DAIKIN

SERVICE MANUAL

Inverter Wall Mounted Single Split

MODELS

Cooling Only

FTKB09AXVJU	RKB09AXVJU
FTKB12AXVJU	RKB12AXVJU
FTKB18AXVJU	RKB18AXVJU
FTKB24AXVJU	RKB24AXVJU
FTKN09AXVJU	RKN09AXVJU
FTKN12AXVJU	RKN12AXVJU
FTKN18AXVJU	RKN18AXVJU
FTKN24AXVJU	RKN24AXVJU

Heatpump

FTXB09AXVJU	RXB09AXVJU
FTXB12AXVJU	RXB12AXVJU
FTXB18AXVJU	RXB18AXVJU
FTXB24AXVJU	RXB24AXVJU
FTXN09AXVJU	RXN09AXVJU
FTXN12AXVJU	RXN12AXVJU
FTXN18AXVJU	RXN18AXVJU
FTXN24AXVJU	RXN24AXVJU

SM-5WM-Y-NA-B1

Table of Contents

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														
	Remote Controller				PCB						Air Purification		Marking		Others
	BRC52A61	BRC52A62	BRC52B63	BRC52B64	W_2_03C	W_2_03D	W_2_03E	W_2_03E_M	W_2_04A	W_2_04B	Saranet Filter	Titanium Apatite	UL	CE	Auto Restart
FTKB09/12AXVJU				X				X			X	X	X		X
FTKN09/12AXVJU		X						X			X		X		X
FTKB18/24AXVJU				X						X	X	X	X		X
FTKN18/24AXVJU		X								X	X		X		X
FTXB09/12AXVJU			X					X			X	X	X		X
FTXN09/12AXVJU	X							X			X		X		X
FTXB18/24AXVJU			X							X	X	X	X		X
FTXN18/24AXVJU	X									X	X		X		X

1.1.2 Outdoor Unit

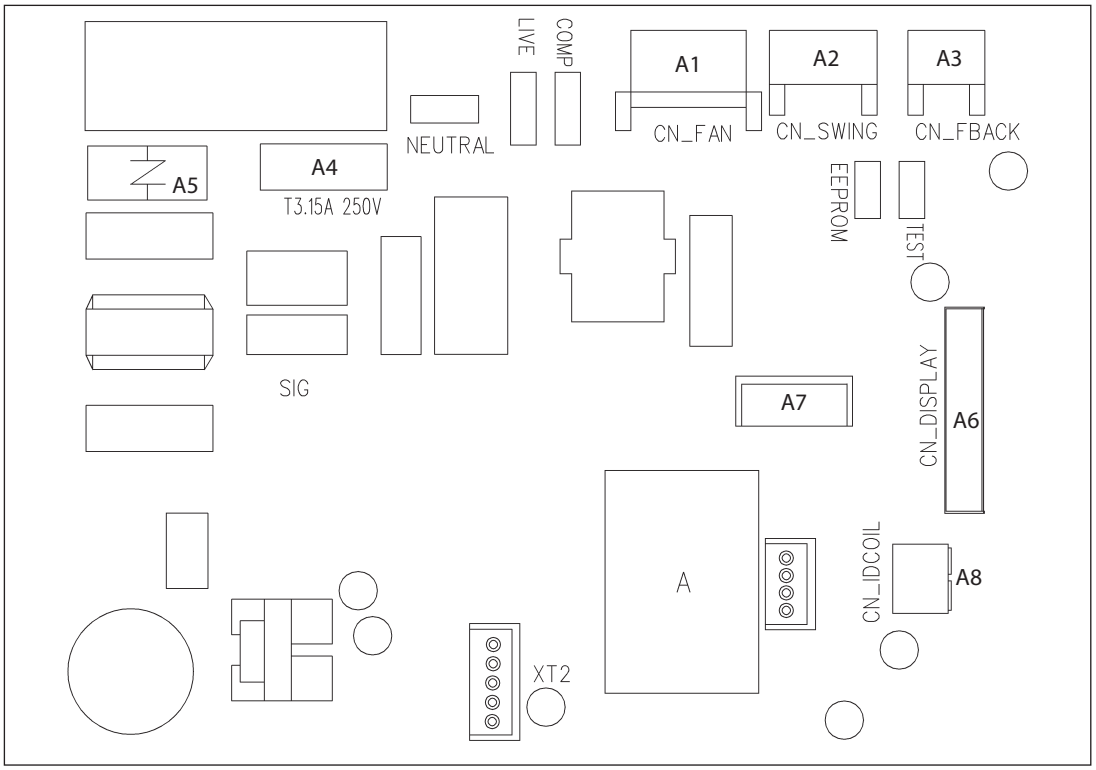
Nomenclature	Classification									
	PCB			Refrigerant Control	Fin		Compressor	Marking		Others
	Main PCB (ADGPA34)	Main PCB (Y364)	Filter PCB (YV62)	EXV	Hydrophilic (Blue)	Hydrophilic (Gold)	DC Inverter Swing	UL	CE	Drain Elbow
RKB09/12AXVJU	X			X	X		X	X		
RKN09/12AXVJU	X			X	X		X	X		
RKB18/24AXVJU		X	X	X	X		X	X		
RKN18/24AXVJU		X	X	X	X		X	X		
RXB09/12AXVJU	X			X	X		X	X		X
RXN09/12AXVJU	X			X	X		X	X		X
RXB18/24AXVJU		X	X	X	X		X	X		X
RXN18/24AXVJU		X	X	X	X		X	X		X

1.2 Printed Circuit Board (PCB) connector wiring diagram

1.2.1 Indoor PCB: FTKB09/12AXVJU, FTKN09/12AXVJU, FTXB09/12AXVJU, FTXN09/12AXVJU

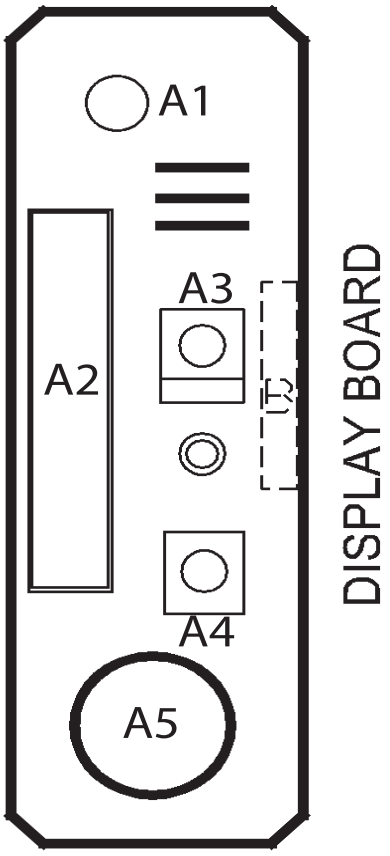
1.2.1.1 Main PCB: W_2_03D ; W_2_03E ; W_2_03E_M

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 controller
7	A7	Connector for signal receiver PCB
8	A8	Connector for heat exchanger thermistor

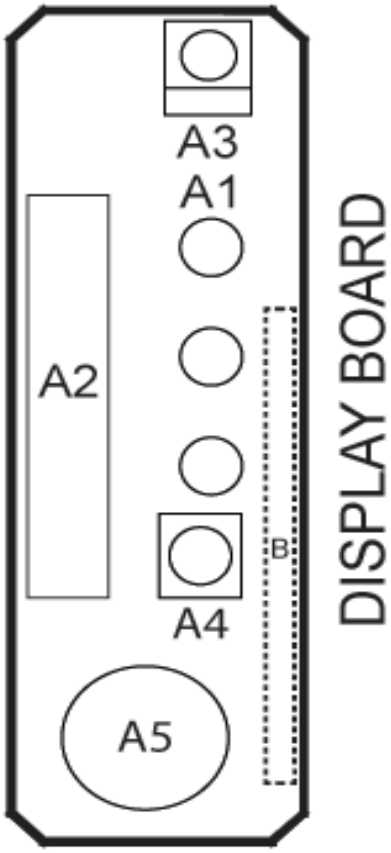


1.2.1.2 Signal board

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



Applicable Model :
FTKB09/12AXVJU
FTXB09/12AXVJU

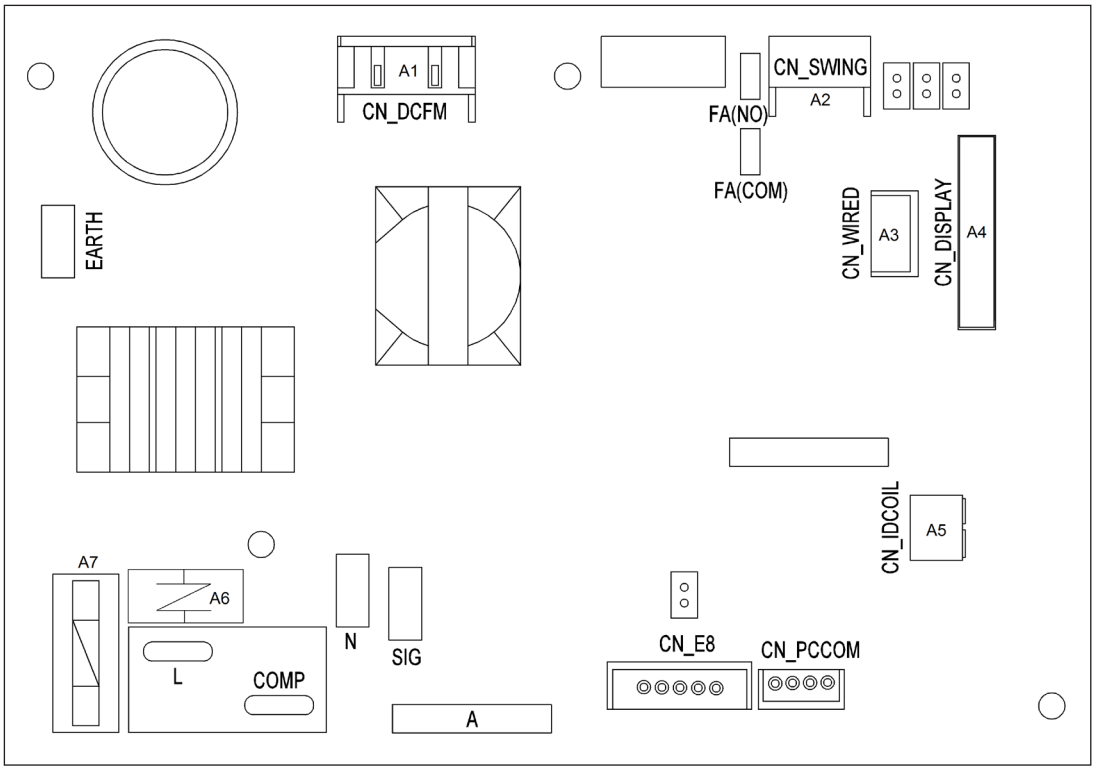


Applicable Model :
FTKN09/12AXVJU
FTXN09/12AXVJU

1.2.2 Indoor PCB: FTKB18/24AXVJU, FTKN18/24AXVJU, FTXB18/24AXVJU, FTXN18/24AXVJU

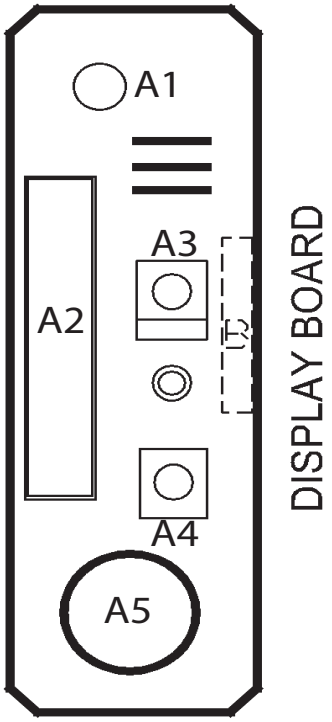
1.2.2.1 Main PCB: W_2_04A ; W_2_04B

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 controller
7	A7	Connector for signal receiver PCB

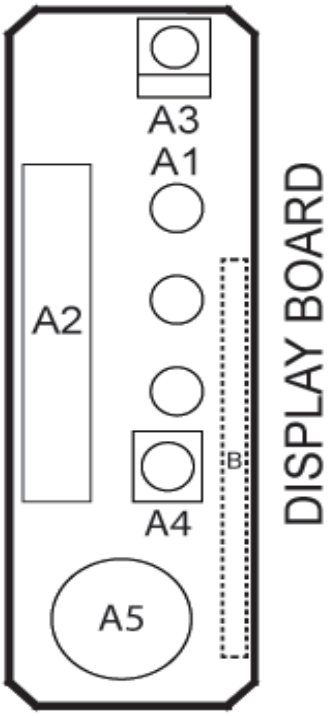


1.2.2.2 Signal board

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



Applicable Model :
FTKB18/24AXVJU
FTXB18/24AXVJU

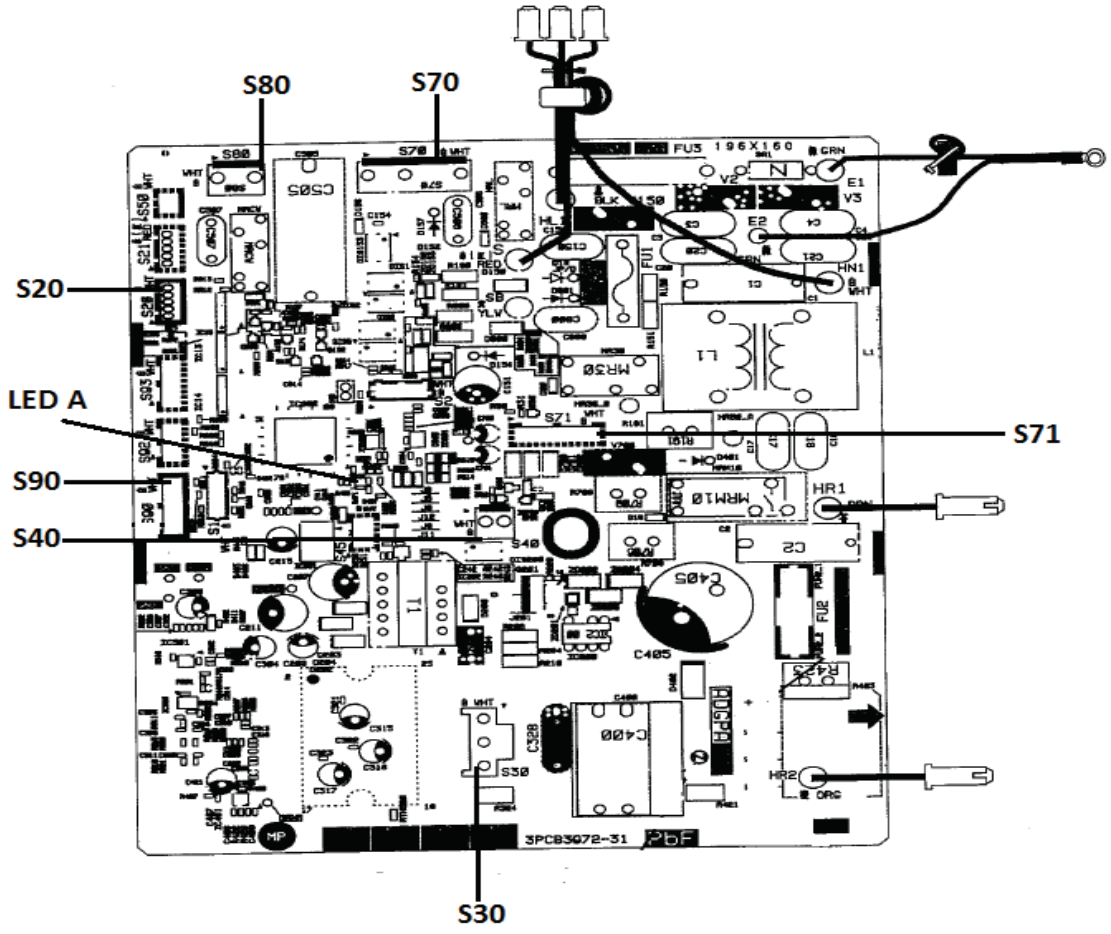


Applicable Model :
FTKN18/24AXVJU
FTXN18/24AXVJU

1.2.3 Outdoor PCB: RKB09/12AXVJU, RKN09/12AXVJU, RXB09/12AXVJU, RXN09/12AXVJU

1.2.3.1 Main PCB

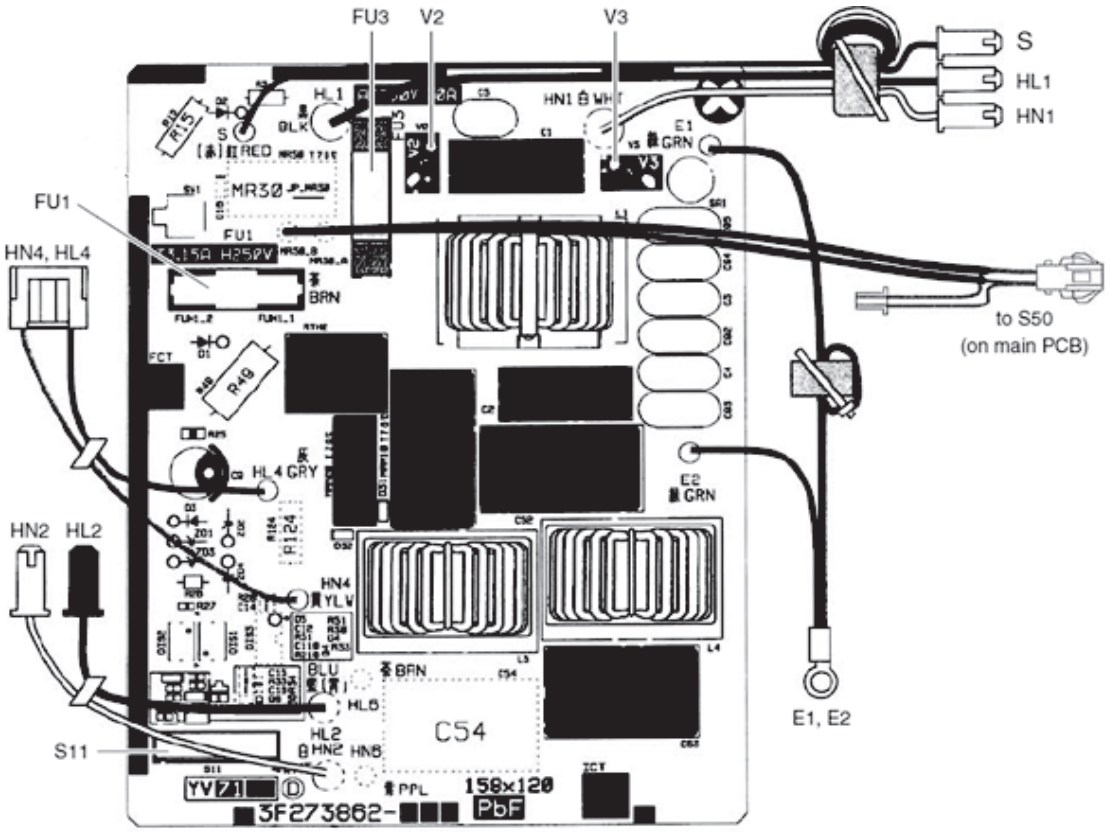
Item	Indication on PCB	Description
1	S11	Connector for S10 on main PCB
2	HL1, HN1, S	Connector for terminal board
3	E1, E2	Terminal for earth wire
4	HL2, HN2	Connector for HL3 HN3 on main PCB
5	HL4, HN4	Connector for S12 on main PCB
6	FU1	Fuse (3.15A, 250V)
7	FU3	Fuse (30A, 250V)
8	V2, V3	Varistor



1.2.4 Outdoor PCB: RKB18/24AXVJU, RKN18/24AXVJU, RXB18/24AXVJU, RXN18/24AXVJU

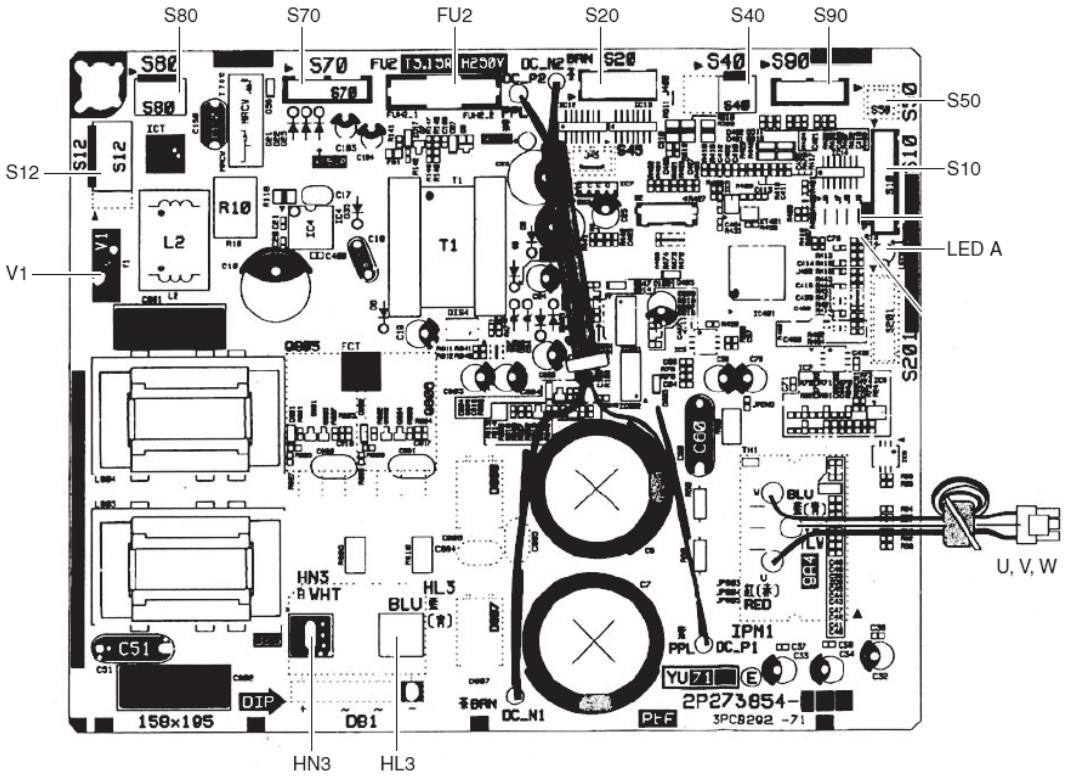
1.2.4.1 Filter PCB

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



1.2.4.2 Main PCB

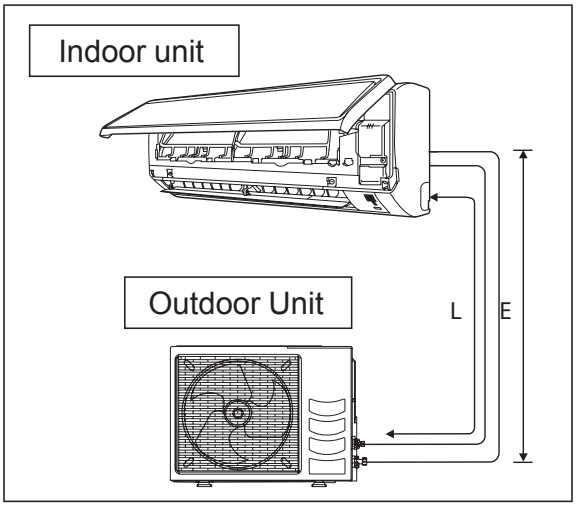
Item	Indication on PCB	Description
1	S10	Connector for filter PCB
2	S20	Connector for electronic expansion valve coil
3	S40	Connector for overload protector
4	S70	Connector for fan motor
5	S80	Connector for four way valve coil
6	S90	Connector for thermistors (outdoor temperature, outdoor heat exchanger, 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



1.3 Piping Length & Elevation

Model	Max. total piping length, L [ft,(m)]	Max. height difference, E [ft,(m)]	Pre-charge for o to piping length [ft,(m)]	Additional charge [oz/ft (g/m)]
RK(X)B09AX RK(X)N09AX	65.6 (20)	32.8 (10)	25 (7.6)	0.21 (20)
RK(X)B12AX RK(X)N12AX	65.6 (20)	32.8 (10)	25 (7.6)	0.21 (20)
RK(X)B18AX RK(X)N18AX	98.4 (30)	32.8 (10)	25 (7.6)	0.21 (20)
RK(X)B24AX RK(X)N24AX	98.4 (30)	32.8 (10)	25 (7.6)	0.21 (20)

Remark : The refrigerant pre-charged in the outdoor unit is for piping length up to 25ft (7.6m).

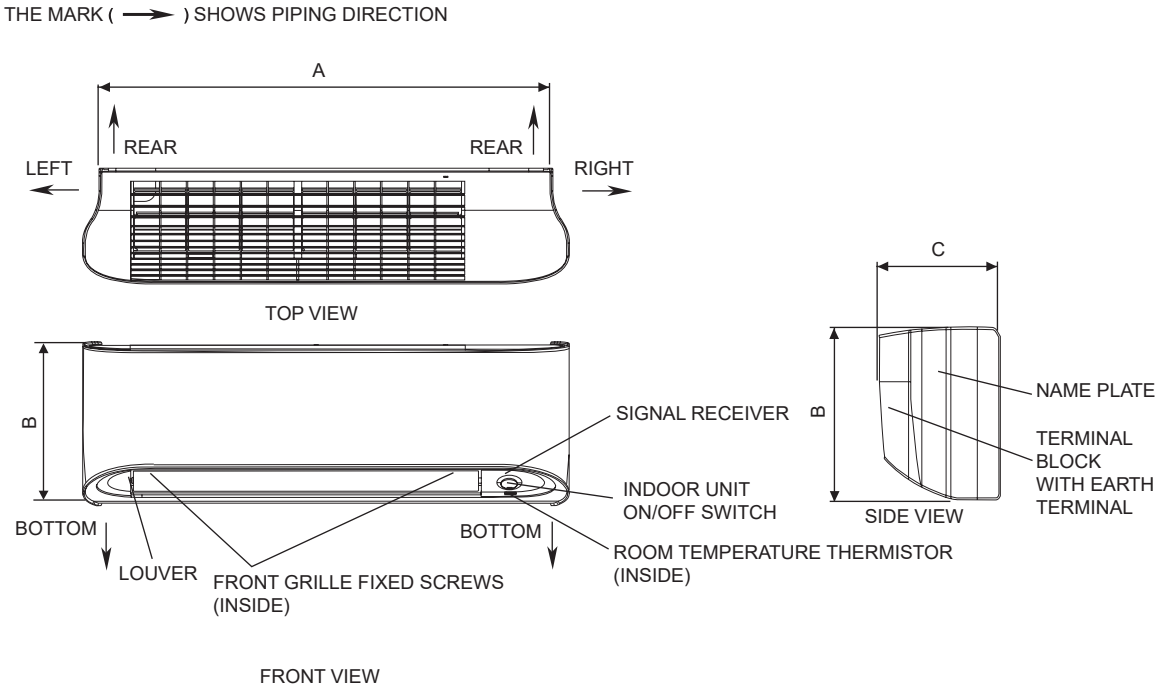


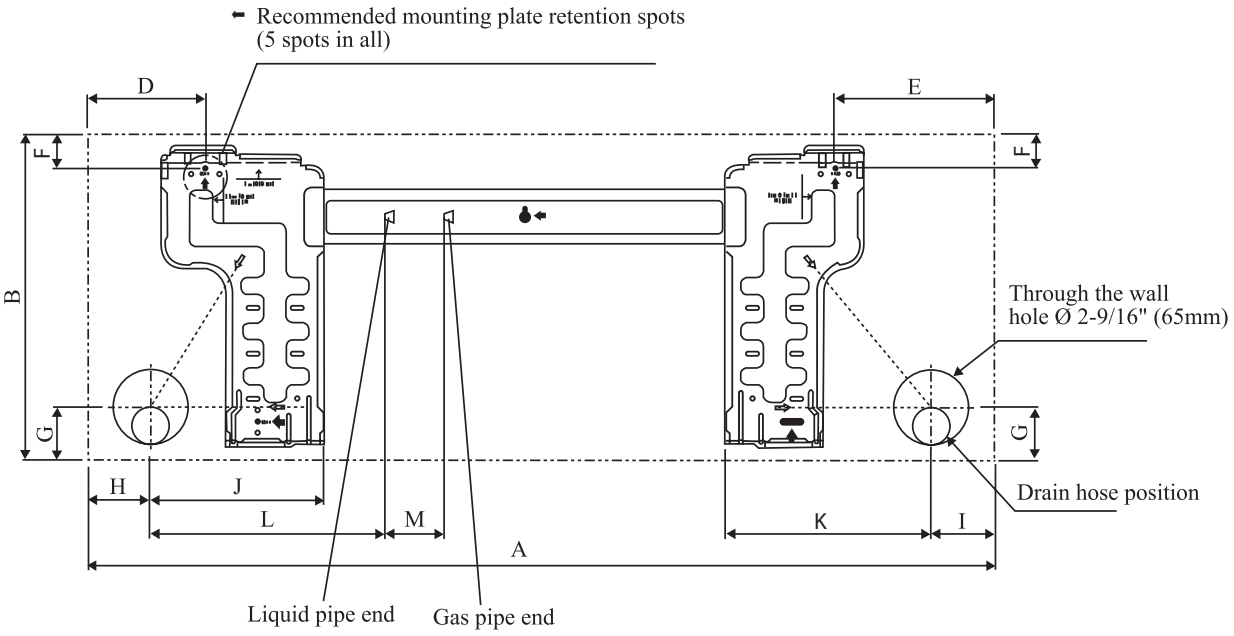
1.4 Outline & Dimension

1.4.1 Indoor Unit

Model: FTK(X)B09/12AX, FTK(X)N09/12AX

FOR ILLUSTRATIVE PURPOSES ONLY





INSTALLATION PLATE 09/12

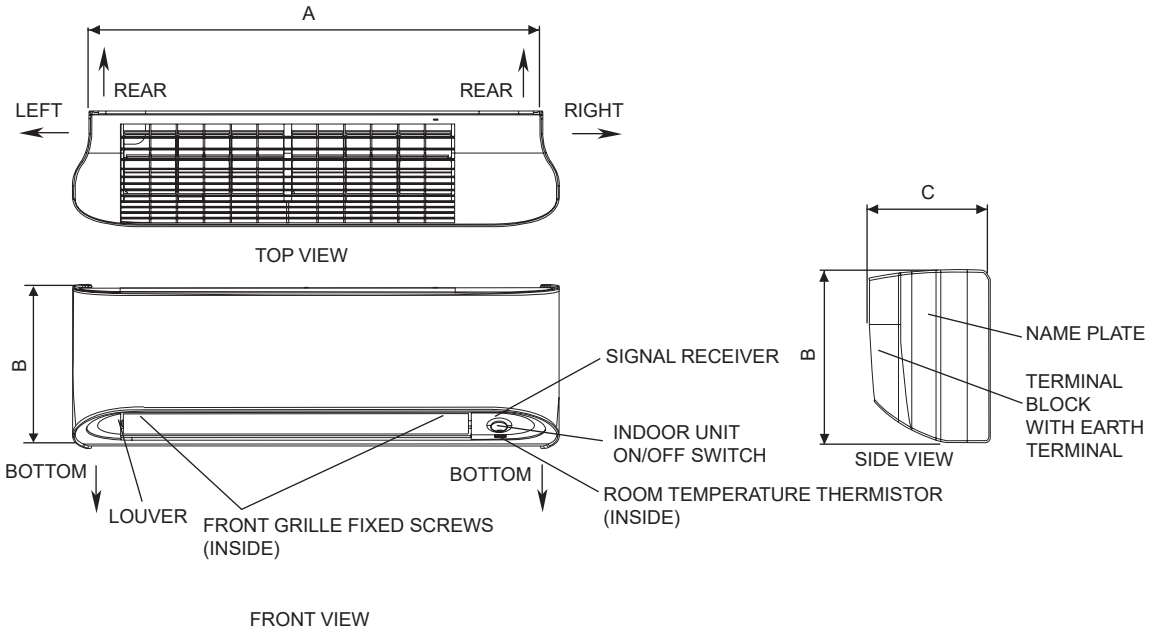
Dimension / Model	A	B	C	D	E	F	G	H	I	J	K	L	M
09/12	35-1/16 (890)	11-11/16 (297)	8-1/4 (210)	4-1/16 (104)	5-9/16 (141)	1-3/16 (30)	1-13/16 (46)	2-3/16 (55)	2-3/16 (56)	6 (153)	7-1/8 (181)	8-1/8 (207)	2-1/16 (52)

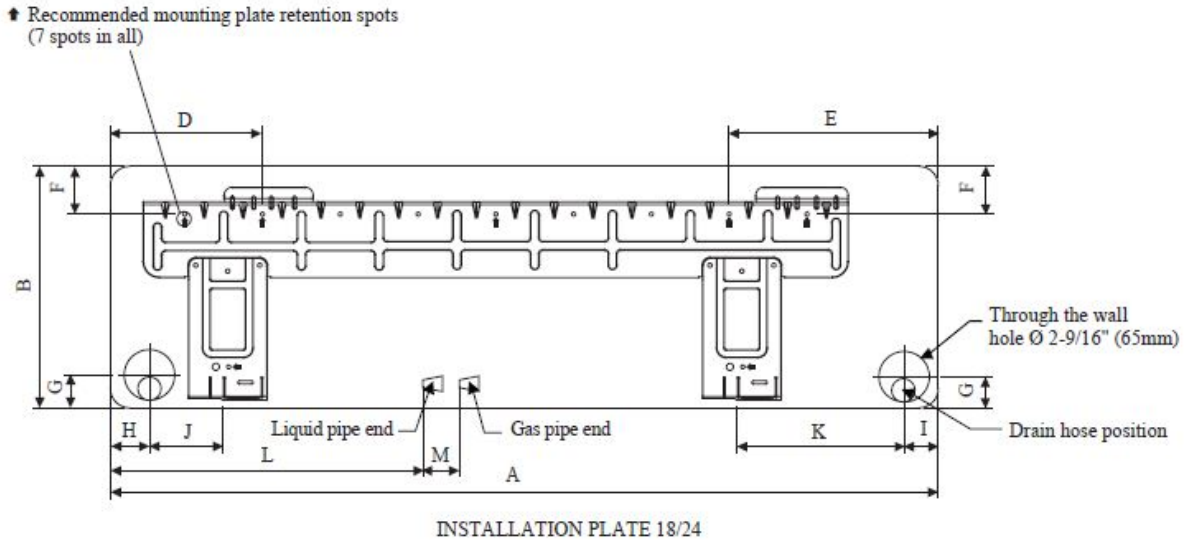
Note: Dimension in inch (mm)

Model: FTK(X)B18/24AX, FTK(X)N18/24AX

FOR ILLUSTRATIVE PURPOSES ONLY

THE MARK (⟶) SHOWS PIPING DIRECTION





INSTALLATION PLATE 18/24

Model \ Dimension	A	B	C	D	E	F	G
18/24	46-1/8 (1172)	12-5/8 (320)	9-1/2 (242)	7-1/2 (190)	6-13/16 (173)	2-3/8 (61)	1-9/16 (40)

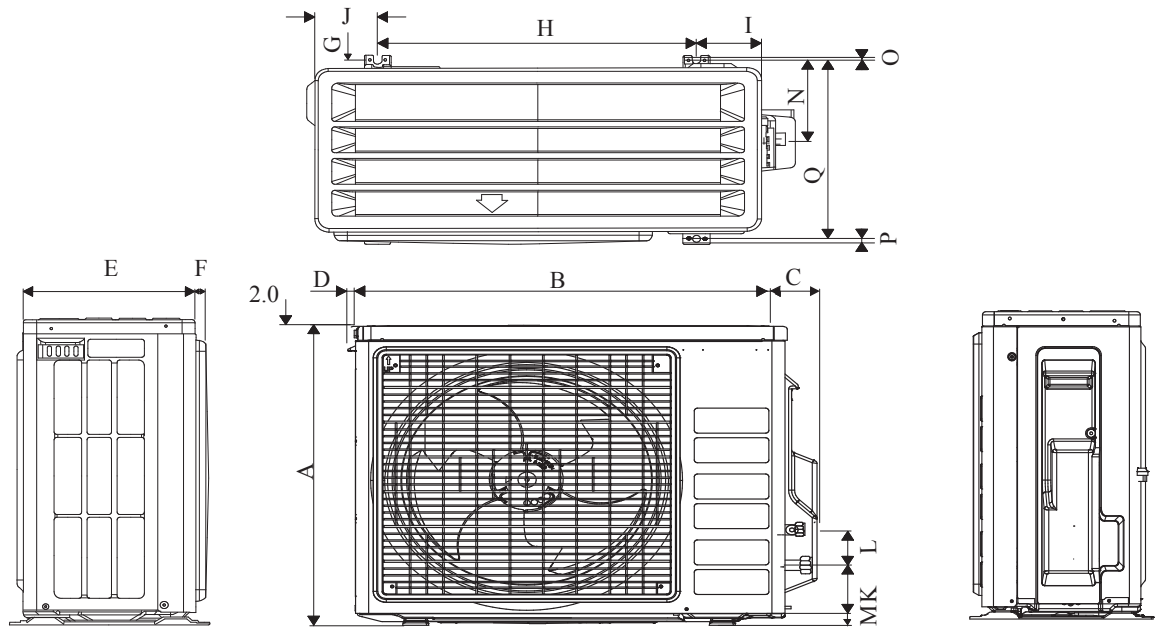
Model \ Dimension	H	I	J	K	L	M
18/24	1-3/4 (45)	1-7/8 (48)	3-9/16 (91)	8-5/8 (219)	22-13/16 (580)	1-3/4 (45)

Note: Dimension in inch (mm)

1.4.2 Outdoor Unit

Model: RK(X)B09/12AX, RK(X)N09/12AX

FOR ILLUSTRATIVE PURPOSES ONLY



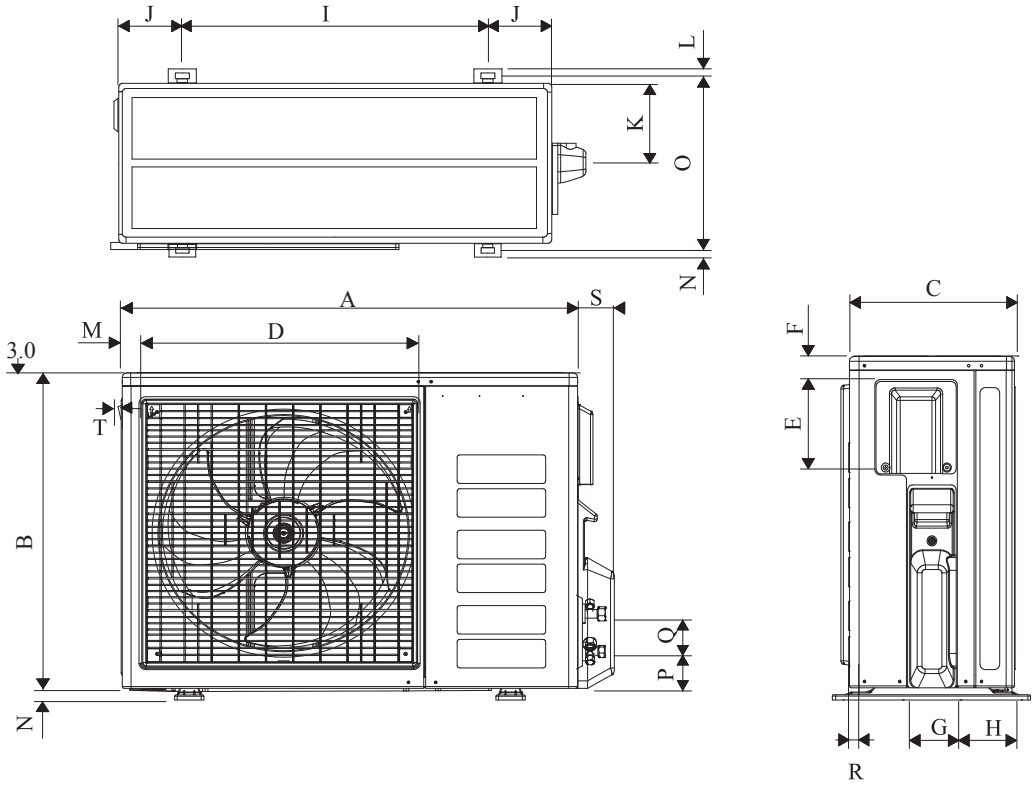
Model \ Dimension	A	B	C	D	E	F	G	H	I
09/12	21-5/8 (550)	22-15/16 (658)	2 (51)	7/16 (11)	10-3/4 (273)	5/8 (16)	9/16 (14)	18-1/2 (470)	3-3/4 (96)

Model \ Dimension	J	K	L	M	N	O	P	Q
09/12	3-11/16 (93)	3-11/16 (94)	2-3/8 (60)	9/16 (14)	5-1/4 (133)	5/16 (8)	3/8 (10)	11-3/4 (299)

Note: Dimension in inch (mm)

Model: RK(X)B18/24AX, RK(X)N18/24AX

FOR ILLUSTRATIVE PURPOSES ONLY



Dimension / Model	A	B	C	D	E	F	G	H	I	J
18	33-11/16 (855)	24-3/4 (628)	12-15/16 (328)	20-1/2 (520)	7-1/16 (179)	1-13/16 (46)	4 (101)	4-7/16 (113)	23-3/4 (603)	4-15/16 (126)
24	33-11/16 (855)	28-3/4 (730)	12-15/16 (328)	20-1/2 (520)	7-1/16 (179)	1-13/16 (46)	4 (101)	4-7/16 (113)	23-3/4 (603)	4-15/16 (126)

Dimension / Model	K	L	M	N	O	P	Q	R	S	T
18	6-7/16 (164)	9/16 (15)	1-5/16 (34)	15/16 (23)	14-1/4 (362)	2-7/8 (73)	2-15/16 (75)	5/16 (8)	2-5/8 (67)	1/4 (7)
24	6-7/16 (164)	9/16 (15)	1-5/16 (34)	15/16 (23)	14-1/4 (362)	2-7/8 (73)	2-15/16 (75)	5/16 (8)	2-5/8 (67)	1/4 (7)

Note: Dimension in inch (mm)

1.5 Engineering Data

1.5.1 Cooling Only

Model				FTKB09AXVJU	FTKB12AXVJU	FTKB18AXVJU	FTKB24AXVJU
		Indoor unit		FTKB09AXVJU	FTKB12AXVJU	FTKB18AXVJU	FTKB24AXVJU
		Outdoor unit		RKB09AXVJU	RKB12AXVJU	RKB18AXVJU	RKB24AXVJU
Nominal Cooling Capacity (Min. ~ Max.)			Btu/h	8800 (4400 - 10200)	11000 (4400 - 13000)	18000 (4300 - 21200)	21200 (6000 - 22200)
			W	2570 (1300 - 3000)	3220 (1300 - 3800)	5270 (1260 - 6200)	6210 (1750 - 6500)
Nominal Total Input Power			W	800	1294	1710	1927
Nominal Running Current			A	3.60	5.79	7.48	8.47
SEER				17	17	17	17
EER			(Btu/h)/W	11.00	8.50	10.50	11.00
Power Supply			V/Ph/Hz	208/230/1/60	208/230/1/60	208/230/1/60	208/230/1/60
INDOOR UNIT	Airflow (H/M/L/T/Q)		cfm	330/272/215/378/165	360/282/232/392/165	430/374/318/486/274	555/486/405/605/336
INDOOR UNIT	Sound Pressure Level (H/M/L/T/Q)		dB(A)	42/35/30/43/23	42/35/32/43/22	40/37/35/43/32	47/44/41/49/37
INDOOR UNIT	Height		in. (mm)	11-11/16 (297)	11-11/16 (297)	12-5/8 (320)	12-5/8 (320)
INDOOR UNIT	Width		in. (mm)	35-1/16 (890)	35-1/16 (890)	46-1/8 (1172)	46-1/8 (1172)
INDOOR UNIT	Depth		in. (mm)	8-1/4 (210)	8-1/4 (210)	9-1/2 (242)	9-1/2 (242)
INDOOR UNIT	Machine Weight		lbs (kg)	20 (9)	20 (9)	31 (14)	31 (14)
OUTDOOR UNIT	Sound Pressure Level		dB(A)	46	48	53	52
OUTDOOR UNIT	Height		in. (mm)	21-5/8 (550)	21-5/8 (550)	25-11/16 (651)	29-11/16 (753)
OUTDOOR UNIT	Width		in. (mm)	25-15/16 (658)	25-15/16 (658)	33-11/16 (855)	33-11/16 (855)
OUTDOOR UNIT	Depth		in. (mm)	10-3/4 (273)	10-3/4 (273)	12-15/16 (328)	12-15/16 (328)
OUTDOOR UNIT	Machine Weight		lbs (kg)	53 (24)	57 (26)	82 (37)	97 (44)
Piping Connections		Liquid	in. (mm)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)
Piping Connections		Gas	in. (mm)	3/8 (9.52)	3/8 (9.52)	1/2 (12.70)	5/8 (15.88)
Operation Range			°F	50 ~115	50 ~115	14 ~115	14 ~115

Model				FTKN09AXVJU	FTKN12AXVJU	FTKN18AXVJU	FTKN24AXVJU
		Indoor unit		FTKN09AXVJU	FTKN12AXVJU	FTKN18AXVJU	FTKN24AXVJU
		Outdoor unit		RKN09AXVJU	RKN12AXVJU	RKN18AXVJU	RKN24AXVJU
Nominal Cooling Capacity (Min. ~ Max.)			Btu/h	8800 (4400 - 10200)	11000 (4400 - 13000)	18000 (4300 - 21200)	21200 (6000 - 22200)
			W	2570 (1300 - 3000)	3220 (1300 - 3800)	5270 (1260 - 6200)	6210 (1750 - 6500)
Nominal Total Input Power			W	800	1294	1710	1927
Nominal Running Current			A	3.60	5.79	7.48	8.47
SEER				17	17	17	17
EER			(Btu/h)/W	11.00	8.50	10.50	11.00
Power Supply			V/Ph/Hz	208/230/1/60	208/230/1/60	208/230/1/60	208/230/1/60
INDOOR UNIT	Airflow (H/M/L/T/Q)		cfm	330/272/215/378/165	360/282/232/392/165	430/374/318/486/274	555/486/405/605/336
INDOOR UNIT	Sound Pressure Level (H/M/L/T/Q)		dB(A)	42/35/30/43/23	42/35/32/43/22	40/37/35/43/32	47/44/41/49/37
INDOOR UNIT	Height		in. (mm)	11-5/16 (288)	11-5/16 (288)	12-3/16 (310)	12-3/16 (310)
INDOOR UNIT	Width		in. (mm)	33-13/16 (859)	33-13/16 (859)	44-1/4 (1124)	44-1/4 (1124)
INDOOR UNIT	Depth		in. (mm)	8-1/4 (209)	8-1/4 (209)	9-5/16 (237)	9-5/16 (237)
INDOOR UNIT	Machine Weight		lbs (kg)	20 (9)	20 (9)	31 (14)	31 (14)
OUTDOOR UNIT	Sound Pressure Level		dB(A)	46	48	53	52
OUTDOOR UNIT	Height		in. (mm)	21-5/8 (550)	21-5/8 (550)	25-11/16 (651)	29-11/16 (753)
OUTDOOR UNIT	Width		in. (mm)	25-15/16 (658)	25-15/16 (658)	33-11/16 (855)	33-11/16 (855)
OUTDOOR UNIT	Depth		in. (mm)	10-3/4 (273)	10-3/4 (273)	12-15/16 (328)	12-15/16 (328)
OUTDOOR UNIT	Machine Weight		lbs (kg)	53 (24)	57 (26)	82 (37)	97 (44)
Piping Connections		Liquid	in. (mm)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)
Piping Connections		Gas	in. (mm)	3/8 (9.52)	3/8 (9.52)	1/2 (12.70)	5/8 (15.88)
Operation Range			°F	50 ~115	50 ~115	14 ~115	14 ~115

1.5.2 Heatpump

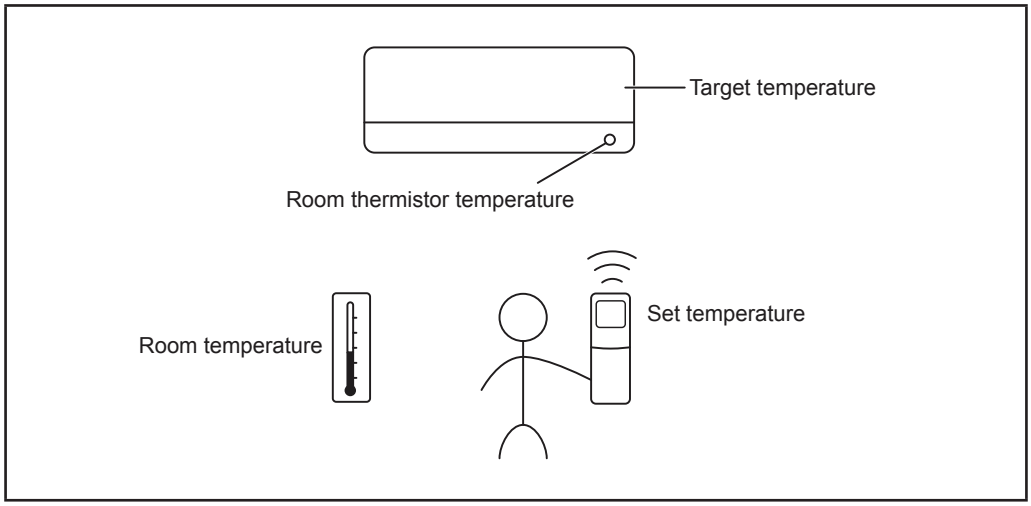
Model	Indoor unit			FTXB09AXVJU	FTXB12AXVJU	FTXB18AXVJU	FTXB24AXVJU
	Outdoor unit			RXB09AXVJU	RXB12AXVJU	RXB18AXVJU	RXB24AXVJU
Nominal Cooling Capacity (Min. ~ Max.)			Btu/h	8800 (4400 - 10200)	11000 (4400 - 13000)	18000 (4300 - 21200)	21200 (6000 - 22200)
			W	2570 (1300 - 3000)	3220 (1300 - 3800)	5270 (1260 - 6200)	6210 (1750 - 6500)
Nominal Heating Capacity (Min. ~ Max.)			Btu/h	9400 (4400 - 13600)	11300 (4400 - 16200)	17900 (4000 - 22500)	21200 (4100 - 27300)
			W	2750 (1300 - 4000)	3310 (1300 - 4750)	5240 (1170 - 6600)	6210 (1200 - 8000)
Nominal Total Input Power (Cooling)			W	800	1294	1710	1927
Nominal Total Input Power (Heating)			W	774	1004	1590	1688
Nominal Running Current (Cooling)			A	3.60	5.79	7.48	8.47
Nominal Running Current (Heating)			A	3.51	4.60	7.03	7.56
SEER				17	17	17	17
EER			(Btu/h)/W	11.00	8.50	10.50	11.00
COP			(Btu/h)/W	12.15	11.26	11.26	12.56
HSPF				9	9	9	9
Power Supply			V/Ph/Hz	208/230/1/60	208/230/1/60	208/230/1/60	208/230/1/60
INDOOR UNIT	Airflow (H/M/L/T/Q) (Cooling)		cfm	330/272/215/378/165	360/282/232/392/165	430/374/318/486/274	555/486/405/605/336
	Airflow (H/M/L/T/Q) (Heating)		cfm	330/272/215/378/165	360/282/232/392/165	435/374/318/486/274	580/486/405/605/336
	Sound Pressure Level (H/M/L/T/Q)		dB(A)	42/35/30/43/23	42/35/32/43/22	40/37/35/43/32	47/44/41/49/37
	Height		in. (mm)	11-11/16 (297)	11-11/16 (297)	12-5/8 (320)	12-5/8 (320)
	Width		in. (mm)	35-1/16 (890)	35-1/16 (890)	46-1/8 (1172)	46-1/8 (1172)
	Depth		in. (mm)	8-1/4 (210)	8-1/4 (210)	9-1/2 (242)	9-1/2 (242)
	Machine Weight		lbs (kg)	20 (9)	20 (9)	31 (14)	31 (14)
OUTDOOR UNIT	Sound Pressure Level		dB(A)	46	48	53	52
	Height		in. (mm)	21-5/8 (550)	21-5/8 (550)	25-11/16 (651)	29-11/16 (753)
	Width		in. (mm)	25-15/16 (658)	25-15/16 (658)	33-11/16 (855)	33-11/16 (855)
	Depth		in. (mm)	10-3/4 (273)	10-3/4 (273)	12-15/16 (328)	12-15/16 (328)
	Machine Weight		lbs (kg)	53 (24)	57 (26)	82 (37)	97 (44)
Piping Connections		Liquid	in. (mm)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)
		Gas	in. (mm)	3/8 (9.52)	3/8 (9.52)	1/2 (12.70)	5/8 (15.88)
Operation Range		Cooling	°F	50 ~115	50 ~115	14 ~115	14 ~115
		Heating	°F	5 ~ 64.4	5 ~ 64.4	5 ~ 64.4	5 ~ 64.4

Model	Indoor unit			FTXN09AXVJU	FTXN12AXVJU	FTXN18AXVJU	FTXN24AXVJU
	Outdoor unit			RXN09AXVJU	RXN12AXVJU	RXN18AXVJU	RXN24AXVJU
Nominal Cooling Capacity (Min. ~ Max.)			Btu/h	8800 (4400 - 10200)	11000 (4400 - 13000)	18000 (4300 - 21200)	21200 (6000 - 22200)
			W	2570 (1300 - 3000)	3220 (1300 - 3800)	5270 (1260 - 6200)	6210 (1750 - 6500)
Nominal Heating Capacity (Min. ~ Max.)			Btu/h	9400 (4400 - 13600)	11300 (4400 - 16200)	17900 (4000 - 22500)	21200 (4100 - 27300)
			W	2750 (1300 - 4000)	3310 (1300 - 4750)	5240 (1170 - 6600)	6210 (1200 - 8000)
Nominal Total Input Power (Cooling)			W	800	1294	1710	1927
Nominal Total Input Power (Heating)			W	774	1004	1590	1688
Nominal Running Current (Cooling)			WWA	3.60	5.79	7.48	8.47
Nominal Running Current (Heating)			A	3.51	4.60	7.03	7.56
SEER				17	17	17	17
EER			(Btu/h)/W	11.00	8.50	10.50	11.00
COP			(Btu/h)/W	12.15	11.26	11.26	12.56
HSPF				9	9	9	9
Power Supply			V/Ph/Hz	208/230/1/60	208/230/1/60	208/230/1/60	208/230/1/60
INDOOR UNIT	Airflow (H/M/L/T/Q) (Cooling)		cfm	330/272/215/378/165	360/282/232/392/165	430/374/318/486/274	555/486/405/605/336
	Airflow (H/M/L/T/Q) (Heating)		cfm	330/272/215/378/165	360/282/232/392/165	435/374/318/486/274	580/486/405/605/336
	Sound Pressure Level (H/M/L/T/Q)		dB(A)	42/35/30/43/23	42/35/32/43/22	40/37/35/43/32	47/44/41/49/37
	Height		in. (mm)	11-5/16 (288)	11-5/16 (288)	12-3/16 (310)	12-3/16 (310)
	Width		in. (mm)	33-13/16 (859)	33-13/16 (859)	44-1/4 (1124)	44-1/4 (1124)
	Depth		in. (mm)	8-1/4 (209)	8-1/4 (209)	9-5/16 (237)	9-5/16 (237)
	Machine Weight		lbs (kg)	20 (9)	20 (9)	31 (14)	31 (14)
OUTDOOR UNIT	Sound Pressure Level		dB(A)	46	48	53	52
	Height		in. (mm)	21-5/8 (550)	21-5/8 (550)	25-11/16 (651)	29-11/16 (753)
	Width		in. (mm)	25-15/16 (658)	25-15/16 (658)	33-11/16 (855)	33-11/16 (855)
	Depth		in. (mm)	10-3/4 (273)	10-3/4 (273)	12-15/16 (328)	12-15/16 (328)
	Machine Weight		lbs (kg)	53 (24)	57 (26)	82 (37)	97 (44)
Piping Connections		Liquid	in. (mm)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)
		Gas	in. (mm)	3/8 (9.52)	3/8 (9.52)	1/2 (12.70)	5/8 (15.88)
Operation Range		Cooling	°F	50 ~115	50 ~115	14 ~115	14 ~115
		Heating	°F	5 ~ 64.4	5 ~ 64.4	5 ~ 64.4	5 ~ 64.4

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 remote controller.
The operating modes are:

- Cool
- Heat
- Fan
- Auto
- Dry

2.2.1 Cooling Mode

When Tr ≥ Ts + 1.5°C (2.7°F)

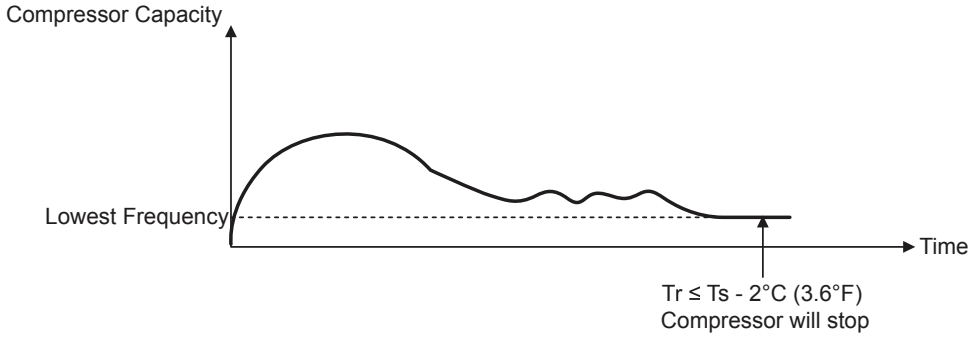
- Compressor, Indoor Fan and Outdoor Fan ON.

When Tr ≤ Ts - 2°C (3.6°F)

- 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.

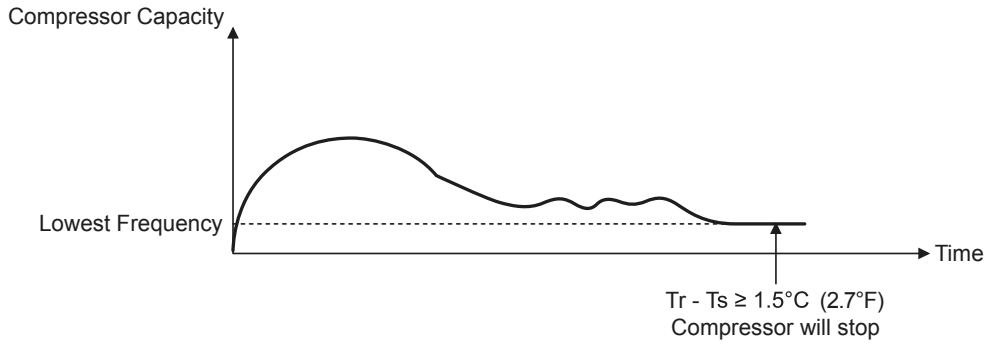


2.2.2 Heating Mode:

When Ts > Tr - 1.0°C (1.8°F)
- Compressor, Indoor Fan and Outdoor Fan ON.

When Ts ≤ Tr - 1.5°C (2.7°F)
- Compressor and Outdoor Fan OFF. Indoor Fan speed will change to Super Low.

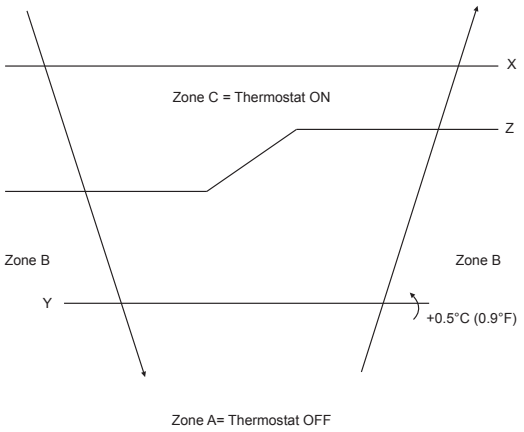
Tr = Room Temperature
Ts = Set Temperature
When heating load is too small, and the room temperature is still rising above compressor cut off point, compressor will stop.



2.3 Dry Mode

Program dry operation removes humidity while preventing the room temperature from lowering. Since the microcomputer controls both the temperature and airflow rate, the temperature adjustment and FAN setting buttons are inoperable.

The microcomputer automatically sets the temperature and airflow rate. The difference between the room thermistor temperature at start-up and the target temperature is divided into two zones. Then, the unit operates in an appropriate capacity for each zone to maintain the temperature and humidity at a comfortable level.



Target temperature X	Thermostat OFF point Y	Thermostat ON point Z*
Setting temperature	Room thermistor temperature – X = -2°C (3.6°F)	Room thermistor temperature – X = -0.5°C (0.9°F)

*Thermostat turns on also when the room temperature is in the zone B for 2 minutes.

2.4 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.

2.5 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:

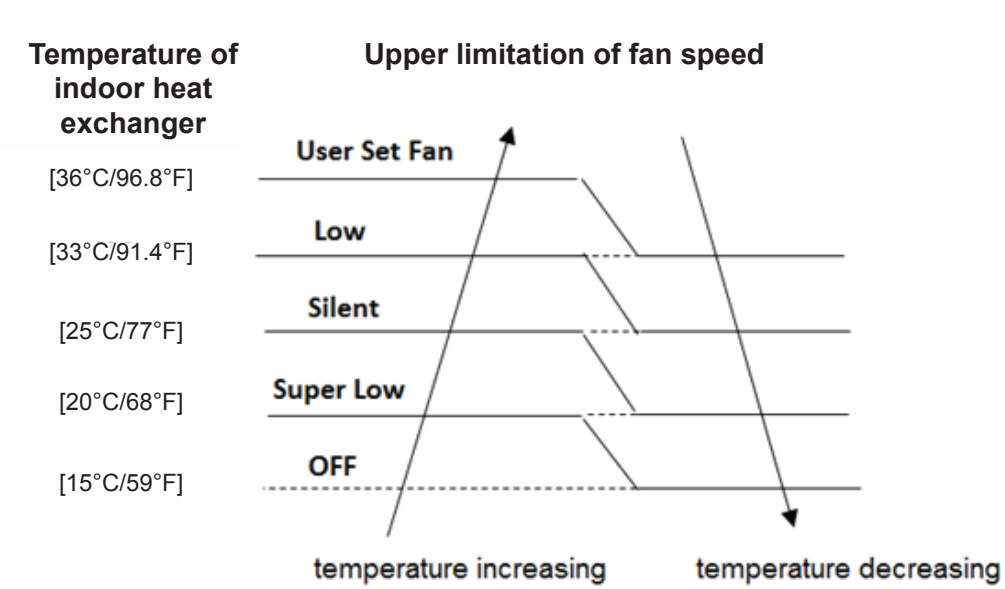
- From Heating to Cooling
  Tr ≥ Ts + 2.5°C (4.5°F)
- From Cooling to Heating
  Tr ≤ Ts – 2.5°C (4.5°F)

During initial operation

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

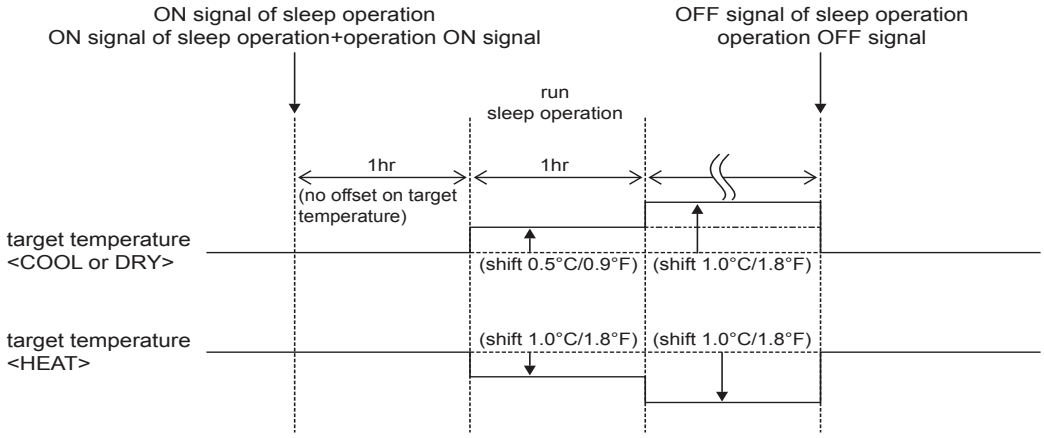
2.6 Cold Draft Prevention

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



2.7 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.

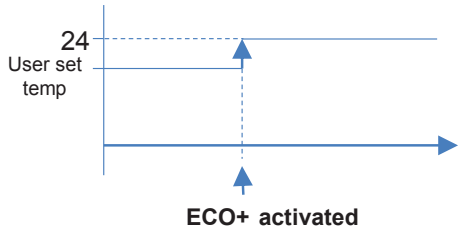
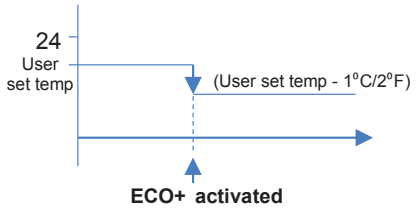
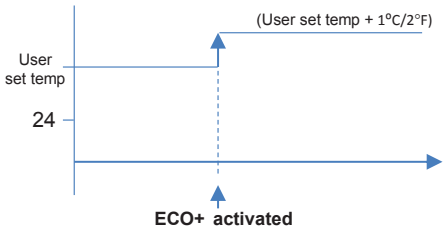
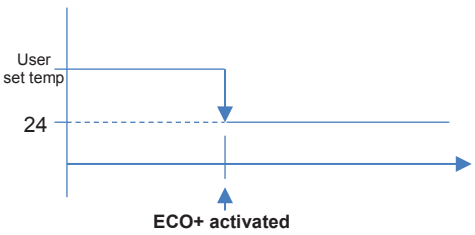


2.8 Quiet function

- Press for quiet operation (for FTK(X)B-AX models) or (for FTK(X)N-AX models) 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.

2.9 ECO+ function (Applicable for FTK(X)B-AX 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.

	Cool mode	Heat mode
User set temperature < 24°C (75°F)	Unit runs at 24°C (75°F) 	Unit runs at (user set temperature - 1°C/2°F) 
User set temperature = 24°C (75°F)	Unit runs at 24°C (75°F)	Unit runs at 24°C (75°F)
User set temperature > 24°C (75°F)	Unit runs at (user set temperature + 1°C/2°F) 	Unit runs at 24°C (75°F) 

2.10 Powerful function

- Press (for FTK(X)B-AX models) or "**TURBO**" for (FTK(X)N-AX models) for powerful mode.
- When POWERFUL/TURBO button is pressed, the fan speed will run at maximum speed for 20 minutes.
- Press again to deactivate the function.
- Available in HEAT and COOL modes only.

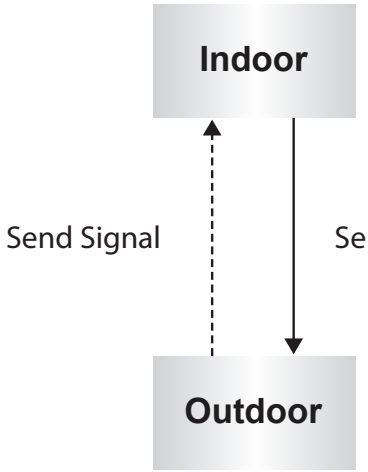
Operation Mode	Fan Speed	Target Temperature
COOL	Current Tap + A rpm	Current set temperature -4°C (7.2°F)
HEAT	Current Tap + B rpm	Current set temperature -6°C (10.8°F)

Class 09/12: A = 100 rpm B = 100 rpm
Class 18: A = 90 rpm B = 50 rpm
Class 24: A = 80 rpm B = 50 rpm

2.11 Indoor-Outdoor Communication

Master by outdoor unit.

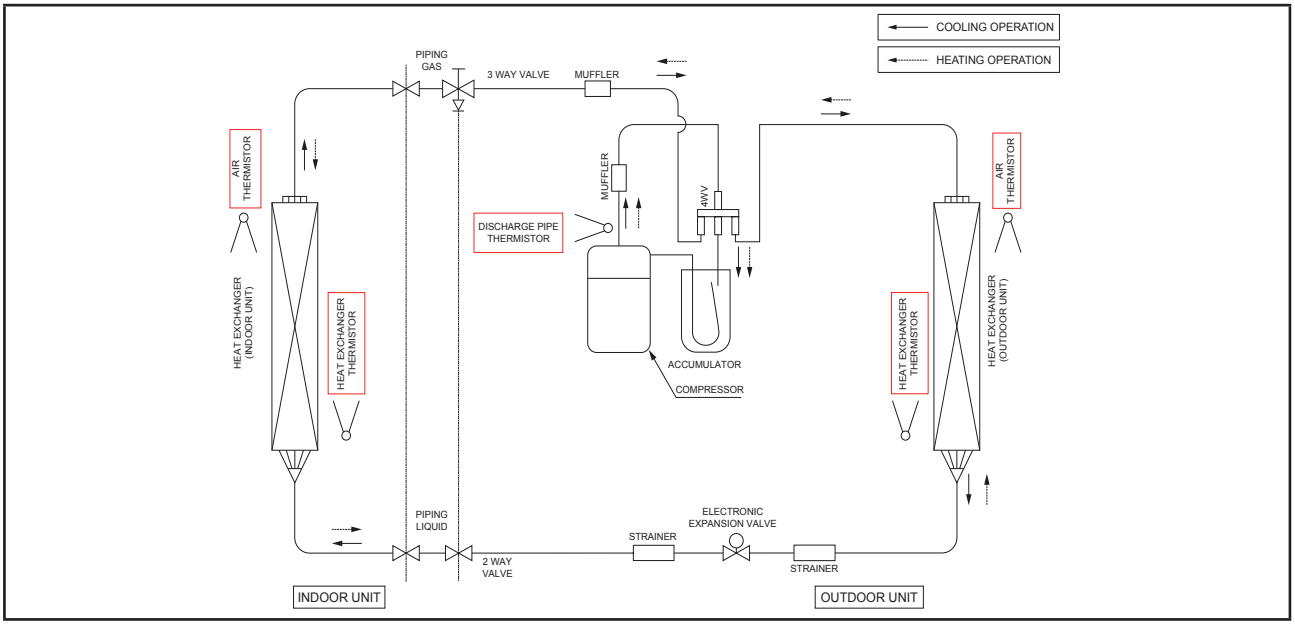
Outdoor controller board will transmit signal to Indoor controller board. Indoor unit will response to outdoor once the valid data is received.



If data communication line between Indoor and Outdoor is disrupted for a period of time (min 15s, max 300s), the compressor will stop & Outdoor fan stop with fan OFF timer. Indoor LED blinks to indicate error. If communication resumes, error is cleared, Indoor LED stop blinking, and the system will be restarted

Communication between indoor and outdoor equipment, terminal 1 to ground 120 VAC, 2 to ground 120 VAC, SIG to ground 120 VAC, between 1 & 2 208/230 VAC, between 2 & 3 0 VAC but 5 to 45 VDC fluctuating signal.

2.12 Thermistors in RK(X)B, RK(X)N



Functions of Thermistor

Thermistor	Functions
Discharge pipe	1. The discharge pipe thermistor is used for controlling discharge pipe temperature. If the discharge pipe temperature (used in place of the inner temperature of the compressor) rises abnormally, the operating frequency becomes lower or the operation halts. 2. The discharge pipe thermistor is used for detecting disconnection of the discharge pipe thermistor.
Outdoor heat exchanger	1. The outdoor heat exchanger thermistor is used for controlling the target discharge pipe temperature. The system sets the target discharge pipe temperature according to the outdoor and indoor heat exchanger temperature, and controls the Electronic Expansion Valve (EXV) opening so that the target discharge pipe temperature can be obtained. 2. In cooling operation, the outdoor heat exchanger thermistor is used for detecting the disconnection of the discharge pipe thermistor. When the discharge pipe temperature drops below the outdoor heat exchanger temperature by more than a certain value, the discharge pipe thermistor is judged as disconnected. 3. In cooling operation, the outdoor heat exchanger thermistor is used for high pressure protection.
Indoor heat exchanger	1. The indoor heat exchanger thermistor is used for controlling the target discharge pipe temperature. The system sets the target discharge pipe temperature according to the outdoor and indoor heat exchanger temperature, and controls the Electronic Expansion Valve (EXV) opening so that the target discharge pipe temperature can be obtained. 2. In cooling operation, the indoor heat exchanger thermistor is used for freeze-up protection control. If the indoor heat exchanger temperature drops abnormally, the operating frequency becomes lower or the operation halts. 3. In heating operation, the indoor heat exchanger thermistor is used for detecting the disconnection of the discharge pipe thermistor. When the discharge pipe temperature drops below the indoor heat exchanger temperature by more than a certain value, the discharge pipe thermistor is judged as disconnected.
Outdoor air	1. Used for defrost & outdoor fan speed control. 2. Used for overall current protection & preheating operation control.
Heat sink	1. Used for capturing heat sink temperature. (Applicable for Daikin controller)
Suction pipe	1. Used for Electronic Expansion Valve (EXV) & suction pipe (SH) protection control in heating.

2.13 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.

2.14 Auto Restart

Factory pre-set.

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

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

Please be informed that after disable auto restart function, unit is not able to restart with last state memory after power resume from failure.

2.15 Auto Random Restart

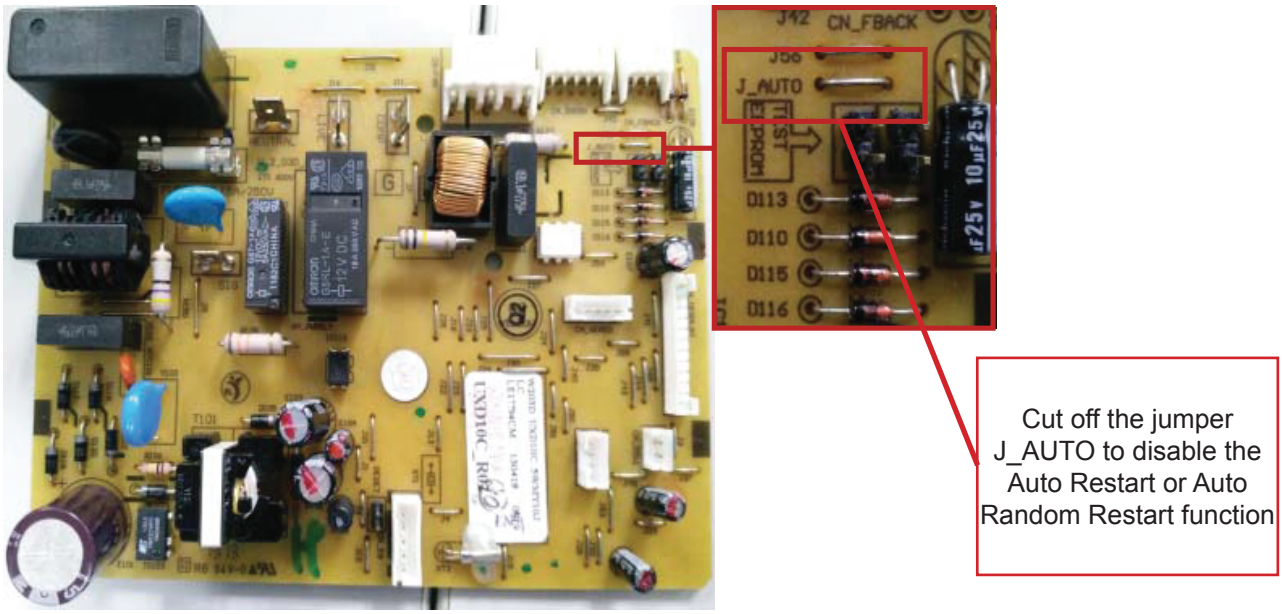
Unit restarts automatically in 64 different recovery timing patterns (within 180 seconds to 244 seconds) and operates based on the previous setting (operating mode, temperature setting and fan speed).

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

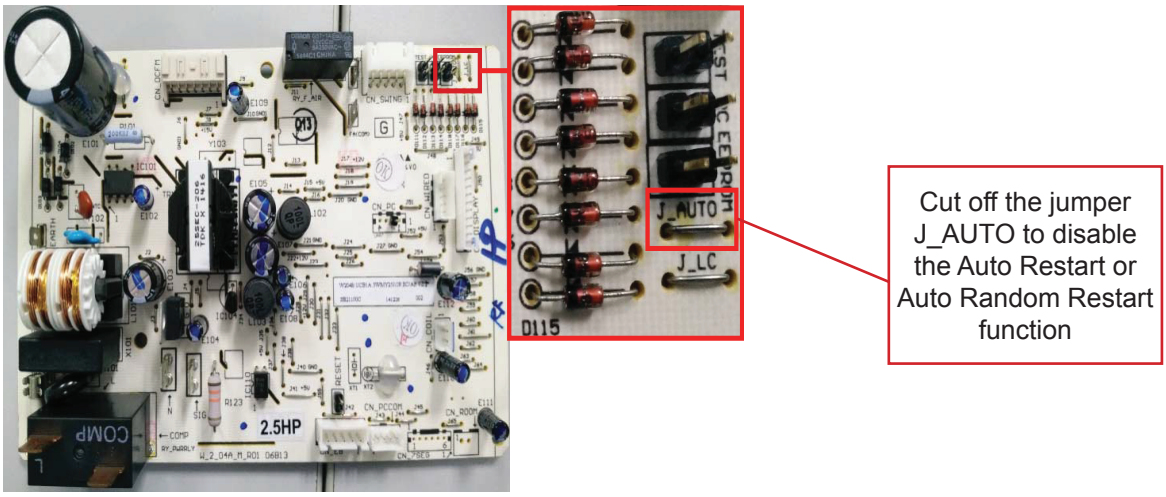
Please be informed that after disable auto random restart, unit is not able to restart with last state memory after power resume from failure. Unit will revert to default setting as below:

Default setting
Unit: Off
Temperature: 24°C (75°F)
Fan speed: High
Mode: Cooling

Applicable for PCB W_2_03D , W_2_03E & W_2_03E_M (For all class 09/12)



Applicable for PCB W_2_04A & W_2_04B (For all class 18/24)



2.16 Four Way Valve Control

Change over switching is only carried out during operation.

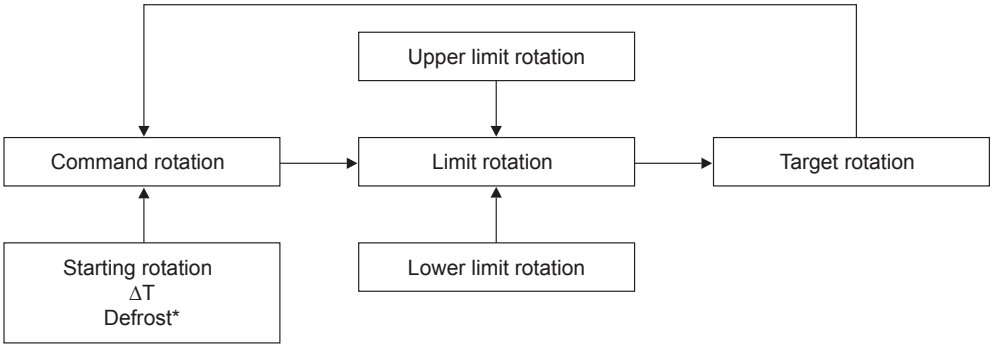
OFF delayed is applied when the coil switches from ON to OFF

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

2.17 Outdoor Fan Control

a) Fan ON control to cool down the electrical box
The outdoor fan is turned ON when the electrical box temperature is high while the compressor is OFF.
b) Fan OFF control during defrosting
The outdoor fan is turned OFF during defrosting
c) Fan OFF delay when stopped
The outdoor fan is turned OFF 60 – 70 seconds after the compressor stops
d) Fan speed control for pressure difference upkeep
The rotation speed of the outdoor fan is controlled for keeping the pressure difference during cooling operation with low outdoor temperature
• When the pressure difference is low, the rotation speed of the outdoor fan is reduced
• When the pressure difference is high, the rotation speed of the outdoor fan is controlled as well as normal operation
e) Fan speed control during forced cooling operation
The outdoor fan is controlled as well as normal operation during forced cooling operation
f) Fan speed control during POWERFUL/TURBO operation
The rotation speed of the outdoor fan is increased during POWERFUL/TURBO operation
g) Fan speed control during indoor unit quiet operation
The rotation speed of the outdoor fan is reduced by the command of the indoor unit quiet operation
h) Fan ON/OFF control when operation (cooling, heating, dry) starts/stops
The outdoor fan is turned ON when the operation starts. The outdoor fan is turned OFF when the operation stops

2.18 Rotation Regulating Functions



** Defrost control for heat pump model only*

2.18.1 Starting Rotation

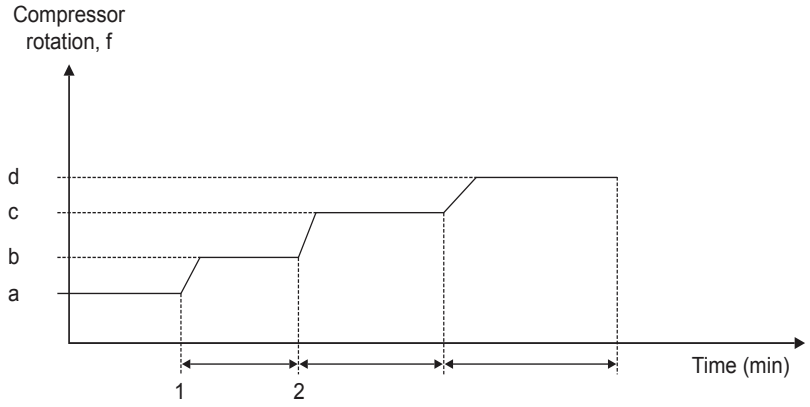
Starting Control

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)
RK(X)B09/12AXVJU RK(X)N09/12AXVJU	40 (180)	54 (420)	72 (180)	90 (120)	-
RK(X)B18/24AXVJU RK(X)N18/24AXVJU	55 (120)	70 (200)	85 (470)	-	-

2.18.2 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.

2.18.3 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.

2.19 Defrost Cycle

Defrosting is carried out by the cooling cycle (reverse cycle). The defrosting time or outdoor heat exchanger temperature must be more than a certain value to finish defrosting.

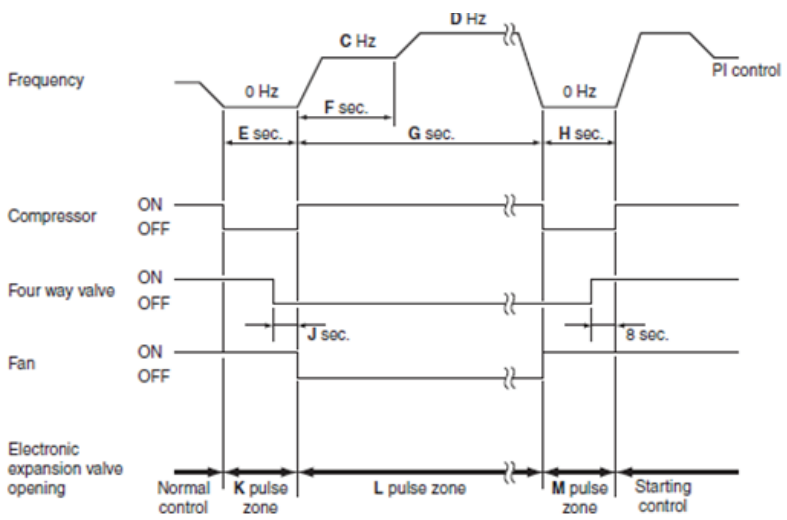
During defrost	All models
Compressor	ON
4-way valve	OFF
EXV in operation room	Fixed opening
Outdoor fan	OFF
Indoor fan	OFF

Conditions for starting Defrost

- The starting conditions are determined with the outdoor temperature and the outdoor heat exchanger temperature
- The system is in heating condition
- Compressor minimum run time – 6 minutes OR
- More than A minutes (depending on the duration of the previous defrost control) of accumulated time have passed since the start of the operation, or ending the previous defrosting

Condition for terminating defrost

The judgment is made with the outdoor heat exchanger temperature (**B**°C)



		09 class	12 class	18 class	24 class
A (minute)		20 - 25	20 - 25	25	25
B	(°C)	2 - 20	2 - 20	6 - 30	6 - 30
	(°F)	35.6 – 68.0	35.6 – 68.0	42.8 – 86.0	42.8 – 86.0
C (Hz)		64	64	48	48
D (Hz)		64	64	42	42
E (seconds)		40	40	60	60
F (seconds)		60	60	60	60
G (seconds)		630	630	490	490
H (seconds)		40	50	60	90
J (seconds)		8	8	5	5
K (pulse)		400	400	450	450
L (pulse)		300	300	300 – 450	300 – 450
M (pulse)		200	350	200	200

2.20 Indoor Coil Freeze Prevention

Only available in cooling mode.

When the indoor coil temperature < 2°C (35.6°F), the compressor starts to drop the frequency.

This protection will cut in when:

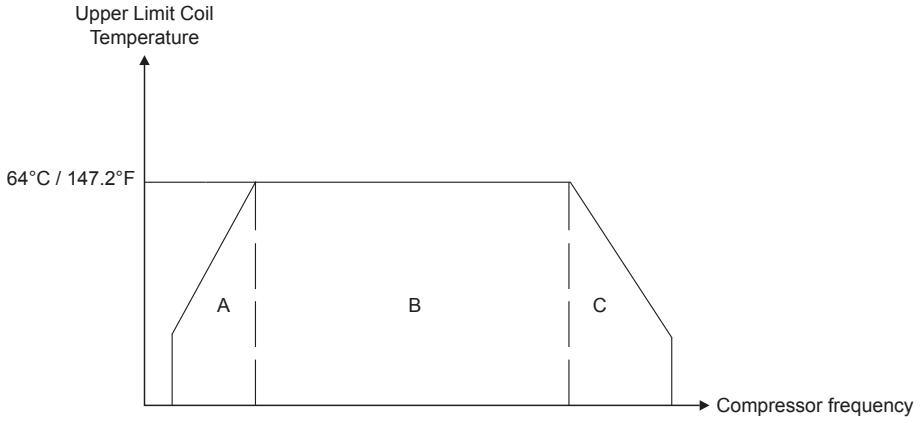
- Indoor coil temperature < 0°C (32°F) for more than 180s. Compressor will stop, outdoor fan stop after 30s and indoor fan can only run at lowest fan speed.

The unit can only be restarted after 3 minutes.
When the indoor coil temperature > 13°C (55.4°F), the compressor frequency will be reset based on the outdoor ambient, room and set temperature.

2.21 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:

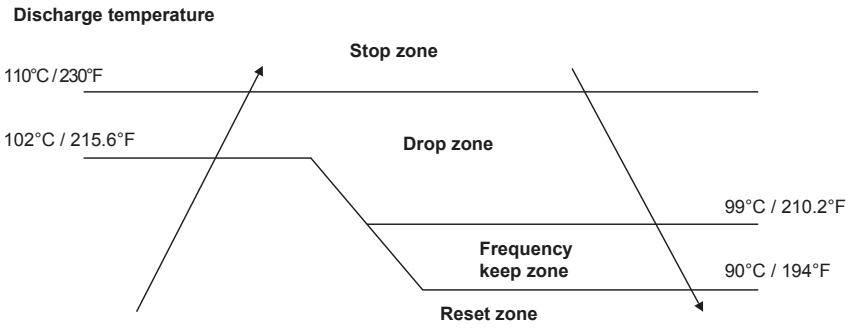
- During cooling mode : outdoor coil temperature.
- During heating mode : indoor coil temperature.

This protection is activated when the coil temperature > 64°C (147.2°F), the compressor stops and outdoor fan stops after 30s.The unit can only be restarted after 3 minutes.

2.22 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 (215.6°F) 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 (210.2°F) and 90°C (194°F) at the keep zone.

This protection is activated when the compressor discharge temperature > 110°C (230°F). The compressor will stop and considered trip.

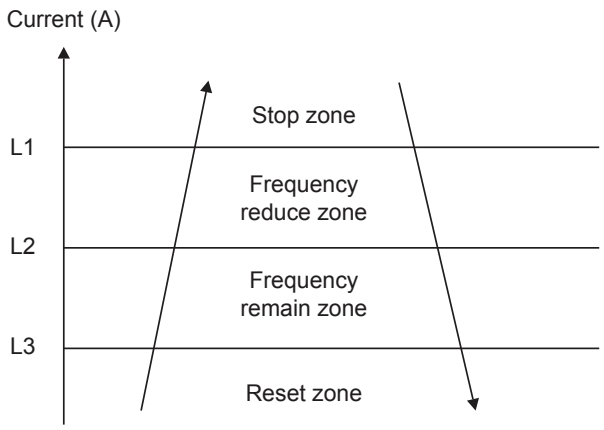
If the compressor discharge temperature < 90°C (194°F) , the compressor frequency will be reset based on the outdoor ambient, set and room temperature.

More detail information (i.e. "based on ambient" give the temperatures)

2.23 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
RK(X)B09AX **RK(X)N09AX**	9.5A
RK(X)B012AX **RK(X)N012AX**	10.0A
RK(X)B18/24AX **RK(X)N18/24AX**	16.0A

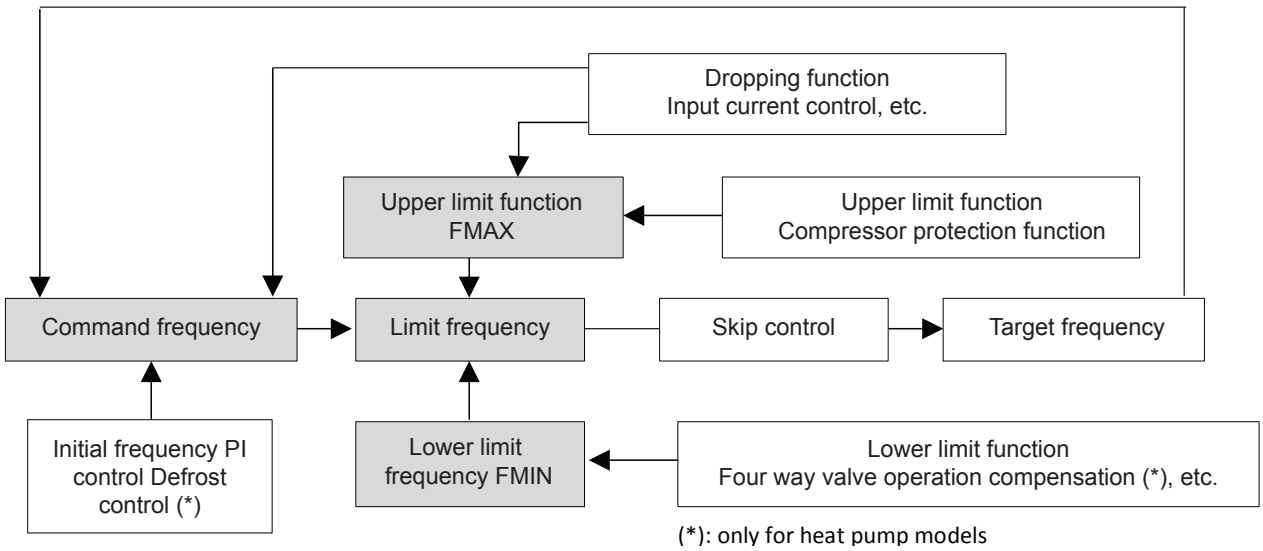
When the input current for running compressor exceeds L2, the running frequency will be reduced by 1 step. If the current still exceeds L2, frequency will be reduced by another step until total current falls between L2 and L3.

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.

2.24 Overall Frequency Control

The compressor frequency is determined according to the difference between the room thermistor temperature and the target temperature.



For Cooling Only Model

1. Determine command frequency

Command frequency is determined in the following order of priority.

a. Forced cooling
b. Indoor frequency command

2. Determine upper limit frequency

The minimum value is set as an upper limit frequency among the frequency upper limits of the following functions Compressor protection, input current, discharge pipe temperature, freeze-up protection.

3. Determine lower limit frequency

The maximum value is set as a lower limit frequency among the frequency lower limits of the following function:
Pressure difference upkeep.

4. Determine prohibited frequency

There is a certain prohibited frequency such as a power supply frequency.

For Heat Pump Model

1. Determine command frequency

Command frequency is determined in the following order of priority.

a. Limited defrost control time
b. Forced cooling
c. Indoor frequency command

2. Determine upper limit frequency

The minimum value is set as an upper limit frequency among the frequency upper limits of the following functions:
Compressor protection, input current, discharge pipe temperature, heating peak-cut, freeze-up protection, defrost control.

3. Determine lower limit frequency

The maximum value is set as a lower limit frequency among the frequency lower limits of the following functions:
Four way valve operation compensation, draft prevention, pressure difference upkeep.

4. Determine prohibited frequency

There is a certain prohibited frequency such as a power supply frequency.

2.24.1 Initial Frequency

When starting the compressor, the frequency is initialized according to the ΔD value of the indoor unit.
<ΔD signal: Indoor frequency commands>
The difference between the room thermistor temperature and the target temperature is recognized as the ΔD signal and is used for frequency command.

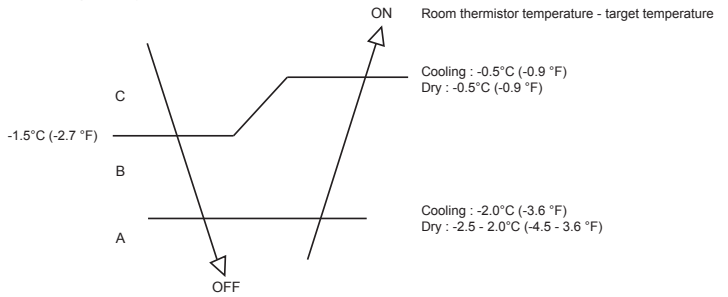
Temperature difference	ΔD signal	Temperature difference	ΔD signal	Temperature difference	ΔD signal	Temperature difference	ΔD signal
-2.0°C (-3.6°F)	*OFF	0°C (0°F)	4	2.0°C (3.6°F)	8	4.0°C (7.2°F)	C
-1.5°C (-2.7°F)	1	0.5°C (0.9°F)	5	2.5°C (4.5°F)	9	4.5°C (8.1°F)	D
-1.0°C (-1.8°F)	2	1.0°C (1.8°F)	6	3.0°C (5.4°F)	A	5.0°C (9.0°F)	E
-0.5°C (-0.9°F)	3	1.5°C (2.7°F)	7	3.5°C (6.3°F)	B	5.5°C (9.9°F)	F

*OFF = Thermostat OFF

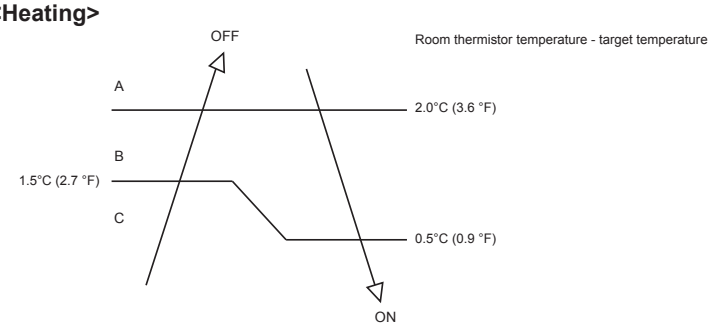
2.24.2 PI Control

1. P control
The ΔD value is calculated in each sampling time (20 seconds), and the frequency is adjusted according to its difference from the frequency previously calculated.
2. I control
If the operating frequency does not change for more than a certain fixed time, the frequency is adjusted according to ΔD value.
When the ΔD value is low, the frequency is lowered.
When the ΔD value is high, the frequency is increased.
3. Frequency control when other controls are functioning
    • When frequency is dropping;
Frequency control is carried out only when the frequency drops.
    • For limiting lower limit;
Frequency control is carried out only when the frequency rises.
4. Upper and lower limit of frequency by PI control
The frequency upper and lower limits are set according to the command of the indoor unit. When the indoor or outdoor unit quiet operation command comes from the indoor unit, the upper limit frequency is lower than the usual setting.

<Cooling / Dry>



<Heating>



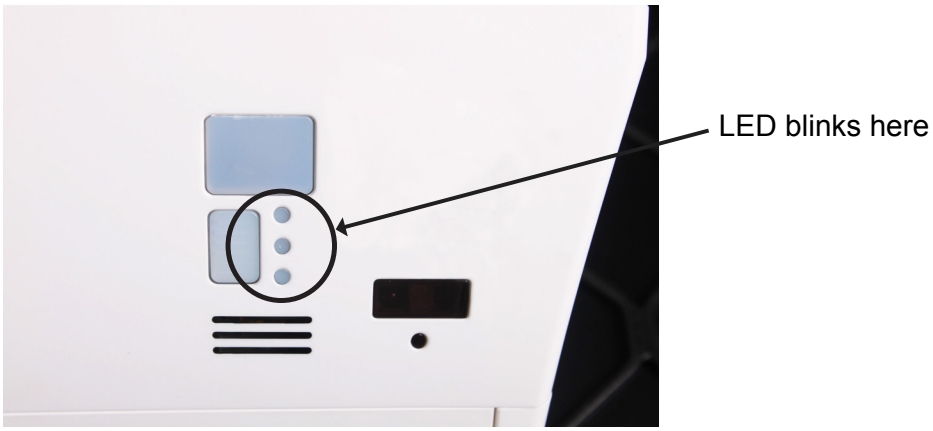
3.0 Service Diagnosis

3.1 Error Indication from Indoor

3.1.1 Indoor model

FTK(X)N09/12/18/24AX

- 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.

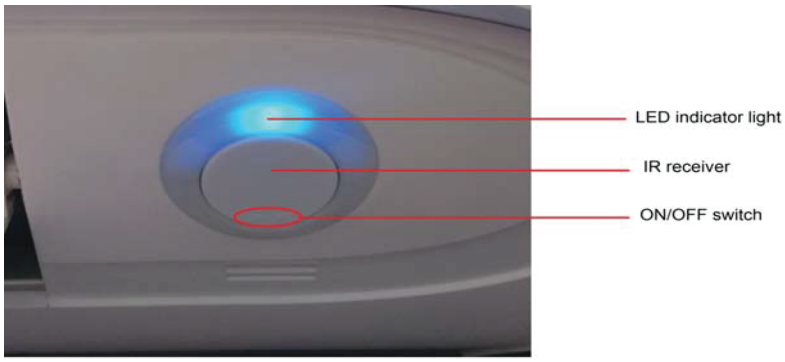


★ SLEEP (ORANGE)	⏻ COOL/HEAT (BLUE/RED)	🕒 TIMER (WHITE)	**Operation / Fault Indication**
	○ Blue		Cooling mode
	○ Red		Heating mode
	○ Red		Auto mode in heating operation
	○ Blue		Auto mode in cooling operation
		○	Timer On
○	○		Sleep mode on
	○ Blue		Fan mode on
	○ Blue		Dry mode on
	◑ Red		Defrost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

○ ON ◑ Blinking

3.1.2 Indoor model
FTK(X)B09/12/18/24AX

- 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.

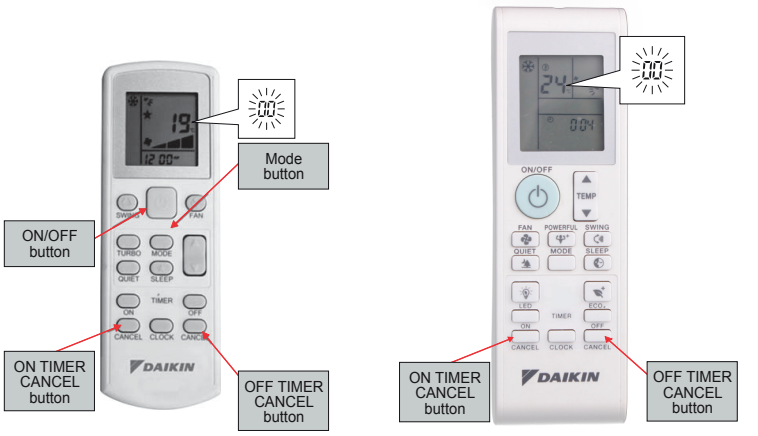


COOL/HEAT/TIMER (BLUE/RED/VIOLET)	Operation / Fault Indication
○ Blue	Cooling mode
○ Red	Heating mode
○ Red	Auto mode in heating operation
○ Blue	Auto mode in cooling operation
○ Violet	Timer On
○ Blue	Fan mode on
○ Blue	Dry mode on
◑ Red	Defrost operation
◑ Blue	Error indication

○ ON ◑ Blinking

3.2 Error Code retrieved by remote controller

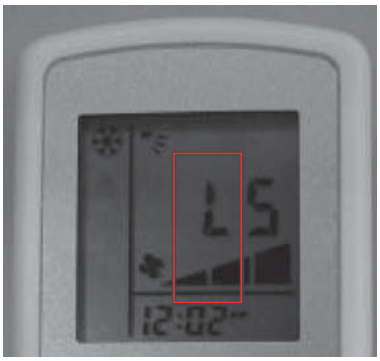
3.2.1 Remote controller model BRC52A & BRC52B



BRC52A	BRC52B

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 consecutive 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 BRC52A & BRC52B

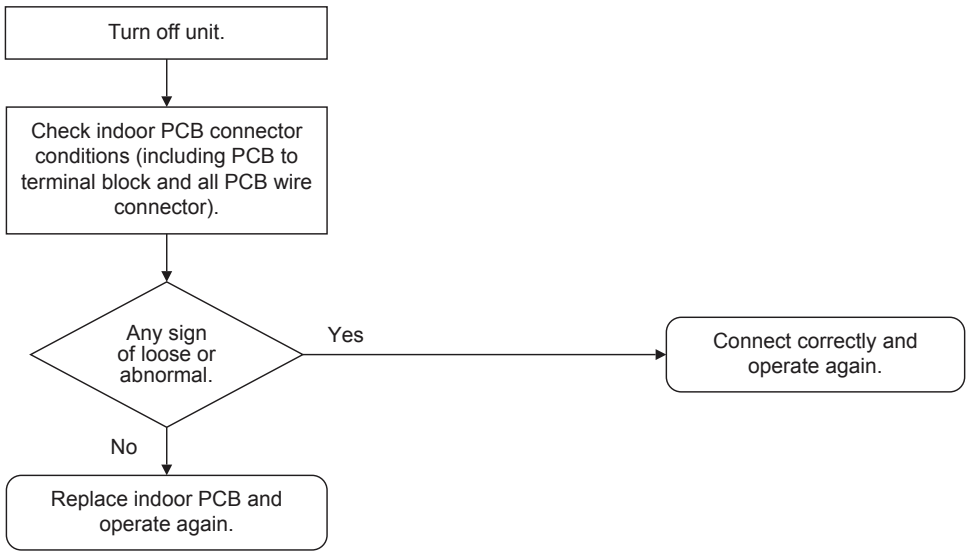
Operating Guide

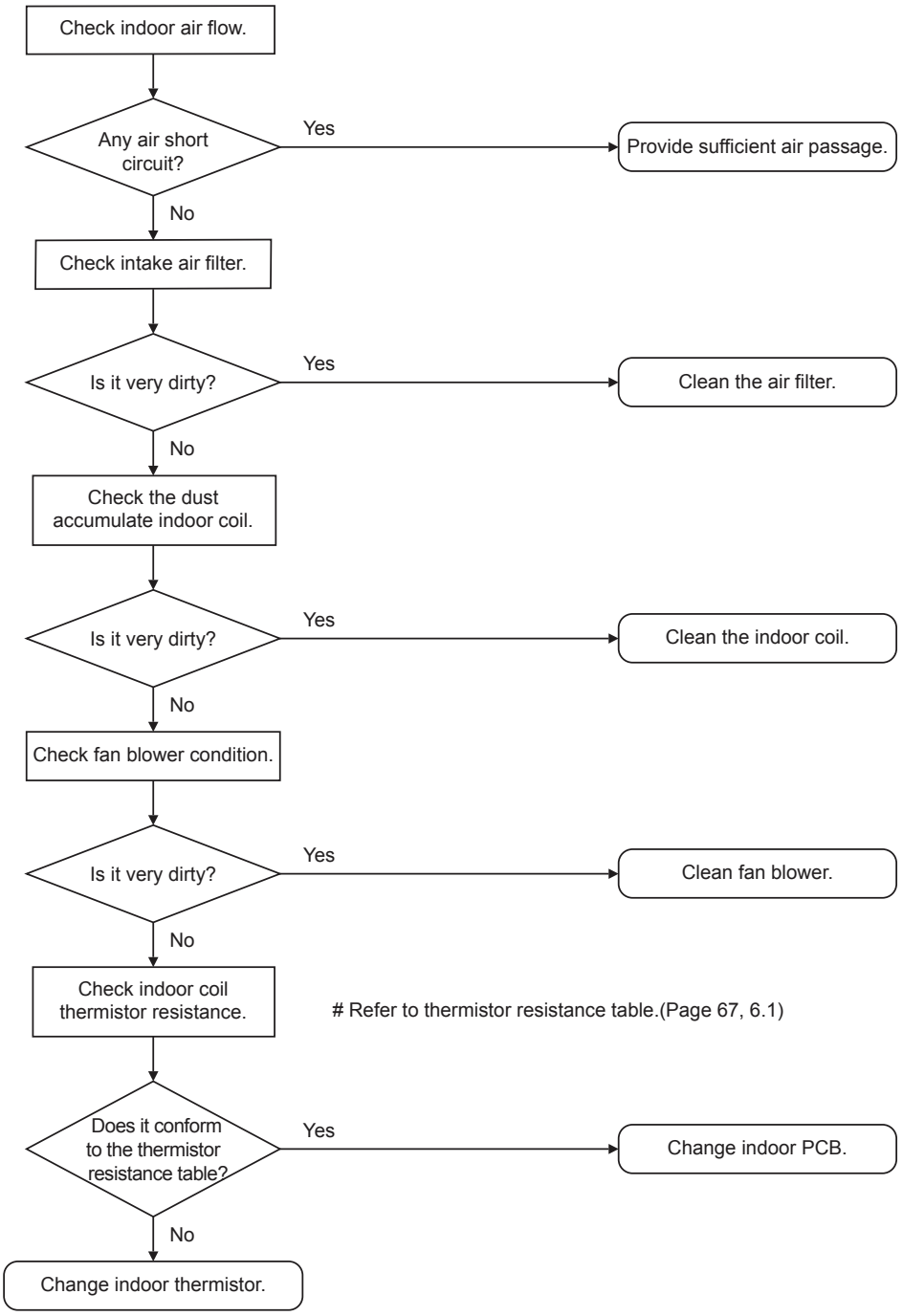
1. Remove battery from remote controller.
2. Replace battery again into remote controller.
3. Press Mode & ON/OFF buttons together.
4. The "00" will show at temperature section.
5. Press Mode button to 5:00.
6. Press Power On toward the indoor unit. Unit LED blinks two times indicate received signal.
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)

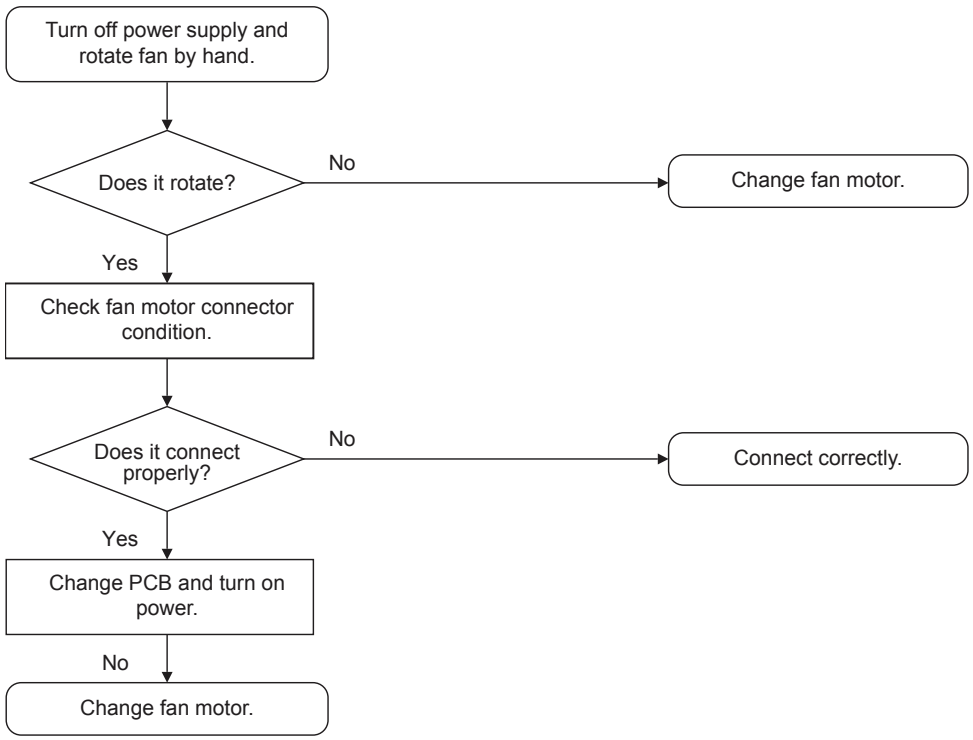
3.3 Error code description for Inverter

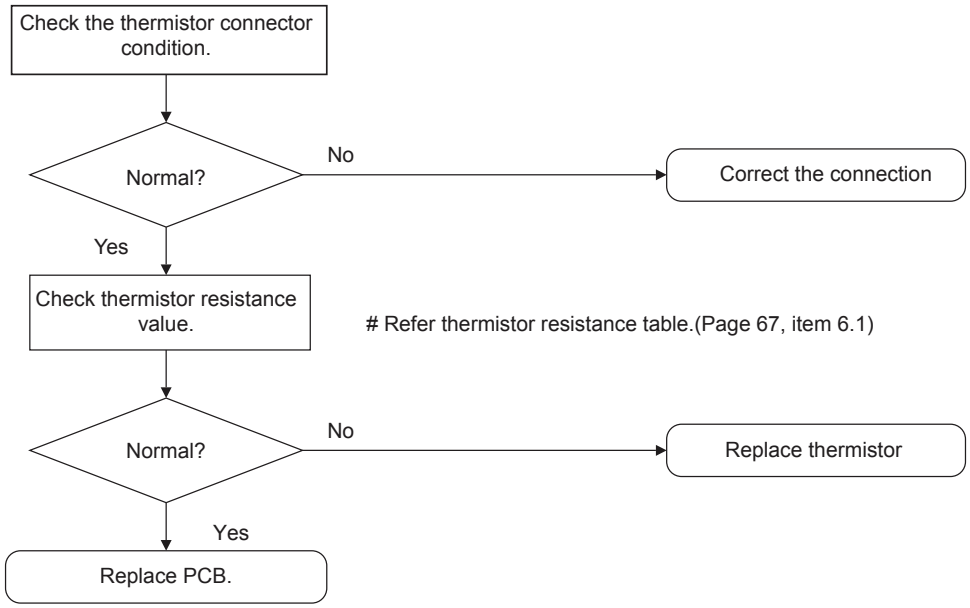
No.	ERROR CODE	ERROR DESCRIPTION	RK(X)B09/12/18/24AX RK(X)N09/12/18/24AX
1	00	NORMAL	O
2	A1	INDOOR PCB ABNORMALITY	O
3	A5	ANTIFREEZE PROTECTION OR HIGH PRESSURE CONTROL	O
4	A6	INDOOR FAN MOTOR ABNORMALITY	O
5	C4	INDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY	O
6	C9	INDOOR ROOM THERMISTOR ABNORMALITY	O
7	E1	OUTDOOR PCB ABNORMALITY	O
8	E5	COMPRESSOR OVERLOAD	O
9	E6	COMPRESSOR LOCK/START-UP ABNORMALITY	O
10	E7	OUTDOOR FAN MOTOR LOCK	O
11	E8	AC INPUT OVER CURRENT	O
12	EA	4 WAY VALVE ABNORMALITY	O
13	F3	DISCHARGE PIPE OVERHEAT	O
14	F6	HEAT EXCHANGER OVERHEAT	O
15	H0	COMPRESSOR SENSOR SYSTEM ABNORMAL	O
16	H6	POSITION SENSOR ABNORMAL (COMPRESSOR)	O
17	H8	AC CURRENT SENSOR ABNORMALITY	O
18	H9	OUTDOOR AIR THERMISTOR ABNORMALITY	O
19	J3	COMPRESSOR DISCHARGE PIPE THERMISTOR ABNORMALITY	O
20	J6	OUTDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY	O
21	L3	ELECTRICAL BOX TEMPERATURE RISE (COMPRESSOR OFF)	O
22	L4	HEAT SINK OVERHEAT (COMPRESSOR ON)	O
23	L5	IPM ABNORMALITY	O
24	P4	HEAT SINK THERMISTOR ABNORMALITY	O
25	U0	INSUFFICIENT GAS	O
26	U2	DC VOLTAGE OUT OF RANGE	O
27	U4	COMMUNICATION ABNORMALITY	O
28	UA	INSTALLATION ABNORMALITY	O

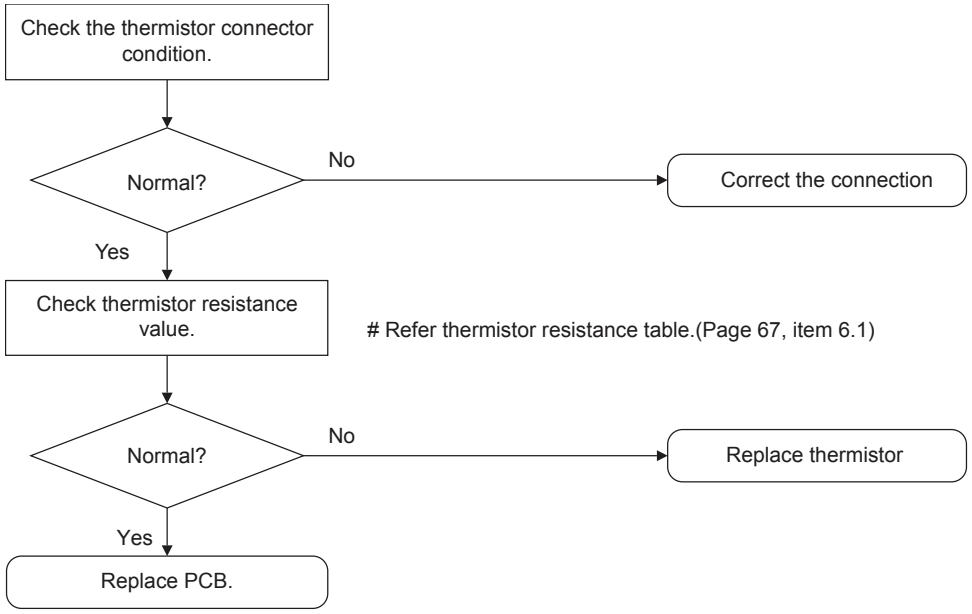
Remark: O : Function
- : Not Applicable

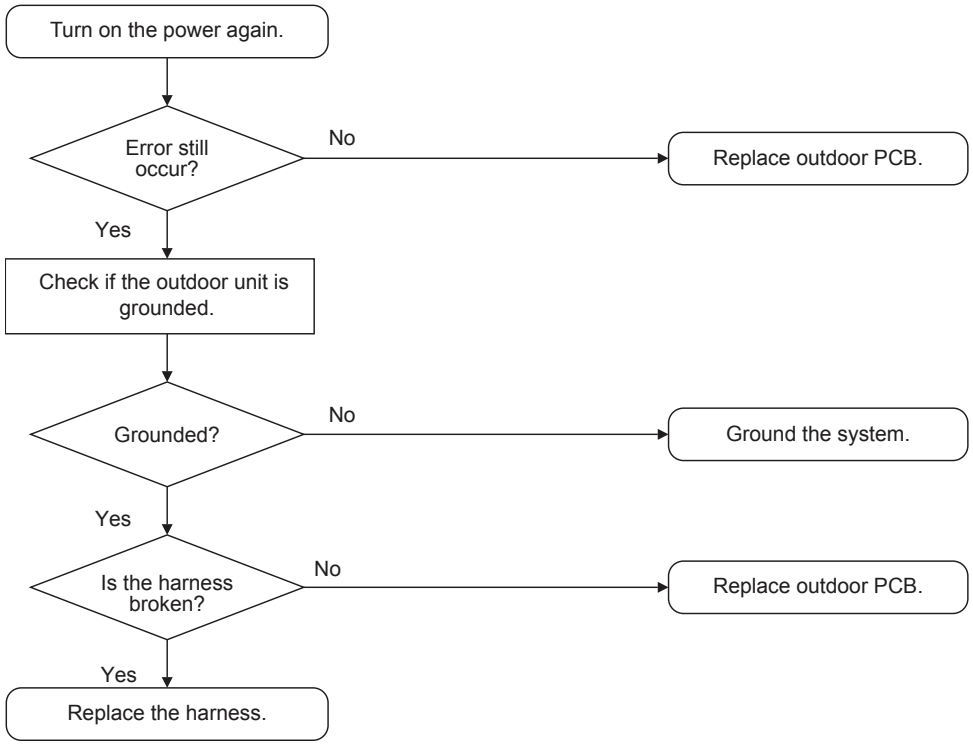
A1	
Description	INDOOR PCB ABNORMALITY
Possible Root cause	1. Faulty indoor PCB. 2. Faulty connector connection at indoor.
Troubleshooting	

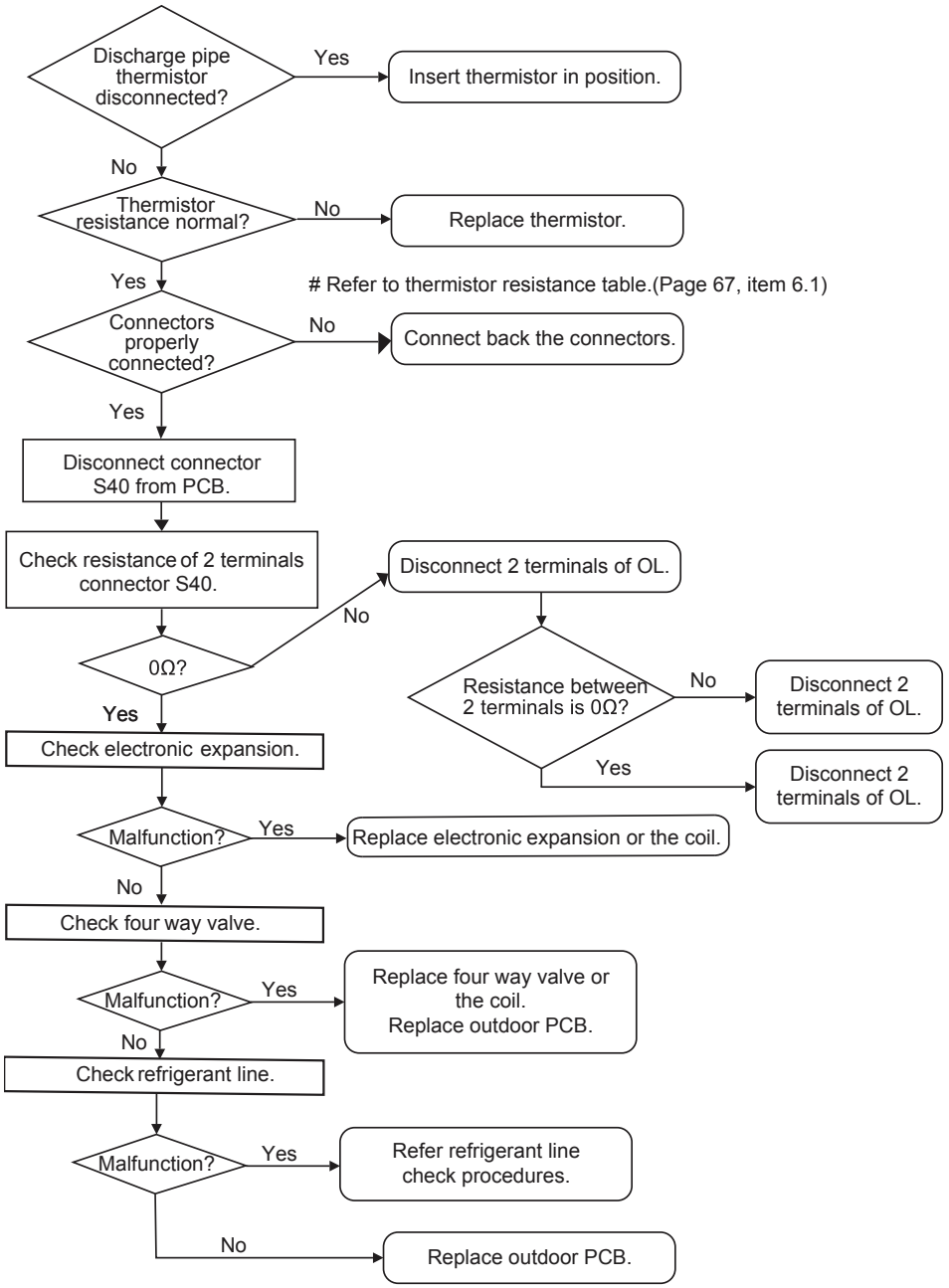
A5	
Description	ANTIFREEZE PROTECTION OR HIGH PRESSURE CONTROL
Possible Root cause	1. Indoor air filter, heat exchanger block due to dust accumulation. 2. Indoor air short circuit. 3. Indoor coil thermistor faulty. 4. Indoor PCB faulty. 5. Fan blower dirty.
Troubleshooting	

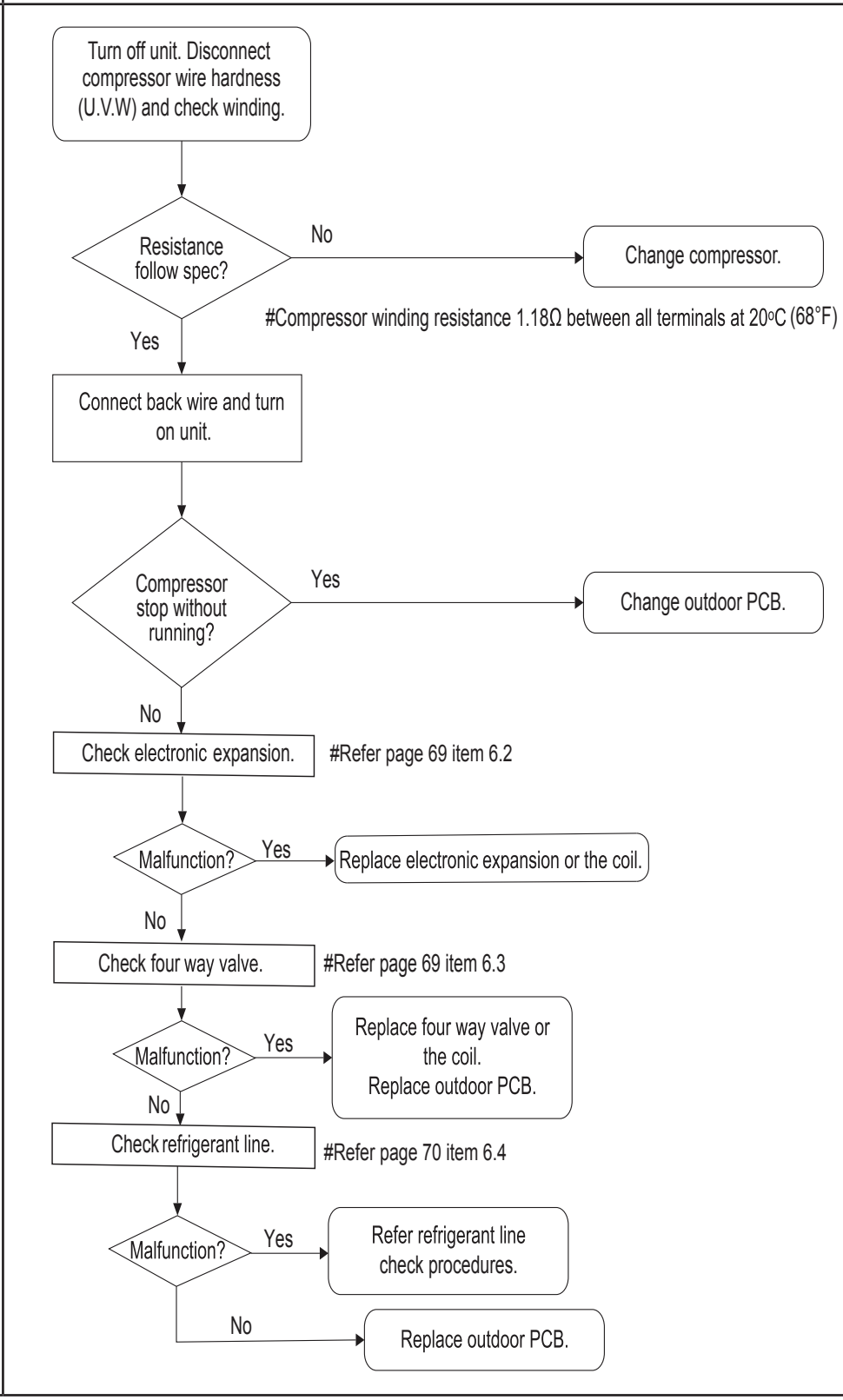
A6	
Description	INDOOR FAN MOTOR ABNORMALITY
Possible Root cause	1. Indoor fan motor winding short, or the motor lead wire broken. 2. Indoor PCB faulty.
Troubleshooting	

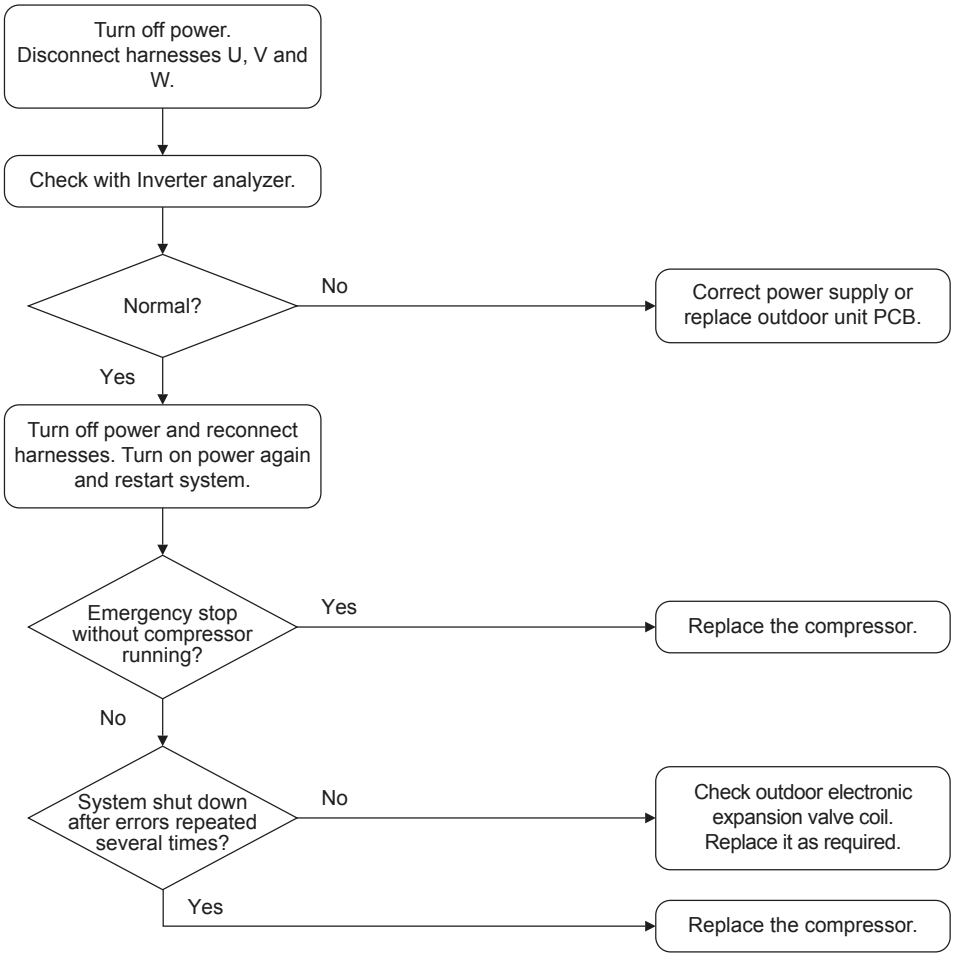
C4	
Description	INDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY
Possible Root cause	1. Thermistor, connector faulty. 2. Indoor PCB faulty.
Troubleshooting	 ***Remark:*** *Refer Thermistor resistance check procedure in Appendix A.(Page 67, item 6.1)*

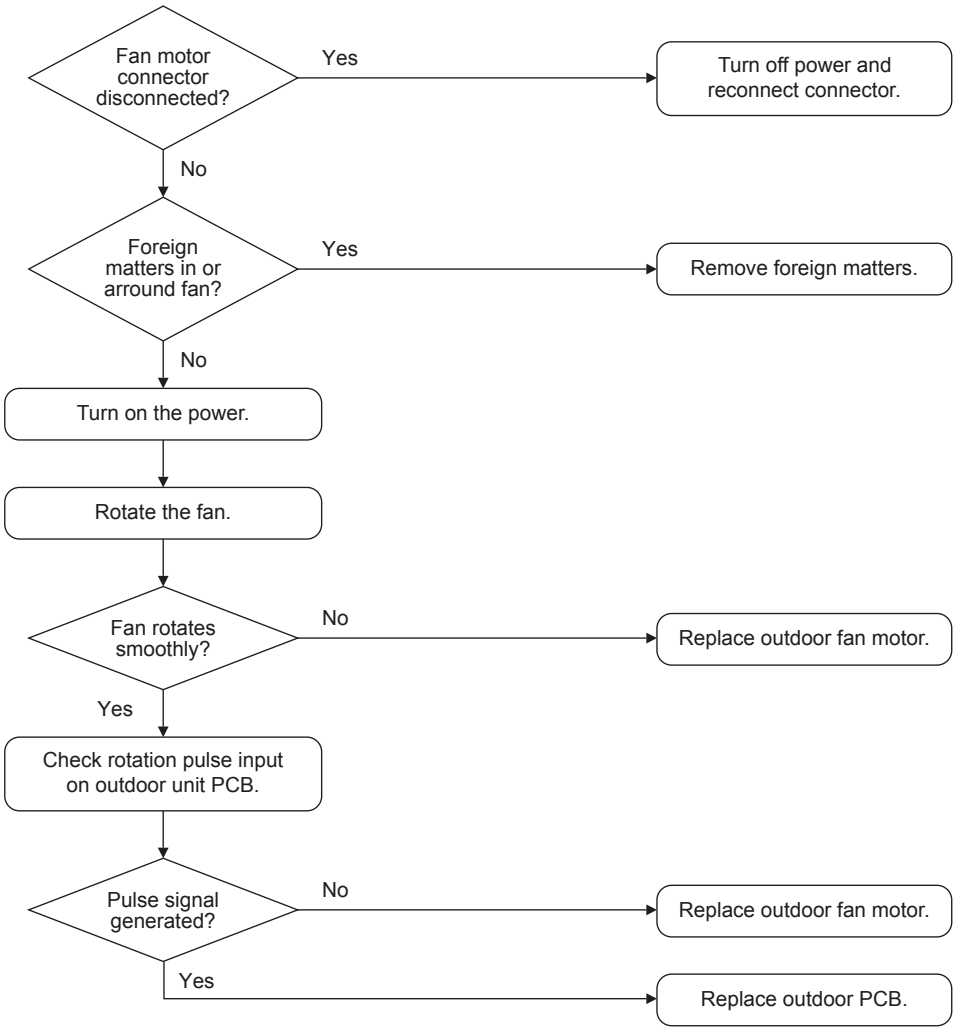
C9	
Description	INDOOR ROOM THERMISTOR ABNORMALITY
Possible Root cause	1. Thermistor, connector faulty. 2. Indoor PCB faulty.
Troubleshooting	

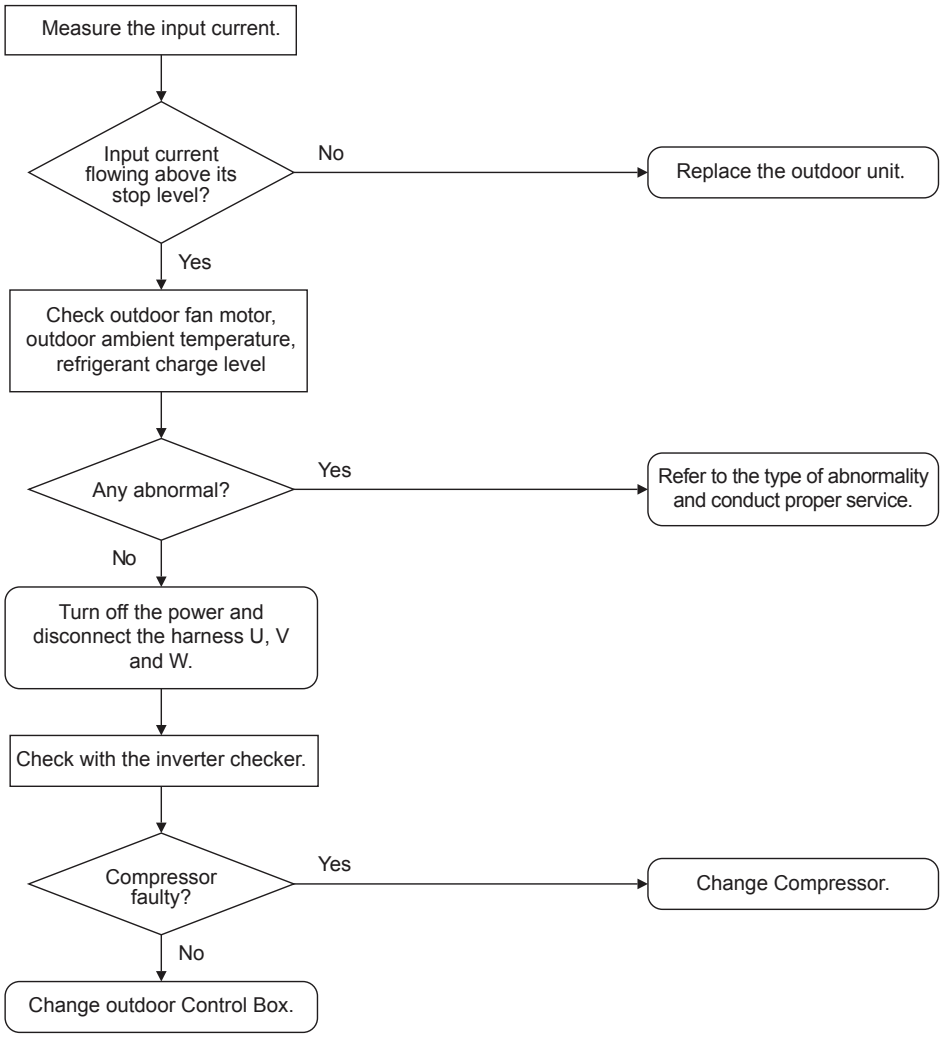
E1	
Description	OUTDOOR PCB ABNORMALITY
Possible Root cause	1. Micro Controller program run-away due to external factor such as Noise, Momentary voltage drop, Momentary power failure. 2. Damage of EEPROM. 3. Faulty outdoor unit PCB. 4. Broken hardness between PCB.
Troubleshooting	

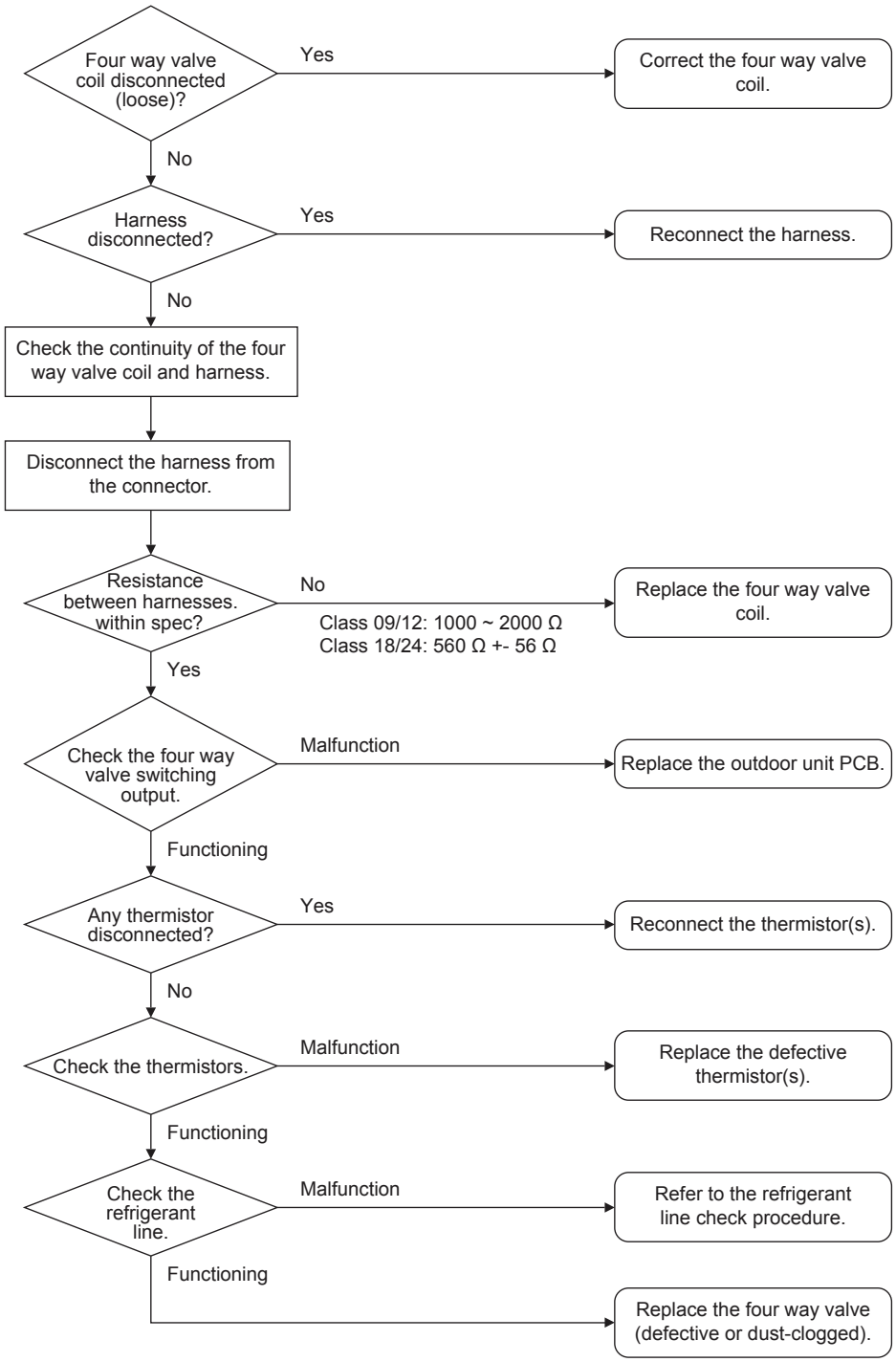
E5	
Description	COMPRESSOR OVERLOAD
Possible Root cause	1. Refrigerant Shortage. 2. 4 way valve malfunction. 3. Stop valve malfunction. 4. Outdoor unit PCB defective. 5. Water mixed in refrigerant. 6. Electronic expansion valve defective. 7. Disconnection of discharge pipe thermistor. 8. Faulty discharge 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 69,item 6.2), four way valve (page 69,item 6.3) and refrigerant line checking procedures (page 70,item 6.4).*

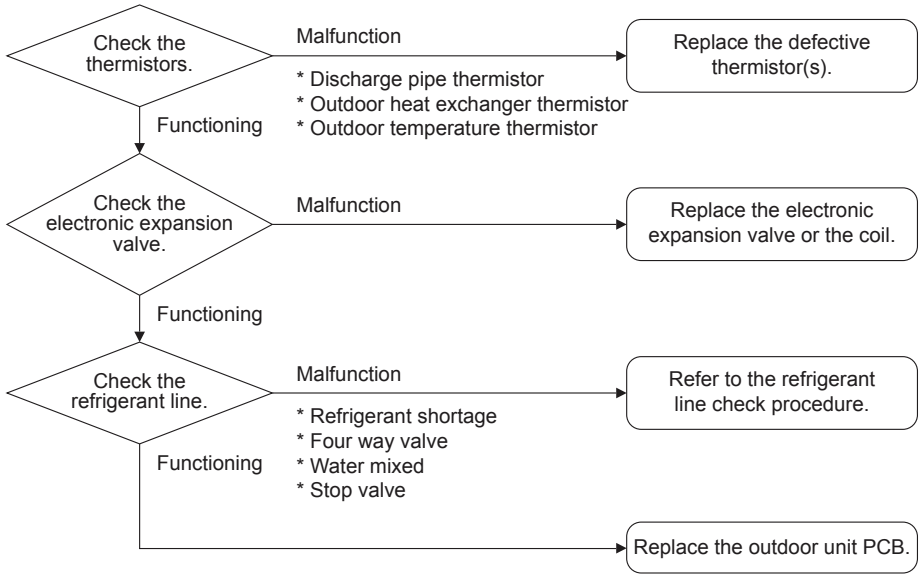
E5	
Description	COMPRESSOR OVERLOAD
Possible Root cause	1. Refrigerant Shortage. 2. 4 way valve malfunction. 3. Electronic expansion valve defective. 4. Outdoor unit PCB defective. 5. Water mixed in refrigerant.
Troubleshooting	

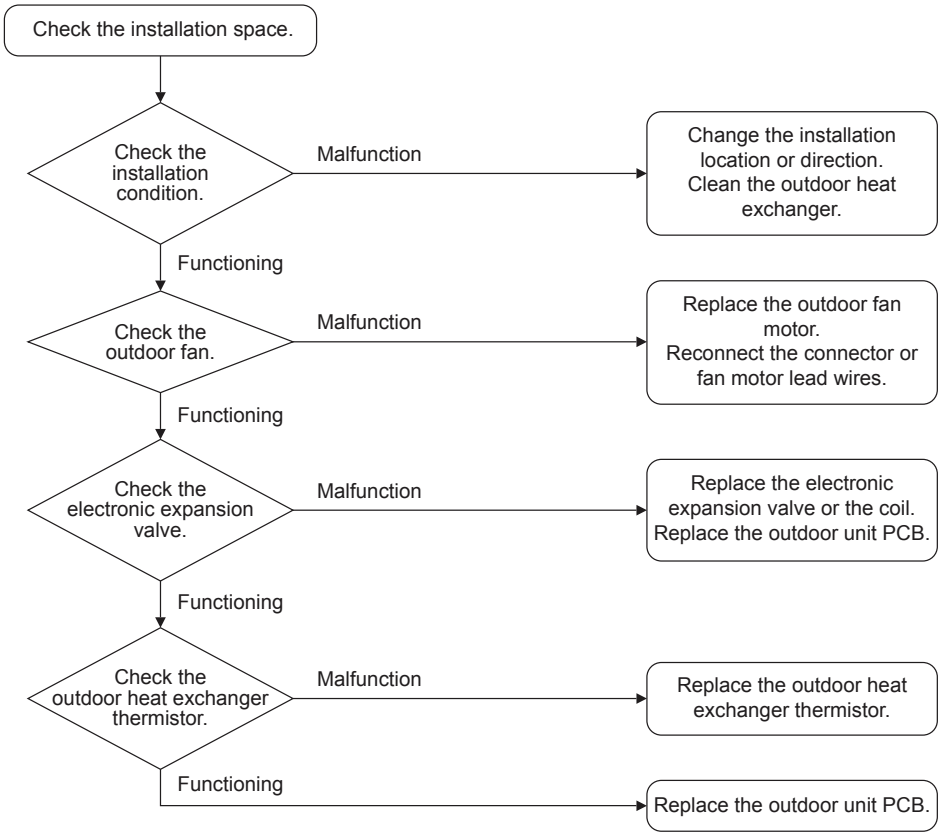
E6	
Description	COMPRESSOR LOCK/START-UP ABNORMALITY
Possible Root cause	1. Compressor locked. 2. Compressor harness disconnect.
Troubleshooting	

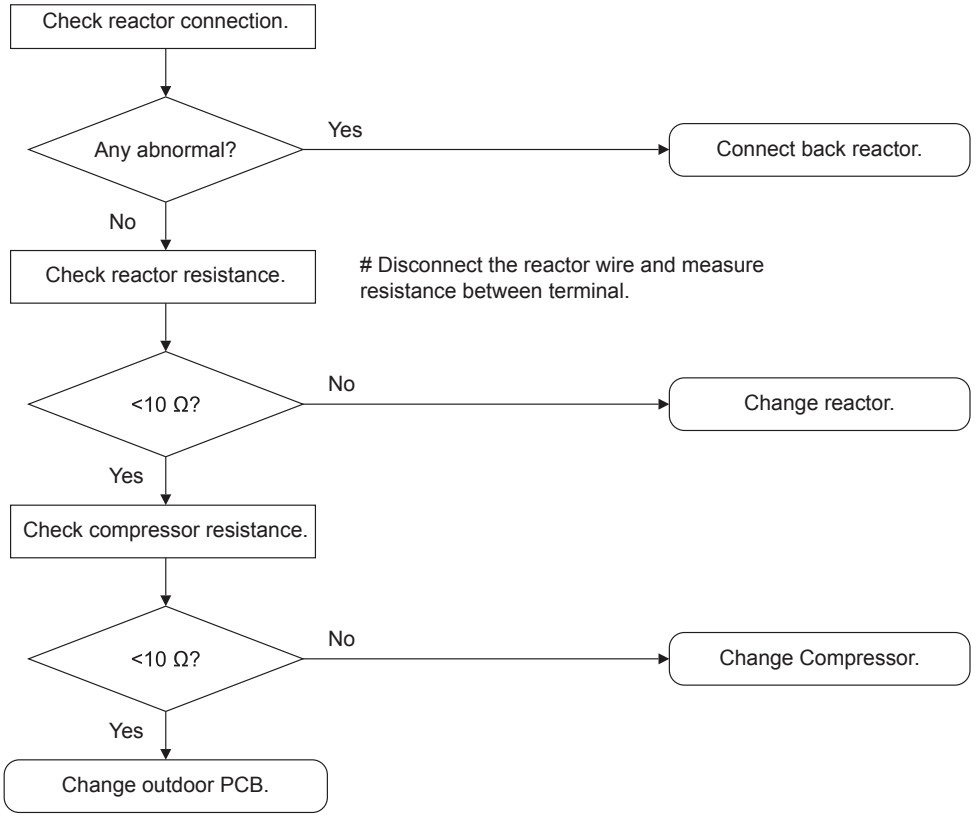
E7	
Description	OUTDOOR FAN MOTOR LOCK
Possible Root cause	1. Fan motor breakdown. 2. Harness or connector disconnected between fan motor and PCB or in poor contact. 3. Foreign matter stuck in fan. 4. Defective outdoor unit PCB.
Troubleshooting	 ***Remark:*** *Refer Appendix A for rotation pulse check.(Page 71, item 6.5)*

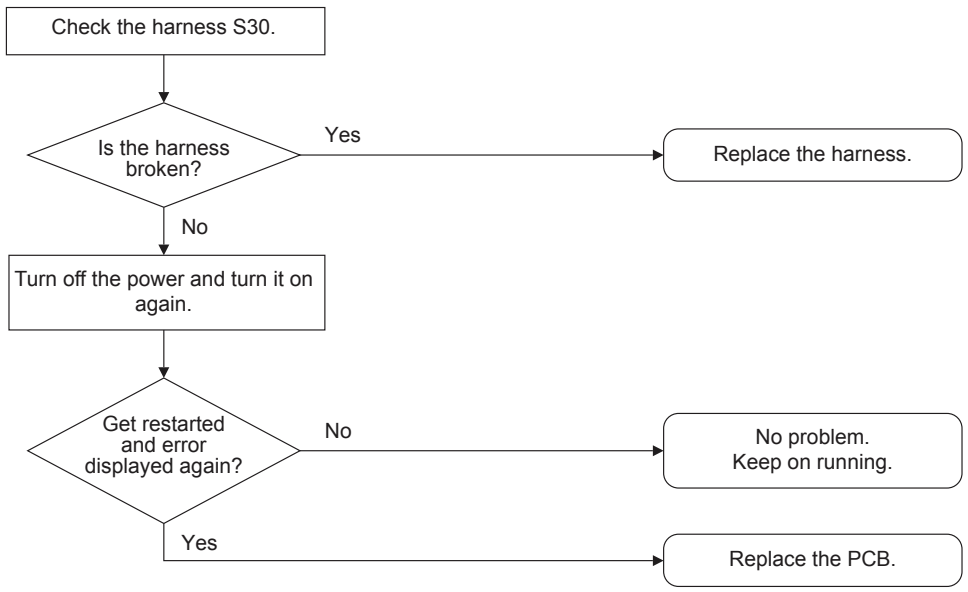
E8	
Description	AC INPUT OVER CURRENT
Possible Root cause	1. Over current due to compressor failure. 2. Over current due to defective outdoor unit PCB. 3. Over current due to defective power transistor. 4. Over current due to short-circuit.
Troubleshooting	

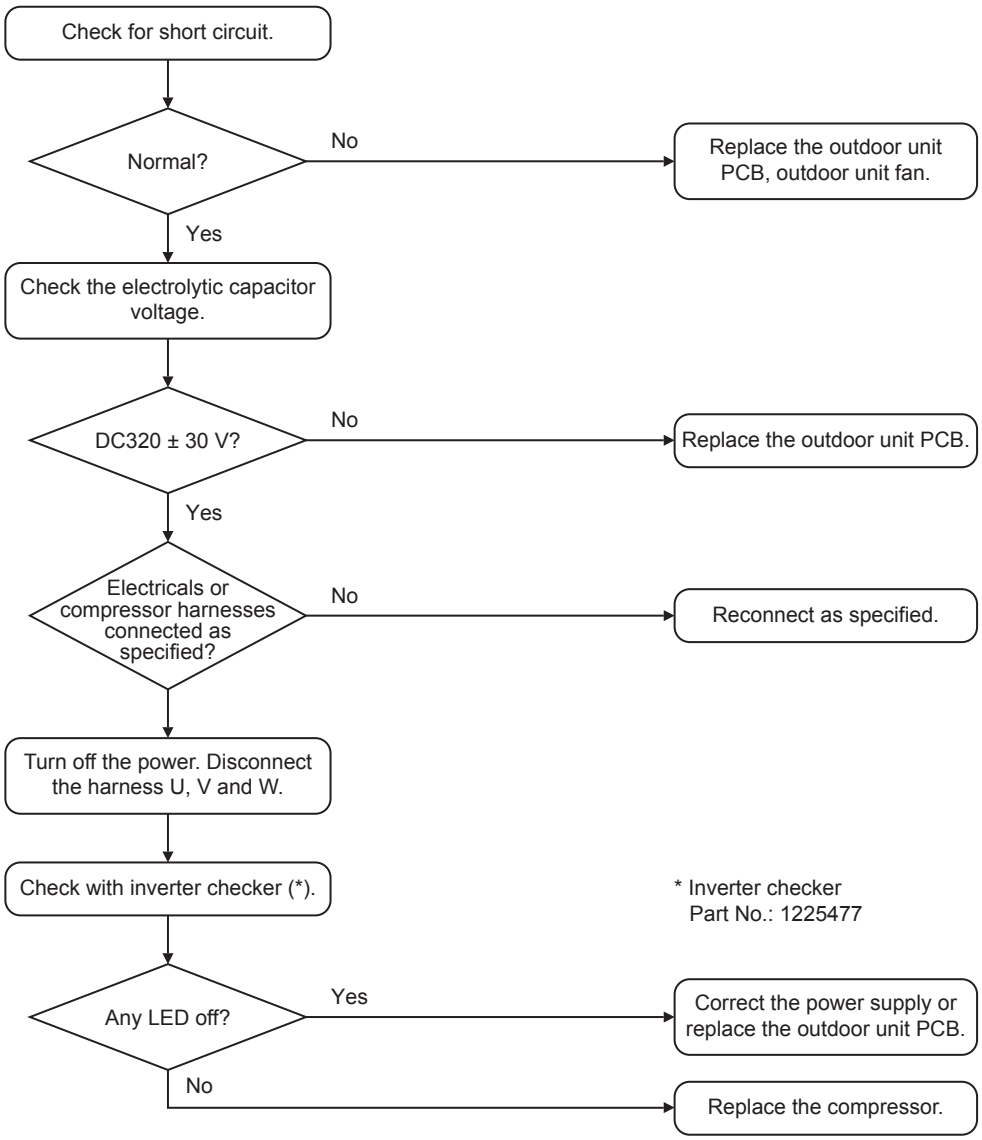
EA	
Description	4 WAY VALVE ABNORMALITY
Possible Root cause	1. Thermistor defective. 2. 4 way valve defective. 3. Outdoor PCB defective. 4. Insufficient gas. 5. Foreign substance mixed in refrigerant. 6. Stop valve defective. 7. Disconnect of 4 way valve coil.
Troubleshooting	 ***Remark:*** *Refer to Appendix A for thermistor resistance checking procedures.(Page 67, item 6.1)* *Refer to Appendix A for Four way valve performance checking procedures.(Page 69, item 6.2)* *Refer to Appendix A for Inverter unit refrigerant check procedures.(Page 70, item 6.4)*

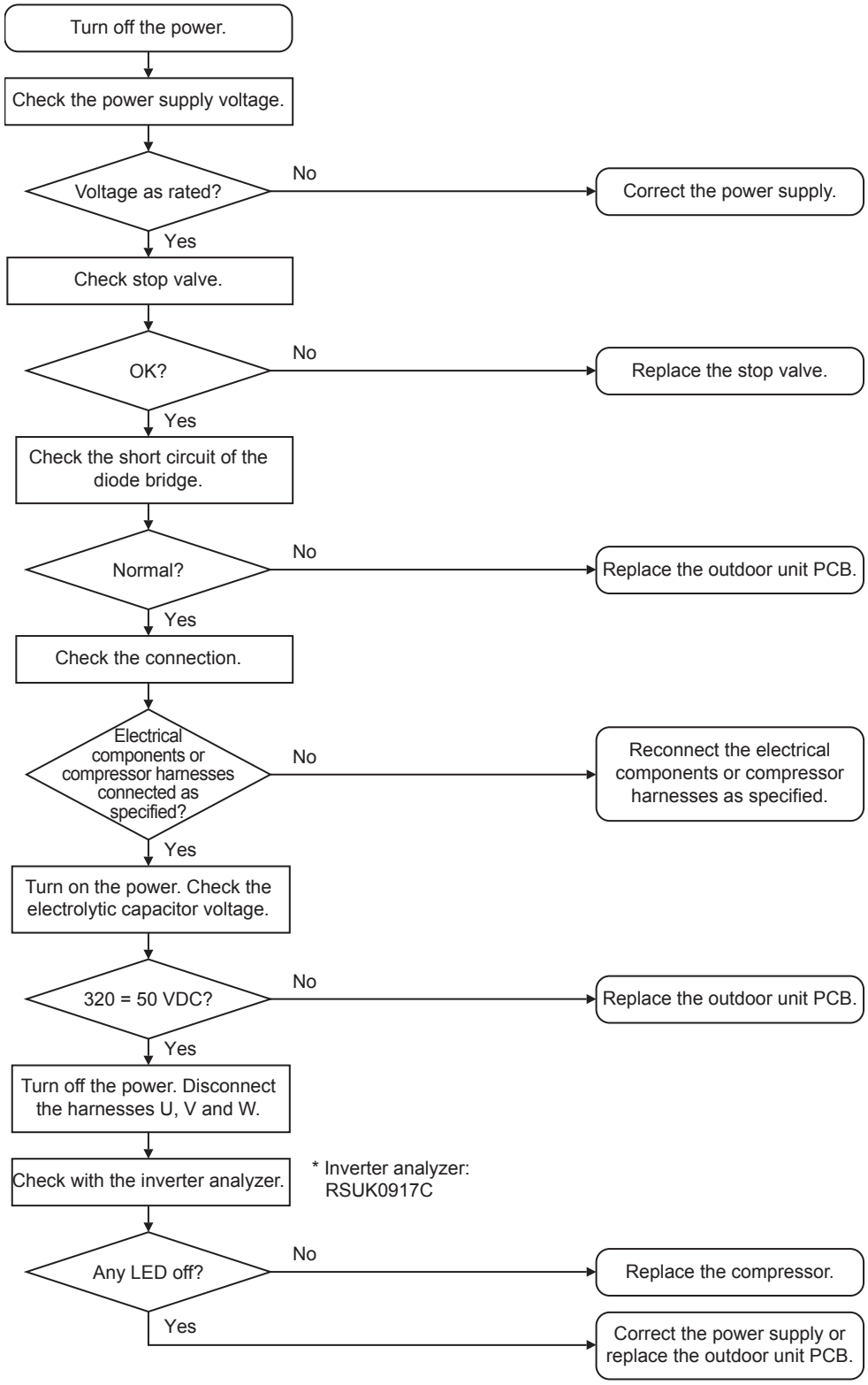
F3	
Description	DISCHARGE PIPE OVERHEAT
Possible Root cause	1. Refrigerant shortage. 2. Four way valve malfunctioning. 3. Discharge pipe thermistor defective. 4. Outdoor PCB defective. 5. Water mixed in the local piping. 6. EXV defective. 7. Stop Valve defective.
Troubleshooting	 ***Remark:*** *Refer to Appendix A for thermistor resistance checking procedures.(Page 67, item 6.1)* *Refer to Appendix A for Electronic Expansion Valve (EXV) checking procedures. (Page 69, item 6.2)* *Refer to Appendix A for Inverter unit refrigerant check procedures. (Page 70, item 6.4)*

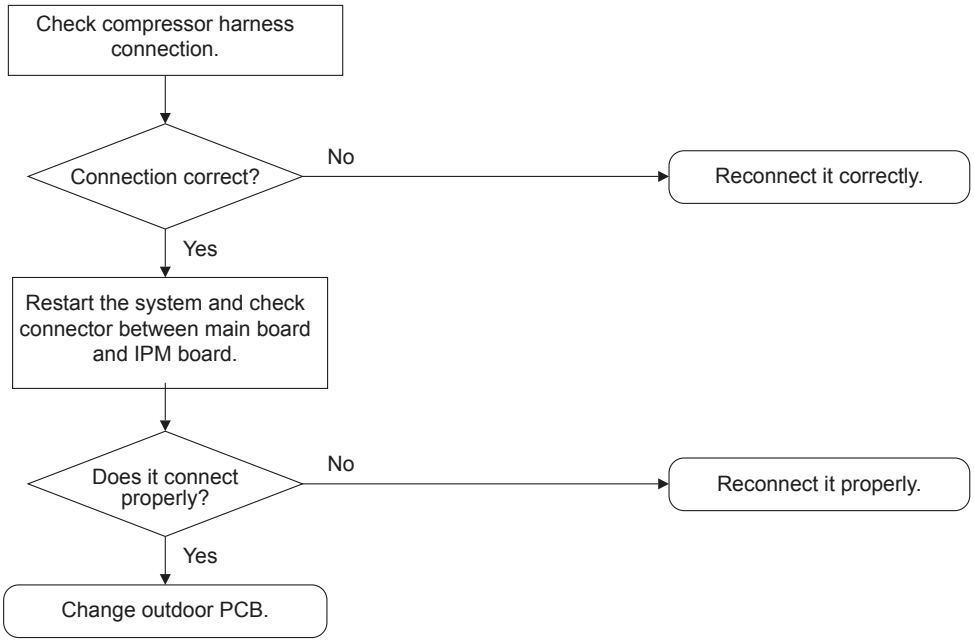
F6	
Description	HEAT EXCHANGER OVERHEAT
Possible Root cause	1. The installation space is not large enough. 2. Faulty outdoor fan motor. 3. Faulty EXV. 4. Faulty outdoor heat exchanger thermistor. 5. Faulty stop valve. 6. Dirty heat exchanger. 7. Unit overcharge. 8. Defective outdoor unit PCB.
Troubleshooting	 ***Remark:*** *Refer to Appendix A for thermistor resistance checking procedures.(Page 67, item 6.1)* *Refer to Appendix A for Electronic Expansion Valve (EXV) checking procedures. (Page 69, item 6.2)* *Refer to Appendix A for Inverter unit refrigerant check procedures. (Page 70, item 6.4)* *Refer to Appendix A for Installation condition check. (Page 71, item 6.6)*

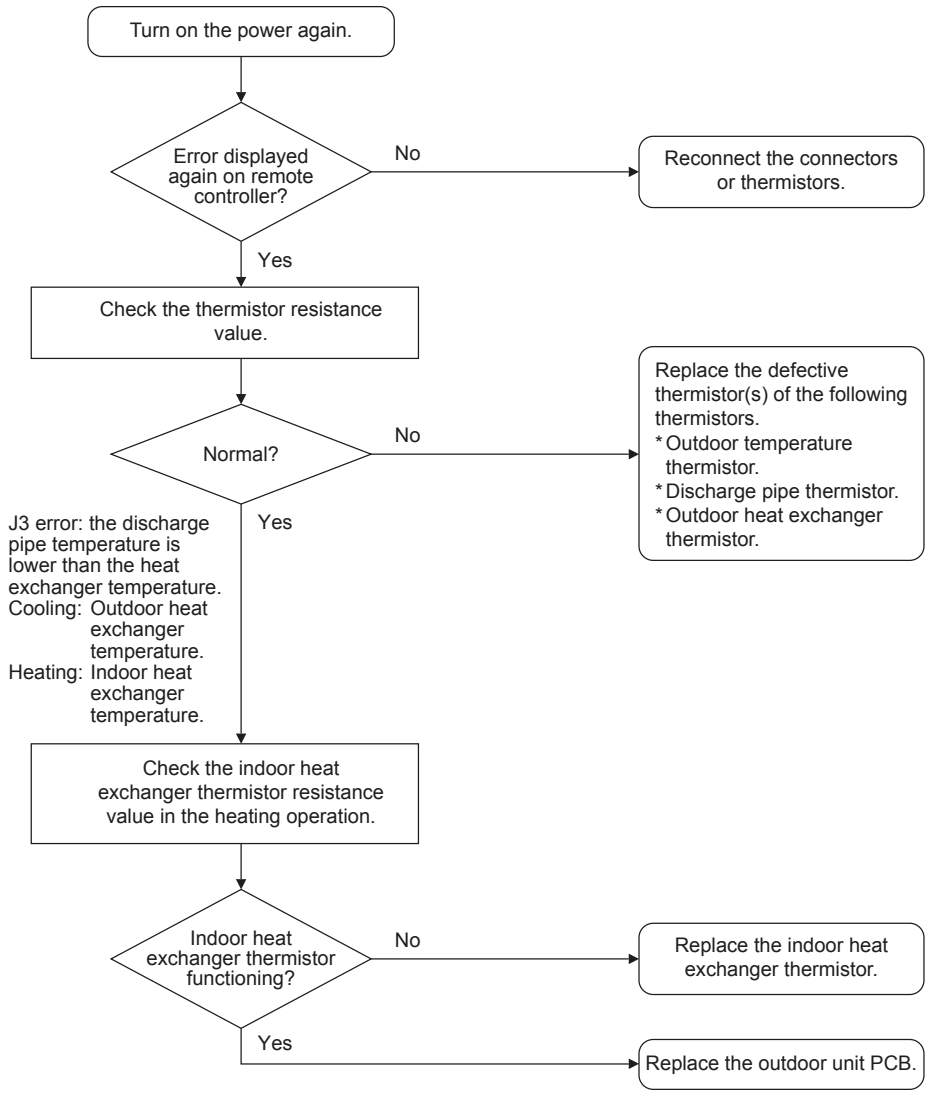
H0 (Class 18/24)	
Description	COMPRESSOR SENSOR SYSTEM ABNORMAL
Possible Root cause	1. Broken and disconnected harness. 2. Outdoor unit PCB defective. 3. Defective compressor.
Troubleshooting	

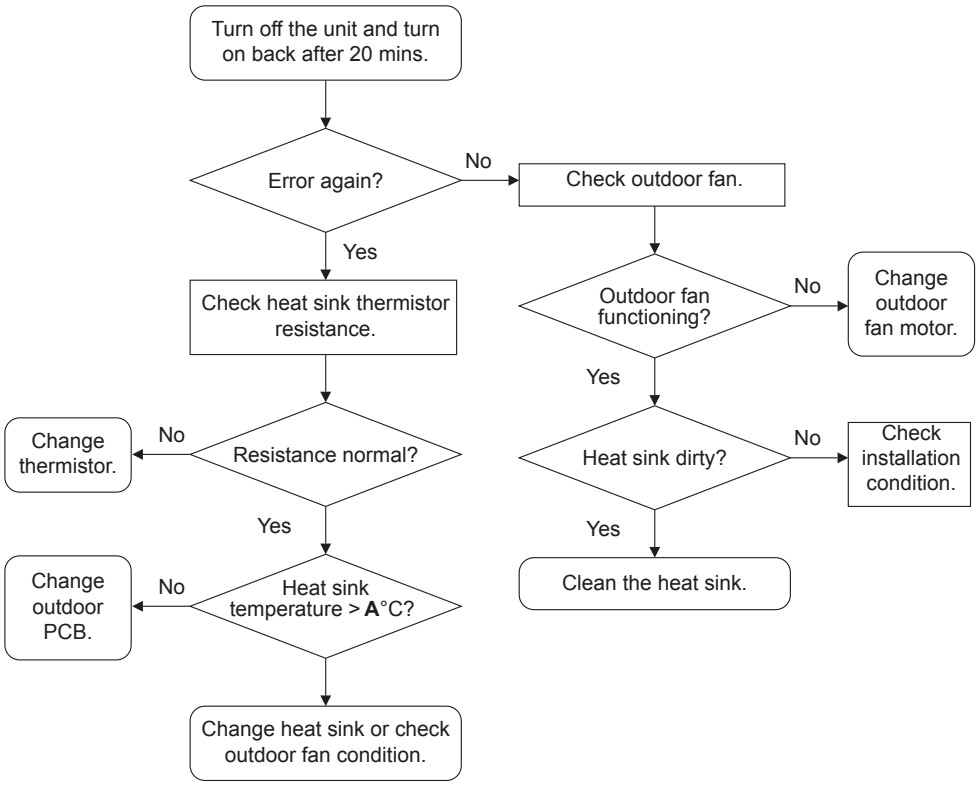
H0 (Class 09/12)	
Description	COMPRESSOR SENSOR SYSTEM ABNORMAL
Possible Root cause	1. Broken and disconnected harness. 2. Outdoor unit PCB defective.
Troubleshooting	

H6 (Class 09/12)	
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 (Class 18/24)	
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 72, item 6.8)*

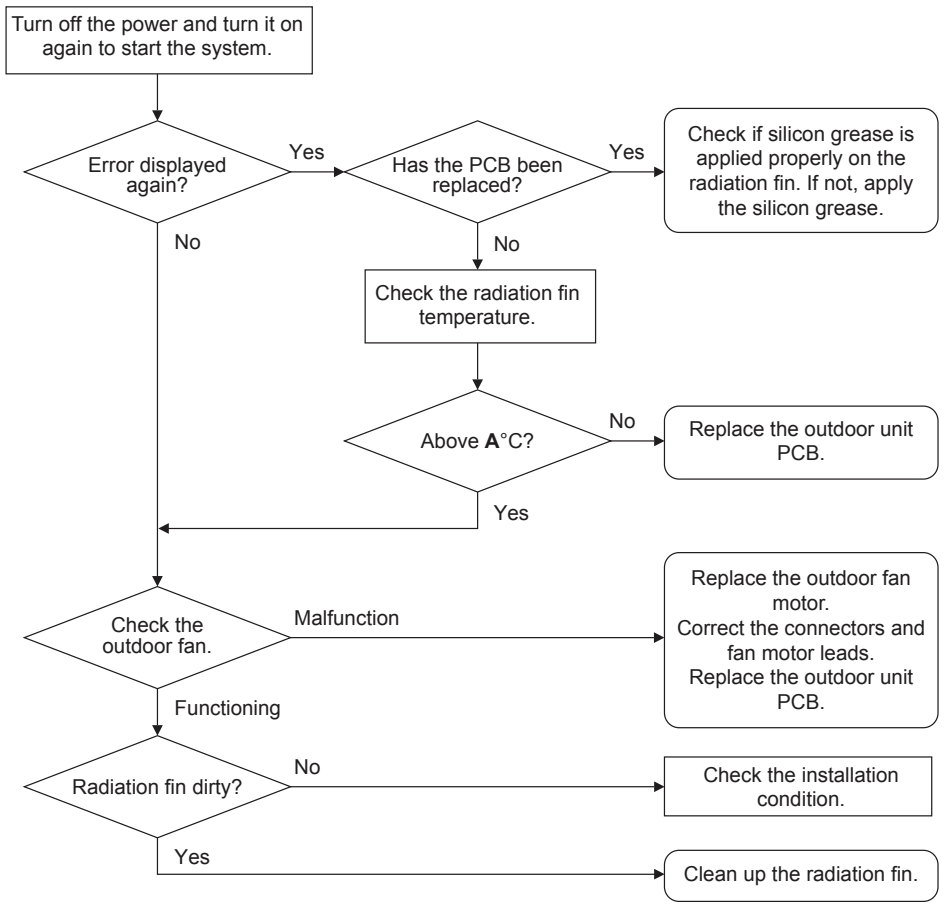
H8	
Description	AC CURRENT SENSOR ABNORMALITY
Possible Root cause	1. Internal wiring broken. 2. Outdoor unit PCB defective.
Troubleshooting	 ***Remark:*** *This error is only applicable for model Class 18/24.*

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 67, 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	

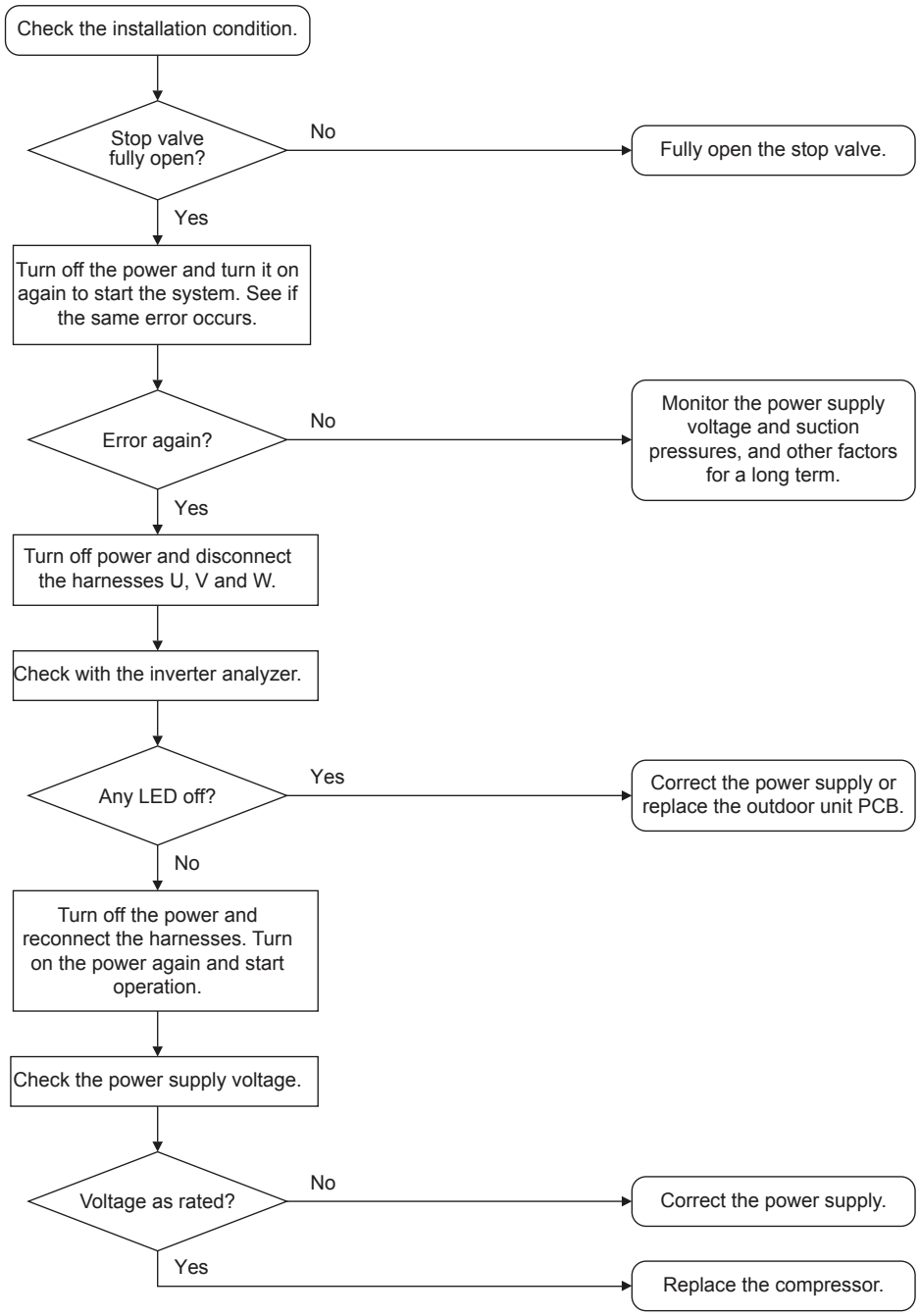
Models	A °C (°F)
Class 09/12	78 (172.4)
class 18/24	122 (251.6)

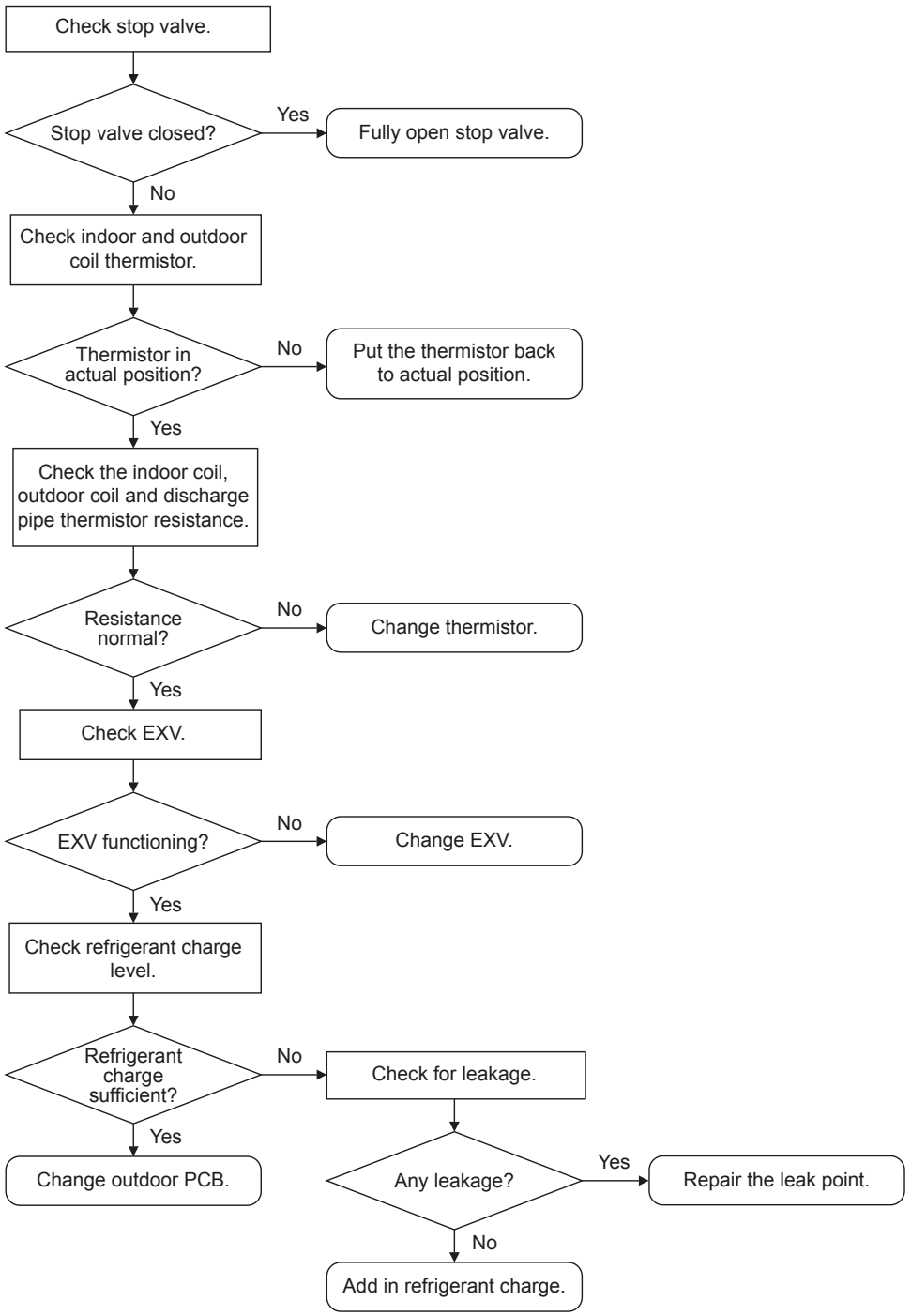
Remark:
Refer to Appendix A for thermistor resistance check procedures.(Page 67, item 6.1)
Refer to Appendix A for outdoor fan system check. (Page 72, item 6.7)
Refer to Appendix A for installation condition check. (Page 71, item 6.6)

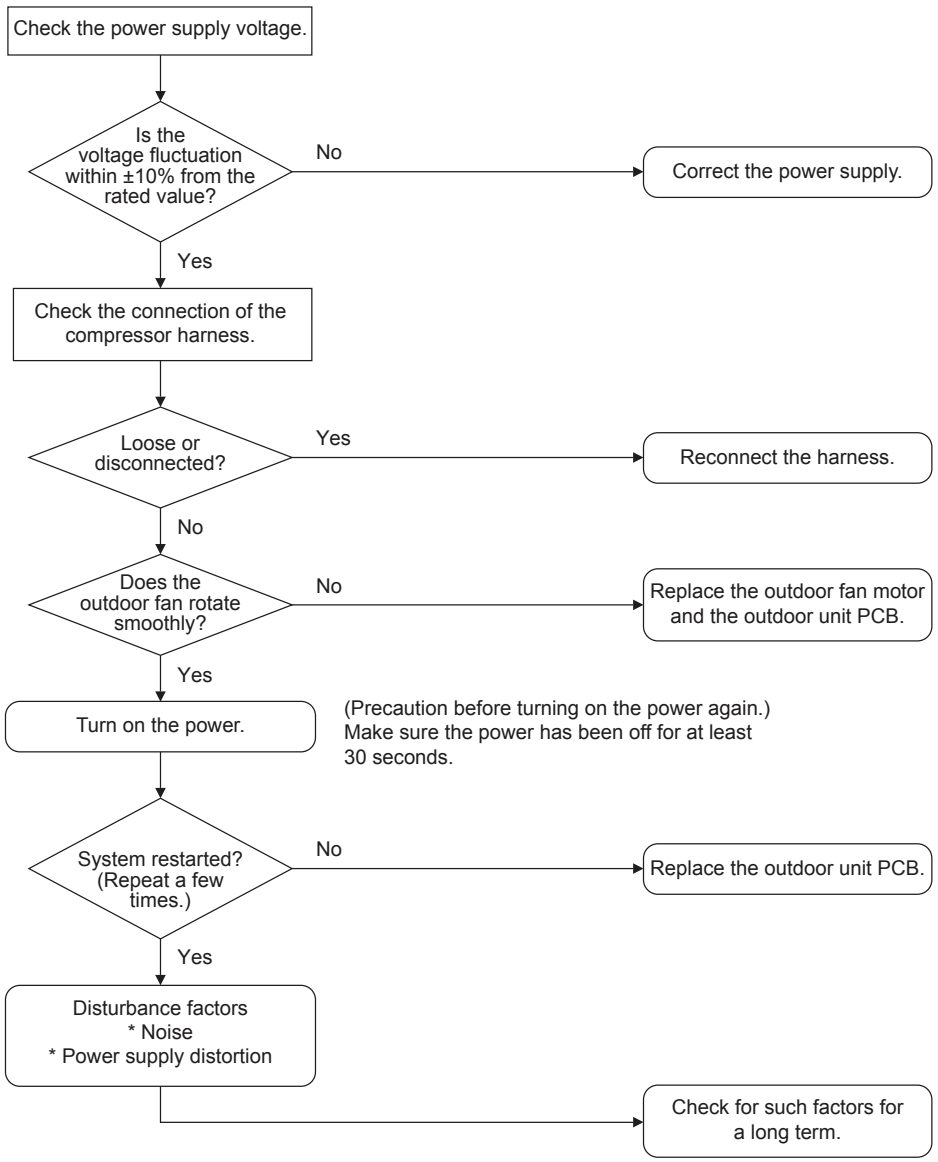
L4	
Description	Heat sink overheat
Possible Root cause	1. Fin temperature rise due to short circuit. 2. Fin temperature rise due to defective outdoor unit fan. 3. Fin thermistor defective. 4. Connector in poor contact. 5. Outdoor unit PCB defective. 6. Silicon grease is not applied properly on the radiation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

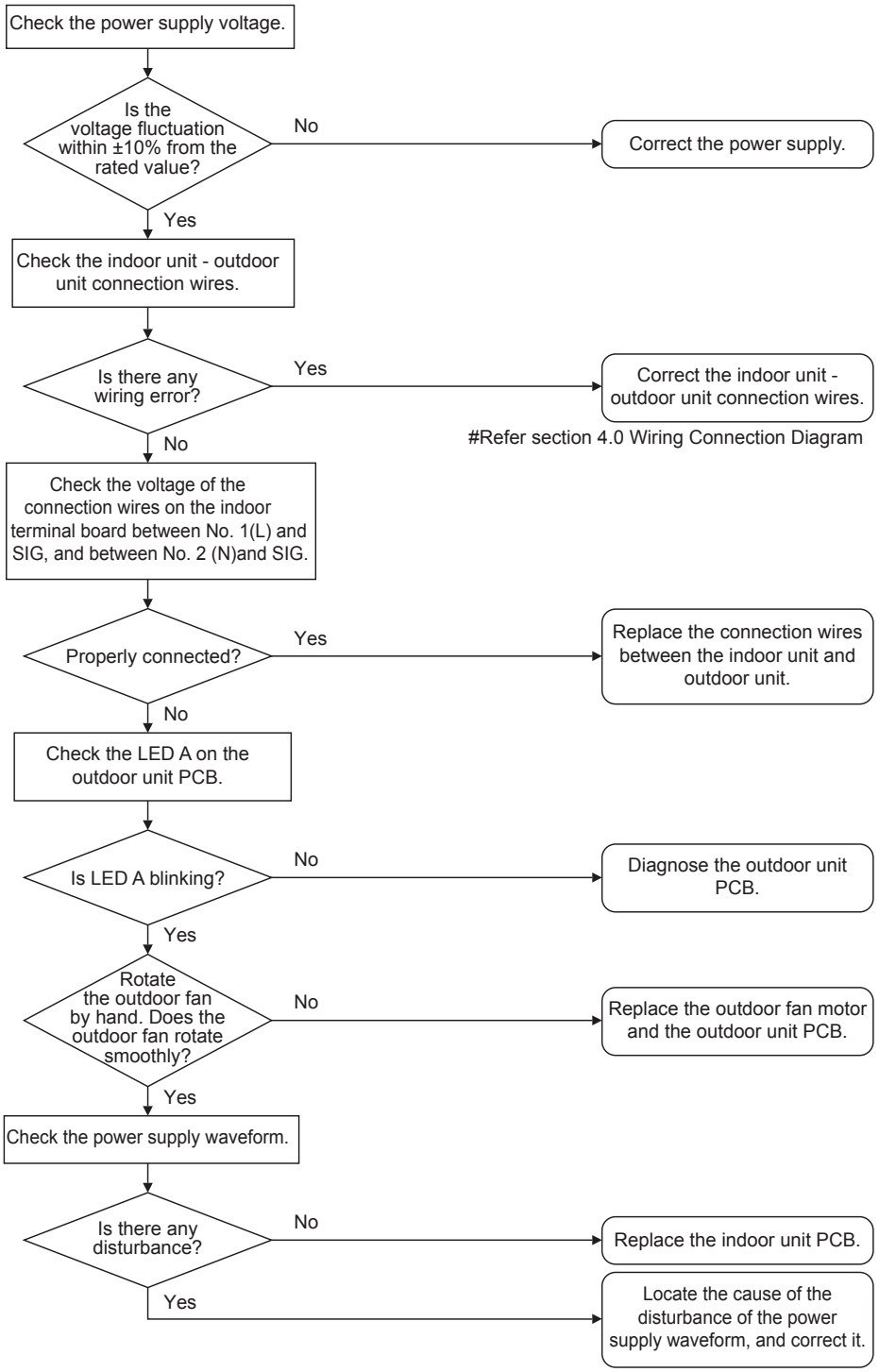
Models	A °C (°F)
Class 09/12	93 (199.4)
class 18/24	85 (185)

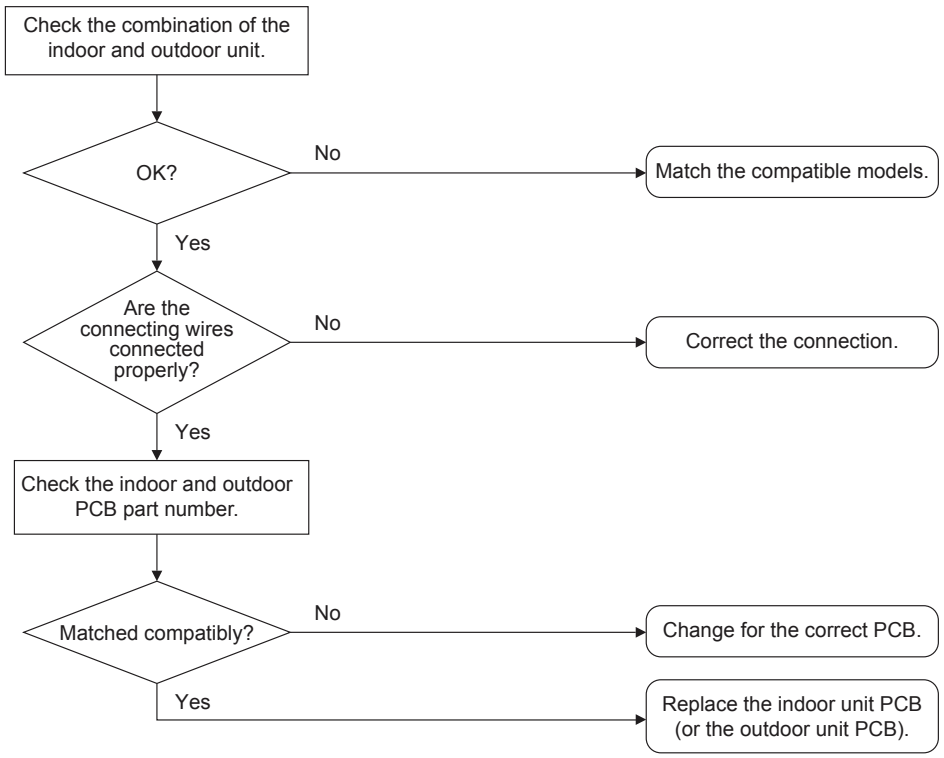
Remark:
Refer to Appendix A for outdoor fan system check.(Page 72, item 6.7)
Refer to Appendix A for installation condition check. (Page 71, item 6.6)

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 71, 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 67, item 6.1)* *Refer to Appendix A for electronic expansion device checking procedures.(Page 69, item 6.2)*

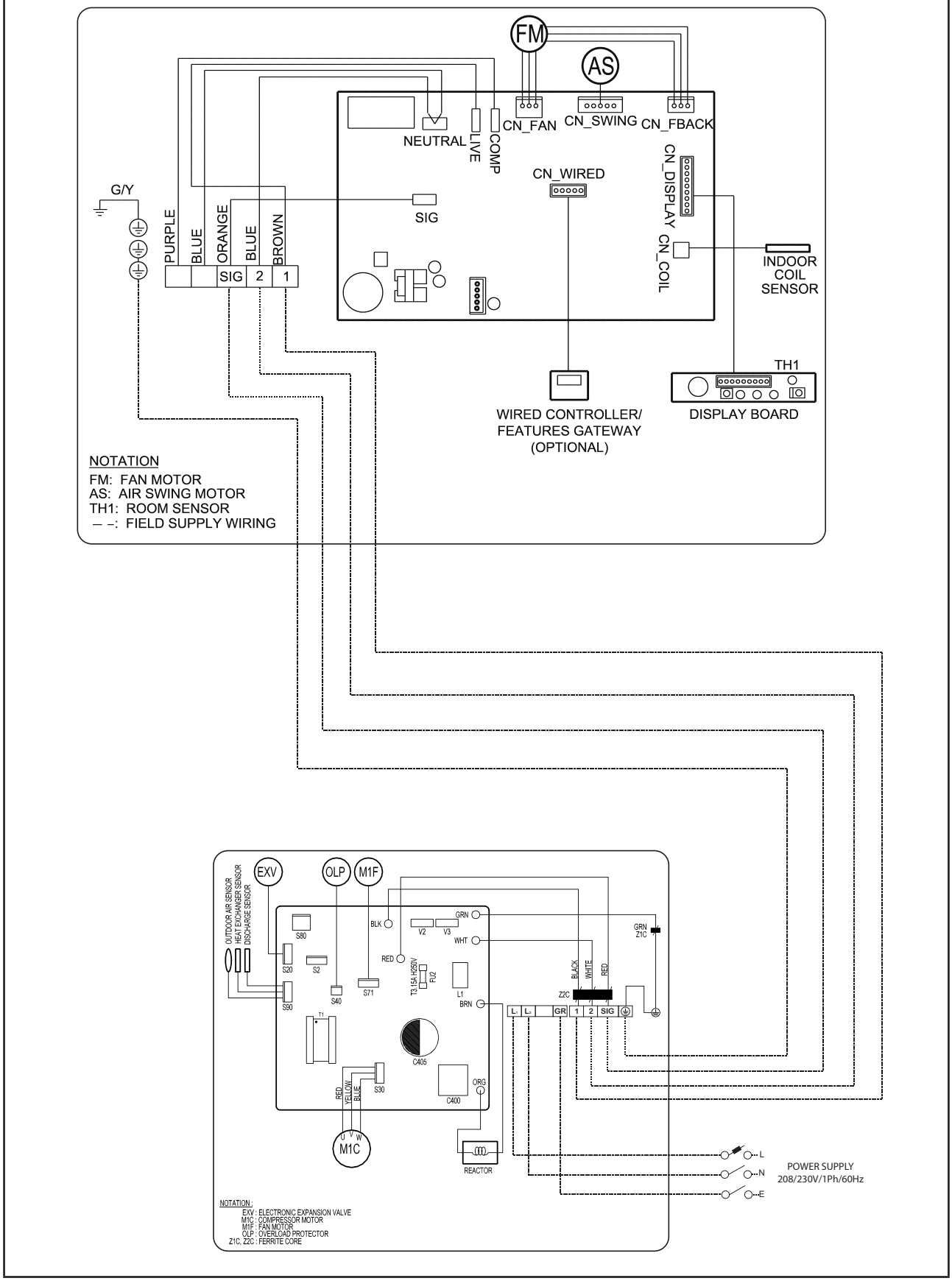
U2	
Description	DC VOLTAGE OUT OF RANGE
Possible Root cause	1. Power supply voltage is not as specified. 2. Defective DC voltage detection circuit. 3. Defective over-voltage detection circuit. 4. Defective PAM control part. 5. Disconnection of compressor harness 6. Short circuit inside the fan motor 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 73, item 6.9)*

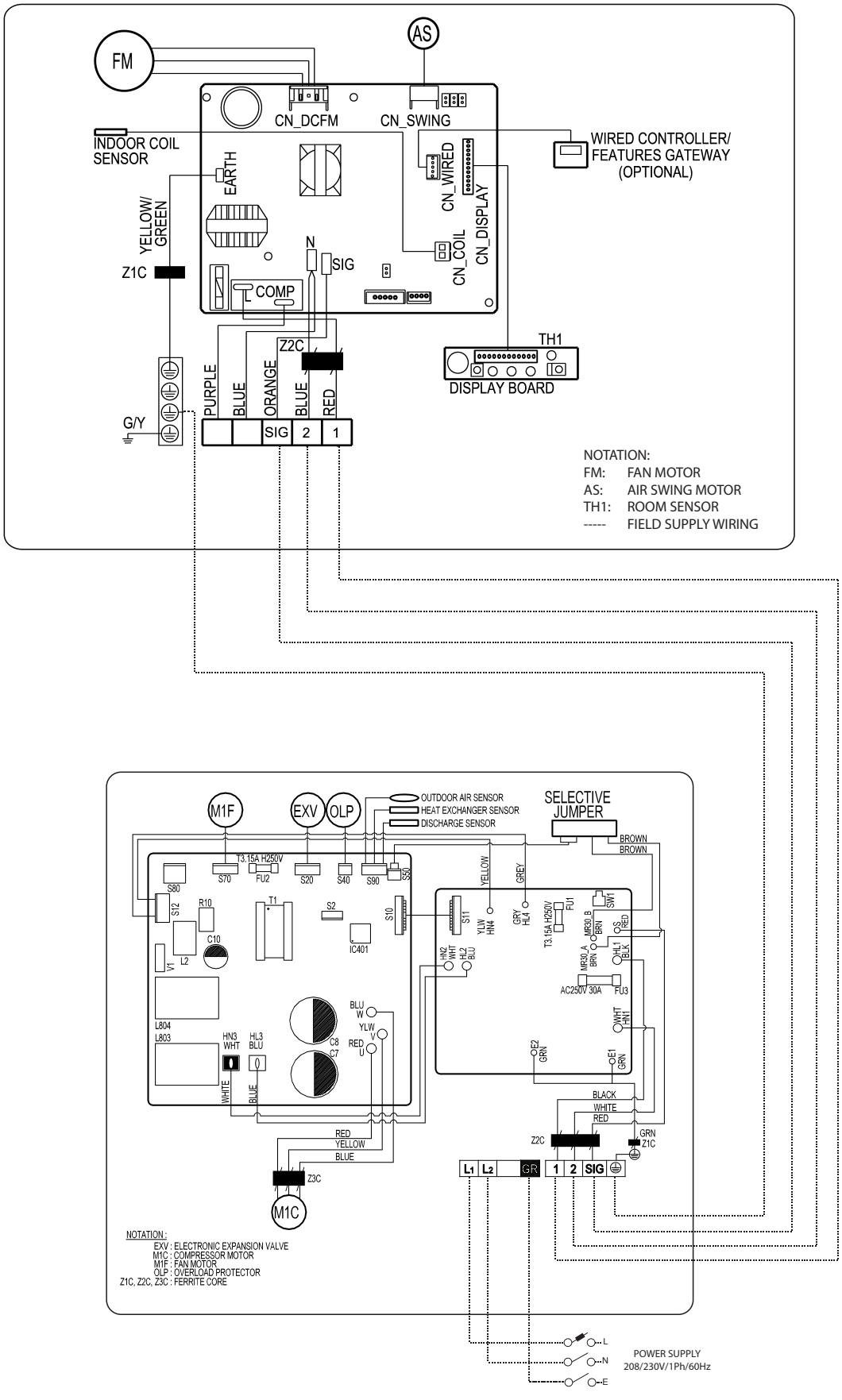
UA	
Description	INSTALLATION ABNORMALITY
Possible Root cause	1. Wrong models interconnected. 2. Wrong indoor unit PCB mounted. 3. Indoor unit PCB defective. 4. Wrong outdoor unit PCB mounted or defective.
Troubleshooting	

4.0 Wiring Connection

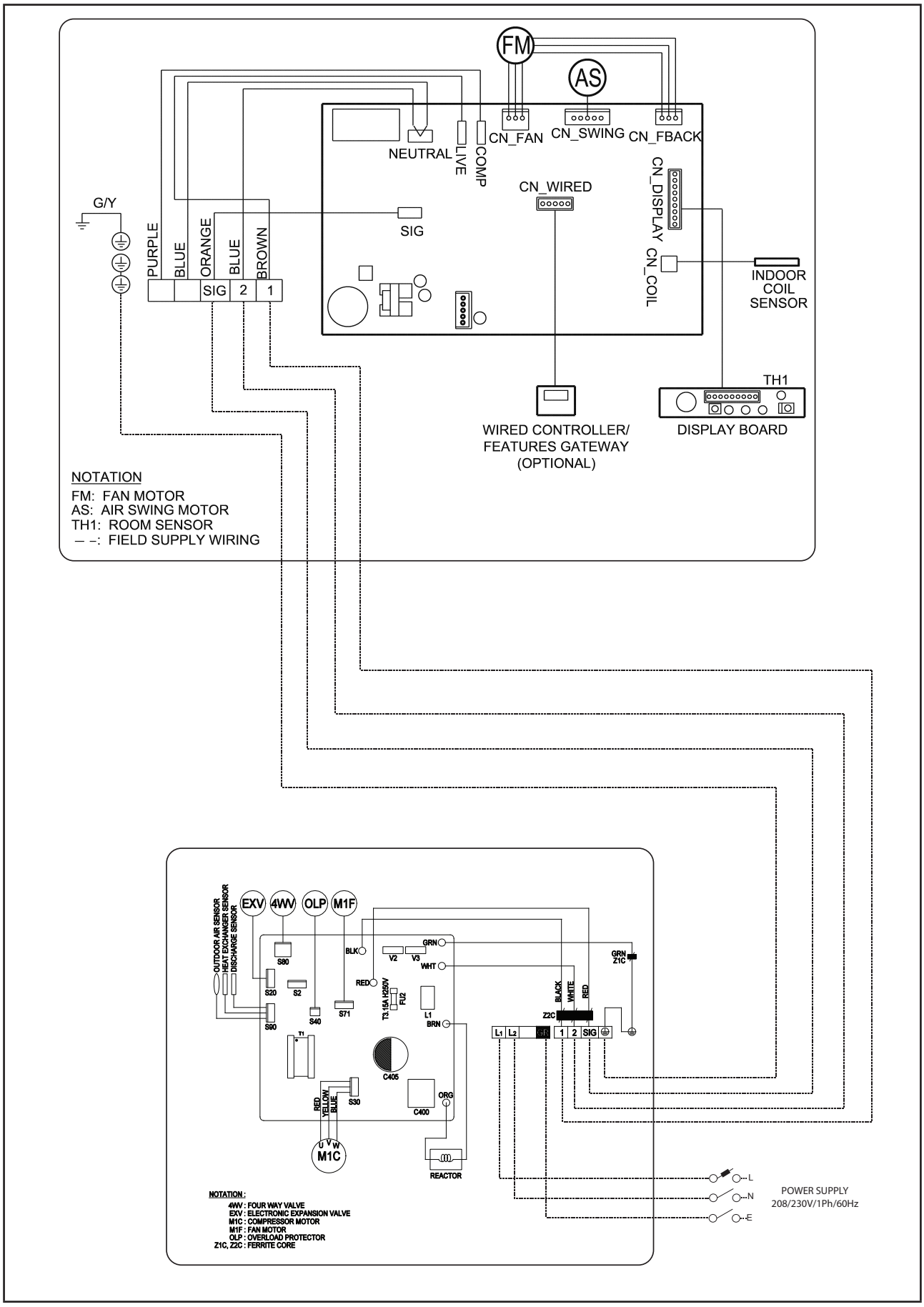
Model: FTKB09/12AX-RKB09/12AX ; FTKN09/12AX-RKN09/12AX



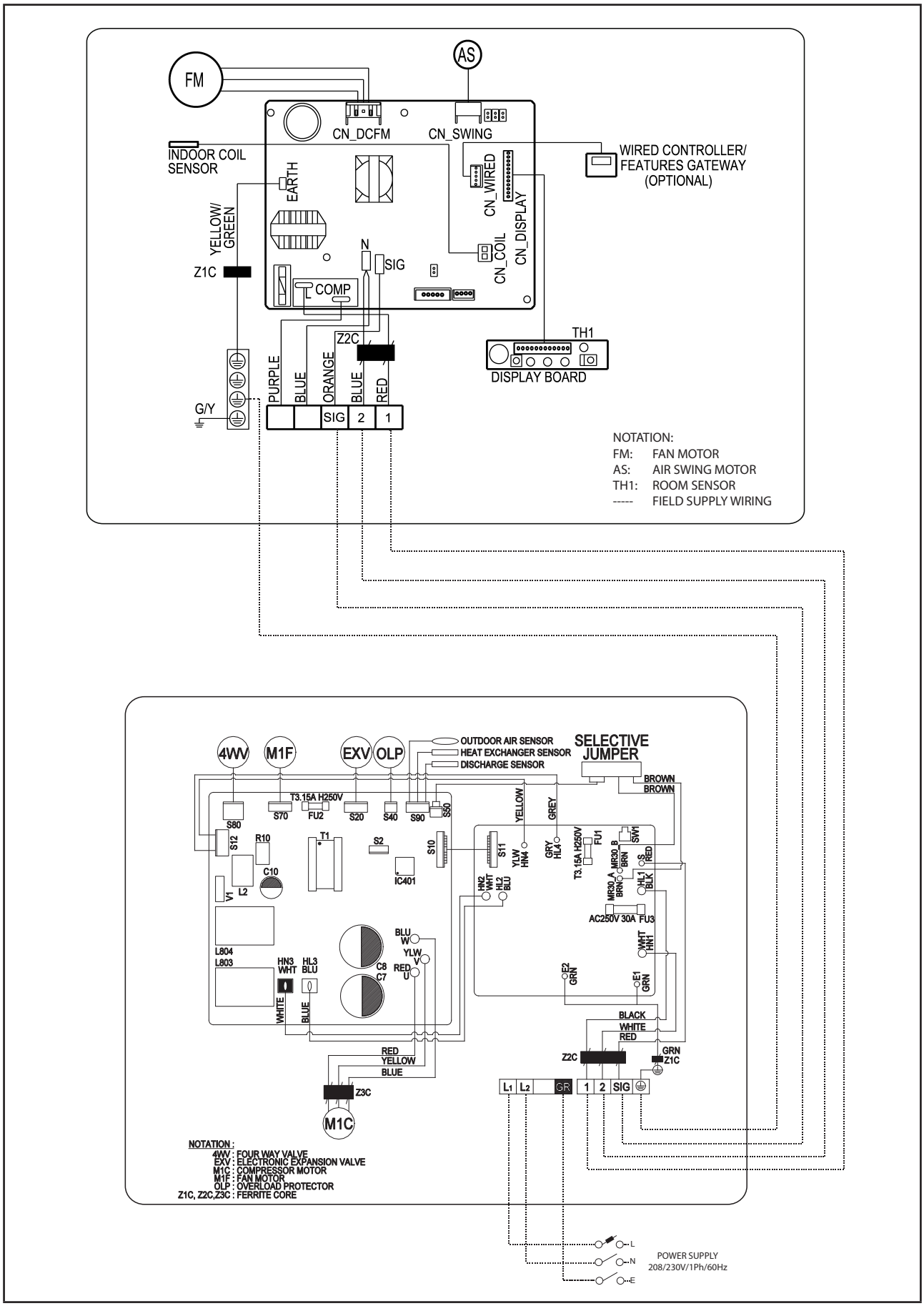
Model: FTKB18/24AX-RKB18/24AX ; FTKN18/24AX-RKN18/24AX



Model: FTXB09/12AX-RXB09/12AX ; FTXN09/12AX-RXN09/12AX

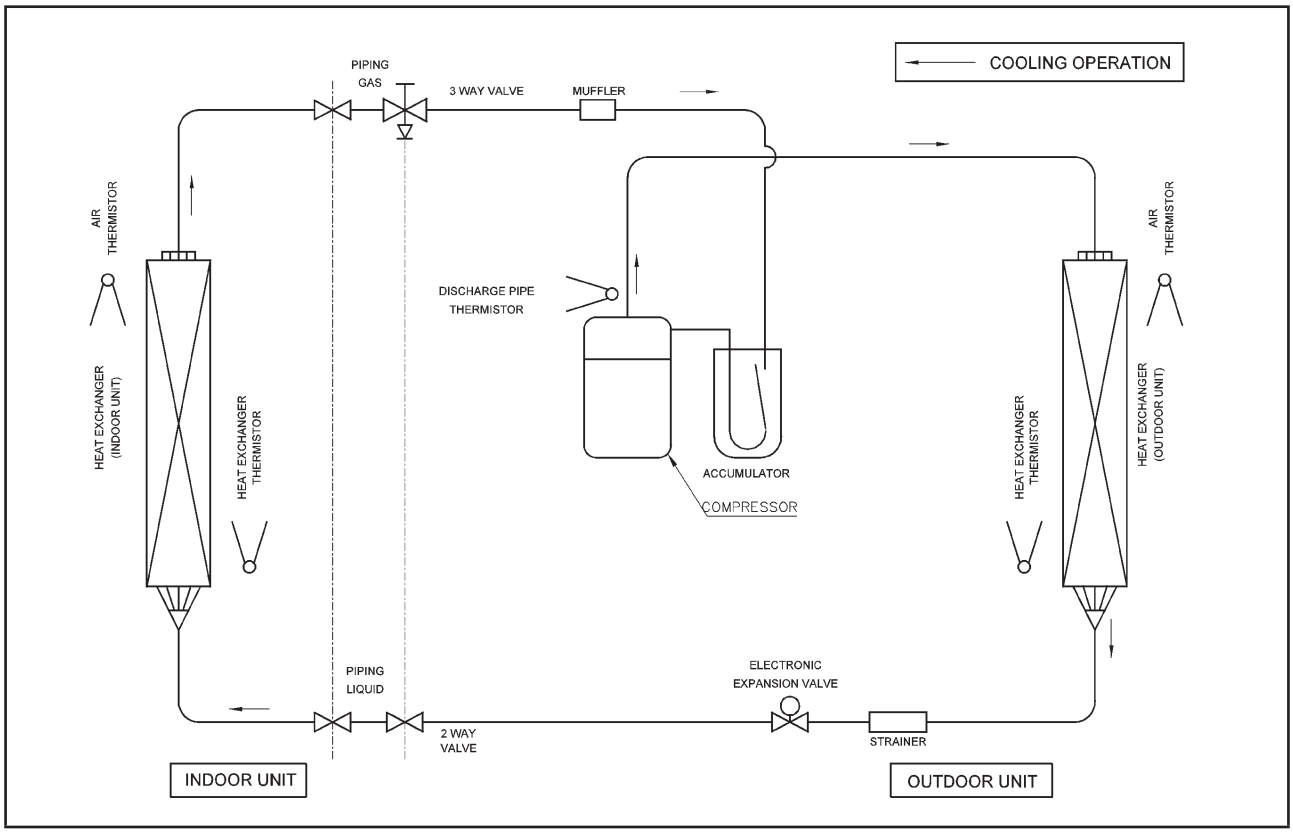


Model: FTXB18/24AX-RXB18/24AX ; FTXN18/24AX-RXN18/24AX

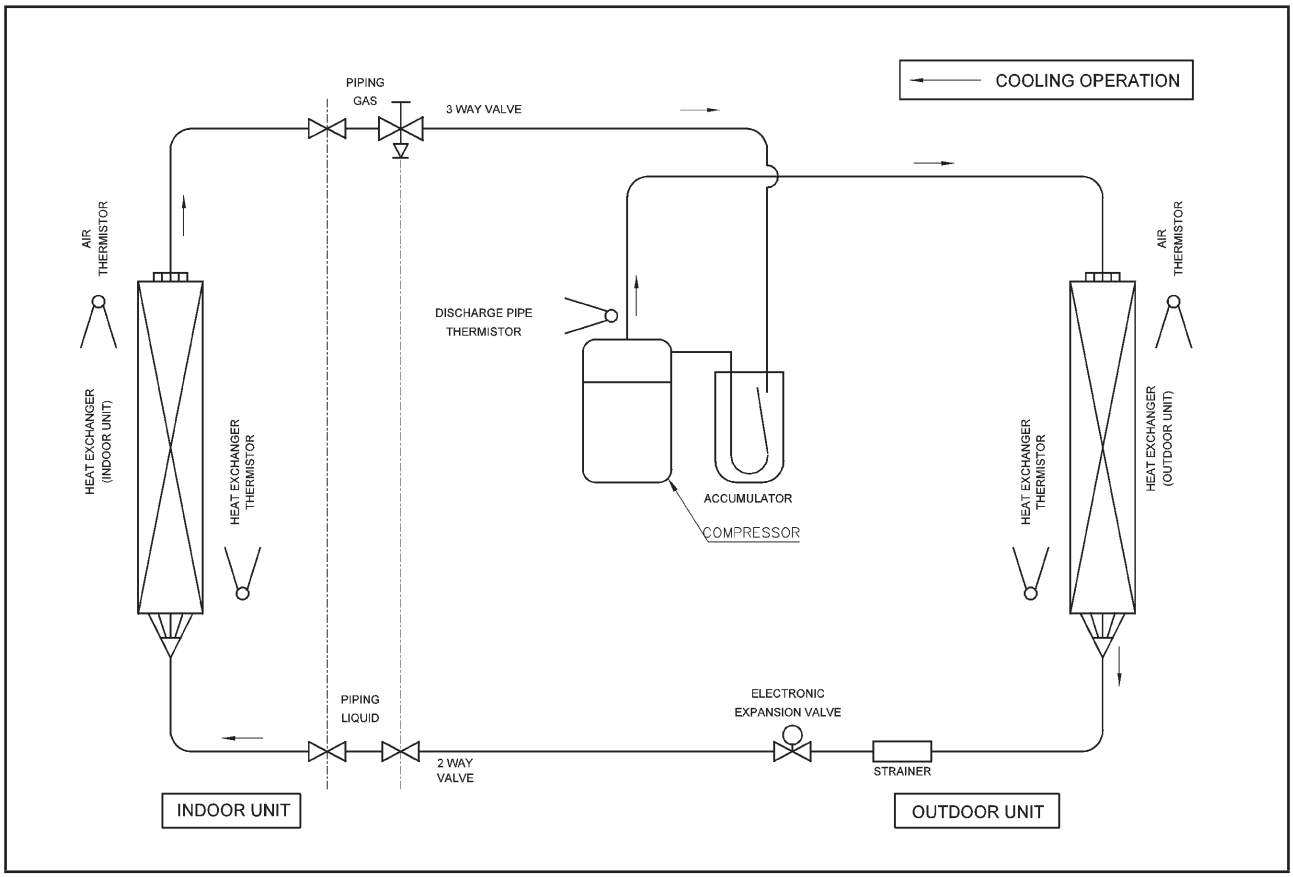


5.0 Refrigerant Diagram

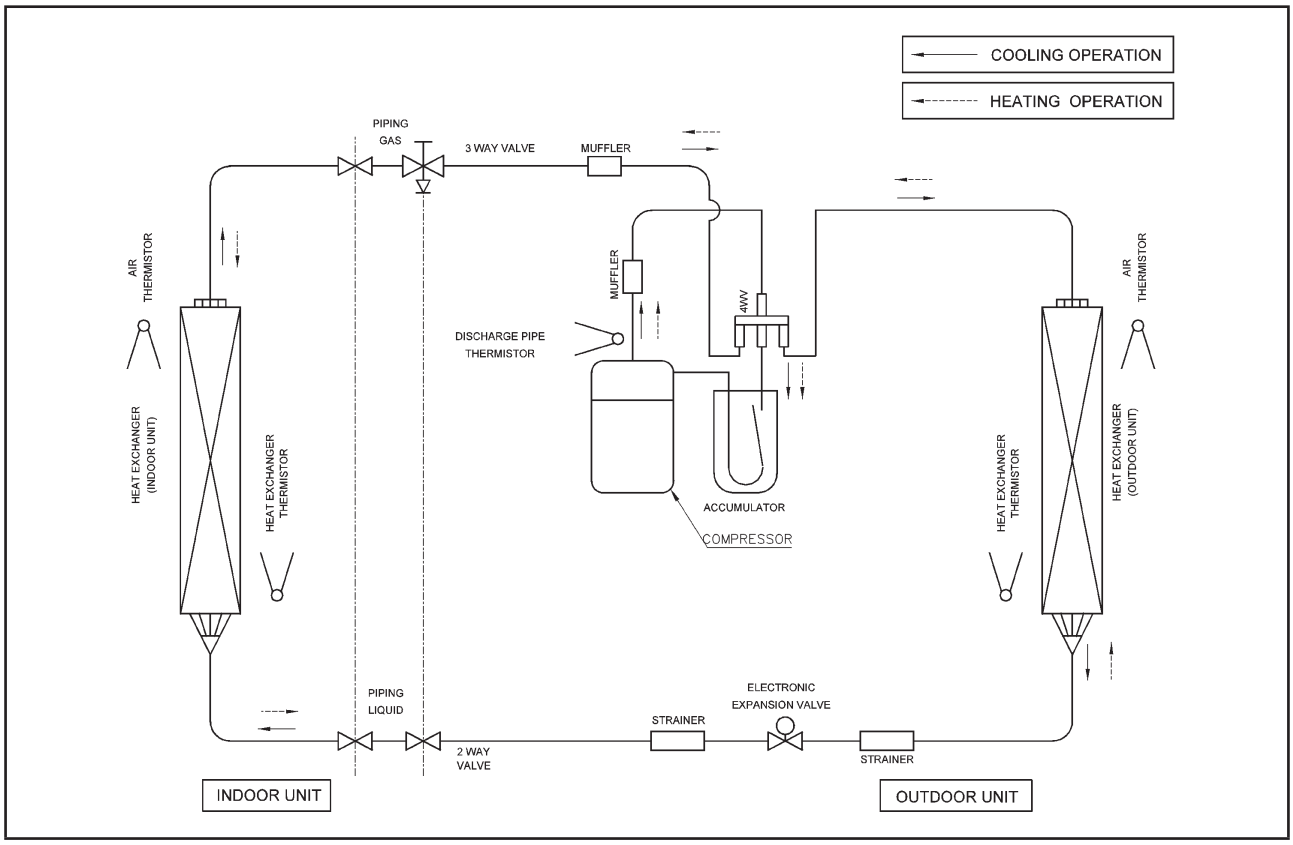
Model: FTKB09/12AX - RKB09/12AX , FTKN09/12AX - RKN09/12AX



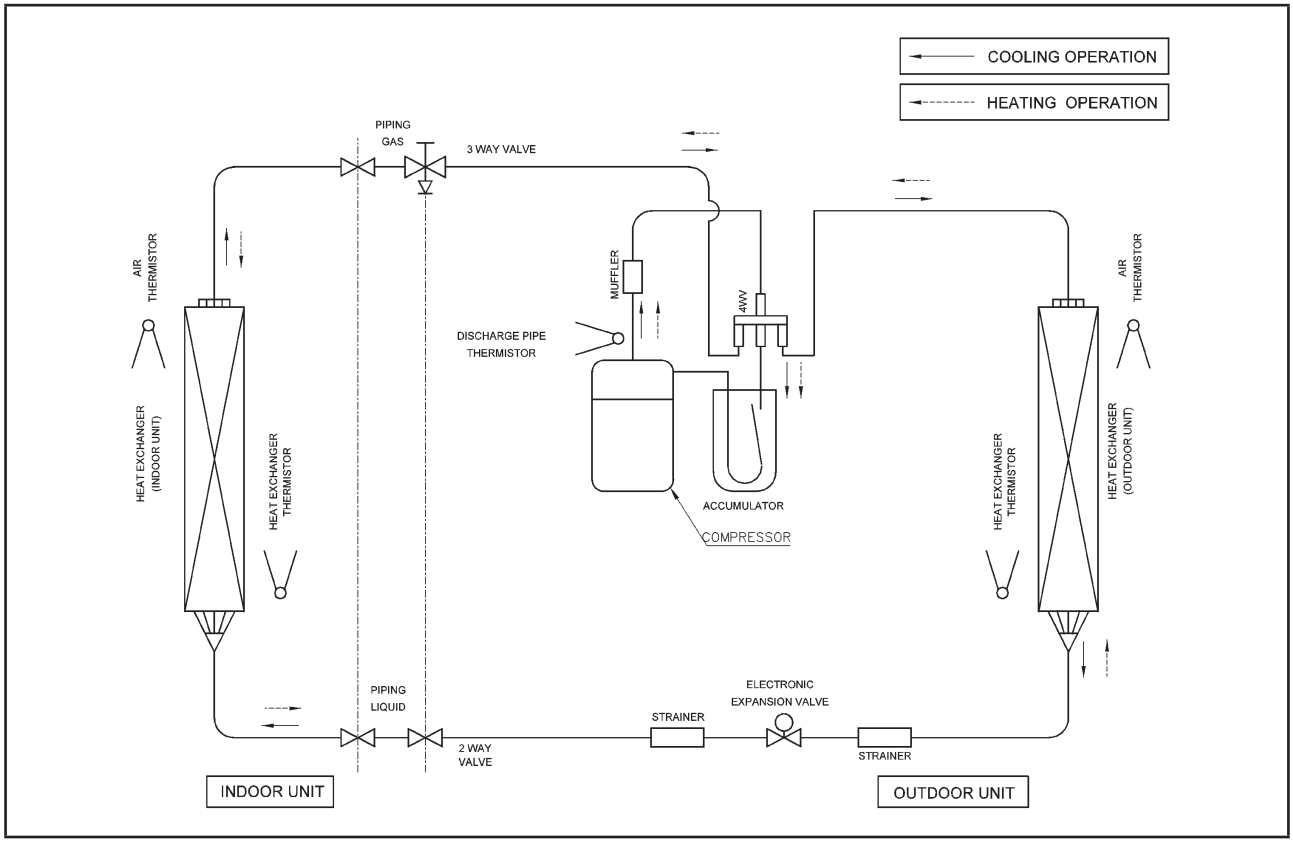
Model: FTKB18/24AX - RKB18/24AX , FTKN18/24AX - RKN18/24AX



Model: FTXB09/12AX - RXB09/12AX , FTXN09/12AX - RXN09/12AX



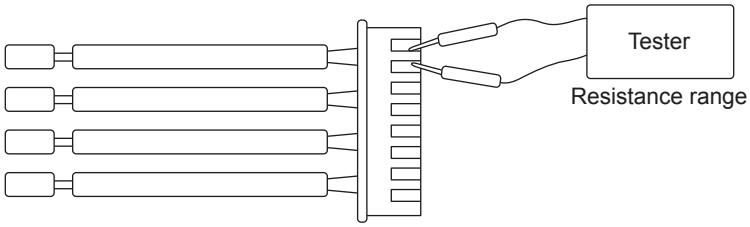
Model: FTXB18/24AX - RXB18/24AX , FTXN18/24AX - RXN18/24AX



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.

		Class 09/12/18/24
Indoor	Wall Mounted	10 kΩ (Table 2)
Outdoor	Outdoor Split	10 kΩ (Table 2)

Table 1: Resistance R25 = 20 kΩ

Temperature (°C)	Temperature (°F)	Resistance value (kΩ)
-20	-4	211.0
-15	5	150.0
-10	14	116.5
-5	23	88.0
0	32	67.2
5	41	51.9
10	50	40.0
15	59	31.8
20	68	25.0
25	77	20.0
30	86	16.0
34	95	13.0
40	104	10.6
45	113	8.7
50	122	7.2

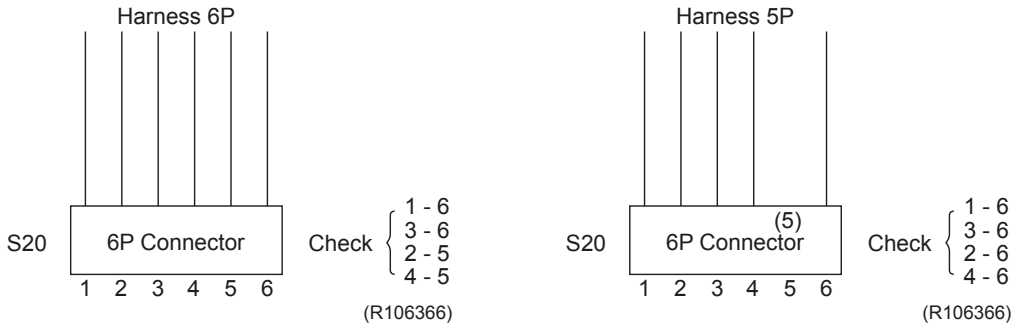
Table 2: Resistance R25 = 10 kΩ

t°C	t°F	Rmin (kΩ)	Rnom (kΩ)	Rmax (kΩ)	t°C	t°F	Rmin (kΩ)	Rnom (kΩ)	Rmax (kΩ)
-10	14.0	44.20	45.30	46.50					
-9	15.8	42.10	43.20	44.30	41	105.8	5.47	5.56	5.64
-8	17.6	40.20	41.20	42.20	42	107.6	5.28	5.37	5.45
-7	19.4	38.30	39.20	40.20	43	109.4	5.10	5.18	5.27
-6	21.2	36.60	37.40	38.30	44	111.2	4.92	5.01	5.09
-5	23.0	34.90	35.70	36.50	45	113.0	4.75	4.84	4.92
-4	24.8	33.30	34.10	34.90	46	114.8	4.59	4.67	4.76
-3	26.6	31.80	32.60	33.30	47	116.6	4.44	4.52	4.60
-2	28.4	30.40	31.10	31.80	48	118.4	4.29	4.37	4.42
-1	30.2	29.00	29.70	30.30	49	120.2	4.15	4.22	4.30
0	32.0	27.80	28.40	29.00	50	122.0	4.01	4.09	4.16
1	33.8	26.60	27.10	27.70	51	123.8	3.88	3.95	4.03
2	35.6	25.40	25.90	26.50	52	125.6	3.75	3.82	3.90
3	37.4	24.30	24.80	25.30	53	127.4	3.63	3.70	3.77
4	39.2	23.30	23.70	24.20	54	129.2	3.51	3.58	3.65
5	41.0	22.30	22.70	23.10	55	131.0	3.40	3.47	3.54
6	42.8	21.40	21.80	22.10	56	132.8	3.29	3.36	3.43
7	44.6	20.50	20.80	21.20	57	134.6	3.18	3.25	3.32
8	46.4	19.60	20.00	20.30	58	136.4	3.08	3.15	3.22
9	48.2	18.80	19.10	19.40	59	138.2	2.98	3.05	3.12
10	50.0	18.00	18.30	18.60	60	140.0	2.89	2.96	3.01
11	51.8	17.30	17.60	17.80	61	141.8	2.80	2.86	2.93
12	53.6	16.60	16.90	17.10	62	143.6	2.71	2.78	2.84
13	55.4	15.90	16.20	16.40	63	145.4	2.63	2.69	2.75
14	57.2	15.30	15.50	15.70	64	147.2	2.55	2.61	2.67
15	59.0	14.70	14.90	15.10	65	149.0	2.47	2.53	2.59
16	60.8	14.10	14.30	14.50	66	150.8	2.40	2.45	2.51
17	62.6	13.50	13.70	13.90	67	152.6	2.32	2.38	2.44
18	64.4	13.00	13.20	13.30	68	154.4	2.25	2.31	2.37
19	66.2	12.50	12.70	12.80	69	156.2	2.19	2.24	2.30
20	68.0	12.00	12.20	12.30	70	158.0	2.12	2.17	2.23
21	69.8	11.60	11.70	11.80	71	159.8	2.06	2.11	2.17
22	71.6	11.10	11.20	11.40	72	161.6	2.00	2.05	2.10
23	73.4	10.70	10.80	10.90	73	163.4	1.94	1.99	2.04
24	75.2	10.30	10.40	10.50	74	165.2	1.88	1.93	1.98
25	77.0	9.90	10.00	10.10	75	167.0	1.83	1.88	1.93
26	78.8	9.52	9.62	9.72	76	168.8	1.77	1.82	1.87
27	80.6	9.16	9.26	9.36	77	170.6	1.72	1.77	1.82
28	82.4	8.82	8.92	9.02	78	172.4	1.67	1.72	1.77
29	84.2	8.49	8.59	8.69	79	174.2	1.63	1.67	1.72
30	86.0	8.17	8.27	8.37	80	176.0	1.58	1.62	1.67
31	87.8	7.87	7.97	8.07	81	177.8	1.53	1.58	1.62
32	89.6	7.58	7.68	7.78	82	179.6	1.49	1.53	1.58
33	91.4	7.31	7.40	7.50	83	181.4	1.45	1.49	1.54
34	93.2	7.04	7.14	7.23	84	183.2	1.41	1.45	1.49
35	95.0	6.79	6.88	6.98	85	185.0	1.37	1.41	1.45
36	96.8	6.54	6.64	6.73	86	186.8	1.33	1.37	1.41
37	98.6	6.31	6.40	6.50	87	188.6	1.30	1.33	1.38
38	100.4	6.09	6.18	6.27	88	190.4	1.26	1.30	1.34
39	102.2	5.87	5.96	6.05	89	192.2	1.23	1.26	1.30
40	104.0	5.67	5.75	5.84	90	194.0	1.19	1.23	1.27

Remarks: At ambient temperature of 25°C (77°F), nominal resistance value is 10.00kΩ.

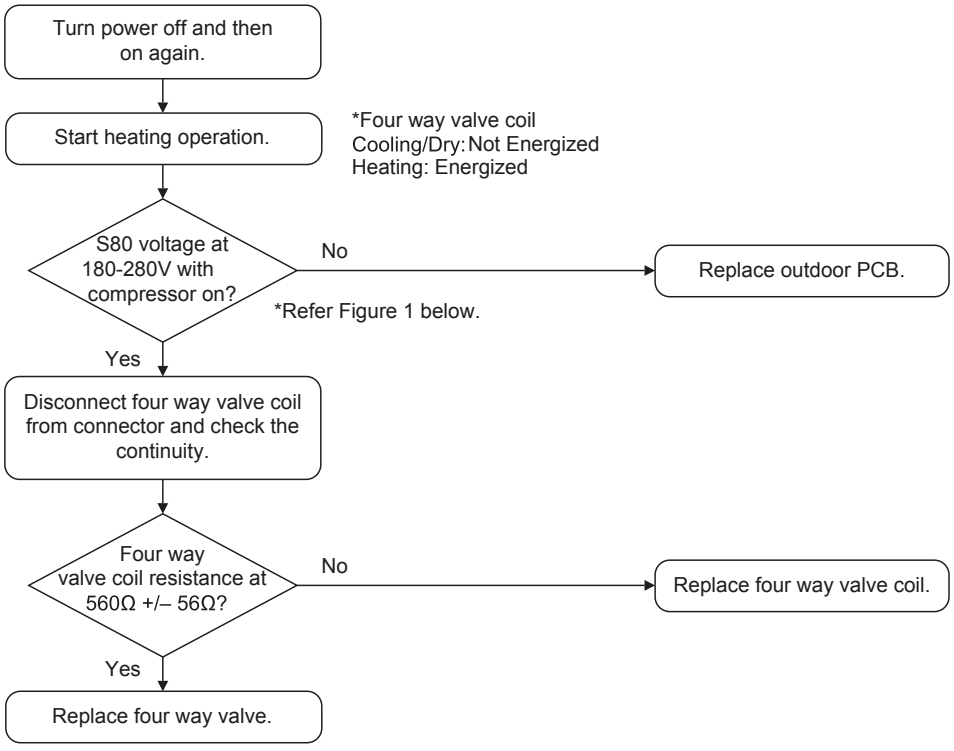
6.2 Electronic Expansion Valve (EXV) checking procedures

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.

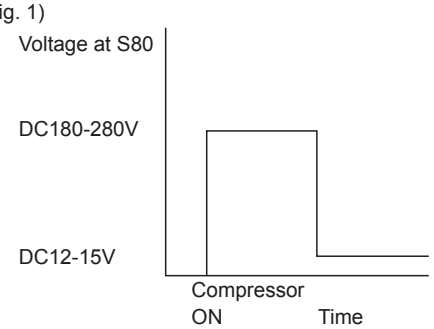


6.3 Four way valve performance checking procedures

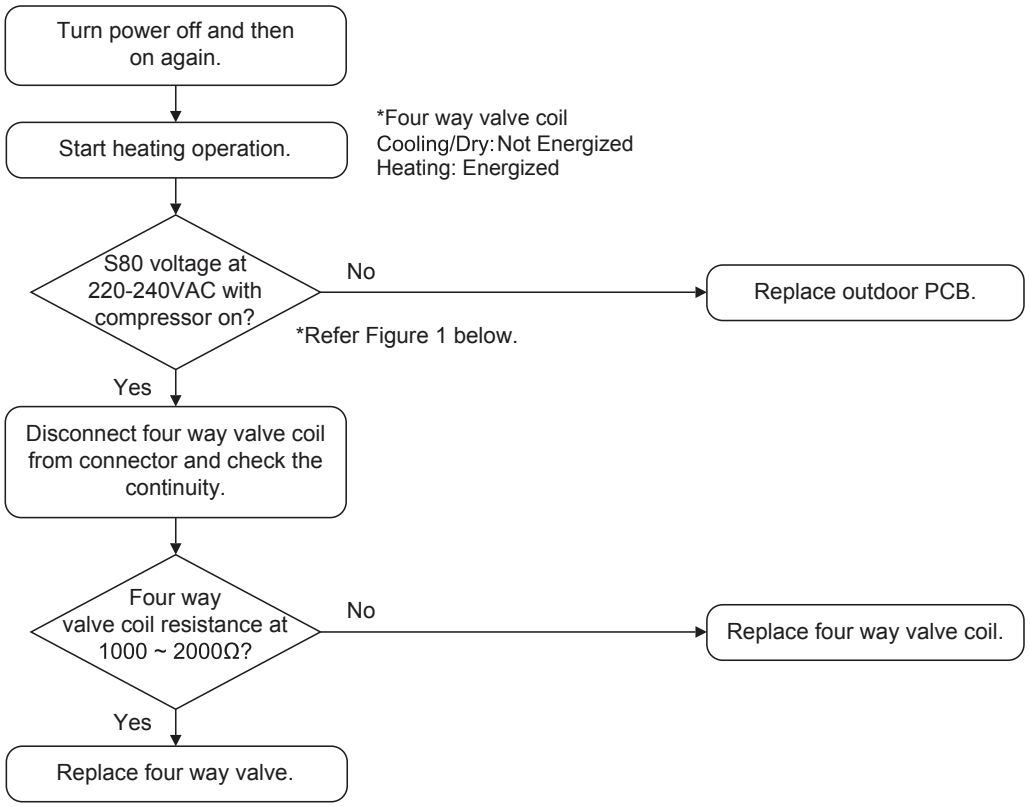
6.3.1 Class 09/12



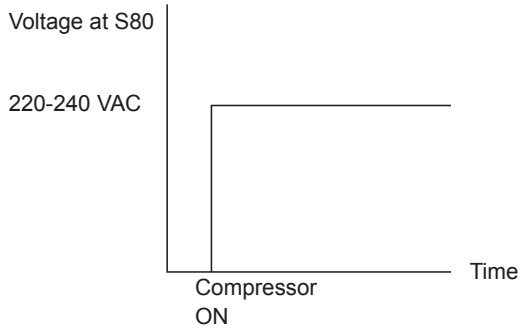
(Fig. 1)



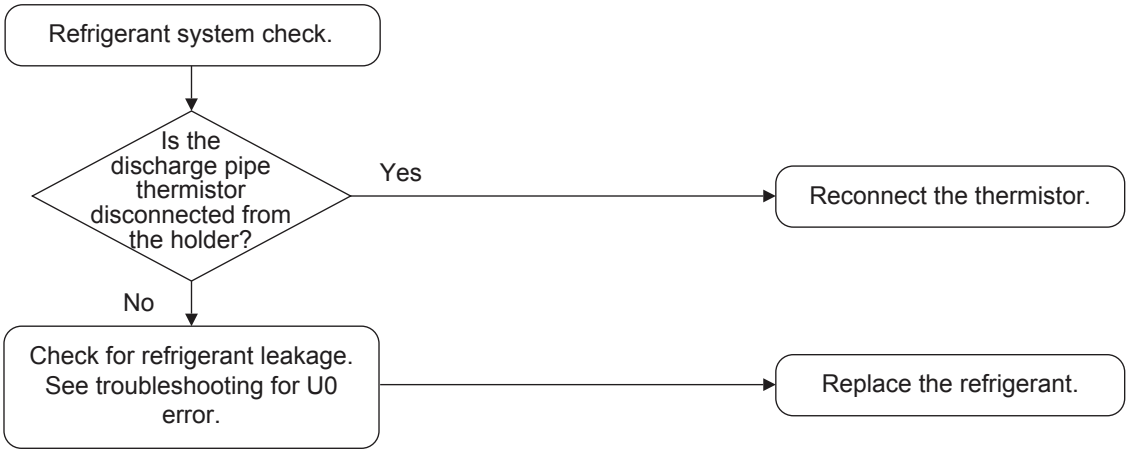
6.3.2 Class 18/24



(Fig. 1)



6.4 Inverter unit refrigerant check procedures



6.5 Rotation pulse check on outdoor unit PCB

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

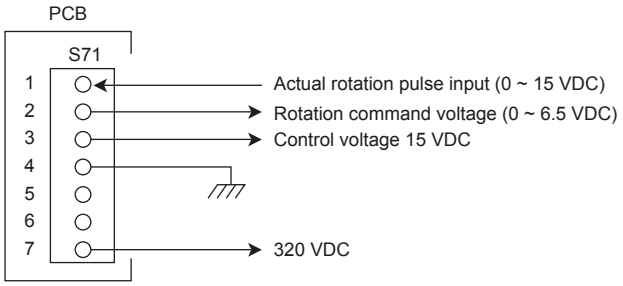
1. Set operation off and power off. Disconnect the connector S71.
2. Check that the voltage between the pins 4 & 7 is 320 VDC.
3. Check that the control voltage between the pins 3 & 4 is 15 VDC.
4. Check that the rotation command voltage between the pins 2 & 4 is 0 - 6.5 VDC.
5. Keep operation off and 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.

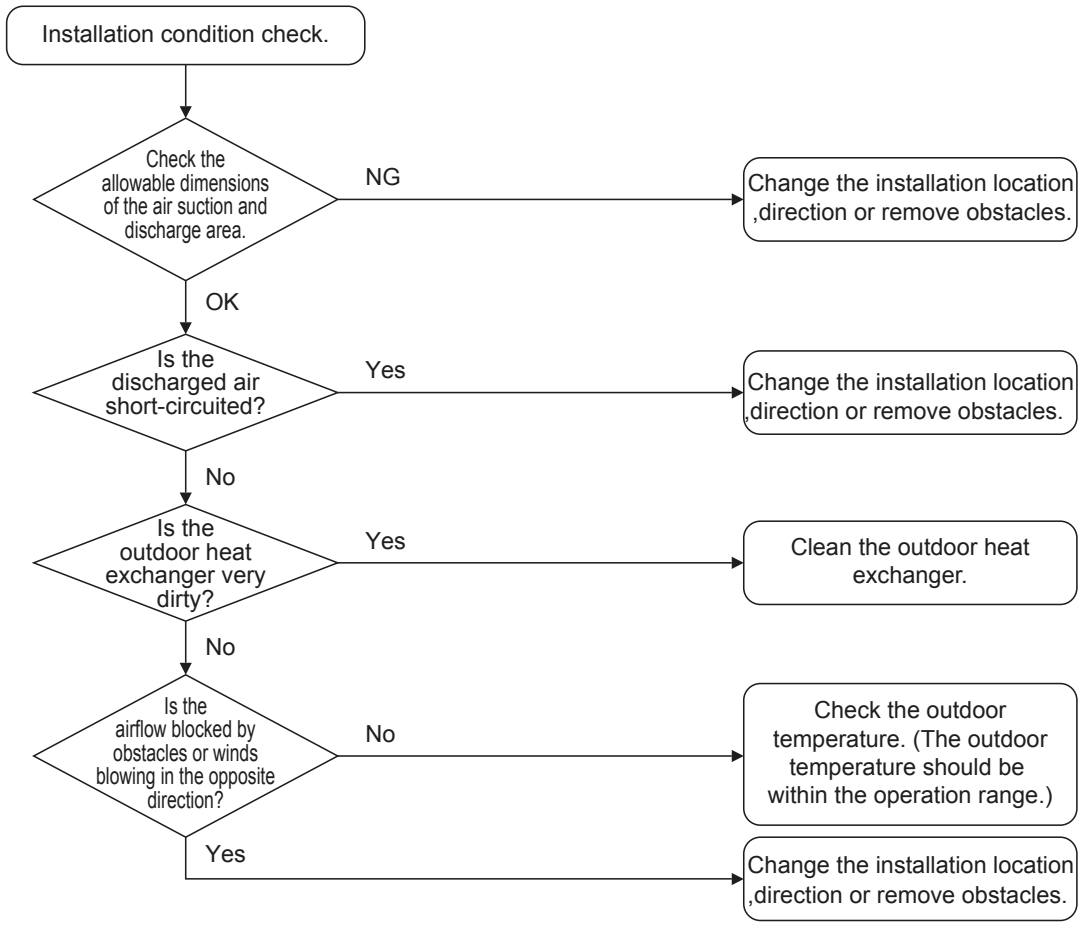
If NG in step 2 : Defective PCB and replace the outdoor unit PCB.

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.

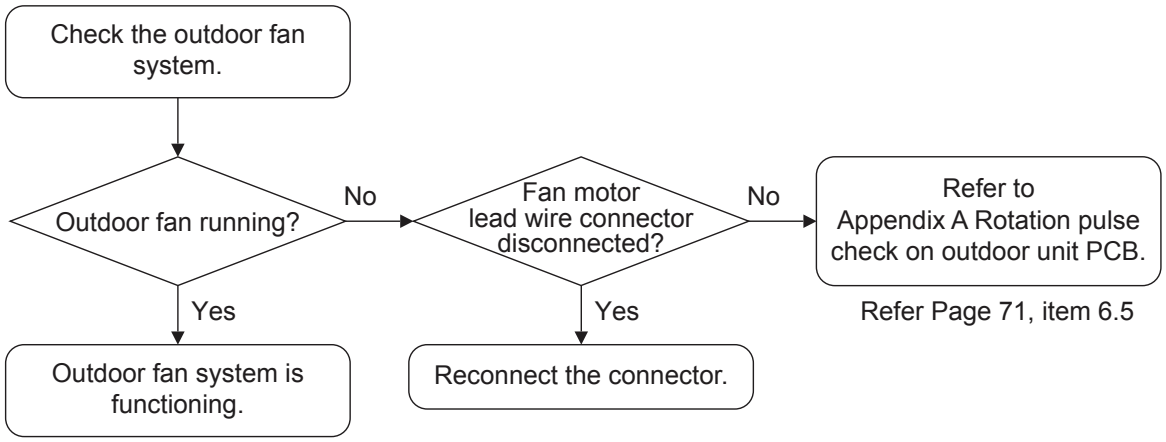


6.6 Installation condition check



6.7 Outdoor fan system check

DC motor



6.8 Diode bridge short circuit check procedures

6.8.1 Power transistor check for class 09 & class 12

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 18 & class 24

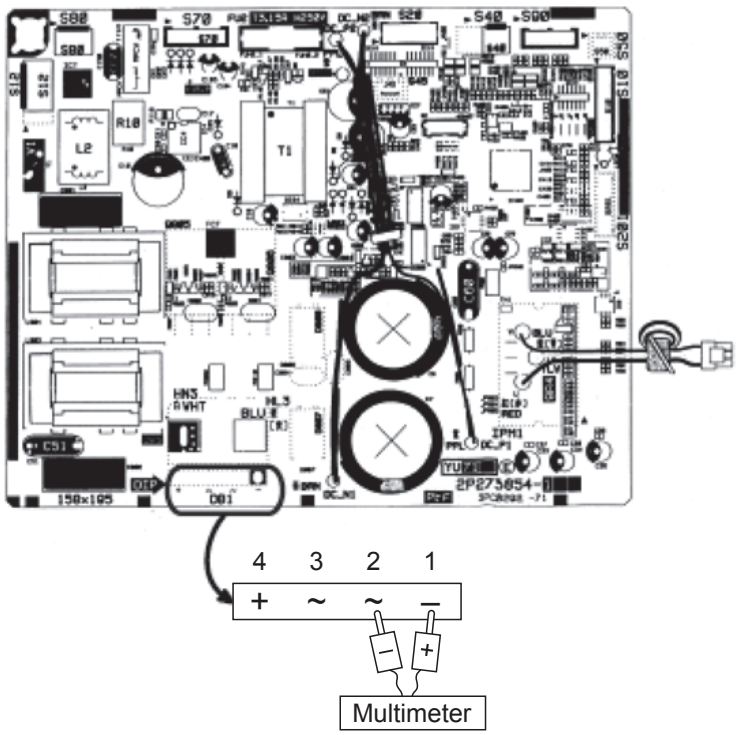
Check to make sure that the voltage between (+) and (-) of the diode bridge (DB1) is approximately 0 V before checking.

- 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.

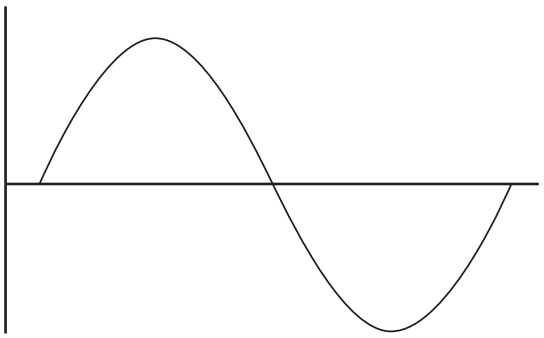


6.9 Power supply waveforms check procedures

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

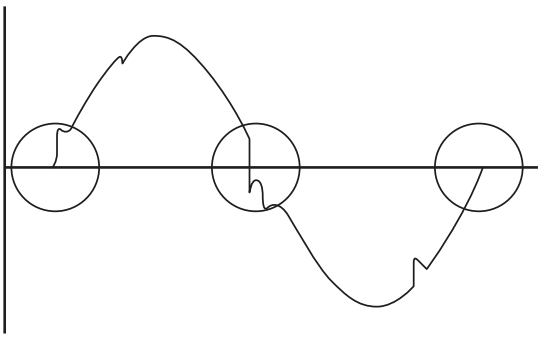
- Check if the power supply waveform is a sine wave (Fig. 1).
- Check if there is waveform disturbance near the zero cross (sections circled in Fig. 2).

Fig. 1



(R1726)

Fig. 2



(R1444)

6.10 Trial Operation and Field Settings

6.10.1 Tips for Servicing

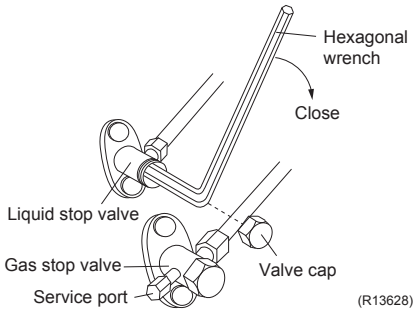
6.10.1.1 Pump Down Operation

In order to protect the environment, be sure to conduct pump down operation when relocating or disposing of the unit.

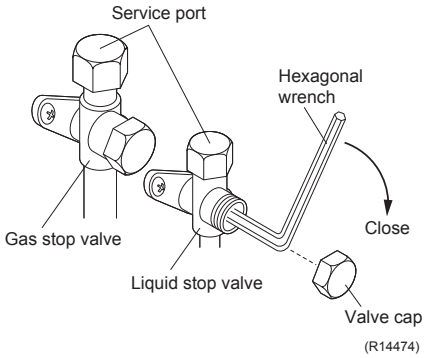
<Details>

1. Remove the valve caps from the liquid stop valve and the gas stop valve.
2. Carry out forced cooling operation.
3. After 4 to 10 minutes, close the liquid stop valve with a hexagonal wrench.
4. After 2 to 3 minutes, close the gas stop valve and stop the forced cooling operation

09/12/18 class



24 class



6.10.1.2 Forced Cooling Operation

Item	Forced Cooling
Conditions	The forced cooling operation is allowed when both the following conditions are met. 1) The outdoor unit is not abnormal and not in the 3-minute standby mode. 2) The outdoor unit is not operating.
Start	Press the forced cooling operation ON/OFF button (SW1) on the indoor unit for 5 seconds.
Command Frequency	Class 09/12: 58Hz Class 18/24: 66Hz
End	The forced cooling operation ends when any of the following conditions is fulfilled. 1)The operation ends automatically after 15 minutes. 2)Press the forced cooling operation ON/OFF switch (SW1) on the indoor unit again. 3)Press the ON/OFF button on the remote controller.
Others	Protection functions have priority over all other functions during forced cooling operation.

FTK(X)B model:

ON/OFF switch (SW1)

FTK(X)N model :

6.10.2 Trial Operation

1. Measure the supply voltage and make sure that it falls within the specified range.
2. Trial operation should be carried out in either cooling or heating operation.
3. Carry out the trial operation in accordance with the operation manual to ensure that all functions and parts, such as louver movement, are working properly.
   - The air conditioner requires a small amount of power in standby mode. If the system is not to be used for some time after installation, shut off the circuit breaker to eliminate unnecessary power consumption.
   - If the circuit breaker trips to shut off the power to the air conditioner, the system backs up the operation mode. The system then restarts operation with the previous operation mode when the circuit breaker is restored. [details refer to section 2.14 Auto Random Restart]
4. In cooling operation, select the lowest programmable temperature; in heating operation, select the highest programmable temperature.
   - Trial operation may be disable in either operation mode depending on the room temperature.
   - After trial operation is complete, set the temperature to a normal level.
     [26 - 28°C (78.8 – 82.4°F) in cooling, 20 - 24°C (68 – 75.2°F) in heating]
   - For protection, the system does not start for 3 minutes after it is turned off.

6.10.3 Field Settings

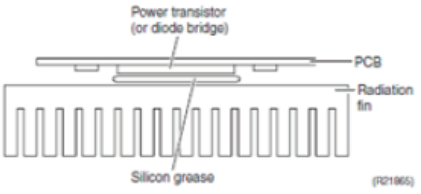
6.10.3.1 Temperature Display Switch
- •Y ou can select Fahrenheit or Celsius for temperature display
- Press the TEMP ▲and ▼ buttons simultaneously for 5 seconds to change the unit temperature display
- Default setting: Fahrenheit

6.10.4 Silicon Grease on Power Transistor / Diode Bridge
Apply the specified silicon grease to the heat radiation part of a power transistor /diode bridge when you replace an outdoor unit PCB. The silicon grease encourages the heat radiation of a power transistor / diode bridge.

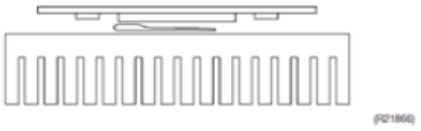
<Details>
1. Wipe off the old silicon grease completely.
2. Apply the silicon grease evenly. See the illustration below for examples of application.
3. Tighten the screws of the power transistor / diode bridge.
4. Make sure that the heat radiation parts are firmly contacted to the radiation fin.

Note: smoke emission may be caused by bad heat radiation when the silicon grease is not appropriately applied.

■ OK: Evenly applied



■ NG: Not evenly applied



■ NG: Foreign matter is stuck.