TECHNICAL DATA & SERVICE MANUAL

AWR508HL	**+**	**AER508SH**
AWR509HL	**+**	**AER509SH**
AFR509HL	**+**	**AER509SH**
AWR512HL	**+**	**AER512SH**
FCR512HL	**+**	**AER512SH**

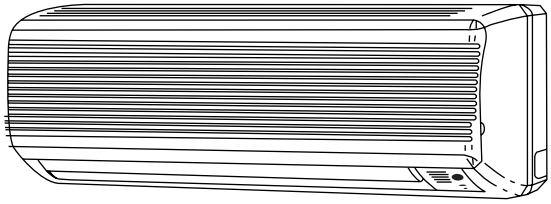
Euro-Line®

SPLIT SYSTEM AIR CONDITIONER

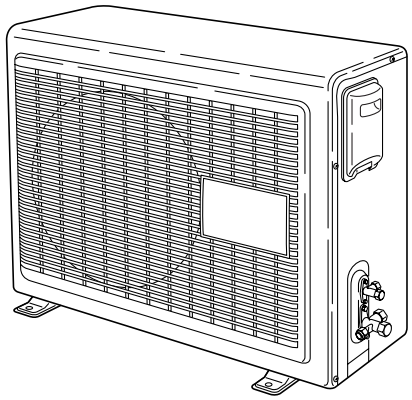
Indoor Unit

Outdoor Unit

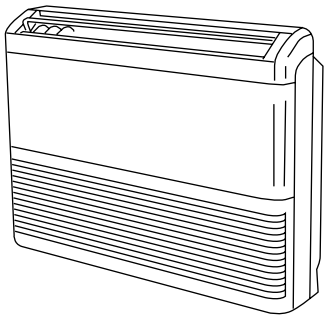
AWR508HL
AWR509HL
AWR512HL



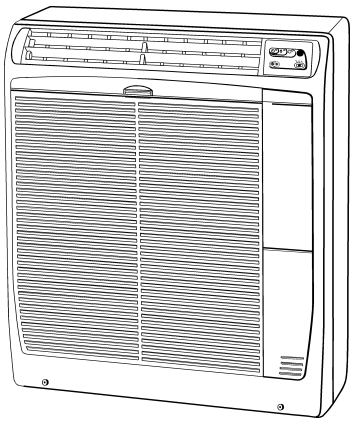
AER508SH
AER509SH
AER512SH



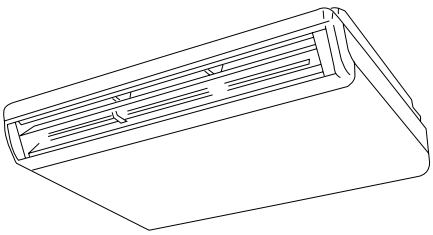
FCR512HL
Floor-Mounted



AFR509HL



Ceiling-Mounted



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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

1. OPERATING RANGE

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

2. SPECIFICATIONS

2-1. Unit Specifications

Indoor Unit **AWR508HL**
Outdoor Unit **AER508SH**

Power Source			220–240V ~ 50Hz	
Voltage rating			230 V	
Performance			Cooling	Heating
Capacity		kW	2.30	2.6
		BTU/h	7,843	8,696
Air circulation (High)		m^3/h	430	
Moisture removal (High)		Liters/h	0.6	—
Electrical Rating			Cooling	Heating
Available voltage range		V	198 ~ 264	
Running amperes		A	3.7	3.6
Power input		W	820	390
Power factor		%	94	96
C.O.P.		W/W	2.9	3.4
Compressor locked rotor amperes		A	20	20
Features				
Controls / Temperature control			Microprocessor / I.C. thermostat	
Control unit			Wireless remote control unit	
Timer			ON/OFF 24 hours & Daily program,1-hour OFF	
Fan speeds		Indoor / Outdoor	3 and Auto / 1(Hi)	
Airflow direction (Indoor)		Horizontal	Manual	
		Vertical	Auto	
Air filter			Washable, Anti-Mold	
Compressor			Rotary (Hermetic)	
Refrigerant / Amount charged at shipment		g	R407c / 770	
Refrigerant control			Capillary tube	
Operation sound	Indoor : Hi / Me / Lo	dB-A	37 / 32 / 31	37 / 32 / 31
	Outdoor : Hi	dB-A	43	45
Refrigerant tubing connections			Flare type	
Max. allowable tubing length at shipment		m	7.5	
Refrigerant	Narrow tube	mm (in.)	6.35(1/4)	
tube diameter	Wide tube	mm (in.)	9.52(3/8)	
Refrigerant tube kit / Accessories			Optional / Air Clean Filter	
Dimensions & Weight			Indoor Unit	Outdoor Unit
Unit dimensions	Height	mm	270	540
	Width	mm	805	700
	Depth	mm	177	265
Package dimensions	Height	mm	243	568
	Width	mm	855	815
	Depth	mm	332	343
Weight	Net	kg	8.0	35.0
	Shipping	kg	10.0	38.0
Shipping volume		m^3	0.07	0.16

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Remarks:

Rating conditions are:

Cooling : Indoor air temperature 27℃ D.B. / 19℃ W.B.
Outdoor air temperature 35℃ D.B. / 24℃ W.B.

Heating : Indoor air temperature 20℃ D.B.
Outdoor air temperature 7℃ D.B. / 6℃ W.B.

Indoor Unit **AWR509HL**
Outdoor Unit **AER509SH**

Power Source			220–240V ~ 50Hz	
Voltage rating			230 V	
Performance			Cooling	Heating
Capacity		kW	2.65	3.5
		BTU/h	9,037	11,93
Air circulation (High)		m^3/h	430	
Moisture removal (High)		Liters/h	0.8	—
Electrical Rating			Cooling	Heating
Available voltage range		V	198 ~ 264	
Running amperes		A	4.7	4.6
Power input		W	1030	1050
Power factor		%	95	96
C.O.P.		W/W	2.6	3.4
Compressor locked rotor amperes		A	24	24
Features				
Controls / Temperature control			Microprocessor / I.C. thermostat	
Control unit			Wireless remote control unit	
Timer			ON/OFF 24 hours & Daily program,1-hour OFF	
Fan speeds		Indoor / Outdoor	3 and Auto / 1(Hi)	
Airflow direction (Indoor)		Horizontal	Manual	
		Vertical	Auto	
Air filter			Washable, Anti-Mold	
Compressor			Rotary (Hermetic)	
Refrigerant / Amount charged at shipment		g	R407c / 990	
Refrigerant control			Capillary tube	
Operation sound	Indoor : Hi / Me / Lo	dB-A	37 / 32 / 31	37 / 32 / 31
	Outdoor : Hi	dB-A	43	45
Refrigerant tubing connections			Flare type	
Max. allowable tubing length at shipment		m	7.5	
Refrigerant	Narrow tube	mm (in.)	6.35(1/4)	
tube diameter	Wide tube	mm (in.)	9.52(3/8)	
Refrigerant tube kit / Accessories			Optional / Air Clean Filter	
Dimensions & Weight			Indoor Unit	Outdoor Unit
Unit dimensions	Height	mm	270	540
	Width	mm	805	700
	Depth	mm	177	265
Package dimensions	Height	mm	243	568
	Width	mm	855	815
	Depth	mm	332	343
Weight	Net	kg	8.0	36.0
	Shipping	kg	10.0	39.0
Shipping volume		m^3	0.07	0.16

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Remarks:

Rating conditions are:

Cooling : Indoor air temperature 27℃ D.B. / 19℃ W.B.
Outdoor air temperature 35℃ D.B. / 24℃ W.B.

Heating : Indoor air temperature 20℃ D.B.
Outdoor air temperature 7℃ D.B. / 6℃ W.B.

Indoor Unit **AWR512HL**
Outdoor Unit **AER512SH**

Power Source	220–240V ~ 50Hz

Voltage rating	230 V

Performance			Cooling	Heating
Capacity		kW	3.30	4.10
		BTU/h	11,424	13,98
Air circulation (High)		m^3/h	430	
Moisture removal (High)		Liters/h	1.3	—

Electrical Rating			Cooling	Heating
Available voltage range		V	198 ~ 264	
Running amperes		A	6.2	6.6
Power input		W	1,300	1,400
Power factor		%	95	94
C.O.P.		W/W	2.5	3.0
Compressor locked rotor amperes		A	33	33

Features				
Controls / Temperature control			Microprocessor / I.C. thermostat	
Control unit			Wireless remote control unit	
Timer			ON/OFF 24 hours & Daily program,1-hour OFF	
Fan speeds		Indoor / Outdoor	3 and Auto / 1(Hi)	
Airflow direction (Indoor)		Horizontal	Manual	
		Vertical	Auto	
Air filter			Washable, Anti-Mold	
Compressor			Rotary (Hermetic)	
Refrigerant / Amount charged at shipment		g	R407c / 1,150	
Refrigerant control			Capillary tube	
Operation sound	Indoor : Hi / Me / Lo	dB-A	39 / 35 / 33	39 / 35 / 33
	Outdoor : Hi	dB-A	45	47
Refrigerant tubing connections			Flare type	
Max. allowable tubing length at shipment		m	7.5	
Refrigerant	Narrow tube	mm (in.)	6.35(1/4)	
tube diameter	Wide tube	mm (in.)	12.7(1/2)	
Refrigerant tube kit / Accessories			Optional / Air Clean Filter	

Dimensions & Weight			Indoor Unit	Outdoor Unit
Unit dimensions	Height	mm	270	540
	Width	mm	805	700
	Depth	mm	177	265
Package dimensions	Height	mm	243	568
	Width	mm	855	815
	Depth	mm	332	343
Weight	Net	kg	8.0	38.0
	Shipping	kg	10.0	41.0
Shipping volume		m^3	0.07	0.16

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Remarks:

Rating conditions are:

Cooling : Indoor air temperature 27℃ D.B. / 19℃ W.B.
Outdoor air temperature 35℃ D.B. / 24℃ W.B.

Heating : Indoor air temperature 20℃ D.B.
Outdoor air temperature 7℃ D.B. / 6℃ W.B.

Indoor Unit **AFR509HL**
Outdoor Unit **AER509SH**

Power Source			220–240V ~ 50Hz	
Voltage rating			230 V	
Performance			Cooling	Heating
Capacity		kW	2.65	3.5
		BTU/h	9,037	11,93
Air circulation (High)		m^3/h	370	
Moisture removal (High)		Liters/h	1.3	—
Electrical Rating			Cooling	Heating
Available voltage range		V	198 ~ 264	
Running amperes		A	4.7	4.6
Power input		W	1030	1050
Power factor		%	95	96
C.O.P.		W/W	2.6	3.4
Compressor locked rotor amperes		A	24	24
Features				
Controls / Temperature control			Microprocessor / I.C. thermostat	
Control unit			Wireless remote control unit	
Timer			ON/OFF 24 hours & Daily program,1-hour OFF	
Fan speeds		Indoor / Outdoor	3 and Auto / 1(Hi)	
Airflow direction (Indoor)		Horizontal	Manual	
		Vertical	Manual	
Air filter			Washable, Anti-Mold	
Compressor			Rotary (Hermetic)	
Refrigerant / Amount charged at shipment		g	R407c / 990	
Refrigerant control			Capillary tube	
Operation sound	Indoor : Hi / Me / Lo	dB-A	37 / 32 / 31	37 / 32 / 31
	Outdoor : Hi	dB-A	43	45
Refrigerant tubing connections			Flare type	
Max. allowable tubing length at shipment		m	7.5	
Refrigerant	Narrow tube	mm (in.)	6.35(1/4)	
tube diameter	Wide tube	mm (in.)	9.52(3/8)	
Refrigerant tube kit / Accessories			Optional / Air Clean Filter	
Dimensions & Weight			Indoor Unit	Outdoor Unit
Unit dimensions	Height	mm	700	540
	Width	mm	560	700
	Depth	mm	200	265
Package dimensions	Height	mm	770	568
	Width	mm	620	815
	Depth	mm	265	343
Weight	Net	kg	18	36.0
	Shipping	kg	20	37.0
Shipping volume		m^3	0.07	0.16

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Remarks:

Rating conditions are:

Cooling : Indoor air temperature 27℃ D.B. / 19℃ W.B.
Outdoor air temperature 35℃ D.B. / 24℃ W.B.

Heating : Indoor air temperature 20℃ D.B.
Outdoor air temperature 7℃ D.B. / 6℃ W.B.

Indoor Unit **FCR512HL**
Outdoor Unit **AER512SH**

Power Source	220–240V ~ 50Hz

Voltage rating	230 V

Performance		Cooling	Heating
Capacity	kW	3.30	4.10
	BTU/h	11,424	14,98
Air circulation (High)	m^3/h	700	
Moisture removal (High)	Liters/h	1.8	—

Electrical Rating		Cooling	Heating
Available voltage range	V	198 ~ 264	
Running amperes	A	6.2	6.6
Power input	W	1300	1400
Power factor	%	95	94
C.O.P.	W/W	2.5	3.0
Compressor locked rotor amperes	A	33	33

Features				
Controls / Temperature control			Microprocessor / I.C. thermostat	
Control unit			Wireless remote control unit	
Timer			ON/OFF 24 hours & Daily program,1-hour OFF	
Fan speeds		Indoor / Outdoor	3 and Auto / 1(Hi)	
Airflow direction (Indoor)		Horizontal	Manual	
		Vertical	Auto	
Air filter			Washable, Anti-Mold	
Compressor			Rotary (Hermetic)	
Refrigerant / Amount charged at shipment		g	R407c /1150	
Refrigerant control			Capillary tube	
Operation sound	Indoor : Hi / Me / Lo	dB-A	44 / 40 / 35	44 / 40 / 35
	Outdoor : Hi	dB-A	45	47
Refrigerant tubing connections			Flare type	
Max. allowable tubing length at shipment		m	7.5	
Refrigerant	Narrow tube	mm (in.)	6.35(1/4)	
tube diameter	Wide tube	mm (in.)	12.7(1/2)	
Refrigerant tube kit / Accessories			Optional / Air Clean Filter	

Dimensions & Weight			Indoor Unit	Outdoor Unit
Unit dimensions	Height	mm	680	540
	Width	mm	900	700
	Depth	mm	190	265
Package dimensions	Height	mm	813	568
	Width	mm	1,011	815
	Depth	mm	296	343
Weight	Net	kg	23.5	38.0
	Shipping	kg	30.0	41.0
Shipping volume		m^3	0.24	0.16

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Remarks:

Rating conditions are:

Cooling : Indoor air temperature 27℃ D.B. / 19℃ W.B.
Outdoor air temperature 35℃ D.B. / 24℃ W.B.

Heating : Indoor air temperature 20℃ D.B.
Outdoor air temperature 7℃ D.B. / 6℃ W.B.

2-2. Major Component Specifications

2-2-1. Indoor Unit

Indoor Unit **AWR508HL**

Controller PCB				
Part No.				POW-K78EH(A), POW-K8EH(B)
Controls				Microprocessor
Control circuit fuse				250 V 3.15 A
Remote Control Unit				RCS-8HPS3E
Fan & Fan Motor				
Type				Cross-flow
Q'ty ... Dia. and length			mm	1 ... ø95 / L617
Fan motor model ... Q'ty				KFV4Q-11H5P-S ... 1
No. of poles ... rpm (230 V, High)				4 ... 1,130
Nominal output			W	10
Coil resistance (Ambient temp. 20℃)			Ω	BRN-WHT : 561.8 VLT-WHT : 197.4 VLT-ORG : 63.4 YEL-ORG : 155.7 YEL-PNK : 115.9
Safety devices	Type			Internal fuse
	Operating temp.	Open	℃	145±2
		Close		—
Run capacitor			μF	0.6
			VAC	440
Flap Motor				
Type				Stepping motor
Model				MP24GA1
Rating				DC 12 V
Coil resistance (Ambient temp. 25℃)			Ω	WHT – BLU (respectively 4 wires) : 380 ± 7%
Heat Exch. Coil				
Coil				Aluminum plate fin / Copper tube
Rows				2
Fin pitch			mm	1.2
Face area			m^2	0.130

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Indoor Unit **AWR509HL**

Controller PCB				
	Part No.			POW-K78EH(A), POW-K8EH(B)
	Controls			Microprocessor
	Control circuit fuse			250 V 3.15 A
Remote Control Unit				RCS-8HPS3E
Fan & Fan Motor				
	Type			Cross-flow
	Q'ty ... Dia. and length		mm	1 ... ø95 / L617
	Fan motor model ... Q'ty			KFV4Q-11H5P-S ... 1
	No. of poles ... rpm (230 V, High)			4 ... 1,190
	Nominal output		W	10
	Coil resistance (Ambient temp. 20℃)		Ω	BRN-WHT : 561.8 VLT-WHT : 197.4 VLT-ORG : 63.4 YEL-ORG : 155.7 YEL-PNK : 115.9
	Safety devices	Type		Internal fuse
		Operating temp. Open	℃	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℃)		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 **AWR512HL**

Controller PCB				
	Part No.			POW-K128EH(A), POW-K8EH(B)
	Controls			Microprocessor
	Control circuit fuse			250 V 3.15 A
Remote Control Unit				RCS-8HPS3E
Fan & Fan Motor				
	Type			Cross-flow
	Q'ty ... Dia. and length		mm	1 ... ø95 / L617
	Fan motor model ... Q'ty			KFV4Q-11H5P-S ... 1
	No. of poles ... rpm (230 V, High)			4 ... 1,230
	Nominal output		W	10
	Coil resistance (Ambient temp. 20℃)		Ω	BRN-WHT : 561.8 VLT-WHT : 197.4 VLT-ORG : 63.4 YEL-ORG : 155.7 YEL-PNK : 115.9
	Safety devices	Type		Internal fuse
		Operating temp. Open	℃	145±2
		Close		—
	Run capacitor		μF	1.0
			VAC	440
Flap Motor				
	Type			Stepping motor
	Model			MP24GA1
	Rating			DC 12 V
	Coil resistance (Ambient temp. 25℃)		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 **AFR509HL**

Controller PCB				
Part No.				POW-K96GHS(C)
Controls				Microprocessor
Control circuit fuse				250 V 3 A
Remote Control Unit				RCS-8HPS3E
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

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Indoor Unit **FCR512HL**

Controller PCB				
	Part No.			POW-K126GHS-(C)
	Controls			Microprocessor
	Control circuit fuse			250 V 3.15 A
Remote Control Unit				RCS-6HPS3E
Fan & Fan Motor				
	Type			Cross-flow
	Q'ty ... Dia. and length		mm	2 ... ø130 / L180
	Fan motor model ... Q'ty			K48407-M01596 ... 1
	No. of poles ... rpm (230 V, High)			4 ... 1,160
	Nominal output		W	20
	Coil resistance (Ambient temp. 20°C)		Ω	GRY-WHT : 314±7% WHT-PNK : 444±7% WHT-VLT : 98.9±7% VLT-ORG : 98.9±7% ORG-YEL : 223±7%
	Safety devices Type			Internal protector
		Operating temp. Open	°C	145±5
		Close		Automatic reclosing
	Run capacitor		µF	1.5
			VAC	440
Flap Motor				
	Model			M2LJ24ZE31
	Rating			AC 208 / 230 V, 50 / 60 Hz
	No. of poles ... rpm			8 ... 2.5 / 3.0
	Nominal output		W	3 / 2.5
	Coil resistance (Ambient temp. 20°C)		kΩ	16.45 ± 15%
Heat Exch. Coil				
	Coil			Aluminum plate fin / Copper tube
	Rows			2
	Fin pitch		mm	1.8
	Face area		m^2	0.192

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2-2-2. Outdoor Unit

Outdoor Unit **AER508SH**

Controller PCB					POW-C96GH	
Compressor						
Type					Rotary (Hermetic)	
Compressor model					C-RN75H5A 80225245F	
Nominal output				W	750	
Compressor oil ... Amount				cc	ROTARY OIL ... 470	
Coil resistance (Ambient temp. 25℃)				Ω	C–R : 3.45 C–S : 8.79	
Safety devices	Type				External(OLR A)	External(OLR T)
	Overload relay				MRA38082-3229	CS-7C115
	Operating temp.	Open		℃	135±5	115±3
		Close		℃	69±11	95±5
	Operating amp.(Ambient temp. 25℃)				Trip in 6 to 16 sec. at 14A	—
Run capacitor				μF	20	
				VAC	400	
Crank case heater					—	
Fan & Fan Motor						
Type					Propeller	
Q'ty ... Dia.					1 ... ø370	
Fan motor model ... Q'ty					K35610M01723 ... 1	
No. of poles ... rpm (230 V, High)					6 ... 810	
Nominal output				W	20	
Coil resistance (Ambient temp. 20℃)				Ω	WHT-BRN : 341 - 392 WHT-PNK : 476 - 548 — —	
Safety devices	Type				Internal fuse	
	Operating temp.	Open		℃	145±2	
		Close		℃	—	
Run capacitor				μF	1.5	
				VAC	450	
Heat Exch. Coil						
Coil					Aluminum plate fin / Copper tube	
Rows					1	
Fin pitch				mm	1.3	
Face area				m^2	0.353	
External Finish					Acrylic baked-on enamel finish	

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Outdoor Unit **AER509SH**

Controller PCB				POW-C96GH	
Compressor					
Type				Rotary (Hermetic)	
Compressor model				C-RN90H5B 80228345-S	
Nominal output			W	900	
Compressor oil ... Amount			cc	ROTARY OIL ... 470	
Coil resistance (Ambient temp. 25℃)			Ω	C–R : 3.07 C–S : 6.69	
Safety devices	Type			External(OLR A)	External(OLR T)
	Overload relay			MRA38066-3229	CS-7C115
	Operating temp.	Open	℃	145±5	115±5
		Close	℃	69±11	95±10
	Operating amp.(Ambient temp. 25℃)			Trip in 6 to 16 sec. at 18A	—
Run capacitor			μF	25	
			VAC	400	
Crank case heater				—	
Fan & Fan Motor					
Type				Propeller	
Q'ty ... Dia.				1 ... ø370	
Fan motor model ... Q'ty				K35610M01723 ... 1	
No. of poles ... rpm (230 V, High)				6 ... 810	
Nominal output			W	20	
Coil resistance (Ambient temp. 20℃)			Ω	WHT-BRN : 341 - 392 WHT-PNK : 476 - 548 — —	
Safety devices	Type			Internal fuse	
	Operating temp.	Open	℃	145±2	
		Close	℃	—	
Run capacitor			μF	1.5	
			VAC	450	
Heat Exch. Coil					
Coil				Aluminum plate fin / Copper tube	
Rows				1	
Fin pitch			mm	1.2	
Face area			m^2	0.353	
External Finish				Acrylic baked-on enamel finish	

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Outdoor Unit **AER512SH**

Controller PCB				POW-C96GH	
Compressor					
Type				Rotary (Hermetic)	
Compressor model				C-RN110H5B 80235645B	
Nominal output			W	1,100	
Compressor oil ... Amount			cc	FV68S ... 550	
Coil resistance (Ambient temp. 25℃)			Ω	C–R : 1.962 C–S : 5.38	
Safety devices	Type			External(OLR A)	External(OLR T)
	Overload relay			MRA38065-3229	CS-7C115
	Operating temp.	Open	℃	135±5	115±3
		Close	℃	69±11	95±5
	Operating amp.(Ambient temp. 25℃)			Trip in 6 to 16 sec. at 14A	—
Run capacitor			μF	25	
			VAC	450	
Crank case heater				—	
Fan & Fan Motor					
Type				Propeller	
Q'ty ... Dia.				1 ... ø370	
Fan motor model ... Q'ty				K35610M01722 ... 1	
No. of poles ... rpm (230 V, High)				6 ... 830	
Nominal output			W	21	
Coil resistance (Ambient temp. 20℃)			Ω	BRN-WHT : 250 - 288 WHT-YEL : 344 - 396	
Safety devices	Type			Internal protector	
	Operating temp.	Open	℃	130±8	
		Close	℃	Automatic reclosing	
Run capacitor			μF	1.5	
			VAC	450	
Heat Exch. Coil					
Coil				Aluminum plate fin / Copper tube	
Rows				2	
Fin pitch			mm	1.4	
Face area			m^2	0.333	
External Finish				Acrylic baked-on enamel finish	

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

2-3. Other Component Specifications

Indoor Unit **AWR508HL**
AWR509HL
AWR512HL

Transformer (TR)		**ATR-J105**
Rating	Primary	AC 230V, 50/60Hz
	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)		**DTN-TKS131B**
Resistance	kΩ	0°C 15.0 ± 2%

Thermistor (Room sensor)		**DTN-TKS134B**
Resistance	kΩ	25°C 5.0 ± 3%

Outdoor Unit **AER508SH**
AER509SH
AER512SH

Power Relay (PR)		**DFU24D1F**
Coil rating		DC 24V
Coil resistance	Ω (at 20°C)	650 ± 10%
Contact rating		AC 250V, 20A

Thermostat (Defrost thermo. 23D)		**TRS02-12MSR**
Operating temp.	°C	ON 12 ± 2
		Diff. 8 deg. below

4-way Valve (SC)		**LB60012 (Coil), VH7100C (Valve)**
Coil rating		AC 220/240V, 50Hz, 6W
Coil resistance	Ω (at 20°C)	1,740 ± 7%

<Only for 7,000BTU/h and 9,000BTU/h class models>

4-way Valve (SC)		**LB60012 (Coil), V26-110B (Valve)**
Coil rating		AC 220/240V, 50Hz, 6W
Coil resistance	Ω (at 20°C)	1,740 ± 7%

<Only for 12,000BTU/h class models>

PTC Thermistor (TH)		**TDK 101YV**
Resistance	Ω (at 25°C)	100 ± 20%

<Only for 12,000BTU/h class models>

Indoor Unit **AFR509HL**

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-H85**
Rating	Primary	AC 235V, 50Hz
	Secondary	11V, 0.727A
	Capacity	8VA
Coil resistance	Ω (at 21°C)	Primary (WHT – WHT): 214 ± 10%
		Secondary (BRN – BRN): 1.58 ± 10%
Thermal cut-off temp.		145°C, 2A, 250V

Indoor Unit **FCR512HL**

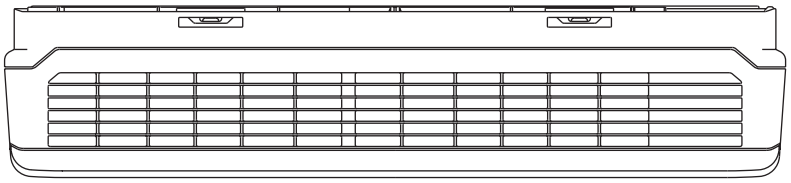
Thermistor (Room sensor TH2)		**KTEC-35-S6**	
Resistance	kΩ	10°C 10.0 ± 4%	30°C 4.0 ± 4%
		15°C 7.9 ± 4%	35°C 3.3 ± 4%
		20°C 6.3 ± 4%	40°C 2.7 ± 4%
		25°C 5.0 ± 4%	50°C 1.8 ± 4%

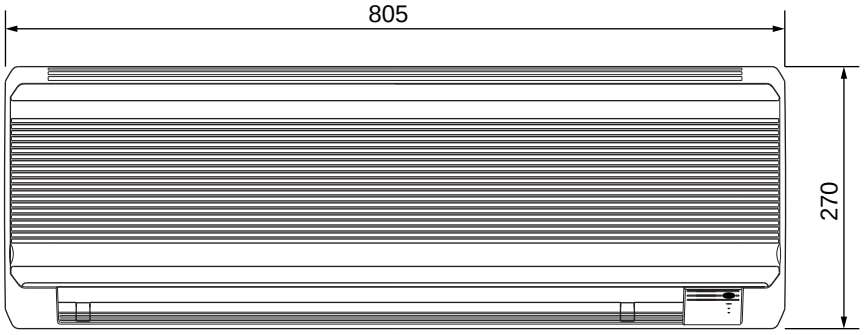
Thermistor (Coil sensor TH1)		**PBC-41E-S14**	
Resistance	kΩ	–20°C 40.1 ± 5%	20°C 6.5 ± 5%
		–10°C 24.4 ± 5%	30°C 4.4 ± 5%
		0°C 15.3 ± 5%	40°C 3.0 ± 5%
		10°C 9.9 ± 5%	50°C 2.1 ± 5%

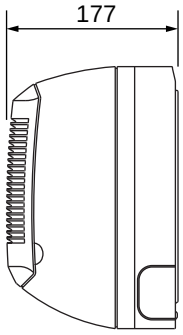
Transformer (TR)		**ATR-J105**
Rating	Primary	AC 230V, 50/60Hz
	Secondary	19V, 0.526A
	Capacity	10VA
Coil resistance	Ω (at 21°C)	Primary (WHT – WHT): 205 ± 10%
		Secondary (BRN – BRN): 2.0 ± 10%
Thermal cut-off temp.		150°C

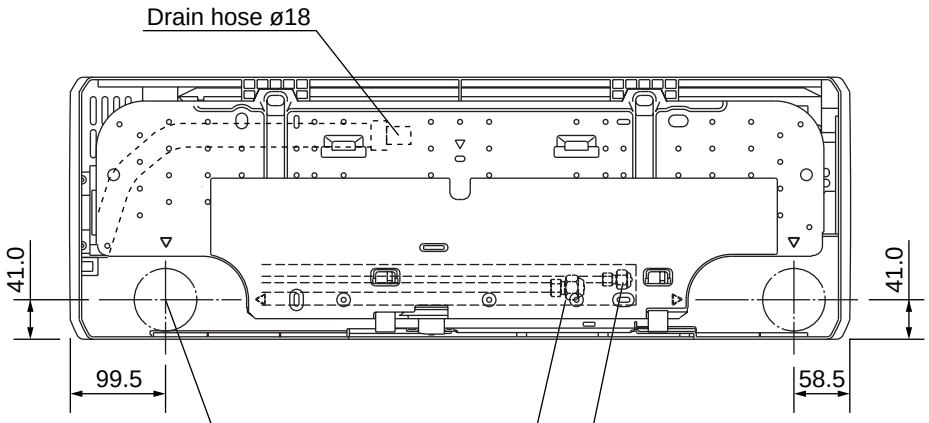
3. DIMENSIONAL DATA

Indoor Unit **AWR508HL**
AWR509HL
AWR512HL

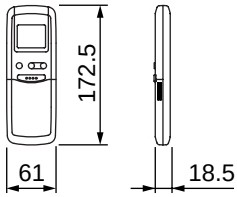






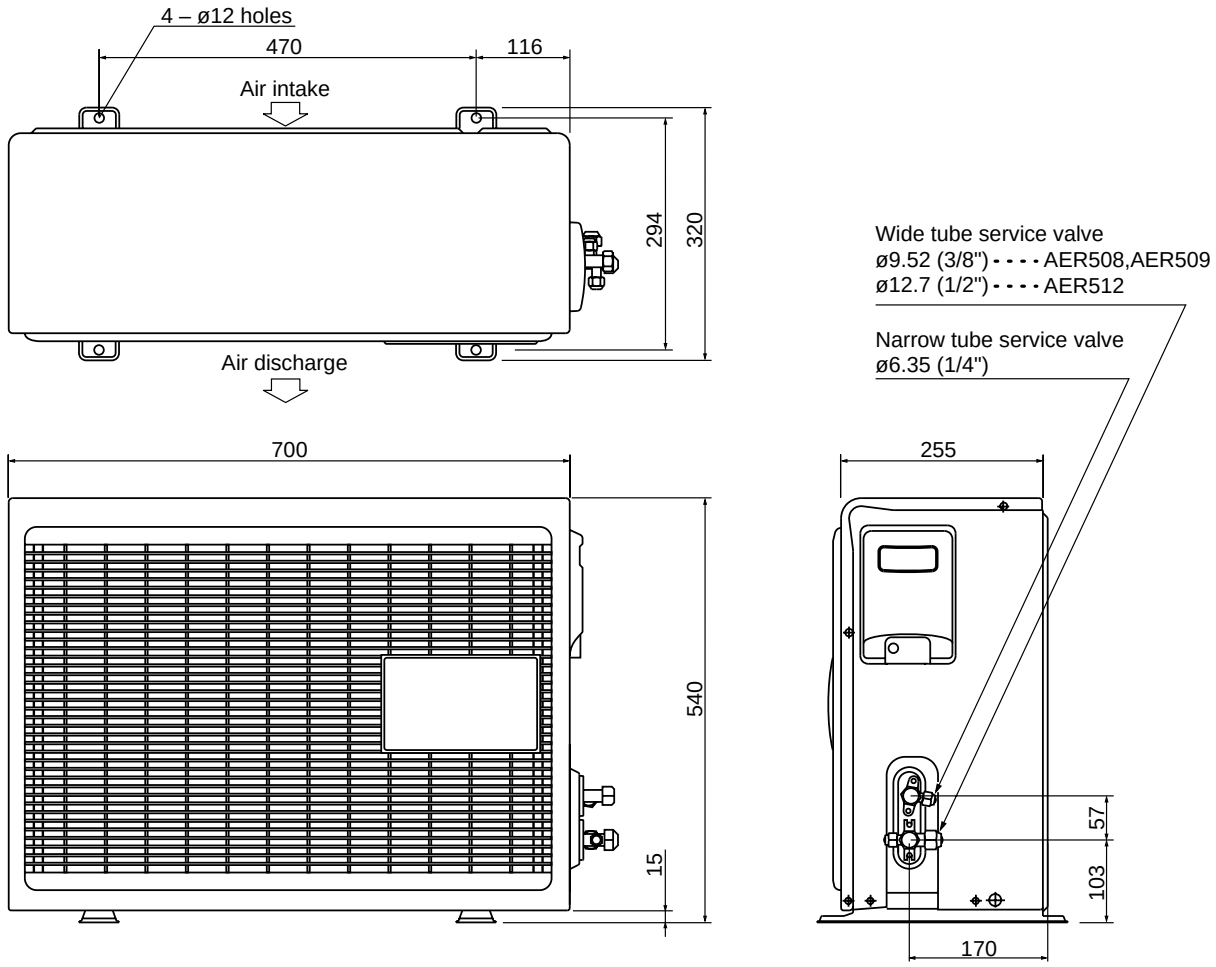


Remote control unit



Unit : mm

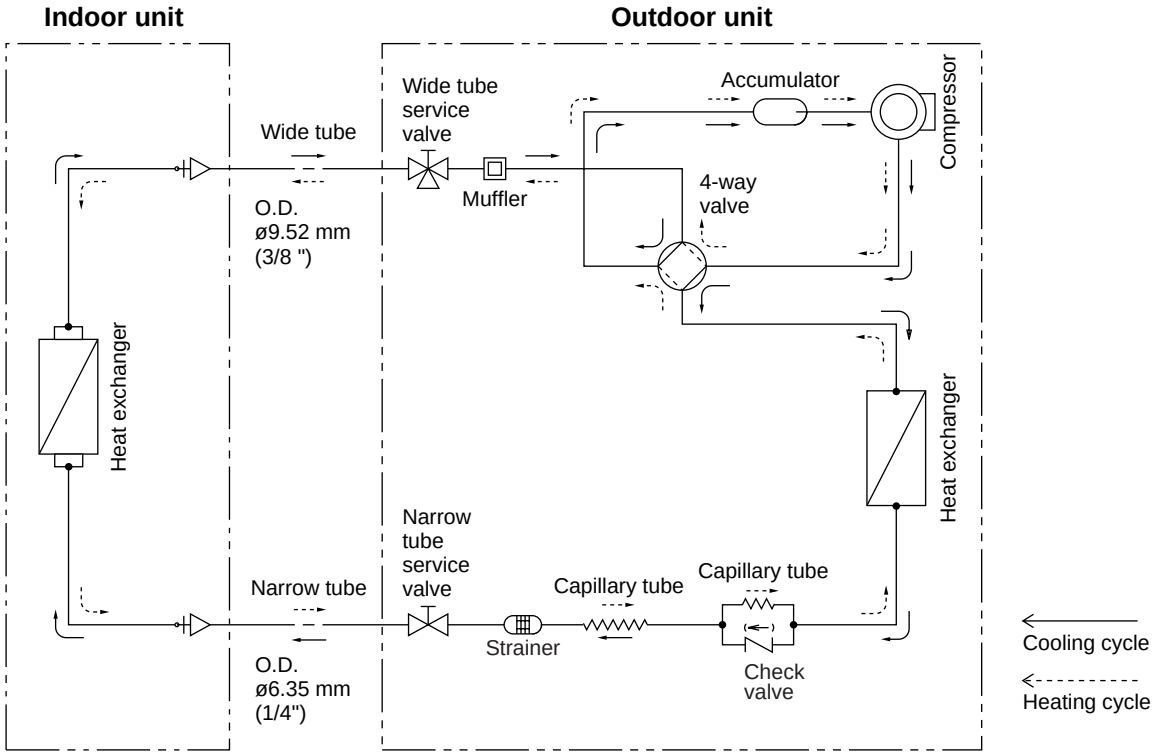
Outdoor Unit **AER508SH**
AER509SH
AER512SH



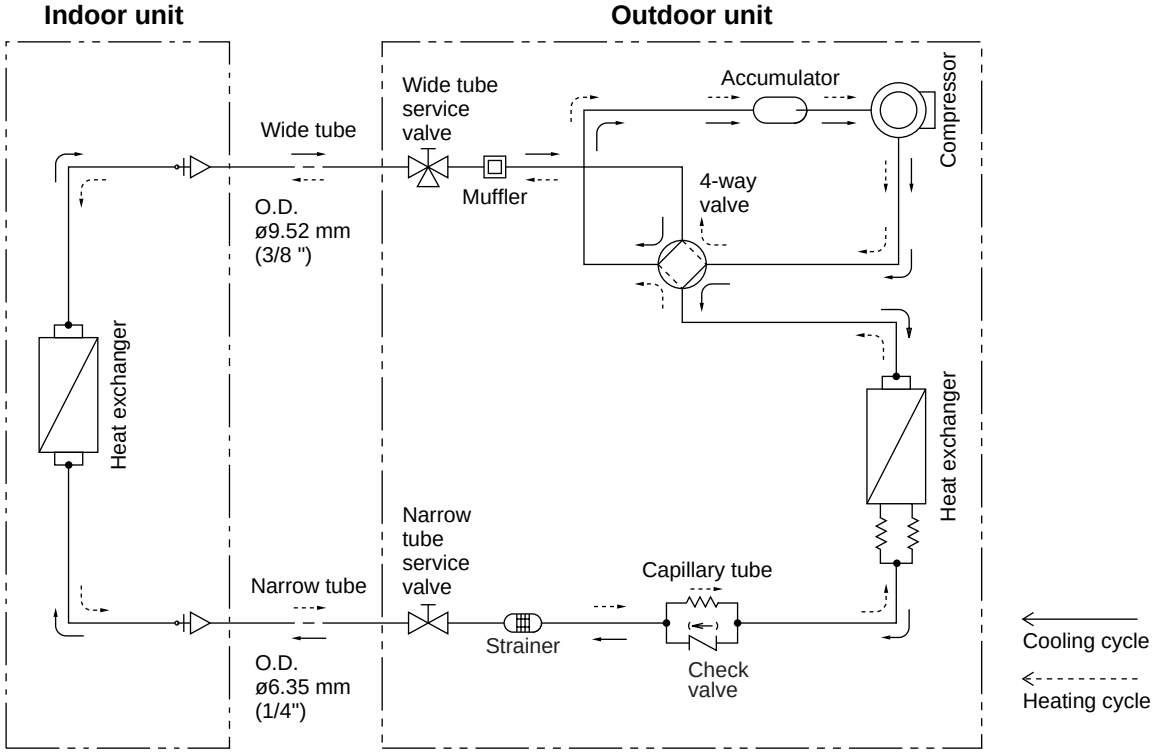
Unit : mm

4. REFRIGERANT FLOW DIAGRAM

Indoor Unit **AWR508HL** Outdoor Unit **AER508SH**

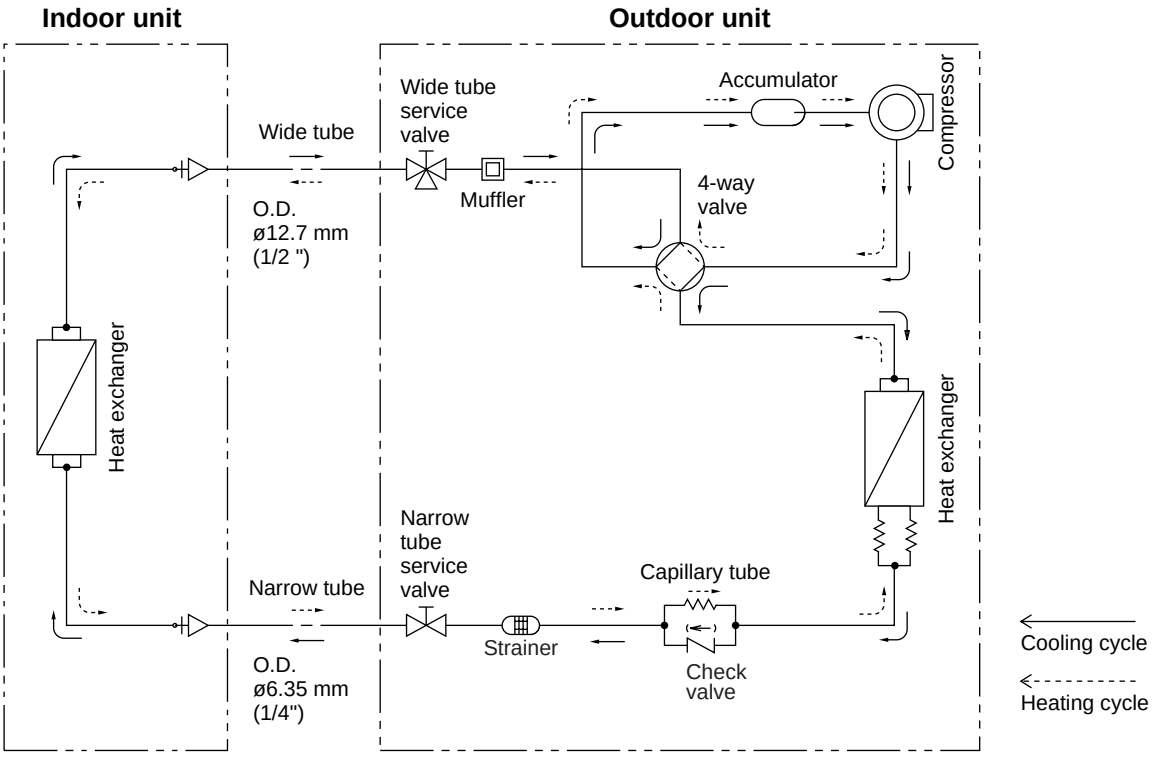


Indoor Unit **AWR509HL** **AFR509HL** Outdoor Unit **AER509SH**



Indoor Unit **AWR512HL**
FCR512HL

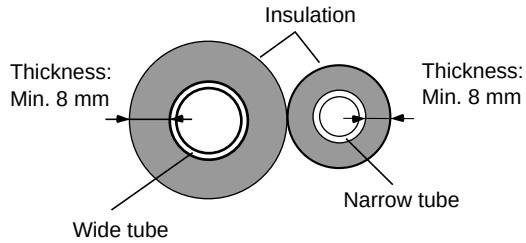
Outdoor Unit **AER512SH**



Insulation of Refrigerant Tubing

IMPORTANT

Because capillary tubing is used in the outdoor unit, both the wide and narrow tubes of this air conditioner become cold. To prevent heat loss and wet floors due to dripping of condensation, **both tubes must be well insulated** with a proper insulation material. The thickness of the insulation should be a min. 8 mm.



CAUTION

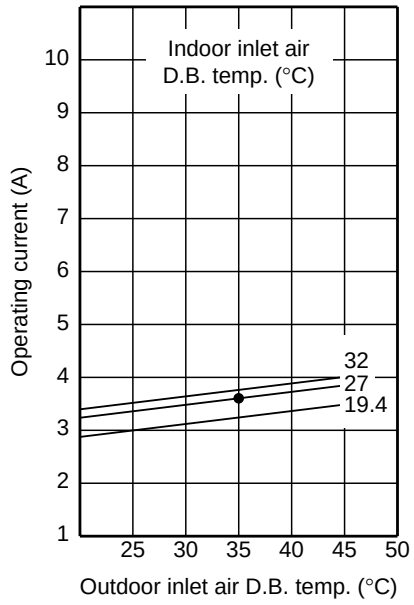
After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.

5. PERFORMANCE DATA

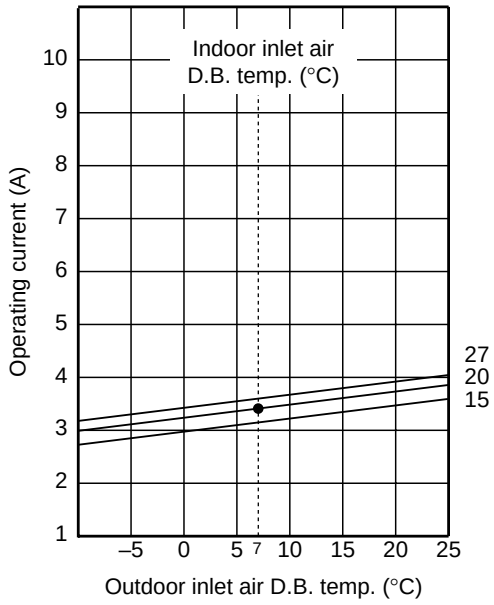
5-1. Performance charts

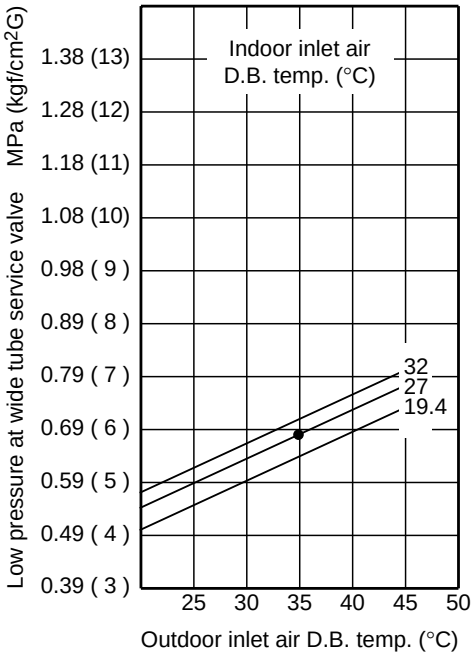
Indoor Unit **AWR508HL**
Outdoor Unit **AER508SH**

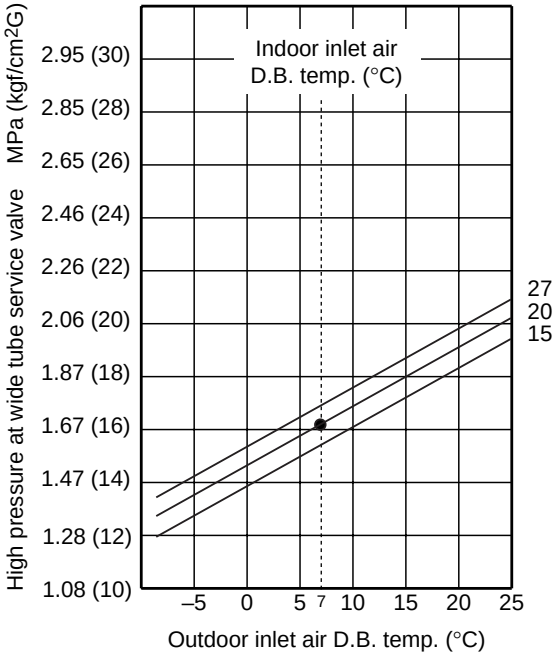
■ Cooling Characteristics



■ Heating Characteristics







NOTE

Overload prevention operates to protect the air conditioner when outdoor ambient temperature reaches extremely high in heating mode. (Refer to “8-5 Overload prevention”)

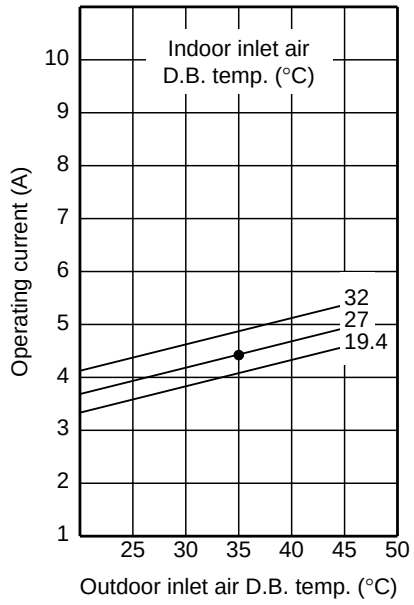
● ..... Points of Rating condition
Black dots in above charts indicate the following rating conditions.

Cooling: Indoor air temperature 27°C D.B./19°C W.B.
Outdoor air temperature 35°C D.B./24°C W.B.

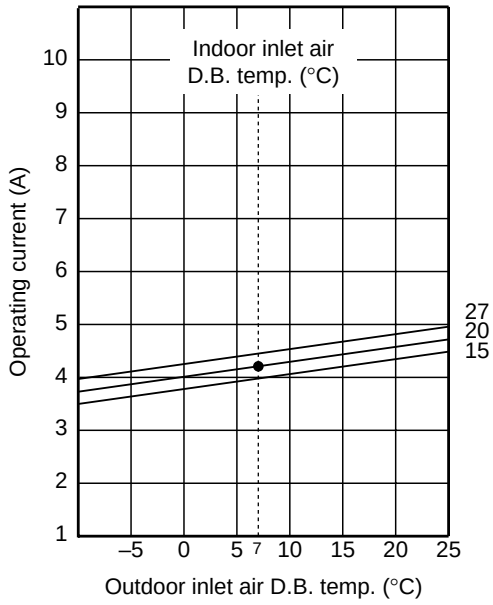
Heating: Indoor air temperature 20°C D.B.
Outdoor air temperature 7°C D.B./6°C W.B.

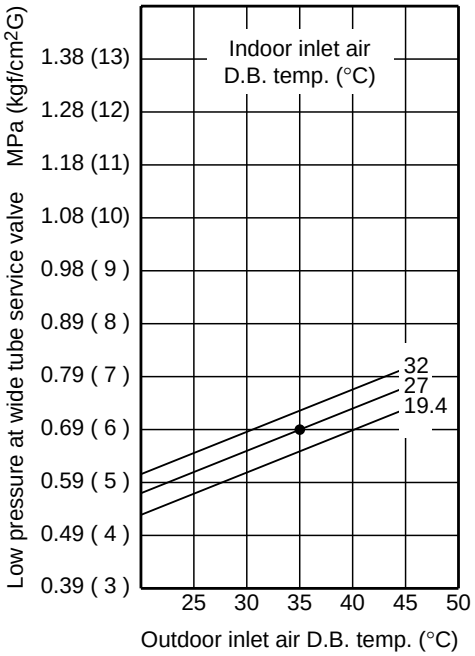
Indoor Unit **AWR509HL AFR509HL**
Outdoor Unit **AER509SH**

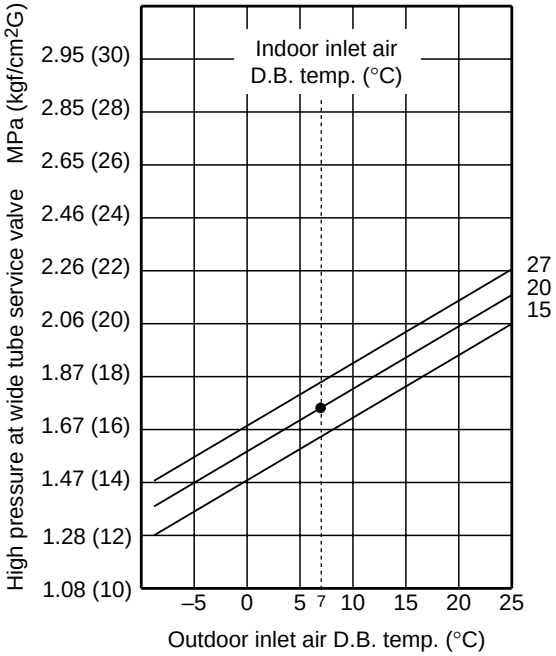
■ Cooling Characteristics



■ Heating Characteristics







NOTE

Overload prevention operates to protect the air conditioner when outdoor ambient temperature reaches extremely high in heating mode. (Refer to “8-5 Overload prevention”)

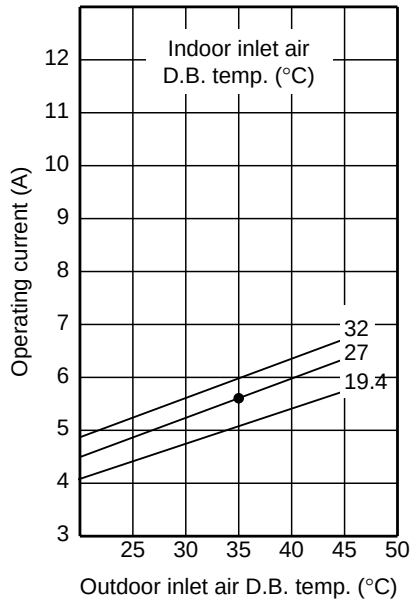
● ..... Points of Rating condition
Black dots in above charts indicate the following rating conditions.

Cooling: Indoor air temperature 27°C D.B./19°C W.B.
Outdoor air temperature 35°C D.B./24°C W.B.

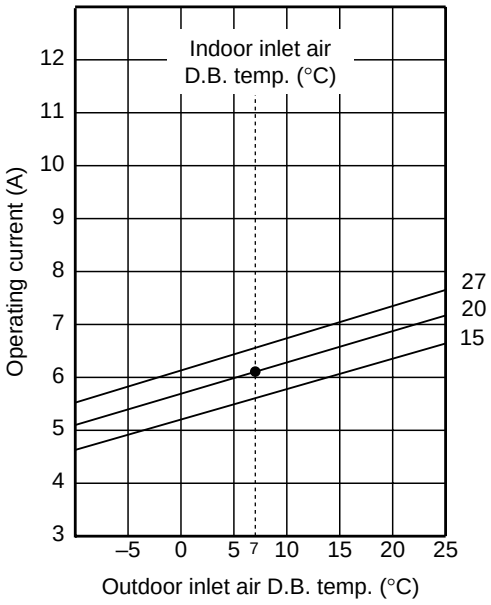
Heating: Indoor air temperature 20°C D.B.
Outdoor air temperature 7°C D.B./6°C W.B.

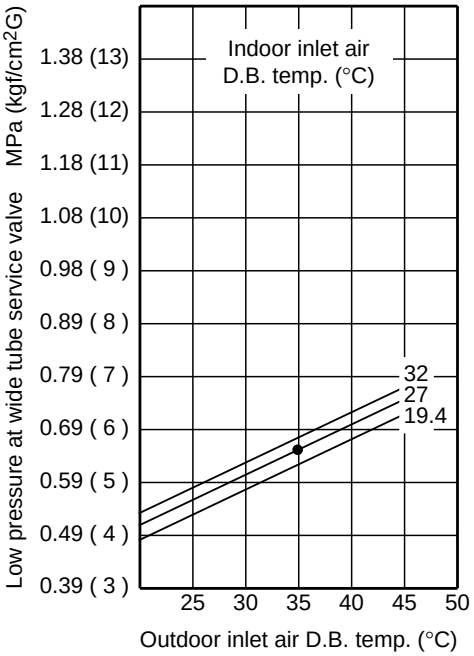
Indoor Unit **AWR512HL FCR512HL**
Outdoor Unit **AER512SH**

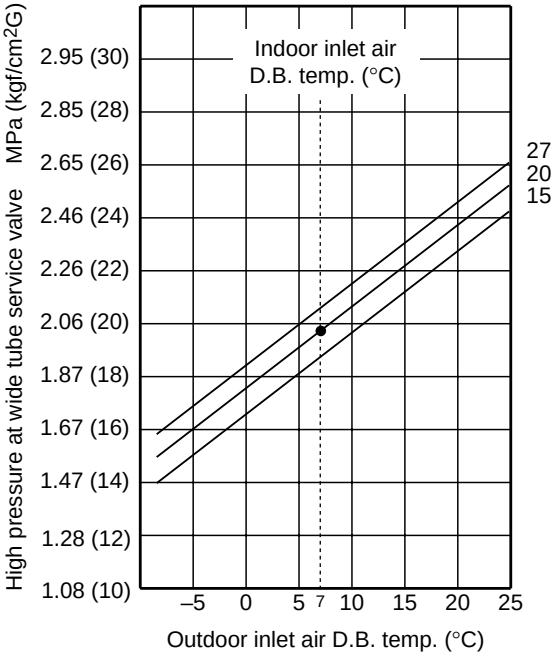
■ Cooling Characteristics



■ Heating Characteristics







NOTE

Overload prevention operates to protect the air conditioner when outdoor ambient temperature reaches extremely high in heating mode. (Refer to “8-5 Overload prevention”)

● ..... Points of Rating condition
Black dots in above charts indicate the following rating conditions.

Cooling: Indoor air temperature 27°C D.B./19°C W.B.
Outdoor air temperature 35°C D.B./24°C W.B.

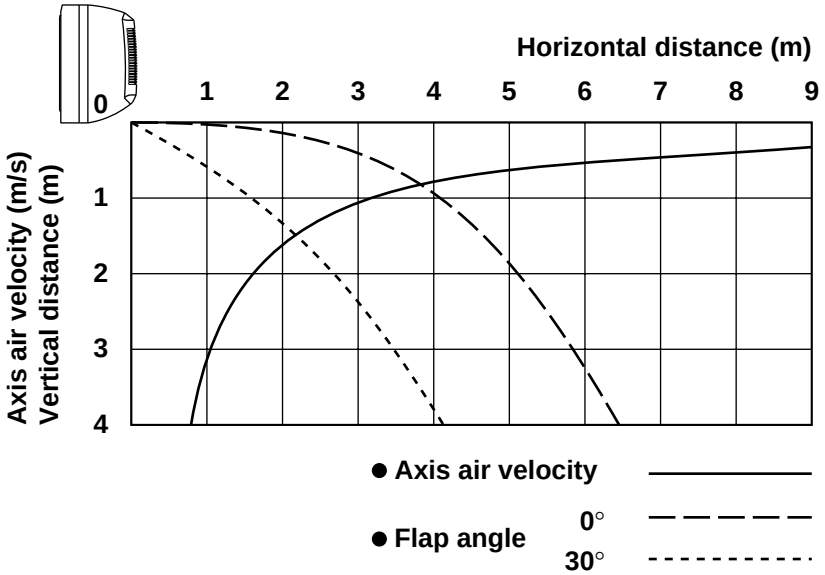
Heating: Indoor air temperature 20°C D.B.
Outdoor air temperature 7°C D.B./6°C W.B.

5-2. Air Throw Distance Chart

Indoor Unit **AWR508HL**

Cooling

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

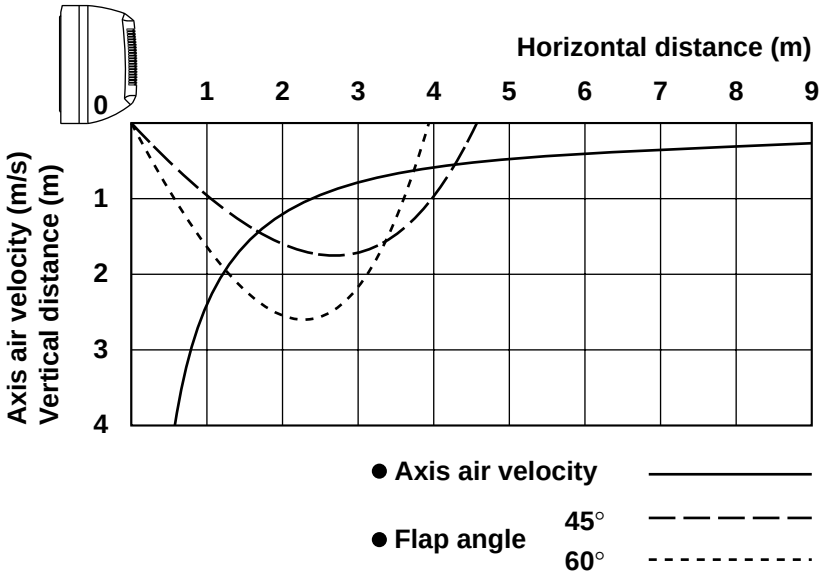


● Axis air velocity ——————

● Flap angle 0° — — — — —
30° - - - - - - - - - - -

Heating

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



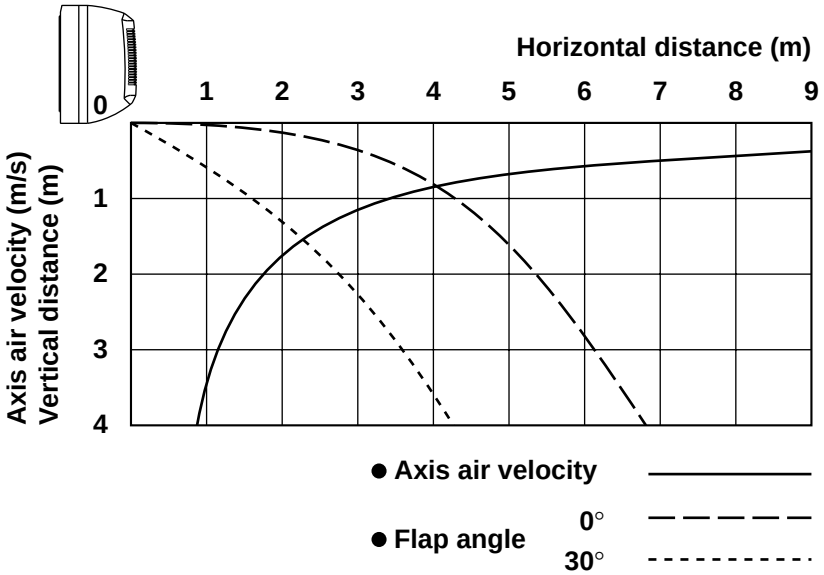
● Axis air velocity ——————

● Flap angle 45° — — — — —
60° - - - - - - - - - - -

Indoor Unit **AWR509HL**

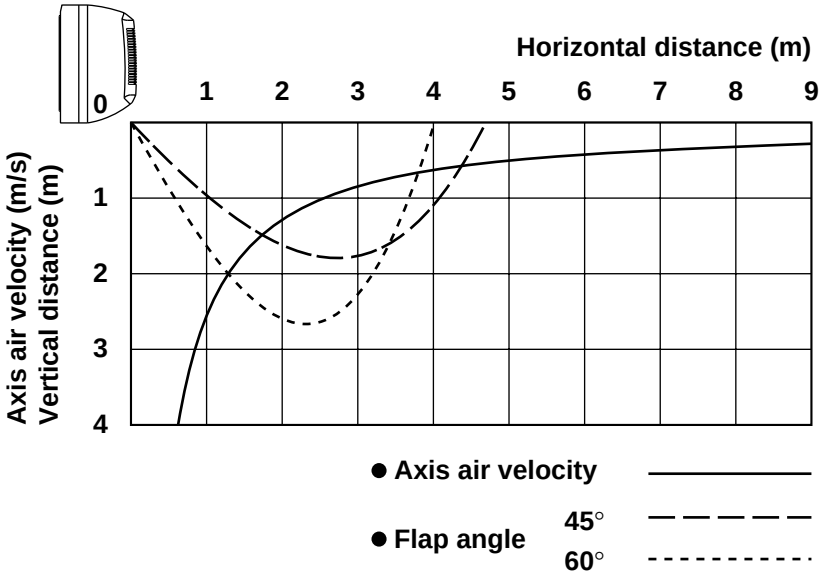
Cooling

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



Heating

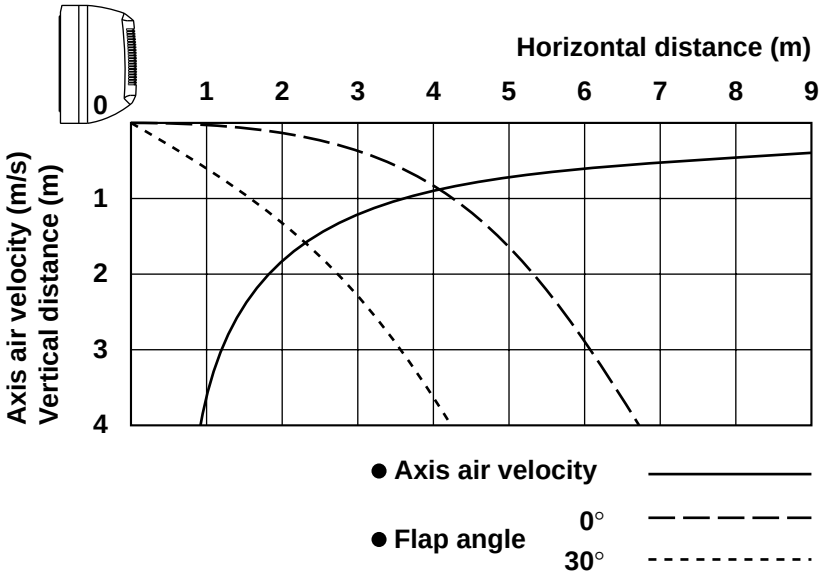
Room air temp. : 20°C
Fan speed : High



Indoor Unit **AWR512HL**

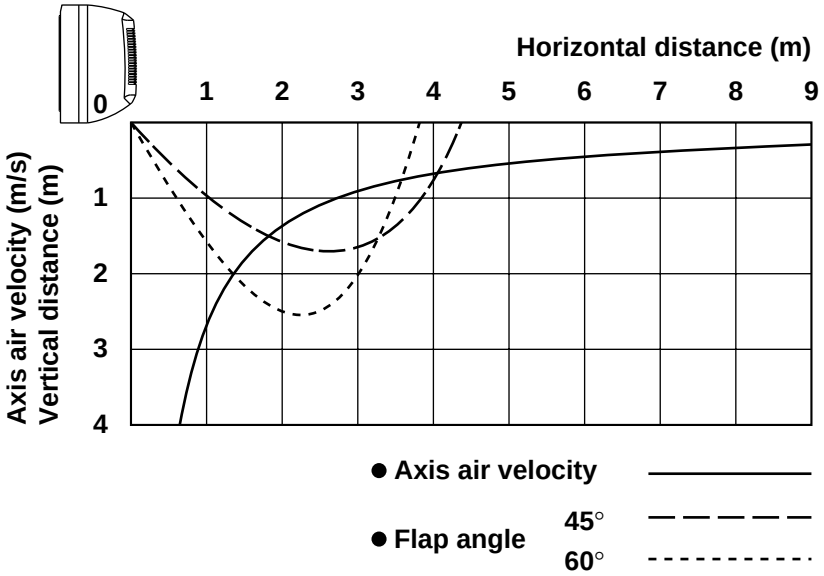
Cooling

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



Heating

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

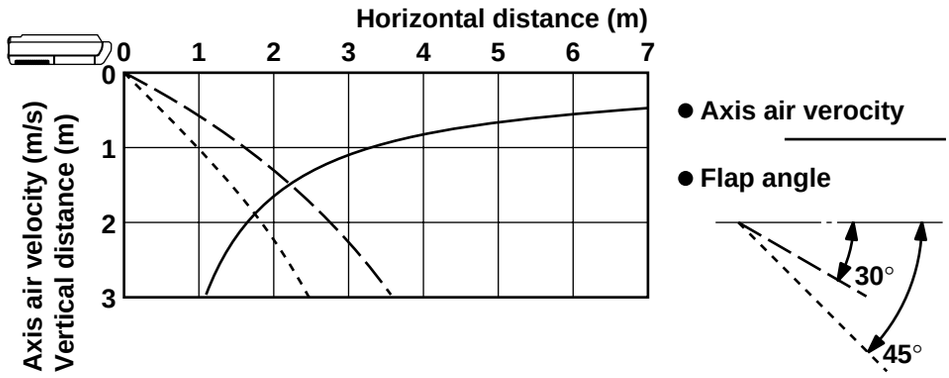


Indoor Unit **FCR512HL**

■ Ceiling mounted

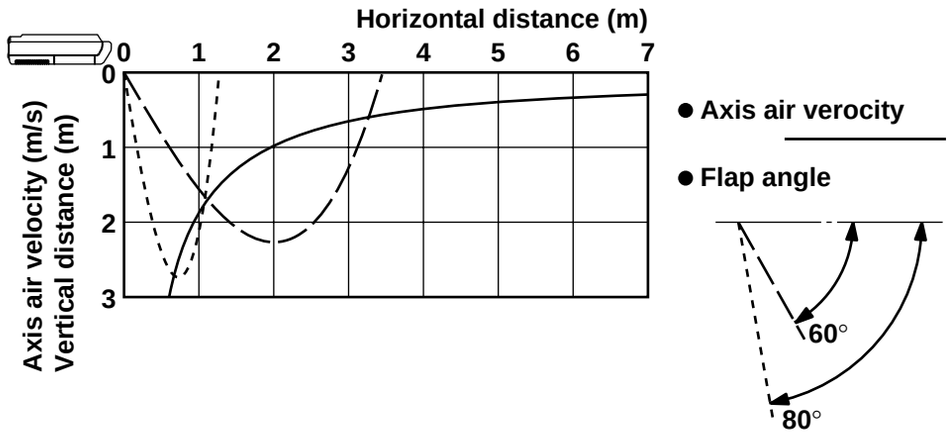
Cooling

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



Heating

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



5-3. Cooling Capacity

Indoor Unit **AWR508HL**
Outdoor Unit **AER508SH**

230V Single Phase 50Hz

RATING CAPACITY 2.30 kW AIR FLOW RATE 430 m^3/h								
EVAPORATOR		CONDENSER						
ENT. TEMP. ℃		OUTDOOR AMBIENT TEMP. ℃						
W.B.	D.B.		20	25	30	35	40	45
		TC	2.32	2.22	2.12	2.02	1.89	1.74
		CM	0.53	0.58	0.62	0.66	0.69	0.72
	21	SHC	1.63	1.58	1.53	1.48	1.42	1.35
15	23	SHC	1.84	1.79	1.74	1.70	1.64	1.57
	25	SHC	2.06	2.01	1.96	1.91	1.85	1.74
	27	SHC	2.28	2.22	2.12	2.02	1.89	1.74
	29	SHC	2.32	2.22	2.12	2.02	1.89	1.74
	31	SHC	2.32	2.22	2.12	2.02	1.89	1.74
		TC	2.49	2.38	2.27	2.16	2.03	1.87
		CM	0.55	0.59	0.63	0.68	0.71	0.74
	21	SHC	1.40	1.35	1.30	1.26	1.20	1.13
17	23	SHC	1.62	1.57	1.52	1.47	1.42	1.35
	25	SHC	1.84	1.79	1.74	1.69	1.63	1.56
	27	SHC	2.05	2.00	1.95	1.91	1.85	1.78
	29	SHC	2.27	2.22	2.17	2.12	2.03	1.87
	31	SHC	2.49	2.38	2.27	2.16	2.03	1.87
		TC	2.65	2.53	2.42	# 2.30	2.16	1.99
		CM	0.56	0.61	0.65	0.70	0.73	0.77
	21	SHC	1.17	1.12	1.07	1.03	0.97	0.90
19	23	SHC	1.39	1.34	1.29	1.24	1.19	1.12
	25	SHC	1.60	1.55	1.51	1.46	1.40	1.33
	27	SHC	1.82	1.77	1.72	1.67	1.62	1.55
	29	SHC	2.04	1.99	1.94	1.89	1.83	1.77
	31	SHC	2.25	2.20	2.16	2.11	2.05	1.98
		TC	2.80	2.68	2.56	2.44	2.29	2.11
		CM	0.58	0.63	0.67	0.72	0.75	0.79
	23	SHC	1.15	1.10	1.06	1.01	0.95	0.89
21	25	SHC	1.37	1.32	1.27	1.23	1.17	1.10
	27	SHC	1.59	1.54	1.49	1.44	1.39	1.32
	29	SHC	1.80	1.75	1.71	1.66	1.60	1.54
	31	SHC	2.02	1.97	1.92	1.88	1.82	1.75
		TC	2.98	2.85	2.71	2.56	2.40	2.23
		CM	0.59	0.64	0.69	0.74	0.77	0.81
23	25	SHC	1.12	1.08	1.03	0.97	0.92	0.86
	27	SHC	1.34	1.29	1.24	1.19	1.13	1.08
	29	SHC	1.56	1.51	1.46	1.41	1.35	1.29
	31	SHC	1.77	1.73	1.68	1.62	1.57	1.51

TC : Total Cooling Capacity (kW)
SHC : Sensible Heat Capacity (kW)
CM : Compressor Input (kW)
Rating conditions (#Mark) are
Outdoor Ambient Temp. 35℃ D.B.
Indoor Unit Entering Air Temp. 27℃ D.B. / 19℃ W.B.

Indoor Unit **AWR509HL**
Outdoor Unit **AER509SH**

230V Single Phase 50Hz

RATING CAPACITY			2.65 kW					
AIR FLOW RATE			430 m^3/h					
EVAPORATOR		CONDENSER						
ENT. TEMP. ℃		OUTDOOR AMBIENT TEMP. ℃						
W.B.	D.B.		20	25	30	35	40	45
		TC	2.67	2.55	2.44	2.32	2.18	2.01
		CM	0.67	0.72	0.77	0.83	0.92	1.01
	21	SHC	1.80	1.74	1.69	1.63	1.56	1.47
15	23	SHC	2.02	1.96	1.90	1.84	1.77	1.69
	25	SHC	2.24	2.18	2.12	2.06	1.99	1.91
	27	SHC	2.45	2.39	2.33	2.28	2.18	2.01
	29	SHC	2.67	2.55	2.44	2.32	2.18	2.01
	31	SHC	2.67	2.55	2.44	2.32	2.18	2.01
		TC	2.86	2.74	2.62	2.49	2.34	2.15
		CM	0.69	0.74	0.79	0.85	0.94	1.03
	21	SHC	1.58	1.52	1.46	1.40	1.34	1.25
17	23	SHC	1.80	1.74	1.68	1.62	1.55	1.47
	25	SHC	2.02	1.96	1.90	1.84	1.77	1.68
	27	SHC	2.23	2.17	2.11	2.05	1.99	1.90
	29	SHC	2.45	2.39	2.33	2.27	2.20	2.12
	31	SHC	2.67	2.61	2.55	2.49	2.34	2.15
		TC	3.05	2.92	2.78	# 2.65	2.49	2.29
		CM	0.71	0.76	0.82	0.88	0.97	1.06
	21	SHC	1.35	1.29	1.23	1.17	1.10	1.02
19	23	SHC	1.57	1.51	1.45	1.39	1.32	1.24
	25	SHC	1.78	1.72	1.66	1.61	1.54	1.45
	27	SHC	2.00	1.94	1.88	1.82	1.75	1.67
	29	SHC	2.22	2.16	2.10	2.04	1.97	1.89
	31	SHC	2.43	2.37	2.31	2.25	2.19	2.10
		TC	3.23	3.09	2.95	2.81	2.64	2.43
		CM	0.73	0.79	0.84	0.90	1.00	1.09
	23	SHC	1.33	1.27	1.21	1.15	1.09	1.01
21	25	SHC	1.54	1.49	1.43	1.37	1.30	1.22
	27	SHC	1.76	1.70	1.64	1.59	1.52	1.44
	29	SHC	1.98	1.92	1.86	1.80	1.74	1.65
	31	SHC	2.19	2.14	2.08	2.02	1.95	1.87
		TC	3.43	3.28	3.12	2.95	2.76	2.57
		CM	0.74	0.81	0.86	0.93	1.02	1.12
23	25	SHC	1.29	1.24	1.18	1.11	1.04	0.97
	27	SHC	1.51	1.45	1.39	1.33	1.26	1.19
	29	SHC	1.73	1.67	1.61	1.55	1.48	1.41
	31	SHC	1.94	1.89	1.83	1.76	1.69	1.62

TC : Total Cooling Capacity (kW)
SHC : Sensible Heat Capacity (kW)
CM : Compressor Input (kW)
Rating conditions (#Mark) are
Outdoor Ambient Temp. 35℃ D.B.
Indoor Unit Entering Air Temp. 27℃ D.B. / 19℃ W.B.

Indoor Unit **AWR512HL**
Outdoor Unit **AER512SH**

230V Single Phase 50Hz

RATING CAPACITY 3.3 kW AIR FLOW RATE 430 m³/h							
EVAPORATOR		CONDENSER					
ENT.TEMP. °C		OUTDOOR AMBIENT TEMP. °C					
W.B.	D.B.		25	30	35	40	43
		TC	3.13	3.03	2.89	2.71	2.50
		CM	0.85	0.90	0.97	1.07	1.16
	21	SHC	2.14	2.10	2.03	1.94	1.84
	23	SHC	2.43	2.38	2.31	2.22	2.12
15	25	SHC	2.71	2.65	2.58	2.50	2.40
	27	SHC	2.99	2.93	2.86	2.71	2.50
	29	SHC	3.13	3.03	2.89	2.71	2.50
	31	SHC	3.13	3.03	2.89	2.71	2.50
		TC	3.39	3.26	3.10	2.91	2.68
		CM	0.87	0.93	1.00	1.10	1.19
	21	SHC	1.88	1.82	1.75	1.66	1.56
	23	SHC	2.16	2.09	2.02	1.94	1.84
17	25	SHC	2.44	2.37	2.30	2.22	2.11
	27	SHC	2.72	2.65	2.58	2.49	2.39
	29	SHC	3.01	2.93	2.86	2.77	2.66
	31	SHC	3.29	3.20	3.10	2.91	2.68
		TC	3.59	3.47	3.30	3.10	2.86
		CM	0.91	0.96	1.03	1.13	1.22
	21	SHC	1.57	1.52	1.45	1.36	1.26
	23	SHC	1.85	1.80	1.73	1.64	1.54
19	25	SHC	2.12	2.07	2.00	1.92	1.82
	27	SHC	2.39	2.35	2.28	2.20	2.09
	29	SHC	2.65	2.63	2.55	2.48	2.37
	31	SHC	2.93	2.91	2.83	2.75	2.65
		TC	3.80	3.67	3.50	3.29	3.03
		CM	0.93	0.99	1.06	1.16	1.26
	23	SHC	1.55	1.50	1.43	1.34	1.24
21	25	SHC	1.82	1.77	1.71	1.62	1.52
	27	SHC	2.09	2.05	1.98	1.90	1.79
	29	SHC	2.36	2.32	2.26	2.17	2.07
	31	SHC	2.63	2.60	2.53	2.45	2.35
		TC	4.06	3.89	3.67	3.44	3.20
		CM	0.95	1.01	1.09	1.19	1.29
23	25	SHC	1.52	1.46	1.38	1.29	1.21
	27	SHC	1.78	1.73	1.65	1.56	1.48
	29	SHC	2.05	2.01	1.93	1.84	1.76
	31	SHC	2.34	2.29	2.20	2.12	2.04

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.

Indoor Unit **AFR509HL**
Outdoor Unit **AER509SH**

230V Single Phase 50Hz

RATING CAPACITY 2.65 kW AIR FLOW RATE 370 m^3/h								
EVAPORATOR		CONDENSER						
ENT. TEMP. ℃		OUTDOOR AMBIENT TEMP. ℃						
W.B.	D.B.		20	25	30	35	40	45
		TC	2.67	2.55	2.44	2.32	2.18	2.01
		CM	0.67	0.72	0.77	0.83	0.92	1.01
	21	SHC	1.80	1.74	1.69	1.63	1.56	1.47
15	23	SHC	2.02	1.96	1.90	1.84	1.77	1.69
	25	SHC	2.24	2.18	2.12	2.06	1.99	1.91
	27	SHC	2.45	2.39	2.33	2.28	2.18	2.01
	29	SHC	2.67	2.55	2.44	2.32	2.18	2.01
	31	SHC	2.67	2.55	2.44	2.32	2.18	2.01
		TC	2.86	2.74	2.62	2.49	2.34	2.15
		CM	0.69	0.74	0.79	0.85	0.94	1.03
	21	SHC	1.58	1.52	1.46	1.40	1.34	1.25
17	23	SHC	1.80	1.74	1.68	1.62	1.55	1.47
	25	SHC	2.02	1.96	1.90	1.84	1.77	1.68
	27	SHC	2.23	2.17	2.11	2.05	1.99	1.90
	29	SHC	2.45	2.39	2.33	2.27	2.20	2.12
	31	SHC	2.67	2.61	2.55	2.49	2.34	2.15
		TC	3.05	2.92	2.78	# 2.65	2.49	2.29
		CM	0.71	0.76	0.82	0.88	0.97	1.06
	21	SHC	1.35	1.29	1.23	1.17	1.10	1.02
19	23	SHC	1.57	1.51	1.45	1.39	1.32	1.24
	25	SHC	1.78	1.72	1.66	1.61	1.54	1.45
	27	SHC	2.00	1.94	1.88	1.82	1.75	1.67
	29	SHC	2.22	2.16	2.10	2.04	1.97	1.89
	31	SHC	2.43	2.37	2.31	2.25	2.19	2.10
		TC	3.23	3.09	2.95	2.81	2.64	2.43
		CM	0.73	0.79	0.84	0.90	1.00	1.09
	23	SHC	1.33	1.27	1.21	1.15	1.09	1.01
21	25	SHC	1.54	1.49	1.43	1.37	1.30	1.22
	27	SHC	1.76	1.70	1.64	1.59	1.52	1.44
	29	SHC	1.98	1.92	1.86	1.80	1.74	1.65
	31	SHC	2.19	2.14	2.08	2.02	1.95	1.87
		TC	3.43	3.28	3.12	2.95	2.76	2.57
		CM	0.74	0.81	0.86	0.93	1.02	1.12
23	25	SHC	1.29	1.24	1.18	1.11	1.04	0.97
	27	SHC	1.51	1.45	1.39	1.33	1.26	1.19
	29	SHC	1.73	1.67	1.61	1.55	1.48	1.41
	31	SHC	1.94	1.89	1.83	1.76	1.69	1.62

TC : Total Cooling Capacity (kW)
SHC : Sensible Heat Capacity (kW)
CM : Compressor Input (kW)
Rating conditions (#Mark) are
Outdoor Ambient Temp. 35℃ D.B.
Indoor Unit Entering Air Temp. 27℃ D.B. / 19℃ W.B.

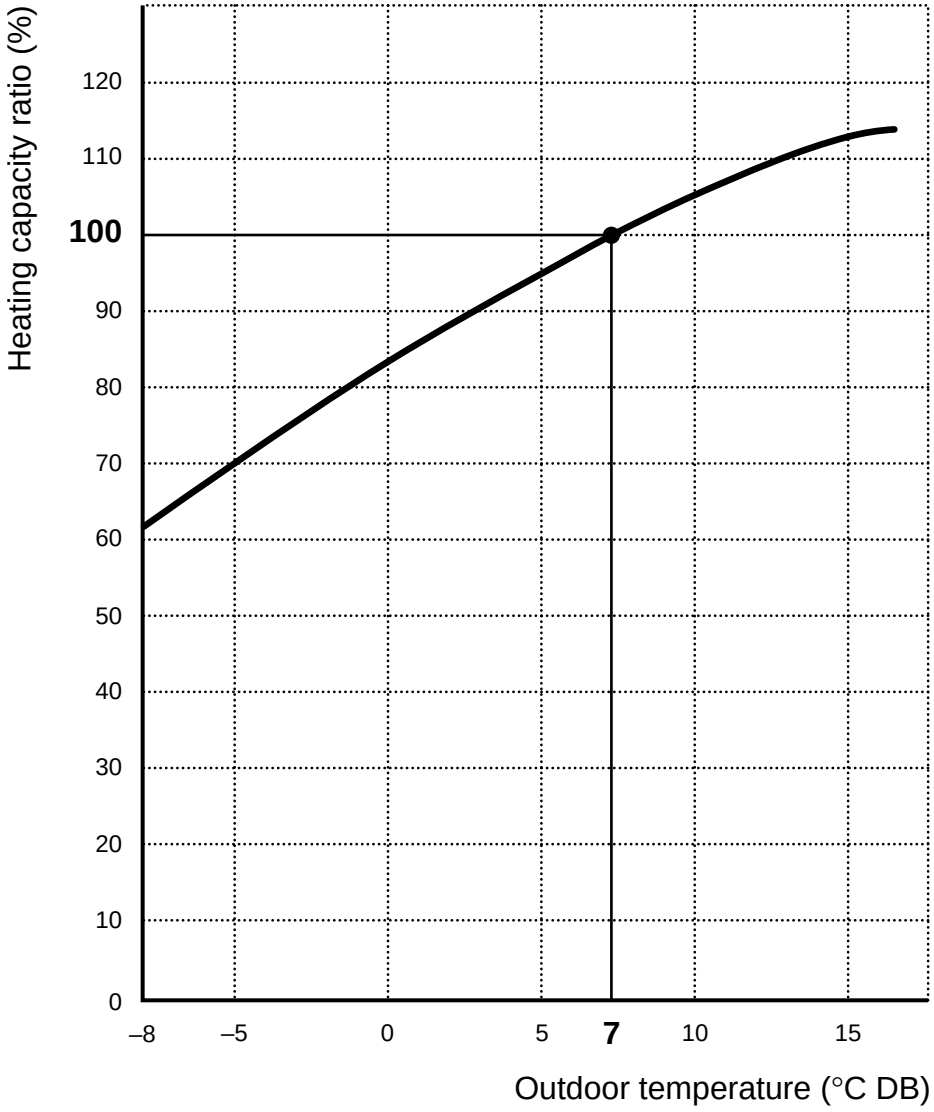
Indoor Unit **FCR512HL**
Outdoor Unit **AER512SH**

240V Single Phase 50Hz

RATING CAPACITY 3.35 kW AIR FLOW RATE 700 m^3/h								
EVAPORATOR		CONDENSER						
ENT. TEMP. ℃		OUTDOOR AMBIENT TEMP. ℃						
W.B.	D.B.		20	25	30	35	40	45
		TC	3.38	3.23	3.08	2.93	2.76	2.54
		CM	0.90	0.97	1.04	1.12	1.22	1.32
	21	SHC	2.42	2.35	2.28	2.21	2.13	2.03
15	23	SHC	2.77	2.70	2.63	2.56	2.48	2.38
	25	SHC	3.11	3.04	2.97	2.91	2.76	2.54
	27	SHC	3.38	3.23	3.08	2.93	2.76	2.54
	29	SHC	3.38	3.23	3.08	2.93	2.76	2.54
	31	SHC	3.38	3.23	3.08	2.93	2.76	2.54
		TC	3.62	3.46	3.31	3.15	2.96	2.72
		CM	0.92	1.00	1.07	1.15	1.25	1.35
	21	SHC	2.07	1.99	1.92	1.86	1.77	1.67
17	23	SHC	2.41	2.34	2.27	2.20	2.12	2.02
	25	SHC	2.76	2.69	2.62	2.55	2.47	2.37
	27	SHC	3.10	3.03	2.96	2.89	2.81	2.71
	29	SHC	3.45	3.38	3.31	3.15	2.96	2.72
	31	SHC	3.62	3.46	3.31	3.15	2.96	2.72
		TC	3.85	3.69	3.52	# 3.35	3.15	2.90
		CM	0.95	1.03	1.10	1.18	1.29	1.39
	21	SHC	1.69	1.62	1.56	1.49	1.41	1.31
19	23	SHC	2.04	1.97	1.90	1.83	1.75	1.65
	25	SHC	2.39	2.32	2.25	2.18	2.10	2.00
	27	SHC	2.73	2.66	2.59	2.53	2.45	2.35
	29	SHC	3.08	3.01	2.94	2.87	2.79	2.69
	31	SHC	3.43	3.36	3.29	3.22	3.14	2.90
		TC	4.08	3.91	3.73	3.55	3.34	3.07
		CM	0.98	1.06	1.13	1.22	1.32	1.43
	23	SHC	1.67	1.60	1.53	1.46	1.39	1.29
21	25	SHC	2.01	1.94	1.88	1.81	1.73	1.63
	27	SHC	2.36	2.29	2.22	2.16	2.08	1.98
	29	SHC	2.71	2.64	2.57	2.50	2.42	2.33
	31	SHC	3.05	2.98	2.92	2.85	2.77	2.67
		TC	4.33	4.15	3.95	3.73	3.49	3.25
		CM	1.00	1.09	1.16	1.25	1.36	1.46
23	25	SHC	1.62	1.55	1.49	1.41	1.33	1.25
	27	SHC	1.97	1.90	1.83	1.76	1.67	1.59
	29	SHC	2.31	2.25	2.18	2.10	2.02	1.94
	31	SHC	2.66	2.59	2.52	2.45	2.37	2.29

TC : Total Cooling Capacity (kW)
SHC : Sensible Heat Capacity (kW)
CM : Compressor Input (kW)

5-4. Heating Capacity



NOTE

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

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

3) Fan speed : High

4) Because this air conditioner heats a room by drawing in the heat of the outside air (heat pump system), the heating efficiency will fall off when the outdoor temperature is very low. If sufficient heat cannot be obtained with this air conditioner, use another heating appliance in conjunction with it.

6. ELECTRICAL DATA

6-1. Electrical Characteristics

Indoor Unit **AWR508HL**
Outdoor Unit **AER508SH**

COOLING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V 1-phase 50Hz			
Rating Conditions	Running Amps.	A	0.11	0.24	3.35	3.7
	Power Input	kW	0.025	0.055	0.74	0.82
Full Load Conditions	Running Amps.	A	0.11	0.24	4.05	4.4
	Power Input	kW	0.025	0.055	0.86	0.94

Rating Conditions : Indoor Air Temperature 27℃ D.B. / 19℃ W.B.
Outdoor Air Temperature 35℃ D.B.
Full Load Conditions : Indoor Air Temperature 32℃ D.B. / 23℃ W.B.
Outdoor Air Temperature 43℃ D.B.

HEATING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V 1-phase 50Hz			
Rating Conditions	Running Amps.	A	0.11	0.24	3.05	3.4
	Power Input	kW	0.025	0.055	0.671	0.75
Full Load Conditions	Running Amps.	A	0.11	0.24	3.65	4.0
	Power Input	kW	0.025	0.055	0.801	0.88

Rating Conditions : Indoor Air Temperature 20℃ D.B.
Outdoor Air Temperature 7℃ D.B. / 6℃ W.B.
Full Load Conditions : Indoor Air Temperature 27℃ D.B.
Outdoor Air Temperature 24℃ D.B. / 18℃ W.B.

Indoor Unit **AWR509HL AFR509HL**
Outdoor Unit **AER509SH**

COOLING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V 1-phase 50Hz			
Rating Conditions	Running Amps.	A	0.12	0.24	4.34	4.7
	Power Input	kW	0.027	0.055	0.948	1.03
Full Load Conditions	Running Amps.	A	0.12	0.24	5.15	5.5
	Power Input	kW	0.027	0.055	1.148	1.23

Rating Conditions : Indoor Air Temperature 27℃ D.B. / 19℃ W.B.
Outdoor Air Temperature 35℃ D.B.
Full Load Conditions : Indoor Air Temperature 32℃ D.B. / 23℃ W.B.
Outdoor Air Temperature 43℃ D.B.

HEATING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V 1-phase 50Hz			
Rating Conditions	Running Amps.	A	0.12	0.24	3.85	4.2
	Power Input	kW	0.027	0.055	0.848	0.93
Full Load Conditions	Running Amps.	A	0.12	0.24	4.85	5.2
	Power Input	kW	0.027	0.055	1.058	1.14

Rating Conditions : Indoor Air Temperature 20℃ D.B.
Outdoor Air Temperature 7℃ D.B. / 6℃ W.B.
Full Load Conditions : Indoor Air Temperature 27℃ D.B.
Outdoor Air Temperature 24℃ D.B. / 18℃ W.B.

Indoor Unit **AWR512HL**
Outdoor Unit **AER512SH**

COOLING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V 1-phase 50Hz			
Rating Conditions	Running Amps.	A	0.13	0.28	5.79	6.2
	Power Input	kW	0.031	0.062	1.207	1.3
Full Load Conditions	Running Amps.	A	0.13	0.28	6.79	7.2
	Power Input	kW	0.031	0.062	1.427	1.52

Rating Conditions : Indoor Air Temperature 27℃ D.B. / 19℃ W.B.
Outdoor Air Temperature 35℃ D.B.
Full Load Conditions : Indoor Air Temperature 32℃ D.B. / 23℃ W.B.
Outdoor Air Temperature 43℃ D.B.

HEATING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V 1-phase 50Hz			
Rating Conditions	Running Amps.	A	0.13	0.28	5.69	6.1
	Power Input	kW	0.031	0.062	1.227	1.32
Full Load Conditions	Running Amps.	A	0.13	0.28	7.59	8.0
	Power Input	kW	0.031	0.062	1.617	1.71

Rating Conditions : Indoor Air Temperature 20℃ D.B.
Outdoor Air Temperature 7℃ D.B. / 6℃ W.B.
Full Load Conditions : Indoor Air Temperature 27℃ D.B.
Outdoor Air Temperature 24℃ D.B. / 18℃ W.B.

Indoor Unit **FCR512HL**
Outdoor Unit **AER512SH**

COOLING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V ~ 50Hz			
Rating Conditions	Running Amps.	A	0.29	0.32	5.6	6.2
	Power Input	kW	0.070	0.076	1.154	1.13
Full Load Conditions	Running Amps.	A	0.29	0.32	6.59	7.2
	Power Input	kW	0.070	0.076	1.374	1.52

Rating Conditions : Indoor Air Temperature 27℃ D.B. / 19℃ W.B.
Outdoor Air Temperature 35℃ D.B.
Full Load Conditions : Indoor Air Temperature 32℃ D.B. / 23℃ W.B.
Outdoor Air Temperature 43℃ D.B.

HEATING

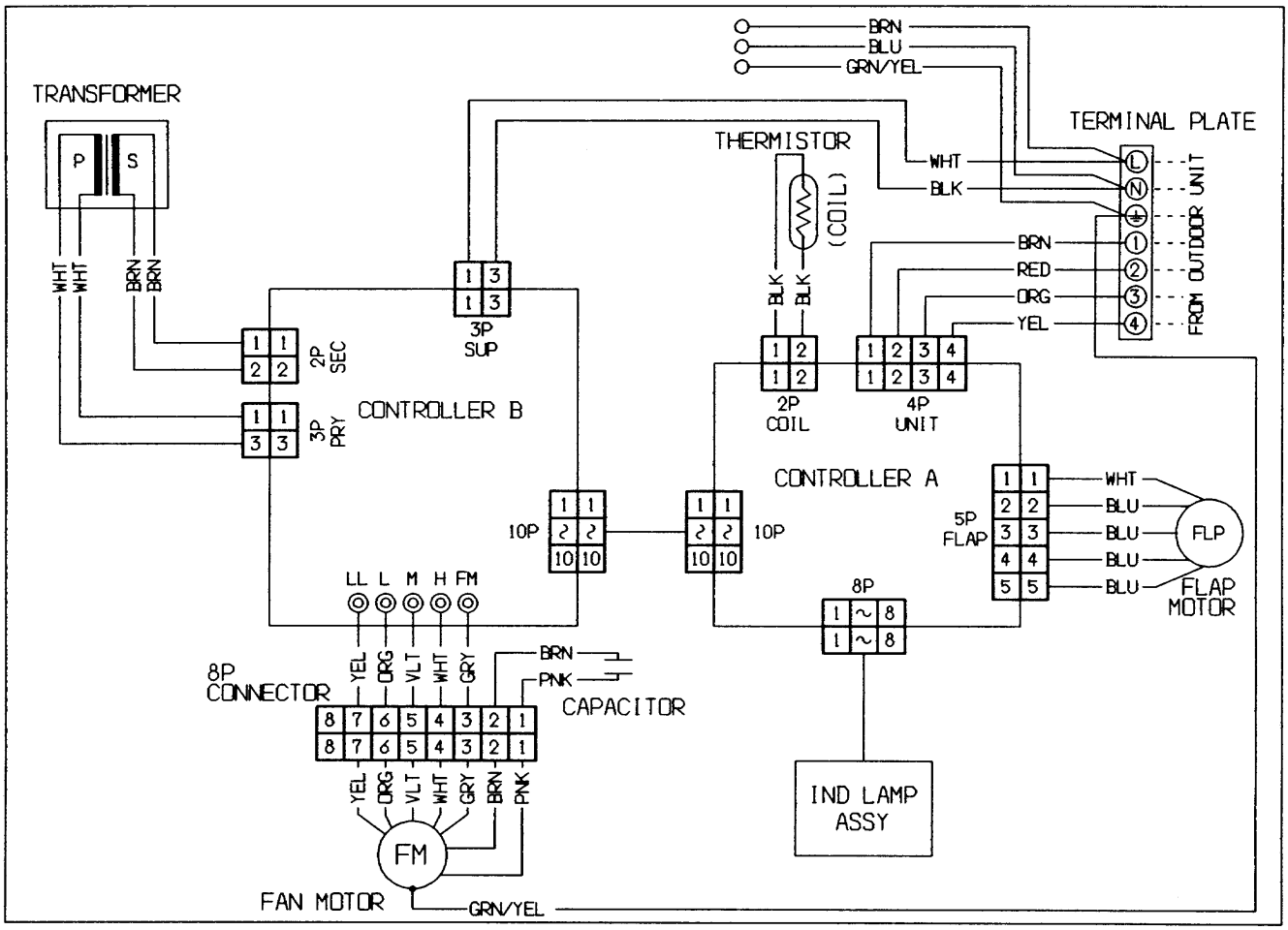
			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			220 – 240V ~ 50Hz			
Rating Conditions	Running Amps.	A	0.29	0.32	5.6	6.2
	Power Input	kW	0.070	0.076	1.22	1.37
Full Load Conditions	Running Amps.	A	0.29	0.32	7.7	8.3
	Power Input	kW	0.070	0.076	1.68	1.83

Rating Conditions : Indoor Air Temperature 20℃ D.B.
Outdoor Air Temperature 7℃ D.B. / 6℃ W.B.
Full Load Conditions : Indoor Air Temperature 27℃ D.B.
Outdoor Air Temperature 24℃ D.B. / 18℃ W.B.

6-2. Electric Wiring Diagrams

Indoor Unit **AWR508HL**
AWR509HL
AWR512HL

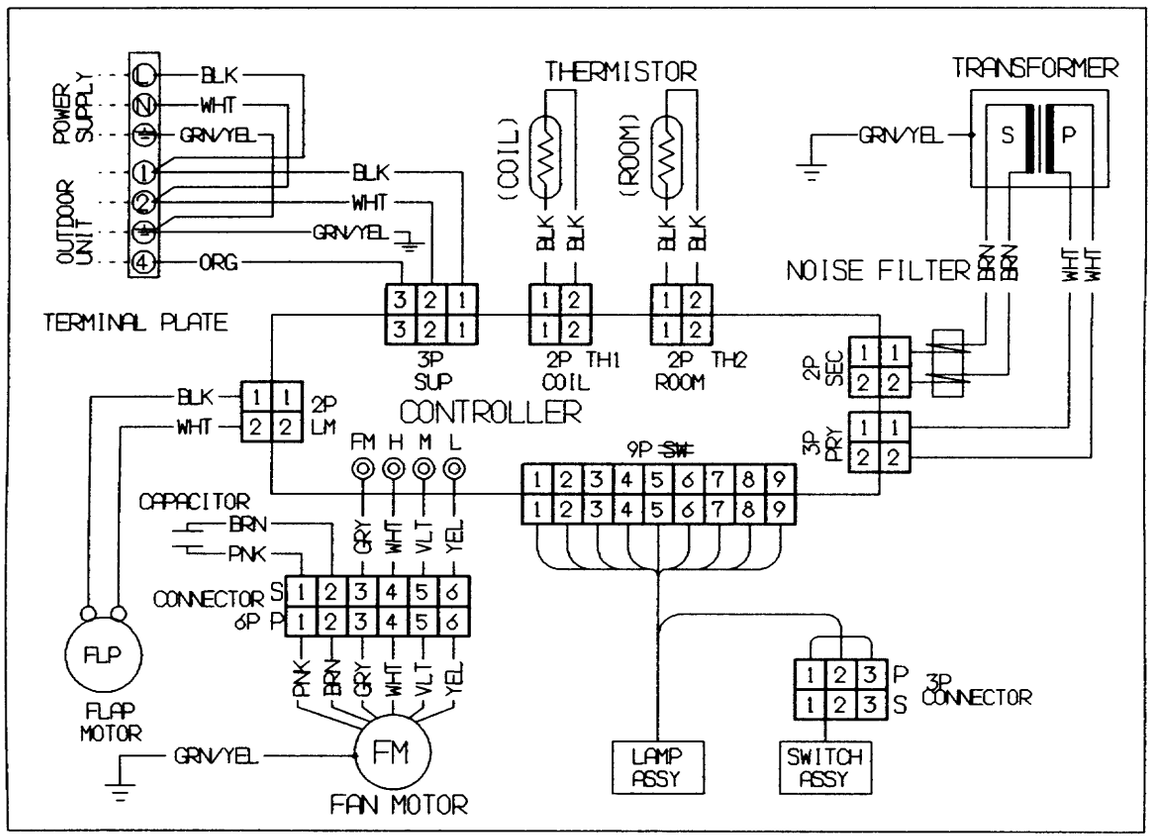
WARNING ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***



851-2-5253-305-XX-1

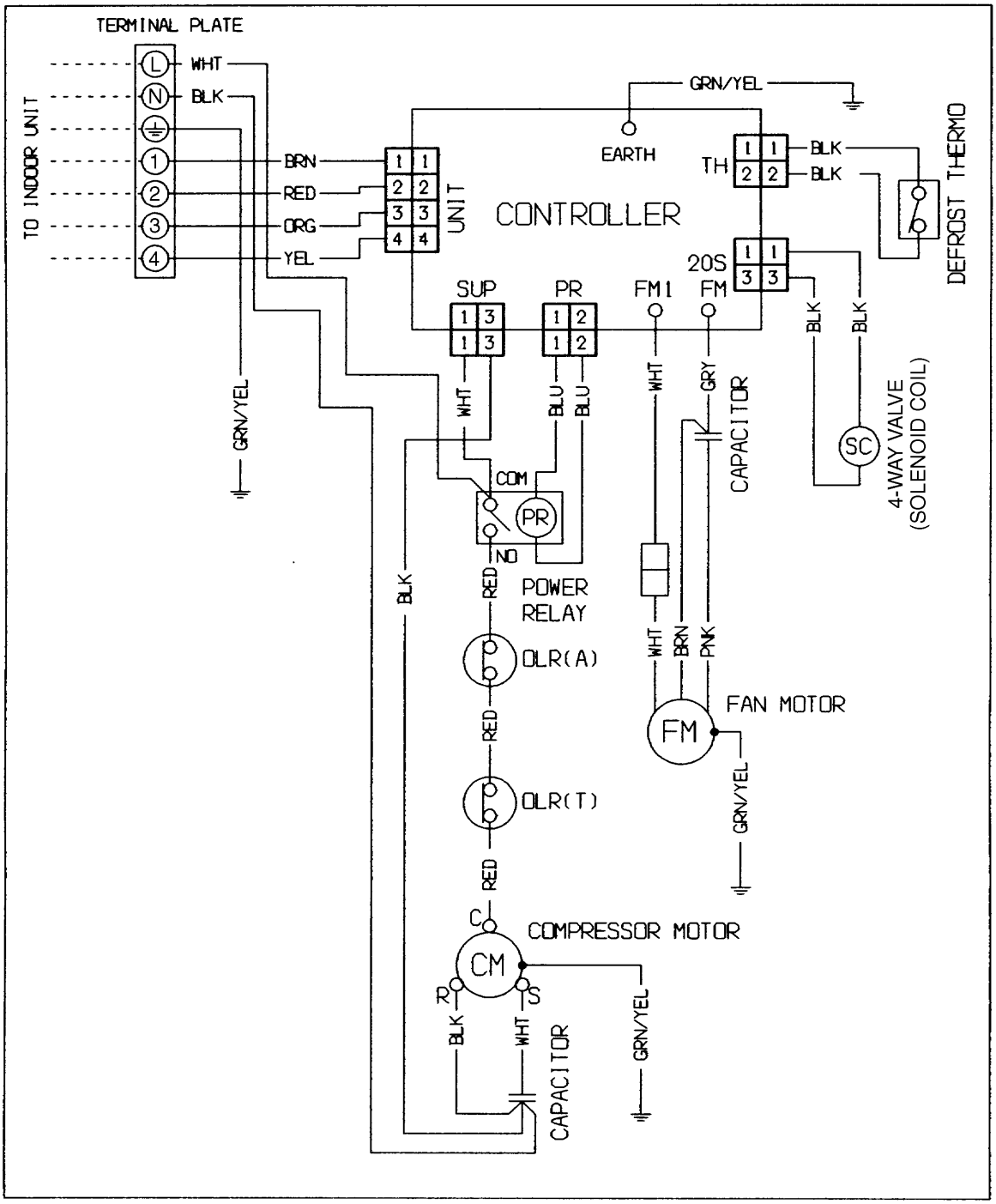
Indoor Unit **FCR512HL**

WARNING ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***



Outdoor Unit **AER508SH**
AER509SH

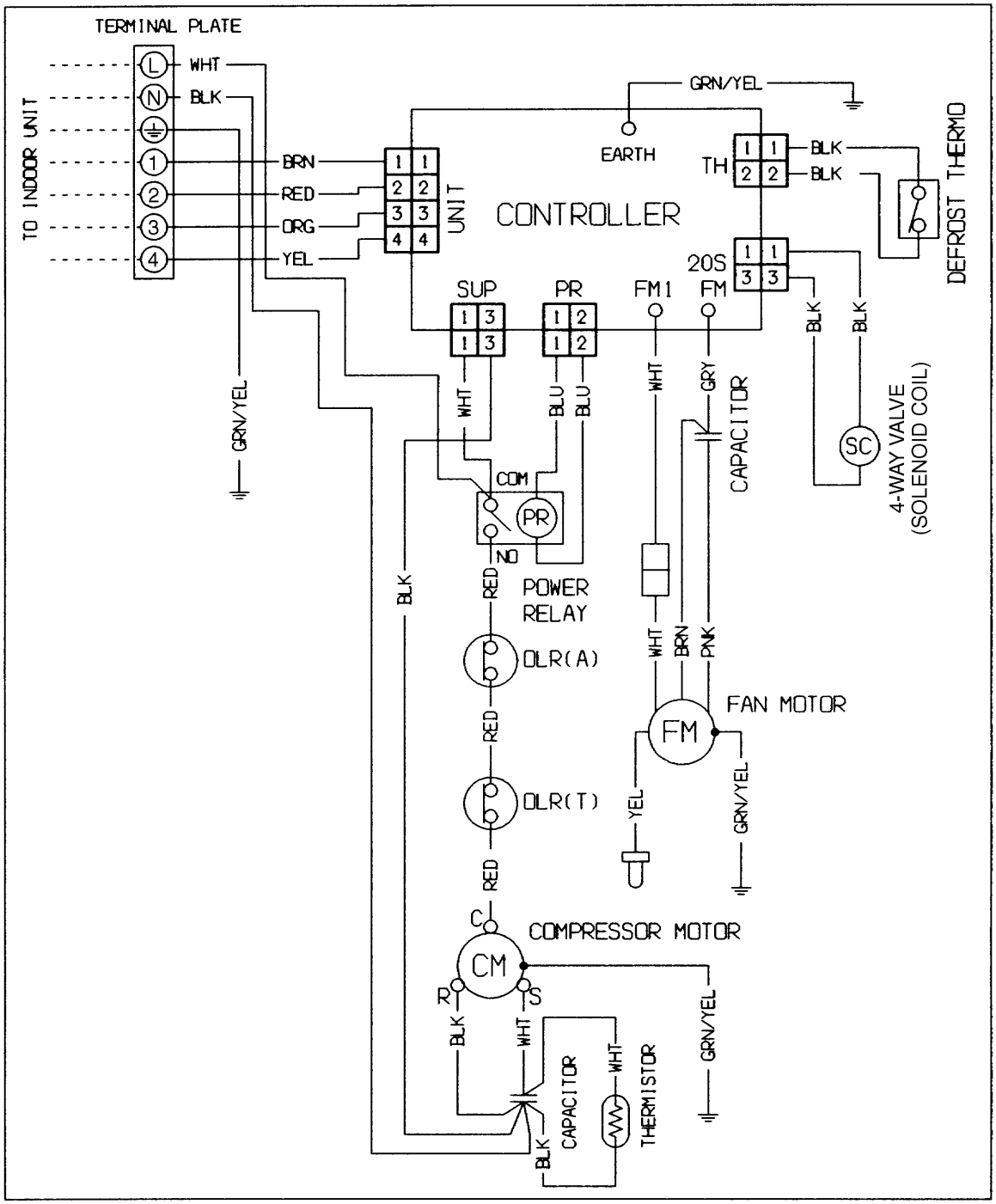
WARNING ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***



8512-5253-305xx-1

Outdoor Unit **AER512SH**

WARNING ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***



851-2-5253-359-XX-1

7. INSTALLATION INSTRUCTIONS

7-1. Installation Site Selection

Indoor Unit

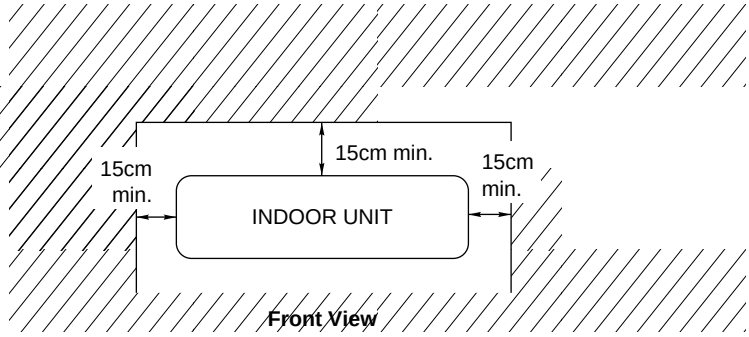


Fig.1

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. 1)
- install the unit within the maximum elevation difference (H) above or below the outdoor unit and within a total tubing length (L) from the outdoor unit as detailed Table 1 and Fig. 2a.

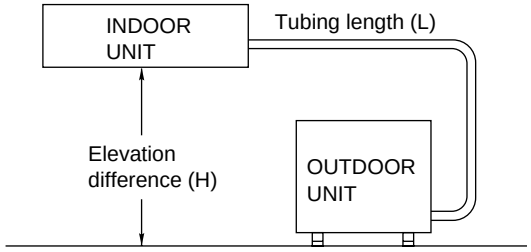


Fig. 2a

CAUTION

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

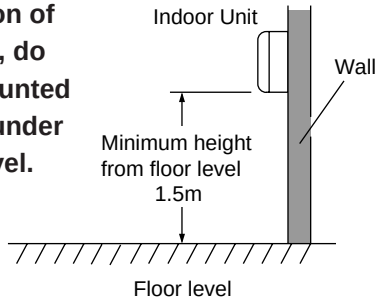


Fig. 2b

Table 1

Model	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)*
AWR508 AWR509	7.5	15	7	a) 15
AWR512	7.5	20	7	b) 25

***** If total tubing length becomes a)7.5 to 15 m , b)7.5 to 20 m (max.), charge additional refrigerant (R407c) by a)15 g/m or b)25 g/m.
No additional charge of compressor oil is necessary.

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. 4b and 4c)
- provide a solid base (concrete block, 10 X 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.5b)
- use lug bolts or equal to bolt down unit, reducing vibration and noise.

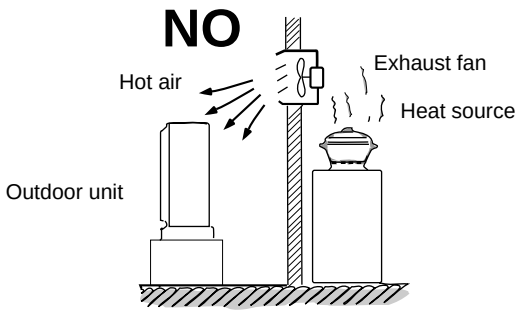
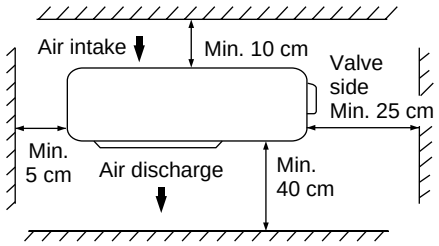


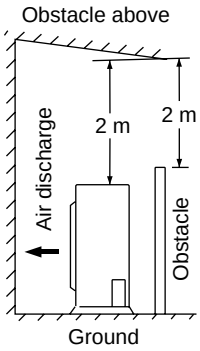
Fig. 3

Required space around the unit.



Top View

Fig. 4b



Side View

Fig. 4c

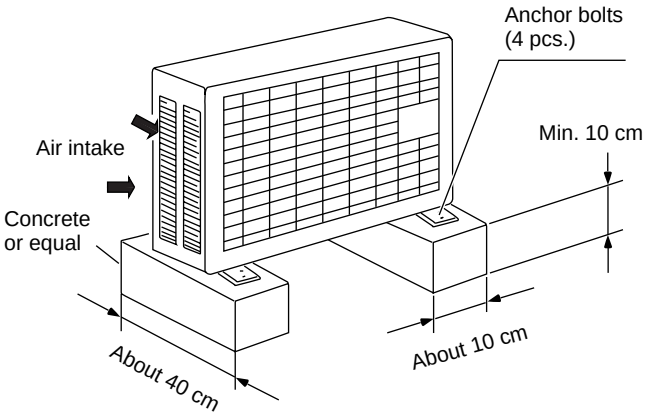


Fig. 5b

7-2. 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

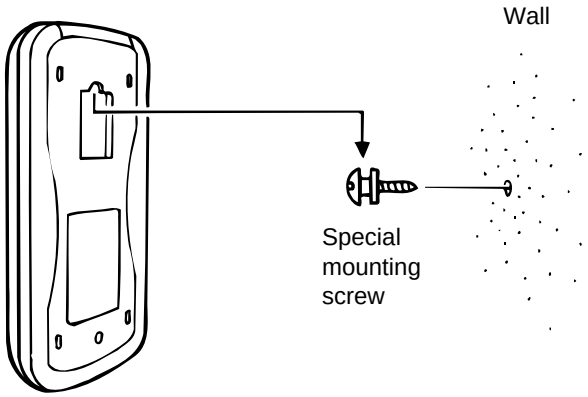


Fig.6a

Non-removable mounting

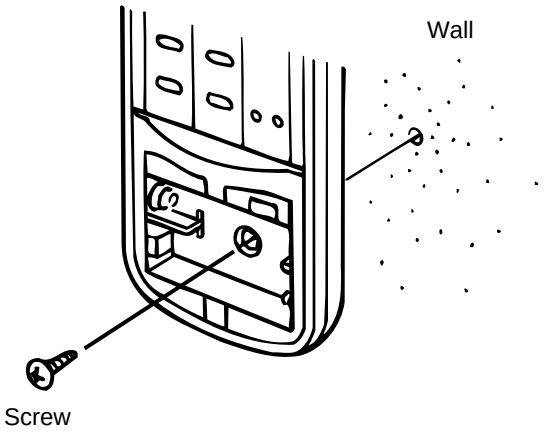


Fig.6b

7-3. 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 cross section area for power supply systems.

NOTE

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

Table 2

Cross Sectional Area (mm^2) / Model	(A) Power Supply Wiring Length (m)	(B) Power Line (m)	(C) Control Line (m)	Fuse or Circuit Breaker Capacity
	2.5 mm^2	2.5 mm^2	1.0 mm^2	
AER508SH	57	20	20	10A
AER509SH	21			
AER512SH	14			

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.**

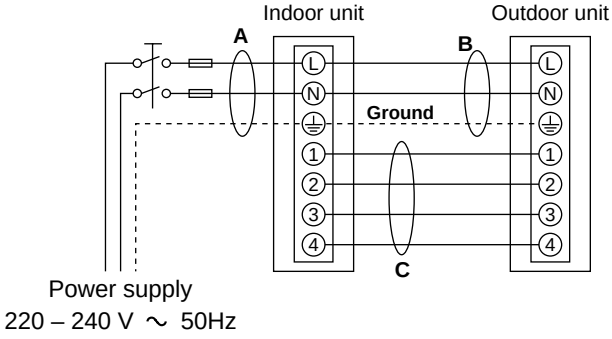
WARNING

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 indoor unit as shown in the wiring diagram. The outdoor unit draws its power from the indoor unit.**

WIRING SYSTEM DIAGRAM

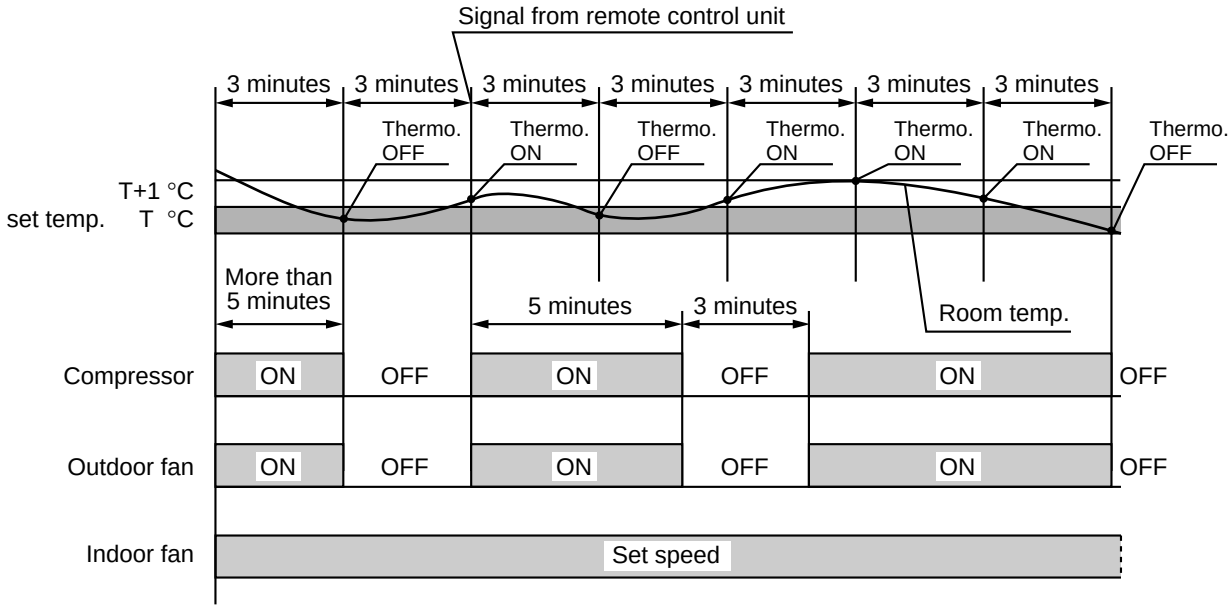


8. FUNCTION

8-1. Room Temperature Control

■ Cooling

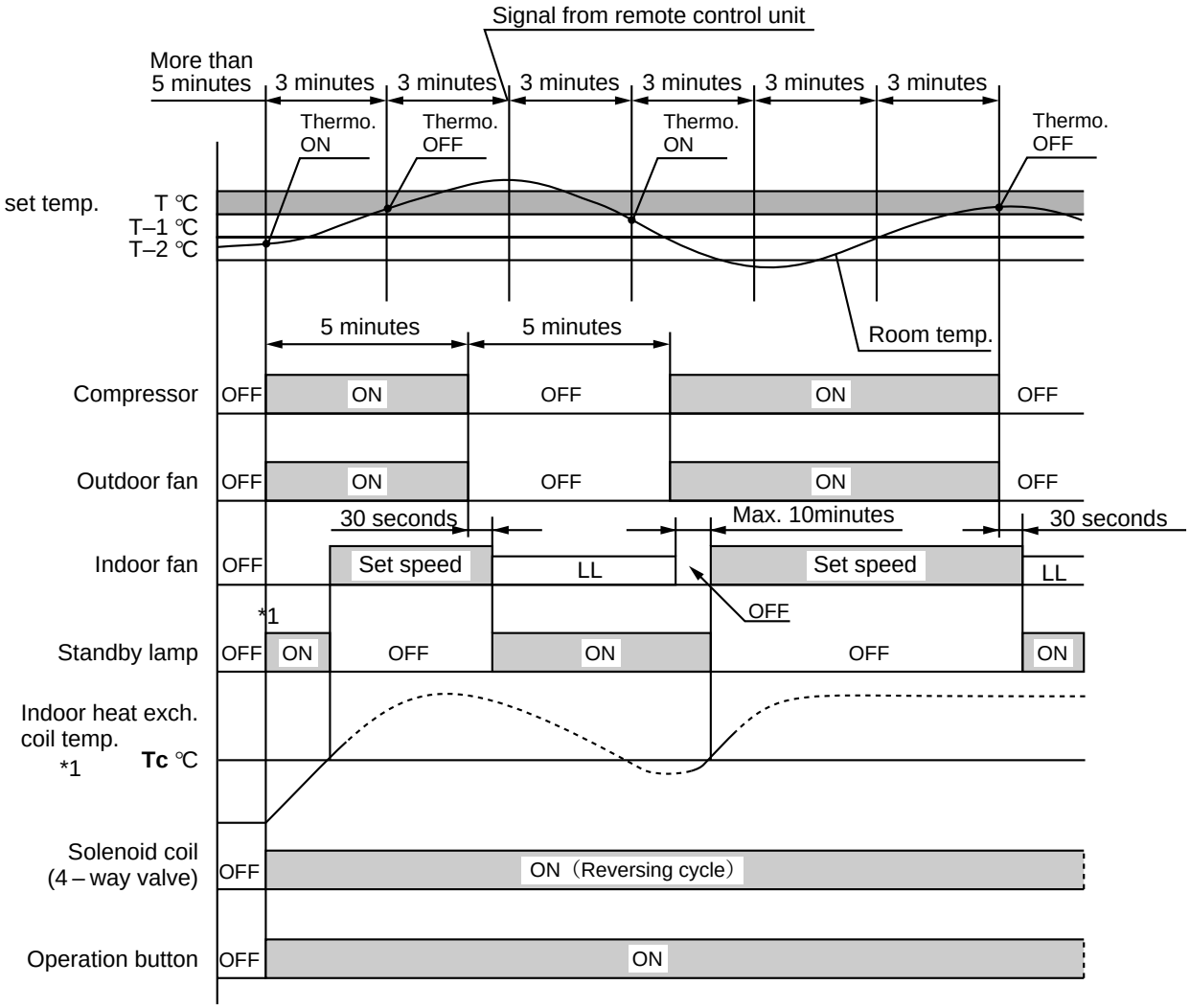
- Room temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The room temperature (and other information) is transmitted every 3 minutes by the remote control unit to the controller in the indoor unit.



- 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.



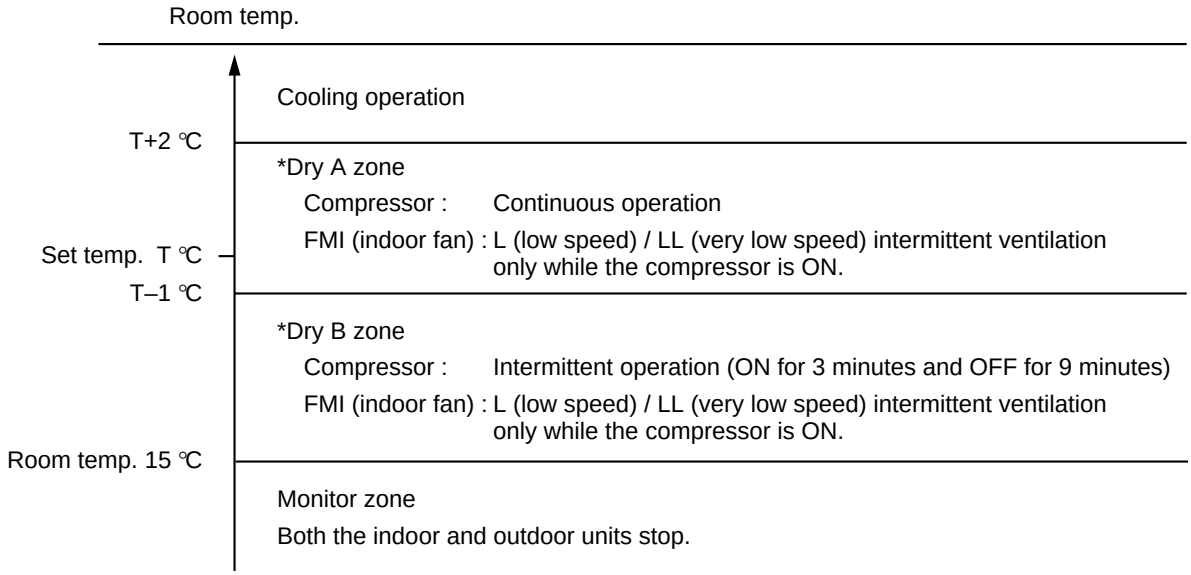
- The control circuit will not attempt to turn the compressor ON until the compressor has been OFF for at least 5 minutes. To protect the compressor from stalling out when trying to start against the high side refrigerant pressure, the control circuit has a built-in automatic time delay to allow the 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 "8-6 Cold Draft Prevention".

8-2. 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.

8-3. Automatic Switching between Cooling and Heating

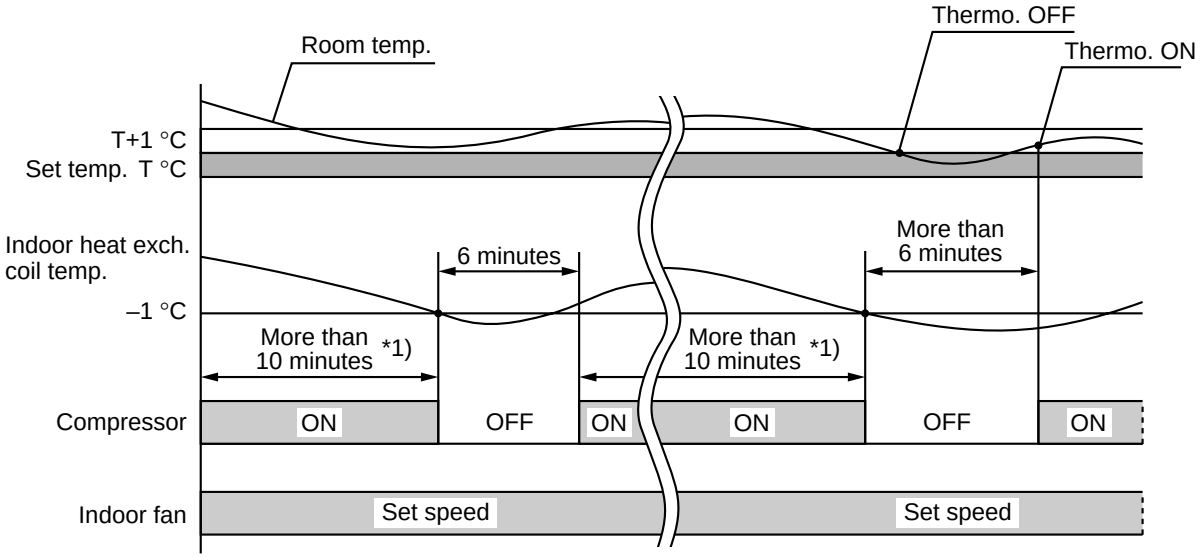
● When AUTO mode is selected, the microprocessor calculates the difference between the set temperature and the room temperature, and automatically switches to COOLING or HEATING mode to maintain the desired temperature.

Room temp. ≥ Set temp. → COOL
Room temp. < Set temp. → HEAT

This means that if the room temperature is **higher than** or **equal to** the set temperature, **COOLING** operation begins. If the room temperature is **lower than** the set temperature, **HEATING** operation begins.

8-4. Freeze Prevention (Cooling)

- This function prevents freezing of the indoor heat exchange coil.
- When the compressor has been running for 10 minutes*1) 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.

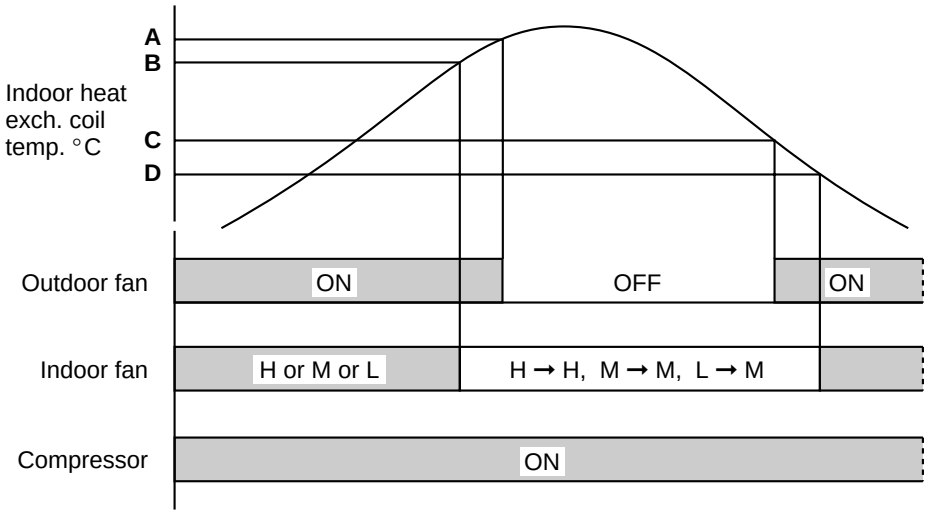


NOTE

*1) Functionally, compressor running period, or time are of two types, 10 minutes and 6 minutes depending upon production date.

8-5. Overload Prevention (Heating)

- This function prevents overheating of the indoor heat exchange coil.
- When the temperature of the indoor heat exchange coil rises above **B°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 **A°C**, the outdoor fan stops.



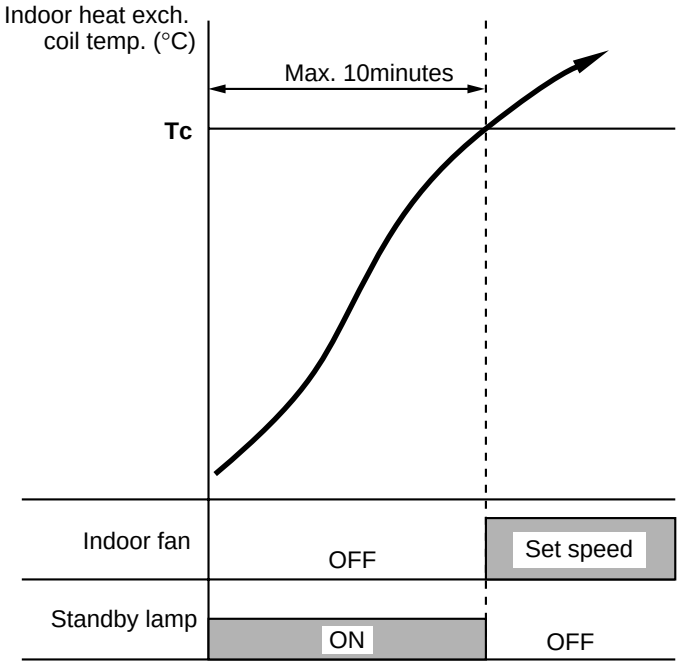
NOTE

The operation temperature shown as **A**, **B**, **C** and **D** in the chart differ by models.

	AWR508HL	AWR509HL	AWR512HL
A	50°C	54°C	58°C
B	49°C	52°C	56°C
C	42°C	45°C	50°C
D	39°C	42°C	46°C

8-6. 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 this function is working.
- when 10 minutes has elapsed,the fan speed is automatically switched to set speed regardless of indoor heat exchange coil temperature.



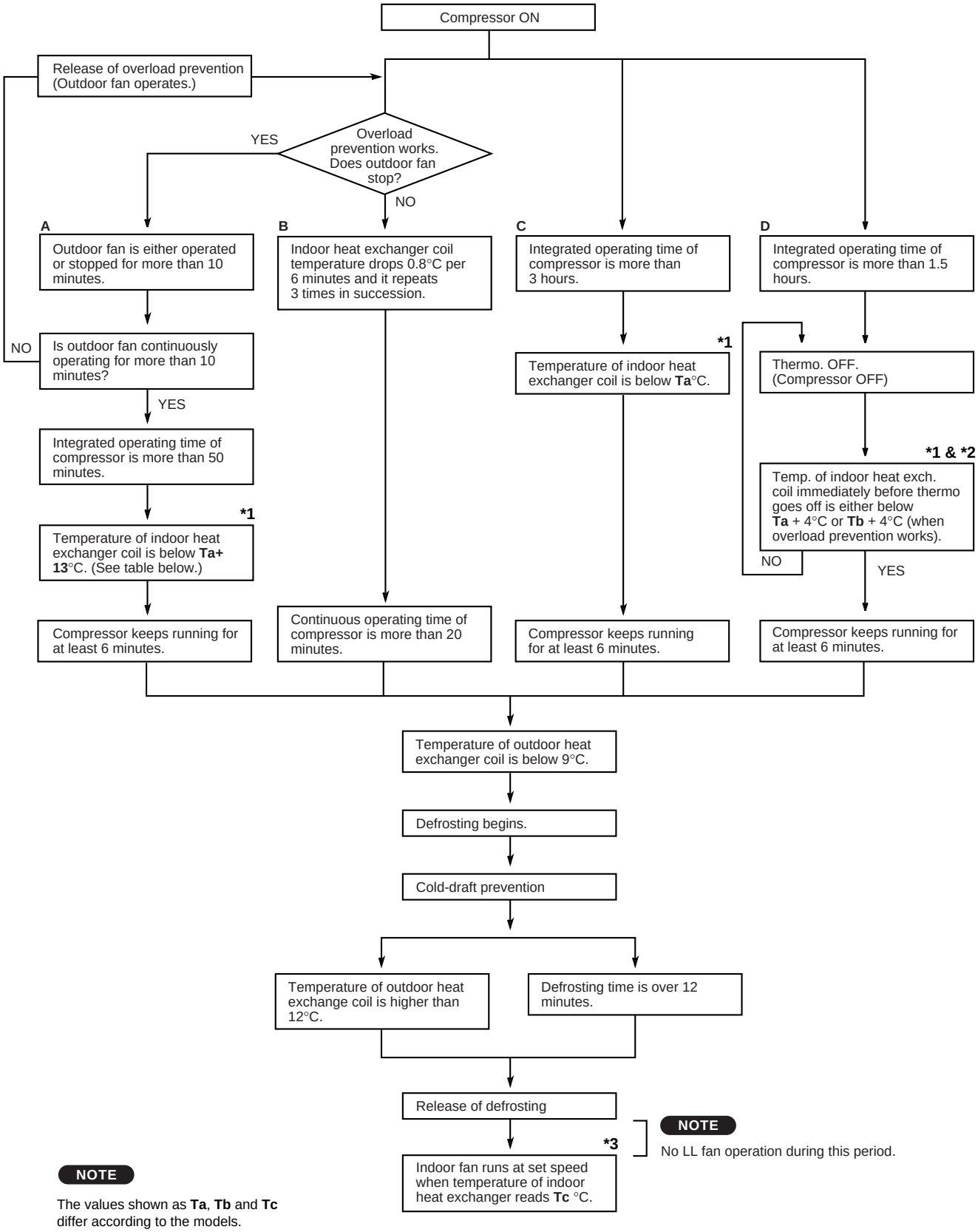
NOTE

The operation temperature shown as **Tc** in the chart differ by models.

	AWR508HL	AWR509HL	AWR512HL
Tc	32°C	33°C	34°C

8-7. Defrosting Operation (Heating)

■ Defrosting Flowchart

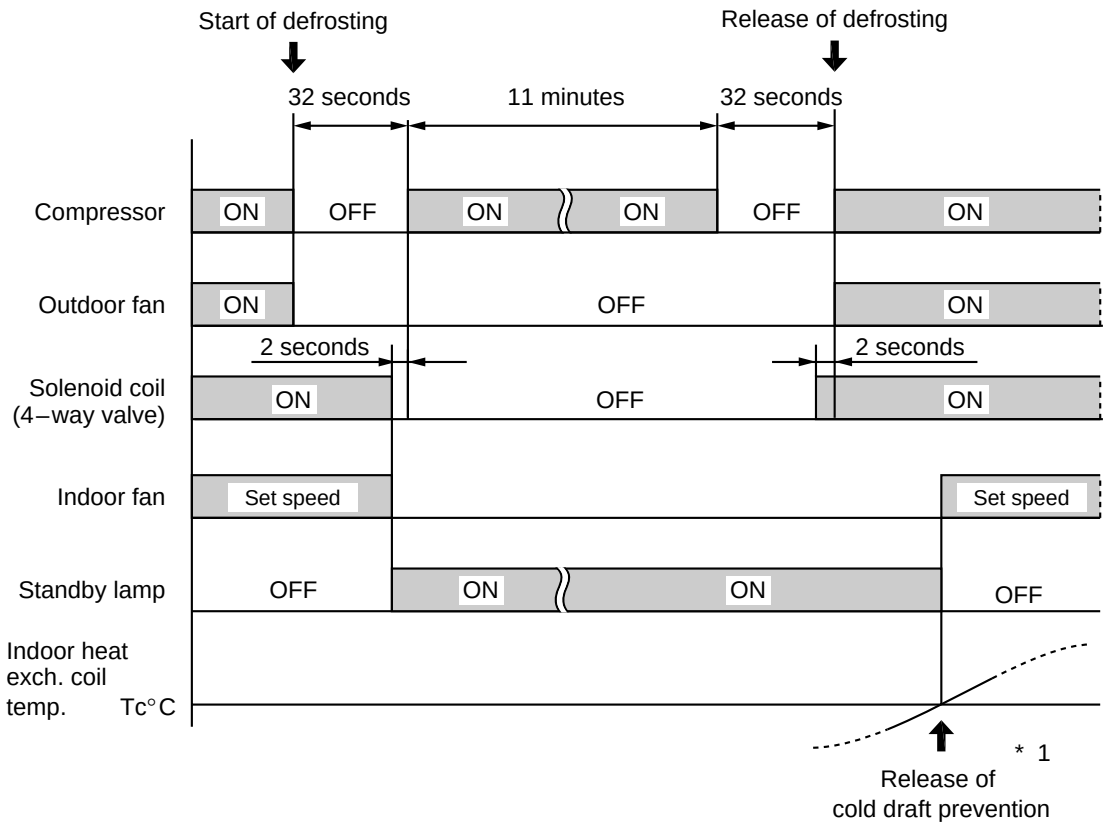


NOTE

The values shown as **Ta**, **Tb** and **Tc** differ according to the models.

		AWR508HL	AWR509HL	AWR512HL
*1	Ta	35	38	44
*2	Tb	48	51	57
*3	Tc	32	33	34

■ Defrosting Mode Timing Chart



NOTE

*1: Refer to "8-6 Cold Draft Prevention".

9. REFRIGERANT R407C : SPECIAL PRECAUTIONS WHEN SERVICING UNIT

9-1. Characteristics of new refrigerant R407C

9-1-1. 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

9-1-2. Components (mixing proportions)

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

9-1-3. 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.**

9-2. 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.

9-3. 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.**

9-4. 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.

9-5. 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".**

9-5-1.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**

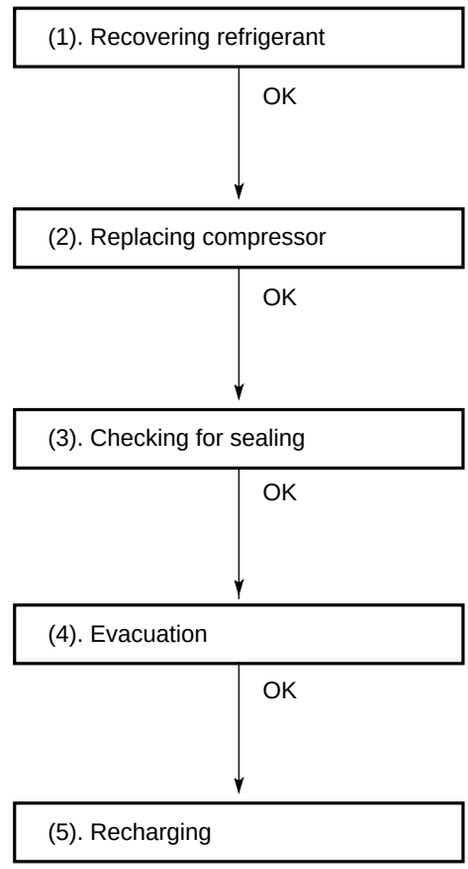
- Soon after removing pinched pipes of both discharge and suction tubes of the new compressor, replace it quickly.

(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.

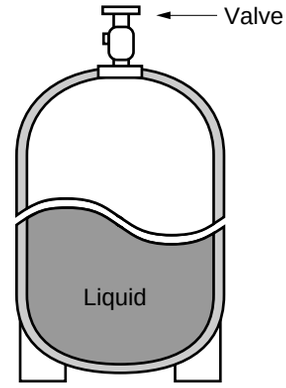
- If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

  Prepare an evacuated charging cylinder beforehand.

CAUTION

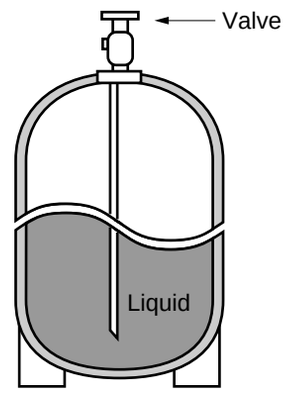
- **To prevent the composition of R407C from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 3)**

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

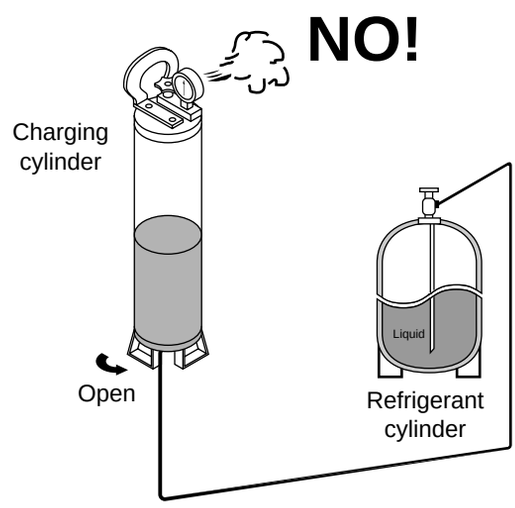


Fig.3

9-6. 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**

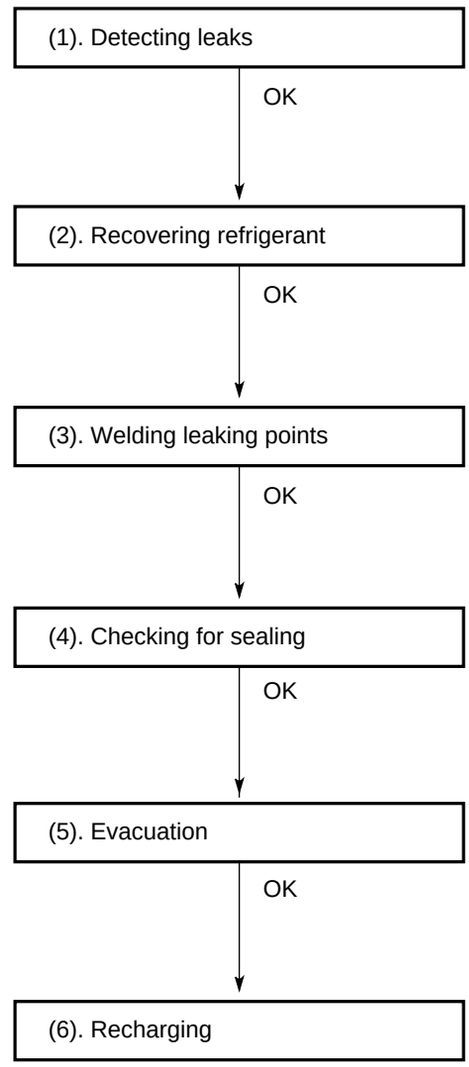
- Confirm again that no residual refrigerant exists in the unit before starting welding.
- Weld securely using flux and wax for R407C.
- Prevent oxide film from forming inside the tubes utilizing substitution with nitrogen (N2) in the refrigerant circuit of the unit. Leave ends of tubes open during welding.

(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.

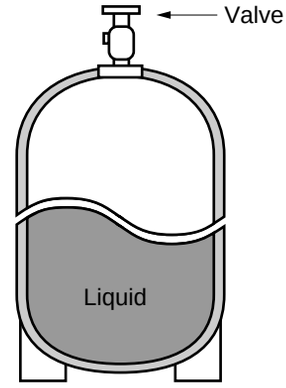
• If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

Prepare an evacuated charging cylinder beforehand.

CAUTION

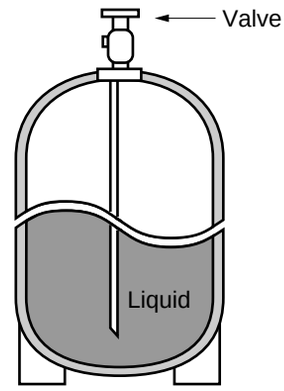
● **To prevent the composition of R407C from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 6)**

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

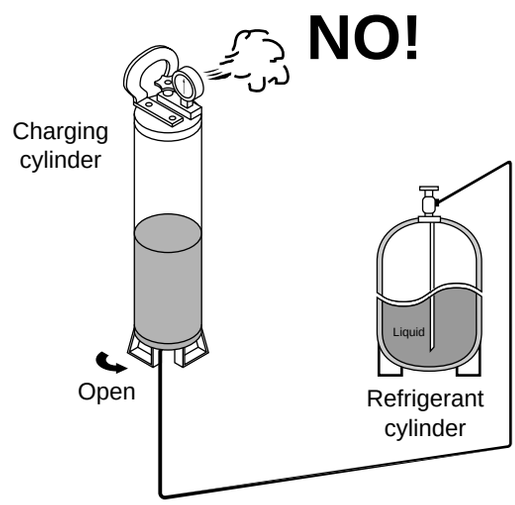


Fig. 6

9-7. Charging additional refrigerant

9-7-1.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.***

● **Never charge additional refrigerant if refrigerant is leaking from the unit. Follow instructions given in "10-6. In case refrigerant is leaking" and completely carry out repairs. Only then should you recharge the refrigerant.**

9-8. Retro-fitting existing systems

9-8-1 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.

9-8-2 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.

10. TROUBLESHOOTING

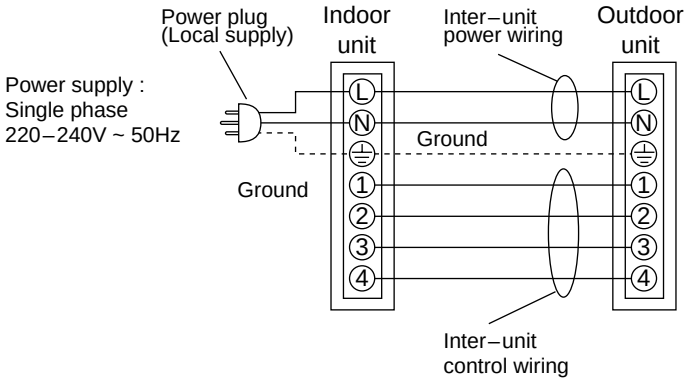
10-1. Check before and after troubleshooting

WARNING

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

10-1-1. Check power supply wiring.

- Check that power supply wires are correctly connected to terminals **L** and **N** on the terminal plate in the indoor unit.



10-1-2. Check inter-unit wiring.

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

10-1-3. Check power supply.

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

10-1-4. 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.

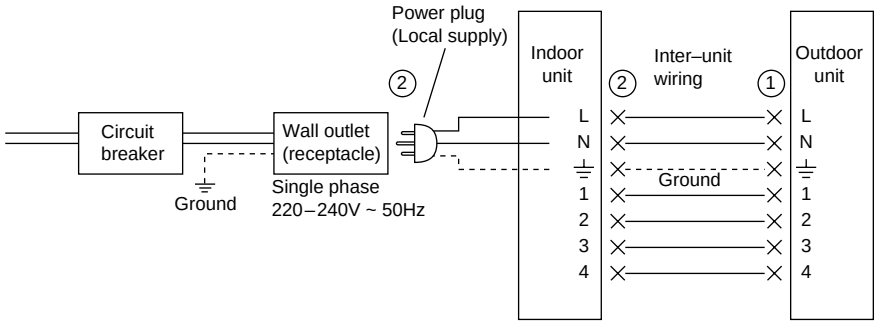
10-2. Air conditioner does not operate.

10-2-1. 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”).



WARNING

*Set circuit breaker to OFF.

① Remove inter-unit wires from terminal plate in outdoor unit.
- Measure insulation resistance of outdoor unit.

NO → Insulation of outdoor unit is defective.

- Measure insulation resistance of electrical parts in outdoor unit.

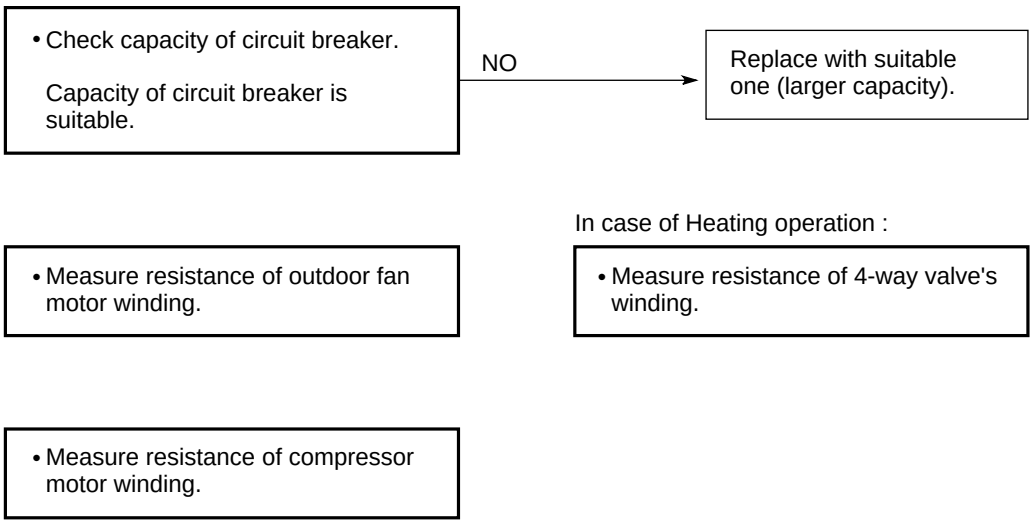
② Remove inter-unit wires from terminal plate in indoor unit. Then, pull the power plug out of the wall outlet
- Measure insulation resistance of indoor unit.

NO → Insulation of indoor unit is defective.

- Measure insulation resistance of electrical parts in indoor unit.

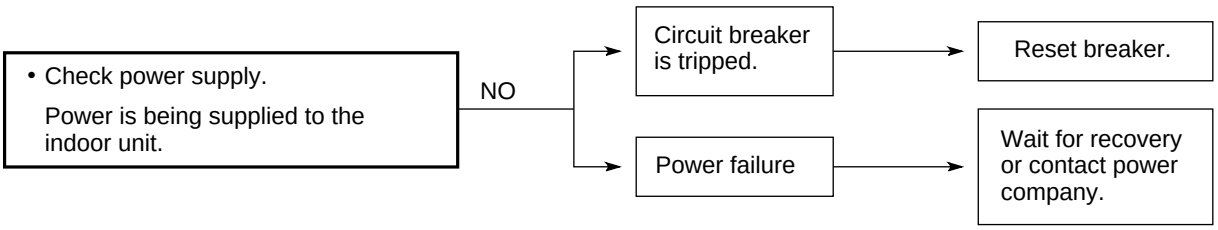
B. Circuit breaker trips in several minutes after turning the air conditioner on.

● There is a possibility of short circuit.

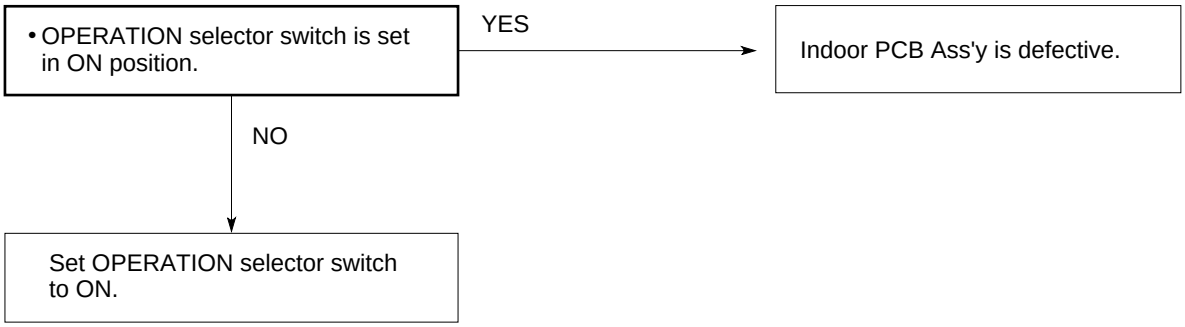


10-2-2. Neither indoor nor outdoor unit runs.

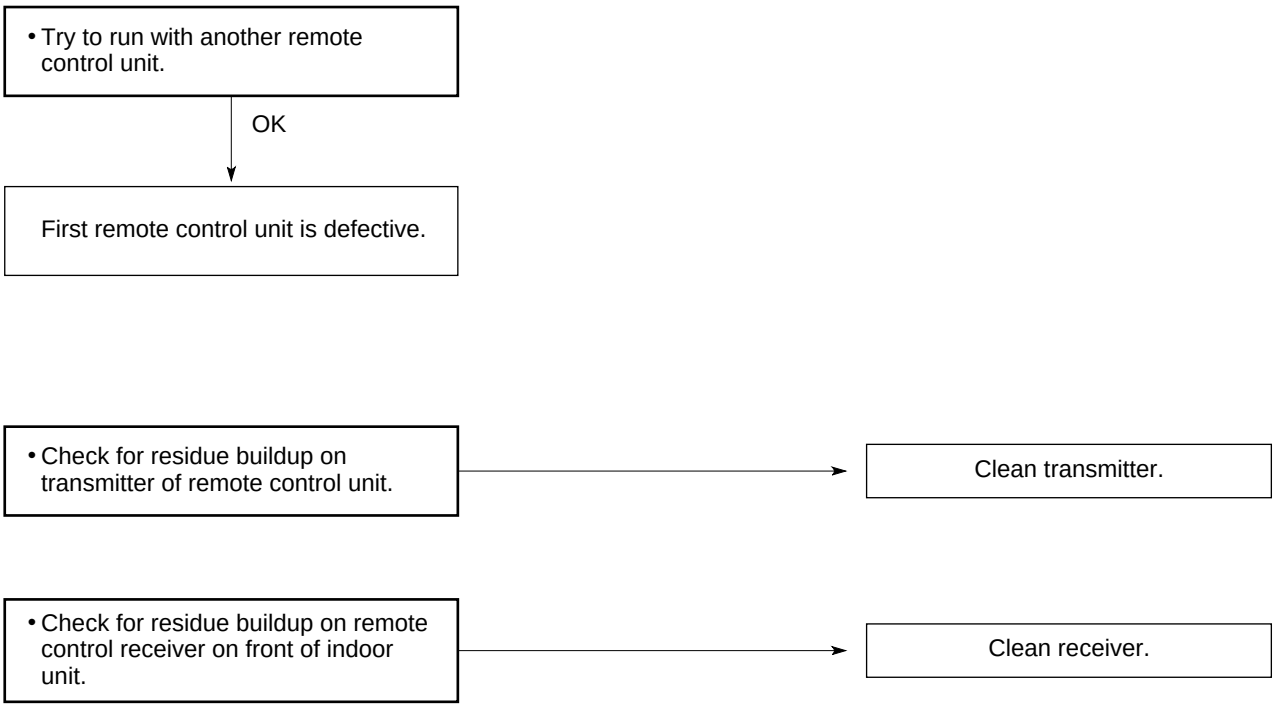
A. Power is not supplied.



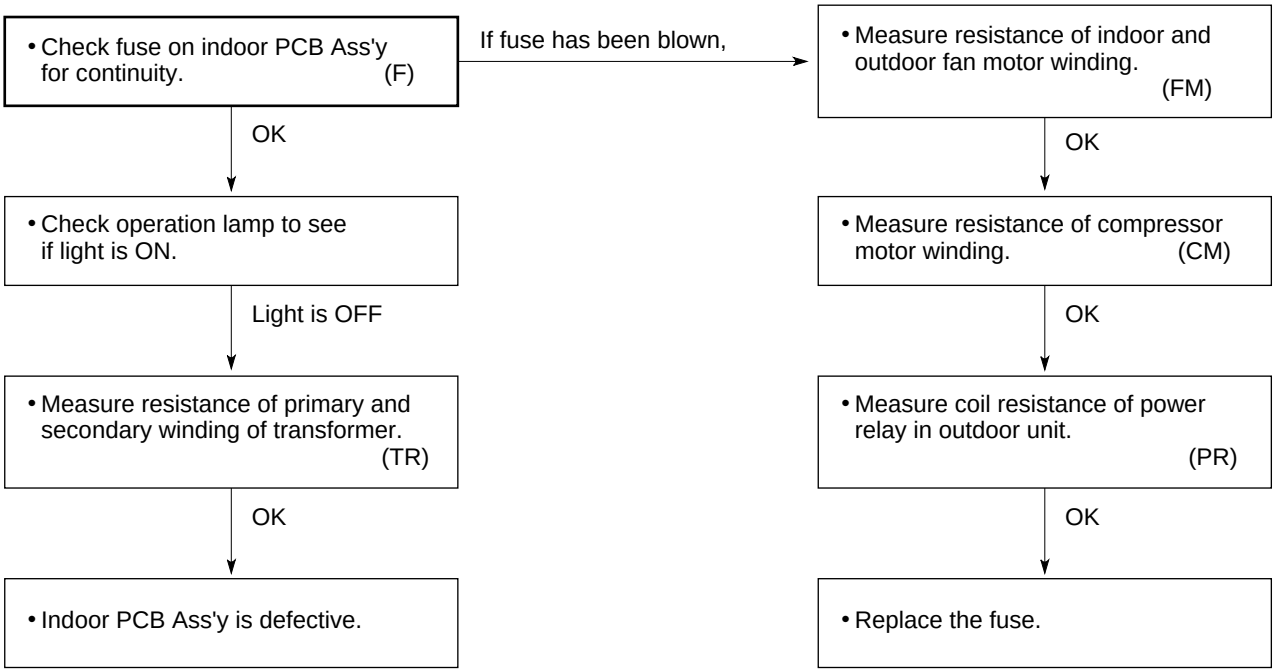
B. Check "OPERATION selector" switch in the indoor unit.



C. Check remote control unit.



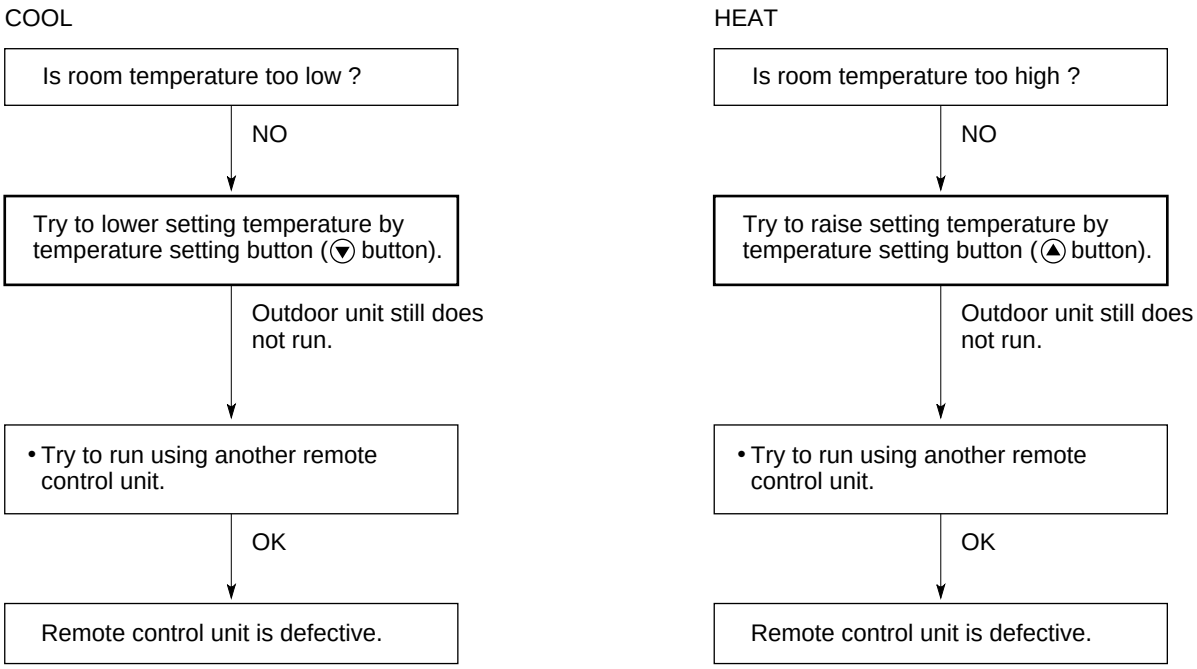
D. Check fuse on the indoor PCB Ass'y.



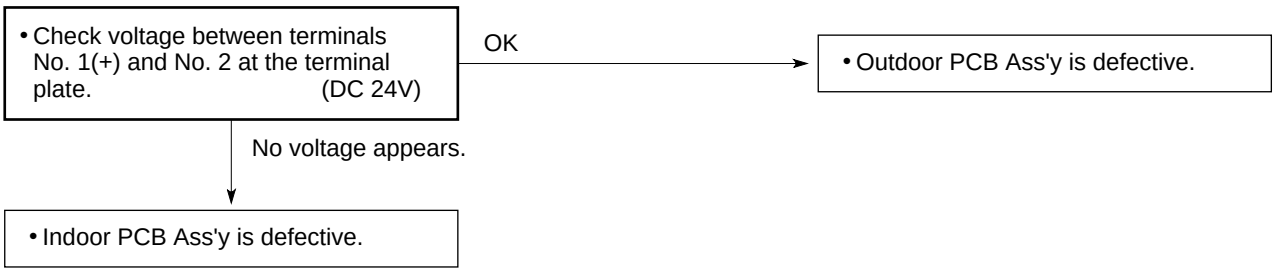
E. Check TIMER on the remote control unit.

10-2-3. Only outdoor unit does not run.

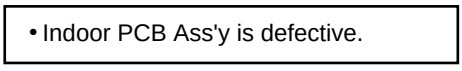
A. Check setting temperature.



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

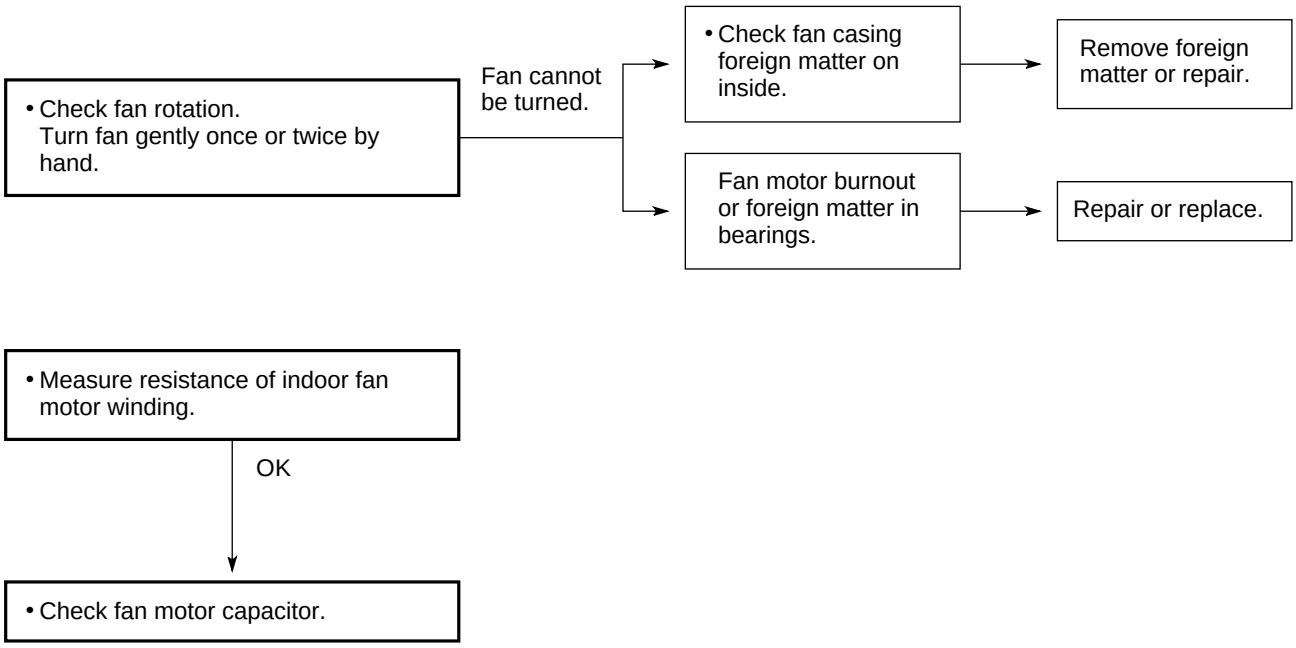


10-2-4. Only Indoor unit does not run.

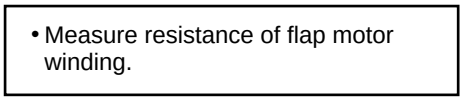


10-3. Some part of air conditioner does not operate.

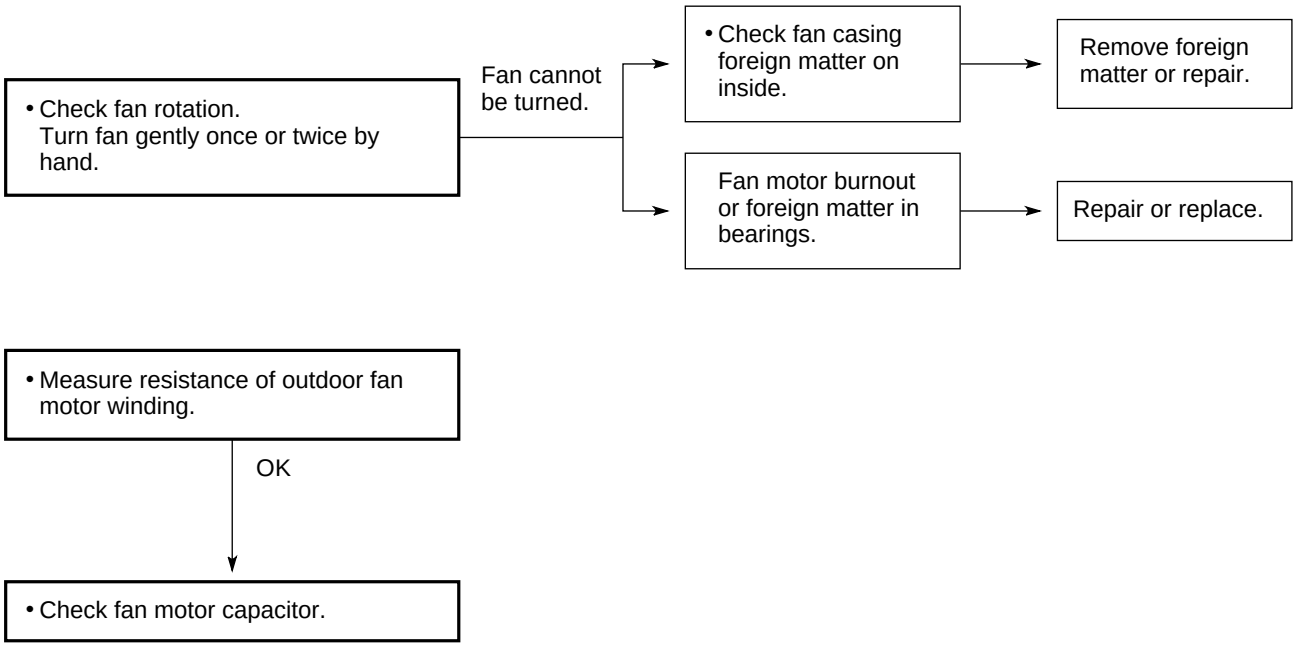
10-3-1. Only indoor fan does not run.



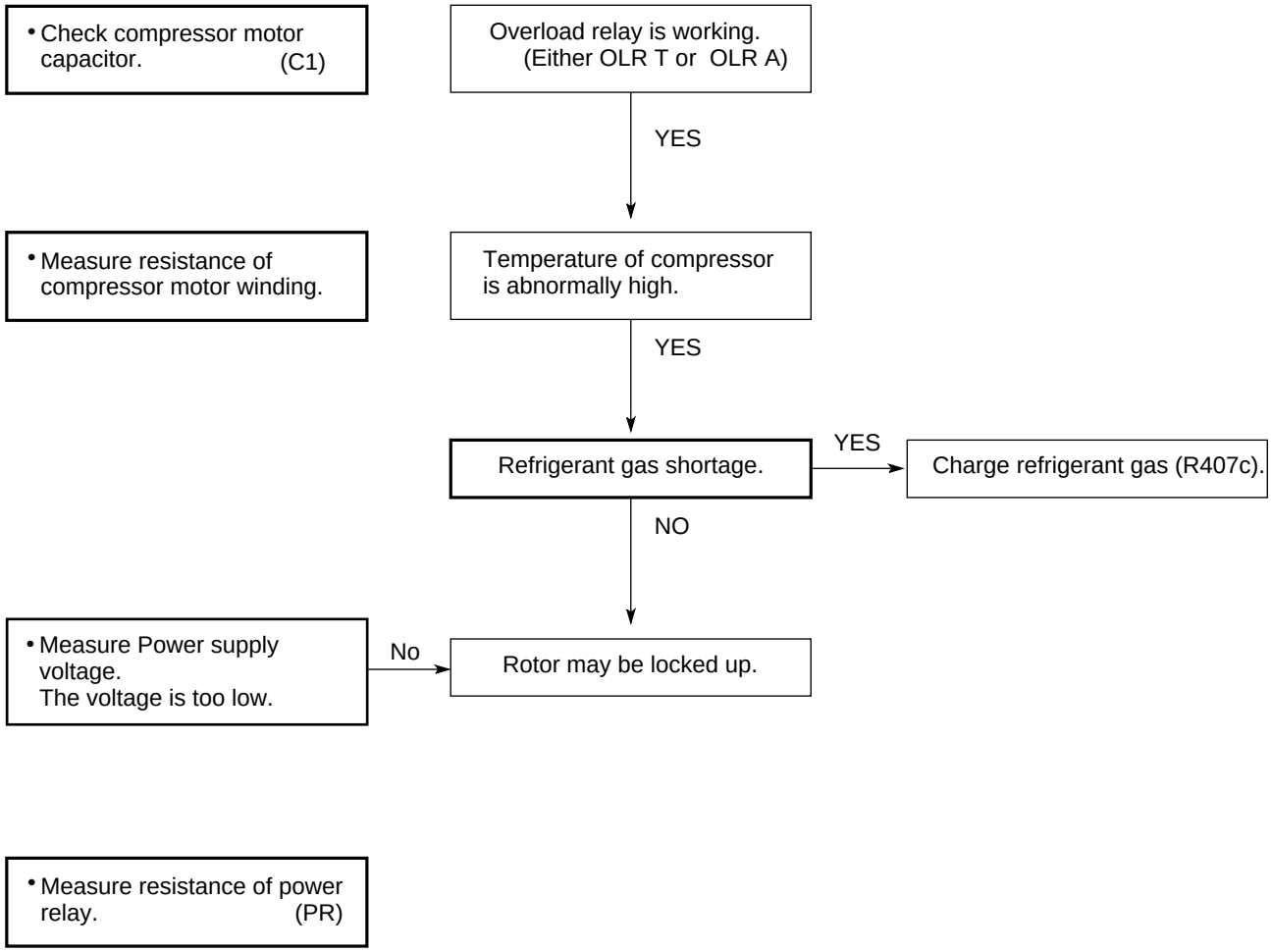
10-3-2. Only flap motor does not run.



10-3-3. Only outdoor fan does not run.

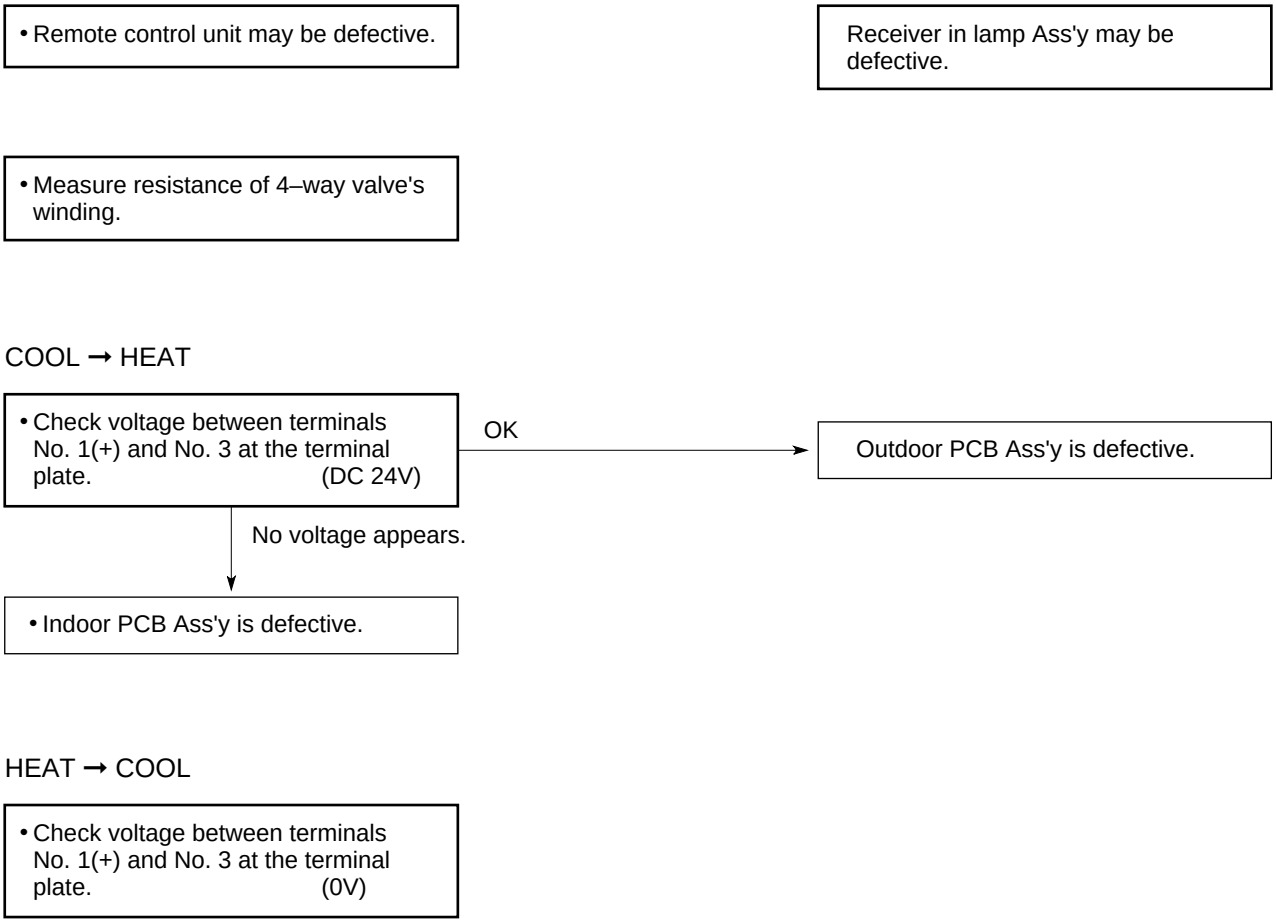


10-3-4. Only compressor does not run.

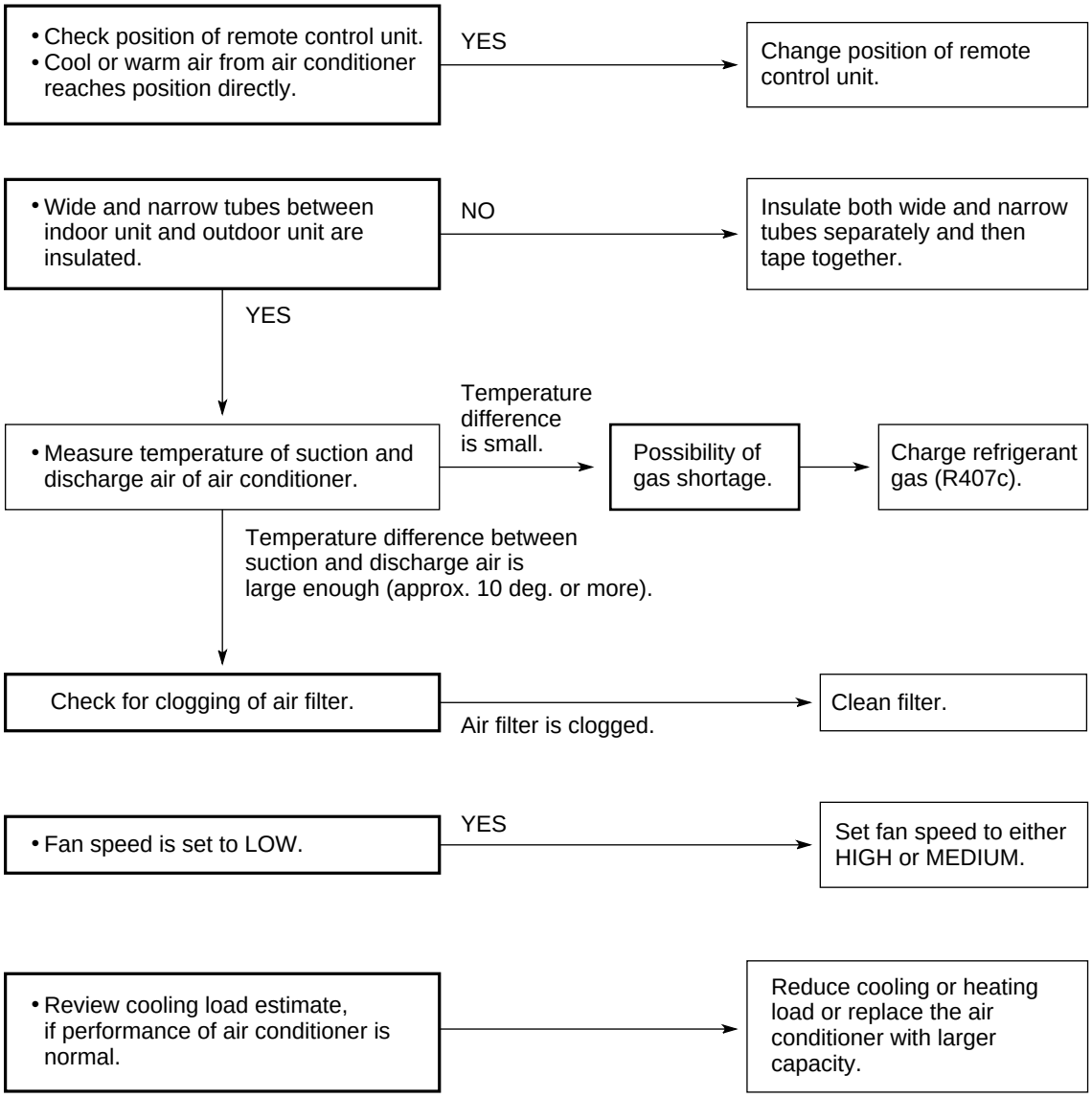


10-4. Air conditioner operates, but abnormalities are observed.

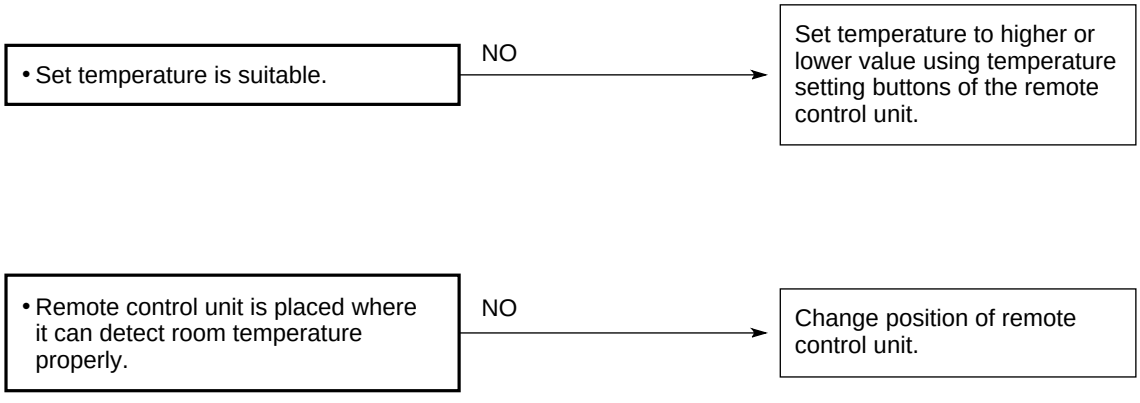
10-4-1. Operation does not switch from HEAT to COOL (or COOL to HEAT).



10-4-2. Poor cooling or heating.



10-4-3. Excessive cooling or heating.



10-5. If a sensor is defective.

10-5-1. 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. At the same time the outdoor unit will stop. Indoor unit will operate only for ventilation.

10-5-2. 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.

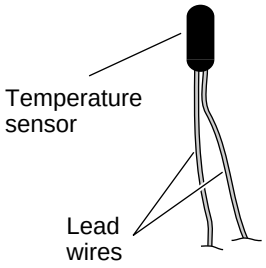
b) In Heating mode: The air conditioner continues to operate (Thermo.ON). Both the outdoor fan and compressor do not stop. As a result, the room becomes too warm.

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.

11. CHECKING ELECTRICAL COMPONENTS

11-1. Measurement of Insulation Resistance

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

11-1-1. Power Supply Wires

Clamp the grounding terminal of the power plug with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the two power terminals. (Fig. 1)

Then, also measure the resistance between the grounding and other power terminals. (Fig. 1)

11-1-2. 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 where power supply lines are connected on the terminal plate. (Fig. 2)

11-1-3. Outdoor 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 on the terminal plate. (Fig. 2)
Note that the ground line terminal should be skipped for the check.

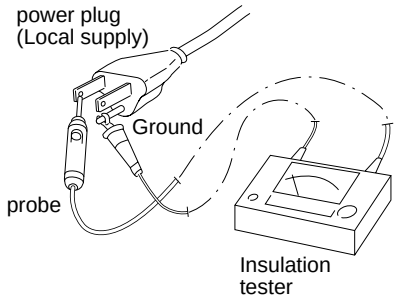
11-1-4. Measurement of Insulation Resistance for Electrical Parts

Disconnect the lead wires of the desired electric part from terminal plate, capacitor, etc. Similarly disconnect the connector. Then measure the insulation resistance. (Figs. 3 and 4)

NOTE

Refer to Electric Wiring Diagram.

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



NOTE

The shape of the power plug may differ from that of the air conditioner which you are servicing.

Fig. 1

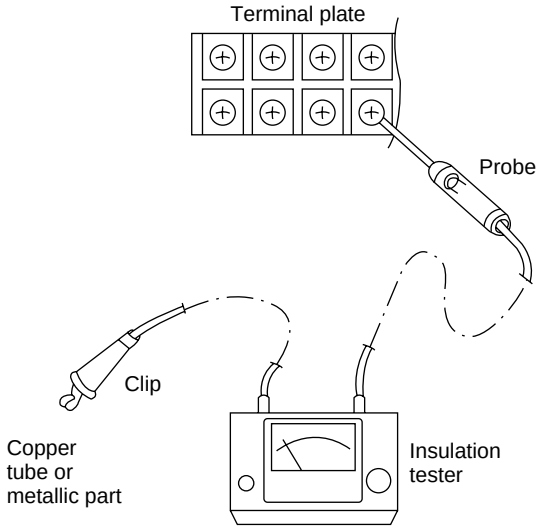


Fig. 2

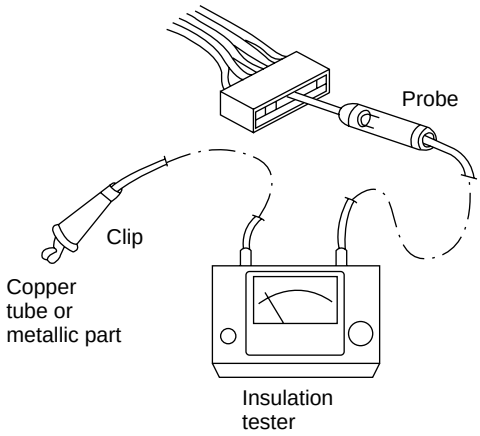


Fig. 3

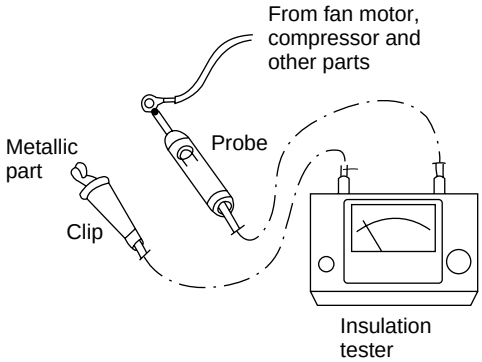


Fig. 4

11-2. Checking Continuity of Fuse on PCB Ass'y

- Remove the PCB Ass'y from the electrical component box. Then pull out the fuse from the PCB Ass'y. (Fig. 5)
- Check for continuity using a multimeter as shown in Fig. 6.

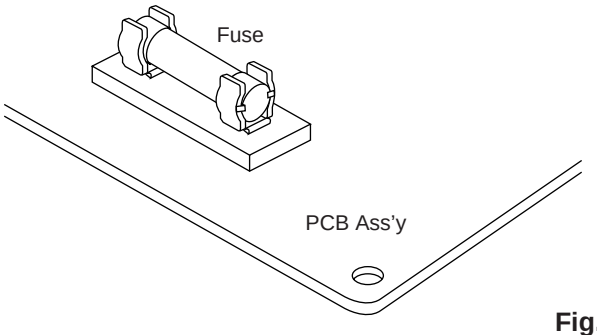


Fig. 5

11-3. 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.

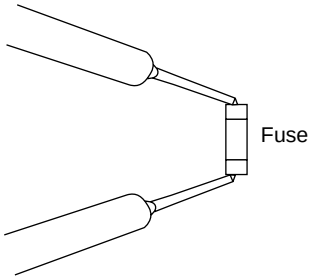


Fig. 6

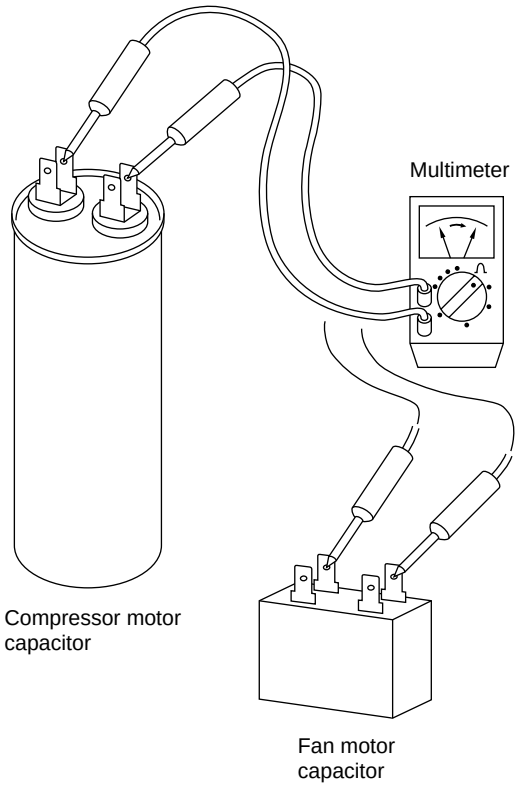


Fig. 7

12. DISASSEMBLY PROCEDURE FOR INDOOR UNIT

IMPORTANT! Please Read Before Starting

Safety precautions for servicing the CEILING-MOUNTED indoor unit

- Before attempting to replace heavy and bulky parts such as the evaporator and fan motor, disconnect the indoor unit from the system and place it on the floor. Refer to the steps given below.
- When checking or servicing the air intake grille, side panels, or electrical component box, first check that power is completely disconnected. Pay utmost care that your working platform is stable enough. Also, do not drop any replaced parts and tools on the floor.

For Floor Installation

12-1. Removing Air Intake Grille

(1) Hold both ends and pull forward to open the air intake grille. (Fig. 1)

(2) Remove the metal clips connecting the unit and the grille. First, with a screwdriver, loosen the * marked screw a little at the right side clip (DO NOT loosen it too much, otherwise, the screw and small metal parts will fall off inside.), then press on the stopper and pull off. (Fig. 2)

(3) Do the same procedure for the left metal clip.

(4) Unlatch the 2 tabs on the lower part of the grille to take it off completely.

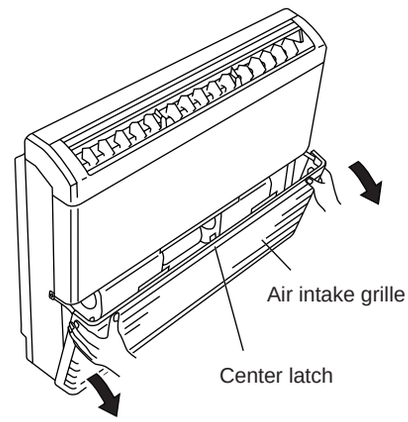


Fig.1

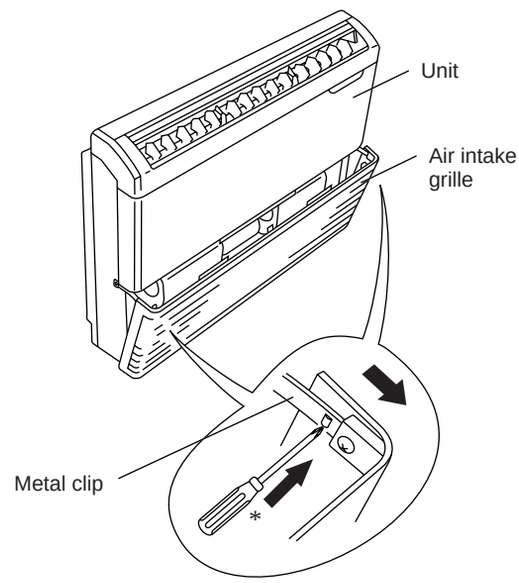


Fig.2

12-2. Removing Side Panels

(1) Remove the 3 screws attaching the left side panel. (Fig. 3)

(2) Note the position of the hook on the inside of the left side panel. To disengage the hook from the slot, slide down the panel for removal. (Fig. 3)

(3) Do the same procedure for the right side panel.

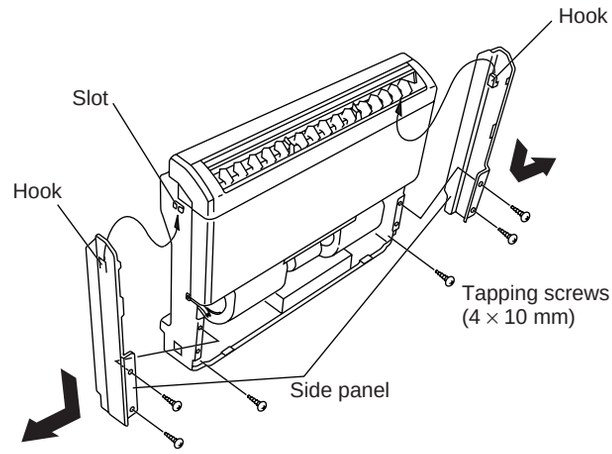


Fig.3

12-3. Access and Removal of Electrical Component Box

WARNING

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

(1) Remove the front screw with a screwdriver. (Fig. 4)

(2) Slide the lid out and up. (Fig. 4)

(3) Disconnect the wiring as necessary.

(4) Remove the 4 screws, then pull out the electrical component box. (Fig. 5)

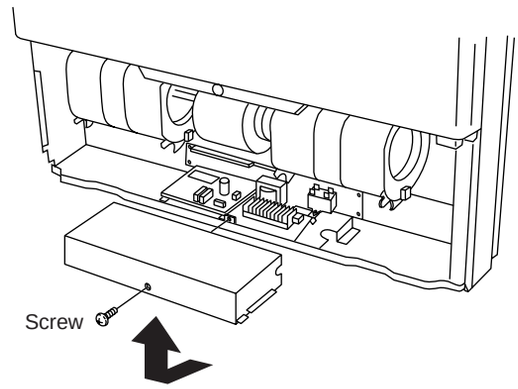


Fig.4

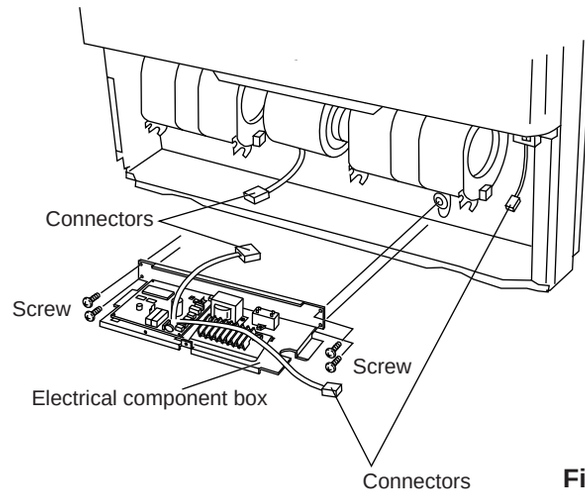


Fig.5

12-4. Removing Flap Motor

(1) Remove the 3 screws used to mount the top panel. (Fig. 6)

(2) While unlatching the 2 tabs inside the back of the top panel, lift the top panel diagonally in the direction of the arrow.(Fig. 6)

(3) Remove the 2 screws to pull off the flap motor. The arm and cam come off together with the motor. (Fig. 7)

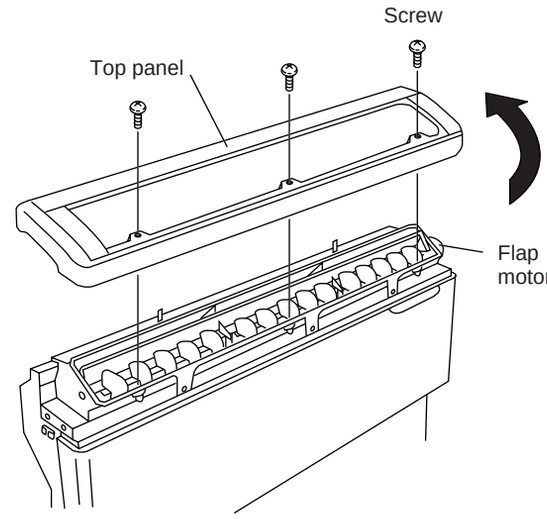


Fig.6

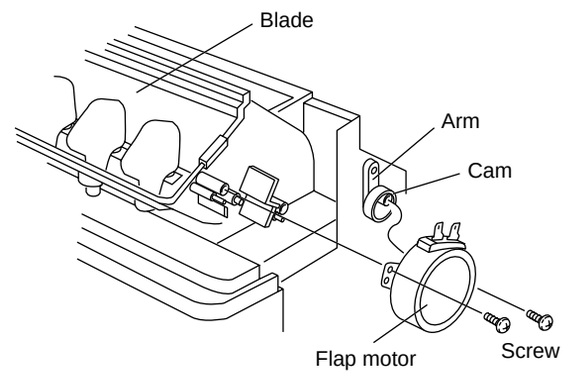


Fig.7

12-5. Removing Evaporator (=Indoor Heat Exchange Coil)

(1) Remove the 7 screws used to mount the blades. (Fig. 8)

(2) Lift the blades in the direction of the arrow.(Fig. 8)

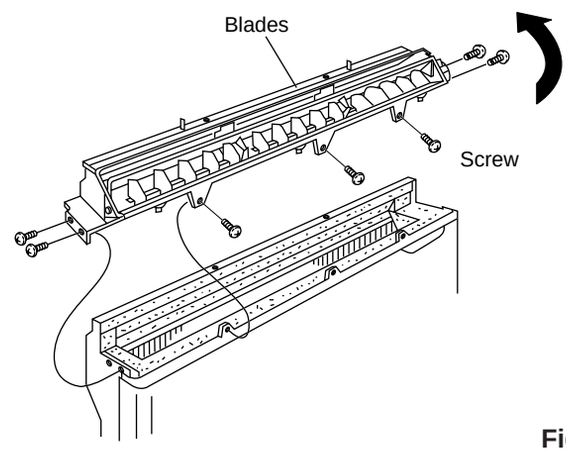


Fig.8

(3) Remove the 6 screws of the front panel and pull it toward you. (Fig. 9)

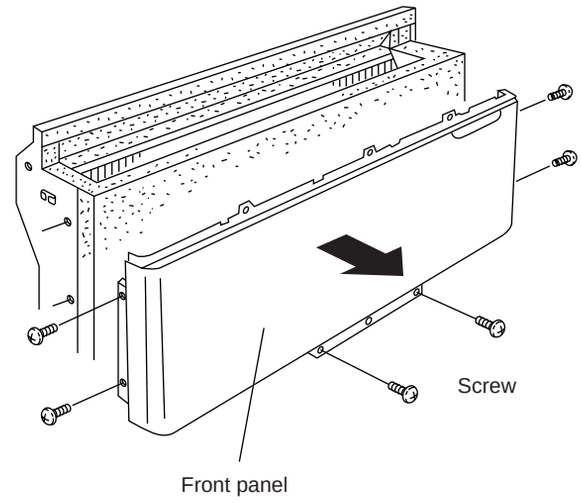


Fig.9

(4) Remove the 2 screws used to mount the evaporator. (Fig. 10)

(5) Remove the rubber cap to pull the thermistor out of the evaporator. (Fig. 10)

(6) Cut the plastic clamp securing the drain hose to the front fan casing. (Fig. 10)

(7) The evaporator is built into the drain pan. Pull out the drain pan together with the evaporator in the direction of the arrow. (Fig. 10)

IMPORTANT

The foamed polystyrene drain pan is fragile: DO NOT apply excessive force when removing it.

(8) The evaporator can be removed by sliding it out from the drain pan in the direction of the arrow. (Fig. 11)

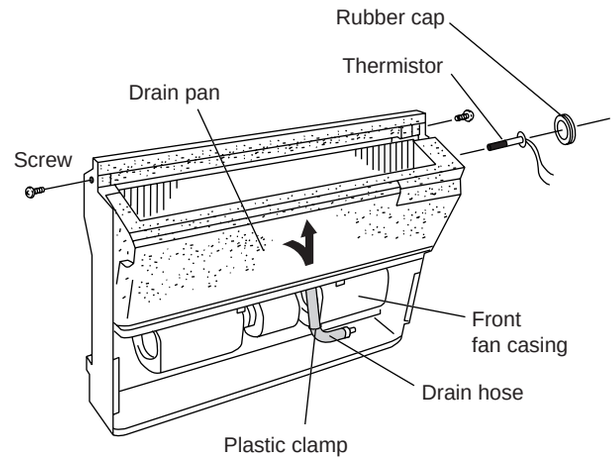


Fig.10

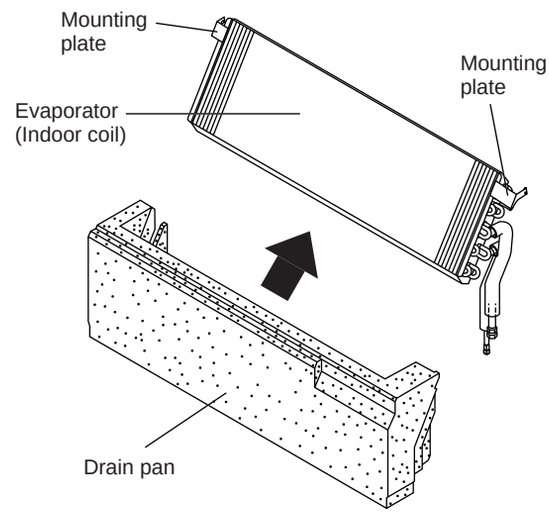


Fig.11

12-6. Removing Fan and Fan Motor

(1) Unlatch the 2 hooks on each side to take off the front fan casing. (Fig. 12)

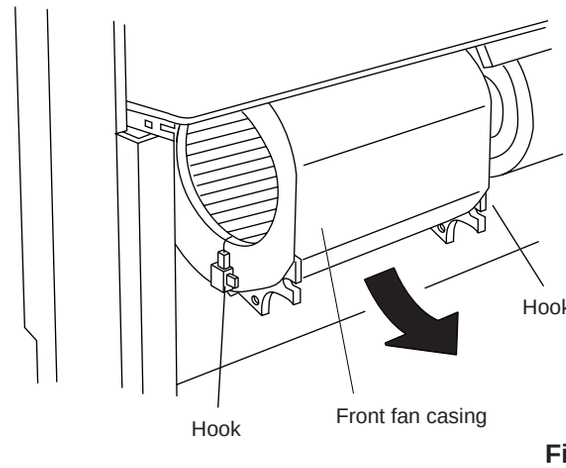


Fig.12

(2) Remove the 2 screws attaching the rear fan casing and then pull the fan casing out.

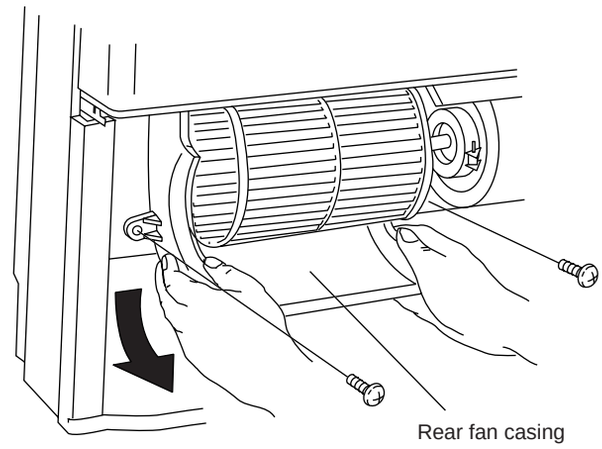


Fig.13

(3) Insert a hex wrench in the fan boss and turn it counterclockwise to loosen the centrifugal fan.

The fan can be removed by sliding it to the left. (Fig. 14)

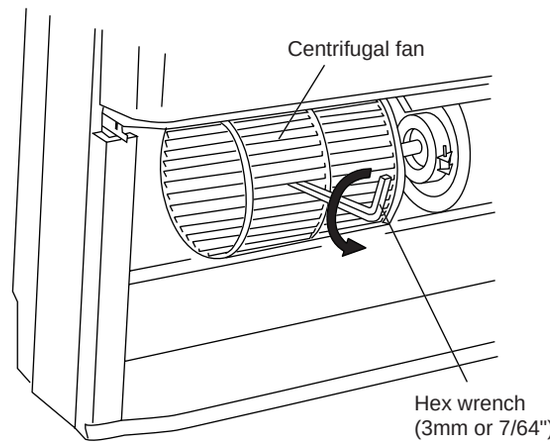


Fig.14

(4) Remove the 4 bolts to remove the fan motor from the frame. (Fig. 15)

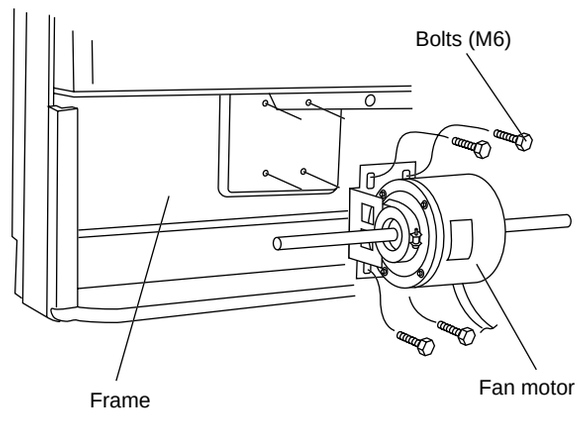


Fig.15

APPENDIX INSTRUCTION MANUAL

AWR508HL + AER508SH
AWR509HL + AER509SH
AWR512HL + AER512SH

Contents

EG

Product Information

If you have problems or questions concerning your Air Conditioner, you will need the following information. Model and serial numbers are on the nameplate on the bottom of the cabinet.

Model No. _____ Serial No. _____

Date of purchase _____

Dealer's address _____

Phone number _____

DECLARATION OF CONFORMITY

This product is marked «CE» as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC, 93/68/EEC and 92/31/EEC.
This declaration will become void in case of mis-usage and/or from non observance though partial of Manufacturer's installation and/or operating instructions.

Alert Symbols

The following symbols used in this manual, alert you to potentially dangerous conditions to users, service personnel or the appliance:

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

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

Installation Location

- **We recommend that this air conditioner be installed properly by qualified installation technicians in accordance with the Installation Instructions provided with the unit.**
- Before installation, check that the voltage of the electric supply in your home or office is the same as the voltage shown on the nameplate.

- **Do not install this air conditioner where there are fumes or flammable gases, or in an extremely humid space such as a greenhouse.**
- **Do not install the air conditioner where excessively high heat-generating objects are placed.**

Avoid: To protect the air conditioner from heavy corrosion, avoid installing the outdoor unit where salty sea water can splash directly onto it or in sulphurous air near a spa.

Electrical Requirements

1. All wiring must conform to the local electrical codes. Consult your dealer or a qualified electrician for details.
2. Each unit must be properly grounded with a ground (or earth) wire or through the supply wiring.
3. Wiring must be done by a qualified electrician.

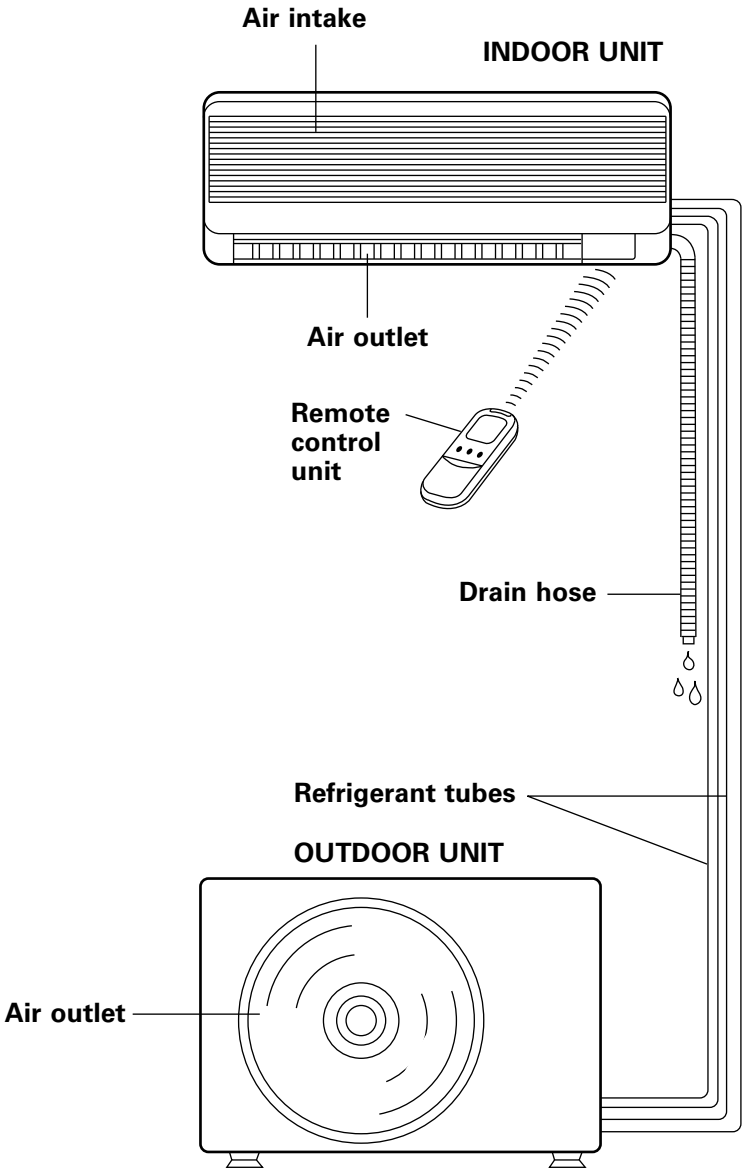
Safety Instructions

- **Read this Instruction Manual carefully before using this air conditioner. If you still have any difficulties or problems, consult your dealer for help.**
- **This air conditioner is designed to give you comfortable room conditions. Use this only for its intended purpose as described in this Instruction Manual.**

- **Never use or store gasoline or other flammable vapor or liquid near the air conditioner — it is very dangerous.**
- **This air conditioner has no ventilator for intaking fresh air from outdoors. You must open doors or windows frequently when you use gas or oil heating appliances in the same room, which consume a lot of oxygen from the air. Otherwise there is a risk of suffocation in an extreme case.**

- **Do not turn the air conditioner on and off from the power mains switch. Use the ON/OFF operation button.**
- **Do not stick anything into the air outlet of the outdoor unit. This is dangerous because the fan is rotating at high speed.**
- **Do not let children play with the air conditioner.**
- **Do not cool or heat the room too much if babies or invalids are present.**

Names of Parts

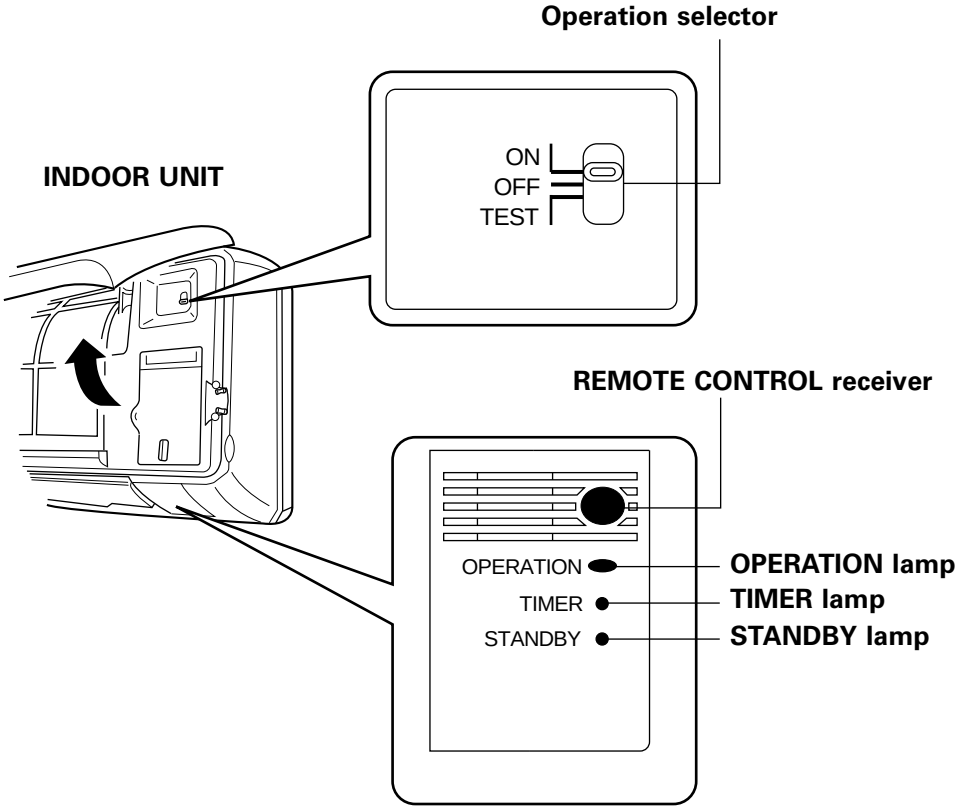


NOTE This illustration is based on the external view of a standard model. Consequently, the shape may differ from that of the air conditioner which you have selected.

This air conditioner consists of an indoor unit and an outdoor unit. You can control the air conditioner with the remote control unit.

Air Intake	Air from the room is drawn into this section and passes through air filters which remove dust.
Air Outlet	Conditioned air is blown out of the air conditioner through the air outlet.
Remote Control Unit	The wireless remote control unit controls power ON/OFF, operation mode selection, temperature, fan speed, timer setting, and air sweeping.
Refrigerant Tubes	The indoor and outdoor units are connected by copper tubes through which refrigerant gas flows.
Drain Hose	Moisture in the room condenses and drains off through this hose.
Outdoor (Condensing) Unit	The outdoor unit contains the compressor, fan motor, heat exchanger coil, and other electrical components.

Unit Display and Operation Selector



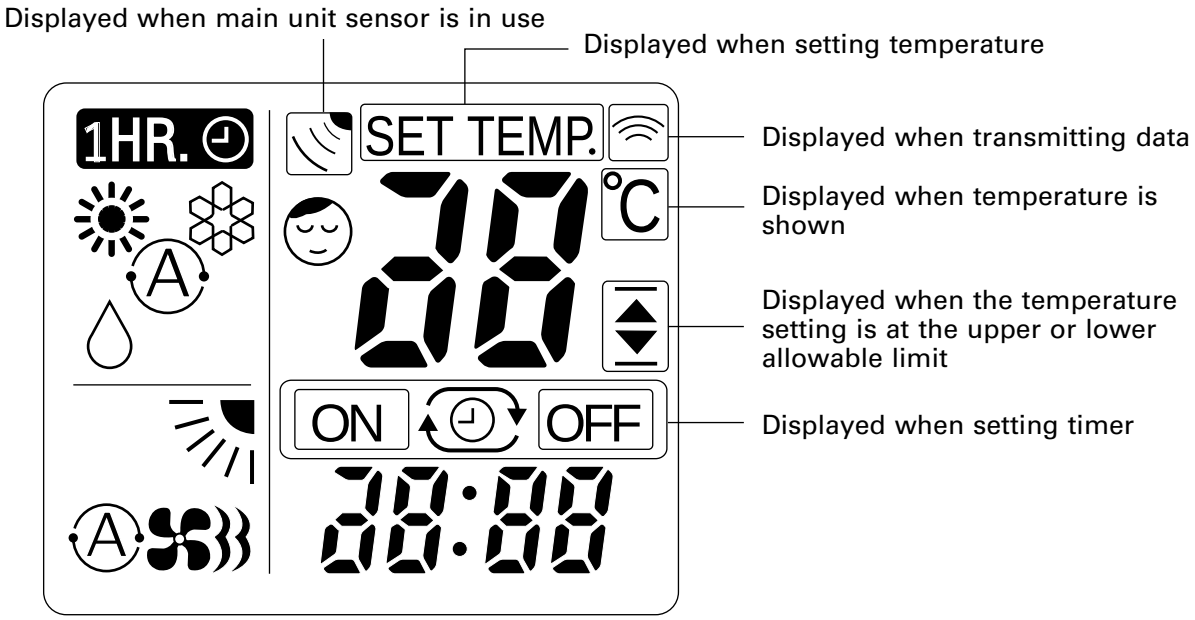
IMPORTANT

Avoid using radio equipment such as mobile phone near (within 1 m) the indoor unit. Some radio equipment may cause malfunction of the unit.

If the trouble happens, disconnect power and restart the air conditioner after a few minutes.

REMOTE CONTROL receiver	This section picks up infrared signals from the remote control unit (transmitter).
Operation selector	
ON position	This position is for operating the air conditioner with the wireless remote control unit. Set the selector normally in this position.
OFF position	Switch the selector to the OFF position if you are not going to use the air conditioner for a few days or longer.
WARNING	**The OFF position does not disconnect the power. Use the main power switch to turn off power completely.**
TEST position	This position is used only when servicing the air conditioner.
CAUTION	**Do not set at the TEST position for normal operation.**
OPERATION lamp	This lamp lights when the system is in the continuous DRY and COOL mode.
TIMER lamp	This lamp lights when the system is being controlled by the timer.

Remote Control Unit (Display)



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Symbols

(1) Operation mode

AUTO.....

COOL.....

HEAT.....

MILD DRY.....

(2) Fan speed

Automatic operation.....

HIGH.....

MEDIUM.....

LOW.....

(3) Set temperature

16–30 °C

When set to 28 °C.....

Current temprature indication.....

(4) Timer

24-hour clock with ON/OFF program Timer.....

24-hour ON Timer.....

24-hour OFF Timer.....

1-hour OFF Timer.....

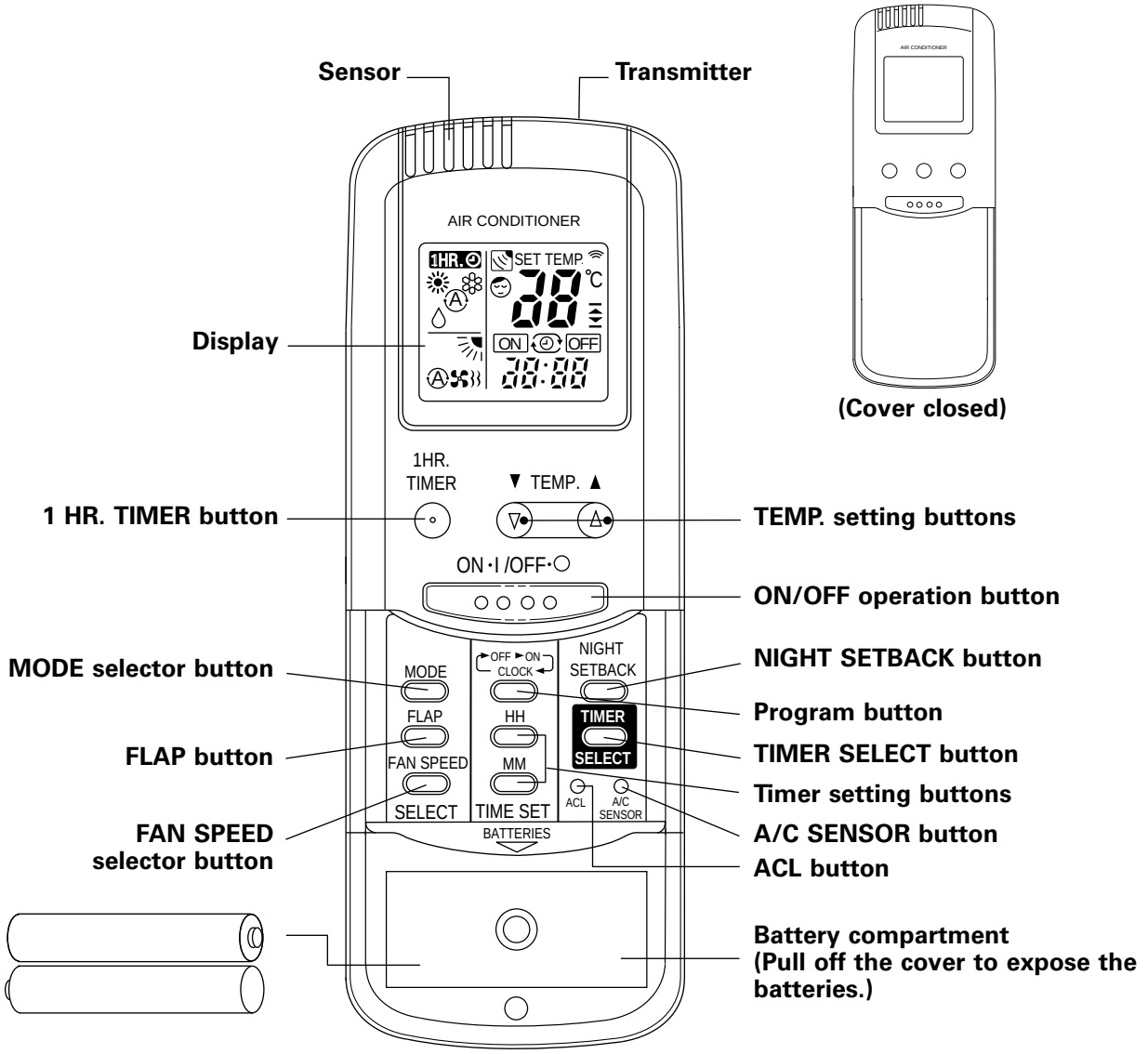
(5) NIGHT SETBACK.....

(6) Confirmation of transmission.....

(7) Flap angle indication.....

(8) Sweep indication.....

Remote Control Unit



NOTE The illustration above pictures the remote control unit after the cover has been lowered and removed.

Transmitter	When you press the buttons on the remote control unit, the mark appears in the display to transmit the setting changes to the receiver in the air conditioner.
Sensor	A temperature sensor inside the remote control unit senses the room temperature.
Display	Information on the operating conditions is displayed while the remote control unit is switched on. If the unit is turned off, only the mode that was set previously is still displayed.
NIGHT SETBACK button	For details, see "Night Setback Mode". When you press this button in the HEAT, DRY or COOL mode, the mark appears in the display, and the remote control unit will automatically adjust the set temperature to save energy.
TEMP. setting buttons	Press the ▲ button to increase the set temperature. Press the ▼ button to reduce the set temperature.
ON/OFF operation button	This button is for turning the air conditioner on and off.
Timer setting buttons	First, press the program button to select the mode you want. Each time you press the "HH" button, the hours advance by one. Each time you press the "MM" button, the minutes advance by one.
Program button	For details, see "Setting the Timer". Press this button to select the mode you want to program.

Remote Control Unit (continued)

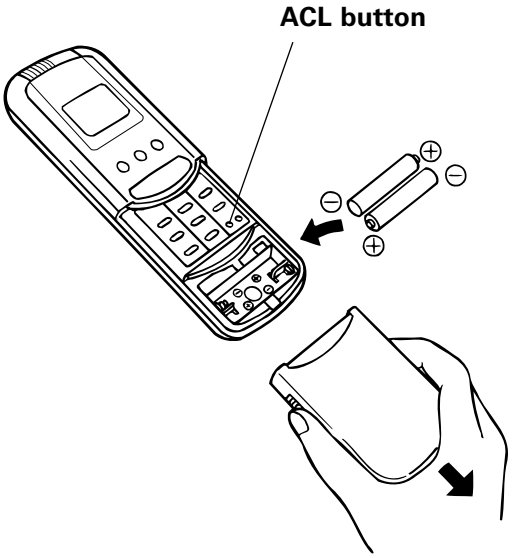
TIMER SELECT button	No display : The timer does not operate. OFF : The air conditioner stops at the set time. ON : The air conditioner starts at the set time. : The air conditioner stops and starts, or starts and stops, at the set times every day.
MODE selector button **(AUTO)** **(HEAT)** **(DRY)** **(COOL)**	Use this button to select AUTO, HEAT, DRY or COOL mode. A : When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the "COOL" or "HEAT" mode as appropriate. : The air conditioner makes the room warmer. : The air conditioner reduces the humidity in the room. : The air conditioner makes the room cooler.
FLAP button **NOTE**	Press this button either to select to set the airflow direction to one of the six possible positions manually, or to select the sweep function, which moves the flap up and down automatically. : The airflow direction can be set manually. (six positions) : The flap moves up and down automatically. To switch to the sweep function ( ) when in the manual ( ) mode, hold down the FLAP button.
FAN SPEED selector button	A : The air conditioner automatically decides the fan speeds. : High fan speed : Medium fan speed : Low fan speed
1 HR. TIMER button **(1-HOUR OFF TIMER)**	1HR. : When you press this button, regardless of whether the unit is operating or stopping, the unit operates for one hour and then shuts down.
ACL button **(ALL CLEAR)**	Puts the remote control unit into pre-operation status. Always press this button after replacing the batteries.
A/C SENSOR button **NOTE**	When you press this button (use a small-tipped object such as a ballpoint pen), the mark will appear at the display. And the room temperature is detected by the sensor which is built into the indoor unit and the air conditioner is controlled accordingly. If the remote control is located near a heat source, such as a space heater or in direct sunlight, press the A/C SENSOR button to switch to the sensor on the indoor unit.

- **Automatic switching between cooling and heating**
  This unit automatically switches between cooling operation and heating operation according to the difference between the room temperature and the temperature setting.

NOTE The remote control unit sends the temperature signal to the air conditioner regularly at three minute intervals. If the signal from the remote control unit stops for more than ten minutes due to the loss of the remote control unit or other trouble, the air conditioner will switch to the temperature sensor which is built into the indoor unit and control the room temperature. In these cases, the temperature around the remote control unit may differ from the temperature detected at the air conditioner's position.

Using the Remote Control Unit

How to Install Batteries



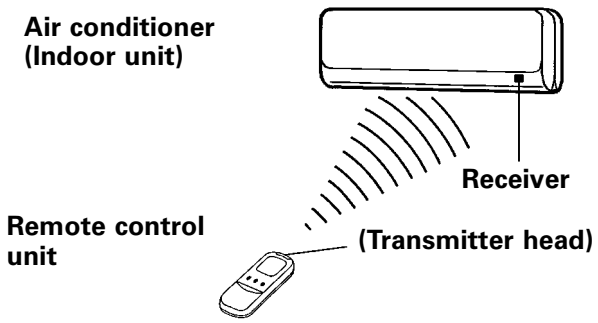
1. Slide the cover in the direction indicated by the arrow and remove it.
2. Install two AAA alkaline batteries. Make sure the batteries point in the direction marked in the battery compartment.
3. Use a thin object such as the tip of a pen to press the ACL button.

NOTE

- **The batteries last about six months, depending on how much you use the remote control unit. Replace the batteries when the remote control unit's display fails to light, or when the remote control cannot be used to change the air conditioner's settings.**
- **Use two fresh leak-proof type-AAA alkaline batteries.**
- **In replacing batteries, follow the instructions as mentioned in the sub-section "How to Install Batteries".**
- **If you do not use the remote control unit more than 1 month, take out the batteries.**

How to Use the Remote Control Unit

When using the remote control unit, always point the unit's transmitter head directly at the air conditioner's receiver.



Remote Control Unit Installation Position

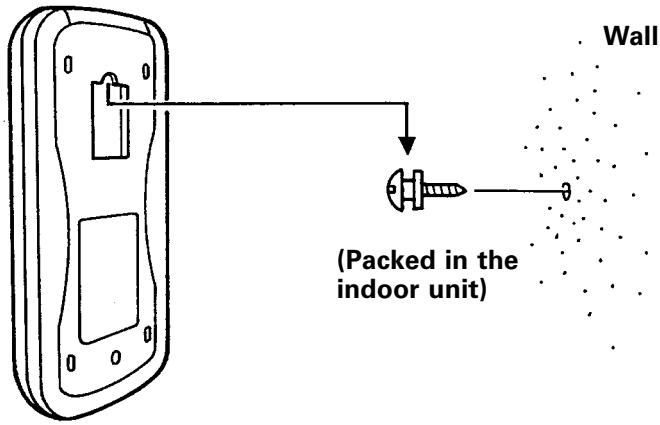
The remote control unit may be operated either from a non-fixed position or from a wall-mounted position. To ensure that the air conditioner operates correctly, DO NOT install the remote control unit in the following places:

DO NOT

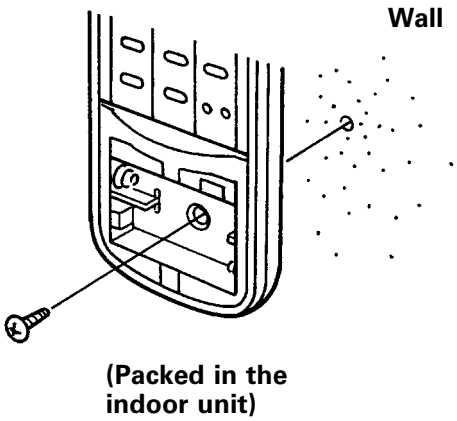
- In direct sunlight
- Behind a curtain or other places where it is covered
- More than 8 m away from the air conditioner
- In the path of the air conditioner's airstream
- Where it may become extremely hot or cold
- Where it may be subject to electrical or magnetic noise
- Where there is an obstacle between the remote control unit and air conditioner (since a check signal is sent from the remote control unit every 3 minutes)

Mounting the Remote Control Unit

Removable mounting



Non-removable mounting



Mounting on a wall

A. Removable mounting

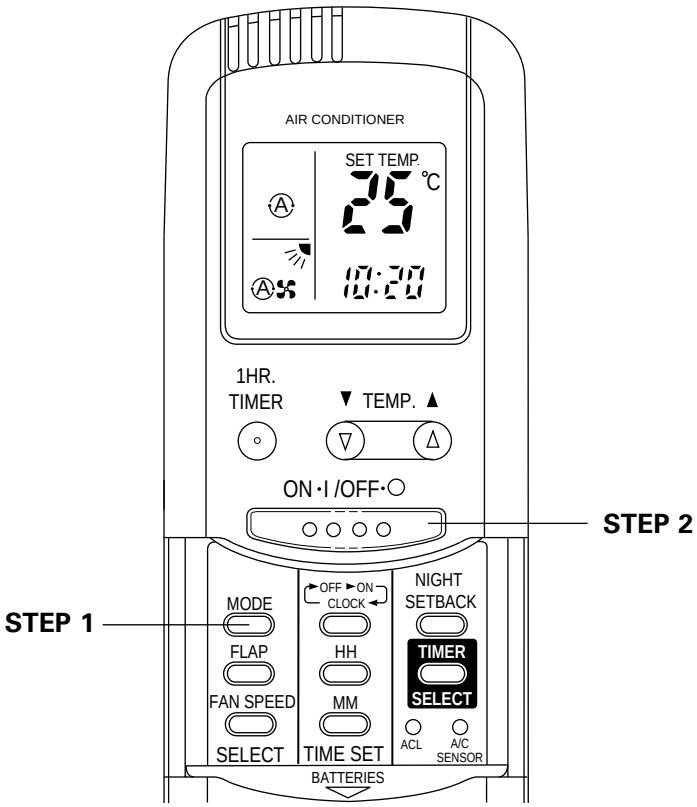
1) Momentarily hold the remote control unit at the desired mounting position.
2) Confirm that the air conditioner responds correctly when you press keys on the remote control from that position.
3) After confirming correct operation, use a screwdriver to screw the mounting screw into the wall.
4) Hang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

Operation with the Remote Control Unit

1. Automatic Operation



NOTE Check that the circuit breaker on the power panel is turned on and that the operation selector of the indoor unit is in the ON position.

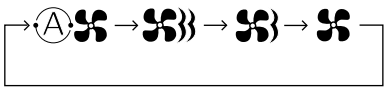
Once Ⓐ mode is selected and the unit is preset by following the steps below, you can have the air conditioner automatically bring the room to the desired temperature simply by pressing the ON/OFF operation button.

STEP 1	Press the MODE selector to Ⓐ.
STEP 2	Press the ON/OFF operation button.

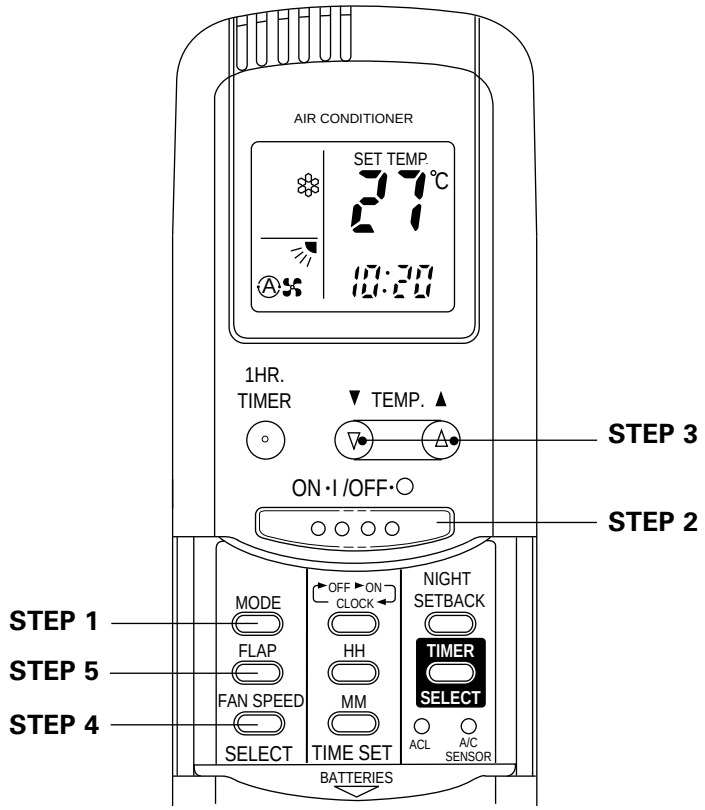
To stop the air conditioner, press the ON/OFF operation button again.

NOTE

- To change the temperature setting, press the temperature setting buttons and change the setting to the desired temperature. The ▲ indicates the upper limit for the temperature setting and the ▼ indicates the lower limit.
- Although the fan speed is set automatically, you can change the fan speed by pressing the FAN SPEED button.



2. Manual Operation



NOTE Check that the circuit breaker on the power panel is turned on and that the operation selector of the indoor unit is in the ON position.

If the automatic operation settings of the unit do not meet your needs, press the setting buttons as described below and change the settings as desired.

STEP 1	Press the MODE selector button and select the desired mode. For heating operation → ☼ For dehumidifying operation → 💧 For cooling operation → ❄
STEP 2	To start the air conditioner, press the ON/OFF operation button.
STEP 3	Press the TEMP. setting buttons to change the temperature setting to the desired temperature. Adjustable temperature range: 30 °C max. 16 °C min.
STEP 4 **NOTE**	Set the FAN SPEED selector button to the setting you want. If the fan speed is set to Ⓐ (Automatic), the fan speed switches automatically, according to the difference between the actual room temperature and the temperature setting.
STEP 5	Press the FLAP button and set the airflow direction as desired. (Refer to "Adjusting the Airflow Direction" on page 21.)

To stop the air conditioner, press the ON/OFF operation button again.

NOTE

- Choose the best position in the room for the remote control unit, which also acts as the sensor for room comfort and transmits the operating instructions. Once you've found this best position, always keep the remote control unit there.
- This appliance has a built-in 3-minute time delay circuit to ensure reliable operation. When the operation button is pressed, the compressor will start running within three minutes. In the event of power failure, the unit will stop. When the power is restored, the unit will restart automatically after three minutes.

3. Adjusting the Fan Speed

A. Automatic

Simply set the FAN SPEED selector to the Ⓐ position.

A microcomputer in the air conditioner automatically controls the fan speed when the Ⓐ mode is selected. When the air conditioner starts operating, the difference between the room temperature and the set temperature is detected by the microcomputer which then automatically switches the fan speed to the most suitable level.

Cooling and DRY mode:

When difference between room temperature and set temperature is	FAN SPEED
2 °C and over	High
Between 2 °C and 1 °C	Medium
Below 1 °C	Low

Heating mode:

When difference between room temperature and set temperature is	FAN SPEED
2 °C and over	High
Below 2 °C	Medium

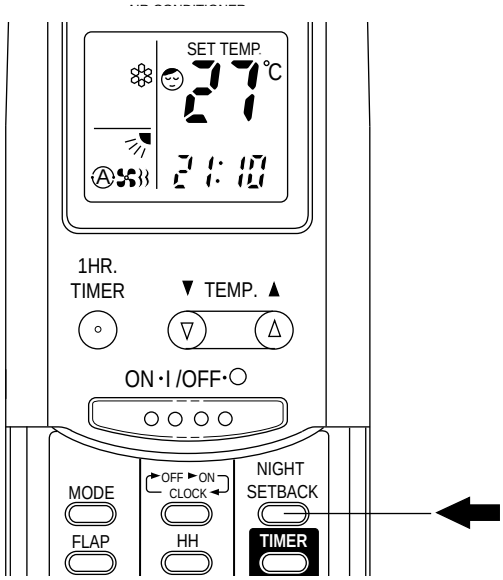
NOTE

The above table assumes that the sensor on the remote control is being used. If the sensor on the indoor unit is being used (the indicator is on), actual operation may differ slightly from the operation described in the table.
(Refer to "A/C SENSOR button" on page 9.)

B. Manual

If you want to adjust fan speed manually during operation, just set the FAN SPEED selector as desired. [, , or]

4. Night Setback Mode



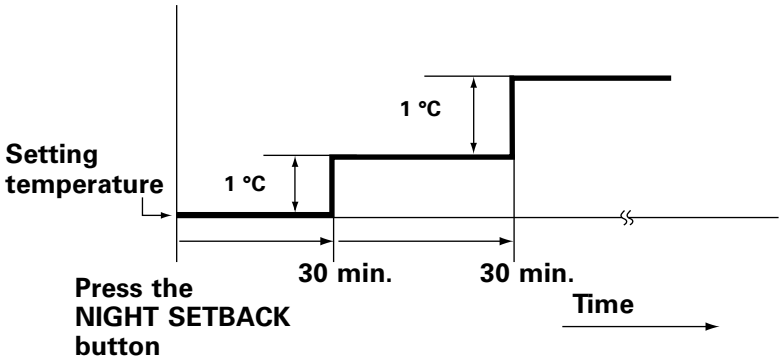
Night Setback Mode is used for saving energy.

Press the NIGHT SETBACK button while operation.
The ☺ mark appears in the display.

To release the night setback function, press the NIGHT SETBACK button again.

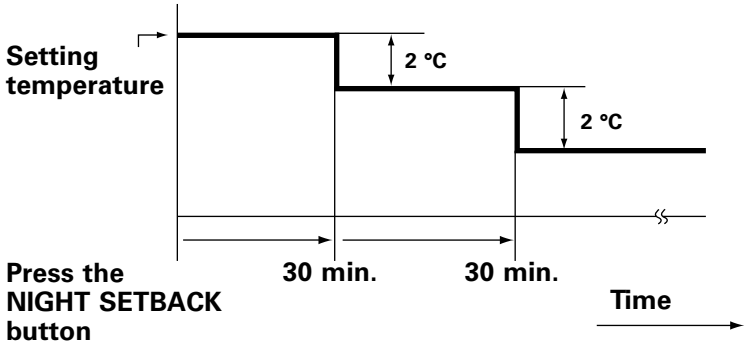
A. In Cooling and DRY Mode: (❄ and 💧)

When the night setback mode is selected, the air conditioner automatically raises the temperature setting 1 °C when 30 minutes have passed after the selection was made, and then another 1 °C after another 30 minutes have passed, regardless of the indoor temperature when night setback was selected. This enables you to save energy without sacrificing comfort. This function is convenient when gentle cooling is needed.



B. In Heating Mode: (☼)

When the night setback mode is selected, the air conditioner automatically lowers the temperature setting 2 °C when 30 minutes have passed after the selection was made, and then another 2 °C after another 30 minutes have passed, regardless of the indoor temperature when night setback was selected. This enables you to save energy without sacrificing comfort. This function is convenient when gentle heating is needed.



Special Remarks

"DRY" ( ) Operation

How it works?

- Once the room temperature reaches the level that was set, the unit repeats the cycle of turning on and off automatically.
- During DRY operation, the fan speed is automatically set to LOW or VERY LOW; the fan speed then switches back and forth between LOW (for 20 seconds) and VERY LOW (for 10 seconds).
- "DRY" operation is not possible if the indoor temperature is 15 °C or less.

Heating ( ) Operation

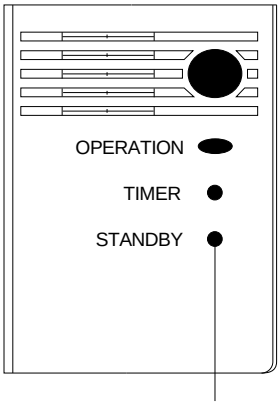
Heating performance

- Because this air conditioner heats a room by drawing in the heat of the outside air (heat pump system), the heating efficiency will fall off when the outdoor temperature is very low. If sufficient heat cannot be obtained with this air conditioner, use another heating appliance in conjunction with it.

Defrosting

- When the outdoor temperature is low, frost or ice may form on the heat exchanger coil, reducing heating performance. When this happens, a microcomputer defrosting system operates. At the same time, the fan on the indoor unit stops (or runs at very low speed in some cases) and the STANDBY lamp remains lit until defrosting is completed. Heating operation restarts after several minutes. (This interval will vary slightly depending upon the outdoor temperature and the way in which frost forms).

STANDBY lamp



STANDBY lamp

- For several minutes after the start of heating operation, the indoor fan will not start running until the indoor heat exchanger coil has warmed up sufficiently. This is because the COLD DRAFT PREVENTION SYSTEM is operating. During this period, the STANDBY lamp remains lit.
- The STANDBY lamp also remains lit during defrosting or when the compressor has been turned off by the thermostat when the system is in the heating mode.
- Upon completion of defrosting and when the compressor is turned on again, for heating operation, the STANDBY lamp will go off automatically.

Power failure during operation

- In the event of power failure, the unit will stop. When the power is resumed, the unit will restart automatically after three minutes.

Clicking Sound

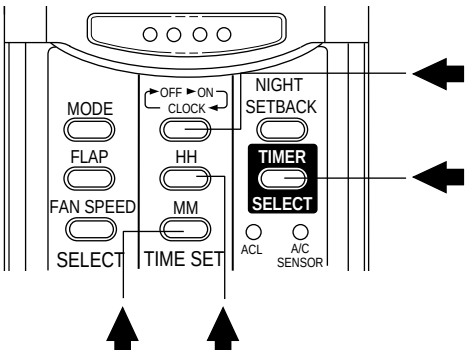
Clicking sound is heard from the air conditioner

- In heating or cooling operation, any plastic parts may expand or shrink due to a sudden temperature change. In this event, a clicking sound may occur. This is normal, and the sound will soon disappear.

Remote control unit

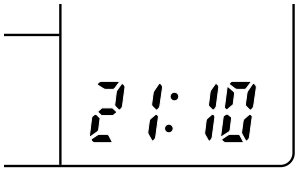
- The remote control unit sends the setting condition to the air conditioner regularly at three minute intervals.

Setting the Timer



NOTE The description below assumes that the switch on the back of the remote control unit has been set to the degrees Celsius display.

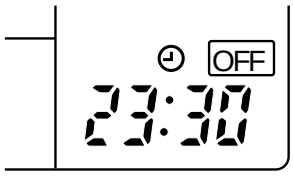
1. How to set the present time



(Example) To set to 21:10

Operation	Indication
1. Press the Program button (OFF ON CLOCK) three times.	The time indication alone flashes.
2. • Press the HH button until 21 is displayed. • Press the MM button until 10 is displayed.	The display will automatically stop flashing except for the ":" symbol after 10 sec.

2. How to set the OFF time



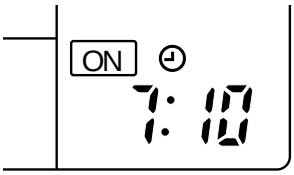
(Example) To stop the air conditioner at 23:30

1. Press the Program button (OFF ON CLOCK) once.	The timer ⏲ OFF and time indications flash.
2. • Press the HH button until 23 is displayed. • Press the MM button until 30 is displayed.	The display will change automatically back to show the present time after 10 sec.
3. Press the ON/OFF button to start the air conditioner.	The present time is displayed.
4. Press the TIMER SELECT button to set OFF time.	The present time and ⏲ OFF are displayed.

Setting the Timer (continued)

3. How to set the ON time

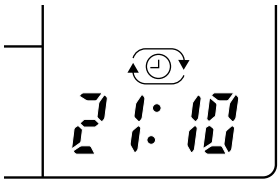
(Example) To start operation at 7:10



Operation	Indication
1. Press the Program button (OFF ON CLOCK) twice.	The timer ON and time indications flash.
2.	
• Press the HH button until 7 is displayed. • Press the MM button until 10 is displayed.	The display will change automatically back to show the present time after 10 sec.
3. Press the ON/OFF button to start the air conditioner.	The present time is displayed.
4. Press the TIMER SELECT button to set ON time.	The present time and ON ◴ are displayed.

4. How to set a program for daily ON/OFF operation

(Example) To start operation at 7:10 and stop the air conditioner at 23:30

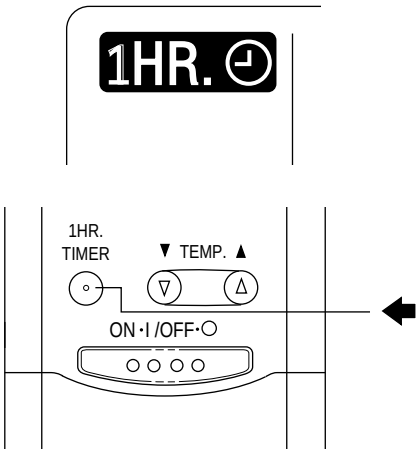


1. Set the timer ON/OFF times as shown in 2) and 3).	
2. Press the ON/OFF button to start the air conditioner.	
3. Press the TIMER SELECT button to set the ON/OFF combination timer.	◴ is displayed.

NOTE You can check the timer ON/OFF times after you have set them by pressing the PROGRAM button.

Using the 1-Hour OFF Timer

1. 1-Hour OFF Timer



This function causes the unit to operate for one hour and then stop, regardless of whether the unit is on or off when this button is pressed.
The 1HR. indicator in the display indicates that this function is operating.

Setting procedure:
Regardless of whether the unit is operating or stopped, press the 1 HR. TIMER button.
1HR. appears in the display.

Cancellation procedure:
Press the ON/OFF operation button to turn the unit off, wait for the unit to stop operating, and then press the ON/OFF operation button again. The 1-Hour Timer function is now cancelled and the unit operates normally.

NOTE

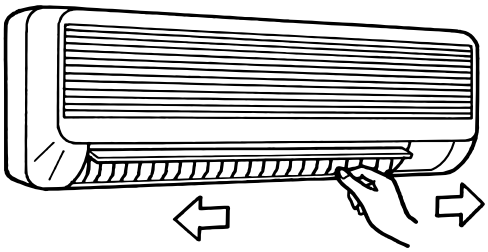
- If, while the 1-Hour Timer function is operating, the 1 HR. TIMER button is pressed once to cancel the function and then again, the unit continues to operate for one hour from that point in time and then stops.

2. Operation Together with the Program Timer

- The Program Timer and 1-Hour OFF Timer may be used together.
- It is not possible to use the OFF Timer and 1-Hour OFF Timer together. Whichever function is set last takes precedence.
  If the 1 HR. TIMER button is pressed while the TIMER OFF function operates, the OFF Timer is cancelled and the unit will stop operating one hour later.

Adjusting the Airflow Direction

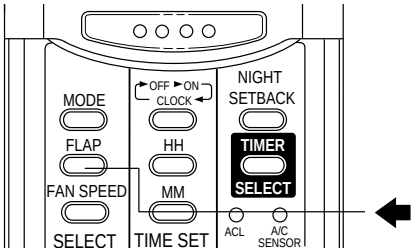
1. Horizontal The horizontal airflow can be adjusted by moving the vertical vanes with your hands to the left or right.

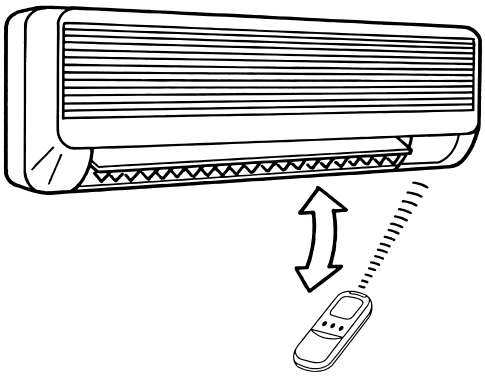


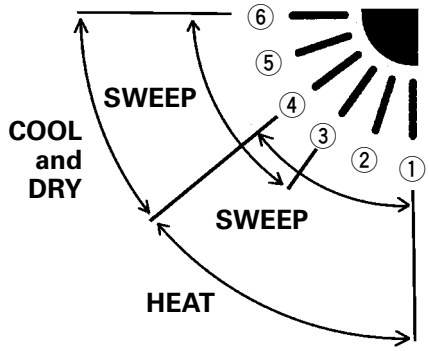
CAUTION

When the humidity is high, the vertical vanes should be in the front position during the cooling or dehumidifying operation. If the vertical vanes are positioned all of the way to the right or left, condensation may begin to form around the air vent and drip down.

2. Vertical The vertical airflow can be adjusted by moving the flap with the remote control unit. Do not move the flap with your hands. Confirm that the remote control unit has been turned on. Use the FLAP button to set either the sweep function or one of the six airflow direction settings.







A. Sweep function

The flap starts moving up and down to deliver air over the sweep range.

B. Setting the Airflow Manually

Referring to the above illustration, use the FLAP button to set the airflow direction within the range used during the heating, cooling, or dehumidifying operation.

NOTE

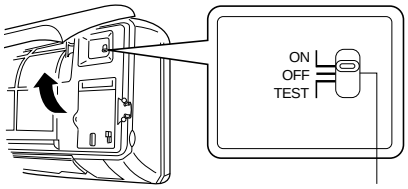
- The flap automatically closes when the unit is off.
- During the heating operation, the fan speed will be very low and the flap will be in the horizontal position (position ⑥) until the air being blown out of the unit begins to warm. Once the air warms up, the flap position and fan speed change to the settings specified with the remote control.

CAUTION

- Use the FLAP button on the remote control to adjust the position of the flap. If you move the flap by hand, the flap position according to the remote control and the actual flap position may no longer match. If this should happen, shut off the unit, wait for the flap to close, and then turn on the unit again; the flap position will now be normal again.
- Do not have the flap pointed down during cooling operation. Condensation may begin to form around the air vent and drip down.

Operation without the Remote Control Unit

INDOOR UNIT



Operation selector

If you have lost the remote control unit or it has trouble, follow the steps below.

1. When the air conditioner is not running
If you want to turn on the air conditioner, switch the operation selector to the OFF position, and then to the ON position.

NOTE The set temperature and fan speed are automatically set at the last selection before stopping.

2. When the air conditioner is running
If you want to turn off the air conditioner, switch the operation selector to the OFF position.

Care and Cleaning

WARNING

1. **For safety, be sure to turn the air conditioner off and also to disconnect the power before cleaning.**
2. **Do not pour water on the indoor unit to clean it. This will damage the internal components and cause an electric shock hazard.**

Casing and Grille (Indoor Unit)

Clean the casing and grille of the indoor unit with a vacuum cleaner brush, or wipe them with a clean, soft cloth.

If these parts are stained, use a clean cloth moistened with a mild liquid detergent. When cleaning the grille, be careful not to force the vanes out of place.

CAUTION

1. **Never use solvents, or harsh chemicals when cleaning the indoor unit. Do not wipe the plastic casing using very hot water.**
2. **Some metal edges and the fins are sharp and may cause injury if handled improperly; be especially careful when you clean these parts.**
3. **The internal coil and other components of the outdoor unit must be cleaned every year. Consult your dealer or service center.**

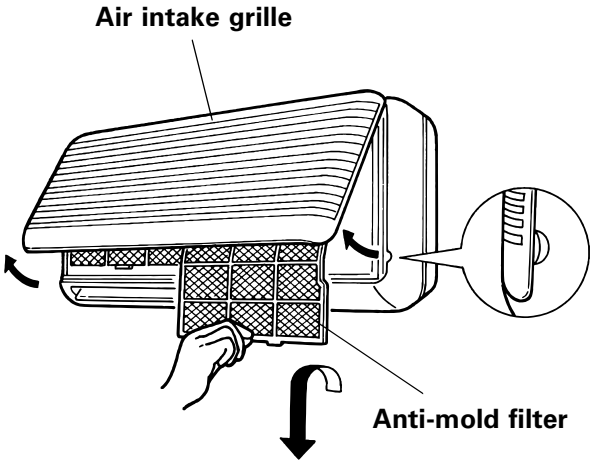
Care and Cleaning (continued)

Anti-Mold Filter

The anti-mold filter behind the air intake grille should be checked and cleaned at least once every two weeks.

How to remove the anti-mold filter

1. Grasp both ends of the air intake grille and pull it out and up.
2. Push the anti-mold filter up slightly, and then pull it down.

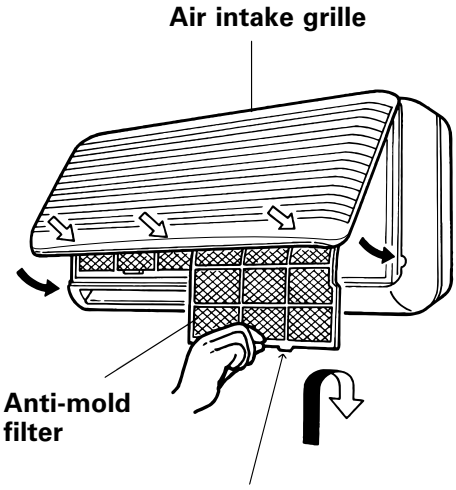


Cleaning

Use a vacuum cleaner to remove light dust. If there is sticky dust on the filter, wash the filter in lukewarm, soapy water, rinse it in clean water, and dry it.

How to replace the anti-mold filter

1. With the "FRONT" mark facing you, slide the anti-mold filter up into the unit and then lower the handle into the groove on the unit.
2. After installing the anti-mold filter, press the locations marked by the arrows (⇩) and close the air intake grille.



Care and Cleaning (continued)

Air Clean Filter (not provided)

The air cleaning filter removes dust and dirt from the air, and reduces odors and smoke from tobacco.

NOTE

The air clean filter is not provided with the air conditioner and must be purchased separately. The first time that you buy the air clean filter, it is necessary to get the **STK-ARF4B-50** model with frame. When changing the filter subsequently, it is only necessary to replace the filter itself (model **STK-F4B-50**).

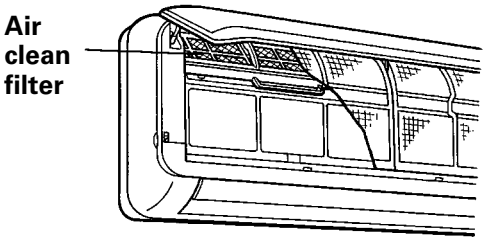
WARNING

This air clean filter cannot remove harmful gases or vapors nor ventilate air in the room. You must open doors or windows frequently when you use gas or oil heating appliances. Otherwise there is a risk of suffocation in extreme cases.

How to install the air clean filter

The air clean filter needs to be installed behind the anti-mold filter.

1. Remove the anti-mold filter.
2. Install the air clean filter in the position shown in the diagram, with the "前面" symbols (meaning "FRONT") facing the front.
3. Reinstall the anti-mold filter.

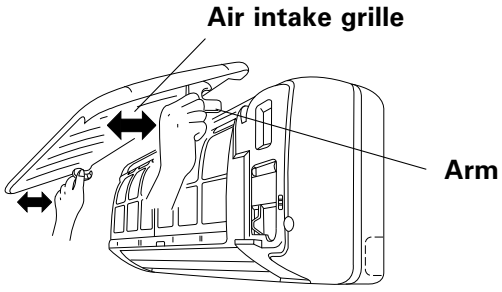


Cleaning the main unit and remote control unit

- Wipe clean using a soft, dry cloth.
- To remove stubborn dirt, moisten a cloth in warm water no hotter than 40°C, wring thoroughly, and then wipe.
- The air intake grille can be removed in order to wash it with water.

Removing and remounting the air intake grille

- With the air intake grille open all the way, grip both arms with your hands and pull toward you to remove.
  To remount, hold the air intake grille roughly horizontal and push it in until the arm shafts fit into the indentations in the main unit, then fit the grille into place.



CAUTION

When using a footstool or the like, be careful not to let it tip over.

Washing the grille with water

- Clean the grille gently using a soft sponge, or the like. Then wipe away any remaining moisture.
- Neutral detergent may be used to remove stubborn dirt. Then rinse thoroughly with water and wipe away any remaining moisture.

Troubleshooting

If your air conditioner does not work properly, first check the following points before requesting service. If it still does not work properly, contact your dealer or service center.

Trouble	Possible Cause	Remedy
Air conditioner does not run at all.	1. Power failure. 2. Leakage breaker tripped. 3. Line voltage is too low. 4. Operation button is OFF. 5. Batteries in remote control unit have run down.	1. Restore power. 2. Contact service center. 3. Consult your electrician or dealer. 4. Press the button again. 5. Replace batteries.
OPERATION lamp flashes and air conditioner does not operate.	Trouble in wiring system.	Contact service center.
Compressor runs but soon stops.	Obstruction in front of condenser coil.	Remove obstruction.
Poor cooling (or heating) performance.	1. Dirty or clogged air filter. 2. Heat source or many people in room. 3. Doors and/or windows are open. 4. Obstacle near air intake or air discharge port. 5. Thermostat is set too high for cooling (or too low for heating). 6. (Outdoor temperature is too low.) 7. (Defrosting system does not work.)	1. Clean air filter to improve airflow. 2. Eliminate heat source if possible. 3. Shut them to keep the heat (or cold) out. 4. Remove it to ensure good airflow. 5. Set the temperature lower (or higher). 6. (Try to use a back-up heater.) 7. (Consult your dealer.)
Clicking sound is heard from the air conditioner.	In heating or cooling operation, any plastic parts may expand or shrink due to a sudden temperature change. In this event, a clicking sound may occur.	This is normal, and the sound will soon disappear.
OPERATION lamp lights but outdoor unit will not run.	1. The use of portable telephones near the air conditioner may cause disturbance to its normal operation.	1. Turn off the power then restart the air conditioner after 1 minute. 2. Consult your dealer.

Tips for Energy Saving

Do not

- **Block the air intake and outlet of the unit. If they are obstructed, the unit will not work well, and may be damaged.**
- Let direct sunlight into the room. Use sunshades, blinds or curtains. If the walls and ceiling of the room are warmed by the sun, it will take longer to cool the room.

Do

- Always try to keep the air filter clean. (Refer to "Care and Cleaning".) A clogged filter will impair the performance of the unit.
- To prevent conditioned air from escaping, keep windows, doors and any other openings closed.

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