Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

September 2011
No.OCH472
REVISED EDITION-A

HFC utilized R410A

TECHNICAL & SERVICE MANUAL

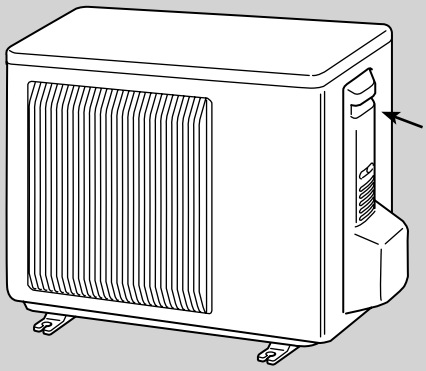
R410A

Outdoor unit

[Model names]	[Service Ref.]
SUZ-KA25VA2	SUZ-KA25VA2.TH
SUZ-KA35VA2	SUZ-KA35VA2.TH
SUZ-KA50VA2	SUZ-KA50VA2.TH
SUZ-KA60VA2	SUZ-KA60VA2.TH
SUZ-KA71VA2	SUZ-KA71VA2.TH

Revision:
- Errors in "11. TROUBLESHOOTING" have been corrected in REVISED EDITION-A.
- Some descriptions have been modified.

- Please void OCH472.



SUZ-KA25VA2.TH
SUZ-KA35VA2.TH

NOTE:
This service manual describes technical data of the outdoor units.
RoHS compliant products have <G> mark on the spec name plate.
For servicing of RoHS compliant products, refer to the RoHS Parts List.

CONTENTS

PARTS CATALOG (OCB472)

1 COMBINATION OF INDOOR AND OUTDOOR UNITS

1-1. INDOOR UNIT SERVICE MANUAL

	Indoor unit		Outdoor unit Heat pump type SUZ-				
	Service Ref.	Service Manual No.	KA25VA2.TH	KA35VA2.TH	KA50VA2.TH	KA60VA2.TH	KA71VA2.TH
Heat pump without electric heater	SLZ-KA25VA(L).TH	OC320	○	—	—	—	—
	SLZ-KA35VA(L).TH		—	○	—	—	—
	SLZ-KA50VA(L).TH		—	—	○	—	—
	SLZ-KA25VAQ.TH	OCH493	○	—	—	—	—
	SLZ-KA35VAQ.TH		—	○	—	—	—
	SLZ-KA50VAQ.TH		—	—	○	—	—
	SEZ-KD25VA(L).TH	HWE0711	○	—	—	—	—
	SEZ-KD35VA(L).TH		—	○	—	—	—
	SEZ-KD50VA(L).TH		—	—	○	—	—
	SEZ-KD60VA(L).TH		—	—	—	○	—
	SEZ-KD71VA(L).TH		—	—	—	—	○
	SEZ-KD25VAQ.TH	HWE1008	○	—	—	—	—
	SEZ-KD35VAQ.TH		—	○	—	—	—
	SEZ-KD50VAQ.TH		—	—	○	—	—
	SEZ-KD60VAQ.TH		—	—	—	○	—
	SEZ-KD71VAQ.TH		—	—	—	—	○
	MFZ-KA25VA-E4	OB409	○	—	—	—	—
	MFZ-KA35VA-E4		—	○	—	—	—
	MFZ-KA50VA-E4		—	—	○	—	—

(NOTE) Please refer to the service manual of indoor unit or the technical data book for the combination data.

2 TECHNICAL CHANGES

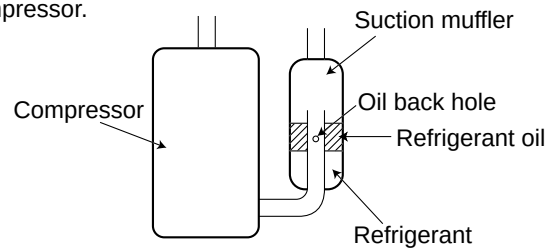
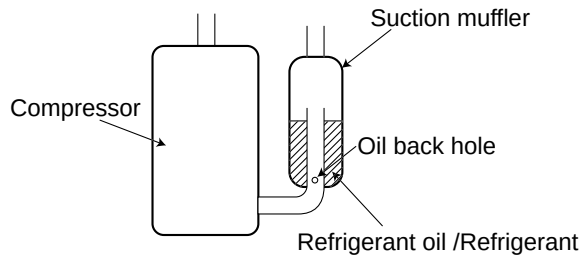
INFORMATION FOR THE AIR CONDITIONER WITH R410A REFRIGERANT

- This room air conditioner adopts an HFC refrigerant (R410A) which never destroys the ozone layer.
- Pay particular attention to the following points, though the basic installation procedure is same as that for R22 conditioners.

① As R410A has working pressure approximate 1.6 times as high as that of R22, some special tools and piping parts/ materials are required. Refer to the table below.
② Take sufficient care not to allow water and other contaminations to enter the R410A refrigerant during storage and installation, since it is more susceptible to contaminations than R22.
③ For refrigerant piping, use clean, pressure-proof parts/materials specifically designed for R410A. (Refer to 2. Refrigerant piping.)
④ Composition change may occur in R410A since it is a mixed refrigerant. When charging, charge liquid refrigerant to prevent composition change.

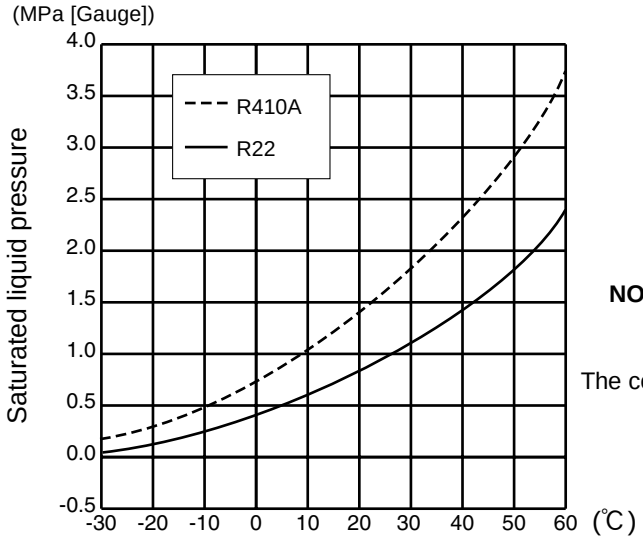
		New refrigerant	Previous refrigerant
Refrigerant	Refrigerant	R410A	R22
	Composition (Ratio)	HFC-32: HFC-125 (50%:50%)	R22 (100%)
	Refrigerant handling	Pseudo-azeotropic refrigerant	Single refrigerant
	Chlorine	Not included	Included
	Safety group (ASHRAE)	A1/A1	A1
	Molecular weight	72.6	86.5
	Boiling point (℃)	-51.4	-40.8
	Steam pressure [25℃](Mpa)	1.557	0.94
	Saturated steam density [25℃](Kg/m³)	64	44.4
	Combustibility	Non combustible	Non combustible
	ODP ※1	0	0.055
	GWP ※2	1730	1700
	Refrigerant charge method	From liquid phase in cylinder	Gas phase
	Additional charge on leakage	Possible	Possible
Refrigerant oil	Kind	Incompatible oil	Compatible oil
	Color	None	Light yellow
	Smell	None	None

※1: Ozone Depletion Potential : based on CFC-11
※2: Global Warming Potential : based on CO_2

	New Specification	Current Specification
Compressor	The incompatible refrigerant oil easily separates from refrigerant and is in the upper layer inside the suction muffler. Raising position of the oil back hole enables to back the refrigerant oil of the upper layer to flow back to the compressor. 	Since refrigerant and refrigerant oil are compatible with each other, refrigerant oil backs to the compressor through the lower position oil back hole. 

NOTE : The unit of pressure has been changed to MPa on the international system of units (SI unit system).
The conversion factor is: **1 (MPa [Gauge]) =10.2 (kgf/cm² [Gauge])**

Conversion chart of refrigerant temperature and pressure



NOTE: The unit of pressure has been changed to MPa on the international system of units (SI unit system).

The conversion factor is: **1 (MPa [Gauge]) =10.2 (kgf/cm² [Gauge])**

1. Tools dedicated for the air conditioner with R410A refrigerant

The following tools are required for R410A refrigerant. Some R22 tools can be substituted for R410A tools.
The diameter of the service port on the stop valve in outdoor unit has been changed to prevent any other refrigerant being charged into the unit. Cap size has been changed from 7/16 UNF with 20 threads to 1/2 UNF with 20 threads.

R410A tools	Can R22 tools be used?	Description
Gauge manifold	No	R410A has high pressures beyond the measurement range of existing gauges. Port diameters have been changed to prevent any other refrigerant from being charged into the unit.
Charge hose	No	Hose material and cap size have been changed to improve the pressure resistance.
Gas leak detector	No	Dedicated for HFC refrigerant.
Torque wrench	Yes	6.35 mm and 9.52 mm
	No	12.7 mm and 15.88 mm
Flare tool	Yes	Clamp bar hole has been enlarged to reinforce the spring strength in the tool.
Flare gauge	New	Provided for flaring work (to be used with R22 flare tool).
Vacuum pump adapter	New	Provided to prevent the back flow of oil. This adapter enables you to use vacuum pumps.
Electronic scale for refrigerant charging	New	It is difficult to measure R410A with a charging cylinder because the refrigerant bubbles due to high pressure and high-speed vaporization

No: Not substitutable for R410A Yes: Substitutable for R410A

2. Refrigerant piping

① Specifications

Use the refrigerant pipes that meet the following specifications.

Pipe	Outside diameter	Wall thickness	Insulation material
	mm	mm	
For liquid	6.35	0.8	Heat resisting foam plastic Specific gravity 0.045 Thickness 8 mm
	9.52	0.8	
For gas	9.52	0.8	
	12.7	0.8	
	15.88	1.0	

- Use a copper pipe or a copper-alloy seamless pipe with a thickness of 0.8 mm. Never use any pipe with a thickness less than 0.8mm, as the pressure resistance is insufficient.

② Flaring work and flare nut

Flaring work for R410A pipe differs from that for R22 pipe.

For details of flaring work, refer to Installation manual “FLARING WORK”.

Pipe diameter (mm)	Dimension of flare nut (mm)	
	R410A	R22
6.35	17	17
9.52	22	22
12.7	26	24
15.88	29	27

3. Refrigerant oil

Apply the special refrigerant oil (accessories: packed with indoor unit) to the flare and the union seat surfaces.

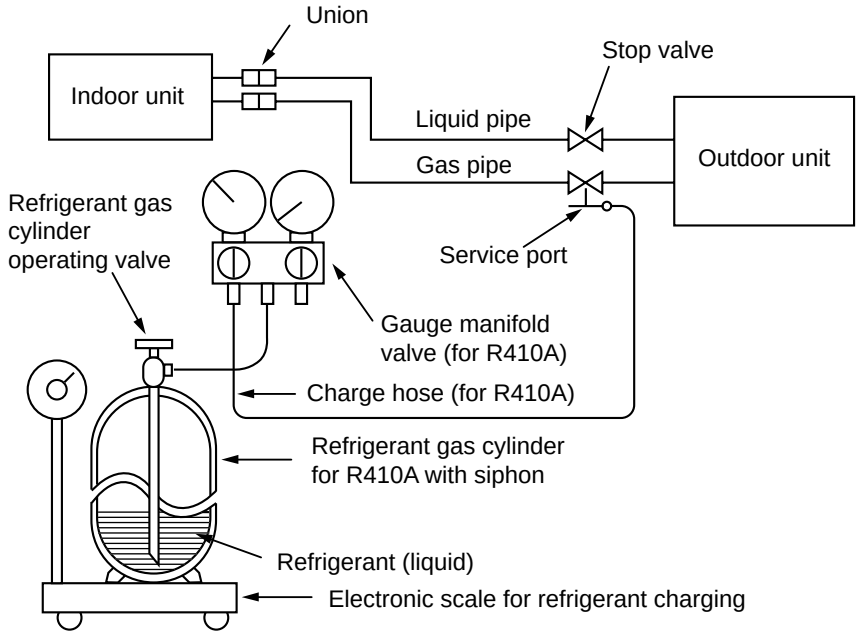
4. Air purge

- Do not discharge the refrigerant into the atmosphere.
  Take care not to discharge refrigerant into the atmosphere during installation, reinstallation, or repairs to the refrigerant circuit.
- Use the vacuum pump for air purging for the purpose of environmental protection.

5. Additional charge

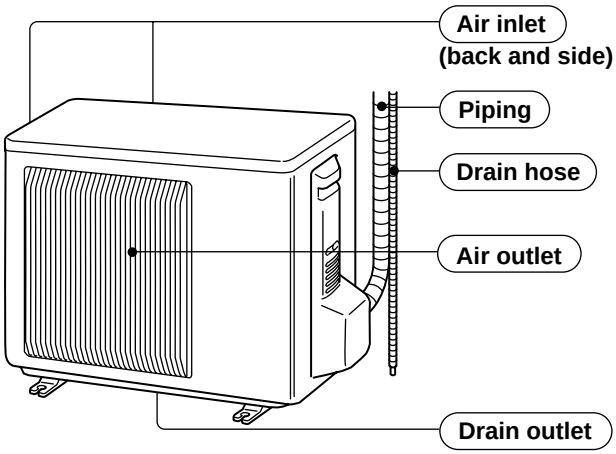
For additional charging, charge the refrigerant from liquid phase of the gas cylinder.

If the refrigerant is charged from the gas phase, composition change may occur in the refrigerant inside the cylinder and the outdoor unit. In this case, ability of the refrigerating cycle decreases or normal operation can be impossible. However, charging the liquid refrigerant all at once may cause the compressor to be locked. Thus, charge the refrigerant slowly.

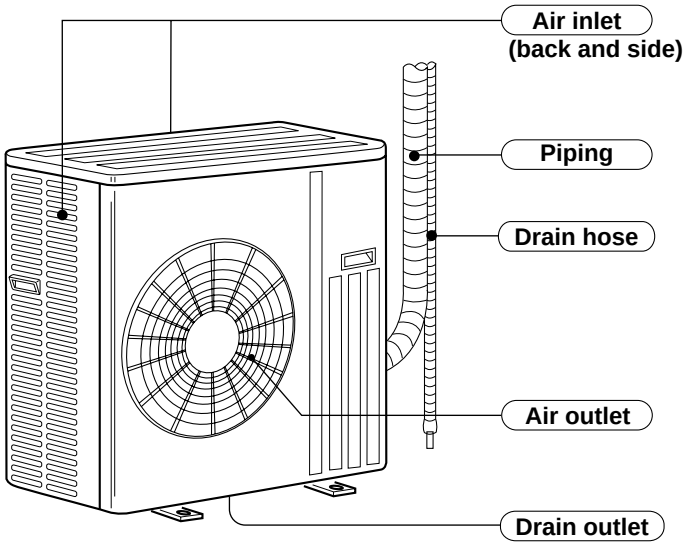


3 PART NAMES AND FUNCTIONS

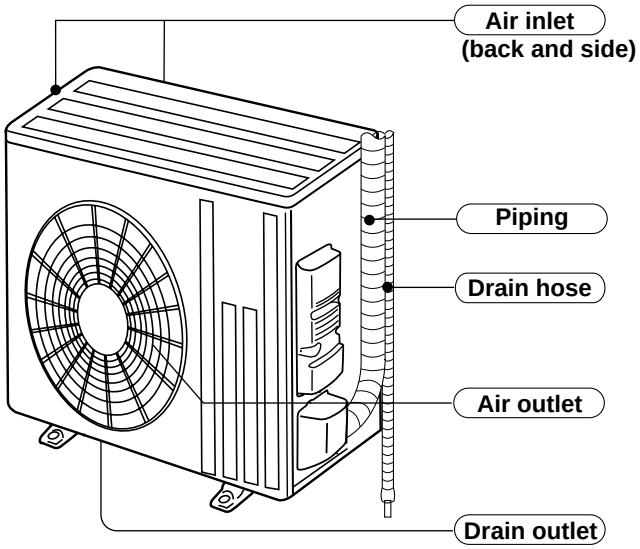
SUZ-KA25VA2.TH SUZ-KA35VA2.TH



SUZ-KA50VA2.TH SUZ-KA60VA2.TH



SUZ-KA71VA2.TH



Model		SUZ-KA25/35VA2.TH	SUZ-KA50/60VA2.TH	SUZ-KA71VA2.TH
①	Drain socket	1	1	1
②	Drain cap	-	2	-

4 SPECIFICATION

Outdoor Service Ref.			SUZ-KA25VA2.TH		SUZ-KA35VA2.TH		SUZ-KA50VA2.TH		SUZ-KA60VA2.TH		SUZ-KA71VA2.TH	
Function			Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
Power supply			Single phase 230V, 50Hz		Single phase 230V, 50Hz		Single phase 230V, 50Hz		Single phase 230V, 50Hz		Single phase 230V, 50Hz	
Electrical data	Starting current *1	A	3.65		4.75		6.75		9.75		8.89	
	Compressor motor current *1	A	2.74	3.37	4.22	4.42	6.45	6.05	8.05	9.45	8.00	8.07
	Fan motor current *1	A	0.31	0.28	0.33	0.33	0.30		0.30		0.83	0.82
Compressor	Model		KNB073FFDH(C)		KNB092FFAH(C)		SNB130FGBH(T)		SNB130FGBH(T)		SNB172FEKMT	
	Output	W	550		650		900		900		1200	
	Winding resistance (at 20℃)	Ω	U-V 1.70 U-W 1.70 V-W 1.70		U-V 1.91 U-W 1.91 V-W 1.91		U-V 0.98 U-W 0.98 V-W 0.98		U-V 0.98 U-W 0.98 V-W 0.98		U-V 1.04 U-W 1.04 V-W 1.04	
Fan motor	Model		RC0J50-DB		RC0J50-DB		RC0J60-AA		RC0J60-AA		RC0J60-BC	
	Winding resistance(at 20℃)	Ω	WHT-BLK 37.0 BLK-RED 37.0 RED-WHT 37.0		WHT-BLK 37.0 BLK-RED 37.0 RED-WHT 37.0		WHT-BLK 15.2 BLK-RED 15.2 RED-WHT 15.2		WHT-BLK 15.2 BLK-RED 15.2 RED-WHT 15.2		WHT-BLK 15.0 BLK-RED 15.0 RED-WHT 15.0	
Air flow(High/Low※)		m³/h	2,058	1,938	2,004		2,940/1,650※	2,940/2,210※	2,940/1,650※	2,940/2,210※	3,.425/3,006 /1,512※	2,892/2,892 /2,280※
Dimensions W×H×D		mm	800×550×285		800×550×285		840×850×330		840×850×330		840×880×330	
Weight		kg	30		33		53		53		53	
Special remarks	Sound level *1	dB	46		47	48	53/51※	55/53※	53/51※	55/53※	55※	55※
	Fan speed(High※/Low※, High※/Med※/Low※)	rpm	810※/650※	880※/810※/650※	840※/760※	880※/800※/630※	840/480※	800/620※	840/480※	800/620※	950/840/450※	810/810/650※
	Fan speed regulator		2	3	2	3	2		2		3	
	Refrigerant filling capacity(R410A)	kg	0.80		1.05		1.60		1.80		1.80	
	Refrigerating oil (Model)	cc	320 (NEO22)		320 (NEO22)		450 (NEO22)		450 (NEO22)		400 (FV50S)	

NOTE : Test conditions are based on ISO 5151
Cooling : Indoor D.B. 27℃ W.B. 19℃
Outdoor D.B. 35℃ W.B. 24℃
Heating : Indoor D.B. 20℃ W.B. 15℃
Outdoor D.B. 7℃ W.B. 6℃
Refrigerant piping length (one way): 5m
*1 Measured under rated operating frequency.
※ Reference value

Specifications and rating conditions of main electric parts

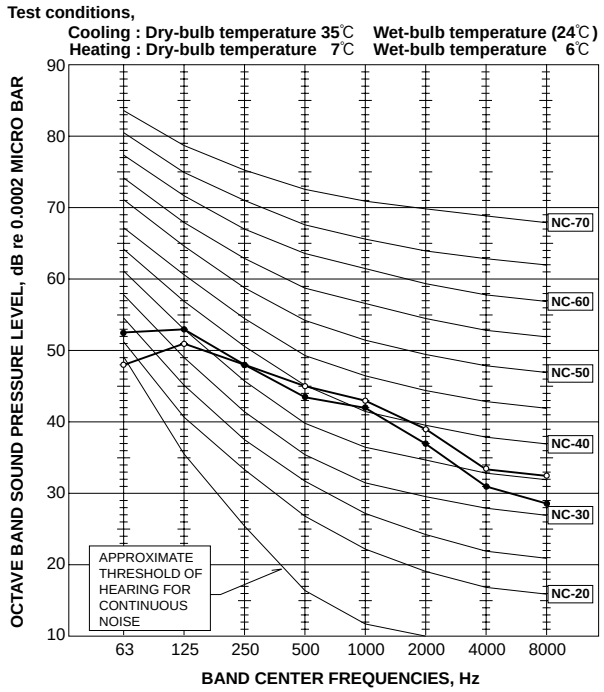
SUZ-KA25VA2.TH SUZ-KA35VA2.TH SUZ-KA50VA2.TH SUZ-KA60VA2.TH SUZ-KA71VA2.TH

Item \ Model		SUZ-KA25VA2.TH	SUZ0KA35VA2.TH	SUZ-KA50VA2.TH	SUZ-KA60VA2.TH	SUZ-KA71VA2.TH
Current transformer	(CT)	20A			–	–
	(CT1, 2)	–			ETQ19Z68AY	–
	(CT61)	–			ETQ19Z53AY	–
	(CT761, CT781)	15A			–	–
Smoothing capacitor	(C61)	–		620μF 420V	–	–
	(C62, C63)	620μF 420V			–	–
	(CB1, 2, 3)	–			560μF 450V	560μF 350V
Diode module	(DB61)	15A 600V		25A 600V	–	–
	(DB65)	25A 600V			–	–
Fuse	(F61)	T20A L250V			–	–
	(F62)	–			–	T20A L250V
	(F63)	–			–	–
	(F64)	–			250V 2A	–
	(F701, F801, F901)	T3.15A L250V				–
	(F911)	–			250V 1A	–
Inteligent power module	(IPM)	15A 600V		20A 600V	15A 600V	20A 600V
	(HC930)	–			3A 450V	–
	(IC932)	–				5A 600V
Power factor controller	(PFC)	–			PS51259-A	20A 600V
Expansion valve coil	(LEV)	DC12V				
High pressure switch	(HPS)	–			ACB-DB156 (for R2)	–
Reactor	(L61)	23mH			–	
	(L)	–			340μH 20A	340μH
Current-detecting resistor	(R61)	45mΩ 5W (1 element)	100mΩ 5W (2 elements)	–		
	(R61, R62)	–		180mΩ 5W (2 elements)	–	
	(R64A, R64B)	–			10Ω 10W	
	(R825)	25mΩ 5W			–	
	(R937, R938, R939)	430mΩ 2W		–		
	(R937A, R937B)	–		1.1Ω 2W	1.1Ω 2W 2%	–
Resistor	(RS1~4)	–			0.04Ω 7W	–
Current-Limiting PTC thermistoe	(PTC64, PTC65)	33Ω			–	33Ω
Terminal block	(TB1, TB2)	3P				
Relay	(X63)	3A 250V			–	
	(X64)	20A 250V			20A 250V	20A 250V
	(X601)	–				3A 250V
	(X602)	–				3A 250V
Solenoid coil relay	(SSR61)	–			TLP3506	–
R.V. coil	(21S4)	AC220-240V				
IGBT	(TR821)	30A 600V			–	–

5 NOISE CRITERIA CURVES

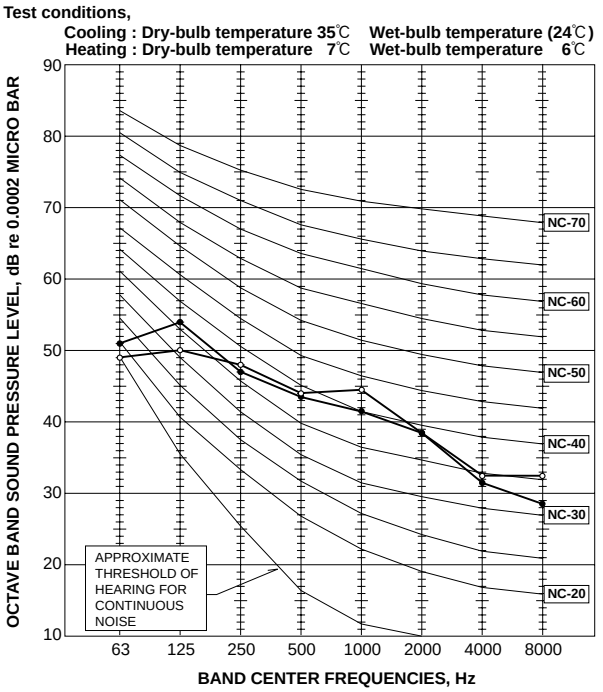
SUZ-KA25VA2.TH

FAN SPEED	FUNCTION	SPL(dB(A))	LINE
High Med.	COOLING	46	●—●
	HEATING	46	○—○



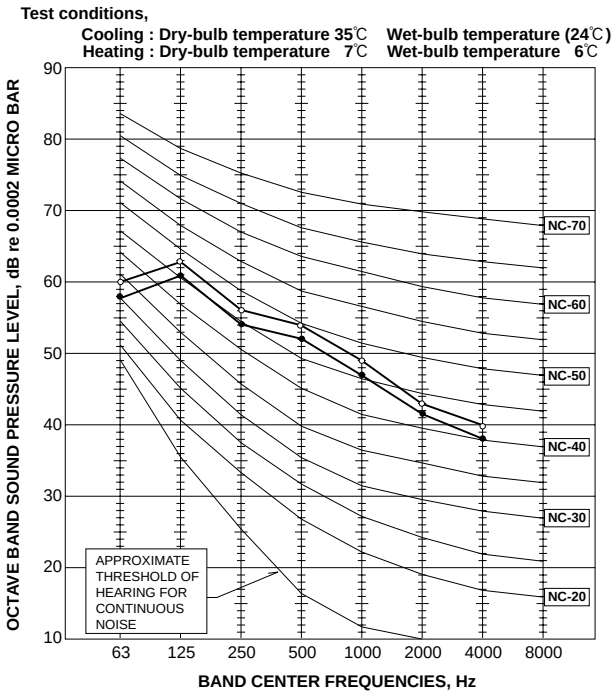
SUZ-KA35VA2.TH

FAN SPEED	FUNCTION	SPL(dB(A))	LINE
High Med.	COOLING	47	●—●
	HEATING	48	○—○



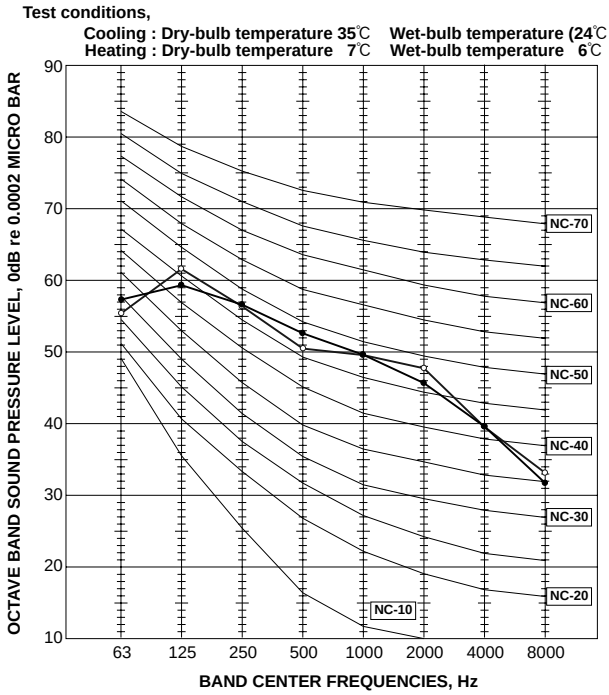
SUZ-KA50VA2.TH SUZ-KA60VA2.TH

FAN SPEED	FUNCTION	SPL(dB(A))	LINE
High	COOLING	53	●—●
	HEATING	55	○—○

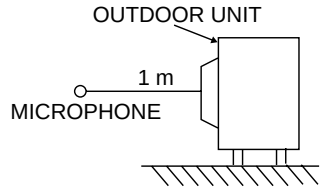


SUZ-KA71VA2.TH

FAN SPEED	FUNCTION	SPL(dB(A))	LINE
High	COOLING	55	●—●
	HEATING	55	○—○



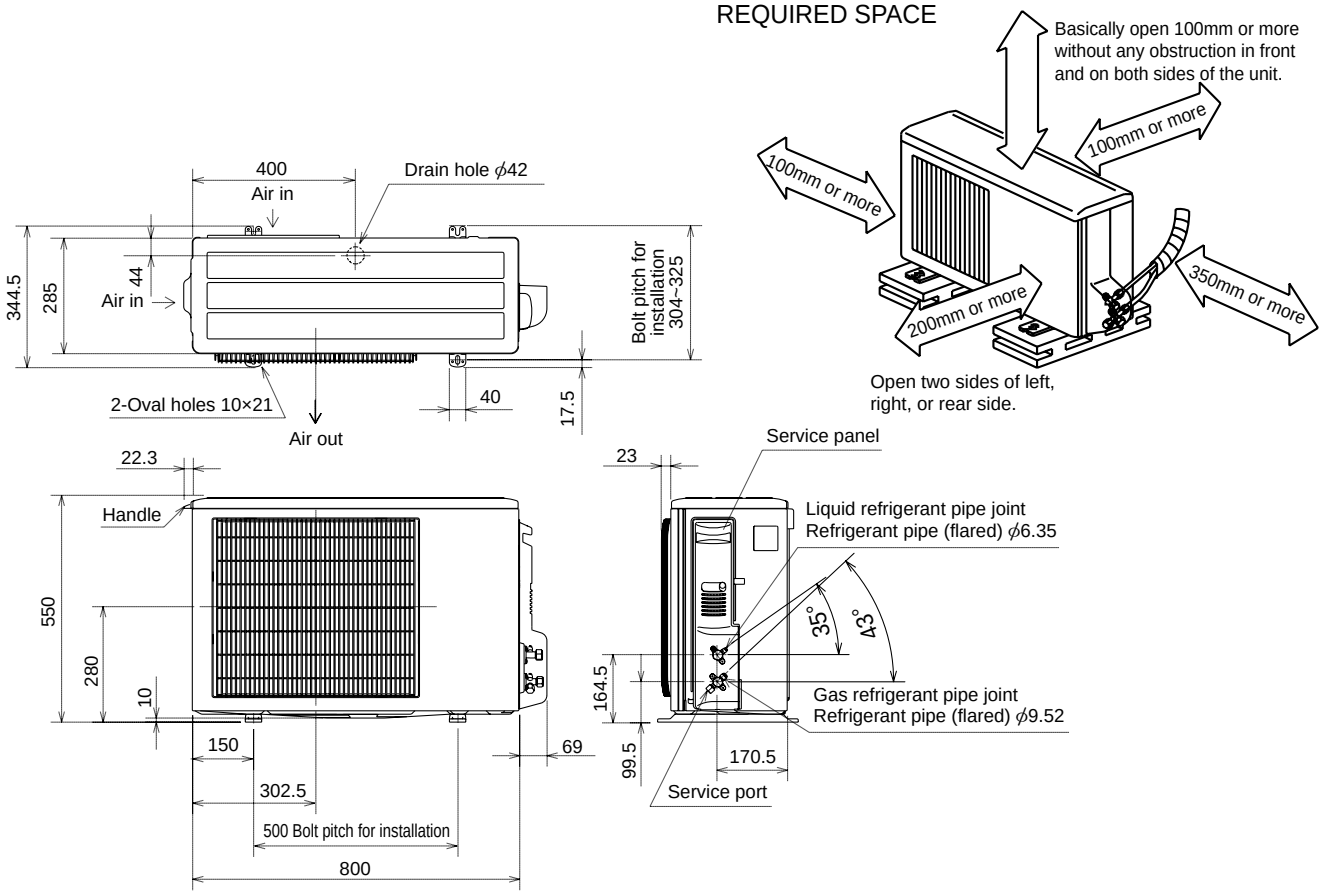
Test conditions
Cooling: Dry-bulb temperature 35°C
Heating: Dry-bulb temperature 7°C
Wet-bulb temperature 6°C



6 OUTLINES AND DIMENSIONS

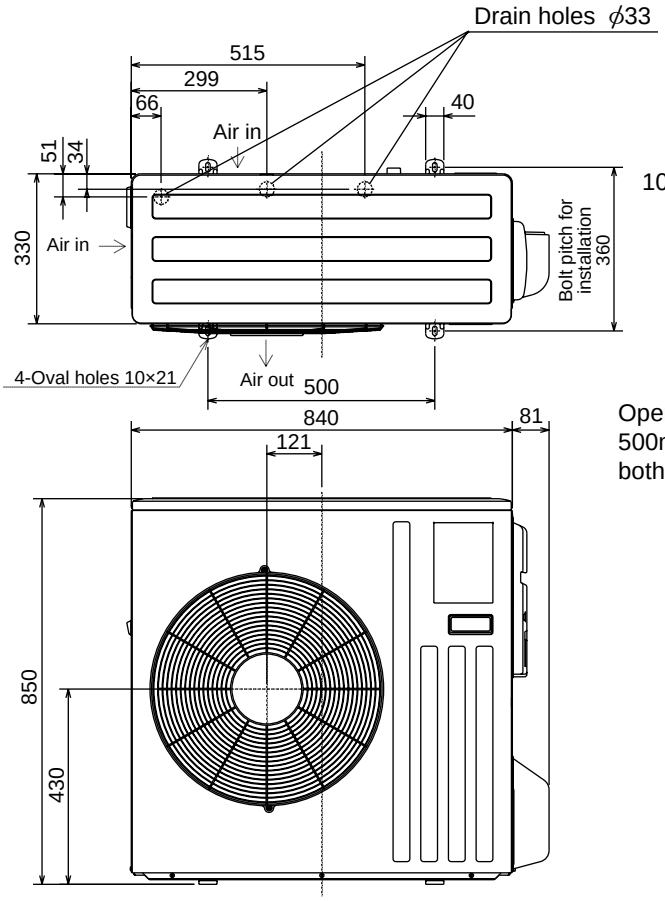
SUZ-KA25VA2.TH SUZ-KA35VA2.TH

Unit: mm

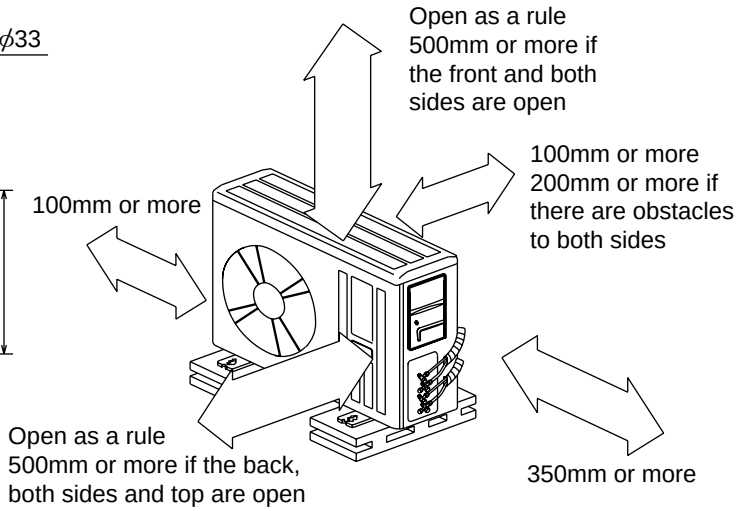


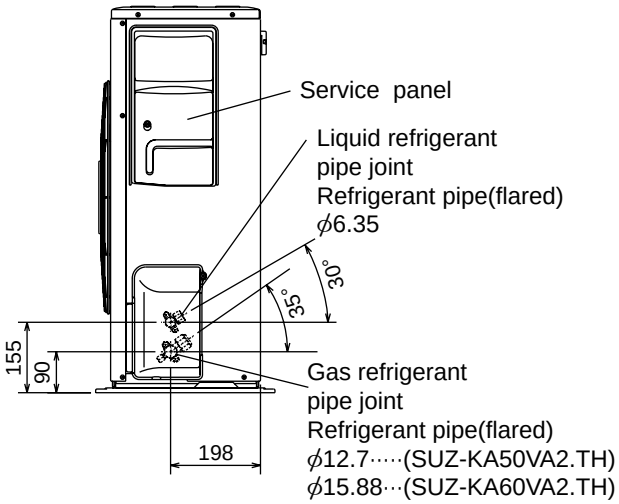
SUZ-KA50VA2.TH SUZ-KA60VA2.TH

Unit: mm



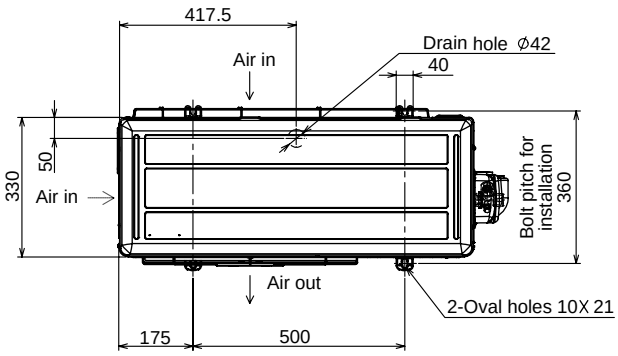
REQUIRED SPACE

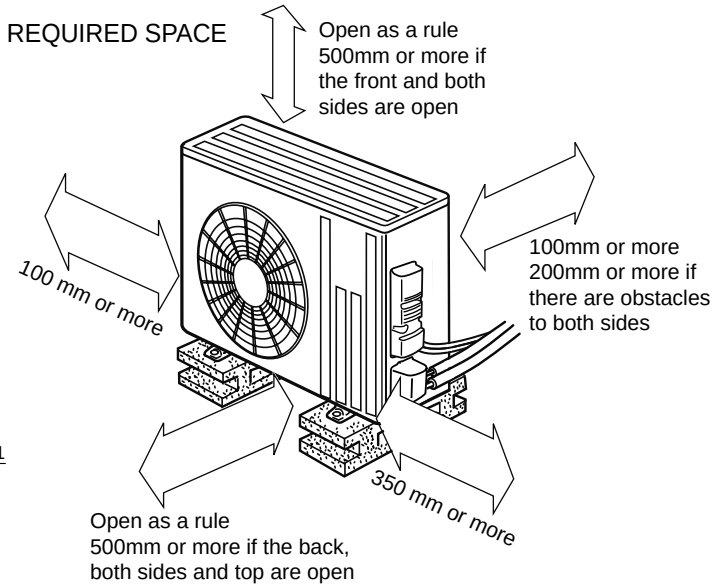


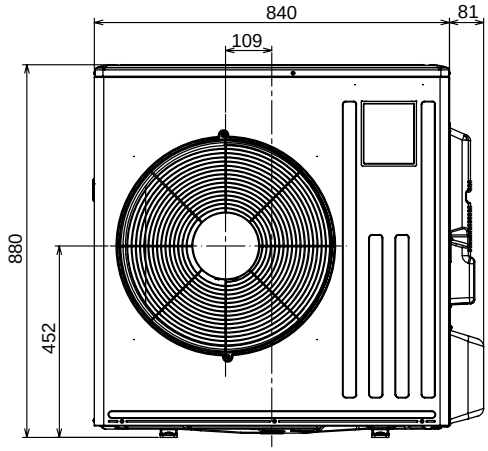


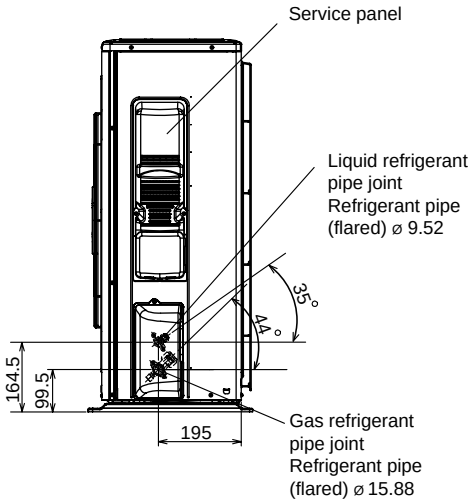
SUZ-KA71VA2.TH

Unit: mm



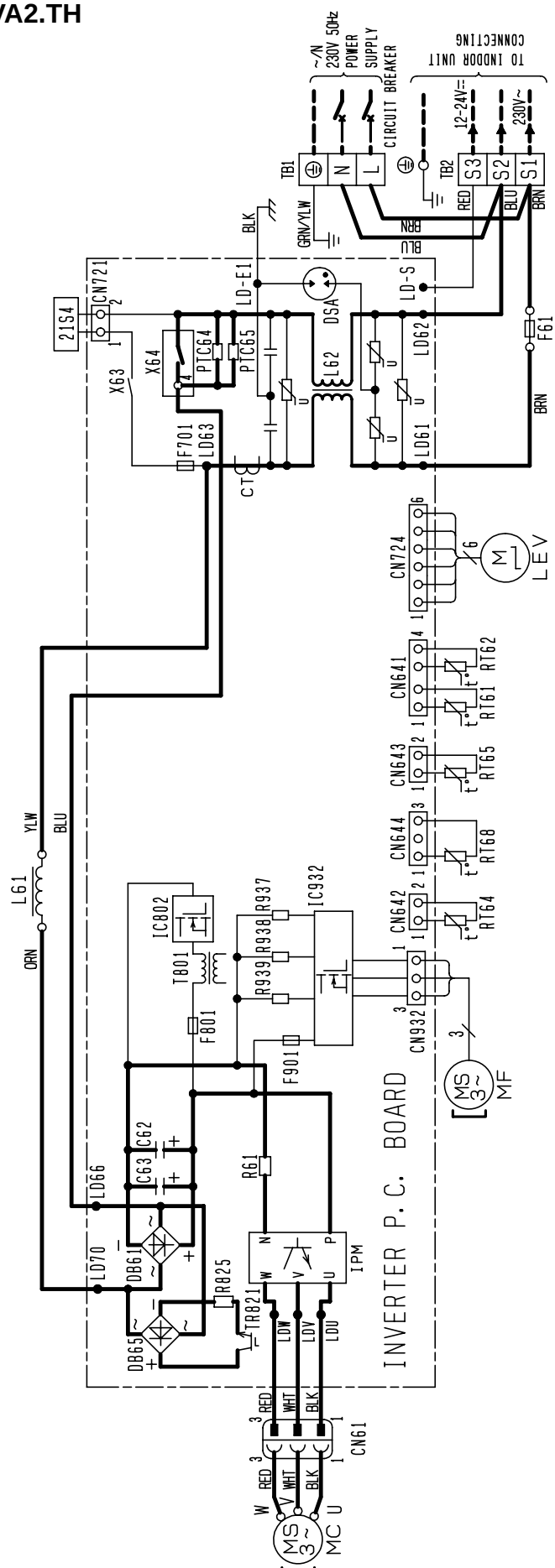






7 WIRING DIAGRAM

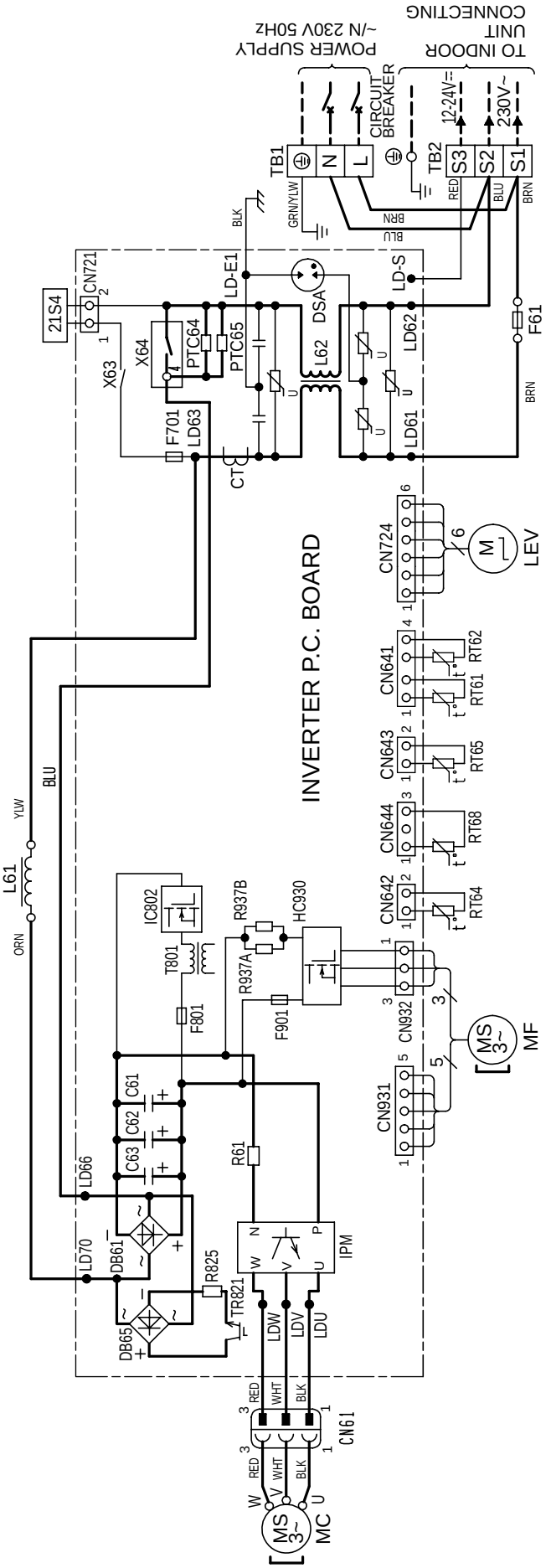
SUZ-KA25VA2.TH
SUZ-KA35VA2.TH



NOTES:1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only. (For field wiring)
3. Symbols below indicate.
□□□ : Terminal block

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CT	CURRENT TRANSFORMER	LEV	EXPANSION VALVE COIL	R61	CURRENT-DETECTING RESISTOR
CG2, CG3	SMOOTHING CAPACITOR	MC	COMPRESSOR	R825, R937	CURRENT-DETECTING RESISTOR
DB61, DB65	DIODE MODULE	MF	FAN MOTOR	R938, R939	CURRENT-DETECTING RESISTOR
DSA	SURGE ABSORBER	PTC64, PTC65	CIRCUIT PROTECTION	TB1, TB2	TERMINAL BLOCK
F61	FUSE (T20AL250V)	RT61	DEFROST THERMISTOR	TR821	SWITCHING POWER TRANSISTOR
F701, F801, F901	FUSE (T3.15AL250V)	RT62	DISCHARGE TEMP. THERMISTOR	T801	TRANSFORMER
IC802	INTELLIGENT POWER DEVICE	RT64	FIN TEMP. THERMISTOR	X63, X64	RELAY
IPM, IC932	INTELLIGENT POWER MODULE	RT65	AMBIENT TEMP. THERMISTOR	21S4	REVERSING VALVE COIL
L61	REACTOR	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR.		
L62	CMC COIL				

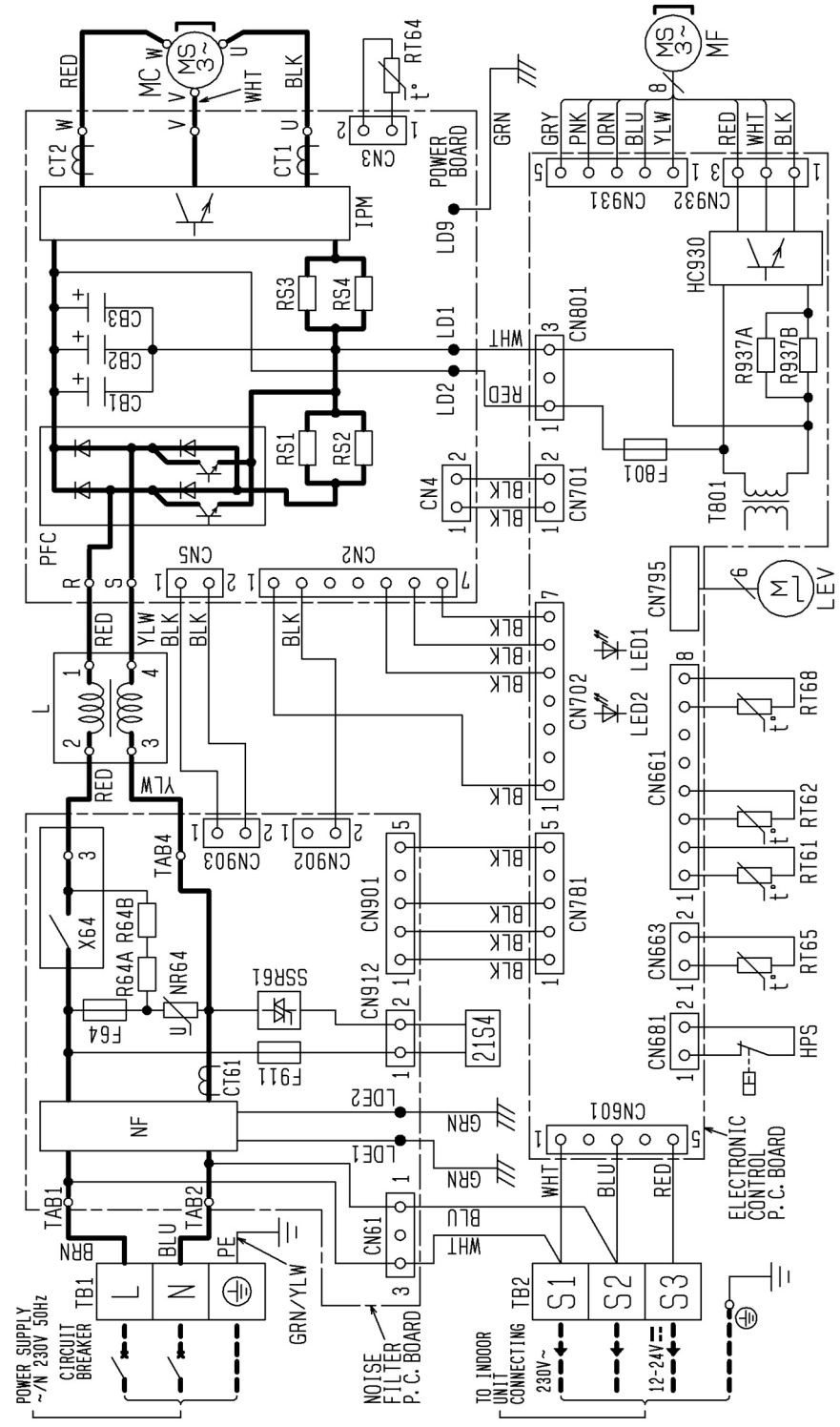
SUZ-KA50VA2.TH



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CT	CURRENT TRANSFORMER	LEV	EXPANSION VALVE COIL	R61	CURRENT-DETECTING RESISTOR
C61,62,63	SMOOTHING CAPACITOR	MC	COMPRESSOR	R825	CURRENT-DETECTING RESISTOR
DB61,DB65	DIODE MODULE	MF	FAN MOTOR	R937A, B	CURRENT-DETECTING RESISTOR
DSA	SURGE ABSORBER	PTC64,PTC65	CIRCUIT PROTECTION	TB1,TB52	TERMINAL BLOCK
F61	FUSE (T20AL 250V)	RT61	DEFROST THERMISTOR	TR821	SWITCHING POWER TRANSISTOR
F701,F801,F901	FUSE (T3.15AL 250V)	RT62	DISCHARGE TEMP. THERMISTOR	T801	TRANSFORMER
HC930,IPM	INTELLIGENT POWER MODULE	RT64	FIN TEMP. THERMISTOR	X63,X64	RELAY
IC802	INTELLIGENT POWER DEVICE	RT65	AMBIENT TEMP. THERMISTOR	21S4	REVERSING VALVE COIL
L61	REACTOR	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR		
L62	REACTOR				

NOTES: 1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only (for field wiring).
3. Symbols below indicate.
□□□ :Terminal block

SUZ-KA60VA2.TH



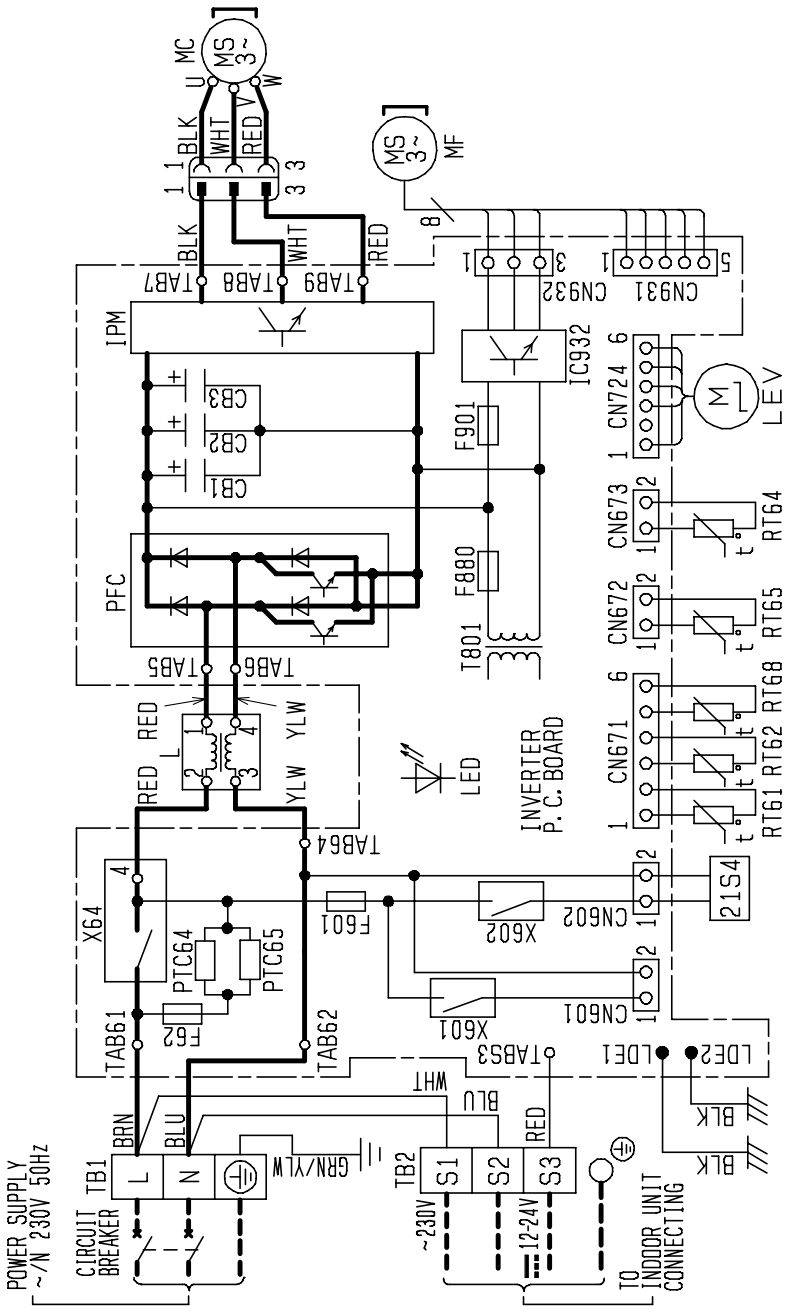
NOTES: 1. About the indoor side electric wiring refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only (for field wiring).
3. Symbols below indicate.
□□□ :Terminal block

SYMBOL	NAME
CB1~3	SMOOTHING CAPACITOR
CT1, 2	CURRENT TRANSFORMER
CT61	CURRENT TRANSFORMER
F64	FUSE (T2AL 250V)
F801	FUSE (T3.15AL 250V)
F911	FUSE (T1AL 250V)
HC930	INTELLIGENT POWER MODULE
HPS	HIGH PRESSURE SWITCH
IPM	INTELLIGENT POWER MODULE
L	REACTOR

SYMBOL	NAME
LEV	EXPANSION VALVE
MC	COMPRESSOR
MF	FAN MOTOR
NF	NOISE FILTER
NR64	VARISTOR
PFC	POWER FACTOR CONTROLLER
RS1~4	RESISTOR
RT61	DEFROST THERMISTOR
RT62	DISCHARGE TEMP. THERMISTOR
RT64	FIN TEMP. THERMISTOR

SYMBOL	NAME
RT65	AMBIENT TEMP. THERMISTOR
RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR
R64A, B	RESISTOR
R937A, B	RESISTOR
SSR61	SOLENOID COIL RELAY
TB1	TERMINAL BLOCK
TB2	TERMINAL BLOCK
T801	TRANSFORMER
X64	RELAY
21S4	REVERSING VALVE COIL

SUZ-KA71VA2.TH



NOTES 1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only(for field wiring).
3. Symbols indicate. □□□ : Terminal block

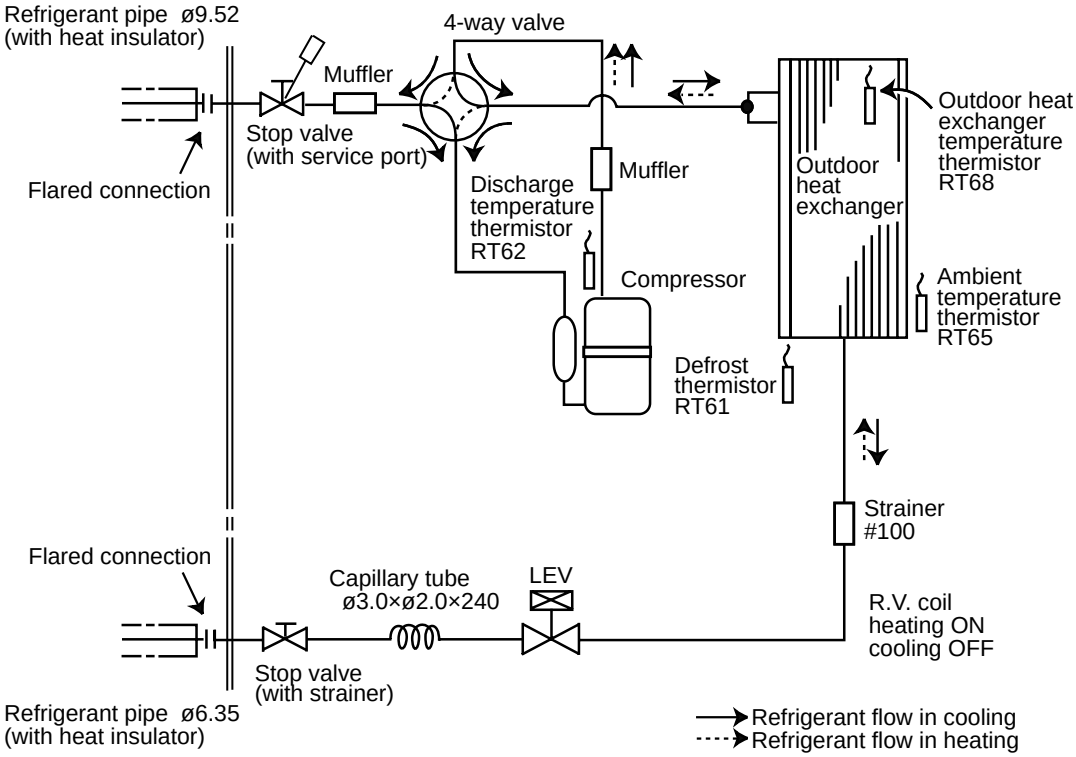
SYMBOL	NAME
CB1~3	SMOOTHING CAPACITOR
F601	FUSE(T3.15AL250V)
F62	FUSE(T2AL250V)
F880	FUSE(T3.15AL250V)
F901	FUSE(T3.15AL250V)
IC932	INTELLIGENT POWER MODULE
IPM	INTELLIGENT POWER MODULE
L	REACTOR
LEV	EXPANSION VALVE COIL
MC	COMPRESSOR
MF	FAN MOTOR
PFC	POWER FACTOR CONTROLLER
PTC64	CIRCUIT PROTECTION

SYMBOL	NAME
PTC65	CIRCUIT PROTECTION
RT61	DEFROST THERMISTOR
RT62	DISCHARGE TEMP.THERMISTOR
RT64	FIN TEMP.THERMISTOR
RT65	AMBIENT TEMP.THERMISTOR
RT68	OUTDOOR HEAT EXCHANGER TEMP.THERMISTOR
TB1,TB2	TERMINAL BLOCK
T801	TRANSFORMER
X601	RELAY
X602	RELAY
X64	RELAY
21S4	REVERSING VALVE SOLENOID COIL

8 REFRIGERANT SYSTEM DIAGRAM

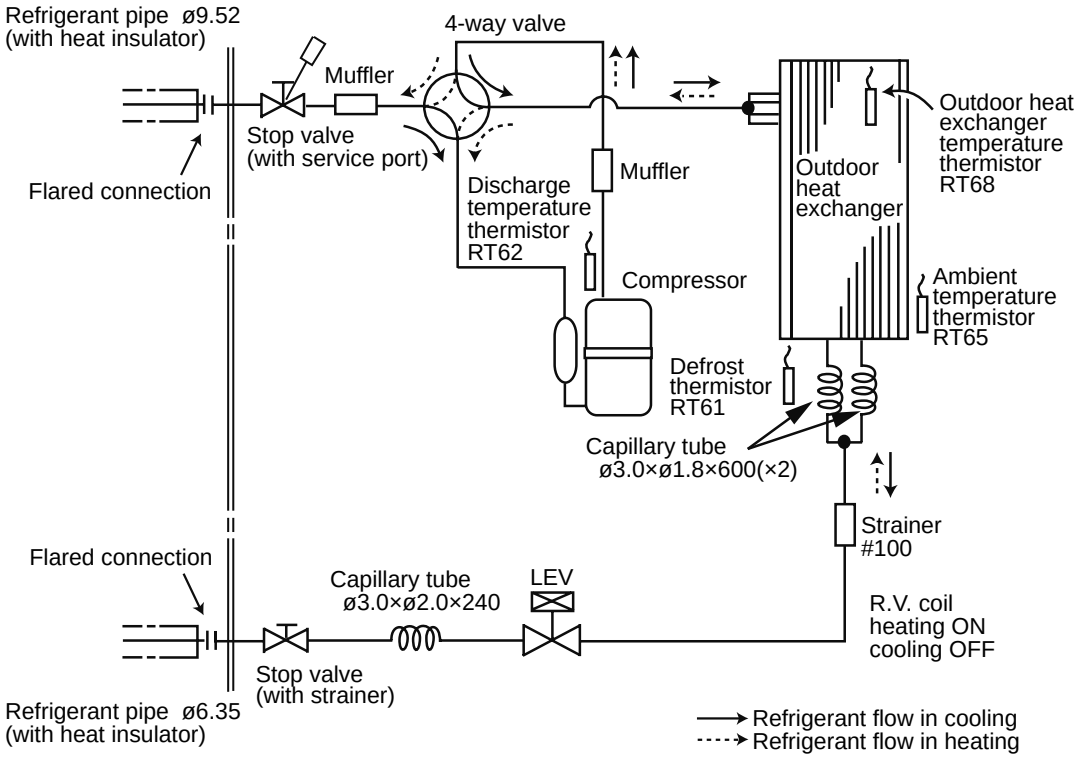
SUZ-KA25VA2.TH

Unit: mm



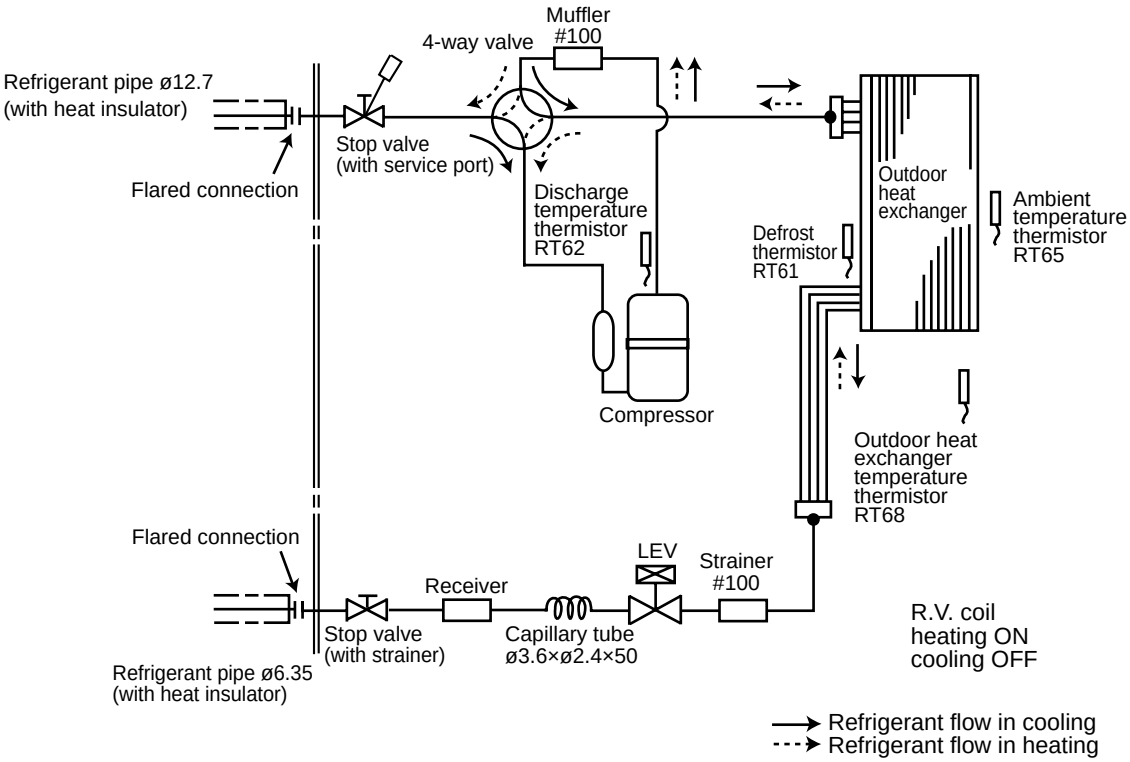
Unit: mm

SUZ-KA35VA2.TH



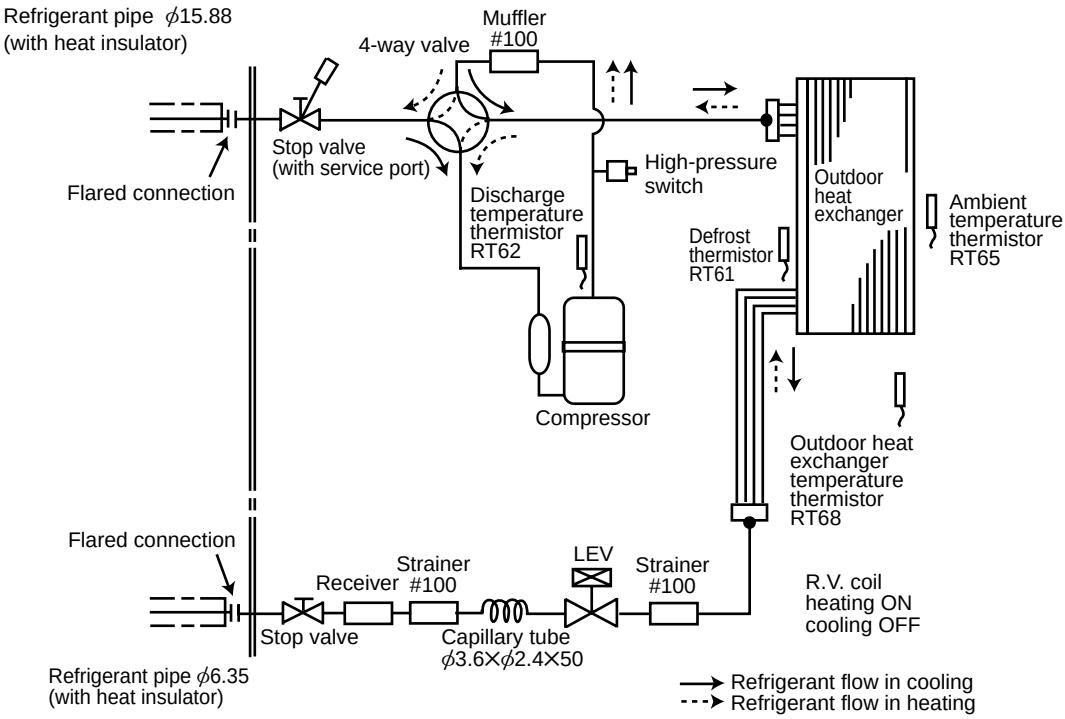
SUZ-KA50VA2.TH

Unit: mm



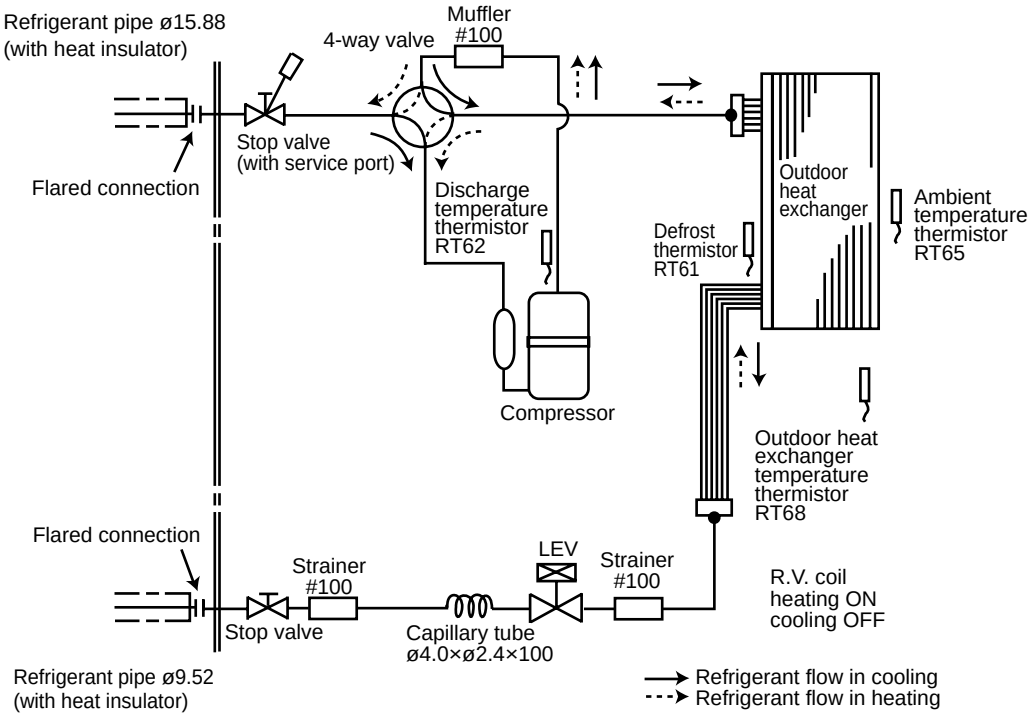
SUZ-KA60VA2.TH

Unit: mm



SUZ-KA71VA2.TH

Unit: mm



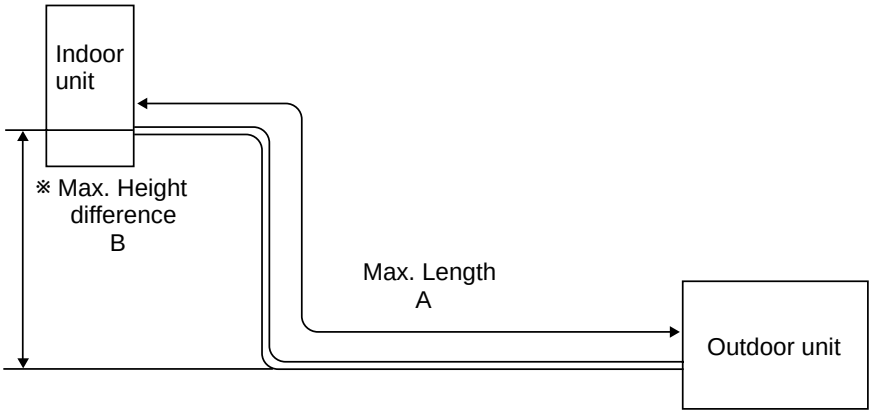
SUZ-KA25VA2.TH SUZ-KA35VA2.TH SUZ-KA50VA2.TH
SUZ-KA60VA2.TH SUZ-KA71VA2.TH

MAX. REFRIGERANT PIPING LENGTH

Models	Refrigerant piping: m		Piping size O.D: mm	
	Max. Length A	Max. Height difference B	Gas	Liquid
SUZ-KA25VA2.TH	20	12	9.52	6.35
SUZ-KA35VA2.TH				
SUZ-KA50VA2.TH	30	30(15)	12.7	
SUZ-KA60VA2.TH			15.88	
SUZ-KA71VA2.TH				9.52

( ): MFZ-KA50VA-E4

MAX. HEIGHT DIFFERENCE



※ Height difference limitations are binding regardless of which unit, indoor or outdoor, is position high.

ADDITIONAL REFRIGERANT CHARGE (R410A: g)

Models	Outdoor unit precharged	Refrigerant piping length (one way)											
		5m	6m	7m	8m	9m	10m	11m	12m	13m	14m	15m	20m
SUZ-KA25VA2.TH	800	0	0	0	90	120	150	180	210	240	270	300	450
SUZ-KA35VA2.TH	1,050	0	0	0	90	120	150	180	210	240	270	300	450

Calculation: Xg=30g/m×(Refrigerant piping length(m)-5)

Models	Outdoor unit precharged	Refrigerant piping length (one way)					
		7m	10m	15m	20m	25m	30m
SUZ-KA50VA2.TH	1,600	0	60	160	260	360	460
SUZ-KA60VA2.TH	1,800	0	60	160	260	360	460

Calculation : Xg=20g/m × (Refrigerant piping length(m)–7)

Models	Outdoor unit precharged	Refrigerant piping length (one way)					
		7m	10m	15m	20m	25m	30m
SUZ-KA71VA2.TH	1,800	0	165	440	715	990	1,265

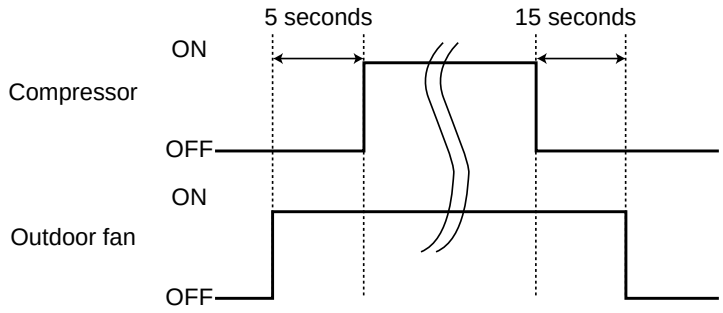
Calculation : Xg=55g/m × (Refrigerant piping length(m)-7)

9 ACTUATOR CONTROL

SUZ-KA25VA2.TH SUZ-KA35VA2.TH SUZ-KA50VA2.TH
SUZ-KA60VA2.TH SUZ-KA71VA2.TH

9-1. Outdoor fan motor control

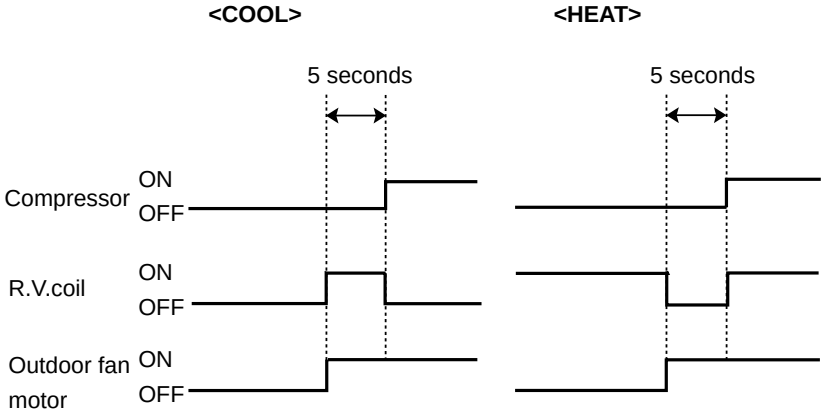
The fan motor turns ON/OFF, interlocking with the compressor.
[ON] The fan motor turns ON 5 seconds before the compressor starts up.
[OFF] The fan motor turns OFF 15 seconds after the compressor has stopped running.



9-2. R.V. coil control

Heating · · · · · · · · · · · · · · · · · · ON
Cooling . . . . . OFF
Dry · OFF

NOTE: The 4-way valve reverses for 5 seconds right before start-up of the compressor.



9-3. Relation between main sensor and actuator

Sensor	Purpose	Actuator			
		Compressor	LEV	Outdoor fan motor	R.V.coil
Discharge temperature thermistor	Protection	○	○		
Indoor coil temperature thermistor	Cooling: Coil frost prevention	○			
	Heating: High pressure protection	○	○		
Defrost thermistor	Heating: Defrosting	○	○	○	○
Fin temperature thermistor	Protection	○		○	
Ambient temperature thermistor	Cooling: Low ambient temperature operation	○	○	○	
Outdoor heat exchanger temperature thermistor	Cooling: Low ambient temperature operation	○	○	○	
	Cooling: High pressure protection	○	○	○	

10 SERVICE FUNCTIONS

SUZ-KA25VA2.TH SUZ-KA35VA2.TH

CHANGE IN DEFROST SETTING

<JS> When the JS wire of the outdoor Inverter P.C. board is cut/ soldered, the defrost finish temperature is changed.
(Refer to 11-6-1)

Jumper wire		Defrost finish temperature	
		SUZ-KA25VA2.TH	**SUZ-KA35VA2.TH**
JS	soldered (Initial setting)	5℃	10℃
	none (cut)	8℃	13℃

11 TROUBLESHOOTING

SUZ-KA25VA2.TH SUZ-KA35VA2.TH
SUZ-KA50VA2.TH SUZ-KA60VA2.TH SUZ-KA71VA2.TH

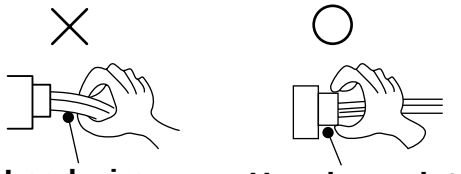
11-1. Cautions on troubleshooting

1. Before troubleshooting, check the following:

1) Check the power supply voltage.
2) Check the indoor/outdoor connecting wire for miswiring.

2. Take care the following during servicing.

1) Before servicing the air conditioner, be sure to turn OFF the main unit first with the remote controller, and turn off the breaker.
2) Be sure to turn OFF the power supply before removing the front panel, the cabinet, the top panel, and the electronic control P.C. board.
3) When removing the electrical parts, be careful of the residual voltage of smoothing capacitor.
4) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.
5) When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.



3. Troubleshooting procedure

1) First, check if the OPERATION INDICATOR lamp is blinking on and off to indicate an abnormality. To make sure, check how many times the abnormality indication is blinking on and off before starting service work.
2) Before servicing check that the connector and terminal are connected properly.
3) If the electronic control P.C. board is supposed to be defective, check the copper foil pattern for disconnection and the components for bursting and discoloration.
4) When troubleshooting, refer to 11-2. and 11-3.

11-2. Failure mode recall function

As this air conditioner has a function to memorize all the failures that had happened, the latest failure detail can be recalled by following the procedures below.
Use this function when the check code is not displayed with wired remote controller or the remote controller at use is wireless type.

11-2-1. Flow chart of the indoor/outdoor unit failure mode recall function

Operational procedure (For wireless remote controller)

Setting up the failure mode recall function

Turn ON the power supply.
① While pressing both OPERATION SELECT button and TOO COOL button on the remote controller at the same time, press RESET button.
② First, release RESET button.
And release the other two buttons since all LCD in operation display section of the remote controller is displayed after 3 seconds.

※1
Press OPERATE/STOP (ON/OFF) button of the remote controller
(the set temperature is displayed).

Does OPERATION INDICATOR lamp on the indoor unit blink at the interval of 0.5 seconds?
Blinks: Either indoor or outdoor unit is abnormal.
Beep sounds are emitted at the same timing of the blinking of OPERATION INDICATOR lamp. ※2

No (OFF) → Indoor unit is normal.
There is a possibility that the plasma or outdoor unit is abnormal.
Confirm the failure detail on the LED display of the outdoor controller board.(refer to 11-2-4.)

Yes (Blinks)

Judgment of indoor/outdoor abnormality

Before blinking, does POWER lamp stay ON for 3 seconds?
Stays ON for 3 seconds (without beep):
The outdoor unit is abnormal.

Yes → The outdoor unit is abnormal.
Check the blinking pattern, and confirm the abnormal point(11-2.3.).
Make sure to check at least two consecutive blinking cycles. ※3

No → The indoor unit is abnormal.
Check the blinking pattern, and confirm the abnormal point.
Make sure to check at least two consecutive blinking cycles. ※2

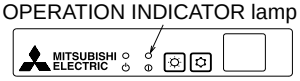
Releasing the failure mode recall function

Release the failure mode recall function by the following procedures.
①With the remote controller headed towards the indoor unit, press any button that is not used in this failure mode recall function (e.g. TIMER button) .
OR
①Turn OFF the power supply and turn ON it again.
②Press RESET button of the remote controller.

Repair the defective parts.

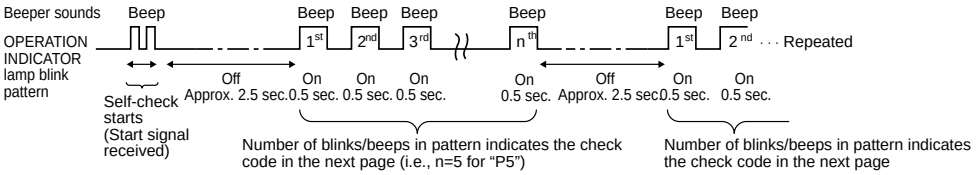
① While pressing both OPERATION SELECT button and TOO COOL button on the remote controller at the same time, press RESET button.
② First, release RESET button.
And release the other two buttons since all LCD in operation display section of the remote controller is displayed after 3 seconds.

※1. Regardless of normal or abnormal, a short beep is emitted once as the signal is received.

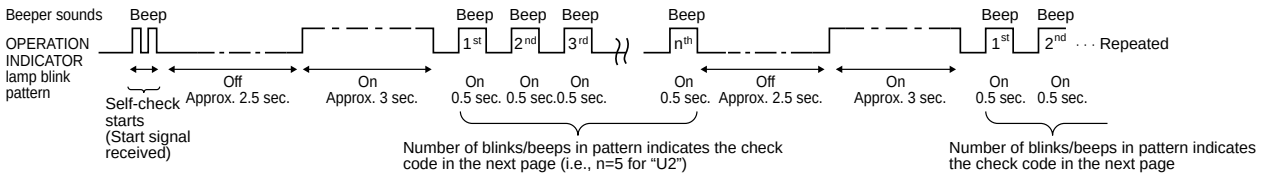


Note1. Make sure to release the failure mode recall function once it is set up, otherwise the unit cannot operate properly.
2. If the abnormal condition is not deleted from the memory, the last abnormal condition is kept memorized.

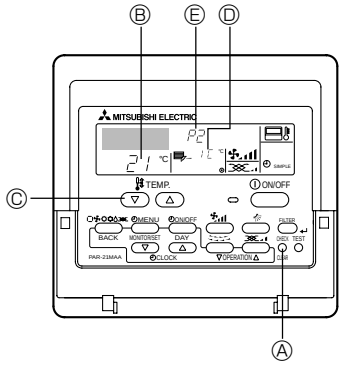
※2. Blinking pattern when the indoor unit is abnormal:[Output pattern A]



※3.Blinking pattern when the outdoor unit is abnormal:[Output pattern B]



11-2-2. Wired remote controller



Ⓐ CHECK button
Ⓑ Refrigerant address
Ⓒ TEMP. button
Ⓓ IC: Indoor unit
OC: Outdoor unit
Ⓔ Check code

① Turn on the power.
② Press the [CHECK] button twice.
③ Set refrigerant address with [TEMP] button if system control is used.
④ Press the [ON/OFF] button to stop the self-check.

11-2-3. Failure mode table (Wireless remote controller/Wired remote controller)

[Output pattern A] Errors detected by indoor unit

Wired remote controller	Wireless remote controller	Symptom	Remark
Check code	Beeper sounds/OPERATION INDICATOR lamp blinks (Number of times)		
P1	1	Intake sensor error	
P2	2	Pipe (TH2) sensor error	
P9		Pipe (TH5) sensor error	
E6,E7	3	Indoor/outdoor unit communication error	
P4	4	Drain sensor error/Float switch connector open	
P5	5	Drain pump error	
P6	6	Freezing/Overheating protection operation	
EE	7	Communication error between indoor and outdoor units	
P8	8	Pipe temperature error	
E4, E5	9	Remote controller signal receiving error	
–	10	–	
–	11	–	
Fb	12	Indoor unit control system error (memory error, etc.)	
E0, E3	–	Remote controller transmission error	
E1, E2	–	Remote controller control board error	

[Output pattern B] Errors detected by unit other than indoor unit (outdoor unit, etc.)

Wired remote controller	Wireless remote controller	Symptom	Remark
Check code	Beeper sounds/OPERATION INDICATOR lamp blinks (Number of times)		
E9	1	Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit)	For details, check the LED display of the outdoor controller board.
UP	2	Compressor overcurrent interruption	
U3,U4	3	Open/short of outdoor unit thermistors	
UF	4	Compressor overcurrent interruption (When compressor locked)	
U2	5	Abnormal high discharging temperature/insufficient refrigerant	
U1,Ud	6	Abnormal high pressure (63H operated)/Overheating protection operation	
U5	7	Abnormal temperature of heat sink	
U8	8	Outdoor unit fan protection stop	
U6	9	Compressor overcurrent interruption/Abnormal of power module	
U7	10	Abnormality of super heat due to low discharge temperature	
U9,UH	11	Abnormality such as overvoltage or voltage shortage and abnormal synchronous signal to main circuit/Current sensor error	
–	12	–	
–	13	–	
Others	14	Other errors	

- If the beeper does not sound again after the initial two beeps to confirm the self-check start signal was received and the OPERATION INDICATOR lamp does not come on, there are no error records.
- If the beeper sounds three times continuously “beep, beep, beep (0.4 + 0.4 + 0.4 sec.)” after the initial two beeps to confirm the self-check start signal was received, the specified refrigerant address is incorrect.
- On wireless remote controller
  The continuous buzzer sounds from receiving section of indoor unit.
  Blink of operation lamp
- On wired remote controller
  Check code displayed in the LCD.

11-2-4. Outdoor unit failure mode table

SUZ-KA25VA2.TH SUZ-KA35VA2.TH SUZ-KA50VA2.TH

Abnormal point (Failure mode/protection)	LED indication (Outdoor P.C. board)	Condition	Correspondence
None (Normal)	—	—	—
Outdoor power system	—	Overcurrent protection stop is continuously performed 3 times within 1 minute after the compressor gets started.	•Reconnect connectors. •Refer to 11-5. Ⓐ "How to check inverter/compressor". •Check stop valve.
Discharge temperature thermistor	1-time flash every 2.5 seconds	Thermistor shorts or opens during compressor running.	•Refer to 11-5. Ⓕ "Check of outdoor thermistors". Defective outdoor thermistors can be identified by checking the blinking pattern of LED.
Defrost thermistor			
Fin temperature thermistor	3-time flash 2.5 seconds OFF		
P.C. board temperature thermistor	4-time flash 2.5 seconds OFF		
Ambient temperature thermistor	2-time flash 2.5 seconds OFF		
Overcurrent	11-time flash 2.5 seconds OFF	Large current flows into intelligent power module.	•Reconnect compressor connector. •Refer to 11-5. Ⓐ "How to check inverter/compressor". •Check stop valve.
Compressor synchronous abnormality (Compressor start-up failure protection)	12-time flash 2.5 seconds OFF	Waveform of compressor current is distorted.	•Reconnect compressor connector. •Refer to 11-5. Ⓐ "How to check inverter/compressor".
Discharge temperature	—	Temperature of discharge temperature thermistor exceeds 116°C, compressor stops. Compressor can restart if discharge temperature thermistor reads 100°C or less 3 minutes later.	•Check refrigerant circuit and refrigerant amount. •Refer to 11-5. Ⓙ "Check of LEV".
High pressure	—	Temperature indoor coil thermistor exceeds 70°C in HEAT mode. Temperature defrost thermistor exceeds 70°C in COOL mode.	•Check refrigerant circuit and refrigerant amount. •Check stop valve.
Fin temperature/P.C. board temperature	7-time flash 2.5 seconds OFF	Temperature of fin temperature thermistor on the inverter P.C. board exceeds 75 ~ 80°C, or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 70 ~ 75°C.	•Check around outdoor unit. •Check outdoor unit air passage. •Refer to 11-5. Ⓗ "Check of outdoor fan motor".
Outdoor fan motor	—	Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up.	•Refer to 11-5. Ⓗ "Check of outdoor fan motor". Refer to 11-5. Ⓚ "Check of inverter P.C. board".
Nonvolatile memory data	5-time flash 2.5 seconds OFF	Nonvolatile memory data cannot be read properly.	•Replace the inverter P.C. board.
Discharge temperature	—	Temperature of discharge temperature thermistor has been 50°C or less for 20 minutes.	•Refer to 11-5. Ⓙ "Checkof LEV". •Check refrigerant circuit and refrigerant amount.
DC voltage	8-time flash 2.5 seconds OFF	DC voltage of inverter cannot be detected normally.	•Refer to 11-5. Ⓐ "How to check inverter/compressor".
Each phase current of compressor	9-time flash 2.5 seconds OFF	Each phase current of compressor cannot be detected normally.	
Overcurrent Compressor open-phase	10-time flash 2.5 seconds OFF	Large current flows into intelligent power module (IPM). The open-phase operation of compressor is detected. The interphase short out occurs in the output of the intelligent power module (IPM). The compressor winding shorts out.	•Reconnect compressor connector. •Refer to 11-5. Ⓐ "How to check inverter/compressor".
Stop valve (Closed valve)	14-time flash 2.5 seconds OFF	Closed valve is detected by compressor current.	•Check stop valve.

NOTE: Blinking patterns of this mode differ from the ones of Troubleshooting check table (11-3.).

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Outdoor LED indication		Abnormal point (Failure mode)	Details of abnormal	Detecting method	Check point
LED1	LED2				
Lighting	Once	Outdoor thermistors	Discharge temperature thermistor	When a short circuit is detected in the thermistor during operation, or when an open circuit is detected in the thermistor after 10 minutes of compressor start-up.	• Check the outdoor thermistors.
			Defrost thermistor	When a short circuit is detected in the thermistor during operation, or when an open circuit is detected in the thermistor after 5 minutes of compressor start-up.	
	Twice		Ambient temperature thermistor	When a short or open circuit is detected in the thermistor during operation.	
	3 times		Fin temperature thermistor		
	4 times		P.C. board temperature thermistor		• Replace the outdoor electronic control P.C. board.
	9 times		Outdoor heat exchanger temperature thermistor	When a short circuit is detected in the thermistor during operation, or when an open circuit is detected in the thermistor after 5 minutes (in cooling) and 10 minutes (in heating) of compressor start-up.	• Check the outdoor thermistors.
	5 times	Outdoor control system	EEPROM	When nonvolatile memory data cannot be read properly, unit stops.	• Replace the outdoor electronic control P.C. board.
	6 times	Converter control system	Communication error between P.C. boards	When the communication between boards protection stop is continuously performed twice.	• Check the connecting wire between outdoor electronic control P.C. board and power board.
			Communication between P.C. boards protection	Communication error occurs between the electronic control P.C.board and power board for more than 10 seconds.	
	7 times		Current sensor	Current sensor protection stop is continuously performed twice.	• Replace the power board.
			Current sensor protection	When a short or open circuit is detected in the current sensor during compressor operating.	
5 times	Goes out		Zero cross detecting circuit	The protection stop of the zero cross detecting circuit is continuously performed 10 times.	• Check the connecting wire among electronic control P.C. board, noise filter P.C. board and power board.
			Zero cross detecting circuit protection	When zero cross signal cannot be detected while the compressor is operating.	
			Converter protection	When a failure is detected in the operation of the converter during operation.	• Replace the power board.
			Bus-bar voltage protection (1)	When the bus-bar voltage exceeds 400V or falls to 200V or below during compressor operating.	
6 times	Goes out		Bus-bar voltage protection (2) ※Even if this protection stop is performed continuously 3 times, it does not mean the abnormality in outdoor power system.	When the bus-bar voltage exceeds 400V or falls to 50V or below during compressor operating.	
Once	Goes out	Overcurrent protection	IPM protection	When overcurrent is detected after 30 seconds of compressor start-up.	• Check the connection of the compressor connecting wire. • Check the inverter/ compressor. • Check the stop valve.
			Lock protection	When overcurrent is detected within 30 seconds after the compressor gets started.	
3 times	Goes out	Fin temperature/P.C. board temperature overheat	Fin temperature overheat protection	When the fin temperature exceeds 87℃ during operation.	• Check around outdoor unit. • Check outdoor unit air passage. • Check the outdoor fan motor.
4 times	Goes out		P.C.boad temperature overheat protection	When the P.C. board temperature exceeds 70℃ during operation.	
Lighting	Lighting	Refrigerant system	Discharge temperature overheat protection	When discharge temperature exceeds 116℃.	• Check refrigerant circuit and refrigerant amount. • Check the LEV. • Check the outdoor thermistors.
		High pressure protection	HPS protection	When high-pressure is detected with the high-pressure switch (HPS) during operation.	• Check refrigerant circuit and refrigerant amount. • Check the stop valve.
			High pressure protection (Overheat protection)	When the indoor coil thermistor (TH5) exceeds 70℃ in HEAT mode. When the outdoor heat exchanger thermistor exceeds 70℃ in COOL mode.	
		Low discharge temperature	Low discharge temperature protection	When the frequency of the compressor is kept 80Hz or more and discharge temperature is kept under 39℃ for more than 20 minutes.	• Check refrigerant circuit and refrigerant amount. • Check the LEV.
		Outdoor fan	Outdoor fan protection	When outdoor fan has stopped within 30 seconds 3 times in a row after outdoor fan start -up,unit stops.	• Check the outdoor fan motor.
		Outdoor power system	Outdoor power system	When IPM protection stop or lock protection stop is continuously performed 3 times within 1 minute after the compressor get started, or when converter protection stop or bus-bar voltage protection stop is continuously performed 3 times within 3 minutes after start-up.	• Reconnect compressor connector. • Check the inverter/ compressor. • Check the stop valve. • Check the PAM module.

NOTE: Blinking patterns of this mode differ from the ones of Troubleshooting check table (11-3).

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Abnormal point (Failure mode / protection)	LED indication (Outdoor P.C. board)	Condition	Correspondence
None (Normal)	—	—	—
Outdoor power system	—	Overcurrent protection stop is continuously performed 3 times within 1 minute after the compressor gets started.	•Reconnect connectors. •Refer to 11-5. ⓔ"How to check inverter/ compressor". •Check stop valve.
Discharge temperature thermistor	1-time flash every 2.5 seconds	Thermistor shorts or opens during compressor running.	•Refer to 11-5.ⓖ"Check of outdoor thermistors". Defective outdoor thermistors can be identified by checking the blinking pattern of LED.
Defrost thermistor			
Fin temperature thermistor	3-time flash 2.5 seconds OFF		
P.C. board temperature thermistor	4-time flash 2.5 seconds OFF		
Ambient temperature thermistor	2-time flash 2.5 seconds OFF		
Outdoor heat exchanger temperature thermistor	—		
Overcurrent	11-time flash 2.5 seconds OFF	Large current flows into intelligent power module.	•Reconnect compressor connector. •Refer to 11-5.ⓔ"How to check inverter/ compressor". •Check stop valve.
Compressor synchronous abnormality (Compressor start-up failure protection)	12-time flash 2.5 seconds OFF	Waveform of compressor current is distorted.	•Reconnect compressor connector. •Refer to 11-5.ⓔ"How to check inverter/ compressor".
Discharge temperature	—	Temperature of discharge temperature thermistor exceeds 116°C, compressor stops. Compressor can restart if discharge temperature thermistor reads 100°C or less 3 minutes later.	•Check refrigerant circuit and refrigerant amount. •Refer to 11-5.ⓚ"Check of LEV".
High pressure	—	Temperature indoor coil thermistor exceeds 70°C in HEAT mode. Temperature defrost thermistor exceeds 70°C in COOL mode.	•Check refrigerant circuit and refrigerant amount. •Check stop valve.
Fin temperature/ P.C. board temperature	7-time flash 2.5 seconds OFF	Temperature of fin temperature thermistor on the inverter P.C. board exceeds 75 ~ 80° C, or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 70 ~ 75°C.	•Check around outdoor unit. •Check outdoor unit air passage. •Refer to 11-5.ⓘ"Check of outdoor fan motor".
Outdoor fan motor	—	Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up.	•Refer to 11-5.ⓘ"Check of outdoor fan motor". Refer to 11-5.ⓘ"Check of inverter P.C. board".
Nonvolatile memory data	5-time flash 2.5 seconds OFF	Nonvolatile memory data cannot be read properly.	•Replace the inverter P.C. board.
Power module	6-time flash 2.5 seconds OFF	The interphase short circuit occurs in the output of the intelligent power module (IPM). The compressor winding shorts circuit.	•Refer to 11-5. ⓔ"How to check inverter/ compressor".
Discharge temperature	—	Temperature of discharge temperature thermistor has been 50°C or less for 20 minutes.	•Refer to 11-5.ⓚ"Check of LEV". •Check refrigerant circuit and refrigerant amount.
DC voltage	8-time flash 2.5 seconds OFF	DC voltage of inverter cannot be detected normally.	•Refer to 11-5.ⓔ"How to check inverter/ compressor".
Each phase current of compressor	9-time flash 2.5 seconds OFF	Each phase current of compressor cannot be detected normally.	
Overcurrent Compressor open-phase	10-time flash 2.5 seconds OFF	Large current flows into intelligent power module (IPM). The open-phase operation of compressor is detected. The interphase short circuit occurs in the output of the intelligent power module (IPM). The compressor winding shorts circuit.	•Reconnect compressor connector. •Refer to 11-5. ⓔ"How to check inverter/ compressor".
Stop valve (Closed valve)	14-time flash 2.5 seconds OFF	Closed valve is detected by compressor current.	•Check stop valve

NOTE: Blinking patterns of this mode differ from the ones of Troubleshooting check table (11-3).

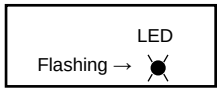
11-3. Trouble shooting check table

SUZ-KA25VA2.TH SUZ-KA35VA2.TH SUZ-KA50VA2.TH

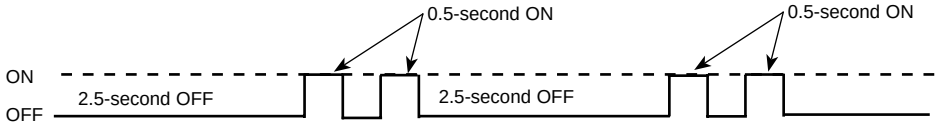
No.	Symptom	LED indication	Abnormal point/ Condition	Condition	Correspondence
1	Outdoor unit does not operate.	1-time flash every 2.5 seconds	Outdoor power system	Overcurrent protection stop is continuously performed 3 times within 1 minute after the compressor gets started, or failure of restart of compressor has repeated 24 times.	•Reconnect connector of compressor. •Refer to 11-5. Ⓐ "How to check inverter/compressor". •Check stop valve.
2			Outdoor thermistors	Discharge temperature thermistor, fin temperature thermistor, defrost thermistor, P.C. board temperature thermistor or ambient temperature thermistor shorts or opens during compressor running.	•Refer to 11-5. Ⓕ "Check of outdoor thermistors".
3			Outdoor control system	Nonvolatile memory data cannot be read properly. (The left lamp of OPERATION INDICATOR lamp of the indoor unit lights up or flashes 7-time.)	•Replace inverter P.C. board.
4		6-time flash 2.5 seconds OFF	Serial signal	The communication fails between the indoor and outdoor unit for 3 minutes.	•Refer to 11-5. Ⓛ "How to check miswiring and serial signal error.
5		11-time flash 2.5 seconds OFF	Stop valve/ Closed valve	Closed valve is detected by compressor current.	•Check stop valve.
6		14-time flash 2.5 seconds OFF	Outdoor unit (Other abnormality)	Outdoor unit is defective.	•Refer to 11-2.1. "Flow chart of the detailed outdoor unit failure mode recall function".
7	'Outdoor unit stops and restarts 3 minutes later' is repeated.	2-time flash 2.5 seconds OFF	Overcurrent protection	Large current flows into intelligent power module, or compressor repeats after 15 seconds when overcurrent protection occurs within 10 seconds after compressor starts. (Repeated 24 times at Maximum)	•Reconnect connector of compressor. •Refer to 11-5. Ⓐ "How to check inverter/compressor". •Check stop valve.
8		3-time flash 2.5 seconds OFF	Discharge temperature overheat protection	Temperature of discharge temperature thermistor exceeds 116°C, compressor stops. Compressor can restart if discharge temperature thermistor reads 100°C or less 3 minutes later.	•Check refrigerant circuit and refrigerant amount. •Refer to 11-5. Ⓙ "Check of LEV".
9		4-time flash 2.5 seconds OFF	Fin temperature/P.C. board temperature thermistor overheat protection	Temperature of fin temperature thermistor on the heat sink exceeds 75 ~ 80°C or temperature of P.C. board temperature thermistor on the inverter P.C.board exceeds 70 ~ 75°C.	•Check around outdoor unit. •Check outdoor unit air passage. •Refer to 11-5. Ⓗ "Check of outdoor fan motor".
10		5-time flash 2.5 seconds OFF	High pressure protection	Indoor coil thermistor exceeds 70°C in HEAT mode. Defrost thermistor exceeds 70°C in COOL mode.	•Check refrigerant circuit and refrigerant amount. •Check stop valve.
11		8-time flash 2.5 seconds OFF	Compressor synchronous abnormality	The waveform of compressor current is distorted.	•Reconnect connector of compressor. •Refer to 11-5. Ⓐ "How to check inverter/compressor".
12		10-time flash 2.5 seconds OFF	Outdoor fan motor	Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up.	•Refer to 11-5. Ⓗ "Check of outdoor fan motor. •Refer to 11-5. Ⓚ "Check of inverter P.C. board.
13		12-time flash 2.5 seconds OFF	Each phase current of compressor	Each phase current of compressor cannot be detected normally	•Refer to 11-5. Ⓐ "How to check inverter/compressor".
14		13-time flash 2.5 seconds OFF	DC voltage	DC voltage of inverter cannot be detected normally.	•Refer to 11-5. Ⓐ "How to check inverter/compressor".
15	Outdoor unit operates.	1-time flash 2.5 seconds OFF	Frequency drop by current protection	Current from power outlet reaches the protection current, and compressor frequency lowers.	The unit is normal, but check the following. •Check if indoor filters are clogged. •Check if refrigerant is short. •Check if indoor/outdoor unit air circulation is short cycled.
16		3-time flash 2.5 seconds OFF	Frequency drop by high pressure protection	Temperature of indoor coil thermistor exceeds 55°C in HEAT mode, compressor frequency lowers.	
			Frequency drop by defrosting in COOL mode	Indoor coil thermistor reads 8°C or less in COOL mode, compressor frequency lowers.	
17		4-time flash 2.5 seconds OFF	Frequency drop by discharge temperature protection	Temperature of discharge temperature thermistor exceeds 111°C, compressor frequency lowers.	•Check refrigerant circuit and refrigerant amount. •Refer to 11-5. Ⓙ "Check of LEV". •Refer to 11-5. Ⓕ "Check of outdoor thermistors".
18	Outdoor unit operates.	7-time flash 2.5 seconds OFF	Low discharge temperature protection	Temperature of discharge temperature thermistor has been 50°C or less for 20 minutes.	•Refer to 11-5. Ⓙ "Check of LEV". •Check refrigerant circuit and refrigerant amount.
19		8-time flash 2.5 seconds OFF	PAM protection PAM: Pulse Amplitude Modulation	The overcurrent flows into IGBT (Insulated Gate Bipolar transistor : TR821) or when the bus-bar voltage reaches 320 V or more, PAM stops and restarts.	This is not malfunction. PAM protection will be activated in the following cases; 1 Instantaneous power voltage drop (Short time power failure) 2 When the power supply voltage is high.
20		9-time flash 2.5 seconds OFF	Inverter check mode	The connector of compressor is disconnected, inverter check mode starts.	•Check if the connector of the compressor is correctly connected. Refer to 11-5. Ⓐ "How to check inverter/ compressor".

NOTE: 1. The location of LED is illustrated at the right figure. Refer to 11-6-1. or 11-6-2.
2. LED is lighted during normal operation.

Inverter P.C. board(Parts side)



The flashing frequency shows the number of times the LED blinks after every 2.5-second OFF.
(Example) When the flashing frequency is "2".



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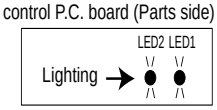
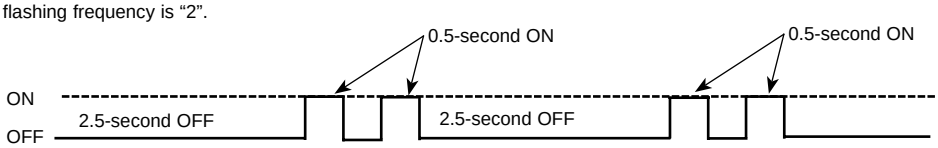
No.	Symptom	Indication		Abnormal point/Condition	Condition	Correspondence
		LED1 (Red)	LED2 (Yellow)			
1	Outdoor unit does not operate.	Lightning	Twice	Outdoor power system	When IPM protection stop or lock protection stop is continuously performed three times within 1 minute after the compressor gets started, or when converter protection stop or bus-bar voltage protection stop is continuously performed three times within 3 minutes after start-up.	• Check the connection of the compressor connecting wire. • Refer to 11-5.ⓗ "How to check inverter/compressor". • Check the stop valve.
2		Lightning	3 times	Discharge temperature thermistor	When a short circuit is detected in the thermistor during operation, or when an open circuit is detected in the thermistor after 10 minutes of compressor start-up.	• Refer to 11-5.ⓖ "Check of outdoor thermistor".
3		Lightning	4 times	Fin temperature thermistor	When a short or open circuit is detected in the thermistor during operation.	• Refer to 11-5.ⓖ "Check of outdoor thermistor".
				P.C board temperature thermistor		• Replace the outdoor electronic control P.C. board.
4		Lightning	5 times	Ambient temperature thermistor	When a short or open circuit is detected in the thermistor during operation.	• Refer to 11-5.ⓖ "Check of outdoor thermistor".
				Outdoor heat exchanger temperature thermistor	When a short circuit is detected in the thermistor during operation, or when an open circuit is detected in the thermistor after 5 minutes (in cooling) and 10 minutes (in heating) of compressor start-up.	
				Defrost thermistor	When a short circuit is detected in the thermistor during operation, or when an open circuit is detected in the thermistor after 5 minutes of compressor start-up.	
5		Lightning	6 times	Serial signal	When the communication fails between the indoor and outdoor unit for 3 minutes.	Refer to 11-5.ⓞ "How to check mis-wiring and serial signal error.
6		Lightning	7 times	Nonvolatile memory data	When the nonvolatile memory data cannot be read properly.	• Replace the outdoor electronic control P.C. board.
7		Lightning	8 times	Current sensor	Current sensor protection stop is continuously performed twice.	• Replace the power board.
8		Lightning	11 times	Communication error between P.C. boards	When the communication protection stop between boards is continuously performed twice.	• Check the connecting wire between outdoor electronic control P.C. board and power board.
9		Lightning	12 times	Zero cross detecting circuit	The protection stop of the zero cross detecting circuit is continuously performed 10 times.	• Check the connecting wire among outdoor electronic control P.C. board, noise filter P.C. board and power board.
10	'Outdoor unit stops and restarts 3 minutes later' is repeated.	Twice	Goes out	IPM protection	When over-current is detected after 30 seconds of compressor start-up.	• Reconnect compressor connector. • Refer to 11-5.ⓗ "How to check inverter/compressor". • Check the stop valve. • Check the power module (PAM module).
				Lock protection	When over-current is detected within 30 seconds of compressor start-up.	
11		3 times	Goes out	Discharge temperature protection	When temperature of discharge temperature thermistor exceeds 116:, compressor stops. Compressor can restart if discharge temperature thermistor reads 100℃ or less 3 minutes later.	• Check the amount of gas and refrigerant circuit. • Refer to 11-5.ⓖ "Check of LEV".
12		4 times	Goes out	Fin temperature protection	When the fin temperature exceeds 87℃ during operation.	•Check refrigerant circuit and refrigerant amount. •Refer to 11-5.ⓖ "Check of LEV".
				P.C. board temperature protection	When the P.C. board temperature exceeds 70℃ during operation.	
13		5 times	Goes out	High-pressure protection	When high-pressure is detected with the high-pressure switch (HPS) during operation.	• Check around of gas and the refrigerant circuit. • Check of stop valve.
					When the outdoor heat exchanger temperature exceeds 70℃ during cooling or when indoor gas pipe temperature exceeds 70℃ during heating.	
14		8 times	Goes out	Converter protection	When a failure is detected in the operation of the converter during operation.	• Replace the power board.
15		9 times	Goes out	Bus-bar voltage protection (1)	When the bus-bar voltage exceeds 400V or falls to 200V or below during compressor operating.	• Replace the power board.
				Bus-bar voltage protection (2)	When the bus-bar voltage exceeds 400V or falls to 50V or below during compressor operating.	
16		13 times	Goes out	Outdoor fan motor	When failure occurs continuously three times within 30 seconds after the fan gets started.	• Refer to 11-5.ⓣ "Check of outdoor fan motor".
17		Lighting	8 times	Current sensor protection	When a short or open circuit is detected in the current sensor during compressor operating.	• Replace the power board.
18		Lighting	11 times	Communication between P.C. boards protection	Communication error occurs between the outdoor electronic control P.C. board and power board for more than 10 seconds.	• Check the connecting wire between outdoor electronic control P.C. board and power board.
19		Lighting	12 times	Zero cross detecting circuit protection	When zero cross signal cannot be detected while the compressor is operating.	• Check the connecting wire among outdoor electronic control P.C. board, noise filter P.C. board and power board.

NOTE 1. The location of LED is illustrated at the right figure.
2. LED is lighted during normal operation.

Outdoor electronic control P.C. board (Parts side)



The flashing frequency shows the number of times the LED blinks after every 2.5-second OFF.
(Example) When the flashing frequency is "2".



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No.	Symptom	Indication		Abnormal point/Condition	Condition	Correspondence
		LED1 (Red)	LED2 (Yellow)			
20	Outdoor unit operates.	Once	Lighting	Primary current protection	When the input current exceeds 15A.	These symptoms do not mean any abnormality of the product, but check the following points. • Check if indoor filters are clogged. • Check if refrigerant is short. • Check if indoor/outdoor unit air circulation is short cycled.
				Secondary current protection	When the current of the compressor exceeds 15A.	
21		Twice	Lighting	High-pressure protection	When the indoor gas pipe temperature exceeds 45℃ during heating.	
				Defrosting in cooling	When the indoor gas pipe temperature falls 3℃ or below during cooling.	
22		3 times	Lighting	Discharge temperature protection	When the discharge temperature exceeds 100℃ during operation.	• Check refrigerant circuit and refrigerant amount. • Refer to 11-5.ⓖ "Check of LEV". • Refer to 11-5.Ⓢ "Check of outdoor thermistors".
23		4 times	Lighting	Low discharge temperature protection	When the frequency of the compressor is kept 80Hz or more and the discharge temperature is kept under 39℃ for more than 20 minutes.	• Refer to 11-5.ⓖ "Check of LEV". • Check refrigerant circuit and refrigerant amount.
24		5 times	Lighting	Cooling high-pressure protection	When the outdoor heat exchanger temperature exceeds 58℃ during operation.	This symptom does not mean any abnormality of the product, but check the following points. • Check if indoor filters are clogged. • Check if refrigerant is short. • Check if indoor/outdoor unit air circulation is short cycled.
25	Outdoor unit operates	9 times	Lighting	Inverter check mode	When the unit is operated with emergency operation switch.	—
26		Lighting	Lighting	Normal	—	—

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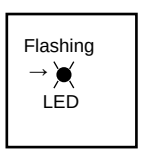
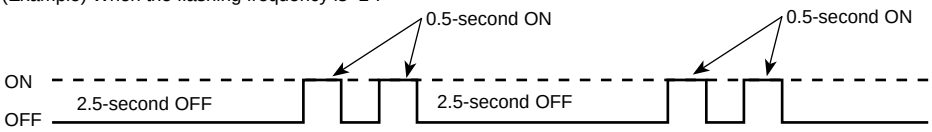
No.	Symptom	LED indication	Abnormal point/ Condition	Condition	Correspondence
1	Outdoor unit does not operate.	1-time flash every 2.5 seconds	Outdoor power system	Overcurrent protection stop is continuously performed 3 times within 1 minute after the compressor gets started.	•Reconnect connector of compressor. •Refer to 11-5.ⓐ "How to check inverter/compressor". •Check stop valve.
2			Outdoor thermistors	Discharge temperature thermistor, fin temperature thermistor, defrost thermistor, P.C. board temperature thermistor, outdoor heat exchanger temperature thermistor or ambient temperature thermistor shorts or opens during compressor running.	•Refer to 11-5.ⓔ "Check of outdoor thermistors".
3			Outdoor control system	Nonvolatile memory data cannot be read properly. (The upper lamp of OPERATION INDICATOR lamp of the indoor unit lights up or flashes 7-time.)	•Replace inverter P.C. board.
4		6-time flash 2.5 seconds OFF	Serial signal	The communication fails between the indoor and outdoor unit for 3 minutes.	•Refer to 11-5. ⓜ"How to check miswiring and serial signal error.
5		11-time flash 2.5 seconds OFF	Stop valve/ Closed valve	Closed valve is detected by compressor current.	•Check stop valve.
6		14-time flash 2.5 seconds OFF	Outdoor unit (Other abnormality)	Outdoor unit is defective.	•Refer to 11-2.1. "Flow chart of the detailed outdoor unit failure mode recall function".
7	'Outdoor unit stops and restarts 3 minutes later' is repeated.	2-time flash 2.5 seconds OFF	Overcurrent protection	Large current flows into intelligent power module.	•Reconnect connector of compressor. •Refer to 11-5. ⓐ"How to check inverter/compressor". •Check stop valve.
8		3-time flash 2.5 seconds OFF	Discharge temperature overheat protection	Temperature of discharge temperature thermistor exceeds 116°C, compressor stops. Compressor can restart if discharge temperature thermistor reads 100°C or less 3 minutes later.	•Check refrigerant circuit and refrigerant amount. •Refer to 11-5. ⓚ"Check of LEV".
9		4-time flash 2.5 seconds OFF	Fin temperature /P.C. board temperature thermistor overheat protection	Temperature of fin temperature thermistor on the heat sink exceeds 75 ~ 80°C or temperature of P.C. board temperature thermistor on the inverter P.C.board exceeds 70 ~ 75°C.	•Check around outdoor unit. •Check outdoor unit air passage. •Refer to 11-5. ⓘ"Check of outdoor fan motor".
10		5-time flash 2.5 seconds OFF	High pressure protection	Indoor coil thermistor exceeds 70°C in HEAT mode. Defrost thermistor exceeds 70°C in COOL mode.	•Check refrigerant circuit and refrigerant amount. •Check stop valve.
11		8-time flash 2.5 seconds OFF	Compressor synchronous abnormality	The waveform of compressor current is distorted.	•Reconnect connector of compressor. •Refer to 11-5. ⓐ"How to check inverter/compressor".
12		10-time flash 2.5 seconds OFF	Outdoor fan motor	Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up.	•Refer to 11-5. ⓘ"Check of outdoor fan motor. •Refer to 11-5. ⓘ"Check of inverter P.C. board.
13		12-time flash 2.5 seconds OFF	Each phase current of compressor	Each phase current of compressor cannot be detected normally.	•Refer to 11-5. ⓐ"How to check inverter/compressor".
14		13-time flash 2.5 seconds OFF	DC voltage	DC voltage of inverter cannot be detected normally.	•Refer to 11-5. ⓐ"How to check inverter/compressor".
15	Outdoor unit operates.	1-time flash 2.5 seconds OFF	Frequency drop by current protection	Current from power outlet is nearing breaker capacity. PFC module stops due to overcurrent.	The unit is normal, but check the following. •Check if indoor filters are clogged. •Check if refrigerant is short. •Check if indoor/outdoor unit air circulation is short cycled.
16		3-time flash 2.5 seconds OFF	Frequency drop by high pressure protection	Temperature of indoor coil thermistor exceeds 55°C in HEAT mode, compressor frequency lowers.	
			Frequency drop by defrosting in COOL mode	Indoor coil thermistor reads 8°C or less in COOL mode, compressor frequency lowers.	
17		4-time flash 2.5 seconds OFF	Frequency drop by discharge temperature protection	Temperature of discharge temperature thermistor exceeds 111°C, compressor frequency lowers.	•Check refrigerant circuit and refrigerant amount. •Refer to 11-5. ⓚ"Check of LEV". •Refer to 11-5. ⓔ"Check of outdoor thermistors".
18	Outdoor unit operates.	7-time flash 2.5 seconds OFF	Low discharge temperature protection	Temperature of discharge temperature thermistor has been 50°C or less for 20 minutes.	•Refer to 11-5. ⓚ"Check of LEV". •Check refrigerant circuit and refrigerant amount.
19		8-time flash 2.5 seconds OFF	Zero cross detecting circuit	Zero cross signal for PAM control cannot be detected.	This is not malfunction. PAM protection will be activated in the following cases: 1 Instantaneous power voltage drop. (Short time power failure) 2 When the power supply voltage is high.
20		9-time flash 2.5 seconds OFF	Inverter check mode	The connector of compressor is disconnected, inverter check mode starts.	•Check if the connector of the compressor is correctly connected. Refer to 11-5. ⓐ"How to check inverter/compressor".

NOTE: 1. The location of LED is illustrated at the right figure. Refer to 11-6-3.
2. LED is lighted during normal operation.

Inverter P.C. board



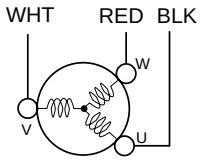
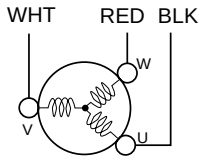
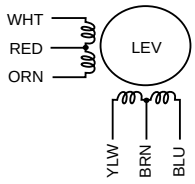
The flashing frequency shows the number of times the LED blinks after every 2.5-second OFF.
(Example) When the flashing frequency is "2".



11-4. Trouble criterion of main parts (1)

SUZ-KA25VA2.TH SUZ-KA35VA2.TH

<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Defrost thermistor (RT61)
Fin temperature thermistor (RT64)
Ambient temperature thermistor (RT65)
Outdoor heat exchanger temperature thermistor(RT68)</td><td>Measure the resistance using a tester.

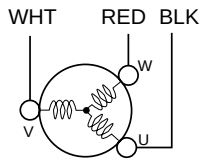
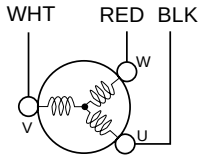
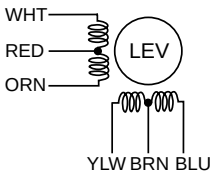
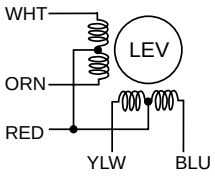
Refer to 11-6. “Test point diagram and voltage”, 11-6-1.
“Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Discharge temperature thermistor (RT62)</td><td>Measure the resistance using a tester.
Before measurement, hold the thermistor with your hands to warm it up.
Refer to 11-6. “Test point diagram and voltage”, 11-6-1.
“Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Compressor</td><td>Measure the resistance between terminals using a tester.
(Temperature : -20°C ~ 40°C)<table><tr><td></td><td colspan="2">Normal</td></tr><tr><td></td><td>SUZ-KA25VA2.TH</td><td>SUZ-KA35VA2.TH</td></tr><tr><td>U-V
U-W
V-W</td><td>1.36 Ω ~ 1.93 Ω</td><td>1.52 Ω ~ 2.17 Ω</td></tr></table></td><td> 
</td></tr>
<tr><td>Outdoor fan motor</td><td>Measure the resistance between terminals using a tester.
(Temperature : -20°C ~ 40°C)<table><tr><td>Color of the lead wire</td><td>Normal</td></tr><tr><td>WHT - BLK
BLK - RED
RED - WHT</td><td>29 Ω ~ 42 Ω</td></tr></table></td><td> 
</td></tr>
<tr><td>R.V. coil (21S4)</td><td>Measure the resistance between terminals using a tester.
(Temperature : -20°C ~ 40°C)<table><tr><td>Normal</td></tr><tr><td>1.19 kΩ ~ 1.78 kΩ</td></tr></table></td><td></td></tr>
<tr><td>Expansion valve coil (LEV)</td><td>Measure the resistance using a tester.
(Temperature : -20°C ~ 40°C)<table><tr><td>Color of the lead wire</td><td>Normal</td></tr><tr><td>WHT - RED</td><td rowspan="4">37 Ω ~ 54 Ω</td></tr><tr><td>RED - ORN</td></tr><tr><td>YLW - BRN</td></tr><tr><td>BRN - BLU</td></tr></table></td><td> 
</td></tr>
</table>

11-4. Trouble criterion of main parts (2)

SUZ-KA50VA2.TH SUZ-KA60VA2.TH SUZ-KA71VA2.TH

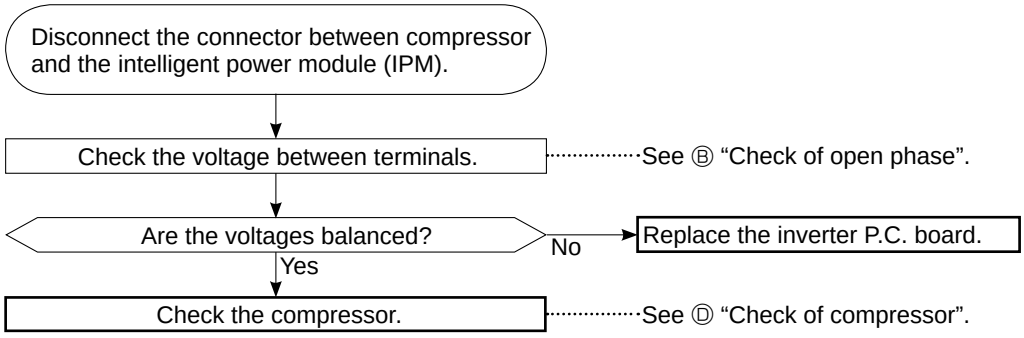
<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Defrost thermistor (RT61)
Fin temperature thermistor (RT64)
Ambient temperature thermistor (RT65)
Outdoor heat exchanger temperature thermistor (RT68)</td><td>Measure the resistance using a tester.

Refer to 11-6. “Test point diagram and voltage”, 11-6-4. “Outdoor electronic control P.C. board” or 11-6-2, 11-6-3. “Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Discharge temperature thermistor (RT62)</td><td>Measure the resistance using a tester.
Before measurement, hold the thermistor with your hands to warm it up.

Refer to 11-6. “Test point diagram and voltage”, 11-6-4. “Outdoor electronic control P.C. board” or 11-6-2, 11-6-3. “Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Compressor</td><td>Measure the resistance between terminals using a tester.
(Temperature : -10°C ~ 40°C)
<table><tr><th colspan="2">Normal</th></tr><tr><th>SUZ-KA50/60VA2.TH</th><th>SUZ-KA71VA2.TH</th></tr><tr><td>0.86 Ω ~ 1.06 Ω</td><td>0.92 Ω ~ 1.12 Ω</td></tr></table></td><td>  </td></tr>
<tr><td>Outdoor fan motor</td><td>Measure the resistance between lead wires using a tester.
(Temperature : -10°C ~ 40°C)
<table><tr><th rowspan="2">Color of the lead wire</th><th colspan="2">Normal</th></tr><tr><th>SUZ-KA50/60VA2.TH</th><th>SUZ-KA71VA2.TH</th></tr><tr><td>RED - BLK</td><td rowspan="3">13.4 Ω ~ 16.4 Ω</td><td rowspan="3">12 Ω ~ 17 Ω</td></tr><tr><td>BLK - WHT</td></tr><tr><td>WHT - RED</td></tr></table></td><td>  </td></tr>
<tr><td>R.V. coil (21S4)</td><td>Measure the resistance using a tester.
(Temperature : -10°C ~ 40°C)
<table><tr><th colspan="2">Normal</th></tr><tr><th>SUZ-KA50/60VA2.TH</th><th>SUZ-KA71VA2.TH</th></tr><tr><td>1.32 kΩ ~ 1.62 kΩ</td><td>1.19 kΩ ~ 1.78 kΩ</td></tr></table></td><td></td></tr>
<tr><td>Expansion valve coil (LEV)</td><td>Measure the resistance using a tester.
(Temperature : -10°C ~ 40°C)
SUZ-KA50/60VA2.TH
<table><tr><th>Color of the lead wire</th><th>Normal</th></tr><tr><td>WHT - RED</td><td rowspan="4">37.4 Ω ~ 53.9 Ω</td></tr><tr><td>RED - ORN</td></tr><tr><td>YLW - BRN</td></tr><tr><td>BRN - BLU</td></tr></table></td><td>  </td></tr>
<tr><td></td><td>SUZ-KA70VA2.TH
<table><tr><th>Color of the lead wire</th><th>Normal</th></tr><tr><td>RED - ORN</td><td rowspan="4">37 Ω ~ 54 Ω</td></tr><tr><td>RED - WHT</td></tr><tr><td>RED - BLU</td></tr><tr><td>RED - YLW</td></tr></table></td><td>  </td></tr>
<tr><td>High pressure switch (HPS)
SUZ-KA60VA2.TH</td><td><table><tr><th colspan="2">Pressure</th></tr><tr><td>3.7 ± 0.15 MPa</td><td>Close</td></tr><tr><td>4.8 $^{+0.05}_{-0.1}$ MPa</td><td>Open</td></tr></table></td><td></td></tr>
</table>

11-5. Troubleshooting flow

Ⓐ How to check inverter/compressor



Ⓑ Check of open phase

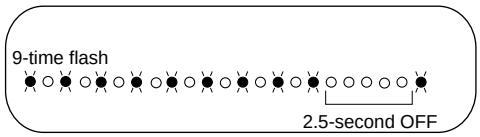
● With the connector between the compressor and the intelligent power module disconnected, activate the inverter and check if the inverter is normal by measuring the balance of voltage between the terminals.

The output voltage values have the tolerance of ± 20%.

<< Operation method(Test run operation)>>

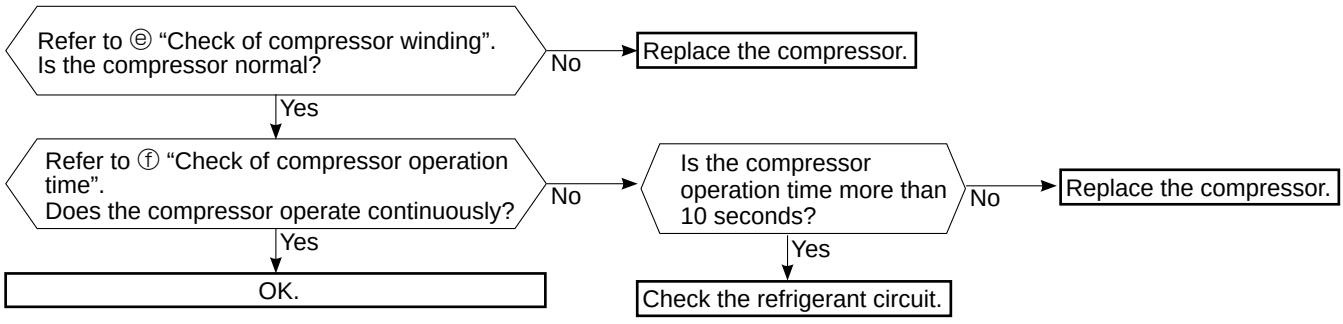
1. Press the EMERGENCY OPERATION switch or the Test button to COOL or HEAT mode.
2. Test run operation starts and continues to operate for 30 minutes.
3. Compressor starts at rated frequency in COOL mode or 58Hz in HEAT mode.
4. Indoor fan operates at High speed.
5. After 30 minutes, test run operation finishes and EMERGENCY OPERATION starts.
6. To cancel test run operation (EMERGENCY OPERATION), press the EMERGENCY OPERATION switch or the ON/OFF button on remote controller.

<<Measurement point>>
At 3 points
BLK (U) - WHT (V)
BLK (U) - RED (W)
WHT (V) - RED (W)



NOTE: 1. Output voltage varies according to power supply voltage.
2. Measure the voltage by analog type tester.
3. During this check, LED of the inverter P.C. board flashes 9 times. (Refer to 11-6-1, 11-6-2)

Ⓒ Check of compressor



[SUZ-KA25/35/50VA2.TH]

Ⓓ Check of compressor winding

● Disconnect the connector between the compressor and intelligent power module, and measure the resistance between the compressor terminals.

<<Measurement point>>

at 3 points

BLK-WHT

BLK-RED ※ Measure the resistance between the lead wires at 3 points.

WHT-RED

<<Judgement>>

Refer to 11-4.

0 [Ω] ·····Abnormal [short]

Infinite [Ω] ·····Abnormal [open]

NOTE: Be sure to zero the ohmmeter before measurement.

Ⓔ Check of compressor operation time

●Connect the compressor and activate the inverter. Then measure the time until the inverter stops due to over current.

<<Operation method>>

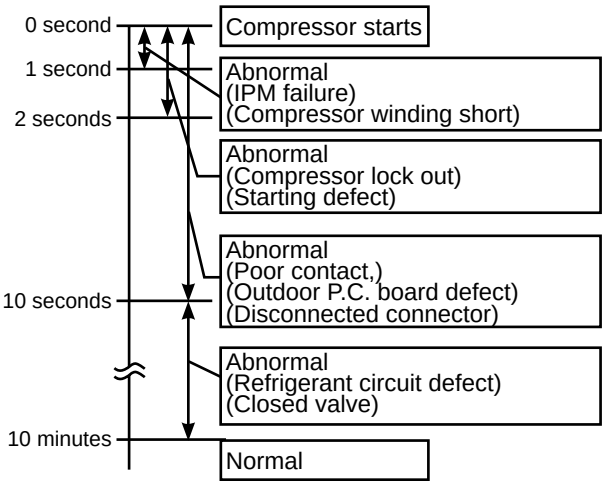
Start heating or cooling operation by pressing EMERGENCY OPERATION switch on the indoor unit.

(TEST RUN OPERATION : Refer to 11-5 Ⓑ.)

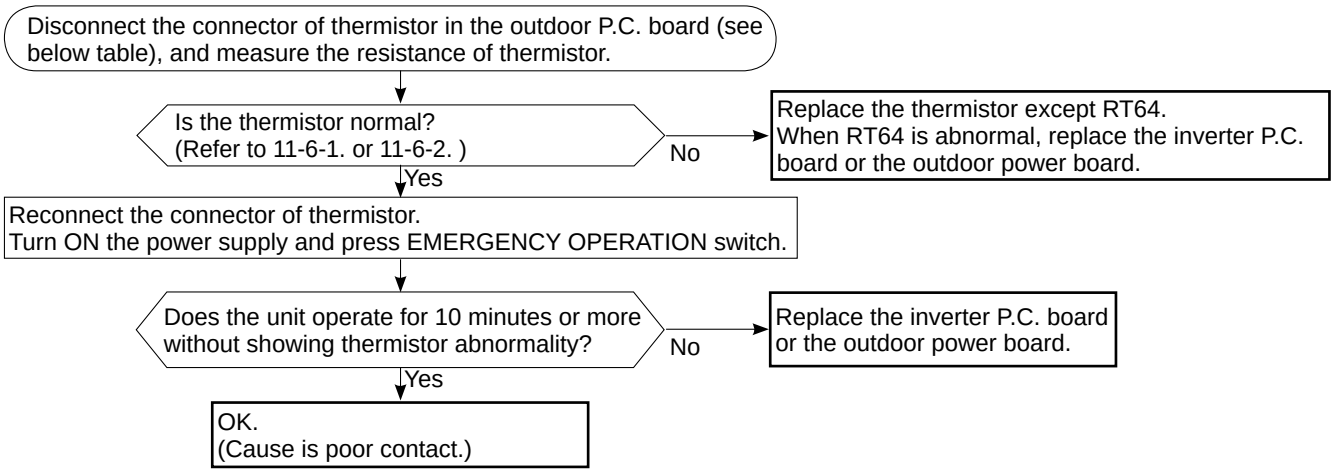
<<Measurement>>

Measure the time from the start of compressor to the stop of compressor due to overcurrent.

<<Judgement>>



Ⓕ Check of outdoor thermistors

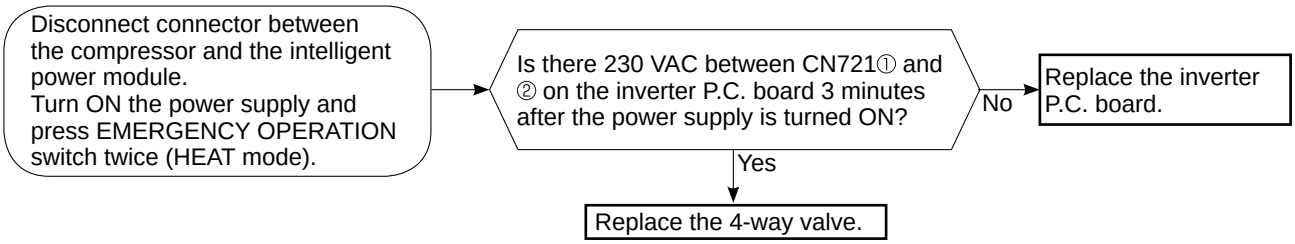


Thermistor	Symbol	Connector, Pin No.	Board
Defrost	RT61	Between CN641 pin1 and pin2	Inverter P.C. board
Discharge temperature	RT62	Between CN641 pin3 and pin4	
Fin temperature	RT64	Between CN642 pin1 and pin2	
Ambient temperature	RT65	Between CN643 pin1 and pin2	
Outdoor heat exchanger temperature	RT68	Between CN644 pin1 and pin3	

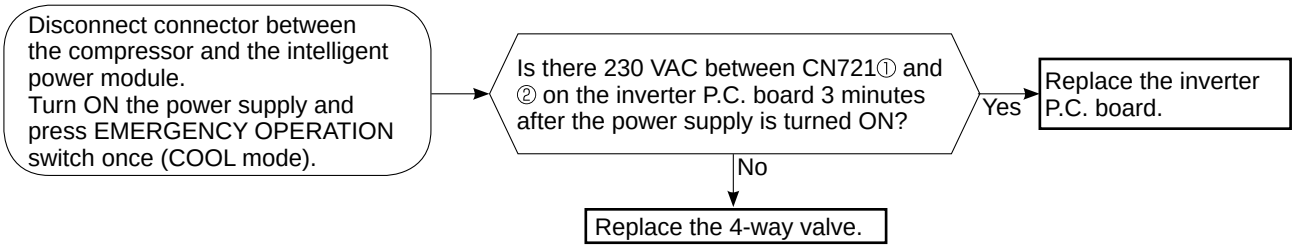
Ⓖ Check of R.V. coil

※ First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to 11-4.
※ In case CN721 is not connected or R.V. coil is open, voltage is generated between the terminal pins of the connector although any signal is not being transmitted to R.V. coil.
Check if CN721 is connected.

Unit operates COOL mode even if it is set to HEAT mode.

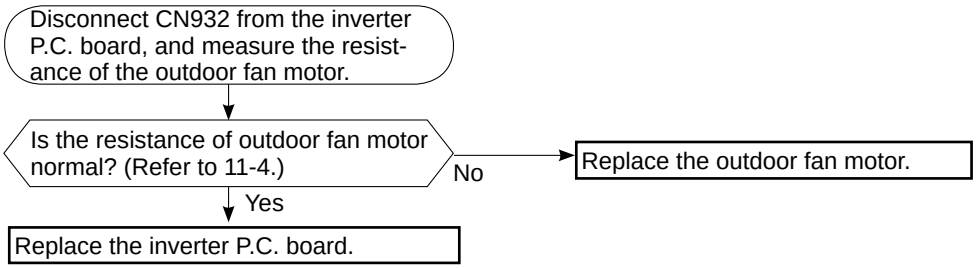


Unit operates HEAT mode even if it is set to COOL mode.

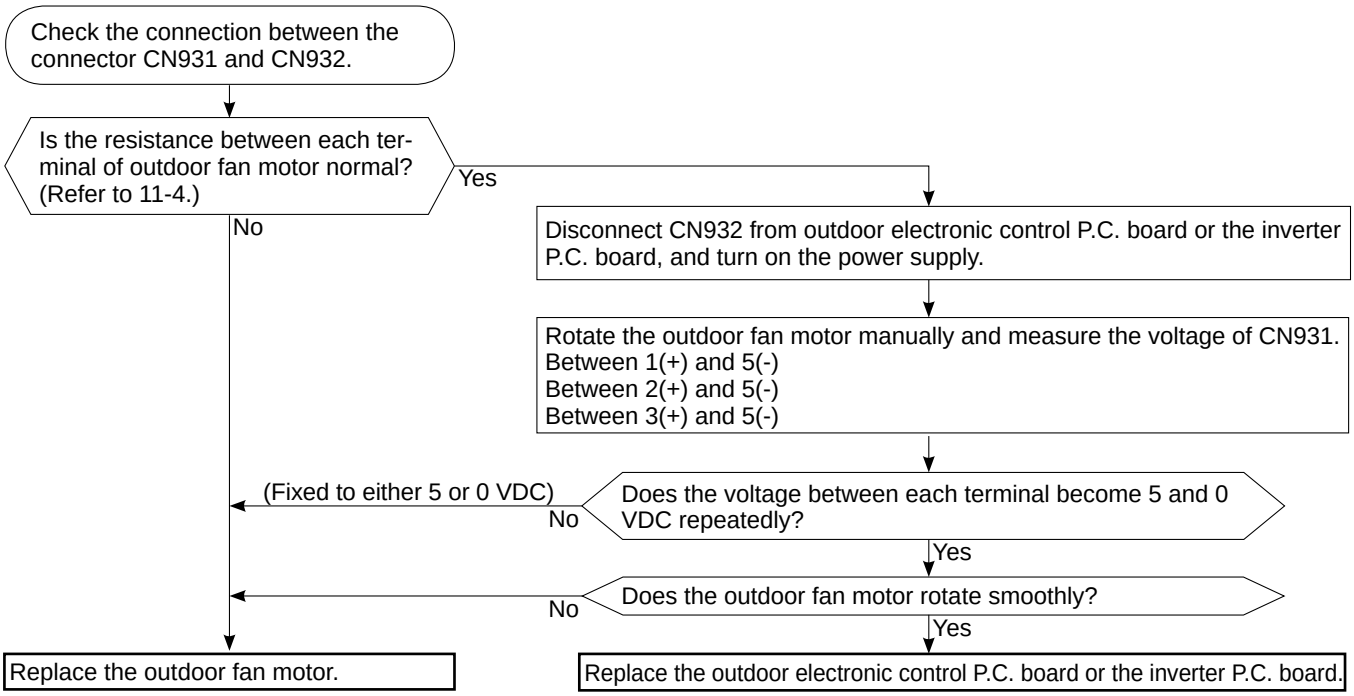


Ⓗ Check of outdoor fan motor

SUZ-KA25/35VA2.TH

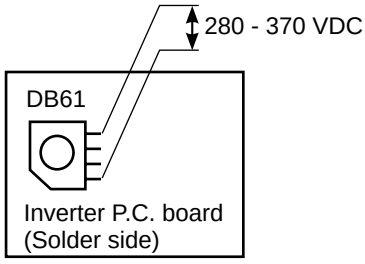


SUZ-KA50VA2.TH



[SUZ-KA25/35/50VA2.TH]

Ⓘ Check of power supply



Disconnect the connector (CN61) between compressor and intelligent power module.
Turn ON power supply and press EMERGENCY OPERATION switch.

Does the left lamp of OPERATION INDICATOR lamp on the indoor unit light up?
- No → Is there voltage 230 VAC between the indoor terminal block S1 and S2?
  - No → Replace the indoor electronic control P.C. board.
  - Yes → Rectify indoor/outdoor connecting wire.
- Yes → Is there voltage 280 - 370 VDC between DB61 (+) and DB61 (–) on the inverter P.C. board? (Refer to 11-6-1. or 11-6-2.)
  - Yes → Dose LED on the inverter P.C. board light up or flash? (Refer to 11-6-1. or 11-6-2.)
    - No → Replace the inverter P.C. board.
    - Yes → If light up, OK. If flash, refer to 11-3.
  - No → Check the electric parts in main circuit.

Ⓙ Check of LEV

(For wireless remote controller use model)

Turn ON the power supply.
<Preparation of the remote controller>
① While pressing both OPERATION SELECT button and TOO COOL button on the remote controller at the same time, press RESET button.
② First, release RESET button.
And release the other two buttons after all LCD except the set temperature in operation display section of the remote controller is displayed after 3 seconds.

Press OPERATE/STOP (ON/OFF) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit. ※1

※1. Regardless of normal or abnormal condition, a short beep is emitted once the signal is received.

Expansion valve operates in full-opening direction.

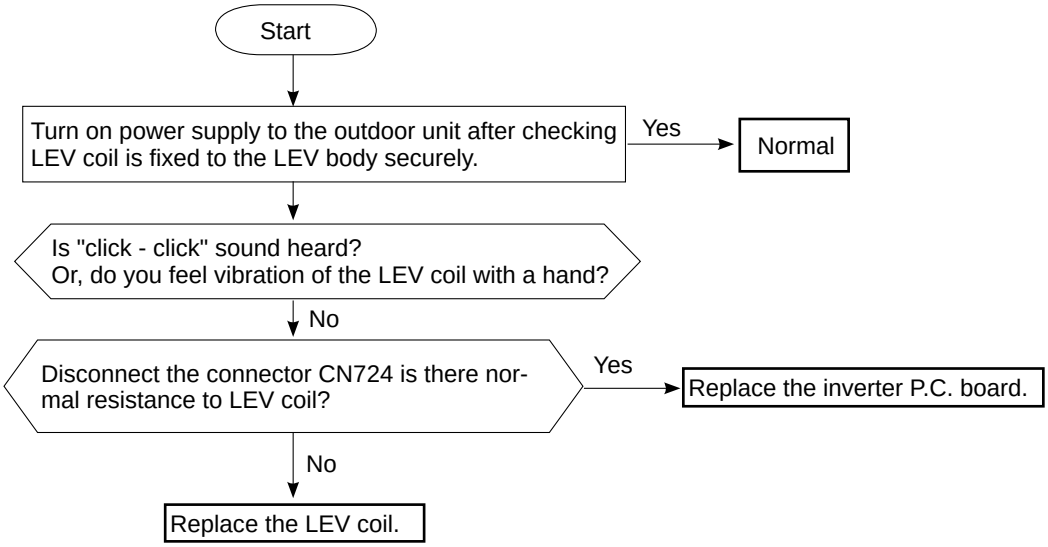
Do you hear the expansion valve "click, click·····"?
Do you feel the expansion valve vibrate on touching it ?
- Yes → OK
- No → Is LEV coil properly fixed to the expansion valve?
  - No → Properly fix the LEV coil to the expansion valve.
  - Yes → Does the resistance of LEV coil have the characteristics? (Refer to 11-4.)
    - Yes → Measure each voltage between connector pins of CN724 on the inverter P.C. board.
      1. Pin③(-) — Pin①(+)
      2. Pin④(-) — Pin①(+)
      3. Pin⑤(-) — Pin①(+)
      4. Pin⑥(-) — Pin①(+)

      Is there about 3 ~ 5 VAC between each?
      NOTE: Measure the voltage by an analog tester.
      - Yes → Replace the expansion valve.
    - No → Replace the LEV coil.

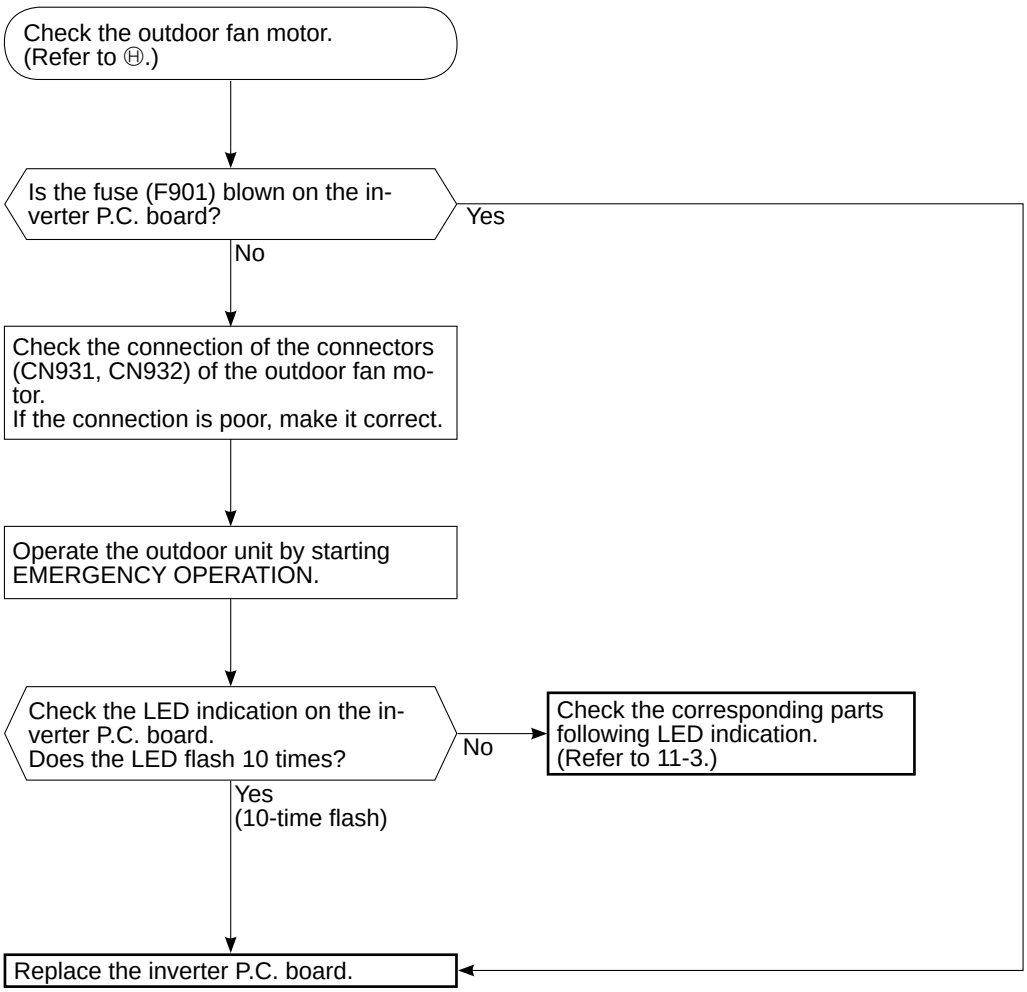
NOTE : After check of LEV, do the undermentioned operations.
1. Turn OFF the power supply and turn ON it again.
2. Press RESET button on the remote controller.

Ⓙ Check of LEV

(For wired remote controller use model)

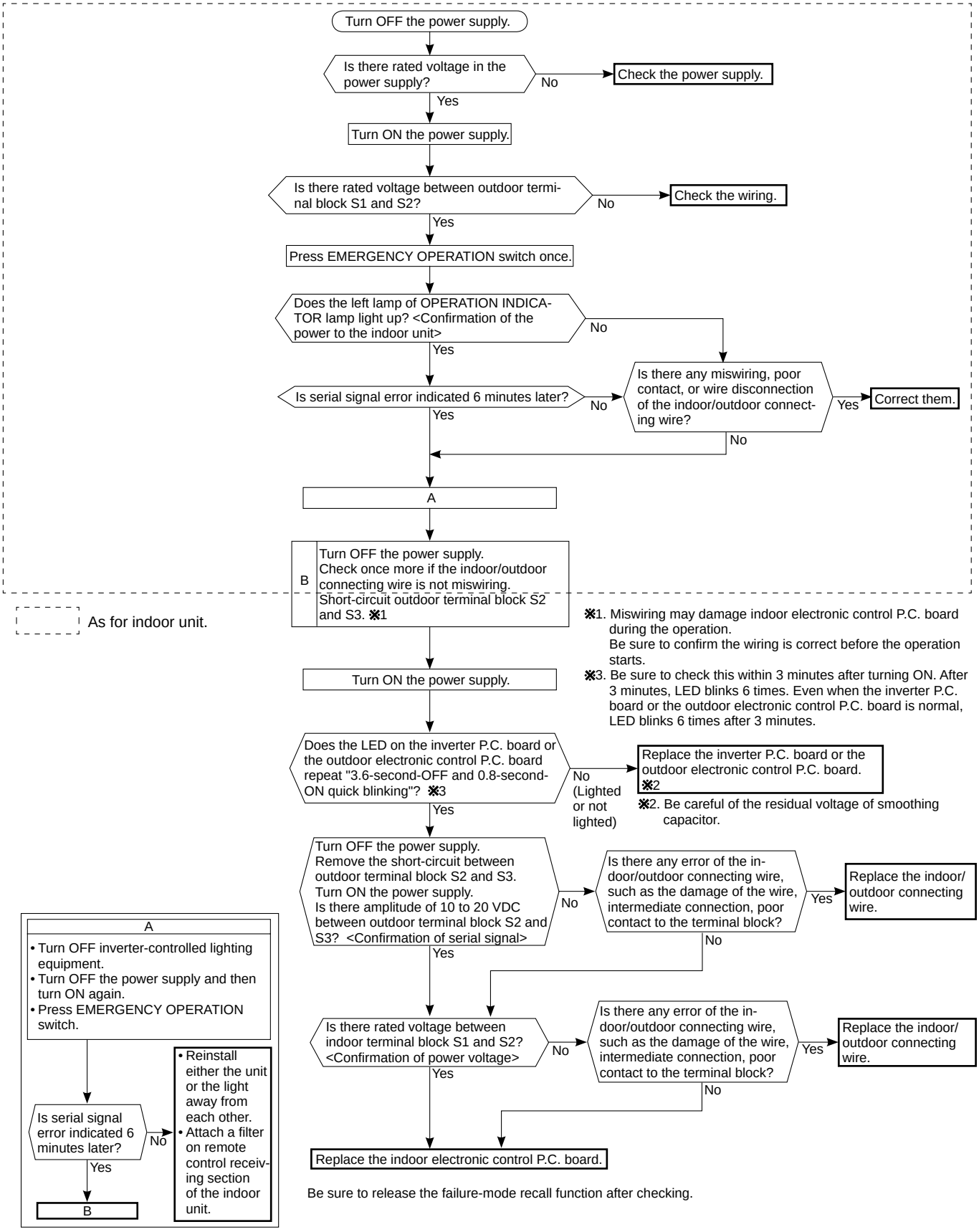


Ⓚ Check of inverter P.C. board



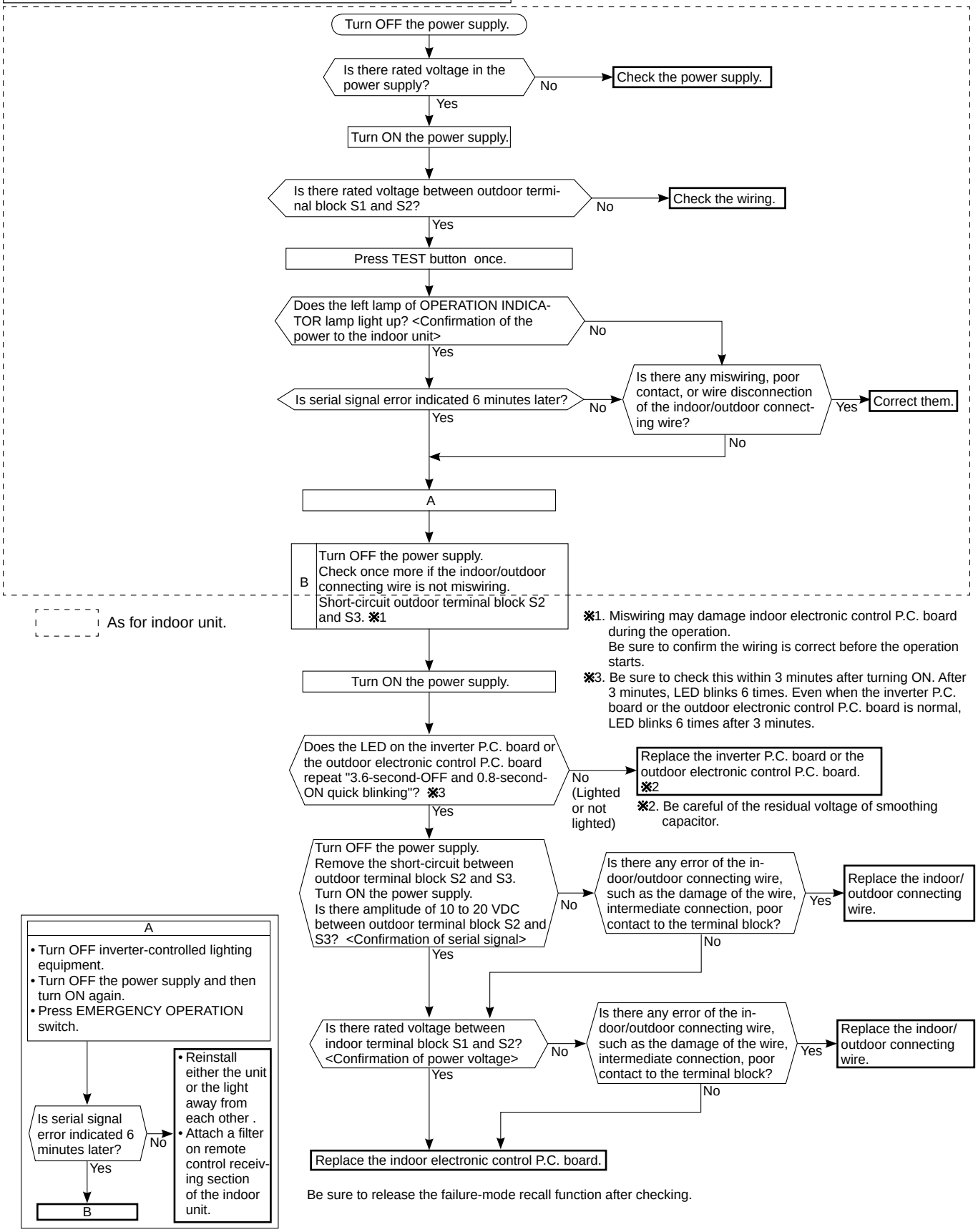
[SUZ-KA25/35/50VA2.TH]

Ⓛ How to check miswiring and serial signal error (For wireless remote controller use model)



[SUZ-KA25/35/50VA2.TH]

Ⓛ How to check miswiring and serial signal error (For wired remote controller use model)



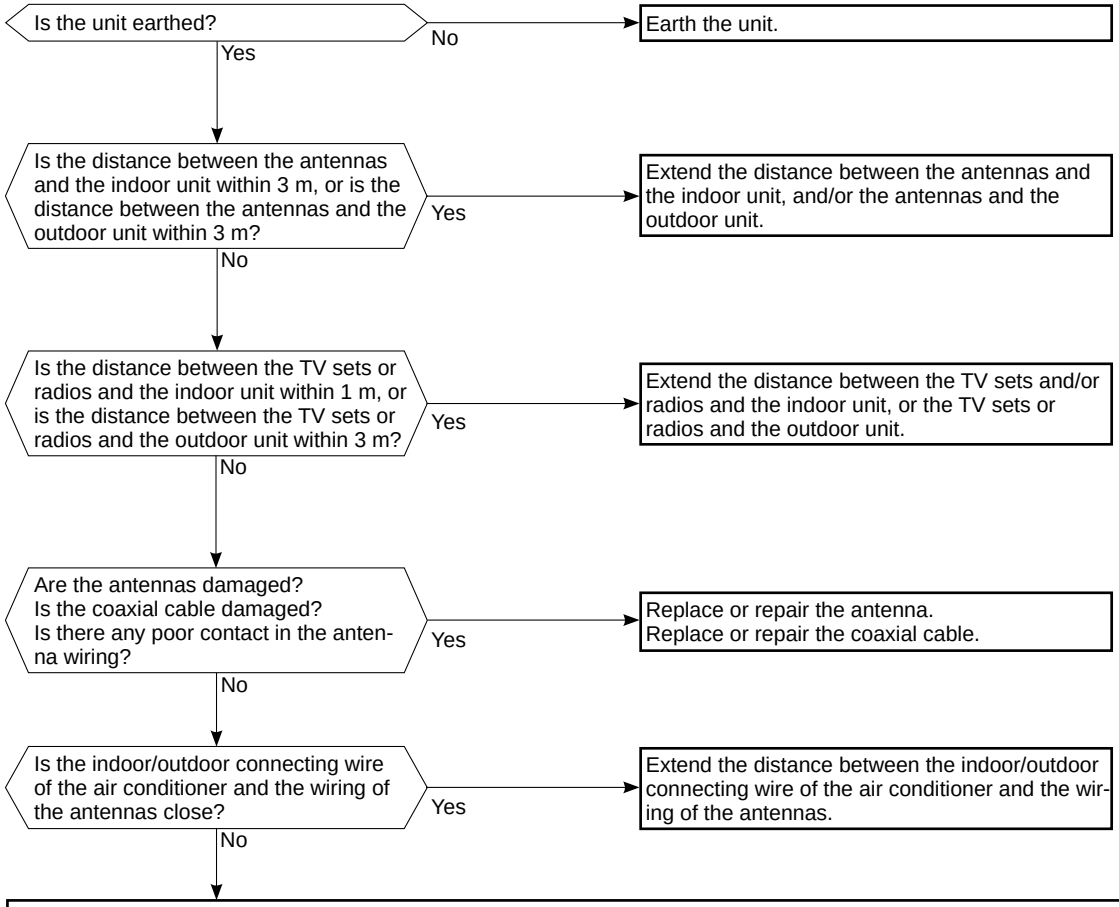
※1. Miswiring may damage indoor electronic control P.C. board during the operation.
Be sure to confirm the wiring is correct before the operation starts.

※3. Be sure to check this within 3 minutes after turning ON. After 3 minutes, LED blinks 6 times. Even when the inverter P.C. board or the outdoor electronic control P.C. board is normal, LED blinks 6 times after 3 minutes.

※2. Be careful of the residual voltage of smoothing capacitor.

Be sure to release the failure-mode recall function after checking.

Ⓜ Electromagnetic noise enters into TV sets or radios



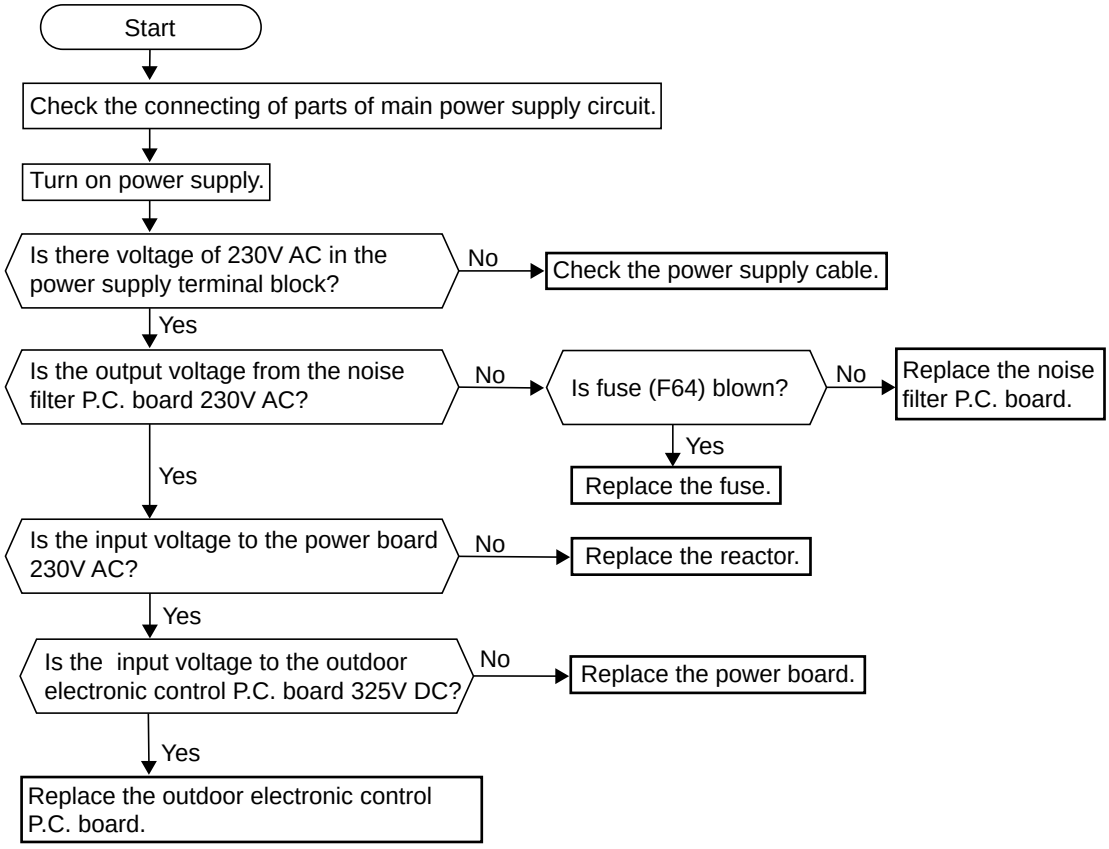
Even if all of the above conditions are fulfilled, the electromagnetic noise may enter, depending on the electric field strength or the installation condition (combination of specific conditions such as antennas or wiring).
Check the following before asking for service.

1. Devices affected by the electromagnetic noise
   TV sets, radios (FM/AM broadcast, shortwave)
2. Channel, frequency, broadcast station affected by the electromagnetic noise
3. Channel, frequency, broadcast station unaffected by the electromagnetic noise
4. Layout of ;
   indoor/outdoor unit of the air conditioner, indoor/outdoor wiring, earth wire, antennas, wiring from antennas, receiver
5. Electric field intensity of the broadcast station affected by the electromagnetic noise
6. Presence or absence of amplifier such as booster
7. Operation condition of air conditioner when the electromagnetic noise enters in
   1) Turn OFF the power supply once, and then turn ON the power supply. In this situation, check for the electromagnetic noise.
   2) Within 3 minutes after turning ON the power supply, press OPERATE/STOP (ON/OFF) button on the remote controller for power ON, and check for the electromagnetic noise.
   3) After a short time (3 minutes later after turning ON), the outdoor unit starts running. During operation, check for the electromagnetic noise.
   4) Press OPERATE/STOP (ON/OFF) button on the remote controller for power OFF, when the outdoor unit stops but the indoor/outdoor communication still runs on. In this situation, check for the electromagnetic noise.

[SUZ-KA60VA2.TH]

Outdoor unit does not operate. (LED display: display OFF)

Ⓝ Check of power supply

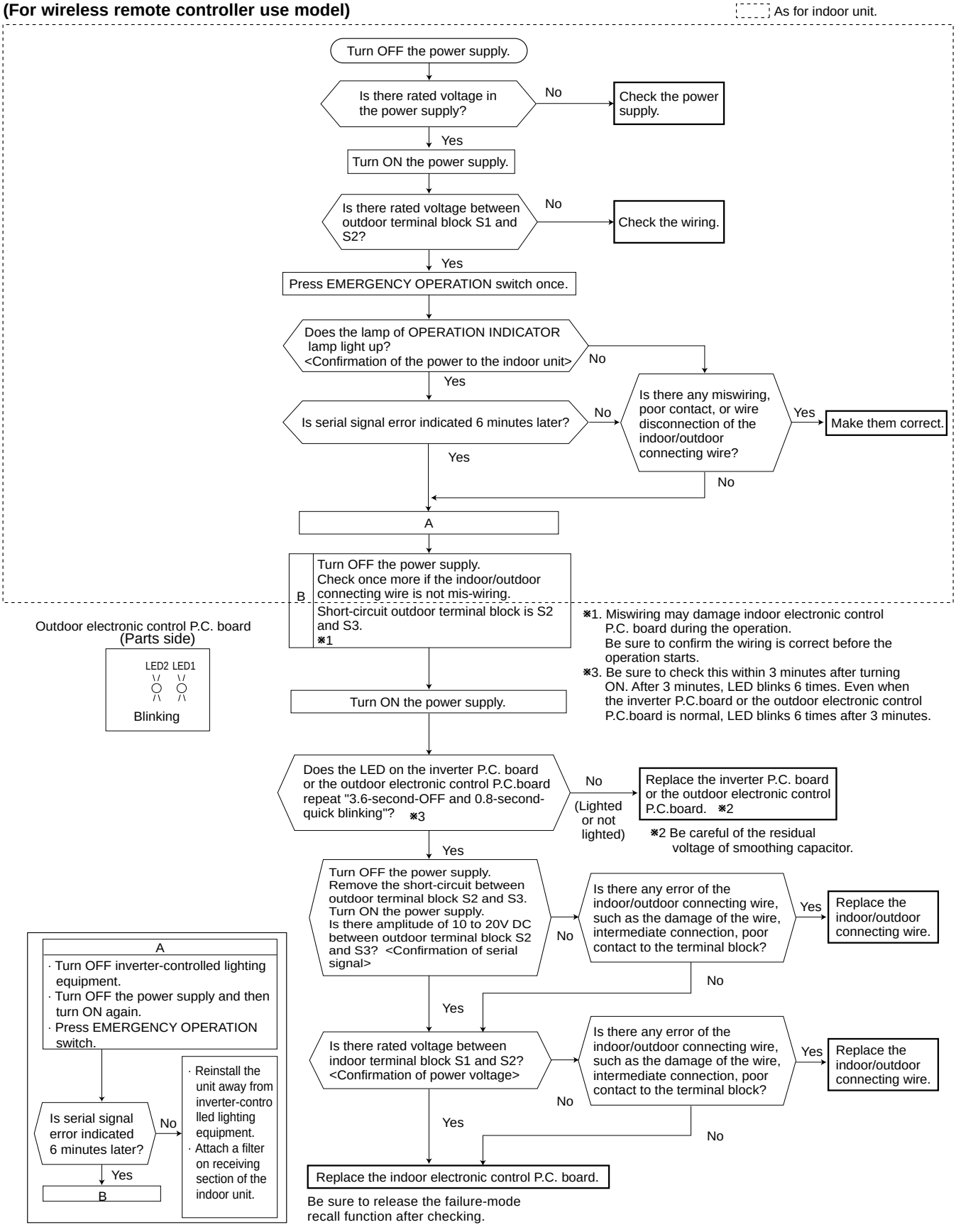


[SUZ-KA60VA2.TH]

- **When unit cannot operate neither by the remote controller nor by EMERGENCY OPERATION switch. Indoor unit does not operate.**
- **Outdoor unit does not operate.**

ⓞ How to check miswiring and serial signal error (when outdoor unit does not work)

(For wireless remote controller use model)

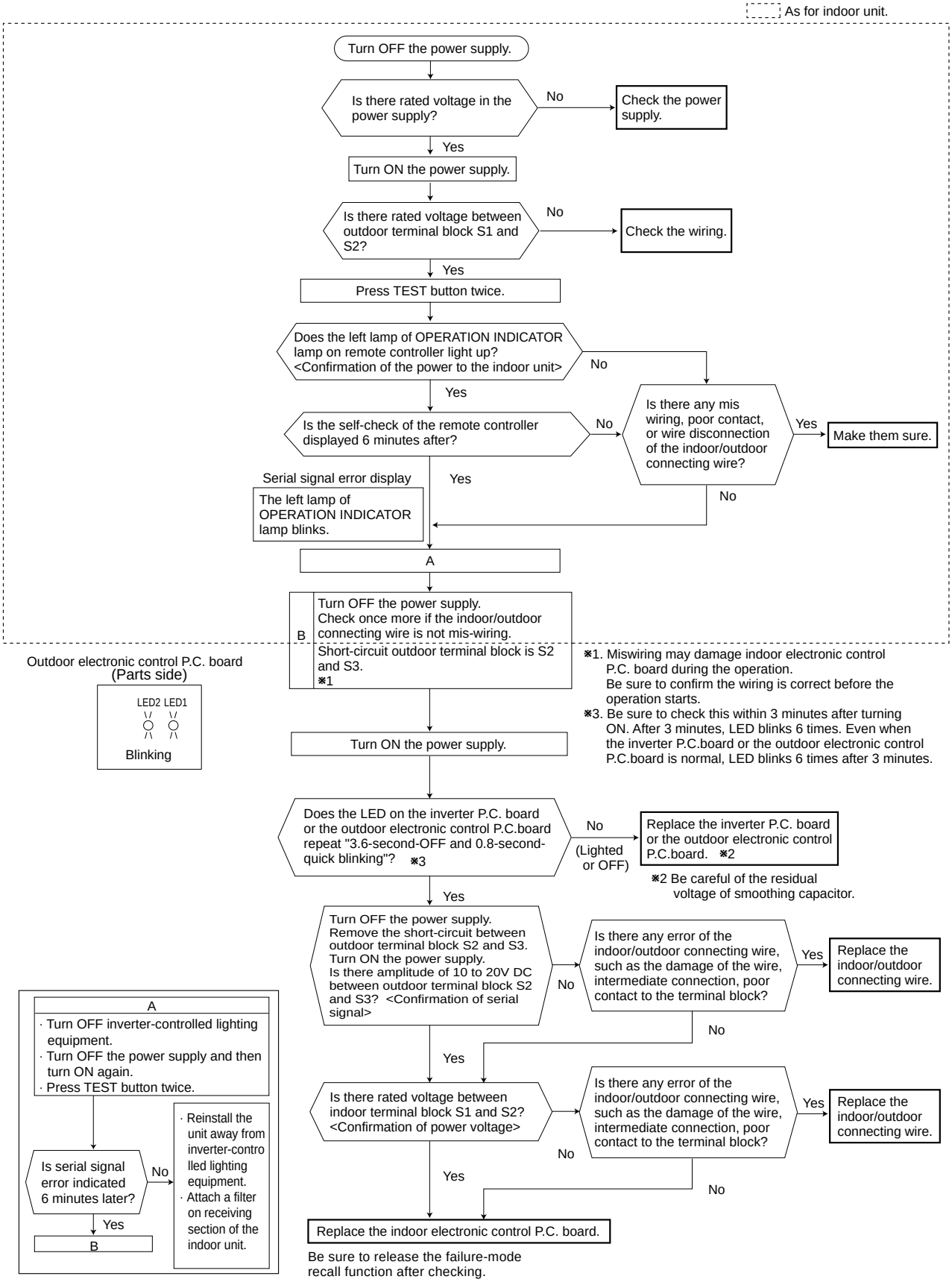


[SUZ-KA60VA2.TH]

- **When unit cannot operate neither by the remote controller. Indoor unit does not operate.**
- **Outdoor unit does not operate.**

ⓞ How to check miswiring and serial signal error (when outdoor unit does not work)

(For wired remote controller use model)

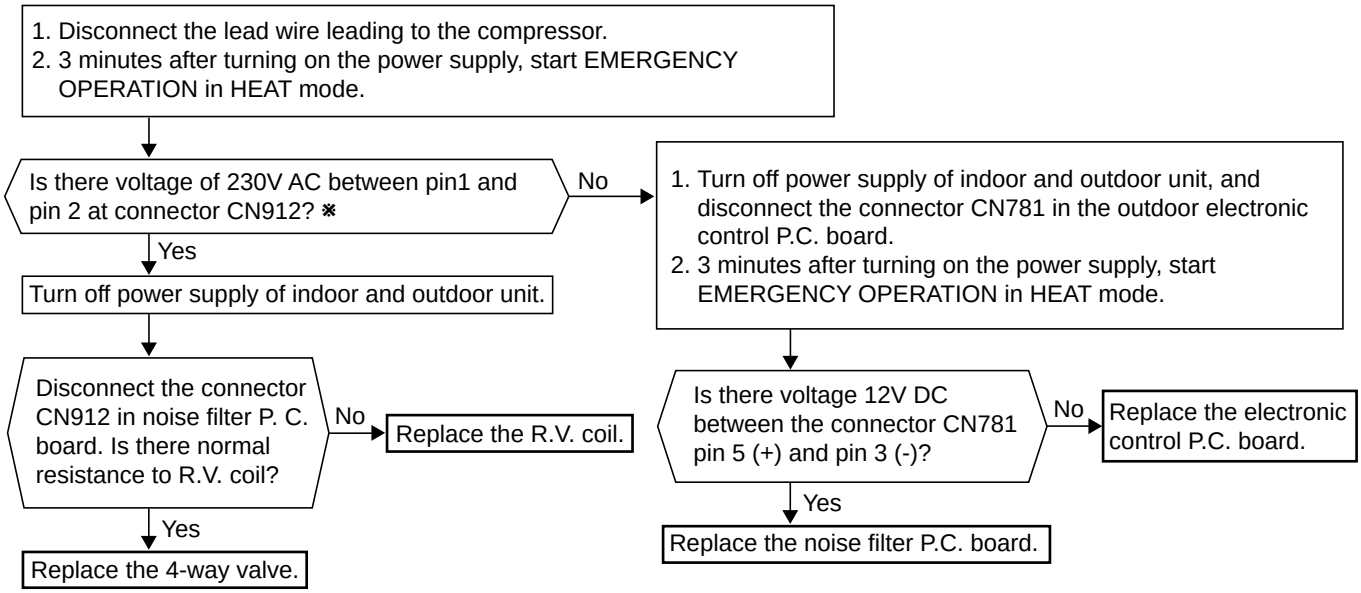


[SUZ-KA60VA2.TH]

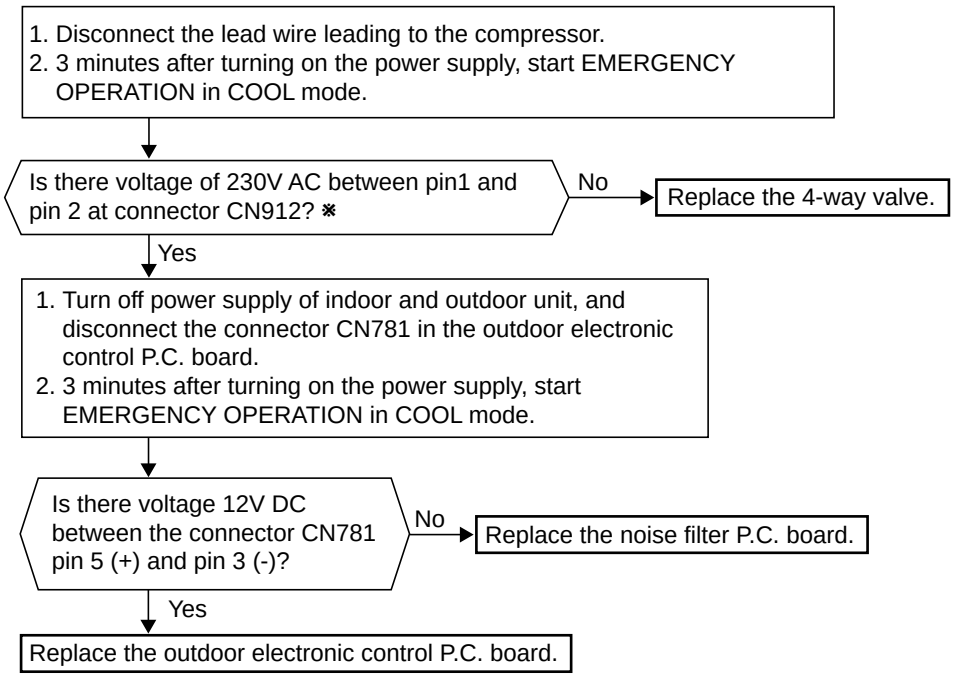
The cooling operation or heating operation does not operate. (LED display: Both LED1 and LED2 lighting)

Ⓟ Check of R.V. coil

• When heating operation does not work.



• When cooling operation does not work.



※ If the connector CN912 is not connected or R.V. coil is open, voltage occurs between terminals even when the control is OFF.

[SUZ-KA60VA2.TH]

• When cooling, heat exchanger of non-operating indoor unit frosts.
• When heating, non-operating indoor unit get warm.

Ⓠ Check of LEV

LED display:

LED1	LED2
Lighting	Lighting
6 time	Goes out

Turn on power supply to the outdoor unit after checking LEV coil is mounted to the LEV body securely.

↓

Is "click - click" sound heard?
Or, do you feel vibration of the LEV coil with a hand?

Yes → Normal

↓ No

Disconnect the connector CN795.
Is there normal resistance to LEV coil?

Yes → Replace the outdoor electronic control P.C. board.

↓ No

Replace the LEV coil.

• When heating, room does not get warm.
• When cooling, room does not get cool.

Ⓡ How to check inverter/ compressor

LED display:

LED1	LED2
Lighting	Lighting
Lighting	Twice
Twice	Goes out

Disconnect the terminal of the compressor. 3 minutes after turning on the power supply, start EMERGENCY OPERATION.

↓

Measure the voltage between each lead wire leading to the compressor.
U (BLK) - V (WHT)
V (WHT) - W (RED)
W (RED) - U (BLK)
Is voltage output on right table?

※ • After the outdoor fan starts running, wait for 1 minutes or more before measuring the voltage.
• The output voltage values have the tolerance of ±20%.

No →

COOL	HEAT
150V (48Hz)	170V (64Hz)

↓ Yes

Is output balanced? No →

↓ Yes

Is the input voltage to the outdoor electronic control P.C. board 370V or more? No → Replace the power board.

↓ Yes

Turn off power supply of indoor and outdoor unit, and measure the compressor winding resistance between the compressor terminals.
Is the resistance between each terminal normal? No → Replace the compressor.

↓ Yes

Reconnect the lead wire of compressor, and turn on power supply to indoor and outdoor unit.
3 minutes later, starts EMERGENCY OPERATION.

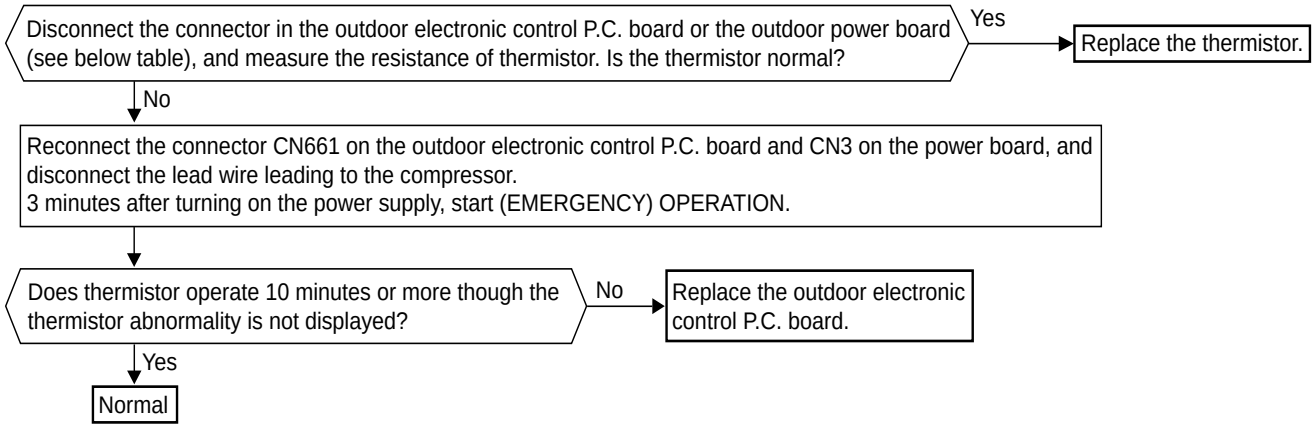
↓

Clarify the causes by counting time until the inverter stops.
0 to 10 seconds: compressor rare short
10 to 60 seconds: compressor lock
60 seconds to 5minutes: refrigerant circuit defective
5 minutes or more: normal

[SUZ-KA60VA2.TH]

• When thermistor is abnormal.

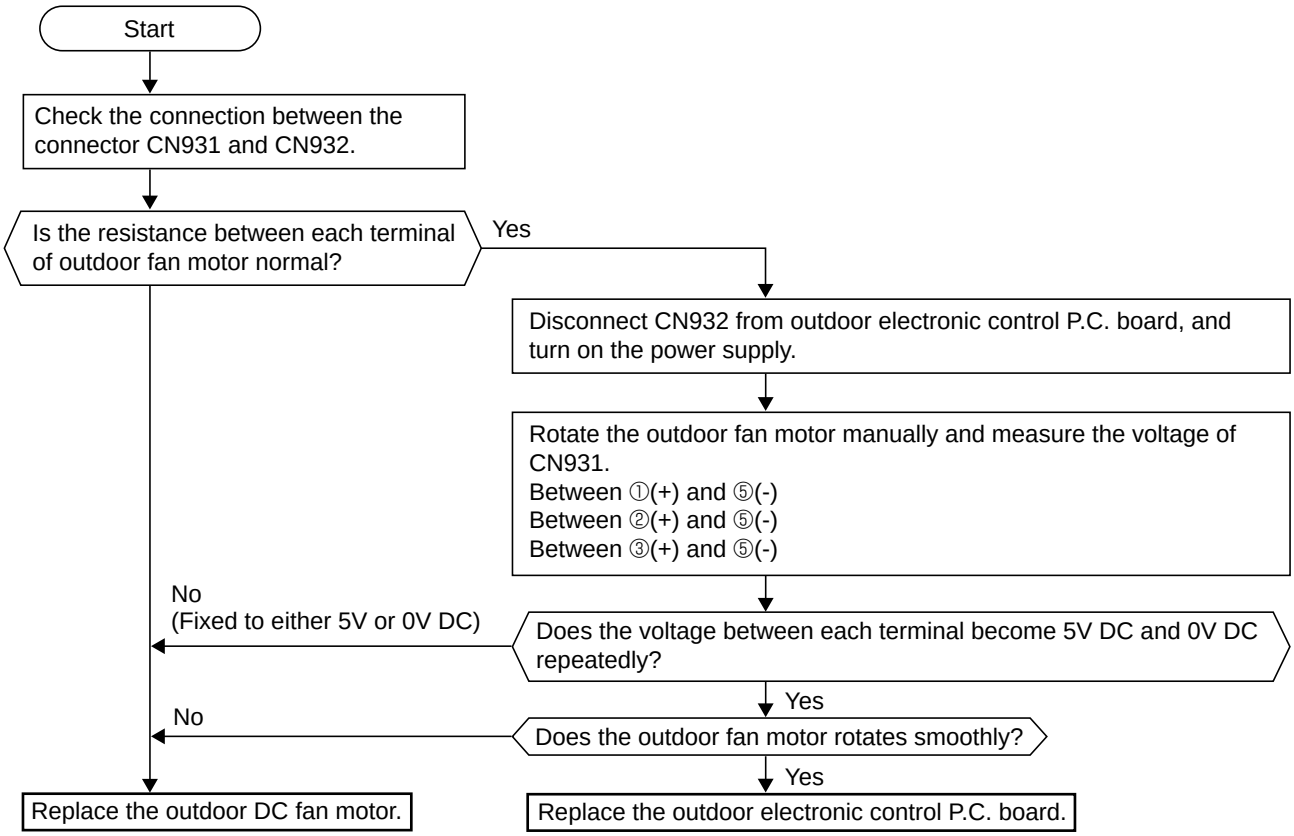
Ⓢ Check of outdoor thermistors



Thermistor	Symbol	Connector, Pin No.
Defrost thermistor	RT61	Between CN661 pin1 and pin2 on the outdoor electronic control P.C. board
Discharge temperature thermistor	RT62	Between CN661 pin3 and pin4 on the outdoor electronic control P.C. board
Outdoor heat exchanger temperature thermistor	RT68	Between CN661 pin7 and pin8 on the outdoor electronic control P.C. board
Fin temperature thermistor	RT64	Between CN3 pin1 and pin2 on the outdoor power board
Ambient temperature thermistor	RT65	Between CN663 pin1 and pin2 on the outdoor electronic control P.C. board

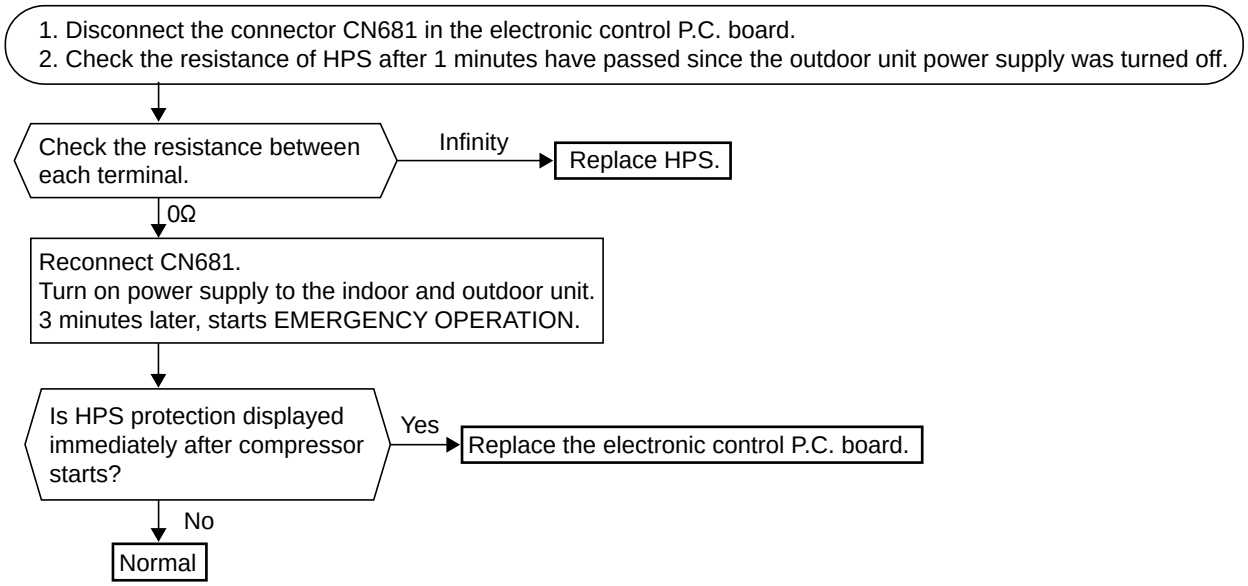
• Fan motor does not operate or stops operating shortly after starting the operation.

Ⓣ Check of outdoor fan motor



• When the operation frequency does not go up from lowest frequency.

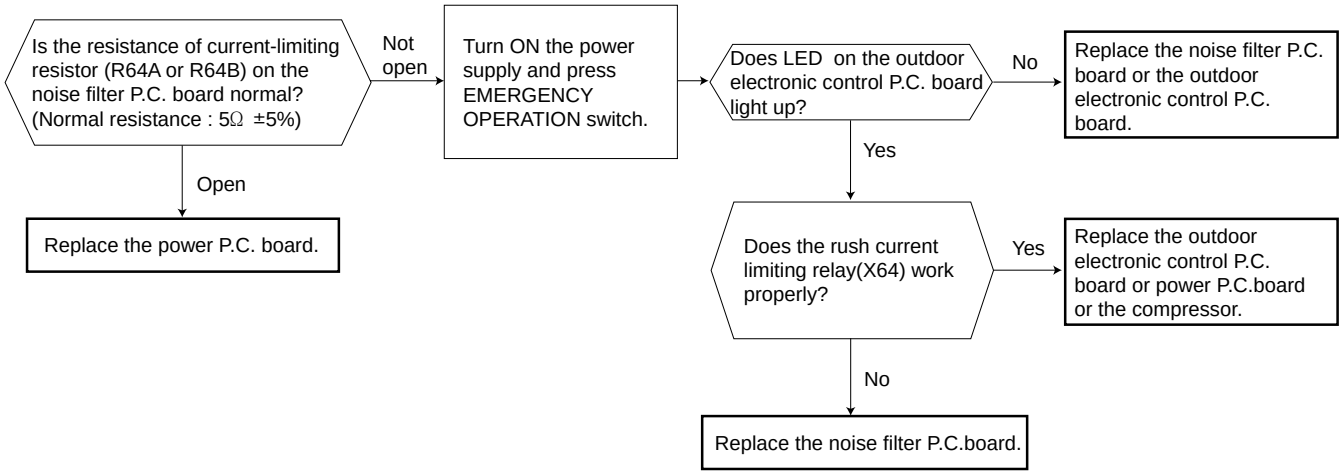
Ⓤ Check of HPS



• Outdoor unit does not operate at all, or stops immediately due to overcurrent.

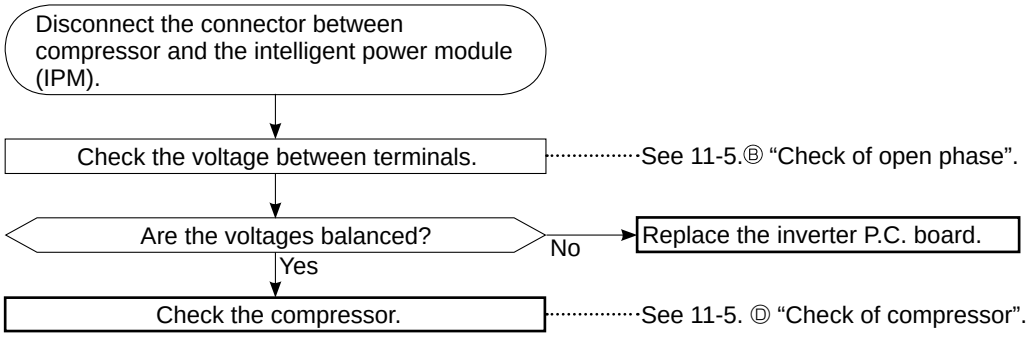
Ⓥ Check of current-limiting resistor

When the current-limiting resistor is open, the rush current limiting relay (X64) may not work properly.



[SUZ-KA71VA2.TH]

ⓐ How to check inverter/compressor



ⓑ Check of open phase

- With the connector between the compressor and the intelligent power module disconnected, activate the inverter and check if the inverter is normal by measuring the balance of voltage between the terminals.

Output voltage is 50 - 130 V. (The voltage may differ according to the tester.)

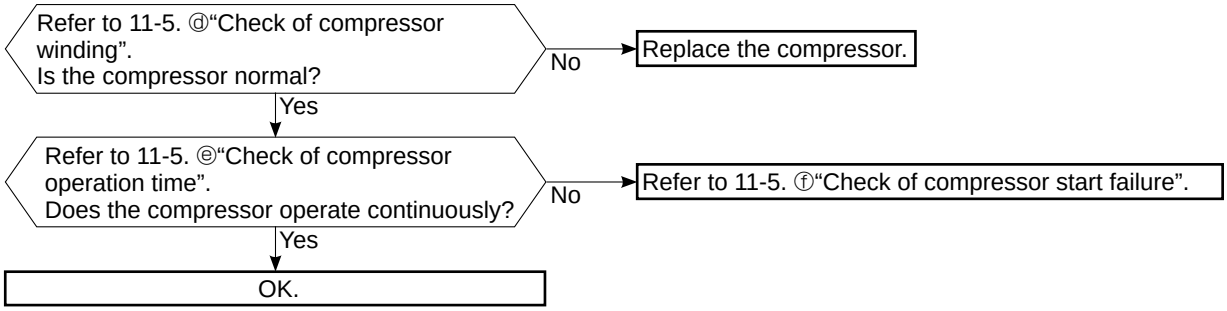
<< Operation method(Test run operation)>>
1. Press EMERGENCY OPERATION switch to start COOL or HEAT mode (COOL: Press once, HEAT: Press twice).
2. Test run operation starts and continues to operate for 30 minutes.
3. Compressor operates at rated frequency in COOL mode or 74 Hz in HEAT mode.
4. Indoor fan operates at High speed.
5. After 30 minutes, test run operation finishes and EMERGENCY OPERATION starts (operation frequency of compressor varies).
6. To cancel test run operation (EMERGENCY OPERATION), press EMERGENCY OPERATION switch or any button on remote controller.

<<Measurement point>>
At 3 points
BLK (U)-WHT (V)
BLK (U)-RED (W)
WHT(V)-RED (W)

※ Measure AC voltage between the lead wires at 3 points.

NOTE: 1. Output voltage varies according to power supply voltage.
2. Measure the voltage by analog type tester.
3. During this check, LED of the inverter P.C. board flashes 9 times. (Refer to 11-6.3.)

ⓒ Check of compressor



ⓓ Check of compressor winding

●Disconnect the connector between the compressor and intelligent power module, and measure the resistance between the compressor terminals.

<<Measurement point>>

at 3 points

BLK-WHT

BLK-RED ※ Measure the resistance between the lead wires at 3 points.

WHT-RED

<<Judgement>>

Refer to 11-4.

0 [Ω] ·····Abnormal [short]

Infinite [Ω] ·····Abnormal [open]

NOTE: Be sure to zero the ohmmeter before measurement.

ⓔ Check of compressor operation time

● Connect the compressor and activate the inverter. Then measure the time until the inverter stops due to over current.

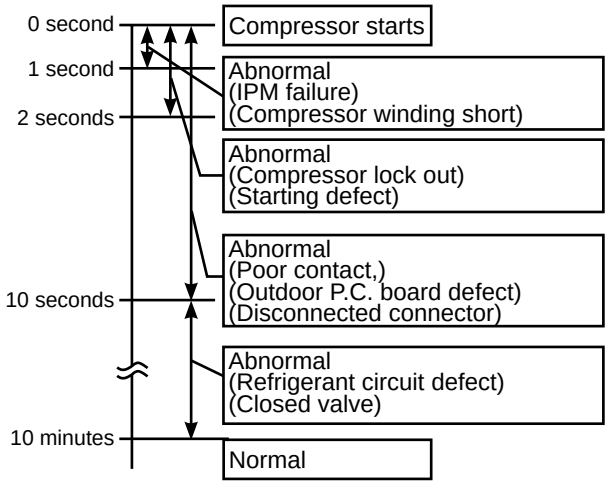
<<Operation method>>

Start heating or cooling operation by pressing EMERGENCY OPERATION switch on the indoor unit. (TEST RUN OPERATION: Refer to 11-5 ⓑ.)

<<Measurement>>

Measure the time from the start of compressor to the stop of compressor due to overcurrent.

<<Judgement>>



ⓕ Check of compressor start failure

Confirm that ①~④ is normal.
•Electrical circuit check
①. Contact of the compressor connector
②. Output voltage of inverter P.C. board and balance of them (See 11-5 ⓑ.)
③. Direct current voltage between JP715(+) and JP30(-) on the inverter P.C.board
④. Voltage between outdoor terminal block S1-S2

↓

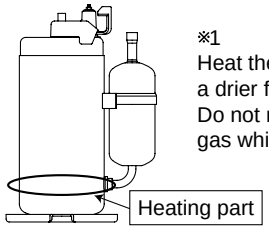
Does the compressor run for 10 seconds or more after it starts? → Yes → Check the refrigerant circuit. Check the stop valve.

↓ No

After the compressor is heated with a drier, does the compressor start? ※1 → No → Replace the compressor.

↓ Yes

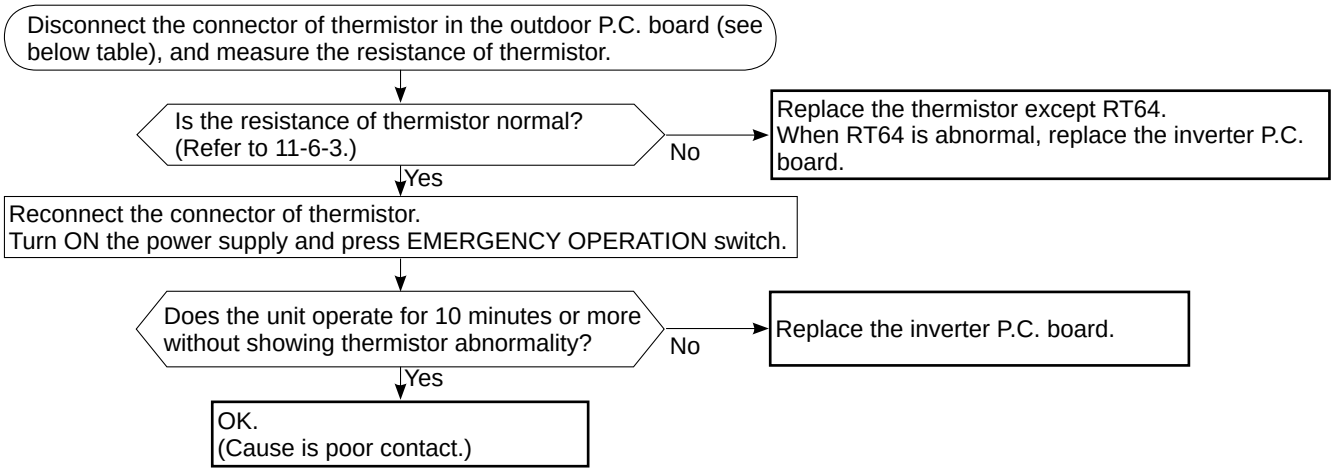
Compressor start failure. Activate pre-heat control.



※1
Heat the compressor with a drier for about 20 minutes. Do not recover refrigerant gas while heating.

[SUZ-KA71VA2.TH]

ⓖ Check of outdoor thermistors

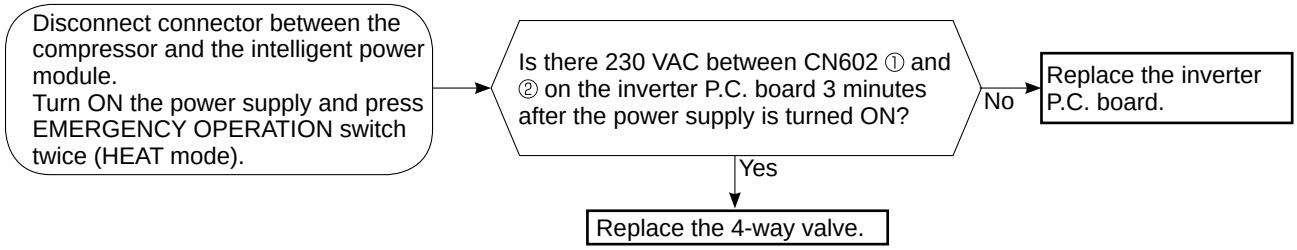


Thermistor	Symbol	Connector, Pin No.	Board
Defrost	RT61	Between CN671 pin1 and pin2	Inverter P.C. board
Discharge temperature	RT62	Between CN671 pin3 and pin4	
Fin temperature	RT64	Between CN673 pin1 and pin2	
Ambient temperature	RT65	Between CN672 pin1 and pin2	
Outdoor heat exchanger temperature	RT68	Between CN671 pin5 and pin6	

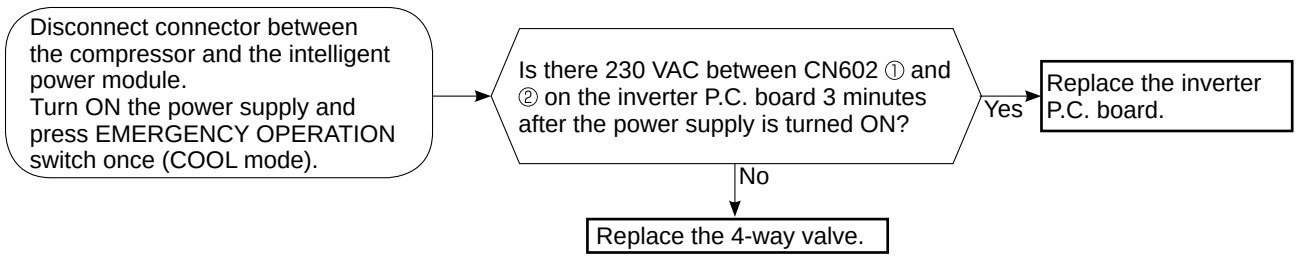
ⓗ Check of R.V. coil

※ First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to 11-4.
※ In case CN602 is disconnected or R.V. coil is open, voltage is generated between the terminal pins of the connector although no signal is being transmitted to R.V. coil.
Check if CN602 is connected.

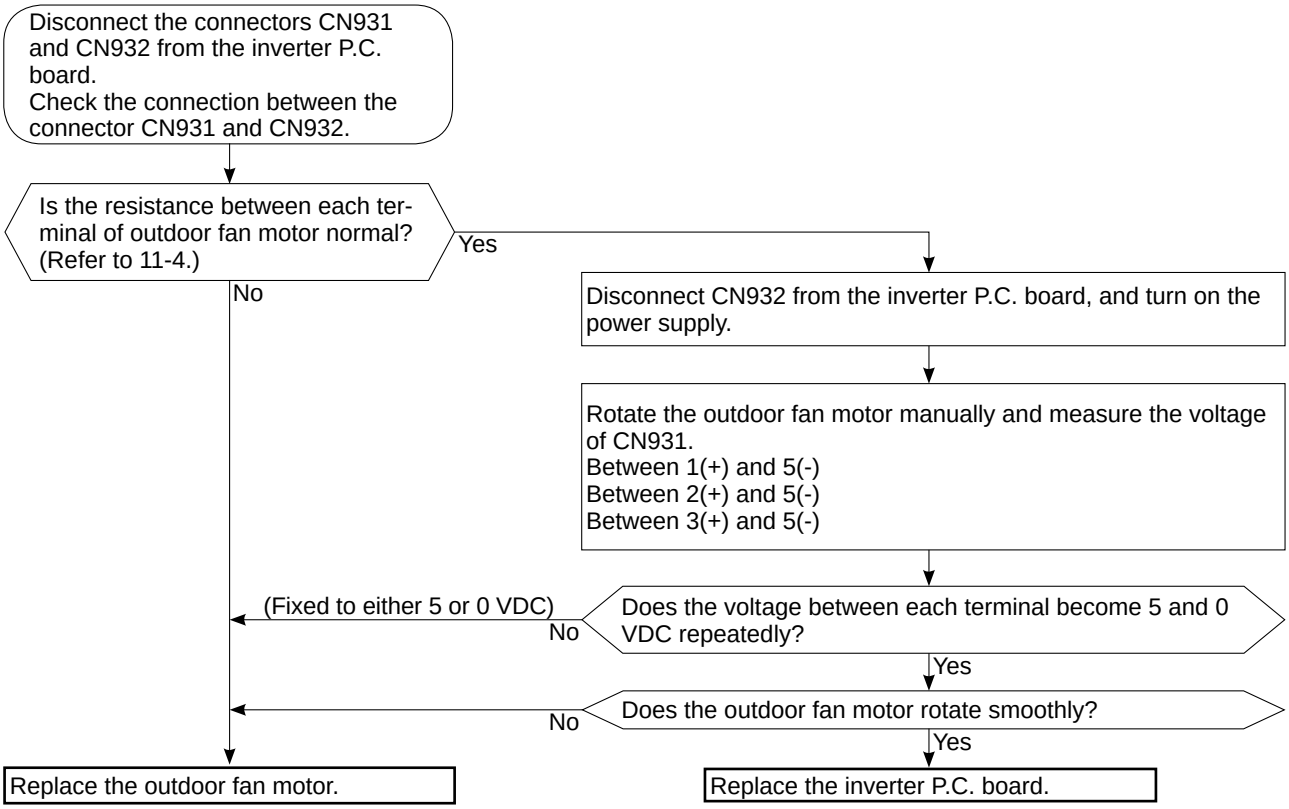
Unit operates COOL mode even if it is set to HEAT mode.



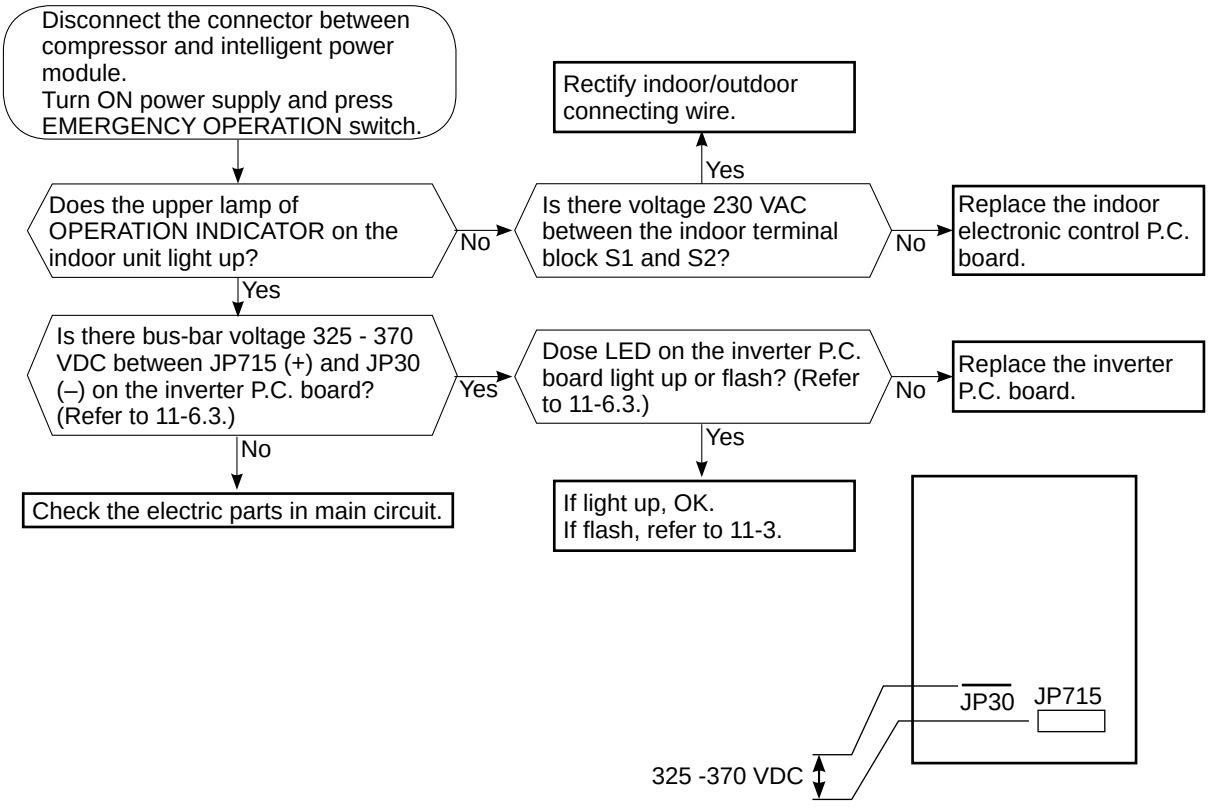
Unit operates HEAT mode even if it is set to COOL mode.



ⓘ Check of outdoor fan motor



Ⓙ Check of power supply



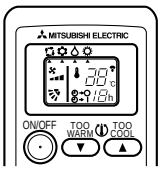
[SUZ-KA71VA2.TH]

ⓚ Check of LEV

(For wireless remote controller use model)

Turn ON the power supply.
<Preparation of the remote controller>
① While pressing both OPERATION SELECT button and TOO COOL button on the remote controller at the same time, press RESET button.
② First, release RESET button.
And release the other two buttons after all LCD except the set temperature in operation display section of the remote controller is displayed after 3 seconds.

Press OPERATE/STOP (ON/OFF) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit. ※1



Expansion valve operates in full-opening direction.

※1. Regardless of normal or abnormal condition, a short beep is emitted once the signal is received.

Do you hear the expansion valve "click, click·····"?
Do you feel the expansion valve vibrate on touching it ?
Yes → OK

No

Is LEV coil properly fixed to the expansion valve?
No → Properly fix the LEV coil to the expansion valve.

Yes

Does the resistance of LEV coil have the characteristics? (Refer to 11-4.)
Yes →
Measure each voltage between connector pins of CN724 on the inverter P.C. board.
1. Pin③(-) — Pin①(+)
2. Pin④(-) — Pin①(+)
3. Pin⑤(-) — Pin①(+)
4. Pin⑥(-) — Pin①(+)
Is there about 3 - 5 VAC between each?
NOTE: Measure the voltage by an analog tester.
No → Replace the inverter P.C. board.

No

Replace the LEV coil.

Yes

Replace the expansion valve.

NOTE: After check of LEV, do the undermentioned operations.
1. Turn OFF the power supply and turn it ON again.
2. Press RESET button on the remote controller.

ⓚ Check of LEV

(For wired remote controller use model)

Start

Turn on power supply to the outdoor unit after checking LEV coil is fixed to the LEV body securely.
Yes → Normal

Is "click - click" sound heard?
Or, do you feel vibration of the LEV coil with a hand?

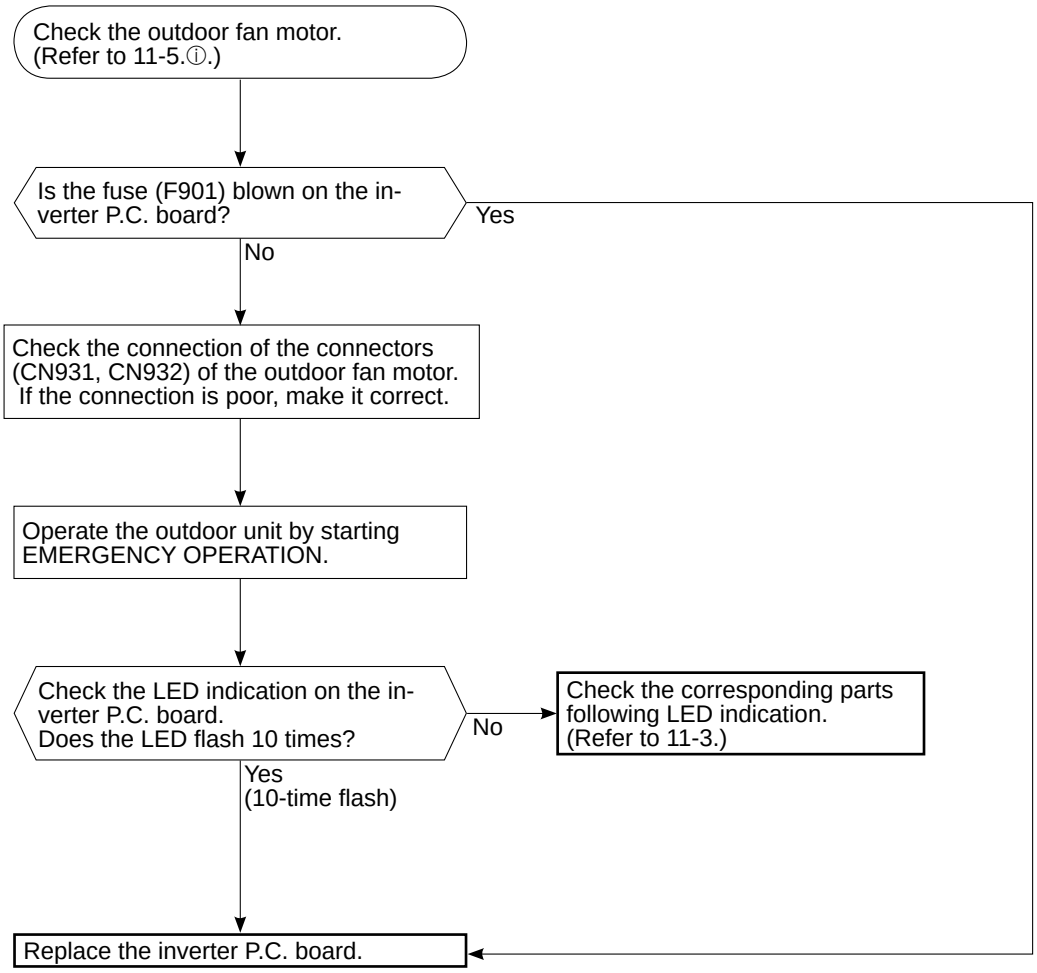
No

Disconnect the connector CN724 is there normal resistance to LEV coil?
Yes → Replace the inverter P.C. board.

No

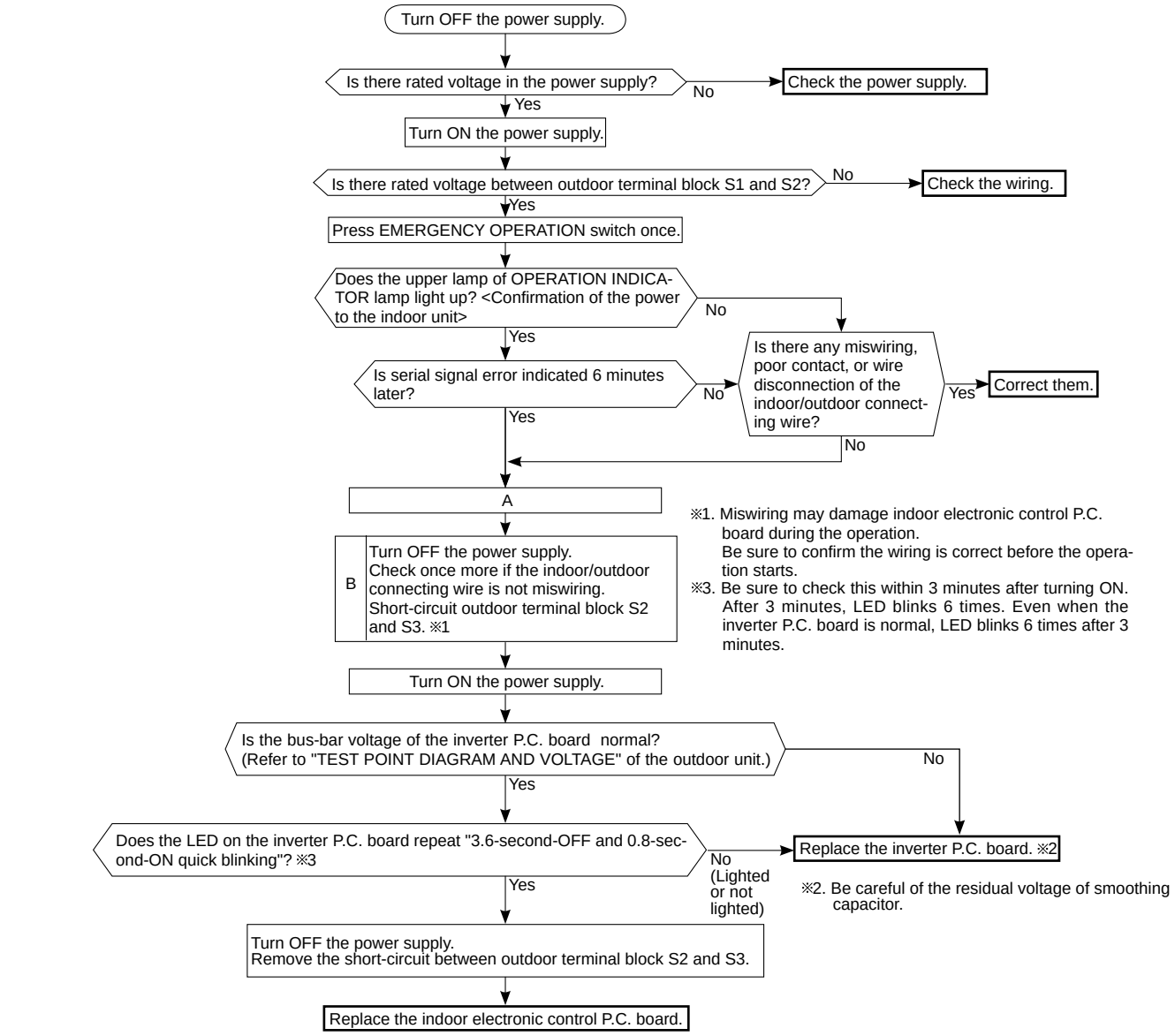
Replace the LEV coil.

ⓘ Check of inverter P.C. board



[SUZ-KA71VA2.TH]

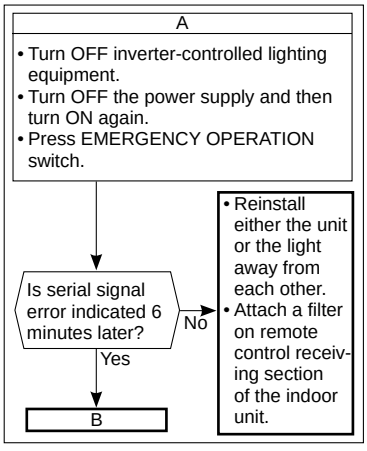
ⓜ How to check miswiring and serial signal error



※1. Miswiring may damage indoor electronic control P.C. board during the operation.
Be sure to confirm the wiring is correct before the operation starts.

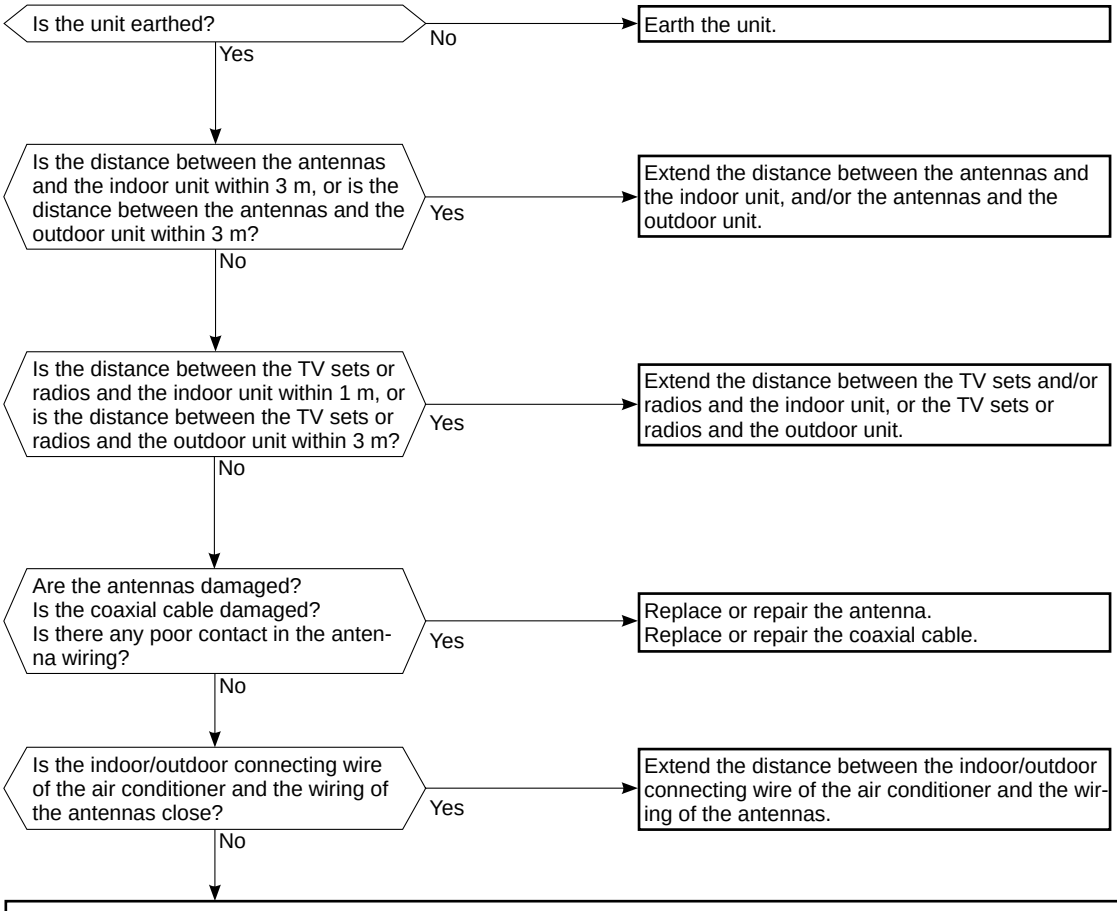
※3. Be sure to check this within 3 minutes after turning ON. After 3 minutes, LED blinks 6 times. Even when the inverter P.C. board is normal, LED blinks 6 times after 3 minutes.

※2. Be careful of the residual voltage of smoothing capacitor.



[SUZ-KA71VA2.TH]

ⓝ Electromagnetic noise enters into TV sets or radios



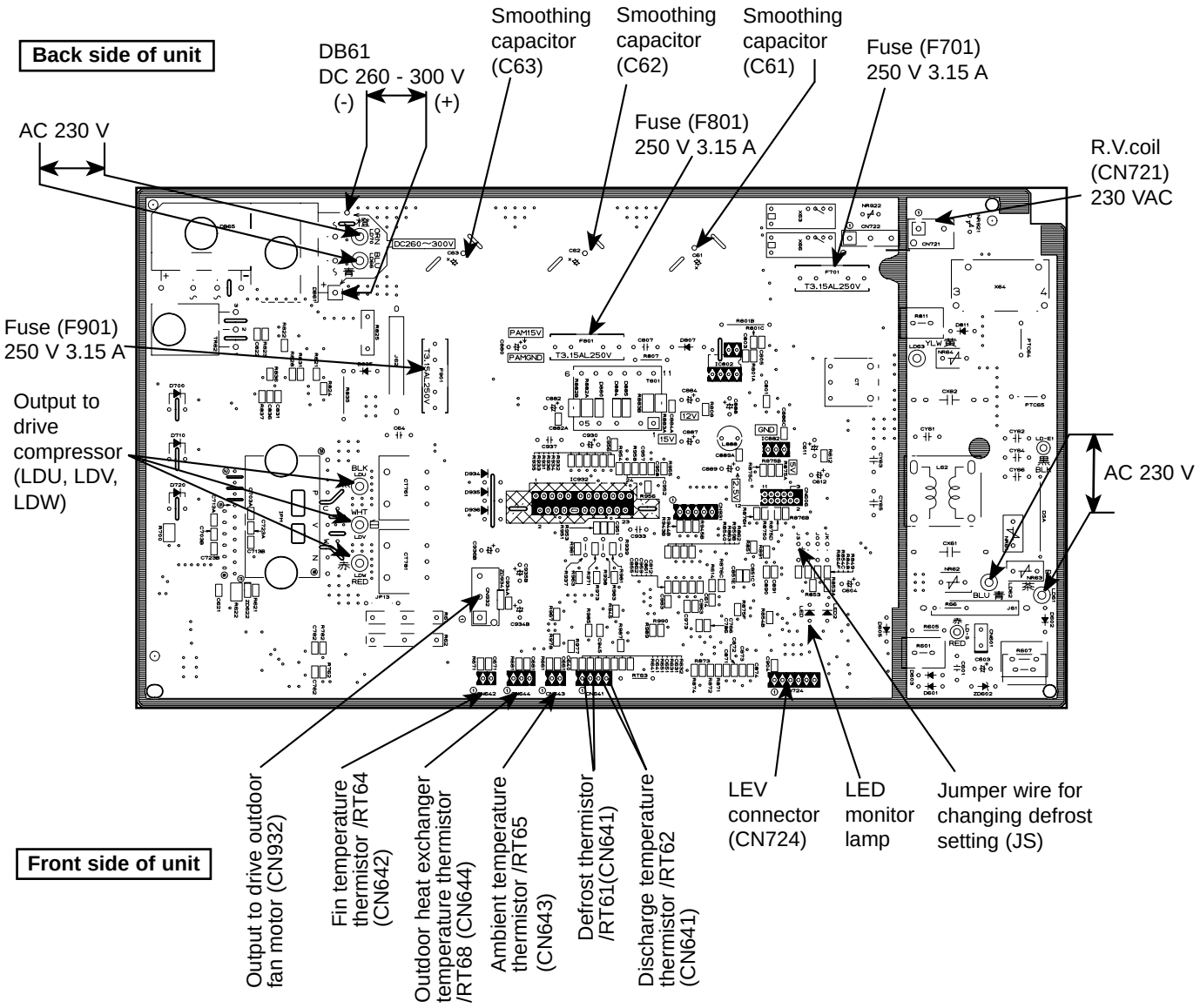
Even if all of the above conditions are fulfilled, the electromagnetic noise may enter, depending on the electric field strength or the installation condition (combination of specific conditions such as antennas or wiring).
Check the following before asking for service.

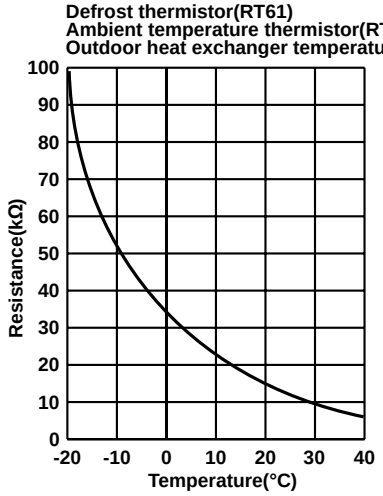
1. Devices affected by the electromagnetic noise
   TV sets, radios (FM/AM broadcast, shortwave)
2. Channel, frequency, broadcast station affected by the electromagnetic noise
3. Channel, frequency, broadcast station unaffected by the electromagnetic noise
4. Layout of:
   indoor/outdoor unit of the air conditioner, indoor/outdoor wiring, earth wire, antennas, wiring from antennas, receiver
5. Electric field intensity of the broadcast station affected by the electromagnetic noise
6. Presence or absence of amplifier such as booster
7. Operation condition of air conditioner when the electromagnetic noise enters in
   1) Turn OFF the power supply once, and then turn ON the power supply. In this situation, check for the electromagnetic noise.
   2) Within 3 minutes after turning ON the power supply, press OPERATE/STOP (ON/OFF) button on the remote controller for power ON, and check for the electromagnetic noise.
   3) After a short time (3 minutes later after turning ON), the outdoor unit starts running. During operation, check for the electromagnetic noise.
   4) Press OPERATE/STOP (ON/OFF) button on the remote controller for power OFF, when the outdoor unit stops but the indoor/outdoor communication still runs on. In this situation, check for the electromagnetic noise.

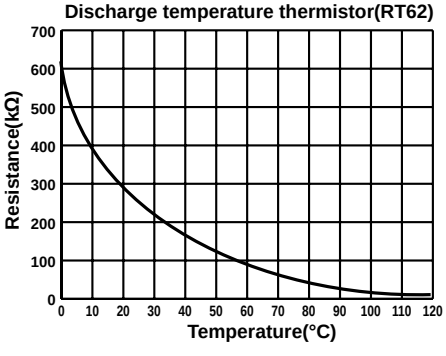
11-6. Test point diagram and voltage

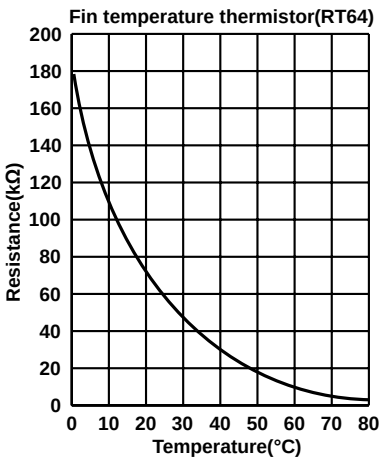
11-6-1. Inverter P.C. board

SUZ-KA25VA2.TH SUZ-KA35VA2.TH

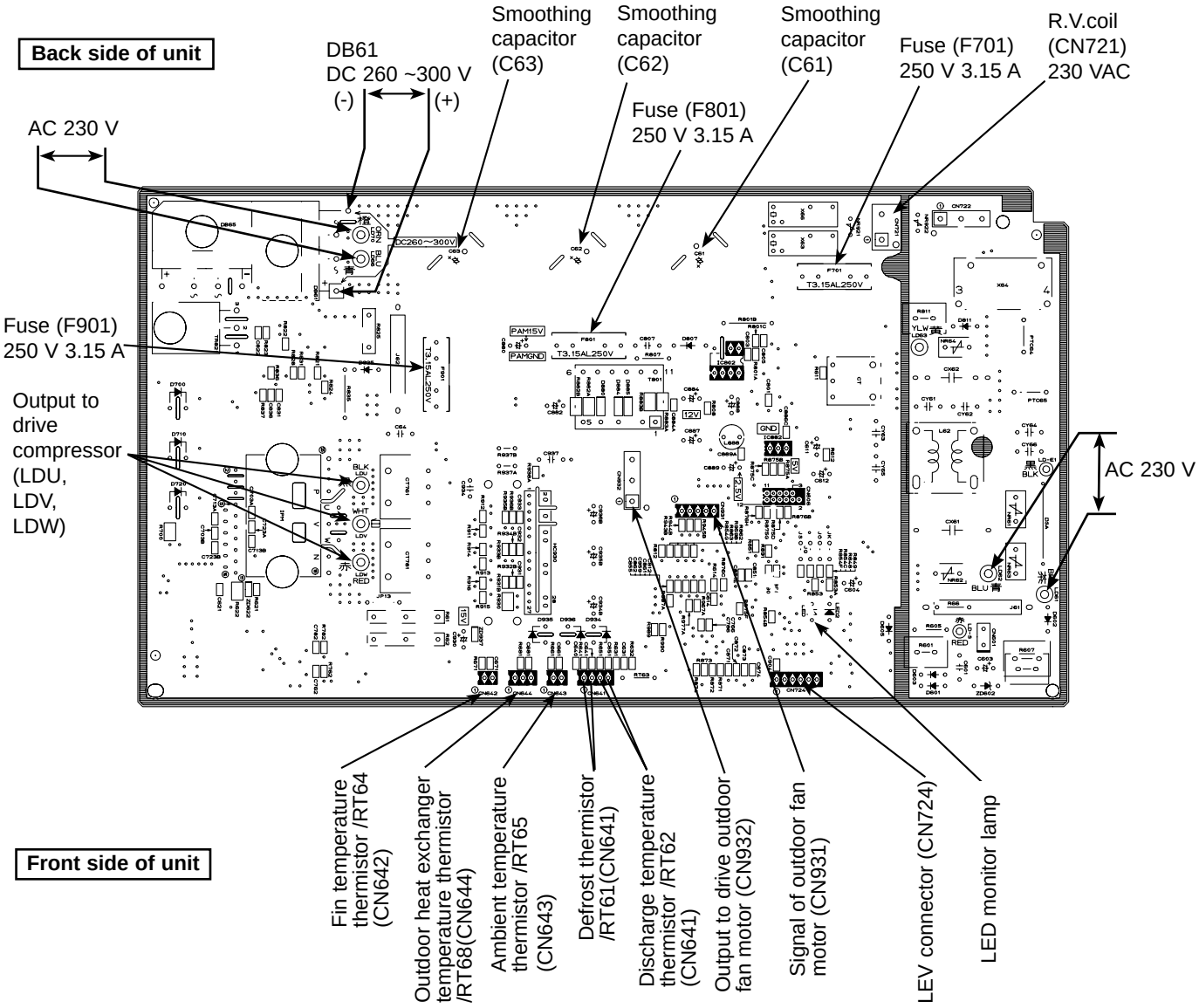


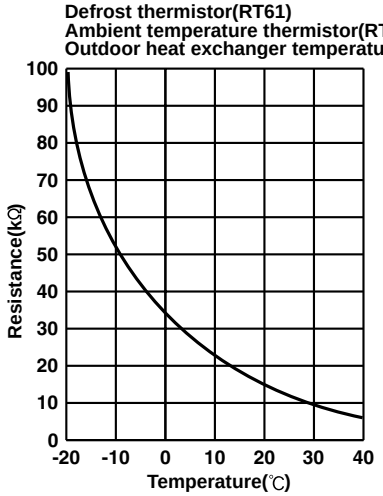


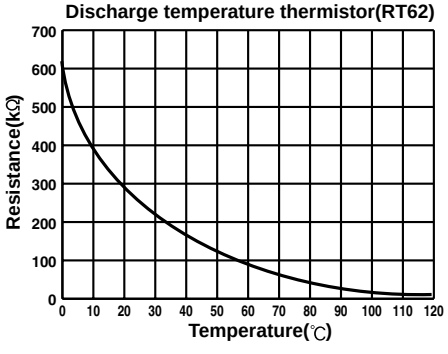


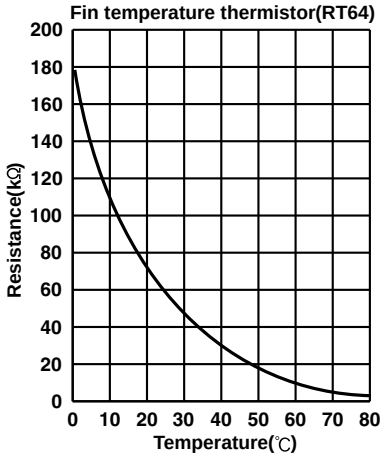


11-6-2. Inverter P.C. board
SUZ-KA50VA2.TH

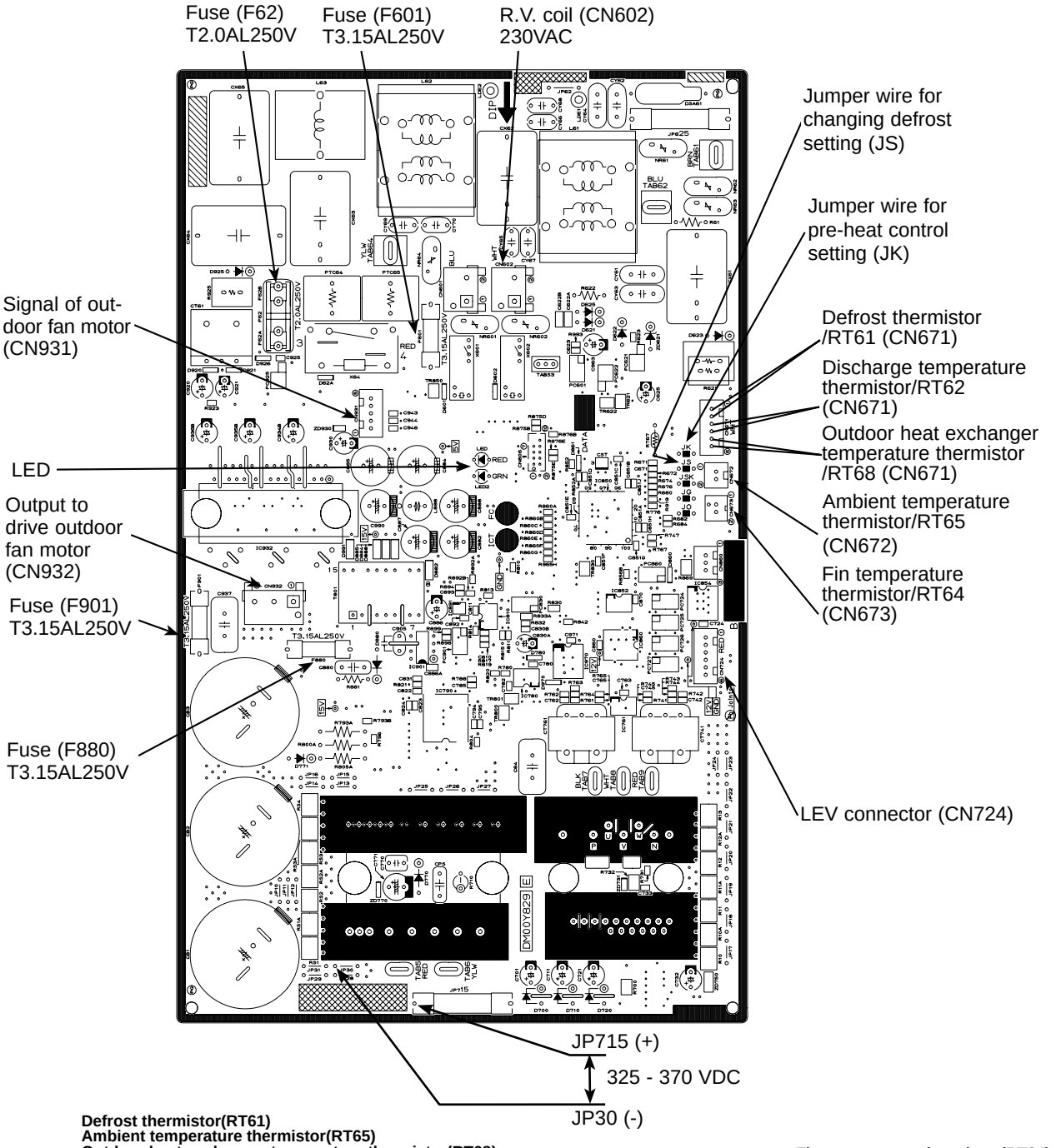


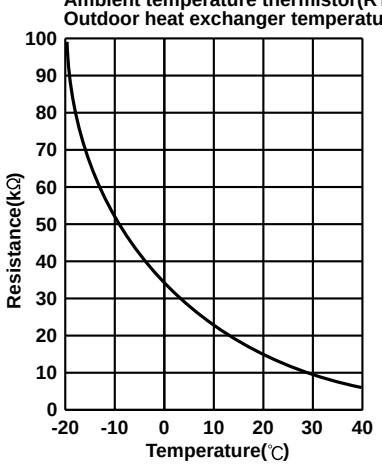


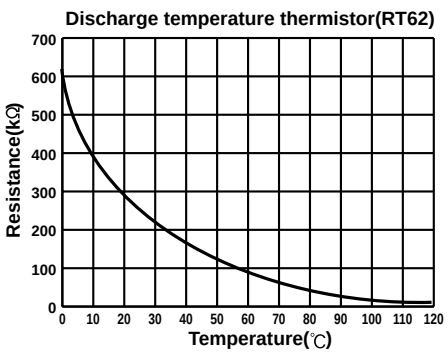


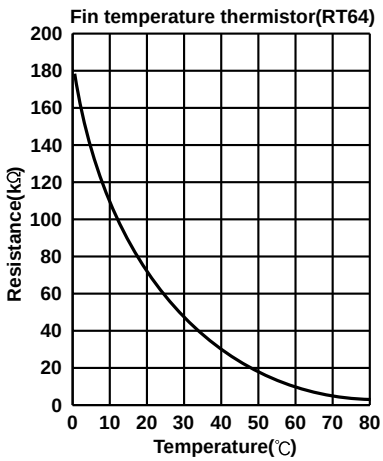


11-6-3. Inverter P.C. board
SUZ-KA71VA2.TH

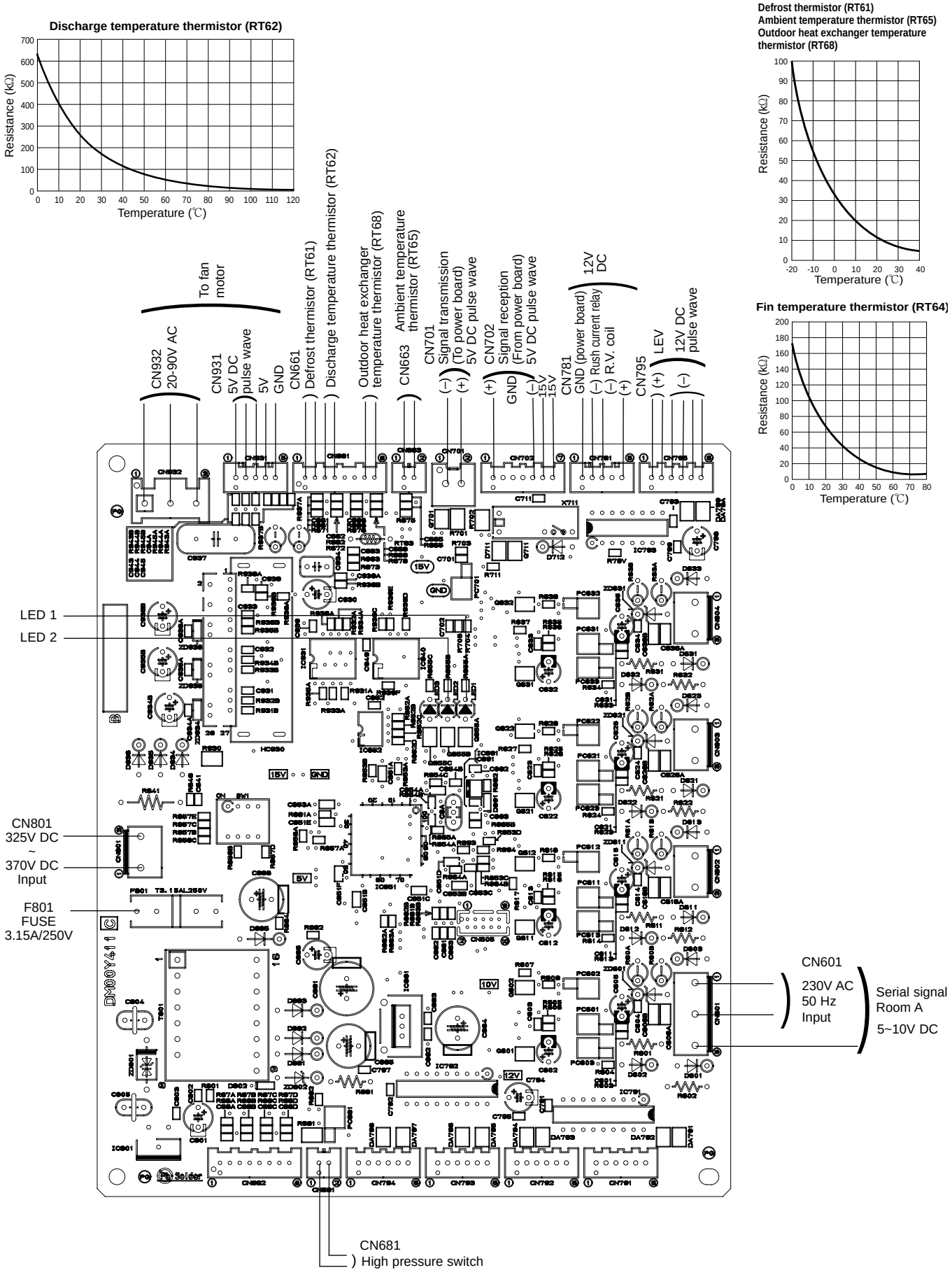




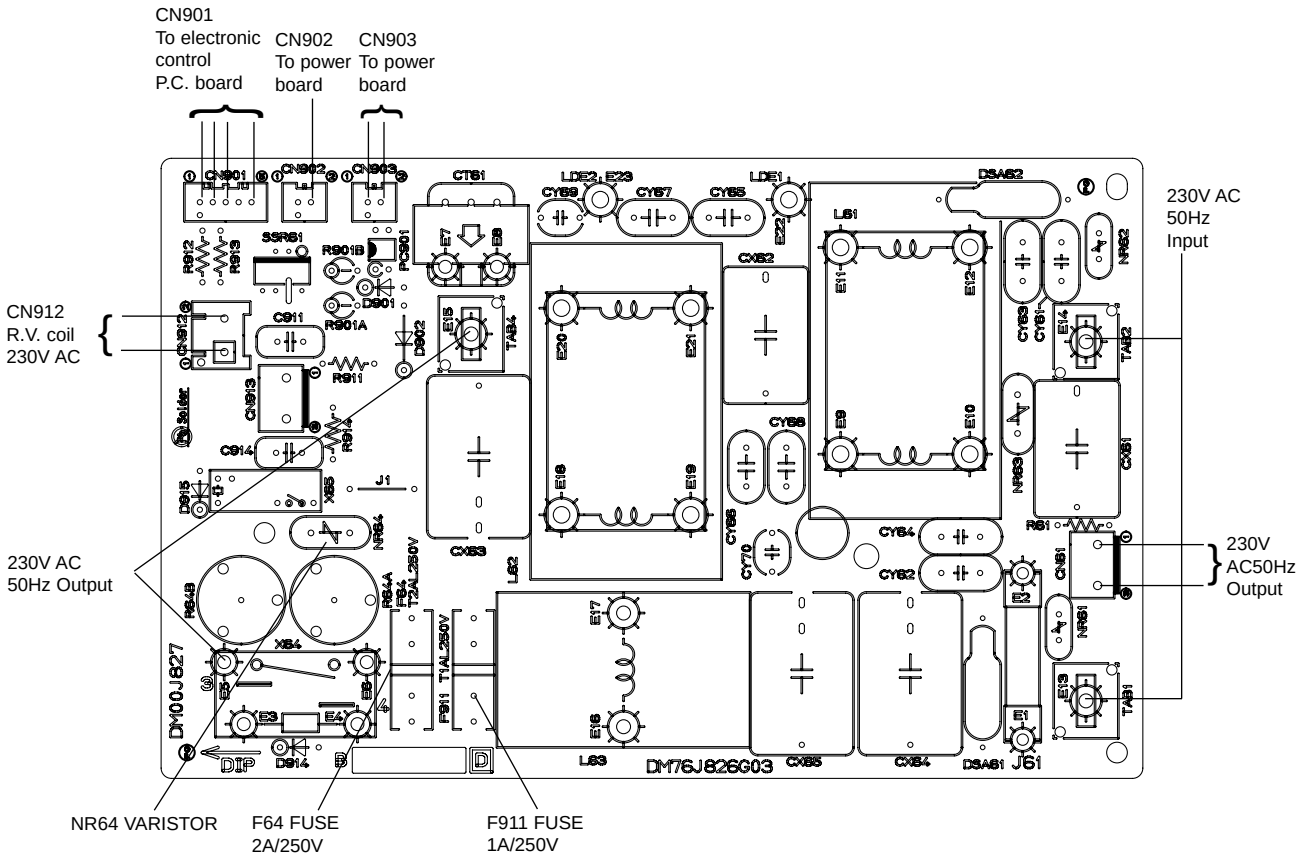




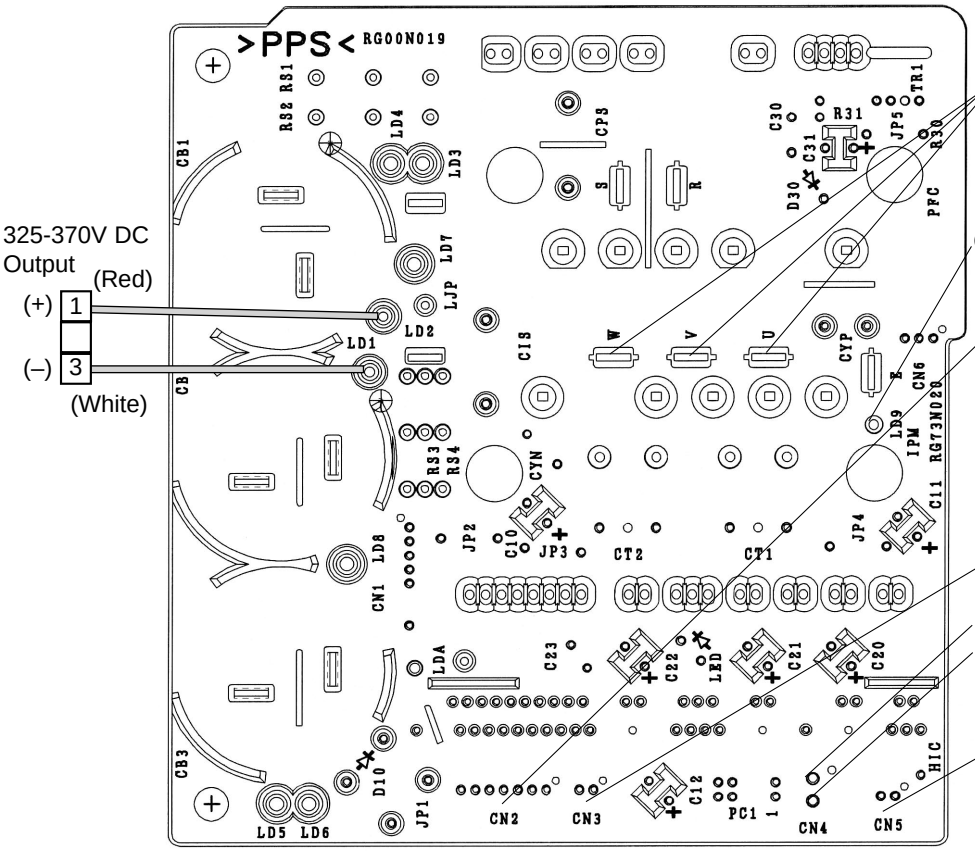
11-6-4. Outdoor electronic control P.C. board
SUZ-KA60VA2.TH

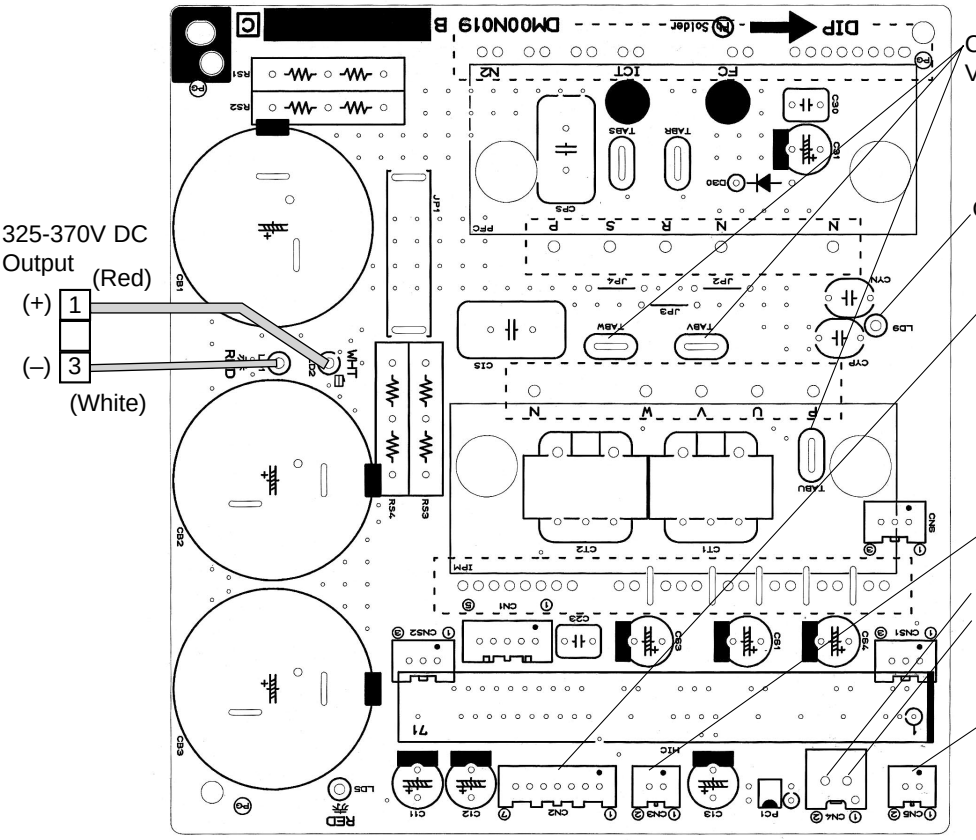


11-6-5. Noise filter P.C. board
SUZ-KA60VA2.TH



11-6-6. Outdoor power board
SUZ-KA60VA2.TH



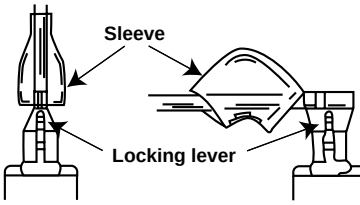


12 DISASSEMBLY INSTRUCTIONS

<"Terminal with locking mechanism" Detaching points>

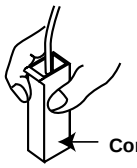
The terminal which has the locking mechanism can be detached as shown below.
There are two types (Refer to (1) and (2)) of the terminal with locking mechanism.
The terminal without locking mechanism can be detached by pulling it out.
Check the shape of the terminal before detaching.

(1) Slide the sleeve and check if there is a locking lever or not.



①Slide the sleeve.
②Pull the terminal while pushing the locking lever.

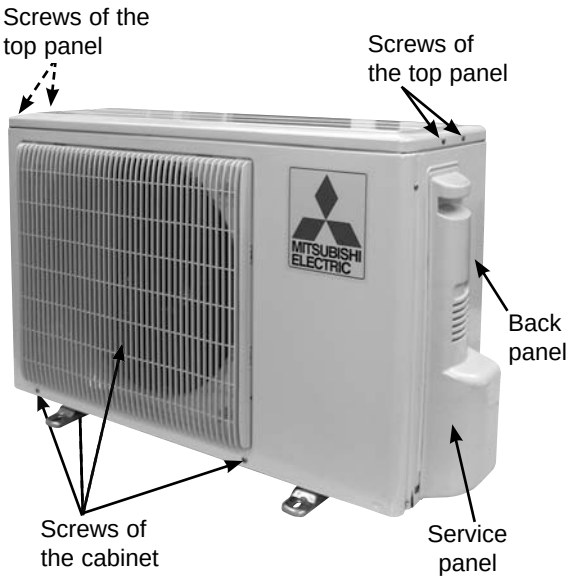
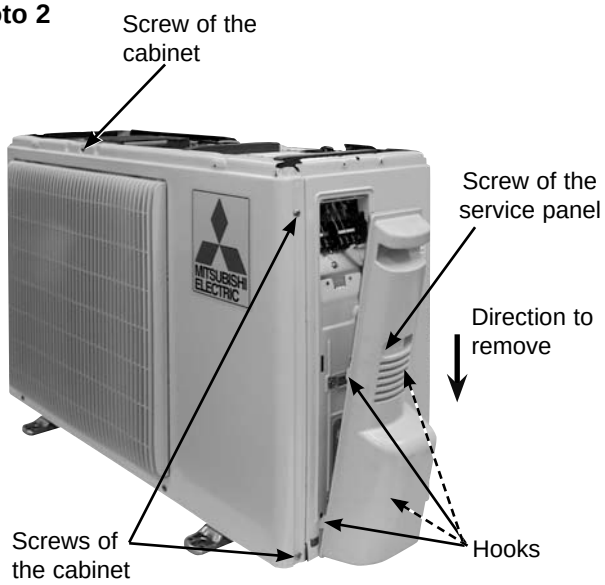
(2) The terminal with this connector has the locking mechanism.

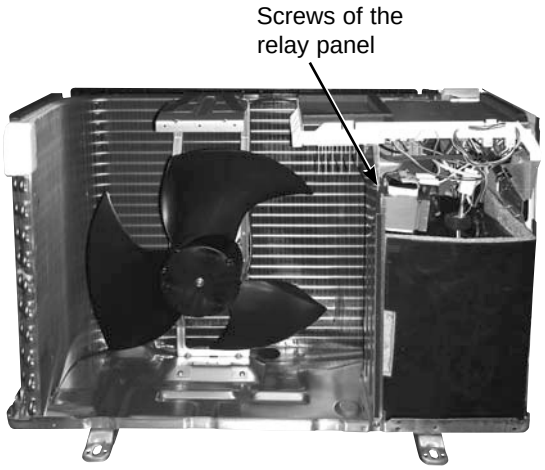
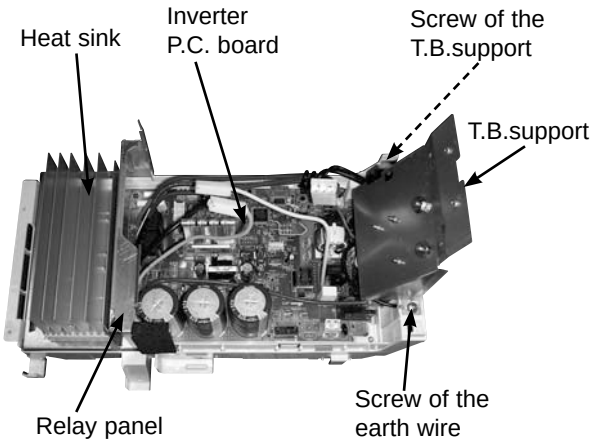


①Hold the sleeve, and pull out the terminal slowly.

SUZ-KA25VA2.TH SUZ-KA35VA2.TH
OUTDOOR UNIT

NOTE: Turn OFF power supply before disassembling.

OPERATING PROCEDURE	PHOTOS
1. Removing the cabinet (1) Remove the screw fixing the service panel. (2) Pull down the service panel and remove it. (3) Disconnect the power supply and indoor/outdoor connecting wire. (4) Remove the screws fixing the top panel. (5) Remove the top panel. (6) Remove the screws fixing the cabinet. (7) Remove the cabinet. (8) Remove the screws fixing the back panel. (9) Remove the back panel.	**Photo 1**  **Photo 2** 

OPERATING PROCEDURE	PHOTOS
2. Removing the inverter assembly, inverter P.C. board (1) Remove the cabinet and panels. (Refer to 1.) (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN721 (R.V. coil) CN932 (Fan motor) CN641 (Defrost thermistor and discharge temperature thermistor) CN643 (Ambient temperature thermistor) CN644 (Outdoor heat exchanger temperature thermistor) CN724 (LEV) (3) Remove the compressor connector (CN61). (4) Remove the screws fixing the relay panel. (Photo 3) (5) Remove the inverter assembly. (Photo 4) (6) Remove the screw of the earth wire and screw of the T.B.support. (Photo 4) (7) Remove the relay panel from the inverter assembly. (8) Remove the inverter P.C. board from the relay panel.	**Photo 3**  **Photo 4 (Inverter assembly)** 
3. Removing R.V. coil (1) Remove the cabinet and panels. (Refer to 1.) (2) Disconnect the following connectors: <Inverter P.C. board> CN721 (R.V. coil) (3) Remove the R.V. coil. (Photo 5)	
4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor (1) Remove the cabinet and panels. (Refer to 1.) (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN641 (Defrost thermistor and discharge temperature thermistor) CN643 (Ambient temperature thermistor) CN644 (Outdoor heat exchanger temperature thermistor) (3) Pull out the discharge temperature thermistor from its holder. (Photo 5) (4) Pull out the defrost thermistor from its holder. (Photo 6) (5) Pull out the outdoor heat exchanger temperature thermistor from its holder. (Photo 6) (6) Pull out the ambient temperature thermistor from its holder.	**Photo 5** 

OPERATING PROCEDURE

5. Removing outdoor fan motor

(1) Remove the cabinet and panels. (Refer to 1.)
(2) Disconnect the following connectors:
<Inverter P.C. board>
CN932 (Fan motor)
(3) Remove the propeller nut. (Photo 7)
(4) Remove the propeller. (Photo 7)
(5) Remove the screws fixing the fan motor. (Photo 7)
(6) Remove the fan motor.

6. Removing the compressor and 4-way valve

(1) Remove the cabinet and panels. (Refer to 1.)
(2) Remove the inverter assembly. (Refer to 2.)
(3) Recover gas from the refrigerant circuit.
NOTE: Recover gas from the pipes until the pressure gauge shows 0 kg/cm^2 (0 MPa).
(4) Detach the welded part of the suction and the discharge pipe connected with compressor.
(5) Remove the nuts of compressor legs.
(6) Remove the compressor.
(7) Detach the welded part of pipes connected with 4-way valve. (Photo 8)

PHOTOS

Photo 6

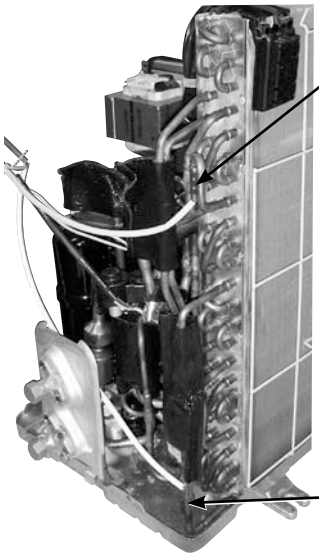


Photo 7

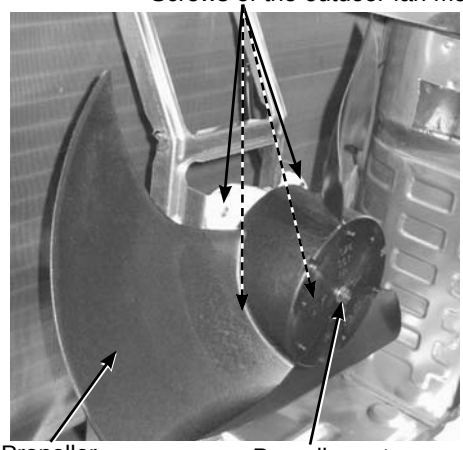
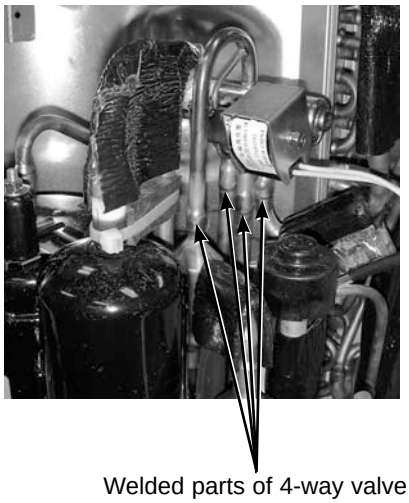
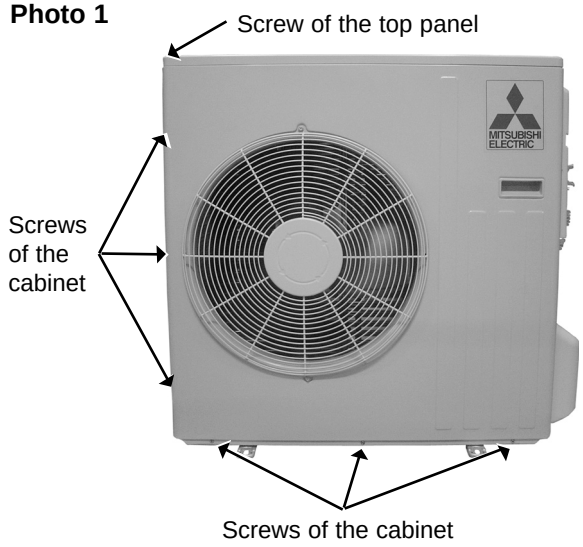
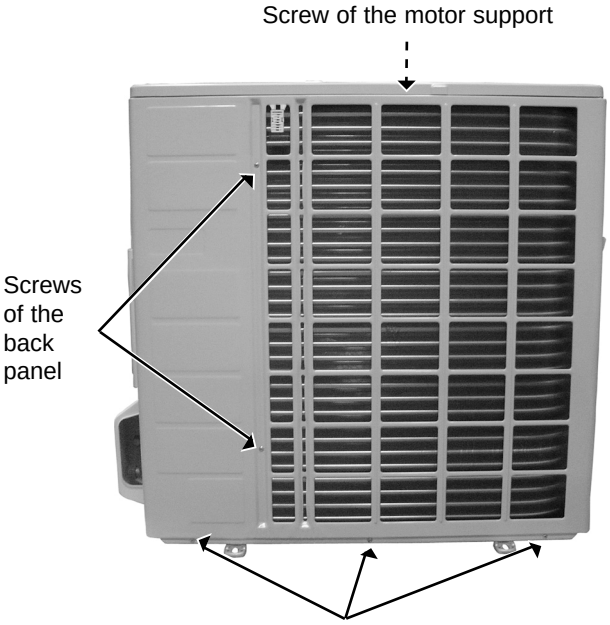
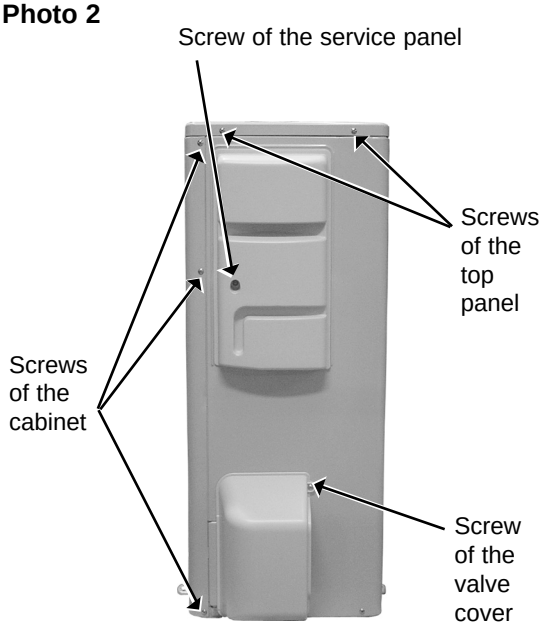


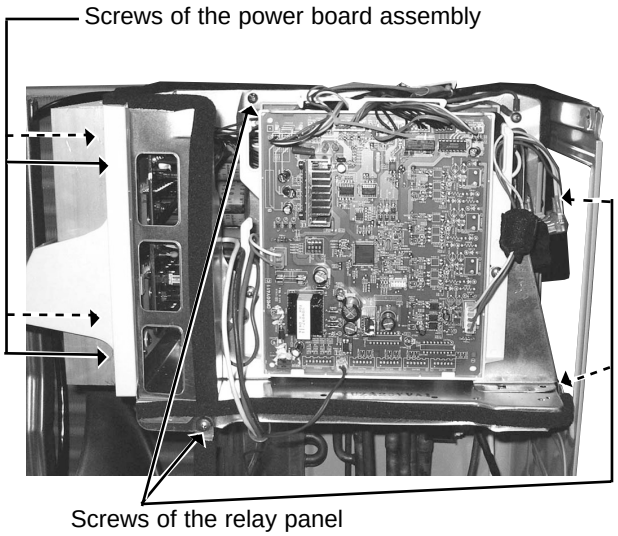
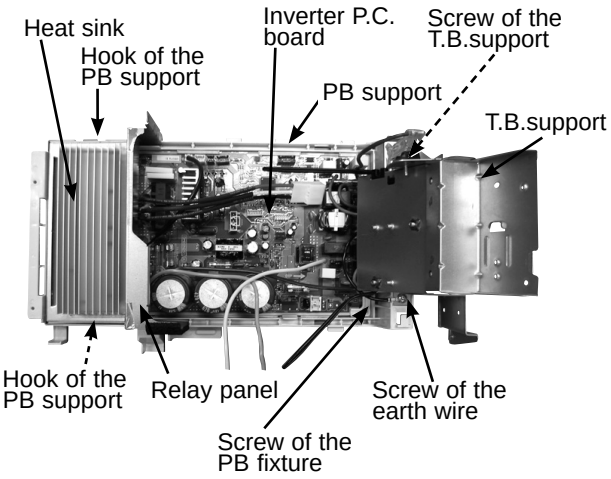
Photo 8

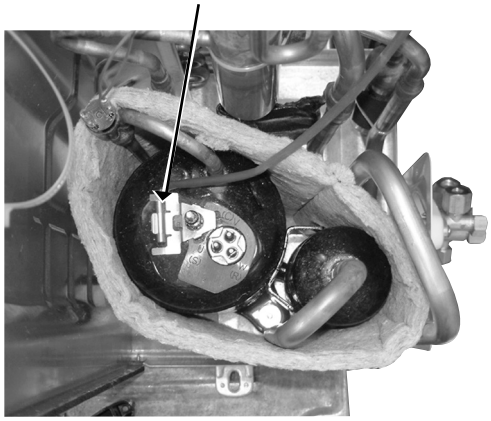
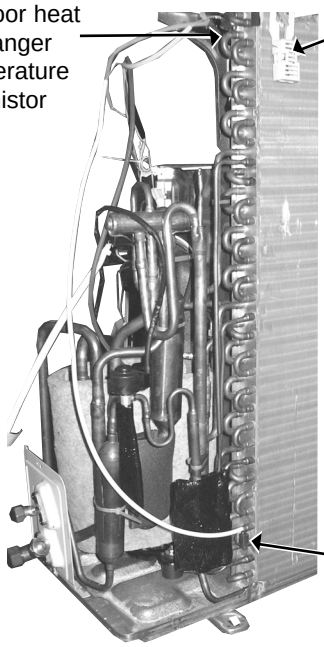


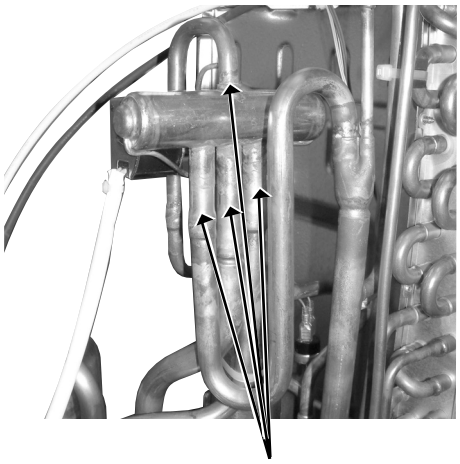
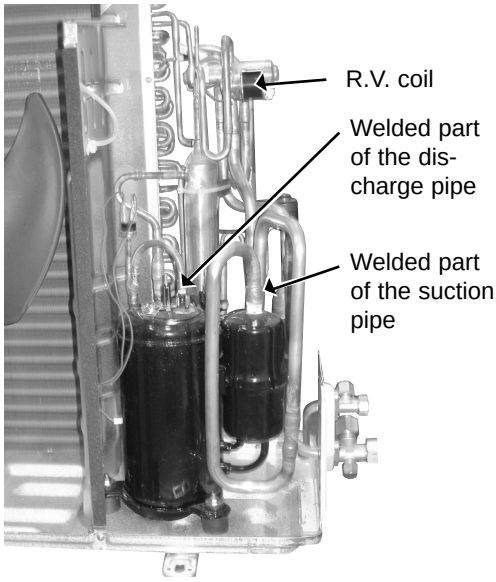
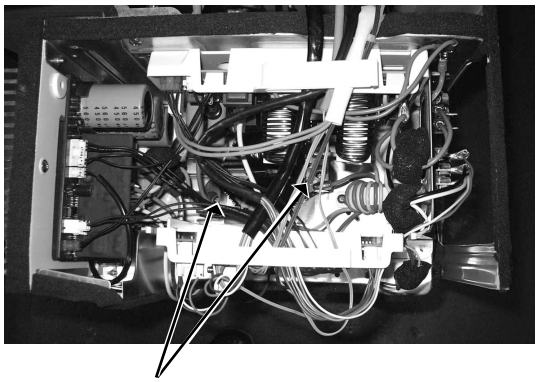
SUZ-KA50VA2.TH SUZ-KA60VA2.TH

NOTE: Turn OFF power supply before disassembling.

OPERATING PROCEDURE	PHOTOS
1. Removing the cabinet (1) Remove the screws of the service panel. (2) Remove the screws of the top panel. (3) Remove the screw of the valve cover. (4) Remove the service panel. (5) Remove the top panel. (6) Remove the valve cover. (7) Remove the screws of the cabinet. (8) Remove the cabinet. (9) Remove the screws of the back panel. (10) Remove the back panel.	**Photo 1** 
Photo 3  	**Photo 2** 

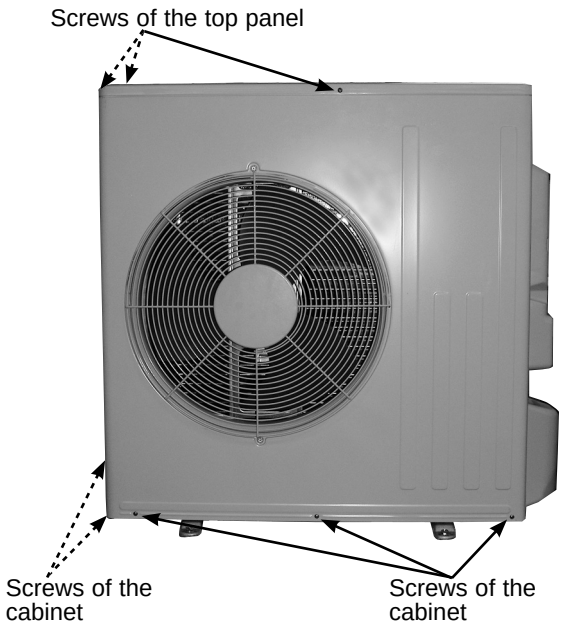
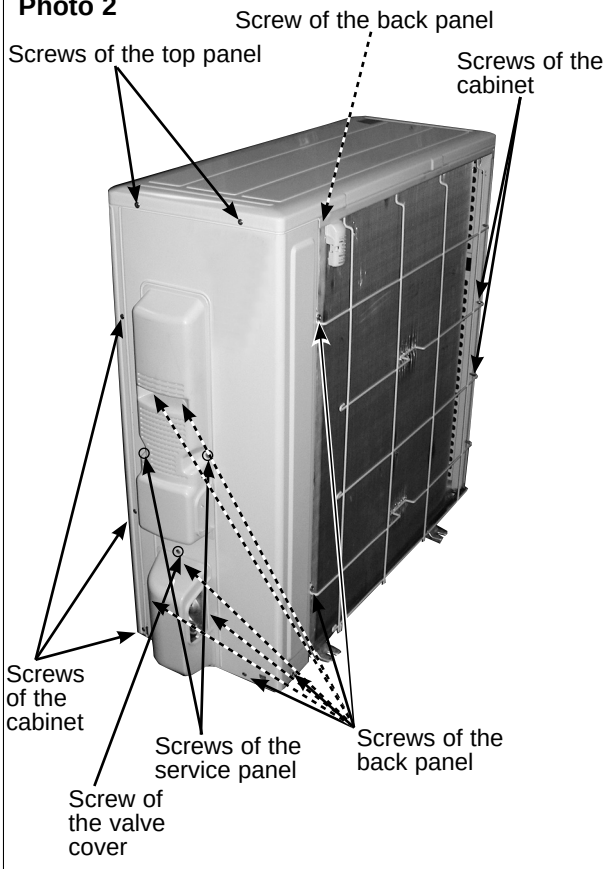
OPERATING PROCEDURE	PHOTOS
2. Removing the inverter assembly, inverter P.C. board and power board **(for SUZ-KA50VA2.TH)** (1) Remove the top panel, cabinet, service panel and back panel. (Refer to 1.) (2) Disconnect the lead wire to the reactor and the following connectors; <Inverter P.C. board> CN721 (R.V.coil) CN932 (Fan motor) CN641 (Defrost thermistor and discharge temperature thermistor) CN643 (Ambient temperature thermistor) CN644 (Outdoor heat exchanger temperature thermistor) CN724 (LEV) (3) Remove the compressor connector (CN61). (4) Remove the screws fixing the relay panel. (Photo 5) (5) Remove the inverter assembly. (Photo 6) (6) Remove the screw of the earth wire and screw of the T.B.support. (Photo 6) (7) Remove the screw of the PB fixture. (8) Remove the relay panel from the PB support. (9) Remove the inverter P.C. board from the inverter assembly. **(for SUZ-KA60VA2.TH)** (1) Remove the top panel, cabinet, service panel and back panel. (Refer to 1.) (2) Disconnect the following connectors; <Electronic control P.C. board> CN931 and CN932 (Fan motor) CN795 (LEV) CN661 (Discharge temperature thermistor, defrost thermistor and outdoor heat exchanger temperature thermistor) <Noise filter P.C. board> CN912 (4-way valve) (3) Remove the compressor connector. (4) Remove the screws fixing the relay panel. (5) Remove the inverter assembly. (6) Disconnect all connectors and lead wires on the electronic control P.C. board. (7) Remove the electronic control P.C. board from the inverter assembly. (8) Remove the screws fixing the power board assembly. (9) Disconnect all connectors and lead wires on the power board. (10) Remove the power board from the inverter assembly. (11) Disconnect all connectors and lead wires on the noise filter P.C. board. (12) Remove the noise filter P.C. board from the inverter assembly.	**Photo 4** 
3. Removing R.V. coil (1) Remove the top panel, cabinet and service panel. (Refer to 1) (2) Remove the back panel. (Refer to 1.) (3) Disconnect the following connectors; **for SUZ-KA50VA2.TH** <inverter P.C. board> CN721 (R.V. coil) **for SUZ-KA60VA2.TH** <Noise filter P.C. board> CN912 (R.V. coil) (4) Remove the R.V. coil. (Photo 11)	**Photo 5 (SUZ-KA50VA2.TH)**  **Photo 6 (SUZ-KA50VA2.TH)** 

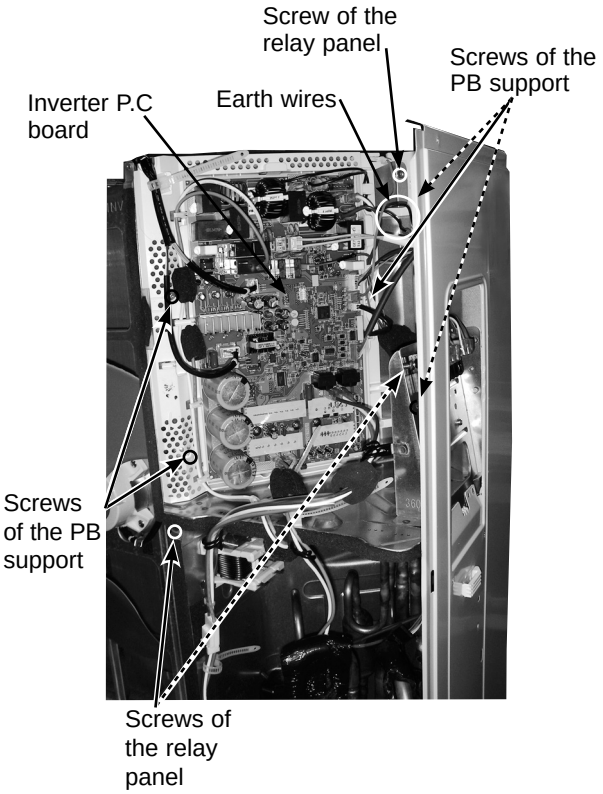
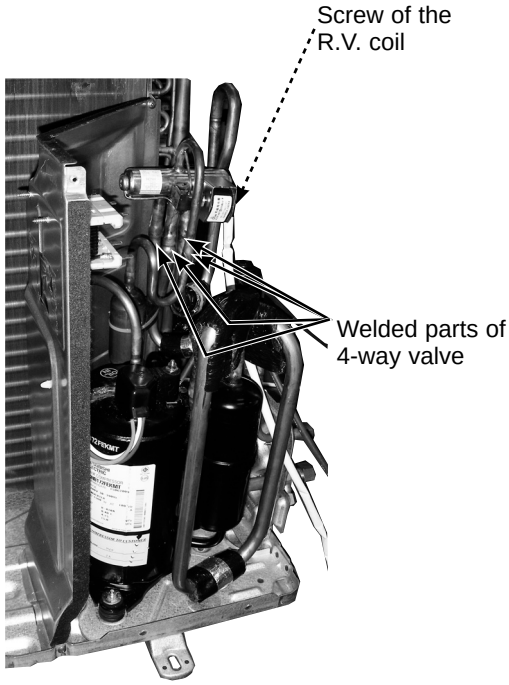
OPERATING PROCEDURE	PHOTOS
4. Removing the defrost thermistor, discharge temperature thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor (1) Remove the top panel, cabinet and service panel. (Refer to 1.) (2) Remove the back panel. (Refer to 1.) (3) Remove the inverter assembly. (Refer to 2.) (4) Pull out the defrost thermistor from its holder. (Photo 8) (5) Pull out the discharge temperature thermistor from its holder. (Photo 7) (6) Pull out the outdoor heat exchanger temperature thermistor from its holder. (Photo 8) (7) Pull out the ambient temperature thermistor from its holder. (Photo 8)	**Photo 7** Discharge temperature thermistor  **Photo 8** Outdoor heat exchanger temperature thermistor Ambient temperature thermistor Defrost thermistor 
5. Removing outdoor fan motor (1) Remove the top panel, cabinet and service panel. (Refer to 1.) (2) Remove the back panel. (Refer to 1.) (3) Disconnect the following connectors; **for SUZ-KA50VA2.TH** <Inverter P.C. board> CN931 and CN932 (Fan motor) **for SUZ-KA60VA2.TH** <Electric control P.C. board> CN931 and CN932 (Fan motor) (4) Remove the propeller. (5) Remove the screws fixing the fan motor. (6) Remove the fan motor	**Photo 9** Screws of the outdoor fan motor Propeller 

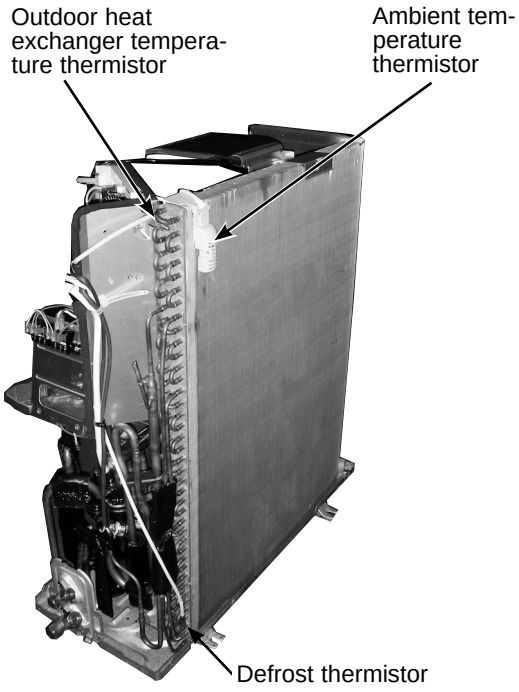
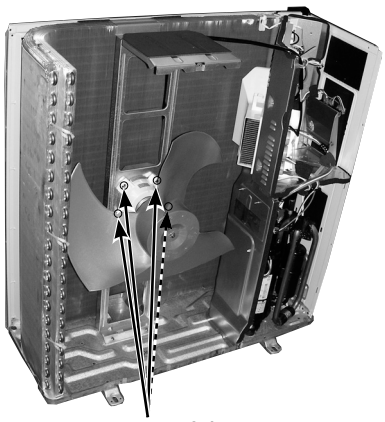
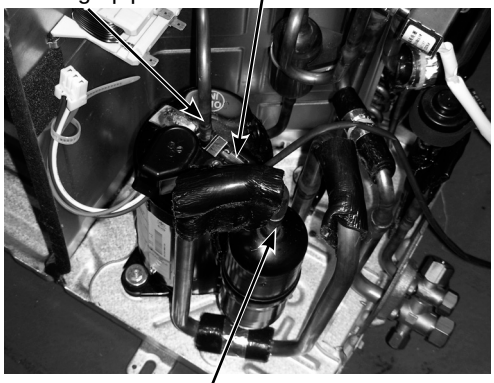
OPERATING PROCEDURE	PHOTOS
6. Removing the compressor and 4-way valve (1) Remove the top panel, cabinet and service panel. (Refer to 1.) (2) Remove the back panel. (Refer to 1.) (3) Remove the inverter assembly. (Refer to 2.) (4) Recover gas from the refrigerant circuit. **NOTE:** Recover gas from the pipes until the pressure gauge shows 0 kg/cm^2 (0 MPa). (5) Detach the welded part of the suction and the discharge pipe connected with compressor. (Photo 11) (6) Remove the compressor nuts. (7) Remove the compressor. (8) Detach the welded part of 4-way valve and pipe. (Photo 10)	**Photo 10**  Welded parts of 4-way valve **Photo 11** 
7. Removing the reactor (1) Remove the top panel. (Refer to 1.) (2) Disconnect the reactor lead wire. (3) Remove the screws of the reactor, and remove the reactor.	**Photo 12**  Screws of the reactor

SUZ-KA71VA2.TH

NOTE: Turn OFF power supply before disassembling.

OPERATING PROCEDURE	PHOTOS
1. Removing the cabinet (1) Remove the screws of the service panel. (2) Remove the screws of the top panel. (3) Remove the screw of the valve cover. (4) Remove the service panel. (5) Remove the top panel. (6) Remove the valve cover. (7) Disconnect the power supply and indoor/outdoor connecting wire. (8) Remove the screws of the cabinet. (9) Remove the cabinet. (10) Remove the screws of the back panel. (11) Remove the back panel.	**Photo 1**  **Photo 2** 

OPERATING PROCEDURE	PHOTOS
2. Removing the inverter assembly, inverter P.C. board (1) Remove the cabinet and panels. (Refer to 1.) (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN602 (R.V. coil) CN931, CN932 (Fan motor) CN671 (Defrost thermistor, discharge temperature thermistor and outdoor heat exchanger temperature thermistor) CN672 (Ambient temperature thermistor) CN724 (LEV) (3) Remove the compressor connector. (4) Remove the screws fixing the relay panel. (5) Remove the relay panel. (6) Remove the earth wires and the lead wires of the inverter P.C. board. (7) Remove the screw of the PB support. (8) Remove the inverter P.C. board from the relay panel.	**Photo 3** 
3. Removing R.V. coil (1) Remove the cabinet and panels. (Refer to 1.) (2) Disconnect the following connector: <Inverter P.C. board> CN602 (R.V. coil) (3) Remove the R.V. coil.	**Photo 4** 

OPERATING PROCEDURE	PHOTOS
4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor (1) Remove the cabinet and panels. (Refer to 1.) (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN671 (Defrost thermistor, discharge temperature thermistor and outdoor heart exchanger temperature thermistor) CN672 (Ambient temperature thermistor) (3) Pull out the discharge temperature thermistor from its holder. (Photo 7) (4) Pull out the defrost thermistor from its holder. (5) Pull out the outdoor heat exchanger temperature thermistor from its holder. (6) Pull out the ambient temperature thermistor from its holder.	**Photo 5** 
5. Removing outdoor fan motor (1) Remove the top panel, cabinet and service panel. (Refer to 1.) (2) Disconnect the following connectors: <Inverter P.C. board> CN931 and CN932 (Fan motor) (3) Remove the propeller. (4) Remove the screws fixing the fan motor. (5) Remove the fan motor.	**Photo 6** 
6. Removing the compressor and 4-way valve (1) Remove the top panel, cabinet and service panel. (Refer to 1.) (2) Remove the back panel. (Refer to 1.) (3) Remove the inverter assembly. (Refer to 2.) (4) Recover gas from the refrigerant circuit. **NOTE:** Recover gas from the pipes until the pressure gauge shows 0 kg/cm^2 (0 MPa). (5) Detach the welded part of the suction and the discharge pipe connected with compressor. (6) Remove the compressor nuts. (7) Remove the compressor. (8) Detach the welded part of 4-way valve and pipe. (Photo 4)	**Photo 7** 

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