TECHNICAL DATA & SERVICE MANUAL

Outdoor Unit
AER518DH

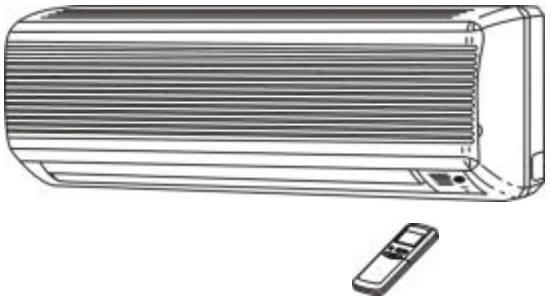
Indoor Unit
AWR509DHL (X2)
AFR509DHL (X2)

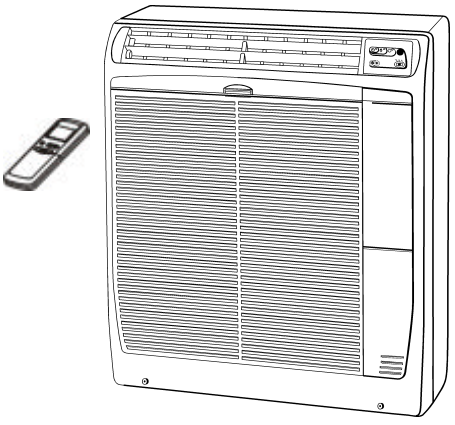
Euro-Line®

MULTI-SPLIT SYSTEM AIR CONDITIONER

Indoor Unit

AWR509DHL

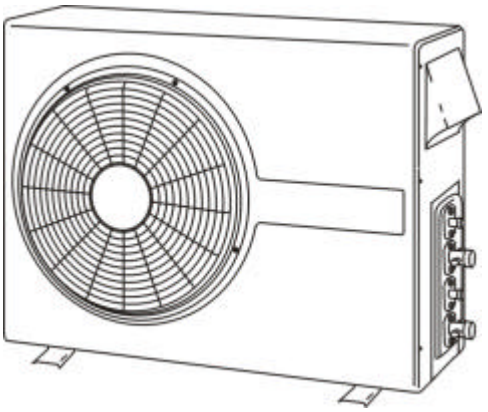




AFR509DHL

Outdoor Unit

AER518DH



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IMPORTANT!
Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.

WARNING This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

CAUTION This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

WARNING When Wiring

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death.**
- **Ground the unit** following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing…

…In a Ceiling or Wall

Make sure the ceiling/wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.

…In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

…In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

…In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

…In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When Connecting Refrigerant Tubing

- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.

Others

CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Escaped refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm upon completing installation that no refrigerant gas is leaking. If escaped gas comes in contact with a stove, gas water heater, electric room heater or other heat source, it can produce dangerously toxic gas.

Table of Contents

■ Unit Combination

Combine indoor and outdoor units only as listed below.

Outdoor Unit	Indoor Unit	Symbol of Indoor Unit	Refer to
AER518DH	AWR/AFR509DHL	A	Fig.1
	AWR/AFR509DHL	B	

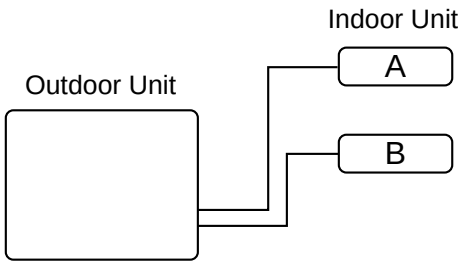

Fig.1

1. OPERATING RANGE

	Temperature	Indoor Air Intake Temp.	Outdoor Air Intake Temp.
Cooling	Maximum	32°C DB / 23°C WB	43°C DB
	Minimum	19°C DB / 14°C WB	19°C DB
Heating	Maximum	27°C DB	24°C DB / 18°C WB
	Minimum	16°C DB	–8°C DB / –9°C WB

2. SPECIFICATIONS

2-1. Unit Specifications

Indoor Unit **AWR509DHL**
Outdoor Unit **AER518DH**

No. of indoor units.				**1-unit**	
Power Source				220 – 240 V ~ 50 Hz	
Performance				Cooling	Heating
	Capacity		kW	2.55	3.15
			BTU/h	8,900	11,100
	Air circulation (High)		m^3/h	470	
	Moisture removal (High)		Liters/h	0.5	—
Electrical Rating	Voltage rating		V	230	
	Available voltage range		V	198 to 264	
	Running amperes		A	4.6	4.3
	Power input		W	1000	1150
	Power factor		%	94	97
	C.O.P.		W/W	2.55	2.7
	Compressor locked rotor amperes		A	24	
Features	Controls / Temperature control			Microprocessor / I.C. thermostat	
	Control unit			Wireless remote control unit	
	Timer			1-hour OFF / 12-hour ON or OFF	
	Fan speeds		Indoor / Outdoor	3 and Auto / 1	
	Airflow direction (Indoor)		Horizontal	Manual	
			Vertical	Auto	
	Air filter			Washable, Anti–Mold	
	Compressor			Rotary (Hermetic)	
	Refrigerant / Amount charged at shipment		g	R407C / 830	
	Refrigerant control			Capillary tube	
	Operation sound	Indoor – Hi / Me / Lo	dB-A	38 / 33 / 31	
		Outdoor – Hi	dB-A	53	
	Refrigerant tubing connections			Flare type	
	Max. allowable tubing length at shipment		m	7.5	
	Refrigerant tube diameter	Narrow tube	mm (in.)	6.35 (1/4)	
		Wide tube	mm (in.)	9.52 (3/8)	
	Refrigerant tube kit / Accessories			Optional / Hanging wall bracket	
Dimensions & Weight				Indoor Unit	Outdoor Unit
	Unit dimensions	Height	mm	270	630
		Width	mm	805	830
		Depth	mm	177	305
	package dimensions	Height	mm	243	713
		Width	mm	855	994
		Depth	mm	332	413
	Weight	Net	kg	8.0	61.0
		Shipping	kg	10.0	66.0
	Shipping volume		m^3	0.07	0.29

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Remarks: Rating conditions are:
Cooling: Indoor air temperature 27°C DB/19°C WB
Outdoor air temperature 35°C DB/24°C WB
Heating: Indoor air temperature 20°C DB
Outdoor air temperature 7°C DB/6°C WB

Indoor Unit **AFR509DHL**
Outdoor Unit **AER518DH**

No. of indoor units.				**1-unit**	
Power Source				220 – 240 V ~ 50 Hz	
Performance				Cooling	Heating
	Capacity		kW	2.55	3.15
			BTU/h	8,900	11,100
	Air circulation (High)		m^3/h	370	
	Moisture removal (High)		Liters/h	1.3—	
Electrical Rating	Voltage rating		V	230	
	Available voltage range		V	198 to 264	
	Running amperes		A	4.6	4.3
	Power input		W	1000	1150
	Power factor		%	94	97
	C.O.P.		W/W	2.55	2.7
	Compressor locked rotor amperes		A	24	
Features	Controls / Temperature control			Microprocessor / I.C. thermostat	
	Control unit			Wireless remote control unit	
	Timer			1-hour OFF / 12-hour ON or OFF	
	Fan speeds		Indoor / Outdoor	3 and Auto / 1	
	Airflow direction (Indoor)		Horizontal	Manual	
			Vertical	Manual	
	Air filter			Washable, Anti–Mold	
	Compressor			Rotary (Hermetic)	
	Refrigerant / Amount charged at shipment		g	R407C / 830	
	Refrigerant control			Capillary tube	
	Operation sound	Indoor – Hi / Me / Lo	dB-A	37/ 32/ 31	
		Outdoor – Hi	dB-A	53	
	Refrigerant tubing connections			Flare type	
	Max. allowable tubing length at shipment		m	7.5	
	Refrigerant tube diameter	Narrow tube	mm (in.)	6.35 (1/4)	
		Wide tube	mm (in.)	9.52 (3/8)	
	Refrigerant tube kit / Accessories			Optional / Hanging wall bracket	
Dimensions & Weight				Indoor Unit	Outdoor Unit
	Unit dimensions	Height	mm	700	630
		Width	mm	560	830
		Depth	mm	200	305
	package dimensions	Height	mm	770	713
		Width	mm	620	994
		Depth	mm	265	413
	Weight	Net	kg	18	61.0
		Shipping	kg	20	66.0
	Shipping volume		m^3	0.07	0.29

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Remarks: Rating conditions are:
Cooling: Indoor air temperature 27°C DB/19°C WB
Outdoor air temperature 35°C DB/24°C WB
Heating: Indoor air temperature 20°C DB
Outdoor air temperature 7°C DB/6°C WB

Indoor Unit **AWR509DHL**
Outdoor Unit **AER518DH**

No. of indoor units.				**2-unit**	
Power Source				220 – 240 V ~ 50 Hz	
Performance				Cooling	Heating
	Capacity		kW	4.70	6.30
			BTU/h	17100	21500
	Air circulation (High)		m^3/h	470 x 2	
	Moisture removal (High)		Liters/h	1.0 x 2	—
Electrical Rating	Voltage rating		V	230	
	Available voltage range		V	198 to 264	
	Running amperes		A	9.3	8.5
	Power input		W	2150	1950
	Power factor		%	98	98
	C.O.P.		W/W	2.2	3.2
	Compressor locked rotor amperes		A	48	
Features	Controls / Temperature control			Microprocessor / I.C. thermostat	
	Control unit			Wireless remote control unit	
	Timer			1-hour OFF / 12-hour ON or OFF	
	Fan speeds		Indoor / Outdoor	3 and Auto / 1	
	Airflow direction (Indoor)		Horizontal	Manual	
			Vertical	Auto	
	Air filter			Washable, Anti–Mold	
	Compressor			Rotary (Hermetic)	
	Refrigerant / Amount charged at shipment		g	R407C / 830 x 2	
	Refrigerant control			Capillary tube	
	Operation sound	Indoor – Hi / Me / Lo	dB-A	38 / 33 / 31	
		Outdoor – Hi	dB-A	53	
	Refrigerant tubing connections			Flare type	
	Max. allowable tubing length at shipment		m	7.5	
	Refrigerant tube diameter	Narrow tube	mm(in)	6.35 (1/4)	
		Wide tube	mm(in)	9.52 (3/8)	
	Refrigerant tube kit / Accessories			Optional / Hanging wall bracket	
Dimensions & Weight				Indoor Unit	Outdoor Unit
	Unit dimensions	Height	mm	270	630
		Width	mm	805	830
		Depth	mm	177	305
	package dimensions	Height	mm	243	713
		Width	mm	855	994
		Depth	mm	332	413
	Weight	Net	kg	8.0	61.0
		Shipping	kg	10.0	66.0
	Shipping volume		m^3	0.07	0.29

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Remarks: Rating conditions are:
Cooling: Indoor air temperature 27°C DB/19°C WB
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Indoor Unit **AFR509DHL**
Outdoor Unit **AER518DH**

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Power Source				220 – 240 V ~ 50 Hz	
Performance				Cooling	Heating
	Capacity		kW	4.70	6.30
			BTU/h	17100	21500
	Air circulation (High)		m^3/h	370x 2	
	Moisture removal (High)		Liters/h	2.6	—
Electrical Rating	Voltage rating		V	230	
	Available voltage range		V	198 to 264	
	Running amperes		A	9.3	8.5
	Power input		W	2150	1950
	Power factor		%	98	98
	C.O.P.		W/W	2.2	3.2
	Compressor locked rotor amperes		A	48	
Features	Controls / Temperature control			Microprocessor / I.C. thermostat	
	Control unit			Wireless remote control unit	
	Timer			1-hour OFF / 12-hour ON or OFF	
	Fan speeds		Indoor / Outdoor	3 and Auto / 1	
	Airflow direction (Indoor)		Horizontal	Manual	
			Vertical	Manual	
	Air filter			Washable, Anti–Mold	
	Compressor			Rotary (Hermetic)	
	Refrigerant / Amount charged at shipment		g	R407C / 830 x 2	
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		Outdoor – Hi	dB-A	53	
	Refrigerant tubing connections			Flare type	
	Max. allowable tubing length at shipment		m	7.5	
	Refrigerant tube diameter	Narrow tube	mm(in)	6.35 (1/4)	
		Wide tube	mm(in)	9.52 (3/8)	
	Refrigerant tube kit / Accessories			Optional / Hanging wall bracket	
Dimensions & Weight				Indoor Unit	Outdoor Unit
	Unit dimensions	Height	mm	700	630
		Width	mm	560	830
		Depth	mm	200	305
	package dimensions	Height	mm	770	713
		Width	mm	620	994
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Outdoor air temperature 35°C DB/24°C WB
Heating: Indoor air temperature 20°C DB
Outdoor air temperature 7°C DB/6°C WB

2-2. Major Component Specifications

Indoor Unit **AWR509DHL**

Controller PCB	Part No.				POW–KM98EH(A) - POW-K8EH(B)
	Controls				Microprocessor
	Control circuit fuse				250 V – 3.15 A
Remote Control Unit					RCS–8MHPN3E
Fan & Fan Motor	Type				Cross–flow
	Number ... Dia. and length			mm	1 ... ø95 / L617
	Fan motor model ... Number				KFV4Q–11H5P -S... 1
	No. of poles ... rpm (230 V, High)				4 ... 1190
	Nominal output			W	10
	Coil resistance (Ambient temp. 20°C)			Ω	WHT – BRN : 561.8 WHT – VLT : 197.4 VLT – ORG : 63.4 ORG – YEL : 155.7 YEL – PNK : 115.9
	Safety devices	Type			Internal thermal fuse
		Operating temp.	Open	°C	145 ± 2
			Close		—
	Run capacitor			µF	0.8
				VAC	440
Flap Motor	Type				Stepping motor
	Model				MP24GA1
	Rating				DC 12 V
	Coil resistance (Ambient temp. 25°C)			Ω	WHT – BLU (respectively 4 wires) : 380 ± 7%
Heat Exch. Coil	Coil				Aluminum plate fin / Copper tube
	Rows				2
	Fin pitch			mm	1.4
	Face area			m^2	0.130

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Indoor Unit **AFR509DHL**

Controller PCB	
Part No.	POW-KM98EH(A) - POW-K8EH(B
Controls	Microprocessor
Control circuit fuse	250 V 3 A

Remote Control Unit	**RCS-8MHPN3E**

Fan & Fan Motor				
Type				Cross-flow
Q'ty ... Dia. and length			mm	1 ... ø100/C410
Fan motor model ... Q'ty				KR35406M01527 ... 1
No. of poles ... rpm (230 V, High)				4 ... 1,130
Nominal output			W	27
Coil resistance (Ambient temp. 20℃)			Ω	GRY-WHT: 545-630 WHT-VLT: 192-105 VLT-YEL: 62-71 YEL-BRN: 780-900
Safety devices	Type			Internal fuse
	Operating temp.	Open	℃	150±10
		Close		—
Run capacitor			μF	0.6
			VAC	400

Heat Exch. Coil		
Coil		Aluminum plate fin / Copper tube
Rows		2
Fin pitch	mm	1.4
Face area	m^2	0.185

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

outdoor Unit **AER518DH**

Controller PCB					POW–C186CMH	
	Control circuit fuse				250 V– 3 A	
Compressor	Type				Rotary (Hermetic)	
	Compressor model ... Number				C–RN95H5A ... 2 / 80230035B ... 2	
	Nominal output			W	950 x 2	
	Compressor oil ... Amount			cc	DAPHNE-FV68S ... 470 x 2	
	Coil resistance (Ambient temp. 25°C)			Ω	C – R : 2.54 C – S : 6.36	
	Safety devices	Type			External (OLR 1, 3)	External (OLR 2, 4)
		Overload relay ... Number			MR99114–9201 ... 2	CS–7C115 ... 2
		Operating temp.	Open	°C	145 ± 5	115 ± 3
			Close	°C	69 ± 11	95 ± 5
		Operating amp.(Ambient temp. 25°C)			Trip in 6 to 16 sec. at 16.5 A	—
	Run capacitor			µF	25 ... 2	
	... Number			VAC	450 ... 2	
Fan & Fan Motor	Type				Propeller	
	Number ... Dia.			mm	1 ... ø400	
	Fan motor model ... Number				SG6–51B5P ... 1	
	No. of poles ... rpm (230 V,High)				6 ... 910	
	Nominal output			W	43	
	Coil resistance (Ambient temp. 20°C)			Ω	WHT – BRN : 83.4 WHT – PNK: 218.7	
	Safety devices	Type			Internal protector	
		Operating temp.	Open	°C	130 ± 5	
			Close		Automatic reclosing	
	Run capacitor			µF	2.0	
				VAC	400	
Heat Exch. Coil	Coil				Aluminum plate fin / Copper tube	
	Rows				2	
	Fin pitch			mm	1.6	
	Face area			m^2	0.453	
External Finish					Acrylic baked-on enamel finish	

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2-3. Other Component Specifications

Indoor Unit **AWR509DHL**

Transformer (TR)		**ATR-J105**
Rating	Primary	AC 230V, 50Hz
	Secondary	19V, 0.526A
	Capacity	10VA
Coil resistance	Ω (at 21°C)	Primary (WHT – WHT): 205 ± 10%
		Secondary (BRN – BRN): 2.0 ± 10%
Thermal cut-off temp.		150°C

Thermistor (Coil sensor)		**DNT-TK5131B**
Resistance	kΩ	0°C 15.0 ± 2%

Thermistor (Room sensor)		**DTN-TKS106E**
Resistance	kΩ	25°C 5.0 ± 3%

Outdoor Unit **AER518DH**

Power Relay (PRA, PRB)		**DFU24D1-F (M)**
Coil rating		DC 24V
Coil resistance	Ω (at 20°C)	650 ± 10%
Contact rating		AC 250V, 20A

Termistor (Coil sensor)		**PBC-41E-S15**	
Resistance	kΩ	–10°C 23.7 ± 5%	25°C 5.3 ± 5%
		0°C 15.0 ± 5%	30°C 4.4 ± 5%
		10°C 9.7 ± 5%	40°C 3.1 ± 5%
		20°C 6.5 ± 5%	

Solenoid Coil (4-way Valve SCA, SCB)		**LB64012 (Coil), VH7100C (Valve)**
Coil rating		AC 230V, 50Hz, 5W
Coil resistance	Ω (at 20°C)	1,408 ± 7%

Indoor Unit **AFR509DHL**

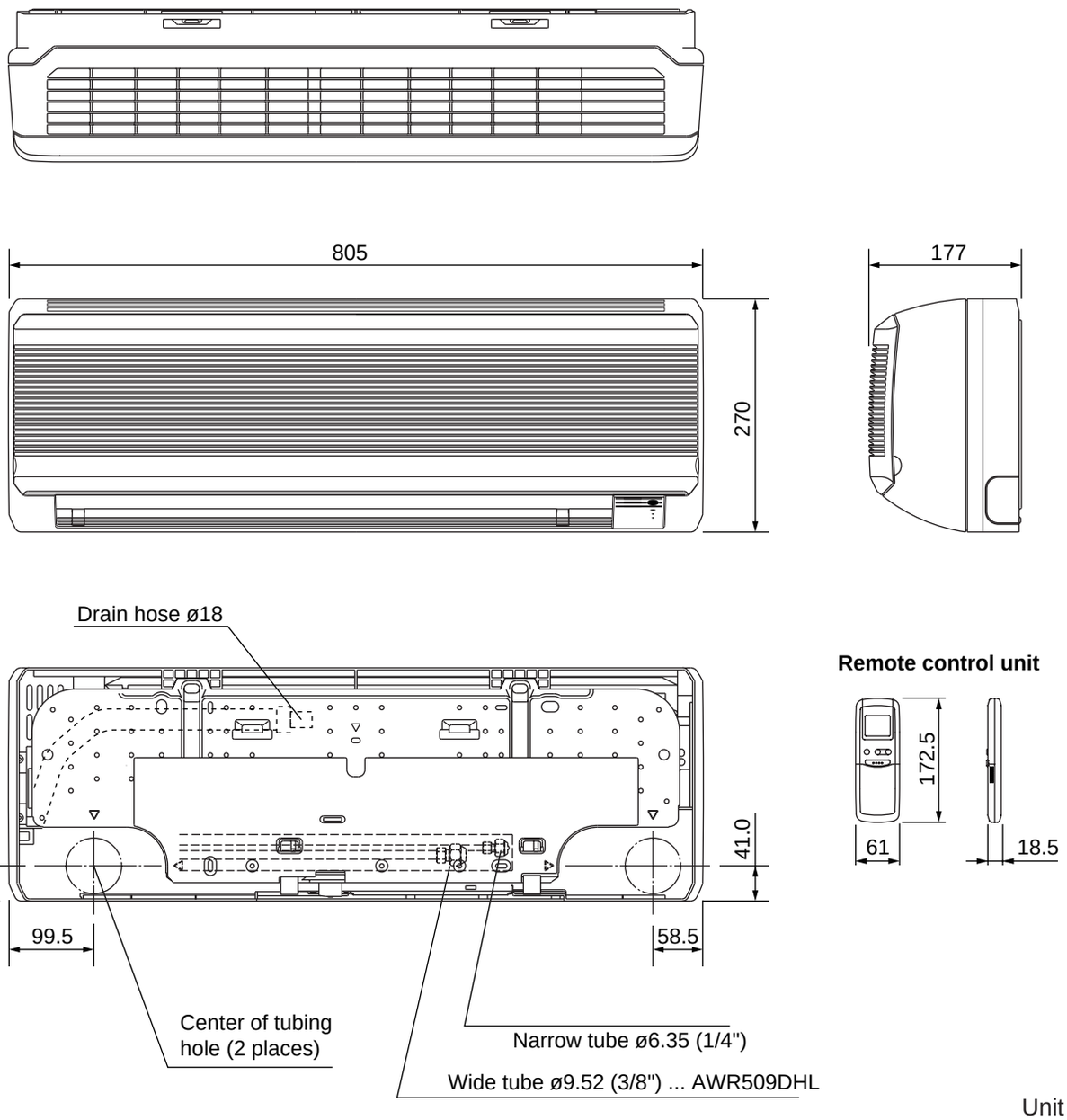
Thermistor (Room sensor TH2)		**DHKTEC-35-S6N**
Resistance	kΩ	-20°C 10 ± 5%
		-10° 7.9 ± 5%
		-20°C 6.3 ± 5%
		-10°C 5.0 ± 5%

Thermistor (Coil sensor TH1)		**DHPBC-41ES-14N**
Resistance	kΩ	–20°C 40.1 ± 5%
		–10°C 24.4 ± 5%
		0°C 15.3 ± 5%
		-10°C 9.9 ± 5%

Transformer (TR)		**ATR-J105**
Rating	Primary	AC 235V, 50Hz
	Secondary	11V, 0.727A
	Capacity	8VA
Coil resistance	Ω (at 21°C)	Primary (WHT Ò WHT): 205 ± 10%
		Secondary (BRN Ò BRN): 2.0 ± 10%
Thermal cut-off temp.		150 C

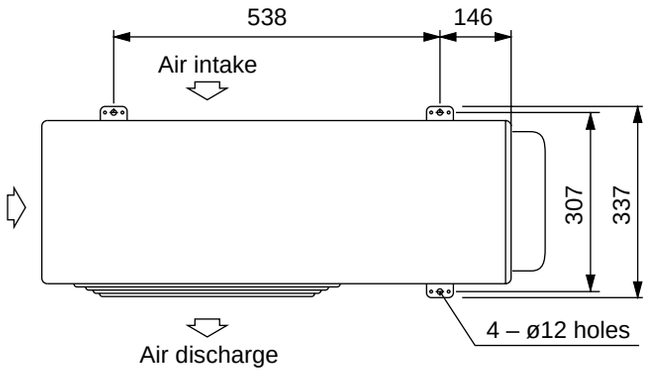
3. DIMENSIONAL DATA

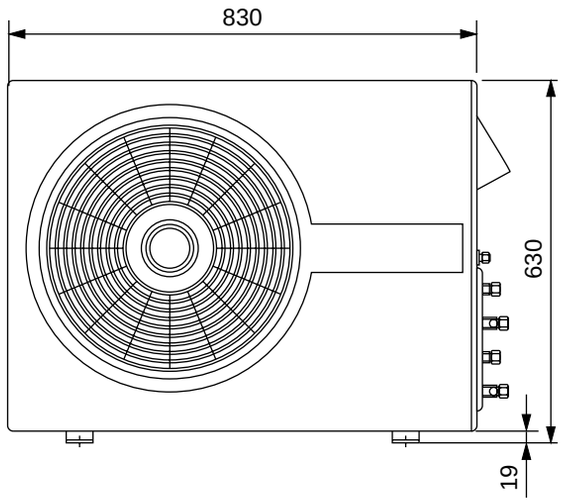
Indoor Unit **AWR509DHL**

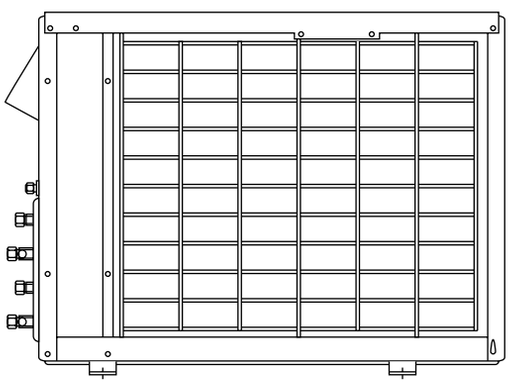


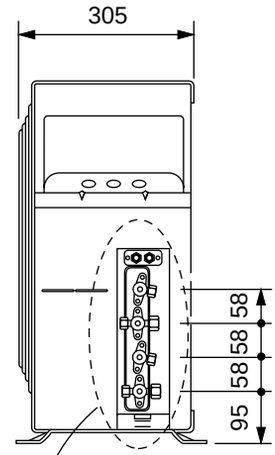
Unit : mm

Outdoor Unit **AER518DH**

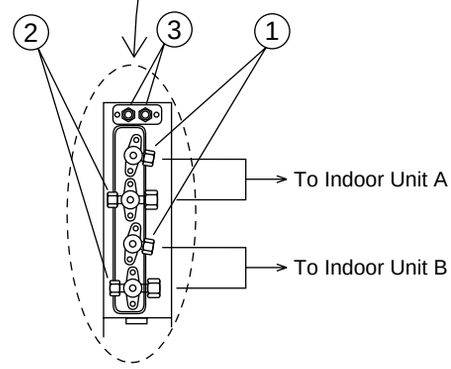








Magnified illustration



① Narrow tube service valve ø6.35(1/4")

② Wide tube service valve ø9.52(3/8")

③ Check Port

Dimensions : mm

4. COOLING CAPACITY

Indoor Unit **AWR509DHL AFR509DHL**
Outoor Unit **AER518DH**

230V 50 Hz

RATING CAPACITY 2.55 kW AIR FLOW RATE 430 m³/h @ 370m³/h							
EVAPORATOR		CONDENSER					
ENT.TEMP. °C		OUTDOOR AMBIENT TEMP. °C					
W.B.	D.B.		25	30	35	40	43
15		TC	2.42	2.34	2.23	2.10	1.93
		CM	0.82	0.88	0.95	1.04	1.13
	21	SHC	1.66	1.62	1.57	1.50	1.42
	23	SHC	1.88	1.84	1.79	1.72	1.64
	25	SHC	2.09	2.05	2.00	1.93	1.85
	27	SHC	2.31	2.27	2.21	2.10	1.93
	29	SHC	2.42	2.34	2.23	2.10	1.93
	31	SHC	2.42	2.34	2.23	2.10	1.93
17		TC	2.62	2.52	2.39	2.25	2.07
		CM	0.84	0.90	0.97	1.07	1.16
	21	SHC	1.45	1.41	1.35	1.29	1.20
	23	SHC	1.67	1.62	1.56	1.50	1.42
	25	SHC	1.89	1.83	1.78	1.71	1.63
	27	SHC	2.11	2.05	1.99	1.92	1.85
	29	SHC	2.33	2.26	2.21	2.14	2.06
	31	SHC	2.54	2.47	2.39	2.25	2.07
19		TC	2.77	2.68	2.55	2.39	2.21
		CM	0.88	0.93	1.00	1.10	1.19
	21	SHC	1.21	1.18	1.12	1.05	0.98
	23	SHC	1.43	1.39	1.34	1.27	1.19
	25	SHC	1.64	1.60	1.55	1.49	1.40
	27	SHC	1.85	1.82	1.76	1.70	1.62
	29	SHC	2.05	2.03	1.97	1.91	1.83
	31	SHC	2.27	2.25	2.19	2.12	2.05
21		TC	2.94	2.84	2.71	2.54	2.34
		CM	0.90	0.96	1.03	1.13	1.23
	23	SHC	1.20	1.16	1.10	1.04	0.96
	25	SHC	1.40	1.37	1.32	1.25	1.18
	27	SHC	1.62	1.59	1.53	1.47	1.39
	29	SHC	1.82	1.80	1.75	1.68	1.60
	31	SHC	2.04	2.01	1.96	1.90	1.82
23		TC	3.14	3.00	2.84	2.66	2.47
		CM	0.92	0.98	1.05	1.15	1.26
	25	SHC	1.18	1.13	1.06	1.00	0.93
	27	SHC	1.38	1.34	1.28	1.21	1.14
	29	SHC	1.58	1.55	1.49	1.42	1.36
	31	SHC	1.81	1.77	1.70	1.64	1.57

TC: TOTAL COOLING CAPACITY kW
SHC: SENSIBLE HEAT CAPACITY kW
CM: COMPRESSOR INPUT kW

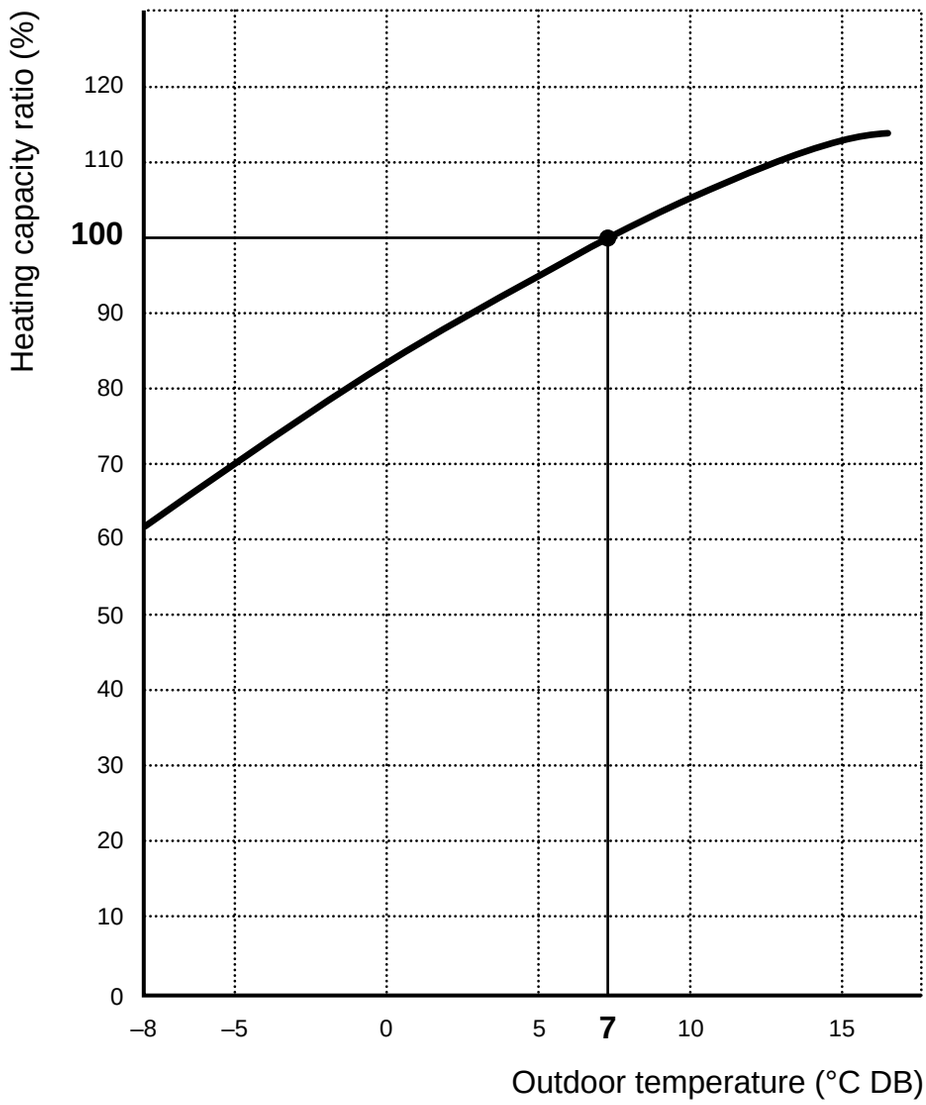
RATING CONDITIONS

OUTDOOR AMBIENT TEMPERATURE 35°C D.B.
INDOOR UNIT ENTERING AIR TEMP. 27°C D.B./19°C W.B.

5. HEATING CAPACITY

Indoor Unit **AWR509DHL AFR508DHL**

Outdoor Unit **AER509DH**



NOTE

1) ●… Point of Rating condition
   Black dot in the chart indicate the following rating condition.
   Indoor : 20°C DB
   Outdoor : 7°C DB / 6°C WB

2) Above characteristics indicate instantaneous operation, which does not take into consideration defrost operation.

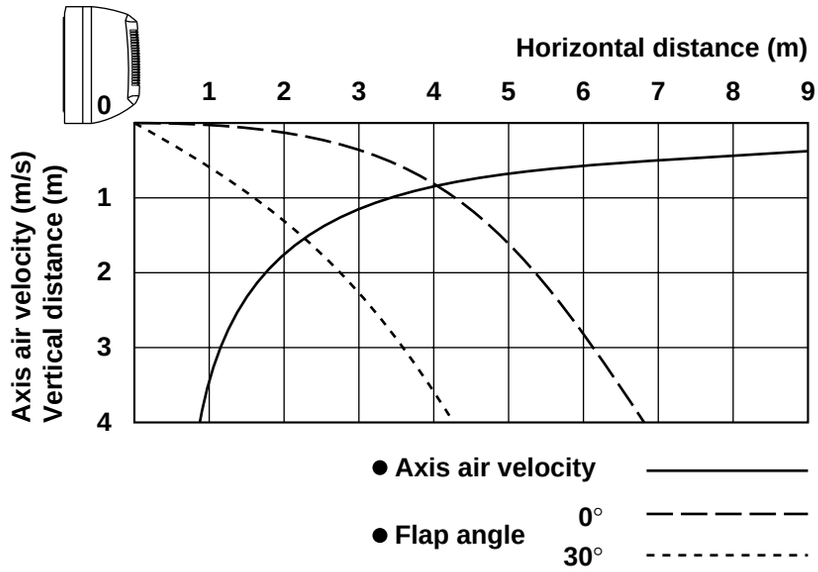
3) Fan speed : High

6. AIR THROW DISTANCE CHART

Indoor Unit **AWR509DHL**

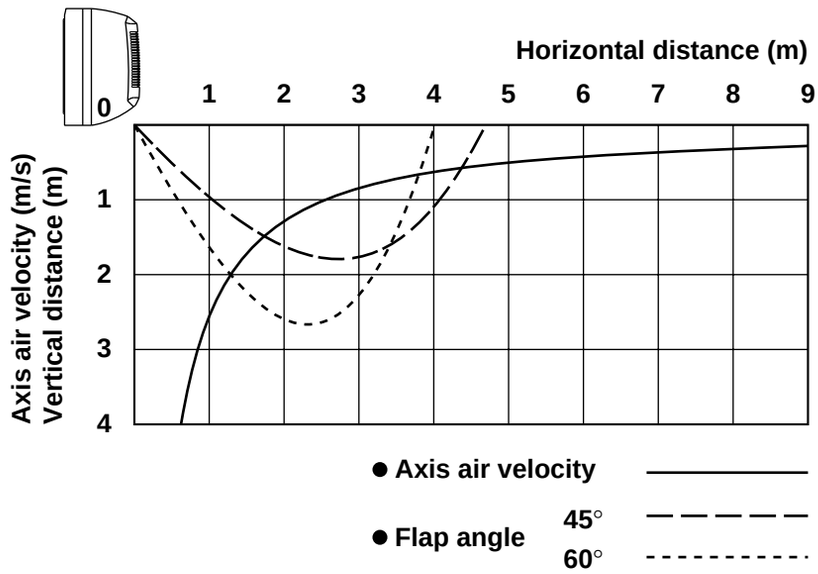
Cooling

Room air temp. : 27°C
Fan speed : High



Heating

Room air temp. : 20°C
Fan speed : High

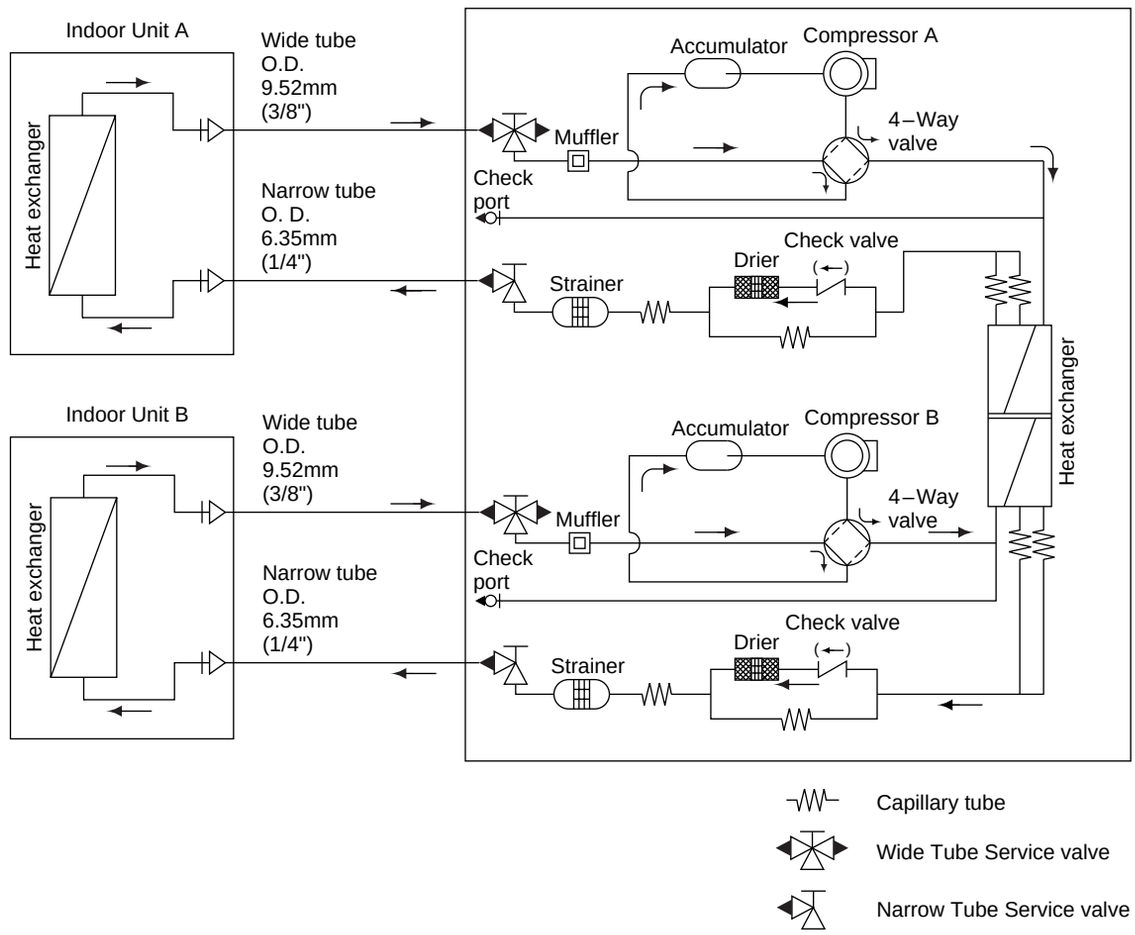


7. REFRIGERANT FLOW DIAGRAM

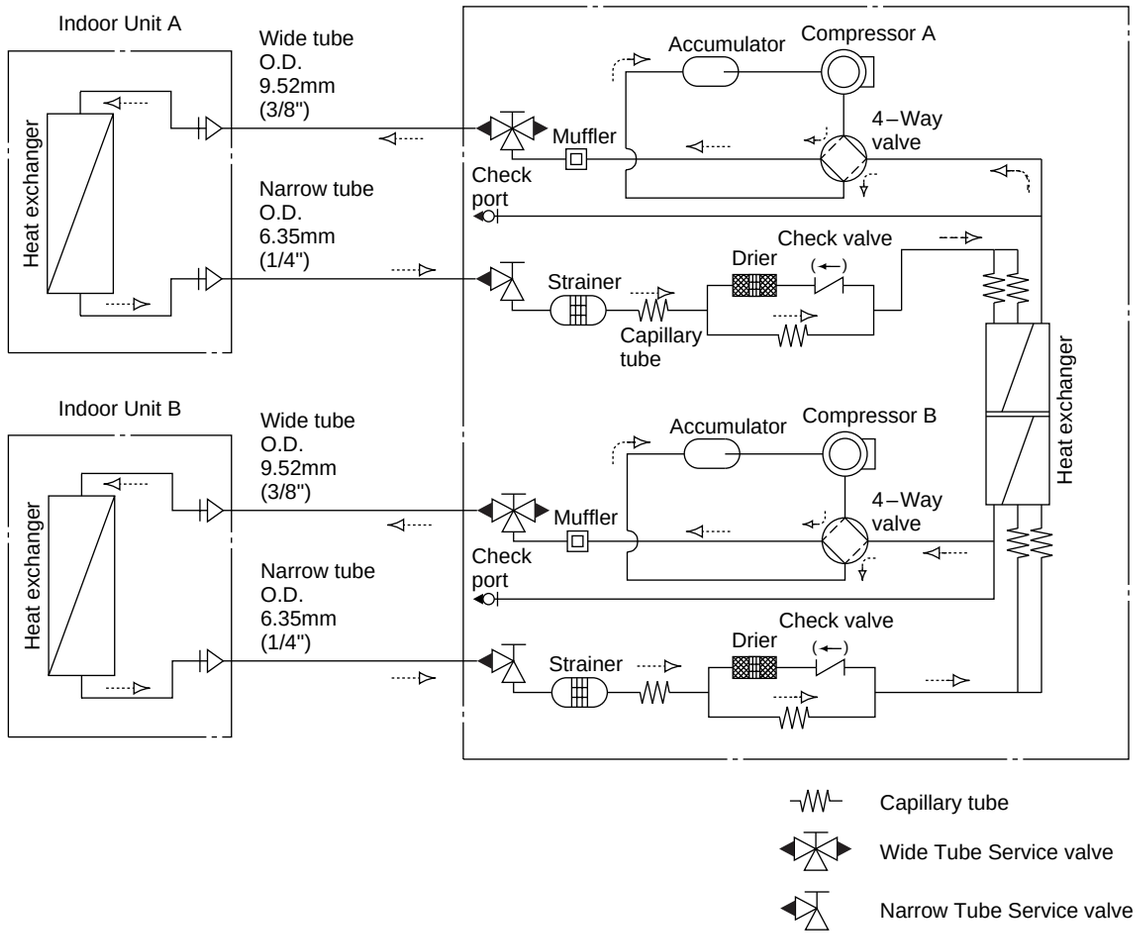
Indoor Unit **AWR509DHL AFR509DHL**

Outdoor Unit **AER518DH**

Cooling cycle



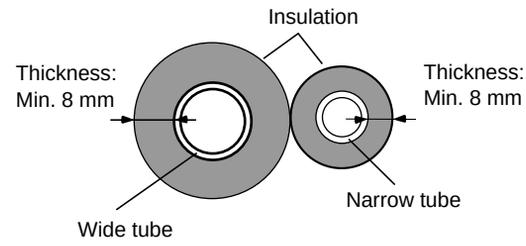
Heating cycle



Insulation of Refrigerant Tubing

IMPORTANT

To prevent heat loss and wet floors due to dripping of condensation water, **both the wide and narrow tubes must be well insulated with proper insulation material.** The thickness of the insulation should be a min. 8 mm.



CAUTION

After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.

8. ELECTRICAL DATA

8-1. Electrical Characteristics

NOTE

The values in the table below indicate the sum of indoor and outdoor units which are in running condition.

Indoor Unit **AWR509DHL AFR509DHL**
Outdoor Unit **AER518DH**

Cooling

230V Single phase 50 Hz

Number of indoor unit			**1 - Unit** (Either A or B)	**2 - Units** (Both A and B)
Rating Conditions	Running amp.	A	4.6	9.3
	Power input	kW	1.0	2.15
Full Load Conditions	Running amp.	A	5.4	10.8
	Power input	kW	1.23	2.47

Heating

230V Single phase 50 Hz

Number of indoor unit			1 - Unit (Either A or B)	2 - Unit (both A and B)
Rating Conditions	Running Amp.	A	4.3	8.5
Rating Conditions	Power Input	kW	1.15	1.95

Cooling

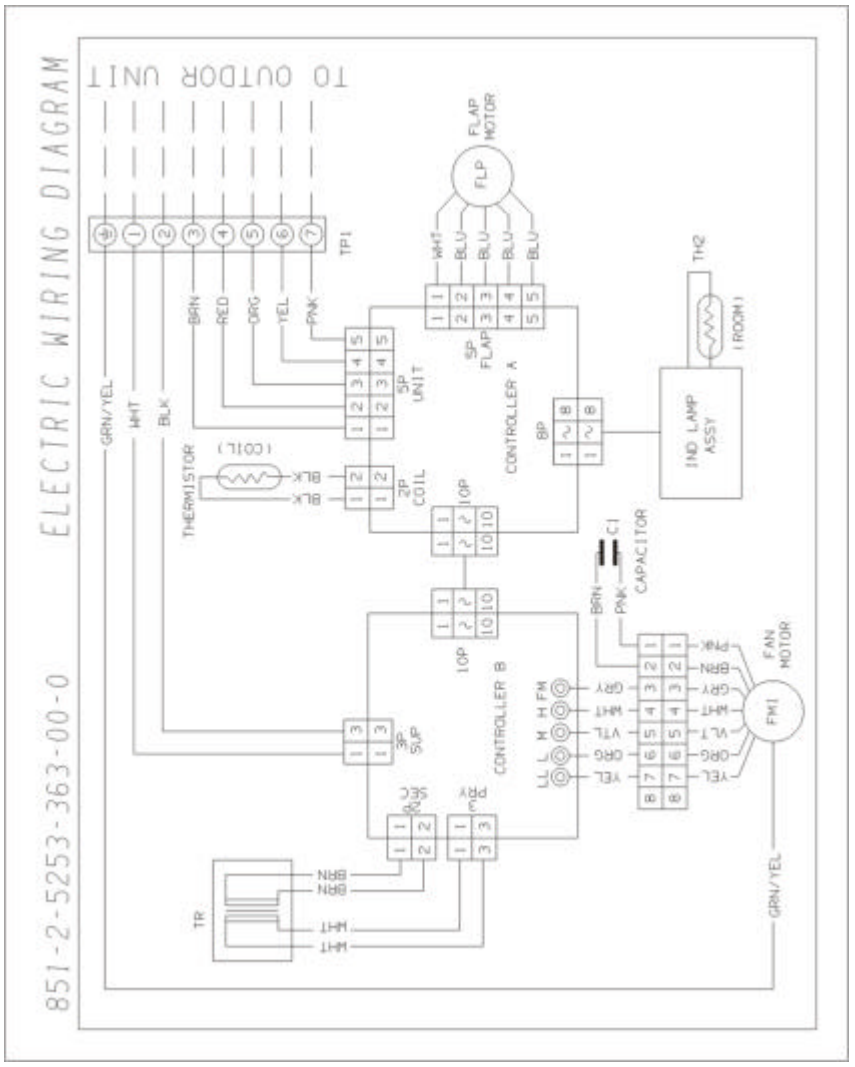
Rating Conditions: Indoor Air Temperature 27°C DB / 19°C WB
Outdoor Air Temperature 35°C DB
Full Load Conditions: Indoor Air Temperature 32°C DB / 23°C WB
Outdoor Air Temperature 43°C DB

Heating

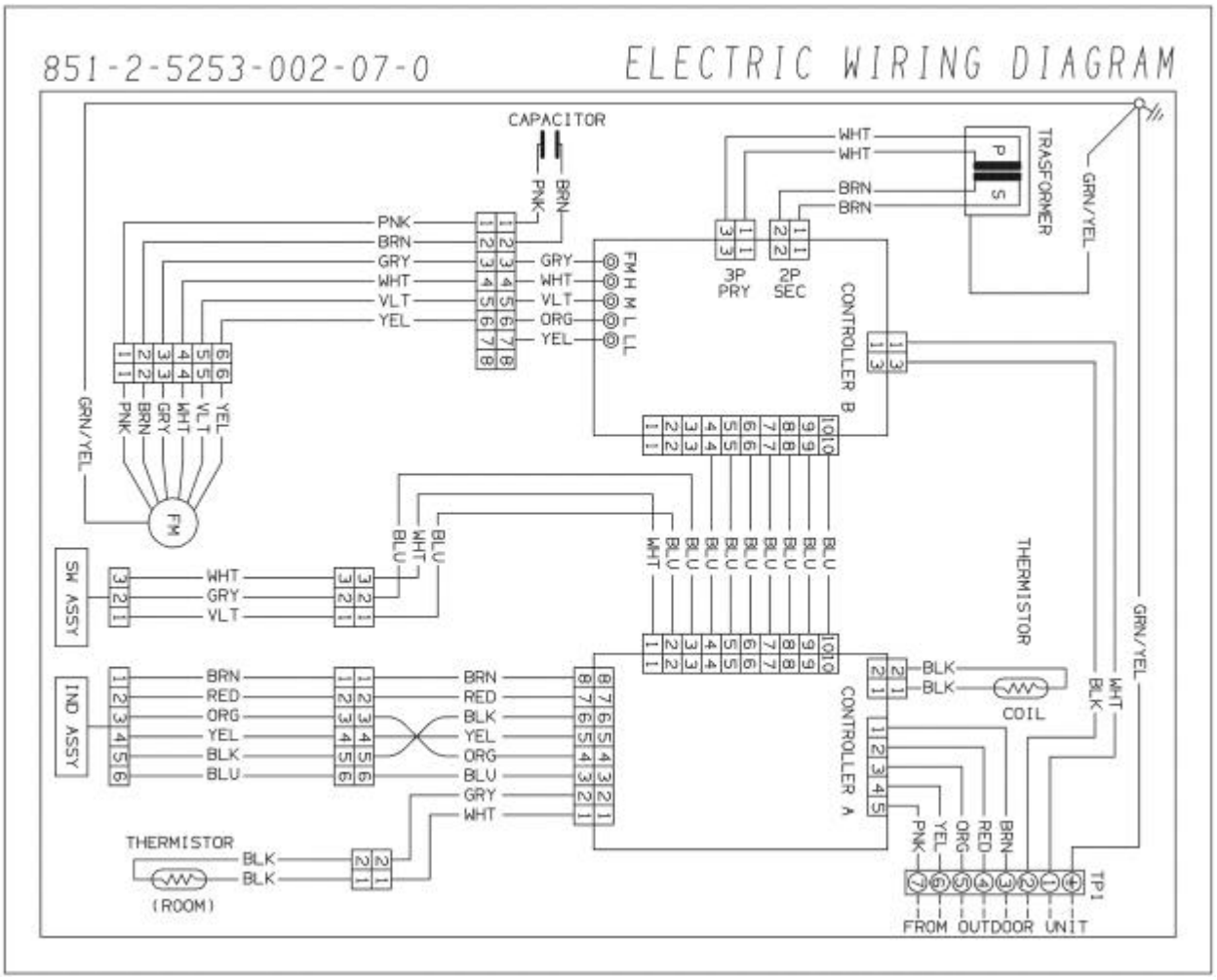
Rating Conditions: Indoor Air Temperature 20°C DB
Outdoor Air Temperature 7°C DB / 6°C WB
Full Load Conditions: Indoor Air Temperature 27°C DB
Outdoor Air Temperature 24°C DB / 18°C WB

8-2. Electric Wiring Diagram

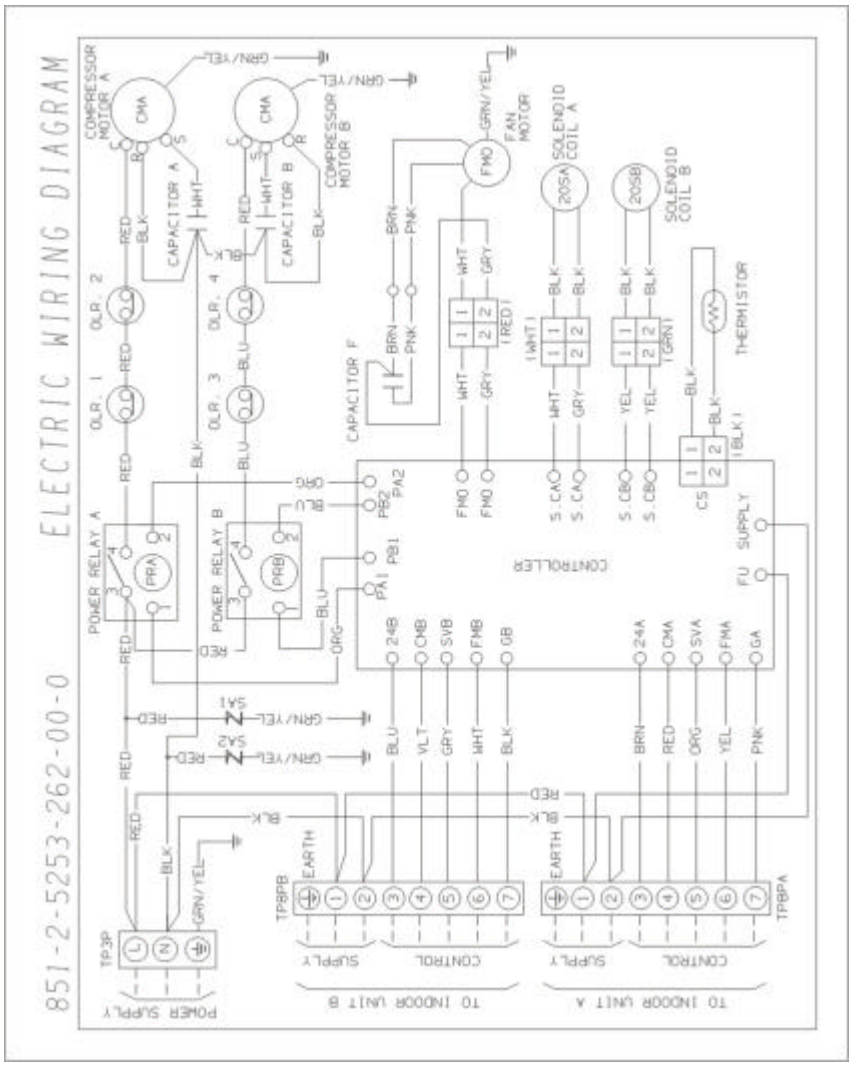
Indoor Unit **AWR509DHL**



Indoor Unit **AFR509DHL**



Outdoor Unit **AER518DH**



9. INSTALLATION INSTRUCTIONS

9-1. Installation Site Selection

Maximum Allowable Tubing Length (L) and Elevation Difference (H).

The Multi-Split System outdoor unit should be installed as close to the indoor units as possible. Maximum allowable length of the refrigerant tubing and elevation difference between outdoor and indoor units are shown in Table 1.

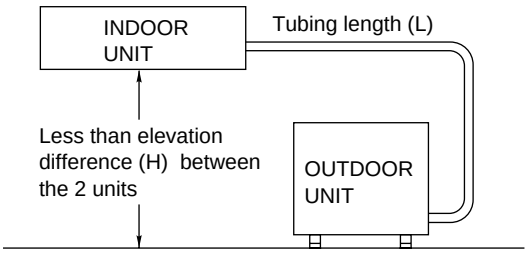


Fig. 1

Table 1

Combination		Max allowable tubing length at shipment.(m)	Limit of tubing length(L). (m)	Limit of elevation difference(H). (m)	Required amount of additional refrigerant*(g/m)
Outdoor unit	Indoor unit				
AER518DH	AWR509DHL	7.5	15	7	15
	AWR509DHL				

* If total tubing length becomes 7.5 to 15 m (max.),charge additional refrigerant (R407C) by 15 g/m. No additional charge of compressor oil is necessary.

Indoor Unit

WARNING

To prevent abnormal heat generation and the possibility of fire, don't place obstacles, enclosures and grills in front of or surrounding the air conditioner in a way that may block air flow.

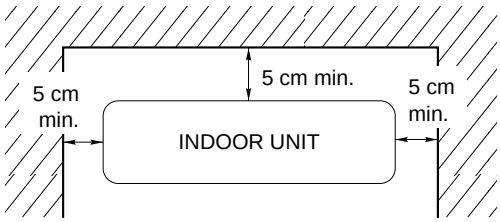
AVOID:

- direct sunlight.
- nearby heat sources that may affect performance of the unit.
- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.

DO:

- select an appropriate position from which every corner of the room can be uniformly air-conditioned. (High on a wall is best)
- select a location that will hold the weight of the unit.
- select a location where tubing and drain pipe have the shortest run to the outside.
- allow room for operation and maintenance as well as unrestricted air flow around the unit. (Fig. 2a)

● Wall-Mounted Type



Front View

Fig.2a

CAUTION

For stable operation of the air conditioner, do not install wall-mounted type indoor units under 1.5m from floor level.

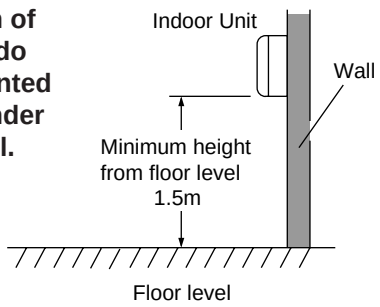


Fig. 2b

Outdoor Unit

AVOID:

- heat sources, exhaust fans, etc. (Fig. 3)
- damp, humid or uneven locations.

DO:

- choose a place as cool as possible.
- choose a place that is well ventilated.
- allow enough room around the unit for air intake/exhaust and possible maintenance. (Figs. 4a and 4c)
- provide a solid base (concrete block, 10 × 40 cm beams or equal), a minimum of 10 cm above ground level to reduce humidity and protect the unit against possible water damage and decreased service life. (Fig. 5a)
- use lug bolts or equal to bolt down unit, reducing vibration and noise.

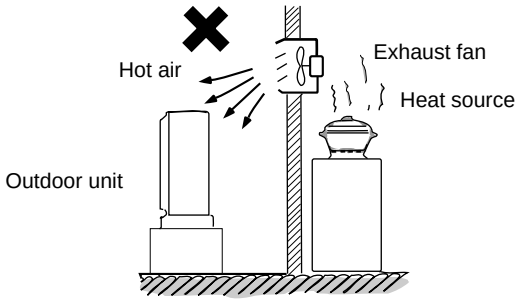
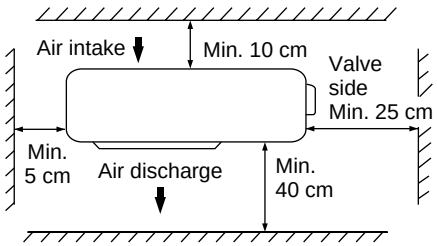


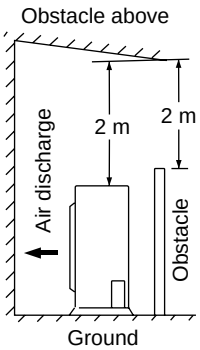
Fig. 3

Required space around the unit.



Top View

Fig. 4a



Side View

Fig. 4c

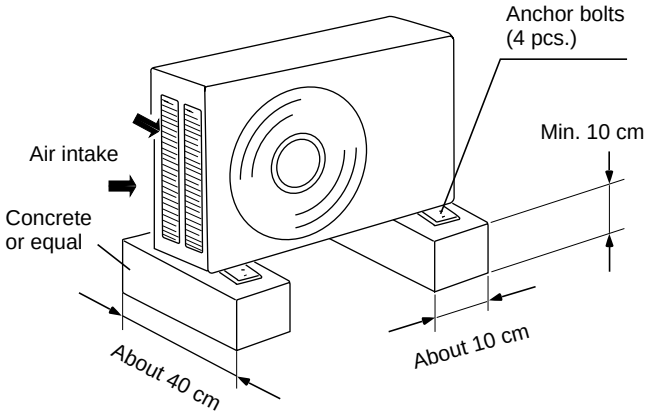


Fig. 5a

9-2. Remote Control Unit Installation Position

The remote control unit can be operated from either a non-fixed position or a wall-mounted position.

To ensure that the air conditioner operates correctly, do not install the remote control unit in the following places:

- In direct sunlight
- Behind a curtain or other place where it is covered
- More than 8 m away from the air conditioner
- In the path of the air conditioner's airstream
- Where it may become extremely hot or cold
- Where it may be subject to electrical or magnetic interference

Mounting on a Wall

a) Removable mounting

1) Momentarily hold the remote control unit at the desired mounting position.
2) Confirm that the air conditioner responds correctly when you press keys on the remote control from that position.
3) After confirming correct operation, use a screwdriver to screw the supplied special mounting screw into the wall. (Fig.6a)
4) Hang the remote control unit from the mounting screw.

b) Non-removable mounting

1) Momentarily hold the remote control unit at the desired mounting position.
2) Confirm that the air conditioner responds correctly when you press keys on the remote control from that position.
3) After confirming correct operation, use a screwdriver to screw the supplied special mounting screw into the wall. (Fig.6a)
4) Remove the remote control cover by sliding it downward.
5) Remove the batteries of the remote control unit.
6) Use a screwdriver to screw the remote control unit securing screw into the wall through the hole in the battery compartment. (Fig.6b)
7) Replace the batteries.
8) Again confirm that the remote control unit operates correctly.

Removable mounting

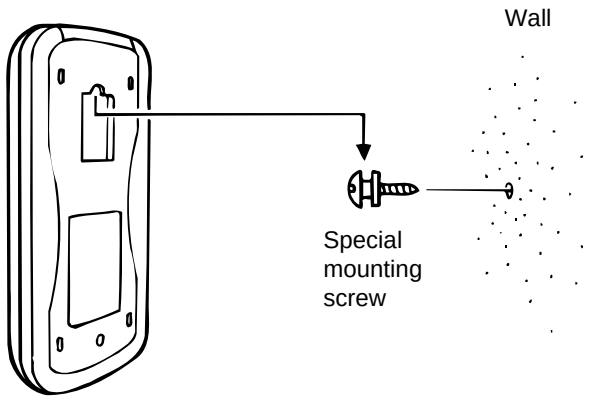


Fig.6a

Non-removable mounting

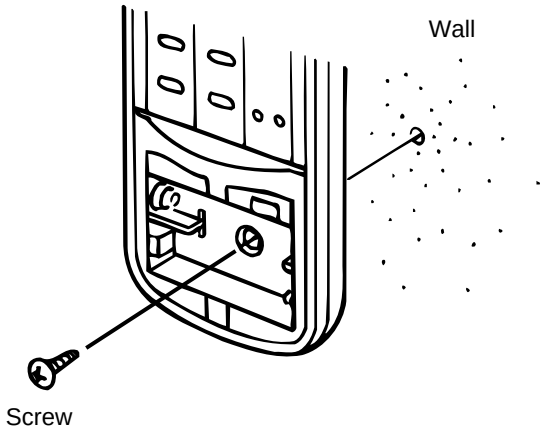


Fig.6b

9-3. Recommended Wire Length and Diameter

Regulations on wiring diameter differ from locality to locality. For field wiring requirements, please refer to your local electrical codes. Carefully observe these regulations when carrying out the installation.
Table 2 lists recommended wire lengths and size for power supply systems.

NOTE

Refer to the WIRING SYSTEM DIAGRAM for the meaning of "A", "B" and "C" in Table 2.

Table 2

Model \ Cross Sectional Area (mm^2)	(A) Power Supply Wiring Length (m)		(B) Power Line Length (m)	(C) Cont rol Line	Fuse or Circuit Capacity
	2 (#14)	3.5 (#12)	2 (#14)	0.75 (#18)	
AER518DH	18	27	20	20	20A

····· AWG (American Wire Gauge)

WARNING

- **Be sure to comply with local codes on running the wire from the indoor unit to the outdoor unit (size of wire and wiring method, etc.).**
- **Each wire must be firmly connected.**
- **No wire should be allowed to touch refrigerant tubing, the compressor, or any moving part.**

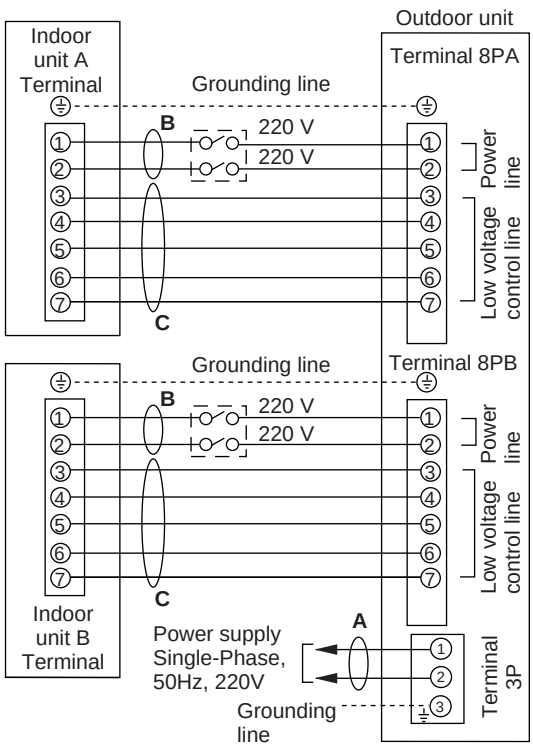
WARNING

- **To avoid the risk of electric shock, each air conditioner unit must be grounded.**

CAUTION

- **Be sure to connect the power supply line to the outdoor unit as shown in the wiring diagram. The indoor unit draws its power from the outdoor unit.**

WIRING SYSTEM DIAGRAM

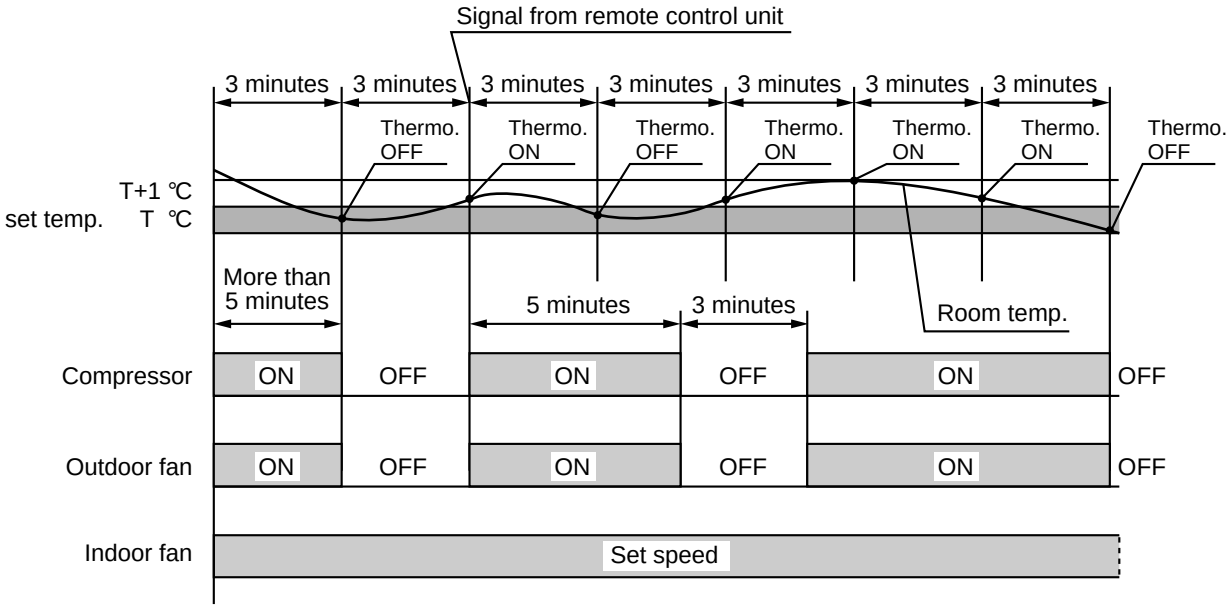


10.FUNCTION

10-1. Room Temperature Control

■ Cooling

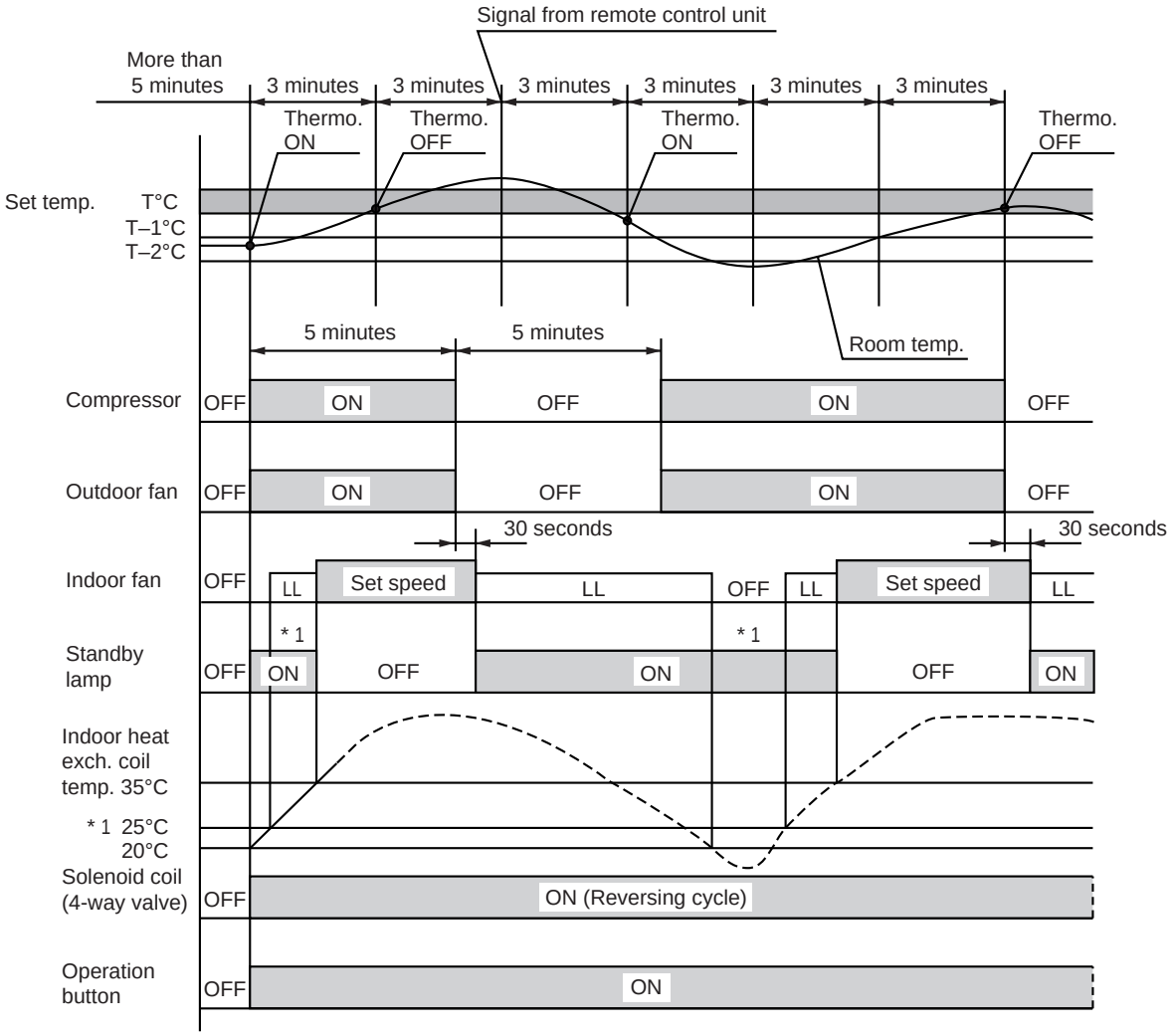
- Room temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The room temperature (and other information) is transmitted every 3 minutes by the remote control unit to the controller in the indoor unit.



- The control circuit will not attempt to turn the compressor ON until the compressor has been OFF for at least 3 minutes. To protect the compressor from stalling out when trying to start against the high side refrigerant pressure, the control circuit has a built-in automatic time delay to allow the internal pressure to equalize.
- As a protective measure, the control circuit switches the compressor OFF after 5 minutes or more of compressor operation.
- Thermo. ON : When the room temperature is above T + 1°C (T°C is set temperature).
  Compressor → ON
- Thermo. OFF : When the room temperature is equal to or below set temperature T°C.
  Compressor → OFF

■ Heating

- Room temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The room temperature (and other information) is transmitted every 3 minutes by the remote control unit to the controller in the indoor unit.

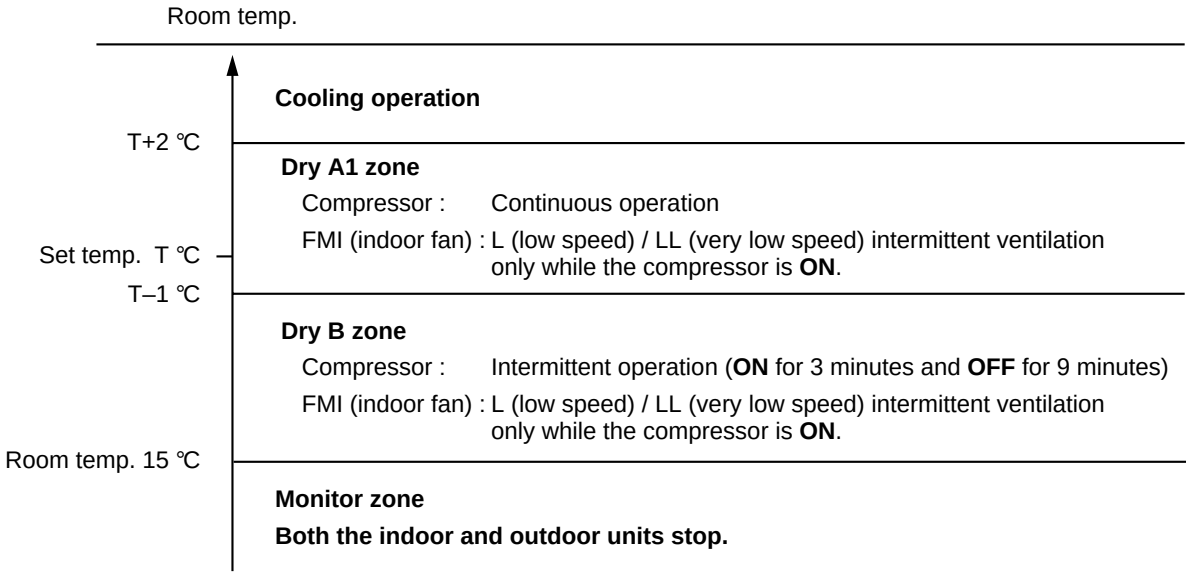


- The control circuit will not attempt to turn the compressor ON until the compressor has been OFF for at least 5 minutes. To protect the compressor from stalling out when trying to start against the high side refrigerant pressure, the control circuit has a built-in automatic time delay to allow the internal pressure to equalize.
- As a protective measure, the control circuit switches the compressor OFF after 5 minutes or more of compressor operation.
- Thermo. ON : When the room temperature is below T – 1°C (T°C is set temperature).
  Compressor → ON
- Thermo. OFF : When the room temperature is equal to or above set temperature T°C.
  Compressor → OFF

NOTE ✻1: Refer to 10-5 "Cold Draft Prevention".

10-2. Dry Operation (Dehumidification)

- Dry operation uses the ability of the cooling cycle to remove moisture from the air, but by running at low level to dehumidify without greatly reducing the room temperature. The air conditioner repeats the cycle of turning ON and OFF automatically as shown in the chart below according to the room temperature.

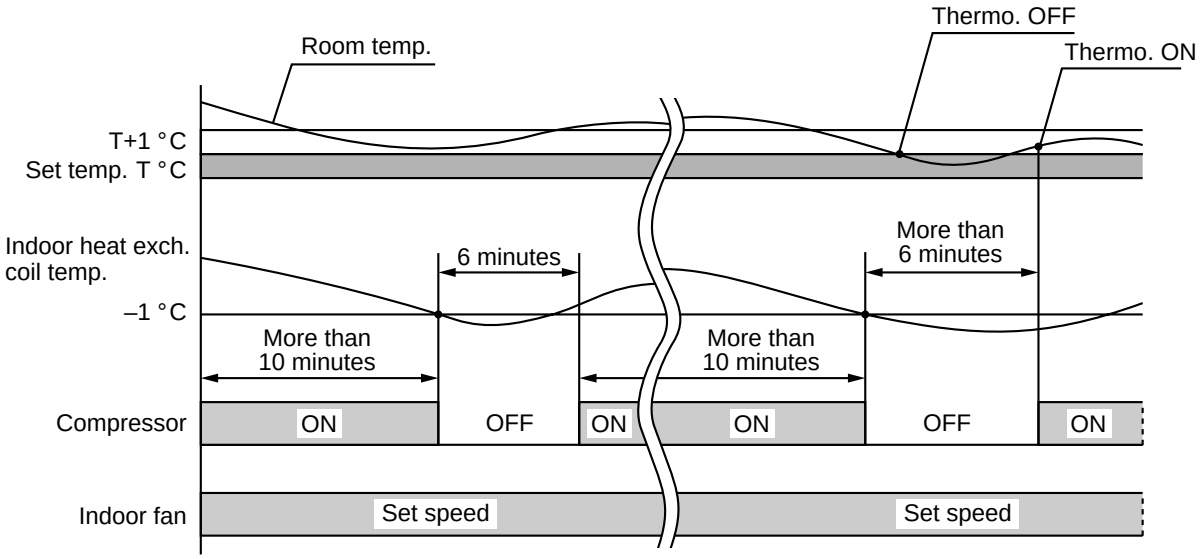


NOTE

- Intermittent ventilation occurs by switching the indoor fan speed between L ↔ LL.
- Dry operation does not occur when the room temperature is under 15°C, which is the monitor zone.
- When the compressor stops, the indoor fan stops as well.

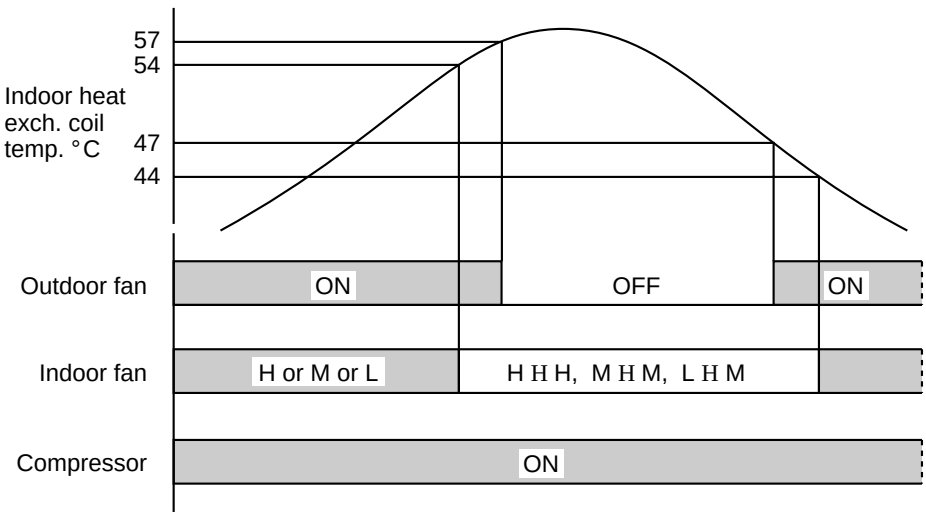
10-3. Freeze Prevention (Cooling)

- This function prevents freezing of the indoor heat exchange coil.
- When the compressor has been running for 10 minutes or more and the temperature of the indoor heat exchange coil falls below –1°C, the control circuit stops the compressor for at least 6 minutes. The compressor does not start again until the temperature rises above 8°C or 6 minutes has elapsed.



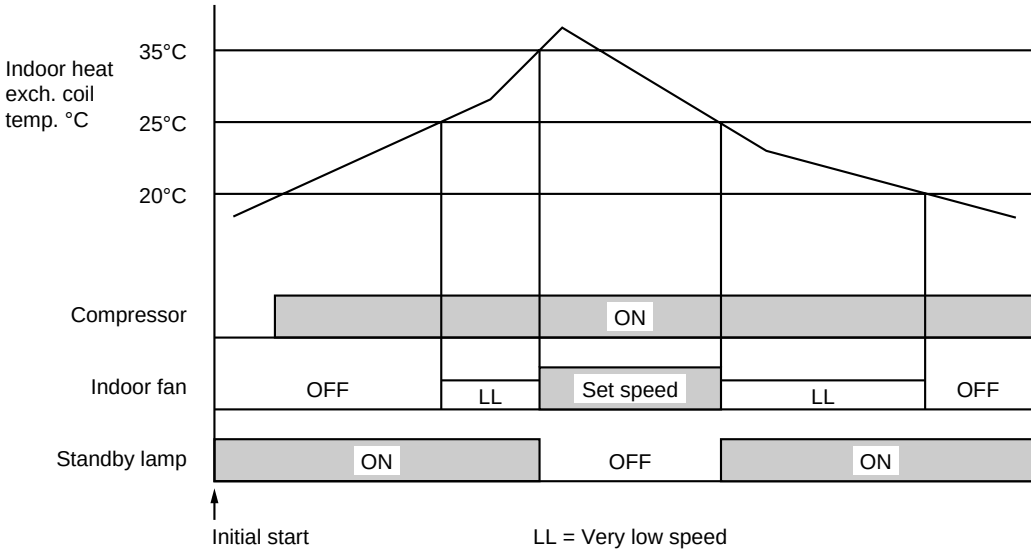
10-4. Overload Prevention (Heating)

- This function prevents overheating of the indoor heat exchange coil.
- When the temperature of the indoor heat exchange coil rises above **54**°C, and if the indoor fan is L (low speed), then the fan speed changes from L (low speed) to M (medium speed).
- When the temperature of the indoor heat exchange coil rises above **57**°C, the outdoor fan stops.



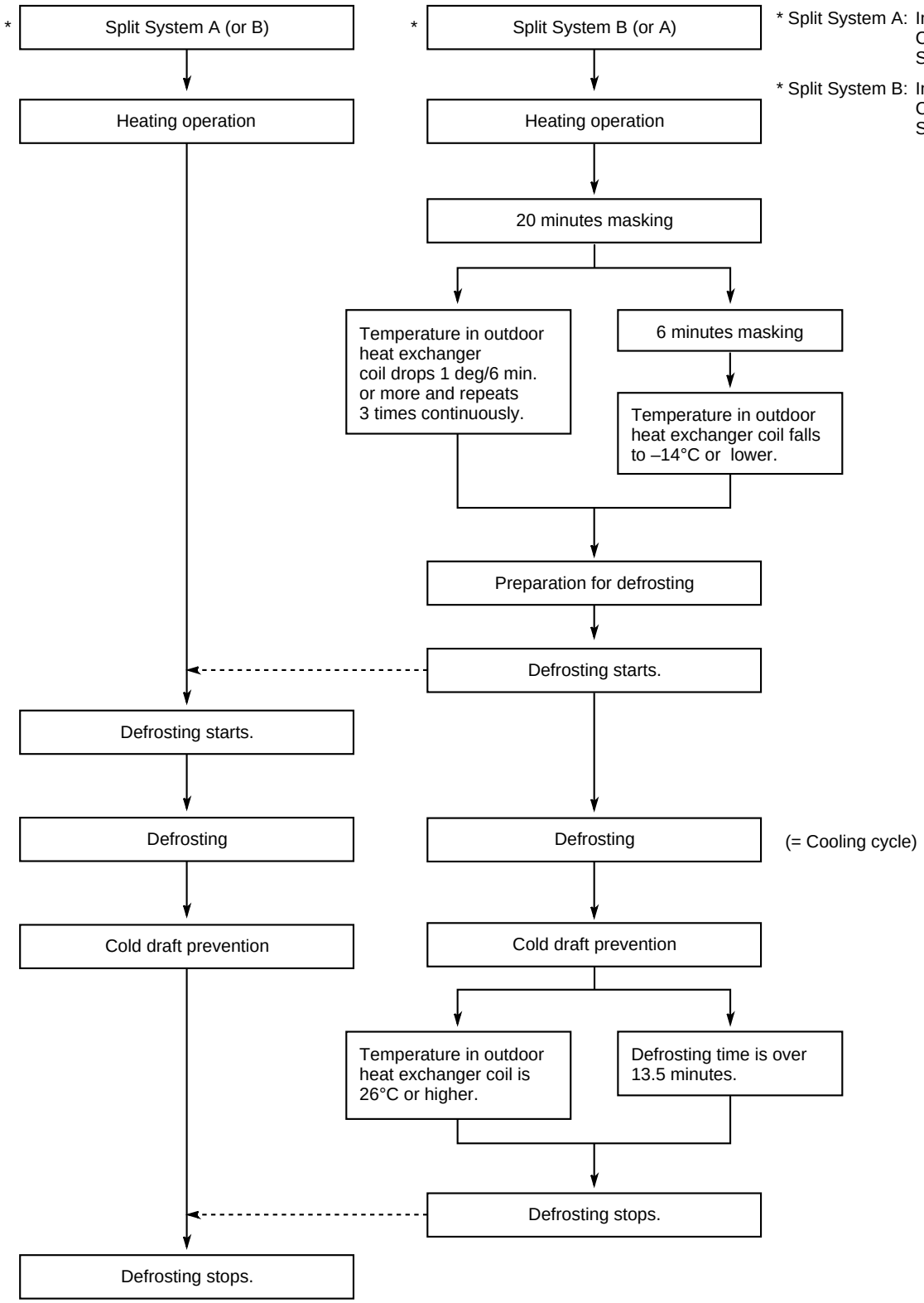
10-5. Cold draft Prevention (Heating)

- This function controls indoor fan speed so a strong draft of cold air will not blow out before the indoor heat exchange coil have sufficiently warmed up.
- STANDBY lamp on front of the indoor unit lights up when the indoor fan speed is either LL or OFF.

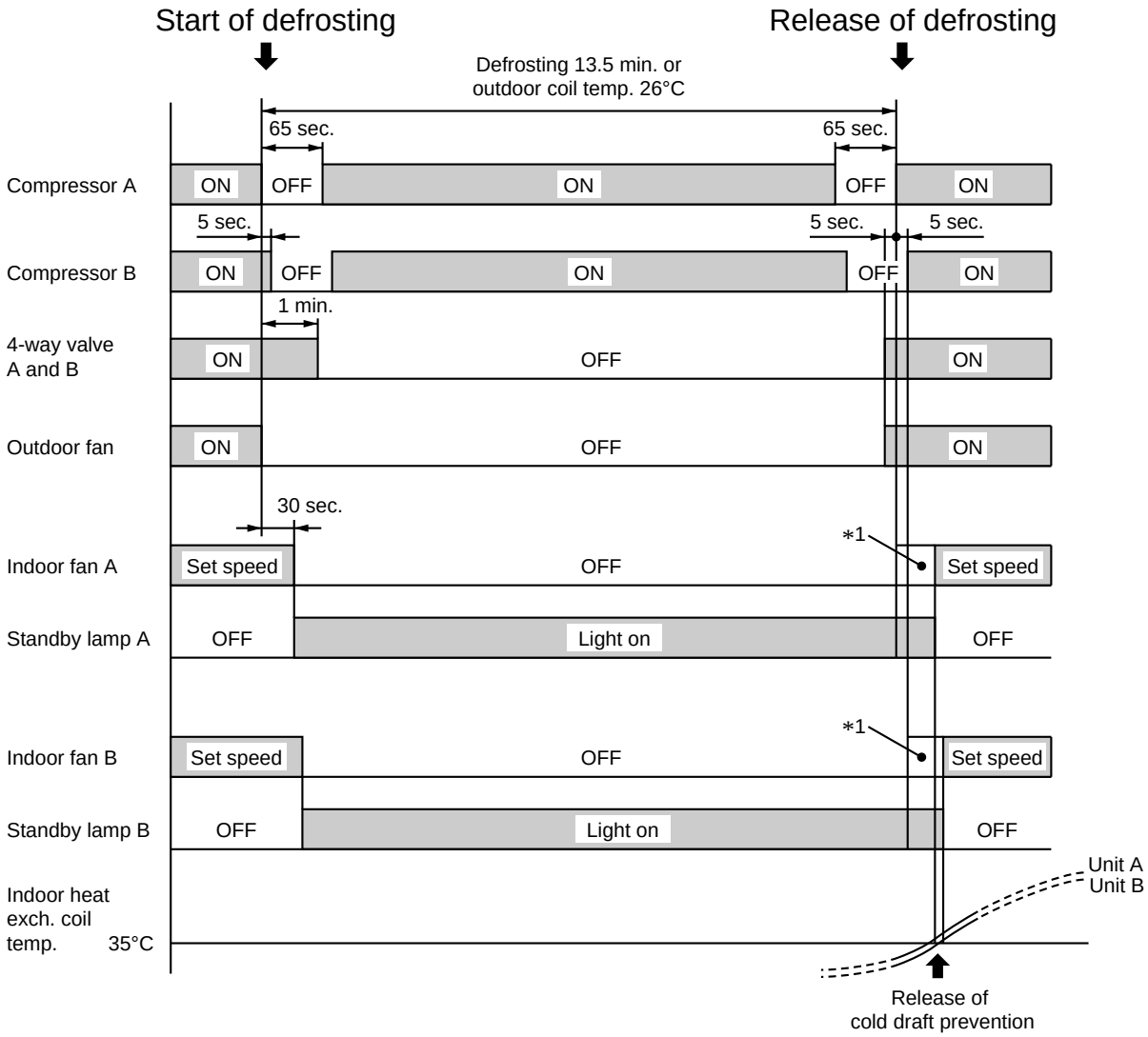


10-6. Defrosting Operation (Heating)

■ Defrosting Flowchart.



■ Defrosting Mode Timing Chart



NOTE *1. No LL fan operation during this period.

11. REFRIGERANT R407C : SPECIAL PRECAUTIONS WHEN SERVICING UNIT

11-1. Characteristics of new refrigerant R407C

11-1-1. What is new refrigerant R407C

R407C is a new refrigerant that contains three types of non-azeotropy-type mixed refrigerant which does not adversely affect the Earth's ozone layer. Its refrigeration capacity and energy efficiency are about the same level as the conventional refrigerant R22

11-1-2. Components (mixing proportions)

HFC32 (23%) / HFC125 (25%) / HFC134a (52%)

11-1-3. Characteristics

- Less toxic, more chemically stable refrigerant.
- Composition of refrigerant R407C changes whether it is in gaseous phase or liquid phase. Thus, when there is a refrigerant leak the basic performance of the air conditioner may be degraded because of a change in composition of the remaining refrigerant. ***Therefore, do not add new refrigerant.*** Instead, recover the remaining refrigerant with the refrigerant recovery unit. Then, after evacuation, totally recharge the specified amount of refrigerant with the new refrigerant at its normal mixed composition state (liquid phase).
- When refrigerant R407C is used, the composition will differ depending on whether it is in gaseous or liquid phase, and the basic performance of the air conditioner will be degraded if it is charged while the refrigerant is in gaseous state. ***Thus, always charge the refrigerant while it is in the liquid phase.***

- **Ether-type oil is used for the compressor oil for R407C-type units, which is different from the mineral oil used for R22. Thus more attention to moisture prevention and faster replacement work compared with conventional models are required.**

11-2. Checklist before servicing

- **Tubing precautions**
  Refrigerant R407C is more easily affected by dust or moisture compared with R22, thus be sure to temporarily cover the ends of the tubing with caps or tape prior to installation.
- **No addition of compressor oil for R407C**
  No additional charge of compressor oil is permitted.
- **No use of refrigerant other than R407C**
  Never use a refrigerant other than R407C.
- **If refrigerant R407C is exposed to fire**
  Through welding, etc., toxic gas may be released when R407C refrigerant is exposed to fire. Therefore, be sure to provide ample ventilation during installation work.
- **Caution in case of R407C leak**
  Check for possible leak points with the special leak detector for R407C. If a leak occurs inside the room, immediately provide thorough ventilation.

11-3. Tools specifically for R407C

● For servicing, use the following tools for R407C

Tool Distinction	Tool Name
Tools specifically for R407C	• Gauge manifold • Charging hose • Gas leak detector • Refrigerant cylinder • Charging cylinder • Refrigerant recovery unit • Vacuum pump with anti-reverse flow **(✻1)** (Solenoid valve-installed type, which prevents oil from flowing back into the unit when the power is off, is recommended.) • Vacuum pump **(✻2)** ..... can be used if the following adapter is attached. • Vacuum pump adapter (reverse-flow prevention adapter) **(✻3)**. (Solenoid valve-installed adapter attached to a conventional vacuum pump.) • Electronic scale for charging refrigerant • Flare tool
Tools which can be commonly used for R22 and R407C	• Bender • Torque wrench • Cutter, Reamer • Welding machine, nitrogen gas cylinder

CAUTION

- **The above tools specifically for R407C must not be used for R22. Doing so will cause malfunction of the unit.**
- **For the above vacuum pump (✻1, ✻2) and vacuum pump adapter (✻3) , those for R22-type units can be used for R407C-type. However, they must be used exclusively for R407C and never alternately with R22.**

11-4. For tubing installation procedures

- When the tubes are connected, ***always apply HAB oil on the flare portions to improve the sealing of tubing.***

The following is the **HAB oil** generally used:
Esso: ZERICE S32

NOTE For details on tubing installation procedures, refer to the installation manuals attached to the indoor unit and outdoor unit.

11-5. In case of compressor malfunction

CAUTION

- **Should the compressor malfunction, be sure to replace compressor as quickly as possible.**
- **Use only the tools indicated exclusively for R407C. → See "10-3. Tools specifically for R407C".**

11-5-1.Procedure for replacing compressor

(1) **Recovering refrigerant**

- Any remaining refrigerant inside the unit should not be released to the atmosphere, but recovered using the refrigerant recovery unit for R407C.
- Do not reuse the recovered refrigerant, since will contain impurities.

(2) **Replacing compressor**

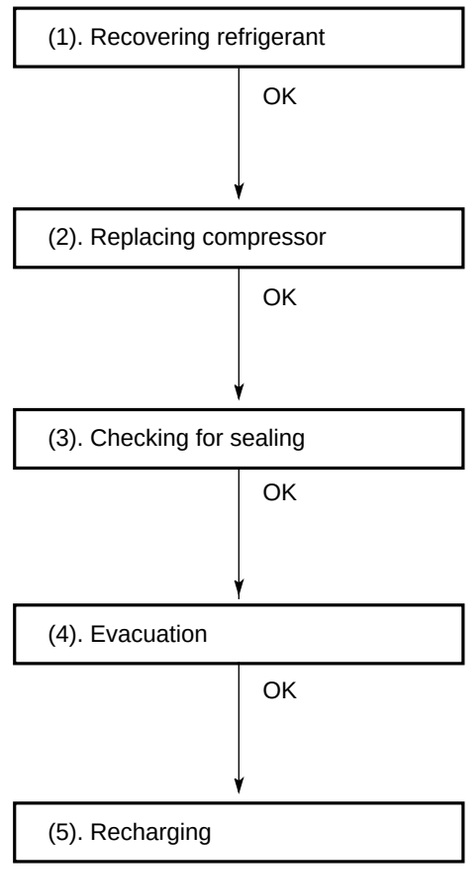
- Soon after removing pinched pipes of both discharge and suction tubes of the new compressor, replace it quickly.

(3) **Checking for sealing**

- Use nitrogen gas for the pressurized gas, and never use a refrigerant other than R407C. Also do not use oxygen or any flammable gas.

(4) **Evacuation**

- ***Use a solenoid valve-installed vacuum pump*** so that even if power is cut off in the middle of evacuation of air due to a power interruption, the valve will prevent the pump oil from flowing back.
- The equipment may be damaged if moisture remains in the tubing, thus carry out the evacuation thoroughly.
- When using a vacuum pump with exhaust air volume more than 25L/min. and ultimate vacuum pressure rate of 0.05Torr:



Standard time of evacuation

Length of tubing	Less than 10 m	More than 10 m
Time	More than 10 min.	More than 15 min.

(5) **Recharging**

- ***Be sure to charge the specified amount of refrigerant in liquid state*** using the service port of wide tube service valve. The proper amount is listed on the unit's nameplate.

  When the entire amount cannot be charged all at once, charge gradually while operating the unit in Cooling Operation.

CAUTION

- **Never charge a large amount of liquid refrigerant at once to the unit. This may cause damage to the compressor.**

- When charged with a refrigerant cylinder, use the electronic scale for charging refrigerant. In this case, if the volume of refrigerant in the cylinder becomes less than 20% of the fully-charged amount, the composition of the refrigerant starts to change. Thus, ***do not use the refrigerant if the amount in the refrigerant cylinder is less than 20%.***

  Also, charge the minimum necessary amount to the cylinder before using it for charging the air conditioning unit.

  Example:
  In case of charging refrigerant to a unit requiring 0.76Kg using a capacity of 10Kg-cylinder, the minimum necessary amount for the cylinder is:

  0.76 + 10 x 0.20 = 2.76Kg

  For the remaining refrigerant, refer to the instructions of the refrigerant manufacturer.

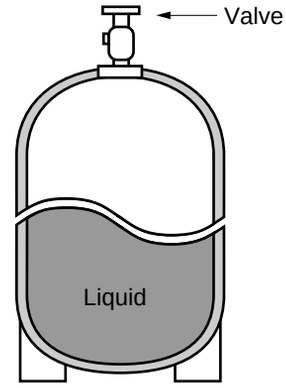
- If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

  Prepare an evacuated charging cylinder beforehand.

CAUTION

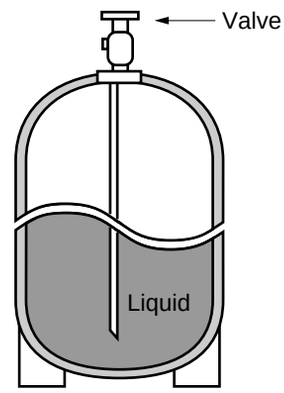
- **To prevent the composition of R407C from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 3)**

Do not use the refrigerant if the amount in the charging cylinder is less than 20%.



Single valve
Charge the liquid refrigerant with the cylinder in the up-side-down position.

Fig. 1



Single valve (with siphon tube)
Charge with the cylinder in the normal position.

Fig. 2

Configurations and characteristics of cylinders

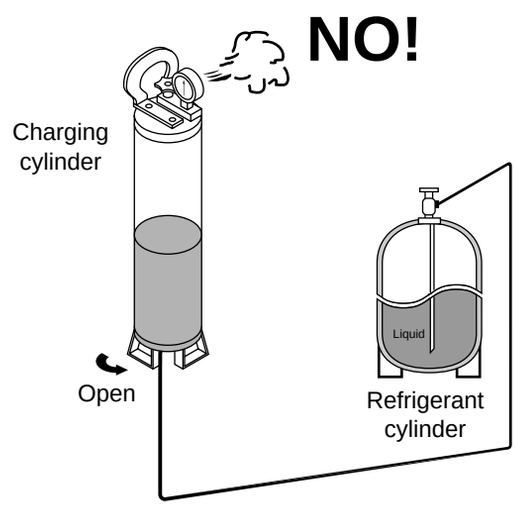


Fig.3

11-6. In case refrigerant is leaking

CAUTION

● **Never attempt to charge additional refrigerant when refrigerant has been leaking from the unit. Follow the procedure described below to locate points of leaks and carry out repairs, then recharge the refrigerant.**

(1) **Detecting Leaks**

- Use the detector for R407C to locate refrigerant leak points.

(2) **Recovering refrigerant**

- Never release the gas to the atmosphere, recover residual refrigerant using the refrigerant recovery unit for R407C, instead.
- Do not reuse the recovered refrigerant because its composition will have been altered.

(3) **Welding leaking points**

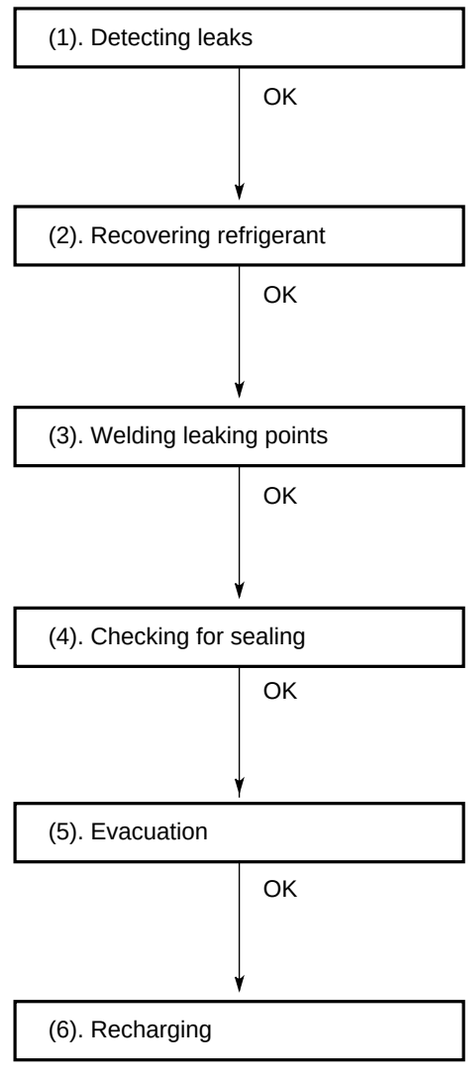
- Confirm again that no residual refrigerant exists in the unit before starting welding.
- Weld securely using flux and wax for R407C.
- Prevent oxide film from forming inside the tubes utilizing substitution with nitrogen (N2) in the refrigerant circuit of the unit. Leave ends of tubes open during welding.

(4) **Checking for sealing**

- Use nitrogen gas for the pressurized gas, and never use a refrigerant other than R407C. Also do not use oxygen or any flammable gas.

(5) **Evacuation**

- ***Use a solenoid valve-installed vacuum pump*** so that even if power is cut off in the middle of evacuation of air due to a power interruption, the valve will prevent the pump oil from flowing back.
- The equipment may be damaged if moisture remains in the tubing, thus carry out the evacuation thoroughly.
- When using a vacuum pump with exhaust air volume more than 25L/min. and ultimate vacuum pressure rate of 0.05Torr:



Standard time of evacuation

Length of tubing	Less than 10 m	More than 10 m
Time	More than 10 min.	More than 15 min.

(6) **Recharging**

- ***Be sure to charge the specified amount of refrigerant in liquid state*** using the service port of wide tube service valve. The proper amount is listed on the unit's nameplate.

  When the entire amount cannot be charged all at once, charge gradually while operating the unit in Cooling Operation.

CAUTION

- **Never charge a large amount of liquid refrigerant at once to the unit. This may cause damage to the compressor.**

- When charged with a refrigerant cylinder, use the electronic scale for charging refrigerant. In this case, if the volume of refrigerant in the cylinder becomes less than 20% of the fully-charged amount, the composition of the refrigerant starts to change. Thus, ***do not use the refrigerant if the amount in the refrigerant cylinder is less than 20%.***

Also, charge the minimum necessary amount to the cylinder before using it for charging the air conditioning unit.

Example:
In case of charging refrigerant to a unit requiring 0.76Kg using a capacity of 10Kg-cylinder, the minimum necessary amount for the cylinder is:

0.76 + 10 x 0.20 = 2.76Kg

For the remaining refrigerant, refer to the instructions of the refrigerant manufacturer.

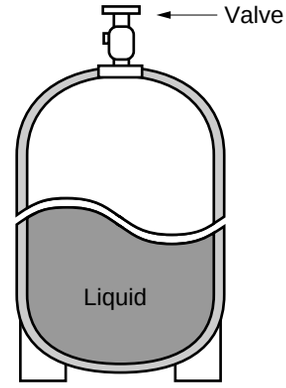
- If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

  Prepare an evacuated charging cylinder beforehand.

CAUTION

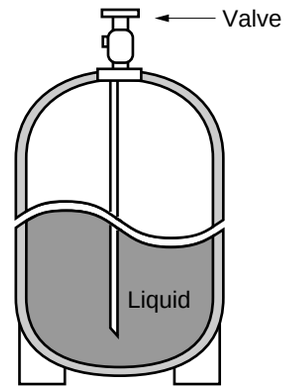
- **To prevent the composition of R407C from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 6)**

Do not use the refrigerant if the amount in the charging cylinder is less than 20%.



Single valve
Charge the liquid refrigerant with the cylinder in the up-side-down position.

Fig. 4



Single valve (with siphon tube)
Charge with the cylinder in the normal position.

Fig. 5

Configurations and characteristics of cylinders

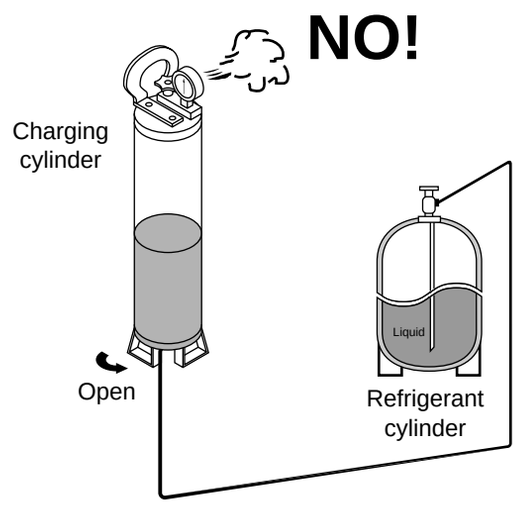


Fig. 6

11-7. Charging additional refrigerant

11-7-1.When tubes are extended

• Observe the proper amount of refrigerant as stated in this service manual or the installation manual that came with the indoor unit. ***Charge additional refrigerant in liquid state.***

CAUTION

● **Never charge additional refrigerant if refrigerant is leaking from the unit. Follow instructions given in "11-6. In case refrigerant is leaking" and completely carry out repairs. Only then should you recharge the refrigerant.**

11-8. Retro-fitting existing systems

101-8-1 Use of existing units

• ***Never use new refrigerant R407C for existing units which use R22.*** This will cause the air conditioner to operate improperly and may result in a hazardous condition.

11-8-2 Use of existing tubing

• If replacing an older unit that used refrigerant R22 with a R407C unit, ***do not use its existing tubing.*** Instead, completely new tubing must be used.

12.TROUBLESHOOTING

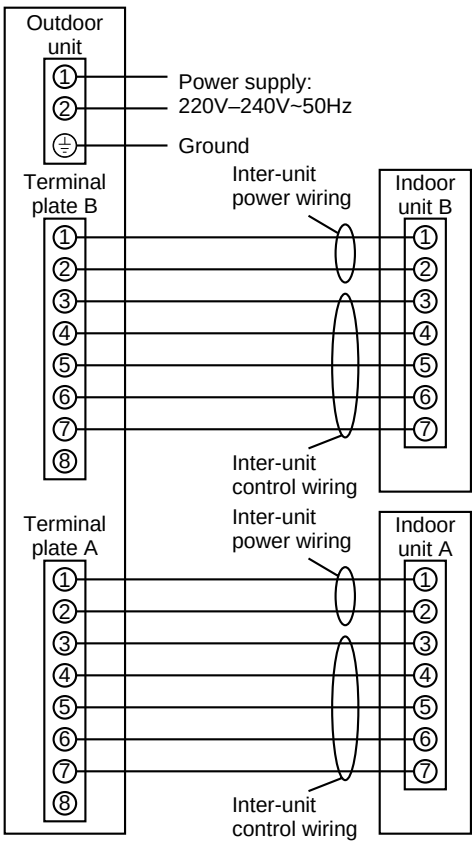
12-1. Check before and after troubleshooting

WARNING

Hazardous voltage can cause ELECTRIC SHOCK or DEATH. Disconnect power or turn off circuit breaker before you start checking or servicing.

12-1-1.Check power supply wiring.

- Check that power supply wires are correctly connected to terminals **No.1** and **No.2** on the 3p terminal plate in the outdoor unit.



12-1-2.Check inter-unit wiring.

- Check that inter-unit wiring is correctly connected to the indoor unit from the outdoor unit.

12-1-3.Check power supply.

- Check that voltage is in specified range (±10% of the rating).
- Check that power is being supplied.

12-1-4.Check lead wires and connectors in indoor and outdoor units.

- Check that coating of lead wires is not damaged.
- Check that lead wires and connectors are firmly connected.
- Check that wiring is correct.

12-2. Air conditioner does not operate.

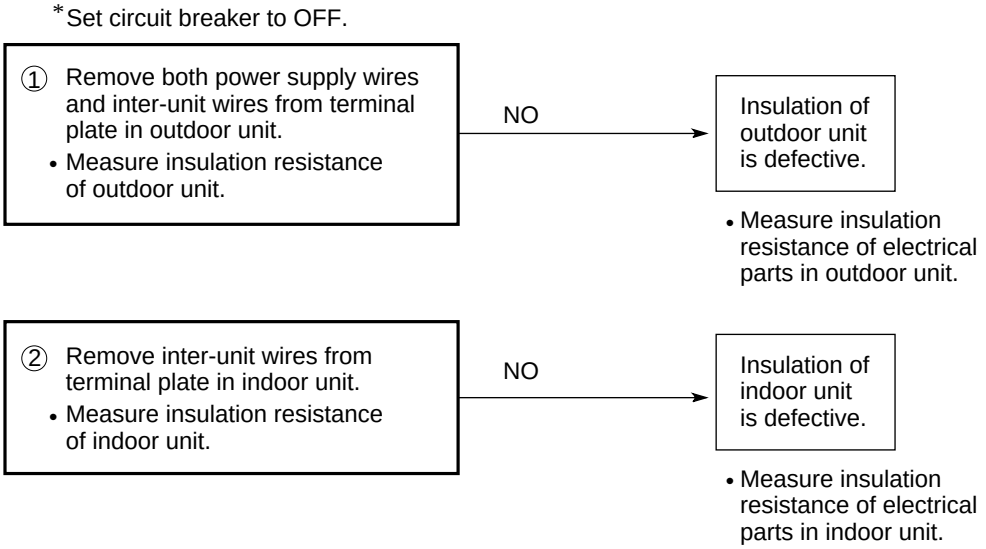
12-2-1.Circuit breaker trips (or fuse blows).

A. When the circuit breaker is set to ON, it is tripped soon. (Resetting is not possible.)

● There is a possibility of ground fault.

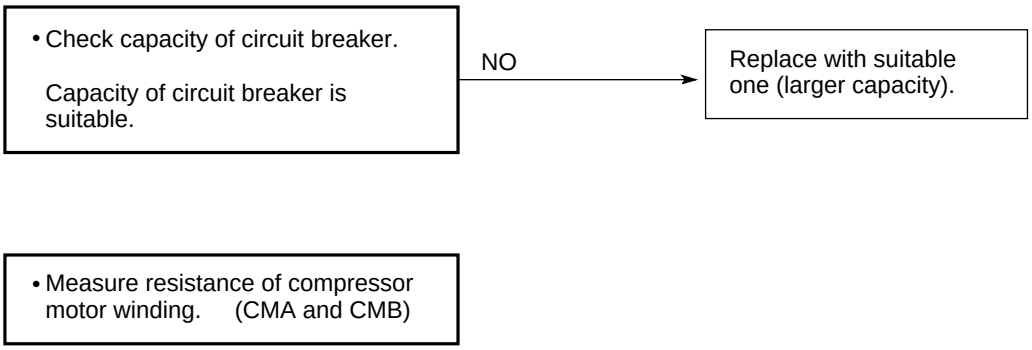
● Check insulation resistance.

If resistance value is 2MΩ or less, insulation is defective (“NO”).



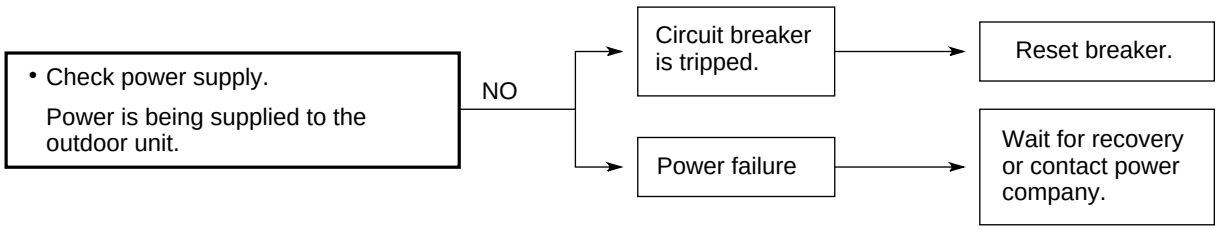
B. Circuit breaker trips in several minutes after turning the air conditioner on.

● There is a possibility of short circuit.

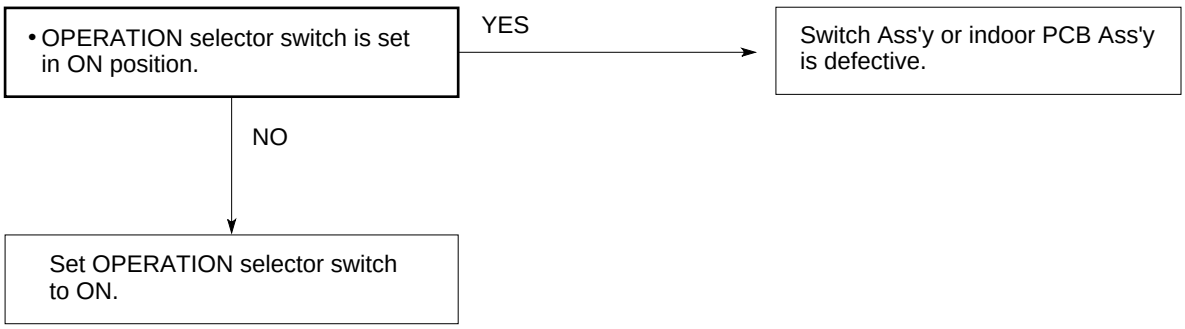


12-2-2.Neither indoor nor outdoor unit runs.

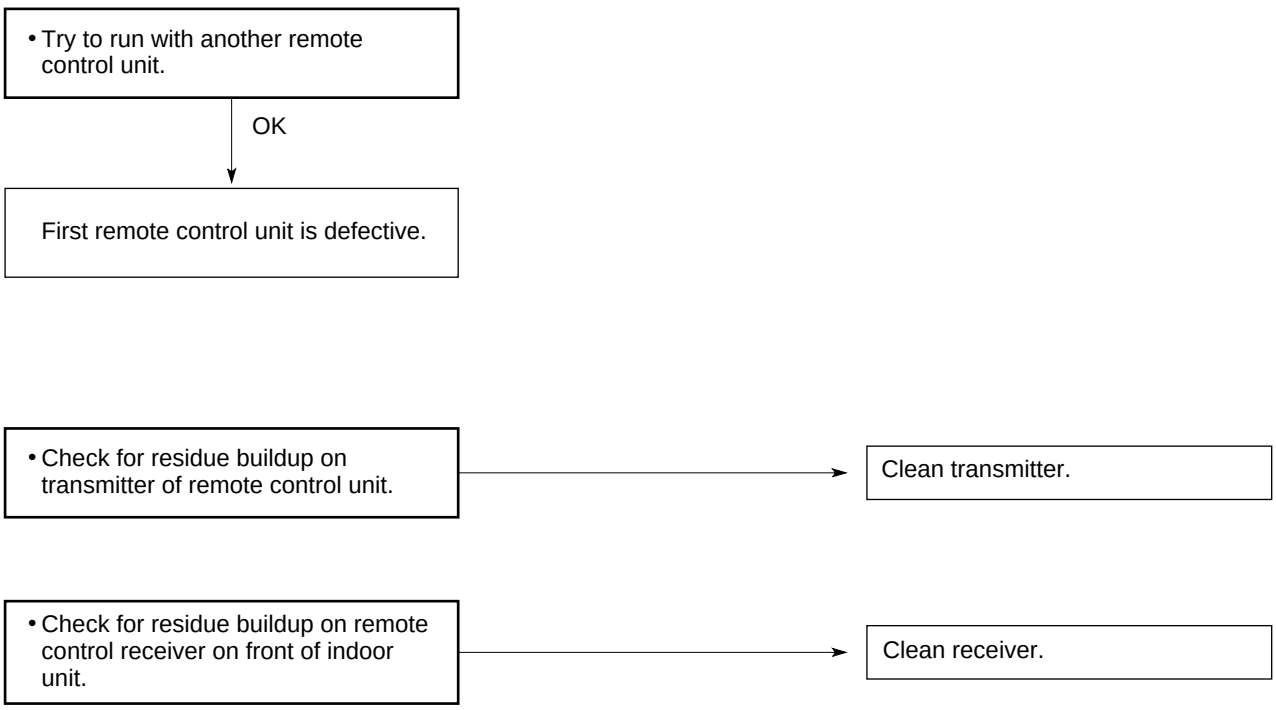
A. Power is not supplied.



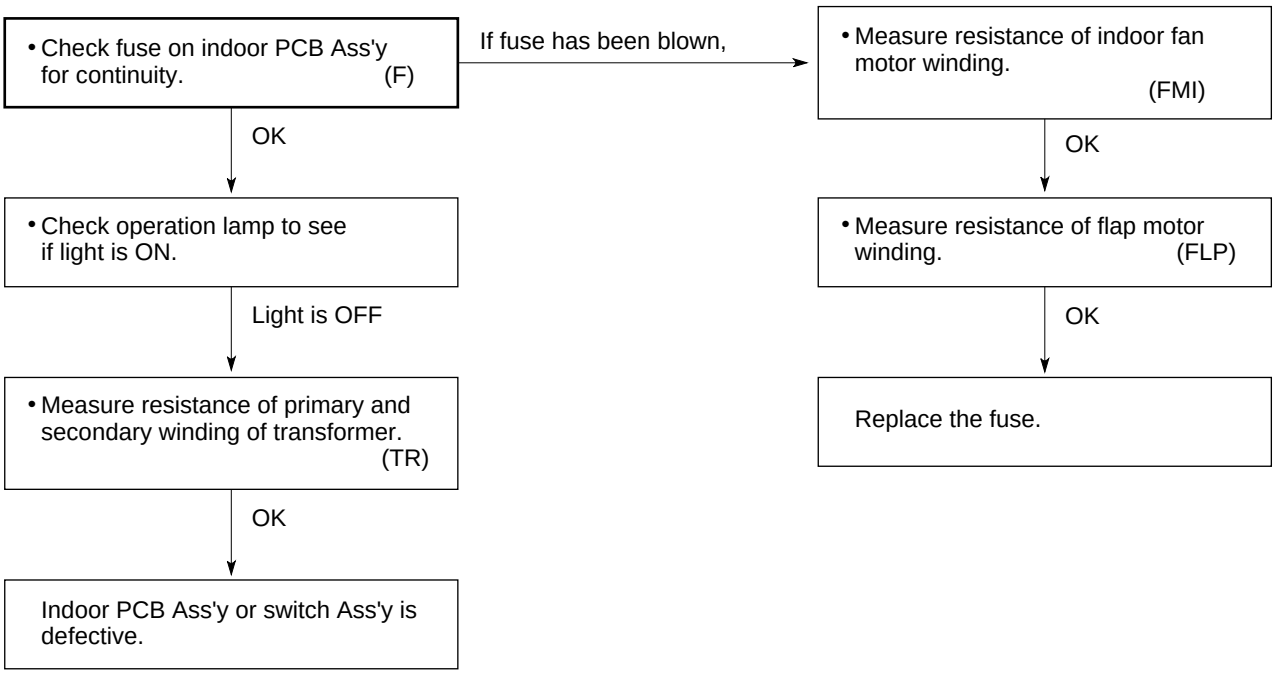
B. Check "OPERATION selector" switch in the indoor unit.



C. Check remote control unit.



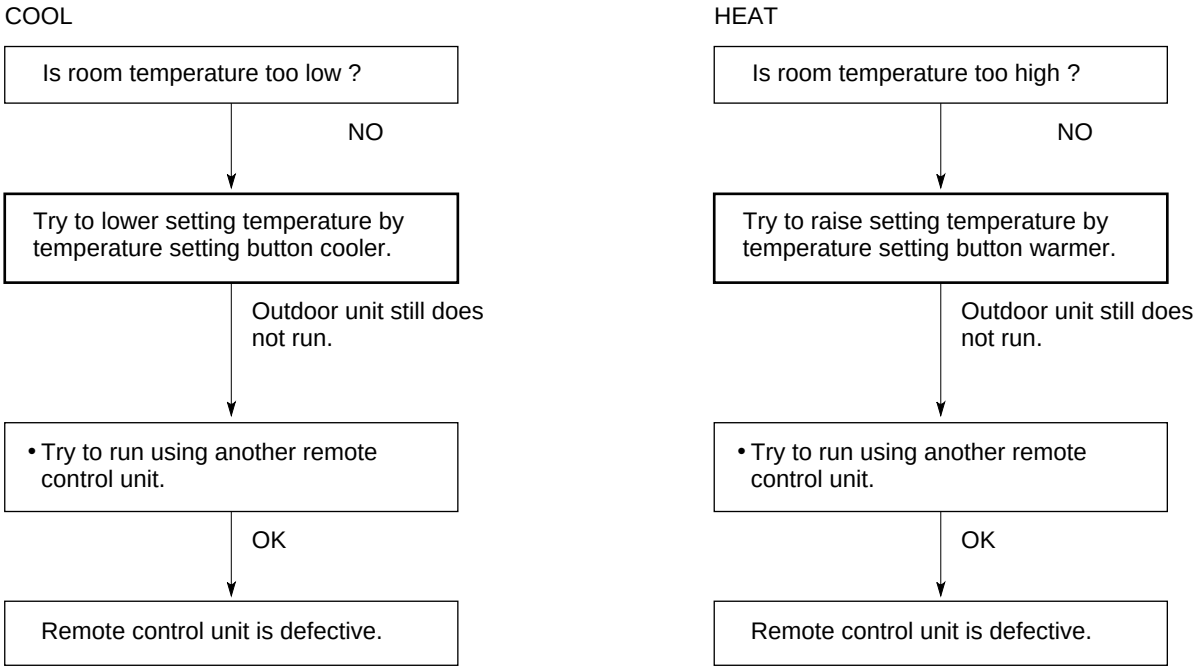
D. Check fuse on the indoor PCB Ass'y.



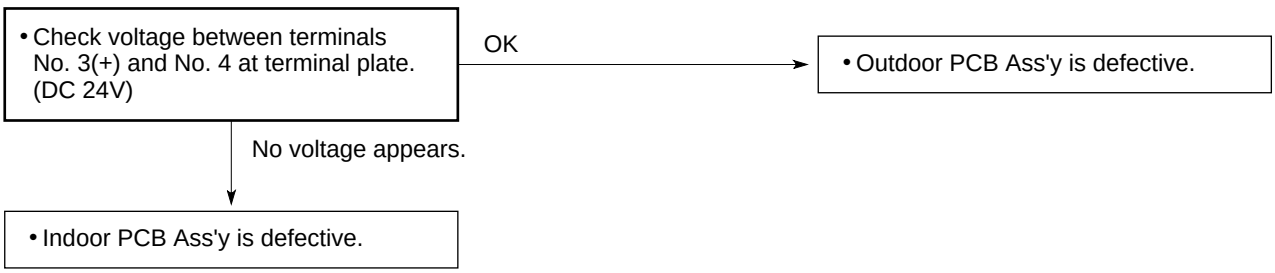
E. Check TIMER SELECT button on the remote control unit.

12-2-3.Only outdoor unit does not run.

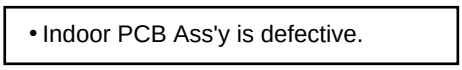
A. Check setting temperature.



B. Check PCB Ass'y in either indoor or outdoor unit.

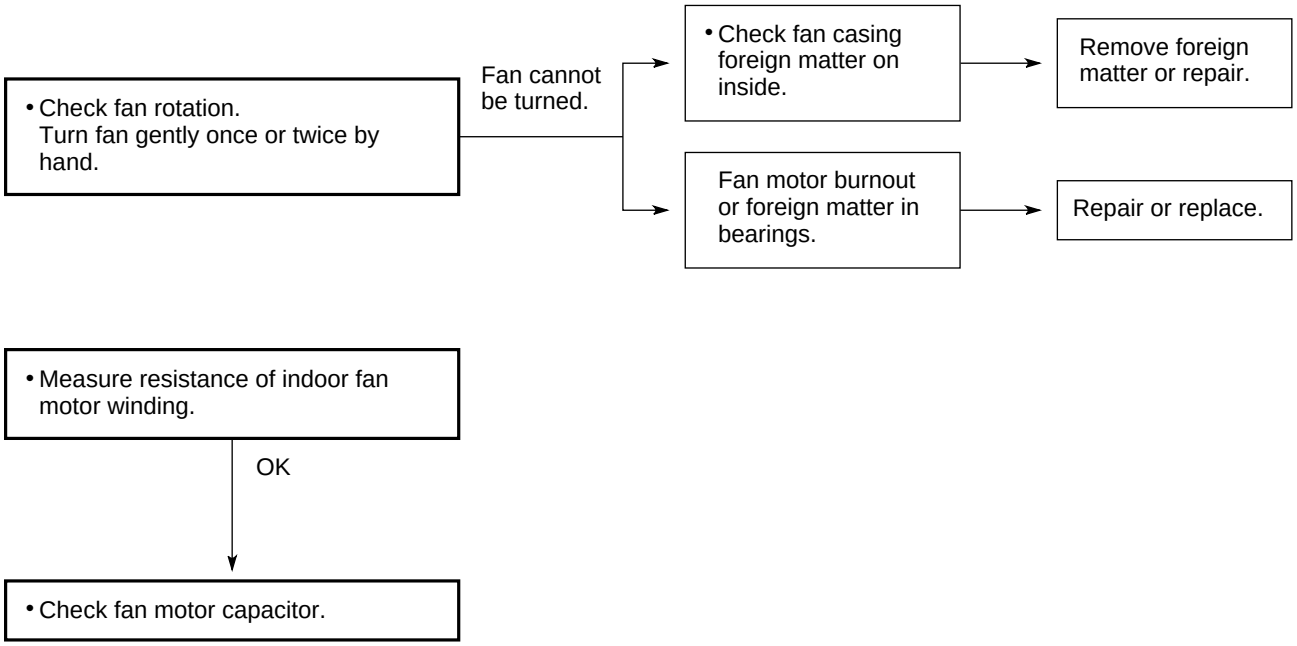


12-2-4.Only indoor unit does not run.

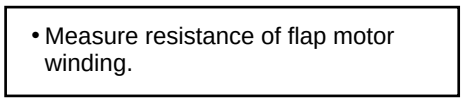


12-3. Some part of air conditioner does not operate.

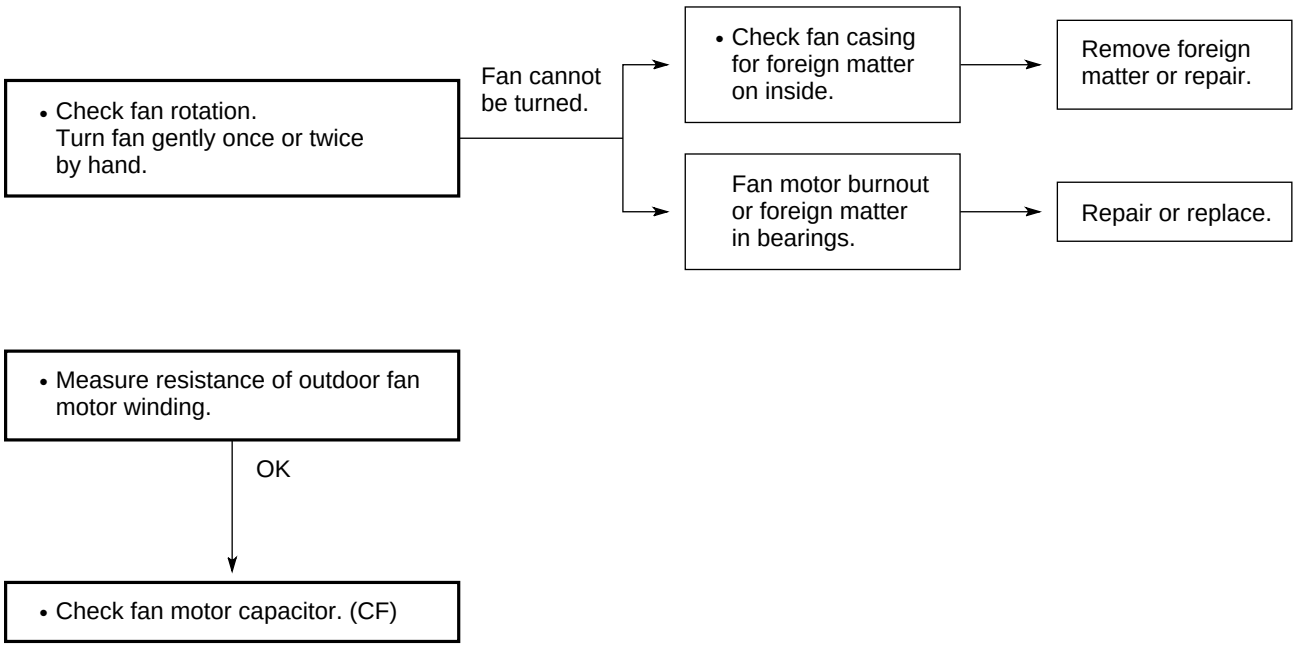
12-3-1.Only indoor fan does not run.



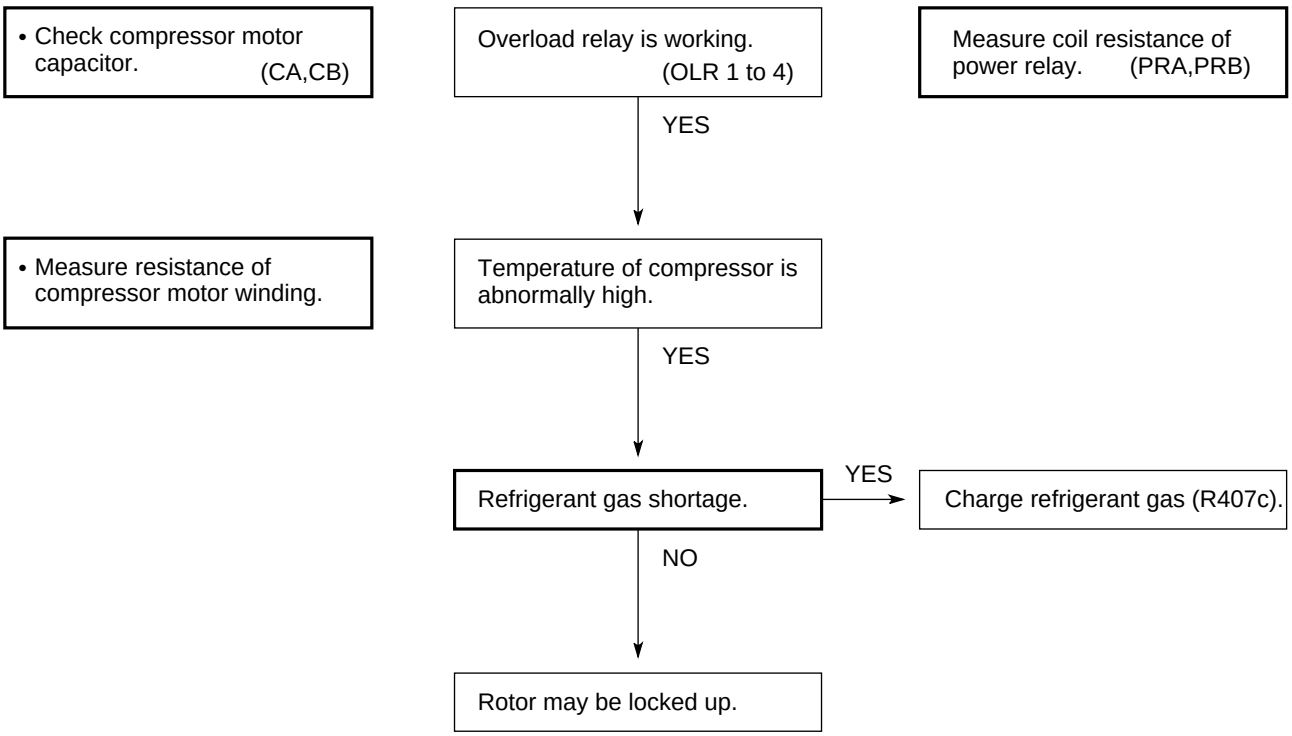
12-3-2.Only flap motor does not run.



12-3-3.Only outdoor fan does not run.

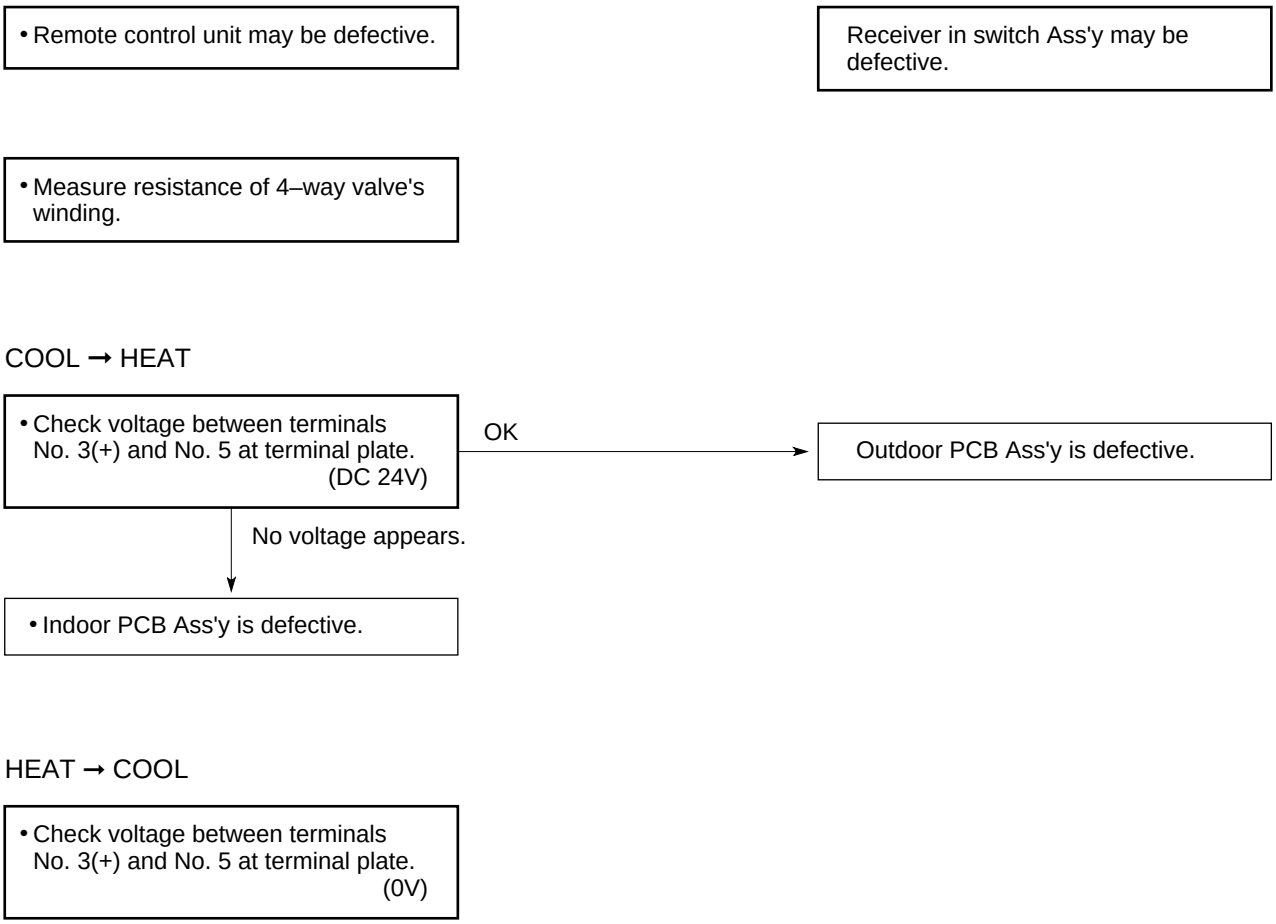


12-3-4.Only compressor does not run.



12-4. Air conditioner operates, but abnormalities are observed.

12-4-1.Operation does not switch from HEAT to COOL (or COOL to HEAT).



CAUTION

Units A and B cannot be operated in different modes simultaneously (for example, unit A operating in the heating mode while unit B is operating in the cooling or drying mode). When operating two units at the same time, set them both to the same mode. Note however that though technically different modes, unit A can operate in the cooling mode while B is operating in the drying mode.

• If the units are operated in different modes (for example, unit A in the heating mode and unit B in the cooling or drying mode), the results are as follows.

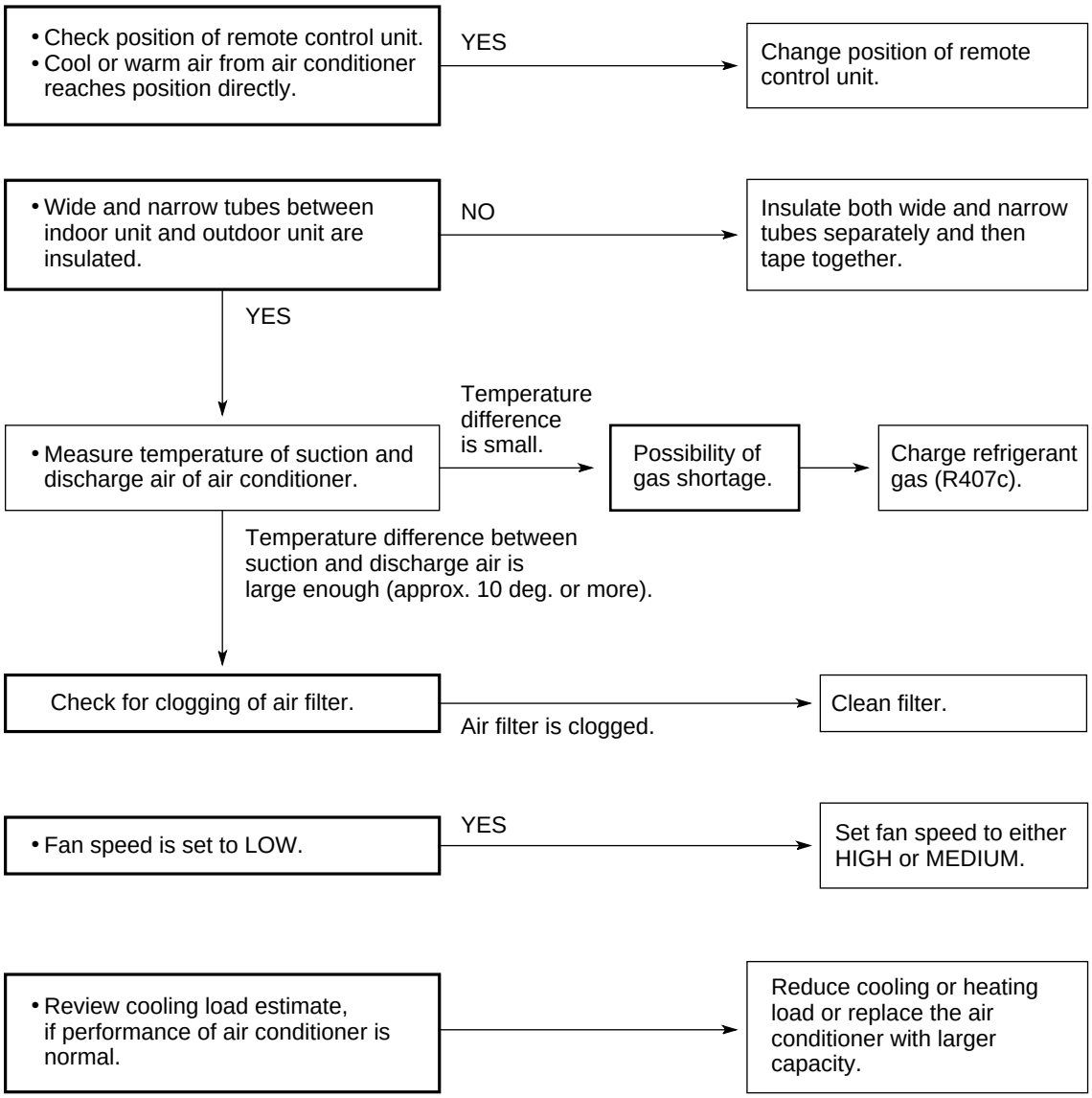
(Example) Unit A in heating mode
Unit B in cooling or drying mode

➡

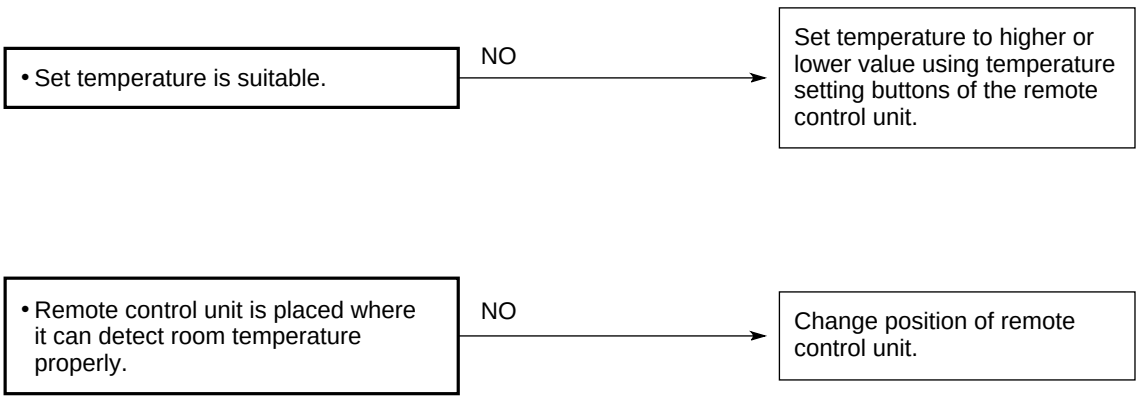
Unit A in heating mode
(Heating operation takes precedence.)
Unit B fan operating

If unit A is stopped, unit B will switch to cooling or drying operation.

12-4-2.Poor cooling or heating.

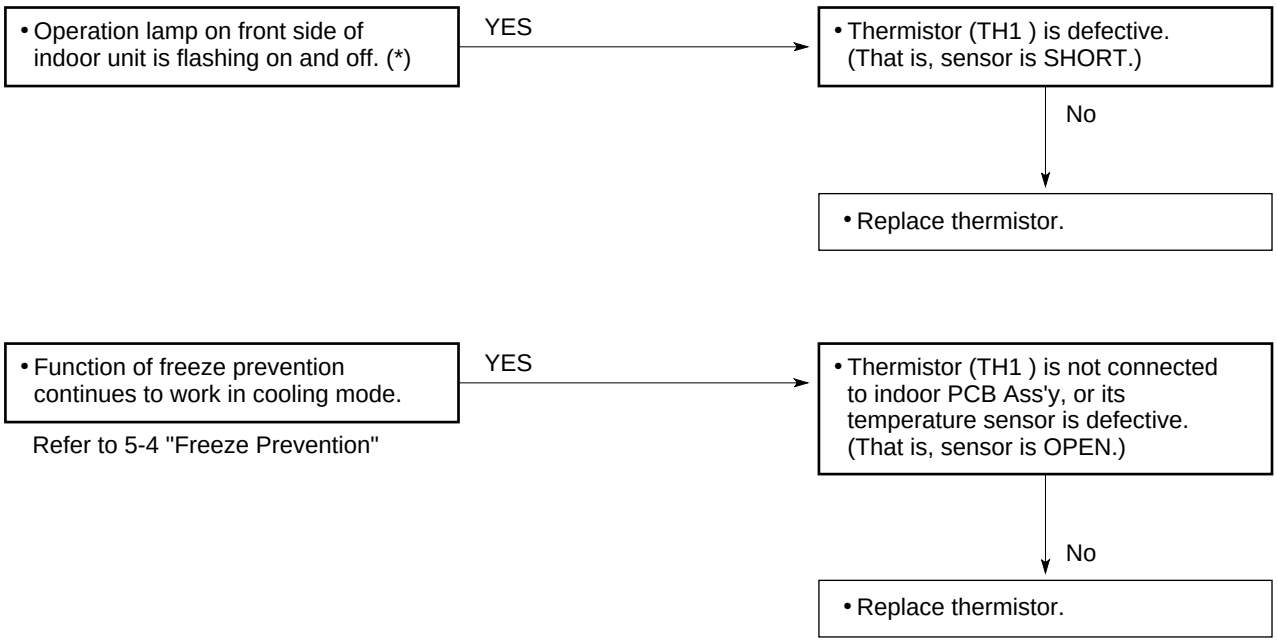


12-4-3.Excessive cooling or heating.



12-5. If a sensor is defective.

12-5-1.Indoor coil temp. thermistor (TH1) is defective.



NOTE **Alarm Signal (*)**

Operation lamp on the front side of the indoor unit will flash on and off when the indoor coil thermistor is defective. (That is, sensor is SHORT). At the same time the outdoor unit will stop. Indoor unit will operate only for ventilation.

12-5-2.Room temp. thermistor (TH2) is defective.

A. Open

When thermistor opens, the air conditioner will be in the following conditions as the controller tries to detect extremely low room temperature.

a) In Cooling mode: The air conditioner soon stops and will not start again. (Thermo.OFF)
Neither outdoor fan nor compressor runs.

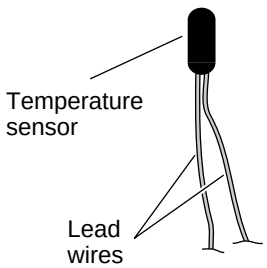
b) In Heating mode: The air conditioner continues to operate. (Thermo.ON)
Both the outdoor fan and compressor do not stop.
As a result, the room becomes too warm.

B. Short

When thermistor is short, the air conditioner will be in the following conditions as the controller tries to detect extremely high room temperature.

a) In Cooling mode: The air conditioner continues to operate. (Thermo.ON)
Both the outdoor fan and compressor do not stop.
As a result, the room becomes too cold.

b) In Heating mode: The air conditioner soon stops and will not start again. (Thermo.OFF)
Neither outdoor fan nor compressor runs.



Thermistor Structure

NOTE **Definition of Open or Short Circuit of Sensor (Thermistor)**

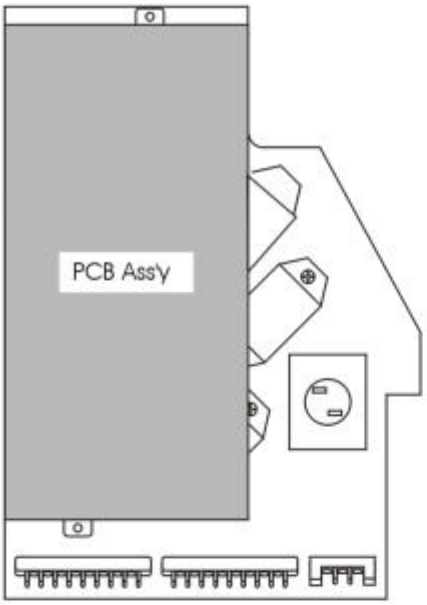
Open... A lead wire is broken or disconnected or the circuit inside the temperature sensor is open .

Short... The protective cover of a lead wire has been damaged, and the exposed wire is touching another metal part, or both lead wires have become exposed and are touching each other. Alternatively, the circuit inside the temperature sensor is closed.

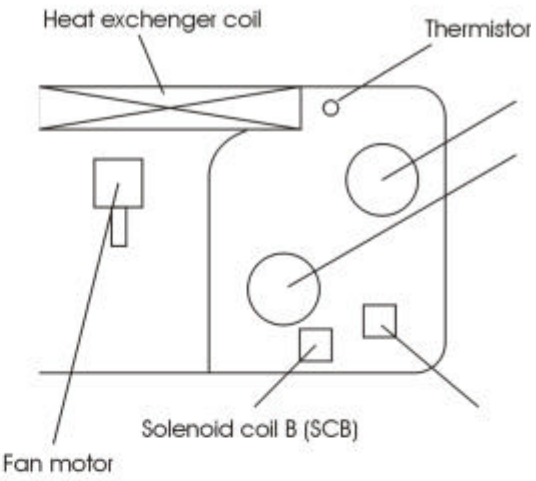
13. ARRANGEMENT OF ELECTRICAL COMPONENT

Outdoor Unit AER518DH

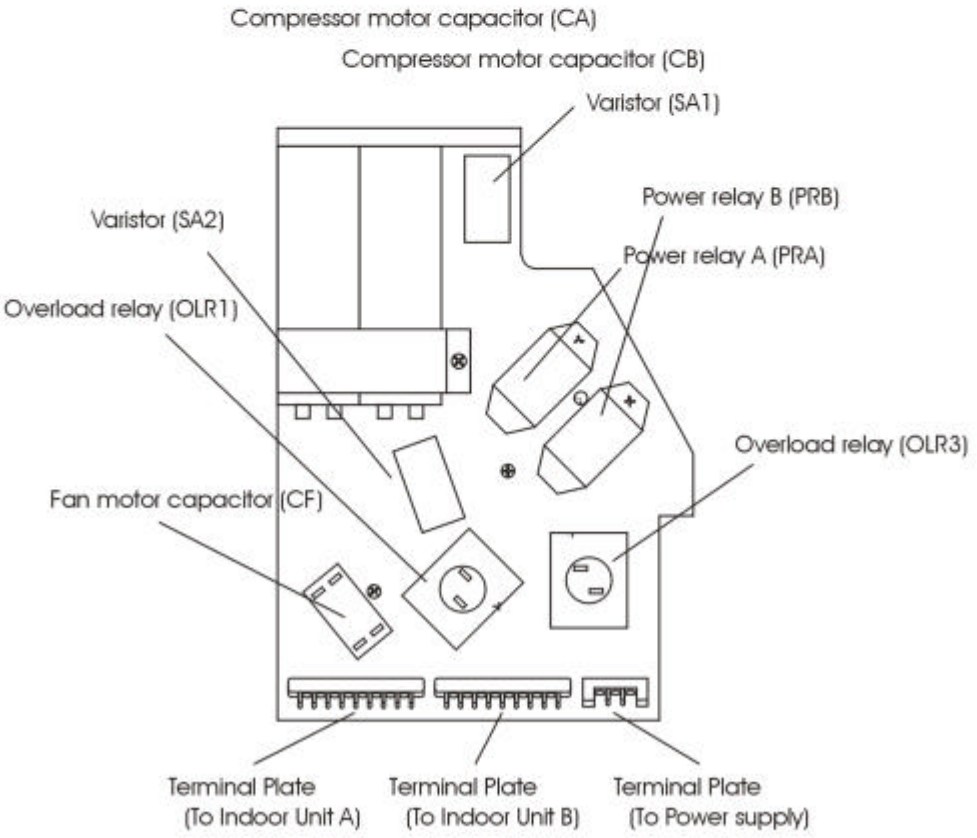
● PCB Ass'y (Controller)



● Parts Layout in Unit



● Electric Parts



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14. CHECKING ELECTRICAL COMPONENTS

14-1. Measurement of Insulation Resistance

- The insulation is in good condition if the resistance exceeds 2MΩ.

14-1-1. Power Supply Wires

Clamp the ground wire of the power supply wires with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the power wires. (Fig. 1)

Then measure the resistance between the ground wire and the other power wire. (Fig. 1)

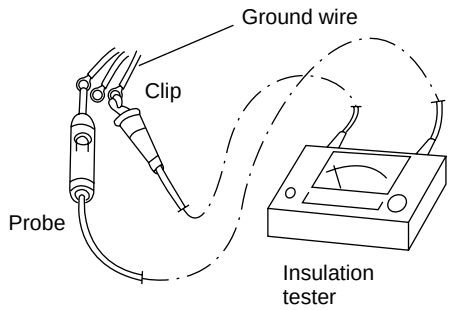

Fig. 1

14-1-2. Indoor Unit

Clamp an aluminum plate fin or copper tube with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on each terminal screw except where the ground line is connected on the terminal plate. (Fig. 2)

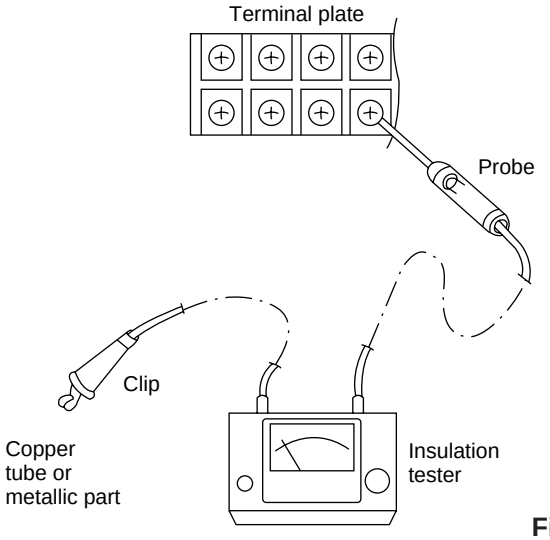

Fig. 2

14-1-3. Outdoor Unit

Clamp a metallic part of the unit with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on each terminal screw where power supply lines are connected on the terminal plate. (Fig. 2)

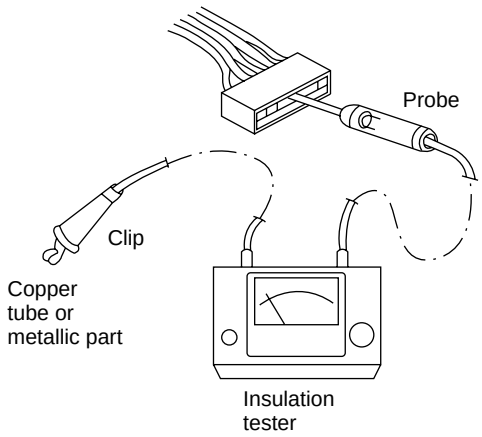

Fig. 3

14-1-4. Measurement of Insulation Resistance for Electrical Parts

Disconnect the lead wires of the desired electric part from terminal plate, capacitor, etc. Similarly disconnect the connector. Then measure the insulation resistance. (Figs. 1 to 4)

Refer to Electric Wiring Diagram.

NOTE

If the probe cannot enter the poles because the hole is too narrow then use a probe with a thinner pin.

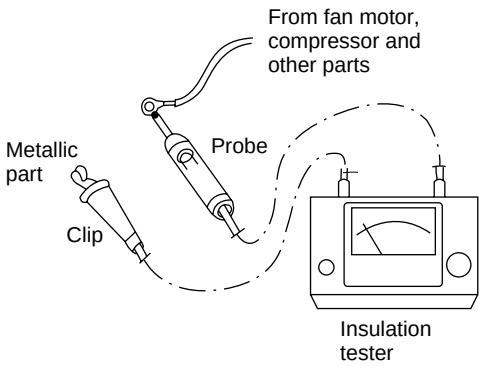

Fig. 4

14-2. Checking continuity of Fuse on PCB Ass'y

● Check for continuity using a multimeter as shown in Fig. 6.

NOTE

Method Used to Replace Fuse on PCB Ass'y

— Indoor PCB Ass'y —

1. Remove the PCB Ass'y from the electrical compo nent box
2. Then pull out the fuse from the PCB Ass'y.(Fig.5a)

— Outdoor PCB Ass'y —

1. Remove the PCB Ass'y from the electrical component box.
2. Pull out the fuse at the metal clasp using pliers while heating the soldered leads on the back side of the PCB Ass'y with a soldering iron (30W or 60W).(Fig.5b)
3. Remove the fuse ends one by one. For replacement insert a fuse of the same rating and solder it. (Allow time to radiate heat during soldering so that the fuse does not melt.)

14-3. Checking Motor Capacitor

Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in Fig. 7. Observe the deflection of the pointer, setting the resistance measuring range of the multimeter to the maximum value.

The capacitor is “good” if the pointer bounces to a great extent and then gradually returns to its original position.

The range of deflection and deflection time differ according to the capacity of the capacitor.

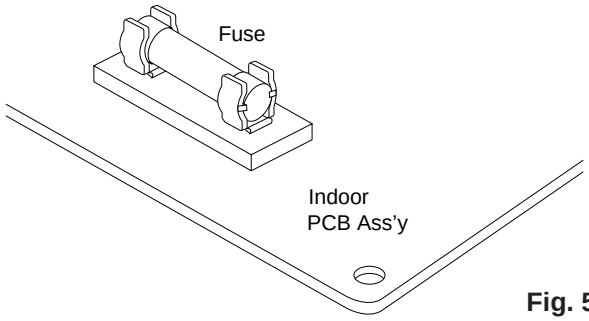

Fig. 5a

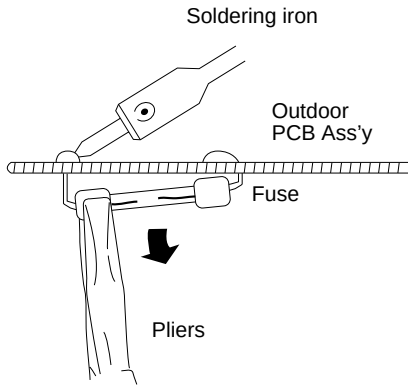

Fig. 5b

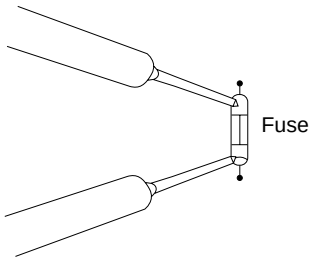

Fig. 6

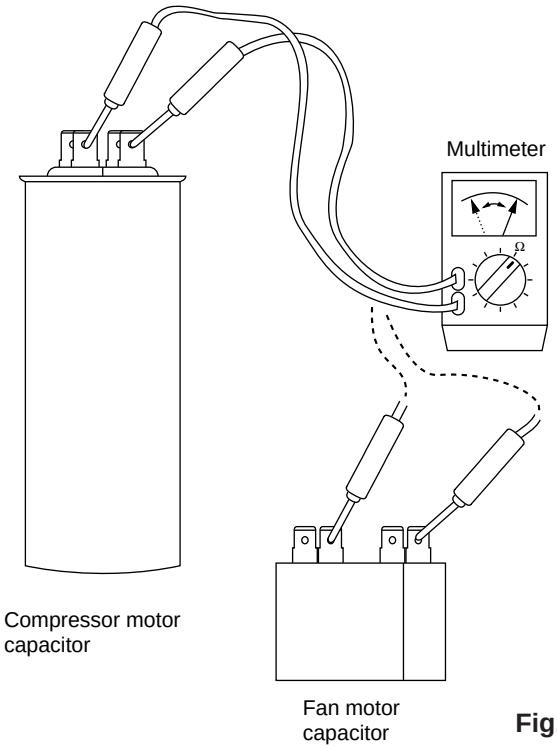

Fig. 7

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