Refrigerant R410A
INVERTER

AIRSTAGE™ V-II

Variable Refrigerant Flow System

Multi Air Conditioning System for Buildings

Large Capacity Multi VRF System
DC Inverter Control Compressor
Long Piping System Design
High Efficiency Refrigerant R410A

SERVICE MANUAL

FUJITSU GENERAL LIMITED

CONTENTS

CONTENTS

3. INDOOR UNIT OPERATION

CONTENTS

Refrigerant R410A INVERTER

AIRSTAGE™ V-II

Variable Refrigerant Flow System

1. TEST RUN

1. TEST RUN

1-1 EXECUTION PROCEDURE AND EXECUTION PRECAUTIONS

Before execution

	Execution procedure and precautions	Reason
Execution zone decision		
Confirmation of refrigerant used	① 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. ② Confirm the product design pressure. R410A 4.12MPa	• Use of a refrigerant other than the specified refrigerant will invite equipment trouble.
Preparation of execution drawings		
Confirmation of installation site		
Preparations 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

Sleeve and insert work	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 10mm. Excessive tilt will cause water leakage.	• Prevention of water leakage
Indoor unit installation		
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 When the pipe is left standing, protect it. ③ Finish flaring exactly. ④ Confirm the width across flats dimension and shape of flare nuts. ⑤ Always blow nitrogen while brazing. ⑥ Perform flushing before connecting the equipment.	• Foreign matter, water, etc. in the piping will cause faulty cooling and compressor trouble. • 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 20m. ② Use hard polyvinylchloride pipe as the drain pipe. ③ Support the drain pipe between 1.5 to 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	① Install a vacuum pump with reverse flow check mechanism or a reverse flow check adaptor to a conventional vacuum pump and use. ② Pump down sufficiently. Approximately 1 hour or longer after -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. • Prevents degradation of the oil by completely removing water and air. *recommend the vacuuming mode
Vacuum drying		

* Vaccuming mode

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

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 of the indoor and outdoor unit, [vacuuming mode] is released.

Execution

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 opearing 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 AD×10, ×1)	Arbitrary numbers can be set in range of 00-99
② Set the outdoor unit address. (DIP SW : SET3-1 / 3-2)	OFF / OFF: Master unit OFF / ON : Slave unit 1 ON / OFF : Slave unit 2
③ Number of slave units setting. (Master unit only) (DIP SW : SET3-3 / SET3-4)	OFF / OFF: 0 units (Master unit only) OFF / ON : 1 unit (1 slave unit connected) ON / OFF : 2 units (2 slave unit connected)
④ Number of outdoor units setting. (DIP SW : SET5-1 / 5-2)	OFF / OFF: 1 (Master unit only) OFF / ON : 2 (1 master unit + 1 slave unit) ON / OFF : 3 (1 master unit + 2 slave units)
[Note] Perform in the power OFF state.	

Piping length setting

Set according to the length of the connection piping.
Set to "Standard (40 to 65m)" at the factory.
Set using the push button SW on the outdoor unit PC board. (Technical Manual pages 06-101)

[Note] Perform in the power ON state.

Address setting

Set the refrigerant circuit address and indoor unit address.
Can be set by rotary SW on the indoor unit control PC board or from a remote controller or from a push button SW on the outdoor unit PC board (automatic address).

Test run & adjustment

[Note] Set the rotary SW on the PC board in the power OFF state.
Perform setting by remote controller and setting from push button SW on the outdoor unit PC board in the power ON state.

Turnover & explanation of operation

1-2 TEST RUN METHOD

1-2-1 Check Items Before Power ON

Procedure	Check contents	Judgment standard	Check
Power source	Circuit breaker capacity	Outdoor unit: 50A (AJ*144/126/108), 30A (AJ*90/72)	
		Indoor unit: 20A	
	Type of power source wiring	Circuit breaker: 30A=4mm^2, 50A=10mm^2, 60A=16mm^2, 80A=22mm^2, 100A=38mm^2	
		Outdoor unit: 10mm^2 (AJ*144/126/108), 4.0mm^2 (AJ*90/72)	
		Indoor unit: 2.5mm^2	
	Supply power source	Using a phase tester, etc., check the phase of the power source.	
		Outdoor unit side: Between R-S AC 400V (380-415V)	
		Between S-T AC 400V (380-415V)	
		Between T-R AC 400V (380-415V)	
		Indoor unit side: AC 230V (220-240V)	

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 panel screws check	
	Type of communication line	0.33mm^2, shielded wire used (22AWG)	
	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	Outdoor unit address setting (SET : 3-1, 2)	
		Setting for number of slave units (SET : 3-3, 4)	
		Number of outdoor units installed (SET : 5-1, 2)	
		Terminal resistor setting (SET : 5-4)	
	Rotary SW setting	Refrigerant circuit address setting (SET : REF AD ×10 & ×1)	
	Additional refrigerant amount	Comparison of calculated value and value written on electrics box. Entered in check sheet.	
	3-way valve	MASTER: Gas pipe shall be full-open.	
		MASTER: Liquid pipe shall be full-open.	
		SLAVE1: Gas pipe shall be full-open.	
		SLAVE1: Liquid pipe shall be full-open.	
		SLAVE2: Gas pipe shall be full-open.	
		SLAVE2: Liquid pipe shall be full-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	0.33mm^2, shielded wire used (22AWG)	
	Communication line connection	Connection points check & loose terminal panel screws check	
	Type of remote controller wiring	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	Judgment standard	Check
Power ON	Outdoor unit circuit breaker ON	Check lighting of PC board 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 PC board push button SW setting/check	Function setting	Are the necessary functions set?	

Address setting/ check	Automatic address setting	Addresses shall be assigned to all indoor units. Check for unset or duplicated addresses.	
	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 ⇒ ON.	

Cooling test run	Outdoor unit (master) 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. *See P01-05 described later.	
All of the indoor units operation (after 30 mins)	<On service tool>		
	High pressure	HPS : 2.7 MPa ∗	
	Low pressure	LPS : 0.8 MPa ∗	
	Discharge pipe temperature (outdoor unit)	TH1 (TH2) : 87°C ∗	
	Suction pipe temperature (outdoor unit)	TH4 : 17°C ∗	
	Subcool (defference between inlet and outlet of SCHEX)	TH6 - TH7 : 10°C or greater ∗	
	Inlet air temperature (indoor unit)	TH21 : 27°C ∗	
	Heat exchange inlet temperature (indoor unit)	TH22 : 11°C ∗	
	Heat exchange outlet temperature (indoor unit)	TH24 : 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 PC board/7-segment display	The 7-segment display of all outdoor units of the same refrigerant circuit shall display	
	Operation voltage	Between R-S AC400V (380-415V)	
		Between S-T AC400V (380-415V)	
		Between T-R AC400V (380-415V)	
	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 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	Judgment 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 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 AJYA90LALH at the standard condition. (Indoor : 27°C, Outdoor : 35°C)

If conditions are different from those above mentioned, the figures will be changed slightly.

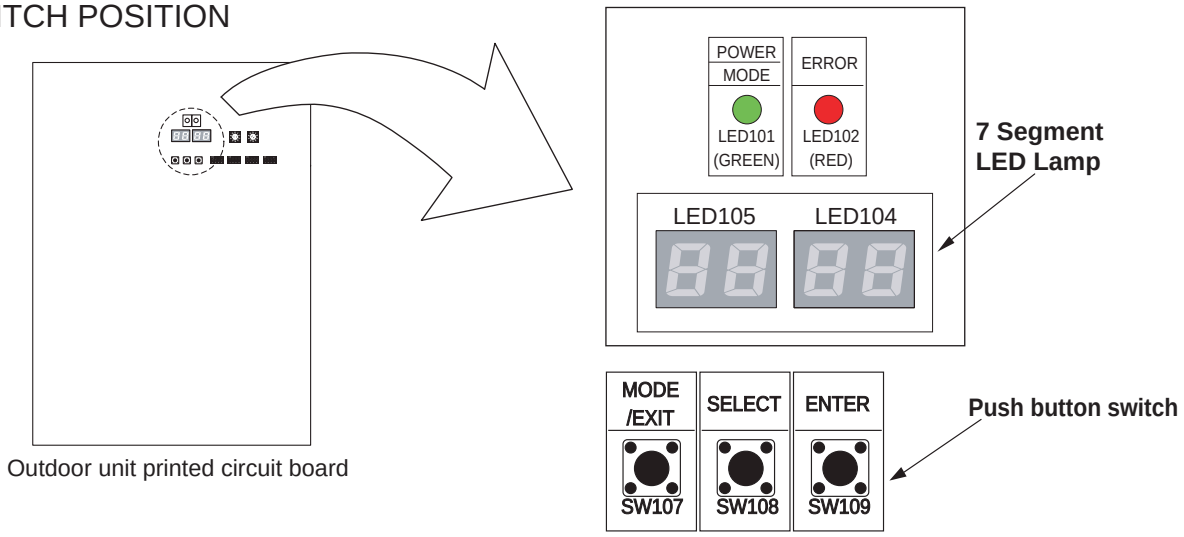
It depends on following conditions.

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

1-2-3 Test Run From Outdoor PC Board

All the indoor units connected to the outdoor unit can be test-operated by push button setting. (Only for master unit)

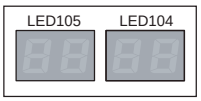
● SWITCH POSITION



● TEST RUN SETTING

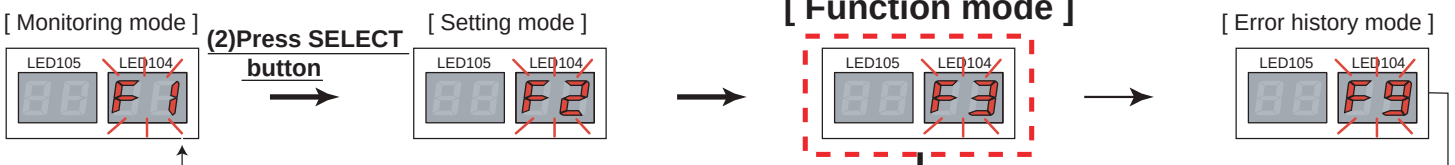
For a detailed description of push button operation, refer to the [D&T manual Chapter 6. SYSTEM DESIGN]

< Monitoring condition >



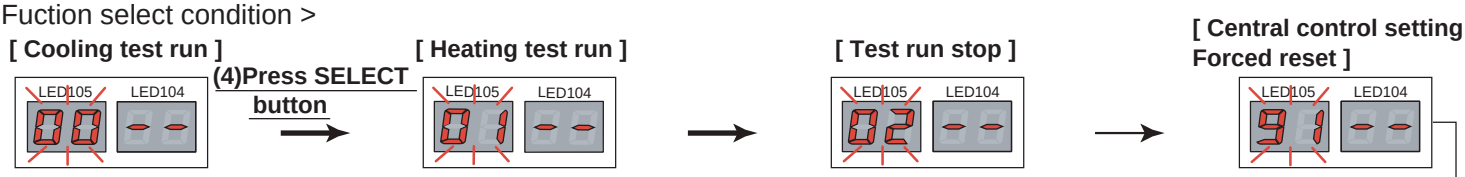
(1) Press the MODE / EXIT button (SW107) once.

< Mode select condition >



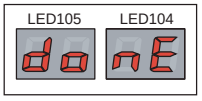
(3) Press the ENTER button (SW109)

< Fuction select condition >



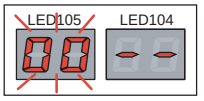
(5) Hold down the ENTER button (SW109) for at least 3 seconds.

< Pursuance completion >



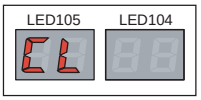
(6) Press the ENTER button (SW109) or Time out (5 seconds)

< Return to mode select condition >



(7) Press the MODE / EXIT button

< Return to monitoring condition >

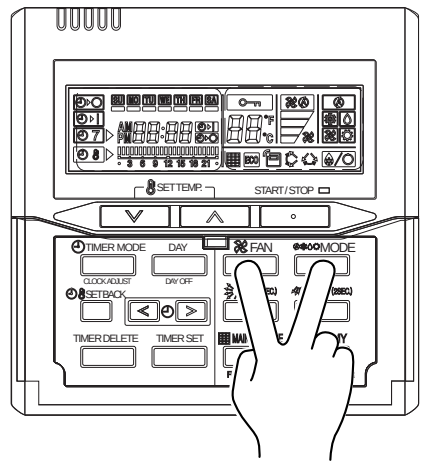


example,
Normal indicate : [**Cooling mode**]

1-2-4 Test Run From Remote Controller

1. Standard wired remote controller

UTY - RNK ∗

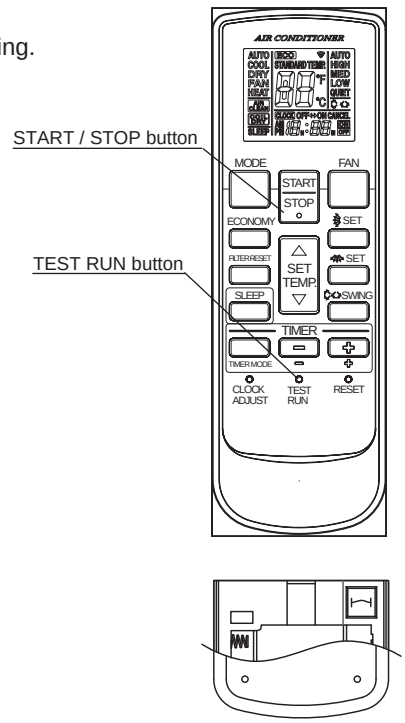


Stop the indoor unit. Push the ⌘ button and
Ⓐ❄◊☼ button simultaneously for more than two seconds.
The air conditioner will start to conduct a test run and "ɑ1" will display on the remote controller display.
However, the ⩒, ⩓ setting button does not have function, but all other buttons, displays, and 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 ∗

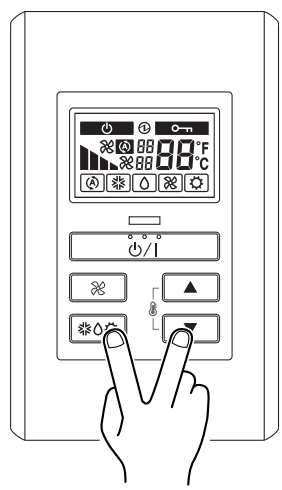


- Press the TEST RUN button on the remote controller, while the air conditioner is running.
- To end test run operation, press the remote controller START / STOP button.

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 ∗

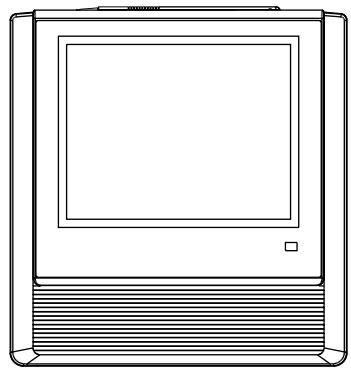


Stop the indoor and outdoor units. Push the remote controller ▼ button and ❄◊☼ button simultaneously for more than three seconds. The air conditioner will start to conduct a test run and "ɑ1" will display on the temperature display.
However the ▲ ▼ setting button does not have function but all other 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.

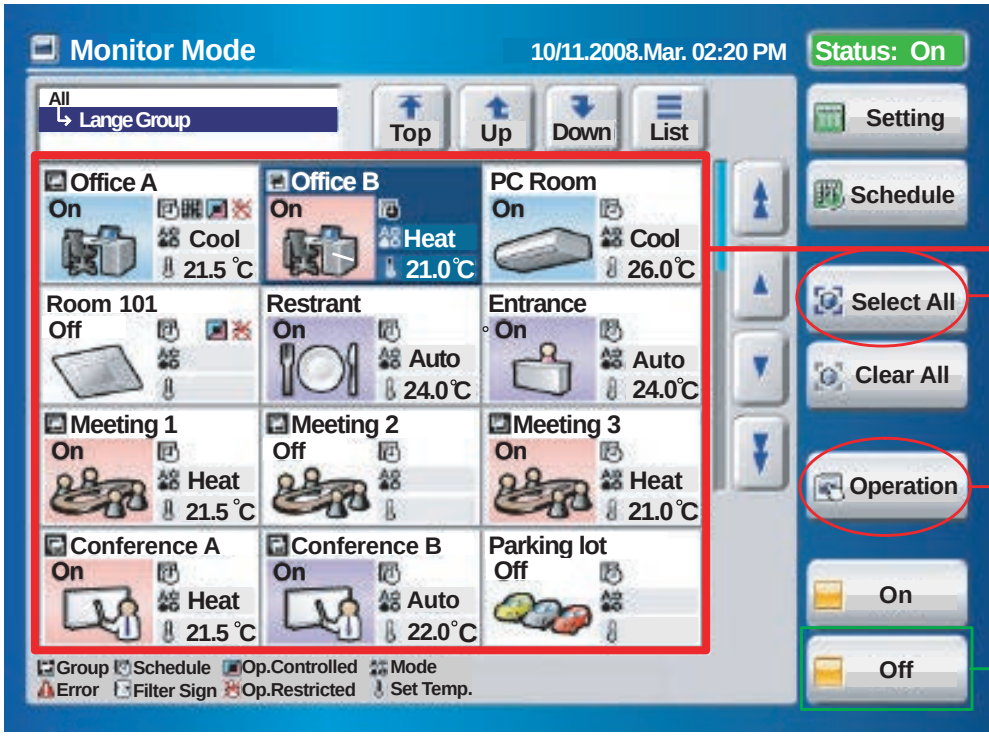
4. Touch panel controller

UTY - DTG∗



Test run operating procedure

<Monitor screen (icon)>



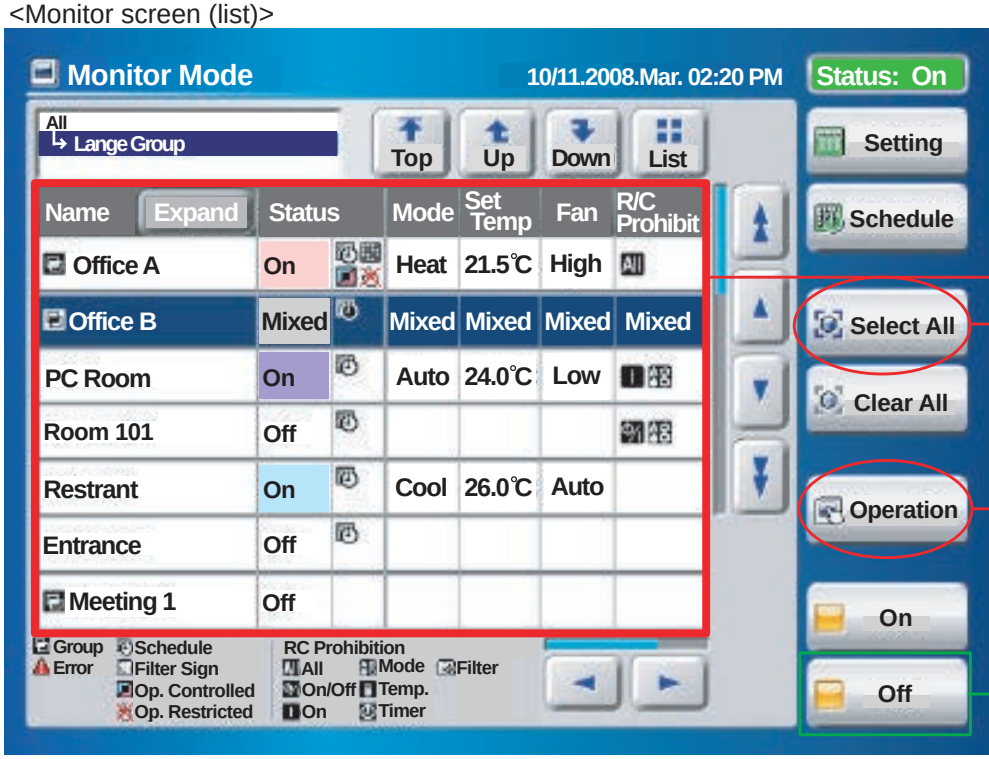
(1)

(1)

(2)

(*)

<Monitor screen (list)>



(1)

(1)

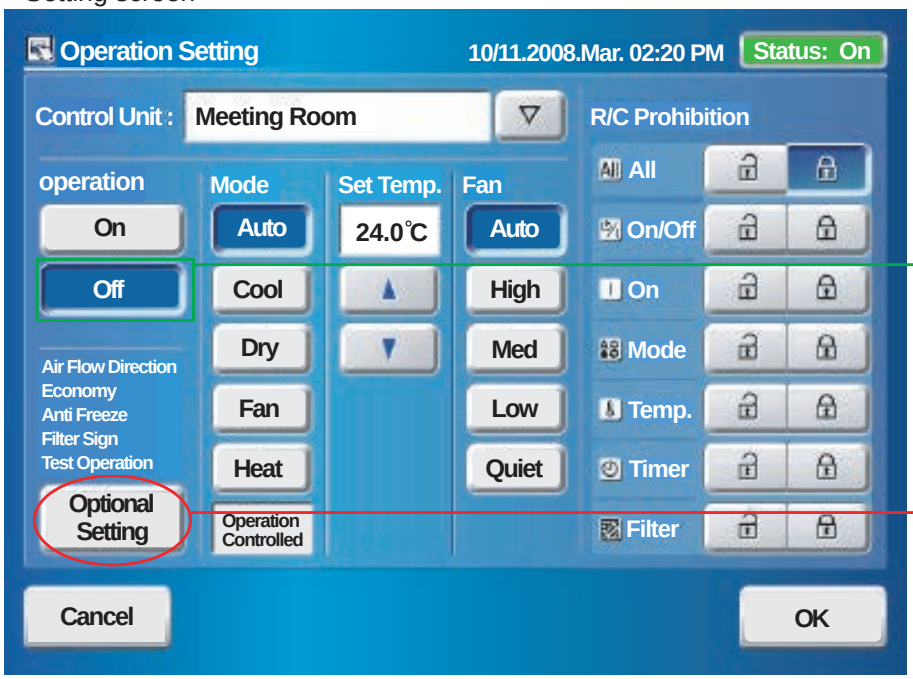
(2)

(*)

(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.

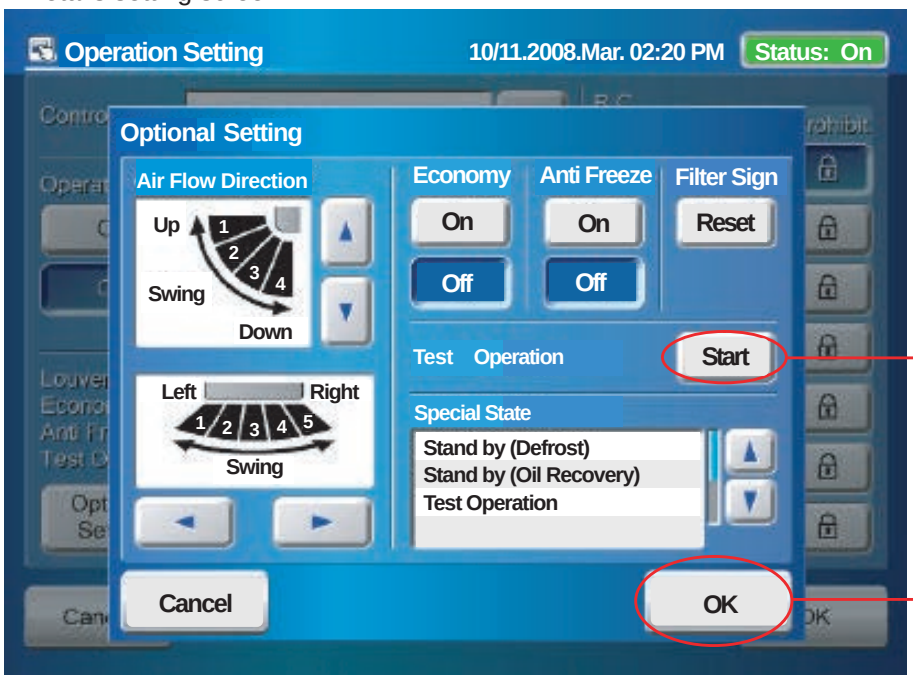
(2) After objective selection at (1), switch to the <Setting screen> by pressing "Operation".

<Setting screen>

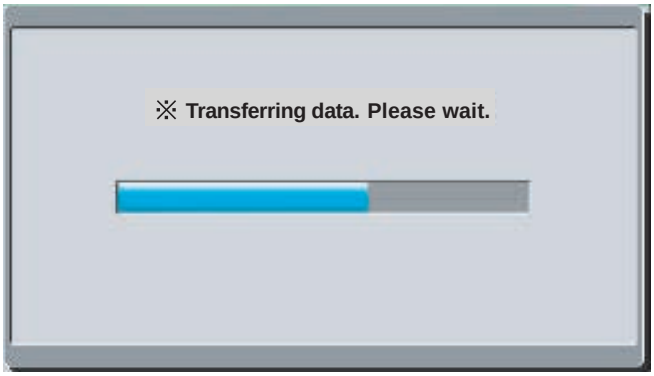


(3) Switch to the <Details setting screen> by pressing "Optional Setting" on the setting screen.

<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.

1-3 TEST RUN CONTROL

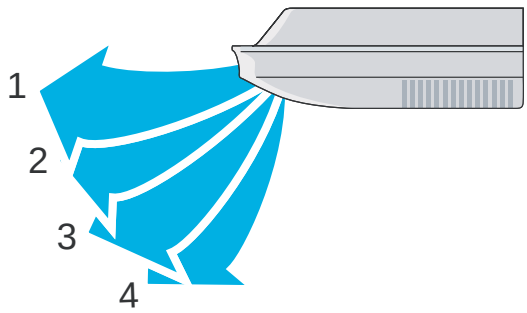
1. When the test run signal is transmitted from standard wired, wireless remote controller, simple remote controller, transmitted netwwork, and outdoor unit.

(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.

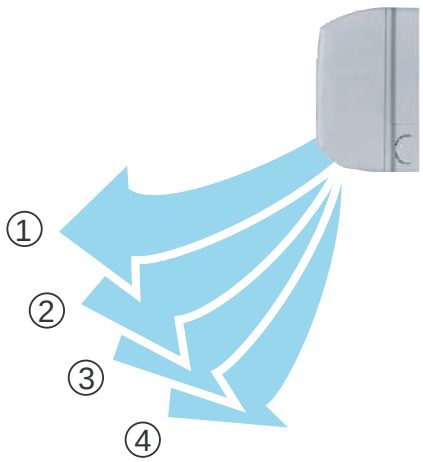
Operating Mode	EXCEPT FOR THE DUCT MODEL		DUCT TYPE	
	Cooling	Heating	Cooling	Heating
Fan speed	Hi	Hi	Hi	Hi
Room Temperature Indication	18	30	18	30
Vertical Air Direction Panel	Position ①	Position ④	————	————
Swing	OFF	OFF	————	————

***EXAMPLE**

■ **COMPACT CASSETTE TYPE**



■ **CEILING TYPE**



■ **COMPACT WALL MOUNTED TYPE**

1-4 Field Setting And Monitor Mode List

	Classification	ITEM CODE No.	Setting Mode	Information contents
Push switch on outdoor unit PCB Monitor 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	Current value of CONST speed compressor	Current value of CONST speed compressor is displayed [A]
		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	CONST speed compressor accumulated time	Accumulated time is displayed of the CONST speed compressor [×10 hour]
	Refrigerant cycle data 1	30	Information on Thermistor 1 (INV compressor discharge temperature)	The value of the Thermistor 1 is displayed [°C] or [°F]
		31	Information on Thermistor 2 (CONST speed compressor discharge temperature)	The value of the Thermistor 2 is displayed [°C] or [°F]
		32	Information on Thermistor 3 (Outdoor temperature)	The value of the Thermistor 3 is displayed [°C] or [°F]
		33	Information on Thermistor 4 (Suction temperature)	The value of the Thermistor 4 is displayed [°C] or [°F]
		34	Information on Thermistor 5 (Heat-exchanger temperature)	The value of the Thermistor 5 is displayed [°C] or [°F]
		35	Information on Thermistor 6 (Liquid temperature 1)	The value of the Thermistor 6 is displayed [°C] or [°F]
		36	Information on Thermistor 7 (Liquid temperature 2)	The value of the Thermistor 7 is displayed [°C] or [°F]
		37	Information on Thermistor 8 (Sub-cool heat-exchanger inlet temperature)	The value of the Thermistor 8 is displayed [°C] or [°F]
		38	Information on Thermistor 9 (Sub-cool heat-exchanger outet temperature)	The value of the Thermistor 9 is displayed [°C] or [°F]
		39	Information on Thermistor 10 (INV compressor temperature)	The value of the Thermistor 10 is displayed [°C] or [°F]
	Refrigerant cycle data 2	40	Information on Thermistor 11 (CONST speed compressor temperature)	The value of the Thermistor 11 is displayed [°C] or [°F]
	Refrigerant cycle data 3	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.	Setting Function	Default
Push switch on outdoor unit PCB Setting mode [F2]	Install	00	Pipe length setting	00	40-65m	○
				01	0-40m	
				02	65-90m	
				03	90-120m	
				04	120-150m	
	Correction	10	Sequential start shift	00	Normal	○
				01	21sec. Delay	
				02	42sec. Delay	
				03	63sec. Delay	
		11	Cooling capacity shift	00	Normal mode	○
				01	Save energy mode 1 (+2°C)	
				02	High power mode 1 (-2°C)	
				03	High power mode 2 (-4°C)	
		12	Heating capacity shift	00	Normal mode	○
				01	Save energy mode (-2°C)	
				02	High power mode 1 (+2°C)	
				03	High power mode 2 (+4°C)	
		13	Defrost setting shift	00	End temperature:Normal	○
				01	End temperature:Higher	
	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	Snow falling protection fan mode	00	Normal operation	○
				01	Snow falling protection fan mode	
		23	Interval setting for snow falling protection fan mode	00	Standard (30min)	○
				01	Short 1 (5min)	
				02	Short 2 (10min)	
				03	Short 3 (20min)	
		24	High static pressure mode	00	Standard	○
				01	High static pressure 1 (equivalent to 30Pa)	
				02	High static pressure 2 (equivalent to 80Pa)	
		28	Change of unit (Temperature)	00	Celsius(°C)	○
				01	Fahrenheit (°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)	
	Low noise setting 1	40	Capacity priority setting (in low noise mode)	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	Low noise mode operation level setting	00	Level 1 (55dB)	○
				01	Level 2 (50dB)	
	Change of function 3	60	Back up operation	00 *1	On	○
				01 *2	Off	
	Change of function 4	70	Electricity meter No. setting 1 (Set the ones digit and tens digit of the No of the electricity meter connected to CN135.) *3	00~99	Setting number x00~x99 (Refer to Design & Technical Manual for details.)	00
		71	Electricity meter No. setting 2 (Set the hundreds digit of the No. of the electricity meter connected to CN135.) *3	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.) *4	00~99	Setting number xx00~xx99 (Refer to Design & Technical Manual for details.)	00
		73	Electricity meter pulse setting 2 (Set the hundreds digit and thousands digit of the electricity meter pulse setting connected to CN135.) *4	00~99	Setting number 00xx~99xx (Refer to Design & Technical Manual for details.)	00

*1 : If one of compressor fails, backup operation will be performed by the remaining compressors.

*2 : If one of compressor fails, all units will be abnormal stop.

*3 : 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"

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

		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.
	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.
	Install and maintenance 2	21	Vacuuming mode	Vacuuming mode operatesRefer to page 01-01 for the function.
	Clear	30	Error history clear	All the abnormal code histories are cleared.
		32	Current time clear	Accumulated current time becomes [0]
		33	INV compressor accumulated timeclear	Accumulated time of the INV compressor becomes [0]
		34	CONST speed compressor accumulated time clear	Accumulated time of the CONST compressor becomes [0]
		35	Field setting all clear	Return to default the all set items.
	Reset	40	Abnormal reset	It was displayed when abnormality occurs, and abnormal 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. *This function is added from Revision Code A.
	Specialtyfunction	91	Central control forced 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.

		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. If the memorized error code becomes over 10, the oldest one will be erased. Refer to Chapter 4.TROUBLE SHOOTING 4-2-3 Error Code List for Outdoor Unit
		01	2 times ago	
		02	3 times ago	
		03	4 times ago	
		04	5 times ago	
		05	6 times ago	
		06	7 times ago	
		07	8 times ago	
		08	9 times ago	
		09	10 times ago (Oldest)	

*< Reset Error Item List By Abnormal Reset Setting >

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

1-5 Field Setting / Function Setting for Indoor unit

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Setting Function	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	00	Default	○
				01	Raise	
		24	Horizontal swing airflow direction	00	Default	○
				01	Left half	
				02	Right half	
		26	Static Pressure setting - Slim Duct Only - The Range of static pressure is different from one model to other.	00	0 Pa	
				01	10 Pa	
				02	20 Pa	
				03	30 Pa	
				04	40 Pa	
				05	50 Pa	
				06	60 Pa	
				07	70 Pa	
				08	80 Pa	
				09	90 Pa	
				31	25 Pa (Standard)	○
	Correction	30	Cool air temperature trigger	00	Default (0°C)	○
				01	Temperature overshoot setting (+2°C)	
				02	Temperature undershoot setting (-2°C)	
		31	Heat air temperature trigger	00	Default (0°C)	○
				01	Temperature undershoot setting (-6°C)	
				02	Temperature slightly undershoot setting (-4°C)	
				03	Temperature overshoot setting (+4°C)	
		32	Temperature correction in Auto	00	Disable	○
				01	Enable (Nonfunctional on J2 Series)	
	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	Foreced stop (Start/Stop by RC is restricted)	
		47	Error report target	00	All	○
				01	Display only for central remote control	

*1: Auto restart is an emargency 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: 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.

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	Address	01	Indoor unit address	00~63	00~63 0	0
		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	
				06	SP mode 06	
				07	SP mode 07	
				08	SP mode 08	
				09	SP mode 09	
				10	SP mode 10	
				11	SP mode 11	
				12	SP mode 12	
				13	SP mode 13	
				14	SP mode 14	
				15	SP mode 15	
				16	SP mode 16	
				17	SP mode 17	
				18	SP mode 18	
				19	SP mode 19	
				20	SP mode 20	
				21	SP mode 21	
				22	SP mode 22	
				31	Normal SP	○
	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	Foreced stop (Start/Stop by RC is restricted)	
		47	Error report target	00	All	○
				01	Display only for central remote control	
		63	Humidifier control *2	00	mode 00	○
				01	mode 01	
				02	mode 02	

Model name	Range of static pressure	Normal static pressure
ARXH054GTAH	SP mode 05 to 19 (50 to 185 Pa)	185 Pa
ARXH072GTAH	SP mode 05 to 20 (50 to 200 Pa)	200 Pa
ARXH096GTAH	SP mode 05 to 22 (50 to 220 Pa)	200 Pa

*1: Auto restart is an emargency 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.

Refrigerant R410A
INVERTER

AIRSTAGE™ V-II
Variable Refrigerant Flow System

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	Pressure sensor	Measure range 0.0 to 5.0MPa
	Suction pressure sensor	Pressure sensor	Measure range 0.0 to 1.7MPa
	Discharge temperature sensor 1	Themistor	Measure range 10 to 130℃
	Discharge temperature sensor 2	Themistor	Measure range 10 to 130℃
	Outdoor temperature sensor	Themistor	Measure range -25 to 58℃
	Suction temperature sensor	Themistor	Measure range -35 to 70℃
	Heat exchanger temperature sensor	Themistor	Measure range -35 to 70℃
	Liquid temperature sensor 1	Themistor	Measure range -35 to 70℃
	Liquid temperature sensor 2	Themistor	Measure range -35 to 70℃
	Sub-cool heat exchanger (inlet) sensor	Themistor	Measure range -35 to 70℃
	Sub-cool heat exchanger (outlet) sensor	Themistor	Measure range -35 to 70℃
	Compressor temperature sensor 1	Themistor	Measure range 10 to 130℃
	Compressor temperature sensor 2	Themistor	Measure range 10 to 130℃
	Operation current sensor	Current transformer	
	Pressure switch 1 (Inverter comp)	Pressure switch	Open 4.2MPa Short 3.2MPa
	Pressure switch 2 (constant speed comp)	Pressure switch	Open 4.2MPa Short 3.2MPa
	Rotary SW & DIP-SW & Push SW	Address and function setting	
OUTPUT	Compressor 1 (Inverter)	Magnetic relay	Operation coil AC220-240V, 50Hz
	Compressor 2	Magnetic relay	Operation coil AC220-240V, 50Hz
	Electronic expansion valve 1 (Main)	EEV coil	Operating voltage DC12V
	Electronic expansion valve 2 (SC-Hex)	EEV coil	Operating voltage DC12V
	Fan motor	DC Brushless motor	
	4-way valve 1	4-way valve coil	AC220-240V, 50/60Hz 6/5 W
	Solenoid valve 1	Hot gas bypass	AC220-240V, 50Hz, 8W
	Solenoid valve 2	INV Comp pressure equalizing valve	AC220-240V, 50Hz, 6W
	Solenoid valve 3	ACM oil return valve1.	AC220-240V, 50Hz, 6W
	Solenoid valve 5	EEV1 bypass valve	AC220-240V, 50Hz, 8W
	Solenoid valve 6	INV comp oil release valve	AC220-240V, 50Hz, 6W
	Crank case heater 1	For Inverter Compressor	AC240V, 25W
	Crank case heater 2	For Constant speed Compressor	AC240V, 35W
	Base heater	Field supply	AC220-240V, 35W
Communication Input / Output	LON WORKS Inverter communication Outdoor unit communication	Indoor unit ⟷ Outdoor unit Outdoor 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)	ON (Error) / OFF (Normal)	Control output: DC 0/12-24V, Max.30mA
	External output 2 (CN137) (Operation display)	ON (Operation) / OFF (Stop)	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.

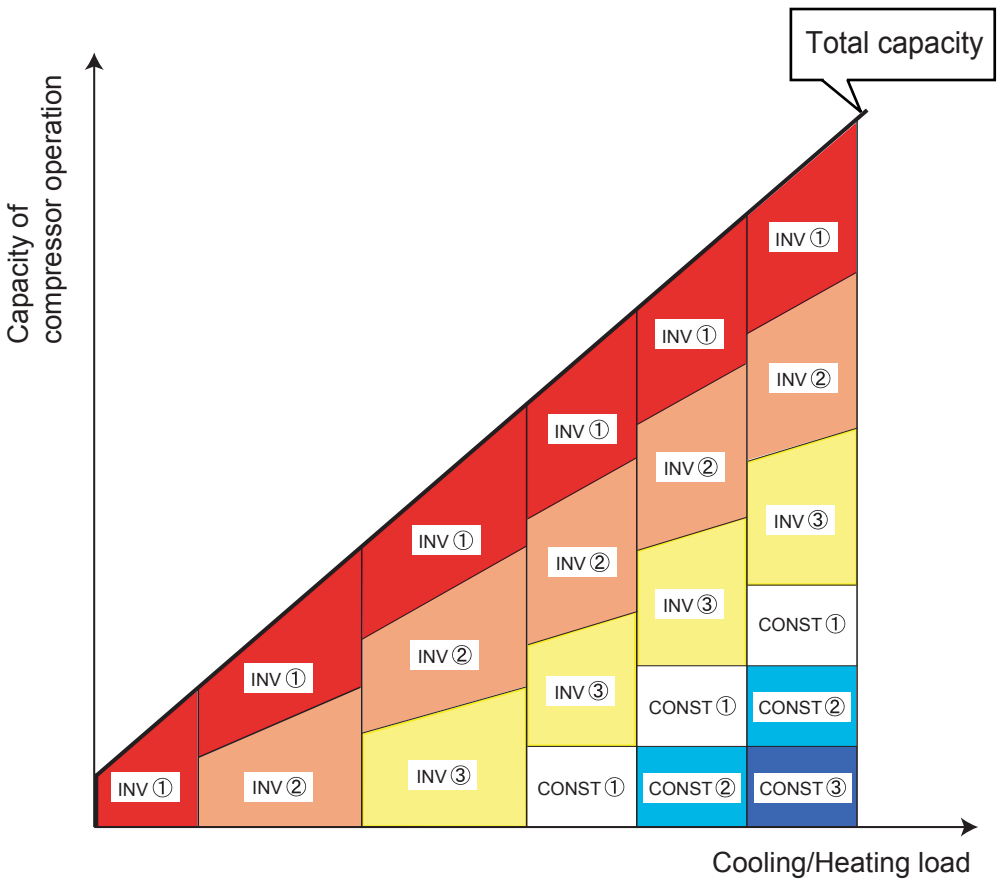
- During 3 minute restart prevention operation
- Icing protection
- Failure (Refer to chapter 4, TROUBLE SHOOTING)
- Oil recovery
- Under expansion valve initialization
- At protective operation
- Emergency stop
- Defrost operation
- Peak cut stop operation

2-2-2 Capacity Control

(1) Capacity of compressor operation

By combining the operation of DC inverter rotary compressor and the constant speed scroll 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 (Master 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 (Master unit).

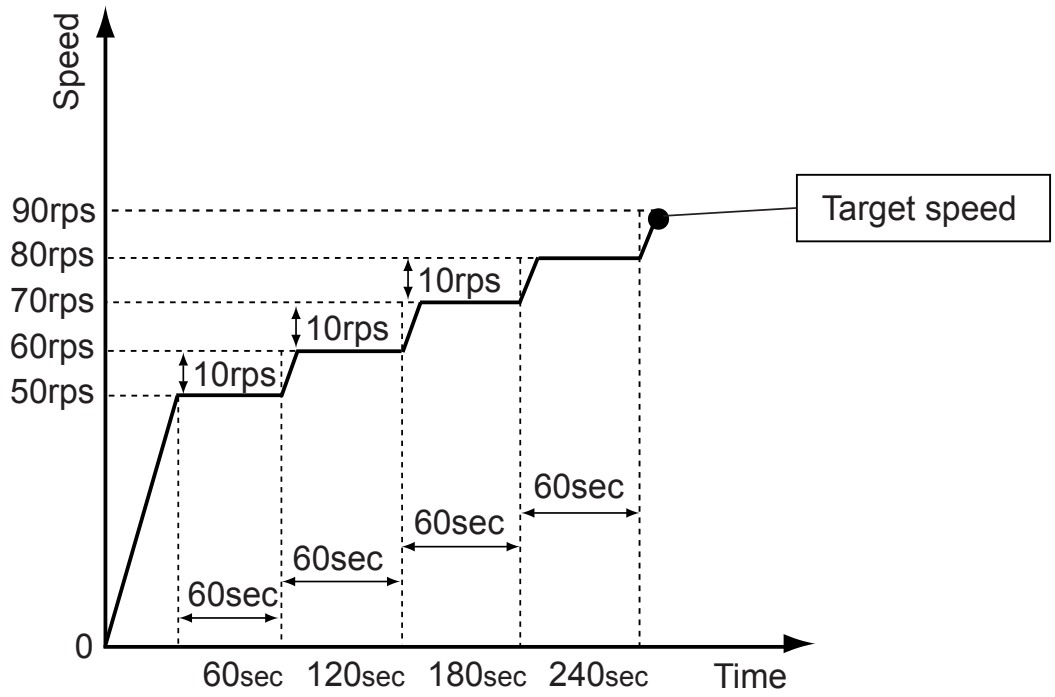
Target low-pressure and high pressure temperature depends on system capacity, capacity of compressor operation, pipe length, and capacity shift switch settings.

2-2-3 Speed Range of Start, Stop, And Operation (For DC Inverter Rotary Compressor)

- On stop mode : 0 rps
- On operating mode : 30 - 100 rps
- Master and slave inverter compressors rotational speed are controlled the same (In the case of multi outdoor unit)

(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.

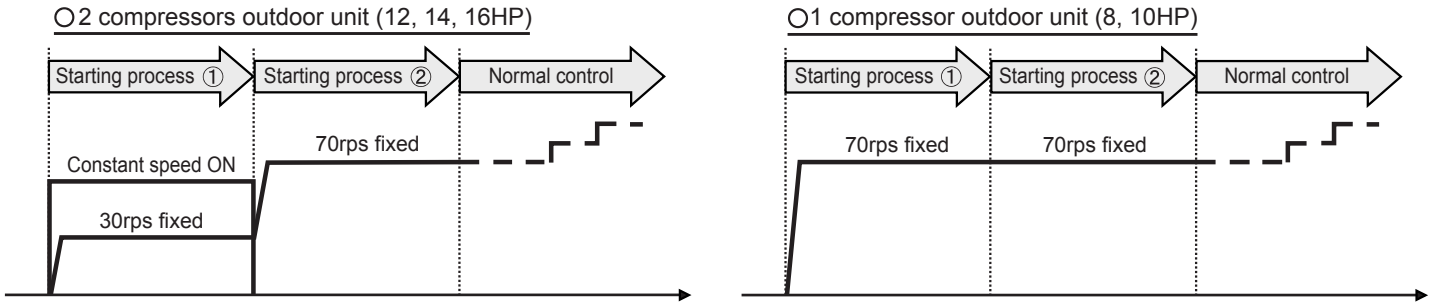
- The compressor operates at the upper limit speed if the target speed is higher than the upper limit speed.
- The compressor operates at the target speed if the target speed is lower than the upper limit speed.



(2) Heating starting process

At the start of heating, the compressor is started by the following process. All compressors 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 >



	End conditions
Starting process ①	7 minutes elapsed from start of process ① or 1 minute elapsed from start of process ① and high-pressure of all outdoor units ≧ 2.50MPa Compression ratio of any outdoor unit ＞ 8
Starting process ②	30 minutes elapsed from start of process ② or high-pressure of all outdoor units ≧ 2.63MPa or discharge SH of all operating compressors ＞ 12℃

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

< Conditions under which starting process is not performed >

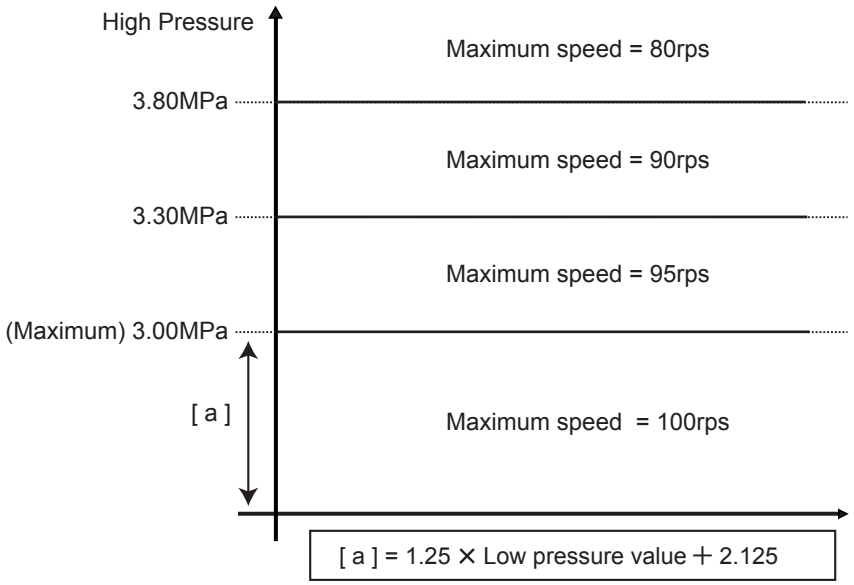
(A) When outside air temperature ＞ 20°C

(B) When the starting process at heating before stopped at the start of heating (including thermostat OFF stop) within 30 minutes after heating stopped.

< Operation >

Inverter compressor of all outdoor unit is started at 40rps and normal control immediately begins. (target high-pressure control)

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



2-2-4 Compressor Sequence Operation

Make a starting sequence and start and stop the compressors in accordance with that sequence.

Starting sequence ⓝ : Compressors are started at nth and stopped nth from the end

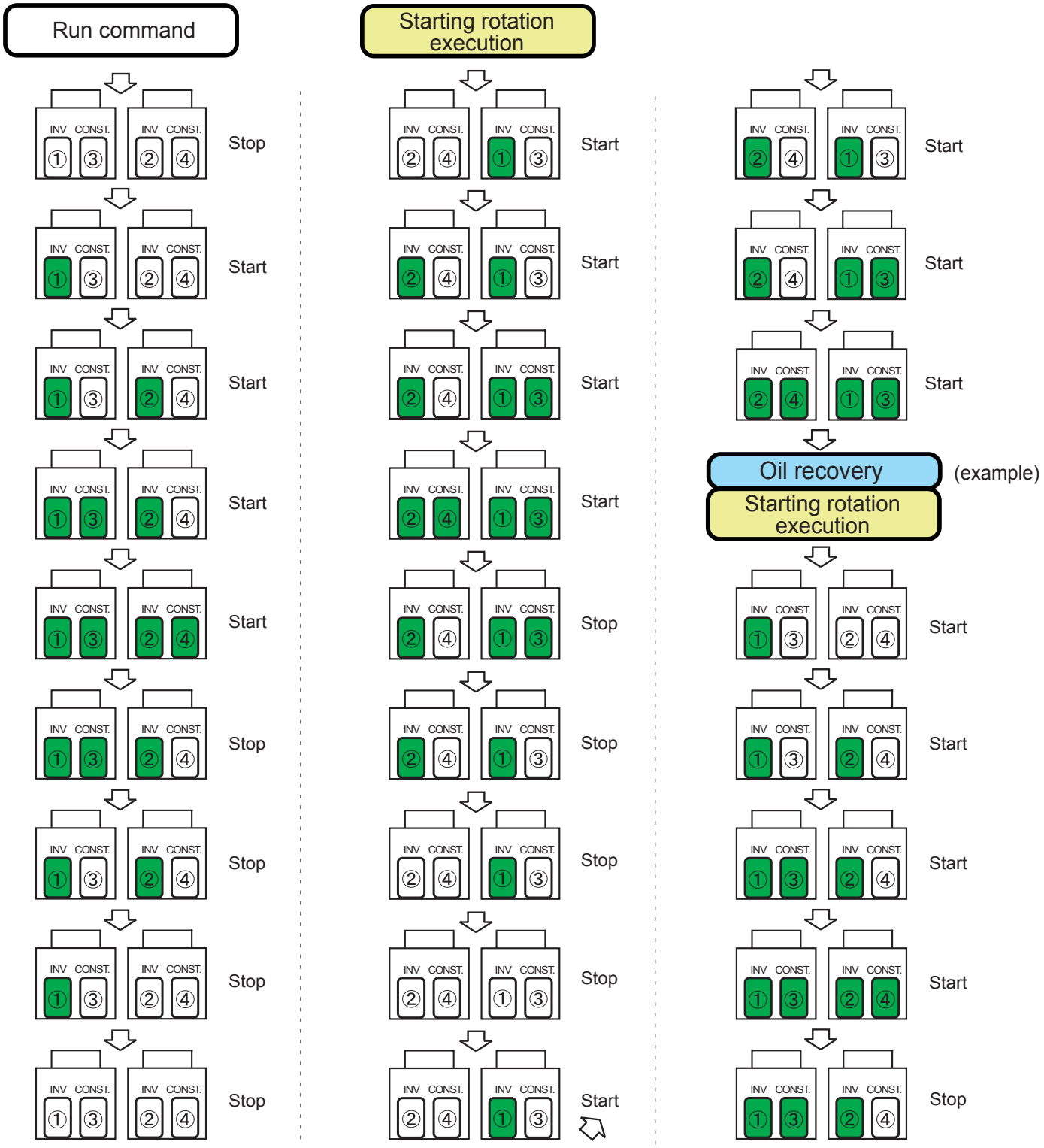
Example) Starting sequence ①: Compressor started first, compressor stopped last
Starting sequence ②: Compressor started 2nd, compressor stopped 2nd from the end

- Make a sequence such that the INV compressors are always started before constant speed compressors.
- Operate so that the speed of the operating INV compressors is the same. (May also vary with the upper limit & lower limit speed restriction)
- Rotate the stating sequence under the following conditions:
  (1) Defrosting
  (2) Oil recovery
  (3) When cooling discharge temperature is high

Stop Compressor

Operation Compressor

CONST. : Constant speed compressor
INV : Inverter compressor



2-3 FAN CONTROL

2-3-1 Cooling Operation

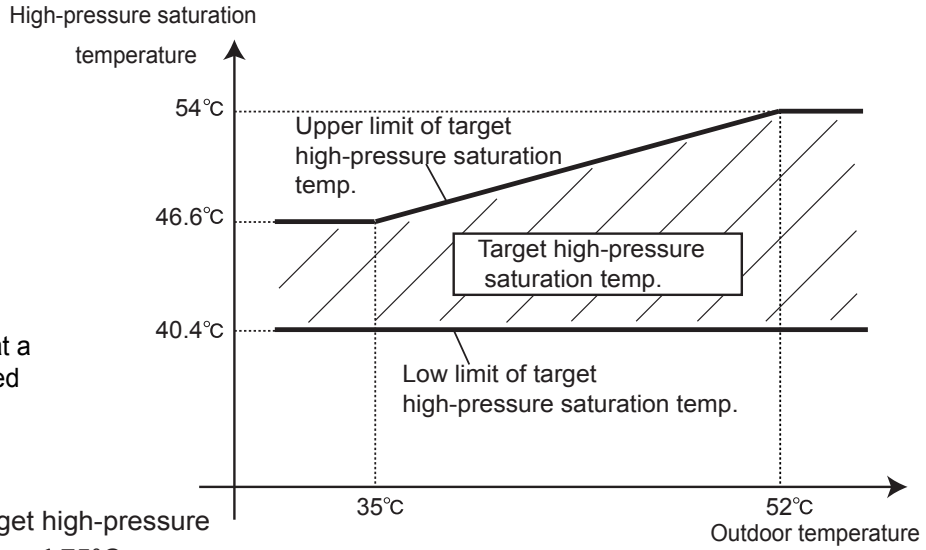
Fan step	Fan speed (rpm)				
	AJ＊A72LALH	AJ＊A90LALH	AJ＊A108LALH	AJ ＊A126LALH	AJ＊A144LALH
16	880	880	880	920	920
15	860	860	860	870	870
14	810	810	810	820	820
13	720	720	720	720	720
12	600	600	600	600	600
11	500	500	500	500	500
10	420	420	420	420	420
9	360	360	360	360	360
8	320	320	320	320	320
7	300	300	300	300	300
6	intermittent 6	intermittent 6	intermittent 6	intermittent 6	intermittent 6
5	intermittent 5	intermittent 5	intermittent 5	intermittent 5	intermittent 5
4	intermittent 4	intermittent 4	intermittent 4	intermittent 4	intermittent 4
3	intermittent 3	intermittent 3	intermittent 3	intermittent 3	intermittent 3
2	intermittent 2	intermittent 2	intermittent 2	intermittent 2	intermittent 2
1	intermittent 1	intermittent 1	intermittent 1	intermittent 1	intermittent 1
0	0	0	0	0	0

● Switching conditions of step

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

Outside air temperature sensor detected value	Fan step
TAOUT ＞ 30°C	16
30°C ≧ TAOUT ＞ 20°C	10
20°C ≧ TAOUT ＞ 10°C	7
10°C ≧ TAOUT	0

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



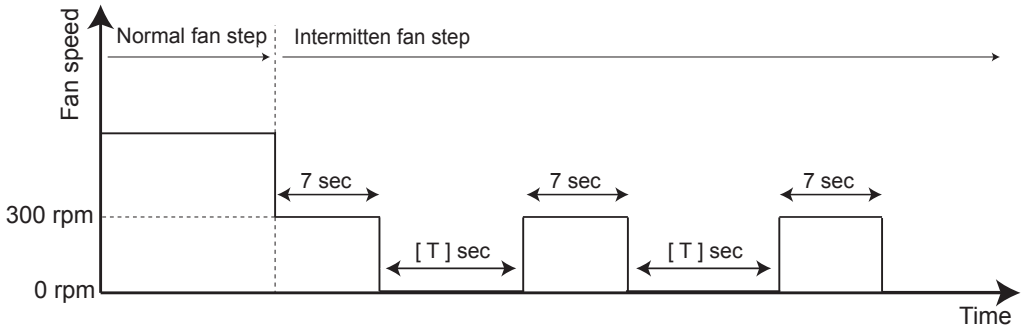
Thereafter, the high-pressure is monitoring at a set time interval and the fan speed is changed by the following conditions.

(Conditions which lower the fan speed)
High-pressure saturation ＜ low limit of target high-pressure saturation range and heat sink temperature ≦ 75°C

(Conditions which raise the fan speed)
High-pressure saturation ＞ upper limit of target high-pressure saturation or heat sink temperature ≧ 80°C

● Intermittent fan mode

Fan step	Fan mode	Fan speed 0 rpm duration time T (sec)	Fan speed 300 rpm duration time (sec)
6	intermittent 6	6	7
5	intermittent 5	12	
4	intermittent 4	19	
3	intermittent 3	26	
2	intermittent 2	33	
1	intermittent 1	40	



When switched from normal fan step to intermittent fan step, always start from 300rpm/7sec.
When there was a change during intermittent step 1-6, switching is performed at the time the current speed duration time reaches time-up.

2-3-2 Heating Operation

Fan step	Fan speed (rpm)				
	AJ＊A72LALH	AJ＊A90LALH	AJ＊A108LALH	AJ ＊A126LALH	AJ＊A144LALH
16	880	880	880	920	920
15	860	860	860	870	870
14	830	830	830	820	820
13	700	700	700	700	700
12	600	600	600	600	600
11	500	500	500	500	500
10	420	420	420	420	420
9	360	360	360	360	360
8	320	320	320	320	320
7	300	300	300	300	300

● 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 ＜ 10°C	16
10°C ≦ TAOUT ＜ 15°C	12
15°C ≦ TAOUT ＜ 20°C	7
20°C ≦ TAOUT	7

Thereafter, the high-pressure is monitoring at a set time interval and the fan speed is changed by the following conditions.
Other outdoor units are normally operated at fan step 16.

(Condition which lowers the fan speed)

High-pressure ≧ 3.30MPa and heat sink temperature ≦75°C

(Condition which raises the fan speed)

High-pressure saturation ≦ 3.20MPa or heat sink temperature ≧80°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	LEVEL 1	LOW NOISE MODE ①
	LEVEL 2	LOW NOISE MODE ②
ON	LEVEL 1	* Automatic switching ①
	LEVEL 2	* Automatic switching ②

《Low noise mode and operation contents》

			8HP	10HP	12HP	14HP	16HP
LOW NOISE MODE ①	COOL	Fan upper limit speed	600rpm	600rpm	600rpm	600rpm	600rpm
		Upper limit compressor capacity	INV 45rps	INV 53rps	INV 60rps	INV 72rps	INV 72rps
	HEAT	Fan upper limit speed	600rpm	600rpm	600rpm	600rpm	600rpm
		Upper limit compressor capacity	INV 46rps	INV 47rps	INV 61rps	INV 100rps	INV 100rps
LOW NOISE MODE ②	COOL	Fan upper limit speed	500rpm	500rpm	500rpm	500rpm	500rpm
		Upper limit compressor capacity	INV 45rps	INV 50rps	INV 60rps	INV 62rps	INV 62rps
	HEAT	Fan upper limit speed	500rpm	500rpm	500rpm	500rpm	500rpm
		Upper limit compressor capacity	INV 45rps	INV 45rps	INV 55rps	INV 62rps	INV 62rps

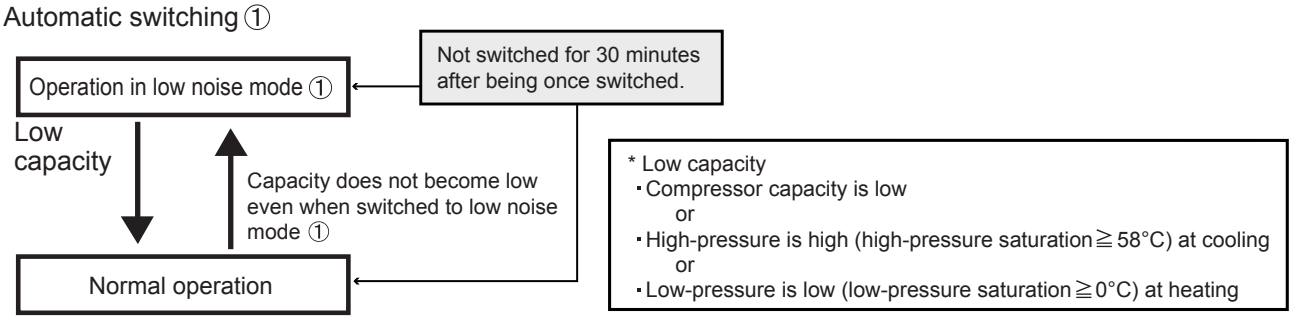
The constant speed compressor is stopped in the LOW NOISE MODE ① and ②

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

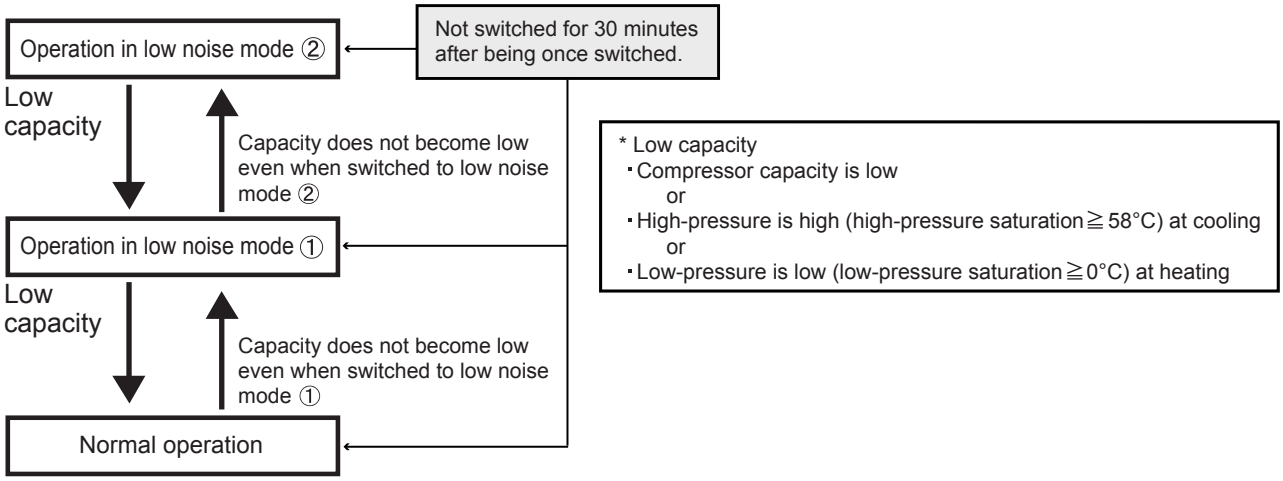
LOW NOISE MODE ① ・・・ The operating sound lowers from about 3 to 5 dB more than the rated value

LOW NOISE MODE ② ・・・ The operating sound lowers from about 3 to 5 dB more than the LOW NOISE MODE ①

* Automatic switching ①



* Automatic switching ②



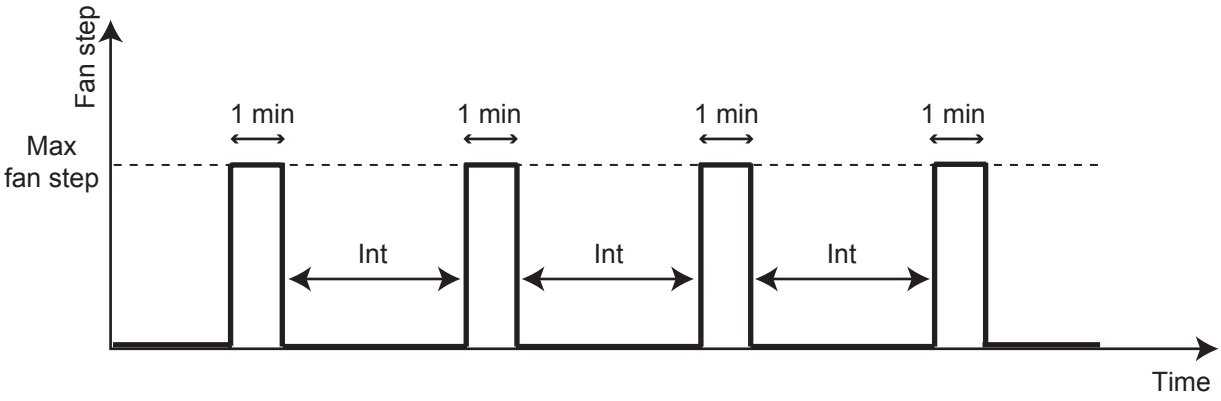
2-3-4 Snow Falling Protection Fan Mode

The fan rotates compulsorily at the maximum speed when the outdoor temperature becomes 5℃ or less when snow falling protection fan mode is set on.
The fan is rotated for 1 minute at the fan step upper limit at the interval set by PUSH SW.

This mode ends when the outdoor temperature becomes 7℃ or more or operation starts.

(Operation contents)

Interval setting	PUSH SW setting (F2 - 23)	Interval time Int (min)
setting ④ (standard)	00	30
setting ①	01	5
setting ②	02	10
setting ③	03	20



2-3-5 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	① When power turned on ② When operation stopped	Cooling	0 pulses	0 pulses
		Heating	55 - 500 pulses	
EEV 2		Cooling	55 - 500 pulses	0 pulses
		Heating		

< Cooling mode >
0 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

(1) 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 **Simple oil recovery operation** < Oil recovery from the gas main pipe > (Only cooling mode)

< Start condition >
Suction temperature — low pressure saturation temperature ≧ 10°C continues for 30 minutes

< End condition >
Suction temperature — low pressure saturation temperature ≦ 7°C

< Operation >
Indoor unit : Expansion valve of operating indoor unit gradually opened
Outdoor unit : Normal cooling operation

② **Cooling oil recovery operation**

< Start condition >
Compressor accumulated operation time since last cooling oil recovery operation exceeds 3 hours (first time : 1hour)

< End condition >
30 seconds have elapsed since the start and "suction temperature - low pressure saturation temperature ≦ 5deg" at all outdoor units or 6 minutes have elapsed since the start.

< Operation >
COMPRESSOR: Performed by all INV compressors and the constant speed compressors operating up until now
INV 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).

③ **Heating oil recovery operation**

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

< End condition >
After 4 minutes have elapsed

< Operation >
COMPRESSOR: Performed by all INV compressors and the constant speed compressors operating up until now
INV 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.

Crankcase heater ON: 30 minutes elapsed since installed compressors stopped (However, ON when power turned on)
OFF: Installed compressors operation

*It doesn't control according to the temperature.

Inverter use: Decided by INV compressor ON-OFF
Constant speed use: Decided by constant speed compressor ON-OFF

2-5-3 Defrost Operation Control

< Defrosting start condition >

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 ≦ -2°C" accumulated operating time is 180 minutes or longer
(75 minutes for indoor unit connection capacity ≦ 90% at 1 outdoor unit connection)

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

(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, -27.6°C to - 6°C)**

If the calculated result is lower than -27.6℃, the judgment temperature is defined as -27.6℃
If the calculated result is higher than -6℃, the judgment temperature is defined as -6℃

< Defrosting end condition >

① At all outdoor units, heat exchange liquid temperature ≧ end judgment temperature
or
② when 10 minutes have elapsed from the start
(When the indoor unit connection capacity is 90% or less, after 15 minutes have elapsed.)

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

If the calculated result is lower than 5℃, the judgment temperature is defined as 5℃
If the calculated result is higher than 12℃, the judgment temperature is defined as 12℃

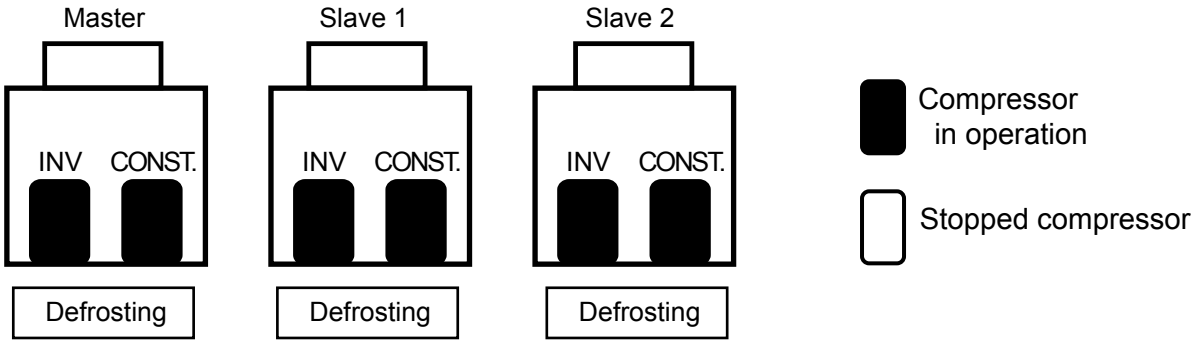
< Operating state of each part during defrosting operation >

Indoor unit EEV : Open FAN : Stop

Outdoor unit FAN : Stop Compressor : In operation

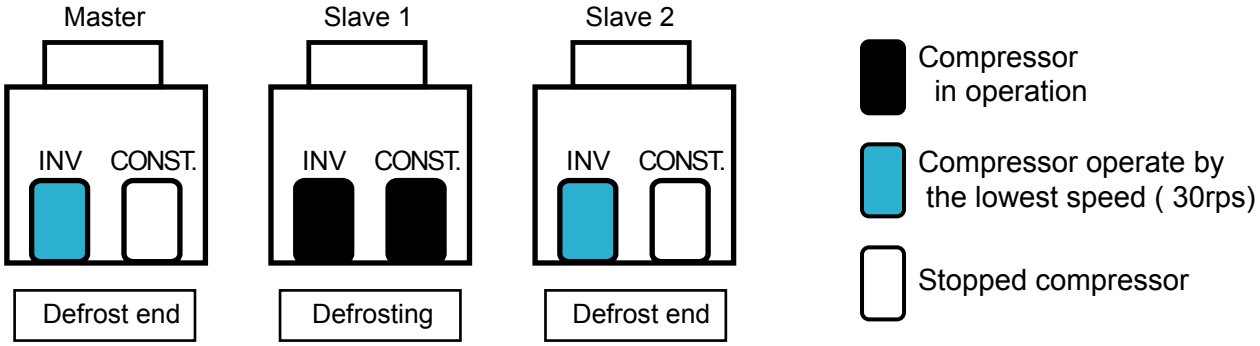
[STEP 1]

All compressors operates and it defrosting.



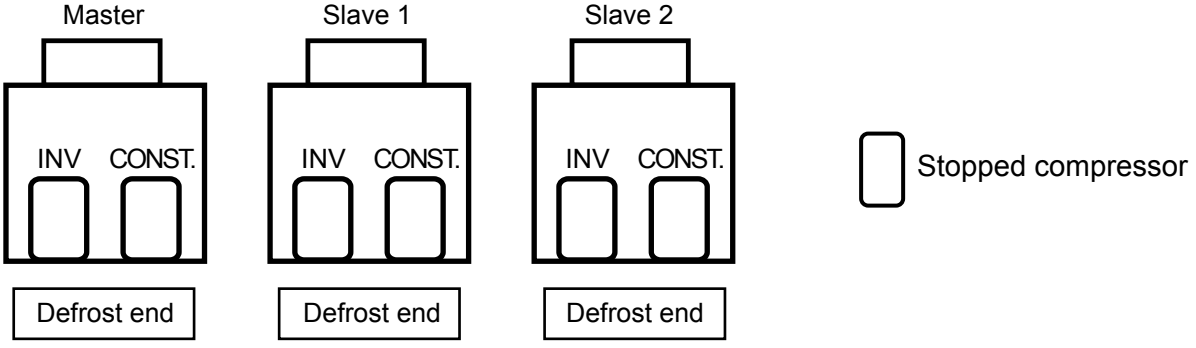
[STEP 2]

Outdoor units which satisfied the defrosting end judgment temperature are stopped for constant speed compressor and are operated at the lowest speed (30rps) for inverter compressor.



[STEP 3]

When the defrosting of all outdoor units ends, all outdoor unit stop.
The start rotation execution is done, and restarts.



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 ≧ 100°C or suction SH ≧ 10°C accumulated time 30 minutes) <Reset conditions> Discharge temperature ≦ 95°C and suction ≦ 7°C	EEV of operating indoor unit gradually opened
Discharge Temp Protection 2	Discharge Temp Thermistor	○	○	—	<Starting conditions> Cooling: Discharge temperature ≧ 95°C Heating: Discharge temperature ≧ 102°C <Reset conditions> Discharge temperature < 90°C Discharge temperature < 97°C	EEV2 + 30pls/30 secs
Discharge Temp Protection 3	Discharge Temp Thermistor	○		—	<Starting conditions> Discharge temperature ≧107°C <Reset conditions> Discharge temperature ≦105°C	Outdoor unit rotation execution * After rotation has been executed once; it is executed every 15 minutes.
Discharge Temp Protection 4	Discharge Temp Thermistor	○	○	—	< starting condition> Discharge temperature ≧105°C <Pattern reset condition> Discharge temperature ≦100°C	INV compressor speed -6rps every 30 secs Speed rise prohibited, when discharge temperature becomes lower than 105°C, prohibit the rotational speed rise of the compressor.
Discharge Temp Protection 5	Discharge Temp Thermistor		○	—	<Starting conditions> Discharge temperature ≧ 95°C and EEV1=500pls <Reset conditions> 2 minutes have elapsed and (discharge temperature ≦ 90°C or EEV1 ≦ 400pls)	Expansion valve of stopped indoor unit gradually opened (upper limit 200pls)
Discharge Temp Protection 6	Discharge Temp Thermistor		○	—	<Starting conditions> Discharge temperature ≧ 90°C <Reset conditions> Discharge temperature < 90°C	EEV1: Forcefully OPEN
Discharge Temp Protection Stop	Discharge Temp Thermistor	○	○	P1	<Pattern① starting condition> Discharge temperature ≧ fixed value (INV: 110°C, constant speed: 115°C) <Pattern① reset condition> 3 minutes have elapsed and discharge temperature ≦ 80°C	Corresponding compressor stopped
				EA11 (INV) EA21 (CONST)	<Pattern② starting condition> Pattern① generated 2 times within 40 minutes <Pattern② reset condition> Error reset (push button SW) executed after power turned on again	Corresponding compressor stopped (permanent stop) Error display
High Pressure Protection 1	High Pressure Sensor	○		—	<Starting conditions> High-pressure ≧ 3.94MPa <Reset conditions> Fixed time has elapsed and high-pressure ≦ 3.70MPa * Fixed time when SV1: ON 180 secs, when SV2: ON 30 secs	At INV independent operation: SV2 ON At constant speed independent operation: SV1 ON
High Pressure Protection 2	High Pressure Sensor		○	—	<Starting conditions> High-pressure ≧3.60MPa <Reset conditions> 3 minutes have elapsed and high-pressure ≦ 2.80MPa	At INV independent operation: SV2 ON When still insufficient: SV1 ON + SV2 ON At INV + constant speed operation, constant speed independent operation: SV1 ON
High Pressure Protection 3	High Pressure Sensor	○		—	<Starting conditions> Fixed time has elapsed and high-pressure ≧ 3.50MPa (* 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		○	—	<Pattern① starting condition> High-pressure ≧ 3.30MPa <Pattern① reset condition> High-pressure < 3.3MPa	Fan speed lowered/every 30 secs
				—	<Pattern② starting condition> High-pressure ≧ 3.50MPa <Pattern② reset condition> High-pressure < 3.5MPa	Fan lowest speed (300rpm) fixed
High Pressure Protection 5	High Pressure Sensor		○	—	<Starting conditions> High-pressure ≧ 3.20MPa <Reset conditions> High-pressure < 3.20MPa	Compressor capacity lowered/every 15 secs
Abnormal High Pressure Protection Control	High Pressure Sensor	○		—	<Pattern① starting condition> High-pressure ≧ 3.78MPa <Pattern① reset condition> After 25 seconds have elapsed and high-pressure < 3.70MPa	Compressor capacity rise prohibited
				—	<Pattern② starting condition> High-pressure ≧ 3.90MPa <Pattern② reset condition> After 25 seconds have elapsed and high-pressure < 3.78MPa	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 ≧ 4.00MPa <Pattern ① reset condition> 5 minutes have elapsed and high-pressure ≦ 3.50MPa	All compressors in outdoor unit 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 ≦ 3.50MPa	All compressors in outdoor unit stopped Error display
High Pressure Protection Stop 2	Pressure Switch	○	○	P2	<Pattern ①starting condition> Pressure SW operated (Operated by high-pressure ≧4.20MPa) <Pattern ①reset condition> 5 minutes have elapsed and pressure SW operation reset (Reset by high-pressure ≦3.2MPa)	Corresponding compressor stopped
				EA42 (INV) EA43 (CONST)	<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 ≦ 3.2MPa)	Corresponding compressor stopped Error display
Low Pressure Protection 1	Low Pressure Sensor	○		—	<Starting conditions> Low-pressure ≦ 0.20MPa <Reset conditions> 5 minutes have elapsed and low-pressure ≧ 0.30MPa	SV1 ON
Low Pressure Protection 2	Low Pressure Sensor		○	—	<Starting conditions> Low-pressure ≦ 0.10MPa <Reset conditions> 3 minutes have elapsed and low-pressure ≧ 0.17MPa	SV1 ON
Low Pressure Protection 3	Low Pressure Sensor	○		—	<Starting conditions> One operating outdoor unit and INV compressor operating at 30rps and low-pressure ≦ 0.65MPa <Reset conditions> 5 minutes have elapsed and INV compressor operating at 40rps or faster	SV1 ON
Low Pressure Protection 4	Low Pressure Sensor		○	—	<Starting conditions> 3 minutes have elapsed and low-pressure ≦ 0.18MPa <Reset conditions> 3 minutes have elapsed and low-pressure ≧ 0.22MPa	EEV of stopped indoor unit opened quickly (450pls)
Abnormal Low Pressure Protection Control	Low Pressure Sensor		○	—	<starting condition> Low-pressure ≦ 0.16MPa <reset condition> 3 minutes have elapsed and low-pressure ≧ 0.18MPa	Compressor capacity lowered every 180 secs, when the Low-pressure becomes more than 0.17MPa, prohibit compressor capacity rise.
Low Pressure Protection Stop	Low Pressure Sensor	○	○	P3	<Pattern ① starting condition> Low-pressure ≦ 0.05MPa or low-pressure ≦ 0.10MPa continues for 10 mins <Pattern ① reset condition> 3 minutes have elapsed and low-pressure ≧ 0.17MPa	All compressors in outdoor unit 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.	All compressors in outdoor unit stopped (permanent stop) Error display
Compressor Temp Protection Stop	Compressor Temp Thermistor	○	○	P4	<Pattern ① starting condition> Compressor temperature ≧ fixed value (INV: 112°C, Constant speed: 120°C) <Pattern ① reset condition> 3 minutes have elapsed and discharge temperature ≦ 80°C	Corresponding compressor stopped
				EA31 (INV) EA32 (CONST)	<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	Corresponding compressor stopped (permanent stop) Error display

Protective Function	Detect Parts	COOL	HEAT	DISPLAY	Operating Condition	Operation
Overcurrent Break Stop (INV compressor)	Overcurrent Protection Circuit	○	○	E941 (permanent stop)	Inverter compressor is stopped when the over currernt protectioncircuit in the inverter PCBoad detects an abnormal current duringthe operation. If it repeated 5 times, the inverter compressor becomes permanentstop.	INV compressor stopped
				E931 (permanent stop)	Inverter compressor is stopped when the over current protection circuit in the inverter PC Board detects an abnormal current at the time of start up. Inverter 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.	
Overcurrent Break Stop (Constant speed compressor)	Carrent Detector Circuit	○	○	—	<Pattern① starting condition> Constant speed compressor current value ≧ 19.5A continues for 2 secs <Pattern① reset condition> 10 minutes have elapsed since compressor was stopped.	Constant speed compressor stopped
				E922	<Pattern② starting condition> Pattern① generated 2 times within 60 minutes. <Pattern② reset condition> Error reset (push button SW) executed after power turned on again.	Constant speed compressor stopped (permanent stop) Error display
Heatsink Temp Protection Stop	Heatsink Temp Thermistor	○	○	—	<Pattern① starting condition> Heat sink temperature ≧ 88°C <Pattern① reset condition> 3 minutes have elapsed and heat sink temperature ≦ 75°C	INV compressor stopped
				EAC4	<Pattern② starting condition> Pattern① generated 3 times within 60 minutes. <Pattern② reset condition> 10 minutes have elapsed and heat sink temperature ≦ 75°C	INV compressor stopped Error display
Frequency Maximum Setting Protection (INV compressor)	Current Detector Circuit	○	○	—	<Pattern① starting condition> Current value ≧ 18.2A <Pattern① reset condition> Current value ＜ 18.2A	INV compressor speed rise prohibited
				—	<Pattern② starting condition> Current value ≧ 19.2A <Pattern② reset condition> Current value ＜ 19.2A • Pattern① and② start current value changed by outside temperature	INV compressor speed lowered

Refrigerant R410A
INVERTER

AIRSTAGE™ V-II
Variable Refrigerant Flow System

3. INDOOR UNIT OPERATION

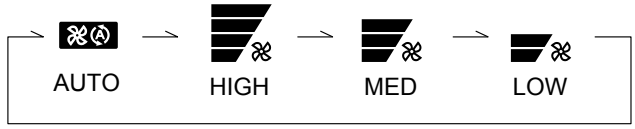
3. INDOOR UNIT OPERATION

3-1 FAN CONTROL

3-1-1 Fan Speed Setting

Fan speed setting

Press the FAN CONTROL button to set the fan speed.

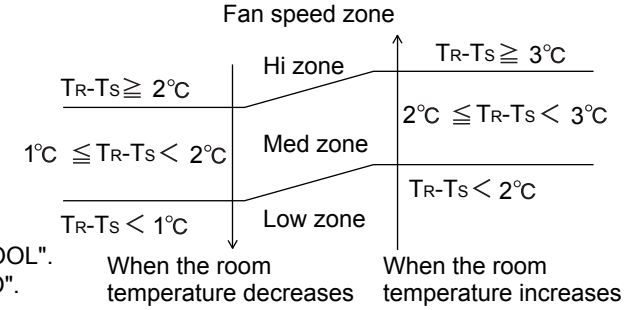


3-1-2 "AUTO" Position

1. COOLING OPERATION

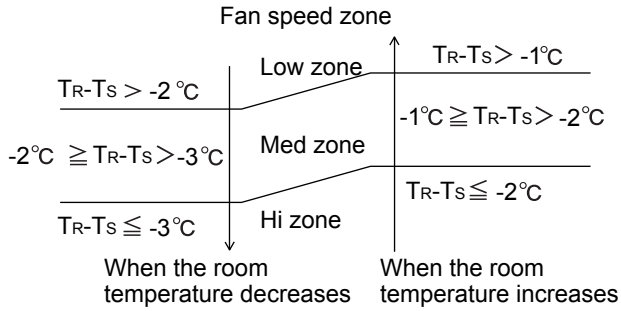
The fan speed is determined automatically in accordance with the condition "(T_R(corrected room temperature) - T_S (corrected set temperature)" as shown on the right.
However, the fan speed zone is determined in the manner as the room temperature increases for the following cases.

(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".



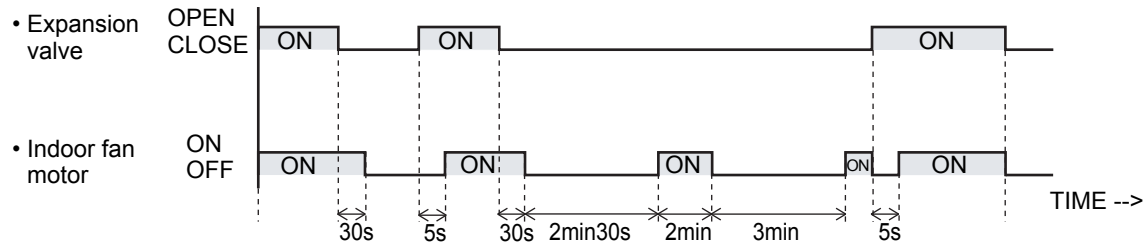
2. HEAT OPERATION

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 difference calculation and frost prevent fuction	Pulse controlled by the temperature difference calculation and frost prevent function	Pulse controlled by the temperature difference.

(3) Priority mode

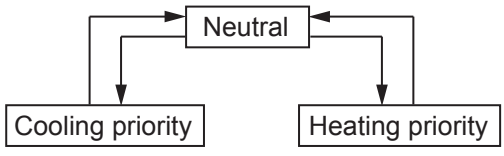
The purpose of the priority mode is to restrict operation commands (heating, cooling, dry) from the connected indoor units. There are 3 priority modes of Neutral, Cooling Priority, and Heating Priority. The operation modes restricted by each of these modes are as follows:

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.

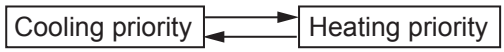
Method 3. (Management by indoor unit)

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 thermostat off and compressor on. Closed at other operation.	Closed at all times

(3) Priority mode

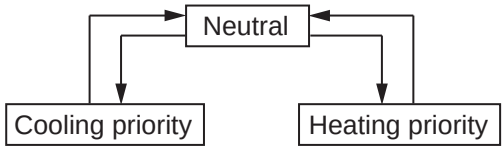
The purpose of the priority mode is to restrict operation commands (heating, cooling) from the connected outdoor air units. There are 3 priority modes of Neutral, Cooling Priority, and Heating Priority. The operation modes restricted by each of these modes are as follows:

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

1. Priority mode decision methods

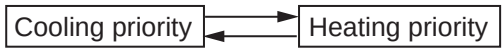
Method 1. (Default value)

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.



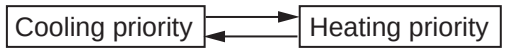
Method 2. (Management by Outdoor unit)

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.

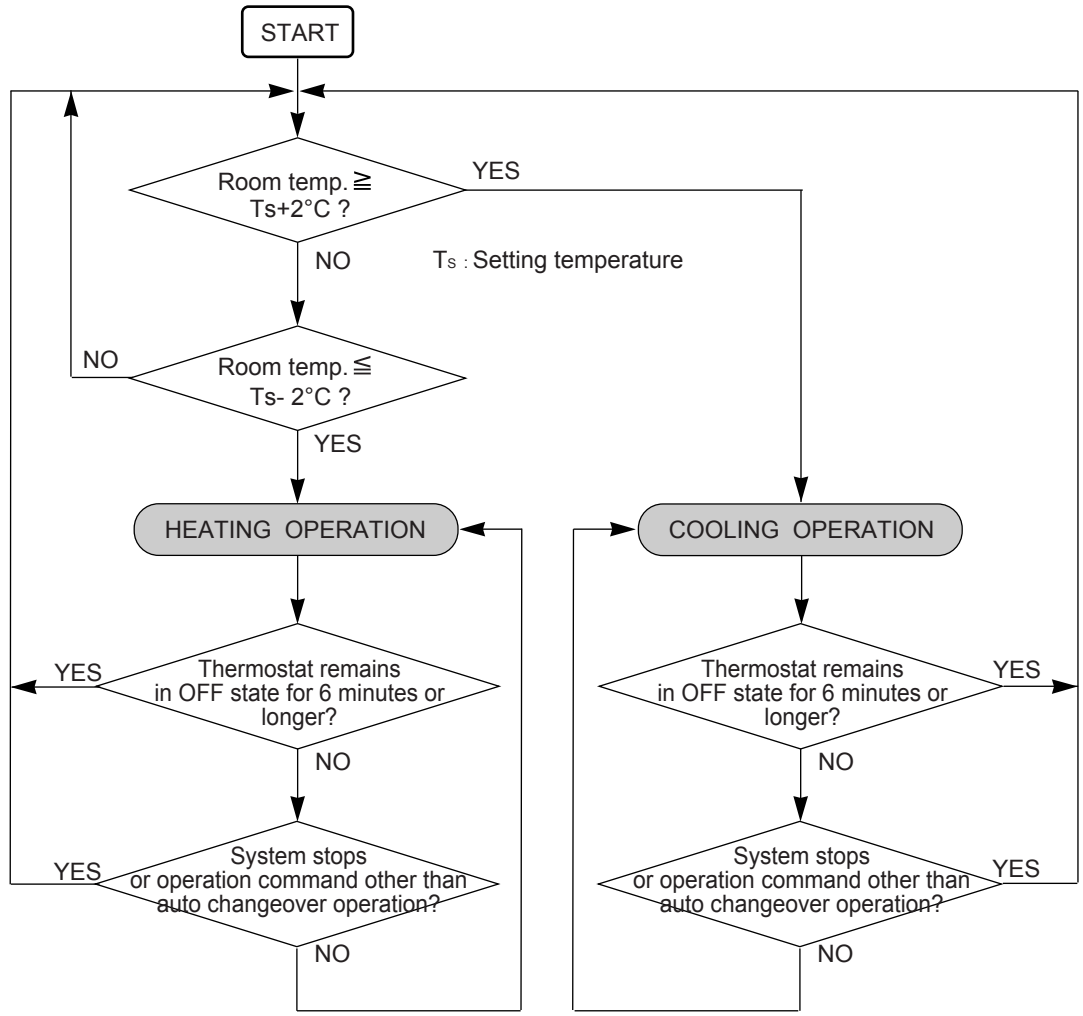
Timer lamp: 3 secs ON/1 sec OFF repeated

3-2-2 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

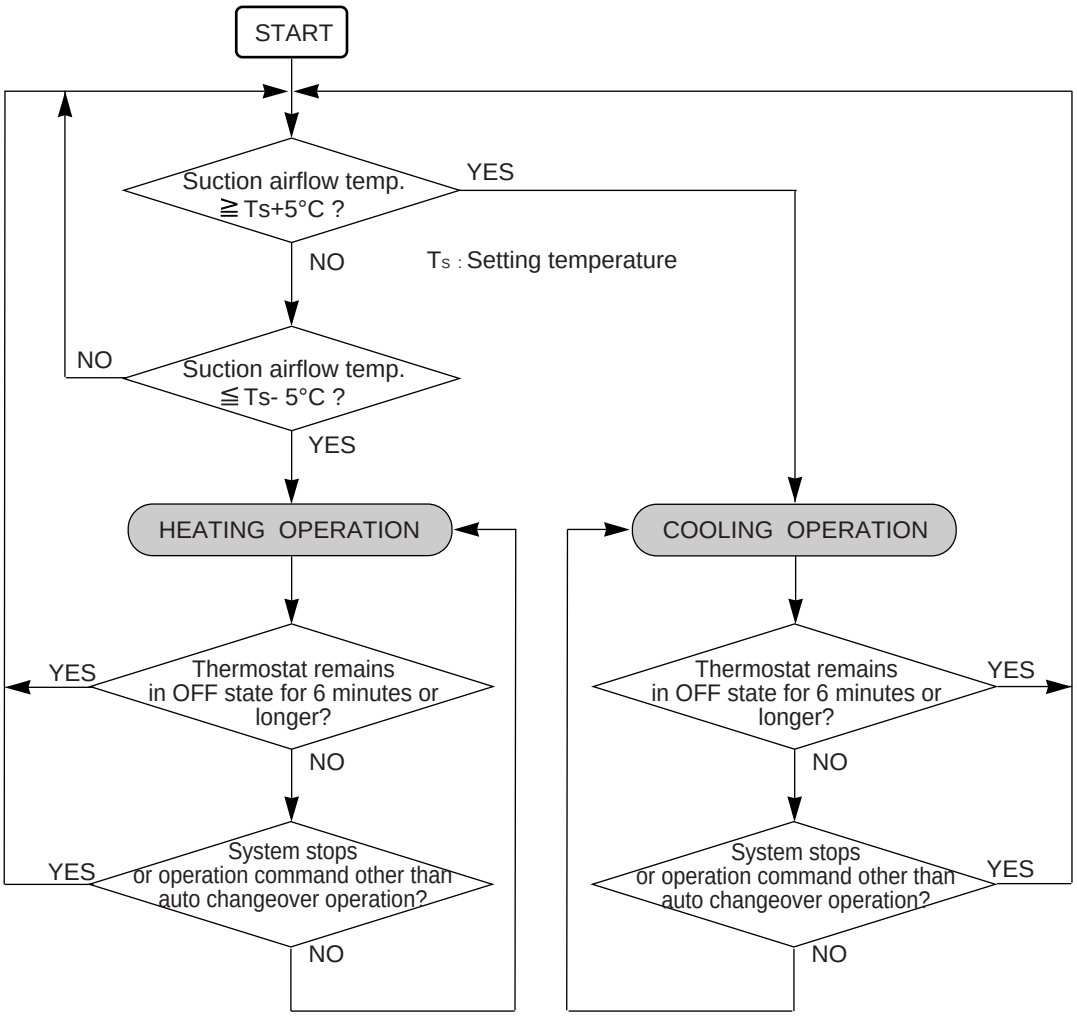
Function is available when an outdoor air unit set as the administrative indoor unit (Management Outdoor air unit). Refer to the setting Method

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 airflow temperature

■ AUTO CHANGEOVER operation

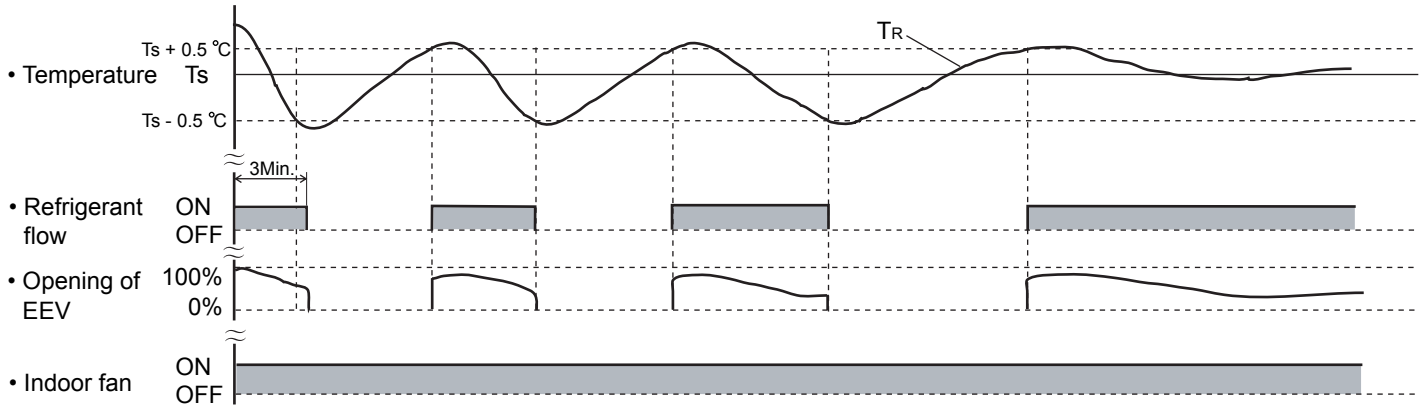
Operation flow chart



3-2-3 "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)

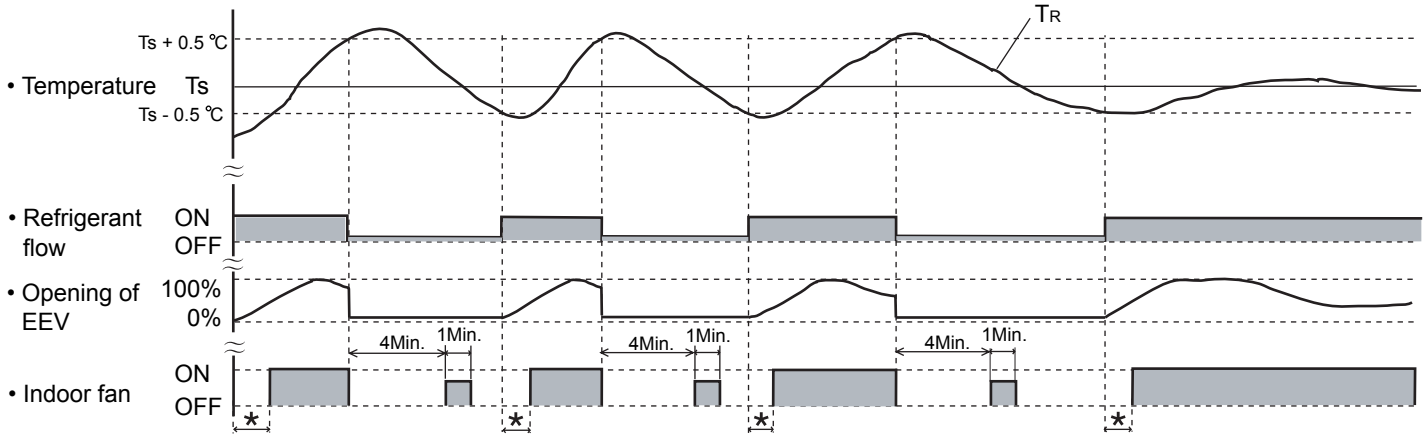


Ts : Corrected setting temperature
TR : Corrected room temperature
Ts + 0.5 ℃: The thres hold temperature of start of refrigrant flow
Ts - 0.5 ℃ : The thres hold temperature of stop of refrigrant flow

3-2-4 "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)

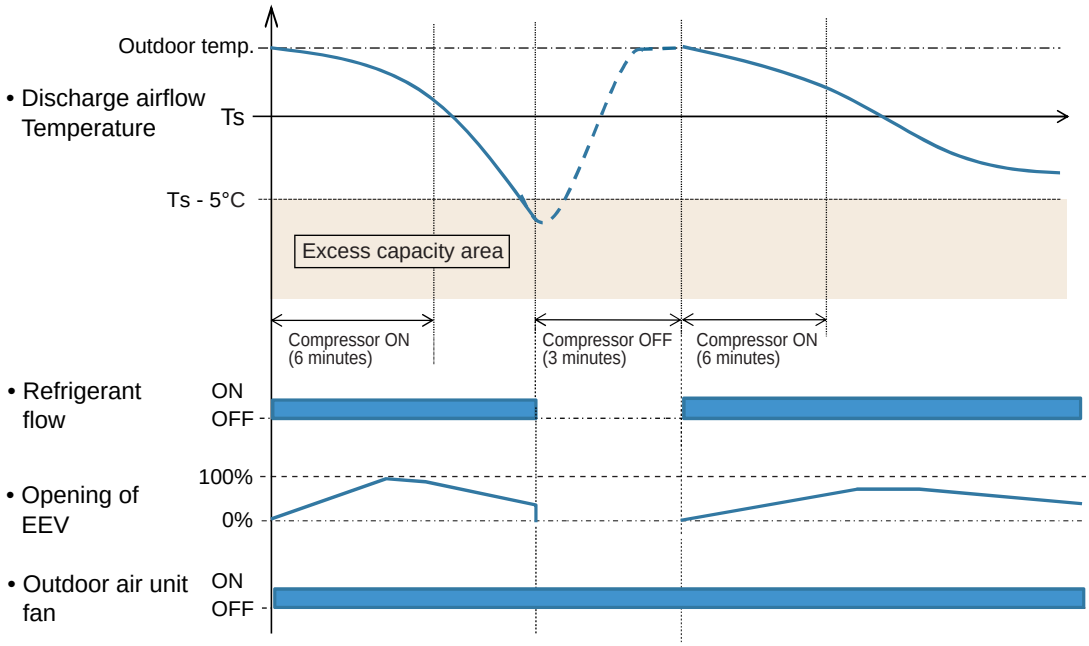


Ts : Corrected setting temperature
TR : Corrected room temperature
* : Duration of cold air prevention
Ts + 0.5 ℃: The thres hold temperature of start of refrigrant flow
Ts - 0.5 ℃ : The thres hold temperature of stop of refrigrant flow

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

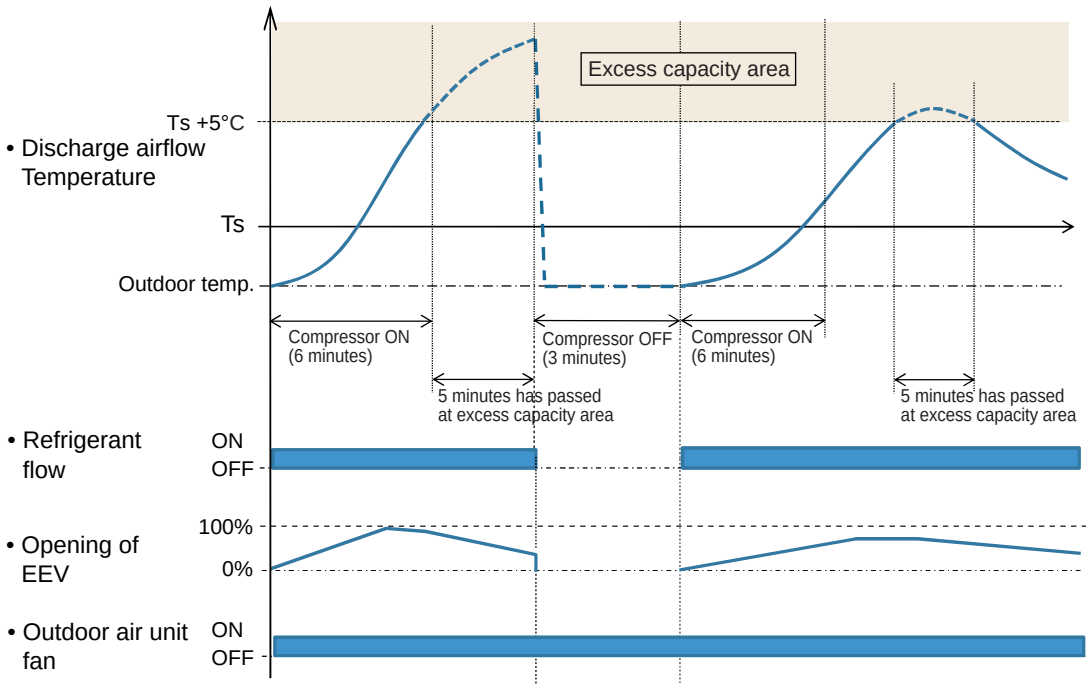
Ts + 0.5°C : The thres hold temperature of start of refrigerant flow
Ts - 5°C : The thres hold temperature of stop of refrigerant flow

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 - 0.5°C : The thres hold temperature of start of refrigerant flow
Ts + 5°C for 5 minutes or more
: The thres hold temperature of stop of refrigerant flow

3-3 LOUVER CONTROL

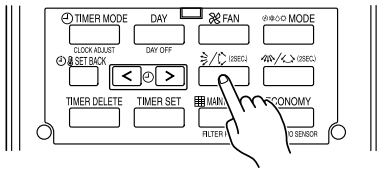
(1) ADJUSTING THE DIRECTION OF AIR CIRCULATION

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 "LARGE CEILING TYPE", "UNIVERSAL FLOOR/CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE" and "COMPACT WALL MOUNTED TYPE".



Example : When set to vertical air direction.

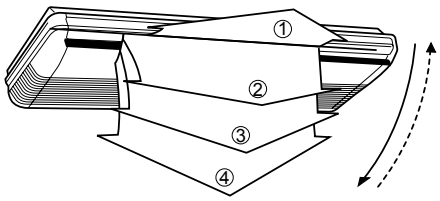
Press the VERTICAL AIR FLOW DIRECTION SET button.

- 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.

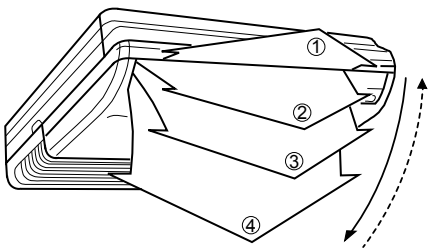
Cooling & Dry : ①, ②, ③, ④

Heating : ①, ②, ③, ④

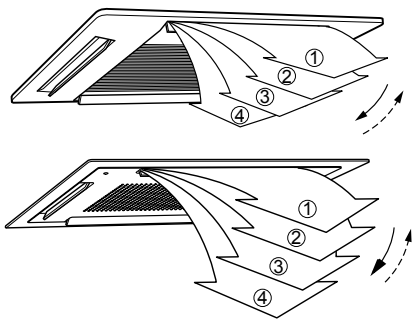
■ **LARGE CEILING TYPE**



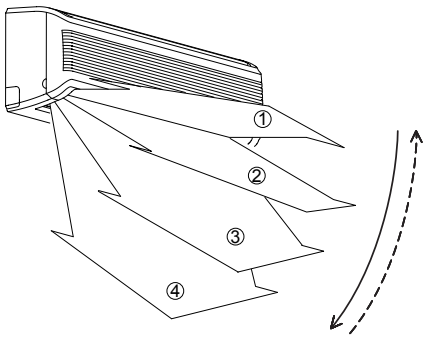
■ **UNIVERSAL FLOOR/CEILING TYPE**



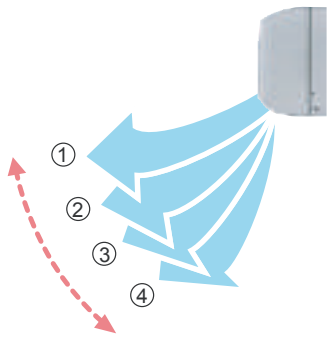
■ **CASSETTE TYPE**



■ **WALL MOUNTED TYPE**



■ **COMPACT WALL MOUNTED TYPE**



⚠ 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, chil-dren, 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
- 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.

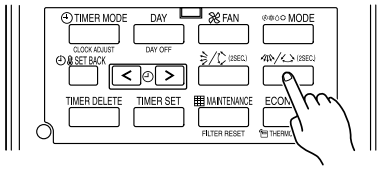
Horizontal Air Direction Adjustment

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

Press the HORIZONTAL AIR FLOW DIRECTION SET button.

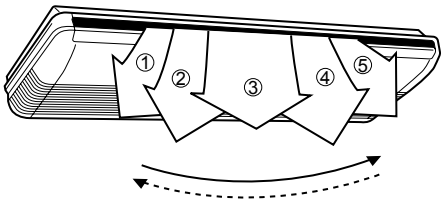
- Press the HORIZONTAL AIRFLOW DIRECTION button. The temperature display will change to the horizontal airflow direction setting display.
- Press the HORIZONTAL AIRFLOW DIRECTION button to change the horizontal louvre position. The position number will appear on the display.

Cooling & Dry : ①, ②, ③, ④, ⑤
Heating : ①, ②, ③, ④, ⑤

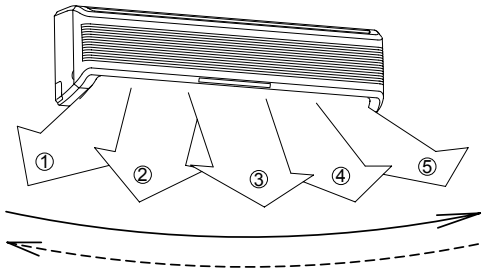


Example : When set to horizontal air direction.

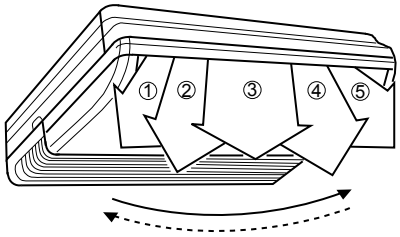
■ **LARGE CEILING TYPE**



■ **WALL MOUNTED TYPE**



■ **UNIVERSAL FLOOR/CEILING TYPE**



(2) SWING OPERATION

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

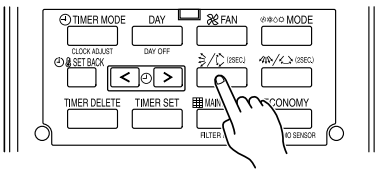
Begin air conditioner operation before performing this procedure.

To select Vertical airflow SWING Operation

This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR/CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE" and "COMPACT WALL MOUNTED 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 "LARGE CEILING TYPE", "UNIVERSAL FLOOR / CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE", and "COMPACT WALL MOUNTED 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

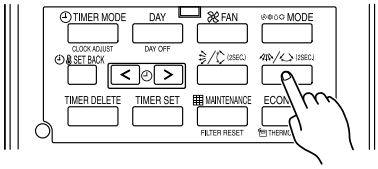
Air flow direction set	Range of swing
①	① to ④ (All range)
②	
③	
④	

To select Horizontal Airflow SWING Operation

This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR / CEILING TYPE", "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

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 0.5℃ 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

3-5 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.

3-4 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 5°C lower than the set-up temperature, EEV is fully closed.
  2) If the suction airflow temperature becomes 0.5°C lower than the set-up temperature, EEV is fully closed.
  Heating operation: 1) If the discharge airflow temperature becomes 5°C higher than the set-up temperature for 5 minutes or more, EEV is fully closed.
  2) If the suction airflow temperature becomes 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 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 ≦ 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

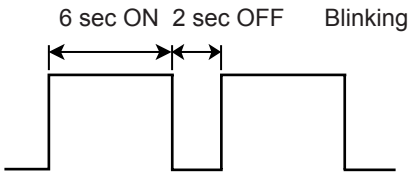
* Drain pump turns off at 60 minutes past the completion of the icing protection operation.

T_A	T_B
1°C	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

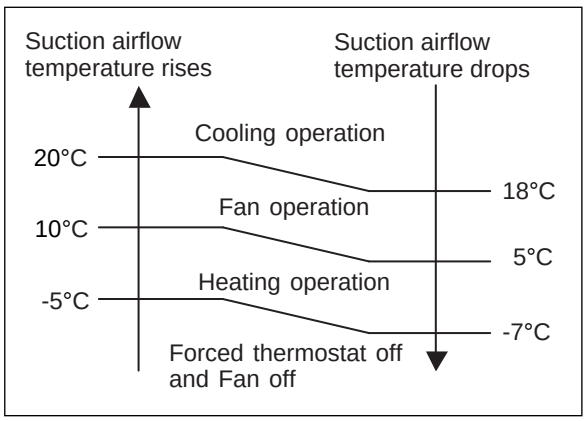
* During the above operation, a refrigerant noise may be from the indoor unit.

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

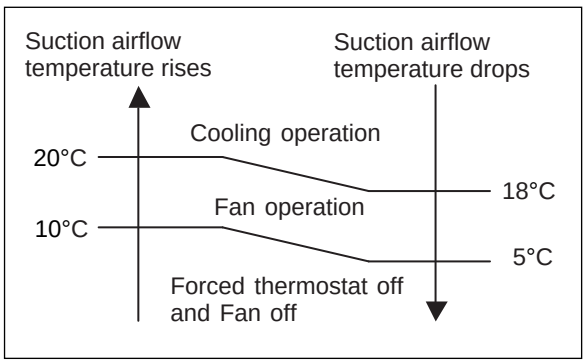
1. COOL OPERATION

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.

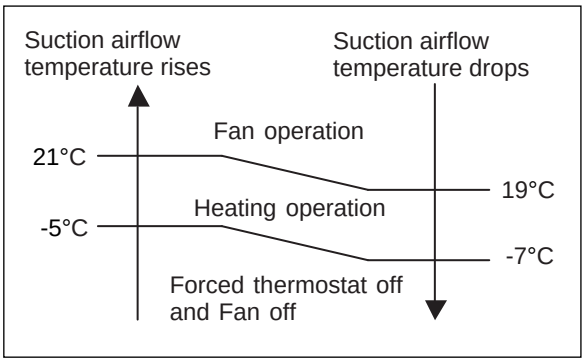


b) Cases Other than (a)



2. HEAT OPERATION

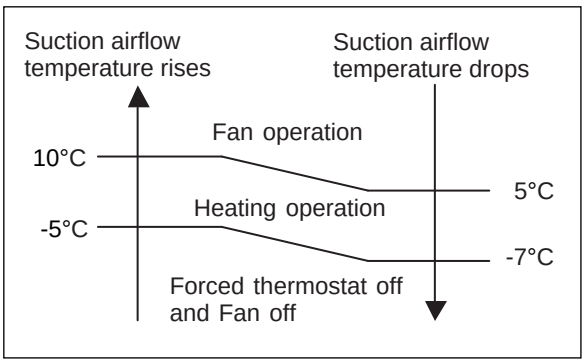
The contents of operation is controlled as following based on the suction airflow temperature.



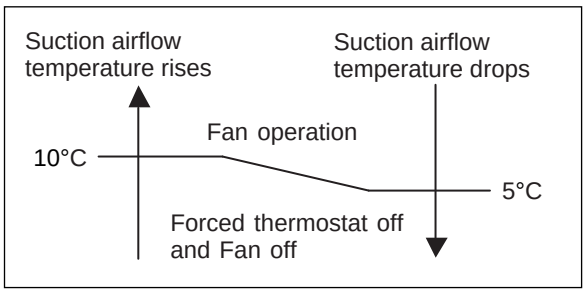
3. FAN OPERATION

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)



3-7 TIMER CONTROL

3-7-1 Wireless Remote Controller

UTY - LNH∗

There are following 4 kinds of timer modes are available.

- ON Timer
- OFF Timer
- PROGRAM Timer
- SLEEP Timer

1. ON / OFF TIMER

The timer functions cannot be used when this controller is used together with the remote controller (Wired type).
A beeping sound is made when a signal is received.

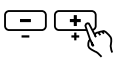
To set the ON / OFF timer

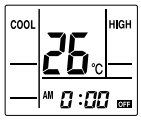
Press the START/ STOP button to start the air conditioner, and then proceed as follows.

1 

Press the TIMER MODE button to select "OFF TIMER" or "ON TIMER"

→CANCEL→ OFF TIMER→ ON TIMER
└ PROGRAM TIMER (OFF← ON, OFF→ ON)←┘

2 



Adjust the OFF or ON time.
(About 5 seconds later, the entire display will reappear.)

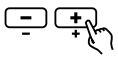
2. PROGRAM TIMER

To set the PROGRAM timer

Press the START/ STOP button to start the air conditioner, and then proceed as follows.

1 

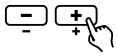
Select "OFF TIMER"

2 

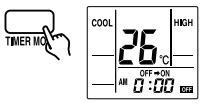
Adjust the OFF time.

3 

Select "ON TIMER"

4 

Adjust the ON time.
(About 5 seconds later, the entire display. will reappear.)

5 

Select "PROGRAM TIMER"
(Either OFF → ON or OFF ← ON will display.)
(If the ON timer has been selected to operate first, the unit will stop operating at this point.)

To cancel the TIMER

Select "CANCEL".
The air conditioner will return to normal operation.

***To change operating conditions**

If you wish to change the operating conditions (ON/OFF,Mode, Fan Speed, Temperature Setting), after making the time setting, wait until the entire display reappears, then press the appropriate buttons to change to the desired operating condition.

*** Even ON/OFF and Sleep timer are valid.**

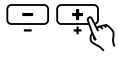
3. SLEEP TIMER

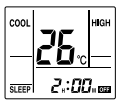
To set the SLEEP timer

Unlike other timer functions, the SLEEP timer is designed to set the duration of time in which the unit does not operate. The SLEEP timer can be set regardless of whether the indoor unit is operating or stopped.

1 

(Both the indoor unit's OPERATION indicator lamp (green) and the TIMER indicator lamp (orange) will light.)

2 

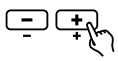


Adjust the OFF time.
(About 5 seconds later,the entire display will reappear.)

To change the timer settings

1 

Press the SLEEP button once again.

2 

Set the time using the TIMER SET buttons.

***To cancel the TIMER**

Select "CANCEL".
The air conditioner will return to normal operation.

***To stop air conditioner operation during timer operating**

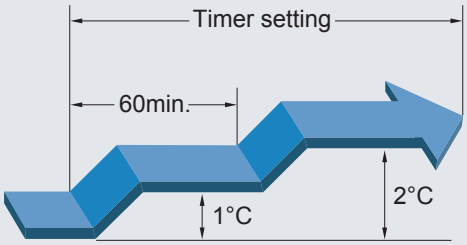
*** Even ON/OFF and Program timer are valid.**

Sleep timer

The sleep timer function automatically corrects the temperature thermostat setting according to the time setting to prevent excessive cooling and heating while sieeping.

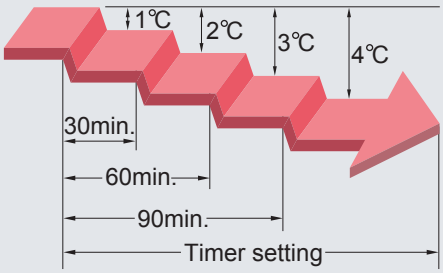
Cooling operation / dry operation

When the sleep timer is set, the set temperature automatically rises 1°C every hour.The set temperature can rise up to a maximum of 2°C



Heating operation

When the sleep timer is set, the set temperature sutomatically drops 1°C every 30 minutes. The set temperature can drop to a maximum of 4°C



3-7-2 Group Remote Controller

UTY - CGG∗ Different schedules can be set for each day of the week.

- WEEKLY TIMER Four timers can be set for each day

1. WEEKLY TIMER

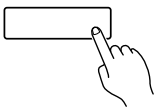
The timer function is not available depending on the initial setting.

- Different schedules can be set for each day of the week.
- Four timers can be set for each day.
- Operation on/off time, operation mode, and temperature can be specified for each timer.

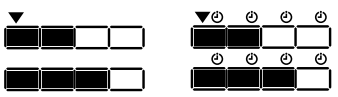
To start / cancel the WEEKLY timer operation

The timer does not start if the time is not set.

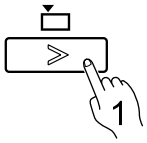
ALL



Press the ALL TIMER button to start or cancel the WEEKLY timers for all indoor units.

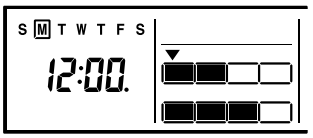


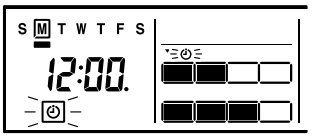
- If any of the indoor units are in the timer mode, pressing this button cancels the timers for all indoor units.
- If none of the indoor units are in the timer mode, pressing this button starts the timers for all indoor units.



Press the Select button to select the indoor unit.

Press the Timer Mode (DELETE) button to start or cancel the WEEKLY timers.

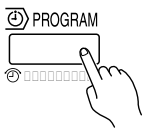




Note: When a time is not set, the weekly timer cannot be started.

To set the WEEKLY timer

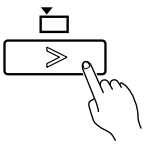
1

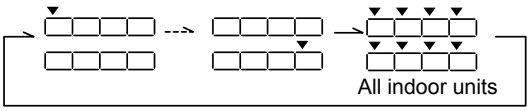


Press the PROGRAM (CLOCK ADJUST) button.

* Do not press this button for two seconds or more, otherwise you will enter the time setting mode.

2

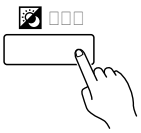


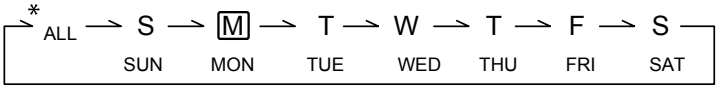


Press the Select button to select the indoor unit.

* If all indoor units are selected, the times for all of the registered indoor unit timers are set at once.

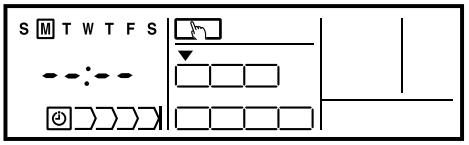
3 ● **Day of the week setting**



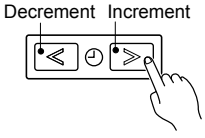


Press the DAY button to select the day of the week.

* For ALL, all of the days can be set together when a ▭ appears around each day.



4 ● **Timer setting**

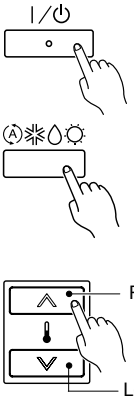


Press the Set Time buttons to set the time in 10-minute increments.

* Hold down a Set Time button to adjust the time quickly.

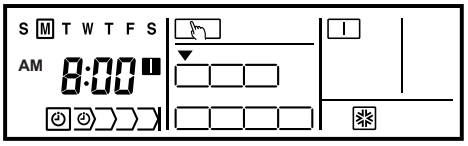
* The time already set at another timer is skipped at the relevant indoor unit.

5 ● Operating setting



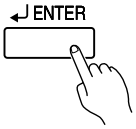
Press the Start/Stop button or the Mode button or the Set Temperature button to set the operation.

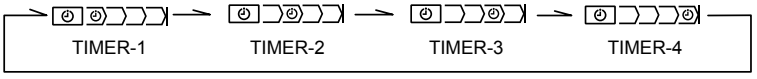
* For the operations that can be set, refer to "Operation mode setting", "Room temperature setting", and "To start /stop operation" , in "OPERATION".
* Only the current operation settings are displayed.



ex.TIMER-1 will start operation at 8:00 on COOL.

6 ● Setting the next timer for the same day:



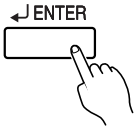


Then press the ENTER button to proceed to the time setting, and repeat steps from ***4*** to ***5*** .

● **Repeat steps *3* to *5* to set the timer for another day of the week.**

※ Be careful for pressing the ENTER button without any operation setting because the time that is set will be cancelled.

7 ● Setting the timer for the other indoor units:

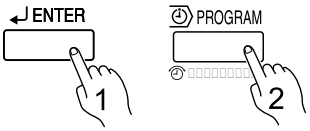


Before setting the timer for other indoor units, press the ENTER button to confirm the settings.

* The display switches to the next timer.

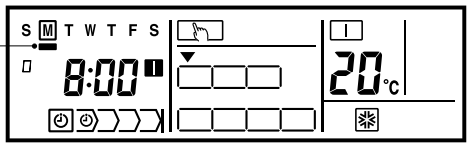
● **Repeat steps *2* to *6* to set the timer for other indoor units.**

8



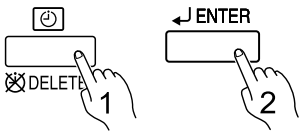
1. Press the ENTER button to confirm the set timer.
2. Press again the PROGRAM (CLOCK ADJUST) button to complete the weekly timer setting.
   * flashes for two seconds.

When the operating time is set, the ■ mark appears.



ex. TIMER-1 will start operation at 8:00 on COOL with a setting of 20℃

● To delete the operating time



1. If the Timer Mode (DELETE) button is pressed during steps ***3*** to ***7*** , the operating time for the selected day will be deleted.
   * If all the days are selected, the operating times for all of the days of the selected timer will be deleted.
2. Press the ENTER button to confirm the deletion.

NOTES

(1) The WEEKLY timer does not operate when the HEAT timer is set if a HEAT PUMP MODEL in the air conditioning system is operating in the cooling mode. In addition, the WEEKLY timer does not operate when the COOL or DRY timer is set if a HEAT PUMP MODEL in the air conditioning system is operating in the heating mode.
(2) Even if the timer operation is set, the timer lamp of the indoor unit does not light up. (The timer lamp is used for wireless remote controller only.)
(3) If the same time is set in Timer-1 to Timer-4 of an indoor unit, the timer setting of the smallest number will be effective.

3-7-3 Wired Remote Controller

UTY - RNK*

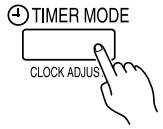
- ON / OFF TIMER
- WEEKLY TIMER
- TEMPERATURE SET BACK TIMER

1. ON / OFF TIMER

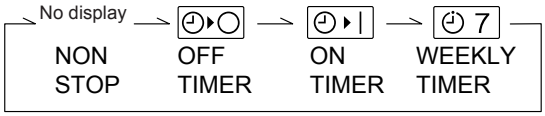
The timer function is not available depending on the model.

To set the ON/OFF timer

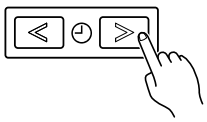
1



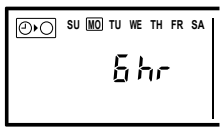
Press the timer mode button to select the ON timer or OFF timer.
It is switched every time as shown in the below diagram when the button is pressed.



2



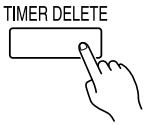
From 1 to 24 hours



ex. OFF timer set for 6 hours

Press the set time buttons to set the time.
After the time is set, the timer will start automatically.
The amount of time until the OFF timer operates that is displayed on the timer display decreases as time passes.

● To cancel



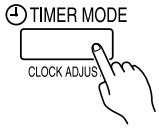
- Press the DELETE button to cancel the timer mode.
- The timer mode can also be canceled by changing the timer mode using the timer mode button.

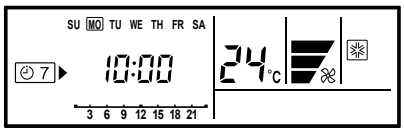
2. WEEKLY TIMER

The timer function is not available depending on the model.

Weekly timer setting

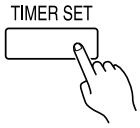
1





Press the timer mode button to select the weekly timer.

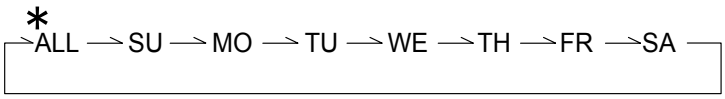
2

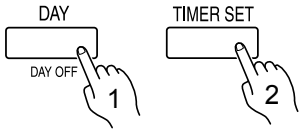


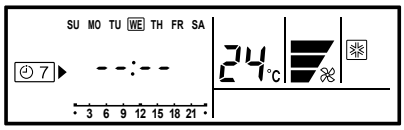
Press the SET button for 2 seconds or more.

3

● **Day of the week setting**





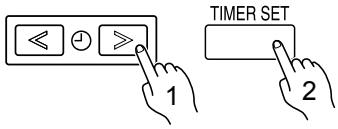


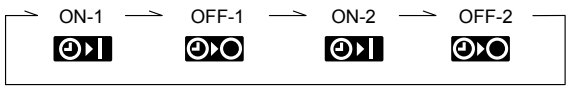
Press the DAY button to select the day of the week, and then press the TIMER SET button to confirm the setting.

* For ALL, all of the days can be set together when a ▭ appears around each day.

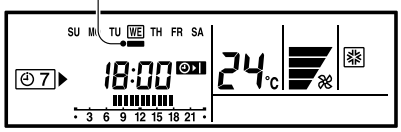
4

● **Time setting (ON / OFF timer)**





When the operating time is set, the ■ mark appears.

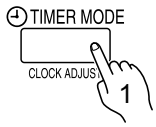


ex. The timer is set for 7:00-18:00.

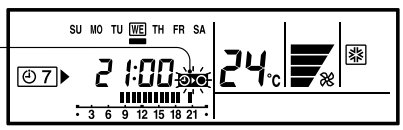
Press the SET TIME buttons to set the ON time in 30-minute increments, then press the TIMER SET button to proceed to the OFF time setting. Set the OFF time in the same way.
If necessary, set the second weekly timer settings in the same way.

● **Time setting (Independent OFF timer)**

Switching from ON/OFF timer to independent OFF timer



The independent timer will flash on the display.



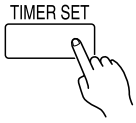
Press the TIMER MODE button to change to the independent OFF timer setting.

* The time setting process is the same as the ON/OFF timer.
  Press the TIMER MODE button to return to the ON/OFF timer setting.

5

Repeat steps **3** and **4** to set the weekly timer for another day of the week.

6



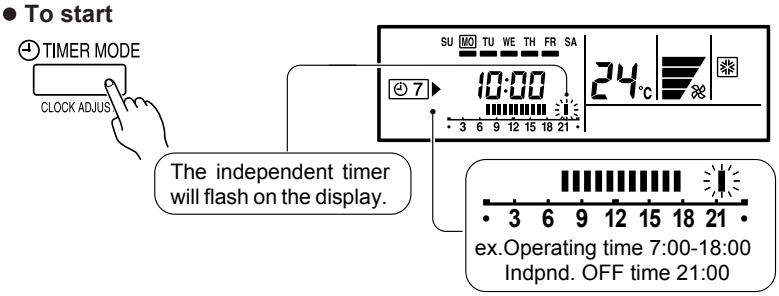
Press the TIMER SET button for 2 seconds or more to complete the weekly timer settings.

● **To delete the operating time**

If the TIMER DELETE button is pressed during steps **3** or **4**, the operating time for the selected day will be deleted.
If all the days are selected, the operating times for all of the days will be deleted.

To start /cancel the WEEKLY timer operation

● **To start**



When the weekly timer is selected, the timer starts automatically.

The operating time for the current day is displayed.

● **To cancel**

- Press the TIMER DELETE button to cancel the timer mode.
- The timer mode can also be canceled by changing the timer mode using the TIMER MODE button.

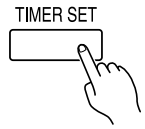
NOTES

(1) PRECAUTIONS DURING WEEKLY TIMER SETUP
Setup is not possible in the following cases, so amend the time.
- Be sure to set the ON time first, then the OFF time. If either the ON time or the OFF time is not set cor rectly, the timer will not operate properly.
- The WEEKLY 2 settings cannot be set earlier than the WEEKLY 1 settings.
- The WEEKLY 1 and WEEKLY 2 time spans cannot overlap.

(2) The earliest OFF time you can set is 30 minutes after the ON time.
(3) The OFF time can be carried over to the next day.
(4) The earliest independent OFF time you can set is 30 min- utes after the last OFF time.
(5) An independent OFF time can be set up to 0:00 hours of the next day.
(6) Even if the timer operation is set, the timer indicator lamp of the indoor unit does not light up. (The timer indicator lamp is used for wireless remote controllers only.)

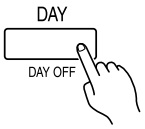
To set the DAY OFF (for a holiday)

1



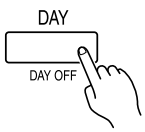
During the weekly timer, press the TIMER SET button for 2 seconds or more to set the day.

2



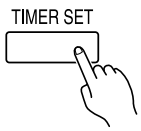
Select the day to set the DAY OFF.

3

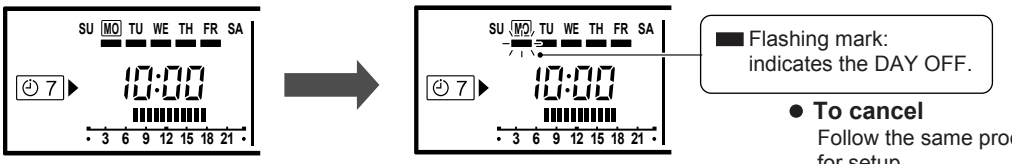


Press the DAY (DAY OFF) button for 2 seconds or more to set the DAY OFF.

4



Press the TIMER SET button for 2 seconds or more to complete the DAY OFF setting.



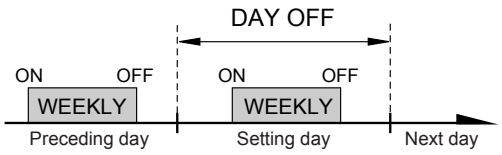
ex. The DAY OFF is set for Monday.

● **To cancel**
Follow the same procedures as those for setup.

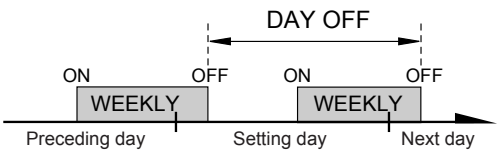
NOTES

- The DAY OFF setting is only available for days for which weekly settings already exist.
- If the operating time carries over to the next day (during a next day setting), the effective DAY OFF range will be set as shown below.

● **Normal**



● **Next day setting**



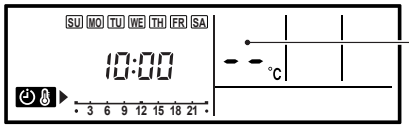
- The DAY OFF setting can only be set one time.
  The DAY OFF setting is cancelled automatically after the set day has passed.

3. TEMPERATURE SET BACK TIMER

The timer function is not available depending on the model.

Temperature SET BACK timer setting

1 SET BACK



If there is no existing SET BACK temperature setting, " - - " will be displayed for the temperature.

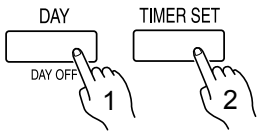
Press the SET BACK button to change to the SET BACK confirmation display.
The SET BACK operating time and the set temperature will be displayed.

2 TIMER SET

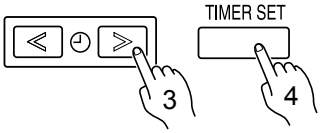
Press the SET button for 2 seconds or more.

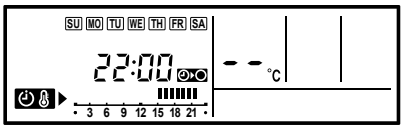
3

● **Day setting**



● **Operating time setting**



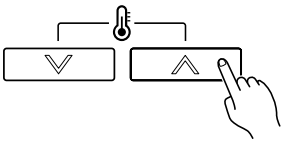


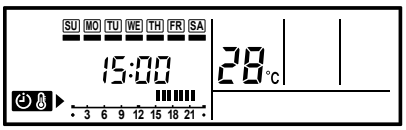
ex. When setting all days together

Follow step **3** and **4** in "To set the WEEKLY timer". The DELETE button is also used as described in the procedures for the weekly timer.

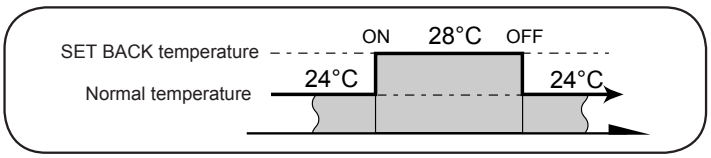
4 ● **Temperature setting**

Press the set temperature buttons to set the temperature. (The temperature setting range is the same as the range for the operation mode.)





ex. Operating time 15:00 - 22:00



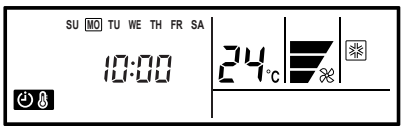
5 TIMER SET

Repeat steps **3** and **4**.
Press the SET button for 2 seconds or more to complete the temperature SET BACK timer settings.

To start /cancel the temperature SET BACK timer operation

● **To start**

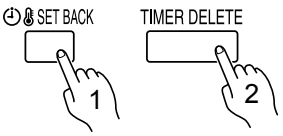
SET BACK



ex. Display during SET BACK timer operation
(The operating time will not be displayed.)

Press the SET BACK button. The SET BACK confirmation display appears for 5 seconds, and then the timer starts automatically.

● **To cancel**



Press the SET BACK button, and then press the DELETE button while the SET BACK confirmation display is displayed. Even if the SET BACK button is pressed again, the SET BACK timer will be cancelled.

NOTES

- The SET BACK timer only changes the set temperature, it cannot be used to start or stop air conditioner operation.
- The SET BACK timer can be set to operate up to two times per day but only one temperature setting can be used.
- The SET BACK timer can be used together with the ON, OFF, and weekly timer functions.
- The SET BACK operating time is displayed only in the SET BACK confirmation display. (Refer to step 1 for the SET BACK confirmation display.)
- During the COOL/DRY mode, the air conditioner will operate at a minimum of 18°C even if the SET BACK temperature is set to 17°C or lower.
- Room temperatures as low as 10, 12, and 14°C cannot be set depending on the model.

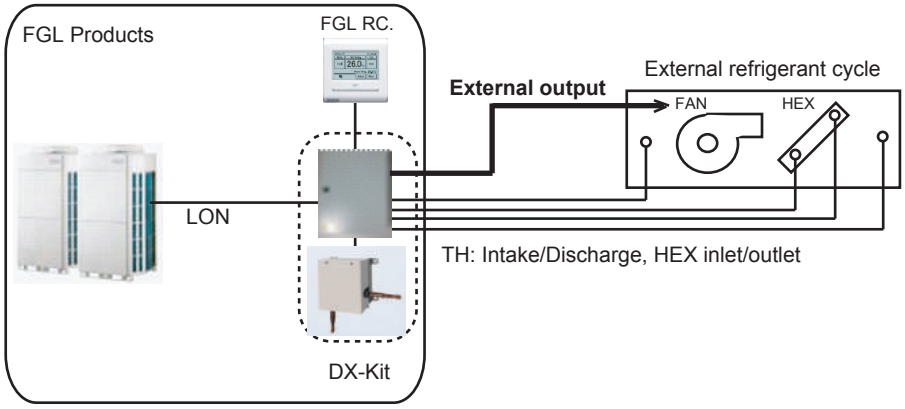
3-8 DX-KIT

3-8-1 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 performe the AHU operation indirectly.

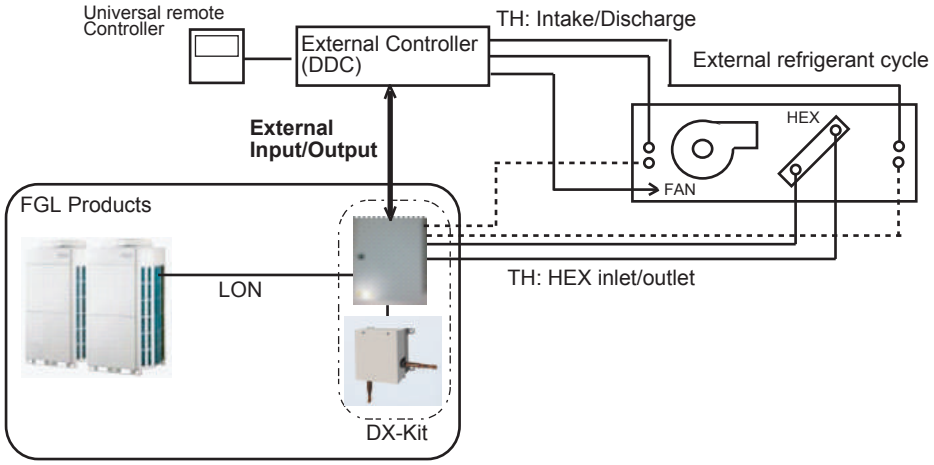
Control devices can be unified with FGL devices.



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

3-8-2 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: 18 to 30℃ Heating: 10 to 30℃	Discharge temperature Cooling: 14 to 25℃ Heating: 17 to 28℃
Thermostat OFF conditions	Cooling Intake temperature < Setting temperature -0.5℃ Heating Intake temperature > Setting temperature +0.5℃	Cooling Discharge temperature < Setting temperature -5.0℃ Heating Discharge temperature > Setting temperature +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

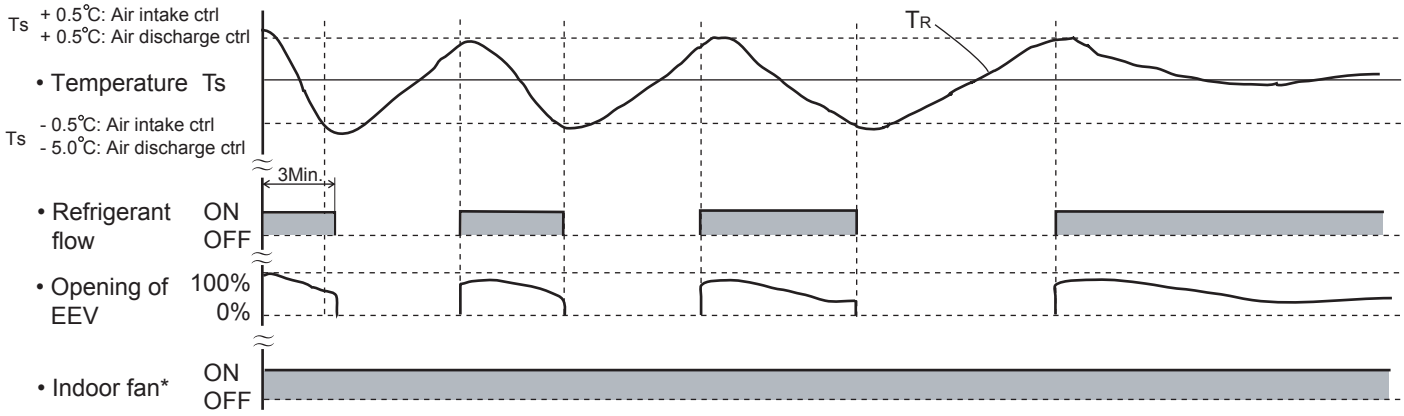
Air conditioning control system (SET3-3)		Intake temperature control	Outlet temperature control
Analog input system (SET3-2)		Set temperature input / Capacity input Selection	Set temperature input / Capacity input Selection
Temperature setting	Temperature Setting range	Intake temperature (Room temperature) Cooling: 18 to 30℃ Heating: 10 to 30℃	Discharge temperature Cooling: 14 to 25℃ Heating: 17 to 28℃
Temperature setting	Thermostat OFF conditions	Cooling Intake temperature < Setting temperature -0.5℃ Heating Intake temperature > Setting temperature +0.5℃	Cooling Discharge temperature < Setting temperature -5.0℃ Heating Discharge temperature > Setting temperature +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.	

3-8-3 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 + 0.5 ℃: The threshold temperature of start of refrigerant flow
Ts - 0.5 ℃ : The threshold temperature of stop of refrigerant flow

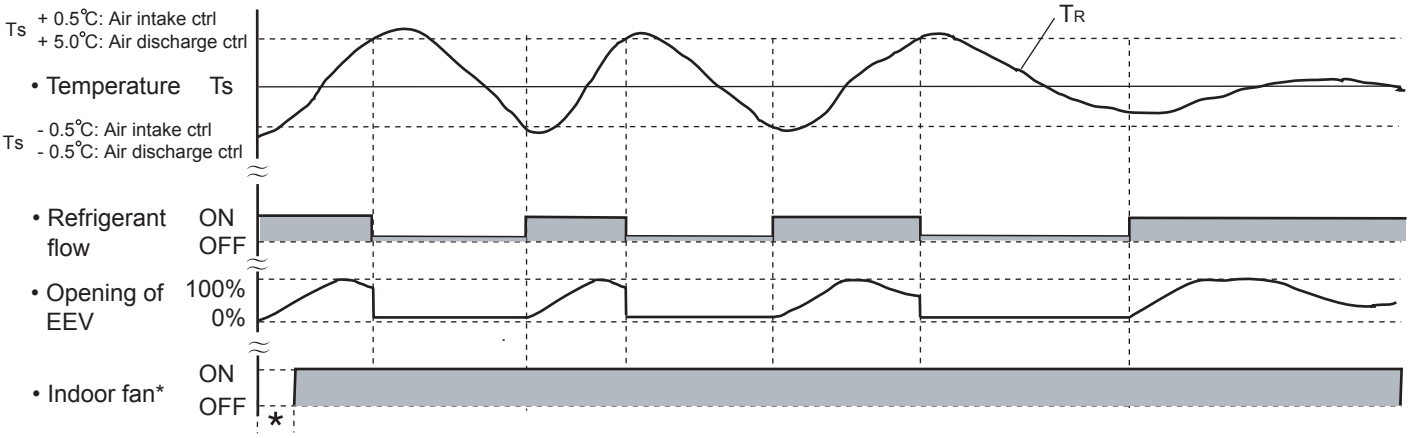
Air discharge temp controlling

Ts + 0.5 ℃: The threshold temperature of start of refrigerant flow
Ts - 5.0 ˚C: 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 - 0.5 ℃: The threshold temperature of start of refrigerant flow
Ts + 0.5 ˚C: The threshold temperature of stop of refrigerant flow

Air discharge temp controlling

Ts - 0.5 ℃: The threshold temperature of start of refrigerant flow
Ts + 5.0 ˚C: The threshhold temperature of stop of refrigerant flow

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

3-8-4 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 5°C lower than the set-up temperature, EEV is fully closed.
  2) If the suction airflow temperature becomes 0.5°C lower than the set-up temperature, EEV is fully closed.
  Heating operation: If the suction airflow temperature becomes 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)

3-8-5 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.

3-8-6 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

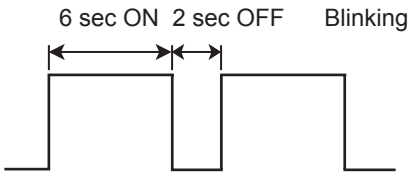
* Drain pump turns off at 60 minutes past the completion of the icing protection operation.

T_A	T_B
1°C	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

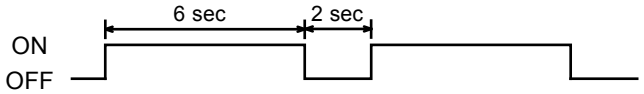
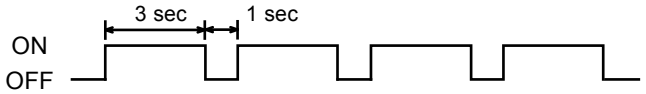
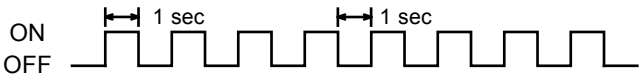
AIRSTAGE™ V-II
Variable Refrigerant Flow System

4. TROUBLE SHOOTING

4. TROUBLESHOOTING

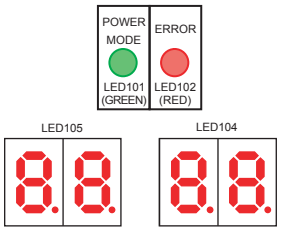
4-1 NORMAL OPERATION

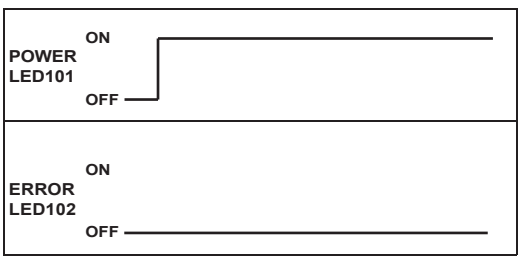
4-1-1 Indoor Unit Display

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 Oil Recovery	Operation LED	
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 (INV:110°C, constant speed:115°C) <Release condition> 3 minutes have elapsed and discharge temperature ≦ 80°C
High Pressure Protection is stopped	"P" ROTECT "2"	<Starting condition> High pressure ≧ 4.00MPa <Release condition> 5 minutes have elapsed and high pressure ≦ 3.50MPa
Low Pressure Protection is stopped	"P" ROTECT "3"	<Starting condition> Low pressure ≦0.05MPa or low pressure ≦0.10MPa continues for 10 mins <Release condition> 3 minutes have elapsed and low pressure ≧0.17MPa
Compressor Temperature Protection is stopped	"P" ROTECT "4"	<Starting condition> Compressor temp ≧ fixed value (INV:112°C, Constant speed:120°C) <Release condition> 3 minutes have elapsed and discharge temperature ≦80°C
Peak Cut Mode	"P" eak "C" ut	
Low Noise Mode	"L" OW "N" OISE	Refer to 02-08 page for operation.
Snow Falling Protection Fan mode	"SN" OW	Refer to 02-09 page for operation.
Inverter Compressor Operation Indication	Blinking	ON / OFF — 1 sec / 1 sec
Constant Speed Compressor Operation Indication	Blinking	ON / OFF — 0.5 sec / 0.5 sec
Inverter Compressor and Constant Speed Compressor Operation Indication	Blinking	ON / OFF — 0.24 sec / 0.24 sec





4-2 ABNORMAL OPERATION

4-2-1 Indoor Unit Display

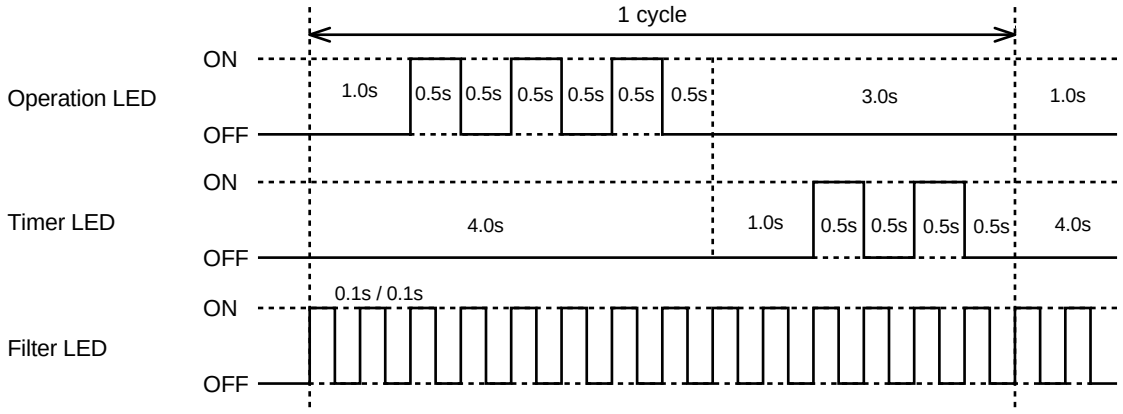
Please refer the flashing pattern as follows.

Error Contents	Operation LED	Timer LED	Filter LED	Trouble shooting
Remote Controller Communication Error	1 times flash	2 times flash	Continuous flash	9,10
Network Communication Error	1 times flash	4 times flash	Continuous flash	12
Indoor Unit Parallel Communication Error	1 times flash	6 times flash	Continuous flash	11
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
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 Fan Motor Error	5 times flash	1 times flash	Continuous flash	8
Water Drain Abnormal	5 times flash	3 times flash	Continuous flash	7
Outdoor Unit Error	9 times flash	15 times flash	Continuous flash	13 ~ 62

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)



Outdoor Air Unit

Error Contents	Error code		Operation LED	Timer LED	Filter LED	Trouble shooting
	Large division	Small division				
Indoor unit power supply error for fan motor 1	3 9	1	3 times flash	9 times flash	Continuous flash	100
Indoor unit power supply error for fan motor 2	3 9	2	3 times flash	9 times flash	Continuous flash	
Indoor unit suction air temp. thermistor error	4 A	1	4 times flash	10 times flash	Continuous flash	101
Indoor unit discharge air temp. thermistor error	4 A	2	4 times flash	10 times flash	Continuous flash	102
Indoor unit fan motor 2 rotation error	5 9	2	5 times flash	9 times flash	Continuous flash	103
No power	-		-	-	-	104

* LED Display when Option receiver unit installed.

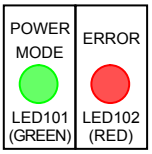
DX-Kit

Error Contents	Error code	Trouble shooting
Remote controller communication error	1 2	9, 10
Network communication error	1 4	12
Peripheral unit communication error	1 6	11
Indoor unit address setting error	2 6	90
Connection unit number error in WRC system	2 9	105
Indoor unit power supply abnormal	3 1	2
Indoor unit main PCB error	3 2	1, 3
Indoor unit (Communication circuit) WRC error	3 A	106
Indoor unit heat ex. temp. thermistor error	4 2	5, 6
Indoor unit air temp. thermistor error	4 A	101, 102
Indoor unit coil 1 (Expansionvalve) error	5 2	107
Indoor unit coil 2 (Expansionvalve) error	5 2	108
Indoor unit water drain abnormal	5 3	7
Outdoor unit miscellaneous error	9 U	14 ~ 62
DX-Kit Error	J 6	109

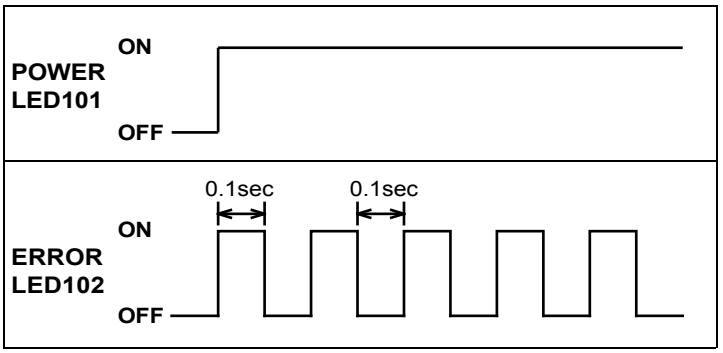
No Error Code	Trouble shooting
Peripheral device - No Power	110
Peripheral device - FAN does not operate	111
Peripheral device - No cooling/ No Heating	112
DX Kit No Power	113

4-2-2 Outdoor Unit Display

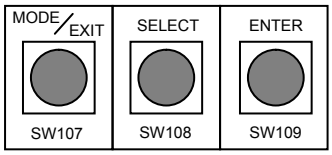
LED display



POWER MODE LED : on
ERROR LED : blink

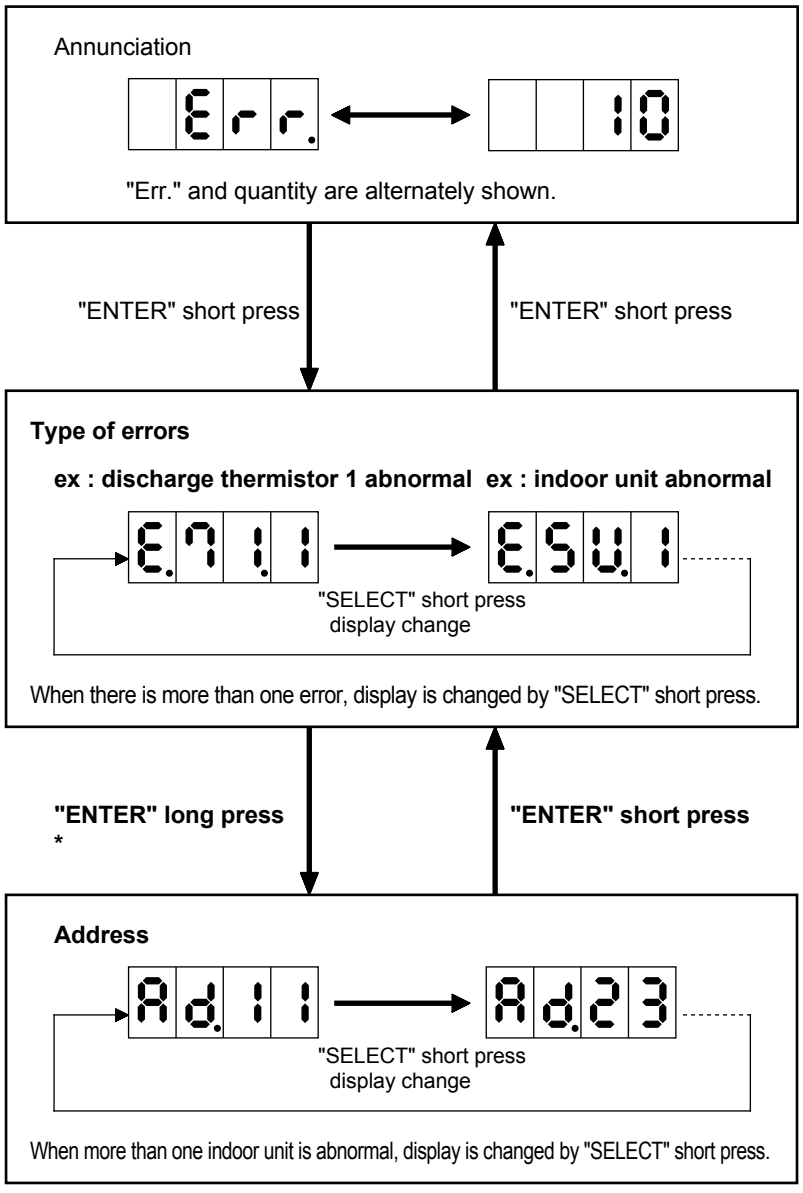


Operation button



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	13
1 3 . 1	Communication Error Between Outdoor Unit	14
1 4 . 1	Outdoor Unit Network communication 1 Error	15
1 4 . 2	Outdoor Unit Network communication 2 Error	16
1 4 . 5	Indoor unit number shortage	62-2
2 8 . 1	Auto Address Setting Error	61
2 8 . 4	Signal Amplifier Auto Address Setting Error	62
5 U . 1	Indoor Unit Error	1～12
6 1 . 5	Outdoor Unit Reverse Phase, Missing Phase Wire Error	17
6 2 . 3	Outdoor Unit EEPROM Access Error	18
6 2 . 6	Inverter Communication Error	19
6 2 . 8	Outdoor Unit EEPROM Data Error	20
6 3 . 1	Inverter Error	21
6 7 . 2	Inverter PCB Momentary Power Failure Detection	22
6 8 . 1	Magnetic Relay Error	23
6 8 . 2	Rush Current Limiting Resistor Temp Rise Protection	24
6 9 . 1	Outdoor Unit Communication PCB Parallel Communication Error	25
7 1 . 1	Discharge Temp Sensor 1 Error	26
7 1 . 2	Discharge Temp Sensor 2 Error	27
7 2 . 1	Compressor Temp Sensor 1 Error	28
7 2 . 2	Compressor Temp Sensor 2 Error	29
7 3 . 3	Outdoor Unit Heat Ex. Liquid Temp. Sensor Error	30
7 4 . 1	Outdoor Temp Sensor Error	31
7 5 . 1	Suction Gas Temp Sensor Error	32
7 7 . 1	Heat Sink Temp Sensor Error	33
8 2 . 1	Sub-cool Heat Ex. Gas Inlet Temp. Sensor Error	34
8 2 . 2	Sub-cool Heat Ex. Gas Outlet Temp. Sensor Error	35
8 3 . 1	Liquid Pipe Temp. Sensor 1 Error	36
8 3 . 2	Liquid Pipe Temp. Sensor 2 Error	37
8 4 . 1	Current Sensor 1 Error	38
8 6 . 1	Discharge Pressure Sensor Error	39

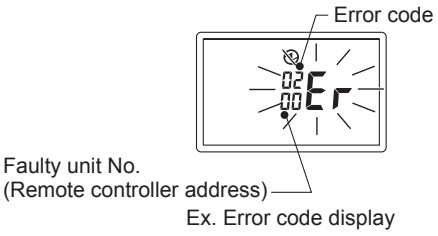
Error Code	Error Contents	Trouble shooting
8 6 . 3	Suction Pressure Sensor Error	40
8 6 . 4	High Pressure Switch 1 Error	41
8 6 . 5	High Pressure Switch 2 Error	42
9 2 . 1	Compressor 2 Error	43
9 2 . 2	Compressor 2 Current Value Error	44
9 3 . 1	Inverter Compressor Start Up Error	45
9 4 . 1	Trip Detection	46
9 5 . 5	Compressor Motor Loss of Synchronization	47
9 7 . 1	Outdoor Unit Fan Motor Lock Error	48
9 7 . 4	Outdoor Unit Fan Motor Undervoltage	49
9 7 . 5	Outdoor Unit Fan Motor Temperature Abnormal	50
9 U . 2	Slave Unit Error	51
A 1 . 1	Discharge Temperature 1 Abnormal	52
A 2 . 1	Discharge Temperature 2 Abnormal	53
A 3 . 1	Compressor 1 Temperature Abnormal	54
A 3 . 2	Compressor 2 Temperature Abnormal	55
A 4 . 1	High Pressure Abnormal	56
A 4 . 2	High Pressure Protection 1	57
A 4 . 3	High Pressure Protection 2	58
A 5 . 1	Low Pressure Abnormal	59
A C . 4	Heat Sink Temperature Abnormal	60

4-2-4 Remote Controller Display

<< *SIMPLE REMOTE CONTROLLER* >>

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.

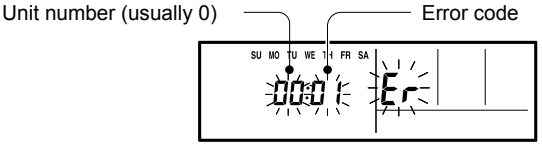


Ex. Error code display

<< *WIRED REMOTE CONTROLLER* >>

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.



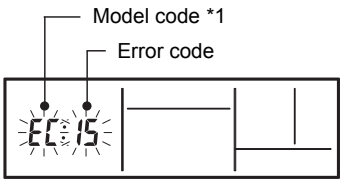
Ex. Error code display

<< *GROUP REMOTE CONTROLLER* >>

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, 10, 97
1 4	Network Communication Error	12
1 5	Scan Error	98
1 6	Indoor Unit Parallel Communication Error	11
3 1	Indoor Unit Power Frequency Abnormal	2
3 2	Indoor Unit Main PCB Error	1, 3

Error Code	Error Contents	Trouble shooting
4 1	Room Temperature Sensor Error	4
4 2	Indoor Unit Heat Ex. Sensor Error	5, 6
5 1	Inddor Unit Fan Motor Error	8
5 3	Water Drain Abnormal	7
9 U	Outdoor Unit Error	14 ~ 62

4-2-6 Error Code List for Group Remote Controller / Central Remote controller / Touch- Panel controller

Error Code	Error Contents	Trouble shooting
- -	Initial Setting Error	13
1 2	Remote Controller Communication Error	7,9,10,86,92
1 3	Communication Error Between Outdoor Unit	14
1 4	Network Communication Error	12,15,16,95
1 5	Scan Error	92
1 6	Indoor Unit Parallel Communication Error	11,89
2 6	Address Setting Error	90
2 8	Other Setting Error	61, 62, 91
3 1	Indoor Unit Power Frequency Abnormal	2
3 2	Indoor Unit Main PCB Error	1, 3
4 1	Room Temperature Sensor Error	4
4 2	Indoor Unit Heat Ex. Sensor Error	5, 6
5 1	Inddor Unit Fan Motor Error	8
5 3	Water Drain Abnormal	7
6 1	Outdoor Unit Reverse Phase, Missing Phase Wire Error	17
6 2	Outdoor Unit Main PCB Error	18 ~ 20
6 3	Inverter Error	21
6 7	Inverter PCB Momentary Power Failure Detection	22
6 8	Magnetic Relay Error	23, 24
6 9	Outdoor Unit Communication PCB Error	25
7 1	Discharge Temperature Sensor Error	26, 27
7 2	Compressor Temperature Sensor Error	28, 29
7 3	Outdoor Unit Heat Ex. Temperature Sensor Error	30
7 4	Outdoor Temperature Sensor Error	31
7 5	Suction Gas Temperature Sensor Error	32
7 7	Heat Sink Temperature Sensor Error	33

Error Code	Error Contents	Trouble shooting
8 2	Sub-cool Heat Ex. Gas Temperature Sensor Error	34, 35
8 3	Liquid Pipe Temperature Sensor Error	36, 37
8 4	Current Sensor Error	38
8 6	Pressure Sensor Error	39 ~ 42
9 2	Compressor 2 Error	43, 44
9 3	Compressor Start Up Error	45
9 4	Trip Detection	46
9 5	Compressor Motor Control Error	47
9 7	Outdoor Unit Fan Motor Error	48 ~ 50
A 1	Discharge Temperature 1 Abnormal	52
A 2	Discharge Temperature 2 Abnormal	53
A 3	Compressor Temperature Abnormal	54, 55
A 4	High Pressure Abnormal	56 ~ 58
A 5	Low Pressure Abnormal	59
A C	Heat Sink Temperature Abnormal	60
C 4	PCB Error	91
C A	Software Error	82, 89
C 1	PCB Error 1	80, 85

4-2-7 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	Operation continues. (Only the subject unit stops)	>Temporary blackout detection protection (Inverter compressor stop) >Outdoor network communication abnormal 1 >Indoor unit nubmer shortage	○ Compressor 2 current value error (Constant speed compressor stops) ○ Compressor 2 error (Constant speed compressor stops) ○ Discharge temperature 1 abnormal (Inverter compressor stops) ○ Discharge temperature 2 abnormal (Constant speed compressor stops) ○ Compressor 1 temperature abnormal (Inverter compressor stops) ○ Compressor 2 temperature abnormal (Constant speed compressor stops) ○ High pressure switch 1 error (Inverter compressor stops) ○ High pressure switch 2 error (Constant speed compressor stops) ○ Discharge Temp sensor 1 error (Inverter compressor stops) ○ Discharge Temp sensor 2 error (Constant speed compressor stops) ○ liquid pipe Temp sensor 1 Error ○ liquid pipe Temp sensor 2 Error ○ 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 ○ Compressor Temp sensor 1 error (Inverter compressor stop) ○ Compressor Temp sensor 2 error (Constant speed compressor stop) ○ Heat sink Temp sensor error (Inverter compressor stop) ○ Current sensor error (Inverter compressor stop) ○ High pressure switch 1 error (Inverter compressor stop) ○ High pressure switch 2 error (Constant speed 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
	>Abnormal >LED indication >Outdoor unit stops >Recoverable >Operation continuable	Only the subject unit stops	(Not available)	(Not available)

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

○ **System will shut down when all compressors are in abnormal stop due to some sort of defect.**

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 >Recoverable >Operation continuable	Subject refrigerant circuit stops	(Not available)	(Not available)
	>Abnormal >LED indication >Outdoor unit stops >Not recoverable >Need to repair >secondary accident is possible.	Subject refrigerant circuit stops	(Not available)	>High pressure abnormal >Low pressure abnormal >Magnetic relay error >Fan motor lock error >Fan motor temperature abnormal >Heat Ex. liquid Temp sensor error >Discharge pressure sensor error >Suction pressure sensor error >Outdoor unit communication PCB parallel communication errrel >Outdoor unit network communication 2 error >Outdoor uniot reverse phase, Missing phase wire error >Outdoor unit fan moter undervoltage >Communication error between outdoor unit

<Important>

Even if power is reset, the following Error cannot release.

- Compressor 2 overcurrent error
- Compressor 2 error
- Discharge temperature 1 abnormal
- Discharge temperature 2 abnormal
- Compressor 1 temperature abnormal
- Compressor 2 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
- Magnetic relay error
- Fan motor lock error

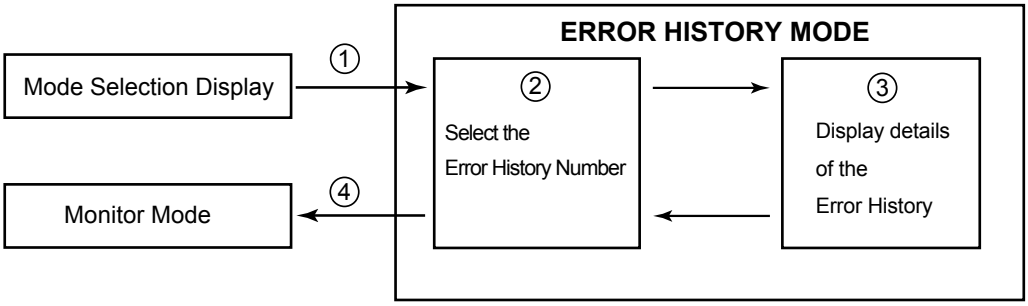
These errors can not be judged without operating the system, and the serviceman would not be able to check it if the system power is turned off before visiting the site for repair.
In Error release, you need to operate push switch and apply "Error reset" (F3-40) after power restart.

4-2-8 ERROR HISTORY MODE

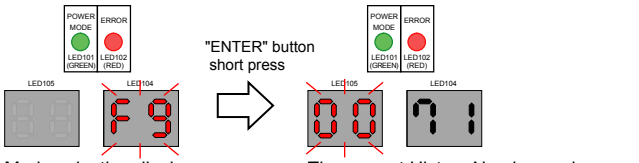
When the abnormality occurred, the V2 system memorizes the history of error codes up to 10 and it can be displayed on 7 segments LED.
It is an effective means to examine abnormality that occurred in the past.

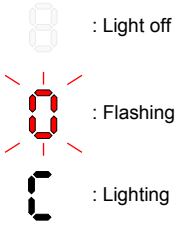
*The error history can be cleared by setting to F3-30.

Refer to the following for the procedure.

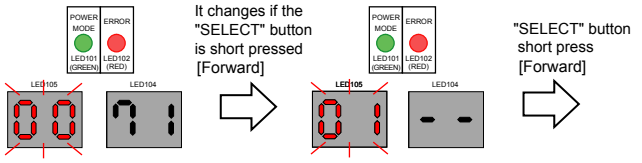


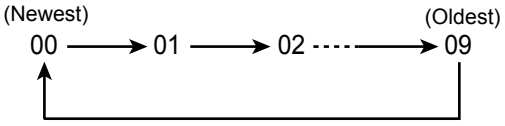
① Change to the Error History Mode from the Mode Selection Display





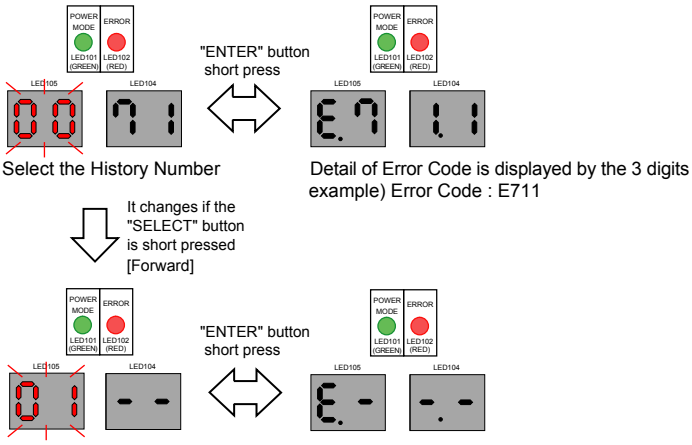
② Select the Error History Number



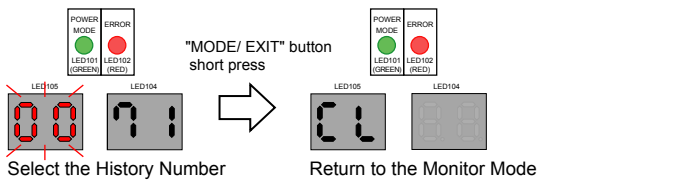


The History Number changes sequentially
from "00" to "09" by the "SELECT" button

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)

Trouble shooting 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 lead 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

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. (Refer to 06-03 page Main PCB removal.)**

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.

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.

Trouble shooting 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: Indoor Unit Controller PCB Circuit	**Detective details:** 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

YES

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.

Check Point 2 : Check Installation condition

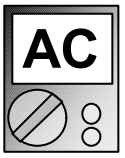
- ☐ Check Cable/Breaker
- ☐ Check loose or removed connection

>> 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 (AC220V between Indoor unit terminal 1 and 2)
- ☐ Check connection of Connector (any lose connector or incorrect wiring)
- ☐ Check any shortage or corrosion on PCB.



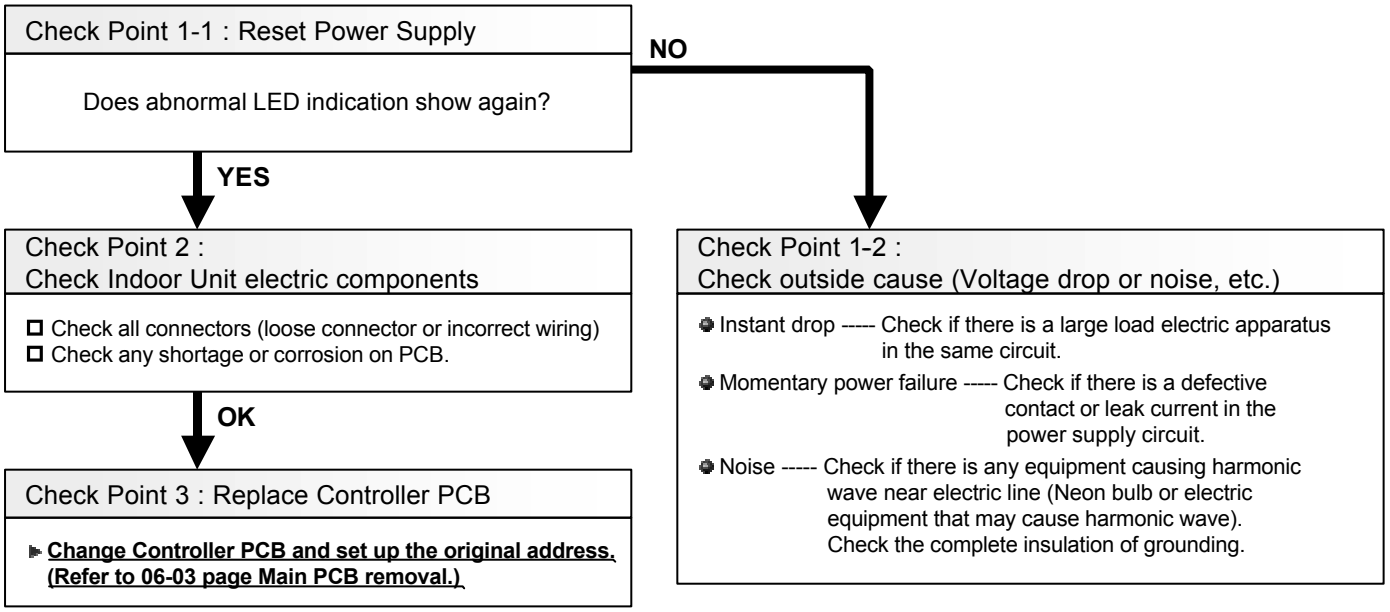
OK

Check Point 4 : Replace Controller PCB

► **Change Controller PCB and set up the original address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 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 lead test of EEPROM.

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



Trouble shooting 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

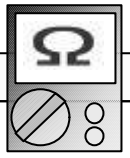
Check Point 1 : Check connection of Connector

- ☐ 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)

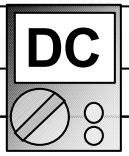
Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	33.6	25.2	20.1	15.8	12.5	10.0	8.0	6.5

Temperature (°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.**

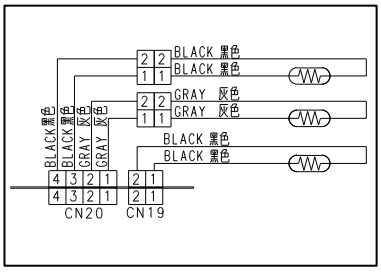
OK

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



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

・Duct Schematic Diagram (Connector connection)

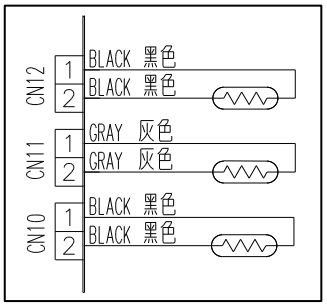


H/E Inlet Thermistor (CN20 Wire:Black)

H/E Outlet Thermistor (CN20 Wire:Gray)

Room Temp. Thermistor (CN19 Wire:Black)

・Small size Wall mount Schematic Diagram(Direct soldering to PCB)



H/E Intlet Thermistor (CN12 Wire:Black)

H/E Outlet Thermistor (CN11 Wire:Gray)

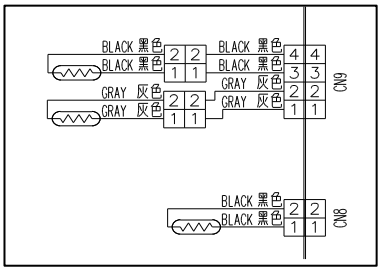
Room Temp. Thermistor (CN10 Wire:Black)

・Cassette Schematic Diagram (Connector connection)

H/E Inlet Thermistor (CN9 Wire:Black)

H/E Outlet Thermistor (CN9 Wire:Gray)

Room Temp. Thermistor (CN8 Wire:Black)

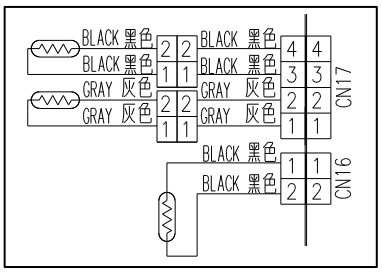


・Wall mount Schematic Diagram (Connector connection)

H/E Inlet Thermistor (CN17 Wire:Black)

H/E Outlet Thermistor (CN17Wire:Gray)

Room Temp. Thermistor (CN16 Wire:Black)



▶ **If the voltage does not appear, replace Controller PCB and set up the original address.**
(Refer to 06-03 page Main PCB removal.)

Trouble shooting 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

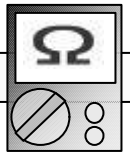
Check Point 1 : Check connection of Connector

- ☐ 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)

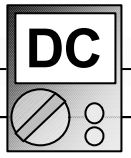
Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	168.6	129.8	100.9	79.1	62.5	49.8	40.0	32.4

Temperature (°C)	40	45	50
Resistance Value (kΩ)	26.3	21.2	17.8

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

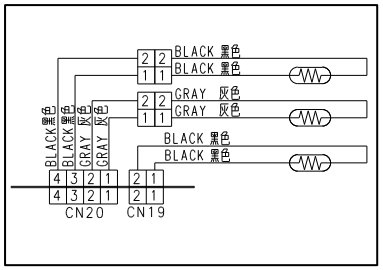
OK

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)

- Duct Schematic Diagram (Connector connection)

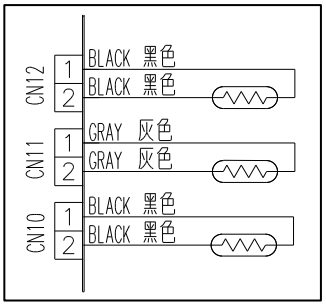


H/E Inlet Thermistor (CN20 Wire:Black)

H/E Outlet Thermistor (CN20 Wire:Gray)

Room Temp. Thermistor (CN19 Wire:Black)

- Small size Wall mount Schematic Diagram(Direct soldering to PCB)



H/E Intlet Thermistor (CN12 Wire:Black)

H/E Outlet Thermistor (CN11 Wire:Gray)

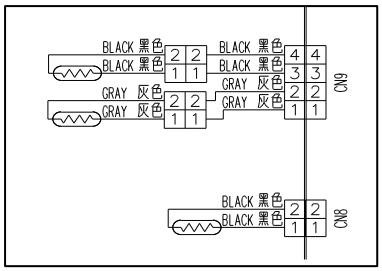
Room Temp. Thermistor (CN10 Wire:Black)

- Cassette Schematic Diagram (Connector connection)

H/E Inlet Thermistor (CN9 Wire:Black)

H/E Outlet Thermistor (CN9 Wire:Gray)

Room Temp. Thermistor (CN8 Wire:Black)

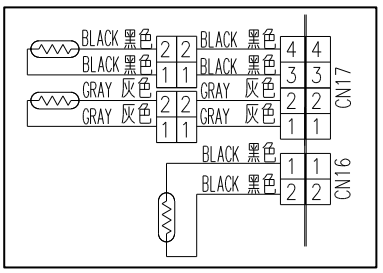


- Wall mount Schematic Diagram (Connector connection)

H/E Inlet Thermistor (CN17 Wire:Black)

H/E Outlet Thermistor (CN17 Wire:Gray)

Room Temp. Thermistor (CN16 Wire:Black)



▸ **If the voltage does not appear, replace Controller PCB and set up the original address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 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)	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
Resistance Value (kΩ)	26.3	21.2	17.8

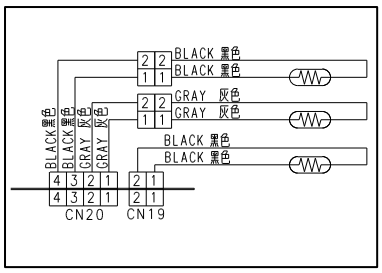
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

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)

・Duct Schematic Diagram (Connector connection)

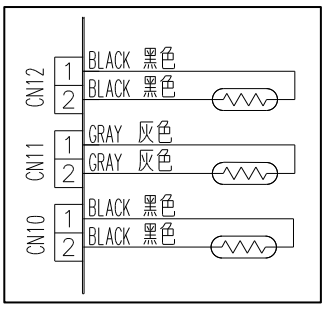


H/E Inlet Thermistor (CN20 Wire:Black)

H/E Outlet Thermistor (CN20 Wire:Gray)

Room Temp. Thermistor (CN19 Wire:Black)

・Small size Wall mount Schematic Diagram(Direct soldering to PCB)



H/E Intlet Thermistor (CN12 Wire:Black)

H/E Outlet Thermistor (CN11 Wire:Gray)

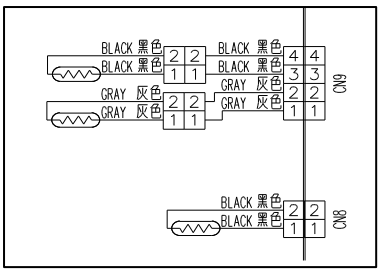
Room Temp. Thermistor (CN10 Wire:Black)

・Cassette Schematic Diagram (Connector connection)

H/E Inlet Thermistor (CN9 Wire:Black)

H/E Outlet Thermistor (CN9 Wire:Gray)

Room Temp. Thermistor (CN8 Wire:Black)

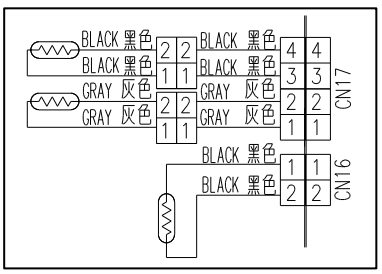


・Wall mount Schematic Diagram (Connector connection)

H/E Inlet Thermistor (CN17 Wire:Black)

H/E Outlet Thermistor (CN17 Wire:Gray)

Room Temp. Thermistor (CN16 Wire:Black)



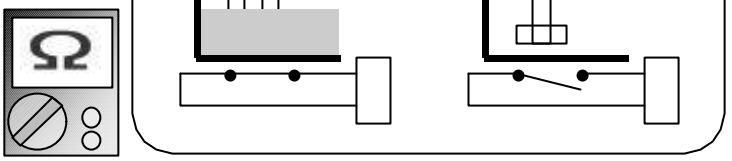
▶ **If the voltage does not appear, replace Controller PCB and set up the original address.**
(Refer to 06-03 page Main PCB removal.)

Trouble shooting 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: Indoor Unit Controller PCB Circuit Float Switch	**Detective details:** 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

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 (CN 1) / Wire

- ☐ Check loose contact of CN1 /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. (Refer to 06-03 page Main PCB removal.)**

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.

Trouble shooting 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 **(PARTS INFORMATION19)**
  >>If Fan motor is abnormal, replace it.

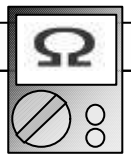
OK

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.
  (Refer to 06-03 page Main PCB removal.)

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

Trouble shooting 9 **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	**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

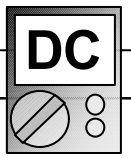
Check Point 1 : Check the connection of terminal

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. (Power supply for Remote)
  Cassette Type ⇒CN5 , AS*E 07,09,12,14LACH / AS*A 07,09,12,14LACH Type ⇒ CN7 , Other ⇒ CN17
  If DC12V, Remote Control failure (Controller PCB is OK) >>> Replace Remote
  If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB(Refer to 06-03 page Main PCB removal.)

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

Trouble shooting 10 **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	**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

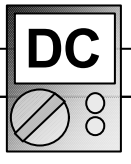
Check Point 1 : Check the connection of terminal

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

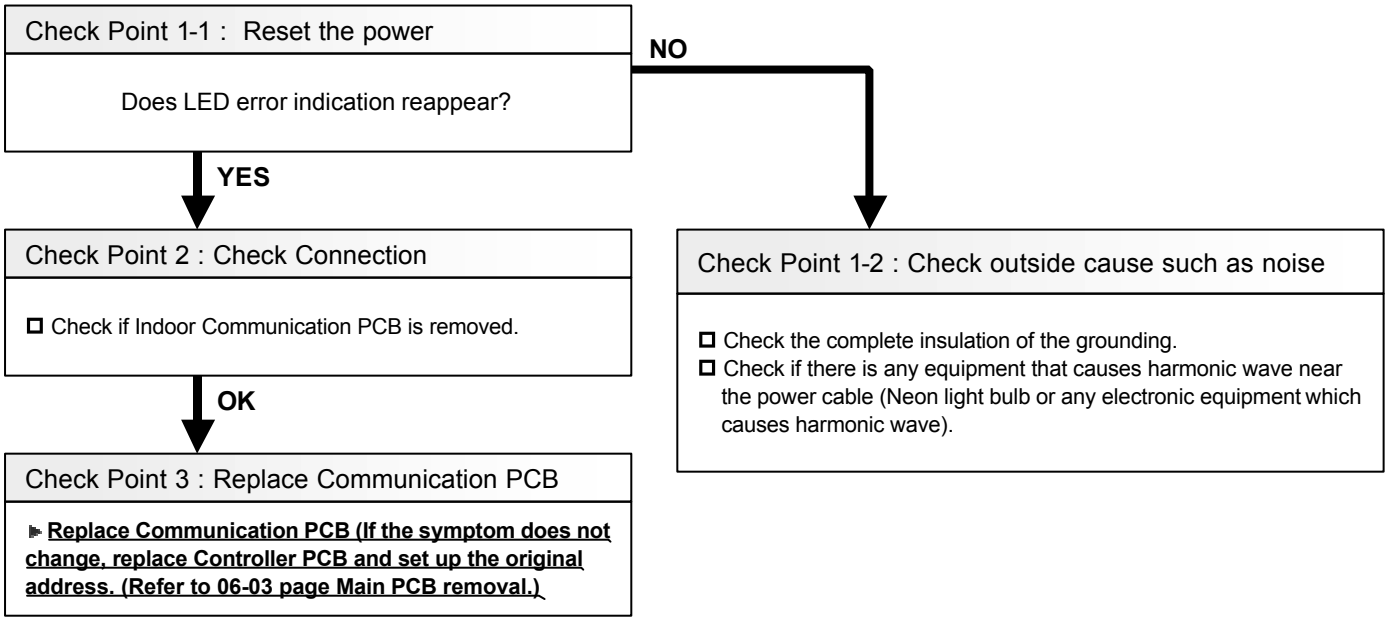


- Check terminal voltage of Controller PCB Connector. (Power supply for Remote)
  Cassette Type ⇒CN5 , AS*E 07,09,12,14LACH / AS*A 07,09,12,14LACH Type ⇒ CN7 , Other ⇒ CN17
  If DC12V, Remote Control failure (Controller PCB is OK) >>> Replace Remote
  IIf DC0V, Controller PCB failure (Remote is OK) >>> Replace Conroller PCB (Refer to 06-03 page Main PCB removal.)

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

Trouble shooting 11 **INDOOR UNIT Error Method:** **Indoor Unit Parallel Communication Error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 1 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash.** **Error Code : 1 6**
Detective Actuators: Indoor unit Controller PCB circuit Indoor unit Communication PCB	**Detective details:** 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



Trouble shooting 12 **INDOOR UNIT Error Method:** **Network Communication Error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Indoor Unit : Operation LED 1 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash.** **Error Code : 1 4**
Detective Actuators: Indoor unit Controller PCB circuit Indoor unit Communication PCB	**Detective details:** 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? (Refer to "TROUBLE SHOOTING FOR OPTIONAL PARTS")

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. (Refer to 06-03 page Main PCB removal.)
- ☐ If all the Indoor units have error, check if the Outdoor Unit Communication PCB has a loose connection (Refer to Trouble Shooting 15).
  >>If the symptom does not change, replace Outdoor unit Communication PCB (Replace Controller PCB if it does not change).

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

Trouble shooting 13 **OUTDOOR UNIT Error Method:** **Initial Setting Error**	**Indicate or Display:** **Outdoor Unit : - - - -** **Indoor Unit : No Display** **Error Code : No Display**
Detective Actuators: Outdoor unit main PCB	**Detective details:** Master unit: When the power is turned on, the number of connected slave units set at the master unit and the number of slave units received by communication do not match. Slave unit: When the power is turned on, not even one master unit communication data can be received.

Forecast of Cause : 1. Power supply defective 2. Outdoor unit address/number of connected slave units setting mistake
3. The number setting mistake of outdoor unit
4. Connection of communication line between outdoor units defective 5. 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 : Chech 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
Slave 1	OFF	ON
Slave 2	ON	OFF

☐ Check the number setting of slave unit

Connected the number (Slave units)	SET 3-3	SET 3-4
0 unit	OFF	OFF
1 unit	OFF	ON
2 units	ON	OFF

OK

Check Point 3 : Check the number setting of outdoor units

☐ Check the number setting of outdoor units

Number of outdoor unit	DIP-SW SET5-1	DIP-SW SET5-2
1 unit	OFF	OFF
2 units	OFF	ON
3 units	ON	OFF

OK

Check Point 4 : Check the connection of communication line betweem outdoor units

Drop the power and perform the check.

☐ Connection and open check of communication lines between outdoor units

OK

Check Point 5 : Replace Main PCB

☐ Change Main PCB and set up the original address. (Refer to 06-03 page Main PCB removal.)

Trouble shooting 14 **OUTDOOR UNIT Error Method:** **Communication Error Between Outdoor Unit**	**Indicate or Display:** **Outdoor Unit : E. 13. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 13**

Detective Actuators:	**Detective details:**
Outdoor unit main PCB	Master unit: State in which "number of connected slave units" by Dip-SW and the number of slave units which can be recognized by communication did not match continued for 10 seconds or more after the start of control. Slave unit: State in which communication from the master unit was not received continued for 10 seconds or more after the start of control.

Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Power supply defective
3. The number setting mistake of outdoor unit
4. Connection of communication lines between outdoor units defective 5. 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 power supply

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

OK

Check Point 3 : Check the number setting of outdoor units

☐ Check the number setting of outdoor units

Number of outdoor unit	DIP-SW SET5-1	DIP-SW SET5-2
1 unit	OFF	OFF
2 units	OFF	ON
3 units	ON	OFF

OK

Check Point 4 : Check the connection of communication lines between outdoor units

Turn off the power and check.

☐ Connection and open check of communication lines between outdoor units.

OK

Check Point 5 : Replace Main PCB

☐ Change Main PCB and set up the original address.
(Refer to 06-03 page Main PCB removal.)

Trouble shooting 15 **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:	**Detective details:**
Outdoor unit Main PCB	▪ 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. Controller 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.
  (Refer to 06-03 page Main PCB removal.)

Trouble shooting 16 **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:	**Detective details:**
Outdoor unit Main PCB	▪ 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. Control 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.
  (Refer to 06-03 page Main PCB removal.)

Trouble shooting 17 **OUTDOOR UNIT Error Method:** **Outdoor Unit Reverse Phase, Missing Phase Wire Error**	**Indicate or Display:** **Outdoor Unit : E. 61. 5** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 61**
Detective Actuators: Outdoor unit Main PCB	**Detective details:** ▪Reverse phase prevention circuit detected reversed phase input or input was not normal.

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

- ☐ Power cable connection, open check

OK

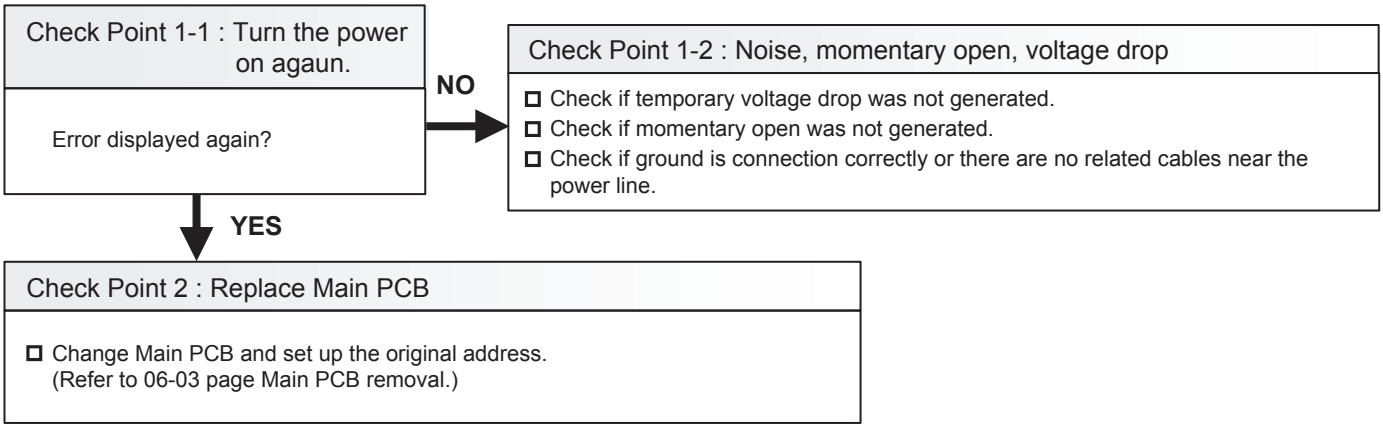
Check Point 3 : Check Filter PCB (Main) and Main PCB

- ☐ Check Filter PCB (Main) and Main PCB.
  (Refer to "Sarvise Parts Information 4")
  >>If replace Main PCB, Refer to 06-03 page Main PCB removal.

Trouble shooting 18 **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



Trouble shooting 19 **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	▪ 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 4")
>>If replace Main PCB, Refer to 06-03 page Main PCB removal.

OK ↓

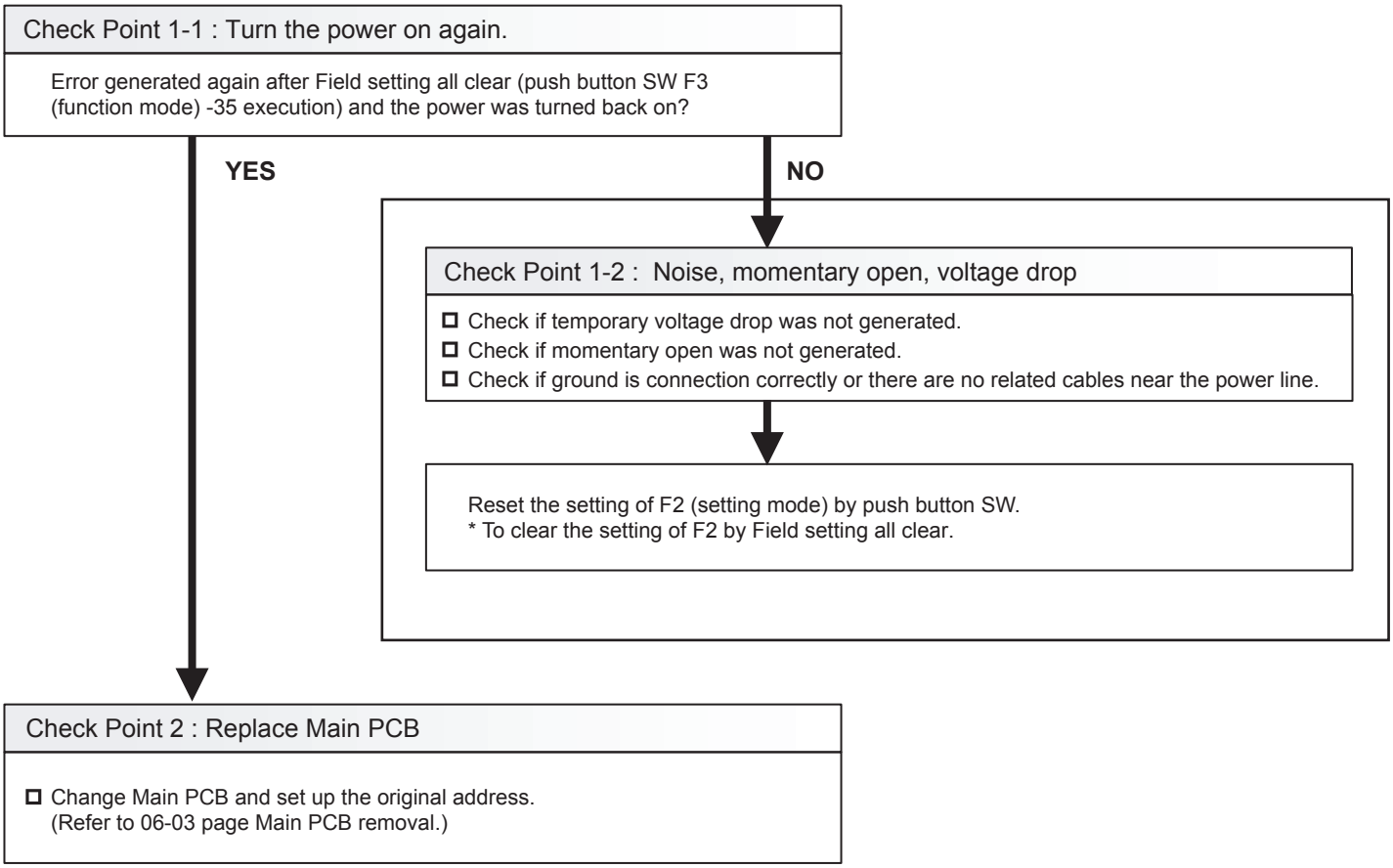
Check Point 4 : Replace Inverter PCB

☐ Replace Inverter PCB.

Trouble shooting 20 **OUTDOOR UNIT Error Method:** Outdoor Unit EEPROM Data 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:	**Detective details:**
Outdoor unit Main PCB	▪ 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



Trouble shooting 21 **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: Inverter PCB	**Detective details:** ▪ 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 5. Cement Resistor Open circuit

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

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 : 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 Cement resistor

- ☐ Check resistance of cement resistor
  If the circuit of both terminal was open circuit, exchange the Resistor
  Correct resistance value: 5.3 - 6.0 Ohm

OK

Check Point 4 : Check Filter PCB (INV) and Inverter PCB

- ☐ Check Filter PCB (INV) and Inverter PCB.
  (Refer to "Sarvise Parts Information 5")

Trouble shooting 22 **OUTDOOR UNIT Error Method:** **Inverter PCB Momentary Power Failure 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. Magnetic Relay (for Inverter) coil side wiring disconnection, open 3. Power supply to Filter PCB (INV) to Inverter PCB wiring disconnection, open 4. Main PCB defective 5. 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 magnetic contactor (for Inverter) coil side wiring

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

OK

Check Point 3 : Check the wiring (Power supply to Filter PCB (INV) to Inverter PCB)

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

OK

Check Point 4 : Check Main PCB

- ☐ Chack Main PCB. (Refer to "Sarvise Parts Information 4")
  >>If replace Main PCB, Refer to 06-03 page Main PCB removal.

OK

Check Point 5 : Replace Inverter PCB

- ☐ Replace Inverter PCB.

Trouble shooting 23 **OUTDOOR UNIT Error Method:** **Magnetic Relay Error**	**Indicate or Display:** **Outdoor Unit : E. 68. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 68**

Detective Actuators:	**Detective details:**
Current sensor 2 (current sensor for constant speed compressor)	▪ "Current value (constant speed) ≧ 3.0A" continues for 5 seconds during constant speed compressor stop command

Forecast of Cause :
1. Magnetic Relay (for constant speed compressor) defective
2. Current sensor 2 (current sensor for constant speed compressor) defective
3. Main PCB defective

Check Point 1 : Check magnetic relay (for costant speed compressor)

☐ Magnetic relay (for constant speed compressor) operation check
(Refer to "Sarvise Parts Information 13")

OK

Check Point 2 : Check the Current sensor 2 (current sensor for constant speed compressor)

☐ Current sensor 2 (current sensor for constant speed compressor) check

* For the characteristics of current sensor 2 (current sensor for constant speed compressor), refer to the "Service Parts Information 7".

OK

Check Point 3 : Replace Main PCB

☐ Change Main PCB and set up the original address.
(Refer to 06-03 page Main PCB removal.)

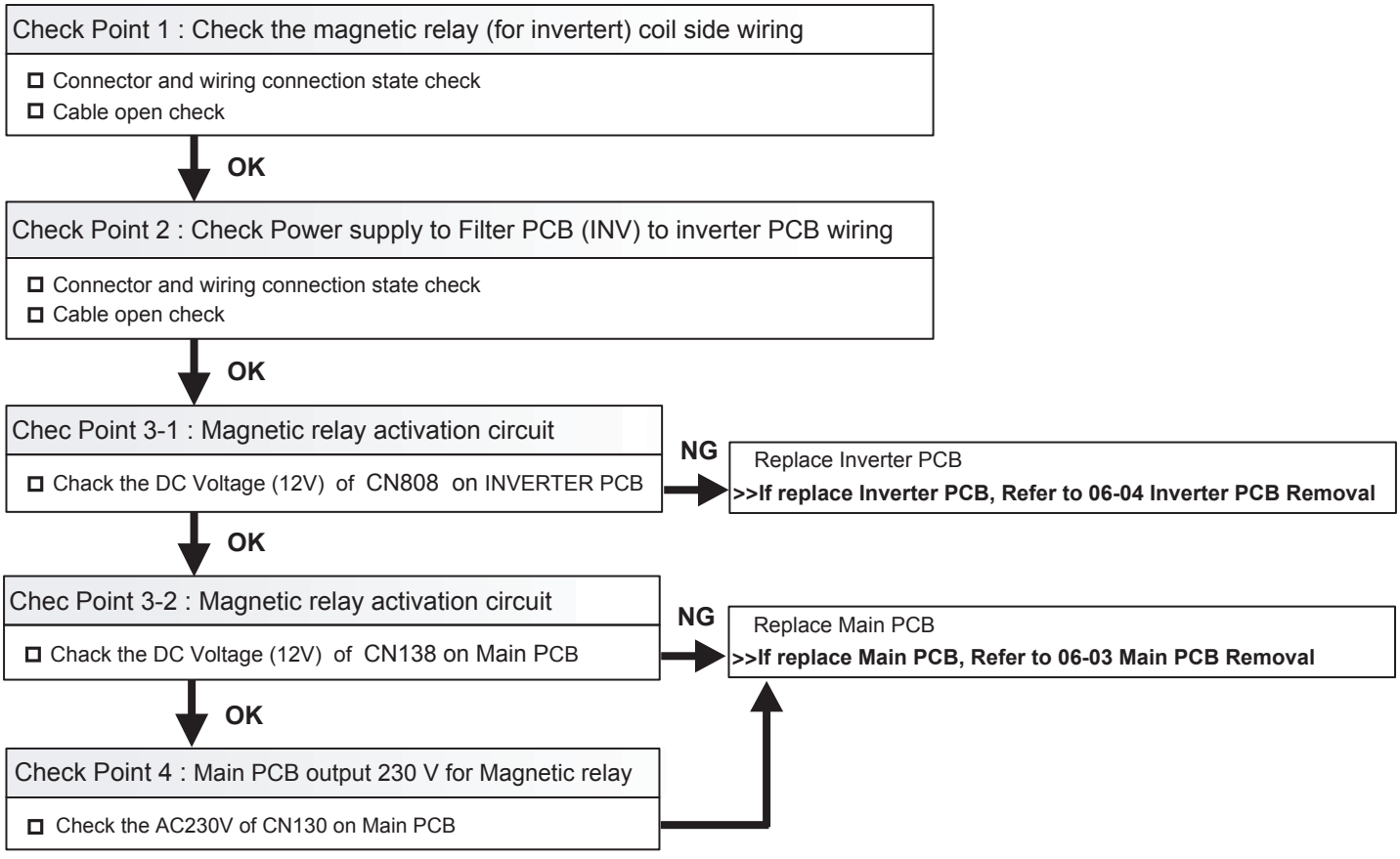
* When the magnetic Relay (for constant speed compressor) was turned ON manually, a Magnetic Relay Error may be generated.

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

Trouble shooting 24 **OUTDOOR UNIT Error Method:** Rush Current Limiting Resistor Temp Rise Protection	**Indicate or Display:** Outdoor Unit : E. 68. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 68

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
6. Main PCB output 230 VAC on CN130 defective
   Main PCB defective (output 230VAC on CN130 for Magnetic relay (INV) defective)



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

Trouble shooting 25 **OUTDOOR UNIT Error Method:** Outdoor Unit Communication 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	▪ Parallel communication (communication between master PC and Neuron Chip) failed 5 times.

Forecast of Cause : 1. Wrong terminal resistor set in the transmission segment
2. Noise 3. Communication PCB connection defective
4. Communication PCB defective 5. Main PCB defective

Check Point 1 : Check the terminal resistor setting

- ☐ No terminal resitor set in the single network segment
- ☐ Dual terminal resitor set in the single network segment

DIP SW SET5-4 OFF: Disable (Factory setting)
ON : Enable

OK

Check Point 2-1 : Turn the power on again.

Error displayed again?

NO

Check Point 2-2 : Noise

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

YES

Check Point 3 : Check the communication PCB connection

- ☐ Communication PCB connection check

OK

Check Point 4 : Check the communication PCB

- ☐ Communication PCB check

OK

Check Point 5 : Replace Main PCB

- ☐ Change Main PCB and set up the original address. (Refer to 06-03 page Main PCB removal.)

Trouble shooting 26 **OUTDOOR UNIT Error Method:** **Discharge Temp Sensor 1 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

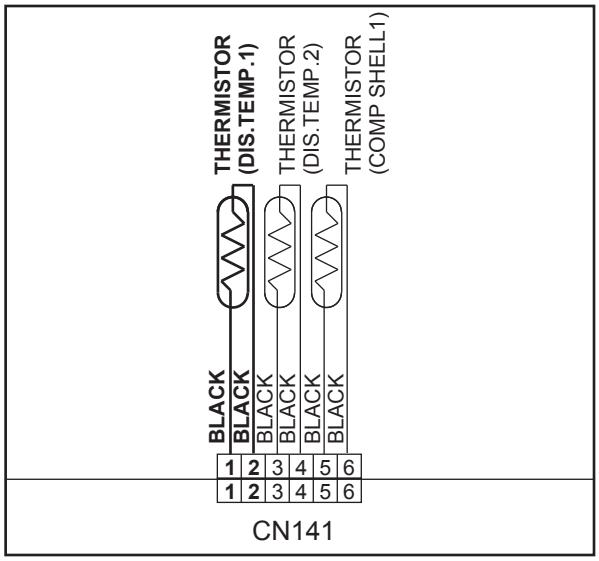
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

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. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 27 **OUTDOOR UNIT Error Method:** **Discharge Temp Sensor 2 Error**	**Indicate or Display:** **Outdoor Unit : E. 71. 2** **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 2	・ Discharge temperature thermistor 2 short detected ・ Discharge thermistor 2 open detected after compressor 2 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

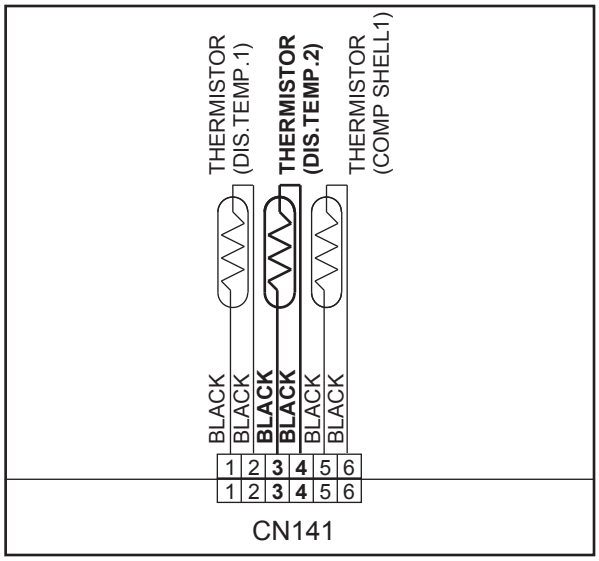
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

OK

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

- ☐ Main PCB (CN141:3-4) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Discharge temperature sensor 2 (CN141:3-4)

► **If the voltage does not appear, replace Main PCB and set up orignal address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 28 **OUTDOOR UNIT Error Method:** **Compressor Temp Sensor 1 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

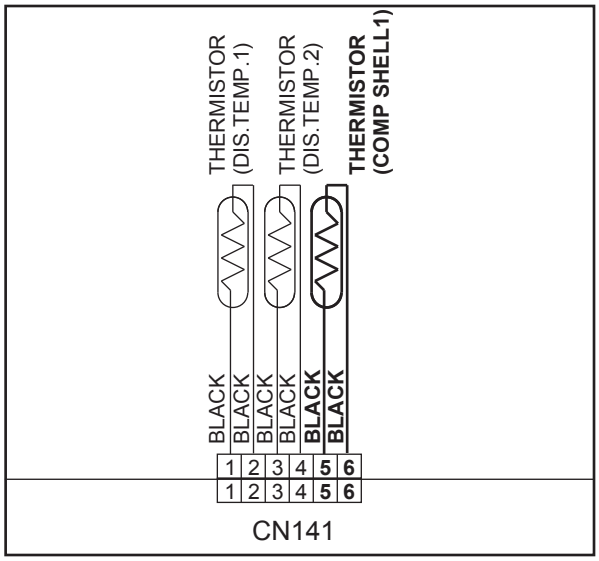
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

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. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 29 **OUTDOOR UNIT Error Method:** **Compressor Temp Sensor 2 Error**	**Indicate or Display:** **Outdoor Unit : E. 72. 2** **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 2	▪ Compressor temperature thermistor 2 short detected ▪ Compressor thermistor 2 open detected after compressor 2 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

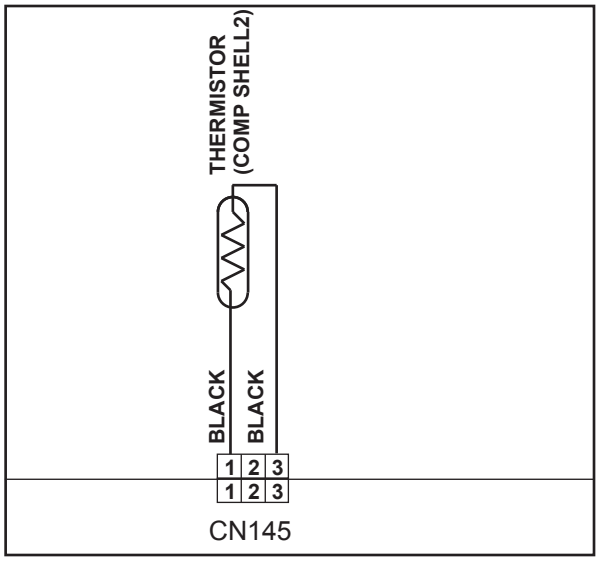
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the Service Parts Information 22.

OK

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

- ☐ Main PCB (CN145:1-3) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Compressor temperature sensor 2 (CN145:1-3)

►**If the voltage does not appear, replace Main PCB and set up orignal address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 30 **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

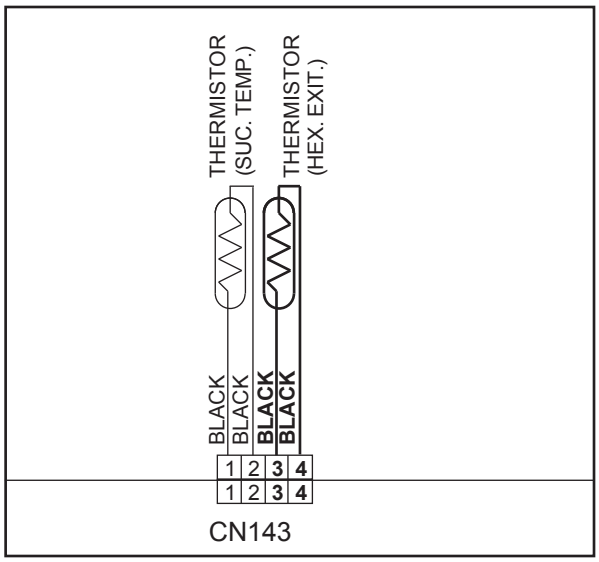
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

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. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 31 **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

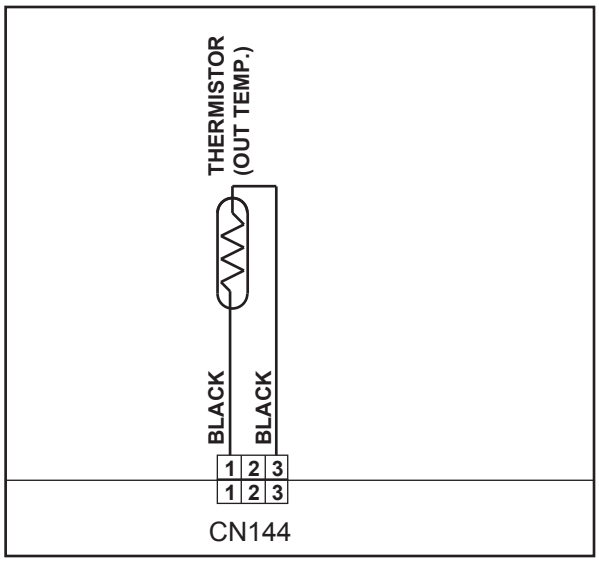
Check Point 2: Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

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. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 32 **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

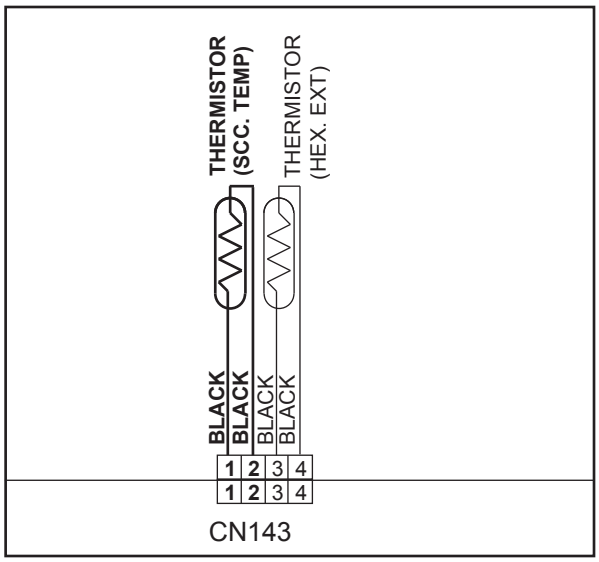
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

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. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 33 **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:**
Heat sink temperature thermistor	・ Heat sink temperature thermistor open/short detected

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

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

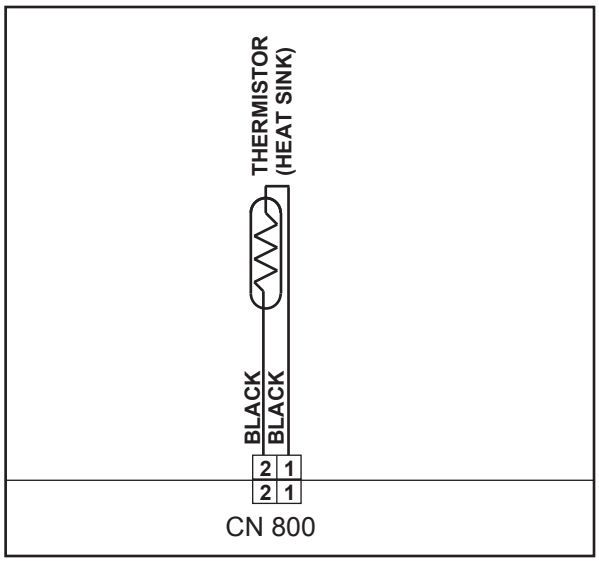
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

OK

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

- ☐ Inverter PCB (CN800:1-2) voltage value = 5V
  Remove the thermistor from Inverter PCB, check the voltage.



Heat sink temperature thermistor (CN800:1-2)

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

Trouble shooting 34 **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

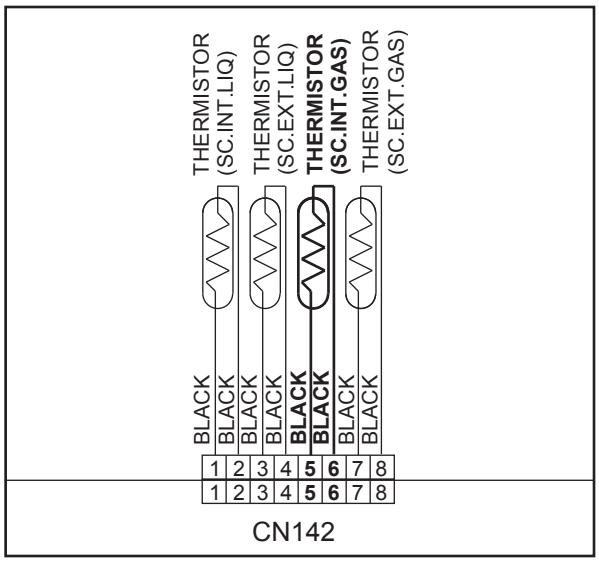
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

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)

►**If the voltage does not appear, replace Main PCB and set up orignal address. (Refer to Refer to 06-03 page Main PCB removal.)**

Trouble shooting 35 **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

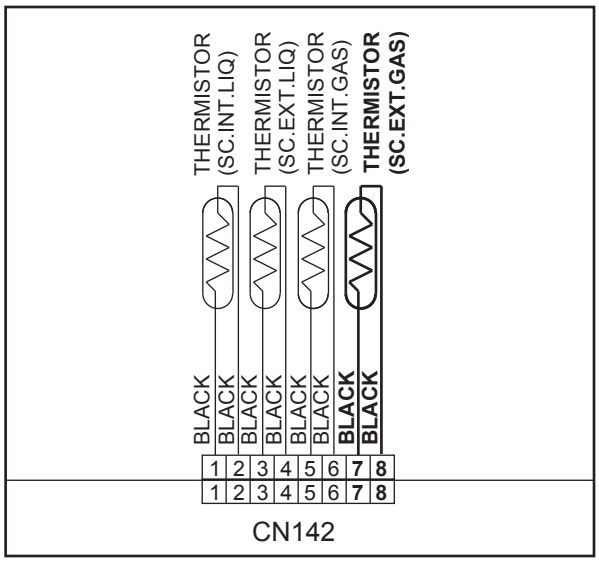
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

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)

►**If the voltage does not appear, replace Main PCB and set up orignal address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 36 **OUTDOOR UNIT Error Method:** **Liquid Pipe Temp. Sensor 1 Error**	**Indicate or Display:** **Outdoor Unit : E. 83. 1** **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 1	・ Liquid pipe temperature thermistor 1 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

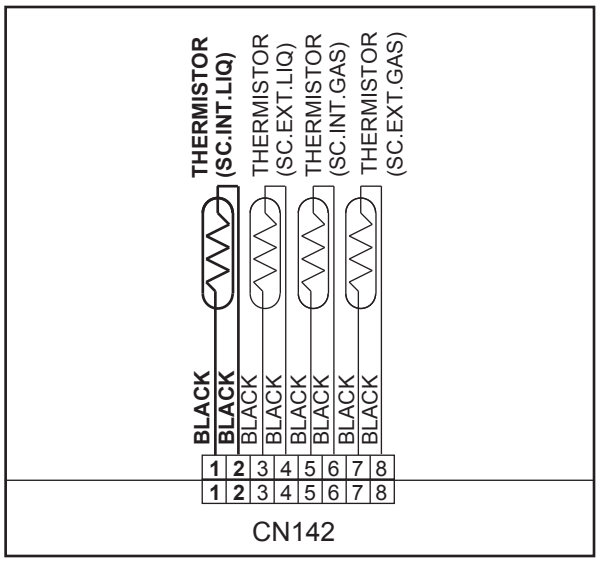
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

OK

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

- ☐ Main PCB (CN142:1-2) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Liquid pipe temperature sensor 1 (CN142:1-2)

►**If the voltage does not appear, replace Main PCB and set up orignal address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 37 **OUTDOOR UNIT Error Method:** **Liquid Pipe Temp Sensor 2 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 2	・ Liquid pipe 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

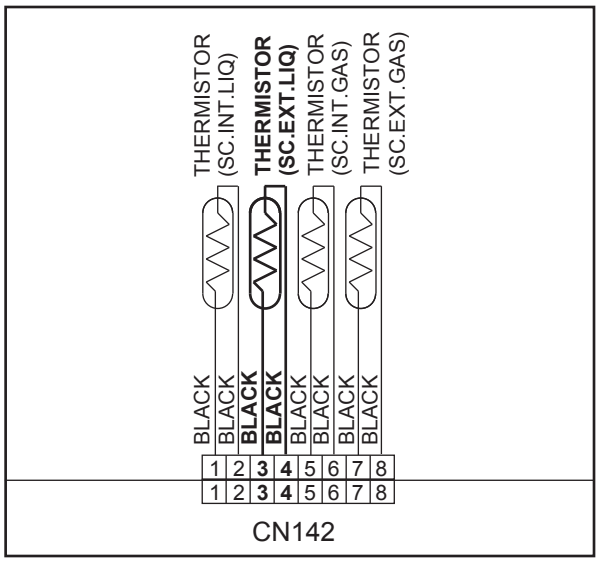
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 22".

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)

►**If the voltage does not appear, replace Main PCB and set up orignal address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 38 **OUTDOOR UNIT Error Method:** **Current Sensor 1 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 ≧ 50rps and sensor value 0A continued for 1 min"" was generated 2 times ・ Sensor value while inverter stopped = maximum was detected

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

Check Point 1 : Filter PCB(INV) to Inverter PCB CT system wiring connection state

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

↓ **OK**

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

- ☐ Connector connection state check
- ☐ Cable open check

↓ **OK**

Check Point 3 : Check Filter PCB (INV) and Inverter PCB

- ☐ Chack Filter PCB (INV) and Inverter PCB.
  (Refer to "Sarvise Parts Information 5")

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

Trouble shooting 39 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

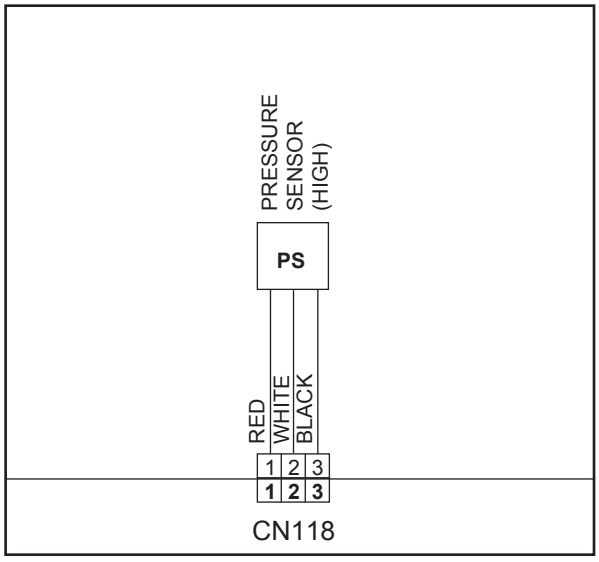
Check Point 2 : Check the discharge pressure sensor

- ☐ Sensor characteristics check
  * For the characteristics of the discharge pressure sensor, refer to the "Service Parts Information 20".

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)

►**If the voltage does not appear, replace Main PCB and set up orignal address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 40 **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

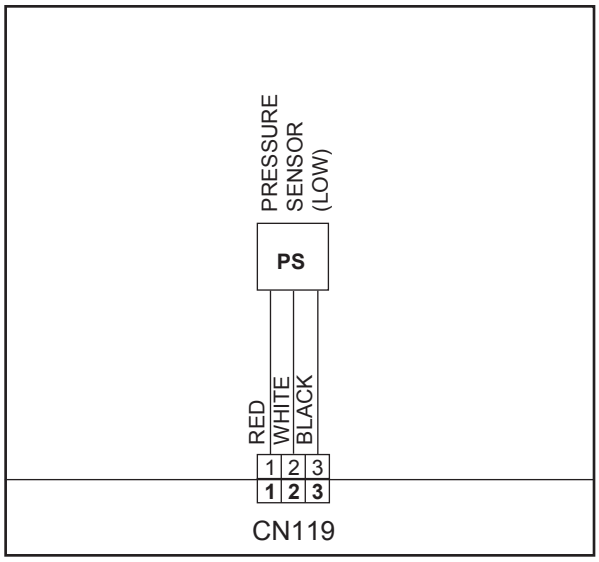
Check Point 2 : Check the suction pressure sensor

- ☐ Sensor characteristics check
  * For the characteristics of the suction pressure sensor, refer to the "Service Parts Information 20".

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)

►**If the voltage does not appear, replace Main PCB and set up orignal address. (Refer to 06-03 page Main PCB removal.)**

Trouble shooting 41 **OUTDOOR UNIT Error Method:** **High Pressure Switch 1 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 1	・ When the power was turned on, "high pressure switch 1: open" was detected.

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

Check Point 1 : Check the high pressure switch 1 connection state

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

OK

Check Point 2 : Check the high pressure switch 1 characteristics

- ☐ Switch characteristics check
  * For the characteristics of high pressure switch 1, refer to the "Service Parts Information 21".

OK

Check Point 3 : Replace Main PCB

- ☐ Change Main PCB and set up the original address.
  (Refer to 06-03 page Main PCB removal.)

Trouble shooting 42 **OUTDOOR UNIT Error Method:** **High Pressure Switch 2 Error**	**Indicate or Display:** **Outdoor Unit : E. 86. 5** **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 2	・ When the power was turned on, "high pressure switch 2: open" was detected.

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

Check Point 1 : Check the high pressure switch 2 connection state

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

OK

Check Point 2 : Check the high pressure switch 2 characteristics

- ☐ Switch characteristics check
  * For the characteristics of high pressure switch 2, refer to the "Service Parts Information 21".

OK

Check Point 3 : Replace Main PCB

- ☐ Change Main PCB and set up the original address.
  (Refer to 06-03 page Main PCB removal.)

Trouble shooting 43 **OUTDOOR UNIT Error Method:** **Compressor 2 Error**	**Indicate or Display:** **Outdoor Unit : E. 92. 1** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 92**

Detective Actuators:	**Detective details:**
Current sensor 2 (for constant speed compressor)	▪ "Protection stop by "current sensor value ≦ 0.1A continued for within 5 hours during compressor ON command"" generated 2 times

Forecast of Cause :

1. Main PCB to magnetic relay (for constant speed compressor) wiring disconnection, open
2. Compressor power supply system wiring disconnection, open (terminal to magnetic Relay for constant speed compressor) to constant speed compressor)
3. Magnetic Relay (for constant speed compressor) defective
4. Current sensor 2 (current sensor for constant speed compressor) to Main PCB wiring disconnection, open
5. Current sensor 2 (current sensor for constant speed compressor) defective
6. Main PCB defective
7. Compressor 2 defective (winding open, protector operated)

Check Point 1 : Check the wiring connection state (main PCB to magnetic Relay (for constant speed compressor))

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

OK

Check Point 2 : Compressor Power supply system (terminal to magnetic Relay (for constant speed compressor) to constant speed compressor) wiring connection state

- ☐ Wiring connection state check
- ☐ Cable open check

OK

Check Point 3 : Check Magnetic Relay (for constant speed compressor)

- ☐ Magnetic relay (for constant speed compressor) operation check (Refer to "Sarvise Parts Information 13")

OK

Check Point 4 : Check the wiring connection state (current sensor 2 (current sensor for constant speed compressor) to Main PCB

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

OK

Check Point 5 : Check the current sensor 2 (current sensor for constant speed compressor)

- ☐ Current sensor 2 (current sensor for constant speed compressor) check (Refer to "Service Parts Information 7")

OK

Check Point 6 : Main PCB check

- ☐ Chack Main PCB. (Refer to "Sarvise Parts Information 4")
  >>If replace Main PCB, Refer to 06-03 page Main PCB removal.

OK

Check Point 7 : Replace compressor 2

- ☐ Compressor 2 replacement

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

Trouble shooting 44 **OUTDOOR UNIT Error Method:** **Compressor 2 Current Value Error**	**Indicate or Display:** **Outdoor Unit : E. 92. 2** **Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.** **Error Code : 92**

Detective Actuators:	**Detective details:**
Current sensor 2 (for constant speed compressor)	▪ "Protection stop by "current sensor value ≧19.5A continued for 2 seconds"" generated 2 times within 60 minutes

Forecast of Cause :
1. Compressor power supply system wiring disconnection, open (terminal to magnetic contactor (for constant speed compressor) to constant speed compressor)
2. Current sensor 2 (current sensor for constant speed compressor) defective
3. Compressor 2 defective (lock, winding short)

Check Point 1 : Compressor power supply system (terminal to magnetic contactor (for constant speed compressor) to constant speed compressor) wiring connection state

- ☐ Wiring connection state check
- ☐ Cable open check

OK

Check Point 2 : Check the current sensor 2 (current sensor for constant speed compressor)

- ☐ Current sensor 2 (current sensor for constant speed compressor) check
  * For the characteristics of current sensor 2 (current sensor for constant speed compressor), refer to the "Service Parts Information 7".

OK

Check Point 3 : Replace the compressor 2

- ☐ Compressor 2 replacement

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

Trouble shooting 45 **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	▪ "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 5)

↓ **OK**

Check Point 3 : Replace the Inverter compressor

- ☐ Inverter compressor replacement

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

Trouble shooting 46 **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	▪ "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)

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 5)

OK

Check Point 3 : Replace the Inverter compressor

- ☐ Inverter compressor replacement

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

Trouble shooting 47 **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	▪ "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 5)

OK

Check Point 2 : Replace the Inverter compressor

☐ Inverter compressor replacement

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

Trouble shooting 48 **OUTDOOR UNIT Error Method:** **Outdoor Unit Fan Motor Lock Error**	**Indicate or Display:** **Outdoor Unit : E. 97. 1** **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 fan	▪ "Protection stop by "fan speed ≦ 100rpm" 20 seconds after fan operation command issued" was generated consecutively 5 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 : Replace Main PCB

- ☐ Drive circuit output check
- ☐ Check if speed can be detected.

>>If replace Main PCB and and set up orignal address, Refer to 06-03 page Main PCB removal.

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

Trouble shooting 49 **OUTDOOR UNIT Error Method:** Outdoor Unit Fan Motor Undervoltage	**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	▪ 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,
Refer to 06-03 page Main PCB removal.

Trouble shooting 50 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor Temperature Abnormal	Indicate or Display: Outdoor Unit : E. 97. 5 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 fan	▪ Protection stop by speed ≦ 270rpm 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

Trouble shooting 51 **OUTDOOR UNIT Error Method:** **Slave Unit Error**	**Indicate or Display:** **Outdoor Unit : E. 9U. 2** **Indoor Unit : No display** **Error Code : 9U**

Detective Actuators:	**Detective details:**
Slave Unit	▪ Error signal rece ived from slave unit of same refrigerant system

Check Point 1 : Check the slave unit
□ Slave unit 7 seg display check ⇒ Check by troubleshooting based on displayed error code.

Trouble shooting 52 **OUTDOOR UNIT Error Method:** Discharge Tempreture 1 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 1	▪ "Protection stop by "discharge temperature1 ≧110°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

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV (EEV2, indoor unit EEV) open?
- ☐ Strainer clogging check (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 14, 16".

OK

Check Point 3 : Check the outdoor unit fan,heat exchanger

- ☐ Check for foreign matter at heat exchanger
- ☐ Check if fan can be rotated by hand.
- ☐ Motor check

OK

Check Point 4 : Check the discharge thermistor 1

- ☐ Discharger thermistor 1 characteristics check (Check by disconnecting thermistor from PCB.)
  * For the characteristics of the thermistor, refer to the "Service Parts Information 22".

OK

Check Point 5 : Check the refrigerant amount

- ☐ Leak check

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV (EEV1, EEV2) open?
- ☐ Strainer clogging check (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 15, 16".

OK

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

Trouble shooting 53 **OUTDOOR UNIT Error Method:** Discharge Tempreture 2 Abnormal	**Indicate or Display:** Outdoor Unit : E. A2. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : A2

Detective Actuators:	**Detective details:**
Discharge temperature thermistor 2	▪ "Protection stop by "discharge temperature 2 ≧ 115°C during compressor 2 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 2 defective
5. Insufficient refrigerant

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV (EEV2, indoor unit EEV) open?
- ☐ Strainer clogging check (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 14, 16".

OK

Check Point 3 : Check the outdoor unit fan,heat exchanger

- ☐ Check for foreign matter at heat exchanger
- ☐ Check if fan can be rotated by hand.
- ☐ Motor check

OK

Check Point 4 : Check the discharge thermistor 2

- ☐ Discharger thermistor 2 characteristics check (Check by disconnecting thermistor from PCB.)
  * For the characteristics of the thermistor, refer to the "Service Parts Information 22".

OK

Check Point 5 : Check the refrigerant amount

- ☐ Leak check

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV (EEV1, EEV2) open?
- ☐ Strainer clogging check (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 15, 16".

OK

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

Trouble shooting 54 **OUTDOOR UNIT Error Method:** Compressor 1 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 1	▪"Protection stop by "compressor 1 tempreture" ≧ 112℃ 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. Compressor 1 temperature thermistor defective
5. Insufficient refrigerant

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV (EEV2, indoor unit EEV) open?
- ☐ Strainer clogging check (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 14, 16".

OK

Check Point 3 : Outdoor unit fan, heat exchanger chek

- ☐ Check for foreign matter at heat exchanger
- ☐ Check if fan can be rotated by hand.
- ☐ Motor check

OK

Check Point 4 : Check the compressor 1 temperature thermistor

- ☐ Compressor 1 temperature thermistor characteristics check (Check by disconnecting thermistor from PCB)
  * For the characteristics of the thermistor, refer to the "Service Parts Information 22.

OK

Check Point 5 : Check the refrigerant amount

- ☐ Leak check

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV (EEV1, EEV2) open?
- ☐ Strainer clogging check (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 15, 16".

OK

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

Trouble shooting 55 OUTDOOR UNIT Error Method : Compressor 2 Tempreture Abnormal	Indicate or Display: Outdoor Unit : E. A3. 2 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 2	▪"Protection stop by "compressor 2 tempreture" ≧ 120℃ during compressor 2 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 temperature thermistor 2 defective
5. Insufficient refrigerant

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.
- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 2 : Check the EEV, strainer
- ☐ EEV (EEV2, indoor unit EEV) open?
- ☐ Strainer clogging check (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 14, 16".

OK

Check Point 3 : Check the outdoor unit fan, heat exchanger
- ☐ Check for foreign matter at heat exchanger
- ☐ Check if fan can be rotated by hand.
- ☐ Motor check

OK

Check Point 4 : Check the compressor 2 temperature thermistor
- ☐ Compressor 2 temperature thermistor characteristics check
  (Check by disconnecting thermistor from PCB)
  * For the characteristics of the thermistor, refer to the "Service Parts Information 22".

OK

Check Point 5 : Check the refrigerant amount
- ☐ Leak check

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.
- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the EEV, strainer
- ☐ EEV (EEV1, EEV2) open?
- ☐ Strainer clogging check (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 15, 16".

OK

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

Trouble shooting 56 **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 ≧ 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

<Cooling operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the outdoor unit fan operation, heat exchanger, ambient temperature

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

OK

Check Point 3 : Check the check valve

- ☐ Check if check valve (parallel with EEV1) not clogged.

OK

Check Point 5 : Check the solenoid valve (SV1, SV2)

- ☐ Solenoid valve operation check
  Refer to "Service Parts Information 17".

OK

Check Point 6 :Check the discharge pressure sensor

- ☐ Discharge pressure sensor characteristics check
  * For the characteristics of the discharge pressure sensor, refer to "Service Parts Information 20".

OK

Check Point 7 : Check the refrigerant amount

- ☐ Refrigerant charged amount check

<Heating operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 4 : Check the EEV, strainer (indoor unit)

- ☐ EEV operation check
- ☐ Check of strainers before and after EEV
  Refer to "Service Parts Information 14, 15, 16".

OK

Trouble shooting 57 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

<Cooling operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the outdoor unit fan operation, heat exchanger, ambient temperature

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

OK

Check Point 3-1 : Check the check valve

- ☐ Check if check valve (parallel with EEV1) not clogged.

OK

Check Point 3-2 : Check the check valve

- ☐ Check if check valve (oilseparetor (out) of compressor 1) is not clogged.

OK

Check Point 5 : Check the solenoid valve (SV1, SV2)

- ☐ Solenoid valve operation check
  Refer to "Service Parts Information 17".

OK

Check Point 6 : Check high pressure switch 1

- ☐ High pressure switch 1 characteristics check
  * For the characteristics of the high pressure switch 1, refer to "Service Parts Information 21".

OK

Check Point 7 : Check the refrigerant amount

- ☐ Refrigerant charged amount check

<Heating operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 4 : Check the EEV, strainer (indoor unit)

- ☐ EEV operation check
- ☐ Check of strainers before and after EEV
  Refer to "Service Parts Information 14, 15, 16".

OK

Trouble shooting 58 **OUTDOOR UNIT Error Method:** **HIgh Pressure Protection 2**	**Indicate or Display:** **Outdoor Unit : E. A4. 3** **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 2	▪ "Protection stop by "high pressure switch 2 operated during compressor 2 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 2 defective 7. Refrigerant overcharged

<Cooling operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the outdoor unit fan operation, heat exchanger, ambient temperature

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

OK

Check Point 3-1 : Check valve check

- ☐ Check if check valve (parallel with EEV1) not clogged.

OK

Check Point 3-2 : Check valve check

- ☐ Check if check valve (oilseparetor (out) of compressor 2) is not clogged.

OK

Check Point 5 : Solenoid valve (SV1, SV2) check

- ☐ Solenoid valve operation check
  Refer to "Service Parts Information 17".

OK

Check Point 6 : High pressure switch 2 check

- ☐ High pressure switch 2 characteristics check
  * For the characteristics of the high pressure switch 2, refer to the "Service Parts Information 21".

OK

Check Point 7 : Refrigerant amount check

- ☐ Refrigerant charged amount check

<Heating operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 4 : Check the EEV, strainer (indoorunit)

- ☐ EEV operation check
- ☐ Check of strainers before and after EEV
  Refer to "Service Parts Information 14, 15, 16".

OK

Trouble shooting 59 **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 ≦ 0.10MPa continued for 10 minutes" or "suction pressure ≦ 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

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.
- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 4 : Check the indoor unit EEV, strainer clogging
- ☐ Indoor unit EEV operation check
- ☐ Strainer not clogged?

OK

Check Point 5 : Check the solenoid valve (SV1)
- ☐ Solenoid valve operation check
  Refer to "Service Parts Information 17".

OK

Check Point 6 : Check the suction pressure sensor
- ☐ Suction pressure sensor characteristics check
  * For the characteristics of the suction pressure sensor, refer to "Service Parts Information 20".

OK

Check Point 7 : Check the refrigerant amount
- ☐ Leak check

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.
- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the outdoor unit ambient temperature
- ☐ Outdoor ambient temperature lower than operating range?

OK

Check Point 3 : Check the outdoor unit fan operation, heat exchanger
- ☐ No foreign matter in air passage?
- ☐ Heat exchange fins clogged
- ☐ Fan rotates?
- ☐ Outdoor unit fan motor check

OK

Check Point 4 : Check the outdoor unit EEV, strainer clogging
- ☐ Outdoor unit EEV1 operation check
- ☐ Strainer not clogged?
  Refer to "Service Parts Information 15".

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

Trouble shooting 60 **OUTDOOR UNIT Error Method:** **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:**
Heat sink thermistor	▪ "Protection stop by "heat sink temperature ≧ 88°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 thermistor 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 : Check the heat sink thermistor

- ☐ Heat sink thermistor characteristics check (Check by disconnecting thermistor from PCB.)
  * For the characteristics of the thermistor, refer to "Service Parts Information 22".

Trouble shooting 61 **UTDOOR 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 more than 64 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 62 **UTDOOR 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 62-2 **INDOOR UNIT Error Method:** **Indoor unit number shortage error**	**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.
  (Refer to 06-03 page Main PCB removal.)

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).

TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 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.

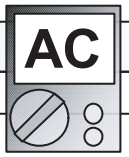
OK

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 AC220V appears at Indoor Unit Terminal 1 - 2 (Power Supply).

NG → (return to Check Point 1)

OK

☐ Check the fuse and thermal fuse.

OK → (to Display PCB)

NG

☐ Replace the fuse or thermal fuse.
☐ Check if the power supply terminals section is shorted.

OK → (to Display PCB)

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.)

OK

NG

☐ Replace the Power Supply PCB.

NG

☐ Replace the Display PCB.

NG

► **If the symptom does not change by above Check 3, replace Controller PCB or Power Supply PCB.**
>>If replace Controller PCB, Refer to 06-03 page Main PCB removal.

Trouble shooting 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.

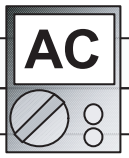
OK

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 AC380V appears at Outdoor Unit Terminal R-S, S-T, T-R, and AC220V at R-N, S-N, T-N.

NO

OK

☐ Check the fuse on the Filter PCB(Main).

OK

NG

☐ Replace the fuse.
☐ Recheck if the power supply terminals section is shorted.
(Note) Always check in the power off state.

OK

NG

☐ Disconnect connecting cable of the Filter PCB(Main) and Main PCB and recheck. if the power supply terminals section is not shorted.
(Note) Always check in the power off state.

OK

NG

☐ Replace the Main PCB.
(Refer to 06-03 page Main PCB removal.)

NG

☐ Replace the Filter PCB(Main).

NG

☐ If the symptom does not change,
Check voltage of "CN125 pins 1-3" on the Main PCB. (DC 5V)

OK

NG

☐ For 8HP and 10HP models, advance to [OK] without checking.
☐ For 12HP, 14HP and 16HP models, disconnect connecting cable of the PWB Unit(CT) and Main PCB and recheck.
Recheck voltage of "CN125 pins 1-3" on the Main PCB. (DC 5V)

OK

NG

☐ Replace the Pressure sensor

OK

☐ Replace the PWB Unit (CT)

NG

If the symptom does not change by above Check 3, replace Main PCB or Filter PCB (Main).
>>If replace Main PCB, Refer to 06-03 page Main PCB removal.

Trouble shooting 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.

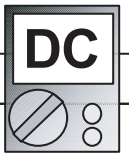
OK

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.)

Trouble shooting 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

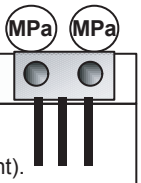
Check Point 4 : Check Indoor/Outdoor Installation Condition

- ☐ 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



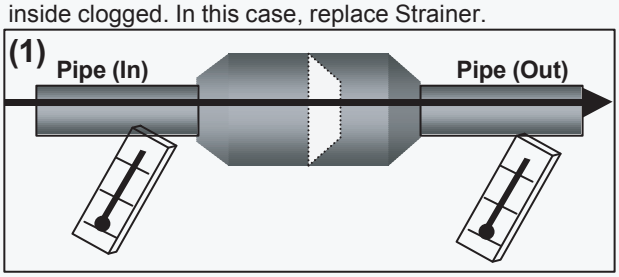
- ☐ Check if Strainer is clogged (Refer to the figure at right).
- ☐ Measure Gas Pressure and if there is a leakage, correct it.

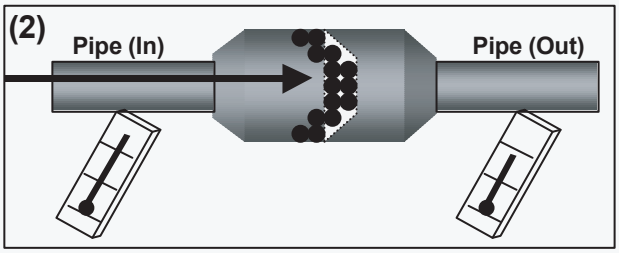
>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

- ▶ Check EEV (Service Parts Information 15, 16)
- ▶ Check Solenoid Valve (Service Parts Information 17)
- ▶ Check Compressor (Service Parts Information 2,3)

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.





Trouble shooting 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.

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 (Service Parts Information 2,3)

Trouble shooting 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 (Service Parts Information 19)

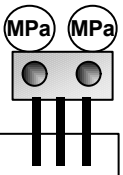
OK

- ☐ Is Float Switch defective?
  >> Check Float Switch (Refer to Trouble Shooting 7)

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 (Service Parts Information 14)

4-3-3 Trouble Shooting for Optional Parts

1. External Switch Controller (UTY-TEKX)

Trouble shooting 69

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.**

Trouble shooting 70

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.**

Trouble shooting 71

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.**

Trouble shooting 72

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.

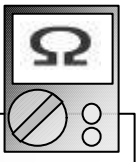
OK

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-VSGX)

Trouble shooting 73

Error Contents :	**Symptom :**
Power Supply Error	**No display**

Details :

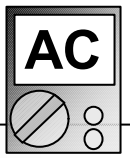
Condition of occurrence : Normal power is not supplied. 7 segment indicator is defective.

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 (220V) is applied to power supply terminal of Signal Amplifier, there is a possibility of defective PCB. Proceed as follows.
►**Replace Signal Amplifier.**

Trouble shooting 74

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

Trouble shooting 75

Error Contents :	**Symptom :**
Address Setting Error	**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.**

Trouble shooting 76

Error Contents :	**Symptom :**
Parallel Communication	**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.**

Trouble shooting 77

Error Contents :	**Symptom :**
Communication Error B	**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.**

Trouble shooting 78

Error Contents :	**Symptom :**
Communication Error A	**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-VGGX)

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

Trouble shooting 79

Error Contents :	**Symptom :**
Power Supply Error	**No display**

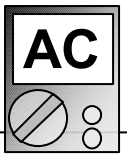
Details :

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 (220V) is applied to power supply terminal of Network Convertor, there is a possibility of defective PCB. Proceed as follows.
►**Replace Nerwork Convertor.**

Trouble shooting 80

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.**

Trouble shooting 81

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.

OK

NO

● It is not a defect of PCB. Remove the surrounding noise source.

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.**

Trouble shooting 82

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.**

Trouble shooting 83

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 more.

Cause 1 : Check of number of indoor unit registration refrigerant circuits

☐ Check indoor unit registration.
(1) Number of refrigerant sircuits of indoor unit registered at Replace Group Remote Controller is 3 refrigerant sircuits or more even though connected to one converter.

YES

☐ Make 2 refrigerant sircuits or less and wait 2 minutes

NO

☐ Replace Network Convertor
Replace Group Remote Controller

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

Trouble shooting 84

Error Contents :	**Symptom :**
Power Supply Error	**No display**

Details :

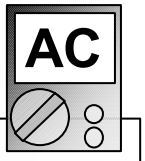
Condition of occurrence : Normal power is not supplied. 7 segment indicator is defective.

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 (220V) is applied to power supply terminal of Network Convertor, there is a possibility of defective PCB. Proceed as follows.
► **Replace Network Convertor.**

Trouble shooting 85

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.**

Trouble shooting 86

Error Contents :	**Symptom :**
Communication Error with Standard Remote Controller	**Error Code display [1 2] Control/Display from Standard Remote s 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.

OK

NO

● It is not a defect of PCB. Remove the surrounding noise source.

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.**

Trouble shooting 87

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.**
>>If replace Controller PCB, Refer to 06-03 page Main PCB removal.

Trouble shooting 88

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.

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.**
>>If replace Controller PCB, Refer to 06-03 page Main PCB removal.

Trouble shooting 89

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.**

Trouble shooting 90

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-CGGY / CGGG)

Trouble shooting 91

Error Contents :	**Symptom :**
PCB Error	**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.**

Trouble shooting 92

Error Contents :	**Symptom :**
Connection Error	**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.**

Trouble shooting 93

Error Contents :	**Symptom :**
Address Setting Error	**Error Code display [2 8]** **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.)

Trouble shooting 94

Error Contents :	**Symptom :**
System Error	**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.**

Trouble shooting 95

Error Contents :	**Symptom :**
Transmission Error	**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-RNK∗)

Trouble shooting 96

Error Contents :	**Symptom :**
Thermo Sensor Error	**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-RNK∗) and Simple Remote Controller (UTY-RSK∗,RHK∗)

Trouble shooting 97

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. (Refer to 06-03 page Main PCB removal.)

Trouble shooting 98

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.
  (Refer to 06-03 page Main PCB removal.)

7. System Controller (UTY-APGX) / Service Tool (UTY-ASGX) / Web Monitoring Tool (UTY-AMGX)
(Referred to as "Service Tool" hereafter)

Trouble shooting 99

Error Contents :	**Symptom :**
Unit Not Detected	**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.

Trouble shooting 100 **INDOOR UNIT Error Method:** **Indoor Unit power supply error for FAN motor 1 (2)**	**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 23)

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.

Trouble shooting 101 **INDOOR UNIT Error Method:** **Indoor unit suction air temp. thermistor error**	**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 CN9 of Controller PCB (DC5.0V)

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

Trouble shooting 102 **INDOOR UNIT Error Method:** **Indoor unit discharge air temp. thermistor error**	**Indicate or Display:** **Outdoor Unit : E.5 U.1** **Error Code : 4 A, 4 A. 2**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Discharge air temp. Sensor	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 CN9 of Controller PCB (DC5.0V)

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

Troublshooting 103 **INDOOR UNIT Error Method:** **Indoor Unit Fan Motor 2 rotation speed Error**	**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 23)**
  >>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.

Trouble shooting 104

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 23
  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.

Trouble shooting 105 **<u>INDOOR UNIT Error Method:</u>** **Connection unit number error (Indoor unit 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

Trouble shooting 106 **INDOOR UNIT Error Method:** **Indoor unit communication circuit (WRC) microcomputers communication 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 (Power supply for remote)

If DC12V, Remote control failure (Controller PCB is OK) >>> Replace Remote controller

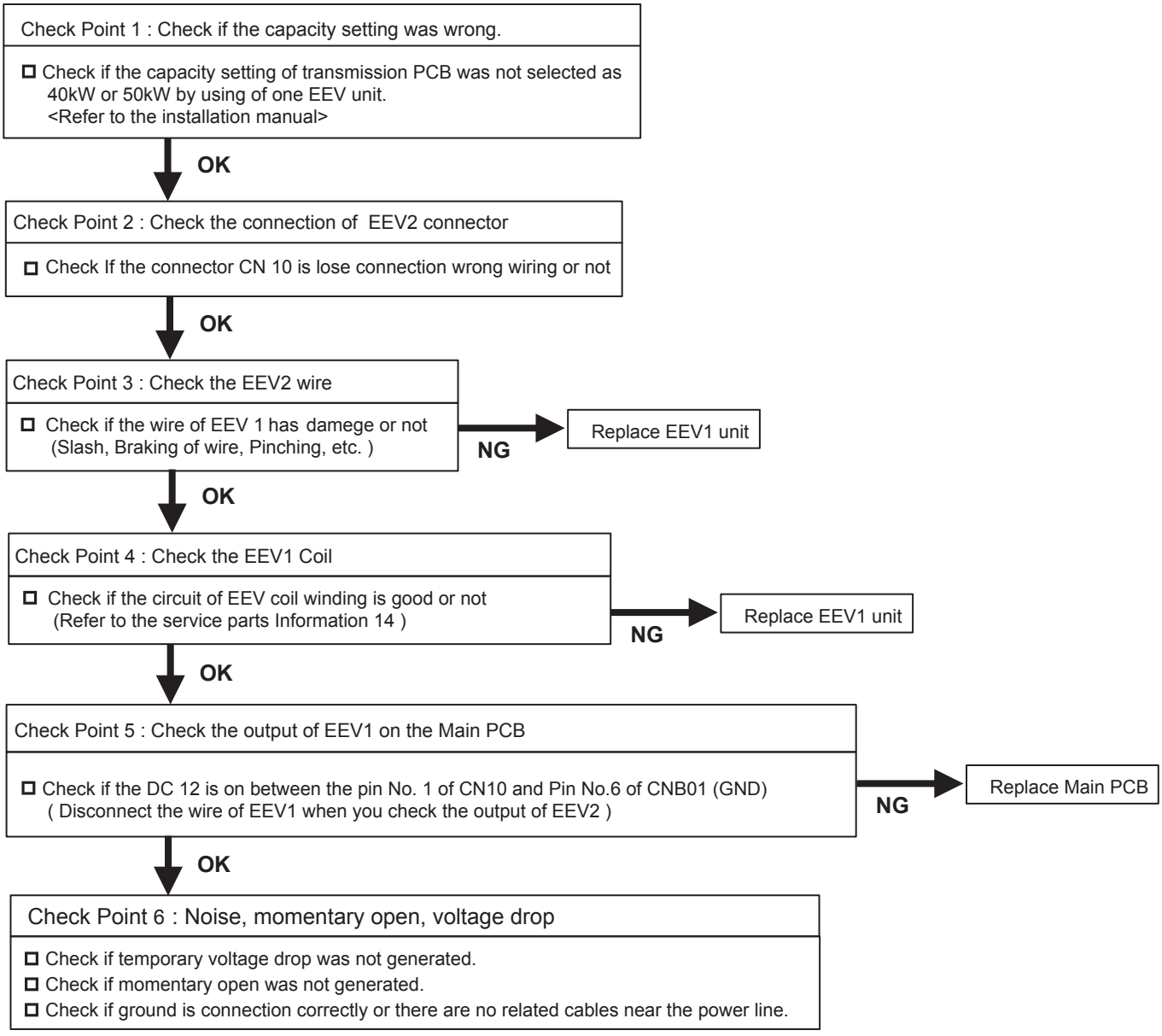
If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB

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

Trouble shooting 107 **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

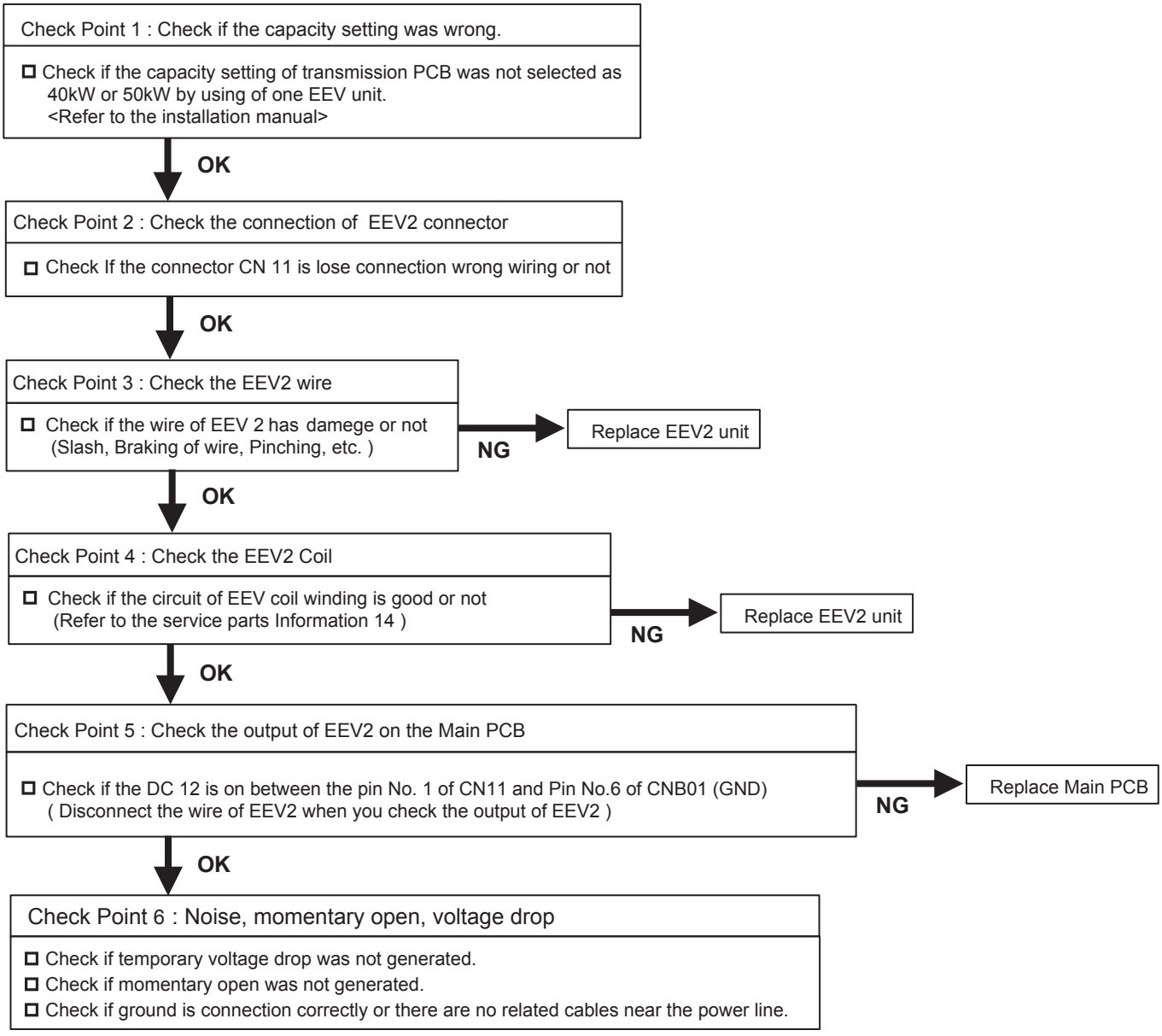
Forecast of Cause : 1. Wrong capacity setting 2. EEV1 coil lose connection 3. EEV1 wire(s) cut or pinched
4. Defective EEV1 coil 5. Controller PCB (DC 12V) output abnormal
6. Noise momentary open, voltage drop



Trouble shooting 108 **INDOOR UNIT Error Method:** Coil 2 (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 EEV2 drive circuit is open circuit

Forecast of Cause : 1. Wrong capacity setting 2. EEV2 coil lose connection 3. EEV2 wire(s) cut or pinched
4. Defective EEV2 coil 5. Controller PCB (DC 12V) output abnormal
6. Noise momentary open, voltage drop



Trouble shooting 109 **INDOOR UNIT Error Method:** Peripheral device Error (DX-KIT Error)	**Indicate or Display:** Outdoor Unit : E.5U.1 Indoor Unit : Operation LED 13 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash. Error Code : J 6

Detective Actuators:	**Detective details:**
Peripheral device Error	When the DX-KIT control unit recived the Error input from Peripheral device Error

Forecast of Cause :

1. Error input connecting wire (When the External input Error input in use.) damage
2. Peripheral device Error

Check point 1: Check the wire connection of External input (Error input)
☐ Check wire btween the terminal “Error input signal” of DX-KIT and the peripheral device, if it is not short circuit. If the connecting wire has the shorcircuit, replace the wire.

Check point 2: Check the Error status of peripheral device
☐ Refer to the Maintenance manual for the peripheral device.

* The type of error cannot be checked at the DX-KIT control unit.

Trouble shooting 110

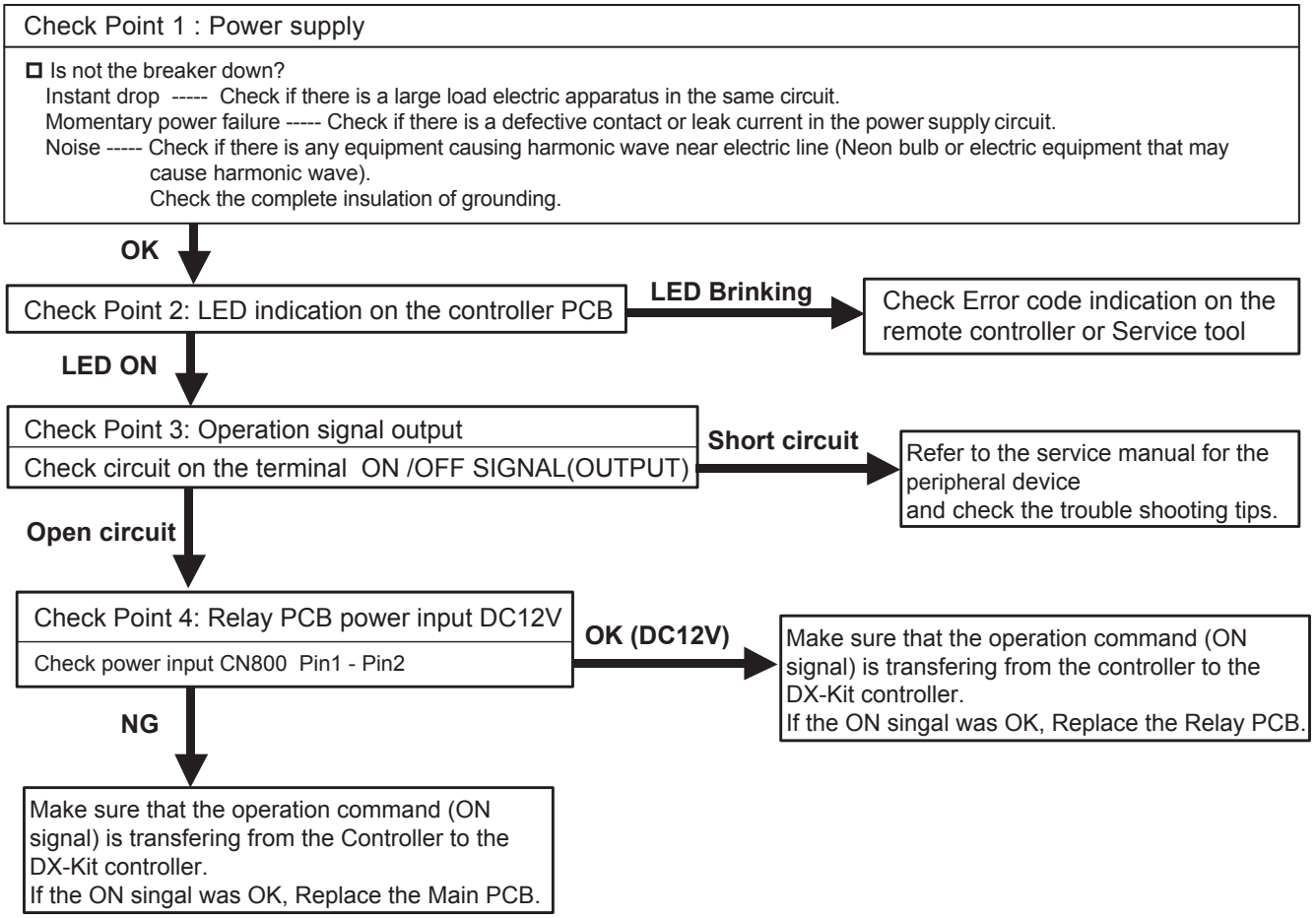
Peripheral device doesn't operate
(No-power)

Forecast of Cause :

1. Power supply failuer 2. Trouble on peripheral device
3. DX-Kit Electrical compornent defective 4. Field setting mismatch

General check procedure

1. Check Error code on the VRF system. (Remote controller, Service tool, etc)
2. Check LED brinks on the controler PCB of DX-KIT
3. Check Error code on the peripheral device.
4. Check non of wrong filed settings or wrong installation.



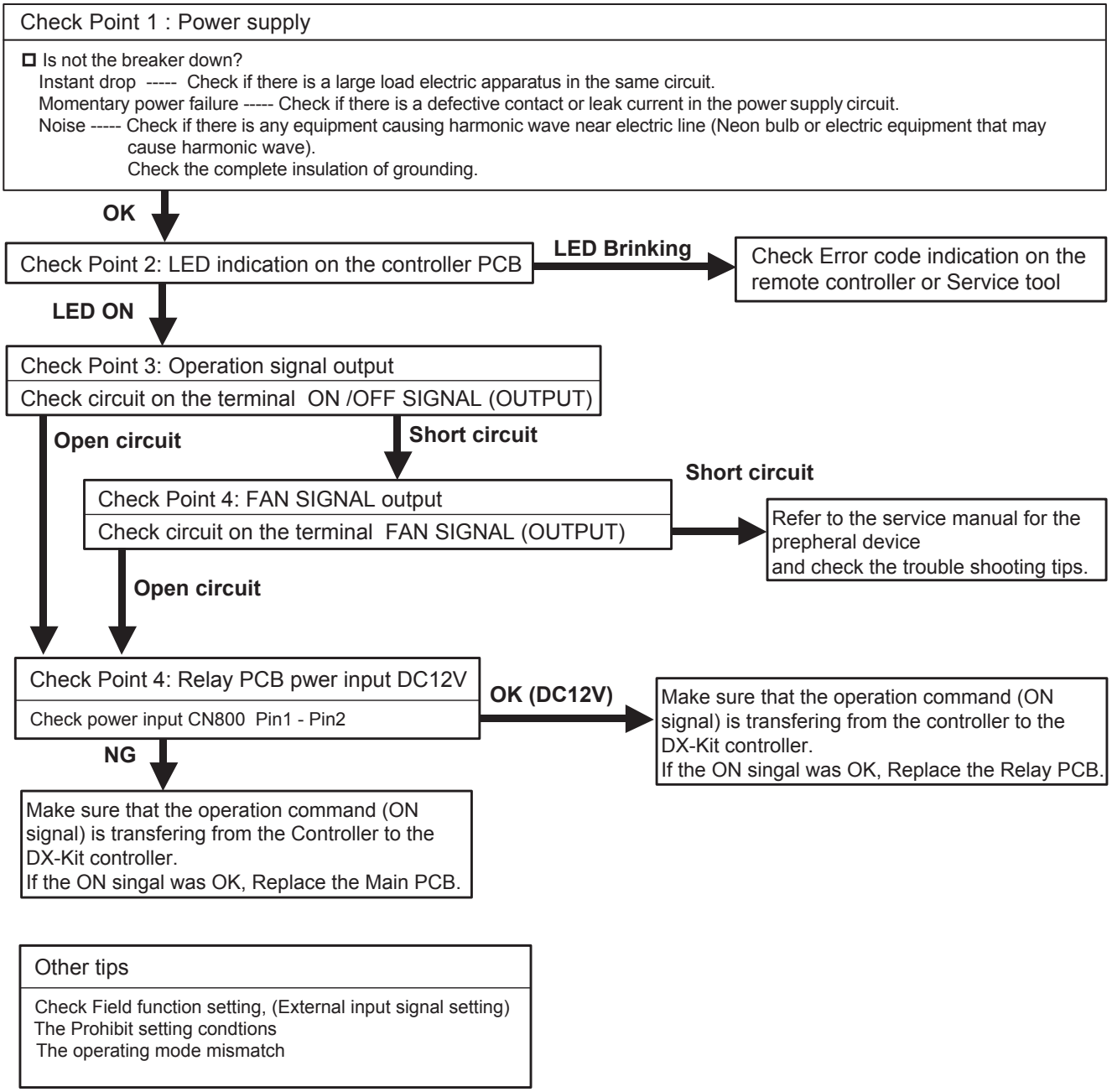
Other tips

Check Field function setting, (External input signal setting)
The Prohibit setting condtions
The operating mode mismatch

Trouble shooting 111	**Forecast of Cause :**
Peripheral device FAN does not operate	1. Power supply failuer 2. Trouble on peripheral device 3. DX-Kit Electrical compornent defective 4. Field setting mismatch

General check procedure

1. Check Error code on the VRF system. (Remote controller, Service tool, etc)
2. Check LED brinks on the controller PCB of DX-KIT
3. Check Error code on the peripheral device.
4. Check non of wrong filed settings or wrong installation.
5. Check if FAN operation stopped by the freeze prevention or the defrosting operation.



Other tips
Check Field function setting, (External input signal setting) The Prohibit setting condtions The operating mode mismatch

Trouble shooting 112

Peripheral device No Cooling / No Heating

Forecast of Cause :

1. Temperature controlling 2. EEV controlling 3. External Factor

General check procedure

1. Check Error code on the VRF system. (Remote controller, Service tool, etc)
2. Check LED brinks on the controler PCB of DX-KIT
3. Check Error code on the peripheral device.
4. Check none of protection function is operating on the system.
   Protection functions (For the description of protective conditions, see the service manual.)
   - Abnormal Temperature: Compressor temperature, Discharge temperature, Heat-sink temperature, IDU HEX temp.
   - Abnormal pressure: High pressure, Low pressure,
   - Abnormal on devices: EEV coil, FAN motor, Compressor Frq,

Check Point 1: Temperature sensors

Sensor position / Wire connection / Temperature detection

- Measure the resistance of sensor at the terminal board, and compare the temperature (transformed with resistance value) with the actual detecting temperature by using the Service tool.

Gas / Liquid Sensor Chracterristcs (Rough value)

Temperature (°F)	32	41	50	59	68	77	86	95	104	113	122
Temperature (°C)	0	5	10	15	20	25	30	35	40	45	50
Resistance Value (kOhm)	33.6	25.2	20.1	15.8	12.5	10.0	8.0	6.5	5.3	4.3	3.5

Inlet / Outlet Air Sensor Chracterristcs (Rough value)

Temperature (°F)	32	41	50	59	68	77	86	95	104	113	122
Temperature (°C)	0	5	10	15	20	25	30	35	40	45	50
Resistance Value (kOhm)	168.6	129.8	100.9	79.1	62.5	49.8	40.0	32.4	26.3	21.2	17.8

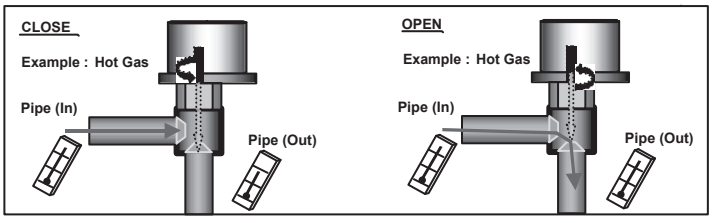
If the sensor position was incorrect, install the sensor to the correct position
If the temperature detection was wrong, replace the sensor.

Check Point 2: EEV

Wire connection / EEV movment

- Measure the resistance of EEV coil and measure the DC12V power input at the terminal board.
  EEV1: CN10_Pin No.1-Pin No.6, Pin No.1-Pin No.4, Pin No.2-Pin No.3, Pin No.2-Pin No.5)
  EEV2: CN11_Pin No.1-Pin No.6, Pin No.1-Pin No.4, Pin No.2-Pin No.3, Pin No.2-Pin No.5)
- Check EEV initialisation movment by the power reset of DX-Kit.
- Check refrigerant flowing by measuring the temperature of pipe inlet and pipe outlet.

Read wire	Resistance value (20°C)
White - Red	**200 ± 10%** Ω
Yellow - Brown	
Orange - Red	
Blue - Brown	



If the resistance of EEV coil was not correct, replace the EEV unit.
If the DC12V did not appear on the terminal, check DCV power supply on CN102.
No Voltage: Replace the power supply PCB, DC12V appeares: Replace the controller PCB.
If the EEV did not react after power reset, or no refrigerant flowing, replace the EEV unit.

Check Point 3: External factor

Air circulation obstruction
Design mismatch (Capacity, FAN speed mismatch, Field setting (Analog signal input) etc,)
Peripheral device abnormal (See the Serivce manual for the peripheral device)

Trouble shooting 113

DX-KIT Controller No Power
(LED on the Main PCB is OFF)

Forecast of Cause :

1. Power supply failuer
2. DX-Kit Electrical compornent 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: FUSE F101 on the Power supply PCB → **OPEN** → Before replacing the burnt FUSE, make sure that the terminal between L-N -E are not short-circuit.

OK

Check Point 2: Output voltage on the power supply PCB
Disconnect the CN 102 on the Power supply PCB.
Check voltage CN102 output voltage
Pin No.1 - Pin No.6: DC12V
Pin No.2 - Pin No.6: DC5V

→ **NG** → Replace the Power supply PCB

OK

the condition of short-circuit, and

Check Point 2: Output voltage on the main PCB
Disconnect the CN 801, and the power input connectors for actuators (EEV, Sensor, Relay PCB.)
Check voltage CN801 output voltage
Pin No.1 - Pin No.2: DC12V

→ **NG** → Replace the Main PCB

OK

Check Point 2: Output voltage on the main PCB
Disconnect the power input connectors for actuators (EEV, Sensor, Relay PCB.)
And check the short circuit of each actuators.

→ **NG** → Replace the actuators which has the Short-circuit conditions

4-4 SERVICE INFORMATION

SERVICE INFORMATION

Backup Operation

Details :

- Backup operation is the operating method of replacing compressor while the system is running. Compressor can be replaced without stopping the system.
- In backup operation, cooling and heating capacity is decreased by the capacity of the separated outdoor unit.
- The work procedure is as follows.

4-4-1 Backup operation

1. Method of backup operation

1-1. Backup operation when compressor of the master unit is defective.

[Procedure]
(Example: Three outdoor units are connected.)

1. Stop the operation, and turn off the all outdoor units.

2. Fully shut off the 3-way valve (Liquid, Gas) of the broken master unit.

3. Set the slave unit #1 as a new master unit, and make up the system of two outdoor units.
   - Change the setting of the DIP SW 3-1/ 3-2 (Outdoor unit address setting) of the slave unit #1, from [OFF/ ON](slave unit #1) to [OFF/ OFF](master unit).
   - Change the setting of the DIP SW 3-3/ 3-4 (Number of slave units connected setting) of the slave unit #1, from [ON/ OFF](zero unit) to [OFF/ ON](one unit).

4. Set up the slave unit #2 as the slave unit #1.
   - Change the DIP SW 3-1/ 3-2 (Outdoor unit address setting) of the slave unit #2, from [ON/ OFF](slave unit #2) to [OFF/ ON](slave unit #1).

5. Uncouple the transmission connector between the broken master unit and indoor units, and connect it into the slave unit #1 (substitutional master unit).

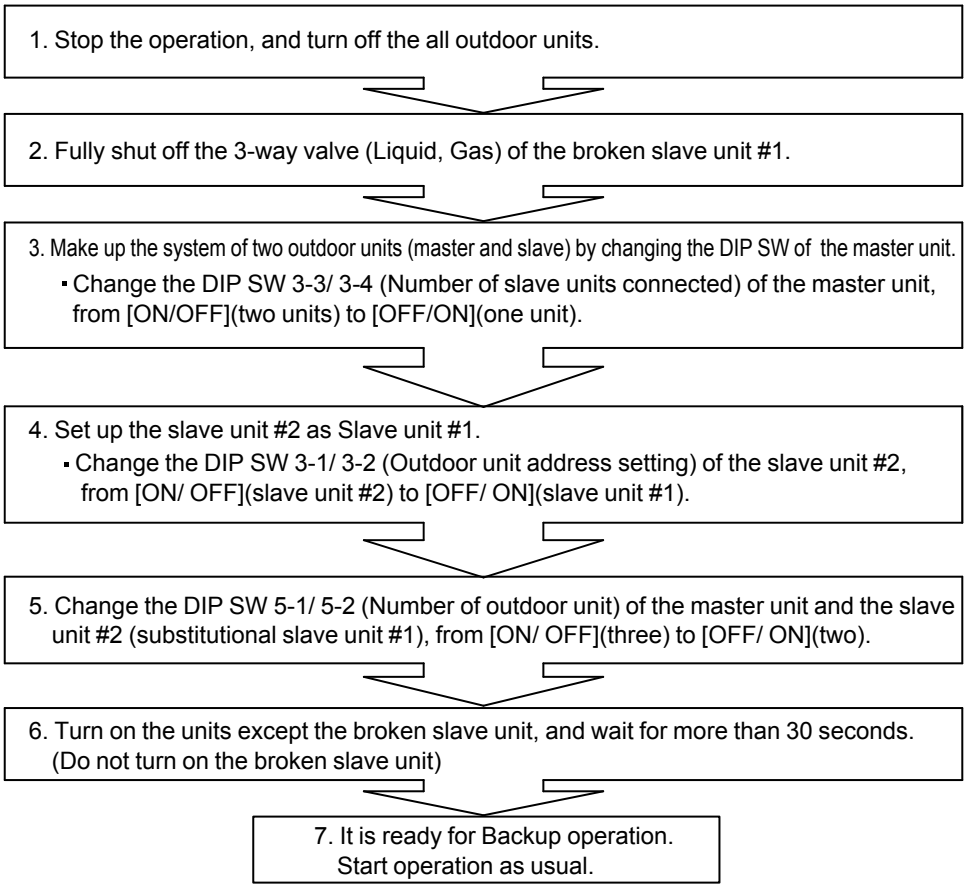
6. Change the setting of the DIP SW 5-1/ 5-2 (Number of outdoor unit) of the slave unit #1 (substitutional master unit) and #2 (substitutional slave unit #1), from [ON/ OFF](3) to [OFF/ ON](2).

7. Turn on the units except the broken master unit, and wait for more than 30 seconds. (Do not turn on the broken master unit)

8. It is ready for Backup operation. Start operation as usual.

1-2. Backup operation when compressor of the slave unit #1 is broken.

[Procedure]
(Example: Three outdoor units are connected. the slave unit #1 is broken.)



4-4-2 Work procedure after the backup operation

1. Refrigerant shortage at the backup operation

When excessive refrigerant accumulates in the defective outdoor unit during the backup operation, it becomes capacity shortage by refrigerant shortage.

The meaning of the sign
- LPS : Low pressure sensor detection value
- EEV1 : Expansion valve #1
- TH3 : Outdoor thermistor detection value
- TH4 : Suction thermistor detection value
- TH5 : Outdoor heat EX. temperature sensor detection value

<How to judge, when refrigerant is deficient>
Refrigerant shortage is judged by the information from "Service tool" during backup operation.

1. On Cooling operation

① It often creates "Low pressure protection stop" at start up or after oil recovery operation.
>>> When LPS < 0.1MPa at start up, the compressor stops.

② Running indoor unit's EEV is fully open condition.
>>> It displays corresponding indoor unit's EEV on the chart at the bottom of the monitor.
If there is no sign of closing the EEV from fully opened condition.

2. On Heating operation

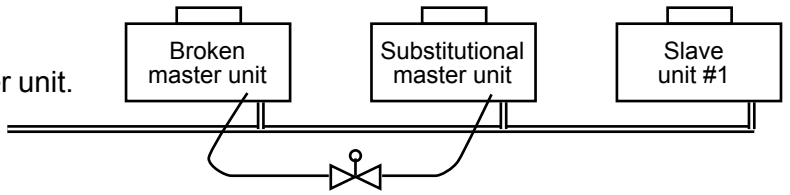
① It often creates "Low pressure protection stop" at start up or after oil recovery operation.
>>> When LPS < 0.1MPa at start up, the compressor stops.

② EEV1 of outdoor unit is open at 500 pulse. (full admission).

③ Suction superheat is too high.
>>> When both TH5 ＜ TH4 and TH4 ≒ TH3.

<How to respond, when refrigerant is deficient>

① Reuse the refrigerant of the broken master unit.



Connect the high pressure service port of the broken master unit and the low pressure service port of the substitutional master unit by charging hose, placing the valve on the way.
>>> Refrigerant release from the heat exchanger of the broken master unit.
(Refrigerant is removed until refrigerant shortage is resolved)

② Not available to reuse.
>>> New refrigerant is encapsulated.
* substitutional master unit, and encapsulating amount is recorded.

2. Refrigerant charging after the compressor replacement.

When the refrigerant leaks at the time of replacing the defective compressor, charge the refrigerant as follows depending on the situation.

① If the amount of recovered refrigerant is available that was pulled out of outdoor unit which compressor was replaced.
(When the refrigerant is recovered by refrigerant recovery machine, and its weight is measured.)
>>> Perform vacuuming of repaired outdoor unit thoroughly , and add the refrigerant with the recovered amount.

② If the amount of recovered refrigerant from outdoor unit that compressor was replaced is not sure.
>>> Once recover all units' refrigerant, and then recharge the calculated amount of refrigerant again after vacuuming.

4-5 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 constant speed compressor, check connection and winding resistance.(Check if Protector is operated) Refer to the next page.
- 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

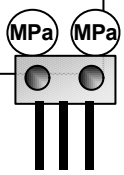
Stops soon after starting up

- 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 constant speed compressor, check connection and winding resistance.(Check if Protector is operated) Refer to the next page.
- 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)**

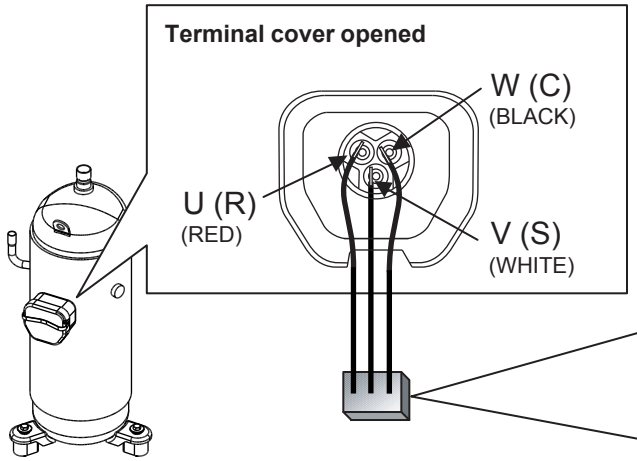
Replace Compressor

SERVICE PARTS INFORMATION 2

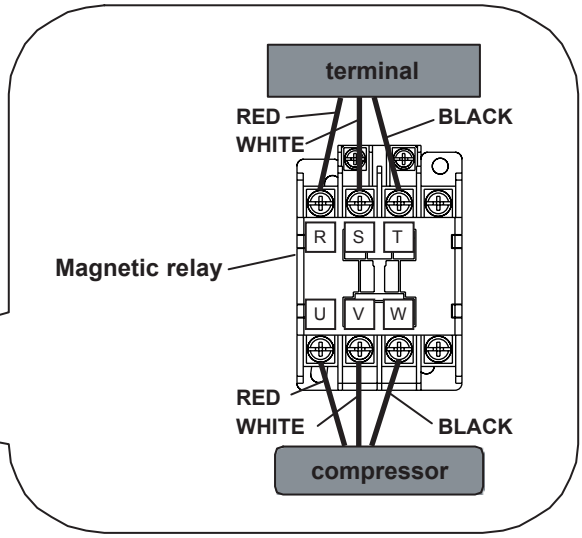
Constant Speed Compressor

Check Point 1 : Check Connection

☐ Check terminal connection of Compressor (loose or incorrect wiring)



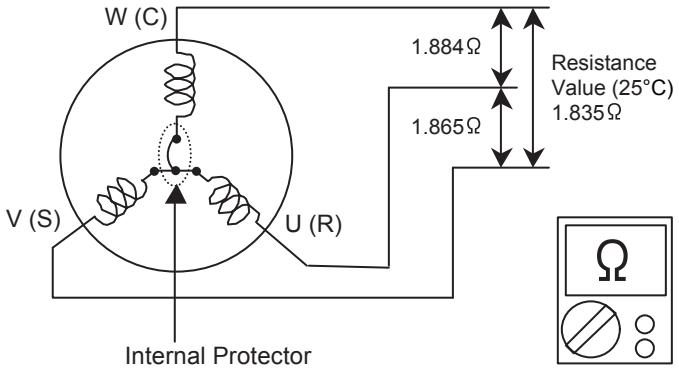
☐ Check connection of magnet relay (Loose or incorrect wiring)



Check Point 2 : Check Winding Resistance

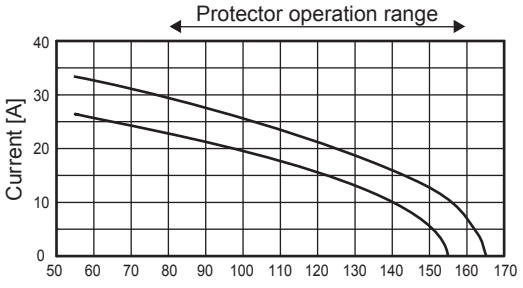
☐ Check winding resistance of each terminal

►**If the resistance value is 0Ω or infinite, replace Compressor. (Check again after several minutes because the protector may be operated.)**



Attention!!

The constant speed compressor is equipped with a protector. It detects the inside temperature and the current value, and if it detects an over current or too high temperature, the protector is operated to stop operation of Compressor. (Protector operates within the range in the following graph, and it is released when the temperature becomes lower than approx. 80°C.



Check Point 3 : Check Cause of Protector Operation

☐ Due to unstable power supply, Compressor is causing an abnormally high temperature.
>> Check Power Voltage once again.

☐ Due to missing phase, Compressor is causing an abnormally high temperature.
>> Check loose or open connection cable once again.

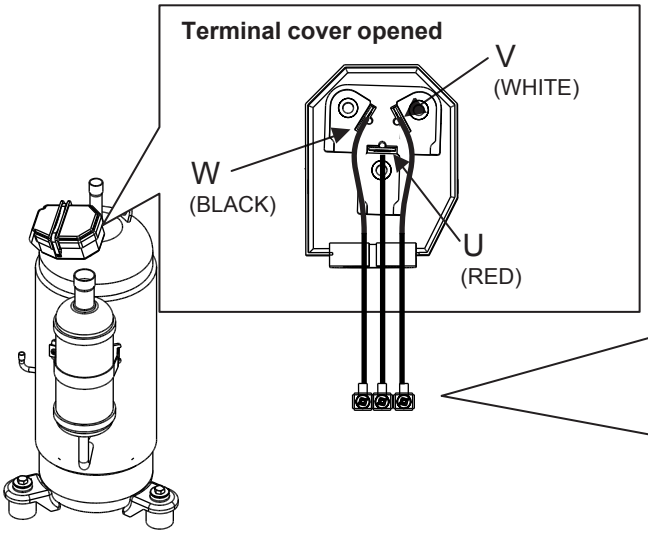
☐ Due to less refrigerant, the cooling effect inside Compressor is decreased.
>> Check if there is a gas leak or less refrigerant.

SERVICE PARTS INFORMATION 3

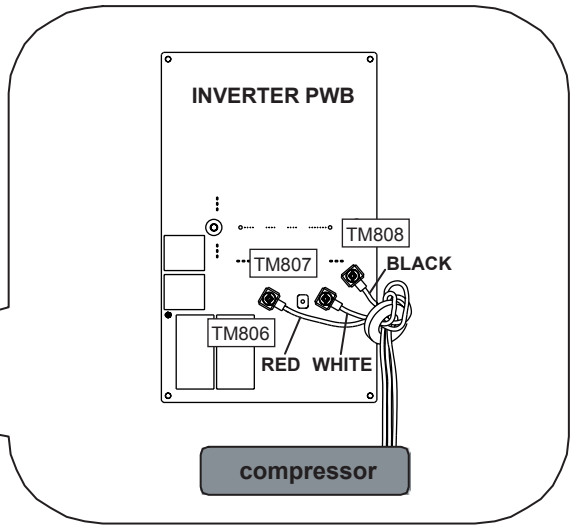
Inverter Compressor

Check Point 1 : Check Connection

☐ Check terminal connection of Compressor (loose or incorrect wiring)



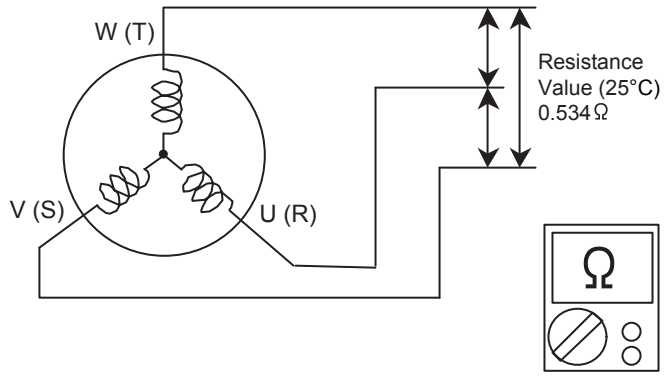
☐ Check connection of magnet relay (Loose or incorrect wiring)



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.

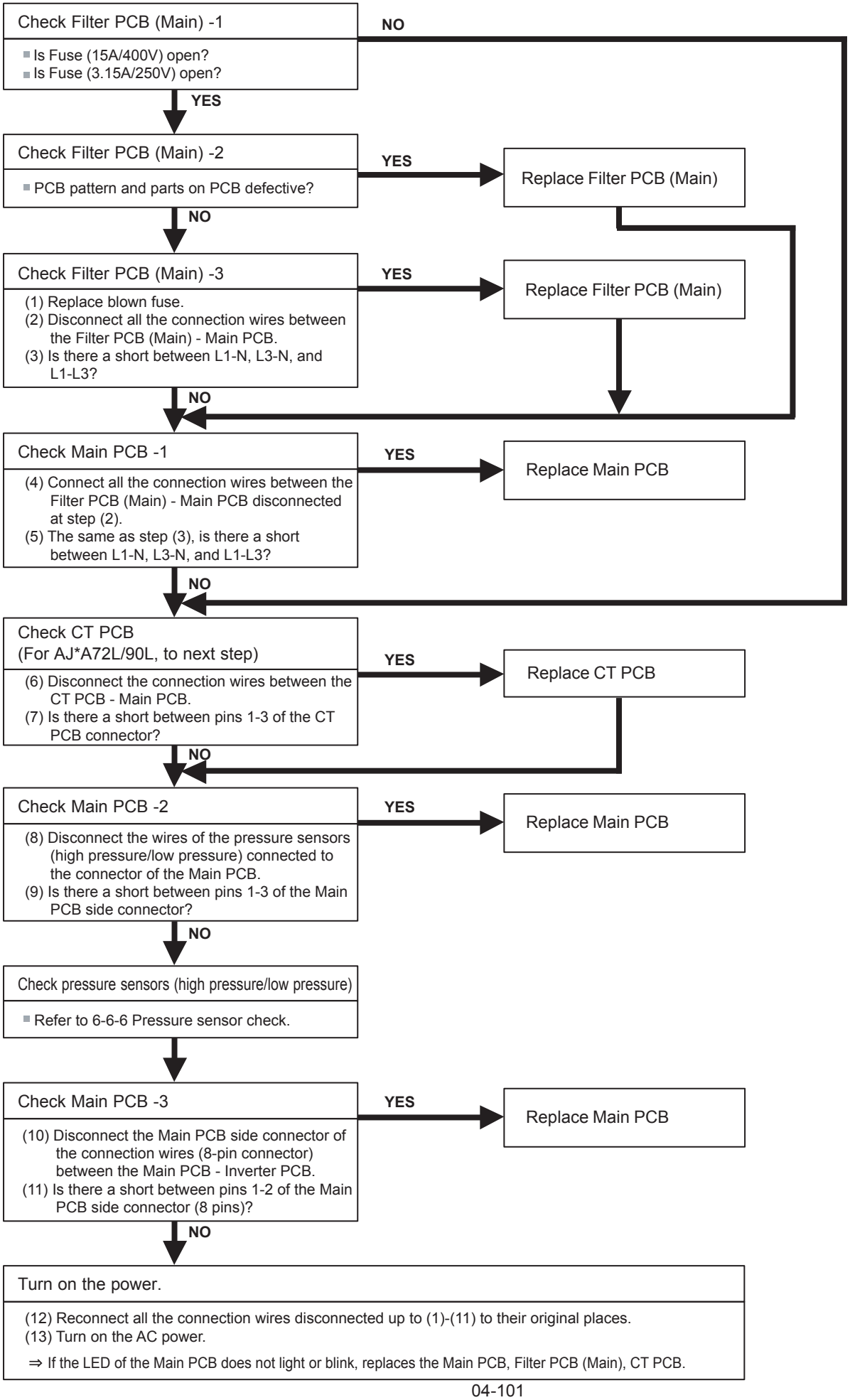
(1) Check AC voltage among each terminals from filter PCB(INV) to Diode Bridge.
(AC380V - 415V, voltage among L1, L2 and L3).
►**If it does not appear, check the power supply terminal.**

(2) Check Voltage from Main PCB to Inverter PCB.
(DC15.0 - 18.0V between terminals of CN126 (1-2) 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.**

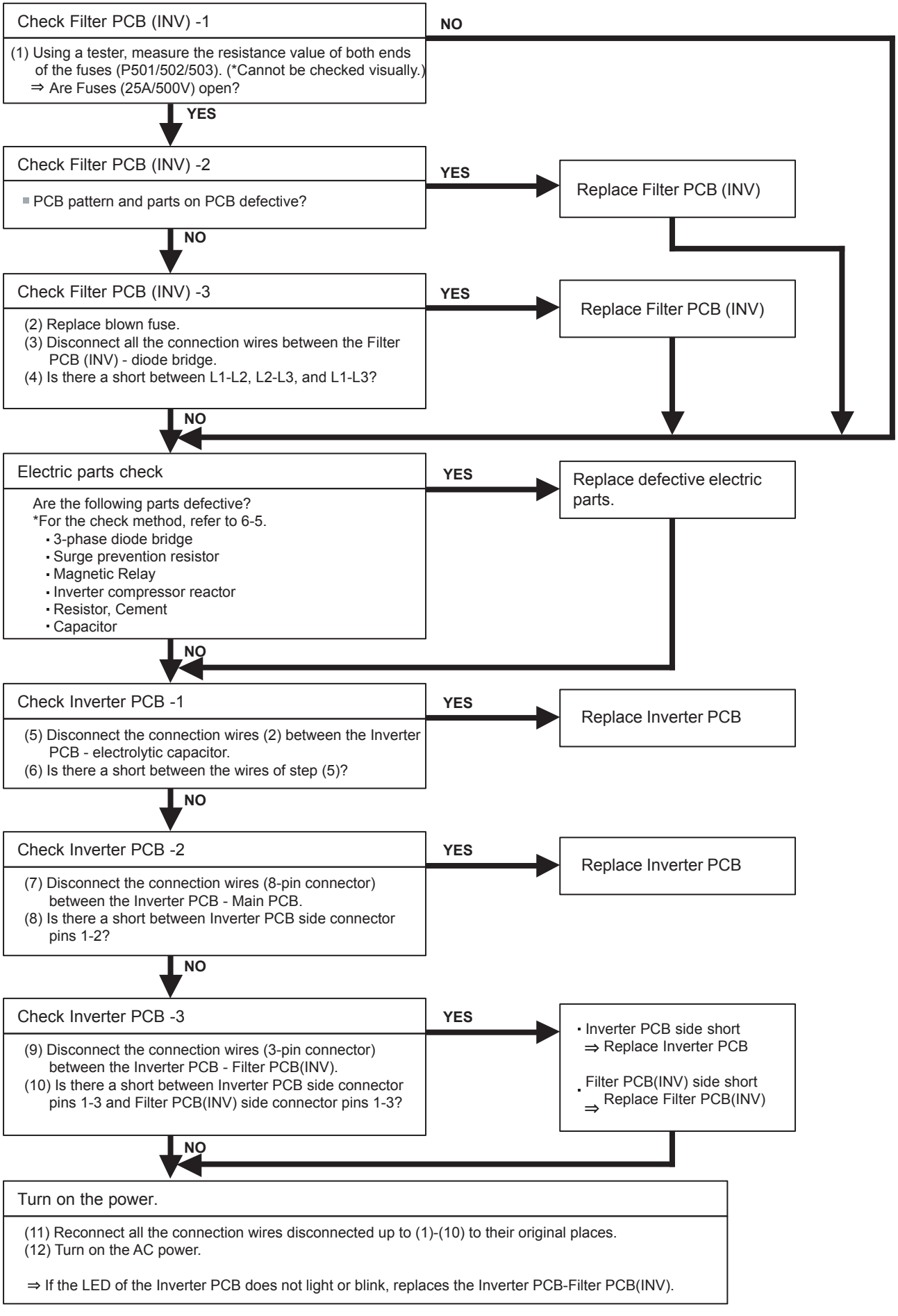
SERVICE PARTS INFORMATION 4

Main PCB
Filter PCB (Main)
PWB UNIT (CT)



SERVICE PARTS INFORMATION 5

Inverter PCB
Filter PCB (INV)



SERVICE PARTS INFORMATION 6

IPM
(Mounted on Inverter PCB)

Check Point 1

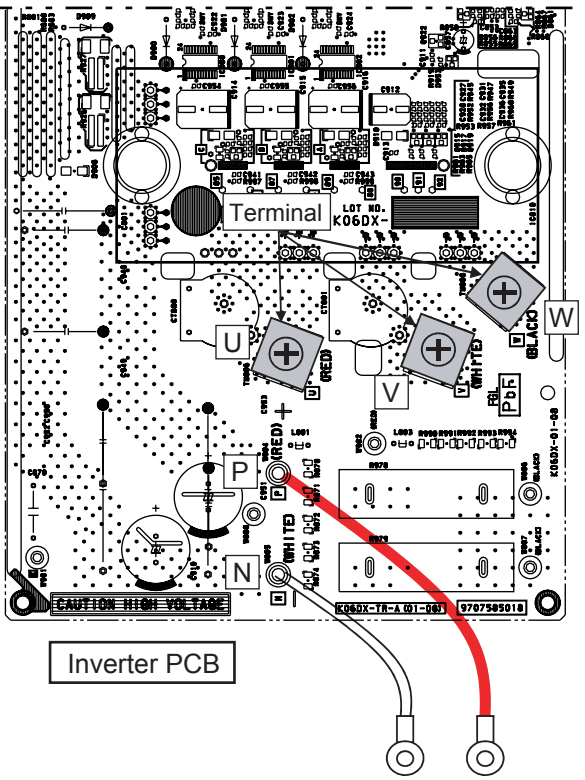
① Disconnect the connection wires between the Inverter PCB - electrolytic capacitor and Inverter PCB - Inverter Compressor.

② Set the tester to the "Resistance" mode, and measure the resistance between the following terminals.

Red wire (P) - screw terminals U/V/W
White wire (N) - screw terminals U/V/W

③ Judge the result of ② as 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	Red wire (P)	
Terminal V		
Terminal W		
White wire (N)	Terminal U	
	Terminal V	
	Terminal W	

⑤ Judge the result of ④ as follows:

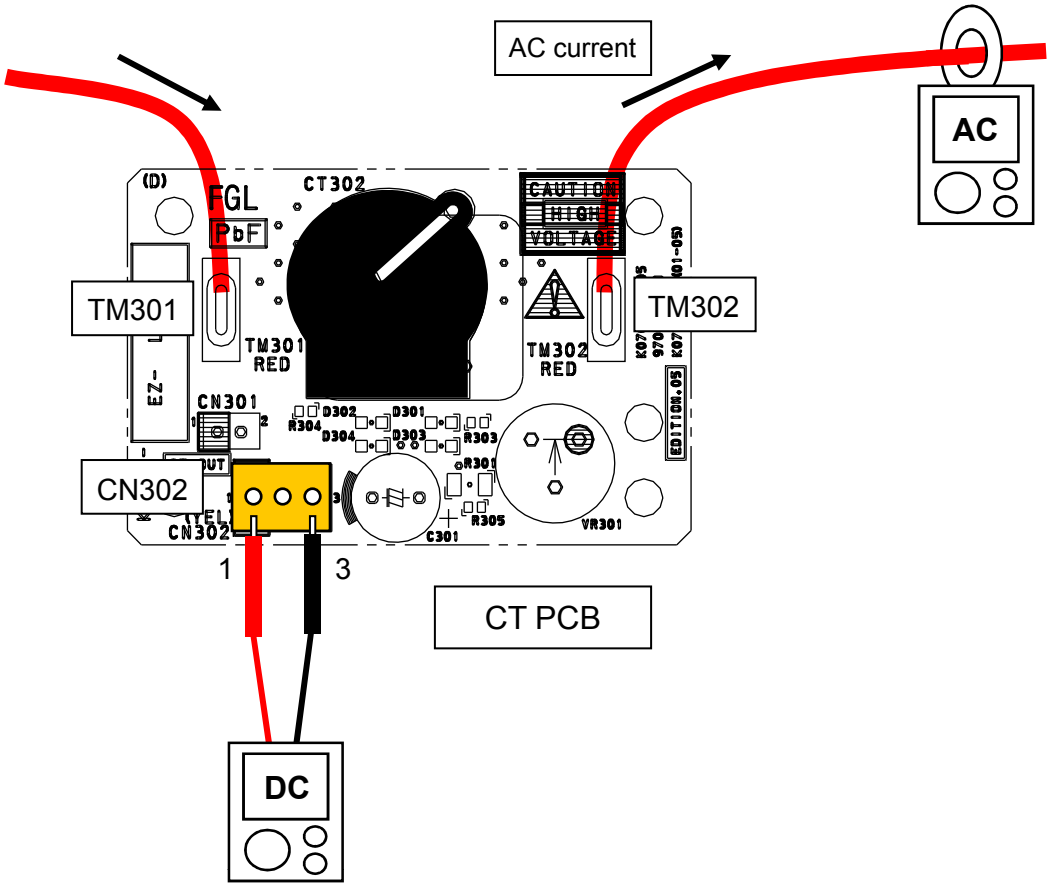
All 6 points several 0.3V to 0.7V	: Normal
1 or more points under 0.1V or over load	: Defective

SERVICE PARTS INFORMATION 7

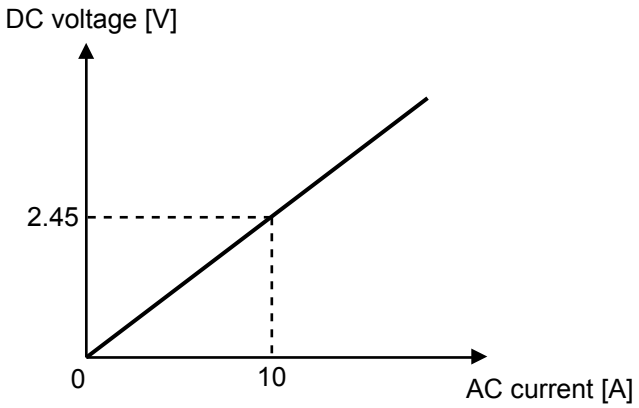
CT PCB

Check Point 1

・Measure the AC current flowing from TM302 and the DC voltage between connector pins 1-3 at that time.



● AC current - DC voltage characteristic



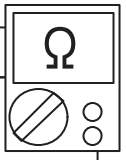
SERVICE PARTS INFORMATION 8

3-Phase Diode Bridge

Check Point 1 : Appearance check

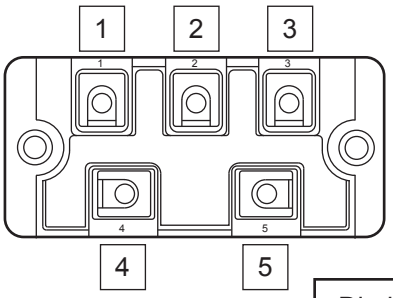
□ No fissures, breaks, damage, etc. at body and terminal section?
□ Is the rear of the body coated with silicone grease?
□ Are there no abnormalities at threaded parts (stripped threads, deformation, damage, etc.) ?

Check Point 2 : Electric check

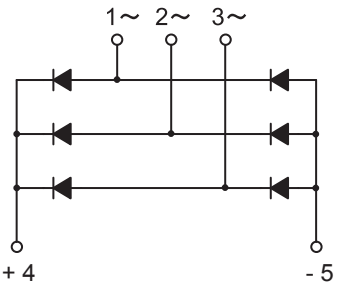


① In the 3-phase diode bridge single part state, set the tester to the "Resistance" mode, and check for open/short between the following terminals.

Tester + side (red)	Tester - side (black)
Pin 1	Pin 4
Pin 2	
Pin 3	
Pin 5	Pin 1
	Pin 2
	Pin 3



Diode bridge



② Judge the result of ① as follows:

All 6 points shorted	: Normal
1 or more points open	: Defective

③ Set the tester to the "Resistance" mode, and check for open/short between the following terminals.

Tester + side (red)	Tester - side (black)
Pin 4	Pin 1
	Pin 2
	Pin 3
Pin 1	Pin 5
Pin 2	
Pin 3	

④ Judge the result of ③ as follows:

All 6 points open	: Normal
1 or more points shorted	: Defective

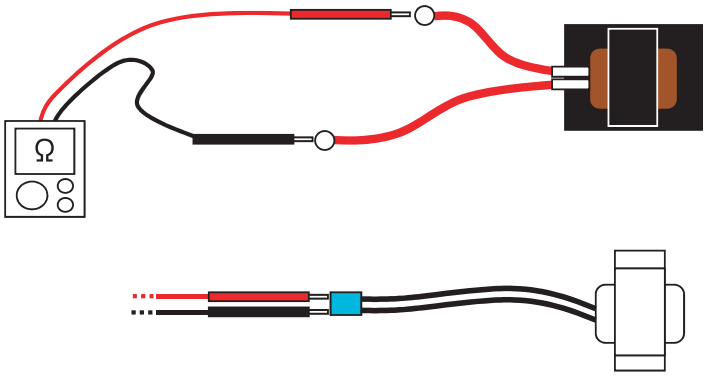
SERVICE PARTS INFORMATION 9

Reactor (INV)
Reactor (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



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 10

Resistor, Cement

Check Point 1 : Appearance check

□ No fissures, breaks, damage, etc. at the body and terminals section?

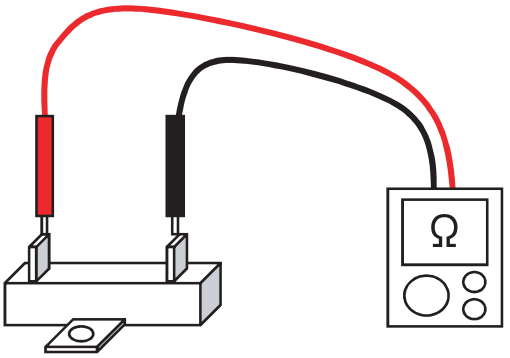
Check Point 2 : Electric check

1. Surge prevention resistor (connected to magnetic contactor)

① Set the tester to the "Resistance" mode, and measure the resistance value between the terminals. (No polarity)

② Judge the result of ① as follows:

5.32Ω to 5.88Ω	: Normal
Other than the above	: Deteriorated, defective



2. Balance resistor (connected to electrolytic capacitor)

① Set the tester to the "Resistance" mode, and measure the resistance value between the terminals. (No polarity)

② Judge the result of ① as follows:

31.35Ω to 34.65Ω	: Normal
Other than the above	: Deteriorated, defective

SERVICE PARTS INFORMATION 11

Capacitor

Check Point 1 : Appearance check

□ Explosion-proof not operated?

□ Electrolyte not leaking?

□ No abnormalities at threaded parts? (Stripped threads, deformation, damage, etc.)

Check Point 2 : Electric check

□ No short between terminals?

SERVICE PARTS INFORMATION 12

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 13

Magnetic Relay

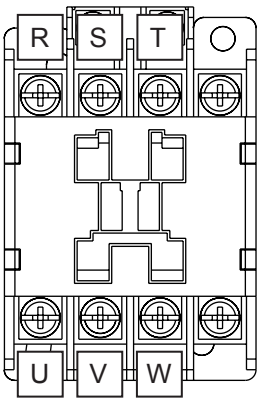
Check Point 1 : Appearance check

- □ No fissures, breaks, damage, etc. at the body and terminals section?
- □ Are there no abnormalities at threaded parts (Stripped threads, deformation, damage, etc.) ?

Check Point 2 : Electric check

① Set the tester to the "Resistance" mode, and check for open/short between the following terminals. (No polarity)

- Between R to U
- Between S to V
- Between T to W



② Judge the result of ① as follows:

Open	: Normal
Short	: Abnormal (contacts fused)

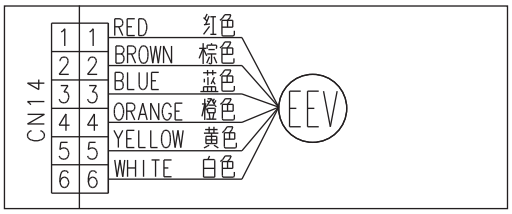
SERVICE PARTS INFORMATION 14

Indoor Unit Electronic Expansion Valve (EEV)

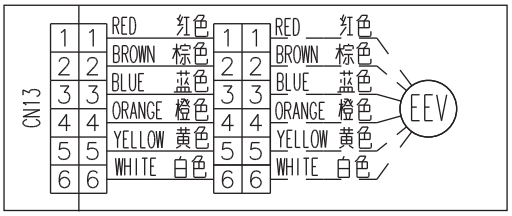
Check Point 1 : Check Connections

☐ Check Connectors (Loose connector or open cable.)

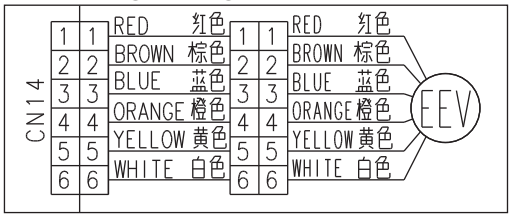
Duct



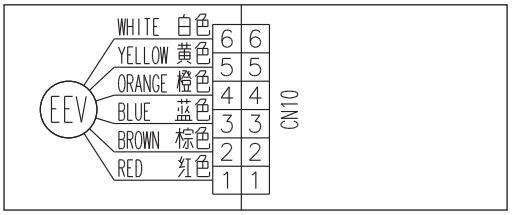
Small Wall mount



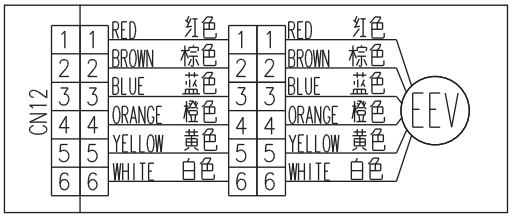
Floor/ Ceiling, Ceiling



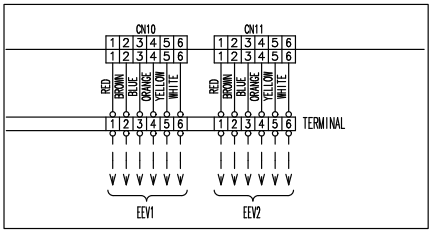
Cassette



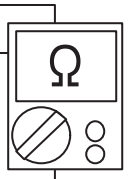
Wall mount



DX-Kit



Check Point 2 : Check Coil of EEV



☐ Remove connector, check each winding resistance of Coil.

Read wire	Resistance value (20°C)
White - Red	**200 ± 10%** Ω
Yellow - Brown	
Orange - Red	
Blue - Brown	

▶ **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.

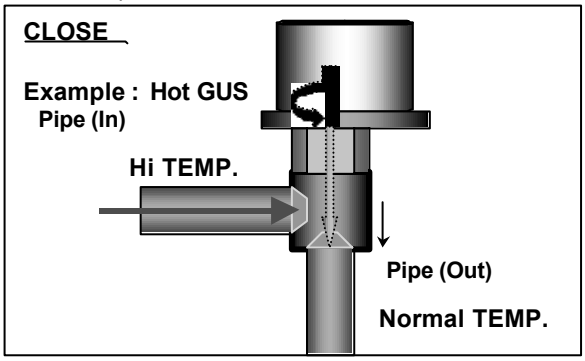
Check Point 4 : Check Noise at start up

Turn on Power and check operation noise.

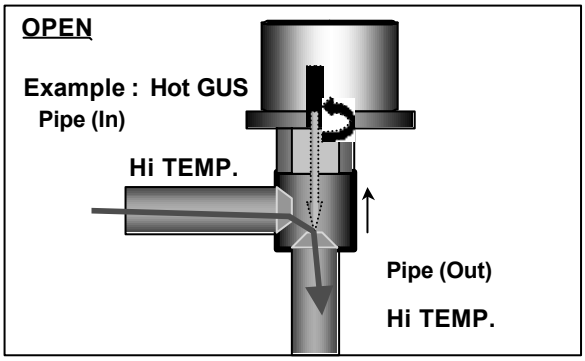
>> If an abnormal noise does not show, replace Controller PCB.

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

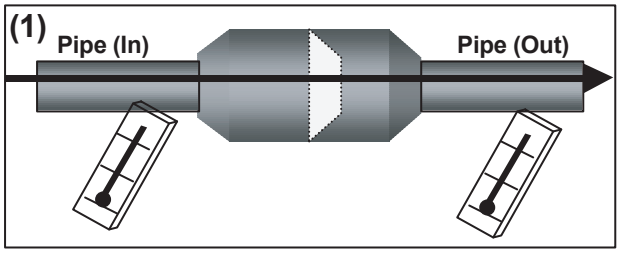


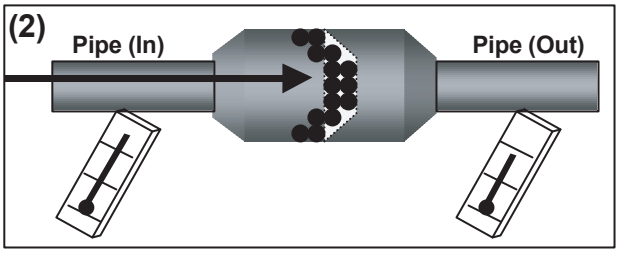
If it is open, it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between 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.



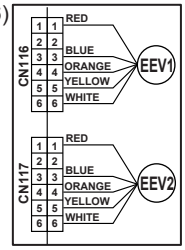


SERVICE PARTS INFORMATION 15

Outdoor Unit Electronic Expansion Valve (EEV1)

Check Point 1 : Check Connections

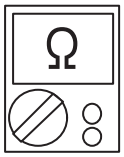
☐ Check connection of connector (CN116)
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV1

☐ Remove connector, check each winding resistance of Coil.

Read wire	Resistance value (20°C)
White - Red	**46 ± 4 %** Ω
Yellow - Red	
Orange - Red	
Blue - Red	



▸ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Voltage from Controller PCB

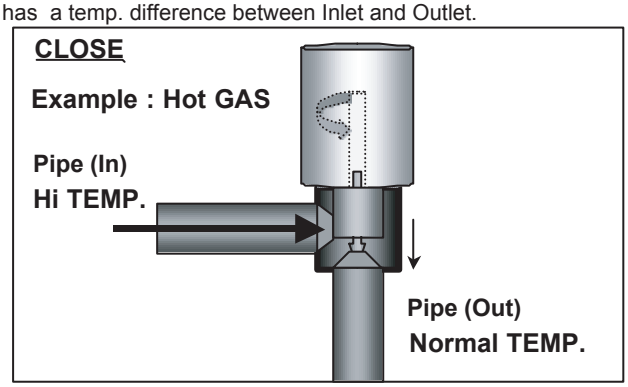
☐ Remove Connector and check Voltage (DC12V).
>> If it does not appear, replace Controller PCB.

Check Point 4 : Check Noise at start up

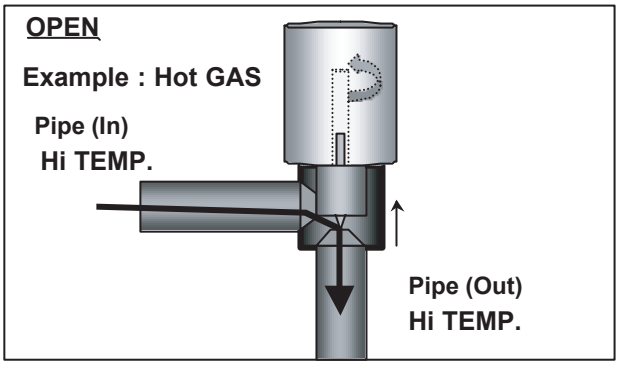
☐ Turn on Power and check operation noise.
>> If an abnormal noise does not show, replace Controller PCB.

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

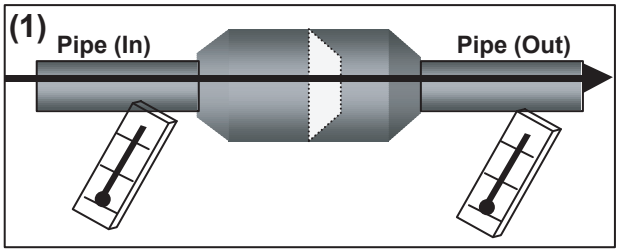


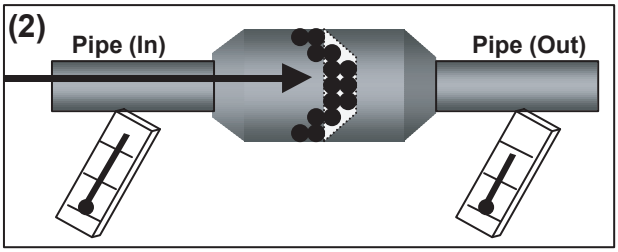
If it is open, it has no temp. difference between Inlet and Outlet.



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.



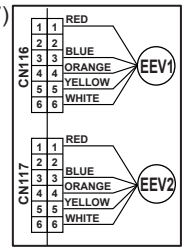


SERVICE PARTS INFORMATION 16

Outdoor Unit Electronic Expansion Valve (EEV2)

Check Point 1 : Check Connections

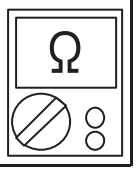
☐ Check connection of connector (CN117)
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV2

☐ Remove connector, check each winding resistance of Coil.

Read wire	Resistance value (20°C)
White - Red	**46 ± 4%** Ω
Yellow - Red	
Orange - Red	
Blue - Red	



▸ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Voltage from Controller PCB

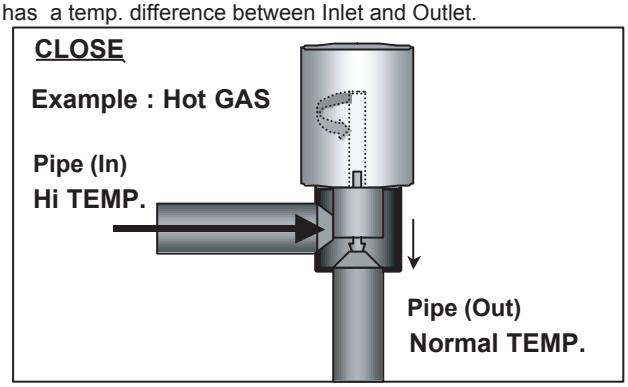
☐ Remove Connector and check Voltage (DC12V).
>> If it does not appear, replace Controller PCB.

Check Point 4 : Check Noise at start up

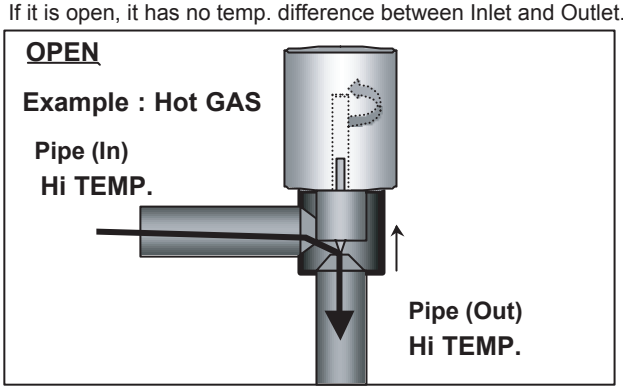
☐ Turn on Power and check operation noise.
>> If an abnormal noise does not show, replace Controller PCB.

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

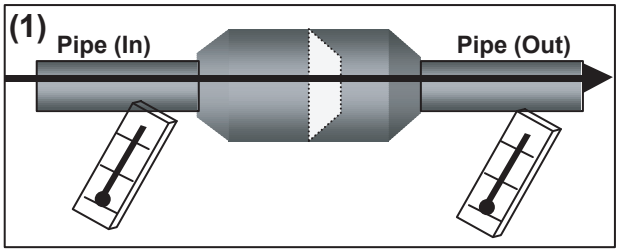


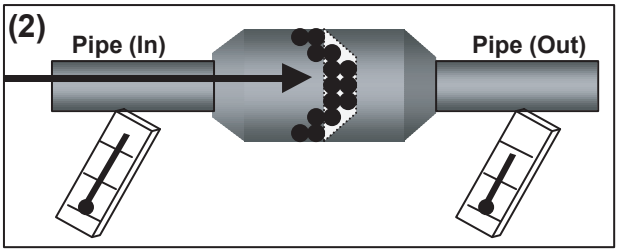
If it is open, it has no temp. difference between Inlet and Outlet.



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.





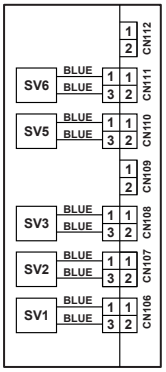
SERVICE PARTS INFORMATION 17

Outdoor Unit Solenoid Valve
(SV1,SV2,SV3,SV5,SV6)

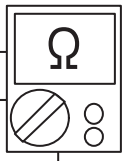
Check Point 1 : Check connections

☐ Check connection of connector.
(Loose connector or open cable)

- AJ*A72,90LALH
  >> C106,C107,C108
- AJ*A108LALH
  >> C106,C107,C108,CN111
- AJ*A126,144LALH
  >> C106,C107,C108,CN110



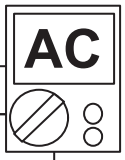
Check Point 2 : Check Solenoid Coil



☐ 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

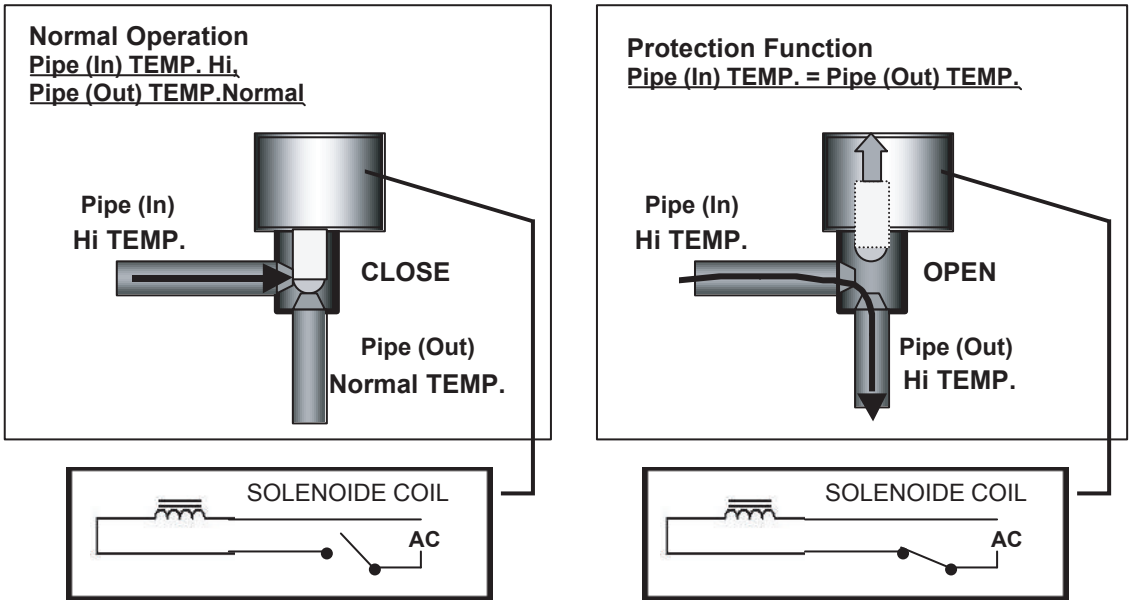


☐ Remove connector and check the voltage (AC220V).

>> If the voltage does not appear, replace Controller PCB.

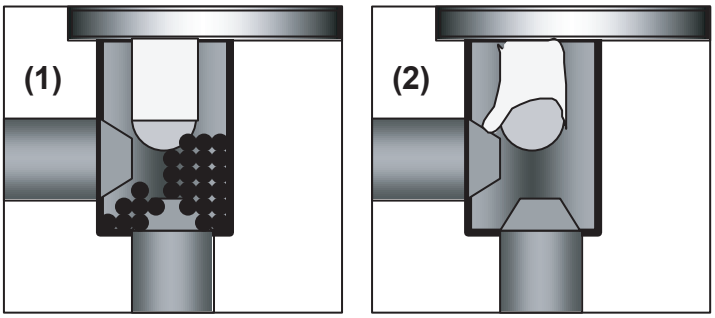
Check Point 4 : Check opening & closing operation of Valve

☐ 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.

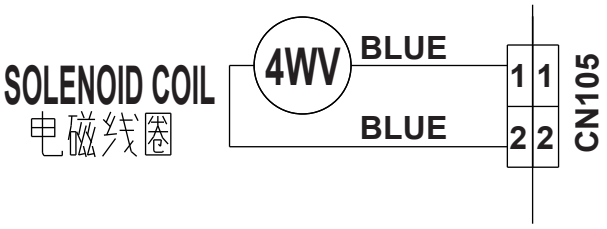


SERVICE PARTS INFORMATION 18

4-WAY VALVE

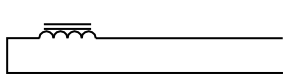
Check Point 1 : Check Circuit connection

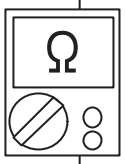
- Check the connection of connector CN 105



Check Point 2 : Check Solenoid Coil

- Remove CN6 from PCB and check the resistance value of coil

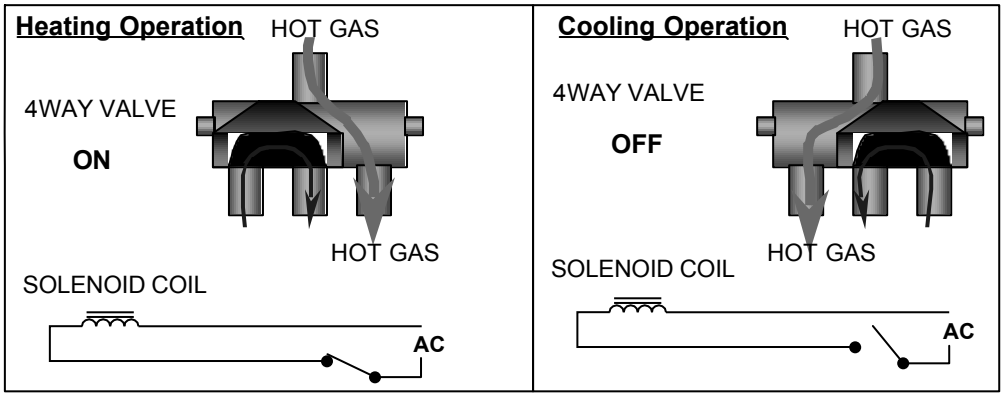




☆If it is Open or abnormal resistance value, replace Solenoid Coil

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 of Solenoid Coil

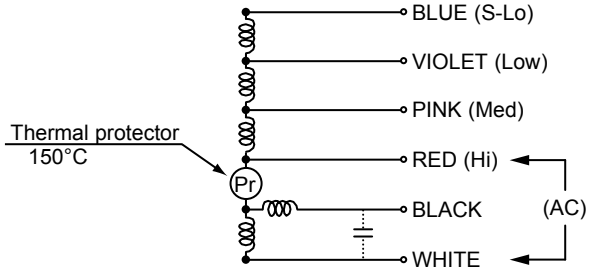
- If CN6 of Control PCB dose not Show 220V ± 20 V during Heating operation (Compressor is in operation), replace Control PCB.

SERVICE PARTS INFORMATION 19

Indoor Unit Fan Motor

Check Point : ARXB24LATH (Low Static pressure Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

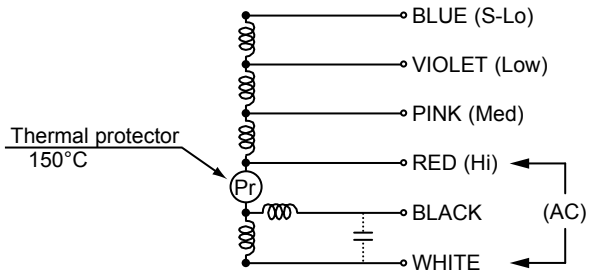


Lead wire	Resistance value
White – Red	**44.8** Ω ±**8%**
Red – Black	**37.3** Ω ±**8%**
Red – Pink	**21.3** Ω ±**8%**
Pink – Violet	**12.9** Ω ±**8%**
Violet – Blue	**12.9** Ω ±**8%**

at 20°C

Check Point : ARXB30/ 36LATH (Low Static pressure Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

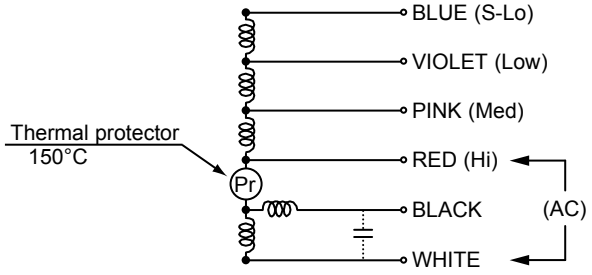


Lead wire	Resistance value
White – Red	**47.1** Ω ±**8%**
Red – Black	**27.4** Ω ±**8%**
Red – Pink	**8.00** Ω ±**8%**
Pink – Violet	**8.00** Ω ±**8%**
Violet – Blue	**8.00** Ω ±**8%**

at 20°C

Check Point : ARXB45LATH (Low Static pressure Duct Type)

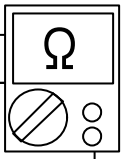
☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**



Lead wire	Resistance value
White – Red	**20.1** Ω ±**8%**
Red – Black	**13.8** Ω ±**8%**
Red – Pink	**6.50** Ω ±**8%**
Pink – Violet	**6.50** Ω ±**8%**
Violet – Blue	**6.50** Ω ±**8%**

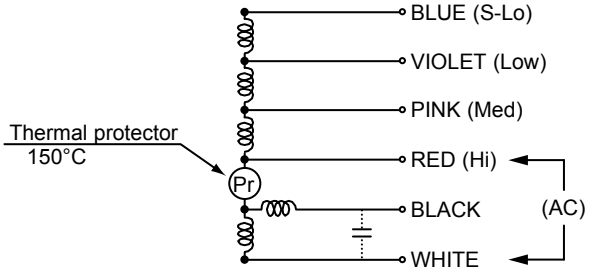
at 20°C

Check Point : ARXA24/ 30LATH (Duct Type)



☐ Check each winding resistance of the motor

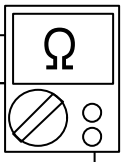
►**If Resistance value is abnormal, replace motor.**



Lead wire	Resistance value
White – Red	**47.1** Ω ±**8%**
Red – Black	**27.4** Ω ±**8%**
Red – Pink	**8.00** Ω ±**8%**
Pink – Violet	**8.00** Ω ±**8%**
Violet – Blue	**8.00** Ω ±**8%**

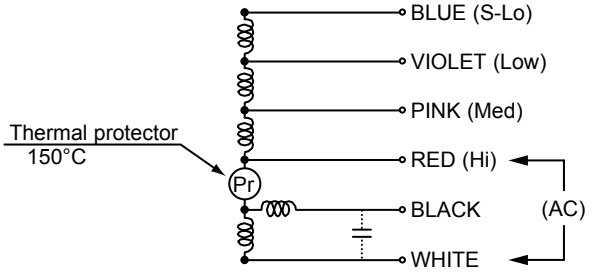
at 20°C

Check Point : ARXA36/ 45LATH (Duct Type)



☐ Check each winding resistance of the motor

►**If Resistance value is abnormal, replace motor.**

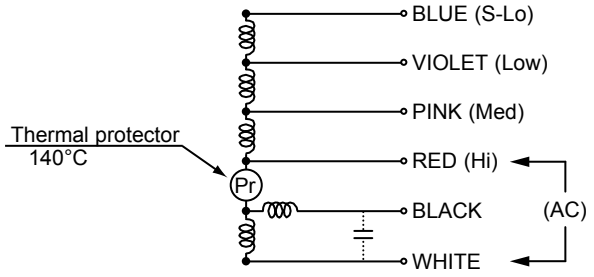


Lead wire	Resistance value
White – Red	**20.1** Ω ±**8%**
Red – Black	**13.8** Ω ±**8%**
Red – Pink	**6.50** Ω ±**8%**
Pink – Violet	**6.50** Ω ±**8%**
Violet – Blue	**6.50** Ω ±**8%**

at 20°C

Check Point : ARXB07LALH (Compact Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

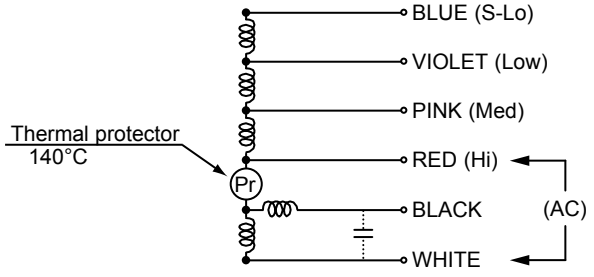


Lead wire	Resistance value
White – Red	**579** Ω ±**8%**
Red – Black	**255** Ω ±**8%**
Red – Pink	**162** Ω ±**8%**
Pink – Violet	**66** Ω ±**8%**
Violet – Blue	**93** Ω ±**8%**

at 20°C

Check Point : ARXB09LALH (Compact Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

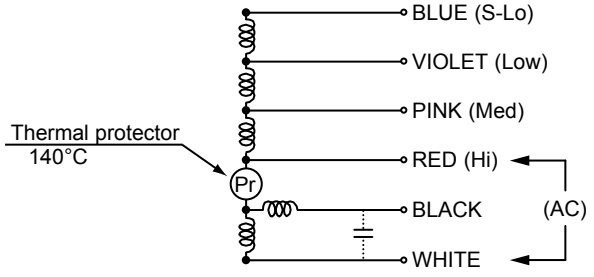


Lead wire	Resistance value
White – Red	**322.8** Ω ±**8%**
Red – Black	**255** Ω ±**8%**
Red – Pink	**103** Ω ±**8%**
Pink – Violet	**53** Ω ±**8%**
Violet – Blue	**100.7** Ω ±**8%**

at 20°C

Check Point : ARXB12LALH (Compact Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

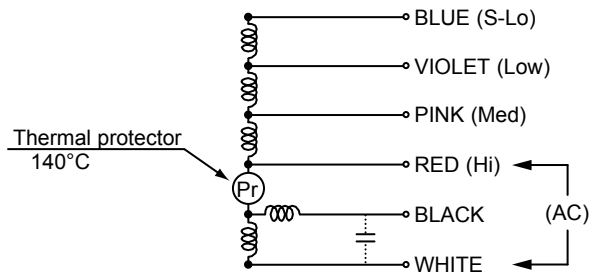


Lead wire	Resistance value
White – Red	**336** Ω ±**8%**
Red – Black	**261** Ω ±**8%**
Red – Pink	**107** Ω ±**8%**
Pink – Violet	**55** Ω ±**8%**
Violet – Blue	**103** Ω ±**8%**

at 20°C

Check Point : ARXB14LALH (Compact Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

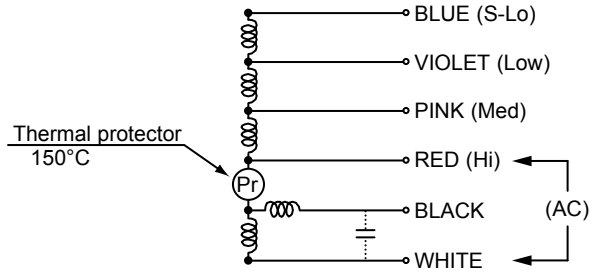


Lead wire	Resistance value
White – Red	**136.5** Ω ±**8%**
Red – Black	**125.6** Ω ±**8%**
Red – Pink	**23.7** Ω ±**8%**
Pink – Violet	**23.7** Ω ±**8%**
Violet – Blue	**49.4** Ω ±**8%**

at 20°C

Check Point : ARXB18LALH (Compact Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

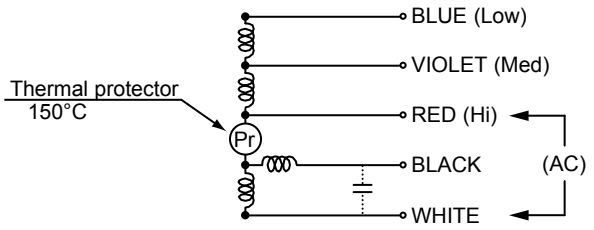


Lead wire	Resistance value
White – Red	**89.7** Ω ±**8%**
Red – Black	**150** Ω ±**8%**
Red – Pink	**37.4** Ω ±**8%**
Pink – Violet	**37.4** Ω ±**8%**
Violet – Blue	**197** Ω ±**8%**

at 20°C

Check Point : AB*A12/ 14LATH (Floor/ Ceiling Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

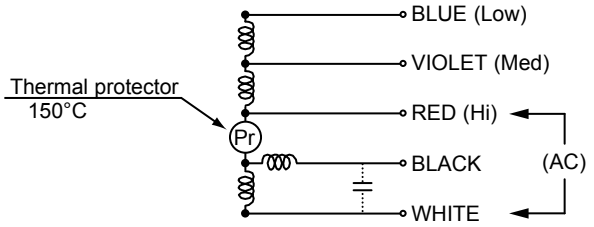


Lead wire	Resistance value
White – Red	**252** Ω ±**8%**
Red – Black	**337** Ω ±**8%**
Red – Violet	**59.5** Ω ±**8%**
Violet – Blue	**59.5** Ω ±**8%**

at 20°C

Check Point : AB*A18LATH (Floor/ Ceiling Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

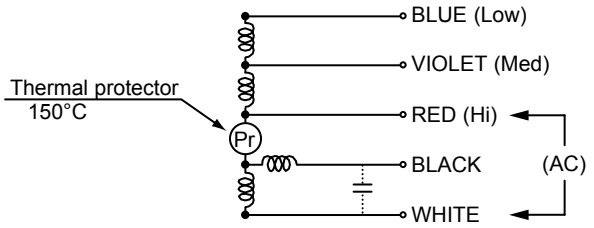


Lead wire	Resistance value
White – Red	**134** Ω ±**8%**
Red – Black	**243** Ω ±**8%**
Red – Violet	**63.1** Ω ±**8%**
Violet – Blue	**63.1** Ω ±**8%**

at 20°C

Check Point : AB*A24LATH (Floor/ Ceiling Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

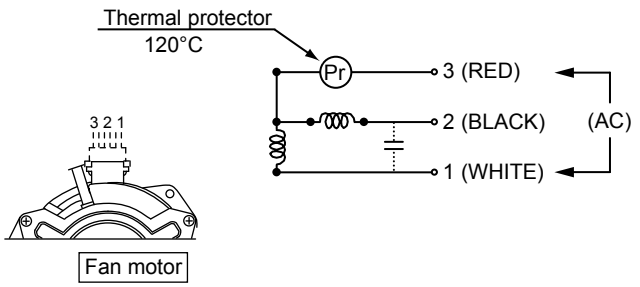


Lead wire	Resistance value
White – Red	**110** Ω ±**8%**
Red – Black	**181** Ω ±**8%**
Red – Violet	**64.9** Ω ±**8%**
Violet – Blue	**64.9** Ω ±**8%**

at 20°C

Check Point : AB*A30/ 36/ 45/ 54LATH (Ceiling Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

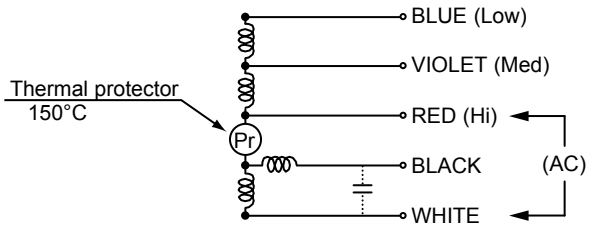


Lead wire	Resistance value
1 (WHITE) – 3 (RED)	**22.8** Ω ±**10%**
2 (BLACK) – 3 (RED)	**31.9** Ω ±**10%**

at 20°C

Check Point : ARXC36LATH (High Static Pressure Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

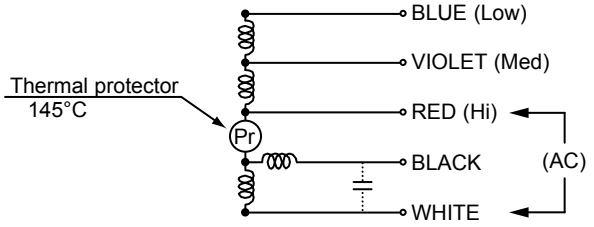


Lead wire	Resistance value
White – Red	**13.4** Ω ±**8%**
Red – Black	**16.9** Ω ±**8%**
Red – Violet	**11.5** Ω ±**8%**
Violet – Blue	**13.3** Ω ±**8%**

at 20°C

Check Point : ARXC45/ 60LATH (High Static Pressure Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

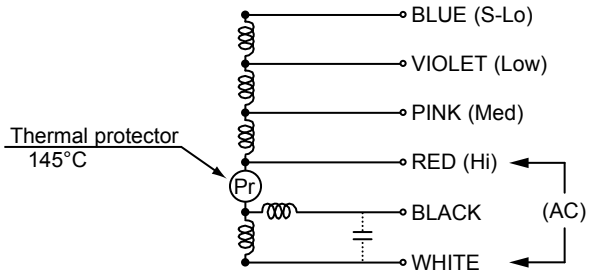


Lead wire	Resistance value
White – Red	**6.84** Ω ±**7%**
Red – Black	**9.78** Ω ±**7%**
Red – Violet	**6.1** Ω ±**7%**
Violet – Blue	**6.1** Ω ±**7%**

at 20°C

Check Point : ARXC72LATH (High Static Pressure Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**

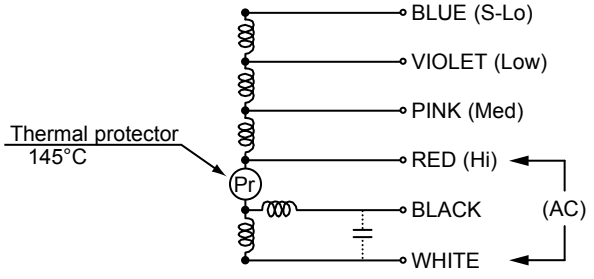


Lead wire	Resistance value
White – Red	**5.25** Ω ±**7%**
Red – Black	**5.02** Ω ±**7%**
Red – Pink	**1.86** Ω ±**7%**
Pink – Violet	**0.94** Ω ±**7%**
Violet – Blue	**0.94** Ω ±**7%**

at 20°C

Check Point : ARXC90LATH (High Static Pressure Duct Type)

☐ Check each winding resistance of the motor
►**If Resistance value is abnormal, replace motor.**



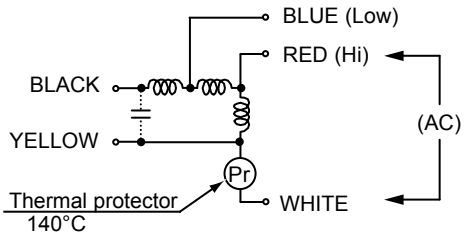
Lead wire	Resistance value
White – Red	**4.24** Ω ±**7%**
Red – Black	**4.16** Ω ±**7%**
Red – Pink	**0.46** Ω ±**7%**
Pink – Violet	**0.91** Ω ±**7%**
Violet – Blue	**0.46** Ω ±**7%**

at 20°C

Check Point : AS＊A18 / 24 / 30 LATH(Wall Mounted Type)

☐ Check each winding resistance of the motor

►**If Resistance value is abnormal, replace motor.**



Lead wire	Resistance value
White – Red	**134** Ω ±**8%**
Blue – Black	**25.5** Ω ±**8%**
Blue – Red	**306** Ω ±**8%**

at 20°C

SERVICE PARTS INFORMATION 20

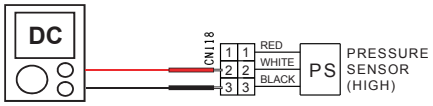
Discharge Pressure Sensor
Suction Pressure Sensor

1. Discharge Pressure Sensor

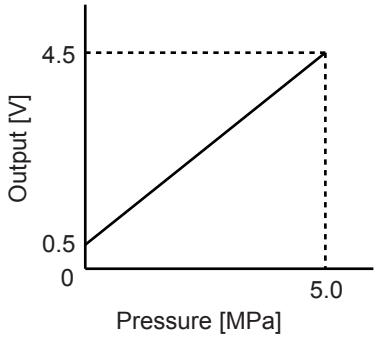
Check Point : Check Voltage from Main PCB

DC

☐ With the connector connected to the PCB, measure the voltage between CN118:2-3 of the Main PCB.



▪ Characteristics of pressure sensor

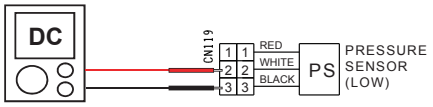


2. Suction Pressure Sensor

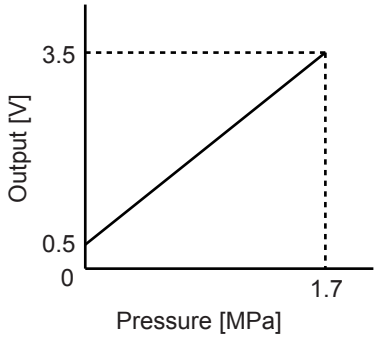
Check Point : Check Voltage from Main PCB

DC

☐ With the connector connected to the PCB, measure the voltage between CN119:2-3 of the Main PCB.



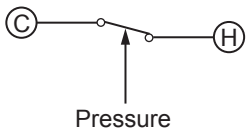
▪ Characteristics of pressure sensor



SERVICE PARTS INFORMATION 21

Pressure switch 1,2

▪ Type of contact



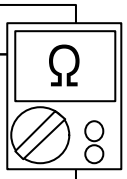
▪ Characteristics of pressure switch

	Pressure switch 1 (For Inverter comp.)	Pressure switch 2 (For Constant speed comp.)
Contact : Short ⇒ Open	4.2±0.1MPa	4.2± 0.1MPa
Contact : Open ⇒ Short	3.2±0.15MPa	3.2± 0.15MPa

SERVICE PARTS INFORMATION 22

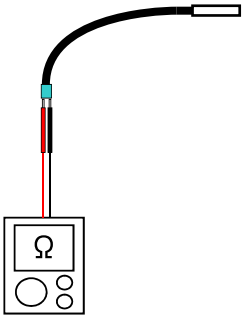
Thermistor

Check Point : Check Thermistor resistance value



☐ Remove connector and check Thermistor resistance value.

Temperature [°C]	Resistance Value [kΩ]			
	Thermistor A	Thermistor B	Thermistor C	Thermistor D
- 20	---	---	105.4	---
- 10	---	27.8	58.2	27.4
- 5	---	21.0	44.0	20.7
0	168.6	16.1	33.6	15.8
5	129.8	12.4	25.9	12.2
10	100.9	9.6	20.2	9.5
15	79.1	7.6	15.8	7.5
20	62.6	6.0	12.5	5.9
25	49.8	4.8	10.0	4.7
30	40.0	3.8	8.0	3.8
40	26.3	2.5	5.3	2.5
50	17.8	1.7	3.6	1.7
60	12.3	1.2	---	1.2
70	8.7	---	---	0.8
80	6.3	---	---	0.6
90	4.6	---	---	0.4
100	3.4	---	---	0.3
110	2.6	---	---	---
120	2.0	---	---	---
Applicable Thermistors	Discharge temp. TH1 Discharge temp. TH2 Comp.1 temp. TH Comp.2 temp. TH	Heat exchanger. TH Suction temp. TH Sub-cool heat exchanger (inlet) TH Sub-cool heat exchanger (outlet) TH Liquid temp. TH1 Liquid temp. TH2	Outdoor temp. TH	Heat sink temp. TH



SERVICE PARTS INFORMATION 23

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.

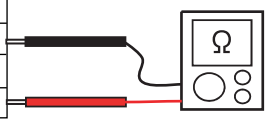
Check Point 1 : Check rotation of Fan

- 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 (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 24

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.

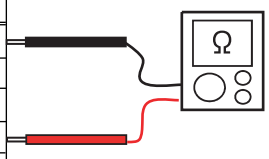
Check Point 1 : Check rotation of Fan

- 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 or Blue)	Feed back (FG)



Refrigerant R410A INVERTER

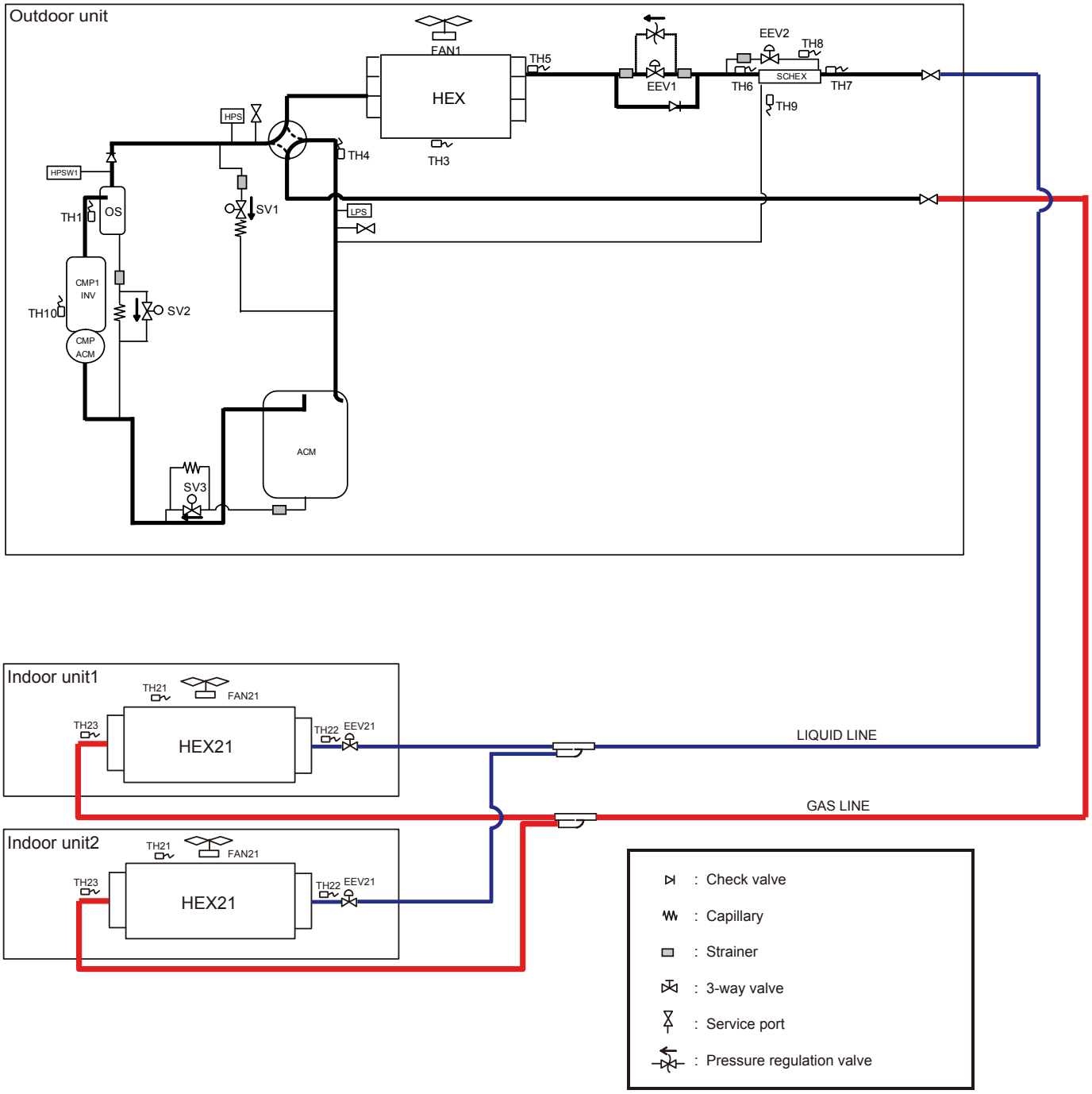
AIRSTAGE™ V-II

Variable Refrigerant Flow System

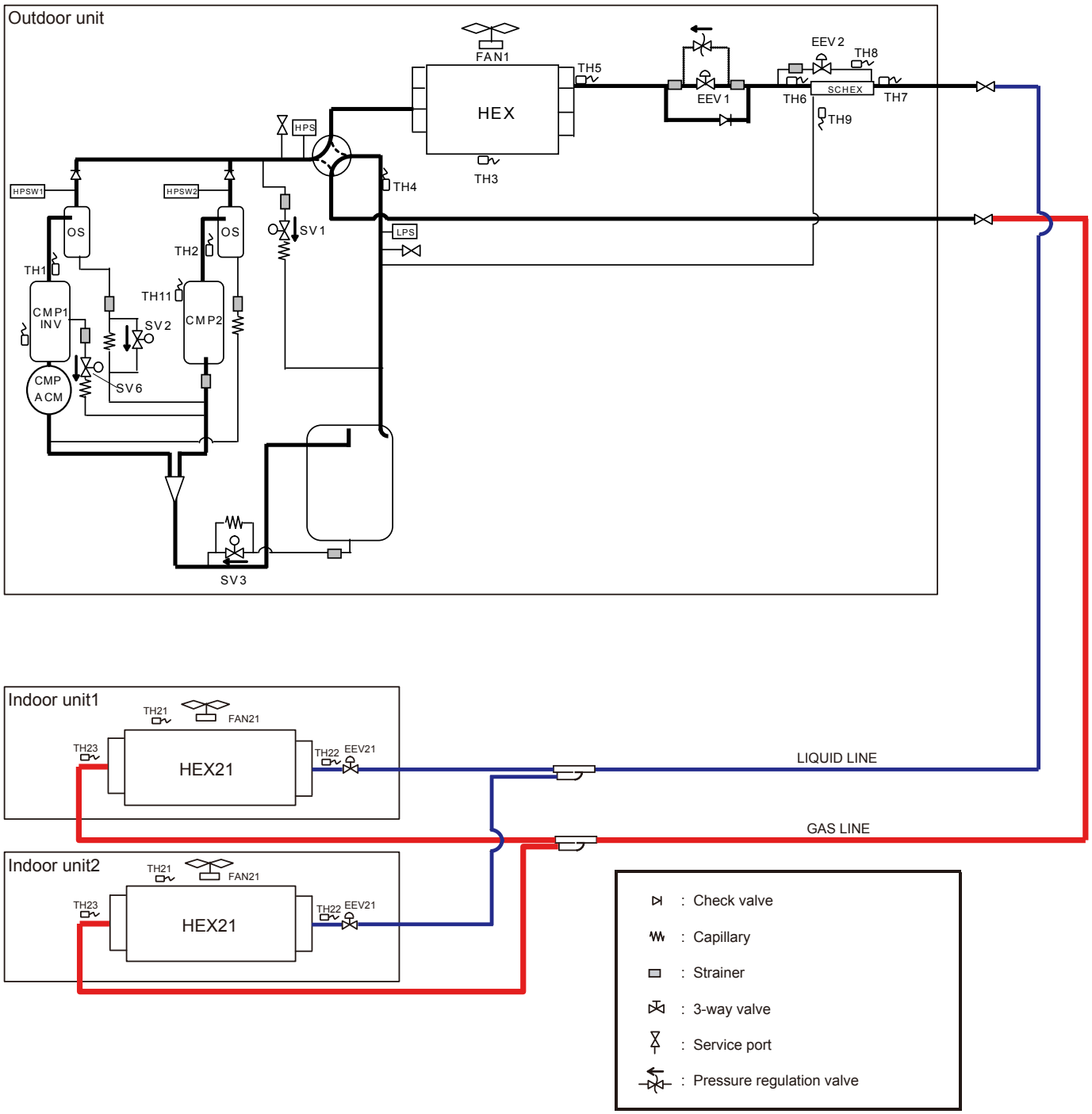
5. APPENDING DATA (UNIT)

5-1 REFRIGERANT CIRCUIT

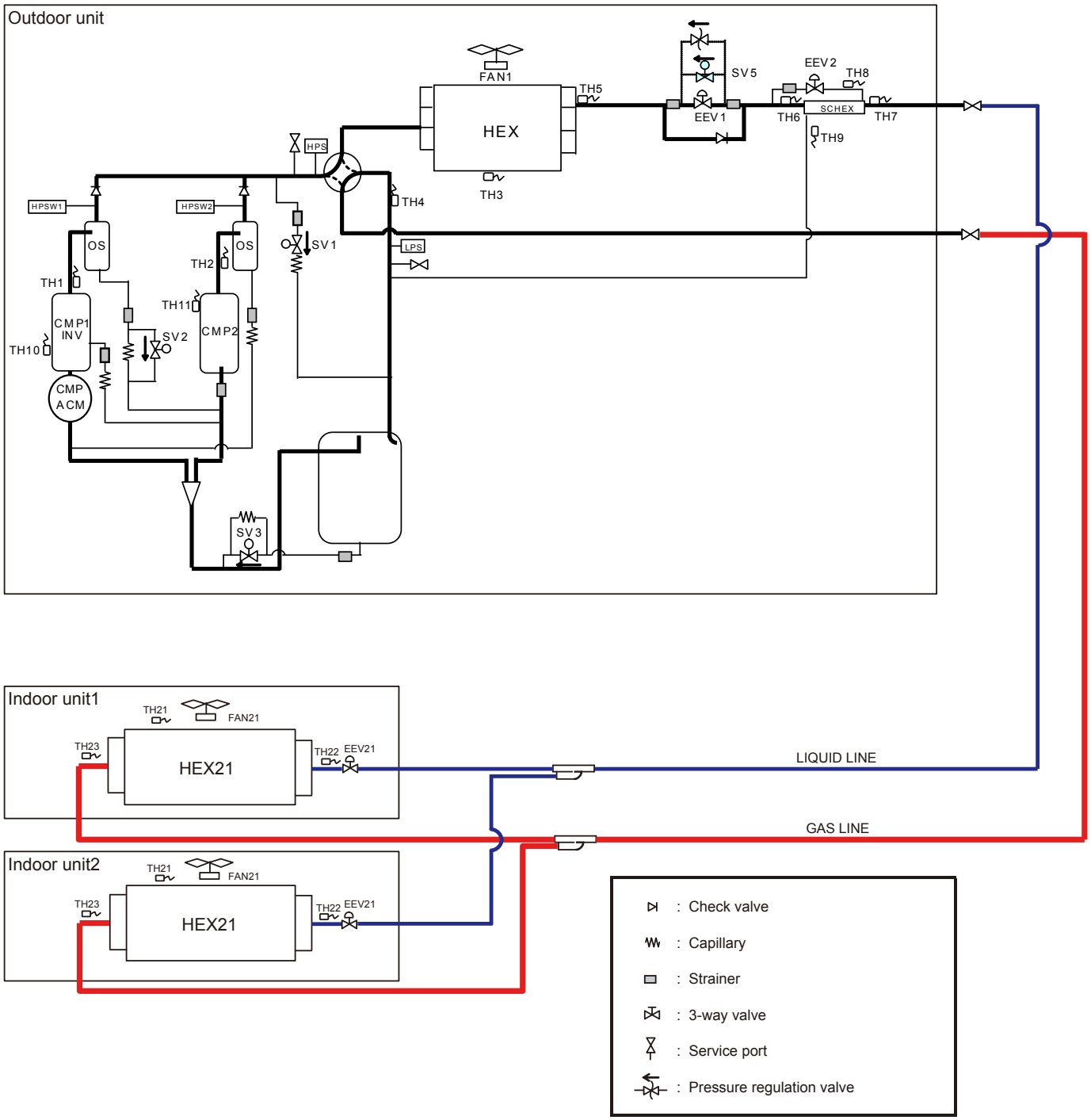
MODELS : AJ＊A72LALH, AJ＊A90LALH



MODEL : AJ＊108LALH



MODELS : AJ＊126LALH, AJ＊144LALH



SYMBOL DESCRIPTION

Outdoor unit

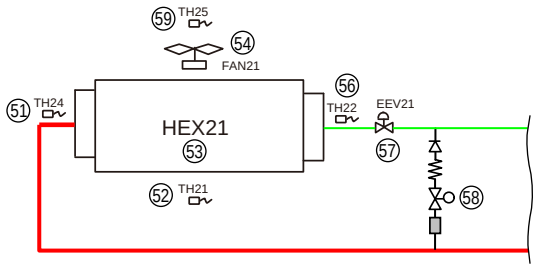
MARK	DESCRIPTION
CMP 1	Compressor 1 (Inverter type)
CMP 2	Compressor 2 (Constant speed type)
HEX	Heat exchanger
FAN 1	Fan 1
ACM	Accumulator
RCV	Receiver tanker
OS	Oil separator
SCHEX	Sub-cool heat exchanger
HPS	High pressure sensor
LPS	Low pressure sensor
HPSW1	High pressure sensor switch 1
4WV	4-way valve
EEV 1	Electric expansion valve 1
EEV 2	Electric expansion valve 2
SV 1	Solenoid valve 1
SV 2	Solenoid valve 2
SV 3	Solenoid valve 3
SV 4	Solenoid valve 4
SV 5	Solenoid valve 5
SV 6	Solenoid valve 6
TH 1	Discharge temperature thermistor 1
TH 2	Discharge temperature thermistor 2
TH 3	Outdoor temperature thermistor
TH 4	Suction temperature thermistor
TH 5	Heat exchanger (outlet) thermistor
TH 6	Liquid temperature thermistor 1
TH 7	Liquid temperature thermistor 2
TH 8	Sub-cool heat exchanger (inlet) thermistor
TH 9	Sub-cool heat exchanger (outlet) thermistor
TH 10	Compressor 1 temperature thermistor
TH 11	Compressor 2 temperature thermistor

Indoor unit

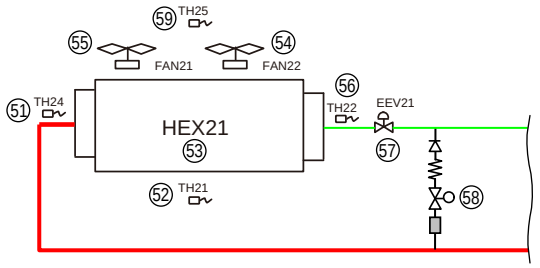
MARK	DESCRIPTION
HEX 21	Heat exchanger
FAN 21	Fan
EEV 21	Electric expansion valve
TH 21	Room temperature thermistor
TH 22	Heat exchanger (inlet) thermistor
TH 23	Heat exchanger (outlet) thermistor

5-1 REFRIGERANT CIRCUIT for Outdoor air unit

Outdoor air unit
(ARXH054/ 096GTAH, ARQH140/ 280GTAH)



Outdoor air unit
(ARXH072GTAH, ARQH224GTAH)



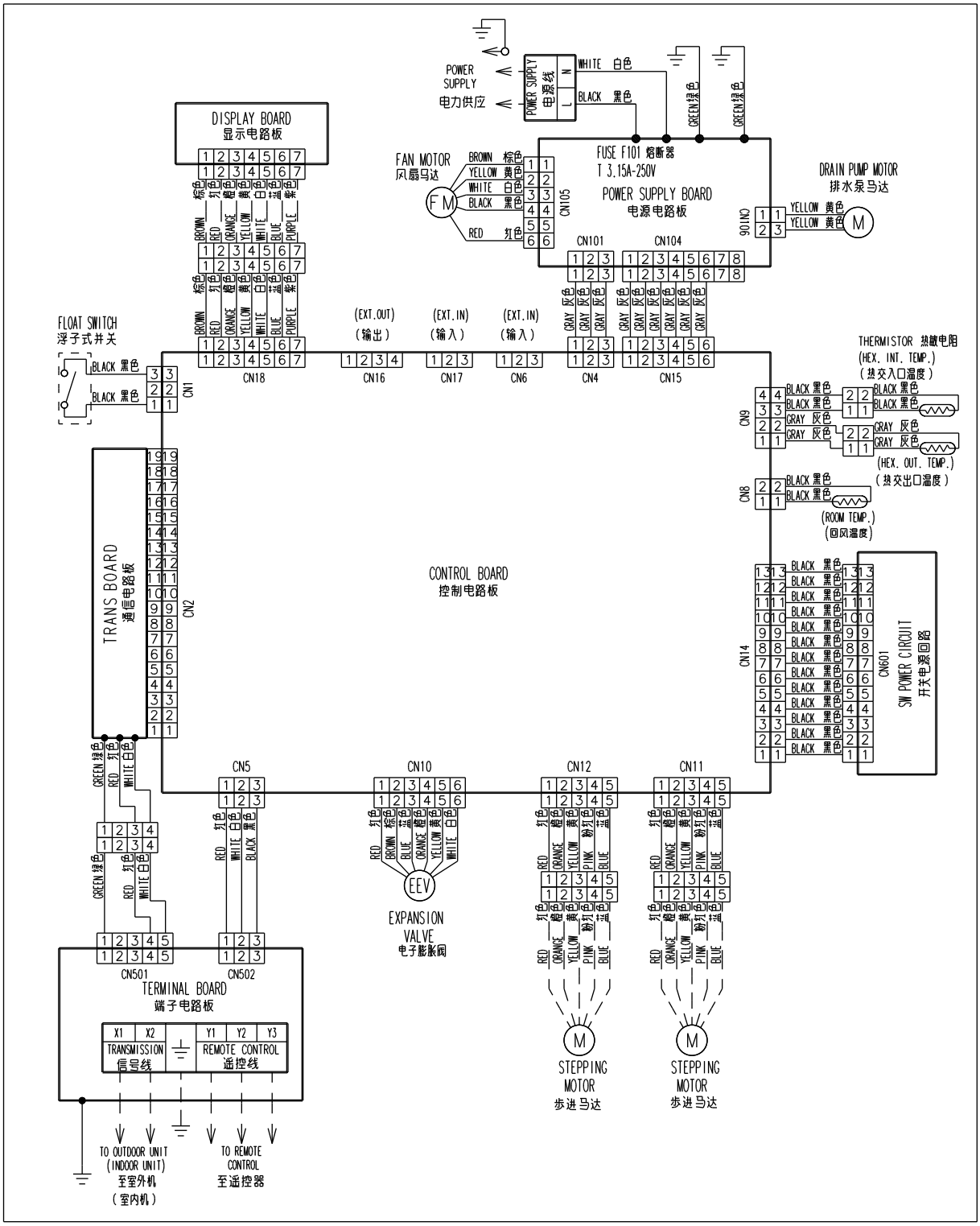
: Capillary : Strainer

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

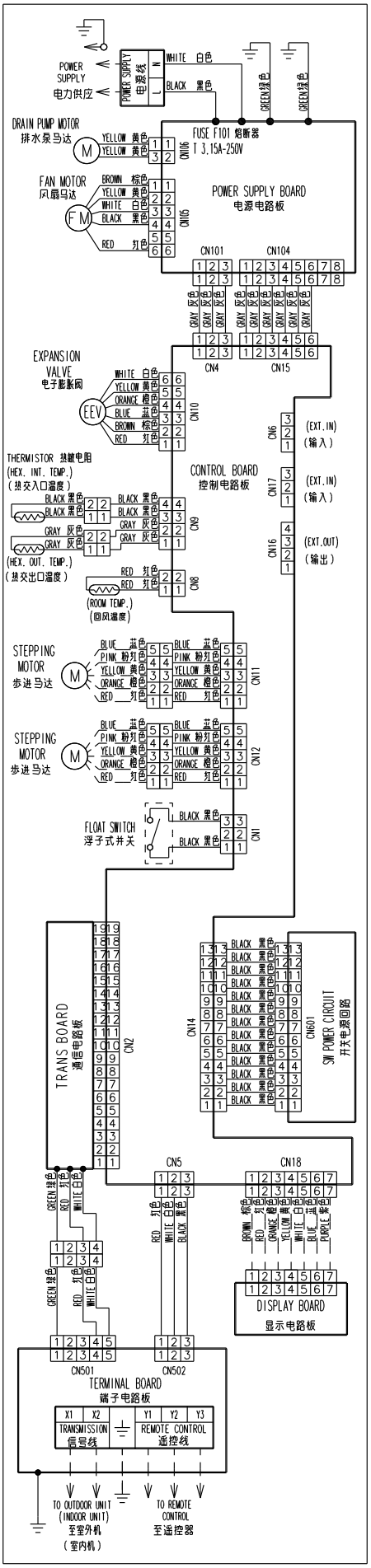
5-2 WIRING DIAGRAM

5-2-1 Indoor Unit

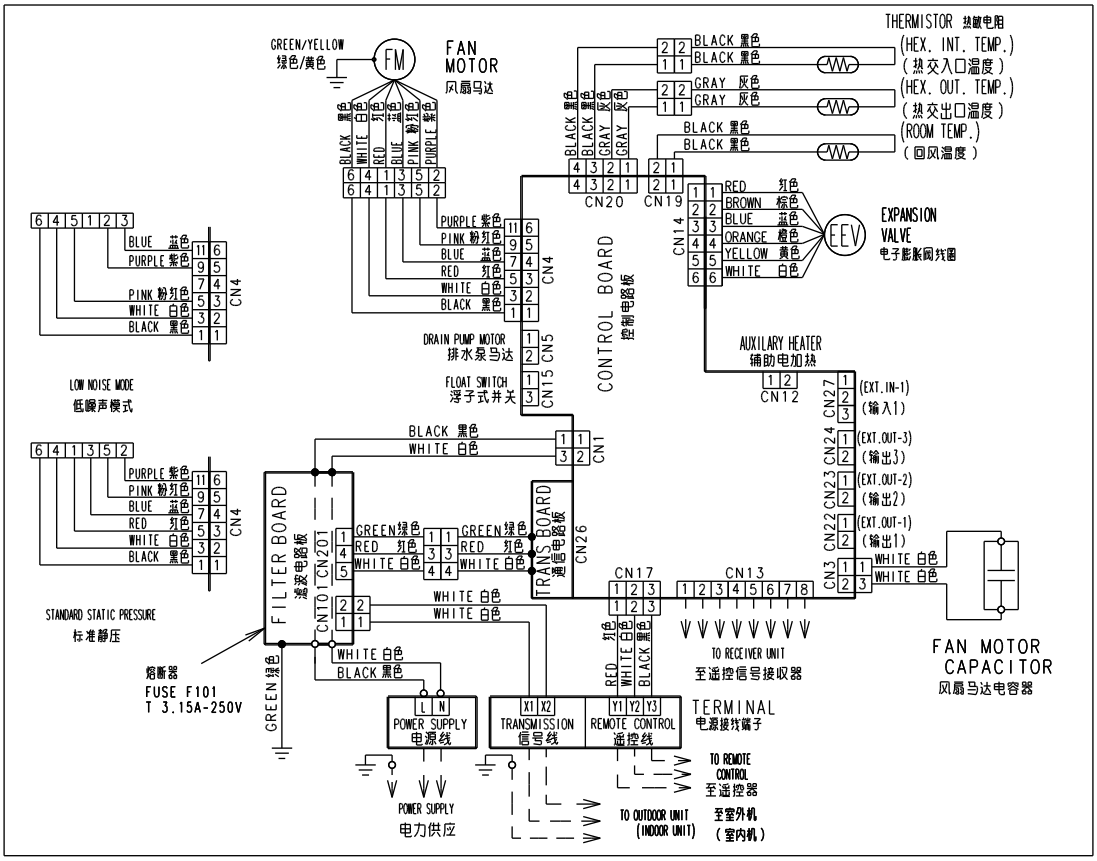
MODELS : AUXB07, AUXB09, AUXB12, AUXB14, AUXB18, AUXB24



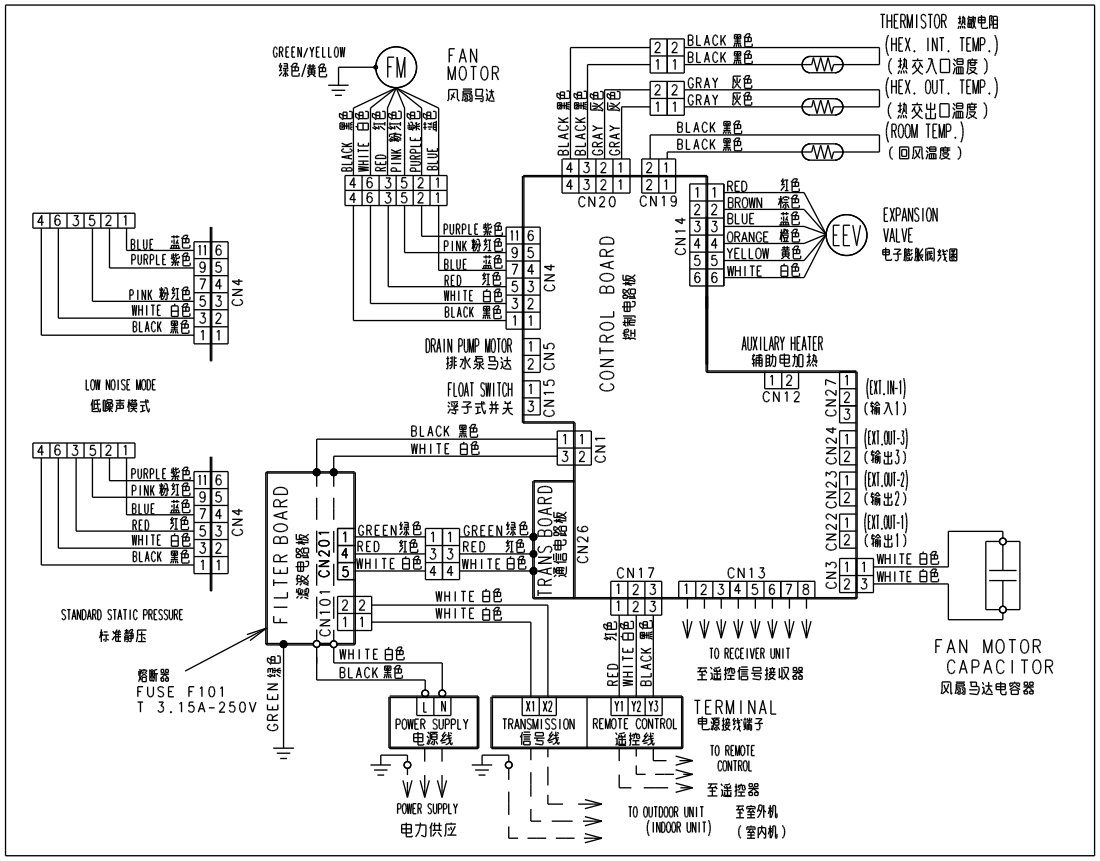
MODELS : AUXD18, AUXD24, AUXA30, AUXA36, AUXA45, AUXA54



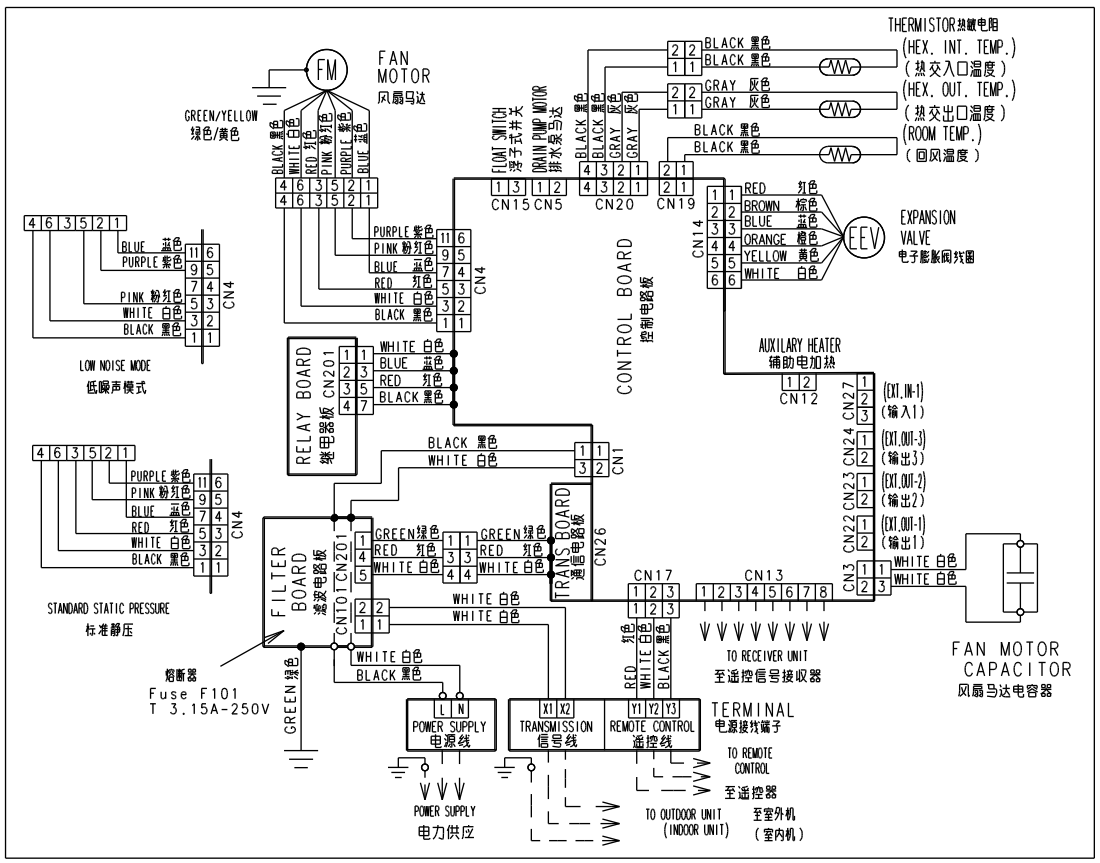
MODELS : ARXB07, ARXB09, ARXB12, ARXB14, ARXB18



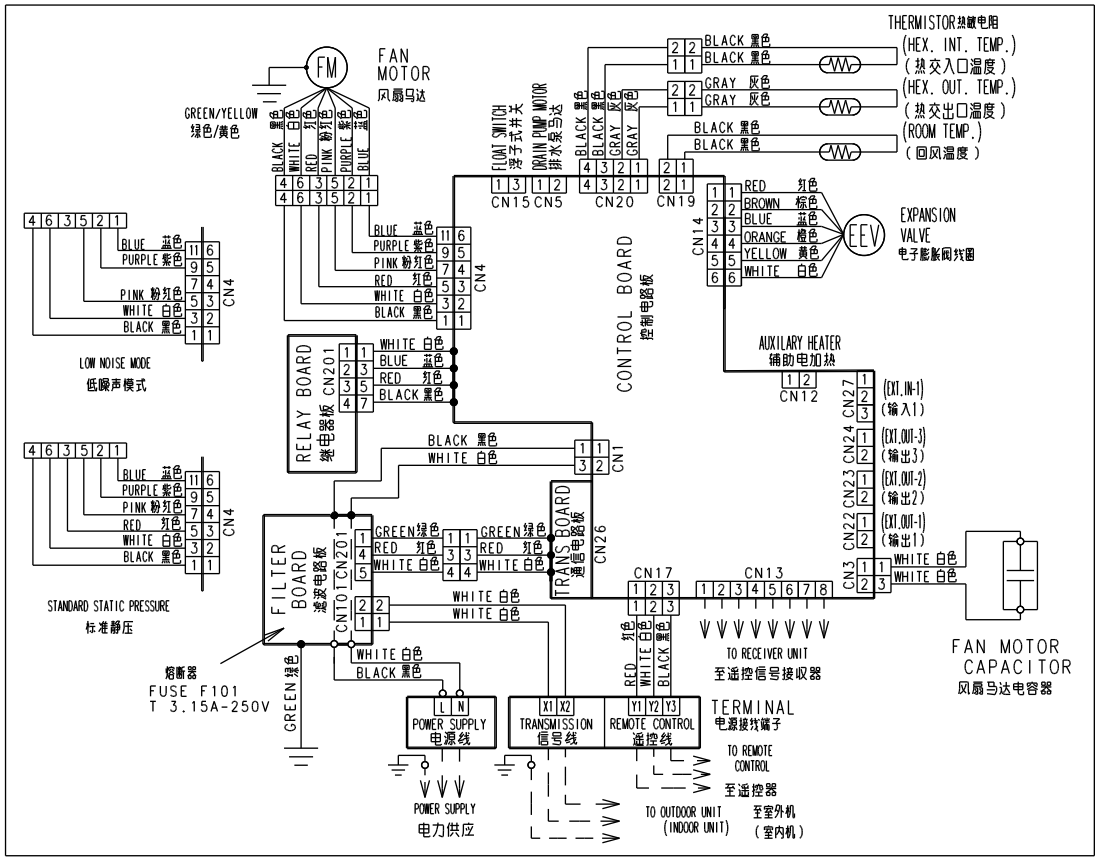
MODEL : ARXB24



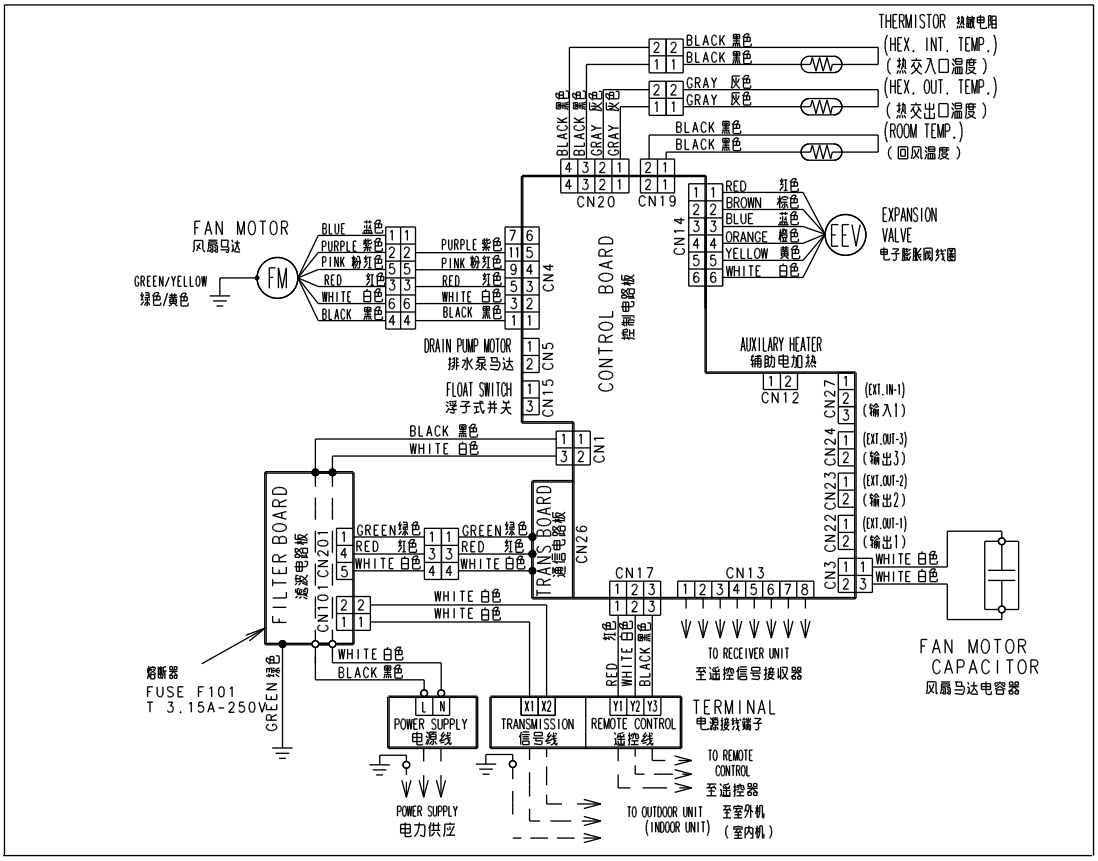
MODELS : ARXB30, ARXB36



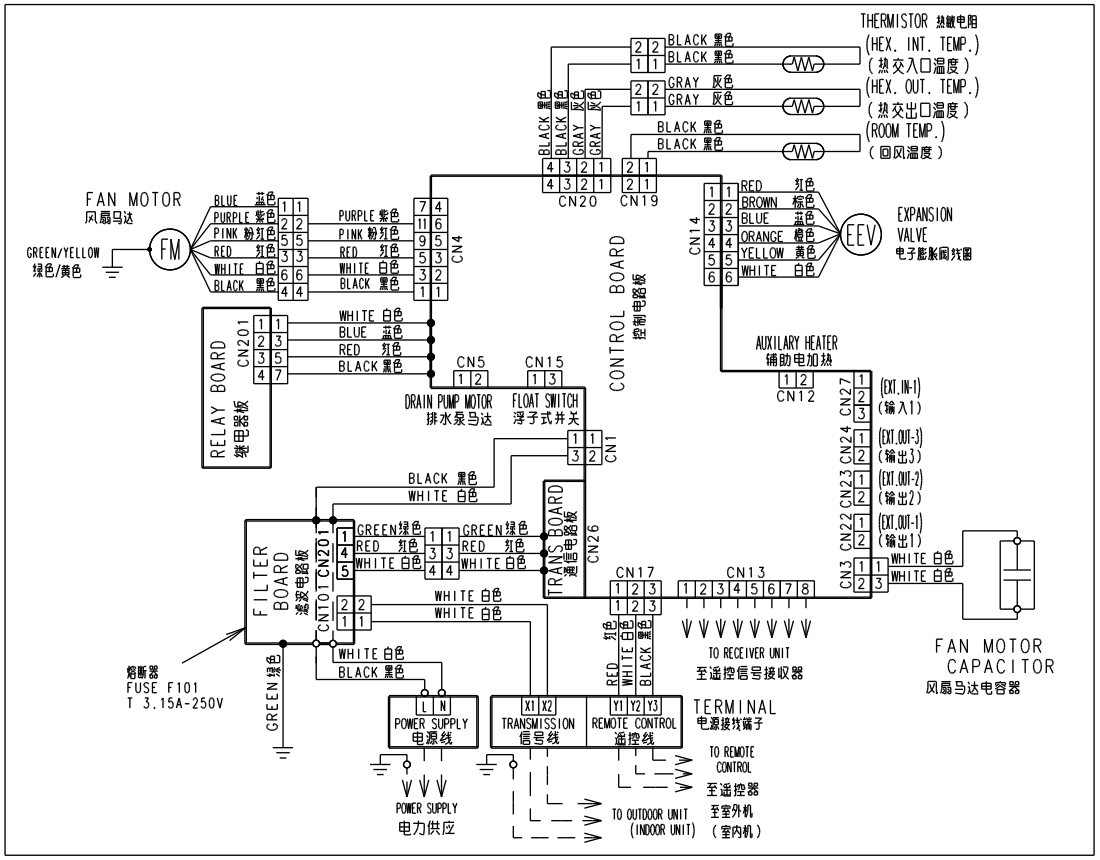
MODEL : ARXB45



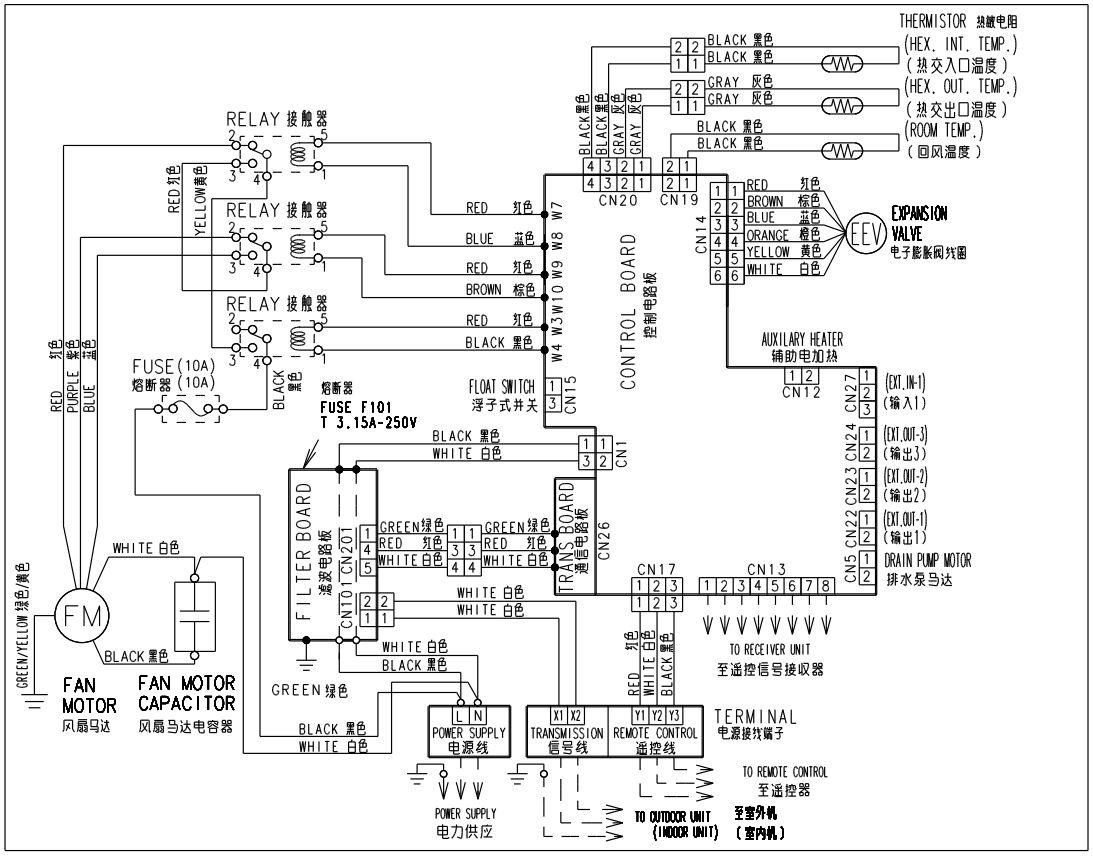
MODEL : ARXA24



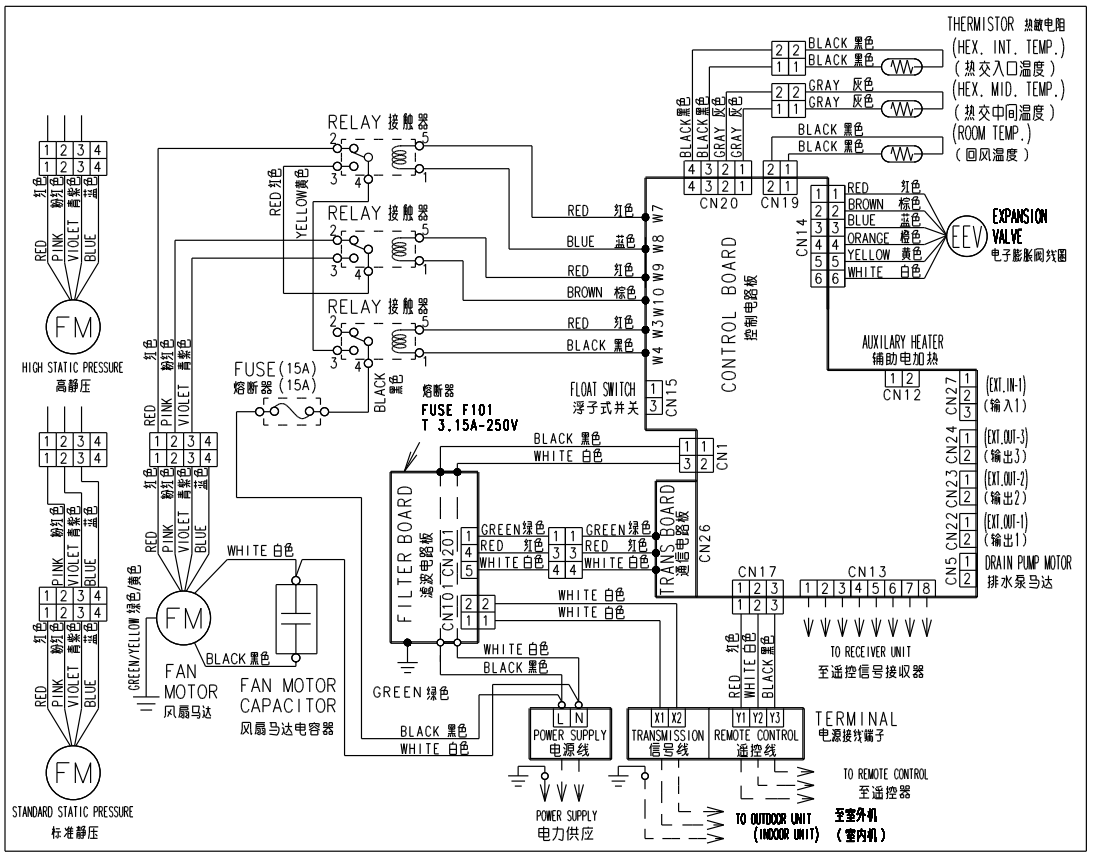
MODELS : ARXA30, ARXA36, ARXA45



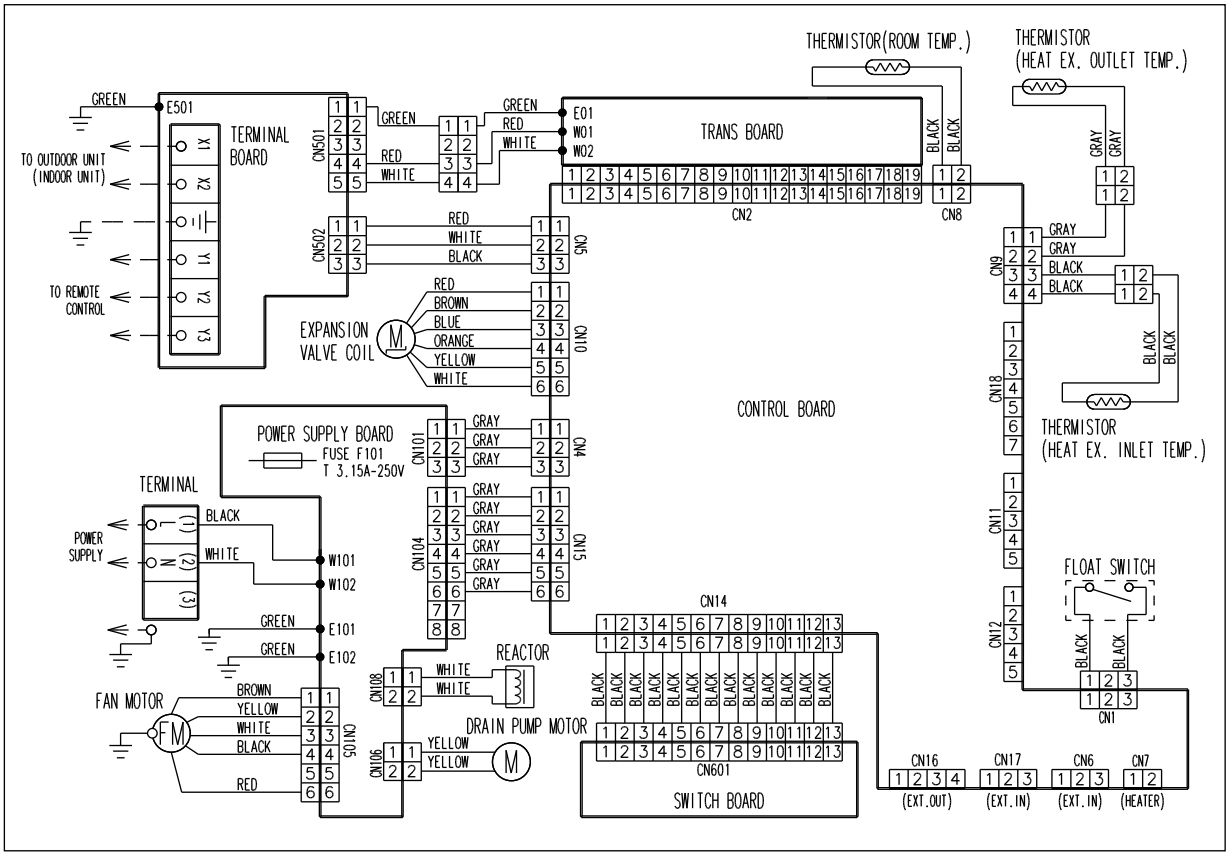
MODELS : ARXC36, ARXC45, ARXC60



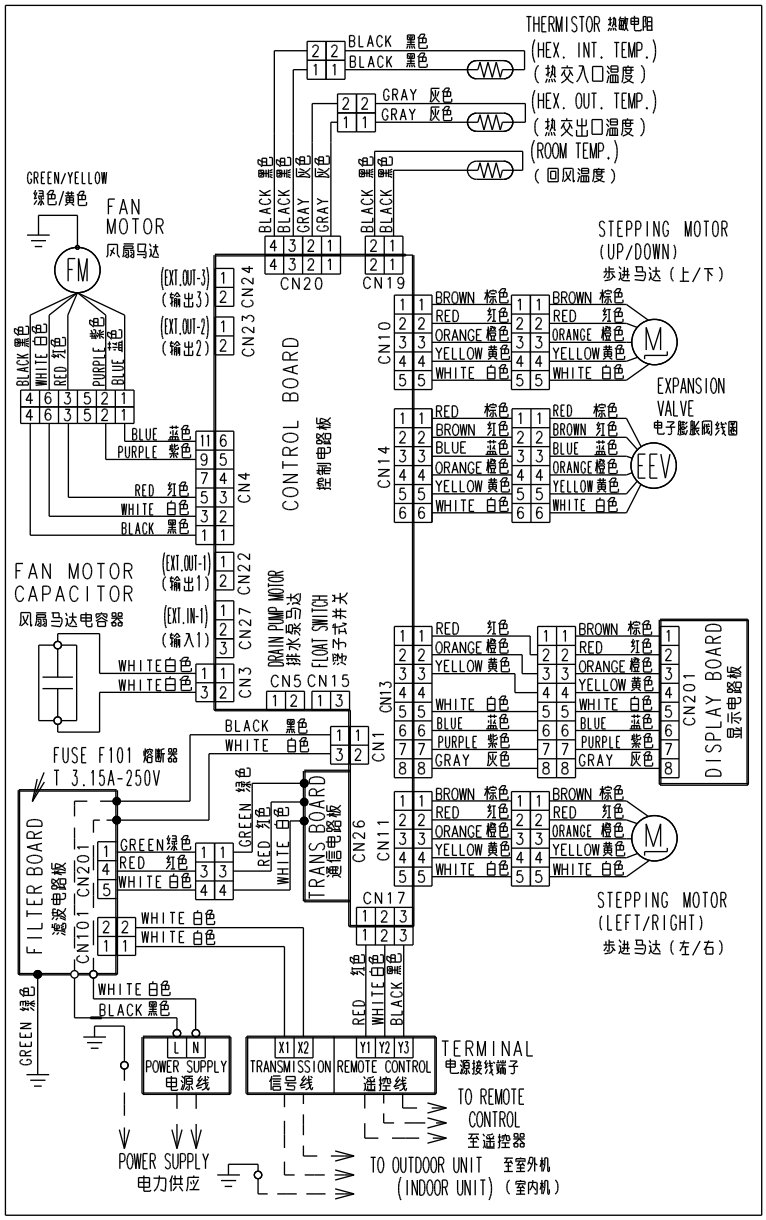
MODELS : ARXC72, ARXC90



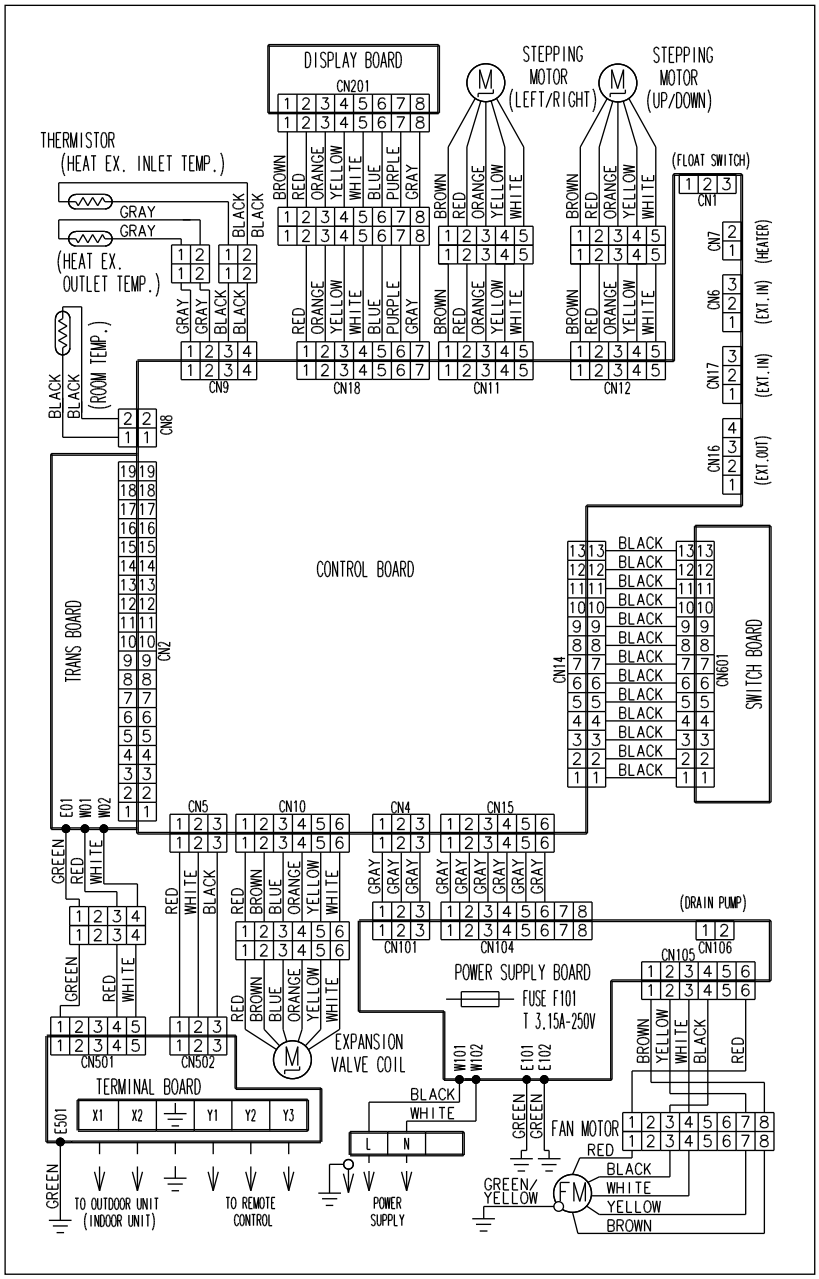
MODELS : ARXD07, ARXD09, ARXD12, ARXD14, ARXD18, ARXD24



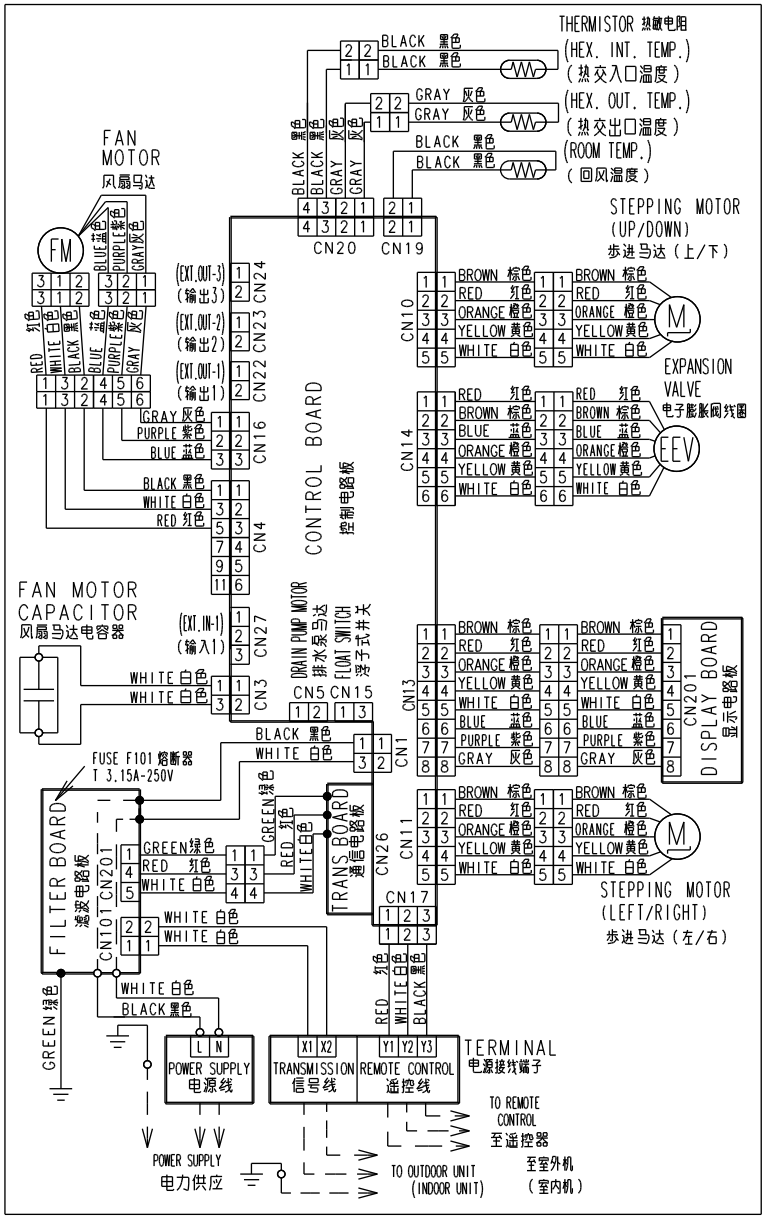
MODELS : AB*A12, AB*A14, AB*A18, AB*A24



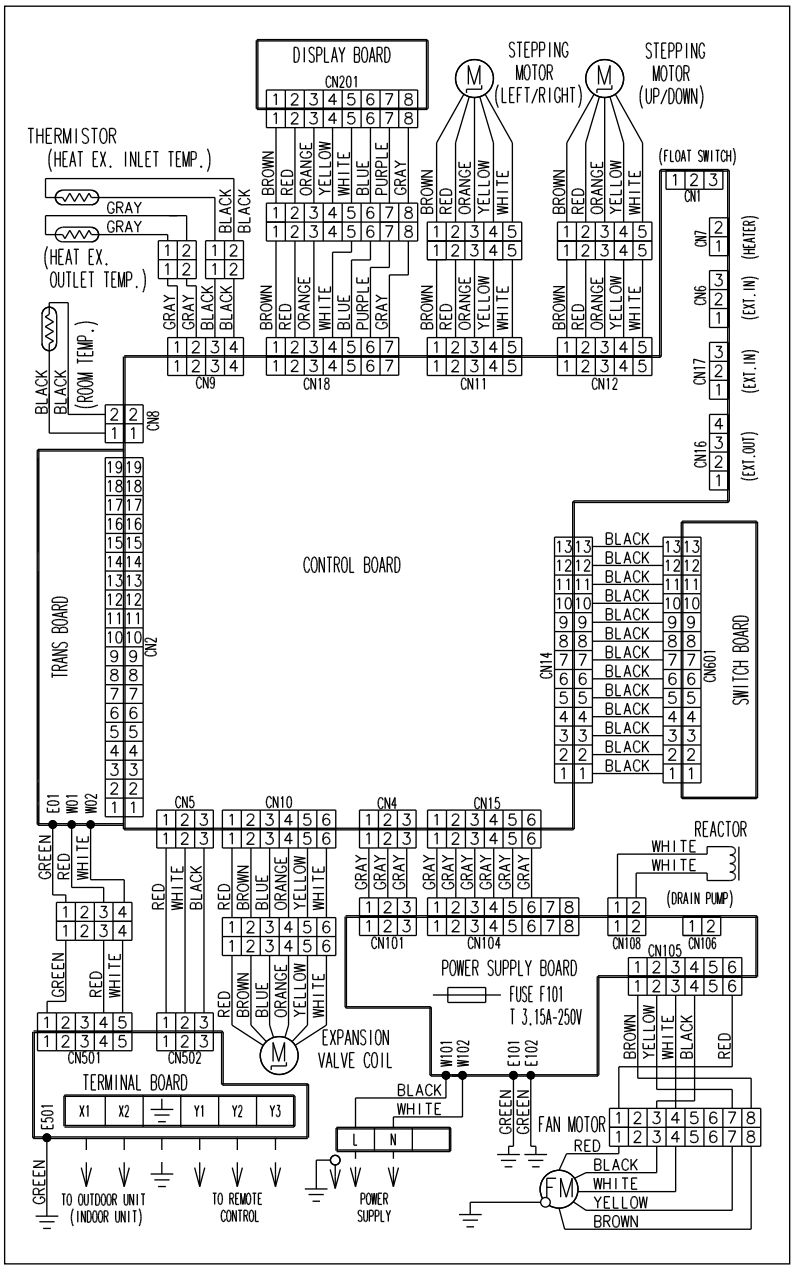
MODELS : AB*A12LBTH, AB*A14LBTH
AB*A18LBTH, AB*A24LBTH



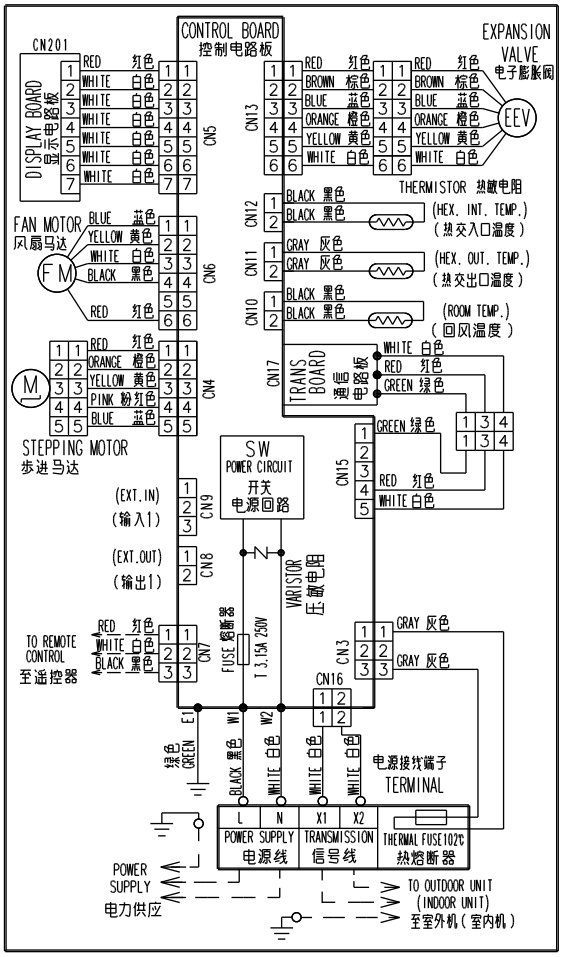
MODELS : AB＊A30, AB＊A36, AB＊A45, AB＊A54



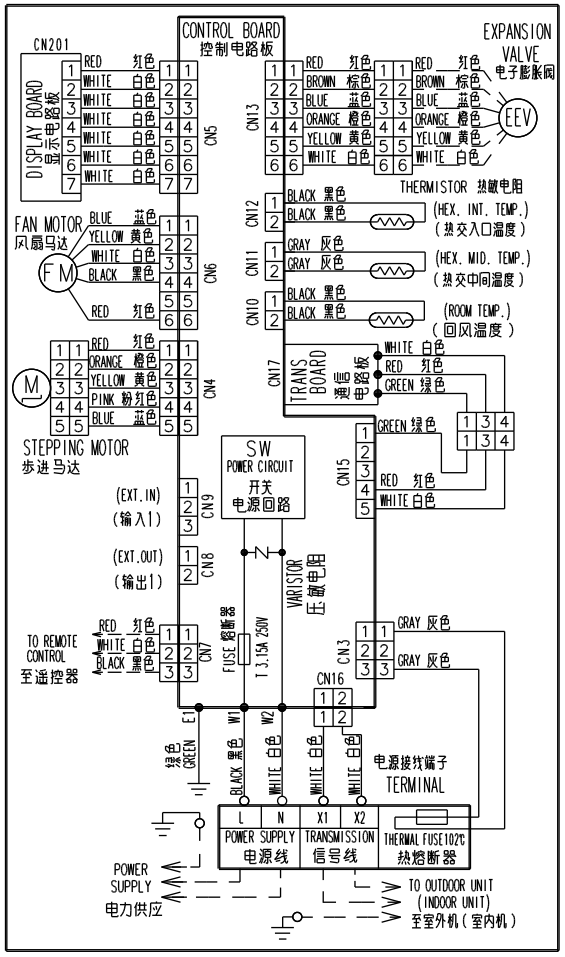
MODELS : AB*A30LBTH, AB*A36LBTH
AB*A45LBTH, AB*A54LBTH



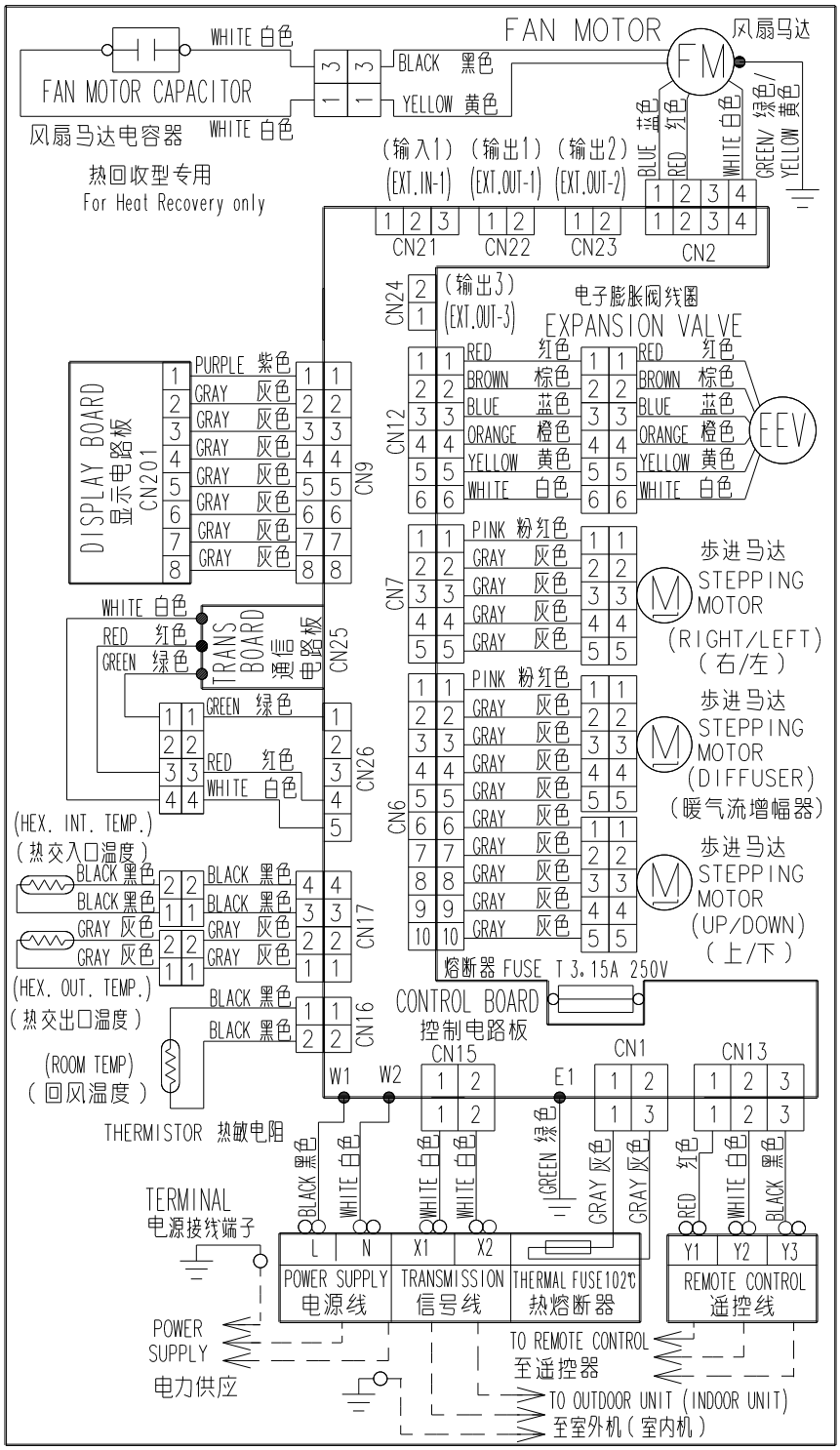
MODELS : AS*A07, AS*A09, AS*A12, AS*A14



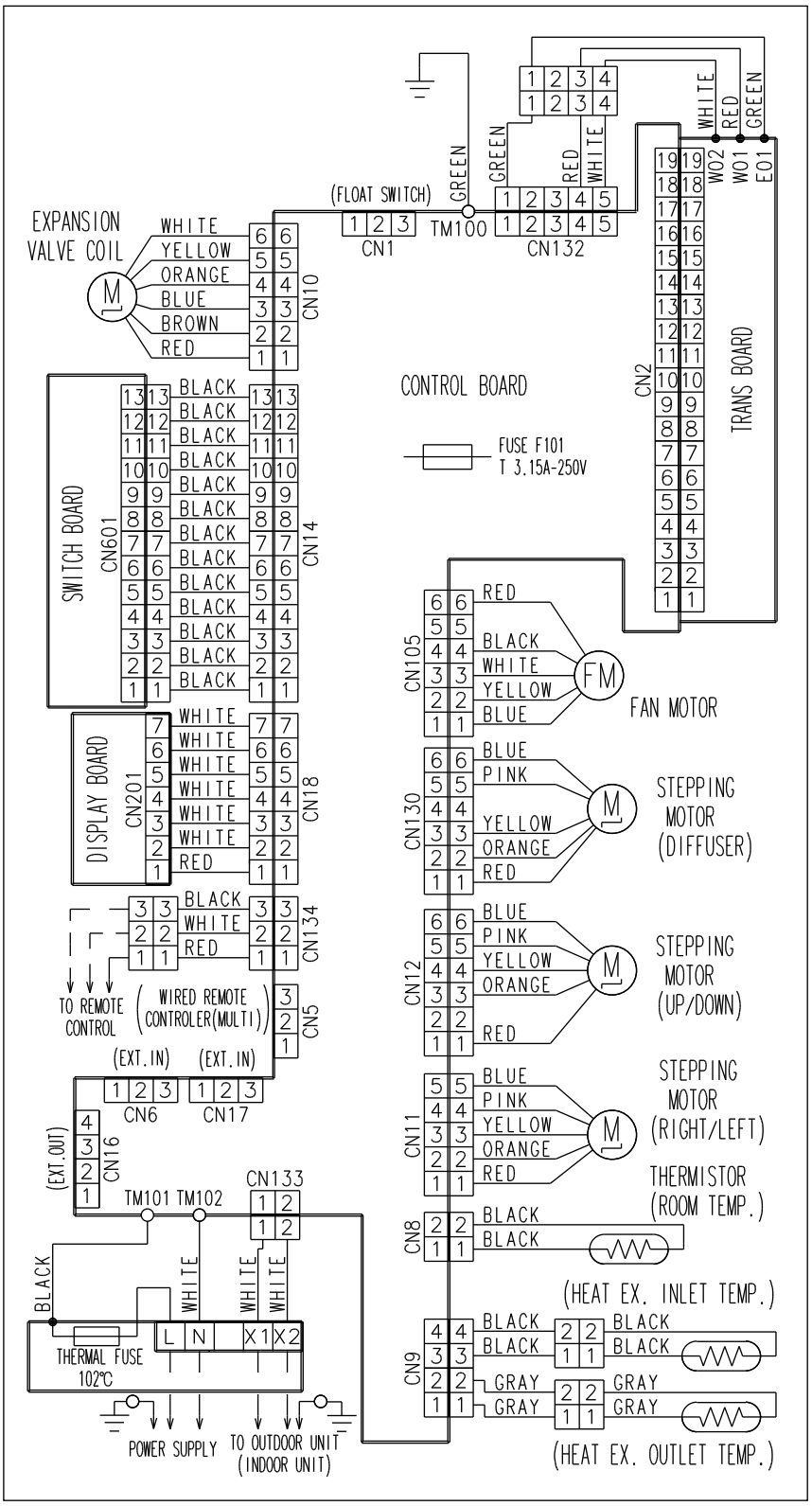
MODELS : AS＊E07, AS＊E09, AS＊E12, AS＊E14



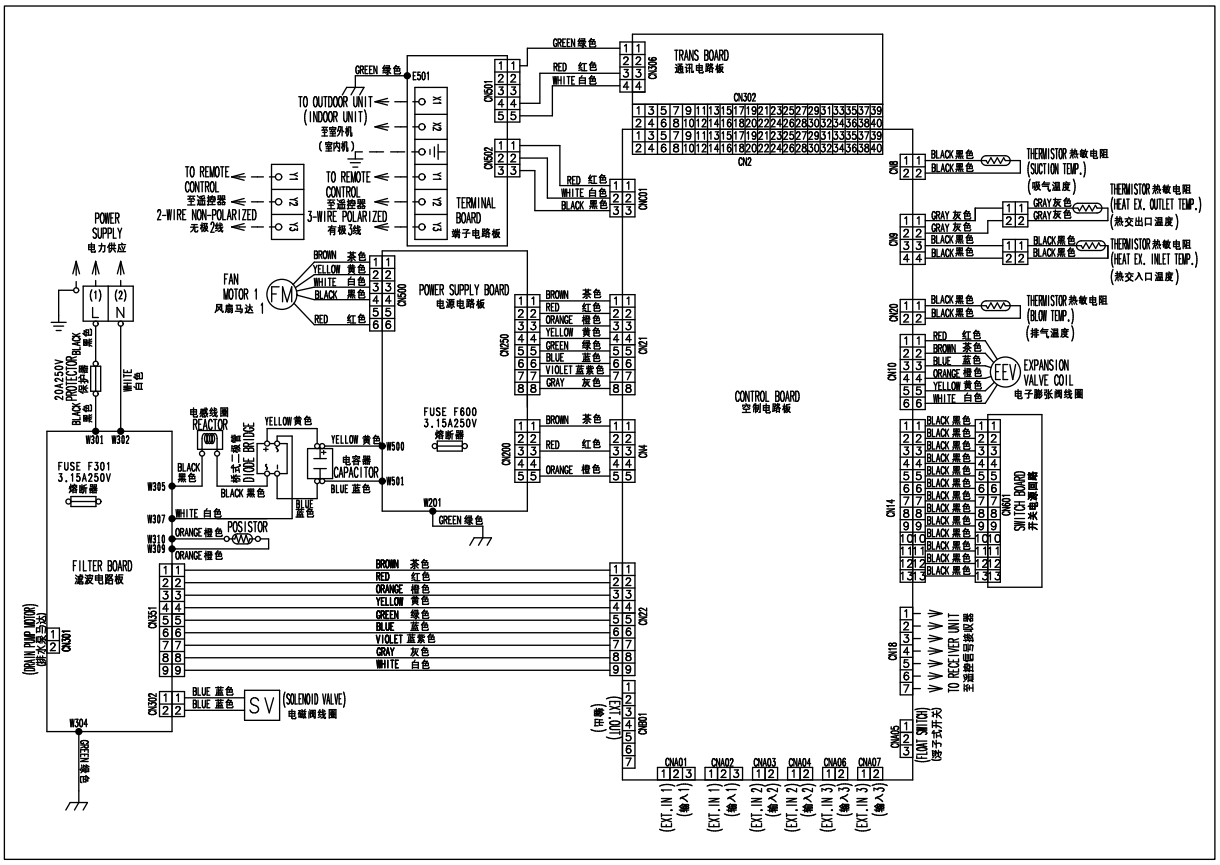
MODELS : AS*A18, AS*A24, AS*A30



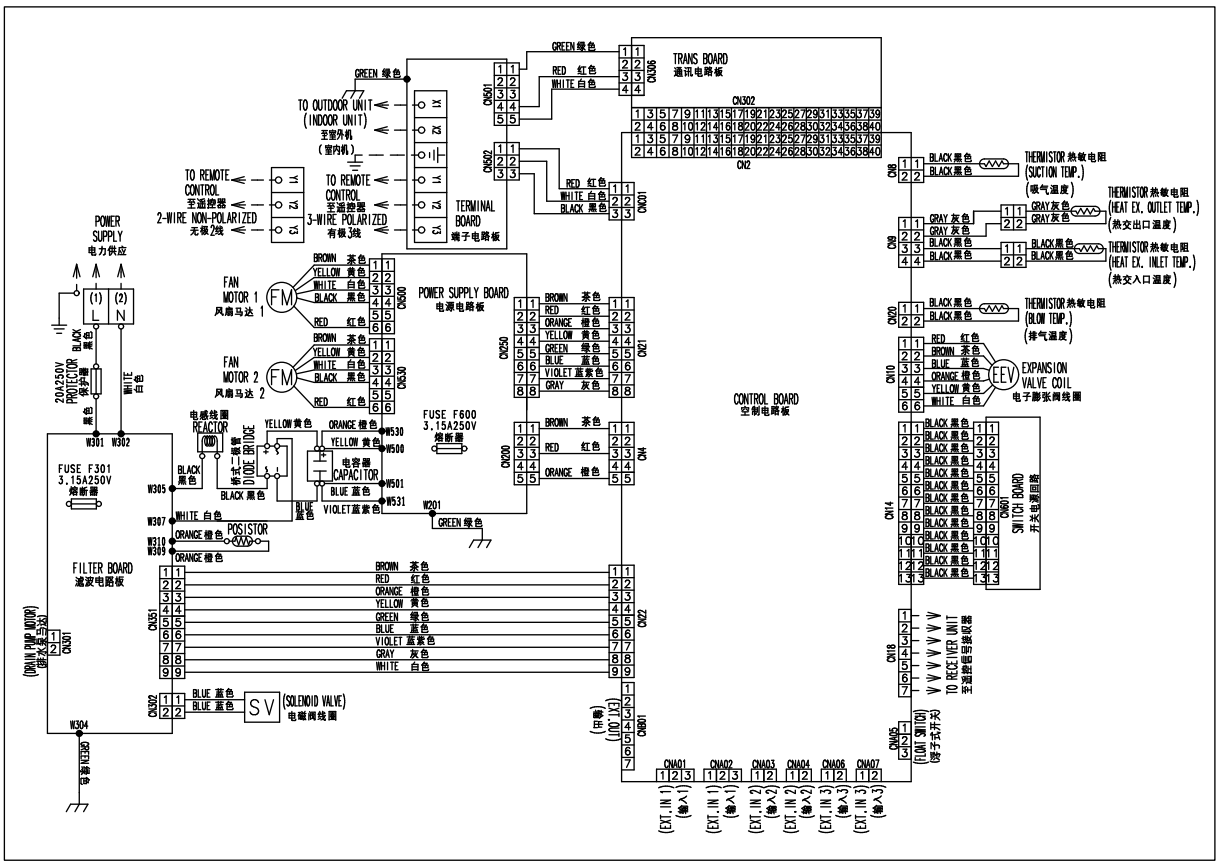
MODELS : AS*A18LACH, AS*A24LACH, AS*A30LACH



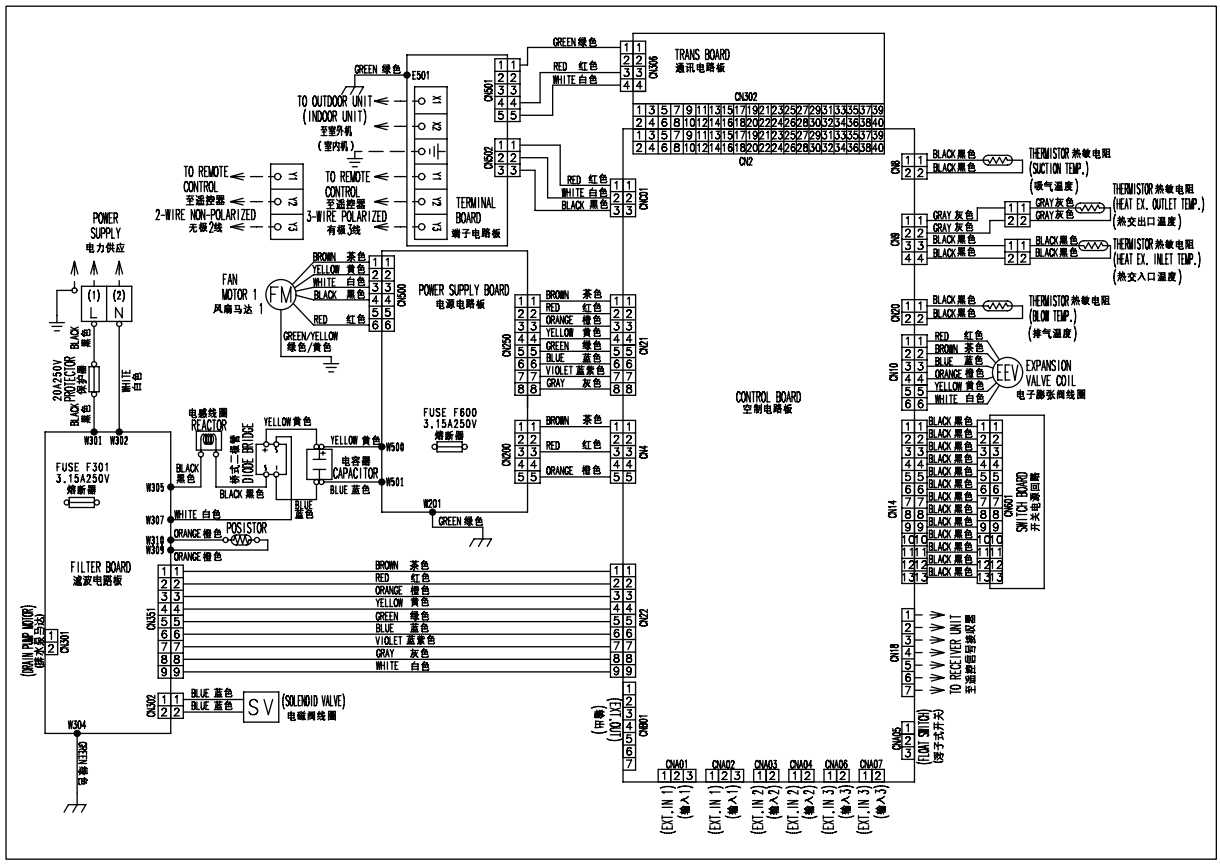
MODELS : ARXH054GTAH, ARQH140GTAH



MODELS : ARXH072GTAH, ARQH224GTAH

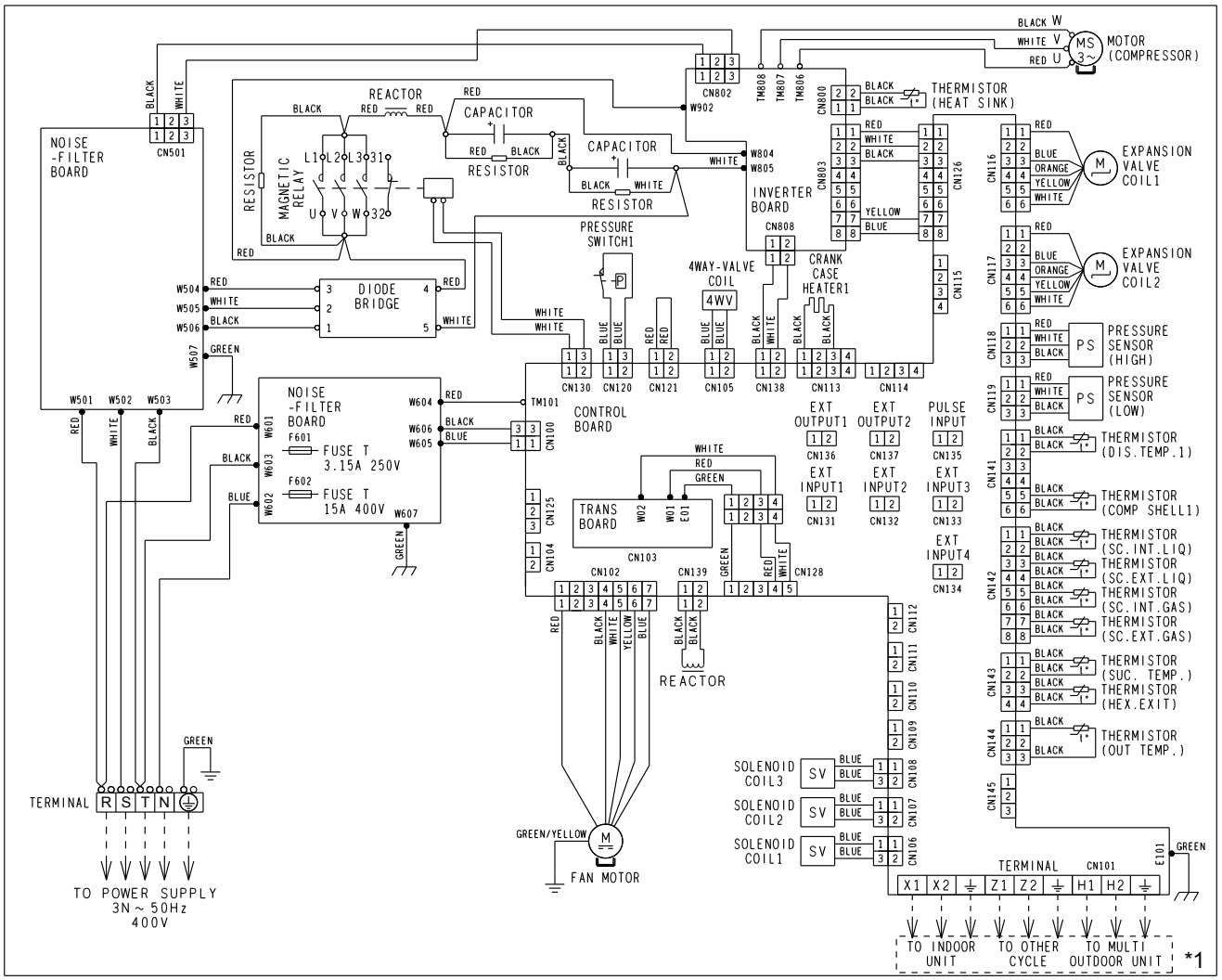


MODELS : ARXH096GTAH



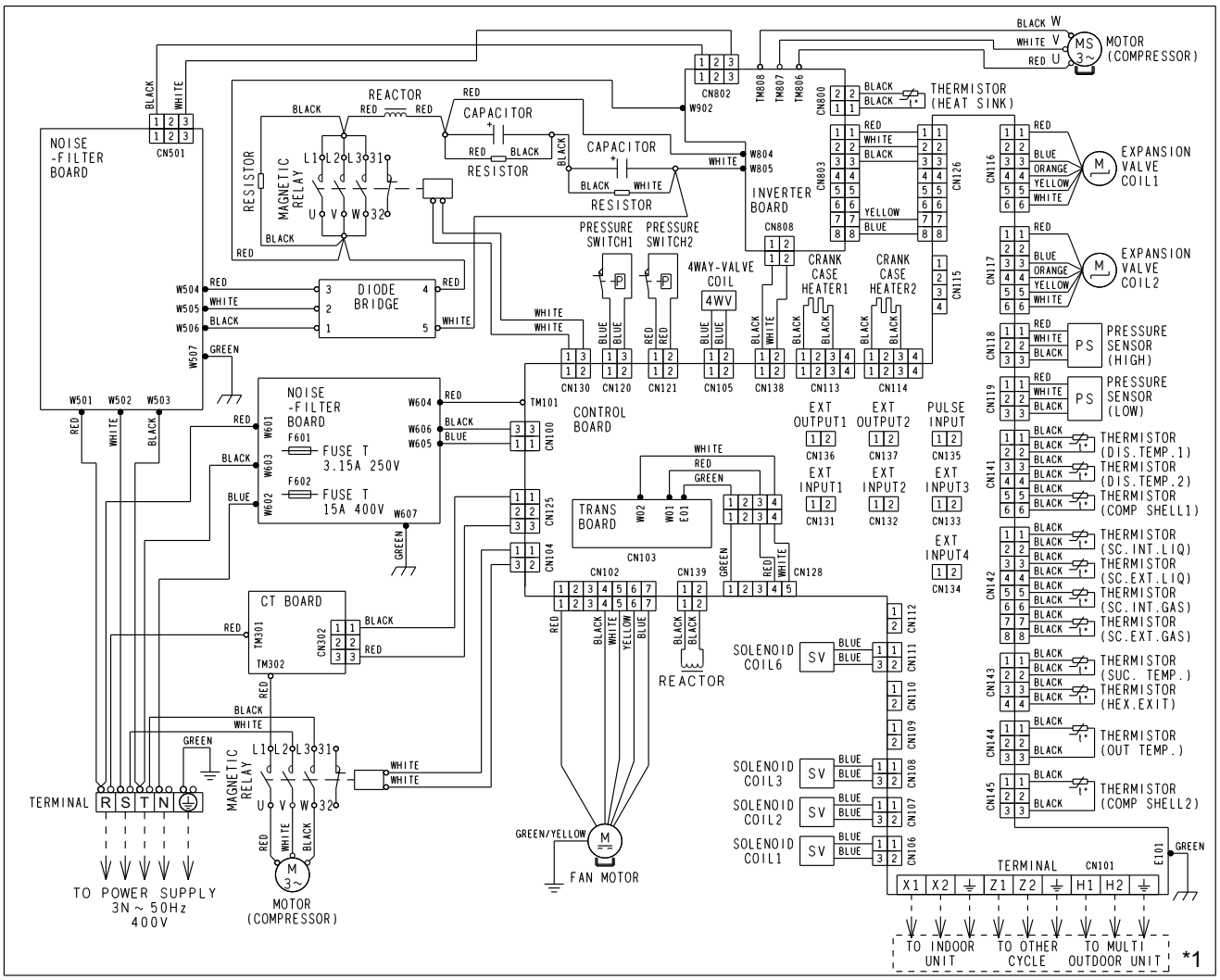
5-2-2 Outdoor Unit

MODELS : AJ＊A72LALH, AJ＊A90LALH



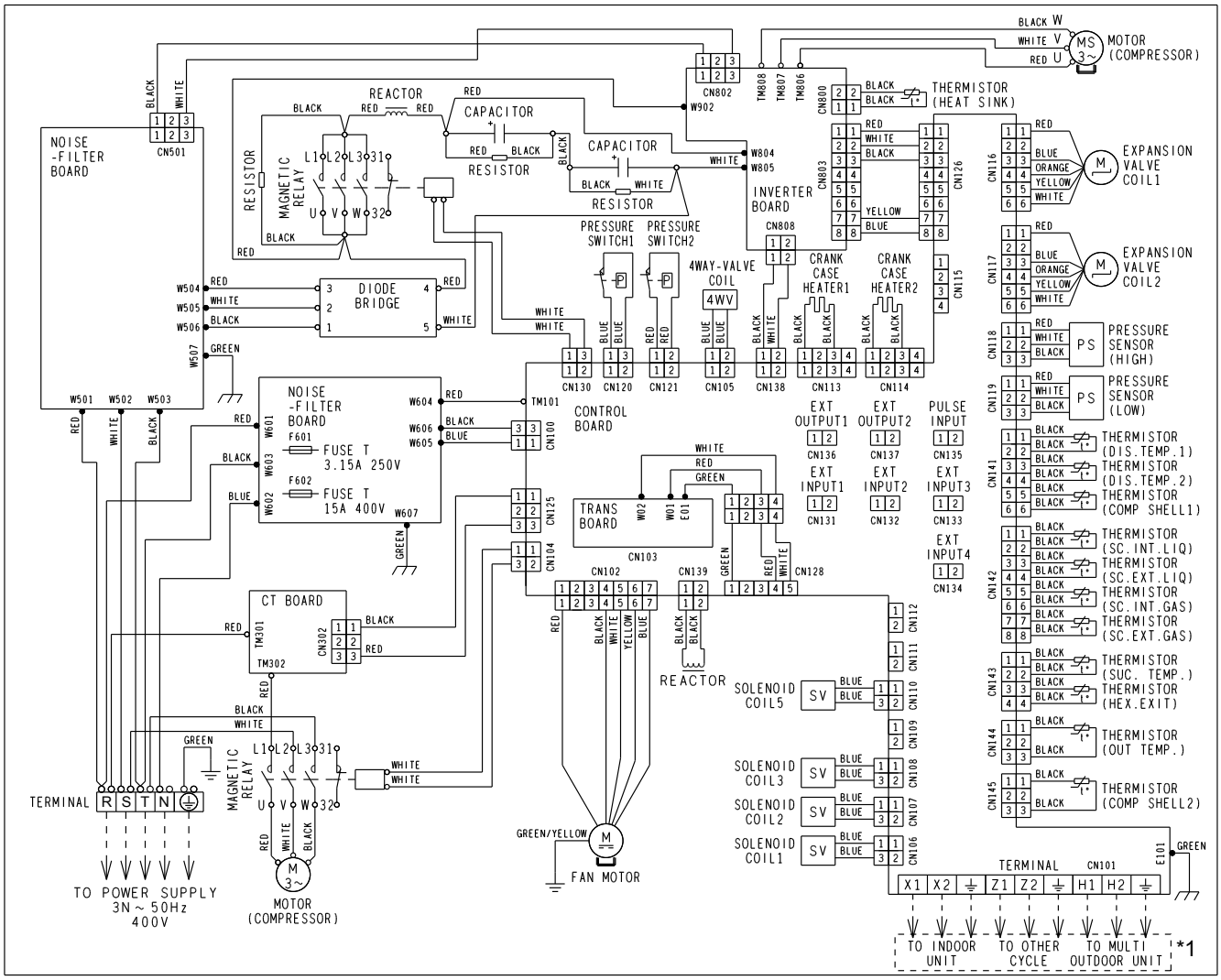
Note : *1
X1, X2 : To be connected to indoor units
Z1, Z2 : To be connected to other master outdoor unit
H1, H2 : To be connected to outdoor unit within same refrigerant system

MODEL : AJ＊108LALH



Note : *1
X1, X2 : To be connected to indoor units
Z1, Z2 : To be connected to other master outdoor unit
H1, H2 : To be connected to outdoor unit within same refrigerant system

MODELS : AJ＊126LALH, AJ＊144LALH

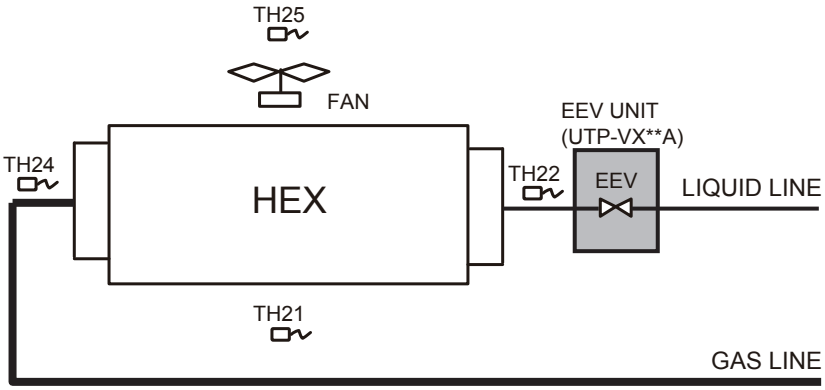


Note : *1
X1, X2 : To be connected to indoor units
Z1, Z2 : To be connected to other master outdoor unit
H1, H2 : To be connected to outdoor unit within same refrigerant system

5-2-3 DX-KIT

1 . REFRIGERANT CIRCUIT

MODELS: UTP-VX30A, UTP-VX60A, UTP-VX90A

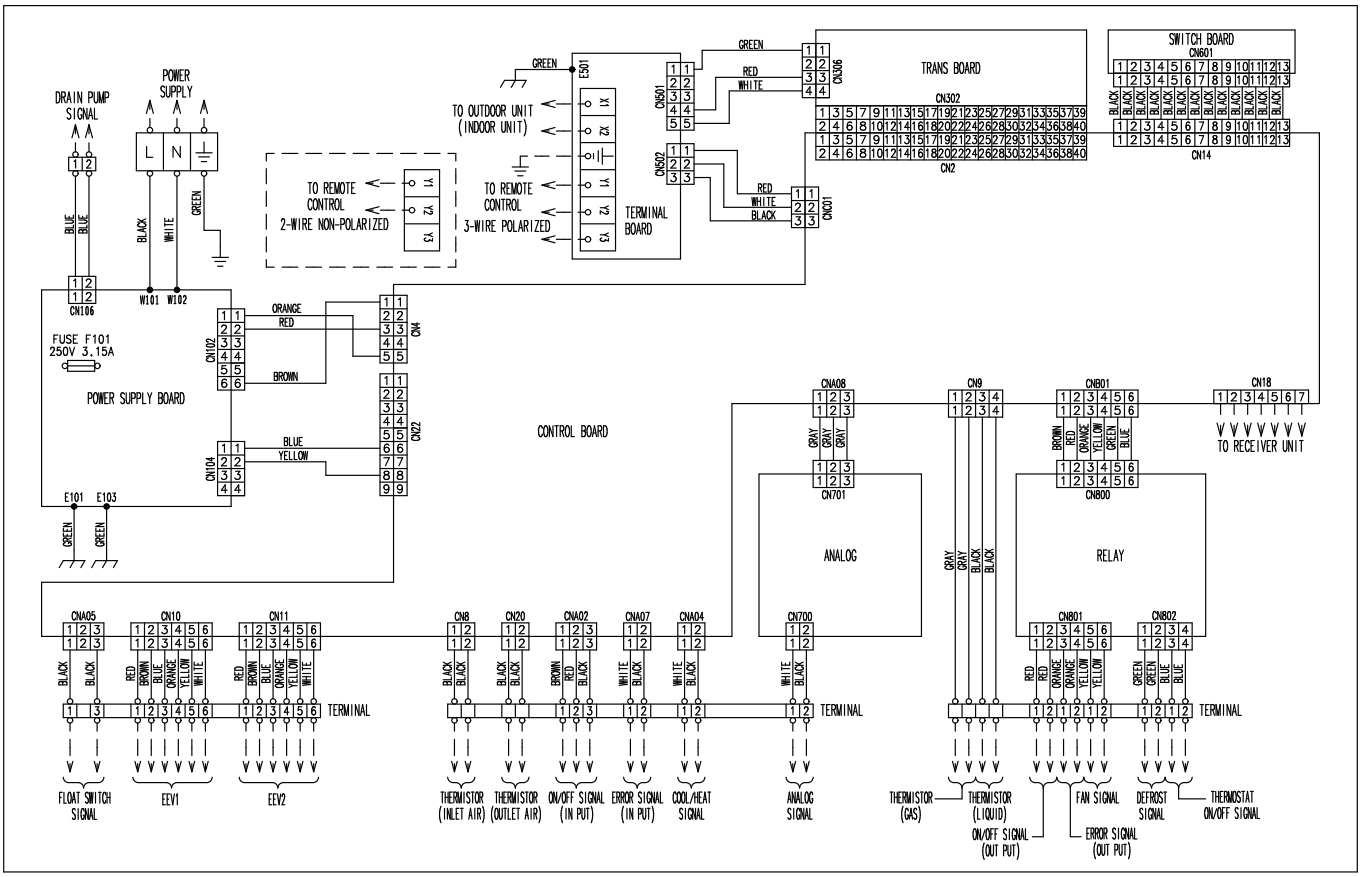


SYMBOL DESCRIPTION

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-VDGX



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					

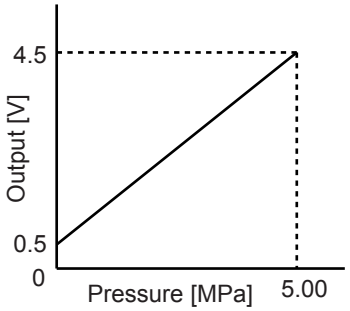
1	2	L	N	E
DRAIN PUMP OUTPUT		POWER SUPPLY		

X1	X2	E	Y1	Y2	Y3
TRANSMISSION TO OUTDOOR UNIT			TO REMOTE-CONTROL		

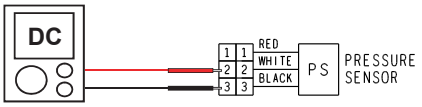
5-3 CHARACTERISTICS OF SENSORS

5-3-1 Pressure senser

1. Discharge Pressure Sensor



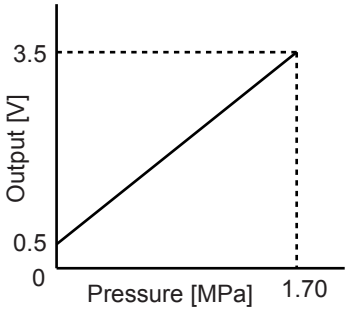
With the connector connected to the PCB, measure the voltage between CN118 : 2-3 of the Main PCB.



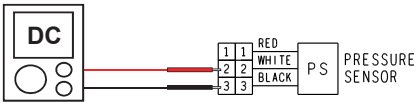
Pressure (MPa)	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.20	1.40	1.60	1.80	2.00
Output (V)	0.50	0.58	0.66	0.74	0.82	0.90	1.06	1.14	1.22	1.30	1.46	1.62	1.78	1.94	2.10

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



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	1.30	1.40	1.50	1.60	1.70
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	3.32	3.50

5-3-2 Thermistor resistance

Thermistor resistance value <Outdoor unit side>

Temperature [°C]	Resistance Value [kΩ]			
	Thermistor A	Thermistor B	Thermistor C	Thermistor D
- 20	---	---	105.4	---
- 10	---	27.8	58.2	27.4
- 5	---	21.0	44.0	20.7
0	168.6	16.1	33.6	15.8
5	129.8	12.4	25.9	12.2
10	100.9	9.6	20.2	9.5
15	79.1	7.6	15.8	7.5
20	62.6	6.0	12.5	5.9
25	49.8	4.8	10.0	4.7
30	40.0	3.8	8.0	3.8
40	26.3	2.5	5.3	2.5
50	17.8	1.7	3.6	1.7
60	12.3	1.2	---	1.2
70	8.7	---	---	0.8
80	6.3	---	---	0.6
90	4.6	---	---	0.4
100	3.4	---	---	0.3
110	2.6	---	---	---
120	2.0	---	---	---
Applicable Thermistors	Discharge temp. TH1 Discharge temp. TH2 Comp.1 temp. TH10 Comp.2 temp. TH11	Heat exchanger. TH5 Suction temp. TH4 Sub-cool heat exchanger (inlet) TH8 Sub-cool heat exchanger (outlet) TH9 Liquid temp.1 TH6 Liquid temp.2 TH7	Outdoor temp. TH3	Heat sink temp. TH (CN800)

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	25.2	20.1	15.8	12.5	10.0	8.0	6.5

Temperature (°C)	40	45	50
Resistance Value (kΩ)	5.3	4.3	3.5

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
Resistance Value (kΩ)	26.3	21.2	17.8

5-3-3 Saturation temperature and saturation pressure tables (R410A)

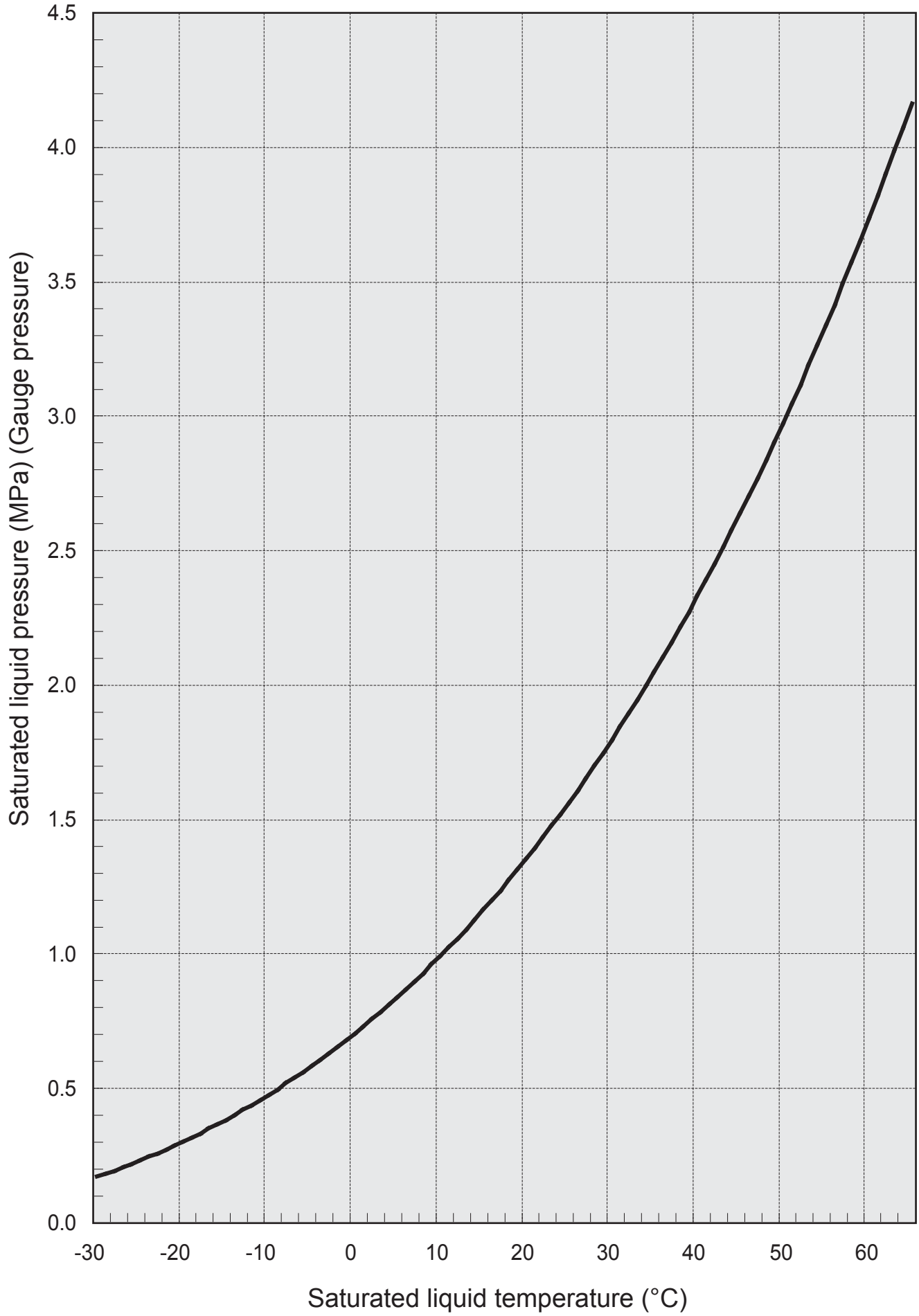
(Pressure: Gauge pressure)

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

5-3-4 Temperature and pressure of refrigerant (Graph)



Refrigerant R410A
INVERTER

AIRSTAGE™ V-II
Variable Refrigerant Flow System

6. DISASSEMBLY PROCESS

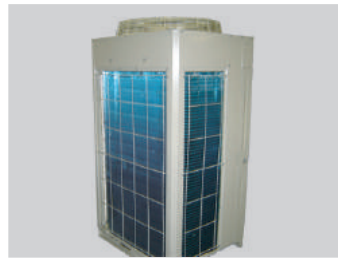
6. DISASSEMBLY PROCESS

⚠ WARNING

Before servicing the unit, turn the power supply switch OFF,
Then, do not touch electric parts for 10 minutes due to the risk of electric shock.

1. Appearance

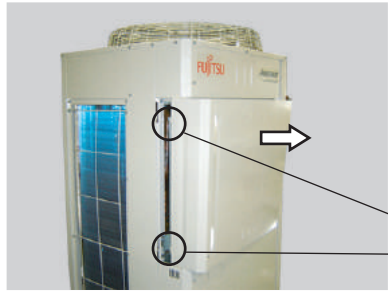
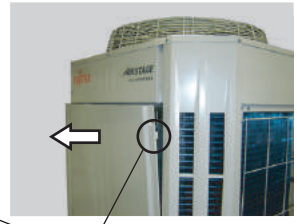




Model : AJYA72LALH

2. PANEL TOP removal

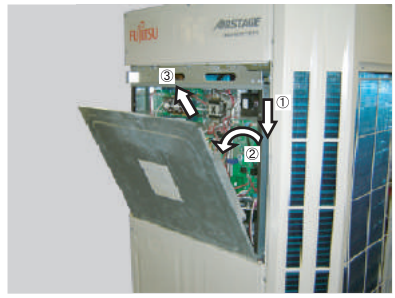
Remove the 4 mounting screws.

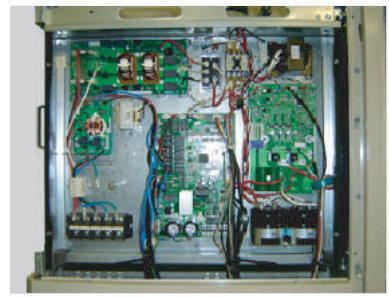



Remove the PANEL TOP
by sliding toward.

3. CONTROL BOX COVER removal

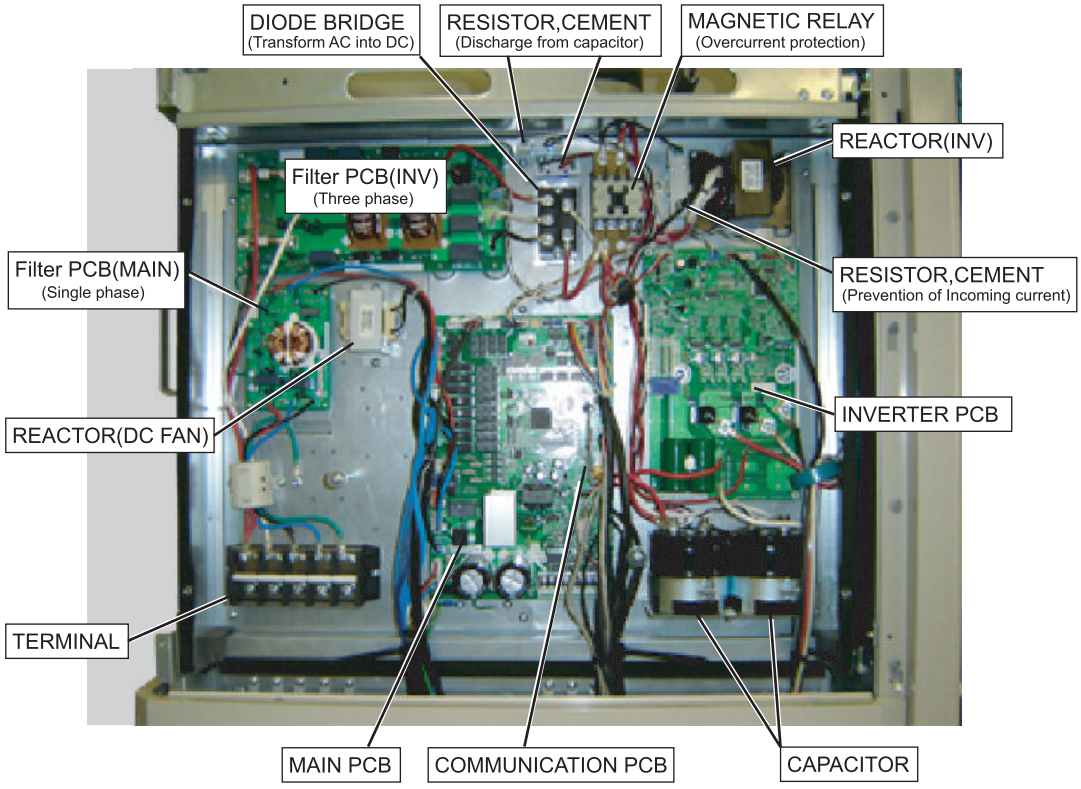
Remove the 4 mounting screws.





Remove the CONTROL BOX COVER
by sliding downward.

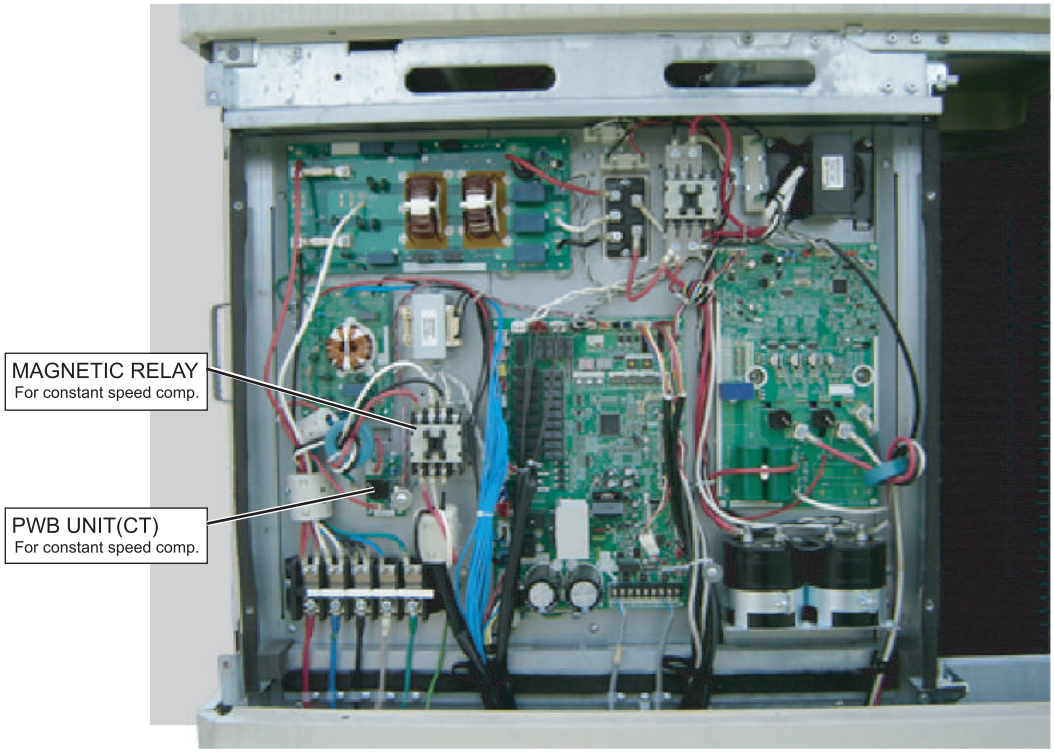
4. Layout plan in CONTROL BOX



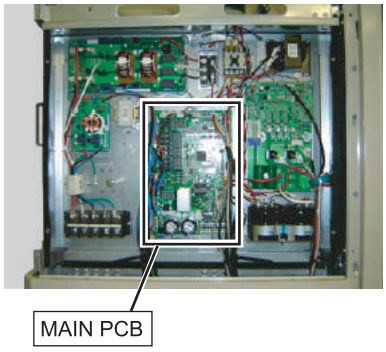
[REFERENCE DATA]

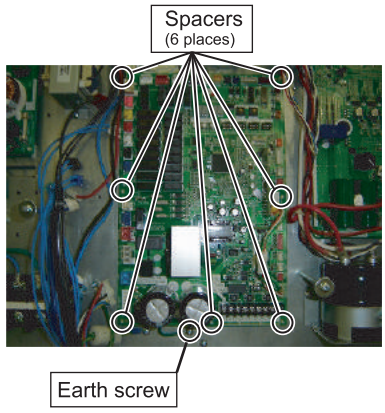
Model : AJY126LALF

(2 compressor model)



5. MAIN PCB removal





Remove the connectors and earth screw.
Remove the spacers.

⚠ CAUTION

The model name is written in MAIN PCB of the outdoor unit and indoor unit, and when the factory of the product is shipped, it is written.
However, the model name is not written in the MAIN PCB supplied for the repair.
When the following function is made to work, the written model name is needed.

1. Display of system list display in service tool or system controller
2. Display of refrigerant circuit diagram in service tool.
3. When you use the electricity charge calculation function as system controller or touch panel controller.

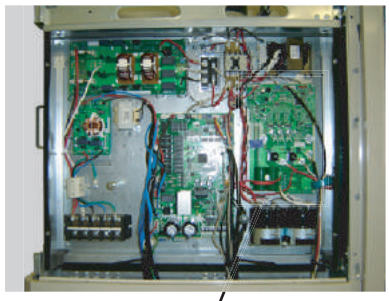
If the model name is not written,
the trouble such as the refrigerant circuit diagram is not displayed or the electricity charge calculation is not done accurately might occur.

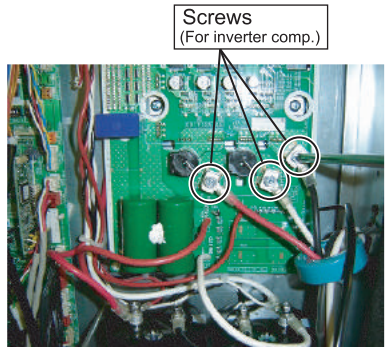
Therefore, please register the model name to each controller who uses it when you exchange MAIN PCB by the repair.

1. Model name registration to service tool
   Please register the model name with the system list template file.
   (Please see the operation manual of the service tool for details)

2. Model name registration to system controller
   Please register the model name by the electricity charge calculation setting.
   (Please see the operation manual of system controller for details)

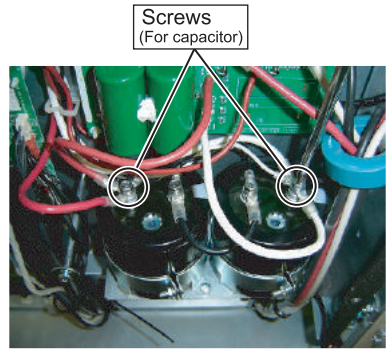
6. INVERTER PCB removal





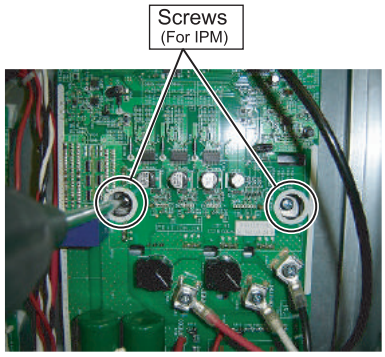
Remove the 3 mounting screws and codes.

Note the tightening torque at the installation.
Tightening torque is 2.5±0.2N•m



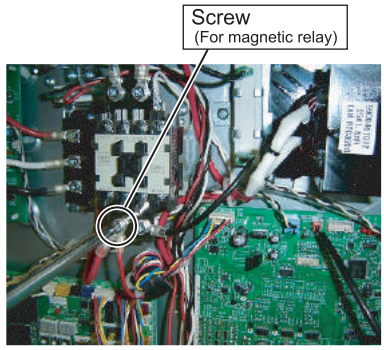
Remove the 2 mounting screws and codes.

Note the tightening torque at the installation.
Tightening torque is 2.5±0.2N•m



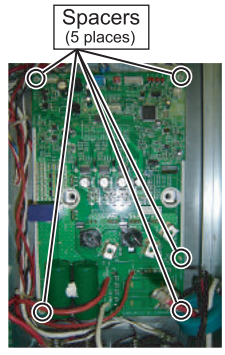
Remove the 2 mounting screws.

Note the tightening torque at the installation.
Tightening torque is 3.0±0.2N•m

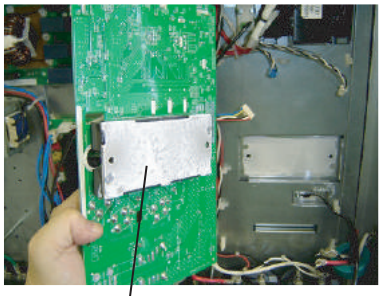


Remove the mounting screw and codes.

Note the tightening torque at the installation.
Tightening torque is 1.5 to 1.8N•m

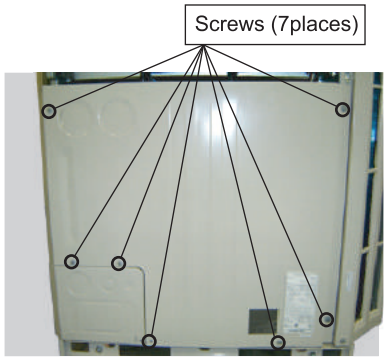


Remove the connectors and spacers.

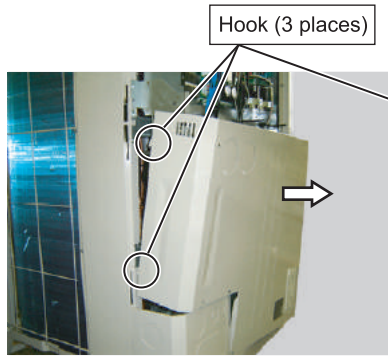


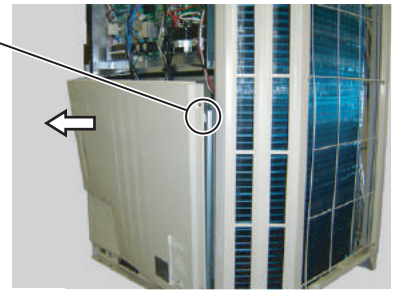
Spread the heat dissipation compound on the other side of IPM when you exchange INVERTER PCB by the repair.

7. PANEL BTM removal



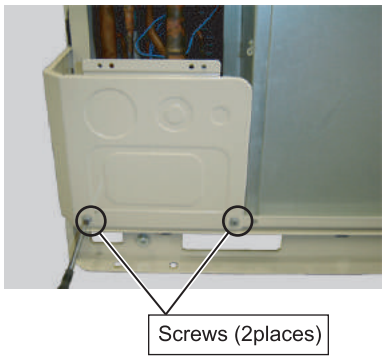
Remove the 7 mounting screws.



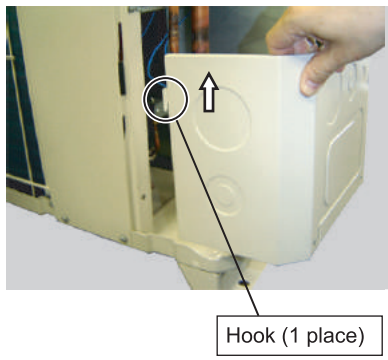


Remove the PANEL BTM
by sliding toward.

8. CONDUIT PLATE removal

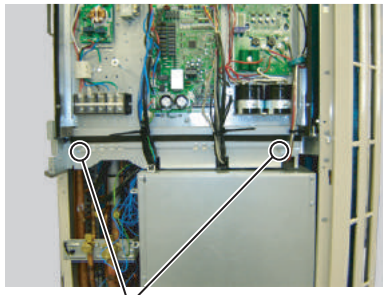


Remove the 2 mounting screws.

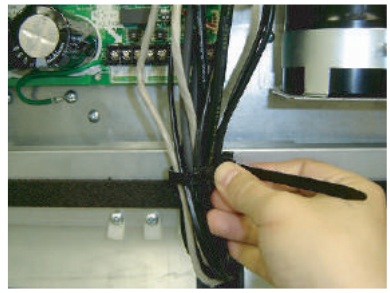


Remove the CONDUIT PLATE
by sliding upward.

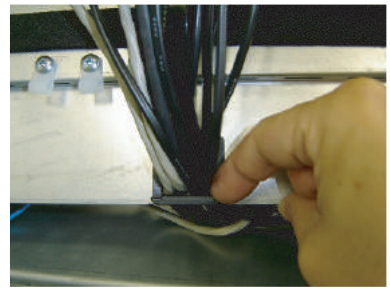
9. CONTROL BOX open



Remove the 2 mounting screws.

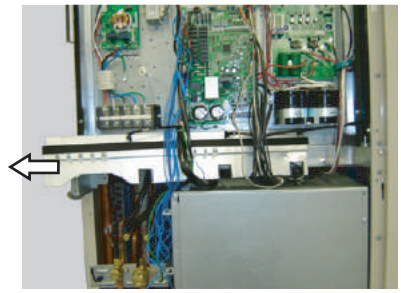


Loose the binders.(3 places)

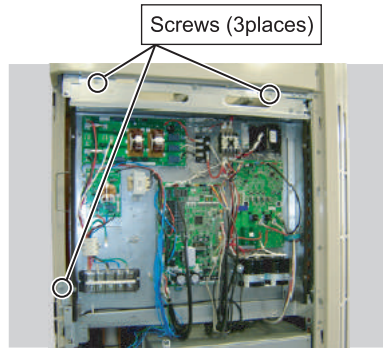


Remove the locking stopper of edging saddle.(3 places)

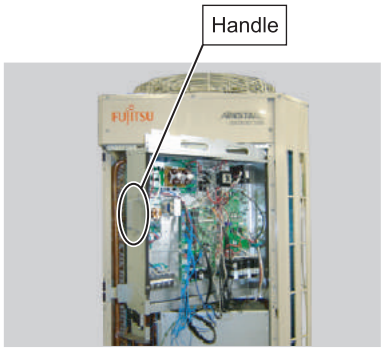
Remove the wires from edging saddle. (3 places)



Remove the WIRE PLATE by sliding leftward.



Remove the 3 mounting screws.



Open the CONTROL BOX with handle.

10. THERMISTORS removal

Cut the binder.

Remove the heat insulation.

11. SOLENOID COILS (4way valve and Solenoid valves) removal

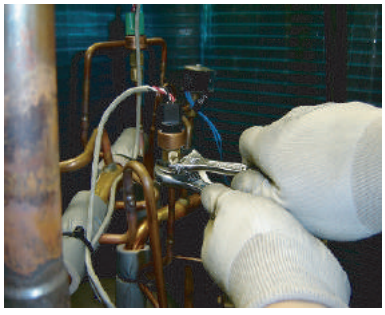
Remove the mounting screw.

Remove the SOLENOID COIL.

12. EEV COILS removal

Remove the EEV coil by hand.
There are two coils.

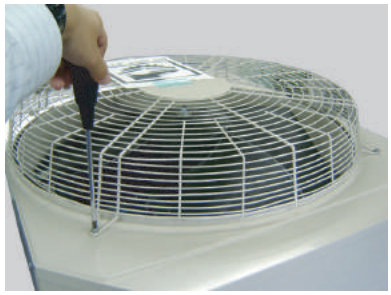
13. PRESSURE SENSORS removal



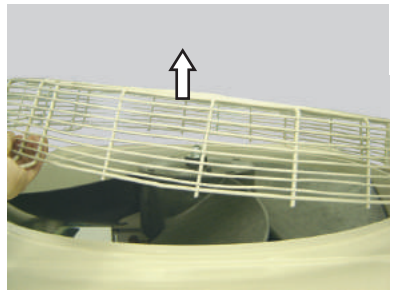
Remove the PRESSURE SENSOR with wrench.
There are two sensors.
(High and Low pressure)

Note the tightening torque at the installation.
Tightening torque is 15±1.5N•m.

14. FAN MOTOR removal



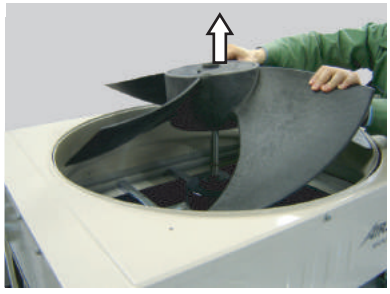
Remove the 4 mounting screws.



Remove the FAN GUARD.

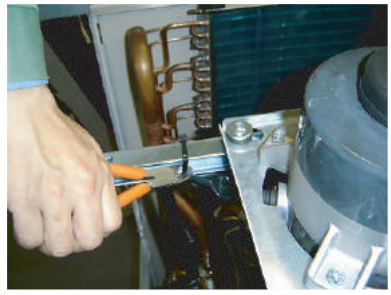
Remove the nut.

Note the tightening torque at the installation.
Tightening torque is from 15 to 20N·m.

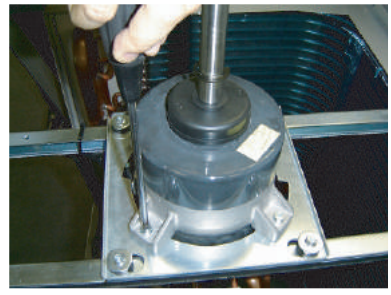


Remove the PROPELLER FAN.

Note at the installation.
Insert propeller Fan and Moter shaft reference D cutting position.

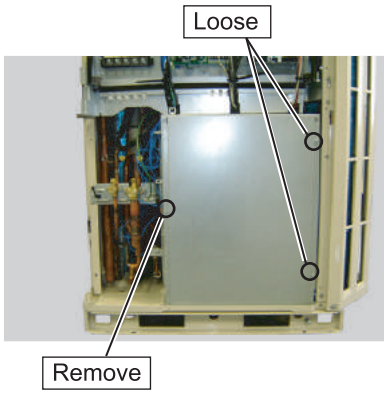


Cut the binder.

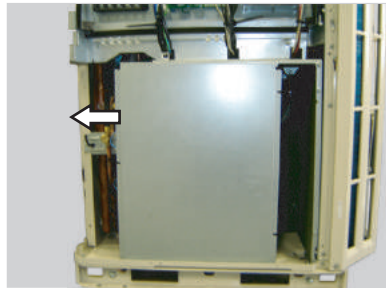


Remove the 4 mounting screws.
Remove the FAN MOTOR.

15. COMP BOX COVER removal



Loose the 2 mounting screws.
Remove the a mounting screw.



Remove the COMP BOX COVER
by sliding leftward.

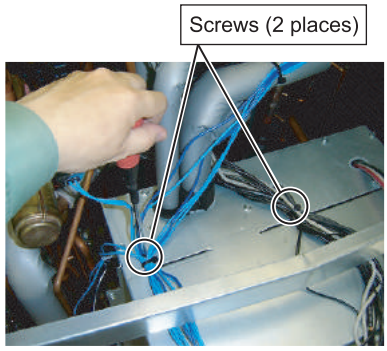
16. COMPRESSOR removal

Precautions for exchange of Compressor.

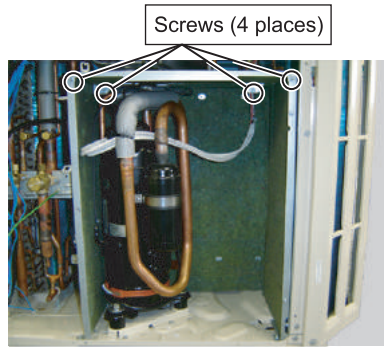
Do not allow moisture or debris to get inside refrigerant pipes during work.

Procedure for compressor removal.

(1) Turn off power.
(2) Remove the PANEL TOP and PANEL BTM.
(3) Fully close the 3WAY VALVE(GAS) and 3WAY VALVE(LIQUID).
(4) Collect the refrigerant from the service port.
Start the following work after completely collecting the refrigerant.
Do not reuse the refrigerant that has been collected.



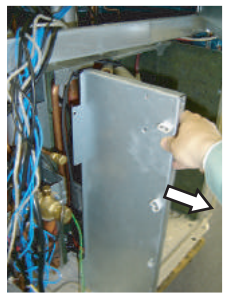
Remove the 2 mounting screws.
Remove the wires.



Remove the 4 mounting screws.

Remove the COMP BOX TOP
by sliding toward.

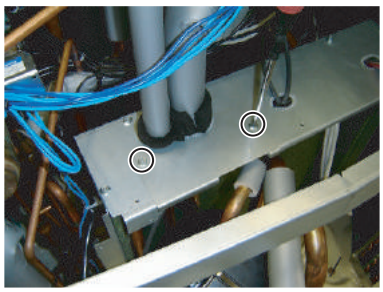
Remove the
3 mounting screws.



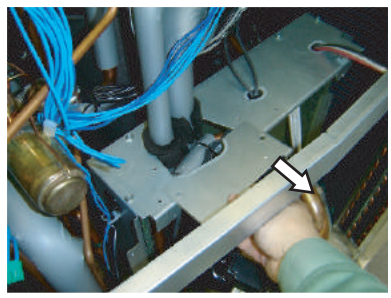
Remove the COMP BOX L
by sliding toward.

Remove the
mounting screw.

Remove the COMP BOX R
by sliding toward.



Remove the 2 mounting screws.

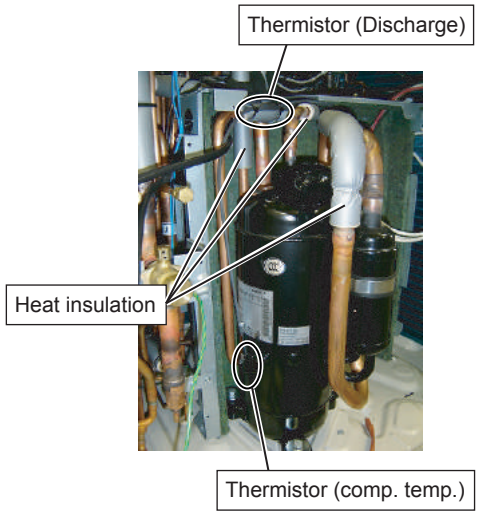


Remove the ROOF PLATE
by sliding toward.

Remove the TERMINAL COVER.

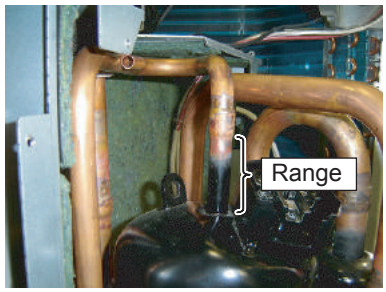
Remove the 3 mounting screws of TERMINAL.
[U : RED, W : BLACK, V : WHITE]

Remove the CRANK CASE HEATER.

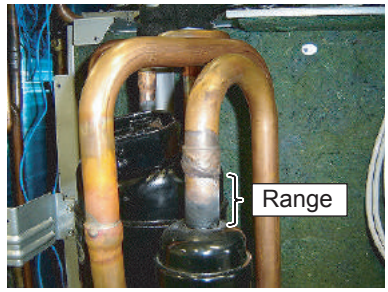


Remove the Thermistor (comp.temp.) and Thermistor (Discharge).
Remove the heat insulations.

Remove the COMP BOLTS.
(3 places)



Cut the Discharge pipe in this range.

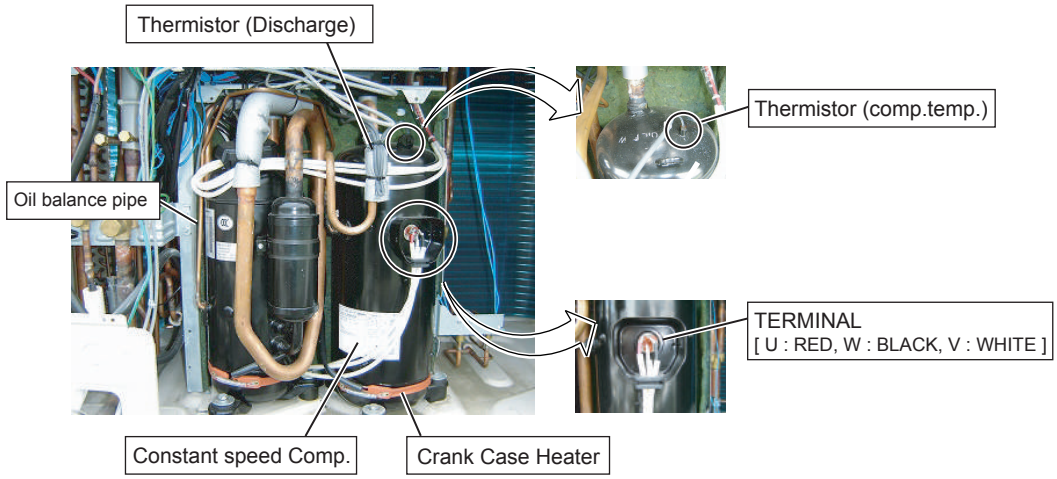


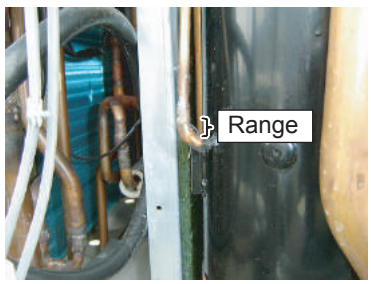
Cut the Suction pipe in this range.
Remove the COMPRESSOR.

Caution
- Keep their shape better.
- There is a possibility of catching fire to oil when removing by the welding without cutting it.

[REFERENCE DATA]

Model : AJY126LALF (2 compressor model)

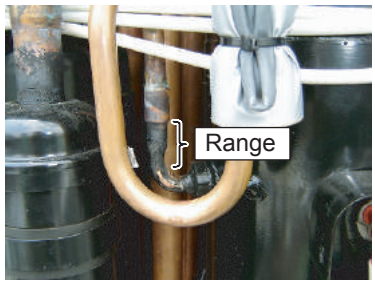




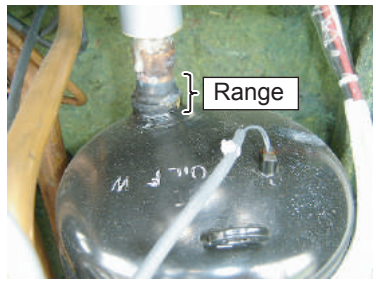
Caution

・Oil flows out when piping is cut when a lot of oil remains. So receive oil with the rag etc.

Cut the Oil balance pipe in this range.



Cut the Discharge pipe in this range.



Cut the Suction pipe in this range.

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. Precautions for exchange of refrigerant-cycle-parts

(1) During exchange the following parts shall be protected by wet rag and not make the allowable temperature or more.
(2) Remove the heat insulation when there is the heat insulation 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 flame seems to hit the following parts directly.
(5) Do not allow moisture or debris to get inside refrigerant pipes during work.
(6) When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

Part name	Allowable temperature	Precautions in work	Applicable Outdoor unit (HP)				
			08	10	12	14	16
SOLENOID VALVE 1 /2 /3	200°C	Remove the coil before brazing. And install the coil after brazing.	○	○	○	○	○
SOLENOID VALVE 5			–	–	–	○	○
SOLENOID VALVE 6			–	–	○	–	–
EXPANSION VALVE 1 /2	120°C	Remove the coil before brazing. And install the coil after brazing.	○	○	○	○	○
4WAY VALVE	120°C	Remove the suction temp. sensor before brazing. And install the suction temp. sensor after brazing.	○	○	○	○	○
CHECK VALVE	120°C		○	○	○	○	○
3WAY VALVE (GAS)	100°C		○	○	○	○	○
3WAY VALVE (LIQUID)			○	○	○	○	○
RELIEF VALVE	120°C		○	○	○	○	○
UNION JOINT	100°C	Remove the pressure sensor before brazing. And install the pressure sensor after brazing.	○	○	○	○	○
HIGH PRESSURE SENSOR	100°C	Tighten the flare part gripping it. (Tightening torque :15±1.5N·m) Do the static electricity measures.	○	○	○	○	○
LOW PRESSURE SENSOR			○	○	○	○	○
PRESSURE SWITCH	100°C		○	○	○	○	○

AIRSTAGE™ V-II

Variable Refrigerant Flow System

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Product specifications are subject to change without notice.

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