TECHNICAL DATA & SERVICE MANUAL

Indoor Unit
AWR518/522HL
FCR518/522HL

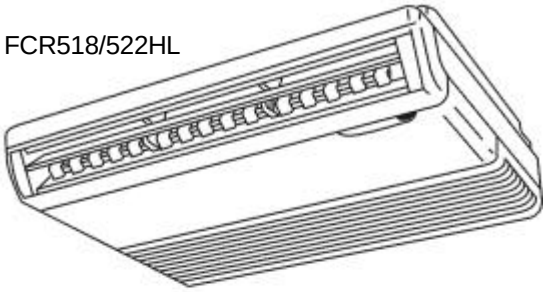
Outdoor Unit
AER518SH3
AER522SH3

Euro-Line®

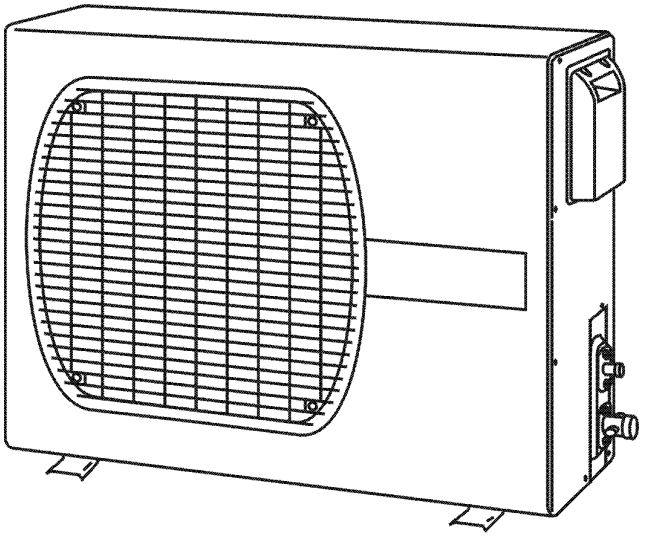
SPLIT SYSTEM AIR CONDITIONER

● **Ceiling-Mounted**

FCR518/522HL

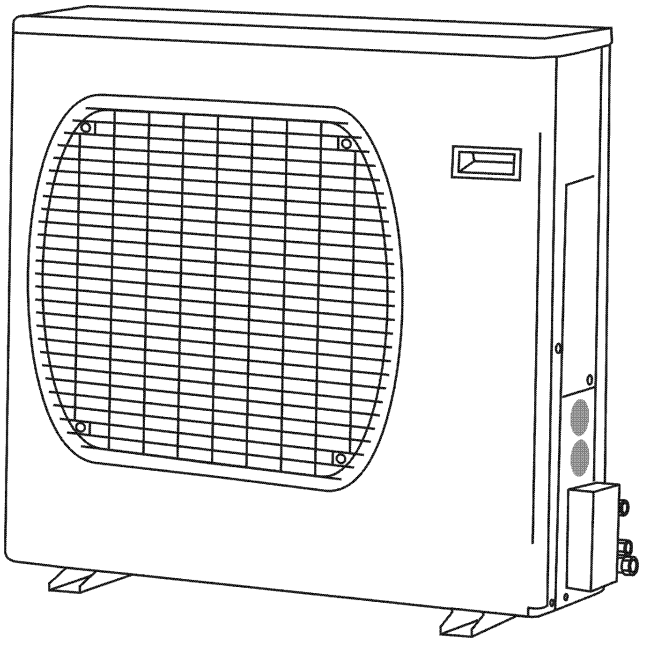


AER518SH3

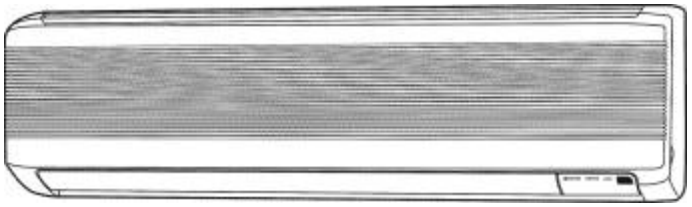


● **Floor-Mounted**

AER522SH3



AWR518/522HL



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 **FCR518HL**
Outdoor Unit **AER518SH3**

Power Source				380 – 400 V – 3N ~ 50 Hz	
Voltage rating			V	400	
Control circuit				230 V ~ 50 Hz	
Performance				Cooling	Heating
	Capacity		kW	4.80	6.40
			BTU/h	16,400	21800
	Air circulation (High)		m^3/h	800	
	Moisture removal (High)		Liters/h	2.7	—
Electrical Rating	Available voltage range		V	342 to 418	
	Running amperes		A	4.0	4.2
	Power input		W	2150	2250
	Power factor		%	—	—
	C.O.P.		W/W	2.30	2.85
	Compressor locked rotor amperes		A	22	
Features	Controls / Temperature control			Microprocessor / I.C. thermostat	
	Control unit			Wireless remote control unit	
	Timer			ON / OFF 24-hours & Daily Program	
	Fan speeds		Indoor / Outdoor	3 and Auto / Auto (Hi, Lo)	
	Airflow direction (Indoor)		Horizontal	Manual	
			Vertical	Auto	
	Air filter			Washable, Anti-Mold	
	Compressor			Rotary (Hermetic)	
	Refrigerant / Amount charged at shipment		g	R407c / 1600	
	Refrigerant control			Capillary tube	
	Operation sound	Indoor – Hi / Me / Lo	dB-A	48 / 44 / 39	
		Outdoor – Hi	dB-A	51	
	Refrigerant tubing connections			Flare type	
	Max. allowable tubing length at shipment		m	10	
	Refrigerant tube diameter	Narrow tube	mm (in.)	6.35 (1/4)	
		Wide tube	mm (in.)	12.7 (1/2)	
	Refrigerant tube kit			Optional	
Dimensions & Weight				Indoor Unit	Outdoor Unit
	Unit dimensions	Height	mm	680	630
		Width	mm	900	830
		Depth	mm	190	305
	Package dimensions	Height	mm	813	713
		Width	mm	1,011	994
		Depth	mm	296	413
	Weight	Net	kg	23.5	59.0
		Shipping	kg	30.0	64.0
	Shipping volume		m^3	0.24	0.29

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

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

Indoor Unit **FCR522HL**
Outdoor Unit **AER522SH3**

Power Source				380 – 400 V – 3N ~ 50 Hz	
Voltage rating			V	400	
Control circuit				230 V ~ 50 Hz	
Performance				Cooling	Heating
	Capacity		kW	5.70	7.40
			BTU/h	19.500	25.200
	Air circulation (High)		m^3/h	900	
	Moisture removal (High)		Li/h	3.0	—
Electrical Rating	Available voltage range		V	342 to 418	
	Running amperes		A	4.8	5.0
	Power input		W	2750	3000
	Power factor		%	—	—
	C.O.P.		W/W	2.1	2.46
	Compressor locked rotor amperes		A	28	
Features	Controls / Temperature control			Microprocessor / I.C. thermostat	
	Control unit			Wireless remote control unit	
	Timer			ON / OFF 24-hours & Daily Program	
	Fan speeds		Indoor / Outdoor	3 and Auto / Auto (Hi, Lo)	
	Airflow direction (Indoor)		Horizontal	Manual	
			Vertical	Auto	
	Air filter			Washable, Anti-Mold	
	Compressor			Rotary (Hermetic)	
	Refrigerant / Amount charged at shipment		g	R407c / 2400	
	Refrigerant control			Capillary tube	
	Operation sound	Indoor – Hi / Me / Lo	dB-A	50 / 47 / 44	
		Outdoor – Hi	dB-A	55	
	Refrigerant tubing connections			Flare type	
	Max. allowable tubing length at shipment		m	10	
	Refrigerant tube diameter	Narrow tube	mm (in.)	6.35 (1/4)	
		Wide tube	mm (in.)	15.88 (5/8)	
	Refrigerant tube kit			Optional	
Dimensions & Weight				Indoor Unit	Outdoor Unit
	Unit dimensions	Height	mm	680	835
		Width	mm	900	850
		Depth	mm	190	305
	Package dimensions	Height	mm	813	913
		Width	mm	1,011	1,000
		Depth	mm	296	400
	Weight	Net	kg	23.5	70.0
		Shipping	kg	30.0	79.0
	Shipping volume		m^3	0.24	0.37

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

Indoor Unit **AWR518HL**
Outdoor Unit **AER522SH3**

Power Source.....Voltage Rating				380-400V-3N-50Hz.....400V	
Control Circuit				230 V - 50Hz	
Performance				Cooling	Heating
	Capacity		kW	4.80	6.40
			BTU/h	16400	21800
	Air circulation (High)		m^3/h	760	
	Moisture removal (High)		Liters/h	2.2	—
Electrical Rating	Available voltage range		V	342 to 418	
	Running amperes		A	4.0	4.2
	Power input		W	2150	2250
	Power factor		%	77	77
	C.O.P.		W/W	2.30	2.85
	Compressor locked rotor amperes		A	22	
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 / Auto (Hi, Lo)	
	Airflow direction (Indoor)		Horizontal	Manual	
			Vertical	Auto	
	Air filter			Washable	
	Compressor			Rotary (Hermetic)	
	Refrigerant / Amount charged at shipment		g	R407c / 1600	
	Refrigerant control			Capillary tube	
	Noise power level	Indoor – Hi / Me / Lo	dB-A	55 / 51 / 49	
		Outdoor – Hi	dB-A	65	
	Refrigerant tubing connections			Flare type	
	Max. allowable tubing length at shipment		m	7.5	
	Refrigerant tube diameter	Narrow tube	mm (in.)	6.35 (1/4)	
		Wide tube	mm (in.)	12.7 (1/2)	
Dimensions & Weight				Indoor Unit	Outdoor Unit
	Unit dimensions	Height	mm	285	630
		Width	mm	995	830
		Depth	mm	206	305
	Package dimensions	Height	mm	276	713
		Width	mm	1,070	994
		Depth	mm	363	413
	Weight	Net	kg	12.0	55
		Shipping	kg	15.0	60
	Shipping volume		m^3	0.11	0.29

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Remarks: Rating conditions are:
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 **AWR522HL**
Outdoor Unit **AER522SH3**

Power Source..... Voltage Rating				380 – 400 V -3N - 50Hz.....400V	
Control Circuit				230 V 50 Hz	
Performance				Cooling	Heating
	Capacity		kW	5.70	7.40
			BTU/h	19.500	25.300
	Air circulation (High)		m^3/h	830	
	Moisture removal (High)		Liters/h	2.7	—
Electrical Rating	Available voltage range		V	342 to 418	
	Running amperes		A	4.8	5.0
	Power input		W	2750	3000
	Power factor		%	-	-
	C.O.P.		W/W	2.1	2.46
	Compressor locked rotor amperes		A	28	
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 / Auto (Hi, Lo)	
	Airflow direction (Indoor)		Horizontal	Manual	
			Vertical	Auto	
	Air filter			Washable	
	Compressor			Rotary (Hermetic)	
	Refrigerant / Amount charged at shipment		g	R407c /	
	Refrigerant control			Capillary tube	
	Noise power level	Indoor – Hi / Me / Lo	dB-A	58 / 55 / 52	
		Outdoor – Hi	dB-A	68	
	Refrigerant tubing connections			Flare type	
	Max. allowable tubing length at shipment		m	7.5	
	Refrigerant tube diameter	Narrow tube	mm (in.)	6.35 (1/4)	
		Wide tube	mm (in.)	15.88 (5/8)	
Dimensions & Weight				Indoor Unit	Outdoor Unit
	Unit dimensions	Height	mm	285	835
		Width	mm	995	850
		Depth	mm	206	305
	Package dimensions	Height	mm	276	913
		Width	mm	1,070	1,000
		Depth	mm	363	400
	Weight	Net	kg	12.0	70.0
		Shipping	kg	15.0	79.0
	Shipping volume		m^3	0.11	0.37

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Remarks: Rating conditions are:
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.

2-2. Major Component Specifications

2-2-1. Indoor Unit

Indoor Unit **FCR518HL**

Controller PCB	Part No.				POW–K186GHS–(C)
	Controls				Microprocessor
	Control circuit fuse				250 V – 3 A
Remote Control Unit					RCS–6HPS3E
Fan & Fan Motor	Type				Centrifugal
	Number ... Dia. and length			mm	2 ... ø 130 / L 180
	Fan motor model ... Number				K48410–M01597 ... 1
	No. of poles ... rpm (230 V, High)				4 ... 1,140
	Nominal output			W	27
	Coil resistance (Ambient temp. 20°C)			Ω	GRY – WHT : 194 - 223 WHT – VLT : 80.1 - 92.2 VLT – ORG : 80.1 - 92.2 ORG – YEL : 200 - 230 WHT – PNK : 238 - 274
	Safety devices	Type			Internal protector
		Operating temp.	Open	°C	145 ± 5
			Close		Automatic reclosing
	Run capacitor			µF	2.0
				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

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Indoor Unit **FCR522HL**

Controller PCB	Part No.				POW–K186GHS–(C)
	Controls				Microprocessor
	Control circuit fuse				250 V – 3 A
Remote Control Unit					RCS–6HPS3E
Fan & Fan Motor	Type				Centrifugal
	Number ... Dia. and length			mm	2 ... ø 130 / L 180
	Fan motor model ... Number				K48410–M01598 ... 1
	No. of poles ... rpm (230 V, High)				4 ... 1,280
	Nominal output			W	41
	Coil resistance (Ambient temp. 20°C)			Ω	GRY – WHT : 124 - 144 WHT – VLT : 69.3 - 79.8 VLT – ORG : 69.3 - 79.8 ORG – YEL : 200 - 233 WHT – PNK : 255 - 294
	Safety devices	Type			Internal protector
		Operating temp.	Open	°C	145 ± 5
			Close		Automatic reclosing
	Run capacitor			µF	2.0
				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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Indoor Unit **AWR518HL**

Controller PCB	Part No.				POW–K181GJH
	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 ... ø88 / L746
	Fan motor model ... Q´ty				UF2– 31A5PA–S ... 1
	No. of poles ...Cool / Heat rpm (High)				2 ... 1,305 / 1,335
	Nominal output			W	30
	Coil resistance (Ambient temp. 20°C)			Ω	WHT – BRN : 130.4 WHT – PNK : 169.8 – : – – : – – : –
	Safety devices	Type			Thermal protector
		Operating temp.	Open	°C	130 ± 8
			Close		Automatic reclosing
	Run capacitor			µF	2.0
				VAC	440
Flap Motor	Type				Stepping motor
	Model				MP24GA2
	Rating				DC 12 V
	Coil resistance (Ambient temp. 20°C)			Ω	Each terminals (1–2, 1–3, 1–4, 1–5) 400 : ± 7%
Heat Exch. Coil	Coil				Aluminum plate fin / Copper tube
	Rows				2
	Fin pitch			mm	1.3
	Face area			m2	0.250

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Indoor Unit **AWR522HL**

Circuit Board Ass´y	Part No.				POW–K241GJH
	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 ... ø88 / L746
	Fan motor model ... Q´ty				UF2– 31A5PA–S ... 1
	No. of poles ...Cool / Heat rpm (High)				2 ... 1,410 / 1,425
	Nominal output			W	30
	Coil resistance (Ambient temp. 20°C)			Ω	WHT – BRN : 130.4 WHT – PNK : 169.8 – : – – : – – : –
	Safety devices	Type			Thermal protector
		Operating temp.	Open	°C	130 ± 8
			Close		Automatic reclosing
	Run capacitor			µF	2.0
				VAC	440
Flap Motor	Type				Stepping motor
	Model				MP24GA2
	Rating				DC 12 V
	Coil resistance (Ambient temp. 20°C)			Ω	Each terminals (1–2, 1–3, 1–4, 1–5) 400 : ± 7%
Heat Exch. Coil	Coil				Aluminum plate fin / Copper tube
	Rows				2
	Fin pitch			mm	1.3
	Face area			m2	0.250

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Outdoor Unit **AER518SH3**

Power source			380 - 400 V - 3N ~ 50 Hz	
Control circuit			220 - 240 V ~ 50 Hz	
CONTROLLER PCB			**POW-C186GH**	
COMPRESSOR				
Type			Rotary (Hermetic)	
Compressor model			C-2RN173H8A 80242088	
Source			380 - 400 V - 3N ~ 50 Hz	
Nominal output		W	1700	
Compressor oil ... Amount		cc	FV68S ... 800	
Coil resistance (Ambient temp. 25°C)	C - R	Ω	5,62	
	C - S	Ω	5,51	
	R - S	Ω	5,62	
Safety devices: Type			Internal protector	External protector
Overload relay			//	HOE-10TB TH-7A
Operating temp.	Open	°C	120 ± 5	//
	Close	°C	Automatic reclosing	//
Operating amp. (Ambient temp. 25°C)			//	5 A
Run capacitor		µF	//	
		VAC	//	
Crank case heater			240 V - 30 W	
FAN AND FAN MOTOR				
Type			Propeller	
Number ... Dia.		mm	1 ... Ø400	
Fan motor model ... Number			Smen 19TFB6055 ... 1	
Source			220 - 240 V ~ 50 Hz	
No. of poles ... rpm (220 V)			6 ... 900	
Nominal output		W	50	
Coil resistance (Ambient temp. 20°C)	WHT - BRN	Ω	77,7	
	WHT - YEL	Ω	366,0	
	WHT - PNK	Ω	211,0	
Safety devices: Type			Internal protector	
Operating temp.	Open	°C	130 ± 8	
	Close		Automatic reclosing	
Run capacitor		µF	2	
		VAC	440	
HEAT EXCH. COIL				
Coil			Aluminum plate fin / Copper tube	
Rows			2	
Fin pitch		mm	1,6	
Face area		m^2	0,453	
EXTERNAL FINISH			Acrylic baked-on enamel finish	

Data subject to change without notice.

Outdoor Unit **AER522SH3**

Power source			380 - 400 V - 3N ~ 50 Hz	
Control circuit			220 - 240 V ~ 50 Hz	
CONTROLLER PCB			**POW-C226GH**	
COMPRESSOR				
Type			Rotary (Hermetic)	
Compressor model			C-RN223H8A 80244088	
Source			380 - 400 V - 3N ~ 50 Hz	
Nominal output		W	2200	
Compressor oil ... Amount		cc	FV68S ... 1350	
Coil resistance (Ambient temp. 25°C)	C - R	Ω	4,97	
	C - S	Ω	4,64	
	R - S	Ω	4,88	
Safety devices: Type			Internal protector	External protector
Overload relay			//	HOE-10TB TH-7A
Operating temp.	Open	°C	Automatic opening	//
	Close	°C	Automatic reclosing	//
Operating amp. (Ambient temp. 25°C)			//	7A
Run capacitor		µF	//	
		VAC	//	
Crank case heater			240 V - 30 W	
FAN AND FAN MOTOR				
Type			Propeller	
Number ... Dia.		mm	1 ... Ø460	
Fan motor model ... Number			Smen 19TFB6064 ... 1	
Source			220 - 240 V ~ 50 Hz	
No. of poles ... rpm (220 V)			6 ... 840	
Nominal output		W	50	
Coil resistance (Ambient temp. 20°C)	WHT - BRN	Ω	99,5	
	WHT - YEL	Ω	252,0	
	WHT - PNK	Ω	63,2	
Safety devices: Type			Internal protector	
Operating temp.	Open	°C	130 ± 8	
	Close		Automatic reclosing	
Run capacitor		µF	5	
		VAC	440	
HEAT EXCH. COIL				
Coil			Aluminum plate fin / Copper tube	
Rows			2	
Fin pitch		mm	2	
Face area		m^2	0,61	
EXTERNAL FINISH			Acrylic baked-on enamel finish	

Data subject to change without notice.

2-3. Other Component Specifications

Indoor Unit **FCR518HL** **FCR522HL**

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

Indoor Unit **AWR518HL**
AWR522HL

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

Thermistor (Coil sensor)		**DTN-TKS131B**
Resistance	kΩ	0°C 15.0 ± 2%

Thermistor (Room sensor)		**DTN-TKS142B**
Resistance	kΩ	25°C 5.0 ± 3%

Outdoor Unit **AER518SH3**

Electro Magnetic Contactor (MG)	**HOE-10TB TH-5A**
Magnetic contactor	
Coil rating	AC 220–240V, 50Hz / AC 240–260V, 60Hz
Coil resistance Ω (at 25°C)	1,260 ± 10%
Contact rating (Main)	AC 440V, 8A
Thermal relay (Overcurrent relay)	
Operating amperes	5A

Negative Phase Relay (47C)	**RDR-S400**
Rating	AC 415V, 3-phase 50Hz
Contact rating	AC 400V, 1A
Operation	Positive phase: ON
	Negative phase: OFF

Relay (PR)	**MY2-TSDF**
Coil rating	DC 24V
Coil resistance Ω (at 20°C)	650 ± 10%
Contact rating	AC 200V, 5A

4-way Valve (SC)	**LB64012 (Coil), V26-110B (Valve)**
Coil rating	AC 220/240V, 50Hz, 6W
Coil resistance Ω (at 20°C)	1,740 ± 7%

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

Thermostat (Fan Speed Control 23S)	**MQT5S-27YZJ**
Switching temp. °C	high → LOW 23.5°C ± 1.5
	low → HIGH 27.0°C $^{+0}_{-3}$
Contact rating	AC 220V, 3A

Outdoor Unit **AER522SH3**

Electro Magnetic Contactor (MG)	**HOE-10TB TH-7A**
Magnetic Contactor	
Coil rating	AC 220–240V, 50Hz / AC 240–260V, 60Hz
Coil resistance Ω (at 25°C)	1,260 ± 10%
Contact rating (Main)	AC 440V, 8A
Thermal relay (Overcurrent relay)	
Operating amperes	7A

Negative Phase Relay (47C)	**RDR-S400**
Rating	AC 415V, 3-phase 50Hz
Contact rating	AC 400V, 1A
Operation	Positive phase: ON
	Negative phase: OFF

4-way Valve (20S)	**LB64012 (Coil), V26-110D (Valve)**
Coil rating	AC 220/240V, 50Hz, 6W
Coil resistance Ω (at 20°C)	1,740 ± 7%

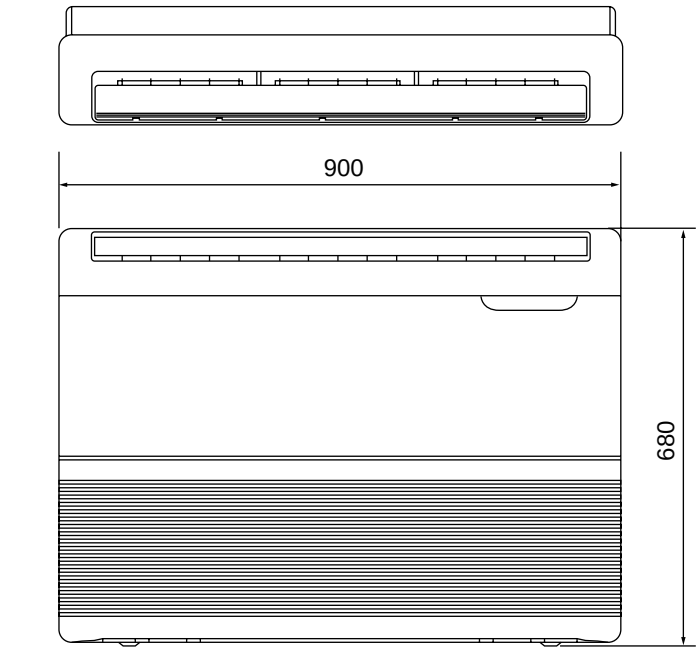
High pressure switch (HPS)	**ACB - IB29**
Operating press. setting	OFF 25 ± 1
	ON 20 ± 1.5

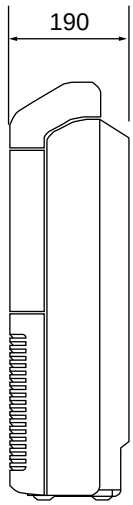
Thermostat (Defrost thermo. 23D)	**TRS02-12MSR316**
Operating temp. °C	ON 12 ± 2
	Diff. 8 deg. below

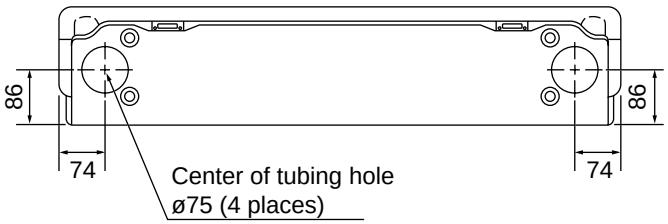
Thermostat (Fan Speed Control 23S)	**YTB-S383**
Switching temp. °C	high → LOW 28.5°C ± 1
	low → HIGH 31°C ± 1

3. DIMENSIONAL DATA

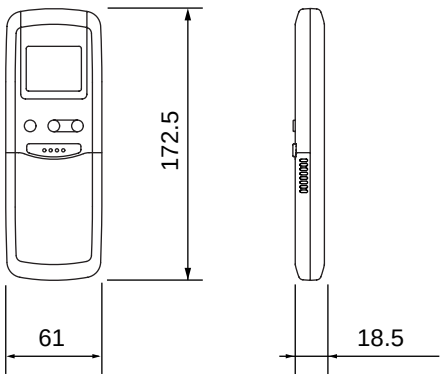
Indoor Unit **FCR518HL** **FCR522HL**

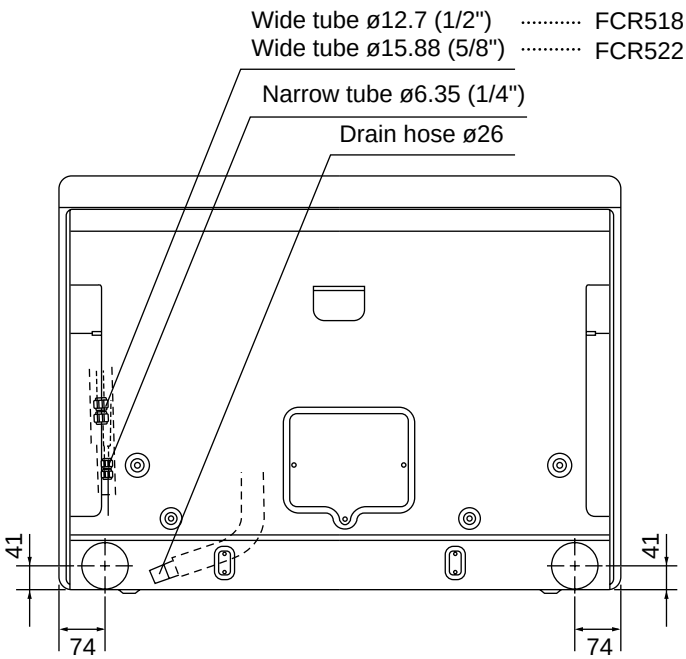






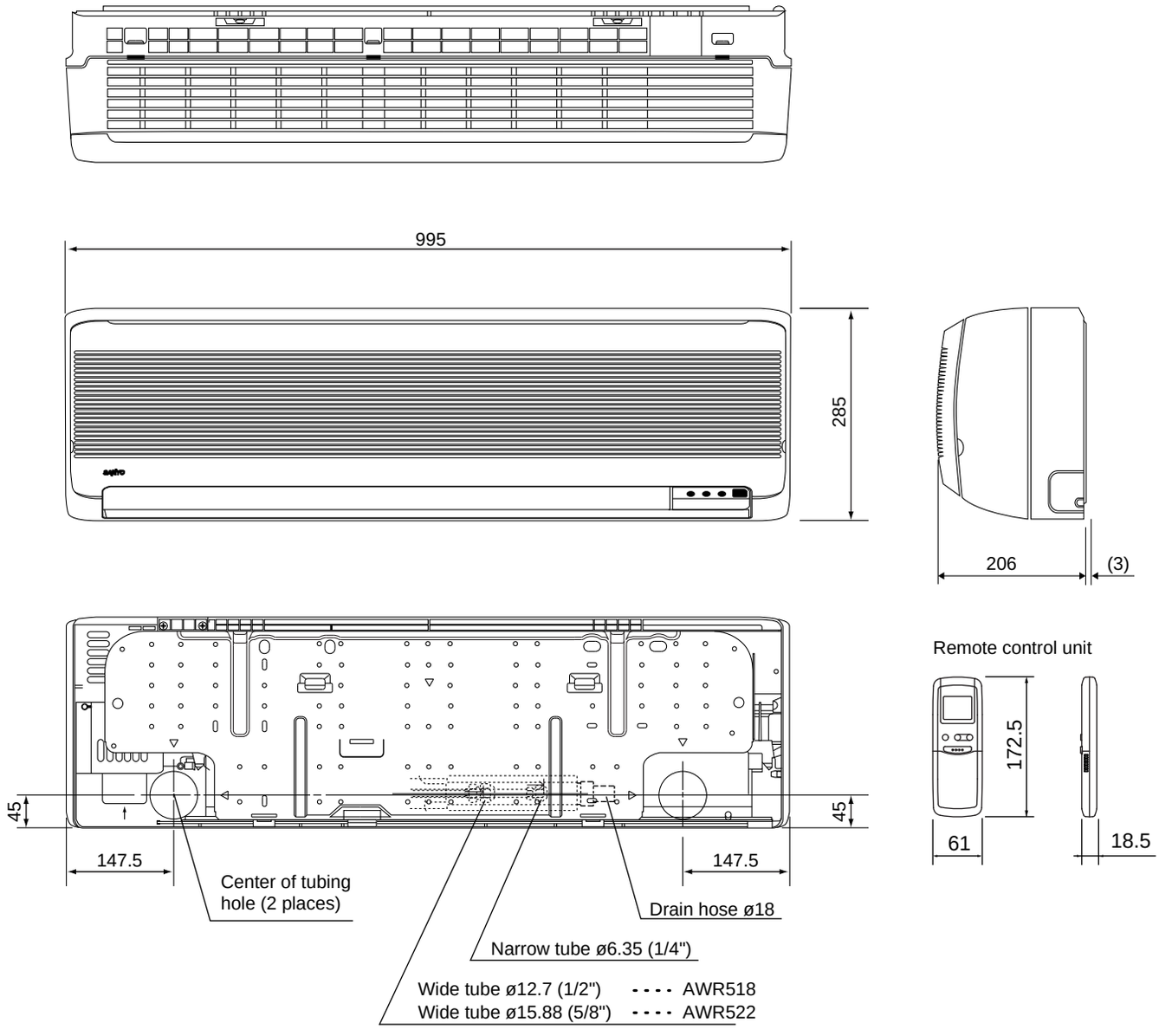
Remote control unit





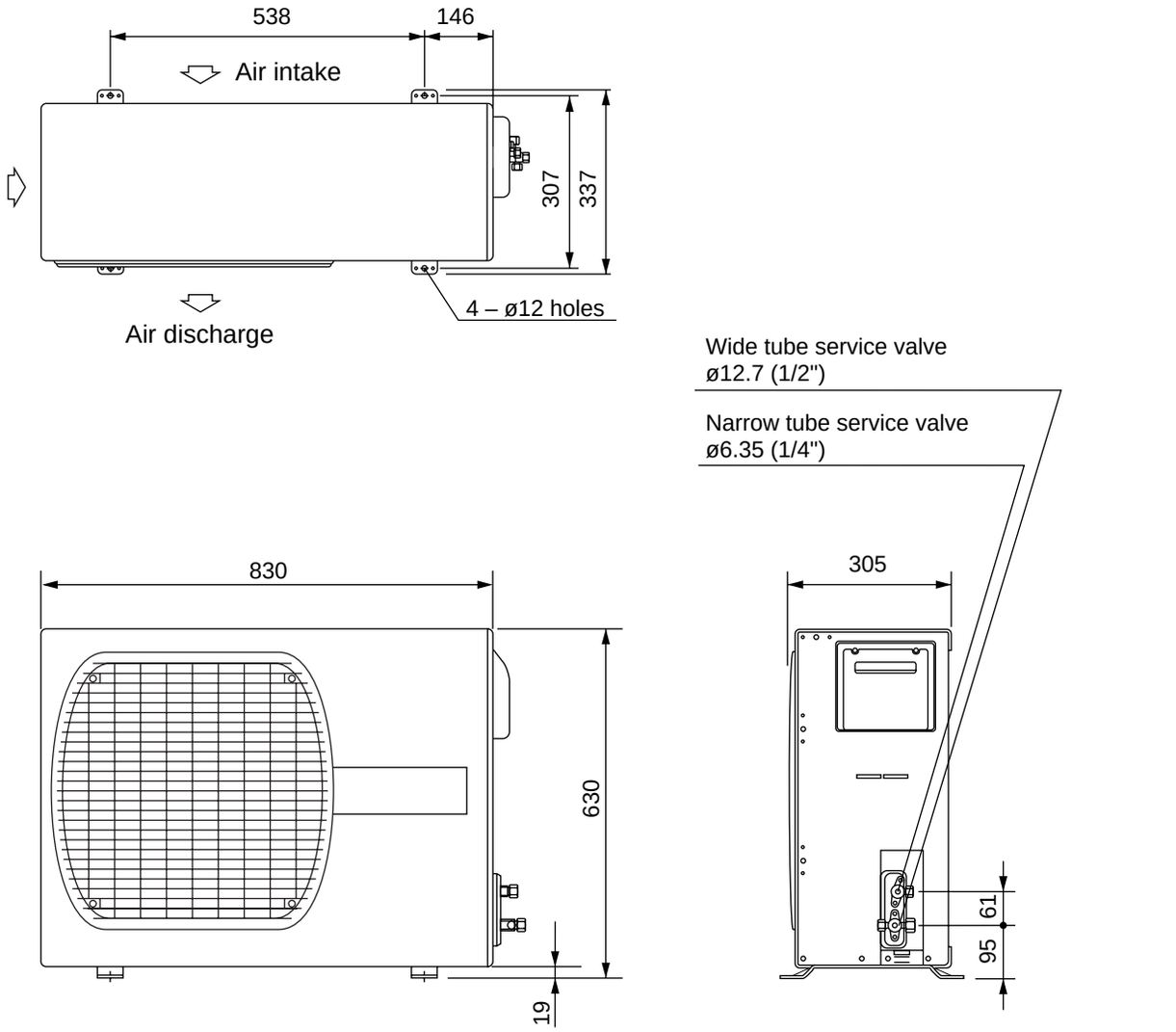
Dimensions : mm

Indoor Unit **AWR518HL**
AWR522HL



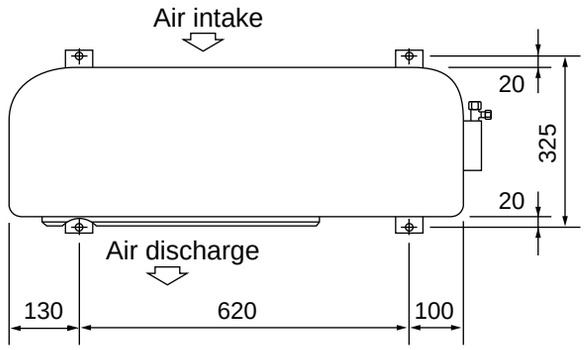
Unit : mm

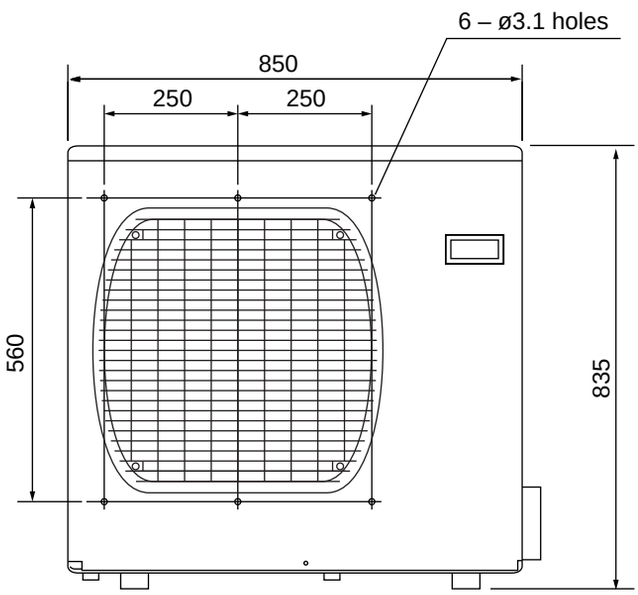
Outdoor Unit **AER518SH3**

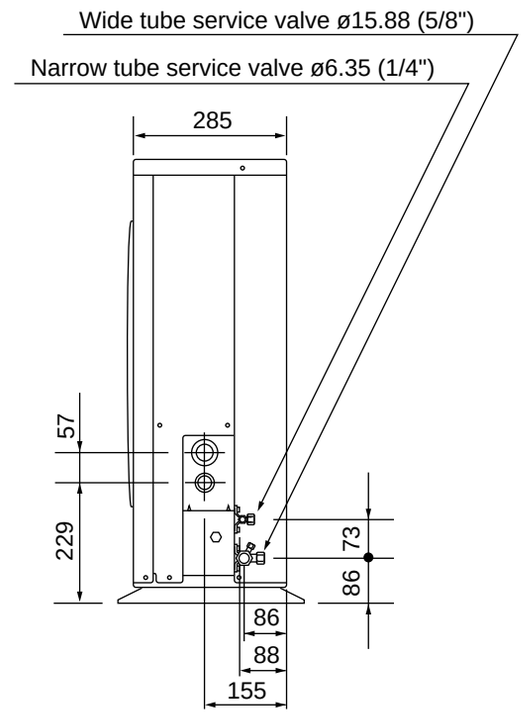


Unit : mm

Outdoor Unit : AER522SH3



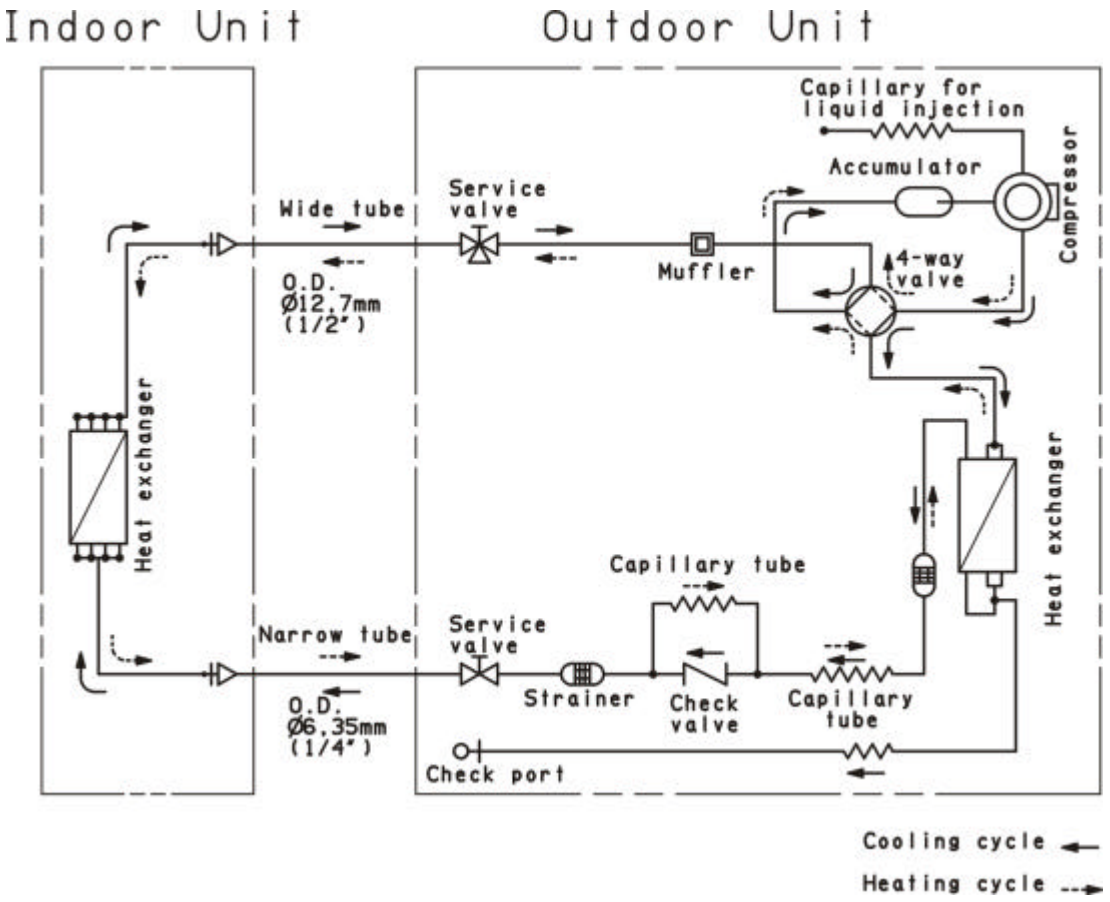




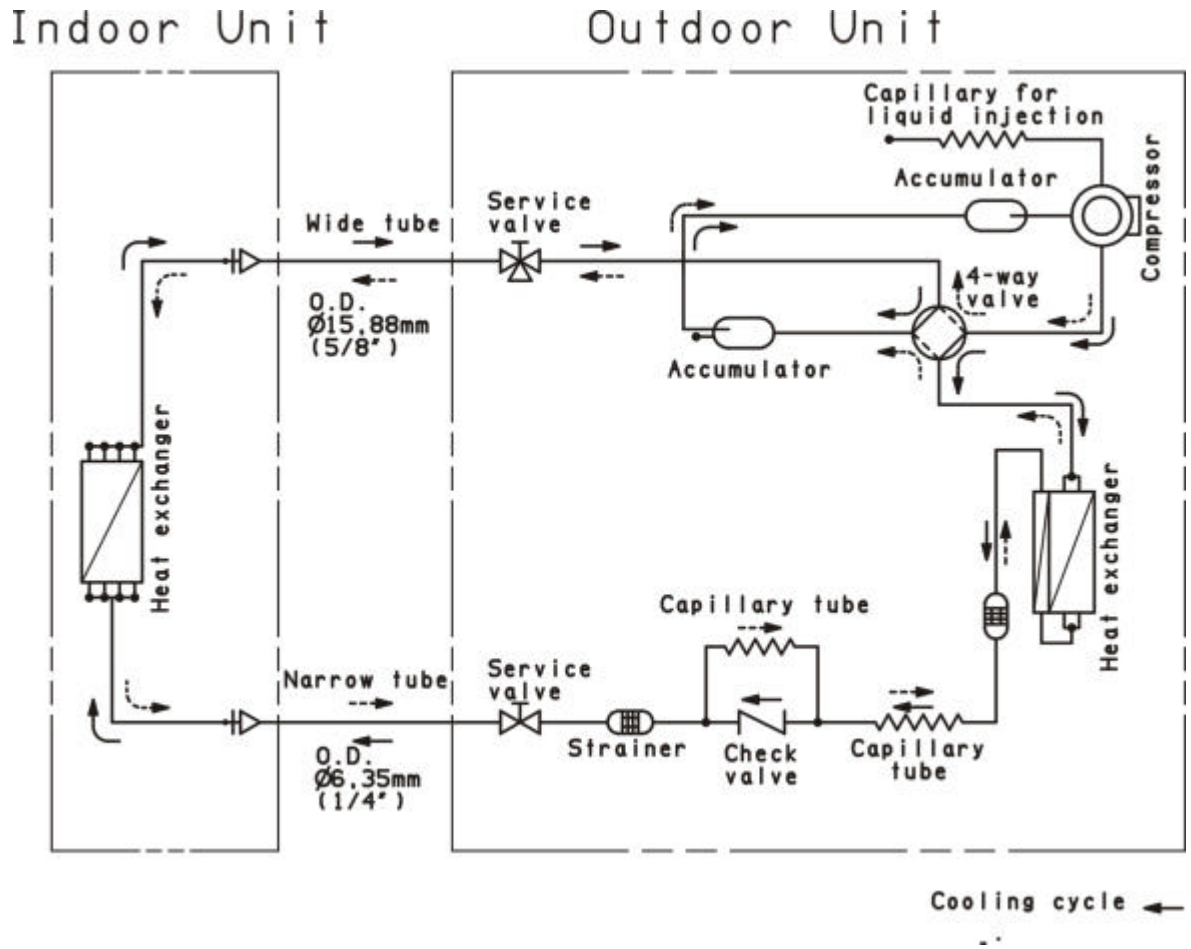
Unit : mm

4. REFRIGERANT FLOW DIAGRAM

Indoor Unit **AWR518HL -FCR518HL** Outdoor Unit **AER518SH3**



Indoor Unit **AWR522HL -FCR522HL** Outdoor Unit **AER522SH3**



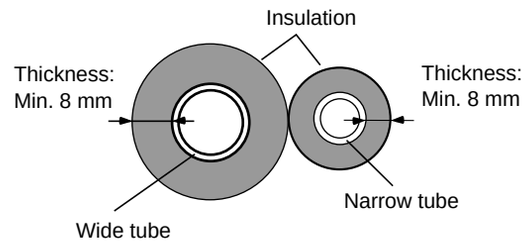
Insulation of Refrigerant Tubing

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

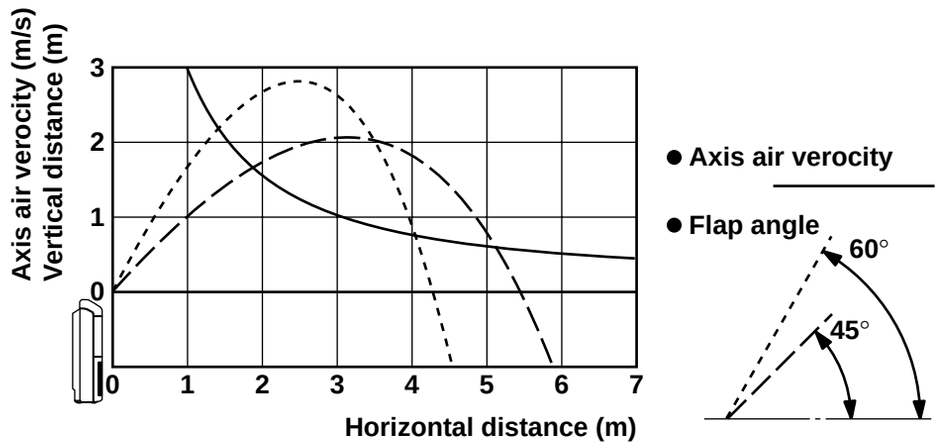
5.1 AIR THROW DISTANCE CHART

Indoor Unit **FCR518HL**

■ Floor mounted

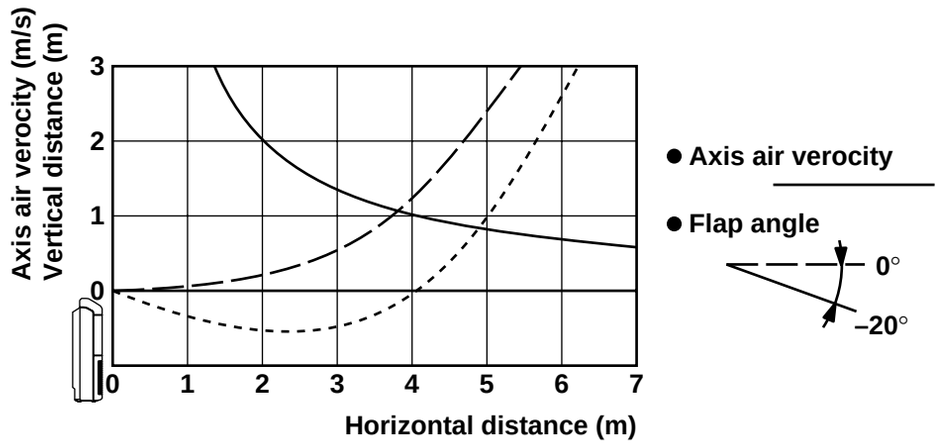
Cooling

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



Heating

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

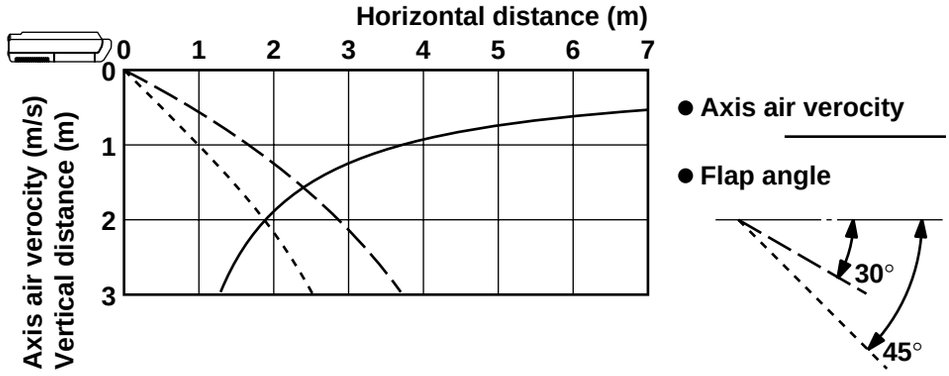


Indoor Unit **FCR518HL**

■ Ceiling mounted

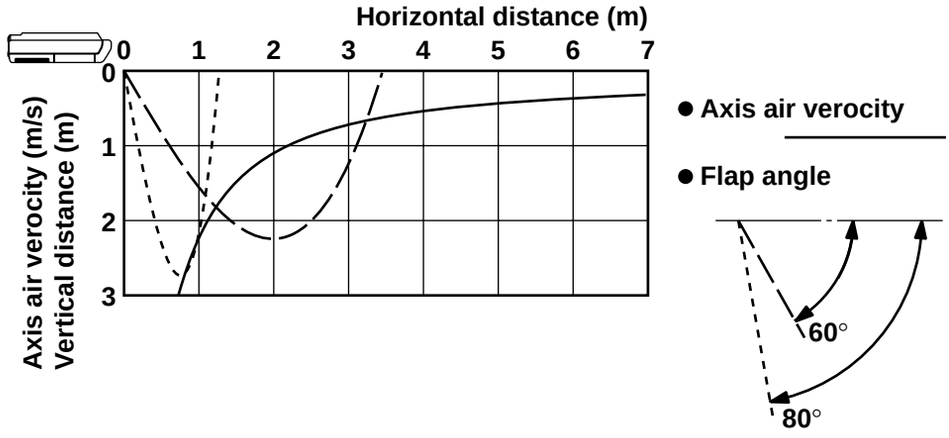
Cooling

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



Heating

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

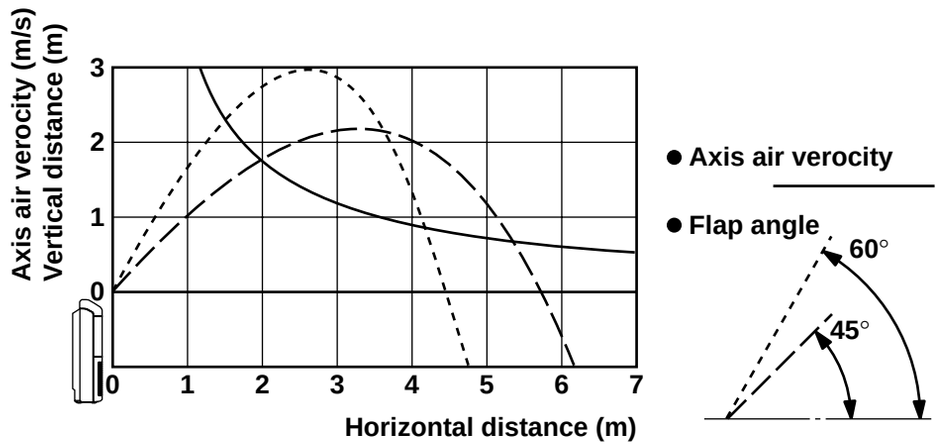


Indoor Unit **FCR522HL**

■ Floor mounted

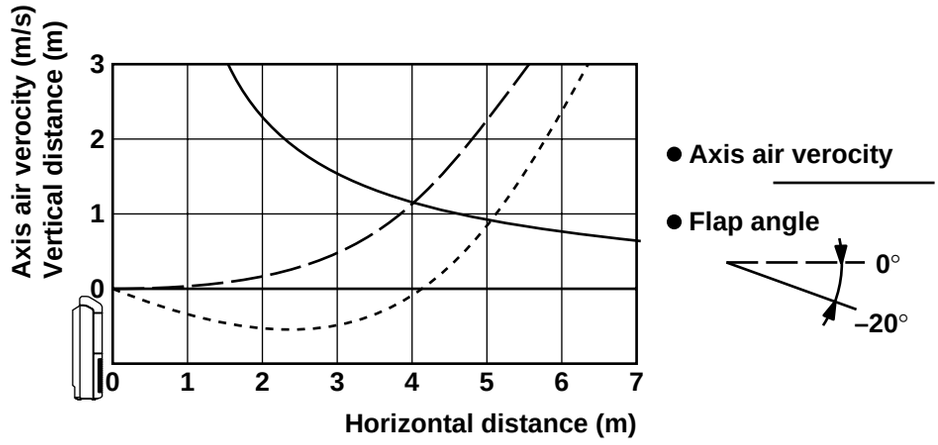
Cooling

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



Heating

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

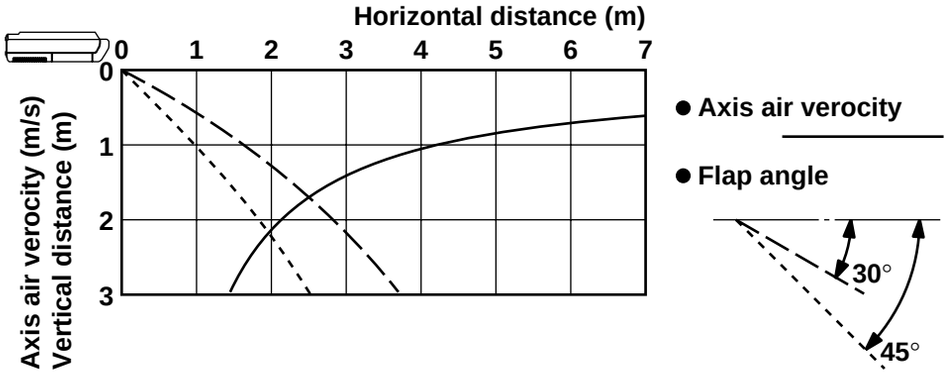


Indoor Unit **FCR522HL**

■ Ceiling mounted

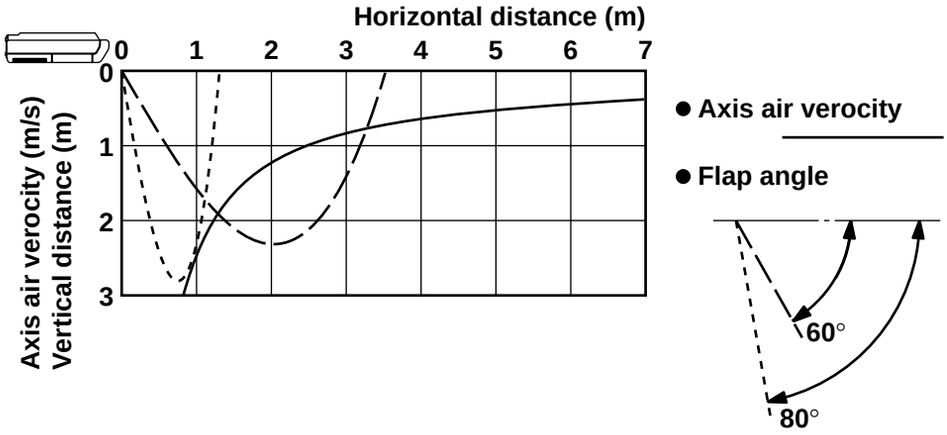
Cooling

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



Heating

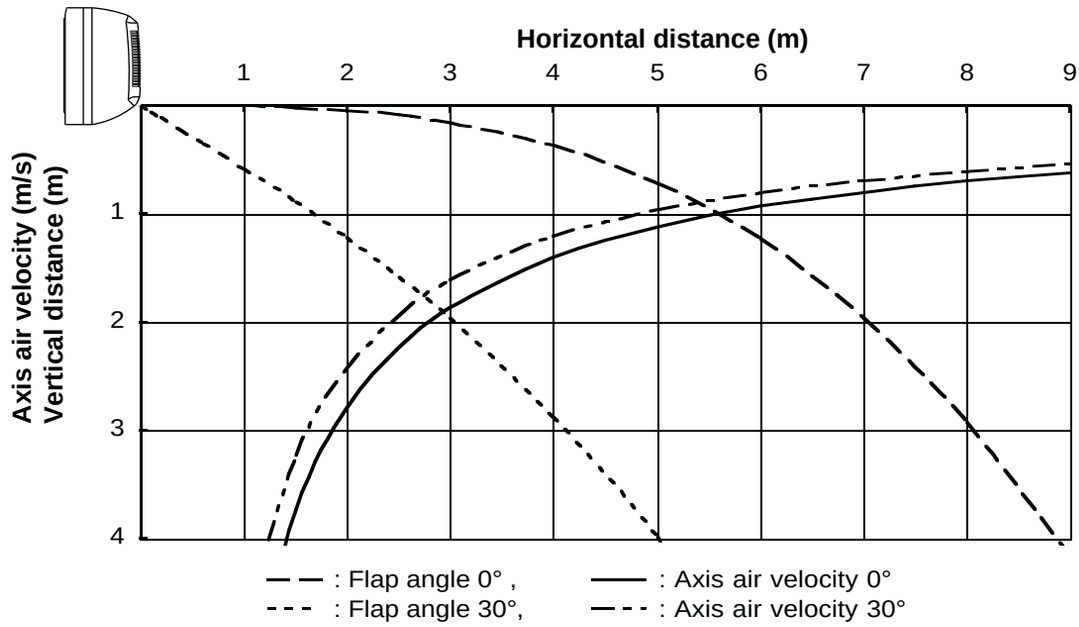
Room air temp. : 20°C
Fan speed : High



Indoor Unit **AWR518HL**

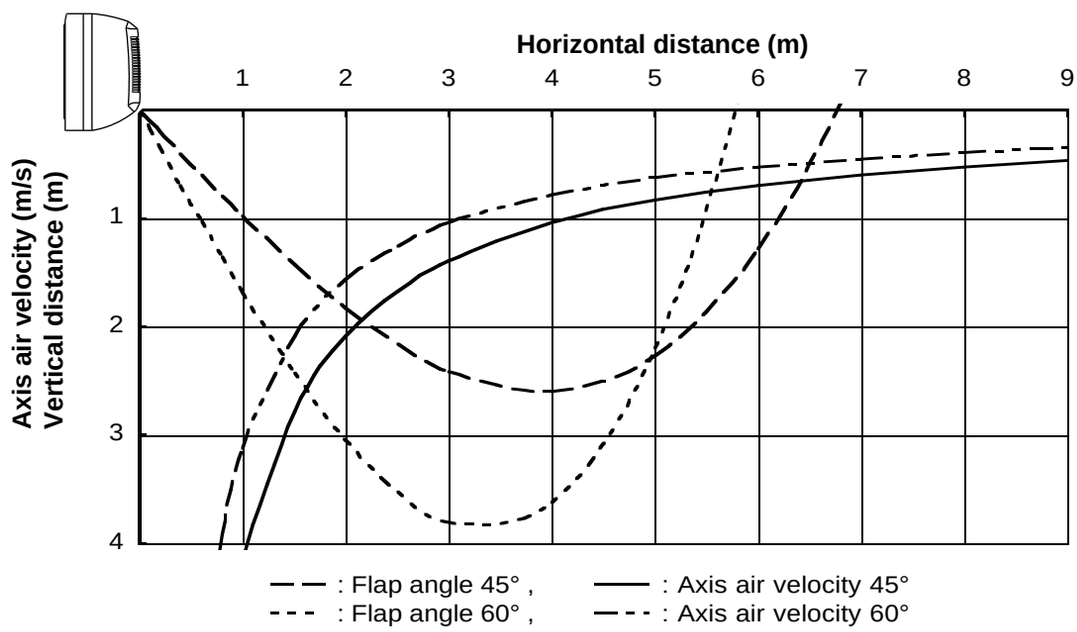
Cooling

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



Heating

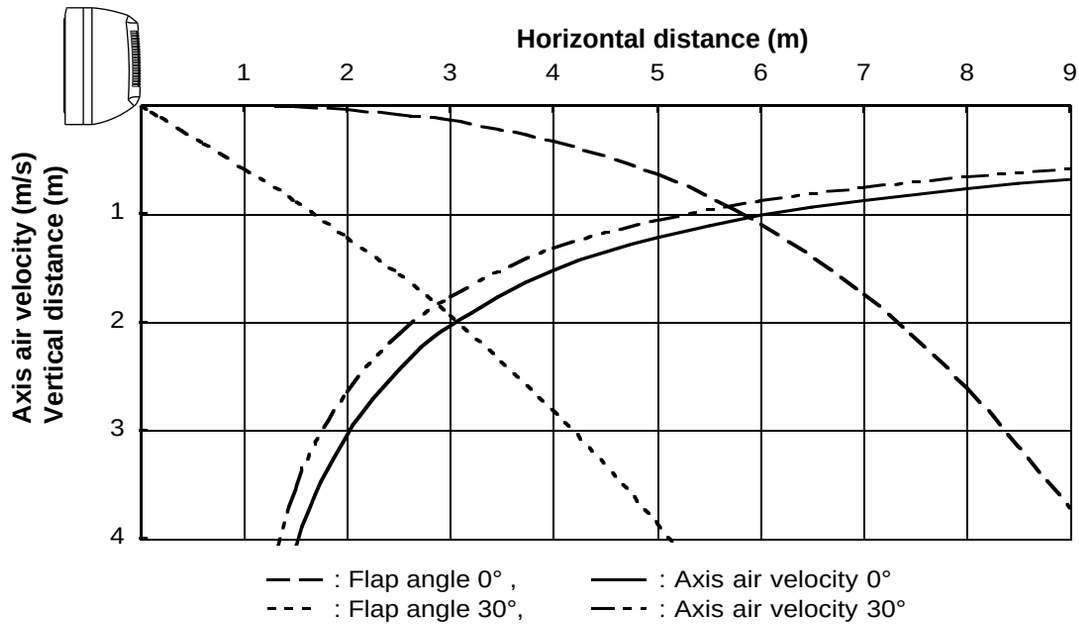
Room air temp. : 20°C
Fan speed : High



Indoor Unit **AWR522HL**

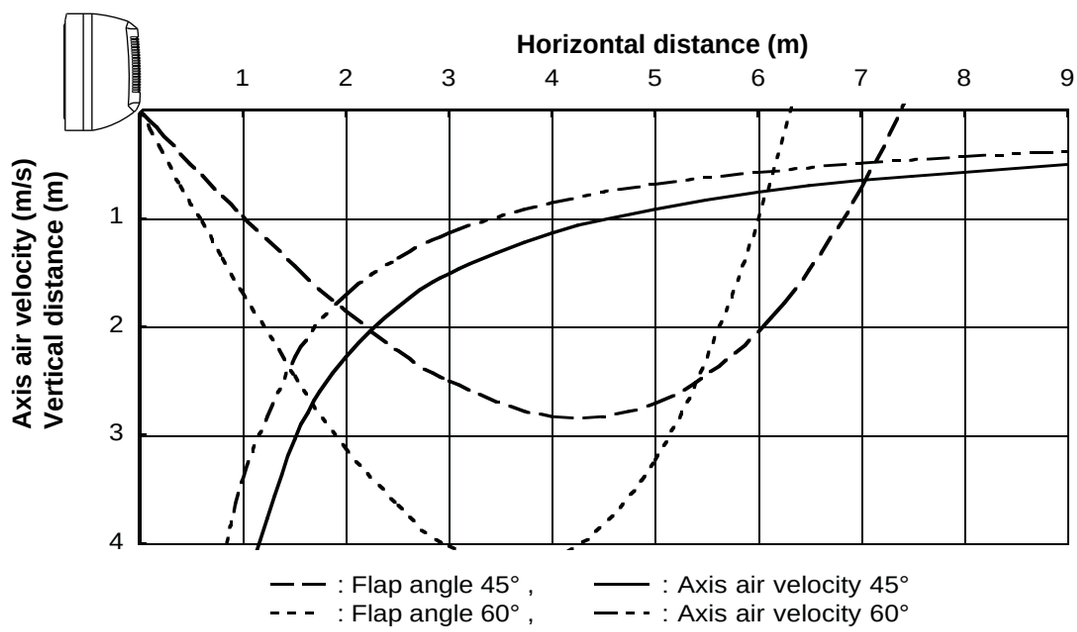
Cooling

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



Heating

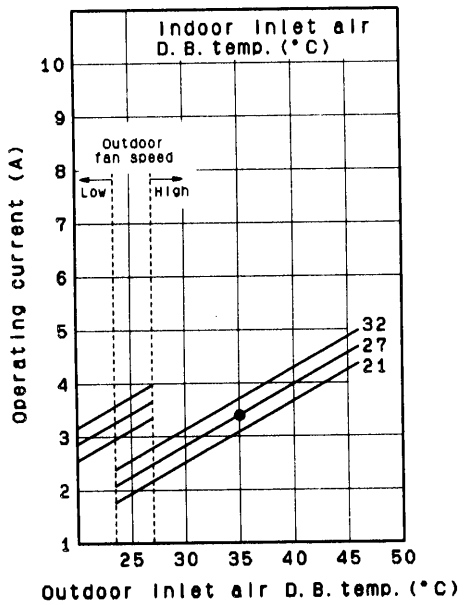
Room air temp. : 20°C
Fan speed : High

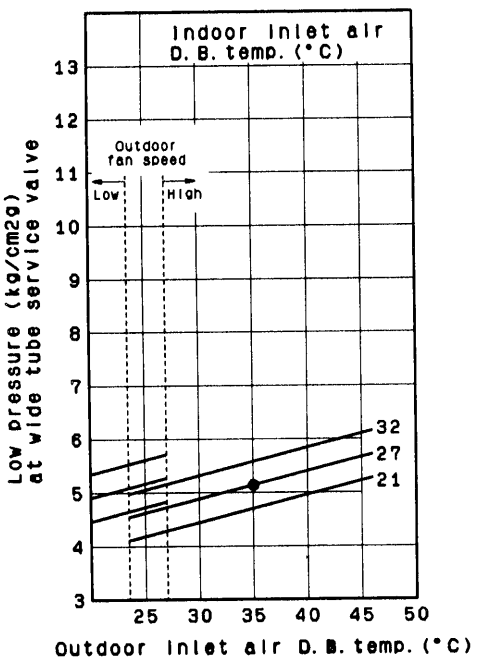


5-2. Performance Charts

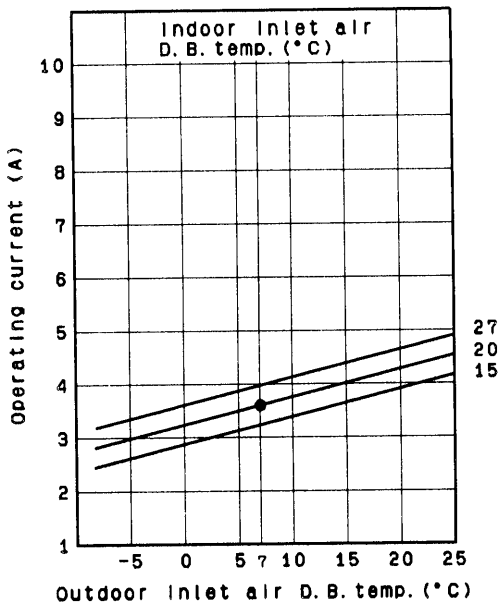
Indoor Unit **FCR518HL** Outdoor Unit **AER518SH3**

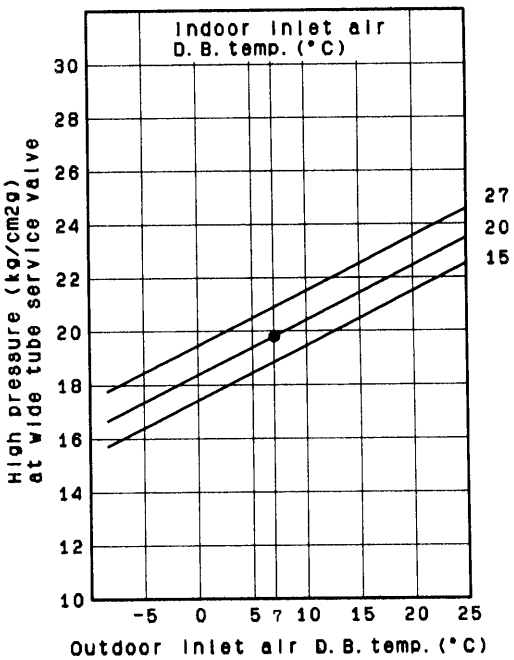
● Cooling characteristics





● Heating characteristics





NOTE

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

●.....Points of Rating condition

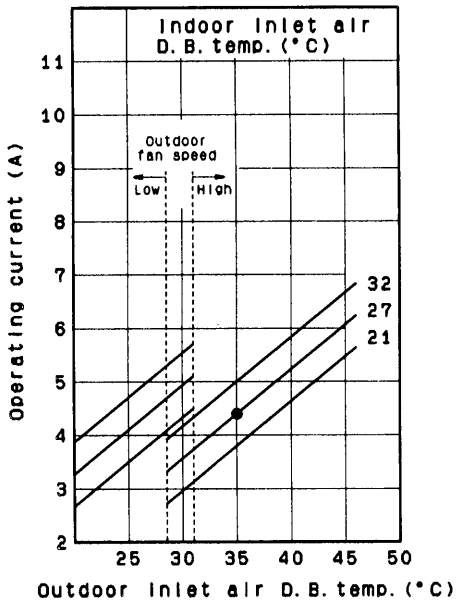
Black dots in above charts indicate the following rating conditions.

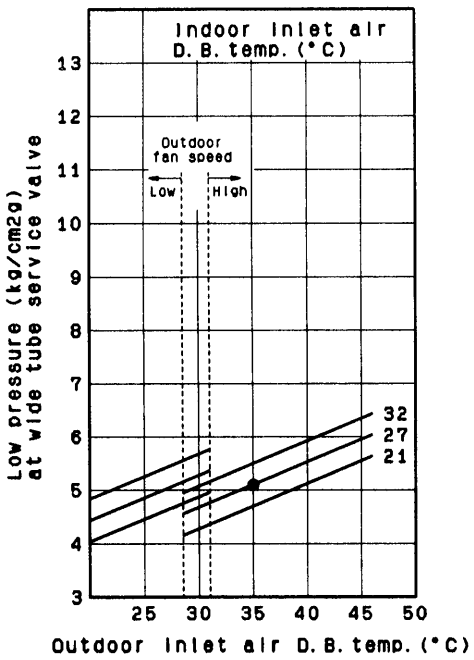
Cooling: Indoor air temperature 27°C DB/19°C WB
Outdoor air temperature 35°C DB/24°C WB

Heating Indoor air temperature 20°C DB
Outdoor air temperature 7°C DB/6°C WB

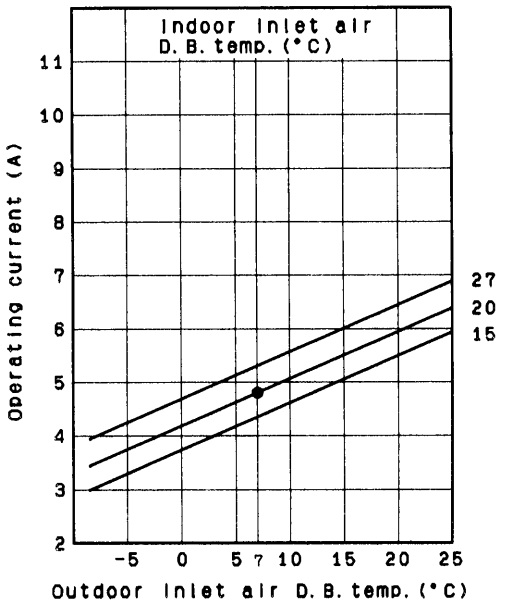
Indoor Unit **FCR522HL** Outdoor Unit **AER522SH3**

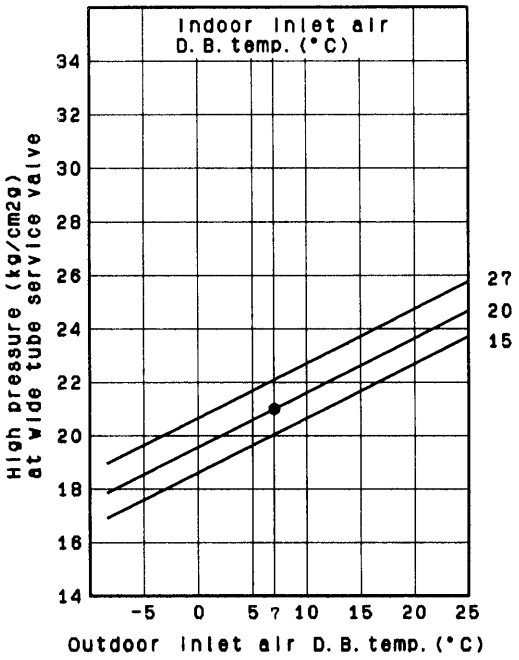
● Cooling characteristics





● Heating characteristics





NOTE

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

●.....Points of Rating condition

Black dots in above charts indicate the following rating conditions.

Cooling: Indoor air temperature 27°C DB/19°C WB
Outdoor air temperature 35°C DB/24°C WB

Heating: Indoor air temperature 20°C DB
Outdoor air temperature 7°C DB/6°C WB

5-3. Cooling Capacity

Indoor Unit **AWR518HL**
Outdoor Unit **AER518SH3**

400V -3N-50Hz

RATING CAPACITY 4.8 kW AIR FLOW RATE 760 m³/h							
EVAPORATOR		CONDENSER					
ENT.TEMP. °C		OUTDOOR AMBIENT TEMP. °C					
W.B.	D.B.		25	30	35	40	43
15		TC	4.55	4.41	4.21	3.94	3.64
		CM	1.77	1.89	2.03	2.23	2.43
	21	SHC	3.12	3.06	2.95	2.83	2.68
	23	SHC	3.54	3.46	3.36	3.23	3.09
	25	SHC	3.94	3.86	3.76	3.63	3.49
	27	SHC	4.35	4.27	4.16	3.94	3.64
	29	SHC	4.55	4.41	4.21	3.94	3.64
	31	SHC	4.55	4.41	4.21	3.94	3.64
17		TC	4.93	4.74	4.51	4.24	3.90
		CM	1.81	1.94	2.08	2.29	2.49
	21	SHC	2.73	2.65	2.55	2.42	2.26
	23	SHC	3.14	3.05	2.94	2.82	2.67
	25	SHC	3.55	3.45	3.35	3.22	3.07
	27	SHC	3.96	3.85	3.75	3.62	3.47
	29	SHC	4.38	4.26	4.15	4.03	3.87
	31	SHC	4.79	4.65	4.51	4.24	3.90
19		TC	5.22	5.04	4.80	4.51	4.15
		CM	1.90	2.01	2.15	2.36	2.56
	21	SHC	2.29	2.21	2.11	1.98	1.84
	23	SHC	2.69	2.62	2.51	2.39	2.24
	25	SHC	3.08	3.02	2.91	2.80	2.64
	27	SHC	3.47	3.42	3.32	3.19	3.05
	29	SHC	3.86	3.82	3.71	3.60	3.44
	31	SHC	4.27	4.23	4.12	4.00	3.85
21		TC	5.53	5.34	5.09	4.78	4.40
		CM	1.94	2.06	2.22	2.43	2.64
	23	SHC	2.26	2.18	2.08	1.95	1.81
	25	SHC	2.64	2.58	2.48	2.36	2.21
	27	SHC	3.04	2.98	2.88	2.77	2.61
	29	SHC	3.43	3.38	3.29	3.16	3.02
	31	SHC	3.83	3.79	3.68	3.57	3.42
23		TC	5.91	5.66	5.34	5.00	4.65
		CM	1.98	2.11	2.27	2.48	2.70
	25	SHC	2.21	2.12	2.00	1.88	1.75
	27	SHC	2.59	2.51	2.40	2.27	2.15
	29	SHC	2.98	2.92	2.81	2.68	2.56
	31	SHC	3.41	3.33	3.20	3.08	2.96

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 **AWR522HL**
Outdoor Unit **AER22SH3**

230V Single Phase 50Hz

RATING CAPACITY 6.10 kW AIR FLOW RATE 830 m^3/h						
EVAPORATOR		CONDENSER				
ENT. TEMP. ℃		OUTDOOR AMBIENT TEMP. ℃				
W.B.	D.B.		30	35	40	46
		TC	5.61	5.34	5.02	4.62
		CM	2.16	2.31	2.56	2.90
	21	SHC	3.66	3.51	3.33	3.12
15	23	SHC	4.04	3.89	3.71	3.50
	25	SHC	4.42	4.27	4.09	3.88
	27	SHC	4.80	4.65	4.47	4.26
	29	SHC	5.18	5.03	4.85	4.62
	31	SHC	5.56	5.34	5.02	4.62
		TC	6.02	5.73	5.39	4.96
		CM	2.22	2.38	2.63	2.97
	21	SHC	3.27	3.12	2.94	2.73
17	23	SHC	3.65	3.50	3.32	3.11
	25	SHC	4.03	3.88	3.70	3.49
	27	SHC	4.41	4.26	4.09	3.87
	29	SHC	4.79	4.64	4.47	4.25
	31	SHC	5.17	5.02	4.85	4.63
		TC	6.41	# 6.10	5.73	5.28
		CM	2.29	2.45	2.70	3.05
	21	SHC	2.86	2.71	2.53	2.32
19	23	SHC	3.24	3.09	2.91	2.70
	25	SHC	3.62	3.47	3.29	3.08
	27	SHC	4.00	3.85	3.67	3.46
	29	SHC	4.38	4.23	4.05	3.84
	31	SHC	4.76	4.61	4.43	4.22
		TC	6.79	6.47	6.08	5.59
		CM	2.35	2.52	2.78	3.13
	23	SHC	2.81	2.66	2.49	2.28
21	25	SHC	3.19	3.04	2.87	2.66
	27	SHC	3.57	3.42	3.25	3.04
	29	SHC	3.95	3.80	3.63	3.42
	31	SHC	4.33	4.18	4.01	3.80
		TC	7.19	6.79	6.36	5.91
		CM	2.41	2.59	2.85	3.20
23	25	SHC	2.74	2.57	2.39	2.21
	27	SHC	3.12	2.95	2.77	2.59
	29	SHC	3.50	3.33	3.15	2.97
	31	SHC	3.88	3.71	3.53	3.35

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 **FCR518HL**
Outdoor Unit **AER518SH3**

400V - 3N - 50Hz

RATING CAPACITY 4.8 kW AIR FLOW RATE 800 m³/h							
EVAPORATOR		CONDENSER					
ENT.TEMP. °C		OUTDOOR AMBIENT TEMP. °C					
W.B.	D.B.		25	30	35	40	43
		TC	4.55	4.41	4.21	3.94	3.64
		CM	1.77	1.89	2.03	2.23	2.43
	21	SHC	3.12	3.06	2.95	2.83	2.68
	23	SHC	3.54	3.46	3.36	3.23	3.09
15	25	SHC	3.94	3.86	3.76	3.63	3.49
	27	SHC	4.35	4.27	4.16	3.94	3.64
	29	SHC	4.55	4.41	4.21	3.94	3.64
	31	SHC	4.55	4.41	4.21	3.94	3.64
		TC	4.93	4.74	4.51	4.24	3.90
		CM	1.81	1.94	2.08	2.29	2.49
	21	SHC	2.73	2.65	2.55	2.42	2.26
	23	SHC	3.14	3.05	2.94	2.82	2.67
17	25	SHC	3.55	3.45	3.35	3.22	3.07
	27	SHC	3.96	3.85	3.75	3.62	3.47
	29	SHC	4.38	4.26	4.15	4.03	3.87
	31	SHC	4.79	4.65	4.51	4.24	3.90
		TC	5.22	5.04	4.80	4.51	4.15
		CM	1.90	2.01	2.15	2.36	2.56
	21	SHC	2.29	2.21	2.11	1.98	1.84
	23	SHC	2.69	2.62	2.51	2.39	2.24
19	25	SHC	3.08	3.02	2.91	2.80	2.64
	27	SHC	3.47	3.42	3.32	3.19	3.05
	29	SHC	3.86	3.82	3.71	3.60	3.44
	31	SHC	4.27	4.23	4.12	4.00	3.85
		TC	5.53	5.34	5.09	4.78	4.40
		CM	1.94	2.06	2.22	2.43	2.64
	23	SHC	2.26	2.18	2.08	1.95	1.81
21	25	SHC	2.64	2.58	2.48	2.36	2.21
	27	SHC	3.04	2.98	2.88	2.77	2.61
	29	SHC	3.43	3.38	3.29	3.16	3.02
	31	SHC	3.83	3.79	3.68	3.57	3.42
		TC	5.91	5.66	5.34	5.00	4.65
		CM	1.98	2.11	2.27	2.48	2.70
23	25	SHC	2.21	2.12	2.00	1.88	1.75
	27	SHC	2.59	2.51	2.40	2.27	2.15
	29	SHC	2.98	2.92	2.81	2.68	2.56
	31	SHC	3.41	3.33	3.20	3.08	2.96

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 **FCR522HL**
Outdoor Unit **AER522SH3**

400V - 3N - 50Hz

RATING CAPACITY 5,7 kW AIR FLOW RATE 900 m³/h							
EVAPORATOR		CONDENSER					
ENT.TEMP. °C		OUTDOOR AMBIENT TEMP. °C					
W.B.	D.B.		25	30	35	40	43
		TC	5402,61	5241,52	4993,70	4683,91	4324,57
		CM	2263,72	2414,63	2599,09	2850,61	3102,13
	21	SHC	3704,81	3630,65	3506,74	3358,04	3184,57
	23	SHC	4197,94	4113,91	3990,00	3841,30	3667,83
15	25	SHC	4678,43	4584,78	4460,87	4312,17	4138,70
	27	SHC	5171,56	5068,04	4944,13	4683,91	4324,57
	29	SHC	5402,61	5241,52	4993,70	4683,91	4324,57
	31	SHC	5402,61	5241,52	4993,70	4683,91	4324,57
		TC	5848,70	5625,65	5353,04	5030,87	4634,35
		CM	2314,02	2481,71	2666,16	2934,45	3185,98
	21	SHC	3239,46	3147,39	3023,48	2874,78	2688,91
	23	SHC	3724,10	3618,26	3494,35	3345,65	3172,17
17	25	SHC	4221,50	4101,52	3977,61	3828,91	3643,04
	27	SHC	4706,14	4572,39	4448,48	4299,78	4126,30
	29	SHC	5203,54	5055,65	4931,74	4783,04	4597,17
	31	SHC	5688,18	5526,52	5353,04	5030,87	4634,35
		TC	6195,65	5985,00	5700,00	5353,04	4931,74
		CM	2431,40	2565,55	2750,00	3018,29	3269,82
	21	SHC	2713,70	2626,96	2503,04	2354,35	2180,87
	23	SHC	3190,76	3110,22	2986,30	2837,61	2664,13
19	25	SHC	3655,43	3581,09	3457,17	3320,87	3135,00
	27	SHC	4126,30	4064,35	3940,43	3791,74	3618,26
	29	SHC	4584,78	4535,22	4411,30	4275,00	4089,13
	31	SHC	5068,04	5018,48	4894,57	4745,87	4572,39
		TC	6567,39	6344,35	6046,96	5675,22	5229,13
		CM	2481,71	2632,62	2833,84	3102,13	3370,43
	23	SHC	2679,50	2589,78	2465,87	2317,17	2143,70
21	25	SHC	3139,21	3060,65	2949,13	2800,43	2626,96
	27	SHC	3612,07	3543,91	3420,00	3283,70	3097,83
	29	SHC	4071,78	4014,78	3903,26	3754,57	3581,09
	31	SHC	4551,20	4498,04	4374,13	4237,83	4064,35
		TC	7013,48	6716,09	6344,35	5935,43	5526,52
		CM	2532,01	2699,70	2900,91	3169,21	3454,27
23	25	SHC	2630,05	2515,43	2379,13	2230,43	2081,74
	27	SHC	3078,92	2986,30	2850,00	2701,30	2552,61
	29	SHC	3541,81	3469,57	3333,26	3184,57	3035,87
	31	SHC	4046,78	3952,83	3804,13	3655,43	3519,13

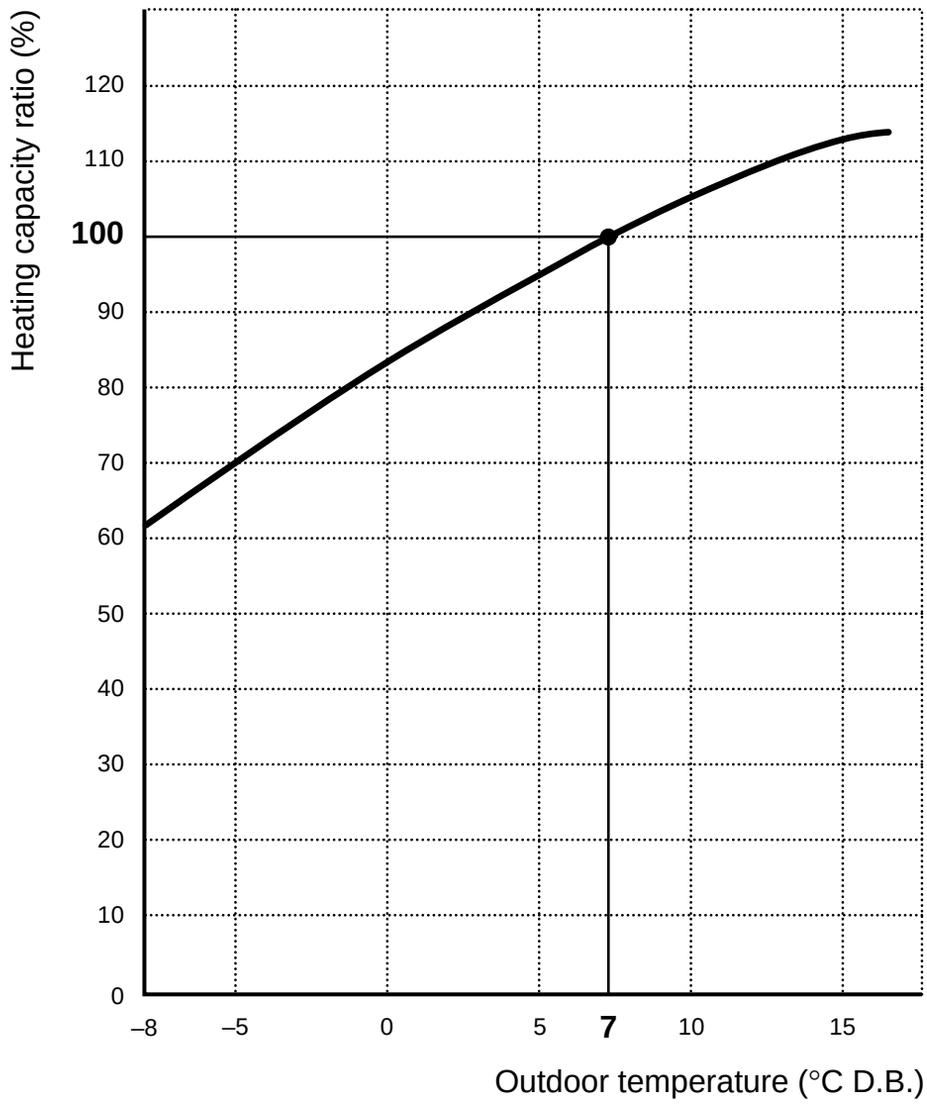
TC: TOTAL COOLING CAPACITY kW
SHC: SENSIBLE HEAT CAPACITY kW
CM: COMPRESSOR INPUT kW

RATING CONDITIONS

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

5-4. Heating Capacity

Indoor Unit **AWR518HL FCR518HL** **AWR522HL FCR522HL**
Outdoor Unit **AER518SH3** **AER522SH3**



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 account 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 **AWR518HL**
Outdoor Unit **AER518SH3**

COOLING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V 50Hz		400 V - 3N - 50Hz	
Rating Conditions	Running Amps.	A	0.38	0.50	3.43	4.0
	Power Input	kW	0.072	0.093	2.002	2.15
Full Load Conditions	Running Amps.	A	0.38	0.50	3.81	4.6
	Power Input	kW	0.072	0.093	2.398	2.60

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 50Hz		400V - 3N - 50Hz	
Rating Conditions	Running Amps.	A	0.38	0.50	3.32	4.2
	Power Input	kW	0.072	0.093	2.107	2.25
Full Load Conditions	Running Amps.	A	0.38	0.50	3.33	4.21
	Power Input	kW	0.072	0.093	2.285	2.45

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 **AWR522HL**
Outdoor Unit **AER522SH3**

COOLING

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V 50Hz		400V - 3N - 50Hz	
Rating Conditions	Running Amps.	A	0.40	0.55	3.85	4.8
	Power Input	kW	0.078	0.120	2.552	2.750
Full Load Conditions	Running Amps.	A	0.40	0.55	4.45	5.4
	Power Input	kW	0.078	0.120	3.102	3.300

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 50Hz		400 - 3N - 50Hz	
Rating Conditions	Running Amps.	A	0.40	0.55	4.05	5.0
	Power Input	kW	0.078	0.120	2.802	3.000
Full Load Conditions	Running Amps.	A	0.40	0.55	4.65	5.6
	Power Input	kW	0.078	0.120	3.460	3.660

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 **FCR518HL**
Outdoor Unit **AER518SH3**

■ Cooling

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230 V ~ 50Hz		400 V – 3N ~ 50Hz	
Rating Conditions	Running Amps.	A	0.33	0.40	3.27	4.0
	Power Input	kW	0.071	0.082	1.997	2.15
Full Load Conditions	Running Amps.	A	0.33	0.40	3.87	4.6
	Power Input	kW	0.071	0.082	2.447	2.60

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

■ Heating

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230 V ~ 50Hz		400 V – 3N ~ 50Hz	
Rating Conditions	Running Amps.	A	0.33	0.40	3.47	4.2
	Power Input	kW	0.071	0.082	2.097	2.25
Full Load Conditions	Running Amps.	A	0.33	0.40	3.42	4.21
	Power Input	kW	0.071	0.082	2.297	2.45

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

Indoor Unit **FCR522HL**
Outdoor Unit **AER522SH3**

■ Cooling

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230 V ~ 50Hz		400 V – 3N ~ 50Hz	
Rating Conditions	Running Amps.	A	0.40	0.54	3.86	4.8
	Power Input	kW	0.083	0.116	2.551	2.75
Full Load Conditions	Running Amps.	A	0.40	0.54	4.46	5.4
	Power Input	kW	0.083	0.116	3.10	3300

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

■ Heating

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230 V ~ 50Hz		400 V – 3N ~ 50Hz	
Rating Conditions	Running Amps.	A	0.40	0.54	4.06	5
	Power Input	kW	0.083	0.116	2.8	3.0
Full Load Conditions	Running Amps.	A	0.40	0.54	4.6	5.6
	Power Input	kW	0.083	0.116	3.4	3.6

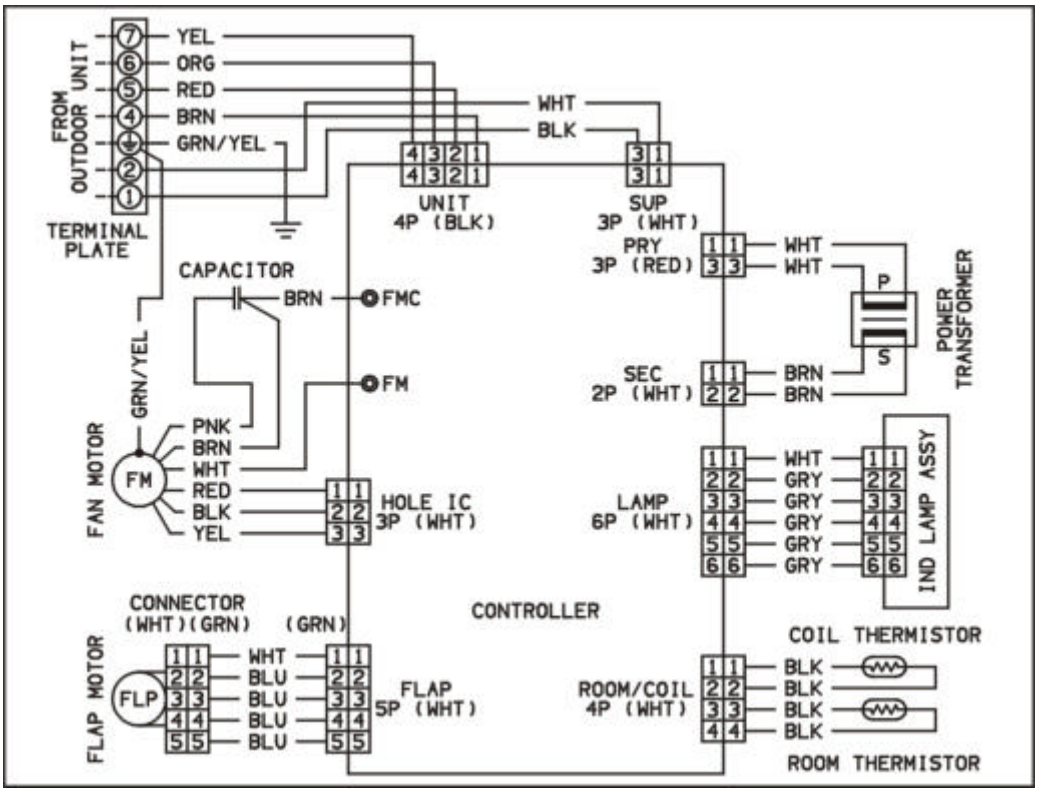
Rating Conditions: Indoor Air Temperature 20°C DB
Outdoor Air Temperature 7°C DB / 6°C WB
Full Load Conditions: Indoor Air Temperature 27°C DB
Outdoor Air Temperature 24°C DB / 18°C WB

6-2 Electric Wiring Diagrams

Indoor Unit **AWR518HL**
AWR522HL

WARNING

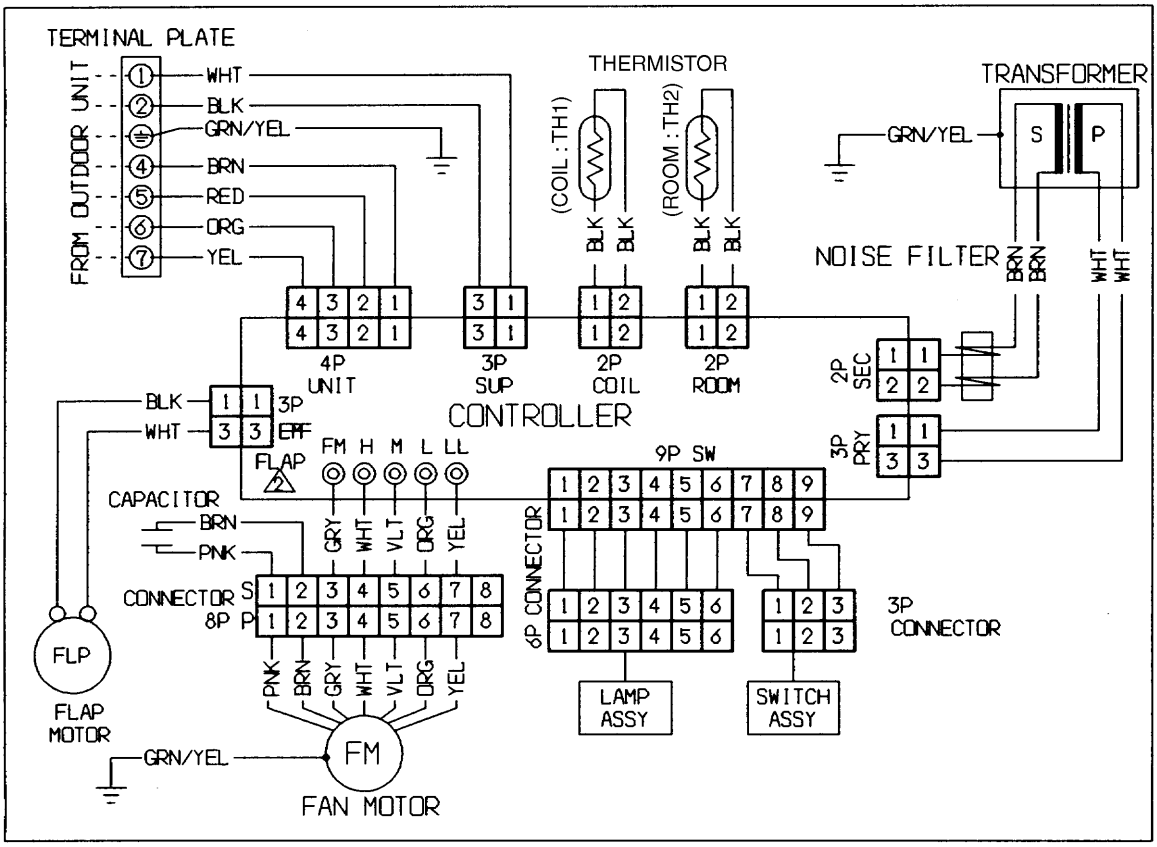
To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts



Indoor unit **FCR518HL**

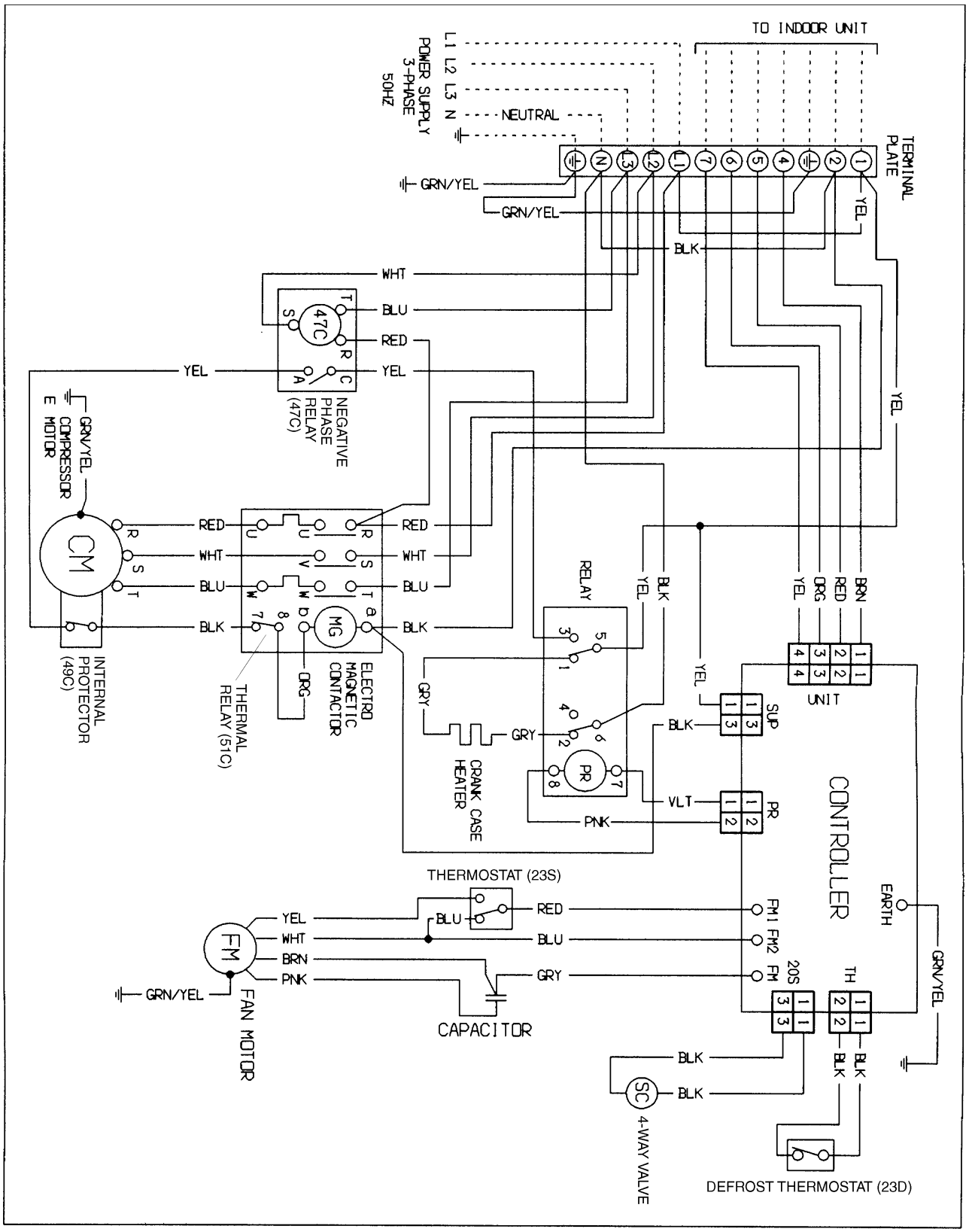
FCR522HL

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

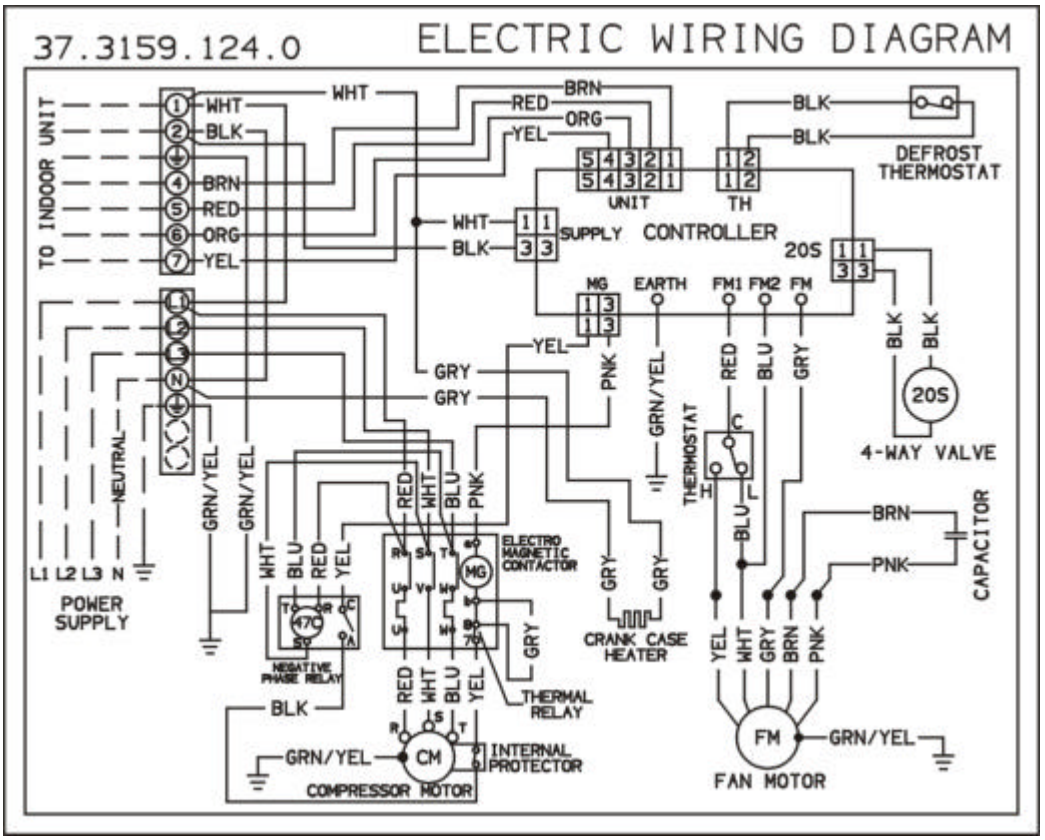


Outdoor unit **AER518SH3**

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



Outdoor unit **AER522SH3**

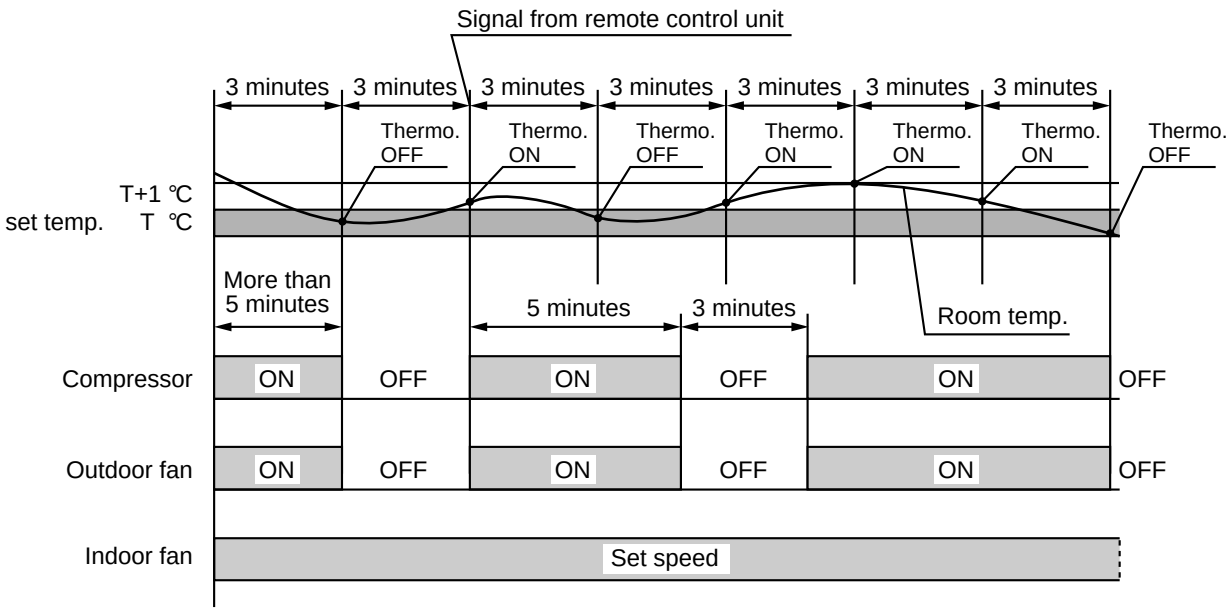


7. FUNCTION

7-1. Room Temperature Control

■ Cooling

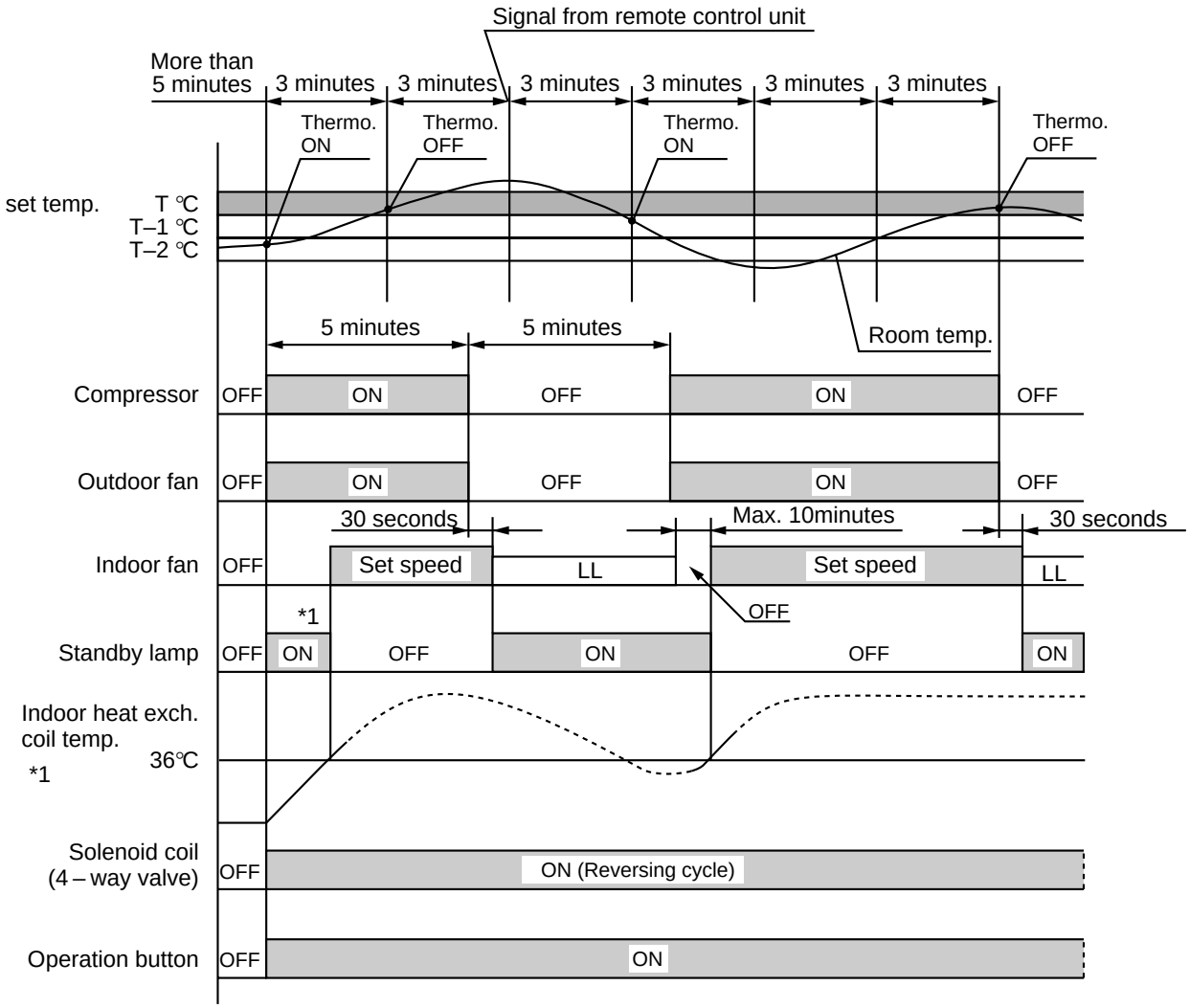
- Room temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The room temperature (and other information) is transmitted every 3 minutes by the remote control unit to the controller in the indoor unit.



- 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.

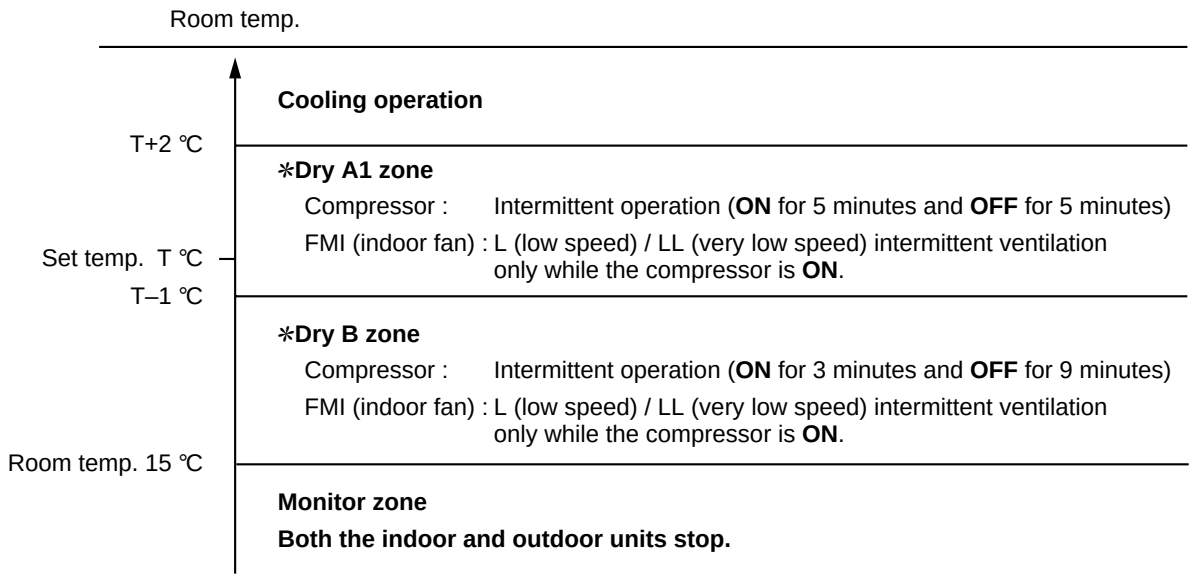


- The control circuit will not attempt to turn the compressor ON until the compressor has been OFF for at least 5 minutes. To protect the compressor from stalling out when trying to start against the high side refrigerant pressure, the control circuit has a built-in automatic time delay to allow the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

7-2. 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.

7-3. Automatic Switching between Cooling and Heating

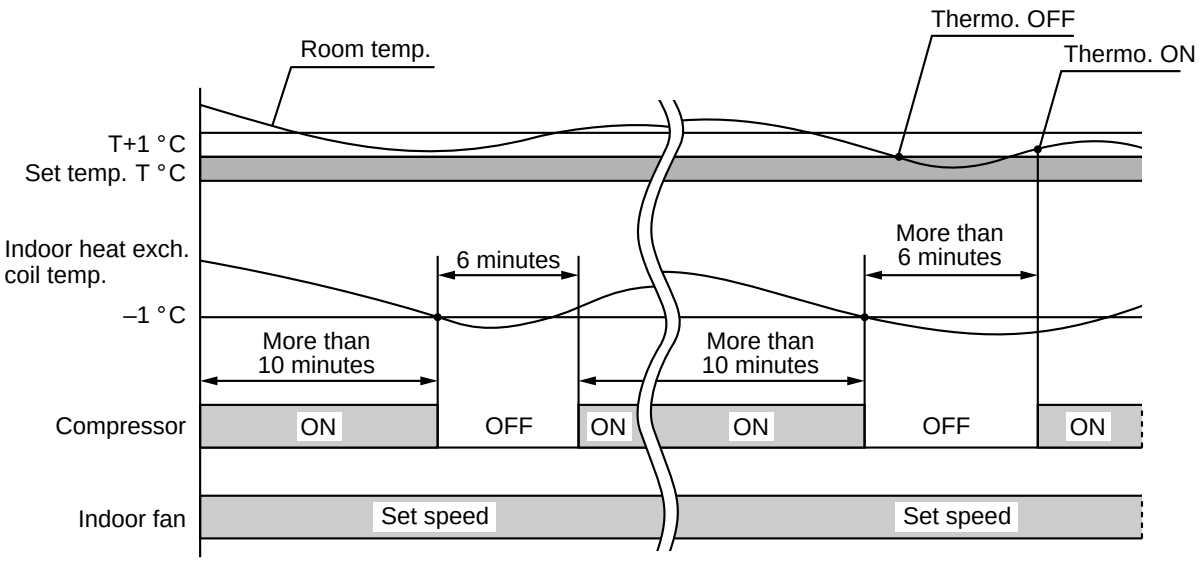
- When AUTO mode is selected, the microprocessor calculates the difference between the set temperature and the room temperature, and automatically switches to COOLING or HEATING mode to maintain the desired temperature.

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.

7-4. Freeze Prevention (Cooling)

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



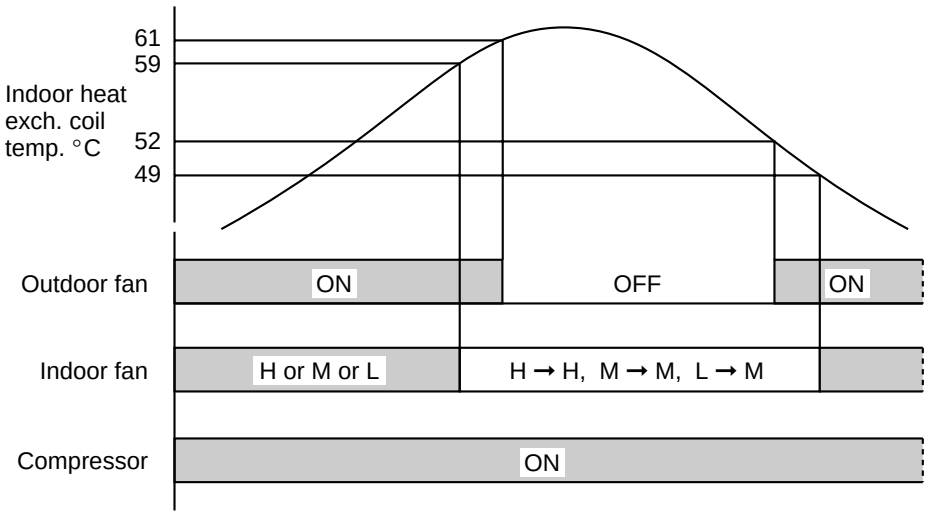
7-5. Overload Prevention (Heating)

● This function prevents overheating of the indoor heat exchange coil.

For (FCR518HL - AWR518HL) (FCR522HL - AWR522HL)

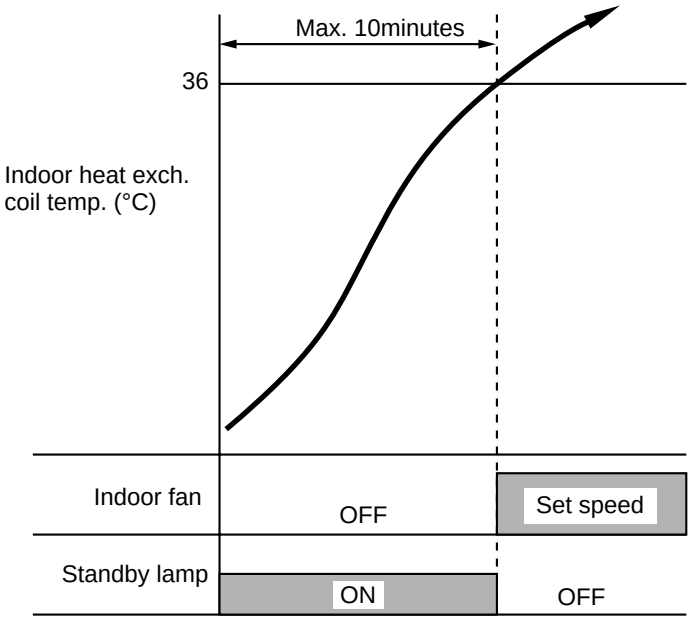
● When the temperature of the indoor heat exchange coil rises above **59**°C, and if the indoor fan is L (low speed), then the fan speed changes from L (low speed) to M (medium speed).

● When the temperature of the indoor heat exchange coil rises above **61**°C, the outdoor fan stops.



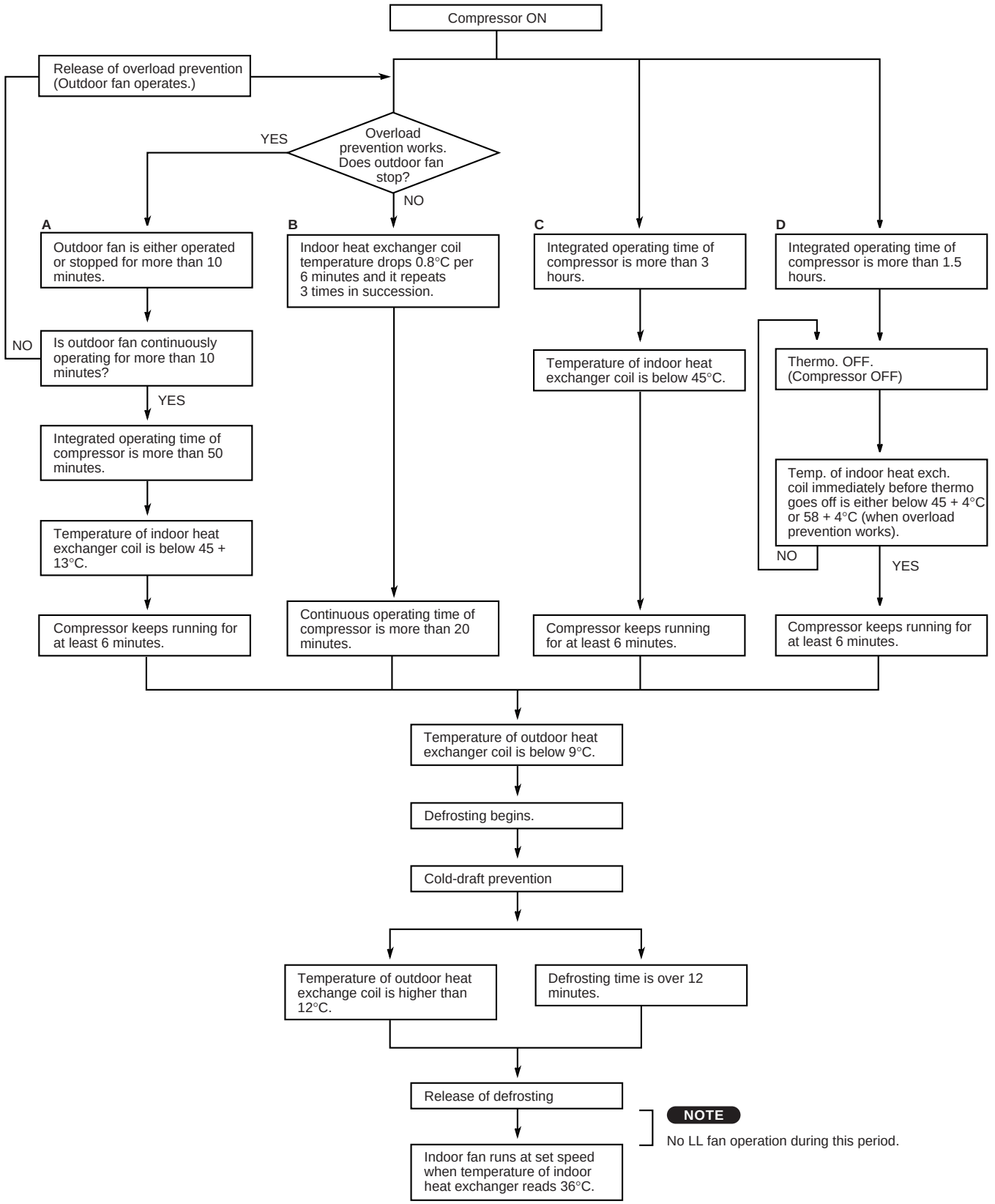
7-6. Cold draft Prevention (Heating)

- 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.

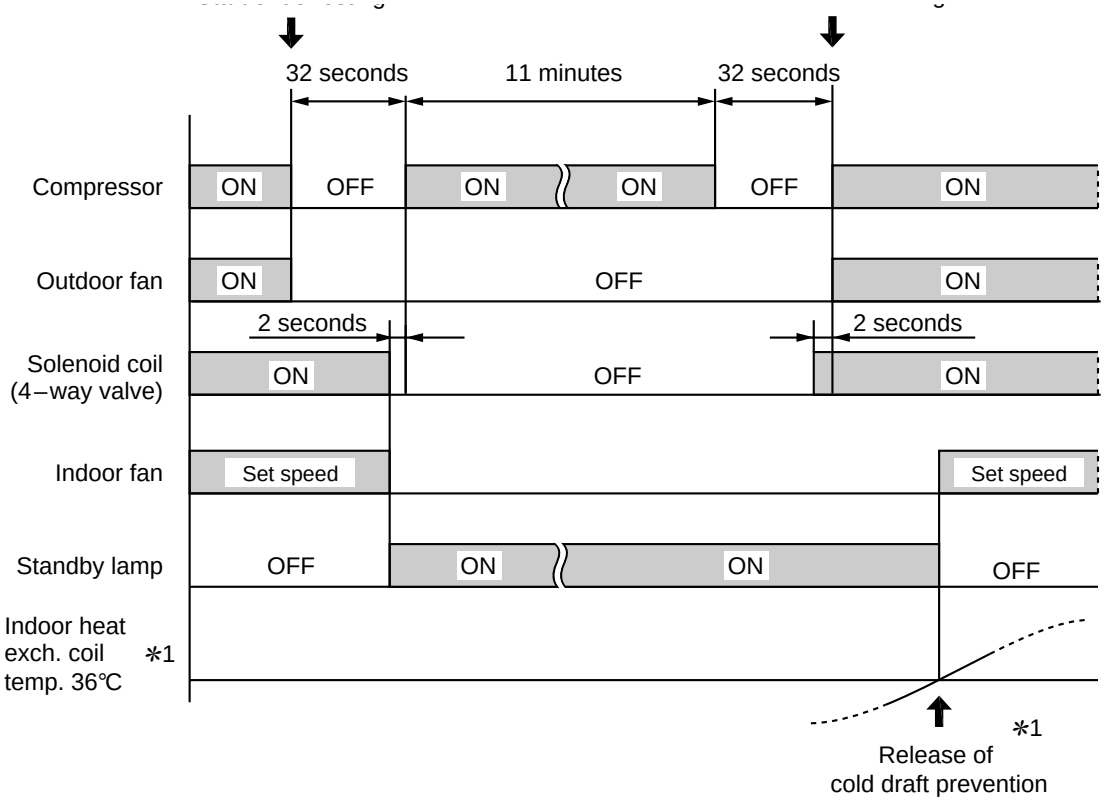


7-7. Defrosting Operation (Heating)

■ Defrosting Flowchart



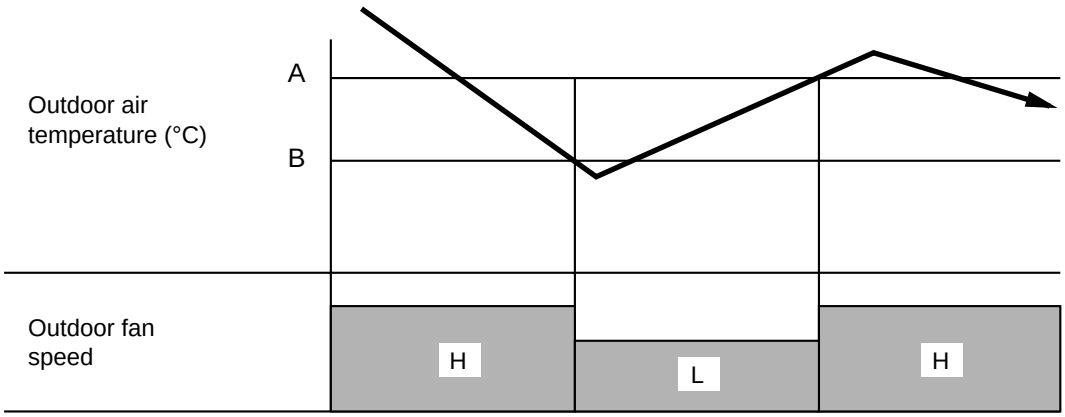
■ Defrosting Mode Timing Chart



NOTE ✻ 1: Refer to 5-6 "Cold Draft Prevention".

7-8. Outdoor Fan Speed Control (Cooling and Dry Operation)

- To optimize performance of the air conditioner, the outdoor fan speed is switched automatically according to the outdoor temperature.
- If the outdoor air temperature falls below **B**°C, the fan speed switches to LOW.
- If the outdoor air temperature rises above **A**°C, the fan speed switches to HIGH.
- This function does not become active in heating operation.



NOTE The operating temperature shown as **A** and **B** in the chart differ by models.

Models	A	B
AER518SH3	27.0°C	23.5°C
AER522SH3	31.0°C	28.5°C

8. REFRIGERANT R407C : SPECIAL PRECAUTIONS WHEN SERVICING UNIT

8-1. Characteristics of new refrigerant R407C

8-1-1. 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

8-1-2. Components (mixing proportions)

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

8-1-3. 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.**

8-2. 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.

8-3. 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.**

8-4. 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.

8-5. 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".**

8-5-1.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**

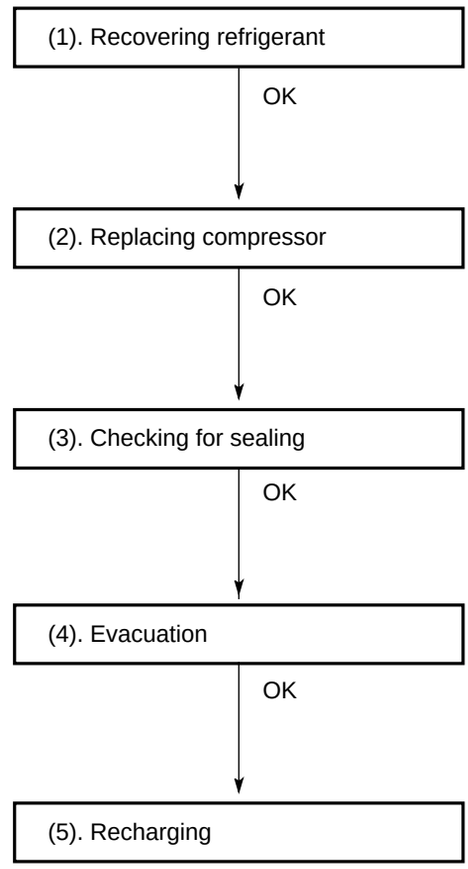
- Soon after removing pinched pipes of both discharge and suction tubes of the new compressor, replace it quickly.

(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.

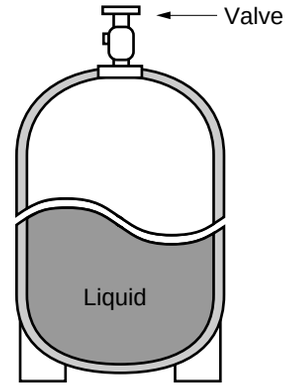
- If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

  Prepare an evacuated charging cylinder beforehand.

CAUTION

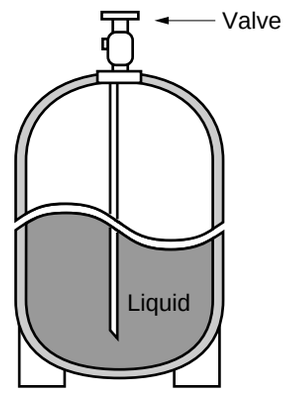
- **To prevent the composition of R407C from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 3)**

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

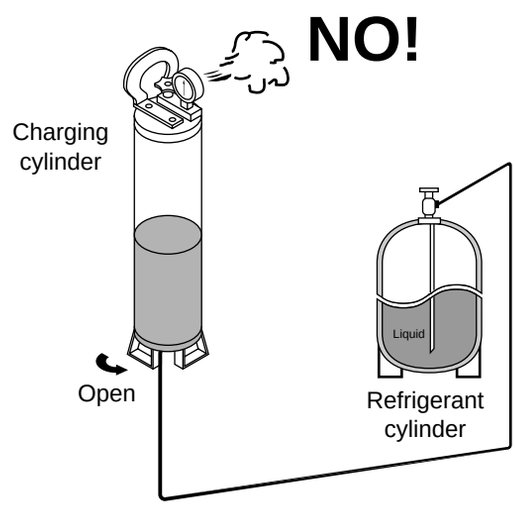


Fig.3

8-6. 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**

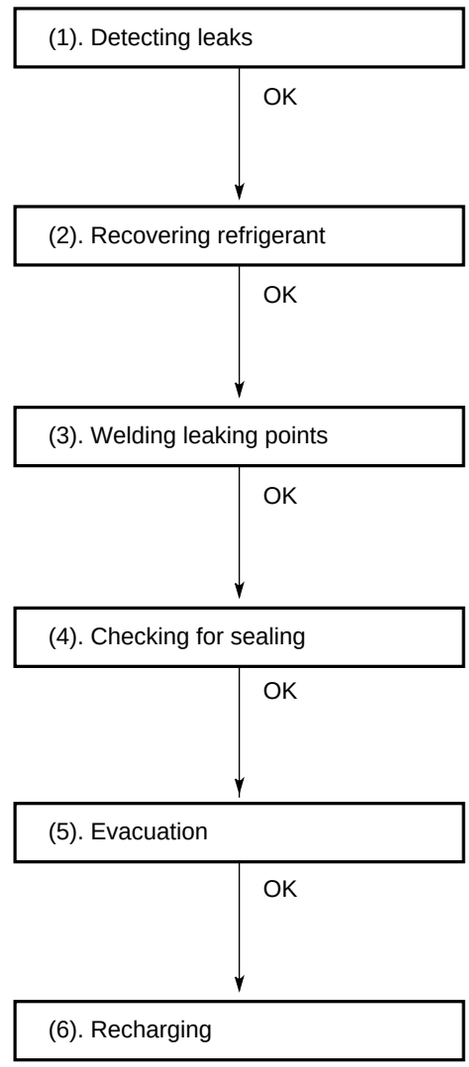
- Confirm again that no residual refrigerant exists in the unit before starting welding.
- Weld securely using flux and wax for R407C.
- Prevent oxide film from forming inside the tubes utilizing substitution with nitrogen (N2) in the refrigerant circuit of the unit. Leave ends of tubes open during welding.

(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.

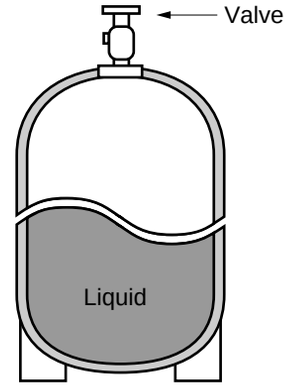
- If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

  Prepare an evacuated charging cylinder beforehand.

CAUTION

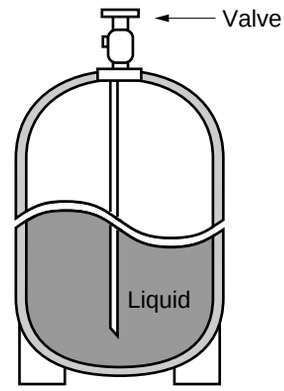
- **To prevent the composition of R407C from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 6)**

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

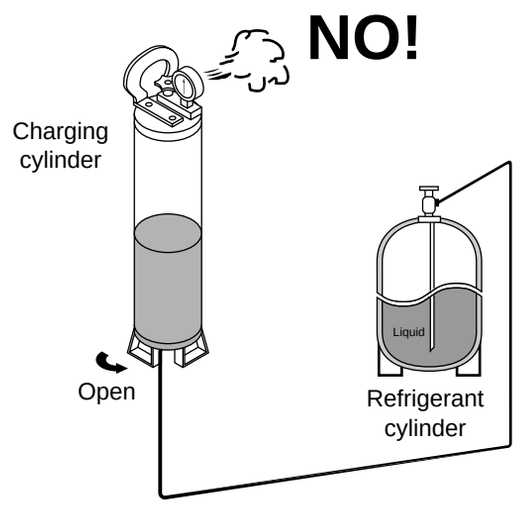


Fig. 6

8-7. Charging additional refrigerant

8-7-1.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.**

8-8. Retro-fitting existing systems

8-8-1 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.

8-8-2 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.

9. TROUBLESHOOTING

9-1. 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.

9-1-1. Check inter-unit wiring.

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

9-1-2. Check power supply.

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

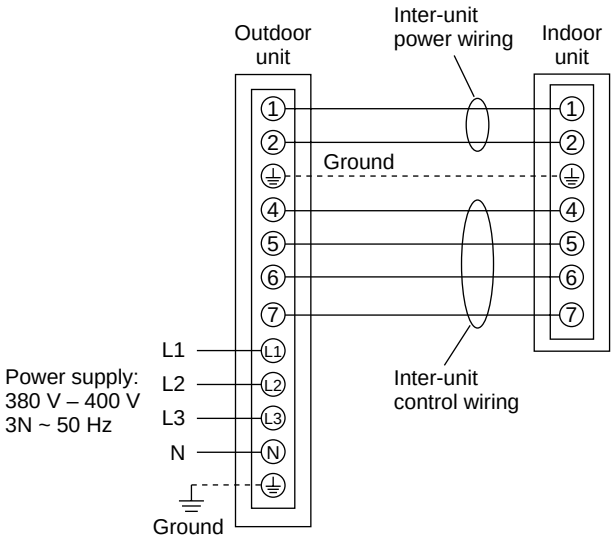
SEE NEXT PAGE FOR THREE-PHASE MODELS

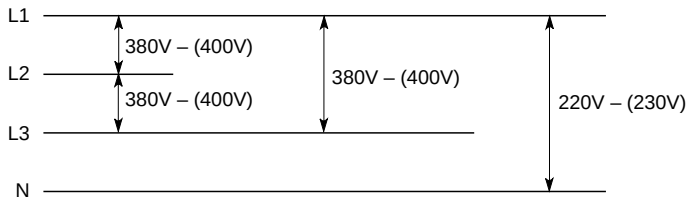
9-1-3. Check lead wires and connectors in indoor and outdoor units.

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

9-1-4. Check power supply wiring.

- Check that power supply wires are correctly connected to terminals **L1, L2 , L3** and **N** on the terminal plate in the outdoor unit.





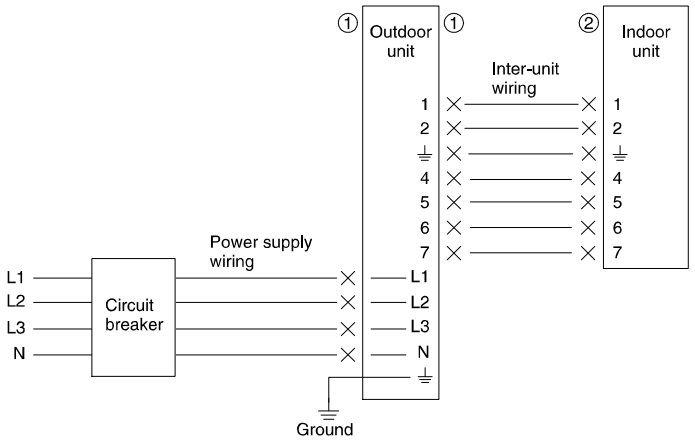
9-2. Air conditioner does not operate.

9-2-1. 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”).



*Set circuit breaker to OFF.

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

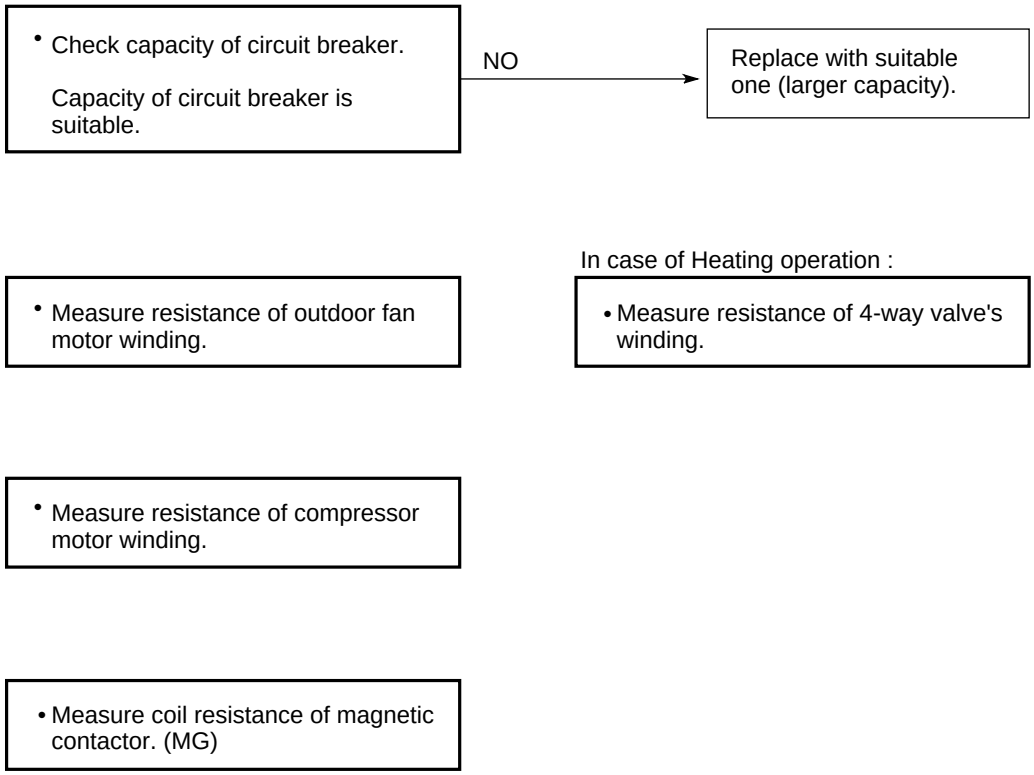
NO → Insulation of outdoor unit is defective.
- Measure insulation resistance of electrical parts in outdoor unit.

② Remove inter-unit wires from terminal plate in indoor unit.
- Measure insulation resistance of indoor unit.

NO → Insulation of indoor unit is defective.
- Measure insulation resistance of electrical parts in indoor unit.

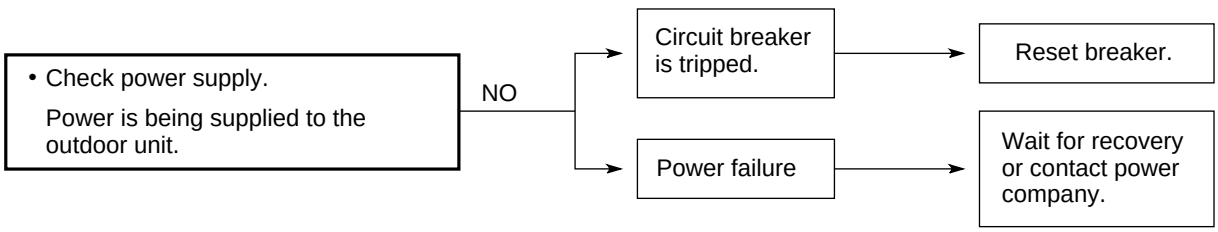
B. Circuit breaker trips in several minutes after turning the air conditioner on.

● There is a possibility of short circuit.

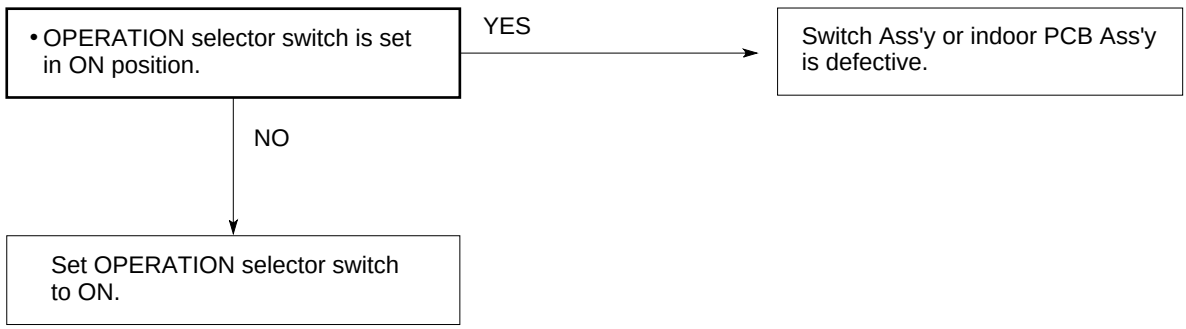


9-2-2. Neither indoor nor outdoor unit runs.

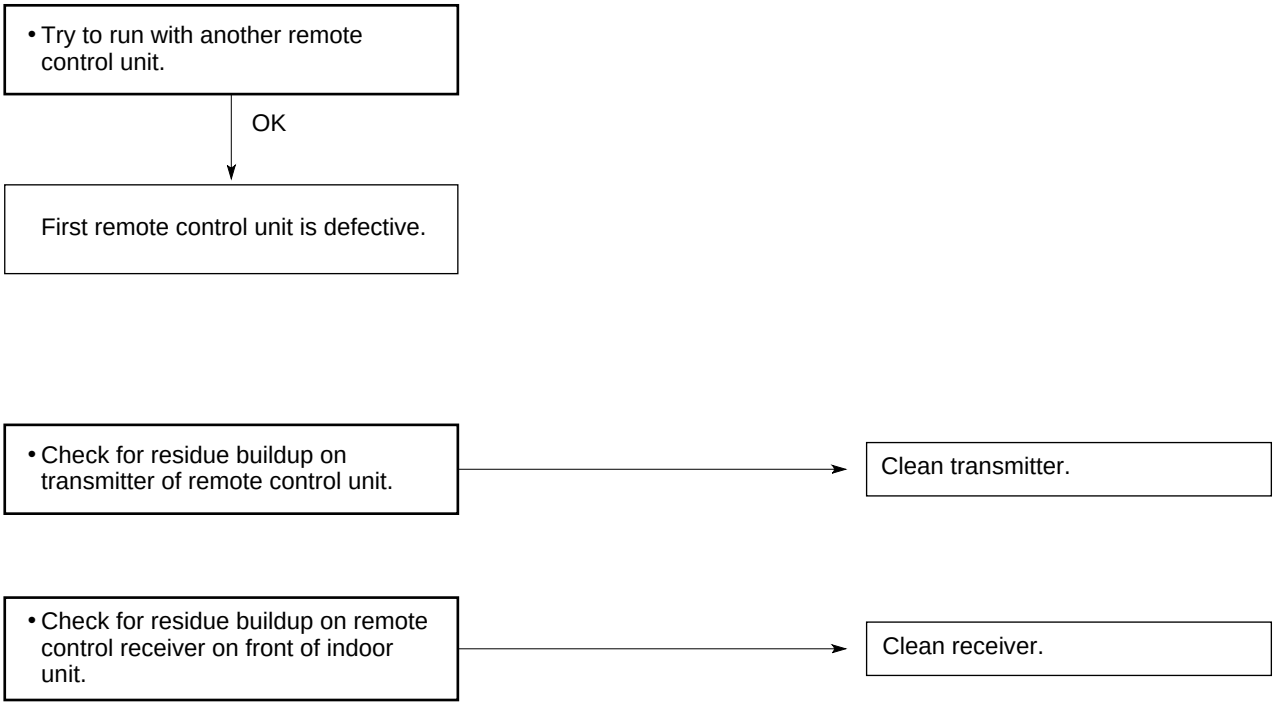
A. Power is not supplied.



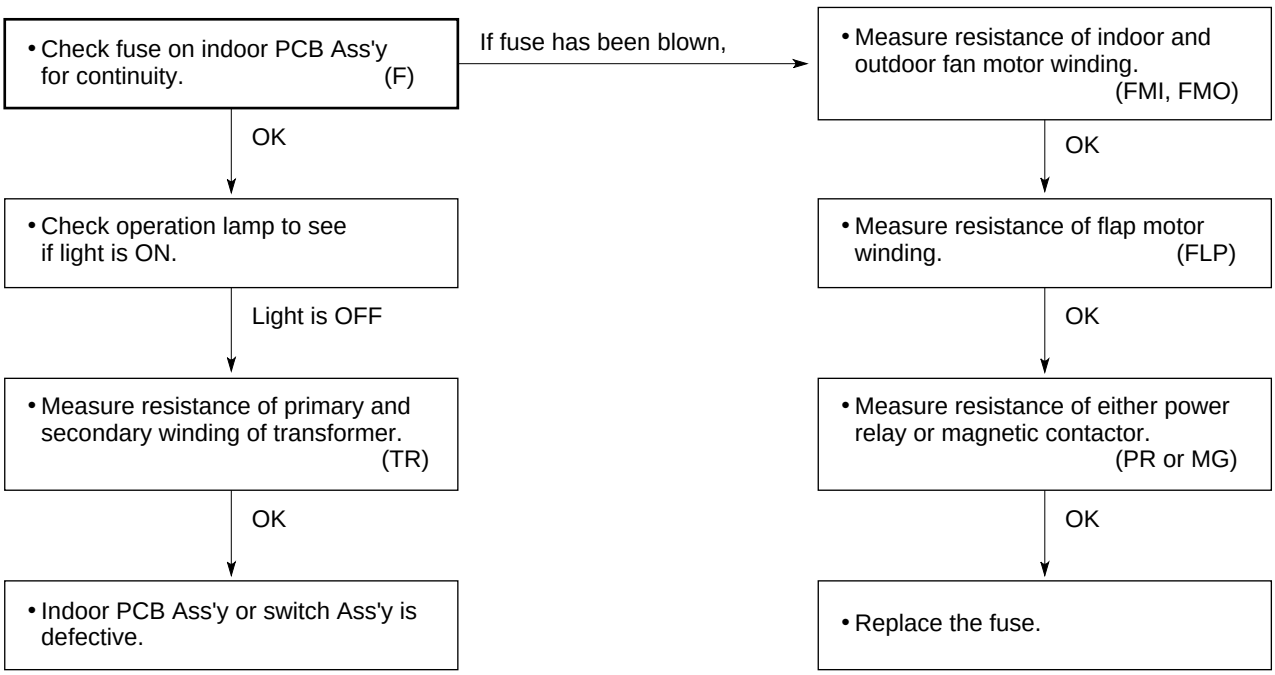
B. Check "OPERATION selector" switch in the indoor unit.



C. Check remote control unit.



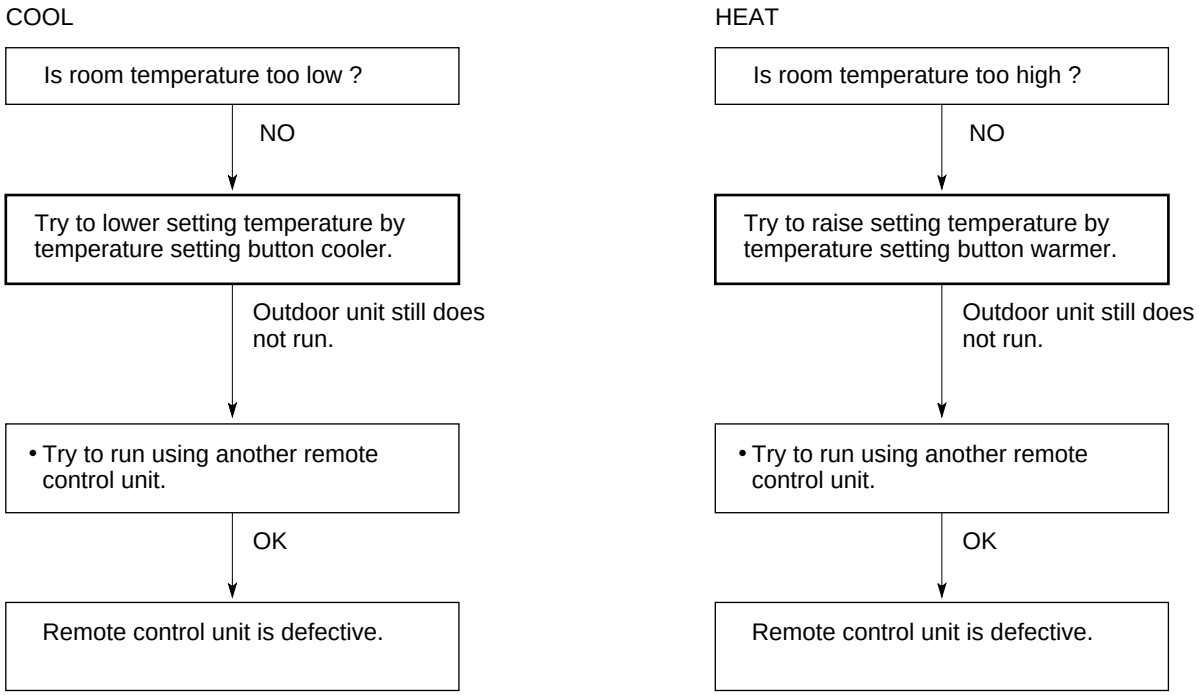
D. Check fuse on the indoor PCB Ass'y.



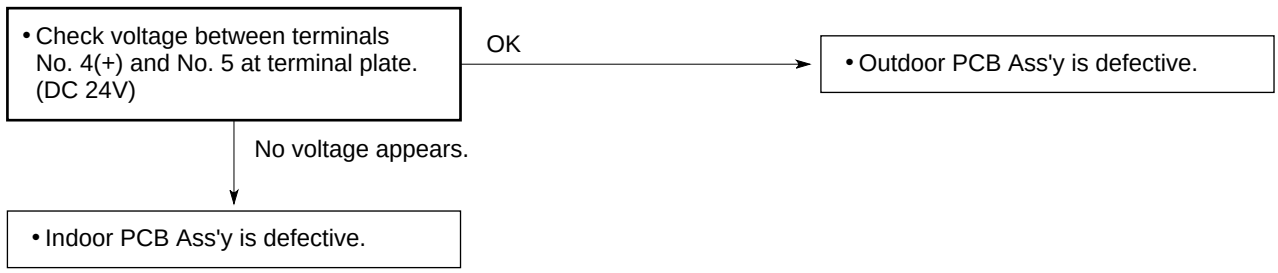
E. Check TIMER on the remote control unit.

9-2-3. Only outdoor unit does not run.

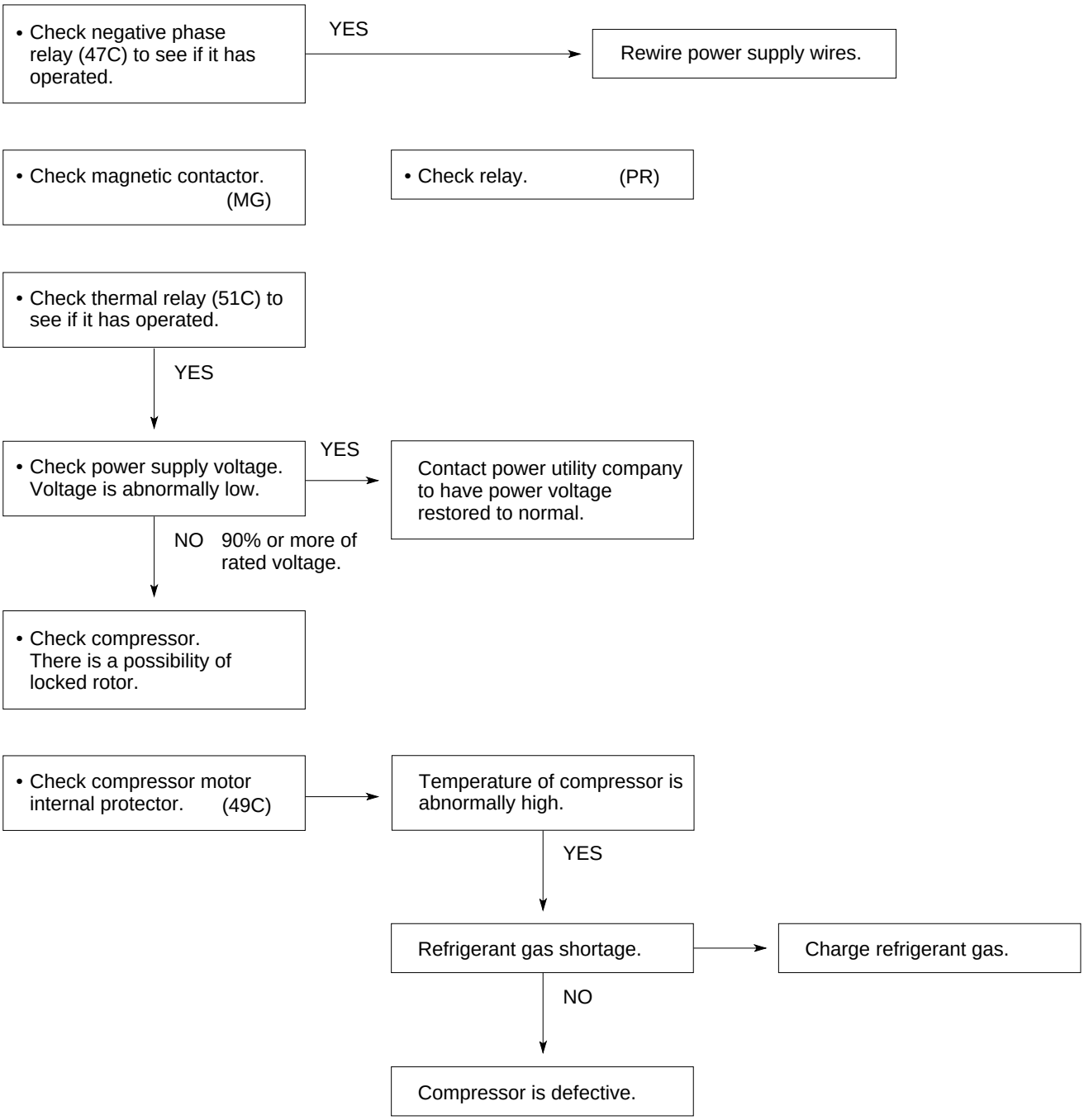
A. Check setting temperature.



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



C. Check other component.

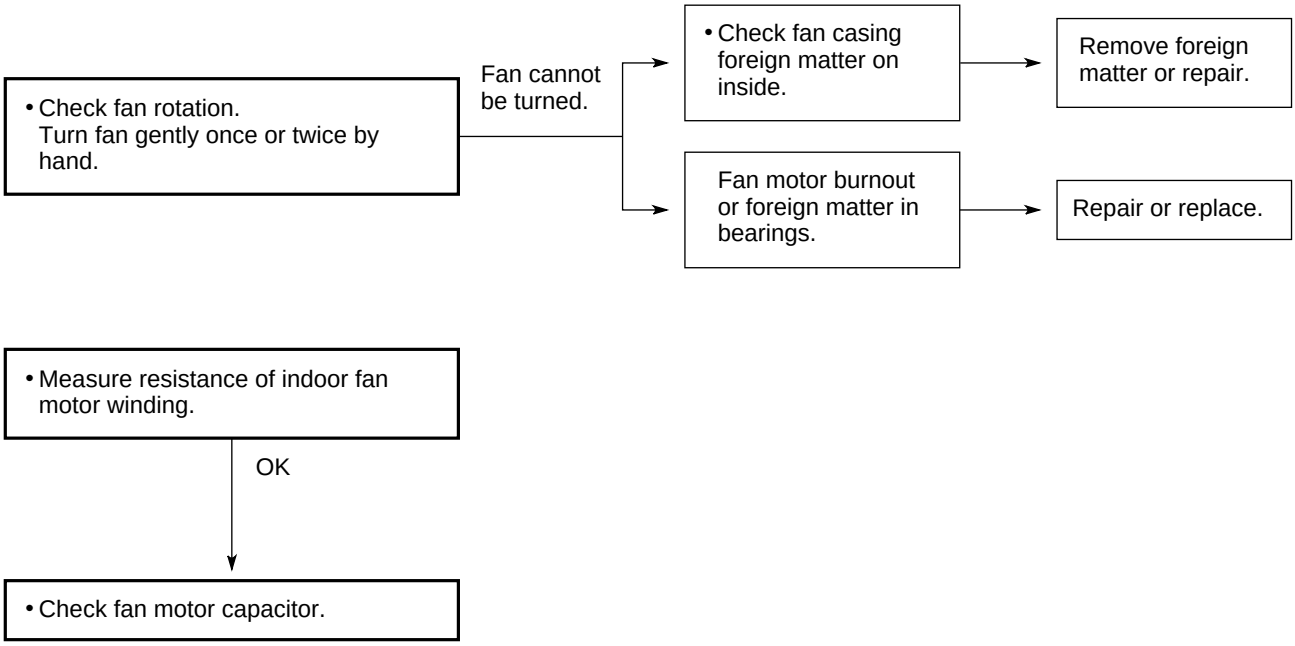


9-2-4. Only indoor unit does not run.

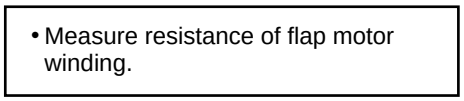
• Indoor PCB Ass'y is defective.

9-3. Some part of air conditioner does not operate.

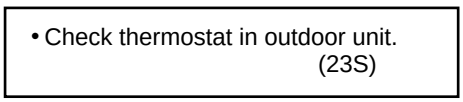
9-3-1. Only indoor fan does not run.



9-3-2. Only flap motor does not run.



9-3-3. Function of outdoor fan speed control does not work properly.



Refer to "5-8 Outdoor Fan Speed Control".

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