DAIKIN

SERVICE MANUAL

Inverter Wall Mounted Single Split

MODELS

FTXN25/35/50/60L	RXN25/35/50/60L
FTXN25/35/50/60M	RXN25/35/50/60M
FTXK25/35/50/60A	RXK25/35/50/60A
FTXN25/35/50/60N	RXN25/35/50/60N
FTXC25/35/50/60A	RXC25/35/50/60A
FTXB50/60A	RXB50/60A
FTXB50/60B	RXB50/60B
FTXB50/60C	RXB50/60C
ATXN25/35/50/60L	ARXN25/35/50/60L
ATXN25/35/50/60M	ARXN25/35/50/60M
ATXN25/35/50/60N	ARXN25/35/50/60N
ATXB50/60C	ARXB50/60C

SM-5WM-Y-EU-A3

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Safety Cautions

Caution and warnings

- Be sure to read the following safety cautions before conducting repair work.
- The caution items are classified into "⚠ **Warning**" and "⚠ **Caution**". The "⚠ **Warning**" items are especially important since they can lead to death or serious injury if they are not followed closely. The "⚠ **Caution**" items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.
- About the pictograms

△ This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.

○ This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.

● This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.

- After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer.

Caution in Repair

⚠ Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

⚠ Caution	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

Cautions Regarding Products after Repair

⚠ Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

⚠ Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	

Inspection after Repair

⚠ Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock,excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.	

⚠ Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 Mohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.0 Inverter Single Split

1.1 Product line-up

1.1.1 Indoor Unit

Nomenclature	Classification													
	Handset		PCB						Air Purification		Marking			Others
	BRC52A61	BRC52B63	W_2_03C	W_2_03D	W_2_03E	W_2_03E_M	W_2_04A	W_2_04B	Saranet Filter	Titanium Apatite	CE	GOST	EAC	Auto Restart
FTXN25/35LV1B	X		X						X	X	X	X		X
FTXN50/60LV1B	X						X		X	X	X	X		X
ATXN25/35LV1B	X		X						X		X			X
ATXN50/60LV1B	X						X		X		X			X
FTXB50/60AV1B	X						X		X		X			X
FTXB50/60BV1B	X						X		X		X			X
FTXN25/35MV1	X		X						X	X	X	X		X
FTXN50/60MV1	X						X		X	X	X	X		X
FTXN25/35MV1B	X			X					X	X	X		X	X
FTXN50/60MV1B	X						X		X	X	X		X	X
FTXN25/35MV1B9	X		X						X		X			X
FTXN50/60MV1B9	X						X		X		X			X
ATXN25/35MV1B	X		X						X		X			X
ATXN50/60MV1B	X						X		X		X			X
ATXN25/35MV1B7	X		X						X		X		X	X
ATXN50/60MV1B7	X						X		X		X		X	X
ATXN25/35MV16	X			X					X	X			X	X
ATXN50/60MV16	X						X		X	X			X	X
FTXK25/35AV1BW		X				X			X		X		X	X
FTXK50/60AV1BW		X						X	X		X		X	X
FTXK25/35AV1BS		X				X			X		X		X	X
FTXK50/60AV1BS		X						X	X		X		X	X
FTXN25/35NV1B	X				X				X	X	X			X
FTXN50/60NV1B	X							X	X	X	X			X

1.1.1 Indoor Unit

Nomenclature	Classification													
	Handset		PCB						Air Purification		Marking			Others
	BRC52A61	BRC52B63	W_2_03C	W_2_03D	W_2_03E	W_2_03E_M	W_2_04A	W_2_04B	Saranet Filter	Titanium Apatite	CE	GOST	EAC	Auto Restart
ATXN25/35NV1B	X				X				X	X	X			X
ATXN50/60NV1B	X							X	X	X	X			X
ATXN25/35NV1B9	X				X				X	X	X			X
ATXN50/60NV1B9	X							X	X	X	X			X
ATXN25/35NV1B7	X				X				X		X			X
ATXN50/60NV1B7	X							X	X		X			X
FTXB50/60CV1B	X						X		X	X	X		X	X
ATXB50/60CV1B	X						X		X	X	X			X
FTXC25/35AV1B	X				X				X	X	X			X
FTXC50/60AV1B	X							X	X	X	X			X

1.1.2 Outdoor Unit

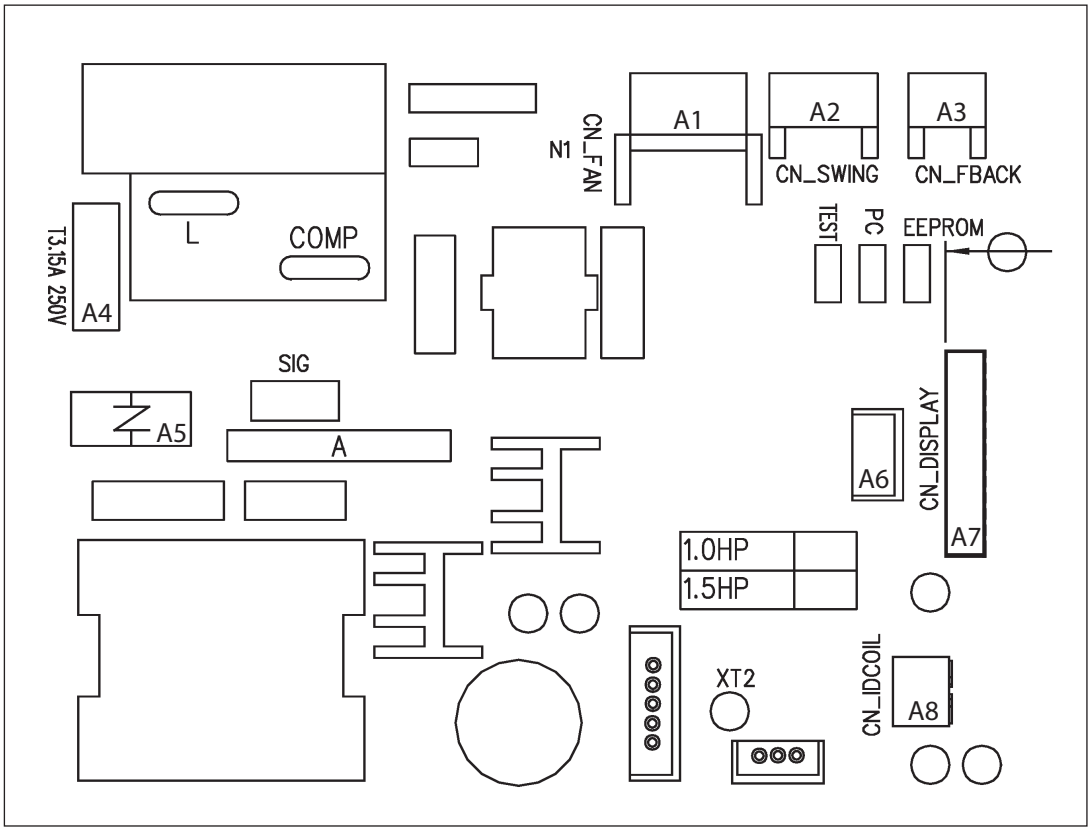
Nomenclature	Classification									
	PCB		Refrigerant Control	Fin		Compressor	Marking			Others
	OYL Board	DKR Board	EXV	Hydrophilic (Blue)	Hydrophilic (Gold)	DC Inverter Swing	CE	GOST	EAC	Drain Elbow
RXN25/35LV1B9		X	X	X		X	X	X		X
RXN50/60LV1B9	X		X	X		X	X	X		X
ARXN25/35LV1B		X	X		X	X	X			X
ARXN50/60LV1B	X		X		X	X	X			X
RXB50/60AV1B	X		X	X		X	X			X
RXB50/60BV1B		X	X	X		X	X			X
RXN25/35MV1		X	X	X		X	X	X		X
RXN50/60MV1		X	X	X		X	X	X		X
RXN25/35MV1B		X	X	X		X	X		X	X
RXN50/60MV1B		X	X	X		X	X		X	X
RXN25/35MV1B9		X	X	X		X	X			X
RXN50/60MV1B9		X	X	X		X	X			X
ARXN25/35MV1B		X	X		X	X	X			X
ARXN50/60MV1B		X	X		X	X	X			X
ARXN25/35MV1B7		X	X		X	X	X		X	X
ARXN50/60MV1B7		X	X		X	X	X		X	X
ARXN25/35MV16		X	X		X	X			X	X
ARXN50/60MV16		X	X		X	X			X	X
RXK25/35AV1B		X	X	X		X	X		X	X
RXK50/60AV1B		X	X	X		X	X		X	X
RXN25/35NV1B		X	X	X		X	X			X
RXN50/60NV1B		X	X	X		X	X			X
ARXN25/35NV1B		X	X	X		X	X			X
ARXN50/60NV1B		X	X	X		X	X			X
ARXN25/35NV1B9		X	X	X		X	X			X
ARXN50/60NV1B9		X	X	X		X	X			X
RXB50/60CV1B		X	X	X		X	X		X	X
ARXB50/60CV1B		X	X	X		X	X			X
RXC25/35AV1B		X	X	X		X	X			X
RXC50/60AV1B		X	X	X		X	X			X

1.2 Printed Circuit board (PCB) connector wiring diagram

1.2.1 Indoor PCB: FTXN25/35L, FTXN25/35MV1, FTXN25/35MV1B9, ATXN25/35L, ATXN25/35MV1B, ATXN25/35MV1B7

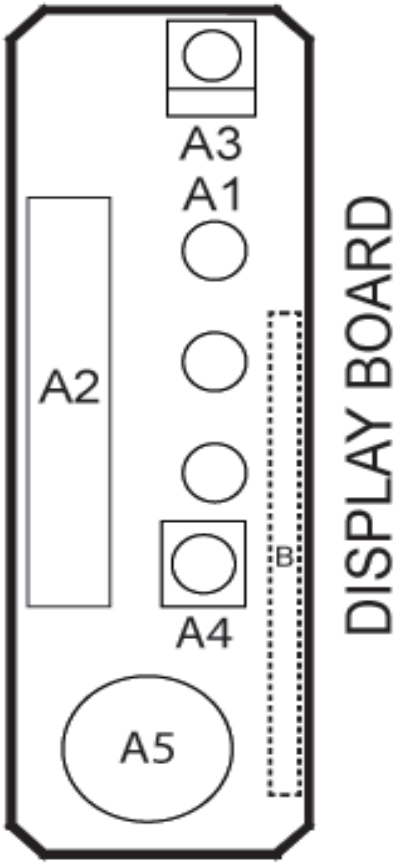
1.2.1.1 Main PCB: W_2_03C

Item	Indication on PCB	Description
1	A1	Connector for fan motor
2	A2	Connector for swing motor
3	A3	Connector for fan motor feedback
4	A4	Fuse
5	A5	Varistor
6	A6	Connector for wired handset
7	A7	Connector for signal receiver PCB
8	A8	Connector for heat exchanger thermistor



1.2.1.2 Signal board

Item	Indication on PCB	Description
1	A1	Operational LED
2	A2	Connector for Control PCB
3	A3	Handset signal receiver
4	A4	Operation ON/OFF switch
5	A5	Buzzer



Applicable Model :

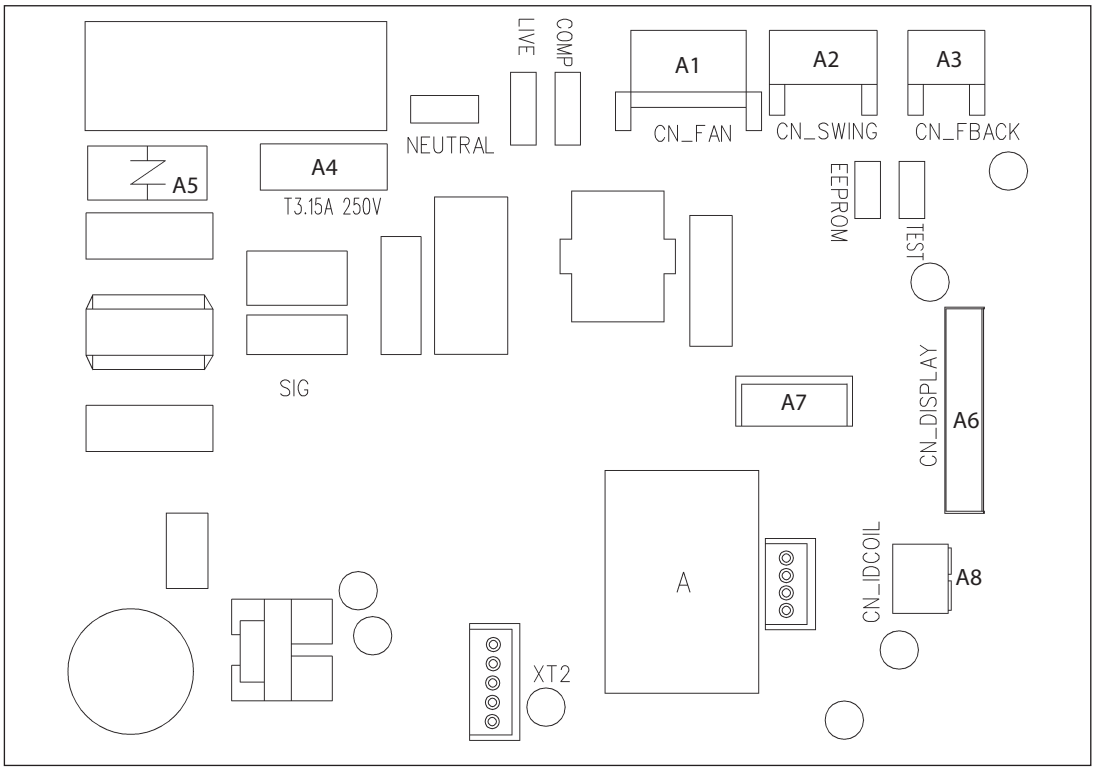
FTXN25/35L, FTXN25/35MV1, FTXN25/35MV1B9,

ATXN25/35L, ATXN25/35MV1B, ATXN25/35MV1B7

1.2.2 Indoor PCB: FTXN25/35MV1B, FTXN25/35N, FTXK25/35A, FTXC25/35A, ATXN25/35MV16, ATXN25/35N

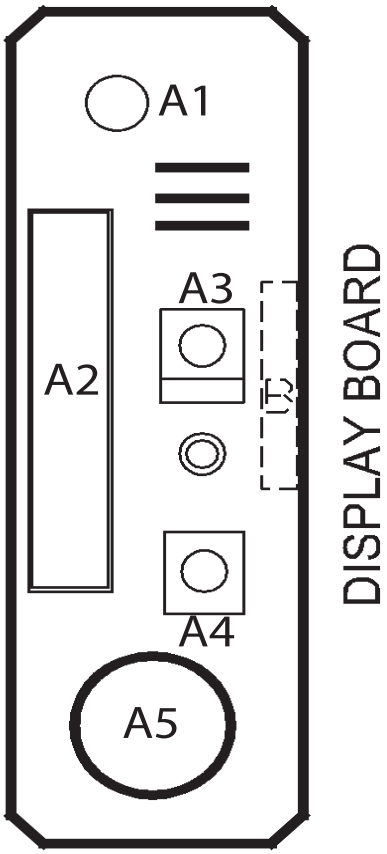
1.2.2.1 Main PCB: W_2_03D ; W_2_03E ; W_2_03E_M

Item	Indication on PCB	Description
1	A1	Connector for fan motor
2	A2	Connector for swing motor
3	A3	Connector for fan motor feedback
4	A4	Fuse
5	A5	Varistor
6	A6	Connector for wired handset
7	A7	Connector for signal receiver PCB
8	A8	Connector for heat exchanger thermistor



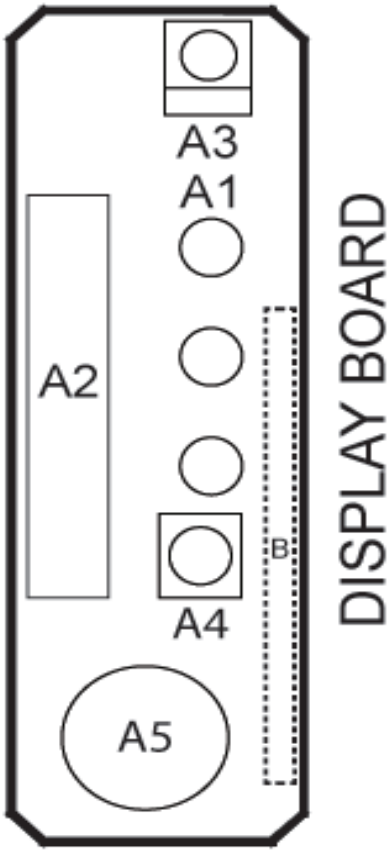
1.2.2.2 Signal board

Item	Indication on PCB	Description
1	A1	Operational LED
2	A2	Connector for Control PCB
3	A3	Handset signal receiver
4	A4	Operation ON/OFF switch
5	A5	Buzzer



Applicable Model :

FTXK25/35A



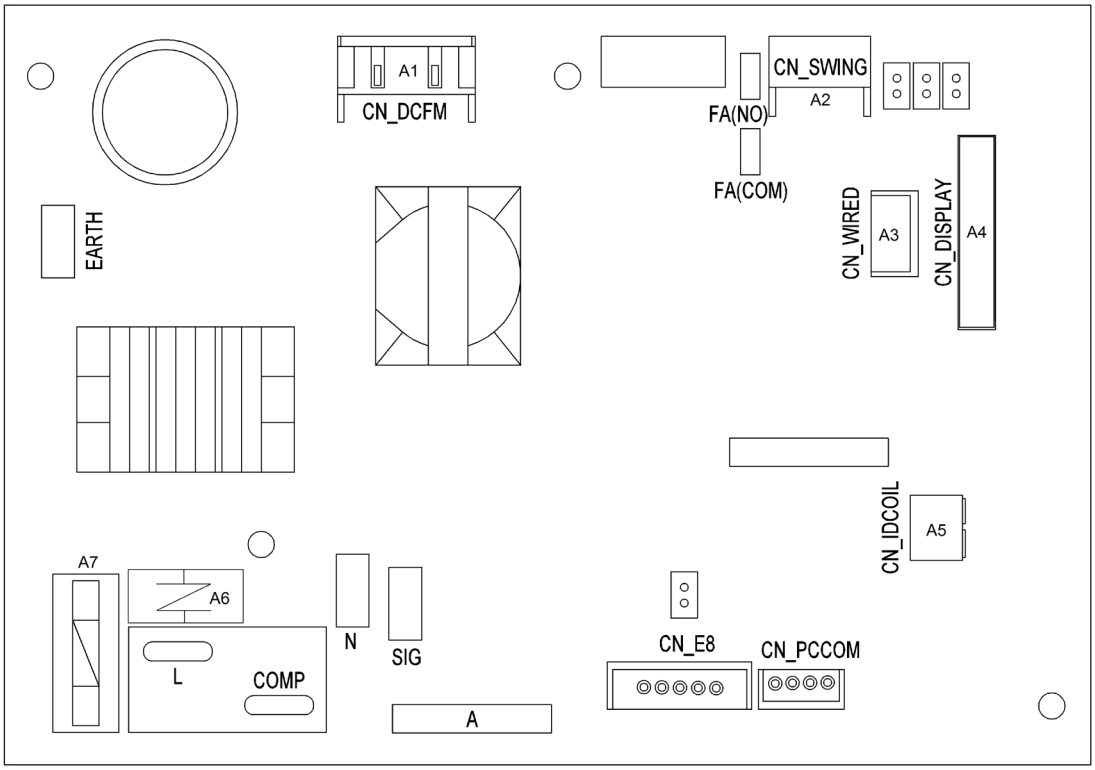
Applicable Model :

FTXN25/35MV1B, FTXN25/35N, FTXC25/35A, ATXN25/35MV16, ATXN25/35N

1.2.3 Indoor PCB: FTXB50/60A, FTXB50/60B, FTXB50/60C, FTXN50/60L, FTXN50/60M, FTXN50/60N, FTXK50/60A, FTXC50/60A, ATXB50/60C, ATXN50/60L, ATXN50/60M, ATXN50/60N

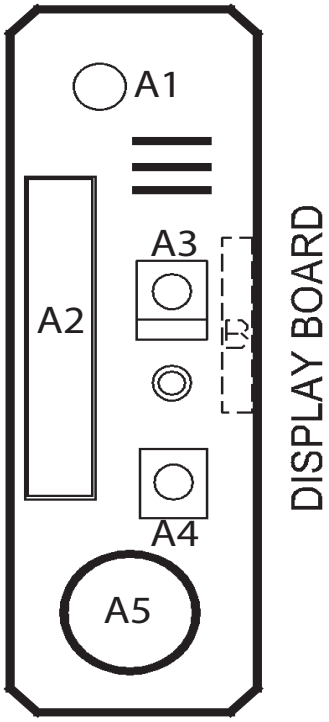
1.2.3.1 Main PCB: W_2_04A ; W_2_04B

Item	Indication on PCB	Description
1	A1	Connector for fan motor
2	A2	Connector for swing motor
3	A3	Connector for fan motor feedback
4	A4	Fuse
5	A5	Varistor
6	A6	Connector for wired handset
7	A7	Connector for signal receiver PCB



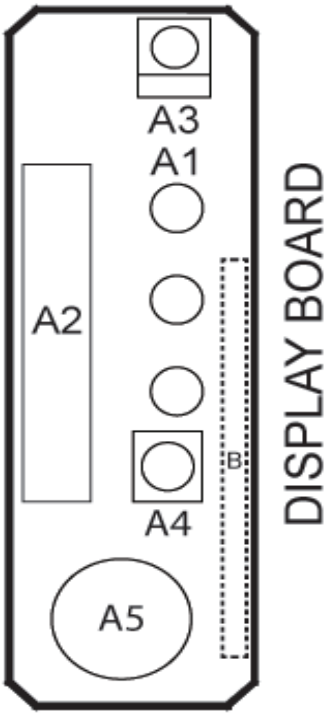
1.2.3.2 Signal board

Item	Indication on PCB	Description
1	A1	Operational LED
2	A2	Connector for Control PCB
3	A3	Handset signal receiver
4	A4	Operation ON/OFF switch
5	A5	Buzzer



Applicable Model :

FTXK50/60A



Applicable Model :

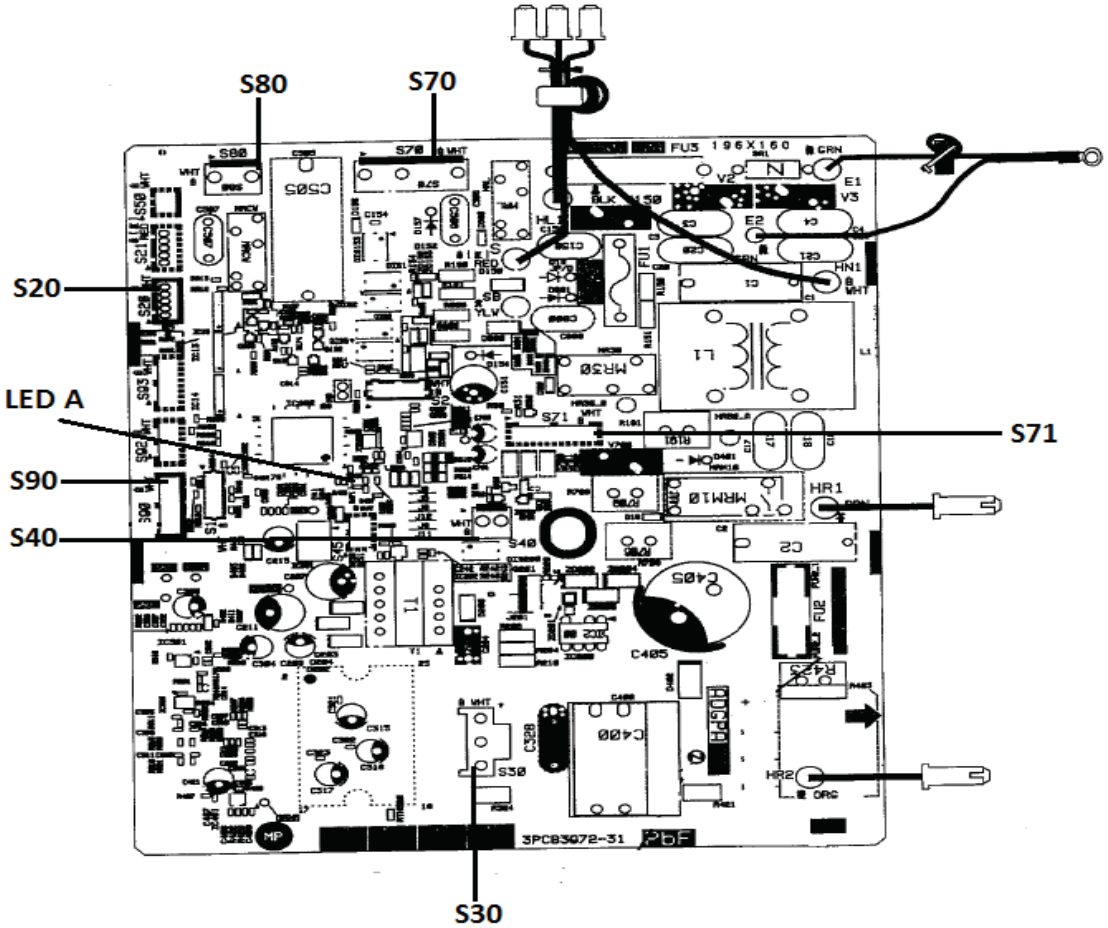
FTXB50/60A, FTXB50/60B, FTXB50/60C, FTXN50/60L, FTXN50/60M, FTXN50/60N, FTXC50/60A

ATXB50/60C, ATXN50/60L, ATXN50/60M, ATXN50/60N

1.2.4 Outdoor PCB: RXN25/35N, RXK25/35A, RXC25/35A, ARXN25/35MV1B7, ARXN25/35MV16, ARXN25/35N

1.2.4.1 Main PCB

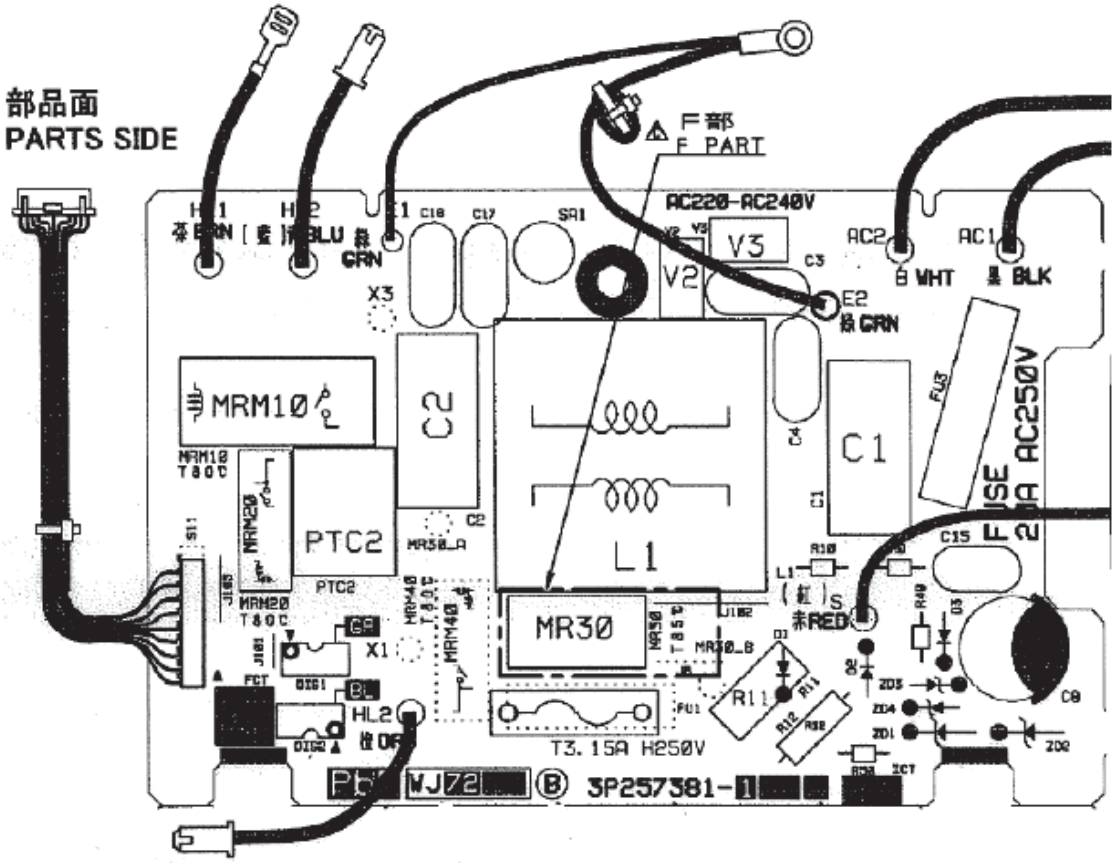
Item	Indication on PCB	Description
1	S11	Connector for S10 on main PCB
2	HL1, HN1, S	Connector for terminal board
3	E1, E2	Terminal for earth wire
4	HL2, HN2	Connector for HL3 HN3 on main PCB
5	HL4, HN4	Connector for S12 on main PCB
6	FU1	Fuse (3.15A, 250V)
7	FU3	Fuse (30A, 250V)
8	V2, V3	Varistor



1.2.5 Outdoor PCB: RXN25/35L, RXN25/35MV1, RXN25/35MV1B, RXN25/35MV1B9, ARXN25/35L, ARXN25/35MV1B

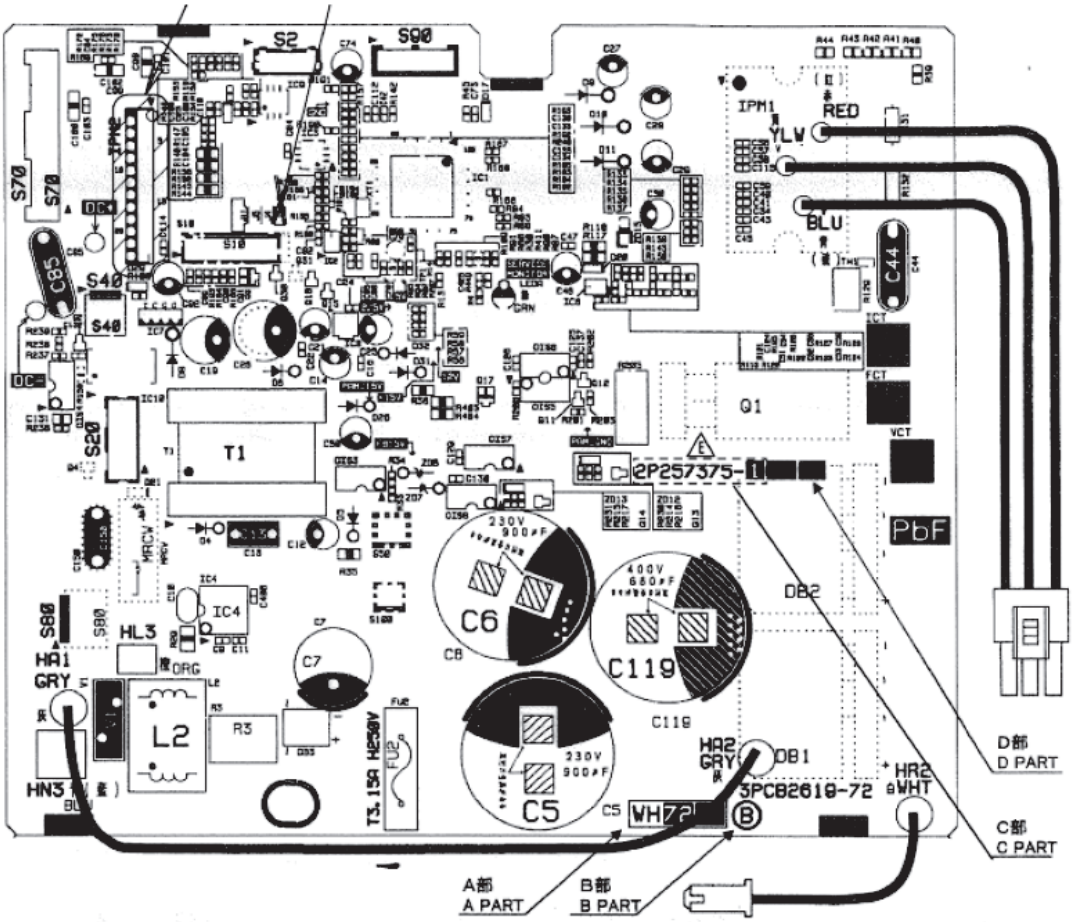
1.2.5.1 Filter PCB

Item	Indication on PCB	Description
1	S11	Connector for indoor PCB
2	FU3	Fuse (20A)
3	V2, V3	Varistor



1.2.5.2 Main PCB

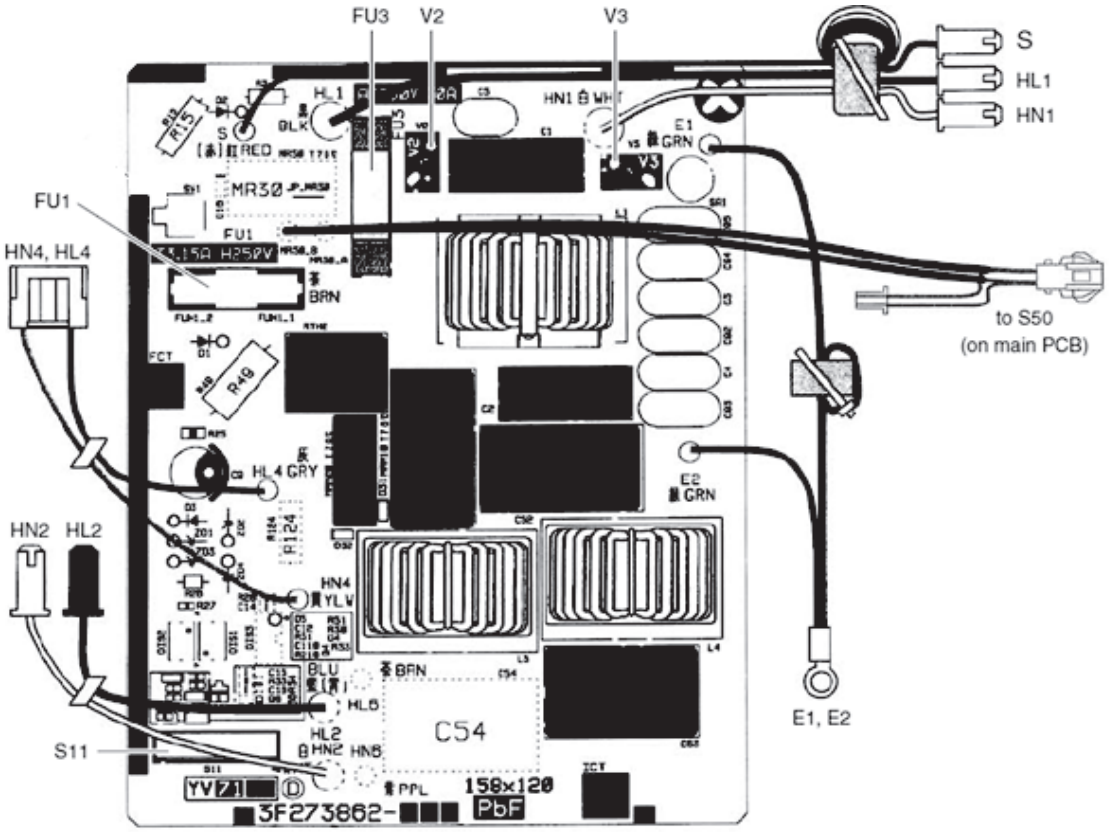
Item	Indication on PCB	Description
1	S10	Connector for filter PCB
2	S20	Connector for electronic expansion valve coil
3	S40	Connector for overload protector
4	S70	Connector for fan motor
5	S80	Connector for four way valve coil
6	S90	Connector for thermistors (outdoor temperature, outdoor heat exchanger, discharge pipe)
7	HL3, HN3	Connector for filter PCB
8	FU1, FU2	Fuse (3.15A)
9	LED A	Service monitor LED (green)
10	V1	Varistor



1.2.6 Outdoor PCB: RXB50/60B, RXB50/60C, RXN50/60M, RXN50/60N, RXK50/60A, RXC50/60A, ARXB50/60C, ARXN50/60M, ARXN50/60N

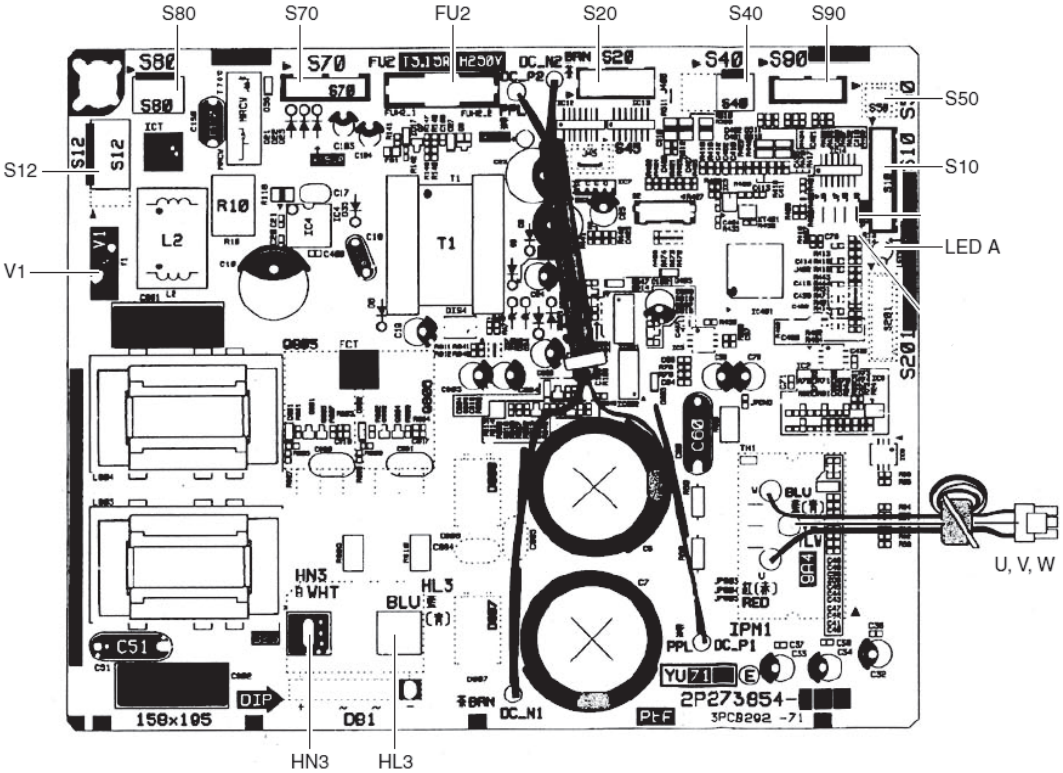
1.2.6.1 Filter PCB

Item	Indication on PCB	Description
1	S11	Connector for indoor PCB
2	FU3	Fuse (20A)
3	V2, V3	Varistor



1.2.6.2 Main PCB

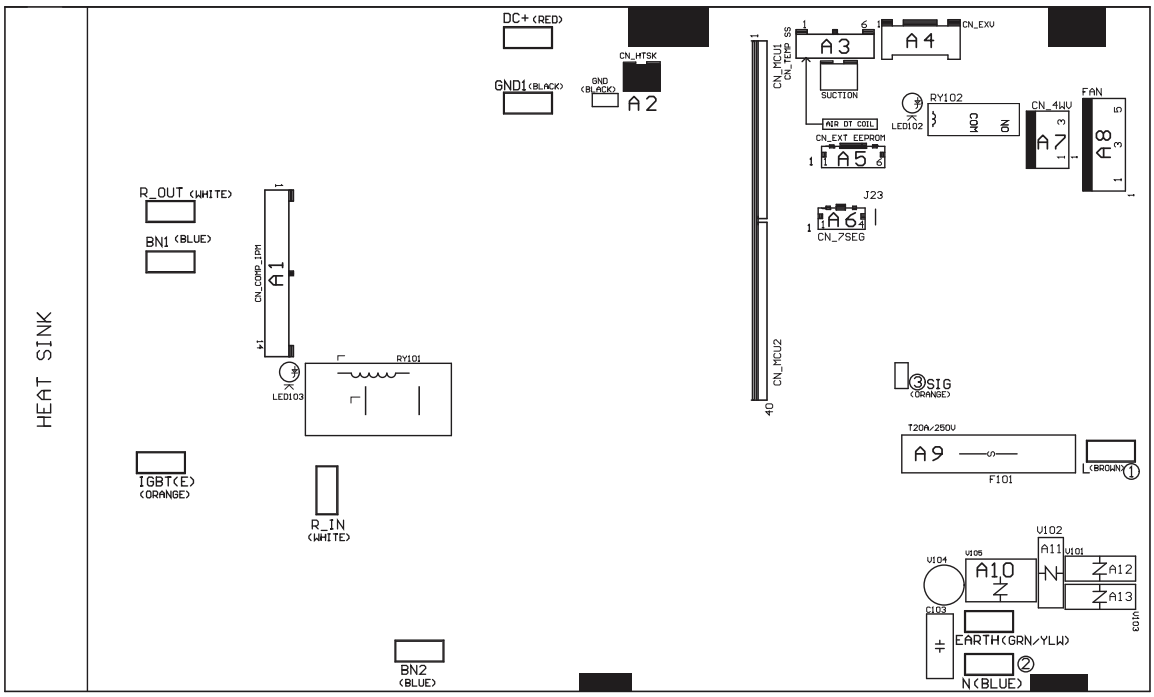
Item	Indication on PCB	Description
1	S10	Connector for filter PCB
2	S20	Connector for electronic expansion valve coil
3	S40	Connector for overload protector
4	S70	Connector for fan motor
5	S80	Connector for four way valve coil
6	S90	Connector for thermistors (outdoor temperature, outdoor heat exchanger, discharge pipe)
7	HL3, HN3	Connector for filter PCB
8	FU1, FU2	Fuse (3.15A)
9	LED A	Service monitor LED (green)
10	V1	Varistor



1.2.7 Outdoor PCB: RXB50/60A, RXN50/60L, ARXN50/60L

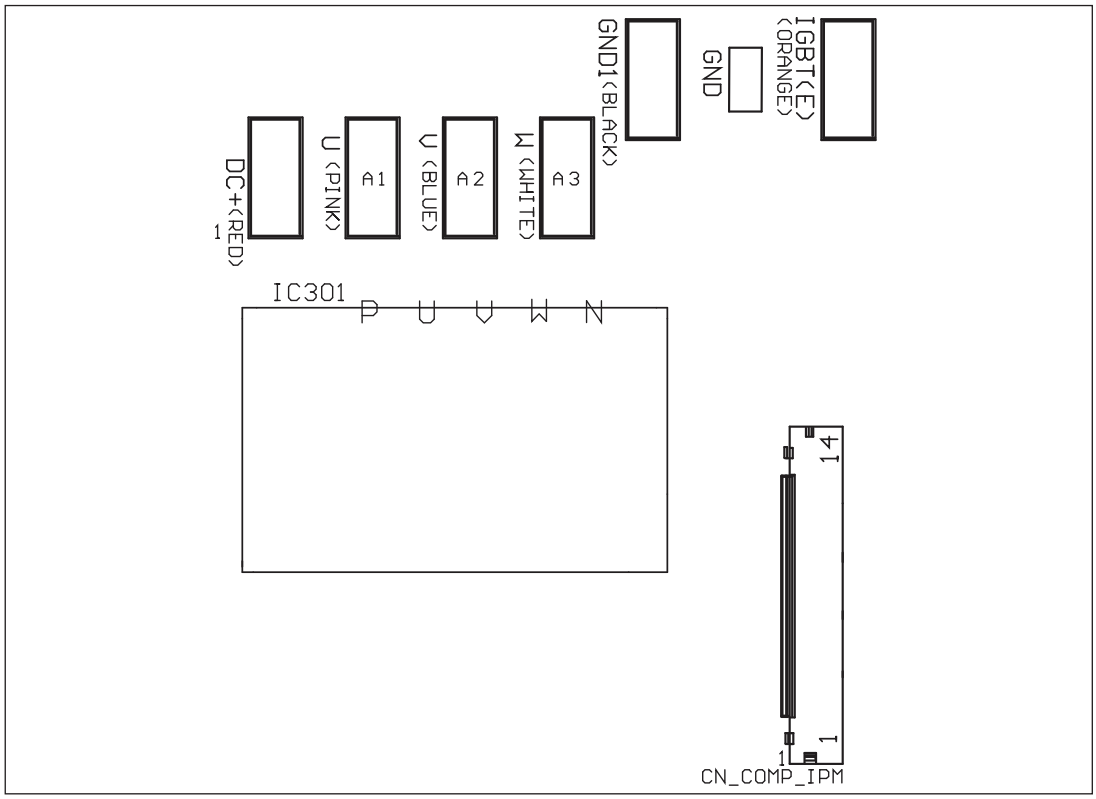
1.2.7.1 Main PCB

Item	Indication on PCB	Description
1	A1	Connector for IPM PCB
2	A2	Connector for heat sink thermistor
3	A3	Connector for thermistors (outdoor air, heat exchanger, discharge pipe)
4	A4	Connector for electronic expansion valve coil
5	A5, A6	Connector for display PCB
6	A7	Connector for four way valve coil
7	A8	Connector for fan motor
8	A9	Fuse
9	A10, A11, A12, A13	Varistor



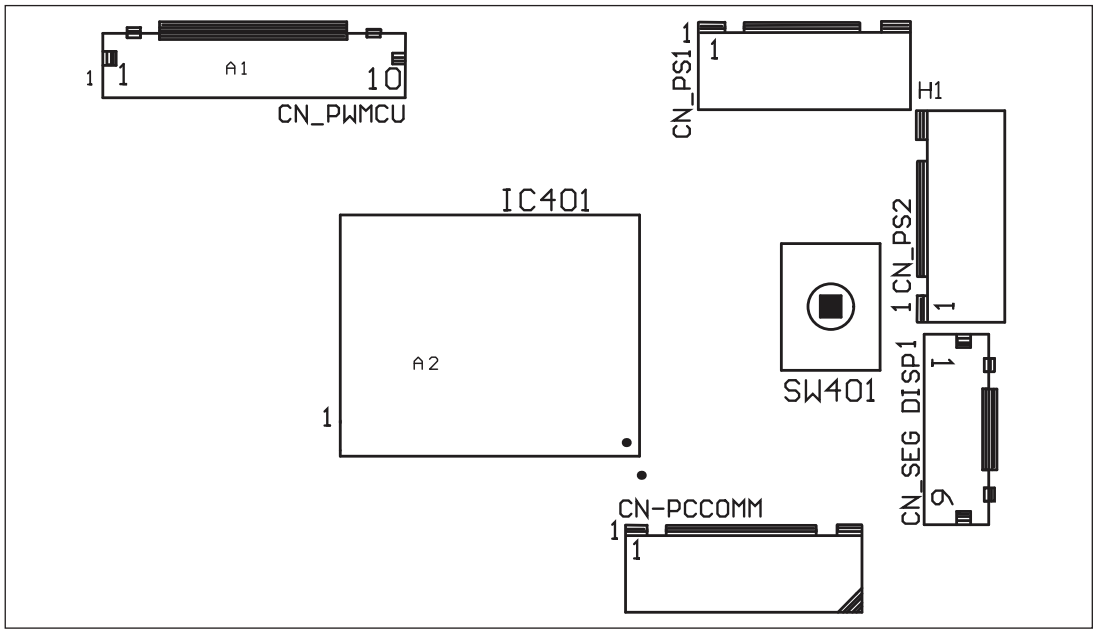
1.2.7.2 IPM board: G202A_I

Item	Indication on PCB	Description
1	A1, A2, A3	Connector to compressor



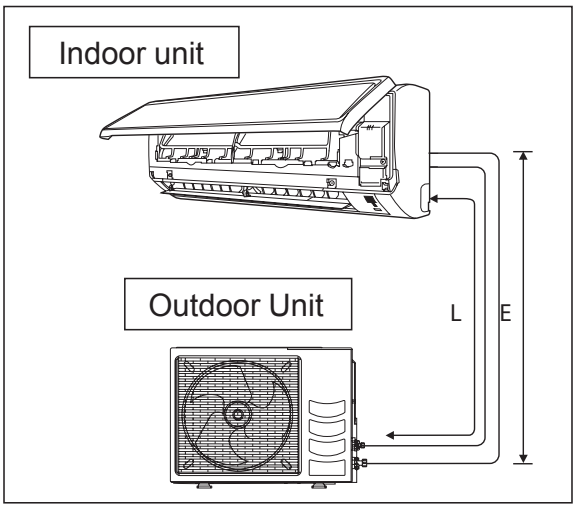
1.2.7.3 Display board: G005A_D

Item	Indication on PCB	Description
1	A1	Connector to control PCB
2	A2	7 segment display



1.3 Piping Length & Elevation

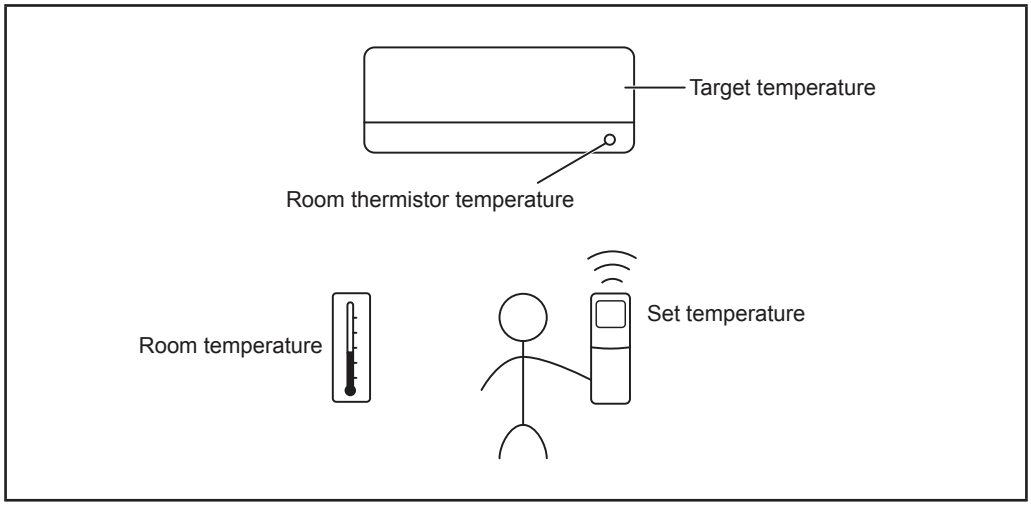
Model	Max. total piping length, L (m)	Max. height difference, E (m)	Pre-charge for up to piping length (m)	Additional charge (g/m)
RXN25, ARXN25, RXK25	20	10	7.5	20
RXN35, ARXN35, RXK35	20	10	7.5	20
RXN50, ARXN50, RXB50, RXK50	30	10	7.5	20
RXN60, ARXN60, RXB60, RXK60	30	10	7.5	20
RXC25	20	15	7.5	17
RXC35	20	15	7.5	17
RXC50	30	15	7.5	17
RXC60	30	15	7.5	17



2.0 Function & Control

2.1 Temperature Control

The temperature is detected by the room temperature thermistor (either on the unit or on the wired panel). The set temperature can be selected either through remote controller or wired controller by user.



2.2 Cooling and Heating Mode Operation

The system has 5 operating modes. The mode selection is done through the indoor by using the handset. The operating modes are:

- Cool
- Heat
- Fan
- Auto
- Dry

2.2.1 Cooling Mode

When Tr ≥ Ts + 1.5°C

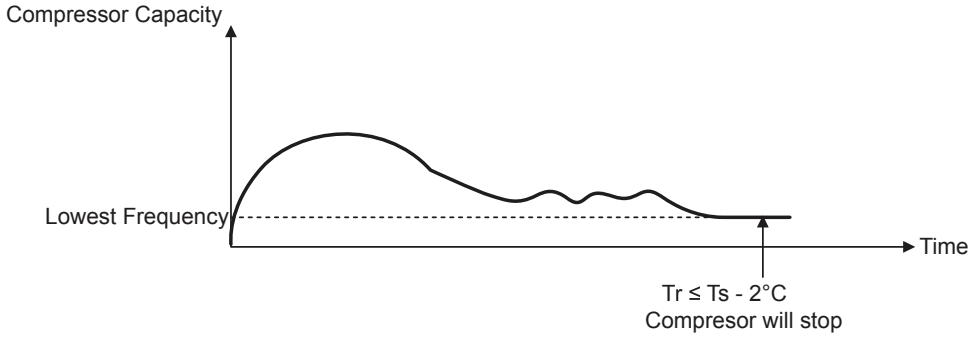
- Compressor, Indoor Fan and Outdoor Fan ON.

When Tr ≤ Ts - 2°C

- Compressor and Outdoor Fan OFF. Indoor Fan remained ON.

Tr = Room Temperature
Ts = Set Temperature

When cooling load is too small and the room temperature still drops below compressor cut off point, compressor will stop.



2.2.2 Heating Mode:

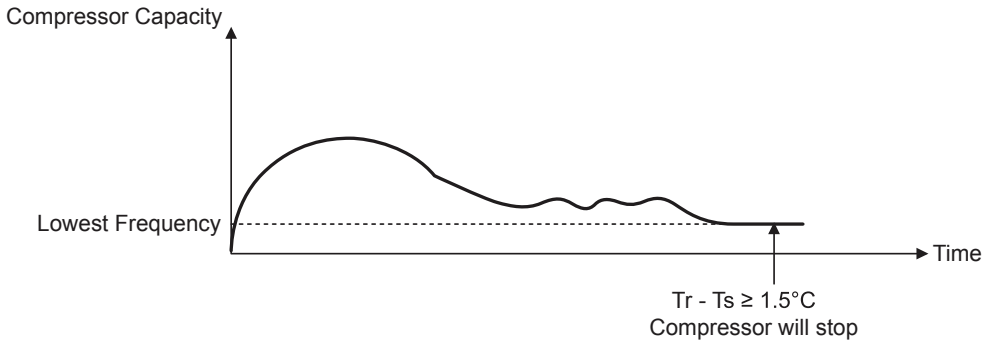
When Ts > Tr - 1.0°C

- Compressor, Indoor Fan and Outdoor Fan ON.

When Ts ≤ Tr - 1.5°C

- Compressor and Outdoor Fan OFF. Indoor Fan speed will change to Super Low.

Tr = Room Temperature
Ts = Set Temperature
When heating load is too small, and the room temperature is still rising above compressor cut off point, compressor will stop.



2.3 Fan Mode

- Compressor and Outdoor Fan OFF. Indoor Fan remains ON.
- Only High, Medium and Low fan speeds are allowed.
- When changing cool mode to fan mode, the compressor will stop and outdoor fan stops based on fan OFF control.
- Compressor only ON if the minimum stop time is > 3 minutes and the user change back to cool mode.
- Fan speed will maintain same as during fan mode.

2.4 Auto Mode

Automatic Cooling / Heating Function

When the automatic operation is selected with the remote controller, the microcomputer automatically determines the operation mode as cooling or heating according to the room temperature and the set temperature at start-up.
The unit automatically switches the operation mode to maintain the room temperature at the set temperature.
For heat pump only
Mode switching point:

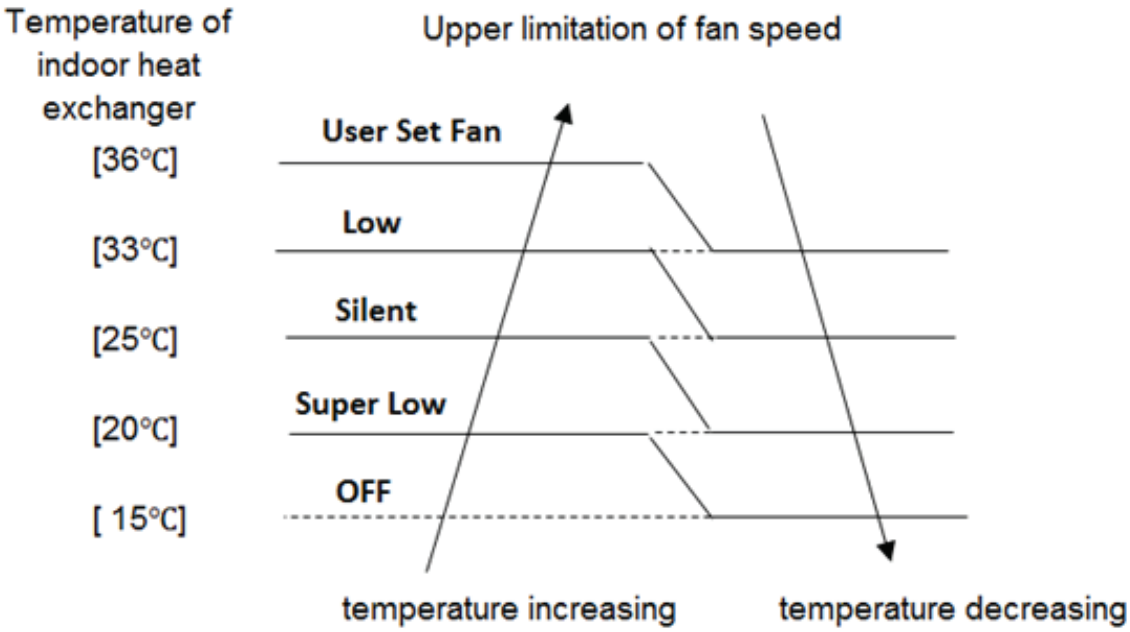
- From Heating to Cooling
  Tr ≥ Ts + 2.5
- From Cooling to Heating
  Tr ≤ Ts – 2.5

During initial operation

- Cooling operation: Tr > Ts
- Heating operation: Tr < Ts

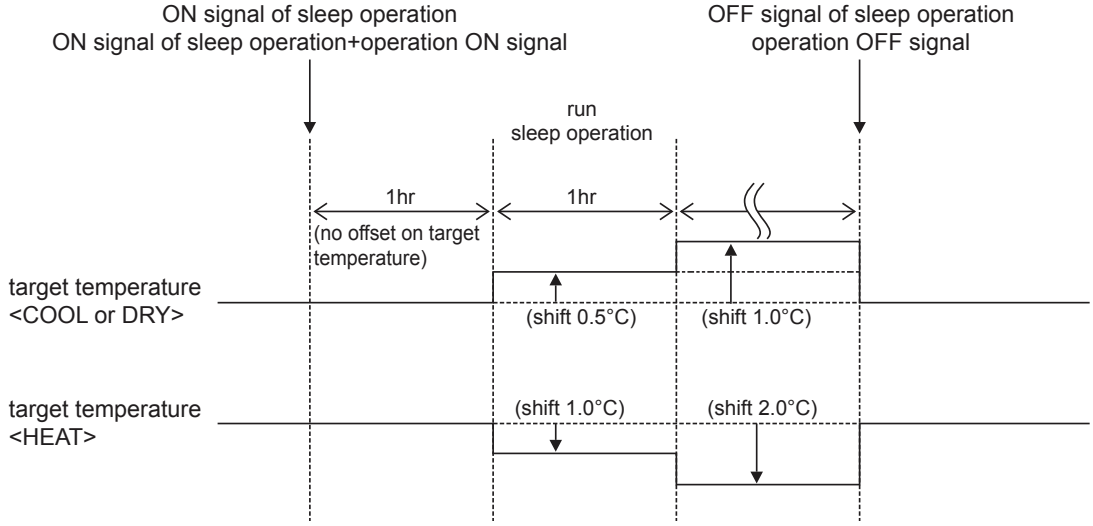
2.5 Cold Draft Prevention

During each thermal cut in cycle, the indoor fan speed will modulate according to the indoor heat exchanger temperature shown as below:



2.6 Sleep Mode

SLEEP Mode can be activated through the remote controller to keep the thermal comfort while sleeping. SLEEP Mode continues operation at the target temperature for the first hour, then automatically raises the target temperature slightly in case of cooling, or lowers it slightly in case of heating. This prevents excessive cooling in summer and excessive heating in winter to ensure comfortable sleeping conditions, and also saves electricity.



2.7 Quiet function (Applicable for FTXK_A models)

- Press for quiet operation.
- Fan speed turns to minimum speed.
- Press again to deactivate the function.
- Available in HEAT and COOL modes only.
- Any change of fan speed will deactivate this function.

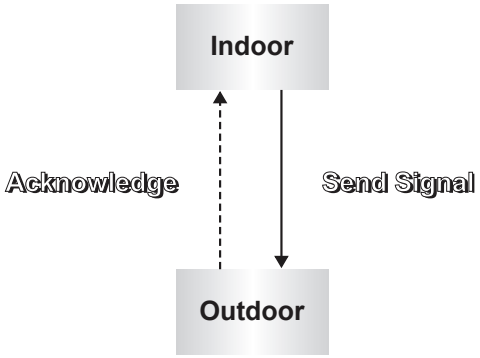
2.8 ECO+ function (Applicable for FTXK_A models)

- Press for eco-friendly mode cooling or heating operation.
- Set temperature automatically adjusts to eco-friendly level.
- Press again to deactivate the function.
- Available in HEAT and COOL modes only.

2.9 Indoor-Outdoor Communication

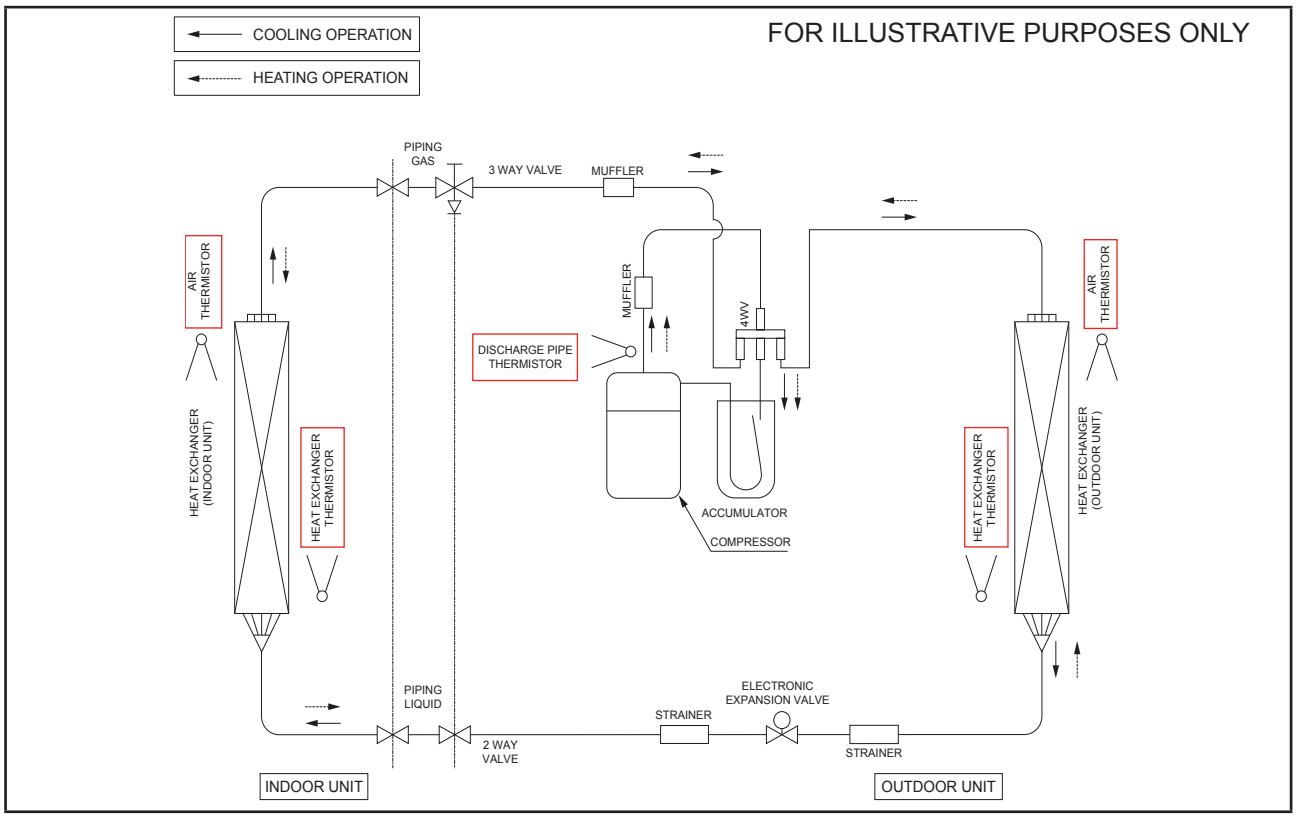
Master by outdoor unit.

Indoor controller board will transmit signal to outdoor controller board every 0.5s. Outdoor unit will response to indoor once the valid data is received.



If the data communication line between indoor and outdoor is disrupted for 15s continuously, the compressor will stop & outdoor fan stops with fan OFF timer. Indoor LED blinks to indicate error. If the communication resumes within 15s, error code is cleared and compressor restarts after 3 minutes. If the communication does not resume after 15s, unit is unable to restart and the error keeps blinking.

2.10 Thermistors in RXN, RXB, RXC, ARXN, ARXB



Functions of Thermistor

Thermistor	Functions
Discharge pipe	Used for discharge superheat (SH) & Electronic Expansion Valve (EXV) control.
Outdoor coil	Used for defrost control. Also used for inverter current protection control in Series II.
Outdoor air	Used for defrost & outdoor fan speed control. Also used for overall current protection & preheating operation control.
Heat sink	Used for capturing heat sink temperature. (Applicable for Daikin controller)
Suction pipe	Used for Electronic Expansion Valve (EXV) & suction pipe (SH) protection control in heating.

2.11 Minimum Off Time Control

To prevent frequent compressor ON/OFF & to allow pressure equalization

- The compressor will be on 3 minutes stand-by after turning OFF before it is allowed to turn ON.
- Outdoor fan OFF delay to improve pressure equalization & to prevent refrigerant from entering into evaporator.

2.12 Auto Restart

Factory pre-set.

Allow unit to automatically resume the same operating mode it was in before a power failure.

2.13 Auto Random Restart

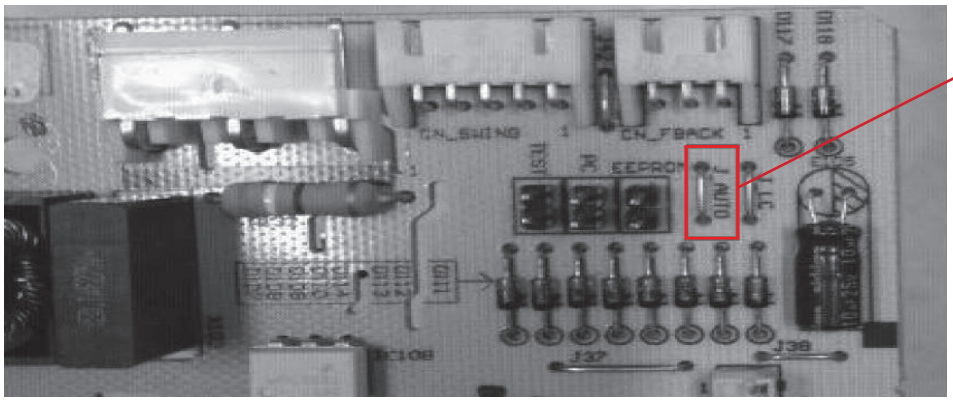
Unit restarts automatically in 64 different recovery timing patterns (within 180 seconds to 244 seconds) and operates based on the previous setting (operating mode, temperature setting and fan speed).

To disable the auto random restart function, cut off the jumper J_AUTO as highlighted in attachment.

Please be informed that after disable auto random restart, unit is not able to restart with last state memory after power resume from failure. Unit will revert to default setting as below:

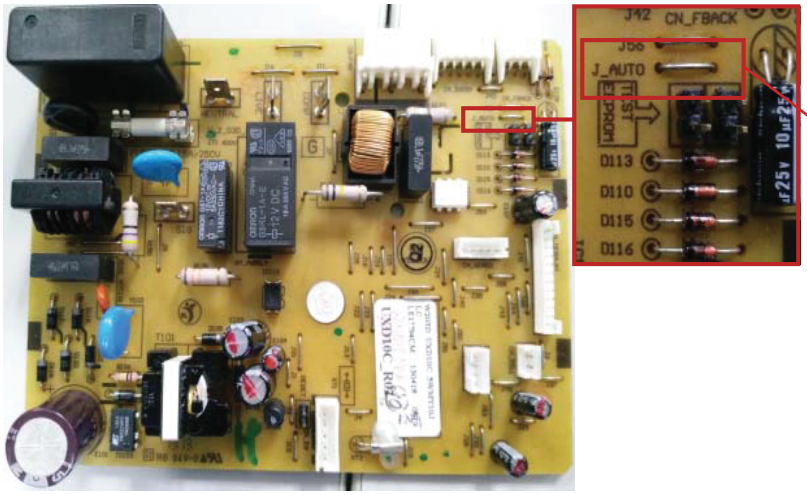
Default setting
Unit: Off
Temperature: 24°C
Fan speed: High
Mode: Cooling

Applicable for PCB W_2_03C Only (Refer product line up for model list)



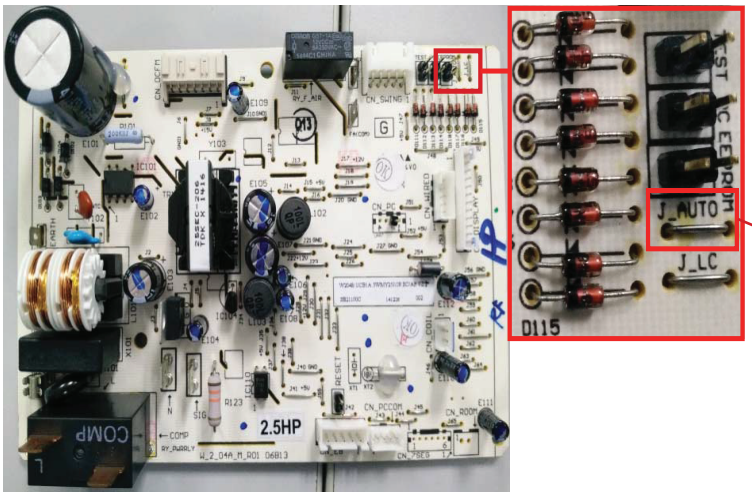
Cut off the jumper J_AUTO to disable the Auto Random Restart function

Applicable for PCB W_2_03D , W_2_03E & W_2_03E_M (Refer product line up for model list)



Cut off the jumper J_AUTO to disable the Auto Random Restart function

Applicable for PCB W_2_04A & W_2_04B (For all class 50 & class 60)



Cut off the jumper J_AUTO to disable the Auto Random Restart function

2.14 Four Way Valve Control

Change over switching is only carried out during operation.

OFF delayed is applied when the coil switches from ON to OFF

Operating mode	4-way valve is
Heat, except for defrost	ON
Cool Dry Defrost	OFF

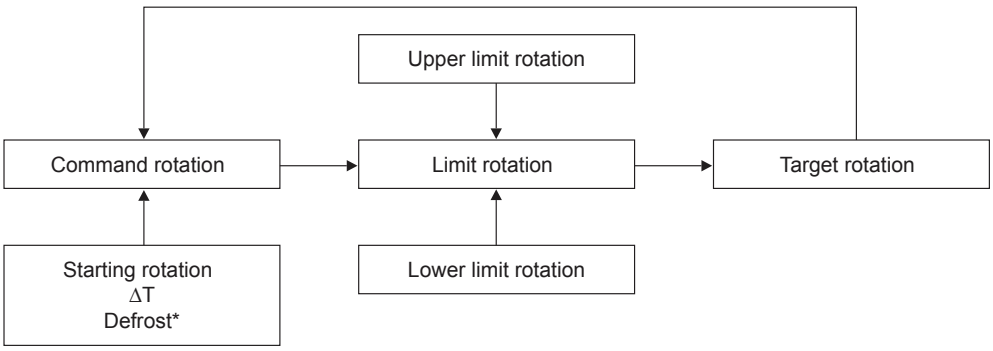
2.15 Outdoor Fan Control

Determine from

- Compressor target rotation: higher fan speed with higher rotation.
- Outdoor air temperature.

Cool mode: Higher fan speed with higher outdoor air temperature.
Heat mode: Higher fan speed with lower outdoor air temperature.
When compressor stops, fan OFF delay of 30 seconds is carried out

2.16 Rotation Regulating Functions



** Defrost control for heat pump model only*

2.16.1 Starting Rotation

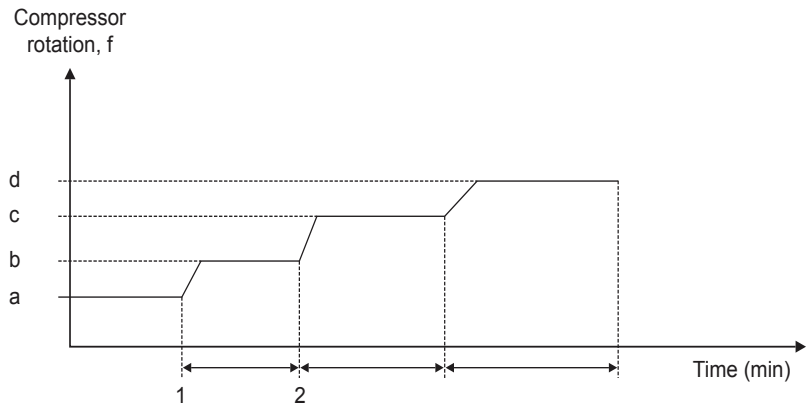
Starting Control

To avoid excessive oil discharge from compressor or to promote oil lubrication during startup.

To prevent liquid flood back to the compressor.

To limit starting current.

When compressor starts to rotate from OFF to ON, compressor rotation is set to run gradually to each upper limit at a specific timer setting.



Model	a Hz (Time, s)	b Hz (Time, s)	c Hz (Time, s)	d Hz (Time, s)	Max Hz (Time, s)
RXN25/35L **ARXN25/35L**	38 (60)	52 (120)	66 (120)	80 (120)	94 (120)
RXN50/60L **ARXN50/60L** **RXB50/60A**	35 (60)	55 (120)	75 (360)	-	-
RXB50/60B **RXN50/60M** **RXC50/60A**	55 (120)	70 (200)	85 (470)	-	-
RXN25/35MV1 **RXN25/35MV1B** **RXN25/35MV1B9** **ARXN25/35MV1B**	40 (180)	54 (420)	72 (180)	90 (120)	-
RXN25/35N **ARXN25/35MV1B7** **ARXN25/35MV16** **ARXN25/35N** **RXK25/35AV1B** **RXC25/35A**	40 (180)	54 (420)	72 (180)	90 (120)	-

2.16.2 Command Rotation

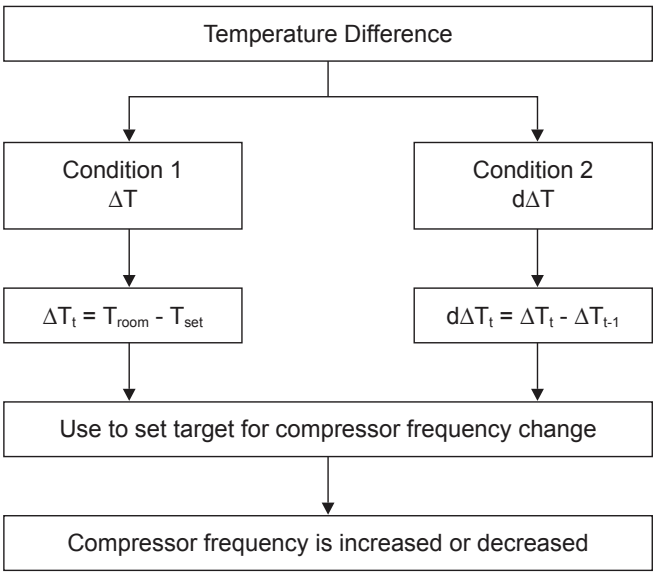
Cut in upon termination of Starting Control.

Achieve capacity control by controlling the compressor rotation based on:

- Temperature difference between set and room temperature, ΔT.
- Limit Rotation.
- Defrost control.

2.16.3 Fuzzy Control (Applicable for ARXN/RXN50/60L)

Based on temperature difference, ΔT, current fan speed setting & current indoor operating mode at every 30 seconds interval.



2.16.4 PI Control

P control: ΔT of each indoor is calculated at every sampling time of 20s and compressor rotation is adjusted according to the difference from the previously calculated rotation.

I control: if the operating frequency is not changed more than a certain fixed time:
- If ΣΔT is small : lower frequency.
- If ΣΔT is large : increase frequency.

2.16.5 Limit Rotation

Determine from
- Upper limit rotation

A minimum value was determined among the upper limits rotation, i.e. protection controls.
- Lower limit rotation

A maximum value was determined among the lower limits rotation, i.e. protection controls.

Generally, compressor rotation is controlled within 5 zones: stop, drop, keep, up and reset subjected to a particular operating temperature/current/pressure.

Zone	Control
Stop	Compressor is stopped when a certain limit reaches the stop zone for abnormality correction.
Drop	Frequency will be dropped with a timer setting.
Keep	Frequency is maintained at lower/upper limit.
Up	Frequency will be increased with a timer setting.
Reset	Frequency lower/upper limit is canceled and returned to command rotation.

2.17 Defrost Cycle

During defrost	All models
Compressor	ON
4-way valve	OFF
EXV in operation room	Fixed opening
Outdoor fan	OFF
Indoor fan	OFF

Condition for entering defrost
- Compressor minimum run time – 6 minutes OR
- Compressor accumulated run time of 45 minutes if Outdoor coil < 3°C.

Condition for terminating defrost
- Outdoor coil > 12°C or
- Total defrost timer of 650 seconds.

2.18 Indoor Coil Freeze Prevention

Only available in cooling mode.

When the indoor coil temperature < 2°C, the compressor starts to drop the frequency.

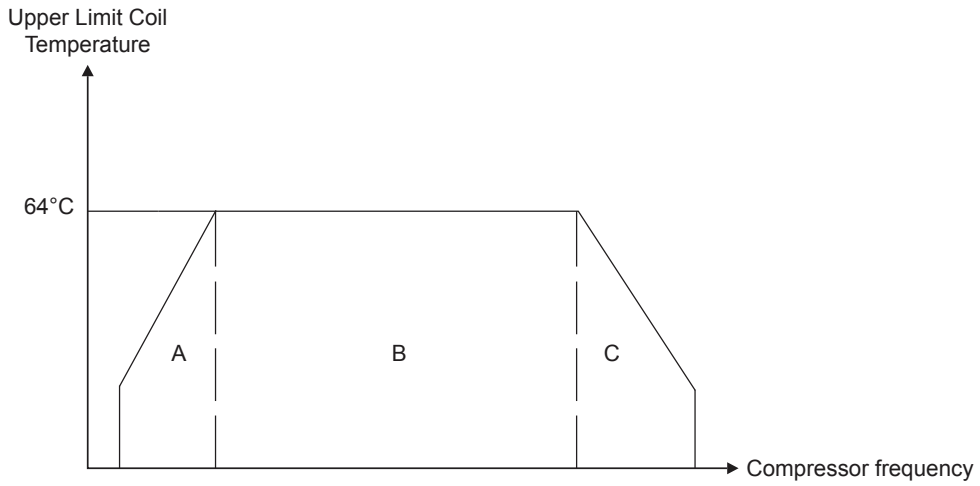
This protection will cut in when:
- Indoor coil temperature < 0°C for more than 180s. Compressor will stop, outdoor fan stop after 30s and indoor fan can only run at lowest fan speed.

The unit can only be restarted after 3 minutes.
When the indoor coil temperature > 13°C, the compressor frequency will be reset based on the outdoor ambient, room and set temperature.

2.19 High Pressure Protection

To prevent high pressure in the system.

Compressor operating frequency is adjusted based on upper limit of coil temperature.



The compressor frequency is adjusted based on coil temperature:

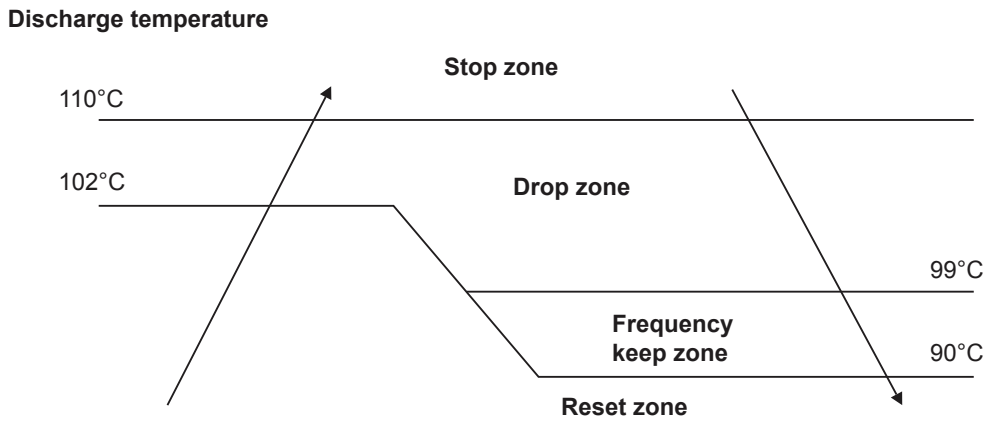
- During cooling mode : outdoor coil temperature.
- During heating mode : indoor coil temperature.

This protection is activated when the coil temperature > 64°C, the compressor stops and outdoor fan stops after 30s.The unit can only be restarted after 3 minutes.

2.20 Discharge Pipe Temperature Control

Used as a measure of the compressor's internal temperature.

Compressor frequency is control to keep this temperature from going up further when it rises above a certain level.



If compressor discharge temperature > 102°C for the first time, this control starts and sets the current frequency as upper limit. At the same time, running frequency starts to reduce by 1 step and so on, until temperature falls between 99°C and 90°C at the keep zone.

This protection is activated when the compressor discharge temperature > 110°C. The compressor will stop and considered trip.

If the compressor discharge temperature < 90°C , the compressor frequency will be reset based on the outdoor ambient, set and room temperature.

2.21 Oil Recovery Control (Applicable for ARXN/RXN50/60L)

When the compressor operates for certain duration at low frequency, the oil level in the compressor may become low due to incomplete oil return.

To prevent damage to the compressor or compressor lock due to low oil level.

To promote refrigerant flow to carry the oil back to the compressor.

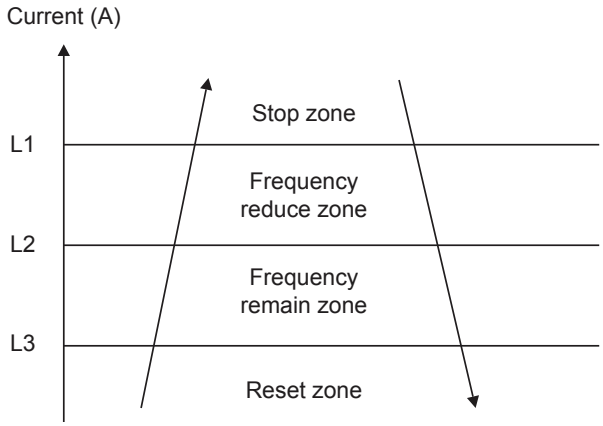
Entering condition:

- Compressor rotation < 35 Hz, at the end of a 20 minutes timer: set lower limit rotation to 35 Hz & EXV opening is fixed at current opening + 50 pulse. This control is reset when rotation > 35 Hz. (2.22 Overall Current Control)

2.22 Overall Current Control

To monitor the overall current and to restrict the compressor upper limit rotation in order to prevent circuit breakers from exceeding the rated capacity.

Detected during compressor running.



Model	L1
RXN25/35L **ARXN25/35L**	14.0A
RXN25M/N **ARXN25M/N** **RXK25A** **RXC25A**	9.5A
RXN35M/N **ARXN35M/N** **RXK35A** **RXC35A**	10.0A
ARXN50/60L **RXB50/60A**	12.0A
RXN50/60L/M/N **ARXN50/60M/N** **RXK50/60A** **RXB50/60B/C** **ARXB50/60C** **RXC50/60A**	16.0A

When the input current for running compressor exceeds L2, the running frequency will be reduced by 1 step. If the current still exceeds L2, frequency will be reduced by another step until total current falls between L2 and L3.
This protection cuts in when the input current exceeds L1 for 2 seconds. Compressor will stop and it is considered total current overload.
If input current < L3, the compressor frequency is reset based on the outdoor ambient, set and room temperature.

3.0 Service Diagnosis

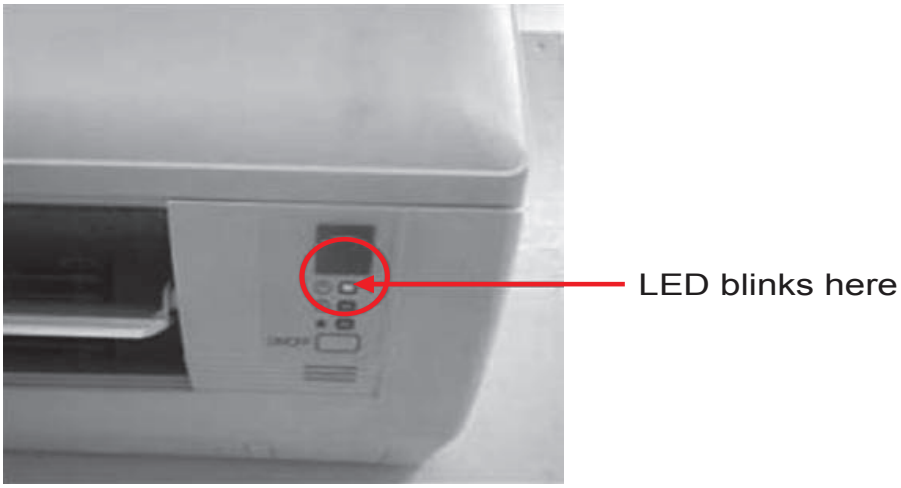
3.1 Error Indication from Indoor

3.1.1 Indoor model

FTXN25/35/50/60L/M, FTXB50/60/A/B/C

ATXN25/35/50/60L/M, ATXB50/60C

- LED display will either be ON during operation or blinking (green color) when any error occur as in below table.
- The blinking pattern does not indicate error details
- The error details needs to be retrieved from remote controller in error code form.



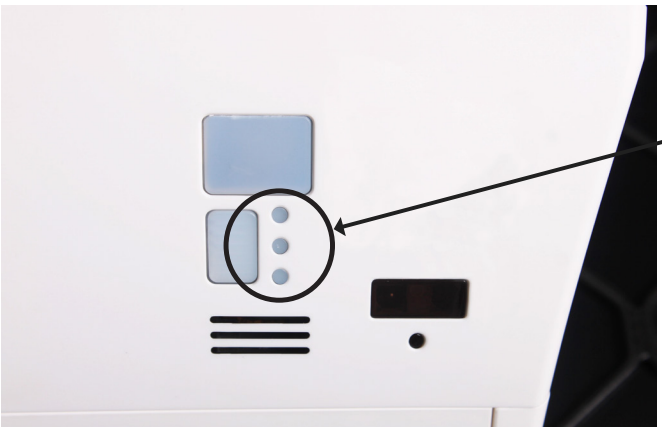
★ SLEEP (RED)	COOL/HEAT (GREEN/RED)	TIMER (ORANGE)	Operation / Fault Indication
	○ Green		Cooling mode
	○ Red		Heating mode
	○ Red		Auto mode in heating operation
	○ Green		Auto mode in cooling operation
	○	○	Time Off (when unit is on)
		○	Time On (when unit is off)
○	○		Sleep mode on
	○ Green		Fan mode on
	○ Green		Dry mode on
	◑ Red		Defrost operation
	◑ Green		Error indication

○ ON ◑ Blinking

3.1.2 Indoor model

FTXN25/35/50/60N, FTXC25/35/50/60A, ATXN25/35/50/60N

- LED display will either be ON during operation or blinking (blue color) when any error occur as in below table.
- The blinking pattern does not indicate error details
- The error details needs to be retrieved from remote controller in error code form.

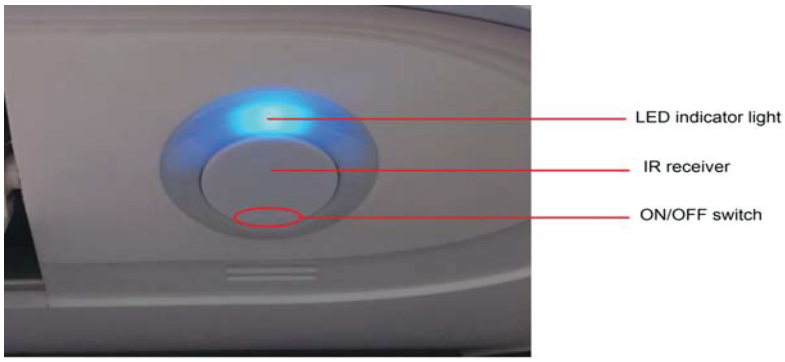


★ SLEEP (ORANGE)	COOL/HEAT (BLUE/RED)	TIMER (WHITE)	**Operation / Fault Indication**
	○ Blue		Cooling mode
	○ Red		Heating mode
	○ Red		Auto mode in heating operation
	○ Blue		Auto mode in cooling operation
		○	Timer On
○	○		Sleep mode on
	○ Blue		Fan mode on
	○ Blue		Dry mode on
	◑ Red		Defrost operation
	◑ Blue		Unit error

○ ON ◑ Blinking

3.1.3 Indoor model
FTXK25/35/50/60A

- LED display will either change color under different running condition or blinking (blue color) when any error occur as in below table.
- The blinking pattern does not indicate error details.
- The error details needs to be retrieved from remote controller in error code form.

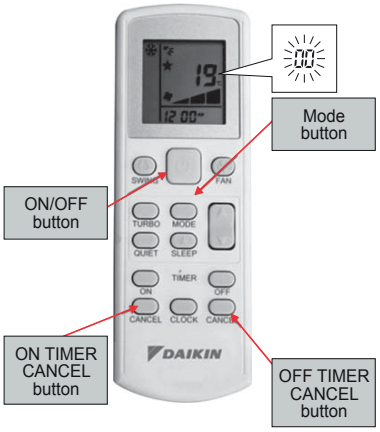


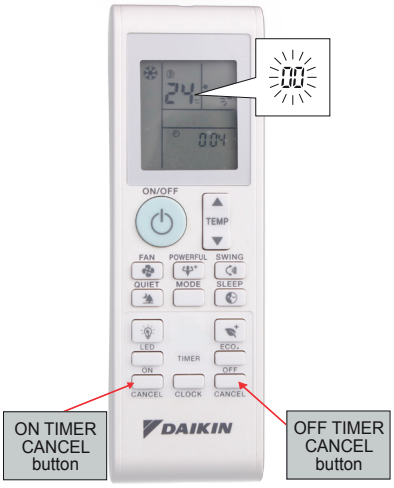
COOL/HEAT/TIMER (BLUE/RED/VIOLET)	Operation / Fault Indication
○ Blue	Cooling mode
○ Red	Heating mode
○ Red	Auto mode in heating operation
○ Blue	Auto mode in cooling operation
○ Violet	Time On
○ Blue	Fan mode on
○ Blue	Dry mode on
◑ Red	Defrost operation
◑ Blue	Error indication

○ ON ◑ Blinking

3.2 Error Code retrieved by remote controller

3.2.1 Remote controller model BRC52A61 & BRC52B63

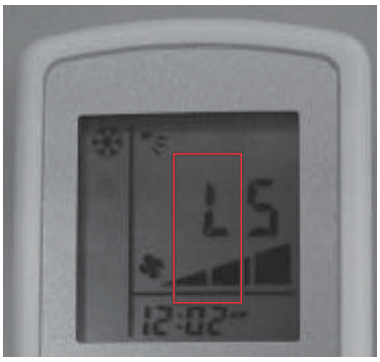




BRC52A61	BRC52B63

Operating Guide

1. Hold down ON TIMER CANCEL or OFF TIMER CANCEL for 5 seconds until "00" indication flashes on the remote controller temperature display section.
2. Then, press the same button repeatedly. A series of error code will appear until indoor buzzer produces a long beep. The corresponding error code is indicated on the remote controller temperature display section.



3. Indoor unit buzzer will produce a long beep if the remote controller error code matched with unit error.
4. A short and two consecutive beeps is not the unit error. For two consecutives beeps, it indicates either the alphabet or number is correct.
5. The code display will cancel itself if the button is not pressed for 1 minute

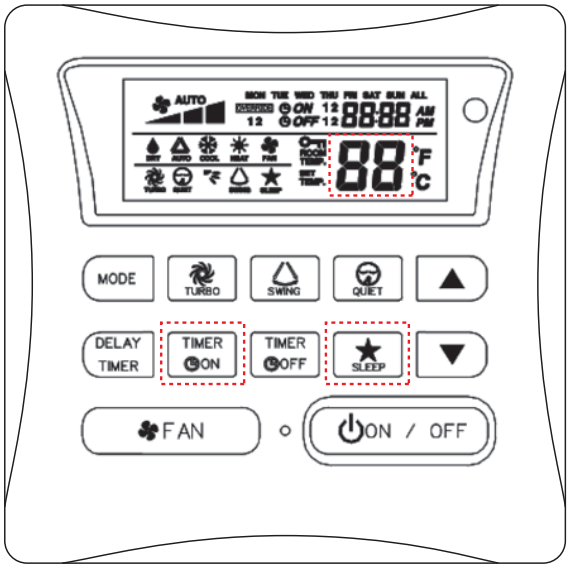
Last State Error retrieved by remote controller BRC52A61 & BRC52B63

Operating Guide

1. Remove battery from remote controller.
2. Replace battery again into remote controller.
3. Press Mode & ON/OFF buttons together.
4. The "00" will show at temperature section.
5. Press Mode button to 5:00.
6. Press Power On toward the indoor unit. Unit LED blinks two times indicate received signal.
7. ON hold fan button till screen become normal display.
8. Repeat the normal step to retrieve error. (by using remote controller step. Holding TIMER CANCEL…)
9. By using this method, the error shown will be Last State Error. (Previous error in the unit)

3.2.2 Wired controller BRC51A61

The error will show at the LCD display.



Last State Error retrieved by wired controller BRC51A61

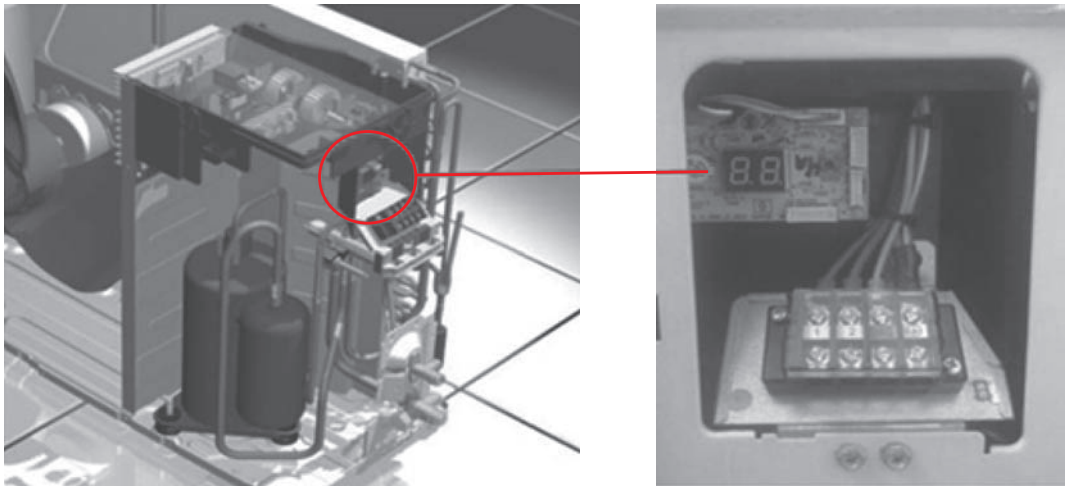
Press SLEEP & TIMER ACTIVE simultaneously for 5 seconds and the error will flash.

Remark : Wired controller is an optional accessory

3.3 Error Indication from Outdoor

3.3.1 ARXN/RXN50/60L , RXB50/60A - 7 Segment Display

It is located inside outdoor unit control panel beside the terminal block. Control panel cover has to be removed to get access to the 7 segment display.



When there is no error, the compressor running frequency is displayed.

When there is an error, the error code flashes as below:

Normal operation

Flashing Error Code

In addition, 7 segment also can be used to retrieve unit operating conditions such as running current, DC voltage, ambient temperature, indoor air temperature, etc.

By pressing the tact switch, the 7 segment will start to flash from "00". Press again, it will show "01" and subsequent running number show the parameter number.

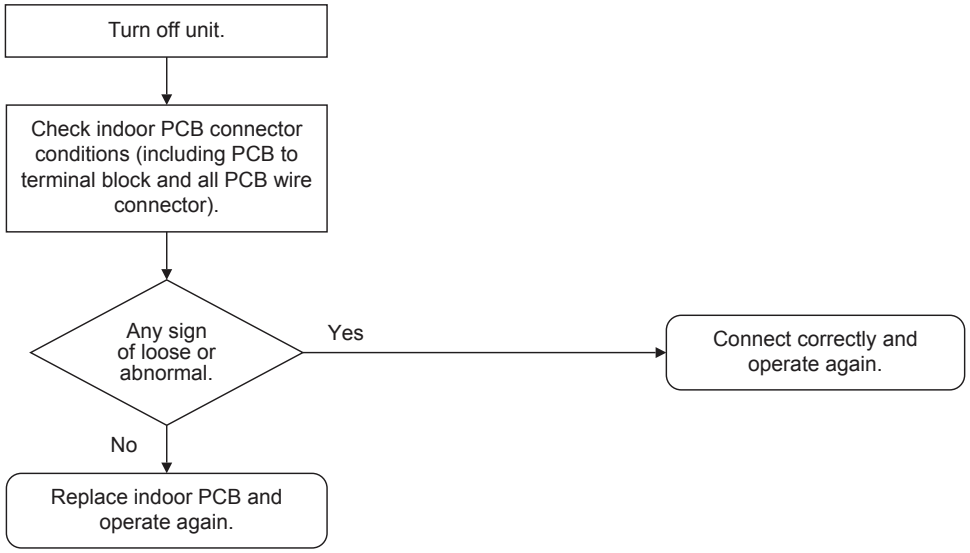
Then, the 7 segment will flash again showing the parameter measurement.
When the 7 segment display is left untouched for 5 min, the display will light off (Dim).

Parameter Number	Parameter Description	Unit/Range
00	Compressor Actual Rotation	r/s
01	Compressor Target Rotation	r/s
02	DC Bus Voltage	VDC
03	Total Current (x10)	A
04	Outdoor Air Temperature	°C
05	Outdoor Heat Exchanger Temperature	°C
06	Compressor Discharge Temperature	°C
07	Outdoor Heatsink Temperature	°C
08	Indoor Air Temperature	°C
09	Indoor Heat Exchanger Temperature	°C
10	Electronic Expansion Valve Opening	Pulse
41	Target Discharge Temperature	°C

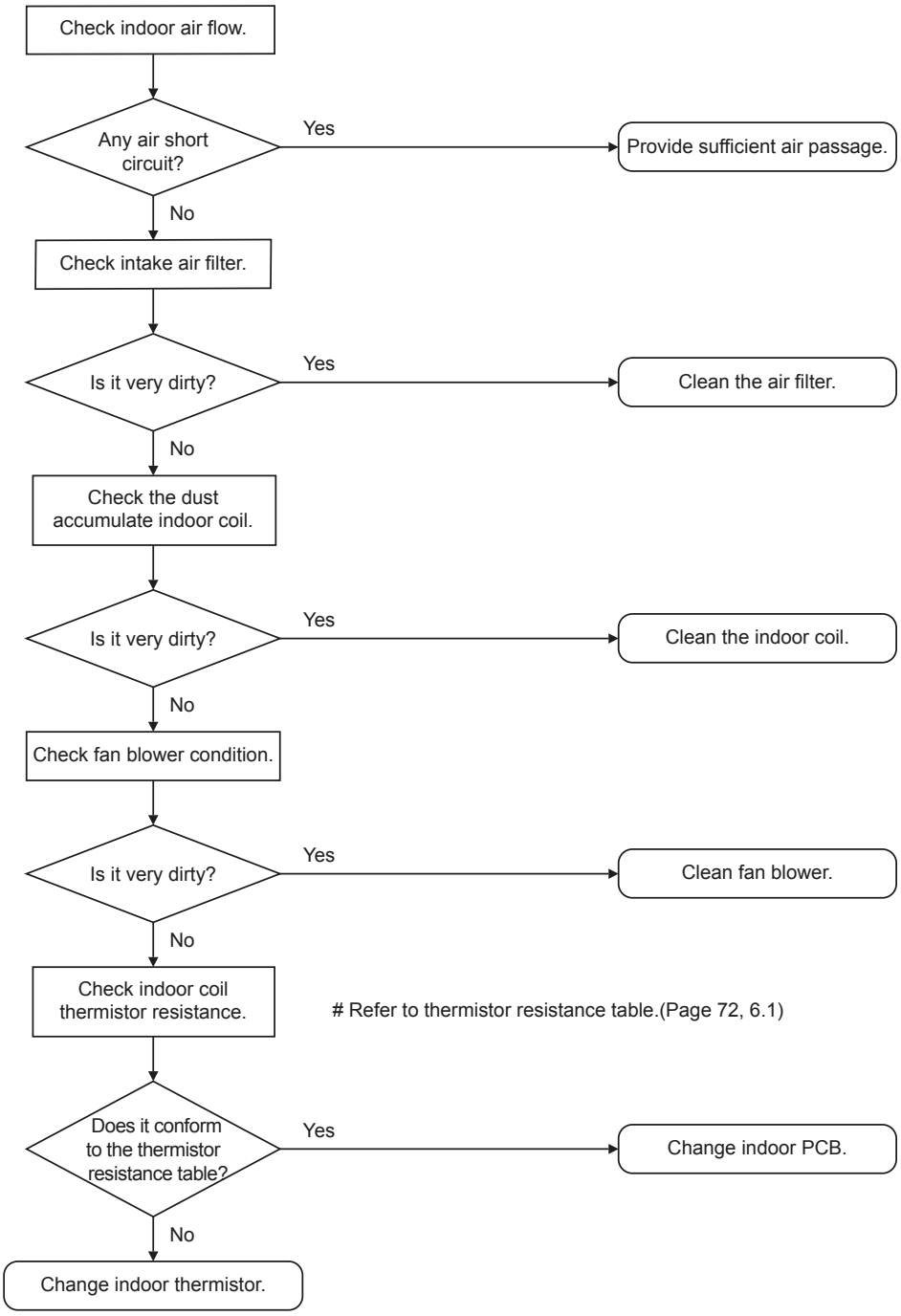
3.4 Error code description for Inverter

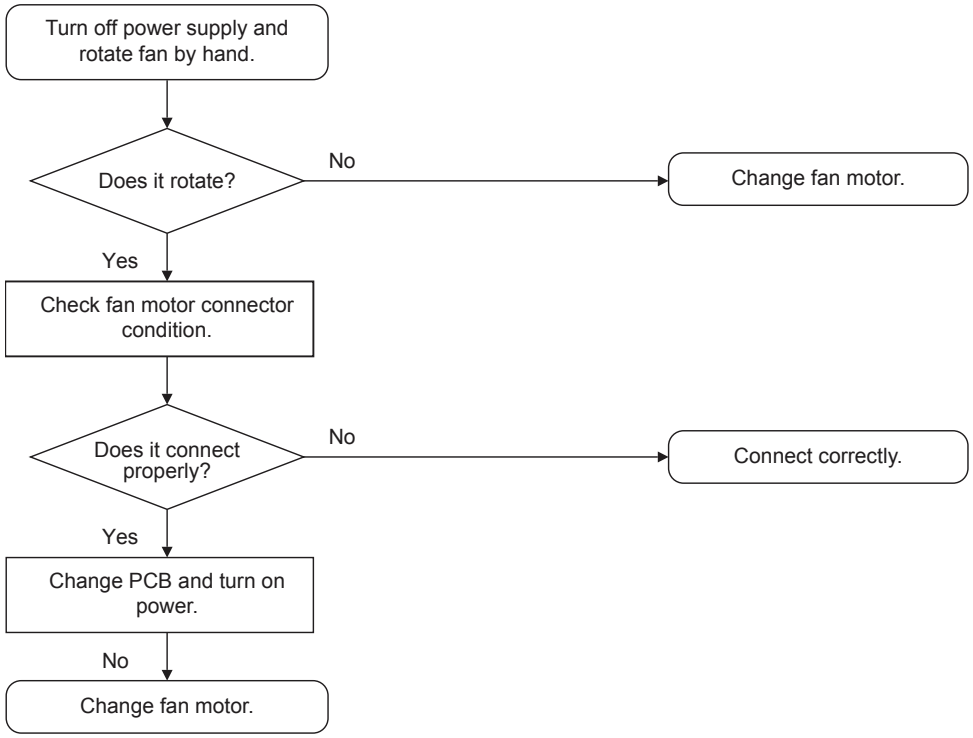
No.	ERROR CODE	ERROR DESCRIPTION	ARXN/ RXN50/60L RX50/60A	ARXN/RXN25/35L ARXN/RXN25/35M/N ARXN/RXN50/60M/N RXB50/60B RXK25/35/50/60A
1	00	NORMAL	O	O
2	A1	INDOOR PCB ABNORMALITY	O	O
3	A5	ANTIFREEZE PROTECTION OR HIGH PRESSURE CONTROL	O	O
4	A6	INDOOR FAN MOTOR ABNORMALITY	O	O
5	C4	INDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY	O	O
6	C9	INDOOR ROOM THERMISTOR ABNORMALITY	O	O
7	E1	OUTDOOR PCB ABNORMALITY	-	O
8	E5	COMPRESSOR OVERLOAD	O	O
9	E6	COMPRESSOR LOCK/START-UP ABNORMALITY	O	O
10	E7	OUTDOOR FAN MOTOR LOCK	O	O
11	E8	AC INPUT OVER CURRENT	O	O
12	EA	4 WAY VALVE ABNORMALITY	O	O
13	F3	DISCHARGE PIPE OVERHEAT	O	O
14	F6	HEAT EXCHANGER OVERHEAT	O	O
15	H0	COMPRESSOR SENSOR SYSTEM ABNORMAL	-	O
16	H6	POSITION SENSOR ABNORMAL (COMPRESSOR)	O	O
17	H8	AC CURRENT SENSOR ABNORMALITY	O	O
18	H9	OUTDOOR AIR THERMISTOR ABNORMALITY	O	O
19	J3	COMPRESSOR DISCHARGE PIPE THERMISTOR ABNORMALITY	O	O
20	J6	OUTDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY	O	O
21	L3	ELECTRICAL BOX TEMPERATURE RISE (COMPRESSOR OFF)	O	O
22	L4	HEAT SINK OVERHEAT (COMPRESSOR ON)	O	O
23	L5	IPM ABNORMALITY	O	O
24	P4	HEAT SINK THERMISTOR ABNORMALITY	O	O
25	U0	INSUFFICIENT GAS	O	O
26	U2	DC VOLTAGE OUT OF RANGE	O	O
27	U4	COMMUNICATION ABNORMALITY	O	O
28	UA	INSTALLATION ABNORMALITY	O	O

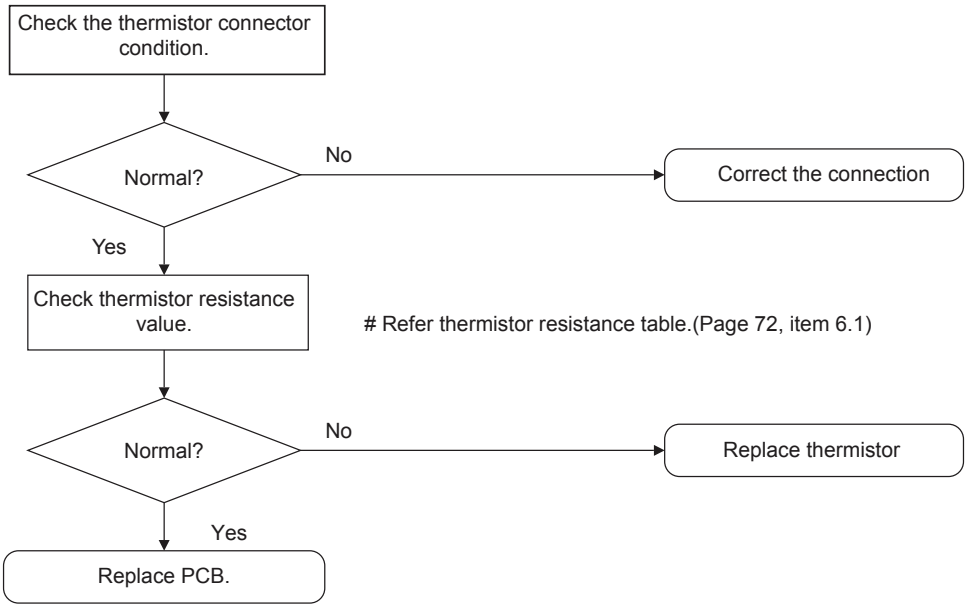
Remark: O : Function
- : Not Applicable

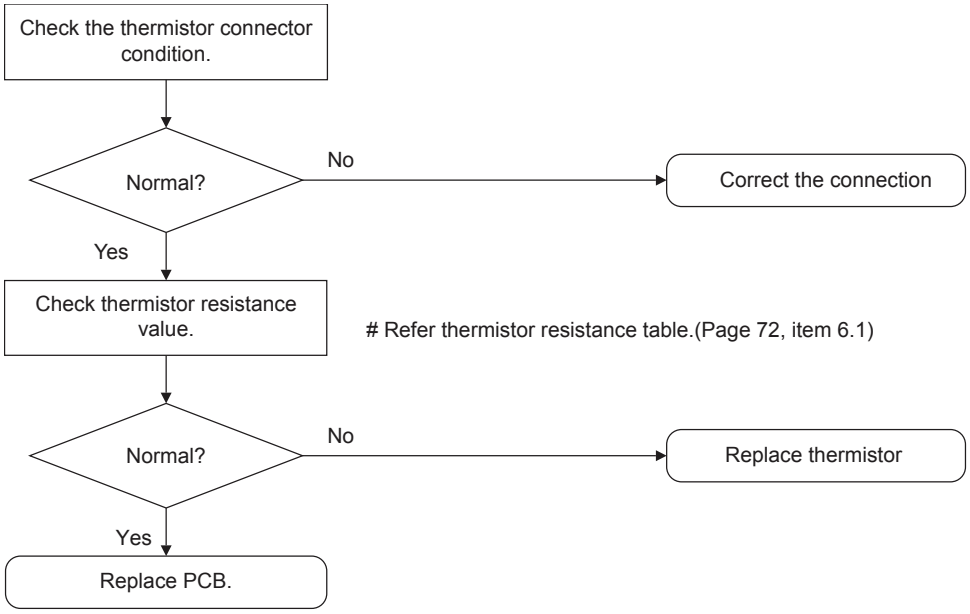
A1	
Description	INDOOR PCB ABNORMALITY
Possible Root cause	1. Faulty indoor PCB. 2. Faulty connector connection at indoor.
Troubleshooting	

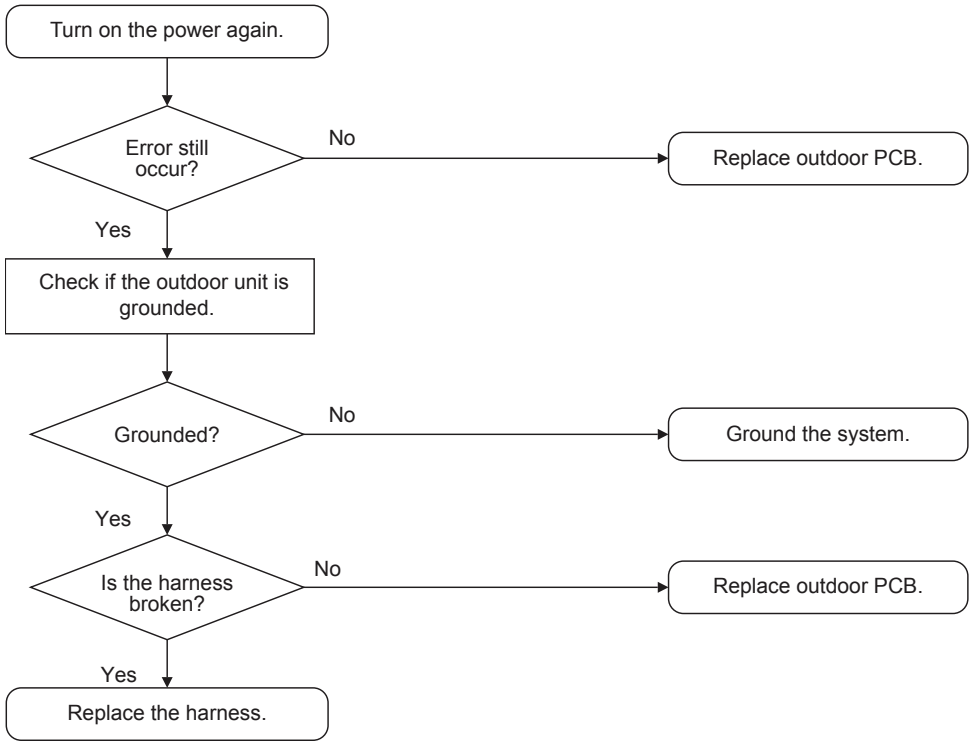
A5	
Description	ANTIFREEZE PROTECTION OR HIGH PRESSURE CONTROL
Possible Root cause	1. Indoor air filter, heat exchanger block due to dust accumulation. 2. Indoor air short circuit. 3. Indoor coil thermistor faulty. 4. Indoor PCB faulty. 5. Fan blower dirty.
Troubleshooting	

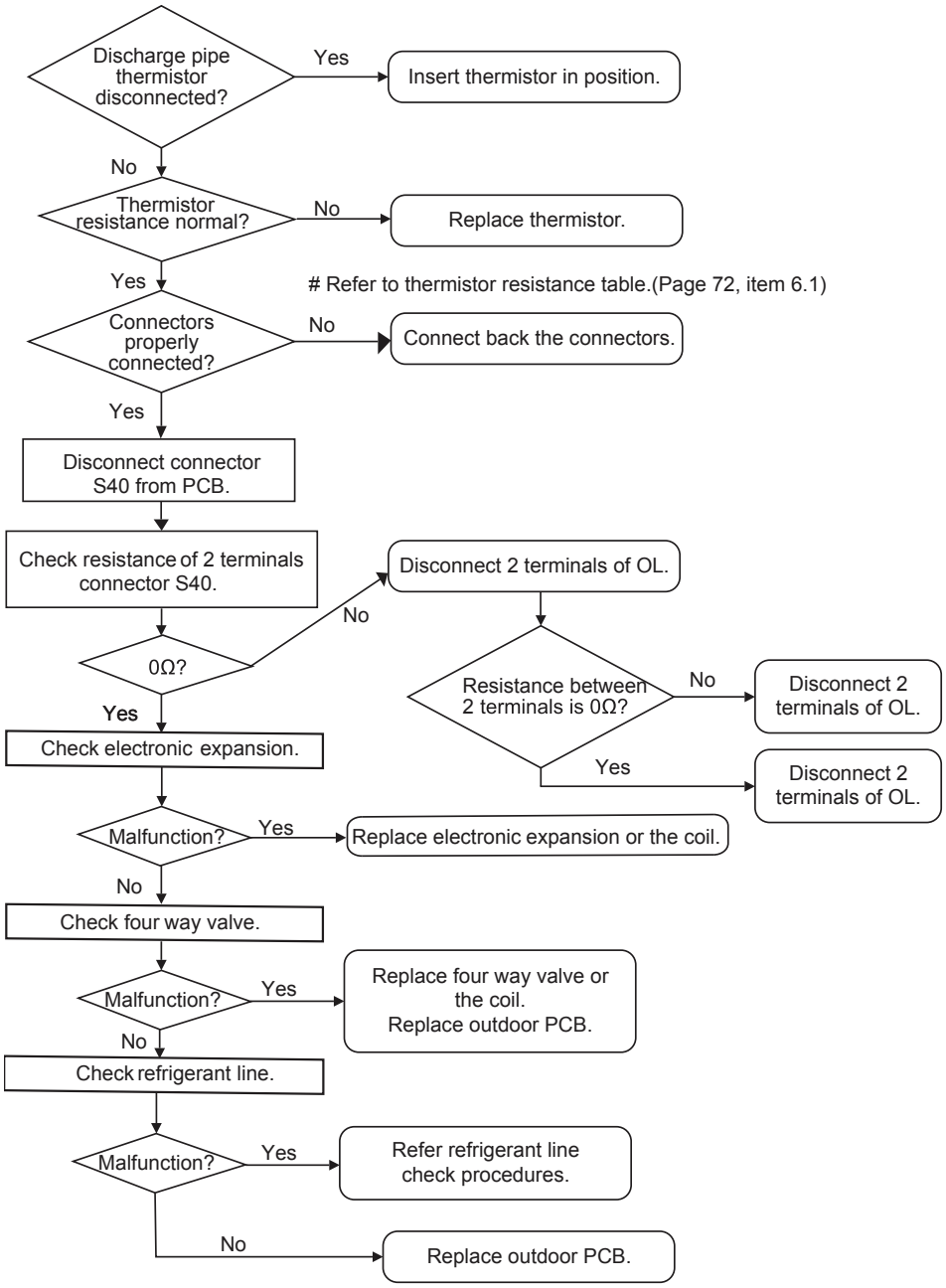


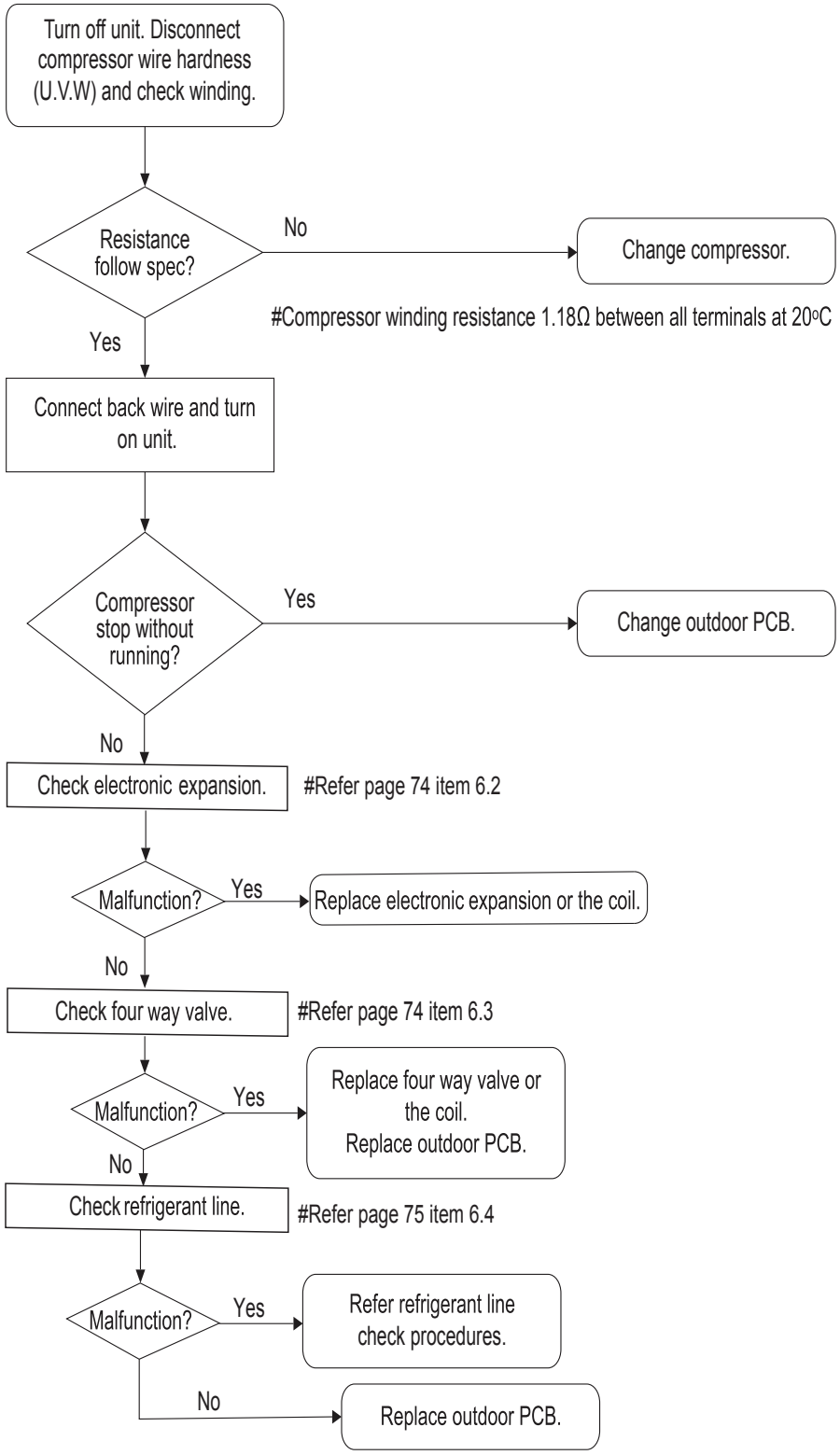
A6	
Description	INDOOR FAN MOTOR ABNORMALITY
Possible Root cause	1. Indoor fan motor winding short, or the motor lead wire broken. 2. Indoor PCB faulty.
Troubleshooting	

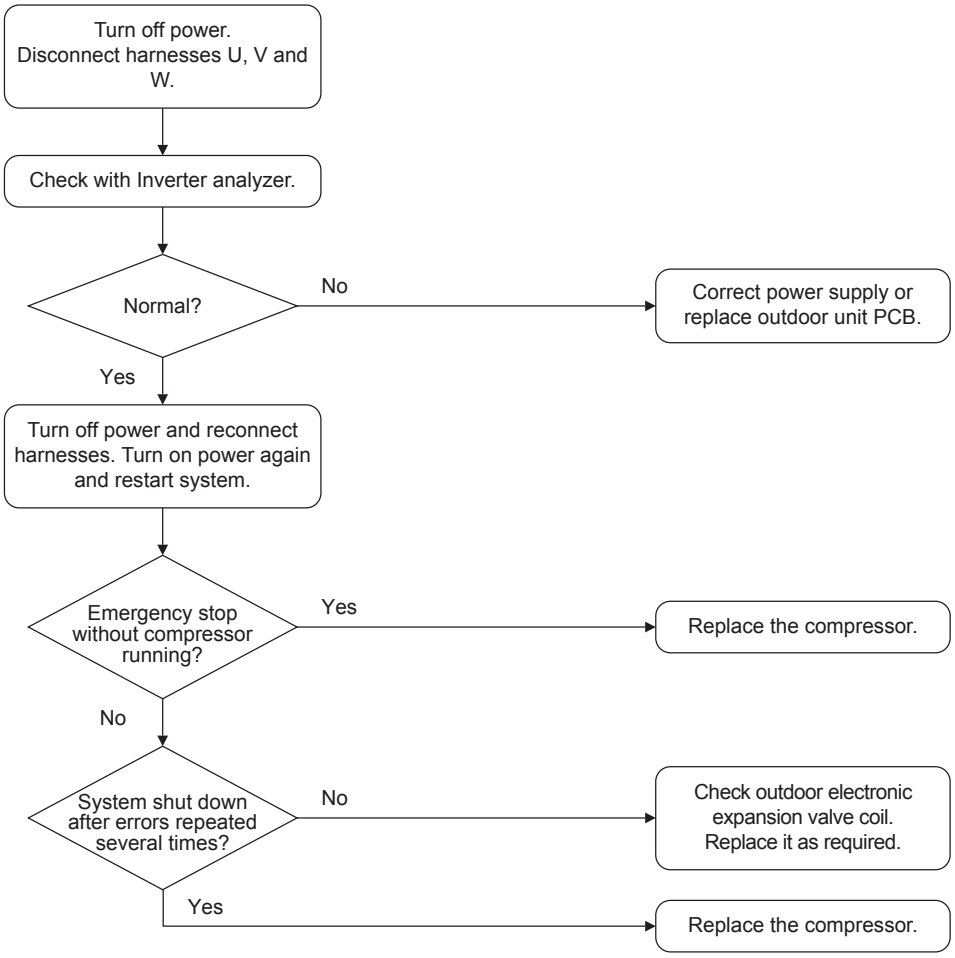
C4	
Description	INDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY
Possible Root cause	1. Thermistor, connector faulty. 2. Indoor PCB faulty.
Troubleshooting	 ***Remark:*** *Refer Thermistor resistance check procedure in Appendix A.(Page 72, item 6.1)*

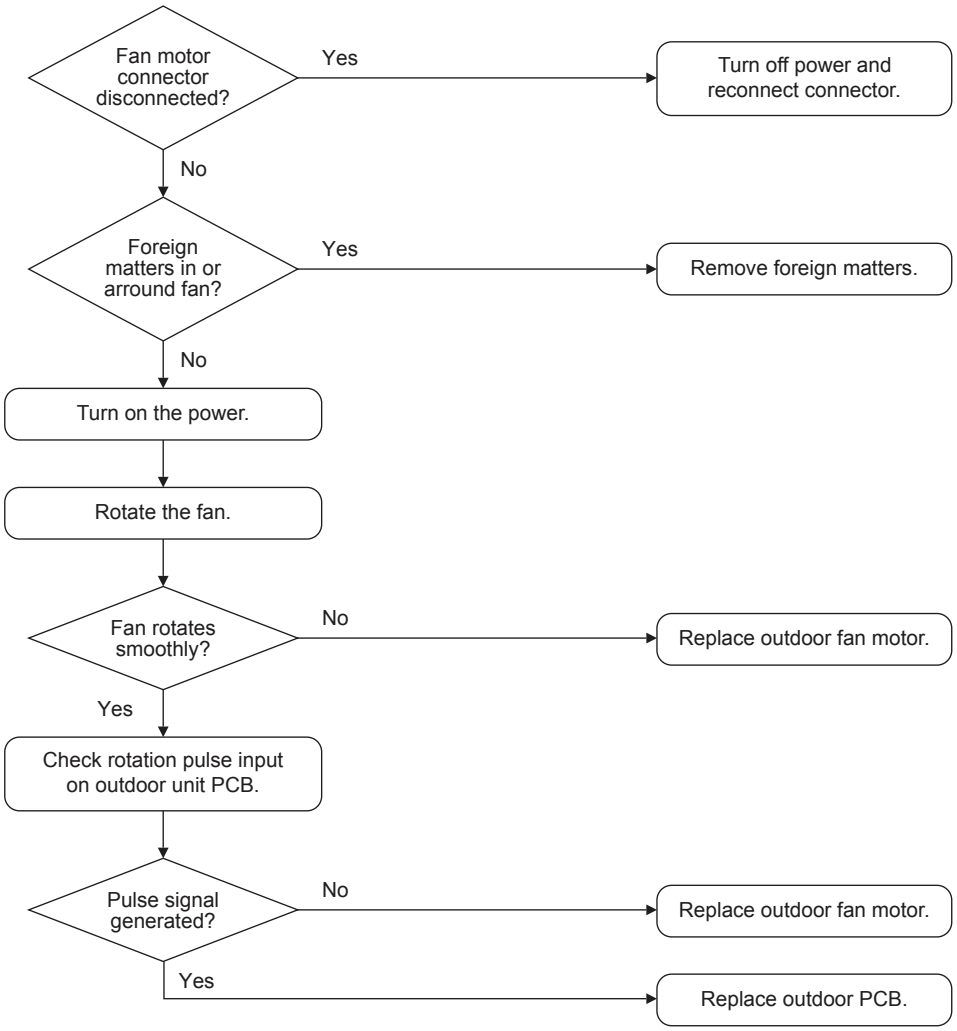
C9	
Description	INDOOR ROOM THERMISTOR ABNORMALITY
Possible Root cause	1. Thermistor, connector faulty. 2. Indoor PCB faulty.
Troubleshooting	

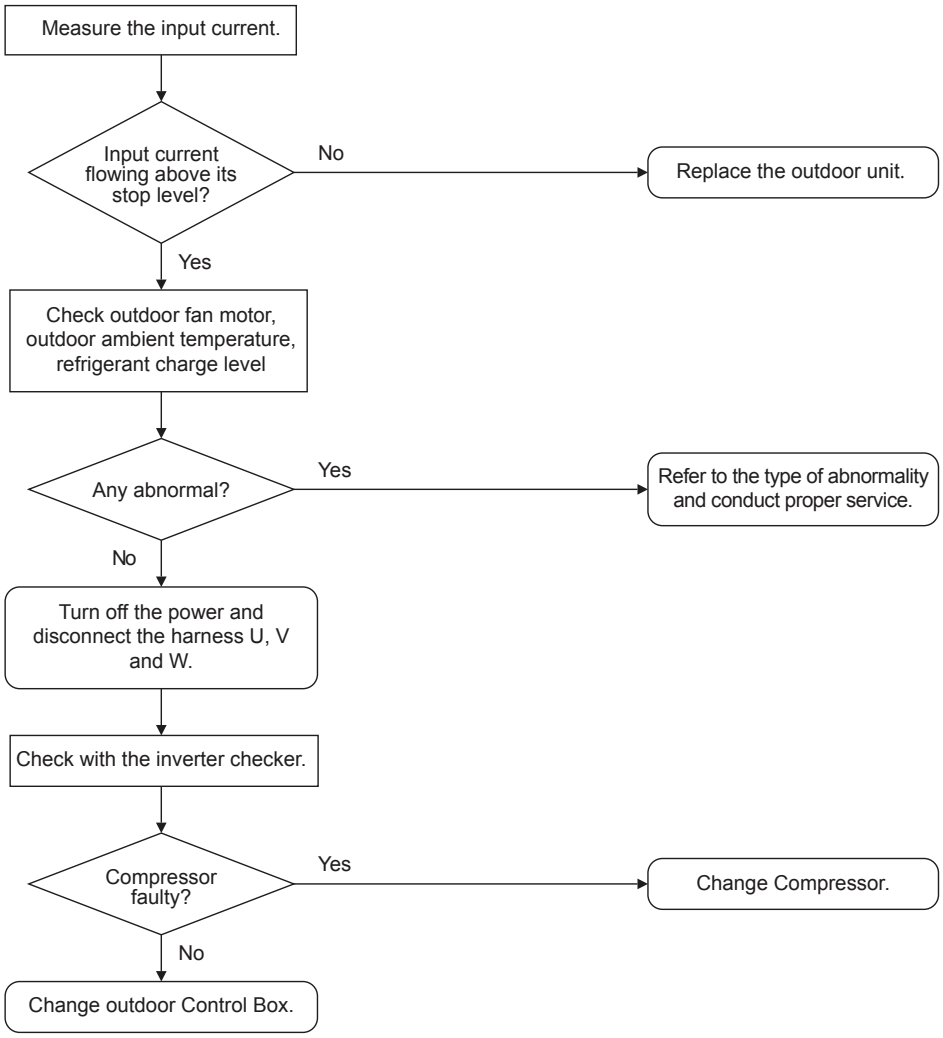
E1	
Description	OUTDOOR PCB ABNORMALITY
Possible Root cause	1. Micro Controller program run-away due to external factor such as Noise, Momentary voltage drop, Momentary power failure. 2. Damage of EEPROM. 3. Faulty outdoor unit PCB. 4. Broken hardness between PCB.
Troubleshooting	

E5 (All models except ARXN/RXN50/60L , RXB50/60A)	
Description	COMPRESSOR OVERLOAD
Possible Root cause	1. Refrigerant Shortage. 2. 4 way valve malfunction. 3. Stop valve malfunction. 4. Outdoor unit PCB defective. 5. Water mixed in refrigerant. 6. Electronic expansion valve defective. 7. Disconnection of discharge pipe thermistor. 8. Faulty discharge pipe thermistor. 9. Disconnection of connector S40. 10. Electronic expansion valve or coil malfunction. 11. Disconnection of 2 terminals of OL.
Troubleshooting	 ***Remark:*** *Please refer to Appendix A for Electronic expansion valve (page 74,item 6.2), four way valve (page 74,item 6.3) and refrigerant line checking procedures (page 75,item 6.4).*

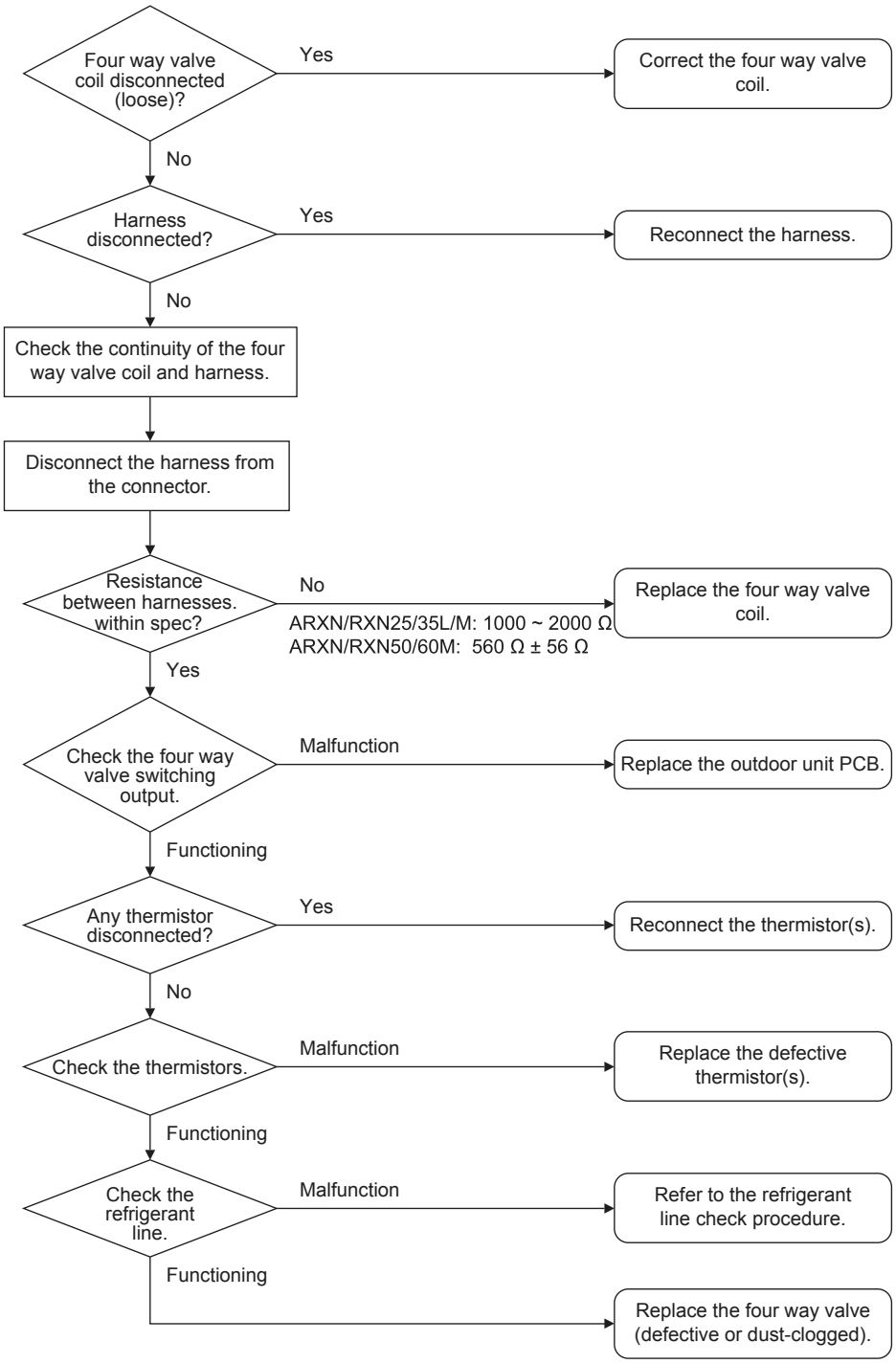
E5 (ARXN/RXN50/60L , RXB50/60A)	
Description	COMPRESSOR OVERLOAD
Possible Root cause	1. Refrigerant Shortage. 2. 4 way valve malfunction. 3. Electronic expansion valve defective. 4. Outdoor unit PCB defective. 5. Water mixed in refrigerant.
Troubleshooting	

E6	
Description	COMPRESSOR LOCK/START-UP ABNORMALITY
Possible Root cause	1. Compressor locked. 2. Compressor harness disconnect.
Troubleshooting	

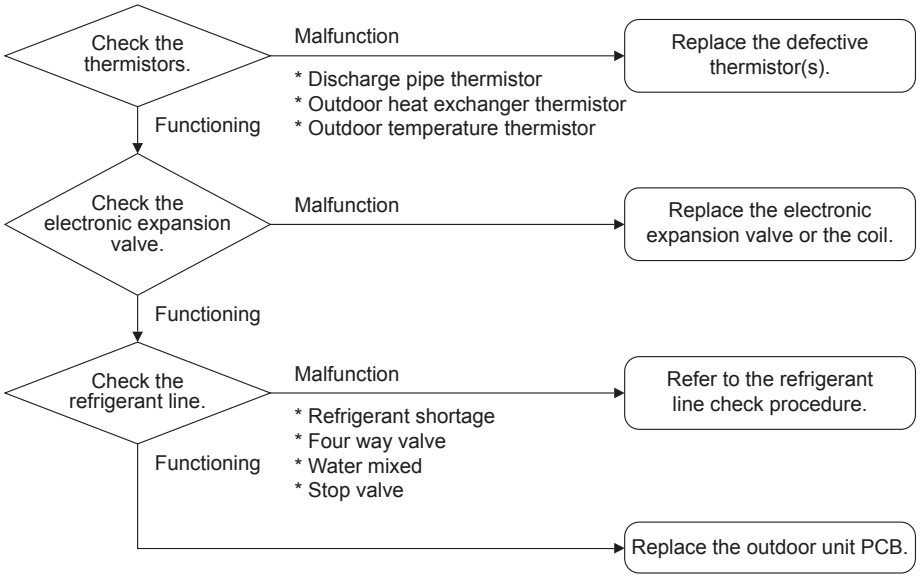
E7	
Description	OUTDOOR FAN MOTOR LOCK
Possible Root cause	1. Fan motor breakdown. 2. Harness or connector disconnected between fan motor and PCB or in poor contact. 3. Foreign matter stuck in fan. 4. Defective outdoor unit PCB.
Troubleshooting	 ***Remark:*** *Refer Appendix A for rotation pulse check.(Page 76, item 6.5)*

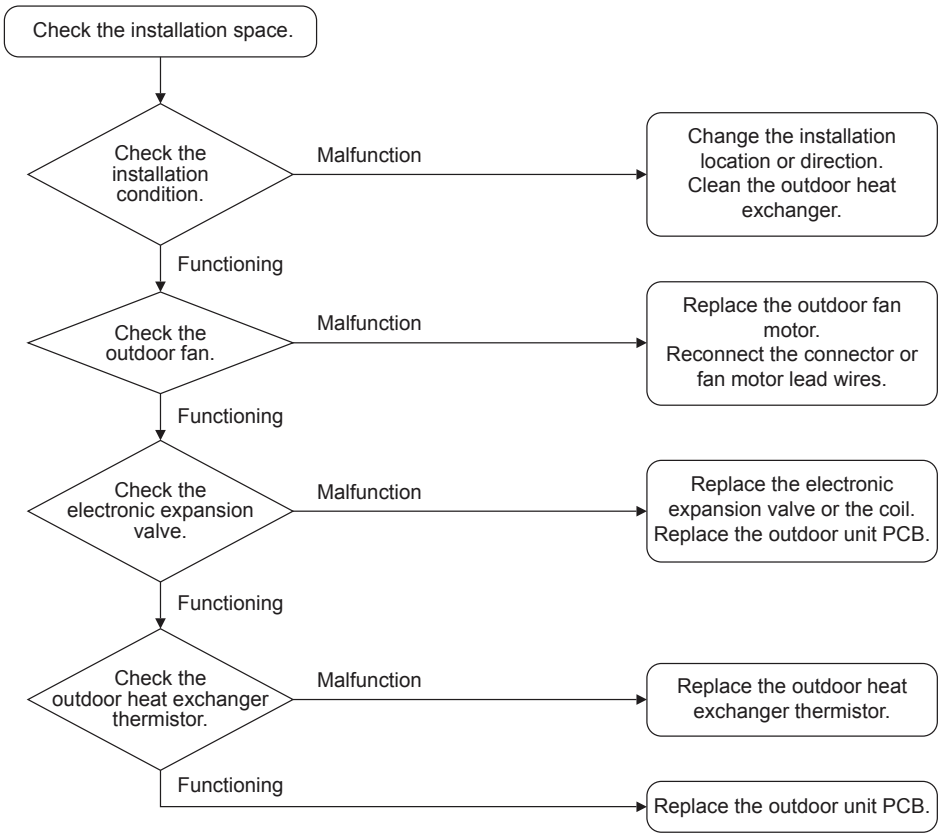
E8	
Description	AC INPUT OVER CURRENT
Possible Root cause	1. Over current due to compressor failure. 2. Over current due to defective outdoor unit PCB. 3. Over current due to defective power transistor. 4. Over current due to short-circuit.
Troubleshooting	

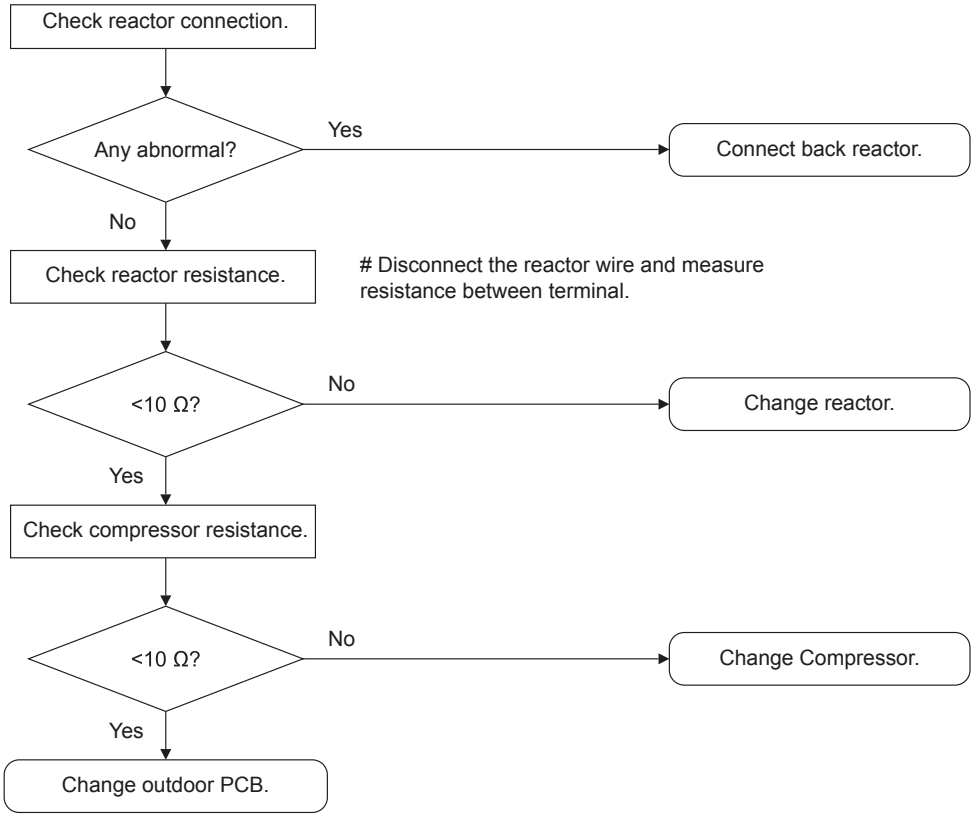
EA	
Description	4 WAY VALVE ABNORMALITY
Possible Root cause	1. Thermistor defective. 2. 4 way valve defective. 3. Outdoor PCB defective. 4. Insufficient gas. 5. Foreign substance mixed in refrigerant. 6. Stop valve defective. 7. Disconnect of 4 way valve coil.
Troubleshooting	

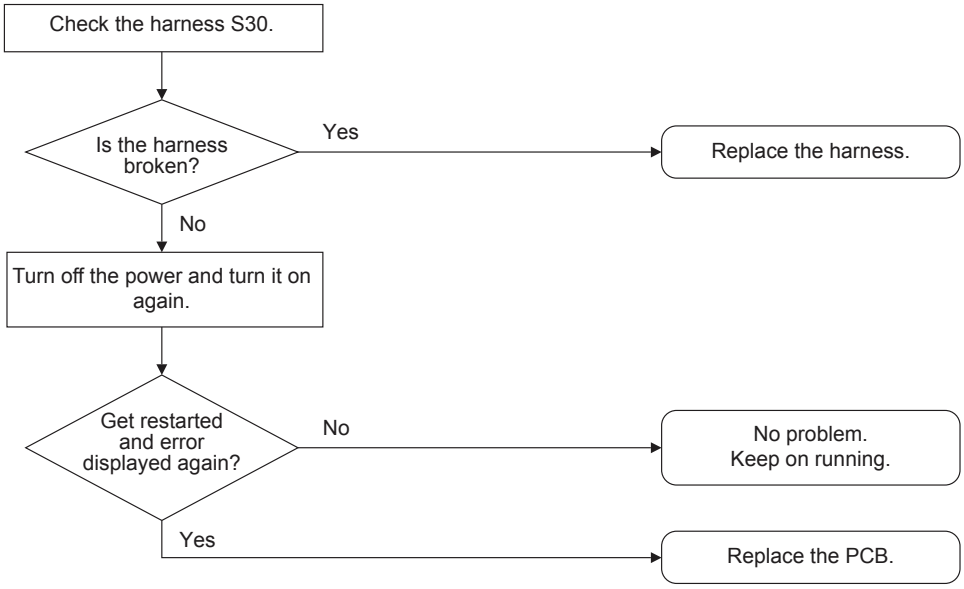


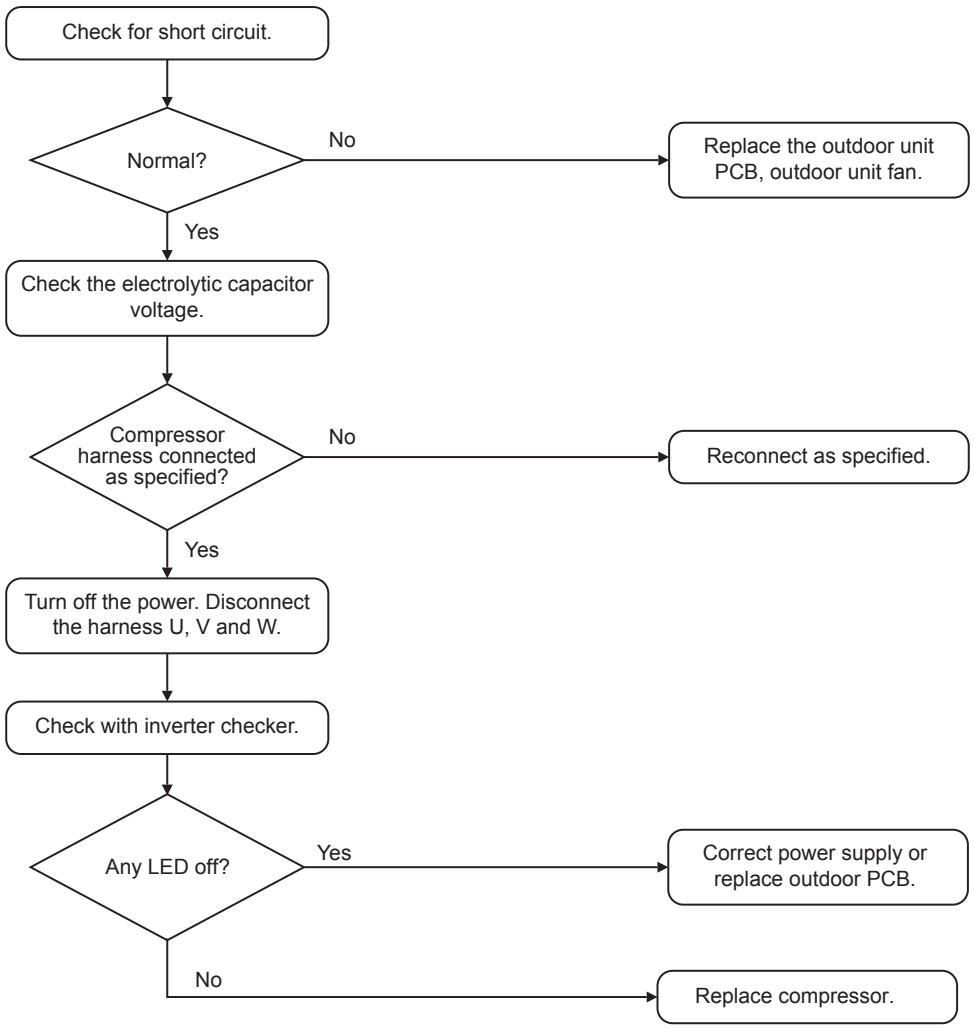
Remark:
Refer to Appendix A for thermistor resistance checking procedures.(Page 72, item 6.1)
Refer to Appendix A for Four way valve performance checking procedures.(Page 74 ,item 6.2)
Refer to Appendix A for Inverter unit refrigerant check procedures.(Page 75 ,item 6.4)

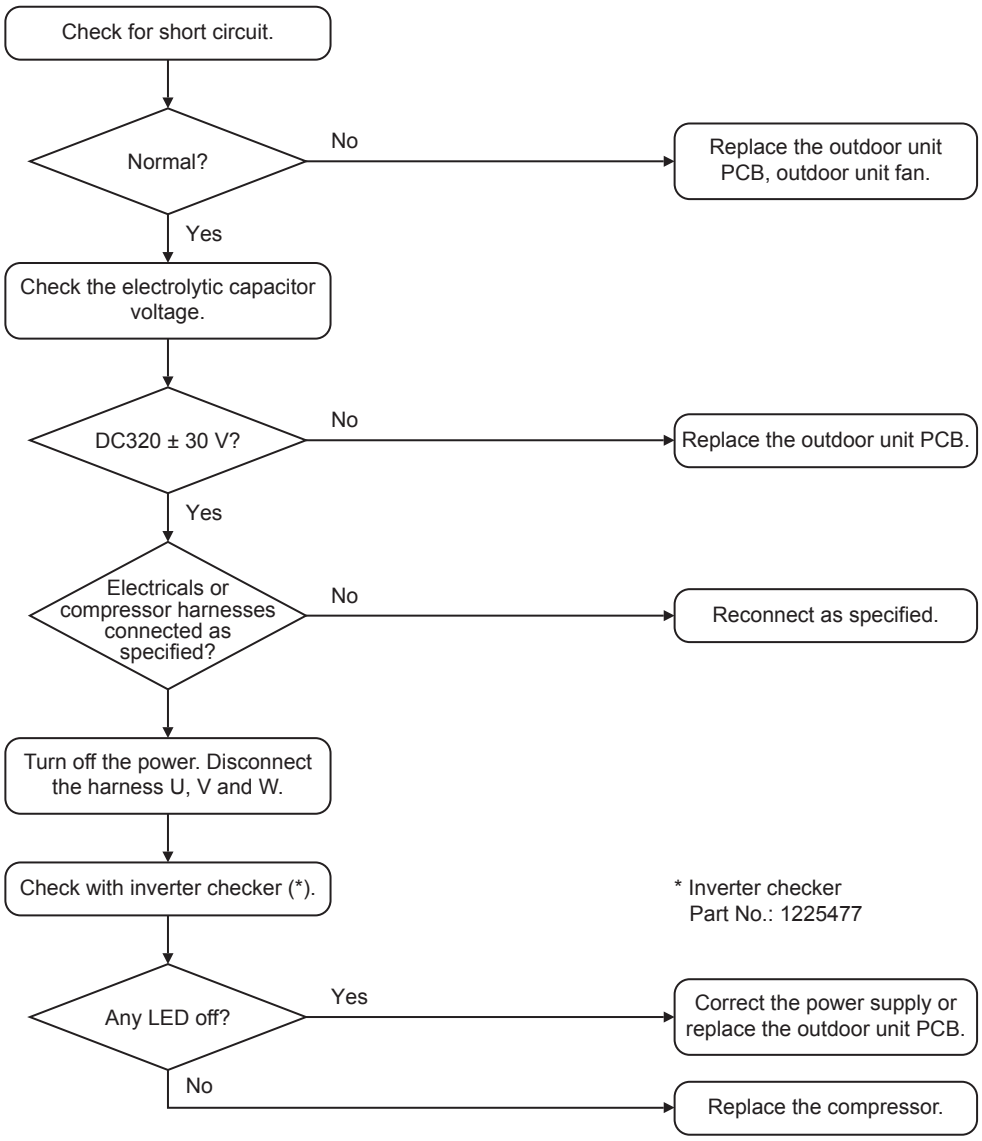
F3	
Description	DISCHARGE PIPE OVERHEAT
Possible Root cause	1. Refrigerant shortage. 2. Four way valve malfunctioning. 3. Discharge pipe thermistor defective. 4. Outdoor PCB defective. 5. Water mixed in the local piping. 6. EXV defective. 7. Stop Valve defective.
Troubleshooting	 ***Remark:*** *Refer to Appendix A for thermistor resistance checking procedures.(Page 72, item 6.1)* *Refer to Appendix A for Electronic Expansion Valve (EXV) checking procedures. (Page 74, item 6.2)* *Refer to Appendix A for Inverter unit refrigerant check procedures. (Page 75, item 6.4)*

F6	
Description	HEAT EXCHANGER OVERHEAT
Possible Root cause	1. The installation space is not large enough. 2. Faulty outdoor fan motor. 3. Faulty EXV. 4. Faulty outdoor heat exchanger thermistor. 5. Faulty stop valve. 6. Dirty heat exchanger. 7. Unit overcharge. 8. Defective outdoor unit PCB.
Troubleshooting	 ***Remark:*** *Refer to Appendix A for thermistor resistance checking procedures.(Page 72, item 6.1)* *Refer to Appendix A for Electronic Expansion Valve (EXV) checking procedures. (Page 74, item 6.2)* *Refer to Appendix A for Inverter unit refrigerant check procedures. (Page 75, item 6.4)* *Refer to Appendix A for Installation condition check. (Page 77, item 6.6)*

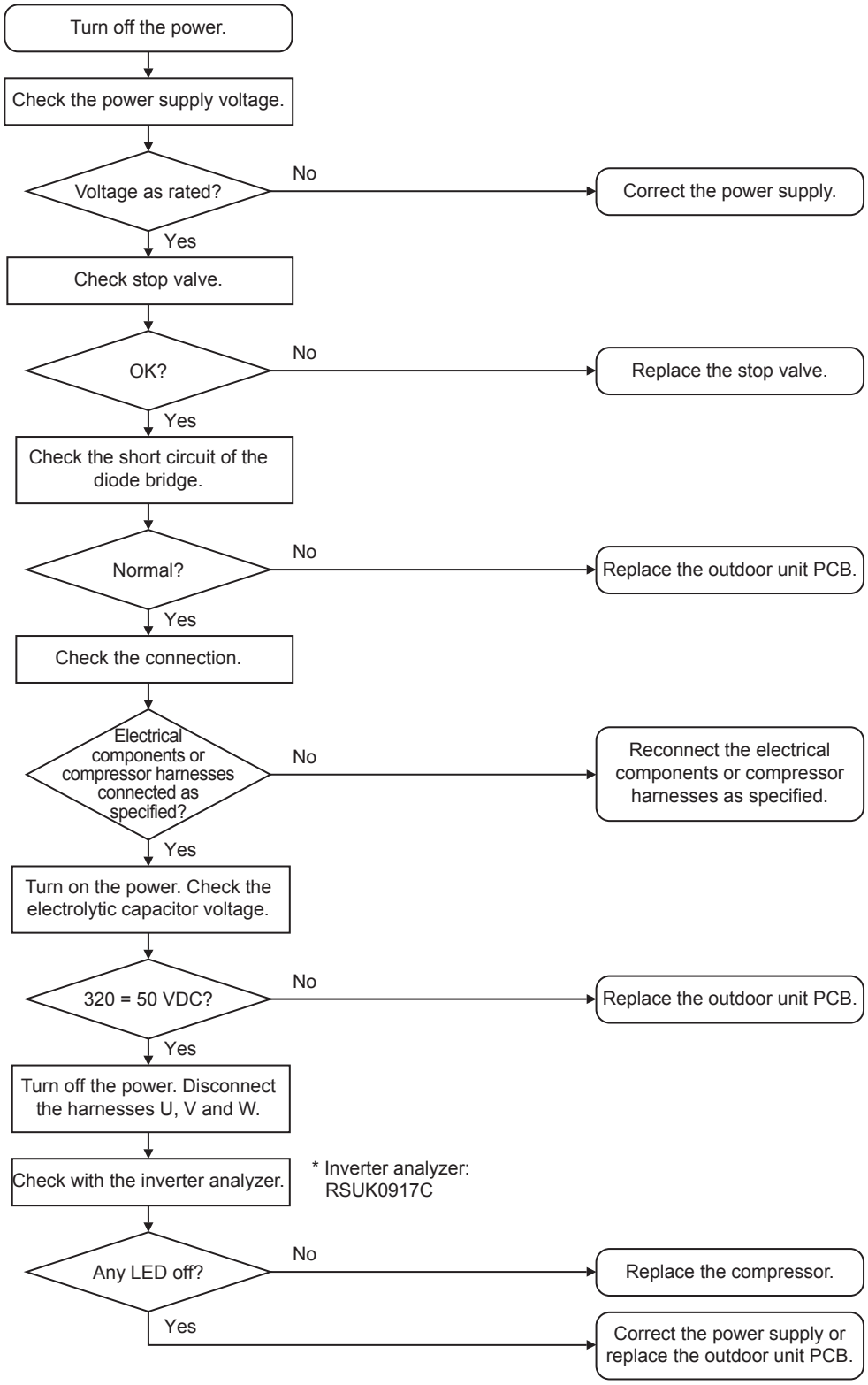
H0 (ARXN/RXN/RXB50/60A)	
Description	COMPRESSOR SENSOR SYSTEM ABNORMAL
Possible Root cause	1. Broken and disconnected harness. 2. Outdoor unit PCB defective. 3. Defective compressor.
Troubleshooting	

H0 (ARXN/RXN25/35M/N, RXK25/35A)	
Description	COMPRESSOR SENSOR SYSTEM ABNORMAL
Possible Root cause	1. Broken and disconnected harness. 2. Outdoor unit PCB defective.
Troubleshooting	

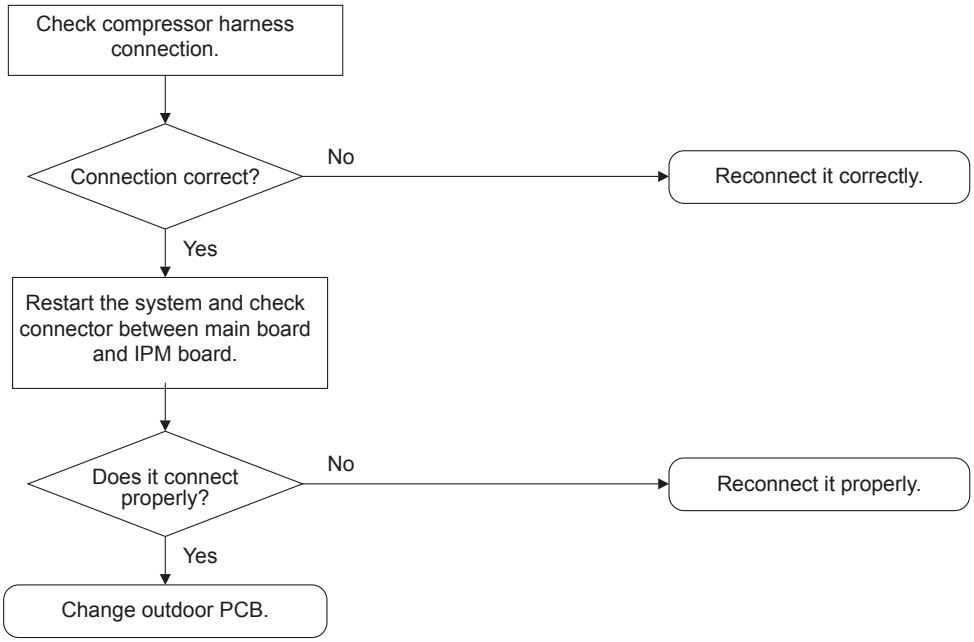
H6 (ARXN/RXN50/60L, RXB50/60A)	
Description	POSITION SENSOR ABNORMAL (COMPRESSOR)
Possible Root cause	1. Compressor relay cable disconnected. 2. Compressor itself defective. 3. Outdoor PCB defective. 4. Stop valve closed. 5. Input voltage out of specification.
Troubleshooting	

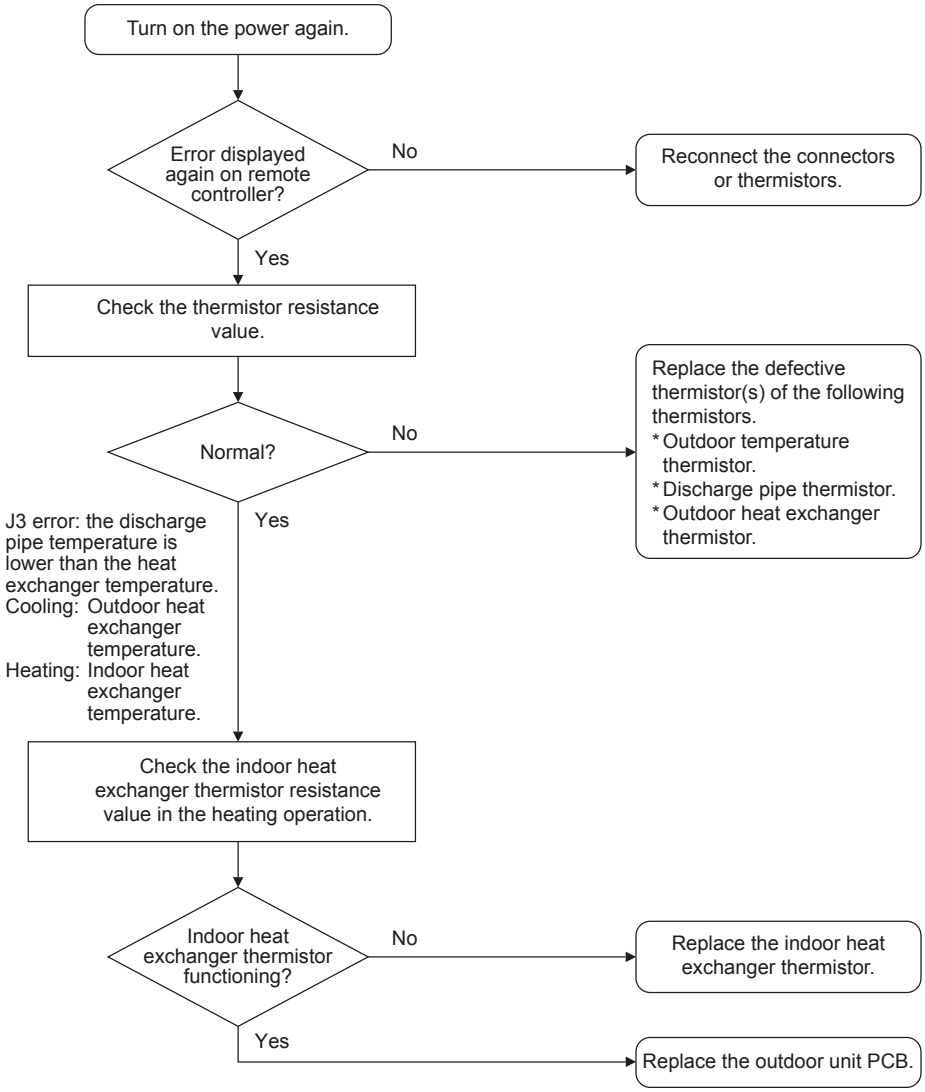
H6 (RXN25/35M/N, RXK25/35A)	
Description	POSITION SENSOR ABNORMAL (COMPRESSOR)
Possible Root cause	1. Compressor relay cable disconnected. 2. Compressor itself defective. 3. Outdoor PCB defective. 4. Stop valve closed. 5. Input voltage out of specification.
Troubleshooting	

H6 (ARXN/RXN50/60M/N, RXK50/60A)	
Description	POSITION SENSOR ABNORMAL (COMPRESSOR)
Possible Root cause	1. Compressor relay cable disconnected. 2. Compressor itself defective. 3. Outdoor PCB defective. 4. Stop valve closed. 5. Input voltage out of specification
Troubleshooting	

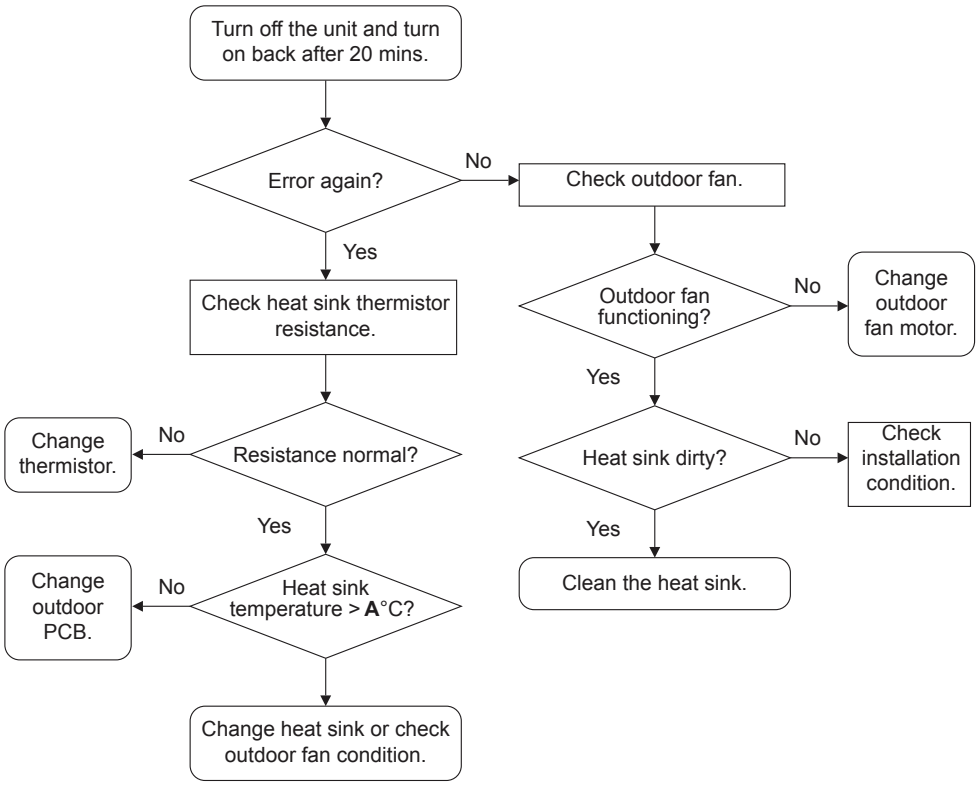


Remark:
Refer to Appendix A for Diode bridge short circuit check procedures.(Page 78, item 6.8)

H8	
Description	AC CURRENT SENSOR ABNORMALITY
Possible Root cause	1. Internal wiring broken. 2. Outdoor unit PCB defective.
Troubleshooting	 ***Remark:*** *This error is only applicable for model ARXN/RXN50/60L and RXB50/60A.*

H9, J3, J6, P4	
Description	Thermistor or related abnormality **H9:** OUTDOOR AIR THERMISTOR ABNORMALITY **J3:** COMPRESSOR DISCHARGE PIPE THERMISTOR ABNORMALITY **J6:** OUTDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY **P4:** HEAT SINK THERMISTOR ABNORMALITY
Possible Root cause	1. Disconnection of the connector for the thermistor. 2. Thermistor corresponding to the error code is defective. 3. Defective heat exchanger thermistor in the case of J3 error (outdoor heat exchanger thermistor in cooling operation, or indoor heat exchanger thermistor in heating operation). 4. Defective outdoor unit PCB.
Troubleshooting	 ***Remark:*** *Refer to Appendix A for thernistor resistance check procedures.(Page 72, item 6.1)*

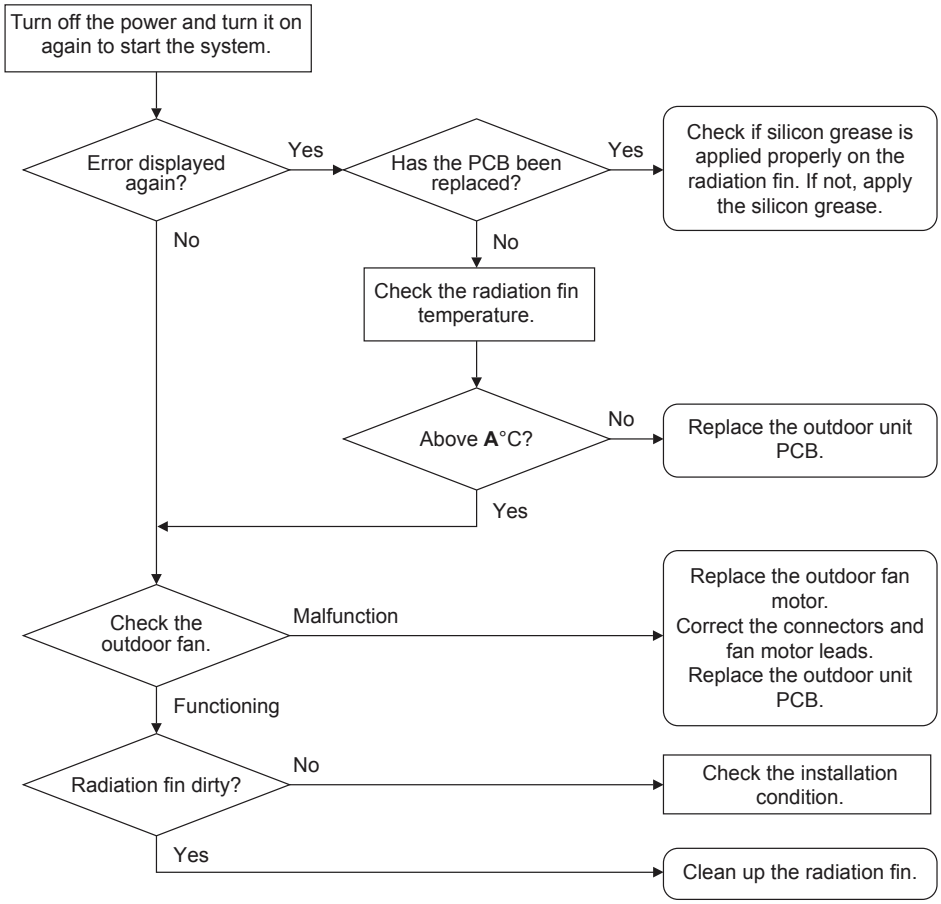
L3	
Description	ELECTRICAL BOX TEMPERATURE RISE (COMPRESSOR OFF)
Possible Root cause	1. Fin temperature rise due to defective outdoor unit fan. 2. Fin temperature rise due to short circuit. 3. Fin thermistor defective. 4. Connector in poor contact. 5. Outdoor unit PCB defective.
Troubleshooting	



Models	A°C
RXB50/60B	80
ARXN/RXN25/35M	78
ARXN/RXN50/60M	122

Remark:
Refer to Appendix A for thermistor resistance check procedures.(Page 72, item 6.1)
Refer to Appendix A for outdoor fan system check. (Page 77, item 6.7)
Refer to Appendix A for installation condition check. (Page 77, item 6.6)

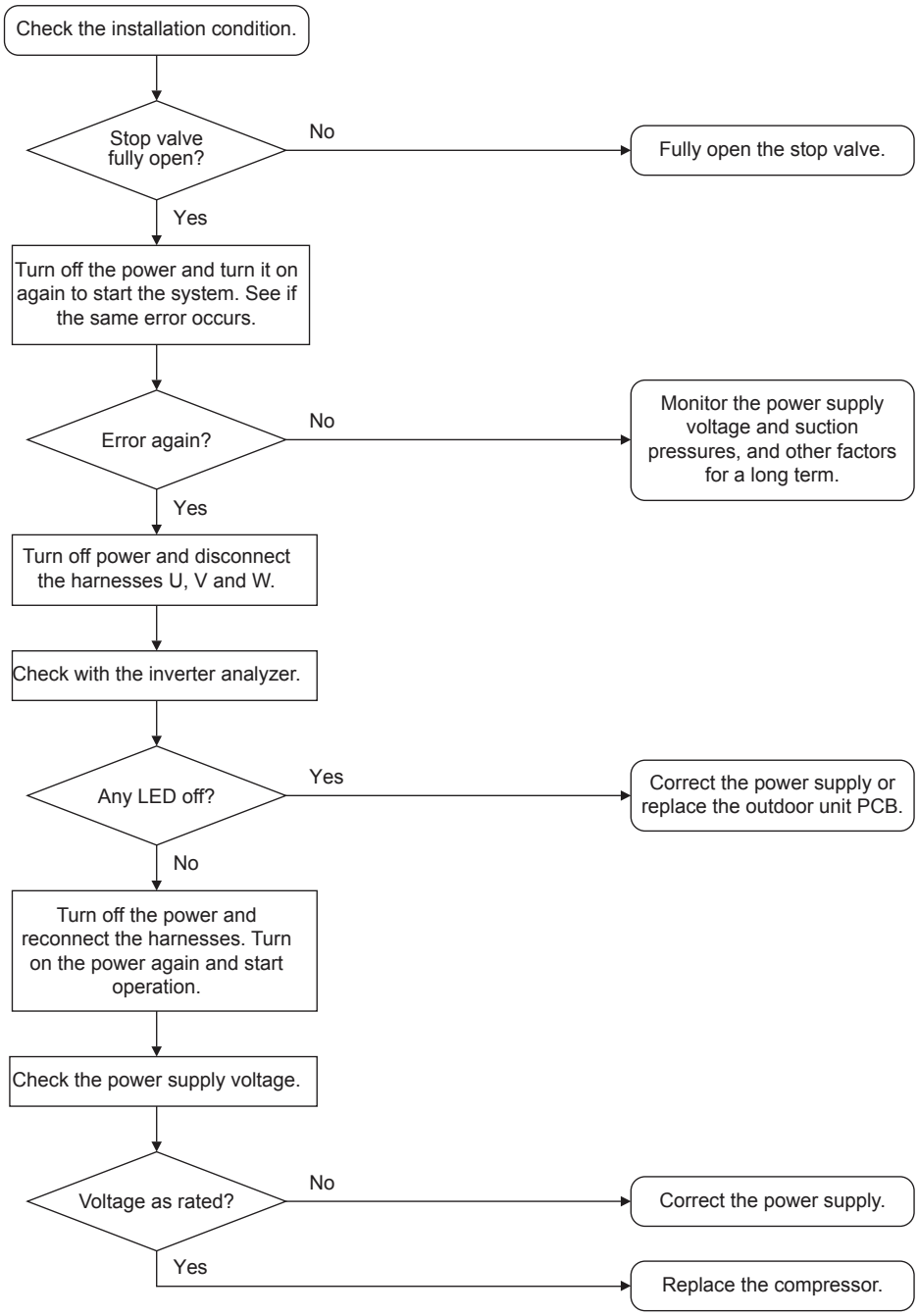
L4	
Description	Heat sink overheat
Possible Root cause	1. Fin temperature rise due to short circuit. 2. Fin temperature rise due to defective outdoor unit fan. 3. Fin thermistor defective. 4. Connector in poor contact. 5. Outdoor unit PCB defective. 6. Silicon grease is not applied properly on the radiation fin after replacing outdoor unit PCB.
Troubleshooting	



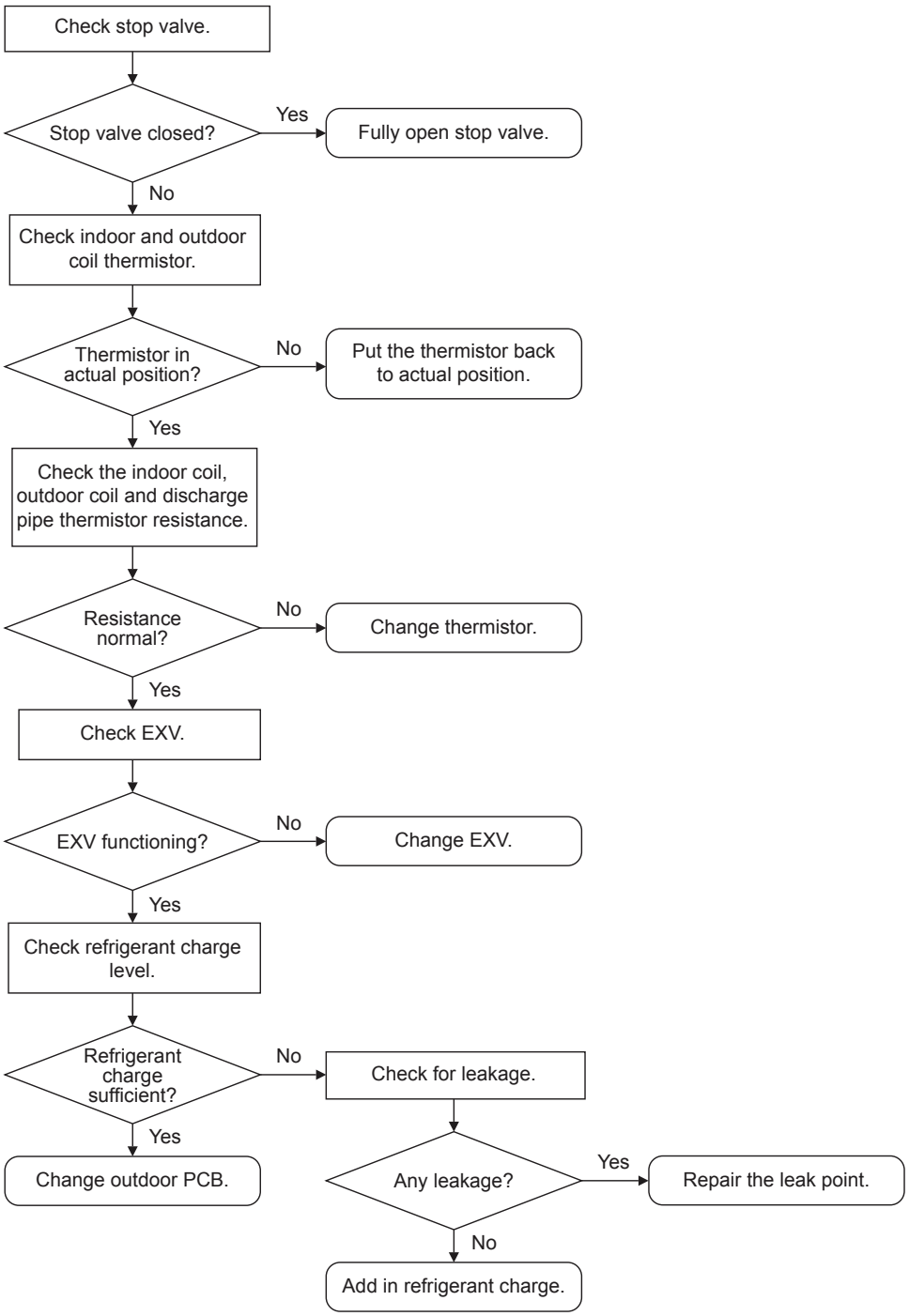
Models	A°C
ARXN/RXN50/60L	85
ARXN/RXN25/35M	93
ARXN/RXN50/60M,RXB50/60B	85

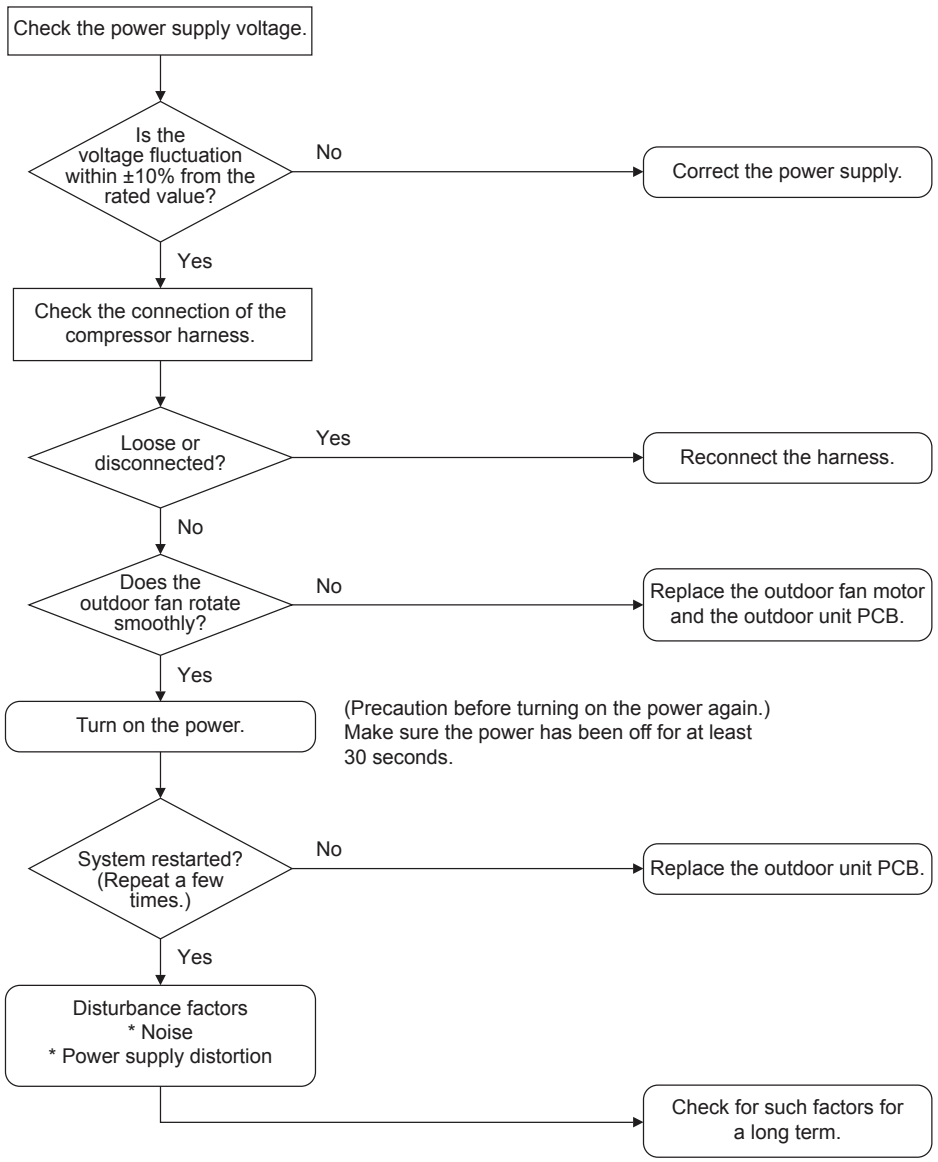
Remark:
Refer to Appendix A for outdoor fan system check.(Page 77, item 6.7)
Refer to Appendix A for installation condition check. (Page 77, item 6.6)

L5	
Description	IPM ABNORMALITY
Possible Root cause	1. Over current due to defective power transistor. 2. Over current due to wrong internal wiring. 3. Over current due to abnormal supply voltage. 4. Over current due to defective PCB. 5. Error detection due to defective PCB. 6. Over- current due to closed stop valve. 7. Over current due to compressor failure. 8. Over current due to poor installation condition. 9. Connection between main board and IPM board is not properly connect.
Troubleshooting	

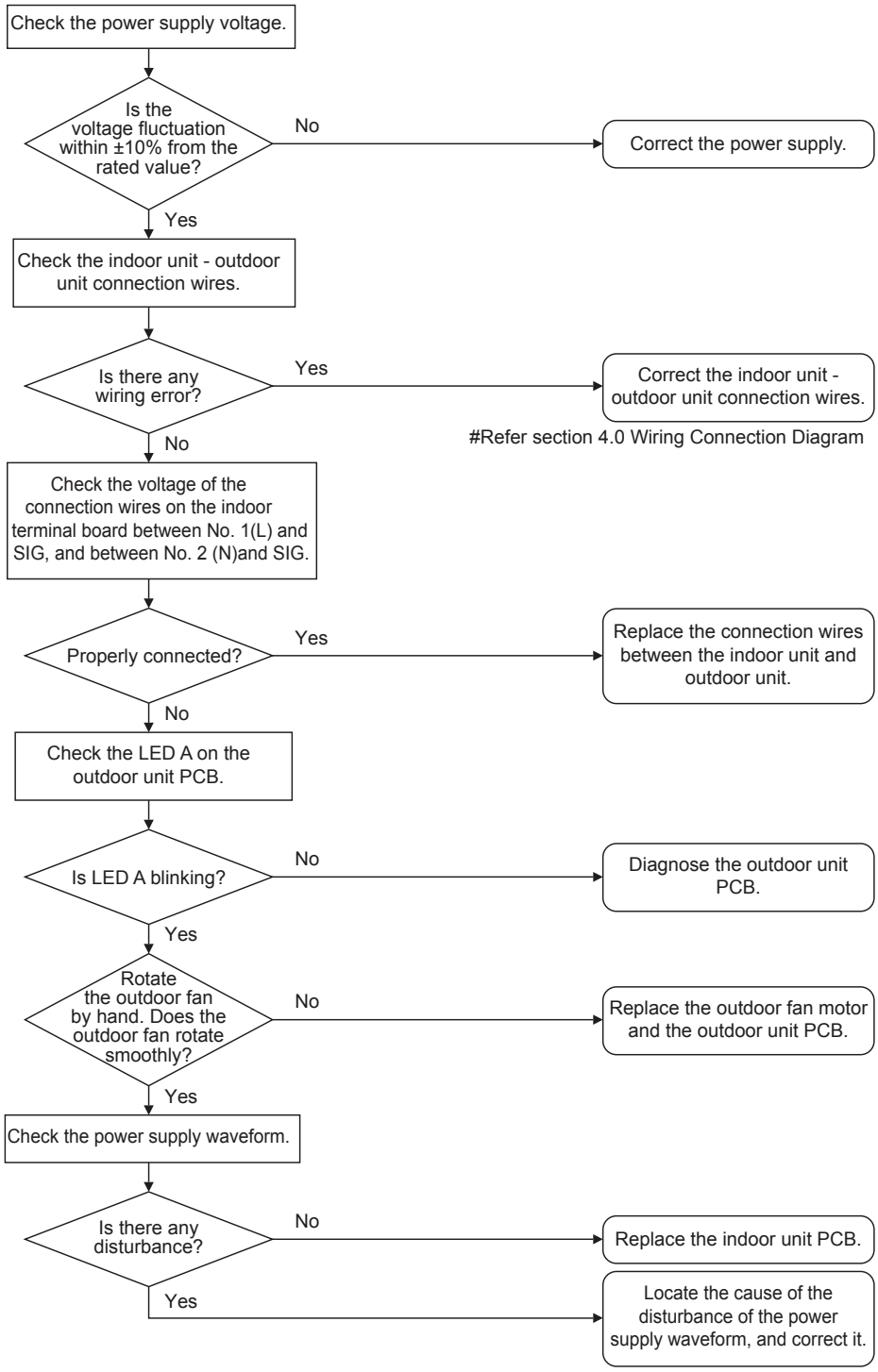


Remark:
Refer to Appendix A for installation condition check. (Page 77, item 6.6)

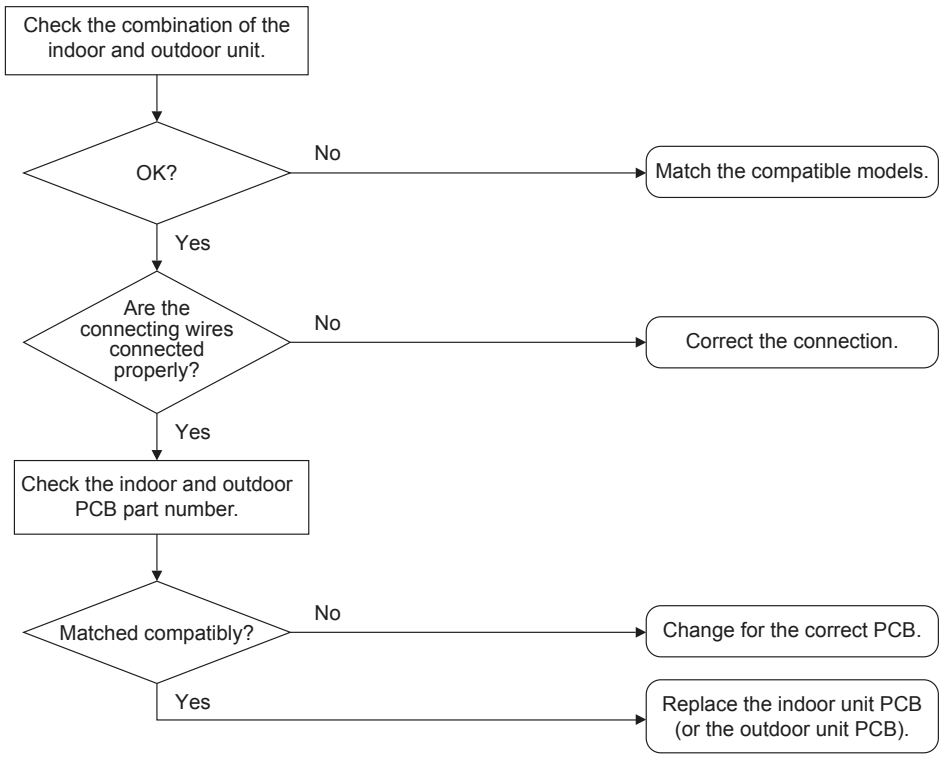
U0	
Description	INSUFFICIENT GAS
Possible Root cause	1. Disconnection of the discharge pipe thermistor, indoor or outdoor heat exchanger,room or outdoor temperature thermistor. 2. Closed stop valve. 3. Refrigerant shortage (refrigerant leakage). 4. Poor compression performance of compressor. 5. Defective electronic expansion valve.
Troubleshooting	 ***Remark:*** *Refer to Appendix A for thermistor resistance checking procedures.(Page 72, item 6.1)* *Refer to Appendix A for electronic expansion device checking procedures.(Page 74, item 6.2)*

U2	
Description	DC VOLTAGE OUT OF RANGE
Possible Root cause	1. Power supply voltage is not as specified. 2. Defective DC voltage detection circuit. 3. Defective over-voltage detection circuit. 4. Defective PAM control part. 5. Disconnection of compressor harness 6. Short circuit inside the fan motor winding. 7. Noise. 8. Momentary drop of voltage. 9. Momentary power failure. 10. Defective outdoor unit PCB.
Troubleshooting	

U4	
Description	COMMUNICATION ABNORMALITY
Possible Root cause	1. Faulty outdoor unit PCB. 2. Faulty indoor unit PCB. 3. Indoor unit – outdoor unit signal transmission error due to wiring error. 4. Indoor unit – outdoor unit signal transmission error due to disturbed power supply waveform. 5. Indoor unit – Outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units
Troubleshooting	

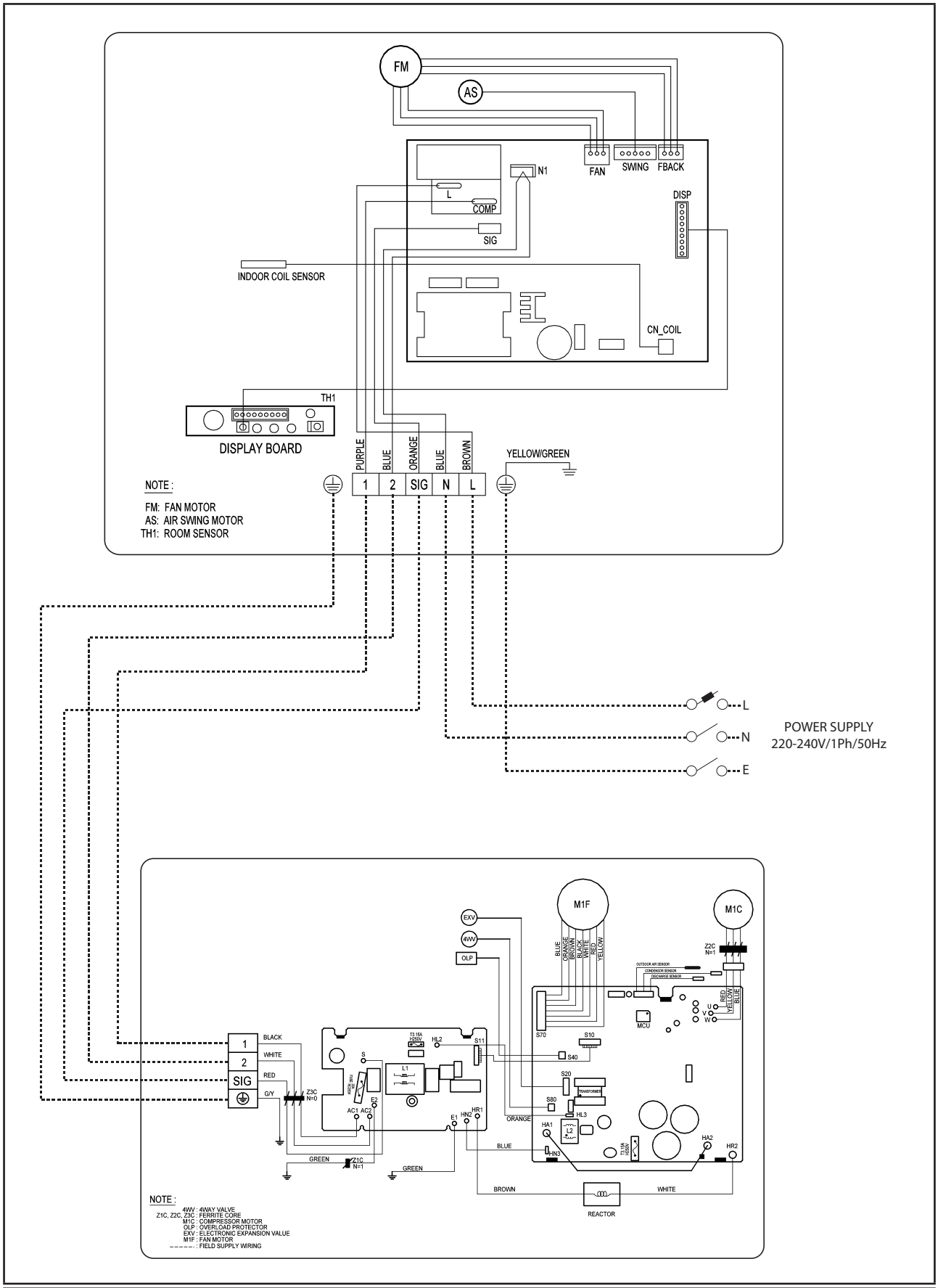


Remark:
Refer to Appendix A for power supply waveform check procedures.(Page 79, item 6.9)

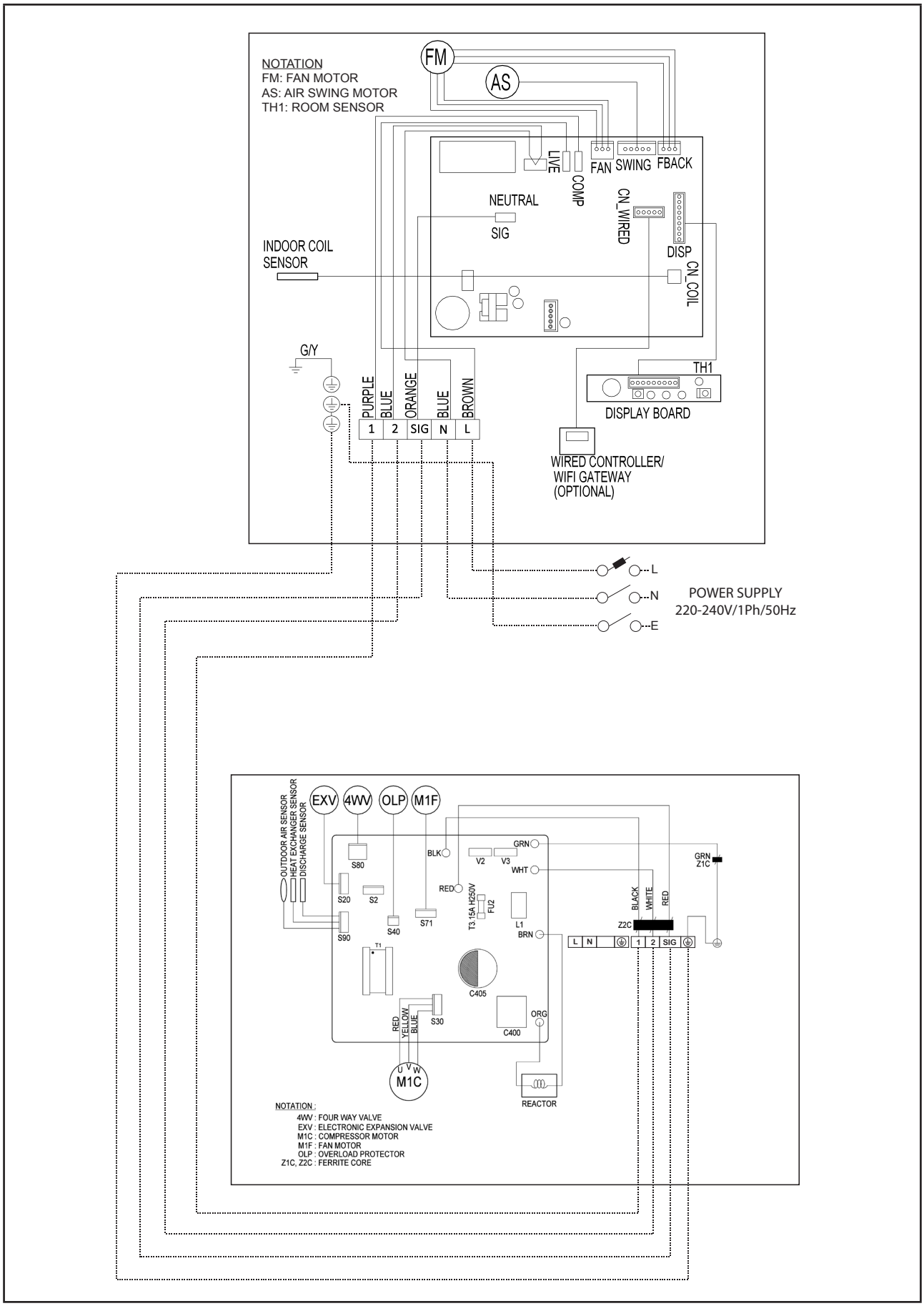
UA	
Description	INSTALLATION ABNORMALITY
Possible Root cause	1. Wrong models interconnected. 2. Wrong indoor unit PCB mounted. 3. Indoor unit PCB defective. 4. Wrong outdoor unit PCB mounted or defective.
Troubleshooting	

4.0 Wiring Connection

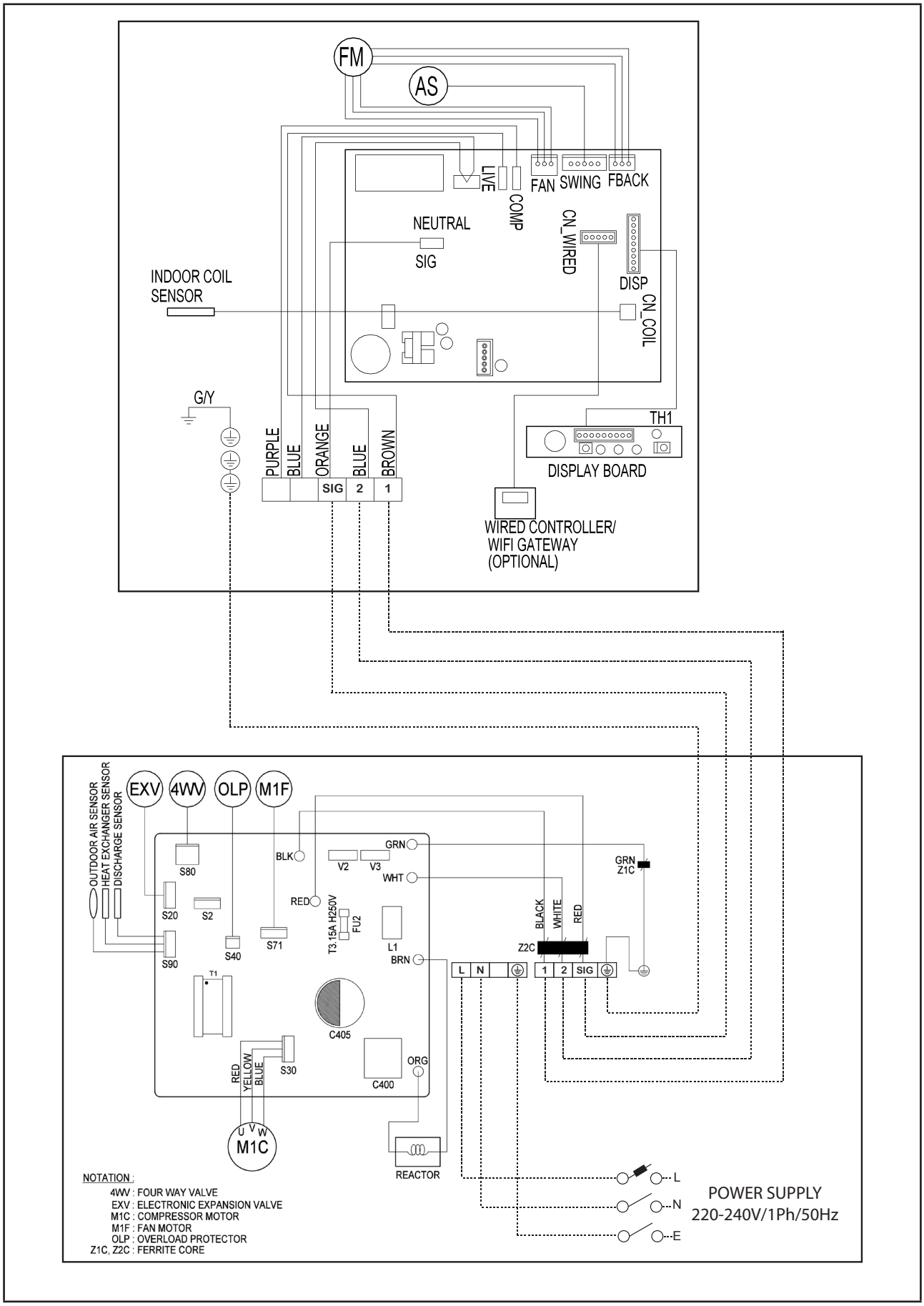
Model: FTXN25/35L-RXN25/35L / ATXN25/35L-ARXN25/35L / FTXN25/35MV1-RXN25/35MV1 / FTXN25/35MV1B-RXN25/35MV1B / FTXN25/35MV1B9-RXN25/35MV1B9 / ATXN25/35MV1B-ARXN25/35MV1B



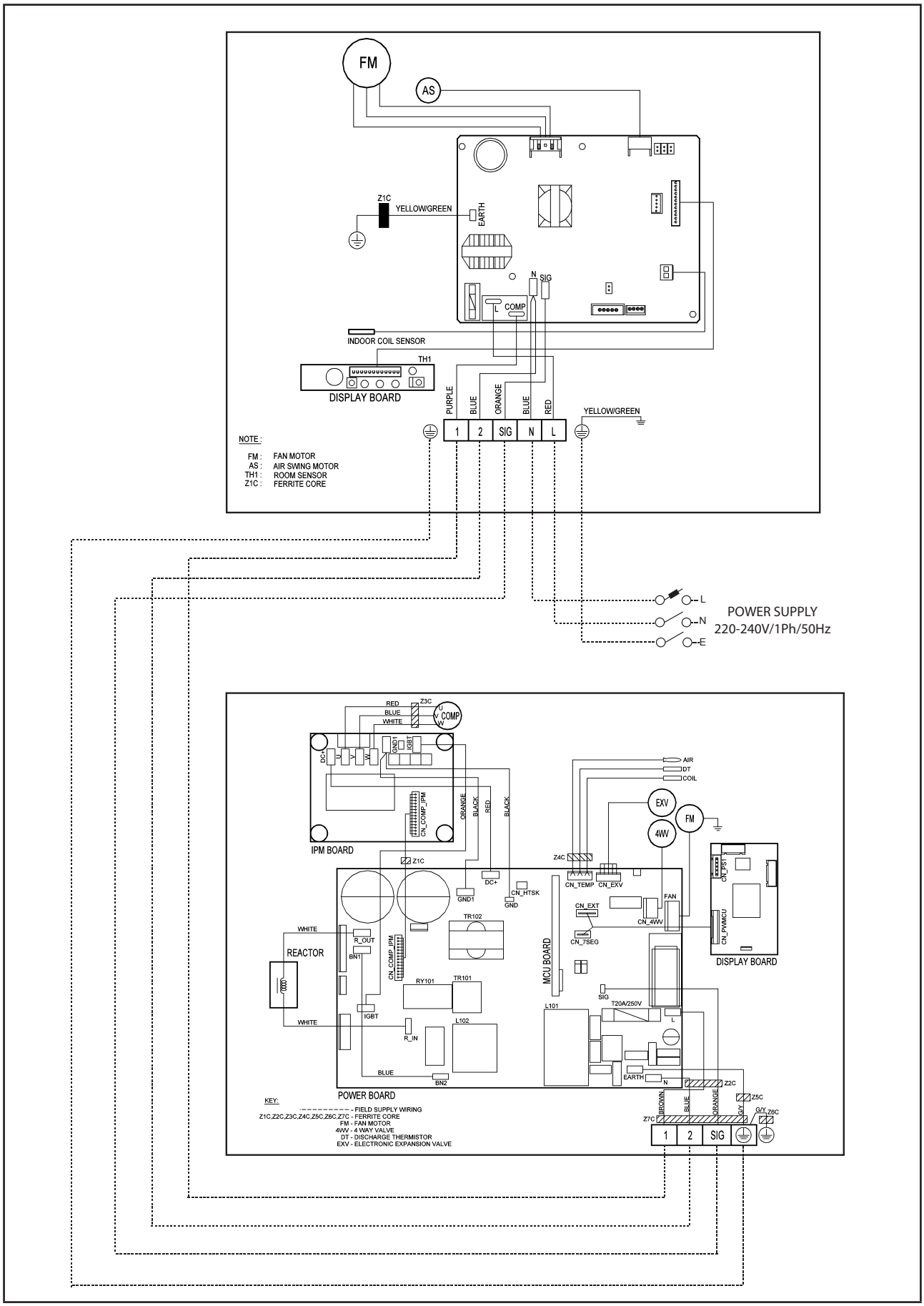
Model: ATXN25/35MV16-ARXN25/35MV16 / ATXN25/35MV1B7-ARXN25/35MV1B7 / ATXN20MV16-ARXN20MV16



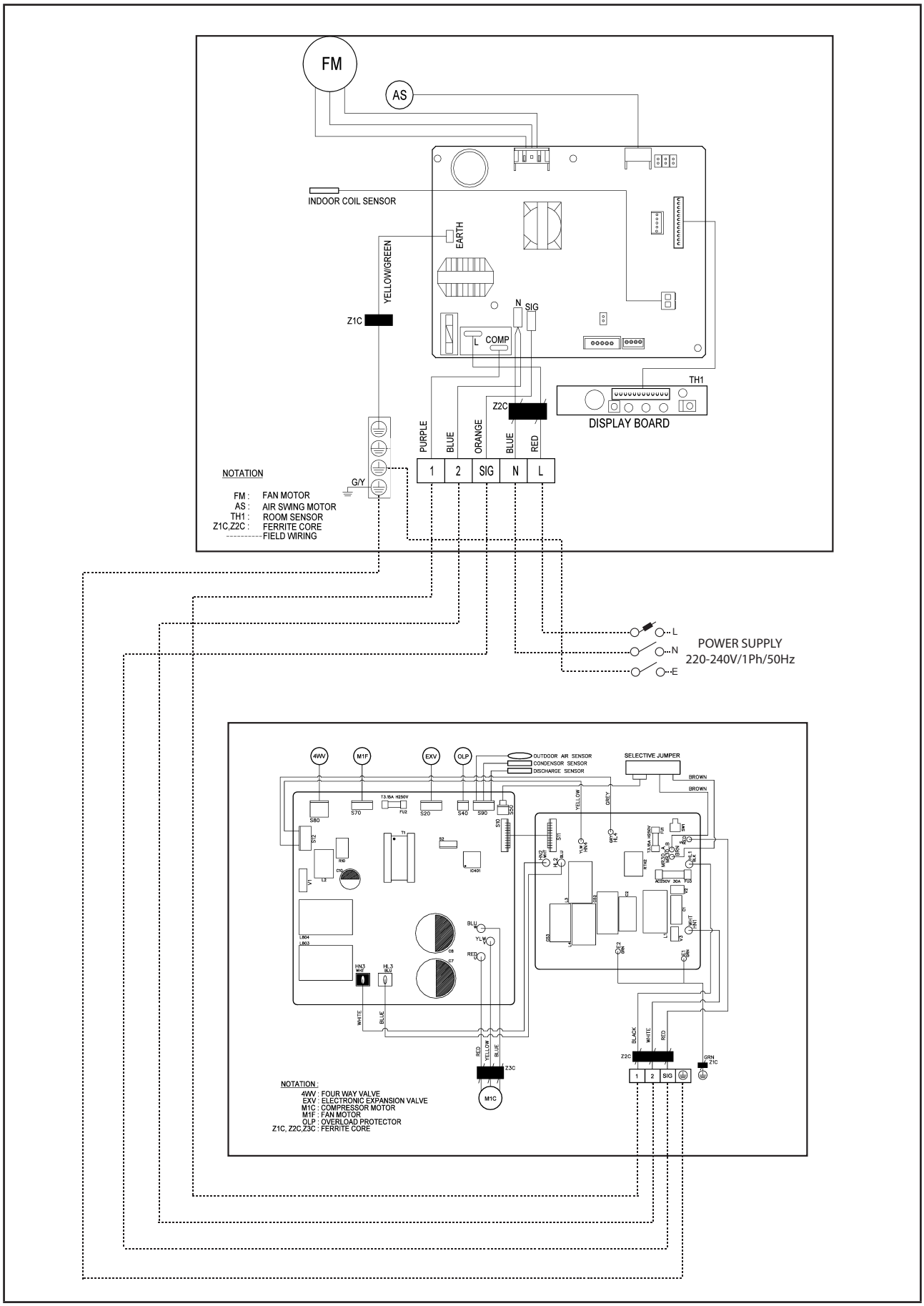
Model: FTXN25/35N-RXN25/35N / ATXN25/35N-ARXN25/35N / FTXK25/35A-RXK25/35A / FTXC25/35A-RXC25/35A



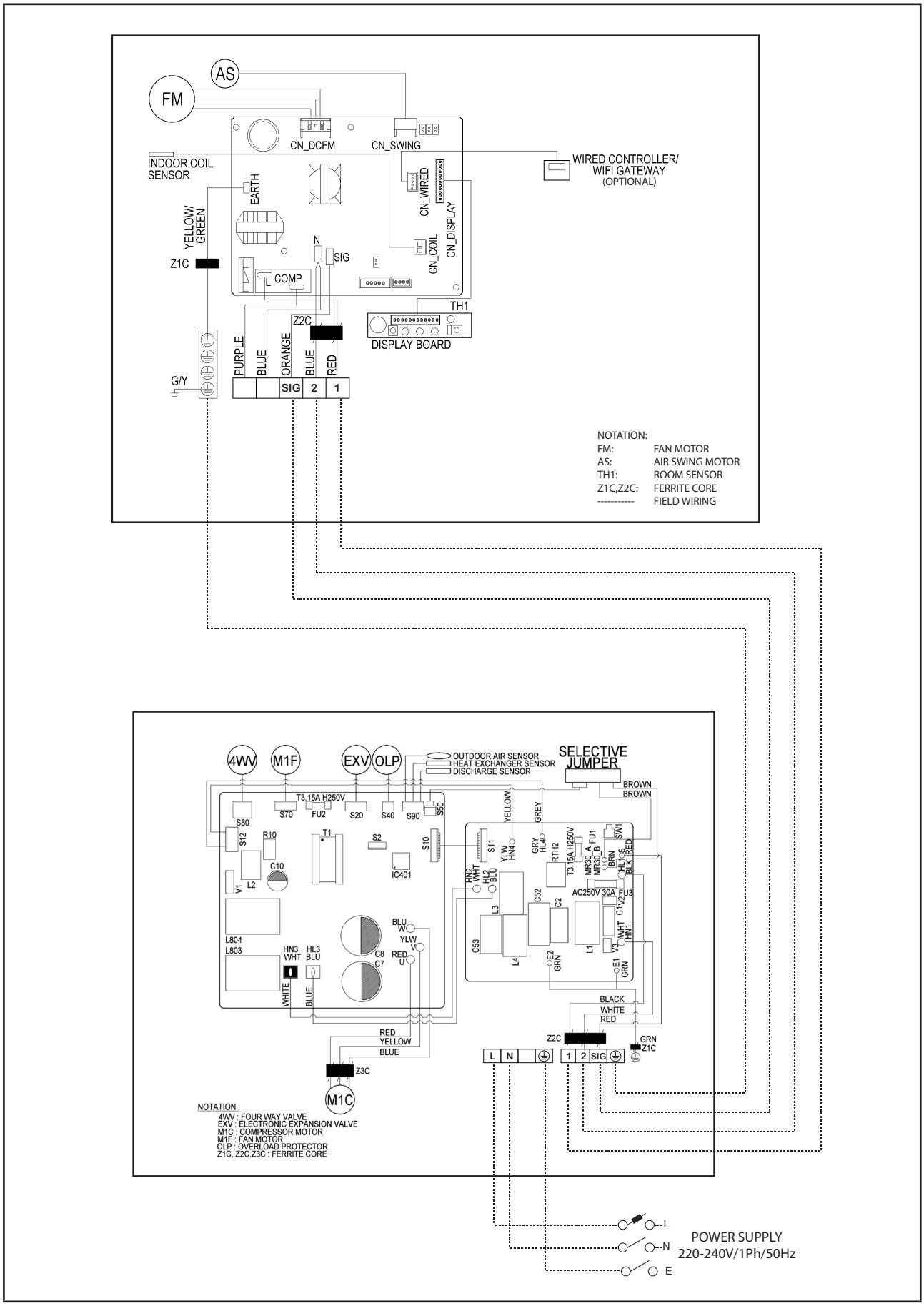
Model: FTXN50/60L-RXN50/60L / ATXN50/60L-ARXN50/60L / FTXB50/60A-RXB50/60A



Model: FTXN50/60M-RXN50/60M / FTXB50/60B-RXB50/60B / ATXN50/60M-ARXN50/60M

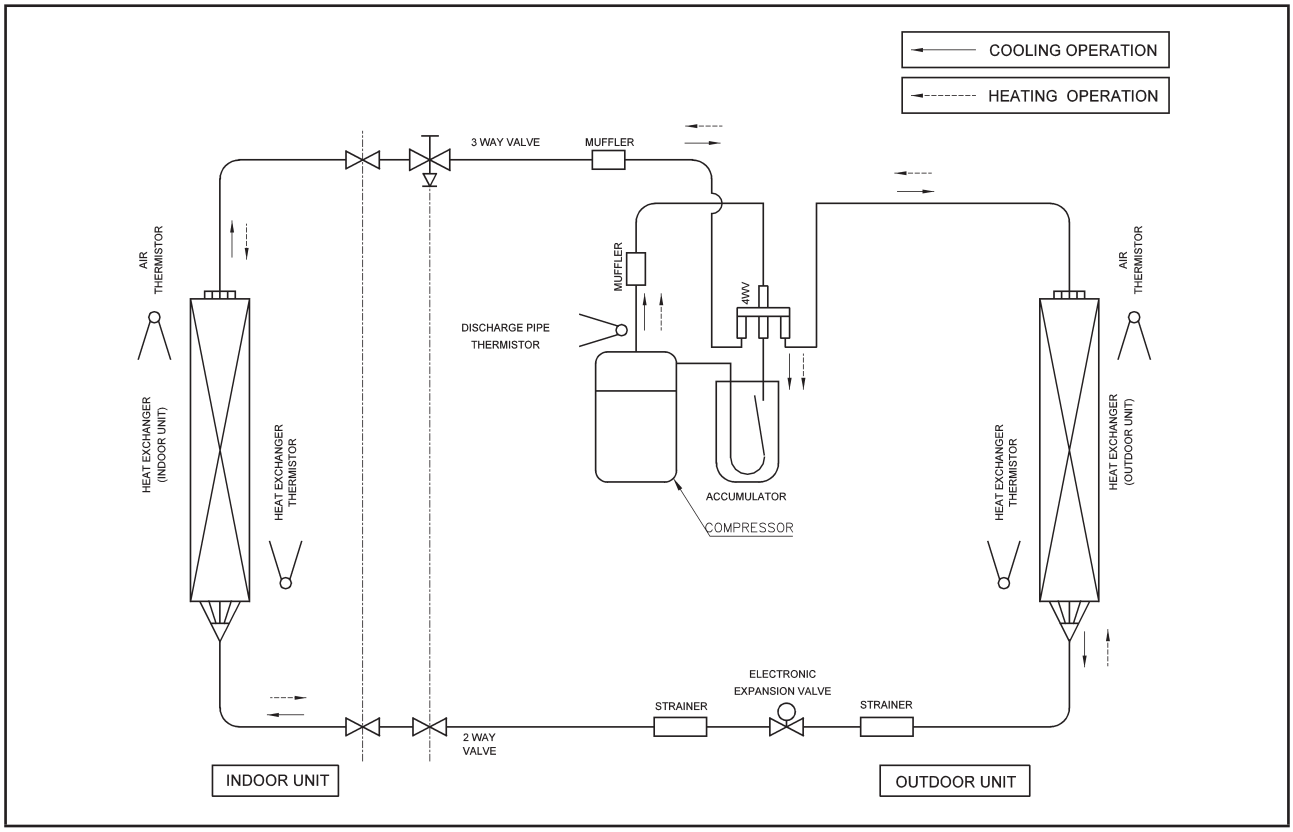


Model: FTXN50/60N-RXN50/60N / ATXN50/60N-ARXN50/60N / FTXB50/60C-RXB50/60C / FTK50/60A-RXK50/60A / ATXB50/60C-ARXB50/60C / FTXC50/60A-RXC50/60A

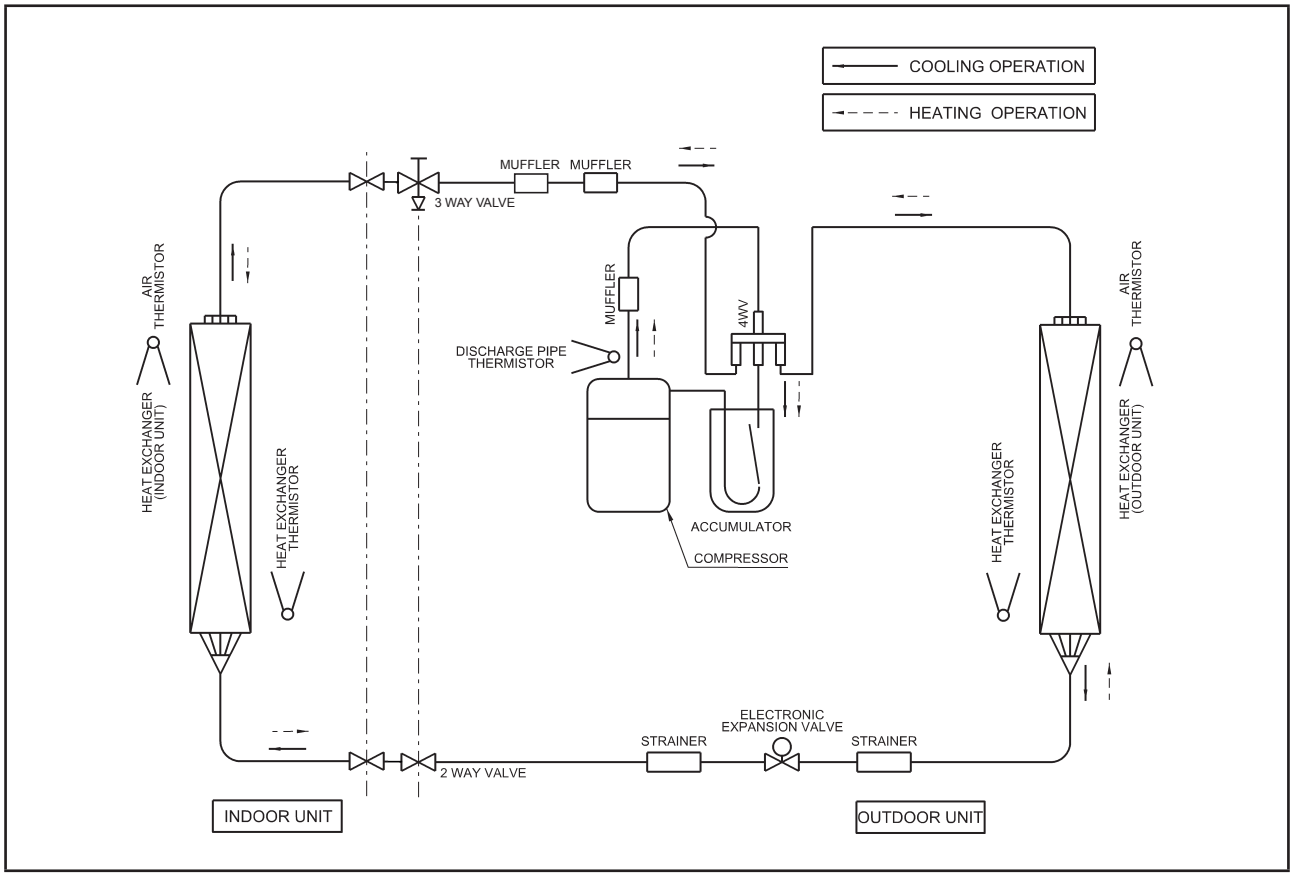


5.0 Refrigerant Diagram

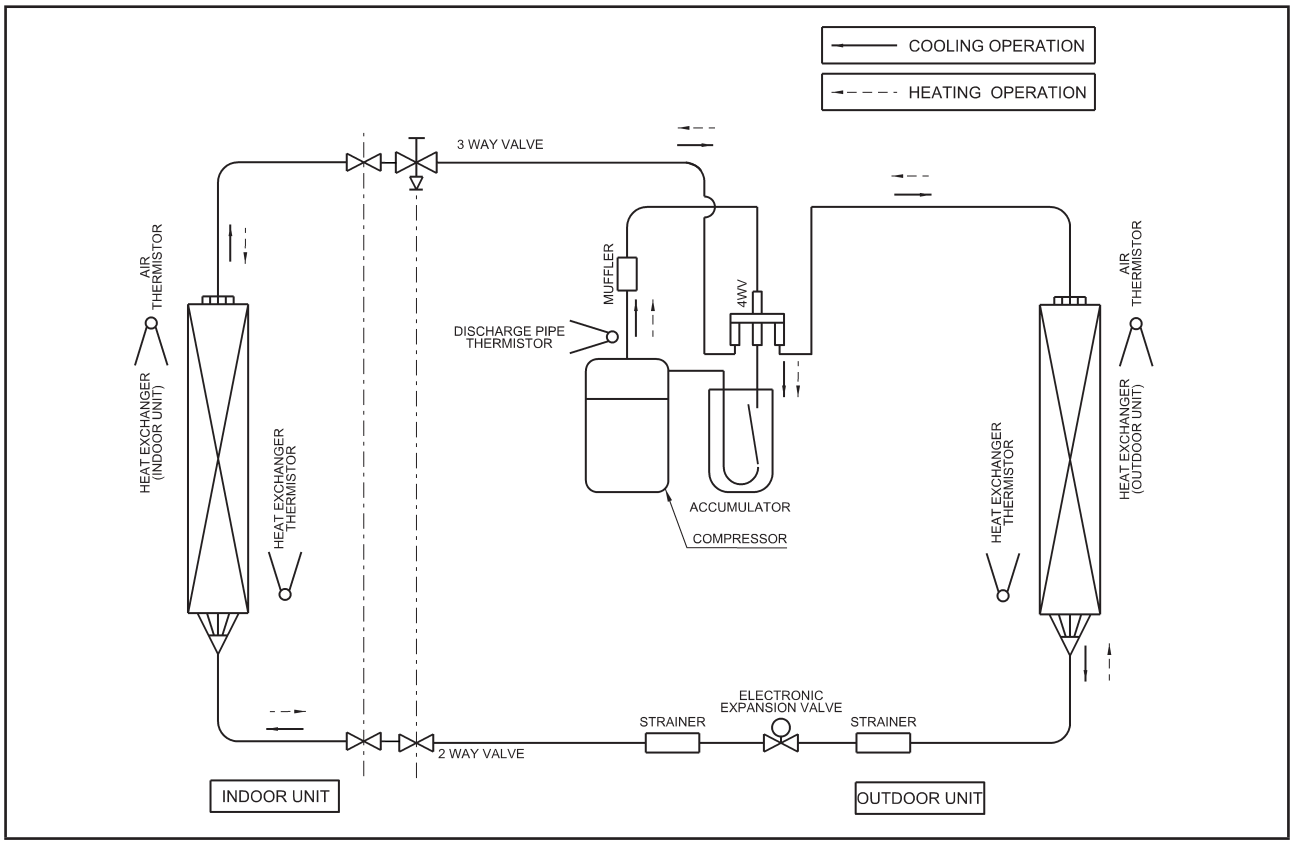
Model: ATXN/FTXN_L / ARXN/RXN_L / FTXB_A / RXB_A / ATXN/FTXN25/35M/N / ARXN/RXN25/35M/N / FTXK25/35A / RXK25/35A / FTXC25/35A / RXC25/35A



Model: FTXC50A/RXC50A



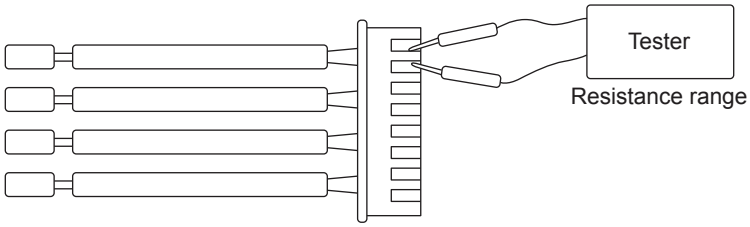
Model: FTXB_B / RXB_B / ATXN/FTXN50/60/M/N / ARXN/RXN50/60/M/N / FTXK50/60A / RXK50/60A / ATXB/FTXB_C / ARXB/RXB_C



6.0 Appendix A:

6.1 Thermistor resistance checking procedures

Remove the connectors of thermistors at PCB and measure resistance of each thermistor using tester as shown below.



Resistance value refer to Resistance table below.

		RXN/ARXN50/60L RXB50/60A	RXN/ARXN25/35L RXN/ARXN25/35/50/60M RXN/ARXN25/35/50/60N RXB50/60B RXB/ARXB50/60C RXC25/35/50/60C
Indoor	Wall Mounted	10 kΩ (Table 2)	10 kΩ (Table 2)
Outdoor	Outdoor Split	10 kΩ (Table 2)	20 kΩ (Table 1)

Table 1: Resistance R25 = 20K ohm

Temperature (°C)	Resistance value (kΩ)
-20	211.0
-15	150.0
-10	116.5
-5	88.0
0	67.2
5	51.9
10	40.0
15	31.8
20	25.0
25	20.0
30	16.0
35	13.0
40	10.6
45	8.7
50	7.2

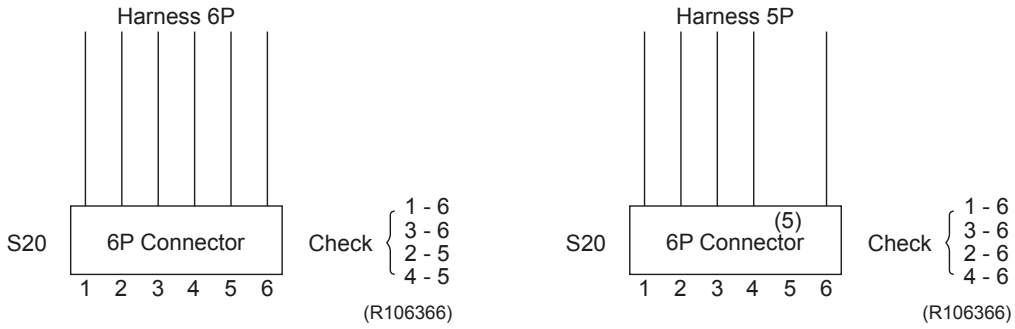
Table 2: Resistance R25 = 10K ohm

t°C	Rmin (kΩ)	Rnom (kΩ)	Rmax (kΩ)	t°C	Rmin (kΩ)	Rnom (kΩ)	Rmax (kΩ)
-10	44.20	45.30	46.50				
-9	42.10	43.20	44.30	41	5.47	5.56	5.64
-8	40.20	41.20	42.20	42	5.28	5.37	5.45
-7	38.30	39.20	40.20	43	5.10	5.18	5.27
-6	36.60	37.40	38.30	44	4.92	5.01	5.09
-5	34.90	35.70	36.50	45	4.75	4.84	4.92
-4	33.30	34.10	34.90	46	4.59	4.67	4.76
-3	31.80	32.60	33.30	47	4.44	4.52	4.60
-2	30.40	31.10	31.80	48	4.29	4.37	4.42
-1	29.00	29.70	30.30	49	4.15	4.22	4.30
0	27.80	28.40	29.00	50	4.01	4.09	4.16
1	26.60	27.10	27.70	51	3.88	3.95	4.03
2	25.40	25.90	26.50	52	3.75	3.82	3.90
3	24.30	24.80	25.30	53	3.63	3.70	3.77
4	23.30	23.70	24.20	54	3.51	3.58	3.65
5	22.30	22.70	23.10	55	3.40	3.47	3.54
6	21.40	21.80	22.10	56	3.29	3.36	3.43
7	20.50	20.80	21.20	57	3.18	3.25	3.32
8	19.60	20.00	20.30	58	3.08	3.15	3.22
9	18.80	19.10	19.40	59	2.98	3.05	3.12
10	18.00	18.30	18.60	60	2.89	2.96	3.01
11	17.30	17.60	17.80	61	2.80	2.86	2.93
12	16.60	16.90	17.10	62	2.71	2.78	2.84
13	15.90	16.20	16.40	63	2.63	2.69	2.75
14	15.30	15.50	15.70	64	2.55	2.61	2.67
15	14.70	14.90	15.10	65	2.47	2.53	2.59
16	14.10	14.30	14.50	66	2.40	2.45	2.51
17	13.50	13.70	13.90	67	2.32	2.38	2.44
18	13.00	13.20	13.30	68	2.25	2.31	2.37
19	12.50	12.70	12.80	69	2.19	2.24	2.30
20	12.00	12.20	12.30	70	2.12	2.17	2.23
21	11.60	11.70	11.80	71	2.06	2.11	2.17
22	11.10	11.20	11.40	72	2.00	2.05	2.10
23	10.70	10.80	10.90	73	1.94	1.99	2.04
24	10.30	10.40	10.50	74	1.88	1.93	1.98
25	9.90	10.00	10.10	75	1.83	1.88	1.93
26	9.52	9.62	9.72	76	1.77	1.82	1.87
27	9.16	9.26	9.36	77	1.72	1.77	1.82
28	8.82	8.92	9.02	78	1.67	1.72	1.77
29	8.49	8.59	8.69	79	1.63	1.67	1.72
30	8.17	8.27	8.37	80	1.58	1.62	1.67
31	7.87	7.97	8.07	81	1.53	1.58	1.62
32	7.58	7.68	7.78	82	1.49	1.53	1.58
33	7.31	7.40	7.50	83	1.45	1.49	1.54
34	7.04	7.14	7.23	84	1.41	1.45	1.49
35	6.79	6.88	6.98	85	1.37	1.41	1.45
36	6.54	6.64	6.73	86	1.33	1.37	1.41
37	6.31	6.40	6.50	87	1.30	1.33	1.38
38	6.09	6.18	6.27	88	1.26	1.30	1.34
39	5.87	5.96	6.05	89	1.23	1.26	1.30
40	5.67	5.75	5.84	90	1.19	1.23	1.27

Remarks: At ambient temperature of 25°C, nominal resistance value is 10.00kΩ.

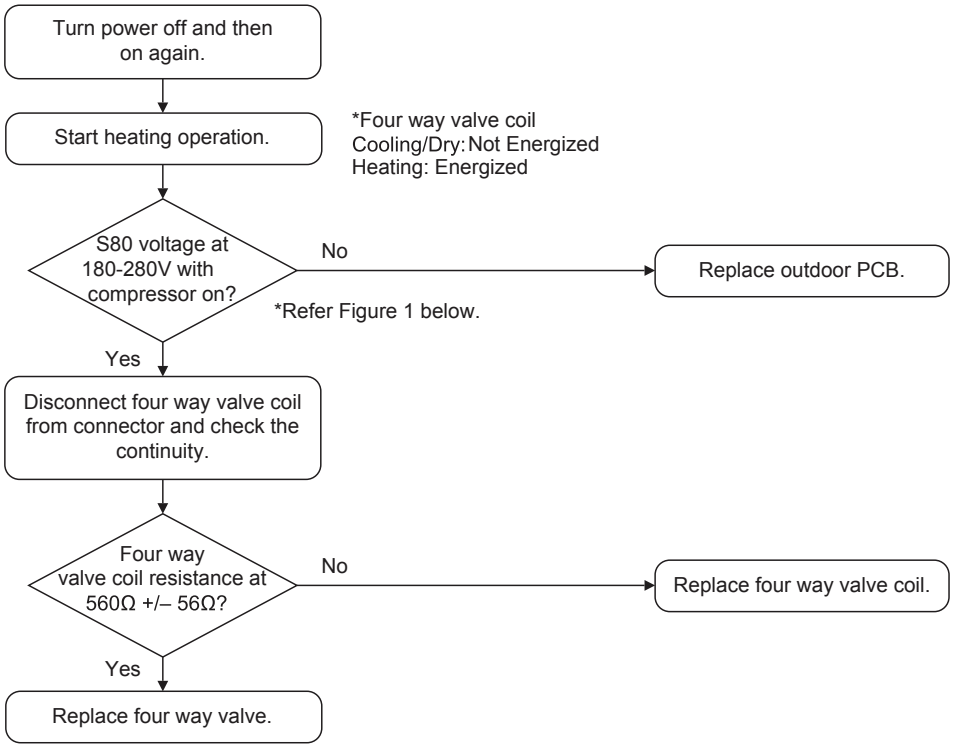
6.2 Electronic Expansion Valve (EXV) checking procedures

a. Check if the EXV connector is correctly connected to PCB.
b. Turn power off and on again, and check if EXV generates a latching sound.
c. If the EXV does not generate a latching sound in above step b., disconnect connector and check continuity using a multimeter.
d. Check the continuity between pins [1-6, 3-6, 2-5, 4-5 (between pins 1-6, 2-6, 3-6, 4-6 for harness 5P models)]. If there is no continuity between the pins, EXV coil is faulty.
e. If the continuity is confirmed in step d., outdoor PCB is faulty.

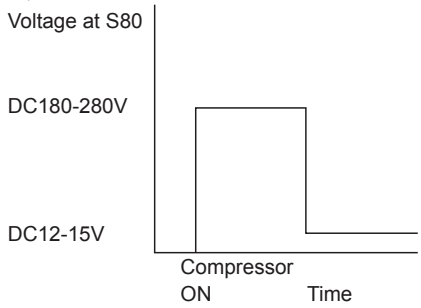


6.3 Four way valve performance checking procedures

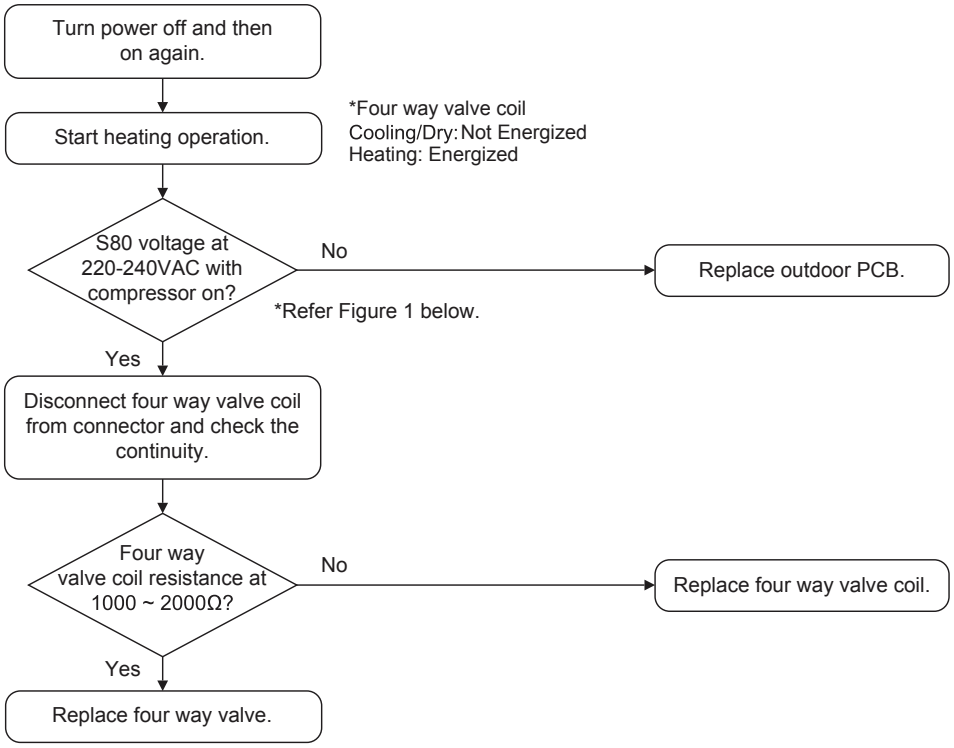
6.3.1 Class 25/35



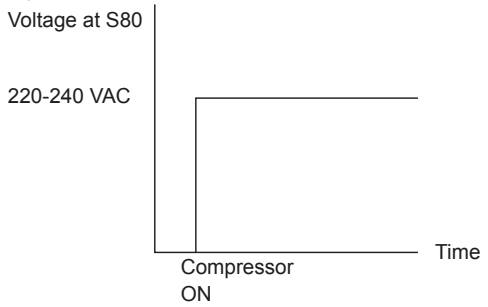
(Fig. 1)



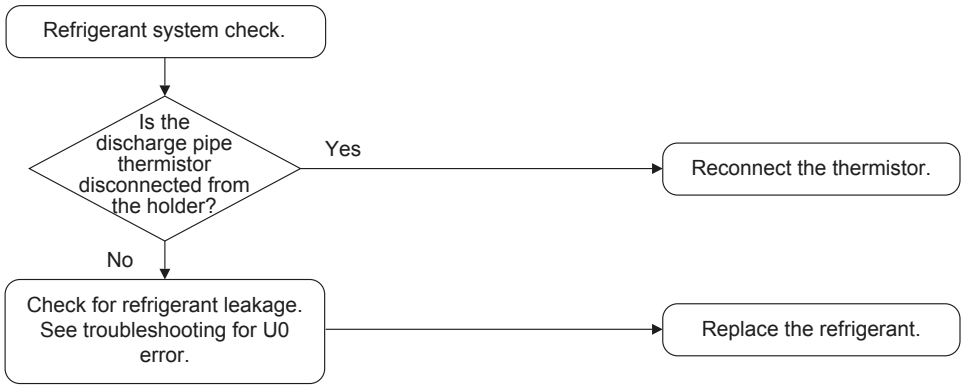
6.3.2 Class 50/60



(Fig. 1)



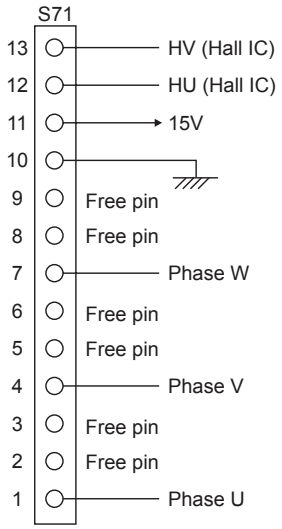
6.4 Inverter unit refrigerant check procedures



6.5 Rotation pulse check on outdoor unit PCB

6.5.1 Turning speed pulse input on outdoor unit PCB check for (A)RXN25/35L, RXN25/35MV1 & RXN25/35MV1B

a. Make sure control voltage of DC15V is being applied.
b. Make a turn of the fan motor with hand and make sure the pulse (0-15V) appears 4 times at pins 10 and 13.



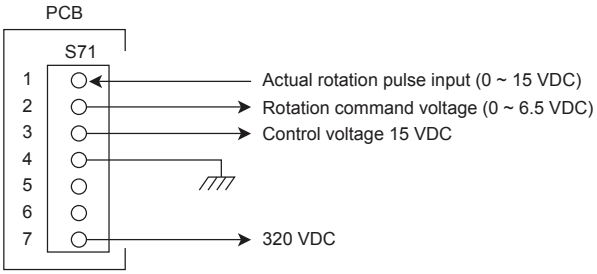
6.5.2 Rotation pulse check on outdoor unit PCB for RXN25/35MV1B9, ARXN25/35MV1B(7), RXK25/35A, (A)RXN25/35N, RXC25/35A and all class 50/60 except (A)RXN50/60L, RXB50/60A/B

Make sure that the voltage of 320 ± 30 V is applied.

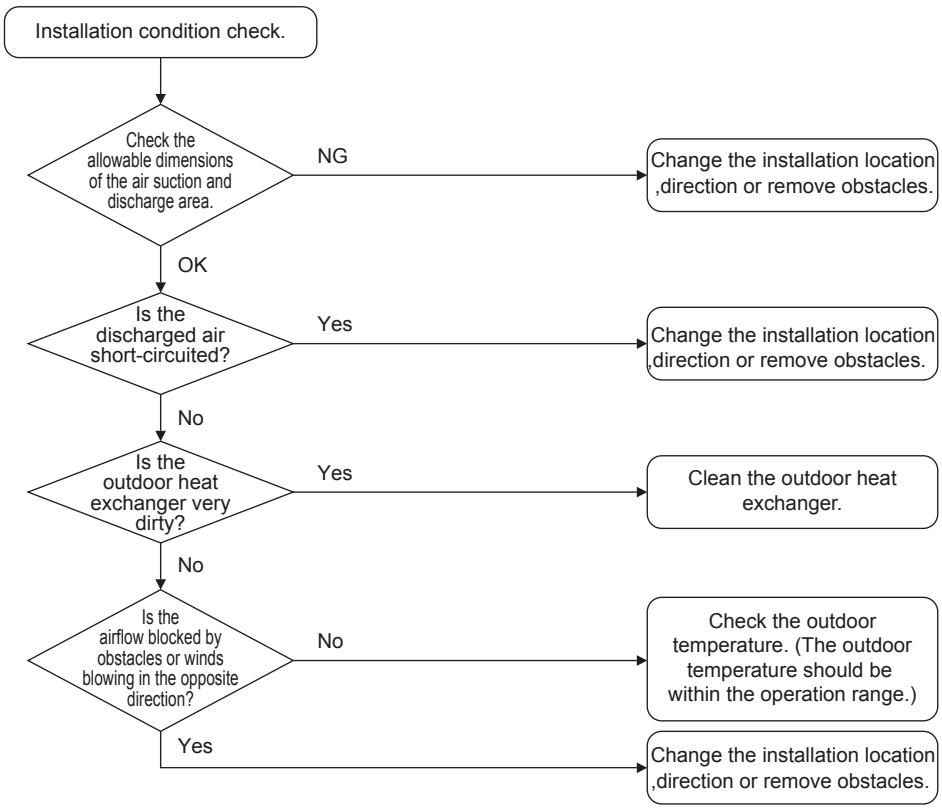
1. Set operation off and power off. Disconnect the connector S71.
2. Check that the voltage between the pins 4 & 7 is 320 VDC.
3. Check that the control voltage between the pins 3 & 4 is 15 VDC.
4. Check that the rotation command voltage between the pins 2 & 4 is 0 - 6.5 VDC.
5. Keep operation off and power off. Connect the connector S71.
6. Check whether 4 pulses (0 ~ 15 VDC) are output at the pins 1 - 4 when the fan motor is rotated 1 turn by hand.

When the fuse is melted, check the outdoor fan motor for proper function.

If NG in step 2 : Defective PCB and replace the outdoor unit PCB.
If NG in step 4 : Defective Hall IC and replace the outdoor fan motor.
If OK in both steps 2 and 4,replace the outdoor unit PCB.

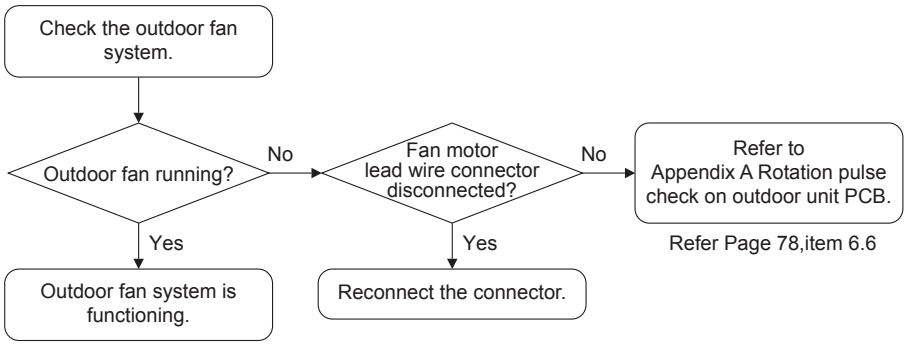


6.6 Installation condition check



6.7 Outdoor fan system check

DC motor



6.8 Diode bridge short circuit check procedures

6.8.1 Power transistor check for class 25 & class 35

Check to make sure that the voltage between the terminal of Power transistor (+) and (-) is approx. 0 volt before checking power transistor.

<Measuring method>

Disconnect the compressor harness connector from the outdoor unit PCB. To disengage the connector, press the protrusion on the connector.

Then, follow the procedure below to measure resistance between power transistor (+) and (-) and the U, V and W terminals of the compressor connector with a multi-tester. Evaluate the measurement results for a pass/fail judgment.

<Power transistor check>

Negative (-) terminal of tester (positive terminal (+) for digital tester)	Power transistor (+)	UVW	Power transistor (-)	UVW
Positive (+) terminal of tester (negative terminal (-) for digital tester)	UVW	Power transistor (+)	UVW	Power transistor (-)
Normal resistance	Several kΩ to several MΩ (*)			
Unacceptable resistance	Short (0Ω) or open			

6.8.2 Main circuit short check for class 50 & class 60

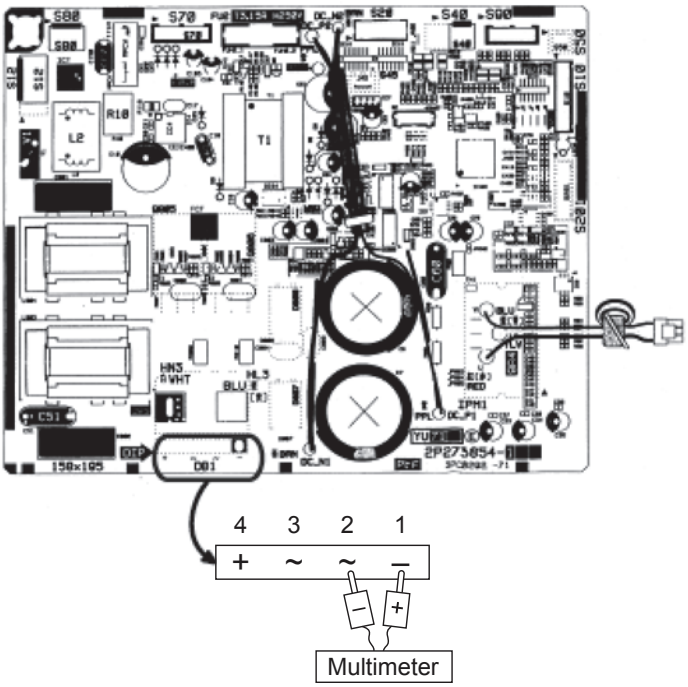
Check to make sure that the voltage between (+) and (-) of the diode bridge (DB1) is approximately 0 V before checking.

- Measure the resistance between the pins of the DB1 referring to the table below.
- If the resistance is ∞ or less than 1 kW, short circuit occurs on the main circuit.

Negative (-) terminal of multimeter	- (2, 3)	+ (4)	- (2, 3)	- (1)
Positive (+) terminal of multimeter	+ (4)	- (2, 3)	- (1)	- (2, 3)
Resistance is OK	Several kΩ ~ several MΩ	∞	∞	Several kΩ ~ several MΩ
Resistance is NG	0Ω or ∞	0	0	0Ω or ∞

Remark:

1. Use opposite sign of terminal for digital multimeter for measurement.

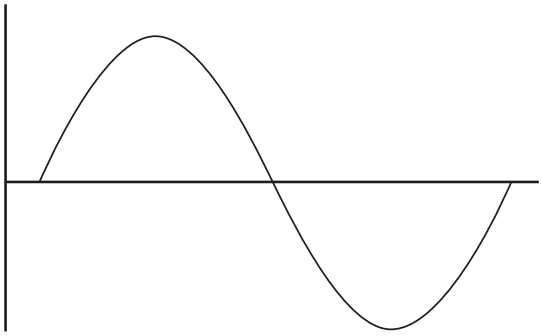


6.9 Power supply waveforms check procedures

Measure the power supply waveform between No. 1(Live) and No. 2(Neutral) on the terminal board, and check the waveform disturbance with osciloscope.

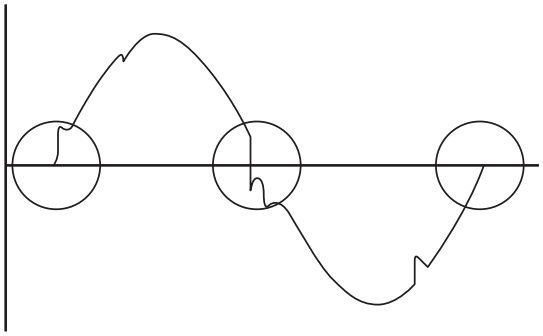
- Check if the power supply waveform is a sine wave (Fig. 1).
- Check if there is waveform disturbance near the zero cross (sections circled in Fig. 2).

Fig. 1



(R1726)

Fig. 2



(R1444)