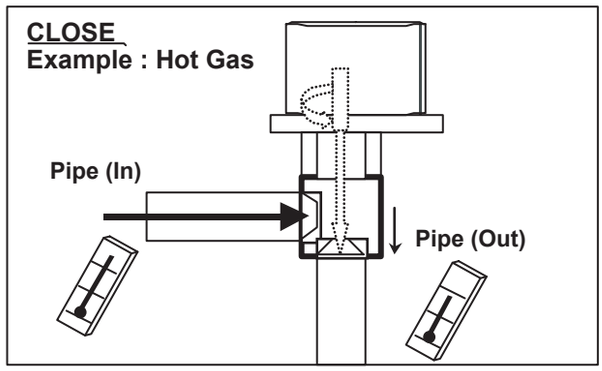
Turn on Power and check operation noise.
>> **If an abnormal noise does not show, replace Controller PCB.**

Check Point 4 : Check Voltage from Controller PCB

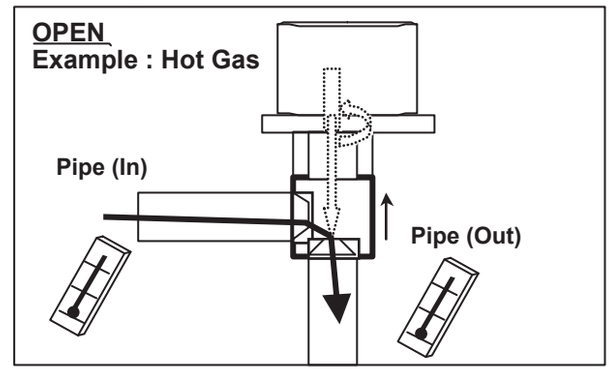
☐ Remove Connector and check Voltage (DC12V).
>> **If it does not appear, replace Controller PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

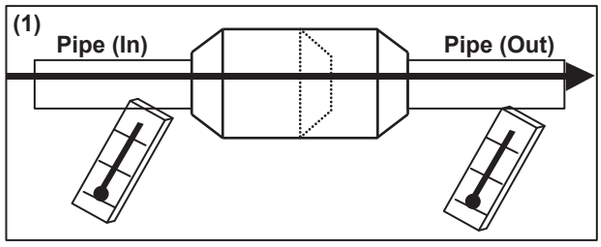


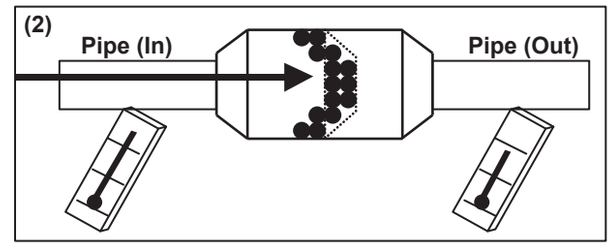
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.





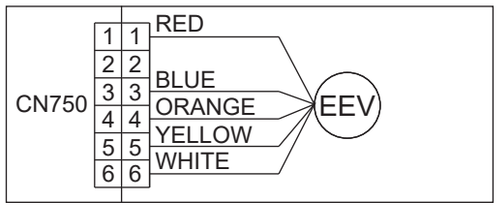
SERVICE PARTS INFORMATION 8-3

Indoor Unit Electronic Expansion Valve (EEV)

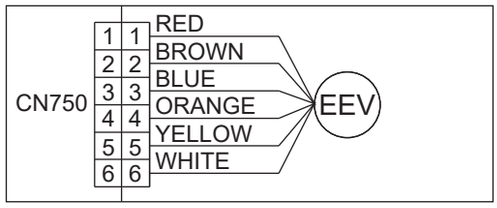
Check Point 1 : Check Connections

☐ Check Connectors (Loose connector or open cable.)

Circular flow cassette (AUUB36/48TLAV2)
Wall mounted (ASUA36TLAV2)



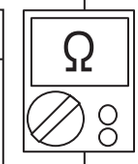
Slim duct (ARUL7/9/12/14/18TLAV2)



Check Point 2 : Check Coil of EEV

☐ Remove connector, check each winding resistance of Coil.

Read wire	Resistance value 68°F(20°C)
White - Red	**150 ± 10%** Ω
Yellow - Red	
Orange - Red	
Blue - Red	



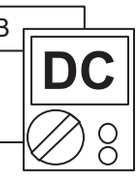
▶ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Noise at start up

Turn on Power and check operation noise.
>> If an abnormal noise does not show, replace Controller PCB.

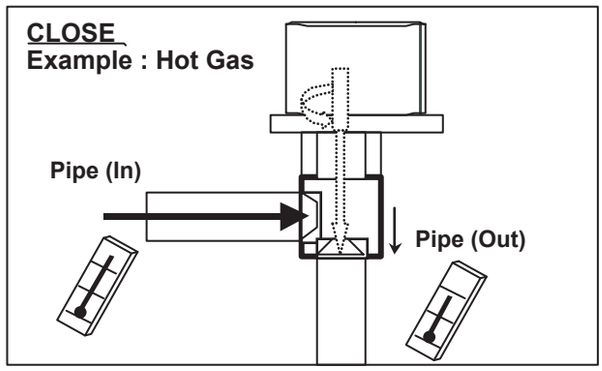
Check Point 4 : Check Voltage from Controller PCB

☐ Remove Connector and check Voltage (DC12V).
>> If it does not appear, replace Controller PCB.

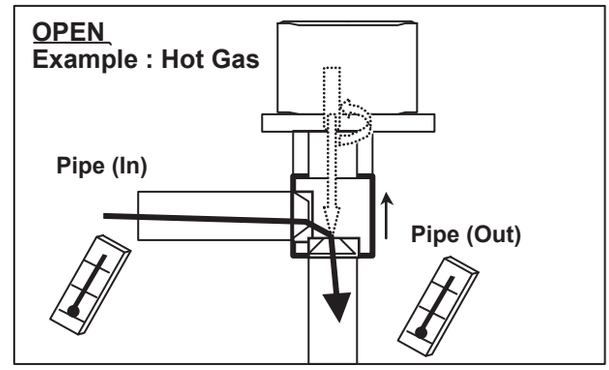


Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

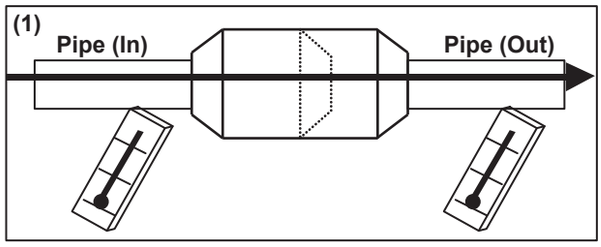


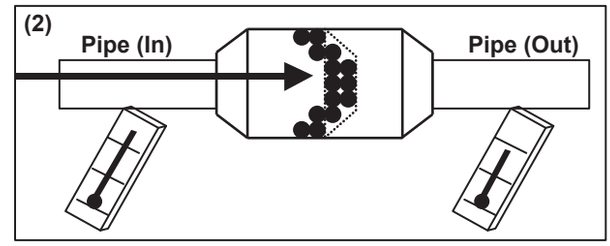
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.



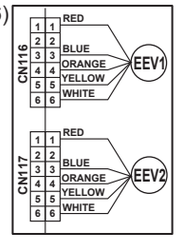


SERVICE PARTS INFORMATION 9

Outdoor Unit Electronic Expansion Valve (EEV1)

Check Point 1 : Check Connections

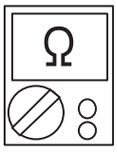
☐ Check connection of connector (CN116)
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV1

☐ Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	**46 ± 4.0Ω** 68°F(20°C)
Yellow - Red	
Orange - Red	
Blue - Red	



▶ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Voltage from Controller PCB

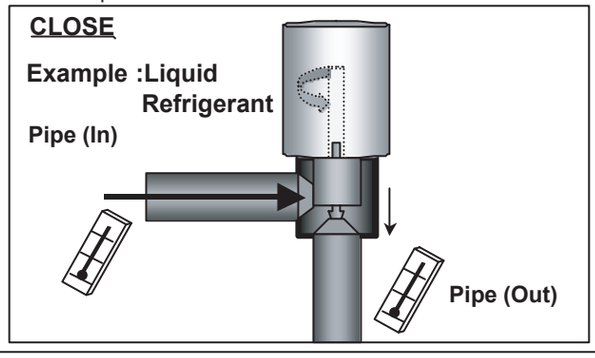
☐ Remove Connector and check Voltage (DC12V).
>> If it does not appear, replace Controller PCB.

Check Point 4 : Check Noise at start up

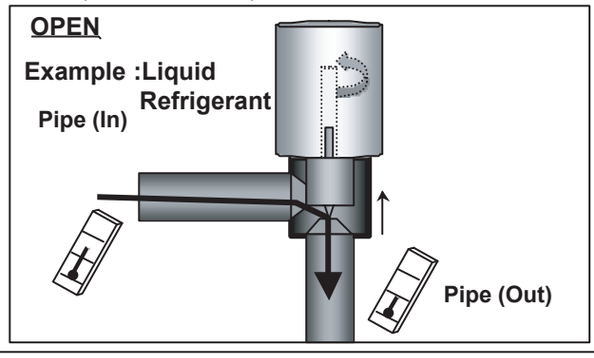
☐ Turn on Power and check operation noise.
>> If an abnormal noise does not show, replace Controller PCB.

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

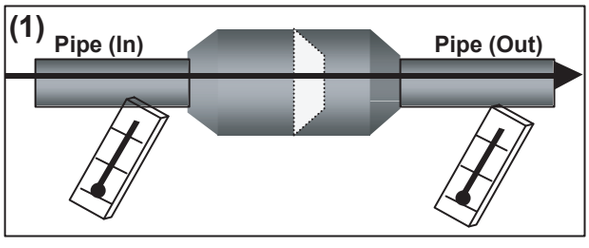


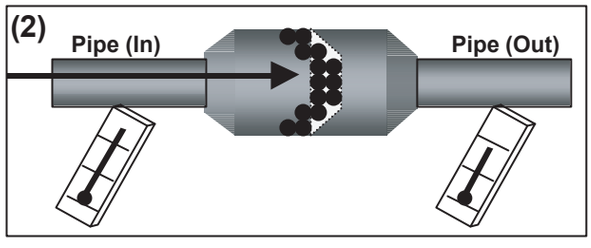
If it is open, it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between i nlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In th is case, replace Strainer.



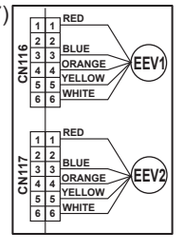


SERVICE PARTS INFORMATION 10

Outdoor Unit Electronic Expansion Valve (EEV2)

Check Point 1 : Check Connections

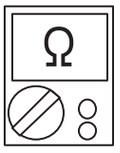
☐ Check connection of connector (CN117)
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV2

☐ Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	**46 ± 4.0** Ω 68°F(20°C)
Yellow - Red	
Orange - Red	
Blue - Red	



▶ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Voltage from Controller PCB

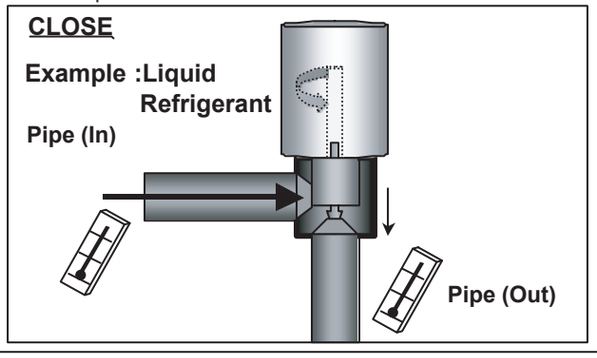
☐ Remove Connector and check Voltage (DC12V).
>> If it does not appear, replace Controller PCB.

Check Point 4 : Check Noise at start up

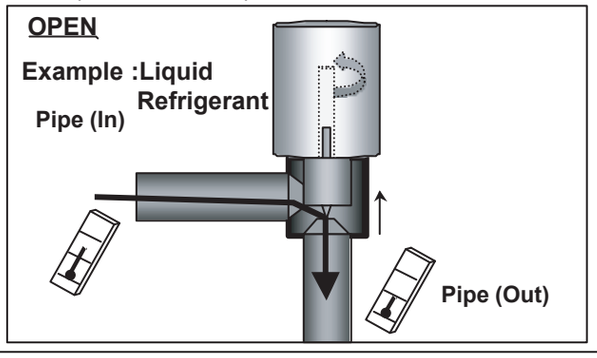
☐ Turn on Power and check operation noise.
>> If an abnormal noise does not show, replace Controller PCB.

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

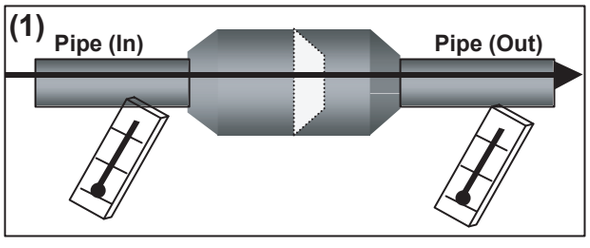


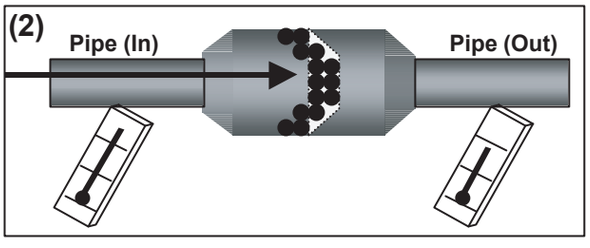
If it is open, it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between i nlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In th is case, replace Strainer.





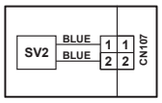
SERVICE PARTS INFORMATION 11

Outdoor Unit Solenoid Valve (SV2)

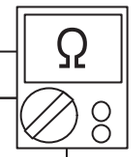
Check Point 1 : Check connections

☐ Check connection of connector.
(Loose connector or open cable)

- AOU36, 48, 60RLAVM4
  >> CN107



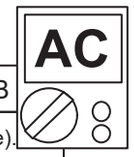
Check Point 2 : Check Solenoid Coil



☐ Remove connector and check if coil is open.
(Normal resistance value of each coil: 1495± 7%Ω)

>> If Resistance value is abnormal, replace Solenoid Coil.

Check Point 3 : Check Voltage from Controller PCB

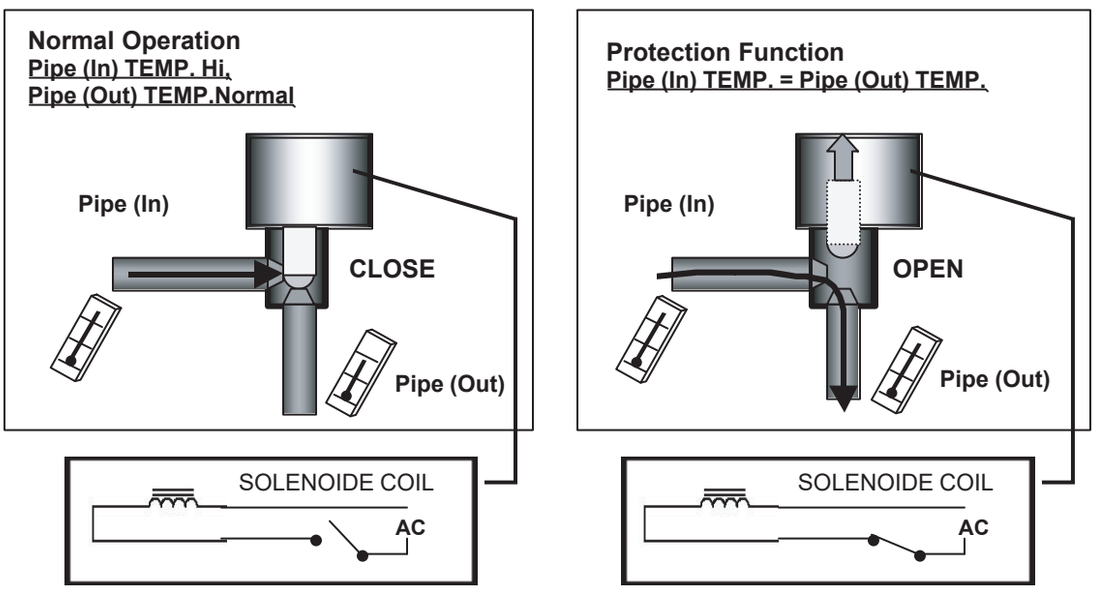


☐ Remove connector and check the voltage (Rated AC voltage).

>> If the voltage does not appear, replace Controller PCB.

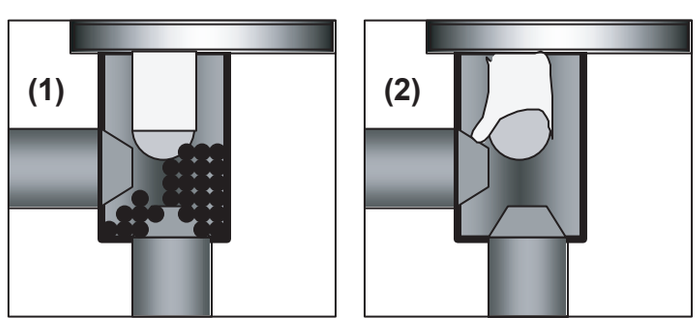
Check Point 4 : Check opening & closing operation of Valve

☐ Depending on either during operation or protection control, check if Valve is operating normally.
(When Valve opens, there is no temperature difference between Inlet and Outlet.)



☐ If the valve closes by removing the connector of the valve which does not close, it is considered to be Controller PCB failure. Replace Controller PCB.

☐ If it does not close by removing connector, there is a possibility of (1) clogging by dirt, or (2) deformation by the heat at the time of Solenoid Valve installation.
In this case, replace Solenoid Valve.

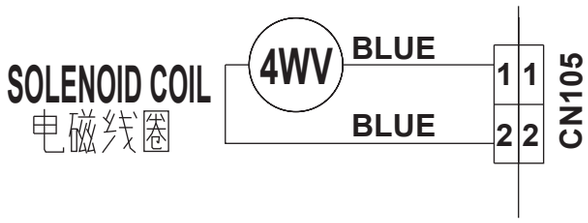


SERVICE PARTS INFORMATION 12

4-WAY VALVE

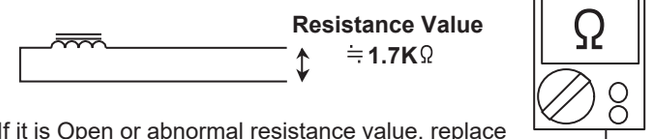
Check Point 1 : Check Circuit connection

- Check the connection of connector CN 105



Check Point 2 : Check Solenoid Coil

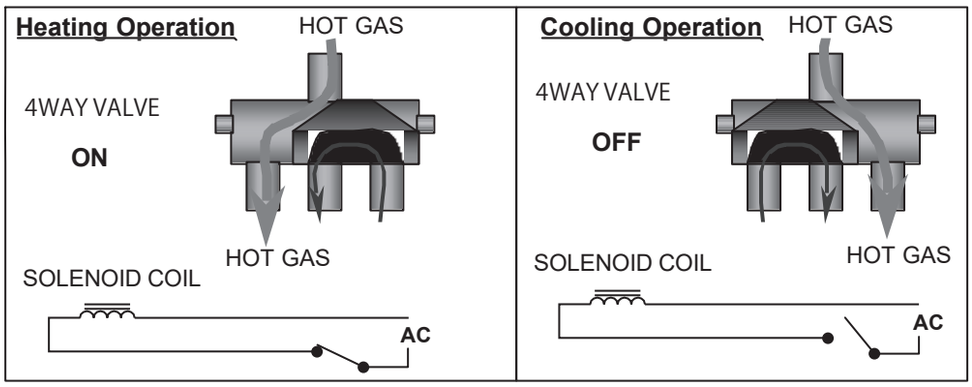
- Remove CN6 from PCB and check the resistance value of coil



☆If it is Open or abnormal resistance value, replace Solenoid Coil

Check Point 3: Check Operation of 4 Way Valve

- Check each piping temperature, and confirm the location of the valve by the temperature difference.



☆If the valve location is not proper, replace 4 way valve.

Check Point 4: Check Voltage from Controller PCB

- Remove connector and check the voltage (Rated AC voltage).

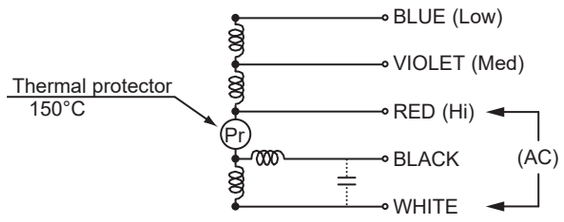
>> If the voltage does not appear, replace Controller PCB.

SERVICE PARTS INFORMATION 13

Indoor Unit AC Fan Motor

Check Point : ARUH36TLAV (High Static Pressure Duct Type)

☐ Check each winding resistance of the motor
► **If Resistance value is abnormal, replace motor.**

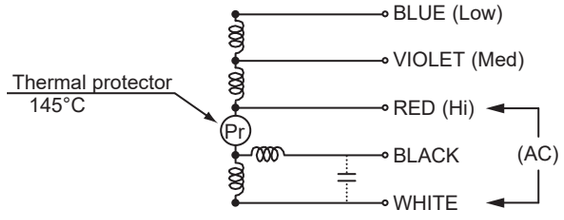


Lead wire	Resistance value
White – Red	**19.8 Ω ±7%**
Red – Black	**23.4 Ω ±7%**
Red – Violet	**8.75 Ω ±7%**
Violet – Blue	**8.75 Ω ±7%**

68°F(20°C)

Check Point : ARUH48/ 60TLAV (High Static Pressure Duct Type)

☐ Check each winding resistance of the motor
► **If Resistance value is abnormal, replace motor.**



Lead wire	Resistance value
White – Red	**8.94 Ω ±7%**
Red – Black	**9.56 Ω ±7%**
Red – Violet	**3.41 Ω ±7%**
Violet – Blue	**2.65 Ω ±7%**

68°F(20°C)

SERVICE PARTS INFORMATION 14-1

Indoor Unit Fan Motor <DC motor>

⚠ When you approach this part, please cut off the power supply and wait for a while until DC voltage has been discharged.

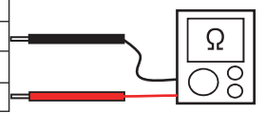
Check Point 1 : Check rotation of Fan

・Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.

Check Point 2 : Check resistance of Indoor Fan Motor

・Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
>>If they are short-circuited (below 300 kΩ), replace Indoor fan motor and Controller PCB.

Pin number (wire color)	Terminal function (symbol)
1 (Brown or Blue)	Feed back (FG)
2 (Yellow)	Speed command (Vsp)
3 (White)	Control voltage (Vcc)
4 (Black)	Earth terminal (GND)
5	No function
6 (Red)	DC voltage (Vm)



SERVICE PARTS INFORMATION 14-2

Indoor Unit Fan Motor <DC motor>
(Lower fan motor of Compact Floor model)

⚠ When you approach this part, please cut off the power supply and wait for a while until DC voltage has been discharged.

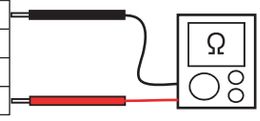
Check Point 1 : Check rotation of Fan

・Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.

Check Point 2 : Check resistance of Indoor Fan Motor

・Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
>>If they are short-circuited (below 300 kΩ), replace Indoor fan motor and Controller PCB.

Pin number (wire color)	Terminal function (symbol)
1 (Blue)	Feed back (FG)
2 (Yellow)	Speed command (Vsp)
3 (White)	Control voltage (Vcc)
4 (Black)	Earth terminal (GND)
5	No function
6	No function
7 (Red)	DC voltage (Vm)



SERVICE PARTS INFORMATION 14-3

Indoor Unit Fan Motor <DC motor>
(For ASUB30/36TLAV2, AUUB18 - 48TLAV2)

⚠ When you approach this part, please cut off the power supply and wait for a while until DC voltage has been discharged.

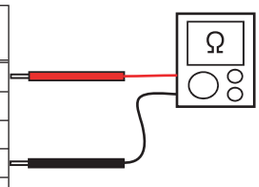
Check Point 1 : Check rotation of Fan

・Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.

Check Point 2 : Check resistance of Indoor Fan Motor

・Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
>>If they are short-circuited (below 300 kΩ), replace Indoor fan motor and Controller PCB.

Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Earth terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown or Blue)	Feed back (FG)



SERVICE PARTS INFORMATION 15

Outdoor Unit Fan Motor

⚠ When you approach this part, please cut off the power supply and wait for a while until DC voltage has been discharged.

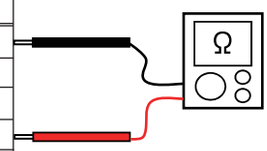
Check Point 1 : Check rotation of Fan

・Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.

Check Point 2 : Check resistance of Outdoor Fan Motor

・Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
>>If they are short-circuited (below 300 kΩ), replace Outdoor fan motor.

Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Earth terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	Feed back (FG)



SERVICE PARTS INFORMATION 16

Discharge Pressure Sensor
Suction Pressure Sensor

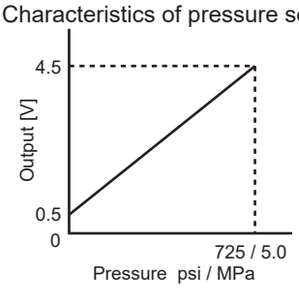
1. Discharge Pressure Sensor

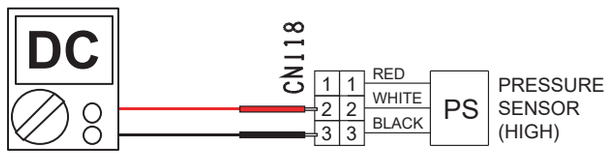
Check Point : Check Voltage from Main PCB

DC

☐ With the connector connected to the PCB, measure the voltage between CN118:2-3 of the Main PCB.

- Characteristics of pressure sensor





psi	0.0	14.5	29.0	43.5	58.0	72.5	101.5	116.0	130.5	145.0	174.0	203.0	232.0	261.0	290.0
MPa	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.20	1.40	1.60	1.80	2.00
Output (V)	0.50	0.58	0.66	0.74	0.82	0.90	1.06	1.14	1.22	1.30	1.46	1.62	1.78	1.94	2.10

psi	319.0	348.0	377.0	406.0	435.0	464.0	493.0	522.0	551.0	580.0	609.0	638.0	667.0	696.0	725.0
MPa	2.20	2.40	2.60	2.80	3.00	3.20	3.40	3.60	3.80	4.00	4.20	4.40	4.60	4.80	5.00
Output (V)	2.26	2.42	2.58	2.74	2.90	3.06	3.22	3.38	3.54	3.70	3.86	4.02	4.18	4.34	4.50

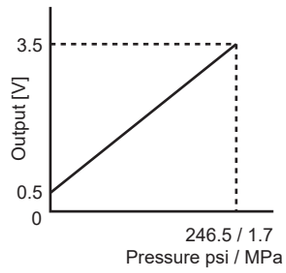
2. Suction Pressure Sensor

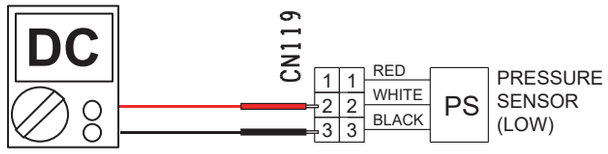
Check Point : Check Voltage from Main PCB

DC

☐ With the connector connected to the PCB, measure the voltage between CN119:2-3 of the Main PCB.

- Characteristics of pressure sensor





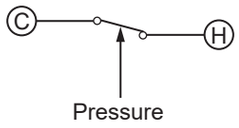
psi	0.0	14.5	29.0	43.5	58.0	72.5	101.5	116.0	130.5	145.0	159.5	174.0	188.5	203.0	217.5
MPa	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50
Output (V)	0.50	0.68	0.85	1.03	1.21	1.38	1.74	1.91	2.09	2.27	2.44	2.62	2.79	2.97	3.15

psi	232.0	246.5
Mpa	1.60	1.70
Output (V)	3.32	3.50

SERVICE PARTS INFORMATION 17

Pressure Switch

▪ Type of contact



▪ Characteristics of pressure switch

Contact : Short ⇒ Open	609 ~ 587.3 psi (4.2 ~ 4.05MPa)
Contact : Open ⇒ Short	464±21.8 psi (3.2±0.15MPa)

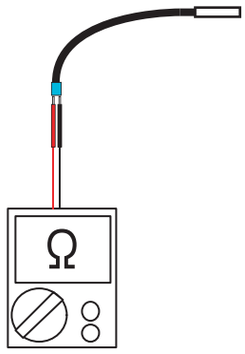
SERVICE PARTS INFORMATION 18

Thermistor

Check Point : Check Thermistor resistance value

☐ Remove connector and check Thermistor resistance value.

Temperature [°F]	Temperature [°C]	Resistance Value [kΩ]		
		Thermistor A	Thermistor B	Thermistor C
- 22	- 30	---	87.2	177.0
- 4	- 20	---	47.8	97.2
14	- 10	---	27.2	55.5
23	- 5	---	20.8	42.4
32	0	---	16.1	32.7
41	5	---	12.5	25.4
50	10	102.5	9.8	19.9
59	15	---	7.7	15.7
68	20	64.2	6.1	12.5
77	25	51.4	4.9	10.0
86	30	41.3	3.9	8.1
104	40	27.3	2.6	5.3
122	50	18.4	1.8	3.6
140	60	12.7	1.2	---
158	70	8.9	0.8	---
176	80	6.4	---	---
194	90	4.6	---	---
212	100	3.4	---	---
230	110	2.6	---	---
248	120	2.0	---	---
Applicable Thermistors		Discharge temp. TH : [TH1] Comp temp. TH : [TH10]	Heat exchanger. TH : [TH5] Suction temp. TH : [TH4] Liquid temp. TH : [TH7] Sub-cool heat exchanger(inlet) TH : [TH8] Sub-cool heat exchanger(outlet) TH : [TH9]	Outdoor temp. TH : [TH3]



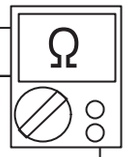
SERVICE PARTS INFORMATION 19

ACTPM
(Active Filter Module)

Check Point 1 : Appearance check

□ No fissures, breaks, damage, etc. at the body and terminals section?

Check Point 2 : Electric check



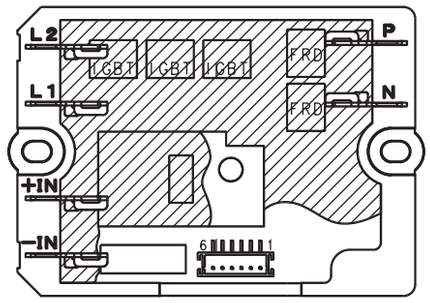
①Disconnect the connection wires.

②Set the tester to the "Resistance" mode, and measure the resistance between the following terminals.

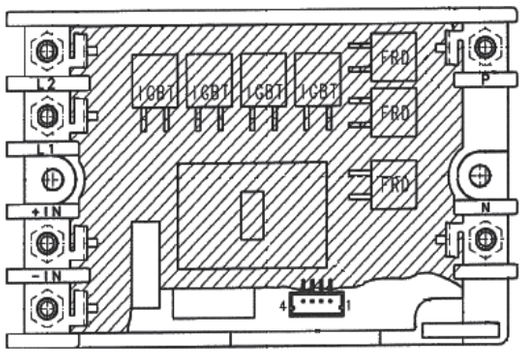
(+IN) - (-IN)
L1 - L2
P - N

③Judge the result of ②as follows:

All 3 points several MΩ or greater	: Normal
1 or more points several kΩ to short	: Defective

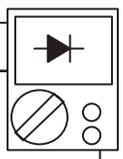


ACTPM (For AOU36,48RLAVM)



ACTPM (For AOU60LAVM)

Check Point 3



④ Set the tester to the "Diode" mode, and measure the voltage value between the following terminals.

Tester +side (red)	Tester - side (black)	Tester display [V]
L2	P	

⑤Judge the result of ④ as follows:

Several 0.3V to 0.7V	: Normal
Under 0.1V or over load	: Defective

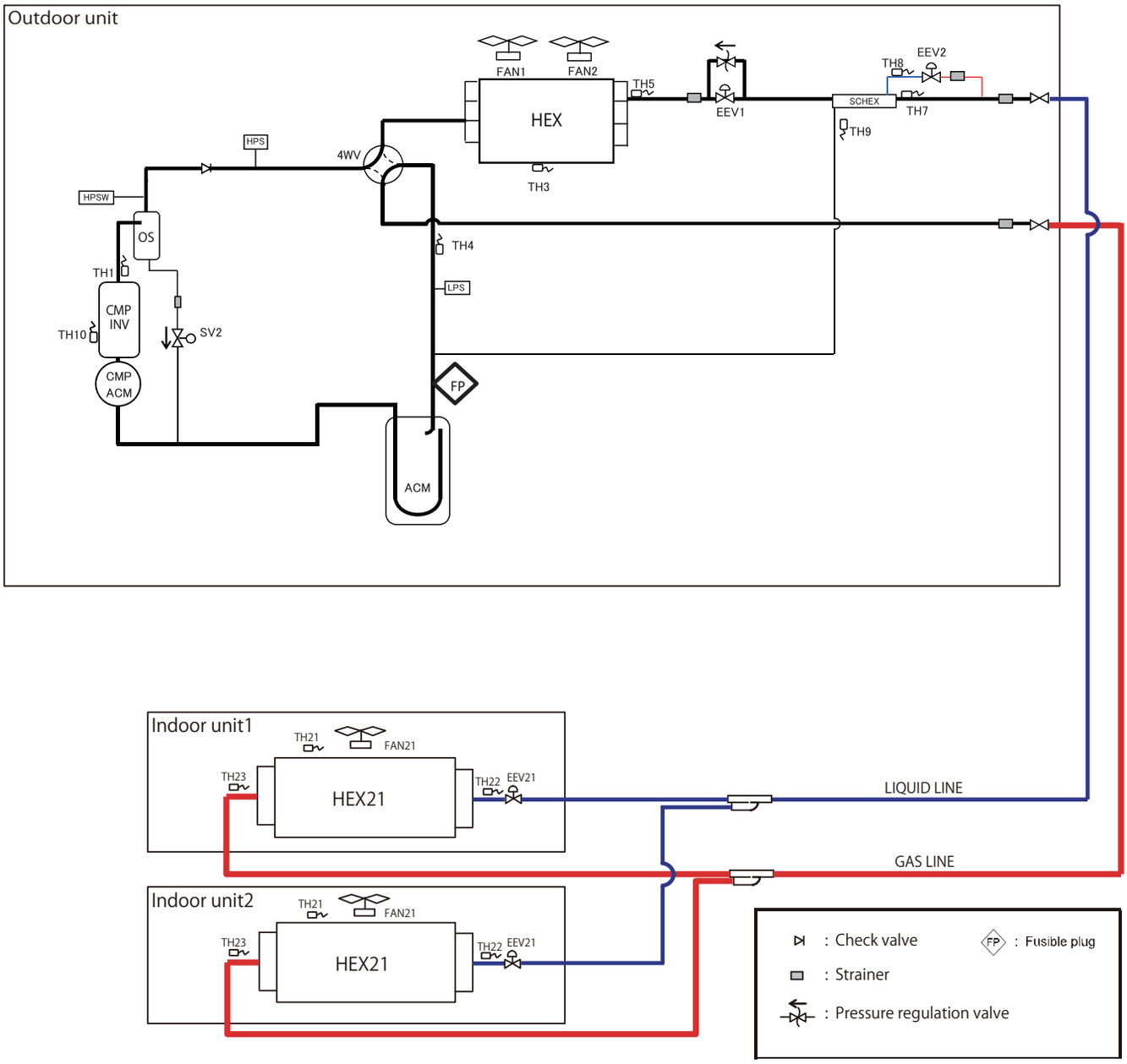
Refrigerant R410A INVERTER

AIRSTAGE J-IV

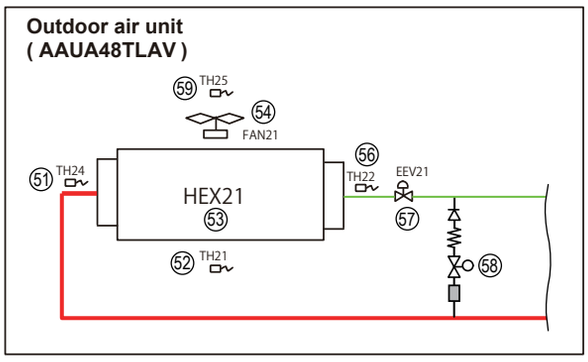
5. APPENDING DATA (UNIT)

5-1 REFRIGERANT CIRCUIT

MODELS : AOU36RLAVM4, AOU48RLAVM4, AOU60RLAVM4



* Indoor unit (Outdoor air unit)



: Capillary : Strainer

SYMBOL DESCRIPTION

Outdoor unit

MARK	DESCRIPTION
CMP	Compressor (Inverter type)
HEX	Heat exchanger
FAN 1	Fan 1
FAN 2	Fan 2
ACM	Accumulator
OS	Oil separator
SCHEX	Sub-cool heat exchanger
HPS	High pressure sensor
LPS	Low pressure sensor
HPSW	High pressure sensor switch
4WV	4-way valve
EEV 1	Electric expansion valve 1
EEV 2	Electric expansion valve 2
SV 2	Solenoid valve
TH 1	Discharge temperature thermistor
TH 3	Outdoor temperature thermistor
TH 4	Suction temperature thermistor
TH 5	Heat exchanger (outlet) thermistor
TH 7	Liquid temperature thermistor
TH 8	Sub-cool heat exchanger (inlet) thermistor
TH 9	Sub-cool heat exchanger (outlet) thermistor
TH 10	Compressor temperature thermistor

Marking (Tube)
Blue
–
Red
Pink
Green
White
Brown
–

Indoor unit

MARK	DESCRIPTION
HEX 21	Heat exchanger
FAN 21	Fan
EEV 21	Electric expansion valve
TH 21	Room temperature thermistor
TH 22	Heat exchanger (inlet) thermistor
TH 23	Heat exchanger (outlet) thermistor

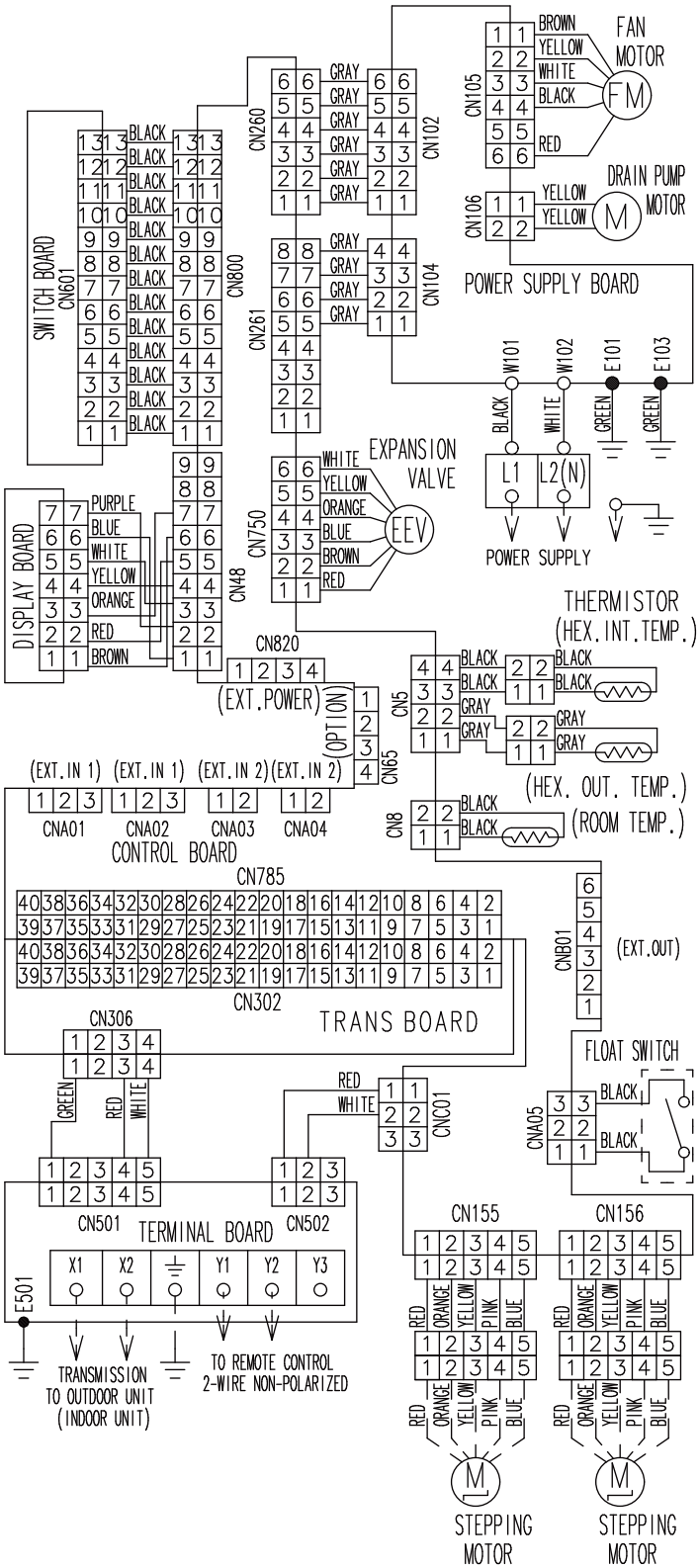
*Indoor unit (Outdoor air unit)

No.	Part name	Function
51	Heat exchanger outlet thermistor	Detects the temperature of refrigerant
52	Suction airflow temp. thermistor	Detects the temperature of suction airflow
53	Heat exchanger	Operates as Condensor / Evapolator
54	Fan motor	Controlled by setting / protection / Compressor OFF
55	Fan motor	Controlled by setting / protection / Compressor OFF
56	Heat exchanger inlet thermistor	Detects the temperature of refrigerant
57	Electric expansion valve	Controlled by setting / protection / Compressor OFF
58	Solenoid valve (Bypass)	Opens at compressor OFF in Heating mode
59	Discharge airflow temp. thermistor	Detects the temperature of discharge airflow

5-2-1 Indoor Unit

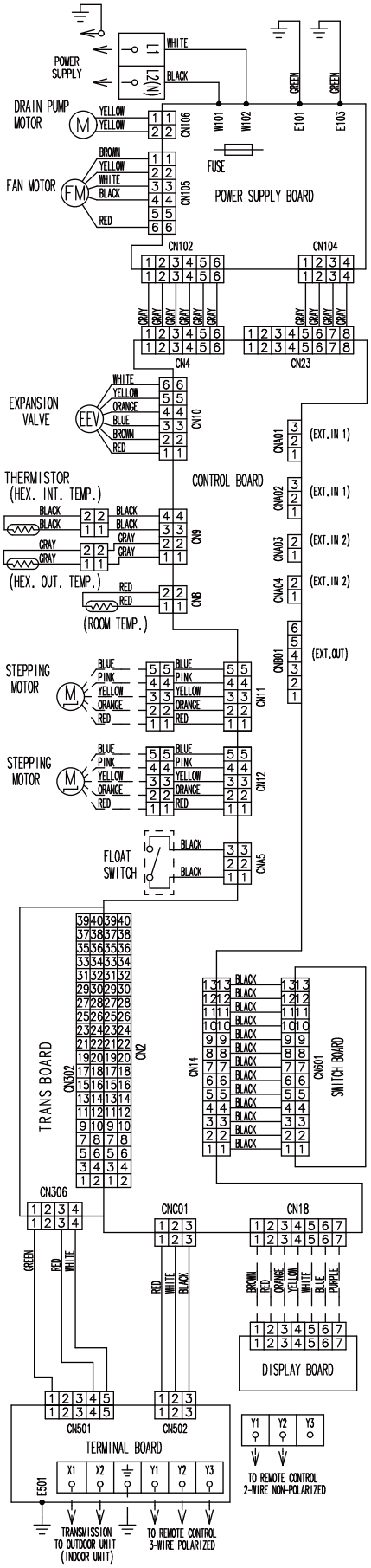
Compact cassette type

■ Models: AUUA4TLAV2, AUUA7TLAV2, AUUA9TLAV2, AUUA12TLAV2, AUUA14TLAV2, AUUA18TLAV2, and AUUA24TLAV2



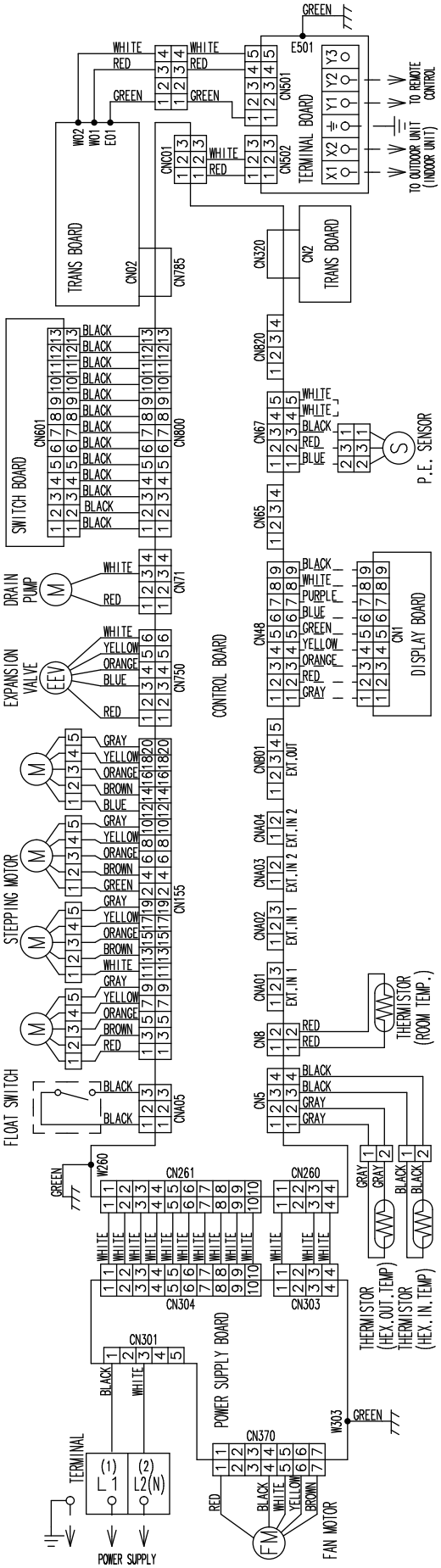
4-way flow cassette type

■ Models: AUUB18TLAV, AUUB24TLAV, AUUB30TLAV and AUUB36TLAV



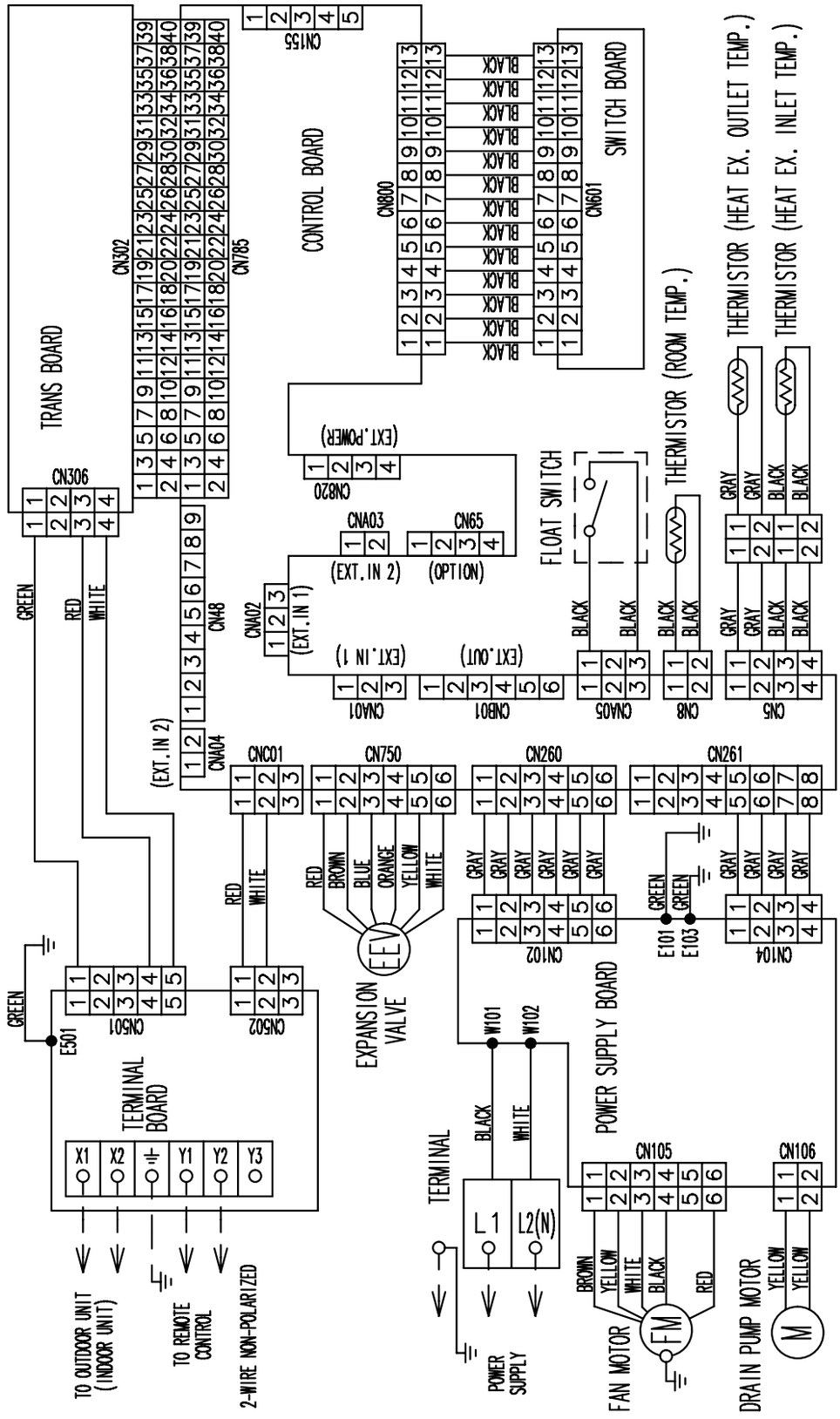
Circular flow cassette type

■ Models: AUUB18TLAV2, AUUB24TLAV2, AUUB30TLAV2, AUUB36TLAV2, and AUUB48TLAV2



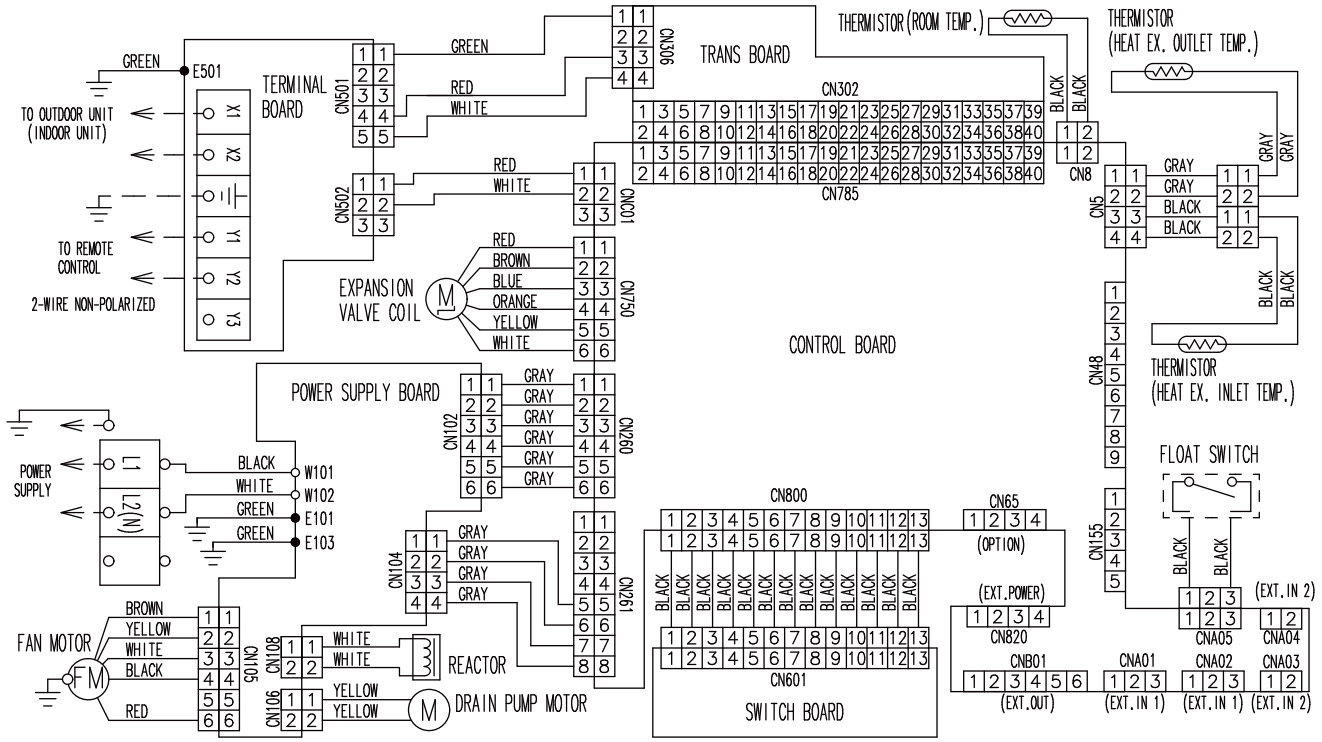
Mini duct type

■ Model: ARUL4TLAV2



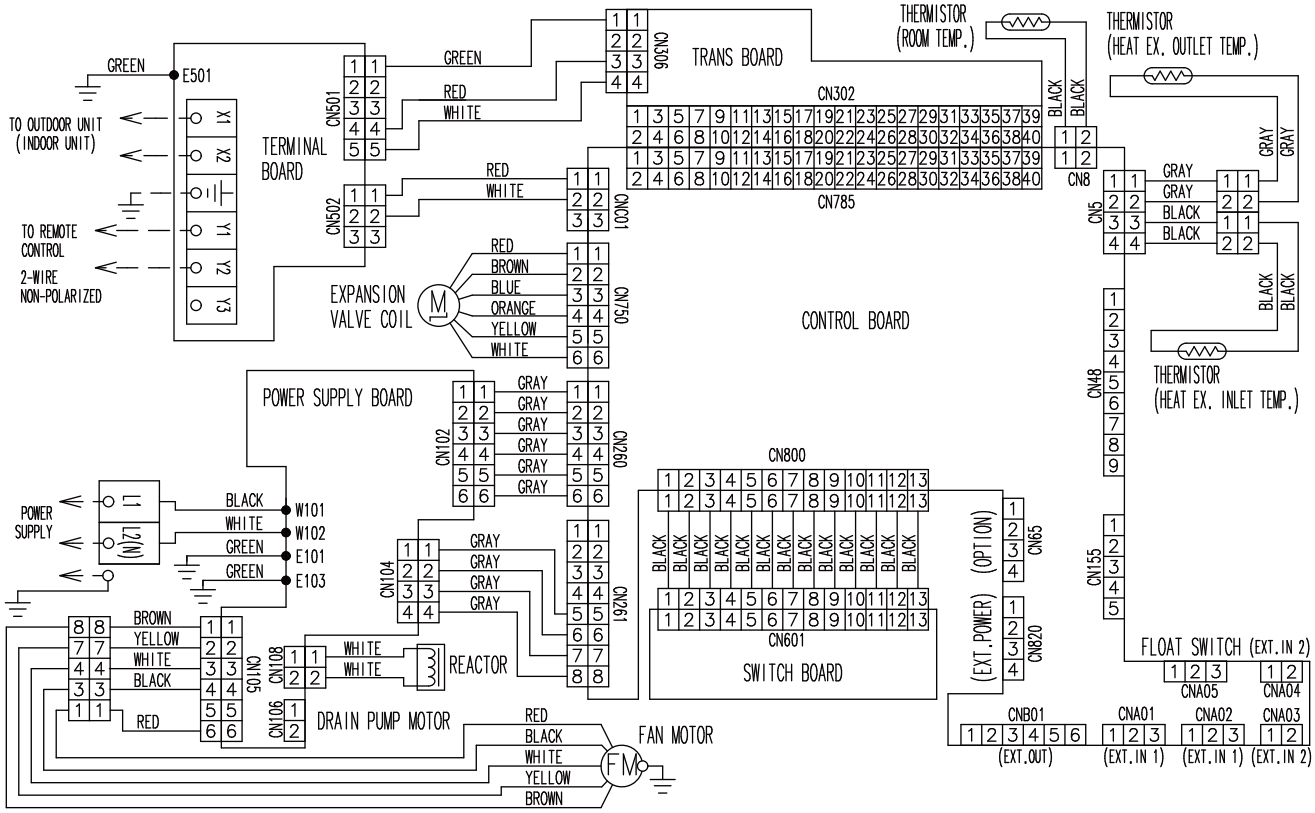
Slim duct/Slim concealed floor type

■ Models: ARUL7TLAV2, ARUL9TLAV2, ARUL12TLAV2, ARUL14TLAV2, and ARUL18TLAV2



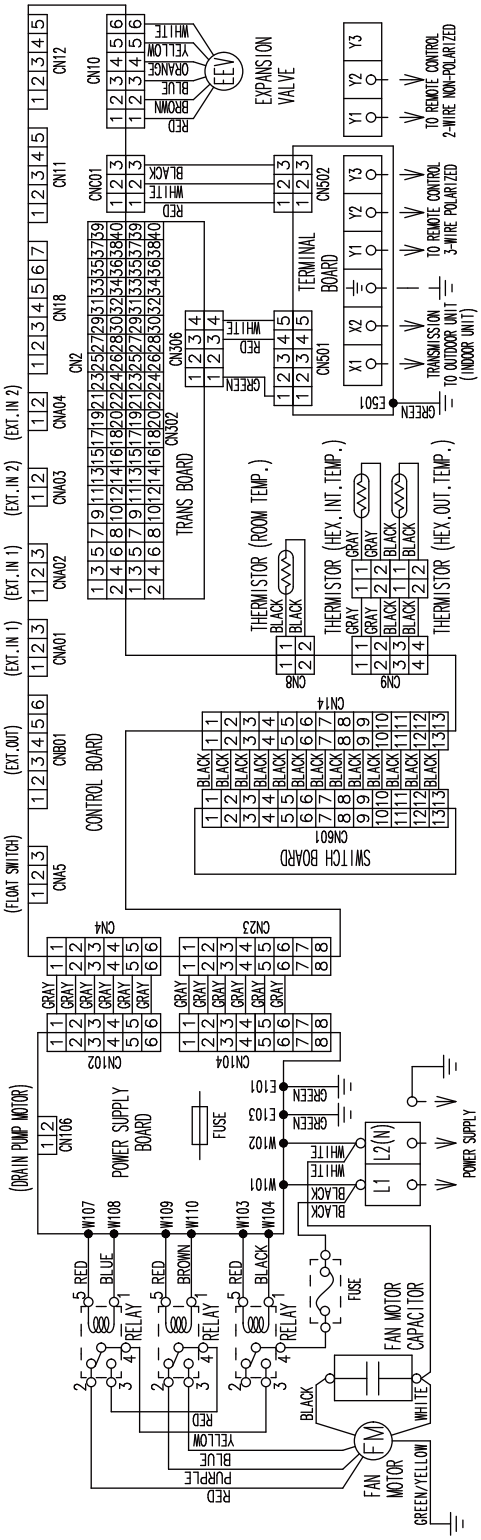
Medium static pressure duct type

■ Models: ARUM24TLAV2, ARUM30TLAV2, and ARUM36TLAV2



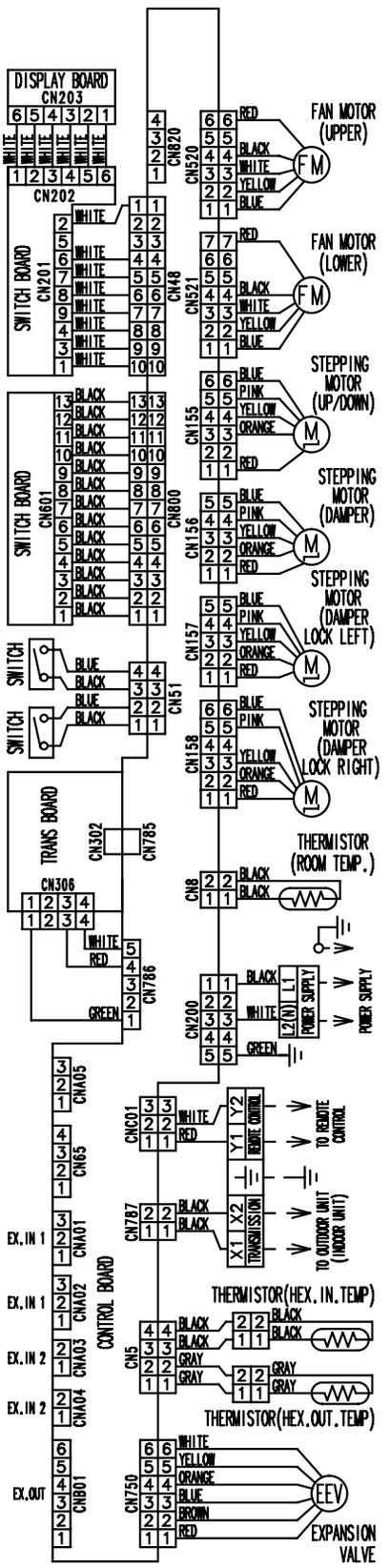
High static pressure duct type

■ Models: ARUH36TLAV, ARUH48TLAV, and ARUH60TLAV



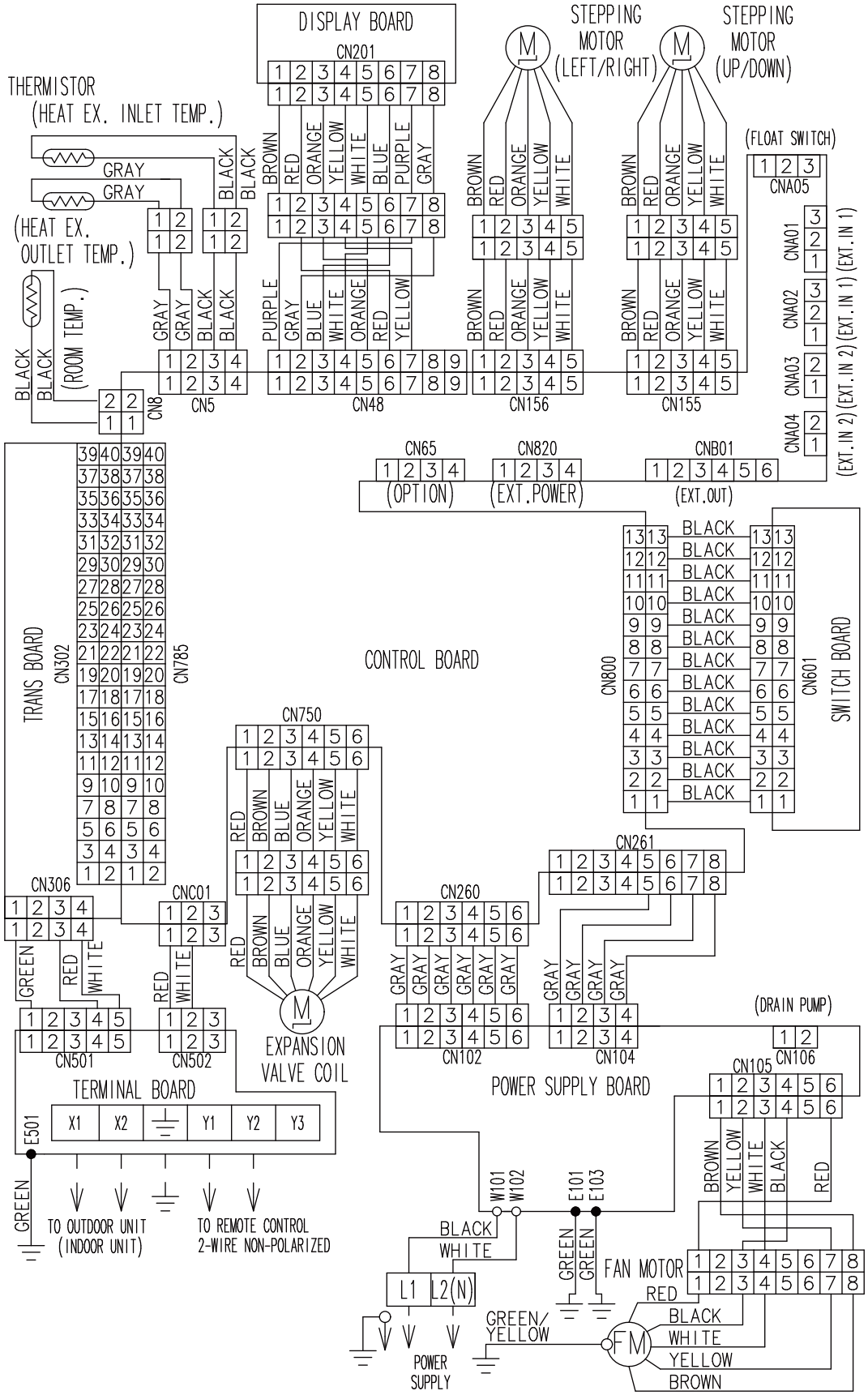
Compact floor type

■ Models: AGUA4TLAV2, AGUA7TLAV2, AGUA9TLAV2, AGUA12TLAV2, and AGUA14TLAV2



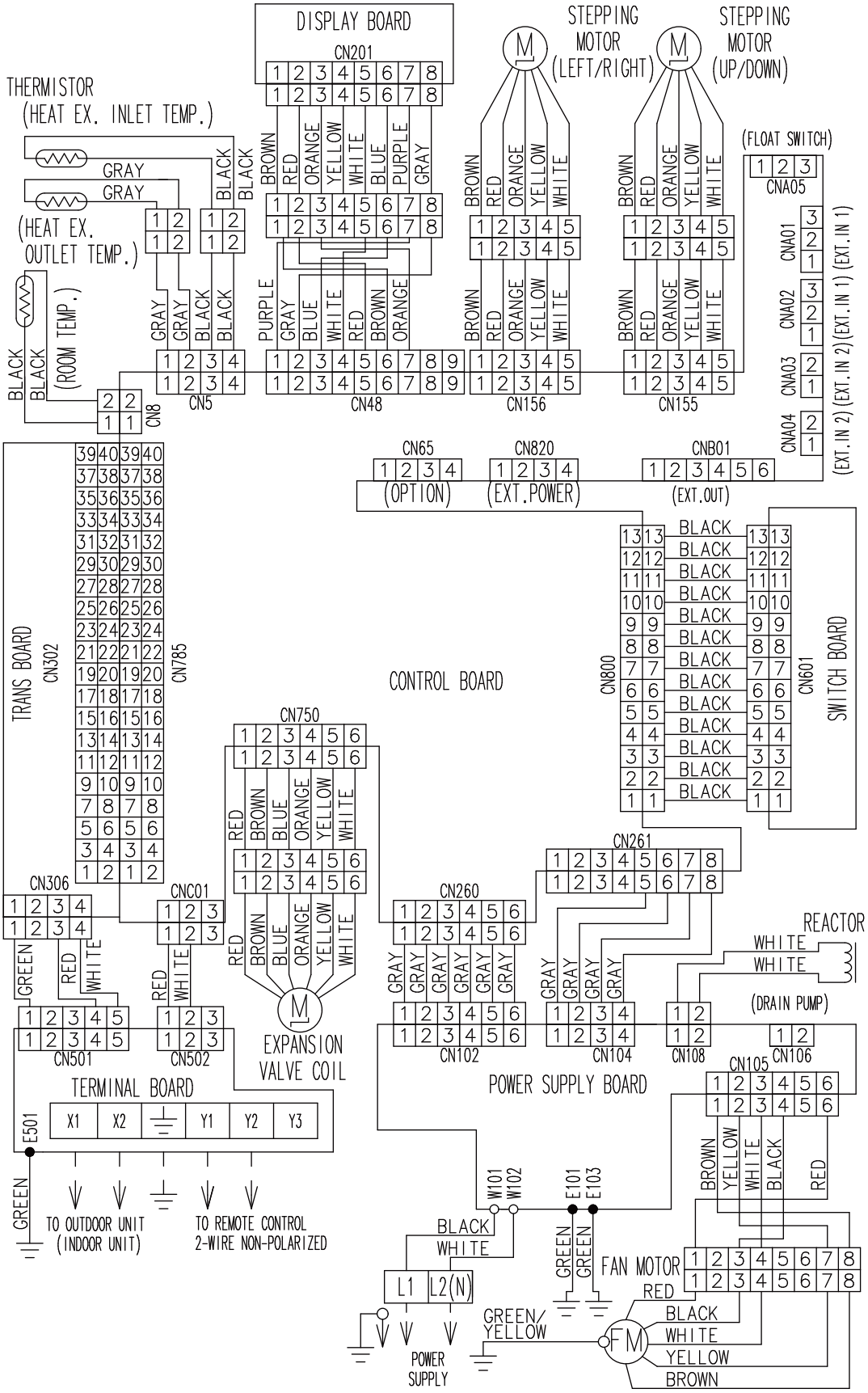
Floor/Ceiling type

■ Models: ABUA12TLAV2, ABUA14TLAV2, ABUA18TLAV2, and ABUA24TLAV2



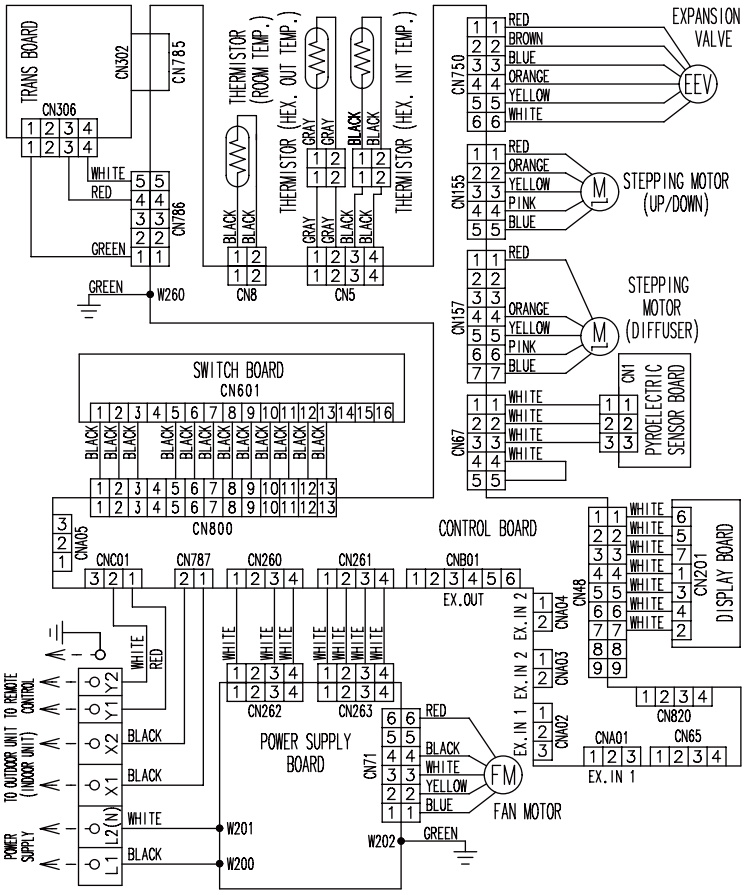
Ceiling type

■ Models: ABUA30TLAV2 and ABUA36TLAV2

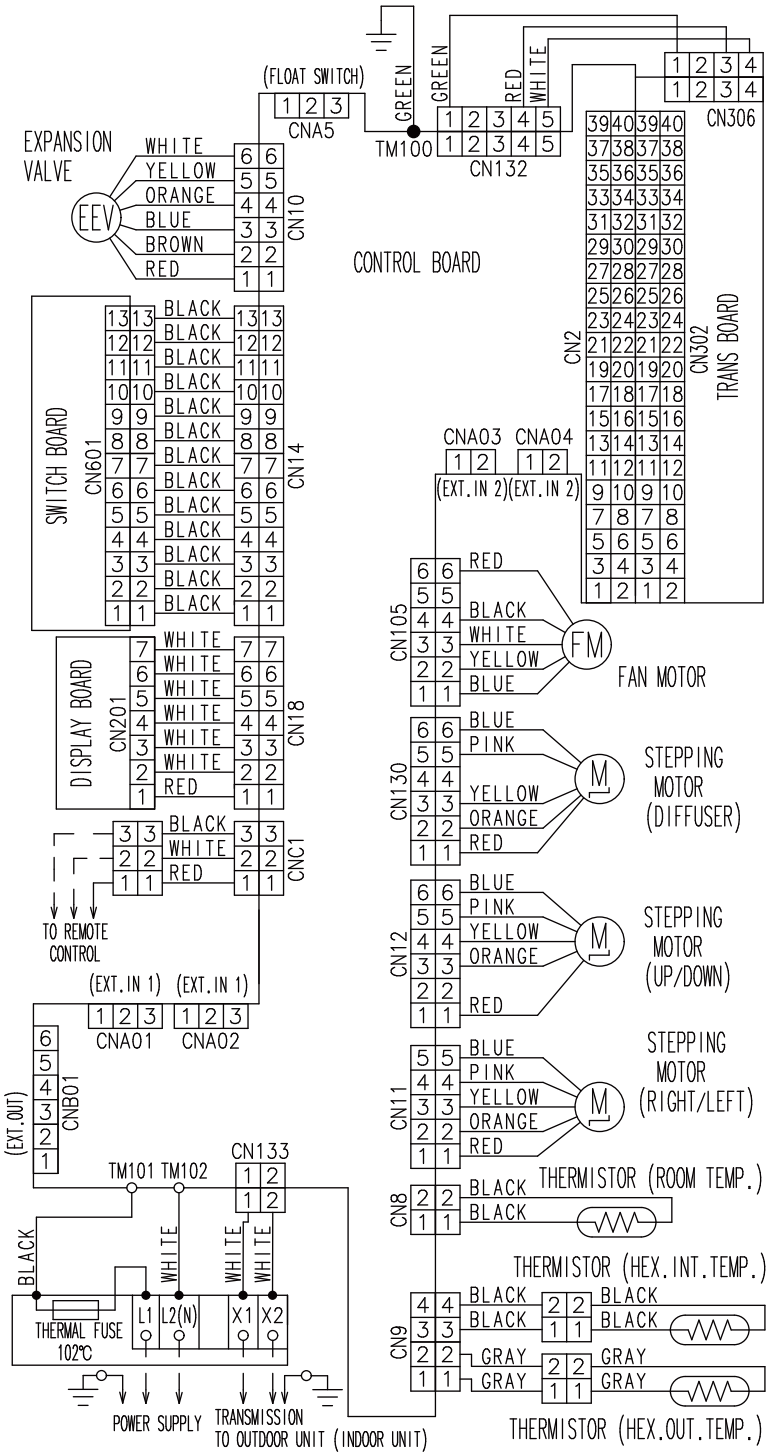


Wall mounted type

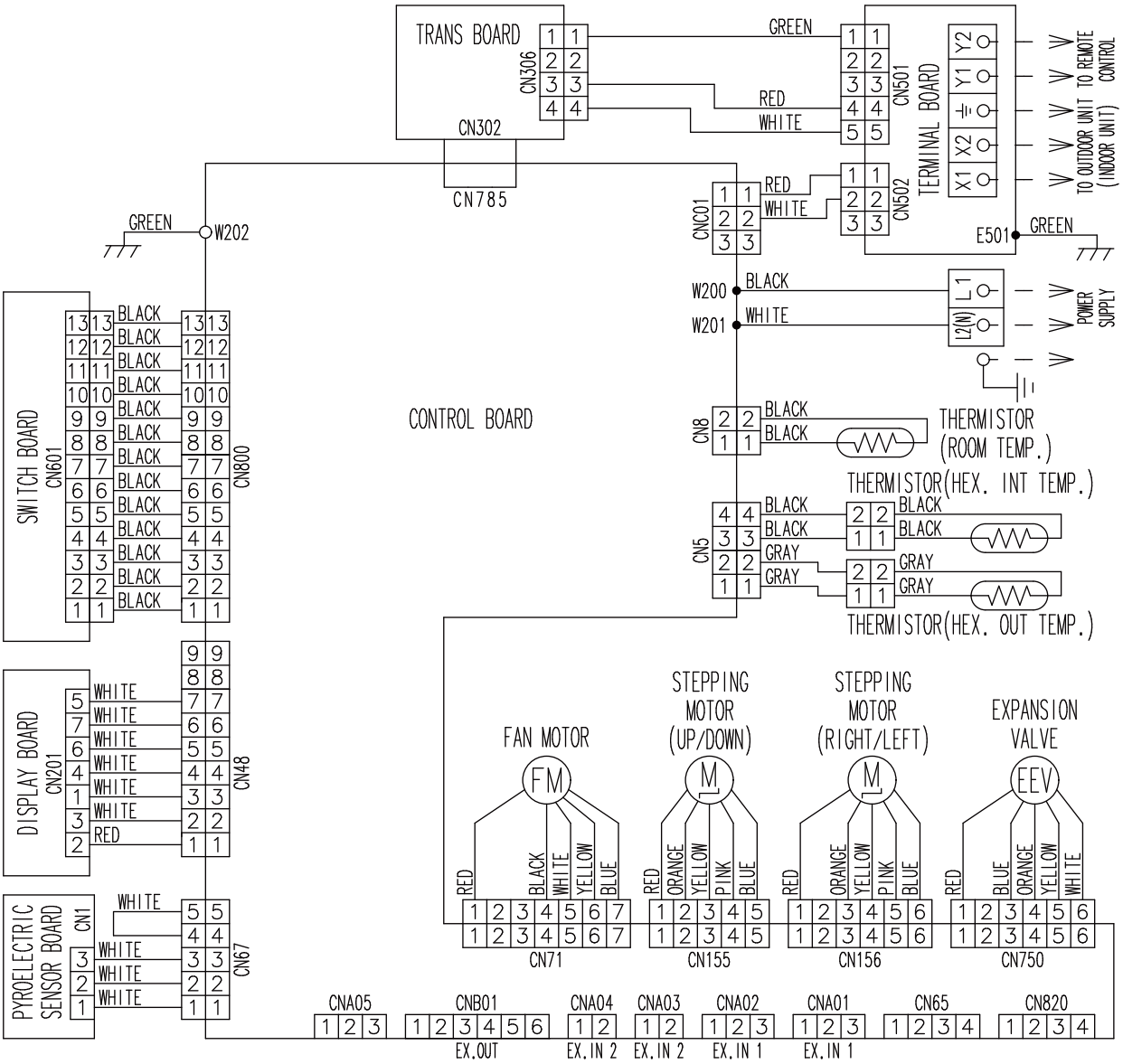
■ Models: ASUA4TLAV2, ASUA7TLAV2, ASUA9TLAV2, ASUA12TLAV2, and ASUA14TLAV2



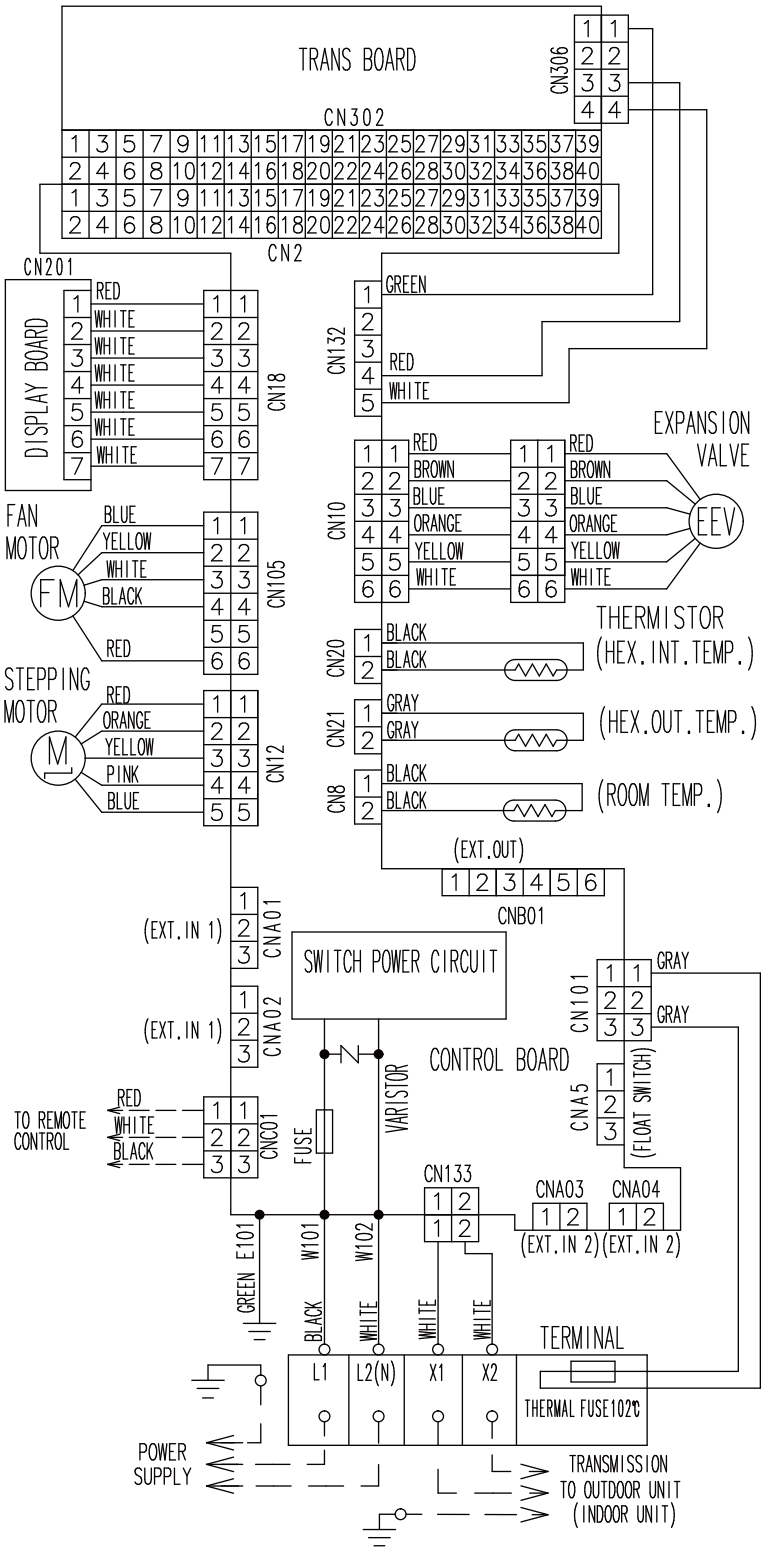
■ Models: ASUB18TLAV1, ASUB24TLAV1, ASUB18TLAV, and ASUB24TLAV



■ Models: ASUA30TLAV2 and ASUA36TLAV2

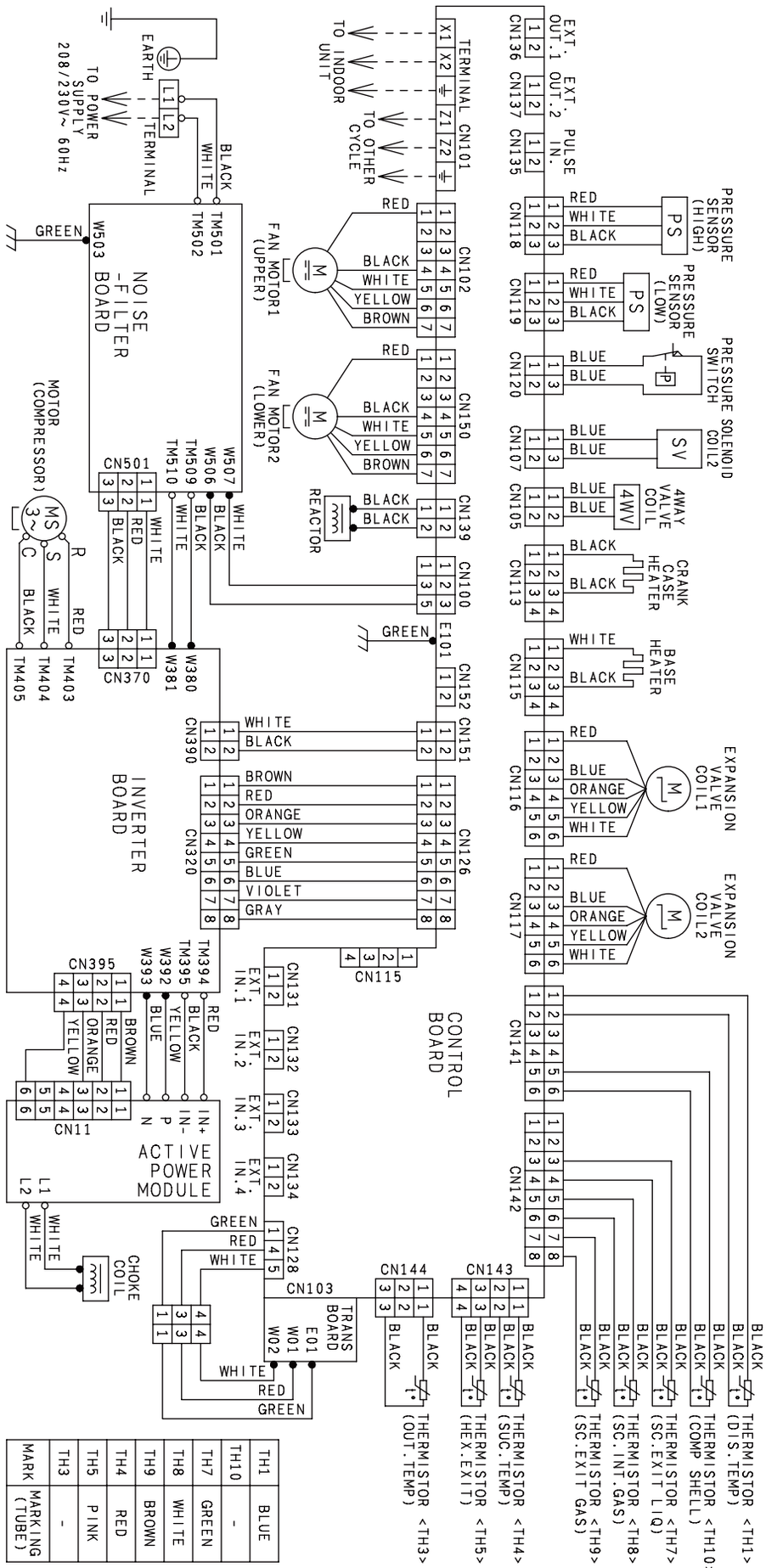


■ Models: ASUA7TLAV, ASUA9TLAV, ASUA12TLAV , and ASUA14TLAV



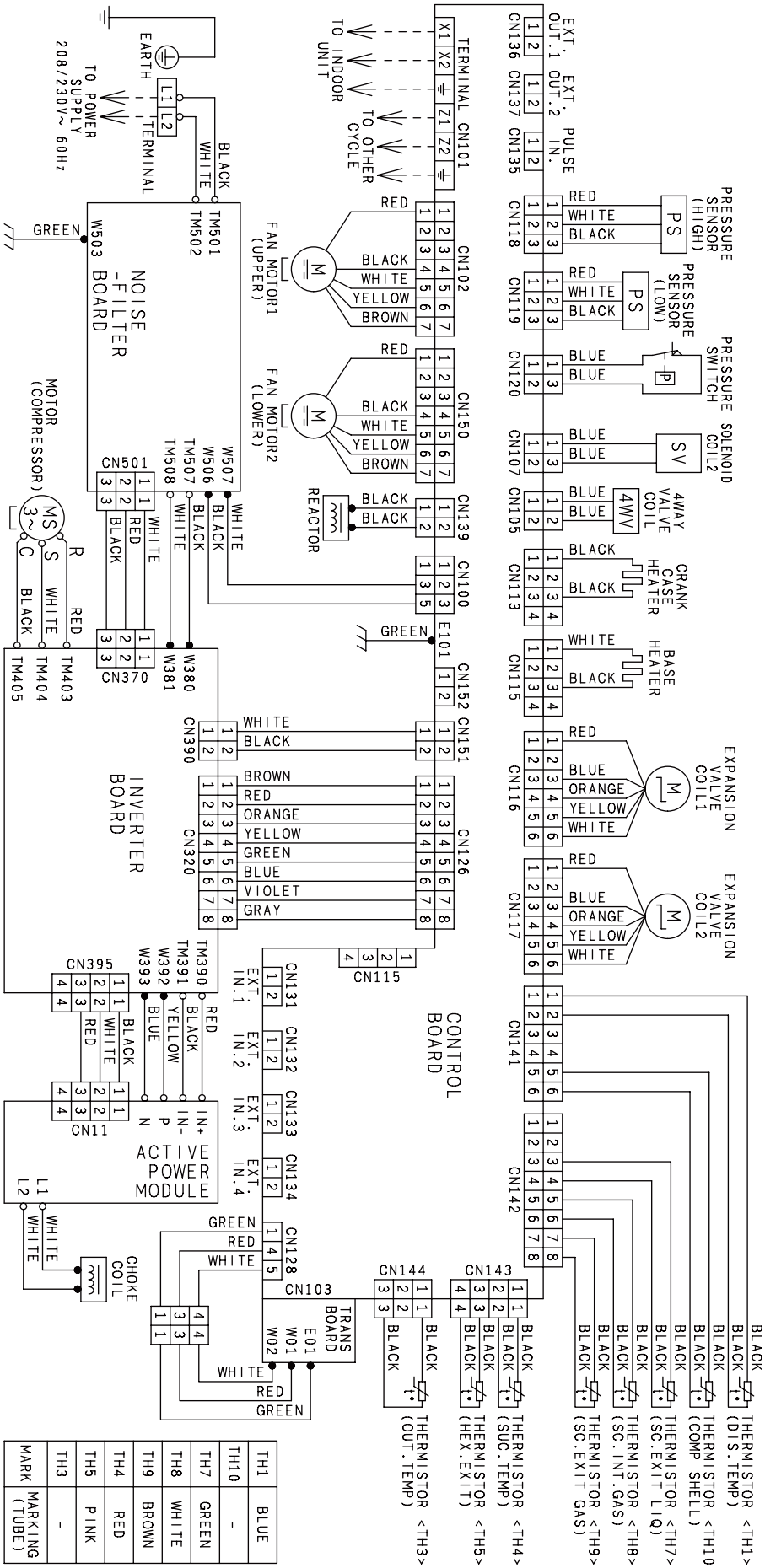
5-2-2 Outdoor Unit

Models: AOU36RLAVM4 and AOU48RLAVM4



MARK	MARKING (TUBE)
TH1	BLUE
TH10	-
TH7	GREEN
TH8	WHITE
TH9	BROWN
TH4	RED
TH5	PINK
TH3	-

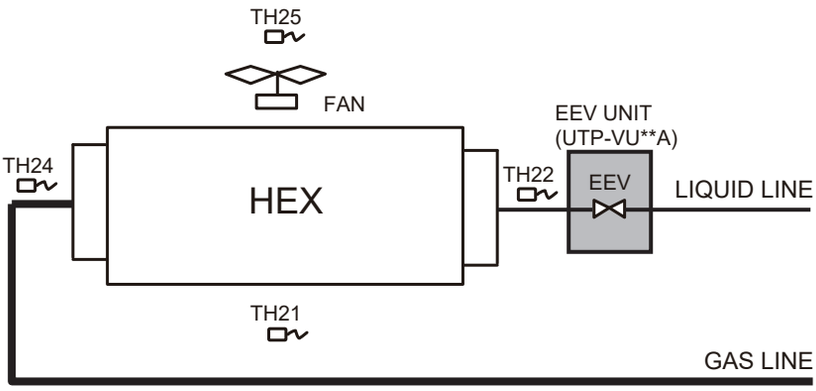
Model: AOU60RLAVM4



5-2-3 DX Kit

1 . REFRIGERANT CIRCUIT

MODELS: UTP-VU30A, UTP-VU60A, UTP-VU90A

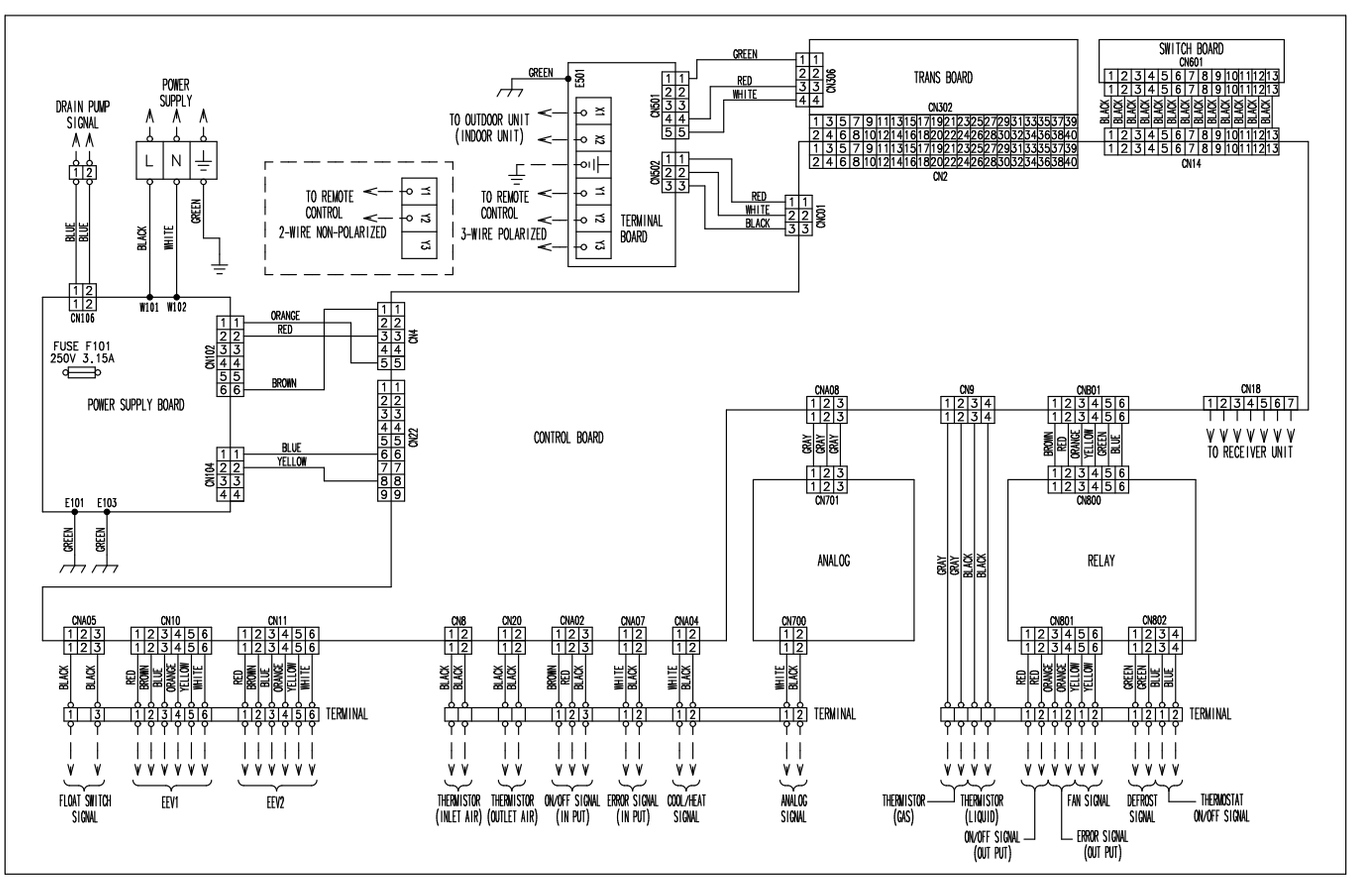


SYMBOL DESCRIPTION

MARK	DESCRIPTION
HEX	Heat exchanger (Locally purchased)
FAN	Fan (Locally purchased)
EEV	Electric expansion valve
TH21	Suction airflow temperature thermistor
TH22	Heat exchanger (inlet) thermistor
TH24	Heat exchanger (outlet) thermistor
TH25	Discharge airflow temperature thermistor

2 . WIRING DIAGRAMS

MODEL: UTY-VDGU



3 . TERMINAL BLOCK LAYOUT

3rd row

				1	2	1	2	1	2	1	2	1	2
Thermistor (GAS)		Thermistor (LIQUID)		ON/OFF Signal (OUT PUT)		Error SIGNAL (OUT PUT)		FAN SIGNAL		DEFROST SIGNAL		THERMOSTAT ON/OFF SIGNAL	

2nd row

				1	2	3	1	2	1	2	1	2	
Thermistor (INLET AIR)		Thermistor (OUTLET AIR)		ON/OFF Signal (IN PUT)			ERROR SIGNAL (IN PUT)		COOL/HEAT SIGNAL		ANALOG SIGNAL		

1st row

1	2	1	2	3	4	5	6	1	2	3	4	5	6
FLOAT SW SIGNAL		EEV1						EEV2					

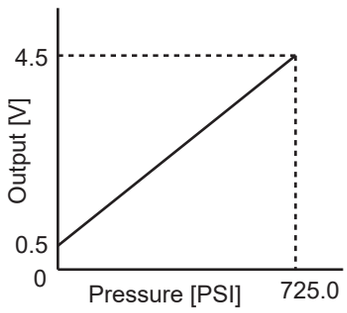
1	2	L	N	E
DRAIN PUMP OUTPUT		POWER SUPPLY		

X1	X2	E	Y1	Y2	Y3
TRANSMISSION TO OUTDOOR UNIT			TO REMOTE-CONTROL		

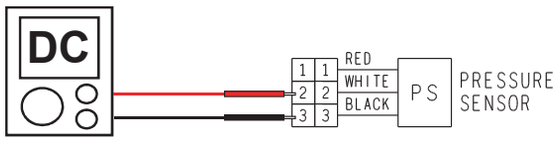
5-3 CHARACTERISTICS OF SENSORS

5-3-1 Pressure senser (PSI / V)

1. Discharge Pressure Sensor - Pressure Sensor (HIGH): CN118 -



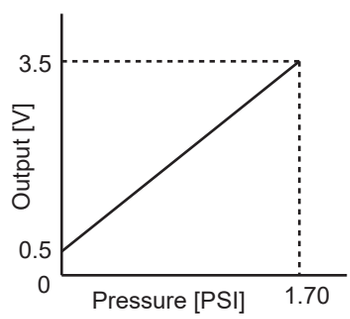
With the connector connected to the PCB, measure the voltage between CN118 : 2-3 of the Main PCB.



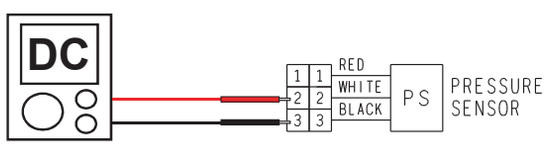
Pressure (PSI)	0.0	14.5	29.0	43.5	58.0	72.5	101.5	116.0	130.5	145.0	174.0	203.0	232.0	261.0	290.0
Output (V)	0.50	0.58	0.66	0.74	0.82	0.90	1.06	1.14	1.22	1.30	1.46	1.62	1.78	1.94	2.10

Pressure (PSI)	319.0	348.0	377.0	406.0	435.0	464.0	493.0	522.0	551.0	580.0	609.0	638.0	667.0	696.0	725.0
Output (V)	2.26	2.42	2.58	2.74	2.90	3.06	3.22	3.38	3.54	3.70	3.86	4.02	4.18	4.34	4.50

2. Suction Pressure Sensor - Pressure Sensor (Low): CN119 -



With the connector connected to the PCB, measure the voltage between CN119 : 2-3 of the Main PCB.

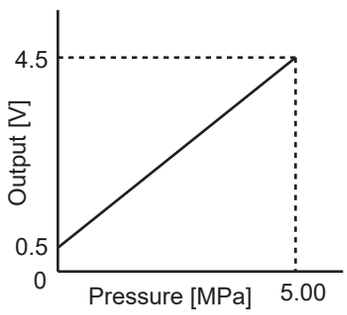


Pressure (PSI)	0.0	14.5	29.0	43.5	58.0	72.5	101.5	116.0	130.5	145.0	159.5	174.0
Output (V)	0.50	0.68	0.85	1.03	1.21	1.38	1.74	1.91	2.09	2.27	2.44	2.62

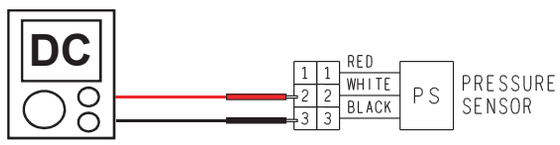
Pressure (PSI)	188.5	203.0	217.5	232.0	246.5							
Output (V)	2.79	2.97	3.15	3.32	3.50							

5-3-2 Pressure senser (MPa / V)

1. Discharge Pressure Sensor - Pressure Sensor (HIGH): CN118 -



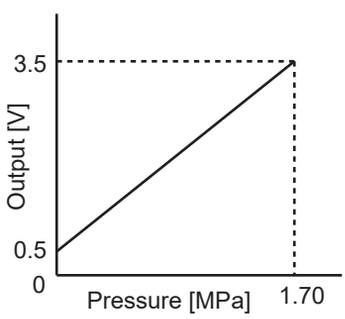
With the connector connected to the PCB, measure the voltage between CN118 : 2-3 of the Main PCB.



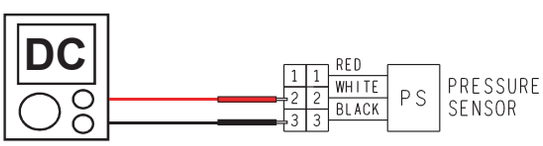
Pressure (MPa)	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.20	1.40	1.60	1.80	2.00
Output (V)	0.50	0.58	0.66	0.74	0.82	0.90	1.06	1.14	1.22	1.30	1.46	1.62	1.78	1.94	2.10

Pressure (MPa)	2.20	2.40	2.60	2.80	3.00	3.20	3.40	3.60	3.80	4.00	4.20	4.40	4.60	4.80	5.00
Output (V)	2.26	2.42	2.58	2.74	2.90	3.06	3.22	3.38	3.54	3.70	3.86	4.02	4.18	4.34	4.50

2. Suction Pressure Sensor - Pressure Sensor (Low): CN119 -



With the connector connected to the PCB, measure the voltage between CN119 : 2-3 of the Main PCB.



Pressure (MPa)	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.10	1.20
Output (V)	0.50	0.68	0.85	1.03	1.21	1.38	1.74	1.91	2.09	2.27	2.44	2.62

Pressure (MPa)	1.30	1.40	1.50	1.60	1.70							
Output (V)	2.79	2.97	3.15	3.32	3.50							

5-3-3 Thermistor resistance (°F / kΩ)

Thermistor resistance value <Outdoor unit side>

Temperature [°F]	Resistance Value [kΩ]		
	Thermistor A	Thermistor B	Thermistor C
- 22	---	87.2	177.0
- 4	---	47.8	97.2
14	---	27.2	55.5
23	---	20.8	42.4
32	---	16.1	32.7
41	---	12.5	25.4
50	102.5	9.8	19.9
59	---	7.7	15.7
68	64.2	6.1	12.5
77	51.4	4.9	10.0
86	41.3	3.9	8.1
104	27.3	2.6	5.3
122	18.4	1.8	3.6
140	12.7	1.2	---
158	8.9	0.8	---
176	6.4	---	---
194	4.6	---	---
212	3.4	---	---
230	2.6	---	---
248	2.0	---	---
Applicable Thermistors	Discharge temp. TH : [TH1] Comp temp. TH : [TH10]	Heat exchanger. TH : [TH5] Suction temp. TH : [TH4] Liquid temp. TH : [TH7] Sub-cool heat exchanger(inlet) TH : [TH8] Sub-cool heat exchanger(outlet) TH : [TH9]	Outdoor temp. TH : [TH3]

Thermistor resistance value <Indoor unit side>

Indoor Temperature Thermistor (TH21)

Temperature (°F)	32	41	50	59	68	77	86	95
Resistance Value (kΩ)	33.6	25.9	20.2	15.8	12.5	10.0	8.0	6.5

Temperature (°F)	104	113
Resistance Value (kΩ)	5.3	4.3

Heat Exchanger Thermistor (Inlet TH22 / Outlet TH23)

Temperature (°F)	32	41	50	59	68	77	86	95
Resistance Value (kΩ)	168.6	129.8	100.9	79.1	62.5	49.8	40.0	32.4

Temperature (°F)	104	113	122	131	140
Resistance Value (kΩ)	26.3	21.6	17.8	14.8	12.3

5-3-4 Thermistor resistance (°C / kΩ)

Thermistor resistance value <Outdoor unit side>

Temperature [°C]	Resistance Value [kΩ]		
	Thermistor A	Thermistor B	Thermistor C
- 30	---	87.2	177.0
- 20	---	47.8	97.2
- 10	---	27.2	55.5
- 5	---	20.8	42.4
0	---	16.1	32.7
5	---	12.5	25.4
10	102.5	9.8	19.9
15	---	7.7	15.7
20	64.2	6.1	12.5
25	51.4	4.9	10.0
30	41.3	3.9	8.1
40	27.3	2.6	5.3
50	18.4	1.8	3.6
60	12.7	1.2	---
70	8.9	0.8	---
80	6.4	---	---
90	4.6	---	---
100	3.4	---	---
110	2.6	---	---
120	2.0	---	---
Applicable Thermistors	Discharge temp. TH : [TH1] Comp temp. TH : [TH10]	Heat exchanger. TH : [TH5] Suction temp. TH : [TH4] Liquid temp. TH : [TH7] Sub-cool heat exchanger(inlet) TH : [TH8] Sub-cool heat exchanger(outlet) TH : [TH9]	Outdoor temp. TH : [TH3]

Thermistor resistance value <Indoor unit side>

Indoor Temperature Thermistor (TH21)

Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	33.6	25.9	20.2	15.8	12.5	10.0	8.0	6.5

Temperature (°C)	40	45
Resistance Value (kΩ)	5.3	4.3

Heat Exchanger Thermistor (Inlet TH22 / Outlet TH23)

Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	168.6	129.8	100.9	79.1	62.5	49.8	40.0	32.4

Temperature (°C)	40	45	50	55	60
Resistance Value (kΩ)	26.3	21.6	17.8	14.8	12.3

5-4 SATURATION TABLE (R410A)

5-4-1 Saturation temperature and saturation pressure tables (°F / PSI)

(Pressure: Gauge pressure)

Temp. (°F)	Saturation pressure (PSI)	
	Saturated liquid	Saturated gas
-22	24.969	24.897
-20	26.622	26.535
-18	28.319	28.232
-17	30.073	29.972
-15	31.886	31.784
-13	33.756	33.640
-11	35.670	35.554
-9	37.657	37.526
-8	39.687	39.556
-6	41.789	41.644
-4	43.950	43.805
-2	46.183	46.023
-0.3	48.474	48.300
1	50.823	50.649
3	53.244	53.056
5	55.738	55.535
7	58.305	58.087
9	60.929	60.712
10	63.641	63.409
12	66.410	66.164
14	69.252	69.006
16	72.181	71.920
18	75.183	74.907
19	78.271	77.967
21	81.432	81.113
23	84.666	84.347
25	88.001	87.653
27	91.408	91.046
28	94.903	94.526
30	98.470	98.093
32	102.15	101.75
34	105.90	105.47
36	109.75	109.32
37	113.68	113.23
39	117.73	117.25
41	121.84	121.35
43	126.08	125.56
45	130.50	129.86
46	134.85	134.27
48	139.35	138.77
50	143.99	143.41
52	148.77	148.19
54	153.56	152.98
55	158.49	157.91
57	163.56	162.84
59	168.78	168.06
61	174.00	173.28
63	179.37	178.64

Temp. (°F)	Saturation pressure (PSI)	
	Saturated liquid	Saturated gas
64	184.88	184.15
66	190.53	189.66
68	196.19	195.46
70	202.13	201.26
72	208.08	207.21
73	214.17	213.30
75	220.40	219.39
77	226.64	225.77
79	233.16	232.15
81	239.83	238.82
82	246.50	245.49
84	253.32	252.30
86	260.42	259.26
88	267.53	266.37
90	274.78	273.62
91	282.17	281.01
93	289.71	288.55
95	297.40	296.24
97	305.23	304.07
99	313.20	312.04
100	321.32	320.16
102	329.59	328.43
104	338.14	336.84
106	346.70	345.39
108	355.40	354.09
109	364.39	362.94
111	373.38	371.94
113	382.66	381.21
115	391.94	390.49
117	401.51	400.06
118	411.22	409.77
120	421.08	419.63
122	431.23	429.64
124	441.38	439.93
126	451.82	450.37
127	462.41	460.81
129	473.14	471.69
131	484.01	482.56
133	495.18	493.73
135	506.49	505.04
136	517.94	516.49
138	529.69	528.24
140	541.58	540.13
142	553.61	552.16
144	565.79	564.49
145	578.26	576.96
147	590.88	589.57
149	603.78	602.48

Saturation pressure (PSI)	Saturation temperature (°F)	
	Saturated liquid	Saturated gas
0.0	-61.33	-61.29
14.5	-35.05	-34.98
29.0	-17.70	-17.59
43.5	-4.38	-4.25
58.0	6.58	6.73
72.5	16.00	16.16
87.0	24.26	24.44
101.5	31.69	31.89
116.0	38.44	38.64
130.5	44.64	44.87
145.0	50.40	50.63
159.5	55.78	56.01
174.0	60.82	61.07
188.5	65.59	65.84
203.0	70.11	70.36
217.5	74.39	74.66
232.0	78.49	78.76
246.5	82.42	82.69
261.0	86.18	86.45
275.5	89.80	90.07
290.0	93.27	93.56
304.5	96.64	96.90
319.0	99.90	100.17
333.5	103.03	103.32
348.0	106.08	106.36
362.5	109.04	109.31
377.0	111.92	112.19
391.5	114.71	114.98
406.0	117.45	117.72
420.5	120.09	120.36
435.0	122.68	122.95
449.5	125.20	125.47
464.0	127.69	127.94
478.5	130.10	130.33
493.0	132.46	132.69
507.5	134.76	135.00
522.0	137.03	137.26
536.5	139.24	139.46
551.0	141.42	141.64
565.5	143.56	143.76
580.0	145.65	145.85
594.5	147.18	147.88

5-4-2 Saturation temperature and saturation pressure tables (°C / Mpa)

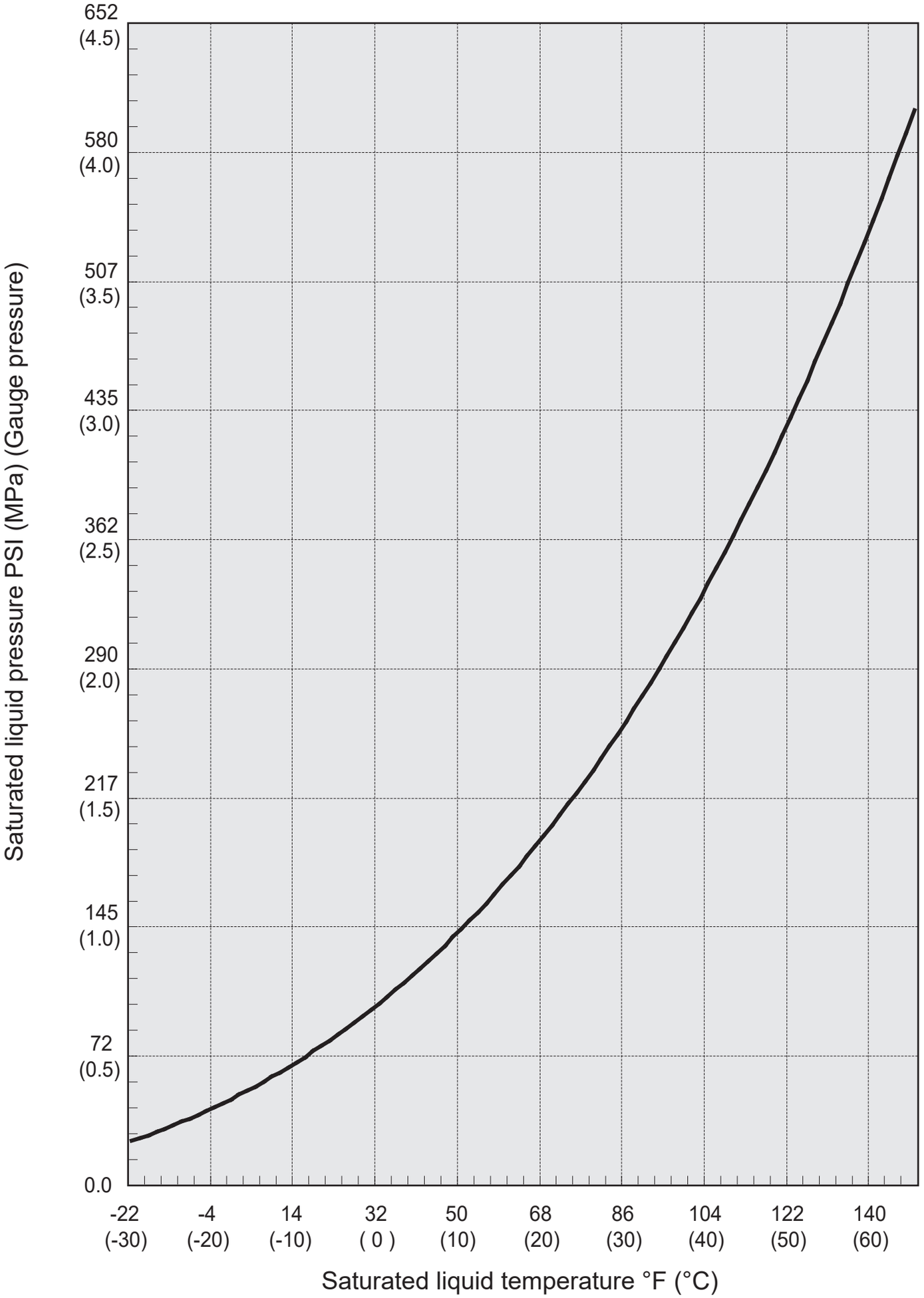
(Pressure: Gauge pressure)

Temp. (°C)	Saturation pressure (Mpa)	
	Saturated liquid	Saturated gas
-30	0.1722	0.1717
-29	0.1836	0.1830
-28	0.1953	0.1947
-27	0.2074	0.2067
-26	0.2199	0.2192
-25	0.2328	0.2320
-24	0.2460	0.2452
-23	0.2597	0.2588
-22	0.2737	0.2728
-21	0.2882	0.2872
-20	0.3031	0.3021
-19	0.3185	0.3174
-18	0.3343	0.3331
-17	0.3505	0.3493
-16	0.3672	0.3659
-15	0.3844	0.3830
-14	0.4021	0.4006
-13	0.4202	0.4187
-12	0.4389	0.4373
-11	0.4580	0.4563
-10	0.4776	0.4759
- 9	0.4978	0.4960
- 8	0.5185	0.5166
- 7	0.5398	0.5377
- 6	0.5616	0.5594
- 5	0.5839	0.5817
- 4	0.6069	0.6045
- 3	0.6304	0.6279
- 2	0.6545	0.6519
- 1	0.6791	0.6765
0	0.7044	0.7017
1	0.7303	0.7274
2	0.7569	0.7539
3	0.7840	0.7809
4	0.8119	0.8086
5	0.8403	0.8369
6	0.8695	0.8659
7	0.9000	0.8956
8	0.930	0.926
9	0.961	0.957
10	0.993	0.989
11	1.026	1.022
12	1.059	1.055
13	1.093	1.089
14	1.128	1.123
15	1.164	1.159
16	1.200	1.195
17	1.237	1.232

Temp. (°C)	Saturation pressure (Mpa)	
	Saturated liquid	Saturated gas
18	1.275	1.270
19	1.314	1.308
20	1.353	1.348
21	1.394	1.388
22	1.435	1.429
23	1.477	1.471
24	1.520	1.513
25	1.563	1.557
26	1.608	1.601
27	1.654	1.647
28	1.700	1.693
29	1.747	1.740
30	1.796	1.788
31	1.845	1.837
32	1.895	1.887
33	1.946	1.938
34	1.998	1.990
35	2.051	2.043
36	2.105	2.097
37	2.160	2.152
38	2.216	2.208
39	2.273	2.265
40	2.332	2.323
41	2.391	2.382
42	2.451	2.442
43	2.513	2.503
44	2.575	2.565
45	2.639	2.629
46	2.703	2.693
47	2.769	2.759
48	2.836	2.826
49	2.904	2.894
50	2.974	2.963
51	3.044	3.034
52	3.116	3.106
53	3.189	3.178
54	3.263	3.253
55	3.338	3.328
56	3.415	3.405
57	3.493	3.483
58	3.572	3.562
59	3.653	3.643
60	3.735	3.725
61	3.818	3.808
62	3.902	3.893
63	3.988	3.979
64	4.075	4.066
65	4.164	4.155

Saturation pressure (Mpa)	Saturation temperature (°C)	
	Saturated liquid	Saturated gas
0.0	-51.85	-51.83
0.1	-37.25	-37.21
0.2	-27.61	-27.55
0.3	-20.21	-20.14
0.4	-14.12	-14.04
0.5	- 8.89	- 8.80
0.6	- 4.30	- 4.20
0.7	- 0.17	- 0.06
0.8	3.58	3.69
0.9	7.02	7.15
1.0	10.22	10.35
1.1	13.21	13.34
1.2	16.01	16.15
1.3	18.66	18.80
1.4	21.17	21.31
1.5	23.55	23.70
1.6	25.83	25.98
1.7	28.01	28.16
1.8	30.10	30.25
1.9	32.11	32.26
2.0	34.04	34.20
2.1	35.91	36.06
2.2	37.72	37.87
2.3	39.46	39.62
2.4	41.16	41.31
2.5	42.80	42.95
2.6	44.40	44.55
2.7	45.95	46.10
2.8	47.47	47.62
2.9	48.94	49.09
3.0	50.38	50.53
3.1	51.78	51.93
3.2	53.16	53.30
3.3	54.50	54.63
3.4	55.81	55.94
3.5	57.09	57.22
3.6	58.35	58.48
3.7	59.58	59.70
3.8	60.79	60.91
3.9	61.98	62.09
4.0	63.14	63.25
4.1	63.99	64.38

5-4-3 Temperature and pressure of refrigerant (Graph)



Refrigerant R410A INVERTER

AIRSTAGE J-IV

6. DISASSEMBLY PROCESS

6. DISASSEMBLY PROCESS

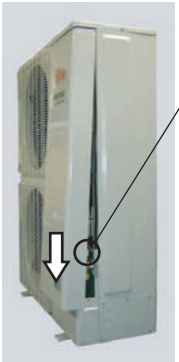
⚠ WARNING

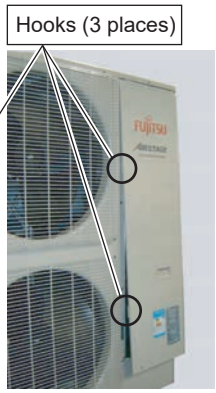
Before servicing the unit, turn the power supply switch OFF,
Then, do not touch electric parts for 20 minutes due to the risk of electric shock.

1. Appearance

2. SERVICE PANEL removal

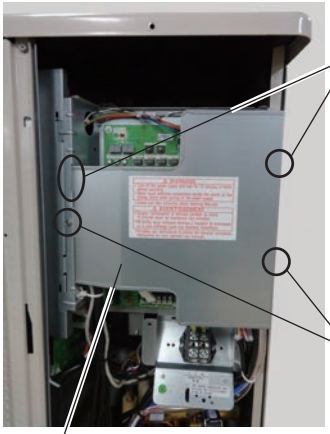
Remove the mounting screws.

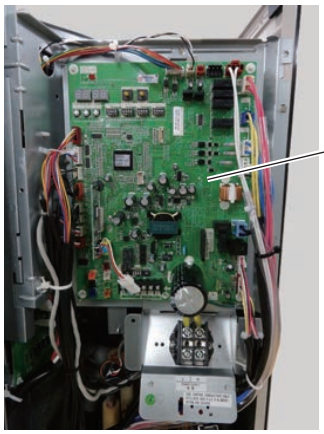




Remove the SERVICE PANEL
by sliding downward.

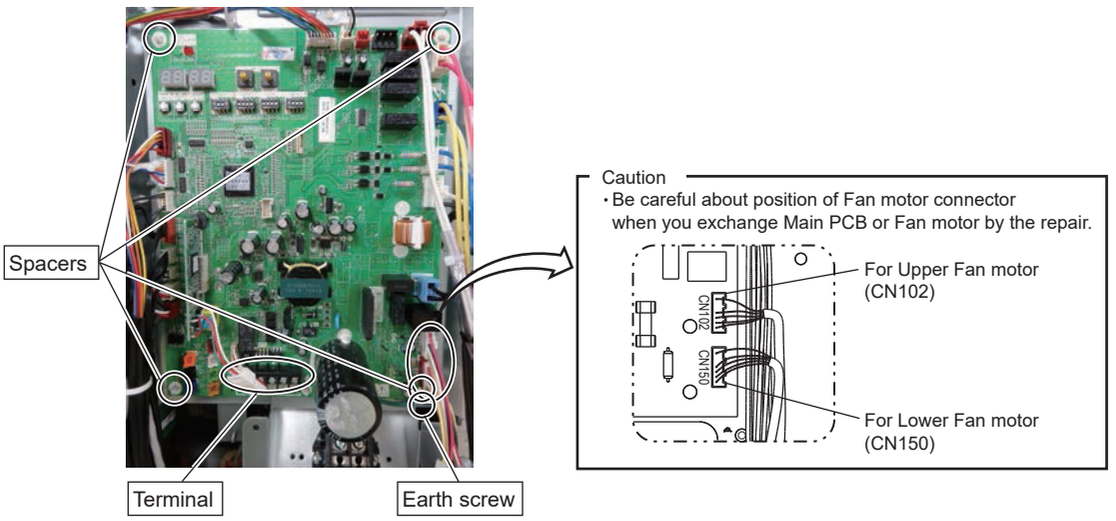
3. CONTROL COVER removal





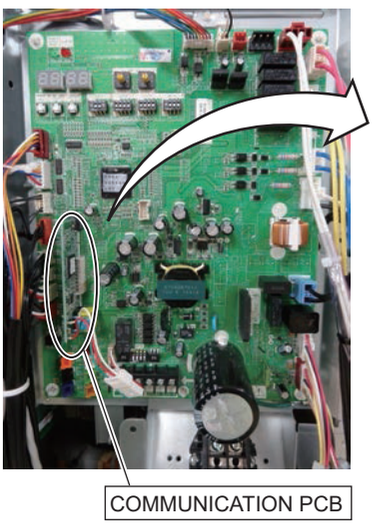
Remove the 2 mounting screws.
Remove the CONTROL COVER by sliding toward..

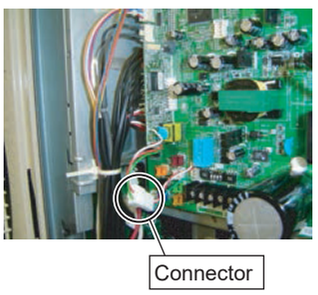
4. MAIN PCB removal



Remove the communication cable connected to the terminal.
Remove the earth screw.
Remove the connectors and spacers.

5. COMMUNICATION PCB removal

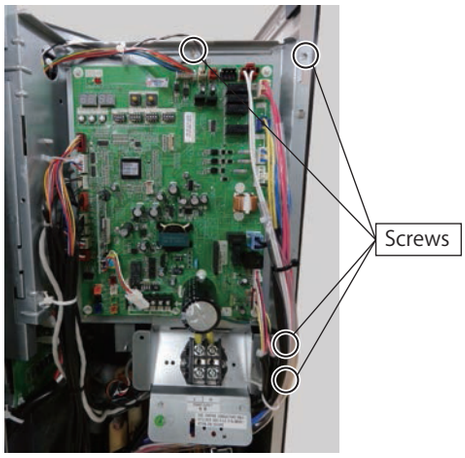




Remove the connector.

Remove the COMMUNICATION PCB.

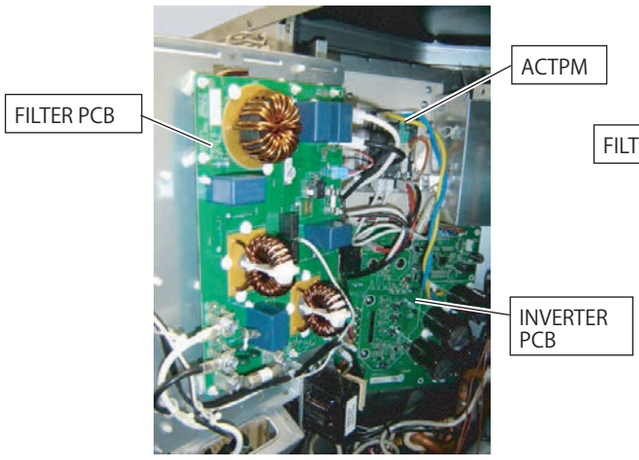
6. INVERTER PCB, FILTER PCB and ACTPM removal



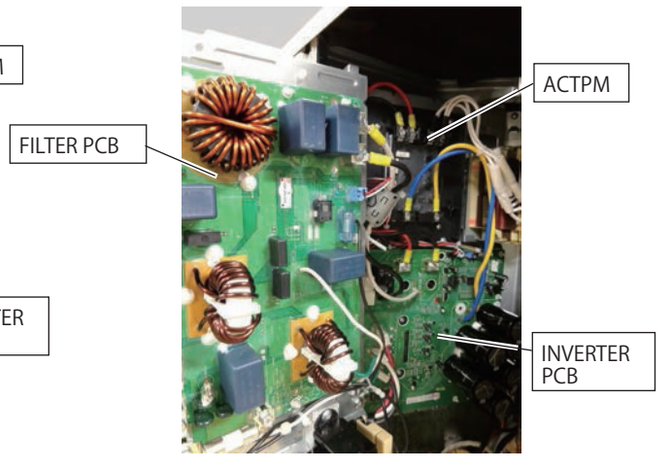
Remove the 4 mounting screws

Open the CONTROL BOX (MAIN).

For AOU36, 48RLAVM4

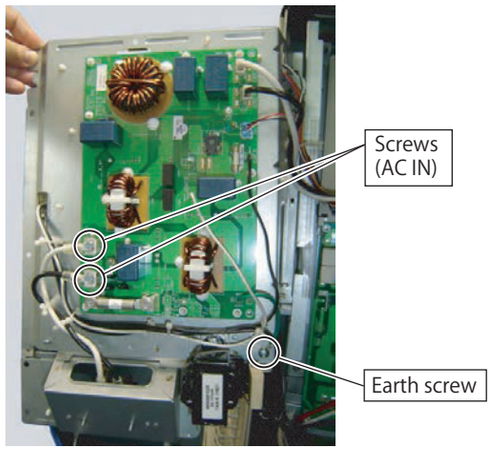


For AOU60RLAVM4



6-1. FILTER PCB removal

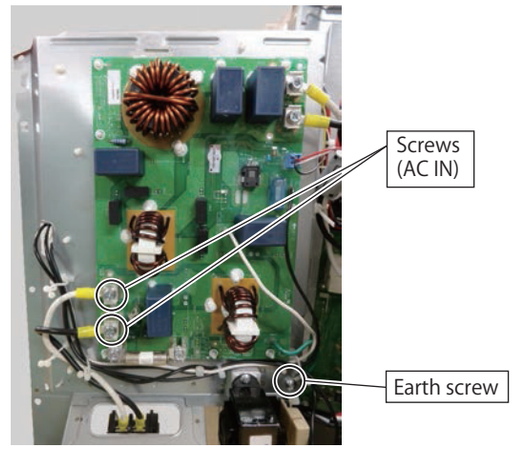
For AOU36, 48RLAVM4



Remove the connectors and screws.

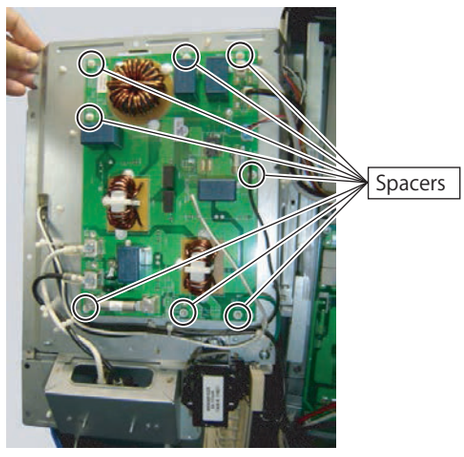
Note the tightening torque
at the installation.
Tightening torque is 2.5 ± 0.2N•m.
(except for the earth screw)

For AOU60RLAVM4

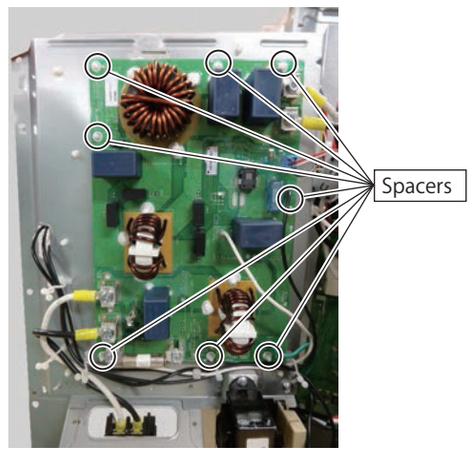


Remove the connectors and screws.

Note the tightening torque
at the installation.
Tightening torque is 2.5 ± 0.2N•m.
(except for the earth screw)



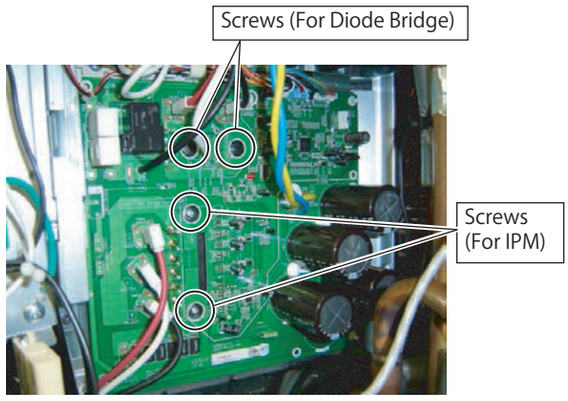
Remove the spacers.
(8 places)



Remove the spacers.
(8 places)

6-2. INVERTER PCB removal

For AOU36, 48RLAVM4

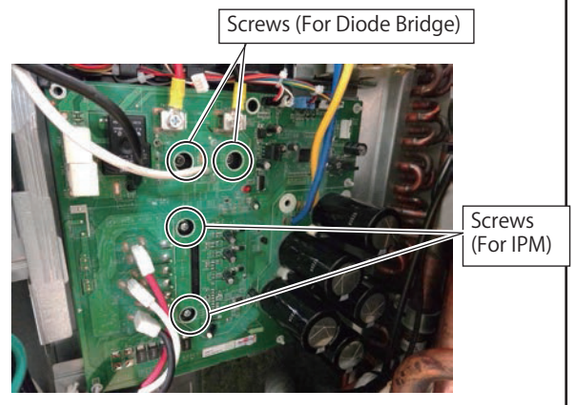


Remove the 4 mounting screws.

For screws of IPM.
Note the tightening torque at the installation.
1. Temporary tightening : 0.2 to 0.4N•m
2. Final tightening : 0.98 to 1.47N•m

For screws of Diode Bridge.
Note the tightening torque at the installation.
1. Temporary tightening : 0.2 to 0.4N•m
2. Final tightening : 0.5 to 0.8N•m

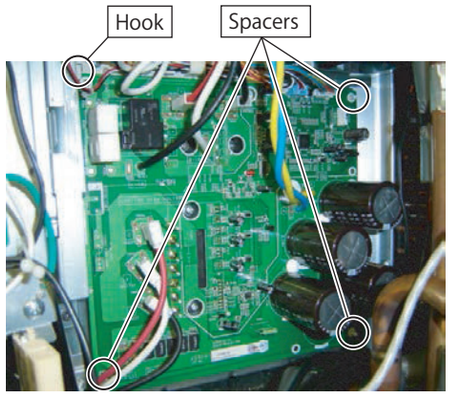
For AOU60RLAVM4



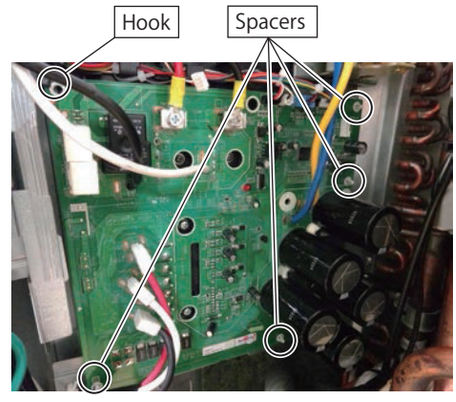
Remove the 4 mounting screws.

For screws of IPM.
Note the tightening torque at the installation.
1. Temporary tightening : 0.2 to 0.4N•m
2. Final tightening : 0.98 to 1.47N•m

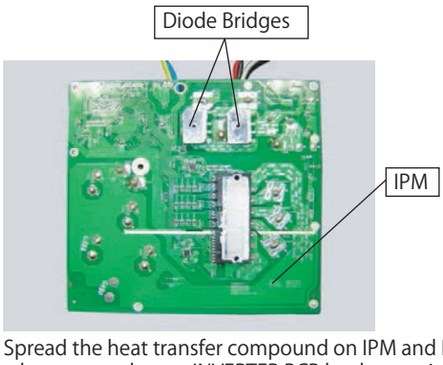
For screws of Diode Bridge.
Note the tightening torque at the installation.
1. Temporary tightening : 0.2 to 0.4N•m
2. Final tightening : 0.5 to 0.8N•m



Remove the connectors and spacers.



Remove the connectors and spacers.

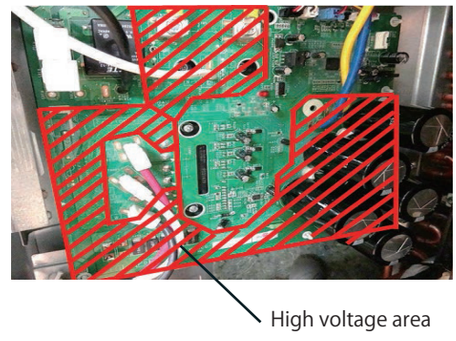


Spread the heat transfer compound on IPM and Diode Bridges when you exchange INVERTER PCB by the repair.

Note at the installation.
1. Remove the old heat transfer compound as possible from IPM and Diode Bridges when you exchange INVERTER PCB by the repair.
2. Spread the heat transfer compound evenly on IPM and Diode Bridges.
3. Prevent foreign matter from attaching to the surface of IPM and Diode Bridges.

Specifications for the heat transfer compound
- Manufacturer : Shin-Etsu Chemical Co.,Ltd
- Grade : G746

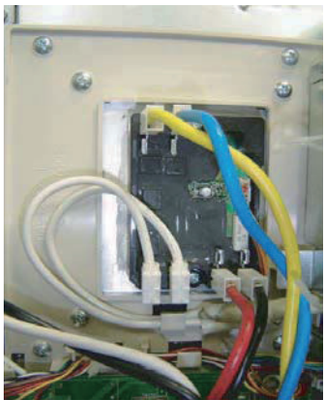
⚠ WARNING



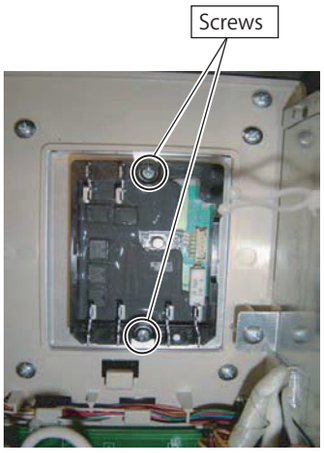
Red line is High voltage area.
When the replace INVERTER PCB,
Please CAUTION voltage shock.
(Discharge times is 20 min.)

6-3. ACTPM removal

For AOU36, 48RLAVM4



Remove the connectors.



Remove the screws.

For screws of ACTPM.
Note the tightening torque at the installation.
1. Temporary tightening : 0.2 to 0.4N•m
2. Final tightening : 0.6 to 0.9N•m

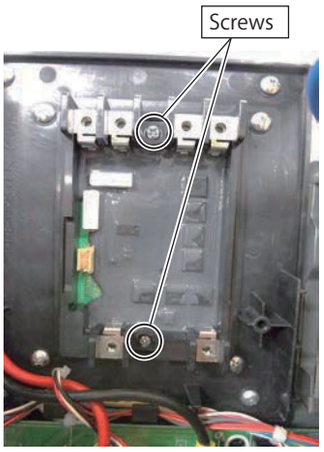
Spread the heat transfer compound on ACTPM when you exchange ACTPM by the repair.

Note at the installation.
1. Remove the old heat transfer compound as possible from ACTPM when you exchange ACTPM by the repair.
2. Spread the heat transfer compound evenly on ACTPM.
3. Prevent foreign matter from attaching to the surface of ACTPM.

Specifications for the heat transfer compound
- Manufacturer : Shin-Etsu Chemical Co.,Ltd
- Grade : G746

For AOU60RLAVM4

Remove the screws and lead wires.



Remove the screws.

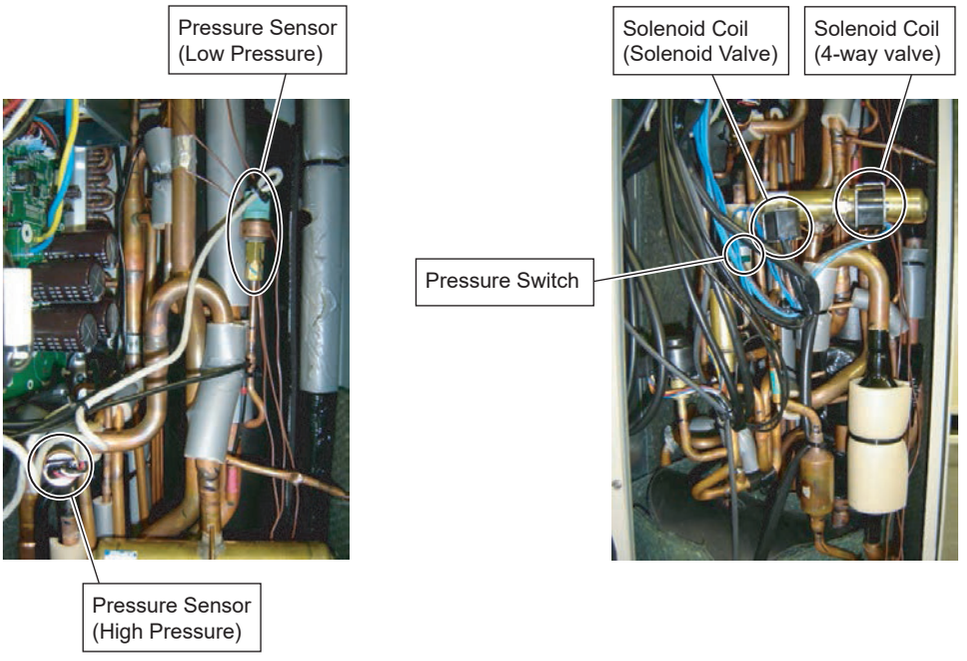
For screws of ACTPM.
Note the tightening torque at the installation.
1. Temporary tightening : 0.2 to 0.4N•m
2. Final tightening : 0.6 to 0.9N•m

Spread the heat transfer compound on ACTPM when you exchange ACTPM by the repair.

Note at the installation.
1. Remove the old heat transfer compound as possible from ACTPM when you exchange ACTPM by the repair.
2. Spread the heat transfer compound evenly on ACTPM.
3. Prevent foreign matter from attaching to the surface of ACTPM.

Specifications for the heat transfer compound
- Manufacturer : Shin-Etsu Chemical Co.,Ltd
- Grade : G746

7. PRESSURE SENSOR, SOLENOID COIL removal



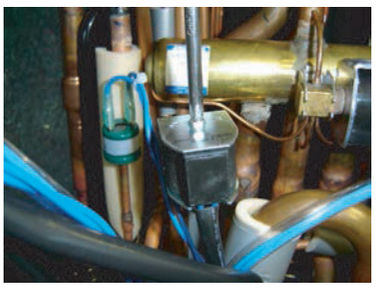
7-1. PRESSURE SENSOR removal

⚠ CAUTION
Wear gloves to prevent the frostbite,
because a small amount of refrigerant leaks during work.

Remove the PRESSURE SENSOR with wrench.

Note the tightening torque at the installation.
Tightening torque is 15±1.5N•m.

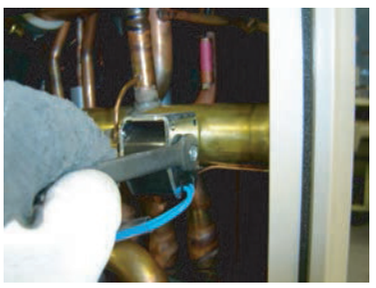
7-2. SOLENOID COIL (Solenoid valve) removal



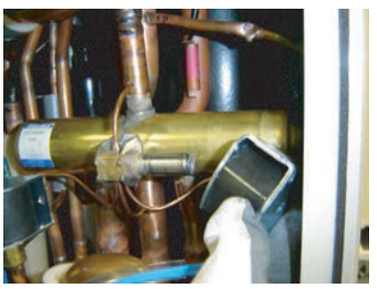
Remove the mounting screw.

Remove the SOLENOID COIL.

7-3. SOLENOID COIL (4way valve) removal



Remove the mounting screw
with wrench or short screwdriver.

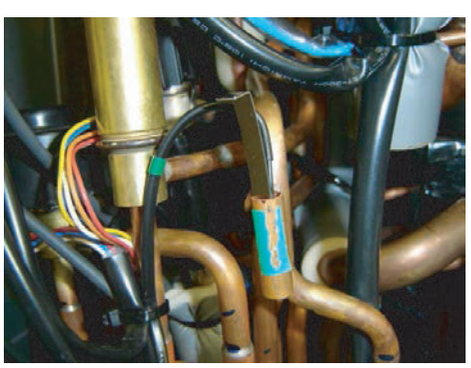


Remove the SOLENOID COIL.

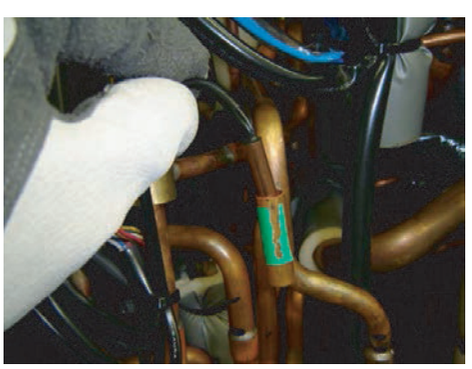
8. EEV COIL removal

Remove the EEV coil by hand.
Be careful so as not to bend the pipe.

9. THERMISTOR removal

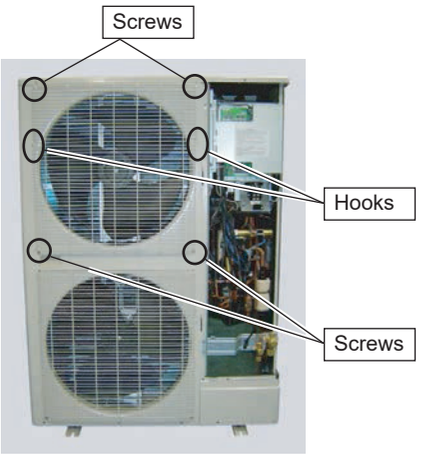


Remove the THERMISTOR SPRING.

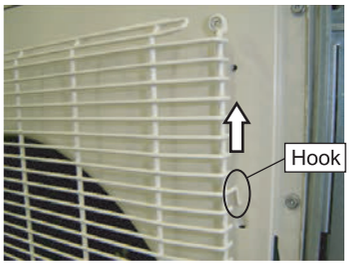


Remove the THERMISTOR.
Careful not to disconnect the thermistor wire with a strong pull.

10. FAN MOTOR removal



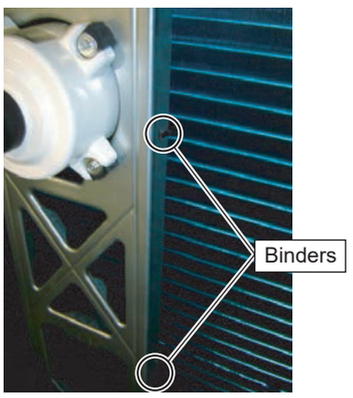
Remove the 4 mounting screws.



Remove the FAN GUARD
by sliding upward.

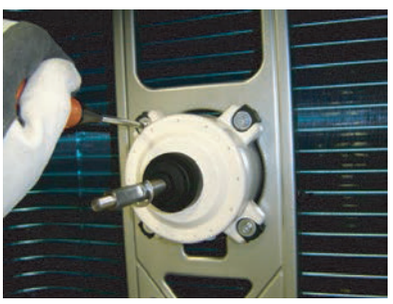
Remove the nut.
And remove the PROPELLER FAN.

Note at the installation.
Insert propeller Fan and Moter shaft reference D cutting position.
And the tightening torque at the installation.
Tightening torque is from 10 to 12N•m.

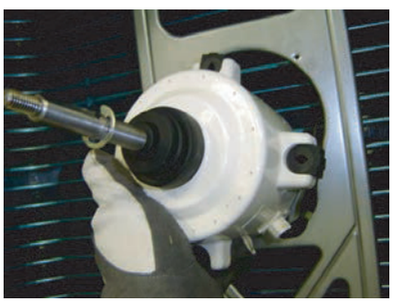


Cut the binder.(2 places)

Loose the wire clamp, and
remove the lead wires.



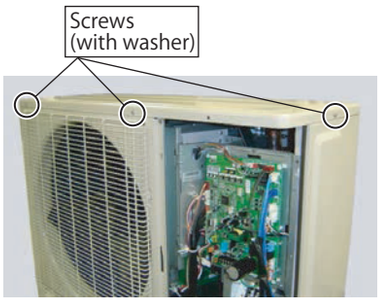
Remove the 4 mounting screws.



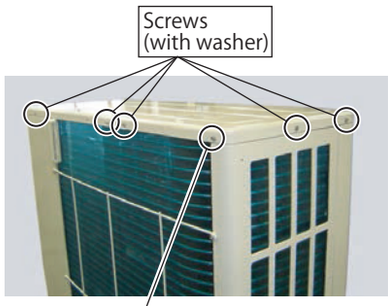
Remove the FAN MOTOR.

Note at the installation.
Motor wire is underside of Fan motor.

11. TOP PANEL removal



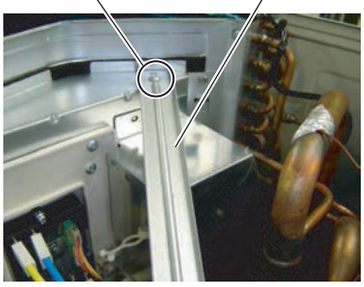
Remove the mounting screws.



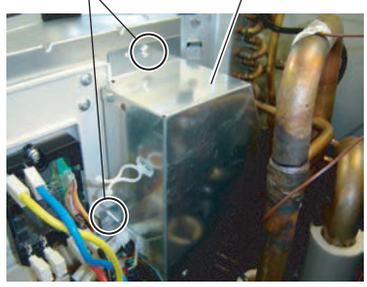
Remove the TOP PANEL.

12. CHOKE COIL removal

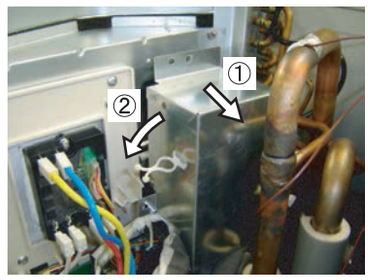
For AOU36, 48RLAVM4

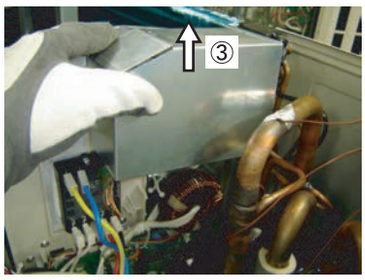


Remove the mounting screw.
Remove the BRACKET CONTROL BOX.



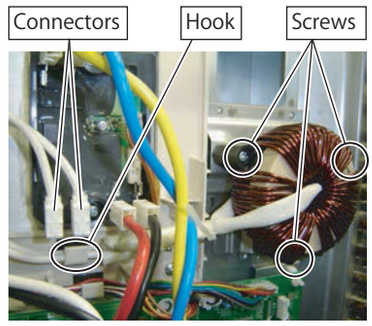
Remove the mounting screws.





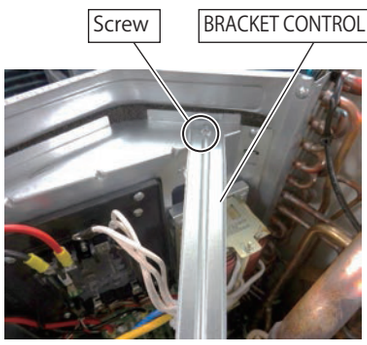
Remove the DUCT A.

Caution
- Protect the choke coil, wiring, and pipes from the edge of DUCT A.

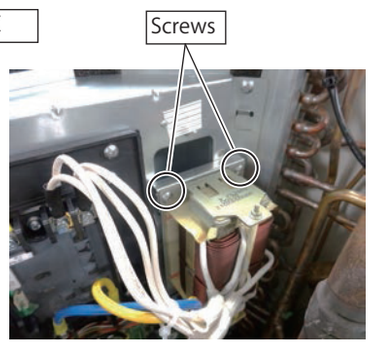


Remove the connectors.
Remove the mounting screws.
Remove the CHOKE COIL.

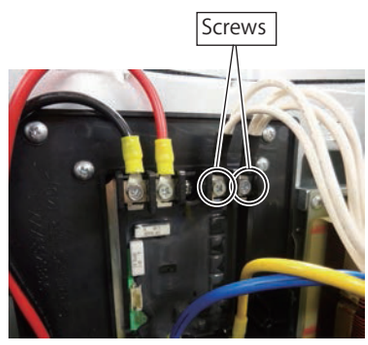
For AOU60RLAVM4



Remove the mounting screw.
Remove the BRACKET CONTROL BOX.

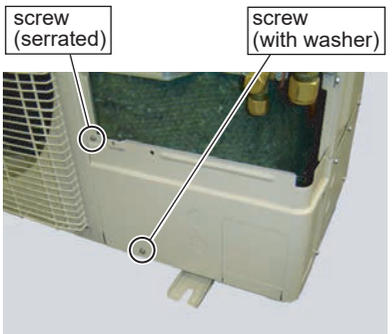


Remove the mounting screws.

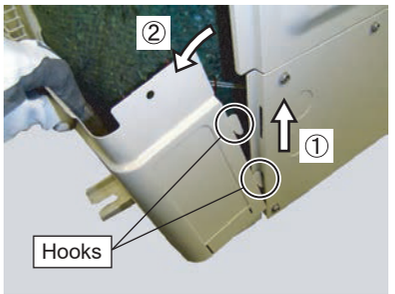


Remove the mounting screws.
Remove the CHOKE COIL.

13. PIPE COVER FRONT removal

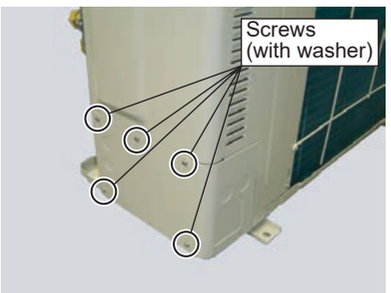


Remove the mounting screws.

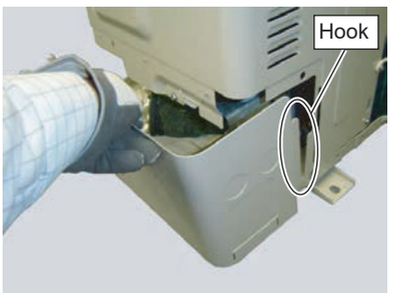


Remove the PIPE COVER FRONT.

14. PIPE COVER REAR removal

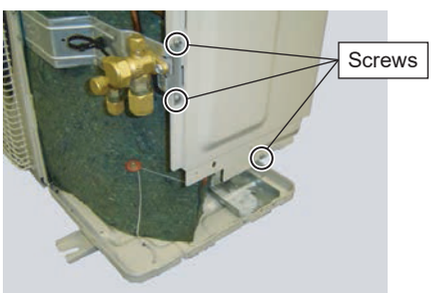


Remove the mounting screws.

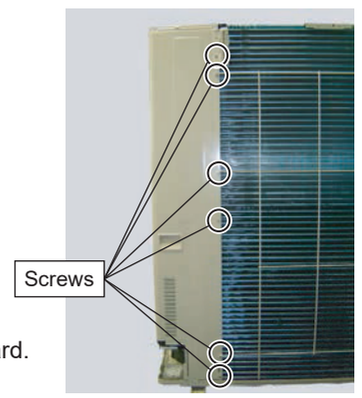


Remove the PIPE COVER REAR.

15. RIGHT PANEL removal



Remove the mounting screws.
Remove the RIGHT PANEL by sliding upward.



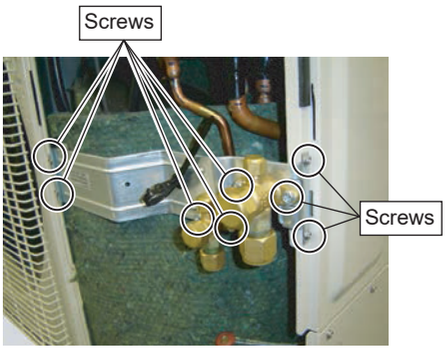
16. COMPRESSOR removal

Precautions for exchange of Compressor.

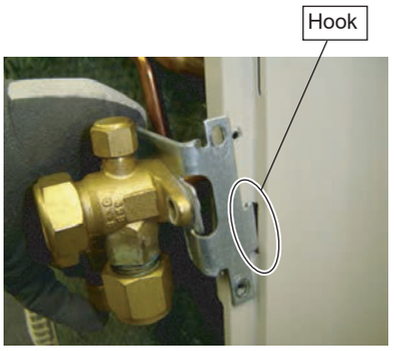
Do not allow moisture or debris to get inside refrigerant pipes during work.

Procedure for compressor removal.

(1) Turn off power.
(2) Remove the SERVICE PANEL and PIPE COVER FRONT.
(3) Fully open the 3WAY VALVE(Gas) and 3WAY VALVE(Liquid).
(4) Open the EEVs of Outdoor units and Indoor units by vaccuming mode.
(5) Collect the refrigerant from the 3WAY VALVE.
Start the following work after completely collecting the refrigerant.
Do not reuse the refrigerant that has been collected.

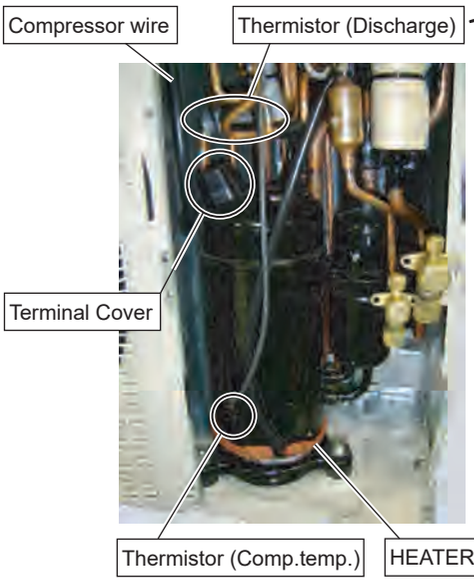


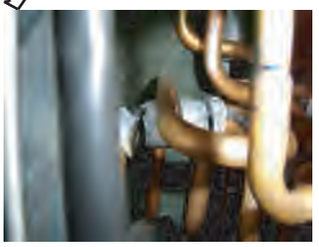
Remove the 8 mounting screws.



Remove the VALVE PLATE.

Remove the COMPRESSOR COVER A and TOP.





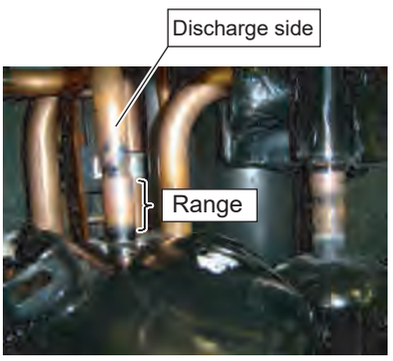
Cut the binder, and
remove the heat insulation.

Remove the Thermistor(Discharge).

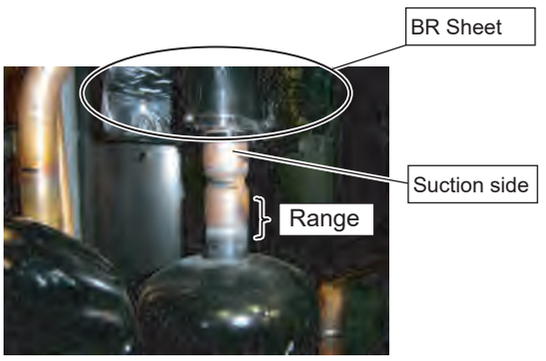
Remove the Thermistor(Comp.temp.)
and Thermistor(Discharge).
Remove the Terminal Cover and Compressor wire.

Loose the HEATER (CRANK CASE)

Remove the COMP BOLTs.
(3 places)



Cut the Discharge pipe in this range.



Cut the Suction pipe in this range.
Remove the Compressor.

Caution
- Keep their shape better.
- There is a possibility of catching fire to oil when removing by the welding without cutting it.

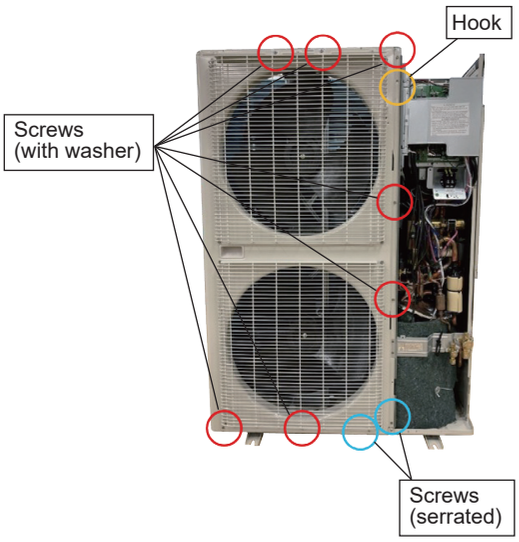
Procedure for compressor installation.

Reverse procedure to removing the compressor.

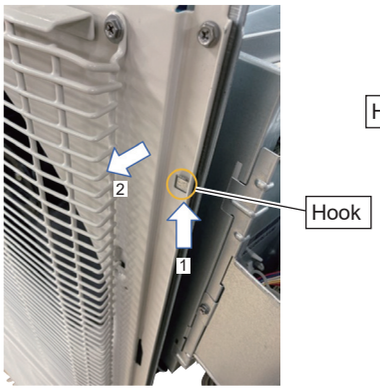
Precautions for installation of Compressor.

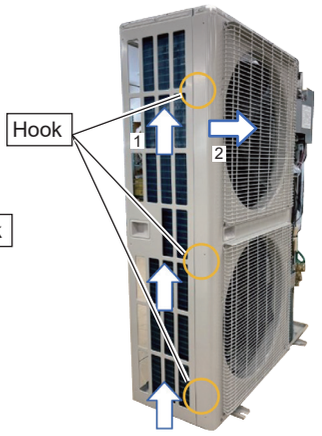
(1) When brazing, do not apply the flame to the terminal.
(2) When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

17. HEATER BASE removal



Remove the mounting screws.



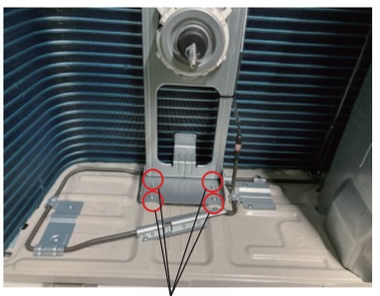


Remove the FRONT PANEL.

Cut the binder (3 plases)

Note at the installation
Route the leads so that they do not loosen
to prevent them from hitting the fan.

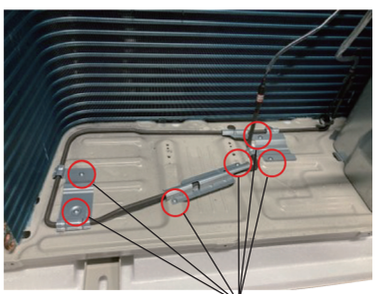
Loose the wire clamp, and remove the lead wires.



Screws

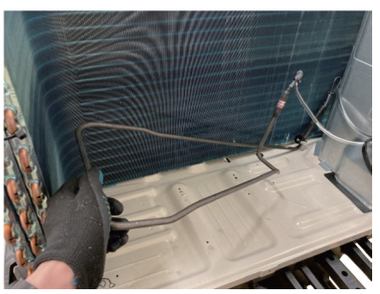
Remove the mounting screws.

Remove the MOTOR BRACKET.



Screws

Remove the mounting screws.



Remove the HEATER BASE.

18. Precautions for exchange of INLET PIPE (ACCUM) ASSY

INLET PIPE (ACCUM) ASSY includes a " Fusible plug ". Be aware of the followings when repairing.

1. Fusible plug

Plug made of fusible alloy.
When a temperature inside equipment extreamly rises by fire disaster,
fusible alloy of plug will melt and make a hole.
And refrigerant inside equipment will be discharged
for preventing a burst of pressure vessel coming from pressure increase.

---

2. Location of Fusible plug

<Precautions>

(1) When a temperature reaches to 167 degrees F (75 degrees C), fusible alloy in the center of plug will melt and make a hole.

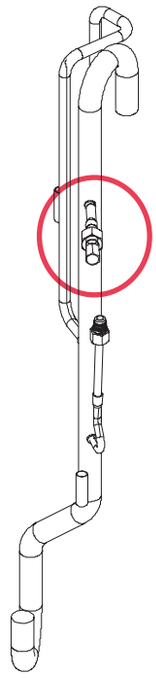
(2) When you replace a fusible plug, make sure to replace "INLET PIPE (ACCUM) ASSY" extensively.

(3) When you replace a "INLET PIPE (ACCUM) ASSY", make sure to drape a wet rag on it for keeping it cool.
If fusible alloy melts and makes a hole from heat,
vacuum drawing and refrigerant charging will be not available.
Also refrigerant inside will be discharged swiftly.

(4) When you weld pipes or parts near fusible plug, make sure to insulate plug and pipes from fire and guard a plug using a wet rag.

(5) Do not unclench a fusible plug. Airtightness will be compromised.
If a plug is unclenched
(In order to keep high airtightness, it is controlled strictly by tightening torque, seal tape and Loctite.)

"INLET PIPE (ACCUM) ASSY"
(P/N 9380005049)



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19. Precautions for exchange of refrigerant-cycle-parts

(1) During exchange the following parts shall be protected by w et rag and not make the allowable temperature or more.
(2) Remove the heat insulation when there is the heat insulatio n near the welding place.
Move and cool it when its detaching is difficult.
(3) Cool the parts when there are parts where heat might be transmitted besides the replacement part.
(4) Interrupt the flame with the fire-retardant board when the flam e seems to hit the following parts directl y.
(5) Do not allow moisture or debris to get inside refrigerant p ipes during work.
(6) When brazing, be sure to replace the air in the pipe with n itrogen gas to prevent forming oxidization scale.
(7) Open the 3WAY VALVE because there is a possibility of squirting the refrigerant from the heated pipes at brazing.

Part name	Allowable temperature	Precautions in work
SOLENOID VALVE	248°F (120°C)	Remove the coil before brazing. And install the coil after brazing.
EXPANSION VALVE	248°F (120°C)	Remove the coil before brazing. And install the coil after brazing.
4WAY VALVE	248°F (120°C)	Remove the coil before brazing. And install the coil after brazing.
3WAY VALVE (GAS)	212°F (100°C)	
3WAY VALVE (LIQUID)		
UNION JOINT	212°F (100°C)	Remove the pressure sensor before brazing. And install the pressure sensor after brazing.
PRESSURE SENSOR	212°F (100°C)	Tighten the flare part gripping it. (Tightening torque :15 ± 1.5N·m) Do the static electricity measures.
PRESSURE SWITCH	212°F (100°C)	Remove the wiring before brazing. And connect the wire after brazing.

AIRSTAGE J-IV

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Product specifications are subject to change without notice.

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