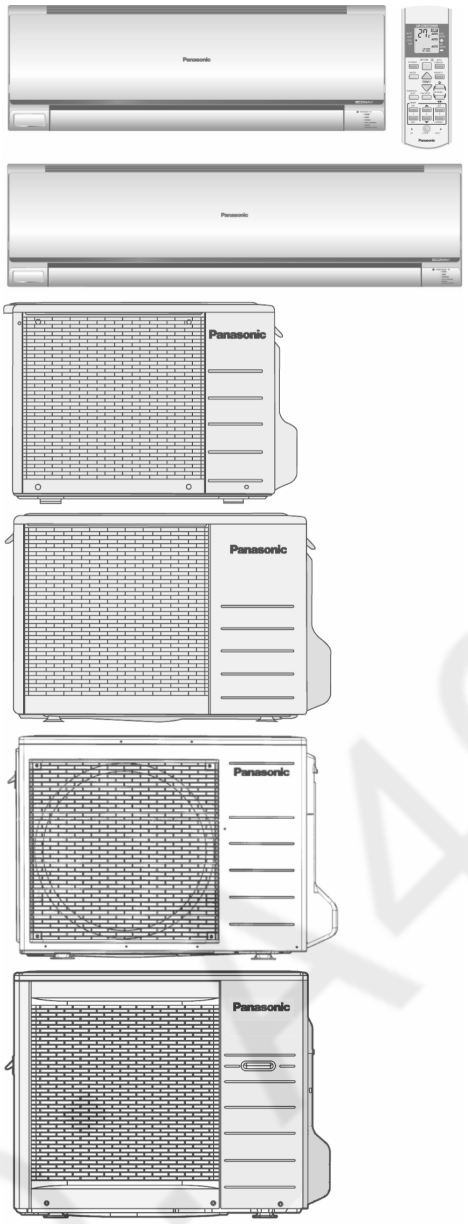
Order No: PAPAMY1301028CE

Service Manual

Air Conditioner



Indoor Unit	Outdoor Unit
CS-A9PKD	CU-A9PKD
CS-A12PKD	CU-A12PKD
CS-A18PKD	CU-A18PKD
CS-A24PKD	CU-A24PKD
CS-A28PKD	CU-A28PKD

Destination
N.Africa
L.America
S.Africa
Middle East

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

Panasonic®

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1. Safety Precautions

- Read the following “SAFETY PRECAUTIONS” carefully before perform any servicing.
- Electrical work must be installed or serviced by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation or servicing due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

⚠ **WARNING**	This indication shows the possibility of causing death or serious injury.
⚠ **CAUTION**	This indication shows the possibility of causing injury or damage to properties.

- The items to be followed are classified by the symbols:

⃠	This symbol denotes item that is PROHIBITED from doing.

- Carry out test running to confirm that no abnormality occurs after the servicing. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

	⚠ **WARNING**	
1.	Do not modify the machine, part, material during repairing service.	
2.	If wiring unit is supplied as repairing part, do not repair or connect the wire even only partial wire break. Exchange the whole wiring unit.	
3.	Do not wrench the fasten terminal. Pull it out or insert it straightly.	
4.	Engage dealer or specialist for installation and servicing. If installation of servicing done by the user is defective, it will cause water leakage, electrical shock or fire.	
5.	Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electric shock or fire.	
6.	Use the attached accessories parts and specified parts for installation and servicing. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.	
7.	Install at a strong and firm location which is able to withstand the set’s weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.	
8.	For electrical work, follow the local national wiring standard, regulation and the installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.	
9.	This equipment is strongly recommended to install with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case equipment breakdown or insulation breakdown.	
10.	Do not use joint cable for indoor / outdoor connection cable. Use the specified Indoor/Outdoor connection cable, refer to installation instruction CONNECT THE CABLE TO THE INDOOR UNIT and connect tightly for indoor / outdoor connection. Clamp the cable so that no external force will be acted on the terminal. If connecting or fixing is not perfect, it will cause heat up or fire at the connection.	
11.	Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up or fire at the connection point of terminal, fire or electrical shock.	
12.	When install or relocate air conditioner, do not let any substance other than the specified refrigerant, eg. air etc. mix into refrigeration cycle (piping). (Mixing of air etc. will cause abnormal high pressure in refrigeration cycle and result in explosion, injury etc.).	
13.	Do not install outdoor unit near handrail of veranda. When installing air-conditioner unit at veranda of high rise building, child may climb up to outdoor unit and cross over the handrail and causing accident.	
14.	This equipment must be properly earthed. Earth line must not be connected to gas pipe, water pipe, earth of lightning rod and telephone. Otherwise, it may cause electric shock in case equipment breakdown or insulation breakdown.	⃠
15.	Keep away from small children, the thin film may cling to nose and mouth and prevent breathing.	⃠
16.	Do not use unspecified cord, modified cord, joint cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire.	⃠
17.	Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.	⃠
18.	During pump down operation, stop the compressor before remove the refrigeration piping. (Removal of compressor while compressor is operating and valves are opened will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.)	⃠
19.	During installation, install the refrigerant piping properly before run the compressor. (Operation of compressor without fixing refrigeration piping and valves at opened condition will caused suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc).	
20.	After completion of installation or service, confirm there is no leakage or refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.	

⚠ WARNING	
21.	Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when refrigerant contacts with fire.
22.	Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.
23.	Must not use other parts except original parts described in catalog and manual.
24.	Using of refrigerant other than the specified type may cause product damage, burst and injury etc.

⚠ CAUTION	
1.	Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.
2.	Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
3.	Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.
4.	Do not touch outdoor unit air inlet and aluminium fin. It may cause injury.
5.	Select an installation location which is easy for maintenance.
6.	Pb free solder has a higher melting point than standard solder; typically the melting point is 50°F – 70°F (30°C – 40°C) higher. Please use a high temperature solder iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C). Pb free solder will tend to splash when heated too high (about 1100°F / 600°C).
7.	**CS/CU-A9/12/18/24PKD** Power supply connection to the room air conditioner. Use power supply cord 3 × 1.5 mm² (1.0 ~ 1.5HP) or 3 × 2.5 mm² (2.0 ~ 2.5HP) type designation 60245 IEC 57 or heavier cord. Connect the power supply cord of the air conditioner to the mains using one of the following method. Power supply point should be in easily accessible place for power disconnection in case of emergency. In some countries, permanent connection of this air conditioner to the power supply is prohibited. 1) Power supply connection to the receptacle using power plug. Use an approved 15/16A (1.0 ~ 1.5HP) or 16A (2.0HP) or 20A (2.5HP) power plug with earth pin for the connection to the socket. 2) Power supply connection to a circuit breaker for the permanent connection. Use an approved 16A (1.0 ~ 2.0HP) or 20A (2.5HP) circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3.0 mm contact gap.
8.	**CS/CU-A28PKD** Power supply connection to the room air conditioner. Use power supply cord 3 × 4.0 mm² type designation 60245 IEC 57 or heavier cord. Connect the power supply cord of the air conditioner to the mains using one of the following method. Power supply point should be in easily accessible place for power disconnection in case of emergency. In some countries, permanent connection of this air conditioner to the power supply is prohibited. 1) Power supply connection to the receptacle using power plug. Use an approved 25A power plug with earth pin for the connection to the socket. 2) Power supply connection to a circuit breaker for the permanent connection. Use an approved 25A circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3.0 mm contact gap.
9.	Do not release refrigerant during piping work for installation, servicing, reinstallation and during repairing a refrigerant parts. Take care of the liquid refrigerant, it may cause frostbite.
10.	Installation or servicing work: It may need two people to carry out the installation or servicing work.
11.	Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.
12.	Do not sit or step on the unit, you may fall down accidentally.
13.	Do not touch the sharp aluminium fins or edges of metal parts. If you are required to handle sharp parts during installation or servicing, please wear hand glove. Sharp parts may cause injury.

2. Specification

Model			Indoor	CS-A9PKD		CS-A12PKD	
			Outdoor	CU-A9PKD		CU-A12PKD	
Performance Test Condition				NEW JIS		NEW JIS	
Power Supply			Phase, Hz	Single, 50		Single, 50	
			V	220	230	220	230
Cooling	Capacity		kW	2.65	2.65	3.52	3.54
			BTU/h	9040	9040	12000	12100
			kcal/h	2280	2280	3030	3040
	Running Current		A	4.1	4.0	5.1	5.1
	Input Power		W	860	890	1.08k	1.12k
	EER		W/W	3.08	2.98	3.26	3.16
			BTU/hW	10.51	10.16	11.11	10.80
	Power Factor		%	95	97	96	95
	Indoor Noise (H / L)		dB-A	36 / 26	36 / 26	39 / 29	39 / 29
			Power Level dB	52 / –	52 / –	55 / –	55 / –
	Outdoor Noise (H / L)		dB-A	48 / –	49 / –	48 / –	49 / –
			Power Level dB	63 / –	64 / –	63 / –	64 / –
Heating	Capacity		kW	2.80	2.85	4.00	4.05
			BTU/h	9550	9720	13600	13800
			kcal/h	2410	2450	3440	3480
	Running Current		A	3.3	3.3	5.2	5.1
	Input Power		W	700	740	1.09k	1.12k
	COP		W/W	4.00	3.85	3.67	3.62
			BTU/hW	13.64	13.14	12.48	12.32
	Power Factor		%	96	97	95	95
	Indoor Noise (H / L)		dB-A	38 / 28	38 / 28	40 / 29	40 / 29
			Power Level dB	54 / –	54 / –	56 / –	56 / –
	Outdoor Noise (H / L)		dB-A	48 / –	49 / –	48 / –	49 / –
			Power Level dB	64 / –	65 / –	64 / –	65 / –
Max Current (A) / Max Input Power (W)				5.1 / 1.13k		6.3 / 1.39k	
Starting Current (A)				18.0		23.0	
Compressor		Type		Hermetic Motor / Rotary		Hermetic Motor / Rotary	
		Motor Type		Induction (2-poles)		Induction (2-poles)	
		Output Power	W	750		950	
Indoor Fan	Type			Cross-flow Fan		Cross-flow Fan	
	Material			ASG20K1		ASG20K1	
	Motor Type			AC / Induction (4-poles)		AC / Induction (4-poles)	
	Input Power		W	51 - 58		51 - 58	
	Output Power		W	24		24	
	Speed	QLo	rpm	Cooling: 640 - 640 Heating: 680 - 680		Cooling: 710 - 710 Heating: 750 - 750	
		Lo	rpm	Cooling: 710 - 710 Heating: 750 - 750		Cooling: 780 - 780 Heating: 820 - 820	
		Me	rpm	Cooling: 850 - 850 Heating: 850 - 850		Cooling: 930 - 930 Heating: 930 - 930	
		Hi	rpm	Cooling: 1020 - 1020 Heating: 1060 - 1060		Cooling: 1080 - 1080 Heating: 1100 - 1100	
		SHi	rpm	Cooling: 1060 - 1060		Cooling: 1100 - 1100	
Outdoor Fan	Type			Propeller Fan		Propeller Fan	
	Material			PP Resin		PP Resin	
	Motor Type			AC / Induction (6-poles)		AC / Induction (6-poles)	
	Input Power		W	66.0 - 70.4		71.5 - 75.9	
	Output Power		W	30		38	
	Speed	Hi	rpm	800 - 815		830 - 840	
Moisture Removal			L/h (Pt/h)	1.6 (3.4)		2.0 (4.2)	

Model		Indoor	CS-A9PKD		CS-A12PKD	
		Outdoor	CU-A9PKD		CU-A12PKD	
Indoor Airflow	QLo	m^3/min (ft^3/min)	Cooling: 6.4 (226) - 6.4 (226) Heating: 6.8 (240) - 6.8 (240)		Cooling: 7.1 (251) - 7.1 (251) Heating: 7.5 (265) - 7.5 (265)	
	Lo	m^3/min (ft^3/min)	Cooling: 7.1 (251) - 7.1 (251) Heating: 7.5 (265) - 7.5 (265)		Cooling: 7.8 (275) - 7.8 (275) Heating: 8.2 (290) - 8.2 (290)	
	Me	m^3/min (ft^3/min)	Cooling: 8.5 (300) - 8.5 (300) Heating: 8.5 (300) - 8.5 (300)		Cooling: 9.3 (328) - 9.3 (328) Heating: 9.3 (328) - 9.3 (328)	
	Hi	m^3/min (ft^3/min)	Cooling: 10.2 (360) - 10.2 (360) Heating: 10.6 (374) - 10.6 (374)		Cooling: 10.8 (381) - 10.8 (381) Heating: 11.0 (388) - 11.0 (388)	
	SHi	m^3/min (ft^3/min)	Cooling: 10.6 (374) - 10.6 (374)		Cooling: 11.0 (388) - 11.0 (388)	
Outdoor Airflow	Hi	m^3/min (ft^3/min)	29.5 (1040) - 30.0 (1060)		32.5 (1150) - 33.0 (1160)	
Refrigeration Cycle	Control Device		Capillary Tube		Capillary Tube	
	Refrigerant Oil	cm^3	ATMOS NM56M or SUNISO 4GDID (350)		ATMOS NM56M or SUNISO 4GDID (350)	
	Refrigerant Type	g (oz)	R22, 670 (23.7)		R22, 960 (33.9)	
Dimension	Height (I/D / O/D)	mm (inch)	290 (11-7/16)	511 (20-1/8)	290 (11-7/16)	542 (21-11/32)
	Width (I/D / O/D)	mm (inch)	870 (34-9/32)	650 (25-19/32)	870 (34-9/32)	780 (30-23/32)
	Depth (I/D / O/D)	mm (inch)	214 (8-7/16)	230 (9-1/16)	214 (8-7/16)	289 (11-13/32)
Weight	Net (I/D / O/D)	kg (lb)	9 (20)	26 (57)	9 (20)	29 (64)
Piping	Pipe Diameter (Liquid / Gas)	mm (inch)	6.35 (1/4) / 9.52 (3/8)		6.35 (1/4) / 12.70 (1/2)	
	Standard length	m (ft)	7.5 (24.6)		7.5 (24.6)	
	Length range (min – max)	m (ft)	3 (9.8) ~ 10 (32.8)		3 (9.8) ~ 15 (49.2)	
	I/D & O/D Height different	m (ft)	5 (16.4)		5 (16.4)	
	Additional Gas Amount	g/m (oz/ft)	20 (0.2)		20 (0.2)	
	Length for Additional Gas	m (ft)	7.5 (24.6)		7.5 (24.6)	
Drain Hose	Inner Diameter	mm	16.7		16.7	
	Length	mm	650		650	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)		Aluminium (Pre Coat)	
	Fin Type		Slit Fin		Slit Fin	
	Row × Stage × FPI		2 × 15 × 21		2 × 15 × 21	
	Size (W × H × L)	mm	610 × 315 × 25.4		610 × 315 × 25.4	
Outdoor Heat Exchanger	Fin Material		Aluminium (Blue Coat)		Aluminium (Blue Coat)	
	Fin Type		Corrugate Fin		Corrugate Fin	
	Row × Stage × FPI		1 × 19 × 19		2 × 24 × 17	
	Size (W × H × L)	mm	22 × 483 × 567		36.38 × 504 × 684.0:715.0	
Air Filter	Material		Polypropelene		Polypropelene	
	Type		One-touch		One-touch	
Power Supply			Indoor		Indoor	
Power Supply Cord		A	10		10	
Thermostat			–		–	
Protection Device			2-Stage Overload Protector		2-Stage Overload Protector	
			Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum °C	32	23	32	23
		Minimum °C	16	11	16	11
	Heating	Maximum °C	30	–	30	–
		Minimum °C	16	–	16	–
Outdoor Operation Range	Cooling	Maximum °C	43	26	43	26
		Minimum °C	16	11	16	11
	Heating	Maximum °C	24	18	24	18
		Minimum °C	-5	-6	-5	-6

1. Cooling capacities are based on indoor temperature of 27°C Dry Bulb (80.6°F Dry Bulb), 19.0°C Wet Bulb (66.2°F Wet Bulb) and outdoor air temperature of 35°C Dry Bulb (95°F Dry Bulb), 24°C Wet Bulb (75.2°F Wet Bulb)
2. Heating capacities are based on indoor temperature of 20°C Dry Bulb (68°F Dry Bulb) and outdoor air temperature of 7°C Dry Bulb (44.6°F Dry Bulb), 6°C Wet Bulb (42.8°F Wet Bulb)
3. Specifications are subjected to change without prior notice for further improvement.

Model			Indoor	CS-A18PKD		CS-A24PKD	
			Outdoor	CU-A18PKD		CU-A24PKD	
Performance Test Condition				NEW JIS		NEW JIS	
Power Supply			Phase, Hz	Single, 50		Single, 50	
			V	220	230	220	230
Cooling	Capacity		kW	5.30	5.30	7.03	7.03
			BTU/h	18100	18100	24000	24000
			kJ/h	19100	19100	25300	25300
	Running Current		A	8.0	7.8	12.3	12.2
	Input Power		W	1.72k	1.76k	2.54k	2.58k
	EER		W/W	3.08	3.01	2.77	2.72
			BTU/hW	10.52	10.28	9.45	9.30
	Power Factor		%	98	98	94	92
	Indoor Noise (H / L)		dB-A	43 / 38	43 / 38	47 / 41	47 / 41
			Power Level dB	59 / –	59 / –	63 / –	63 / –
	Outdoor Noise (H / L)		dB-A	53 / –	54 / –	53 / –	54 / –
			Power Level dB	68 / –	69 / –	68 / –	69 / –
Heating	Capacity		kW	5.65	5.70	7.80	7.80
			BTU/h	19300	19400	26600	26600
			kcal/h	20300	20500	28100	28100
	Running Current		A	7.7	7.6	12.2	12.2
	Input Power		W	1.65k	1.71k	2.53k	2.56k
	COP		W/W	3.42	3.33	3.08	3.05
			BTU/hW	11.70	11.35	10.51	10.39
	Power Factor		%	97	98	94	91
	Indoor Noise (H / L)		dB-A	42 / 38	42 / 38	46 / 41	46 / 41
			Power Level dB	58 / –	58 / –	62 / –	62 / –
	Outdoor Noise (H / L)		dB-A	54 / –	55 / –	54 / –	55 / –
			Power Level dB	70 / –	71 / –	70 / –	71 / –
Max Current (A) / Max Input Power (W)				10.2 / 2.20k		14.6 / 3.25k	
Starting Current (A)				40.0		60.0	
Compressor		Type		Hermetic Motor / Rotary		Hermetic Motor / Rotary	
		Motor Type		Induction (2-poles)		Induction (2-poles)	
		Output Power	W	1.5k		2.0k	
Indoor Fan	Type			Cross-flow Fan		Cross-flow Fan	
	Material			ASG30K1		ASG30K1	
	Motor Type			DC / Transistor (8-poles)		DC / Transistor (8-poles)	
	Input Power		W	94.8 - 94.8		94.8 - 94.8	
	Output Power		W	40		40	
	Speed	QLo	rpm	Cooling: 910 - 910 Heating: 970 - 970		Cooling: 1010 - 1010 Heating: 1090 - 1090	
		Lo	rpm	Cooling: 1000 - 1000 Heating: 1060 - 1060		Cooling: 1100 - 1100 Heating: 1180 - 1180	
		Me	rpm	Cooling: 1110 - 1110 Heating: 1100 - 1100		Cooling: 1220 - 1220 Heating: 1220 - 1220	
		Hi	rpm	Cooling: 1240 - 1240 Heating:1310 - 1310		Cooling: 1390 - 1390 Heating: 1530 - 1530	
		SHi	rpm	Cooling: 1310 - 1310		Cooling: 1530 - 1530	
Outdoor Fan	Type			Propeller Fan		Propeller Fan	
	Material			PP Resin		PP Resin	
	Motor Type			AC / Induction (6-poles)		AC / Induction (6-poles)	
	Input Power		W	138.3 - 150.3		138.3 - 150.3	
	Output Power		W	80		80	
	Speed	Lo	rpm	450 - 490		450 - 490	
		Hi	rpm	815 - 830		815 - 830	
Moisture Removal			L/h (Pt/h)	2.9 (6.1)		4.0 (8.5)	

Model		Indoor	CS-A18PKD		CS-A24PKD	
		Outdoor	CU-A18PKD		CU-A24PKD	
Indoor Airflow	QLo	m^3/min (ft^3/min)	Cooling: 12.0 (425) - 12.0 (425) Heating: 12.7 (447) - 12.7 (447)		Cooling: 13.5 (477) - 13.5 (477) Heating: 14.2 (503) - 14.2 (503)	
	Lo	m^3/min (ft^3/min)	Cooling: 13.2 (467) - 13.2 (467) Heating: 13.8 (489) - 13.8 (489)		Cooling: 14.7 (520) - 14.7 (520) Heating: 15.4 (545) - 15.4 (545)	
	Me	m^3/min (ft^3/min)	Cooling: 14.5 (514) - 14.5 (514) Heating: 14.4 (507) - 14.4 (507)		Cooling: 16.3 (577) - 16.3 (577) Heating: 15.9 (563) - 15.9 (563)	
	Hi	m^3/min (ft^3/min)	Cooling: 16.4 (579) - 16.4 (579) Heating: 17.1 (604) - 17.1 (604)		Cooling: 18.6 (657) - 18.6 (657) Heating: 20.0 (706) - 20.0 (706)	
	SHi	m^3/min (ft^3/min)	Cooling: 17.3 (612) - 17.3 (612)		Cooling: 20.5 (723) - 20.5 (723)	
Outdoor Airflow	Hi	m^3/min (ft^3/min)	50.0 (1770) - 51.0 (1800)		50.7 (1790) - 51.7 (1830)	
Refrigeration Cycle	Control Device		Capillary Tube		Capillary Tube	
	Refrigerant Oil	cm^3	ATMOSNM56M or SUNISO 4GDID (700)		ATMOS M60 or SUNISO 4GDID (1130)	
	Refrigerant Type	g (oz)	R22, 1.60k (56.5)		R22, 2.05k (72.4)	
Dimension	Height (I/D / O/D)	mm (inch)	290 (11-7/16)	695 (27-3/8)	290 (11-7/16)	750 (29-17/32)
	Width (I/D / O/D)	mm (inch)	1070 (42-5/32)	875 (34-15/32)	1070 (42-5/32)	875 (34-15/32)
	Depth (I/D / O/D)	mm (inch)	240 (9-15/32)	320 (12-5/8)	240 (9-15/32)	345 (13-19/32)
Weight	Net (I/D / O/D)	kg (lb)	12 (26)	55 (121)	12 (26)	60 (132)
Piping	Pipe Diameter (Liquid / Gas)	mm (inch)	6.35 (1/4) / 12.70 (1/2)		6.35 (1/4) / 15.88 (5/8)	
	Standard length	m (ft)	5.0 (16.4)		5.0 (16.4)	
	Length range (min – max)	m (ft)	3 (9.8) ~ 25 (82.0)		3 (9.8) ~ 25 (82.0)	
	I/D & O/D Height different	m (ft)	20 (65.6)		20 (65.6)	
	Additional Gas Amount	g/m (oz/ft)	20 (0.2)		30 (0.3)	
	Length for Additional Gas	m (ft)	7.5 (24.6)		7.5 (24.6)	
Drain Hose	Inner Diameter	mm	16.7		16.7	
	Length	mm	650		650	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)		Aluminium (Pre Coat)	
	Fin Type		Slit Fin		Slit Fin	
	Row × Stage × FPI		2 × 15 × 17		2 × 15 × 17	
	Size (W × H × L)	mm	810 × 315 × 25.4		810 × 315 × 25.4	
Outdoor Heat Exchanger	Fin Material		Aluminium (Blue Coat)		Aluminium (Blue Coat)	
	Fin Type		Corrugate		Corrugate	
	Row × Stage × FPI		2 × 26 × 17		2 × 28 × 17	
	Size (W × H × L)	mm	660.4 × 796.7 × 831.3		44 × 711.2 × 782.4:816.9	
Air Filter	Material		Polypropelene		Polypropelene	
	Type		One-touch		One-touch	
Power Supply			Indoor		Indoor	
Power Supply Cord		A	16		20	
Thermostat			–		–	
Protection Device			–		–	
			Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum °C	32	23	32	23
		Minimum °C	16	11	16	11
	Heating	Maximum °C	30	–	30	–
		Minimum °C	16	–	16	–
Outdoor Operation Range	Cooling	Maximum °C	43	26	43	26
		Minimum °C	16	11	16	11
	Heating	Maximum °C	24	18	24	18
		Minimum °C	-5	-6	-5	-6

1. Cooling capacities are based on indoor temperature of 27°C Dry Bulb (80.6°F Dry Bulb), 19.0°C Wet Bulb (66.2°F Wet Bulb) and outdoor air temperature of 35°C Dry Bulb (95°F Dry Bulb), 24°C Wet Bulb (75.2°F Wet Bulb)
2. Heating capacities are based on indoor temperature of 20°C Dry Bulb (68°F Dry Bulb) and outdoor air temperature of 7°C Dry Bulb (44.6°F Dry Bulb), 6°C Wet Bulb (42.8°F Wet Bulb)
3. Specifications are subjected to change without prior notice for further improvement.

Model			Indoor	CS-A28PKD	
			Outdoor	CU-A28PKD	
Performance Test Condition				NEW JIS	
Power Supply			Phase, Hz	Single, 50	
			V	220	230
Cooling	Capacity		kW	8.00	8.00
			BTU/h	27300	27300
			kJ/h	28800	28800
	Running Current		A	13.2	12.7
	Input Power		W	2.86k	2.88k
	EER		W/W	2.80	2.78
			Btu/hW	9.55	9.48
	Power Factor		%	98	99
	Indoor Noise (H / L)		dB-A	49 / 44	
			Power Level dB	65 / –	
	Outdoor Noise (H / L)		dB-A	55 / –	
			Power Level dB	70 / –	
Heating	Capacity		kW	8.80	8.80
			BTU/h	30000	30000
			kJ/h	31680	31680
	Running Current		A	13.1	12.6
	Input Power		W	2.84k	2.86k
	EER		W/W	3.10	3.08
			Btu/hW	10.56	10.49
	Power Factor		%	99	99
	Indoor Noise (H / L)		dB-A	48 / 44	
			Power Level dB	64 / –	
	Outdoor Noise (H / L)		dB-A	55 / –	
			Power Level dB	71 / –	
Max Current (A) / Max Input Power (W)				16.4 / 3.45k	
Starting Current (A)				40	
Compressor		Type		Hermetic Motor / Rotary	
		Motor Type		Induction (2 poles)	
		Output Power	W	2.4k	
Indoor Fan	Type			Cross-Flow Fan	
	Material			ASG30K1	
	Motor Type			DC / Transistor (8 poles)	
	Input Power		W	94.8 - 94.8	
	Output Power		W	40	
	Speed	QLo	rpm	Cooling: 1110 Heating: 1180	
		Lo	rpm	Cooling: 1200 Heating: 1270	
		Me	rpm	Cooling: 1320 Heating: 1320	
		Hi	rpm	Cooling: 1470 Heating: 1520	
		SHi	rpm	Cooling: 1520	
Outdoor Fan	Type			Propeller Fan	
	Material			PP	
	Motor Type			AC / Induction (6 poles)	
	Input Power		W	146.7 - 154.9	
	Output Power		W	80	
	Speed	Lo	rpm	460 - 490	
		Hi	rpm	840 - 855	
Moisture Removal			L/h (Pt/h)	4.7 (9.9)	

Model		Indoor	CS-A28PKD	
		Outdoor	CU-A28PKD	
Indoor Airflow	QLo	m^3/min (ft^3/min)	Cooling: 15.0 (528) Heating: 15.8 (559)	
	Lo	m^3/min (ft^3/min)	Cooling: 16.2 (571) Heating: 17.0 (602)	
	Me	m^3/min (ft^3/min)	Cooling: 17.8 (628) Heating: 17.7 (626)	
	Hi	m^3/min (ft^3/min)	Cooling: 19.80 (699) Heating: 20.40 (720)	
	SHi	m^3/min (ft^3/min)	Cooling: 20.5 (723)	
Outdoor Airflow	Lo	m^3/min (ft^3/min)	30.1 (1060) - 32.0 (1130)	
	Hi	m^3/min (ft^3/min)	52.5 (1850) - 53.5 (1890)	
Refrigeration Cycle	Control Device		Capillary Tube	
	Refrigerant Oil	cm^3	SUNISO 4GDID or ATMOS M60 (900)	
	Refrigerant Type	g (oz)	R22, 2130 (75.2)	
Dimension	Height (I/D / O/D)	mm (inch)	290 (11-7/16) / 750 (29-17/32)	
	Width (I/D / O/D)	mm (inch)	1070 (42-5/32) / 875 (34-15/32)	
	Depth (I/D / O/D)	mm (inch)	240 (9-15/32) / 345 (13-19/32)	
Weight	Net (I/D / O/D)	kg (lb)	12 (26) / 66 (146)	
Piping	Pipe Diameter (Liquid / Gas)	mm (inch)	6.35 (1/4) / 15.88 (5/8)	
	Standard length	m (ft)	5.0 (16.4)	
	Length range (min – max)	m (ft)	3 ~ 30 (9.8 ~ 98.4)	
	I/D & O/D Height different	m (ft)	20.0 (65.6)	
	Additional Gas Amount	g/m (oz/ft)	30 (0.3)	
	Length for Additional Gas	m (ft)	7.5 (24.6)	
Drain Hose	Inner Diameter	mm	16.7	
	Length	mm	650	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre coated)	
	Fin Type		Slit Fin	
	Row × Stage × FPI		2 × 15 × 21	
	Size (W × H × L)	mm	810 × 315 × 25.4	
Outdoor Heat Exchanger	Fin Material		Aluminium (Blue coated)	
	Fin Type		Corrugated Fin	
	Row × Stage × FPI		2 × 28 × 17	
	Size (W × H × L)	mm	44.0 × 711.2 × 802.4:836.9	
Air Filter	Material		Polypropelene	
	Type		One-touch	
Power Supply			Outdoor	
Power Supply Cord		A	20	
Thermostat			–	
Protection Device			Inner Protector	
			DRY BULB	WET BULB
Indoor Operation Range	Cooling	Maximum °C	32	23
		Minimum °C	16	11
	Heating	Maximum °C	30	–
		Minimum °C	16	–
Outdoor Operation Range	Cooling	Maximum °C	43	26
		Minimum °C	16	11
	Heating	Maximum °C	24	18
		Minimum °C	-5	-6

1. Cooling capacities are based on indoor temperature of 27°C Dry Bulb (80.6°F Dry Bulb), 19.0°C Wet Bulb (66.2°F Wet Bulb) and outdoor air temperature of 35°C Dry Bulb (95°F Dry Bulb), 24°C Wet Bulb (75.2°F Wet Bulb)
2. Heating capacities are based on indoor temperature of 20°C Dry Bulb (68°F Dry Bulb) and outdoor air temperature of 7°C Dry Bulb (44.6°F Dry Bulb), 6°C Wet Bulb (42.8°F Wet Bulb)
3. Specifications are subjected to change without prior notice for further improvement.

3. Features

- Air Purifying System with nanoe-G
  - Deactivates and removes bacterial, viruses and mould.

- Long Installation Piping
  - CS/CU-A9PK, long piping up to 10 meters.
  - CS/CU-A12PK, long piping up to 15 meters.
  - CS/CU-A18PK, CS/CU-A24PK, long piping up to 25 meters.
  - CS/CU-A28PK, long piping up to 30 meters.

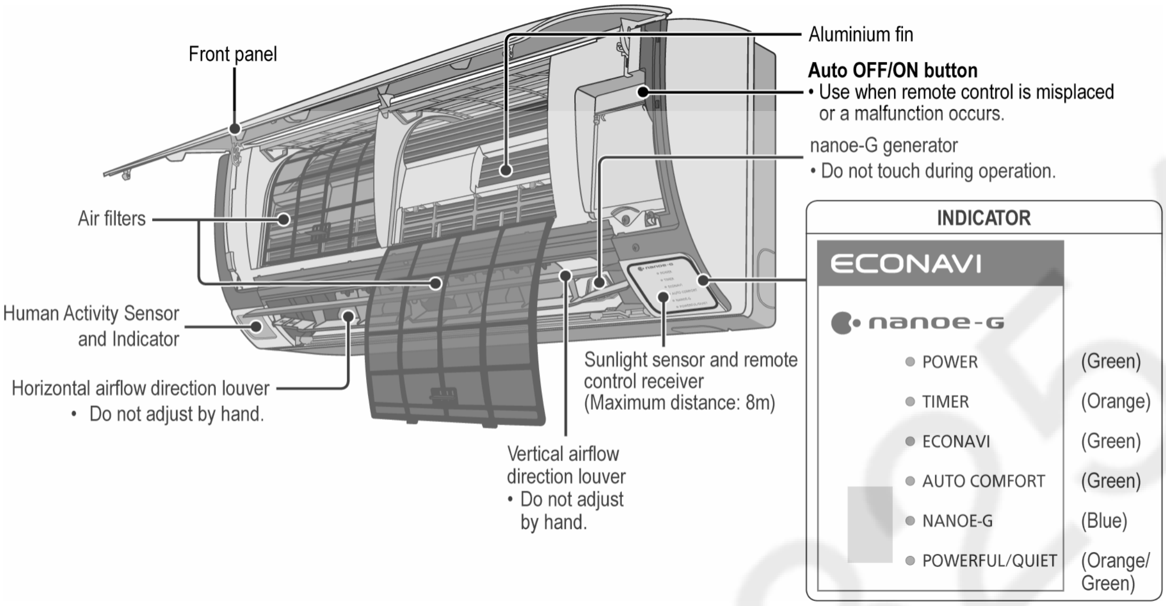
- Easy to use remote control

- Quality Improvement
  - Random auto restart after power failure for safety restart operation
  - Gas leakage protection
  - Prevent compressor reverse cycle
  - Inner protector to protect compressor
  - Noise prevention during soft dry operation
  - Blue coated condenser for high resistance to corrosion

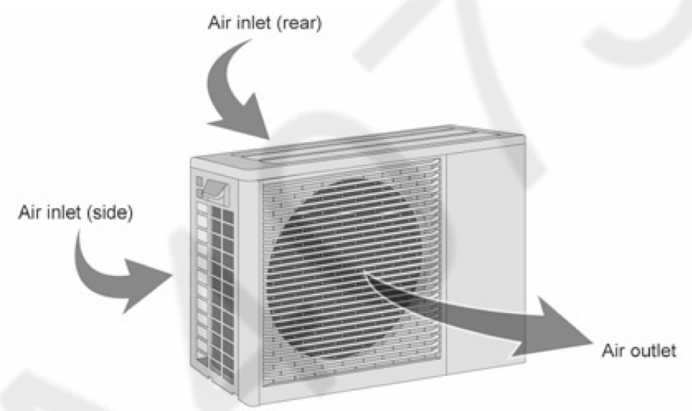
- Operation Improvement
  - Quiet mode to reduce the indoor unit operating sound
  - Powerful mode to reach the desired room temperature quickly
  - 24-hour timer setting

4. Location of Controls and Components

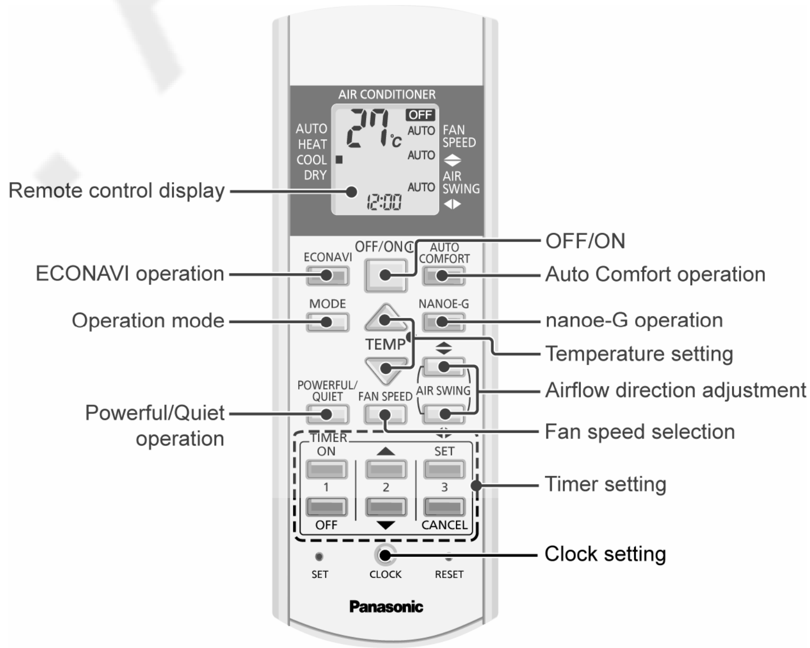
4.1 Indoor Unit



4.2 Outdoor Unit



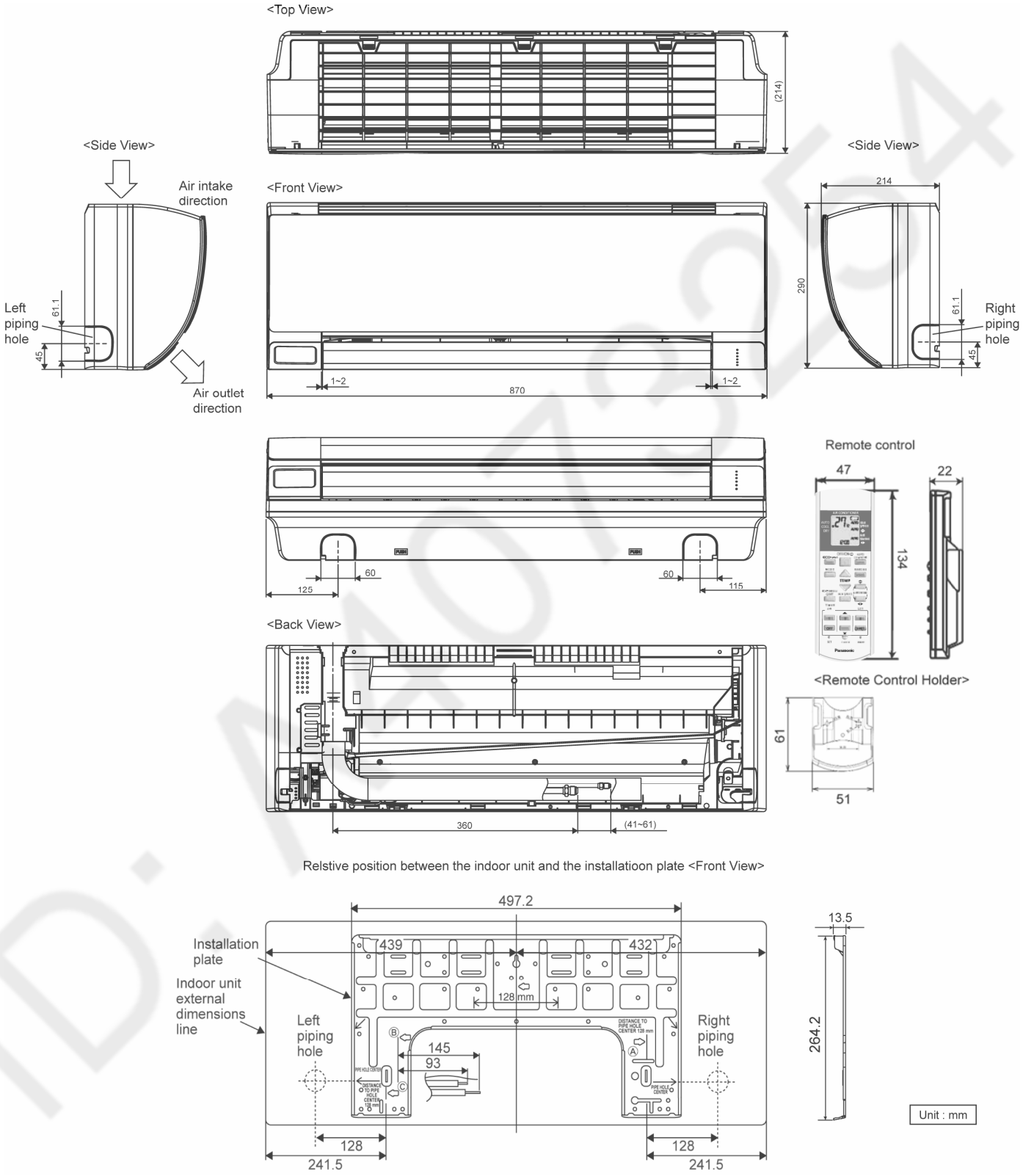
4.3 Remote Control



5. Dimensions

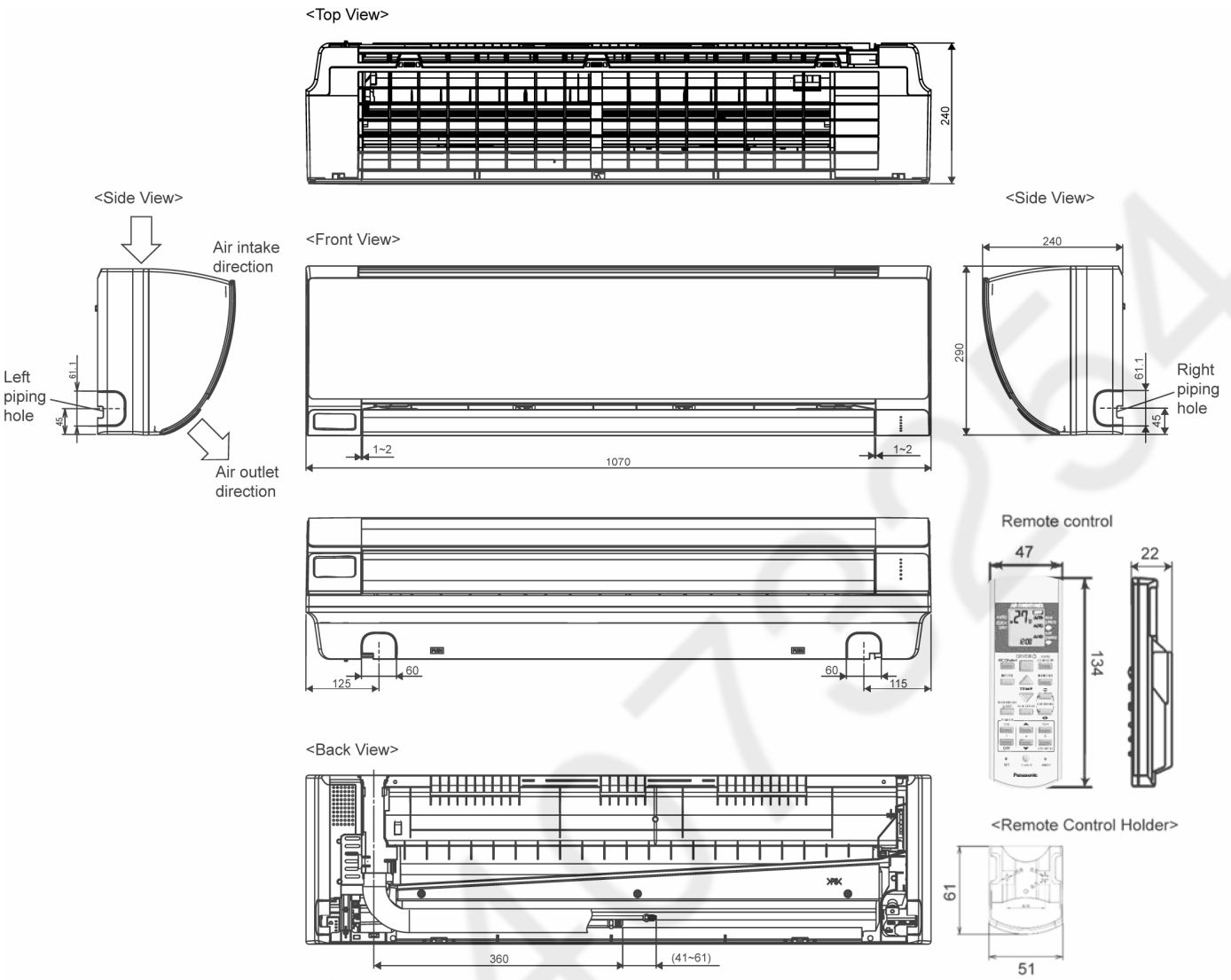
5.1 Indoor Unit

5.1.1 CS-A9PKD CS-A12PKD

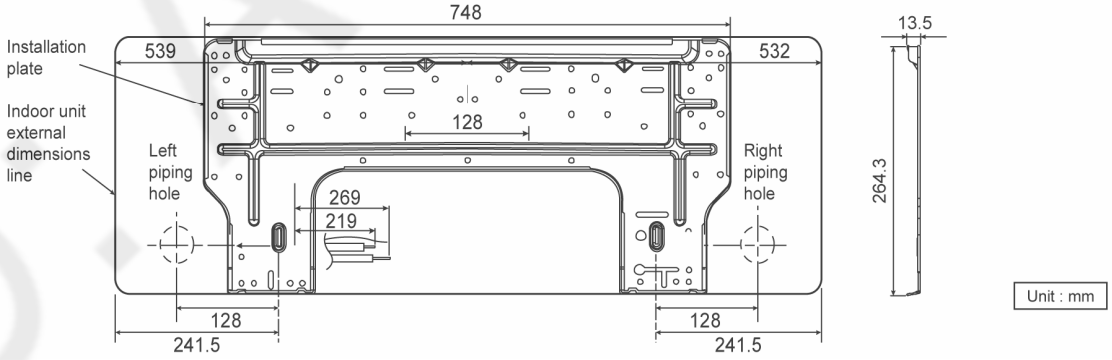


Relstive position between the indoor unit and the installatioon plate <Front View>

5.1.2 CS-A18PKD CS-A24PKD CS-A28PKD

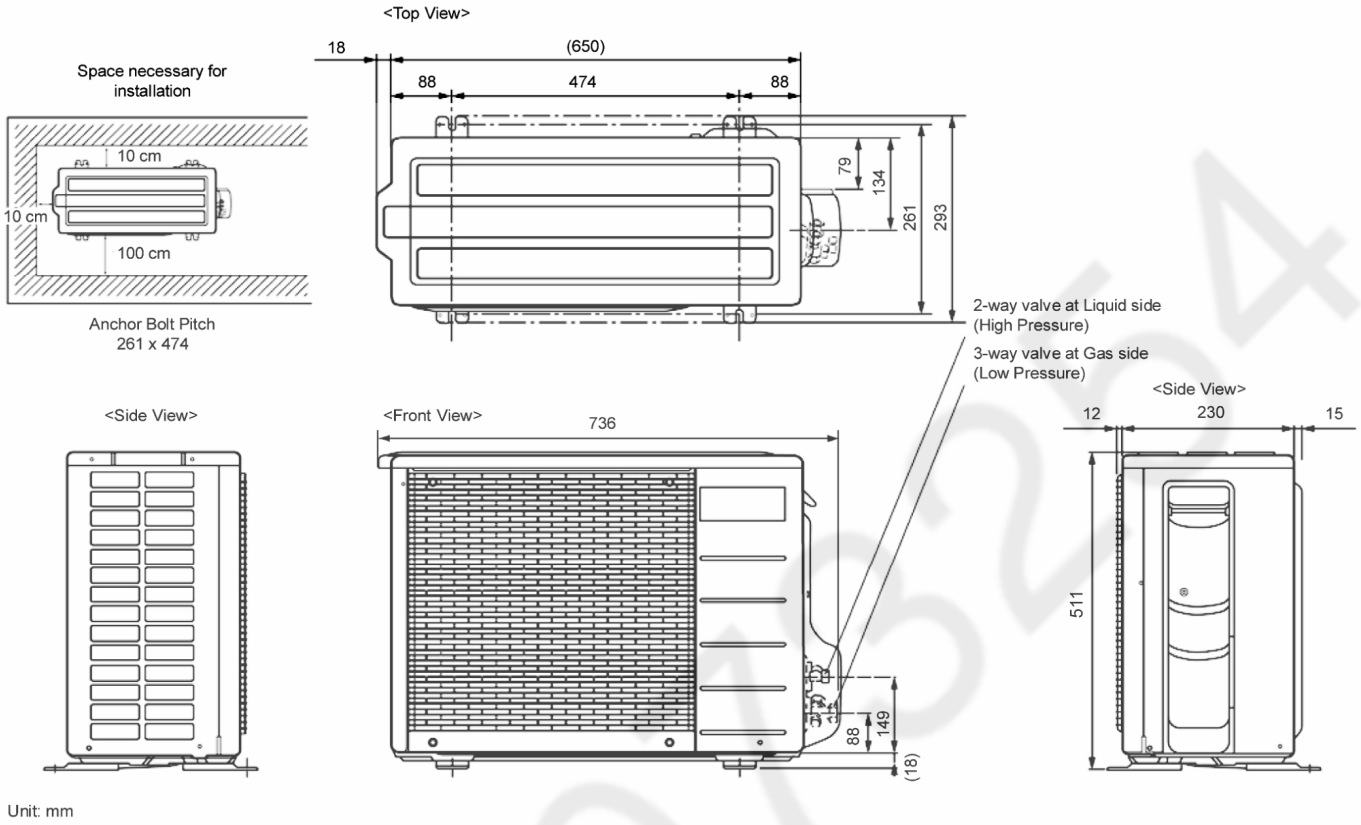


Relative position between the indoor unit and the installation plate <Front View>



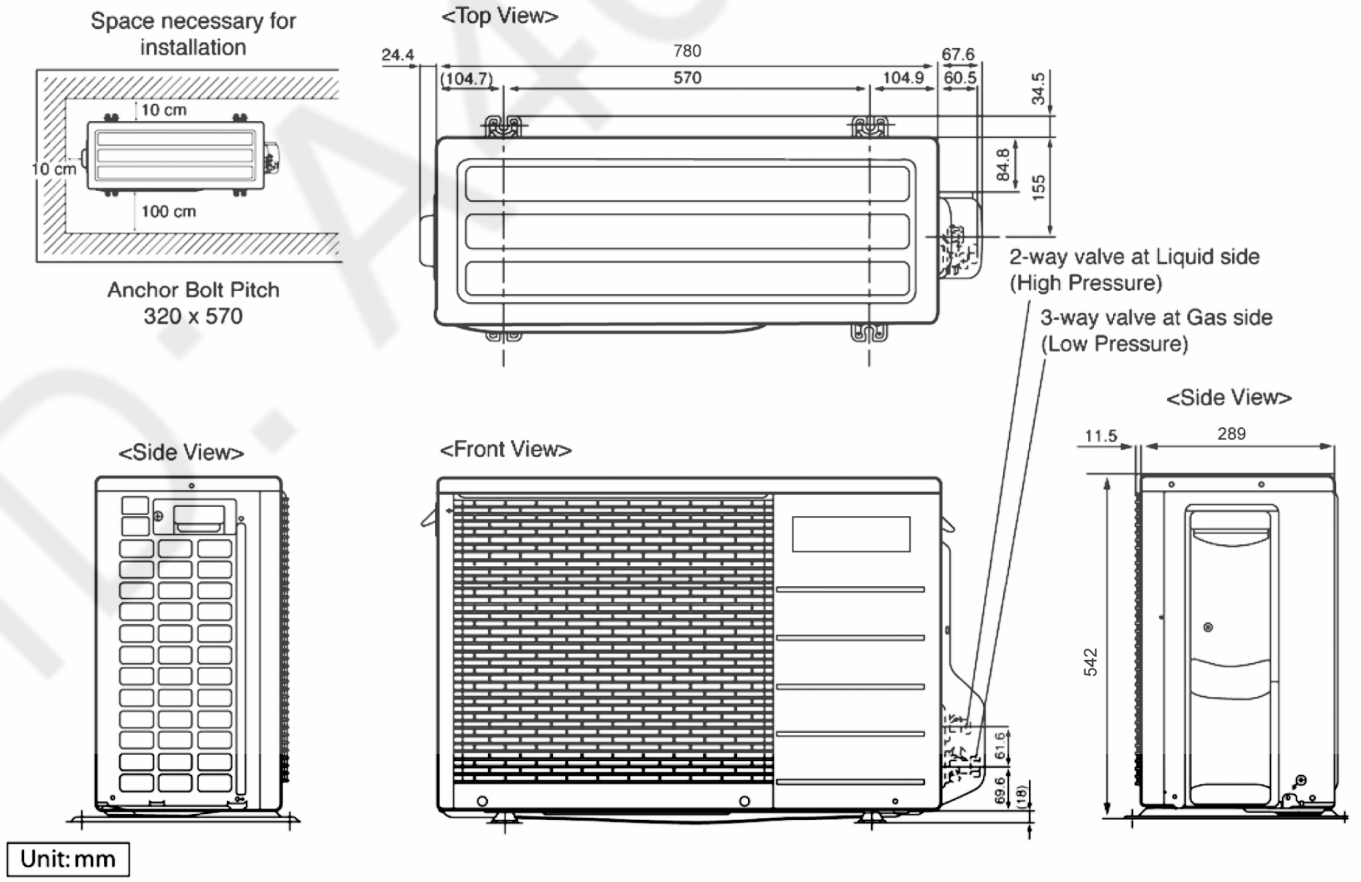
5.2 Outdoor Unit

5.2.1 CU-A9PKD



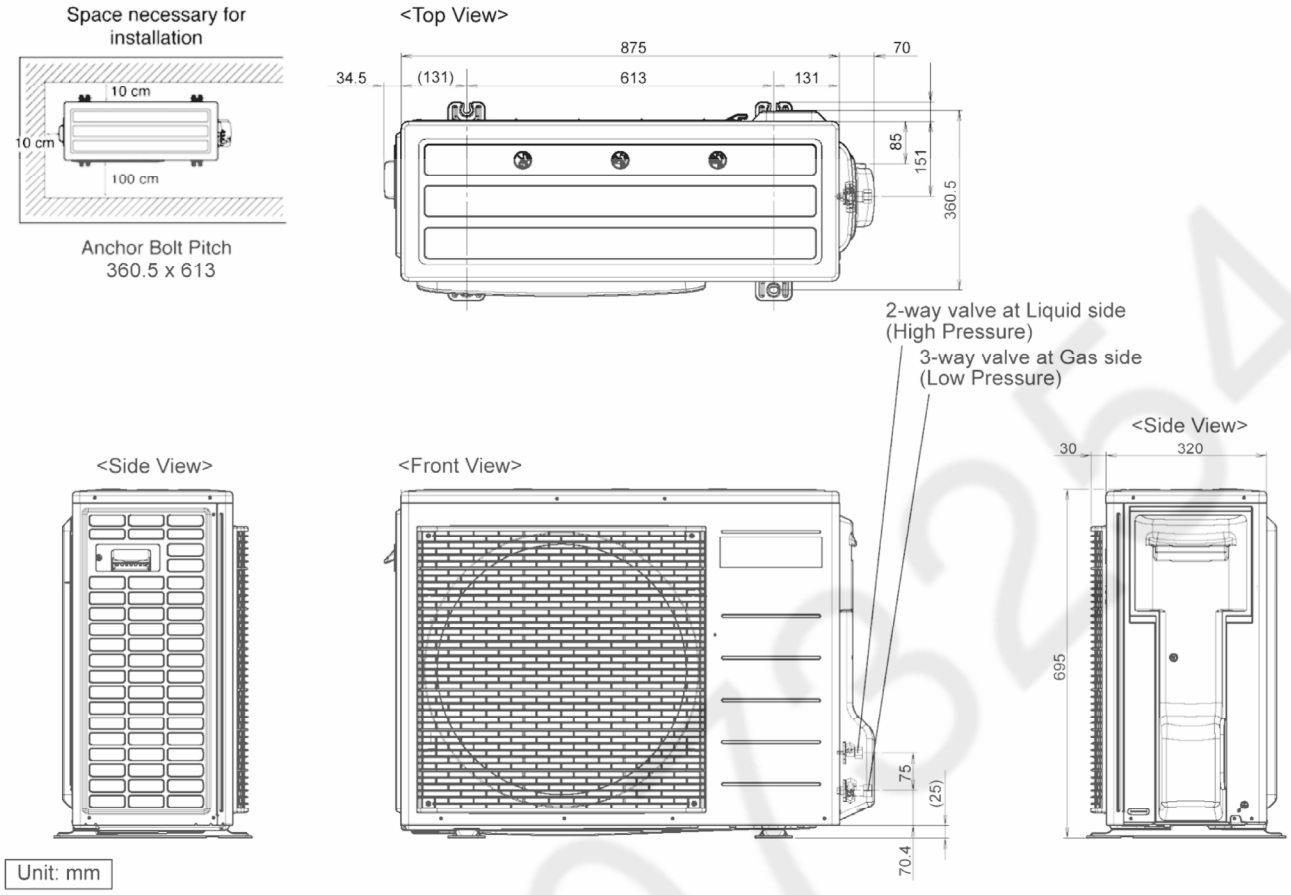
Unit: mm

5.2.2 CU-A12PKD

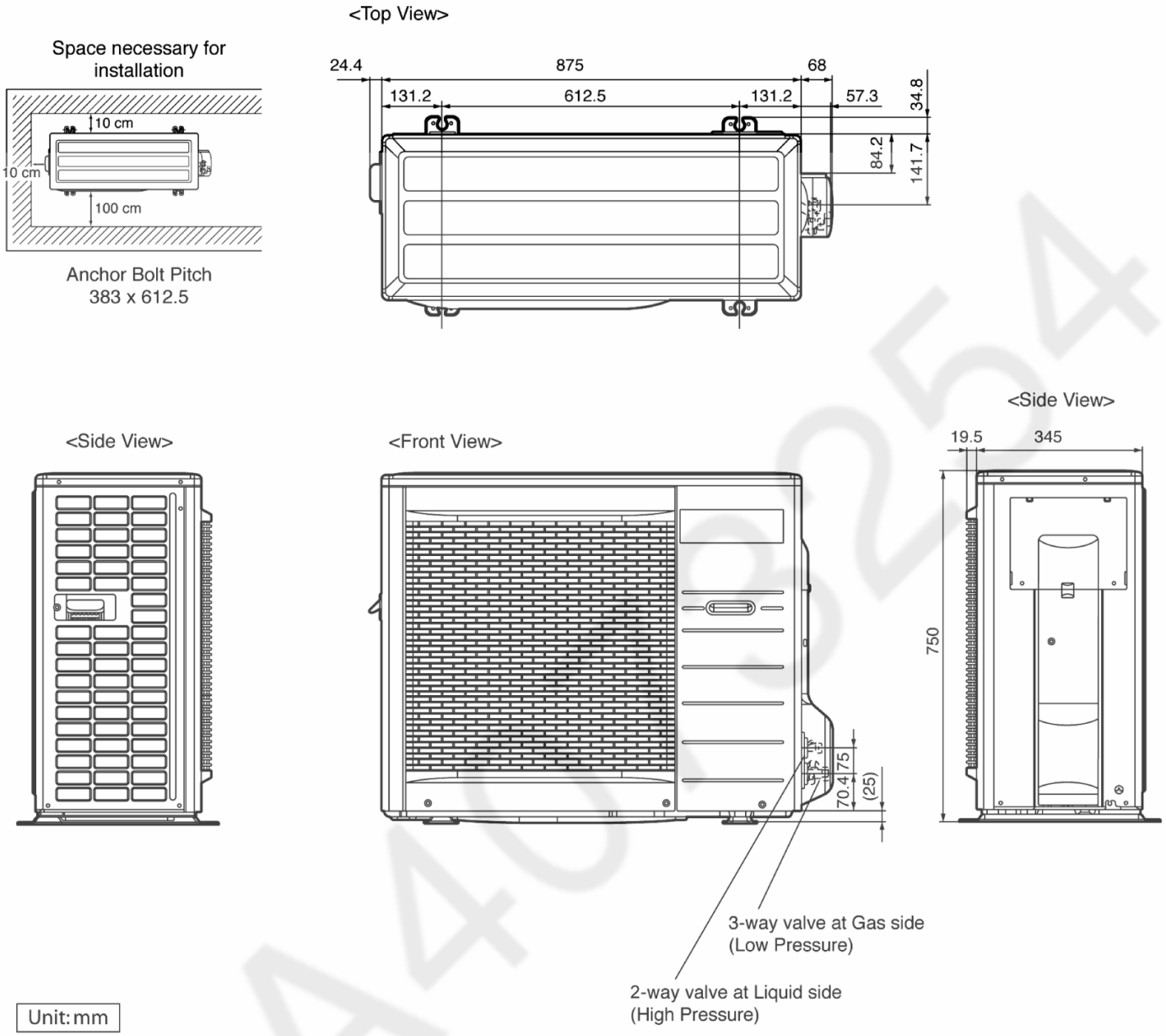


Unit: mm

5.2.3 CU-A18PKD



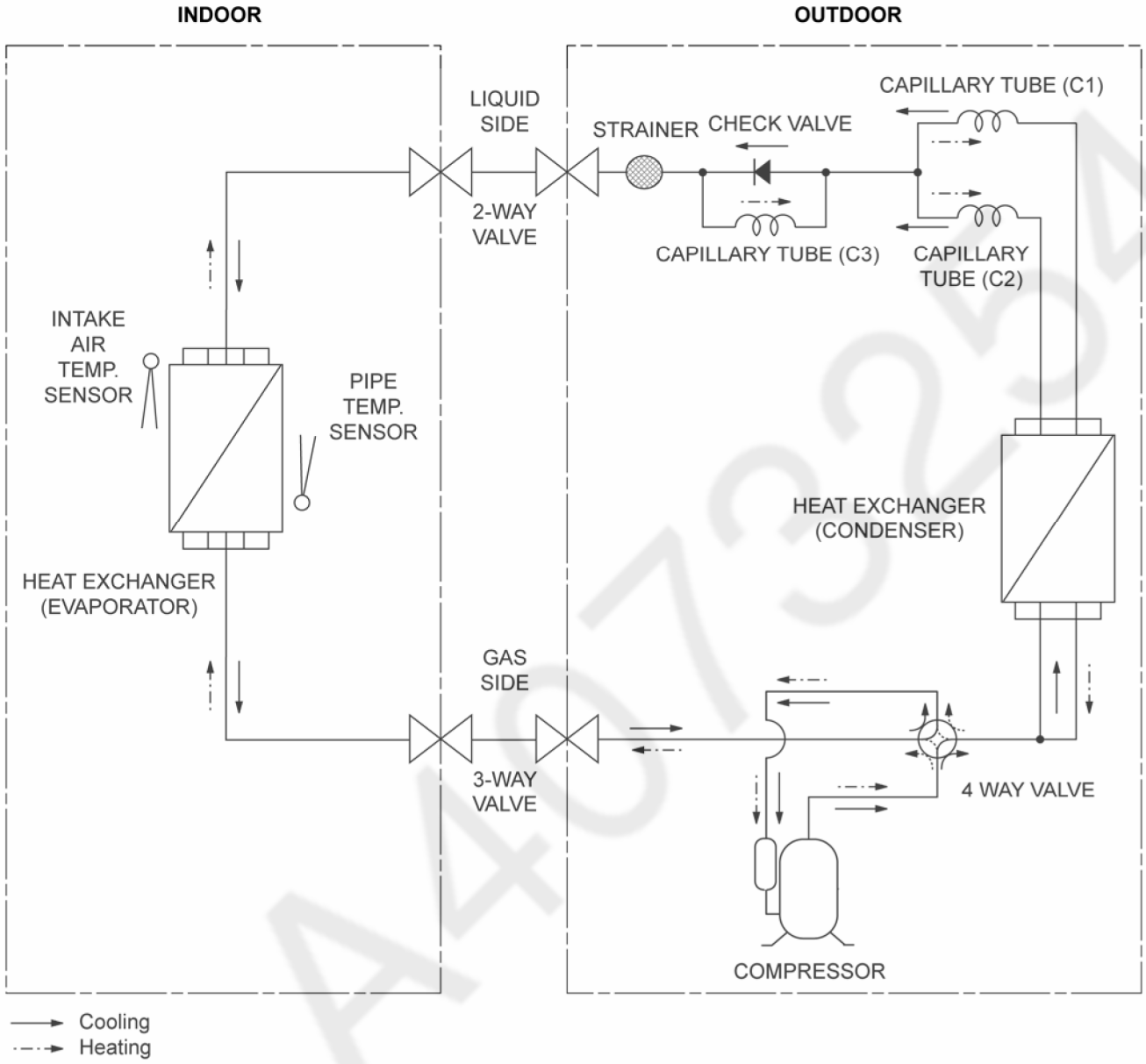
5.2.4 CU-A24PKD CU-A28PKD



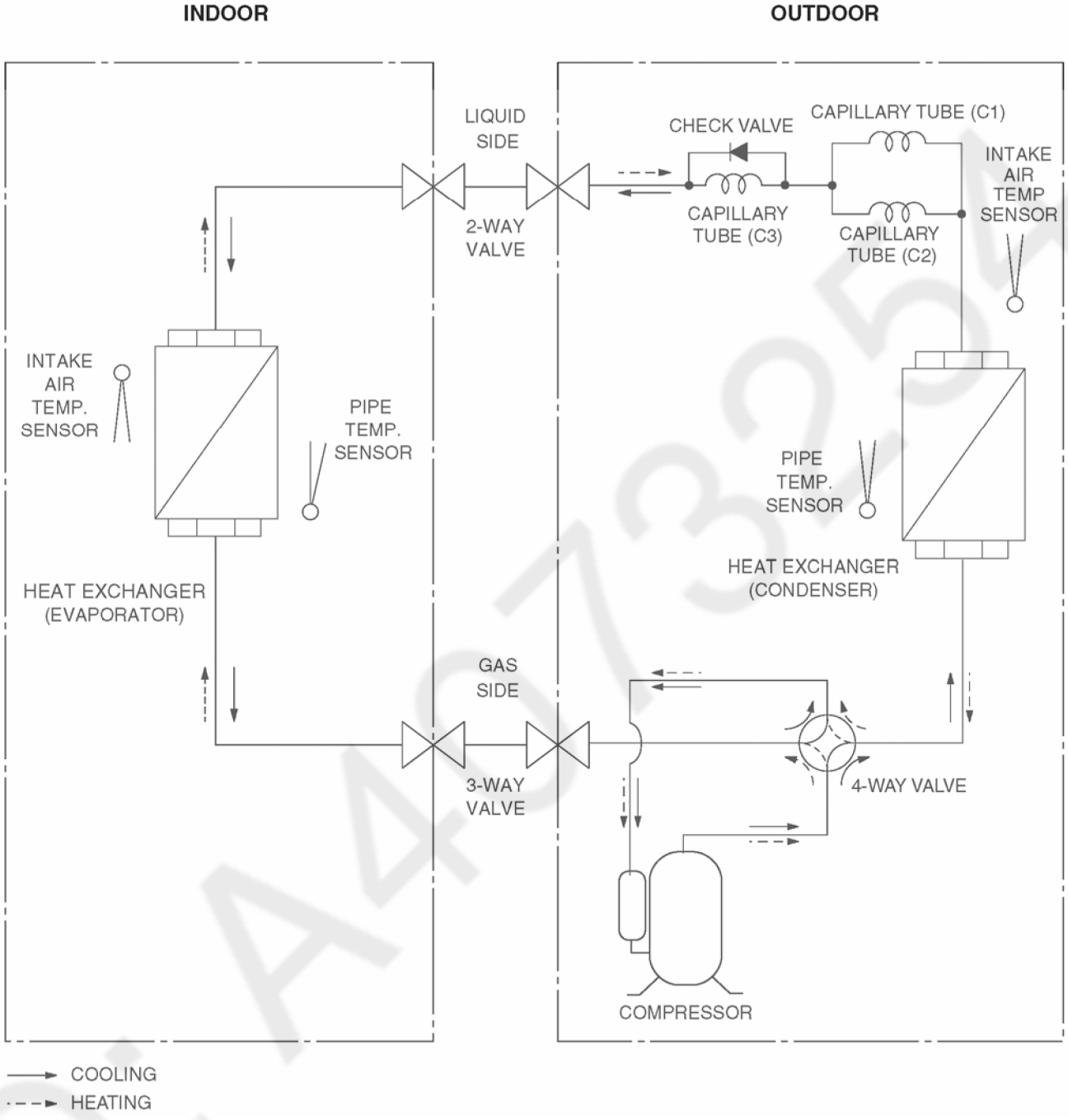
Unit: mm

6. Refrigeration Cycle Diagram

6.1 CS-A9PKD CU-A9PKD CS-A12PKD CU-A12PKD

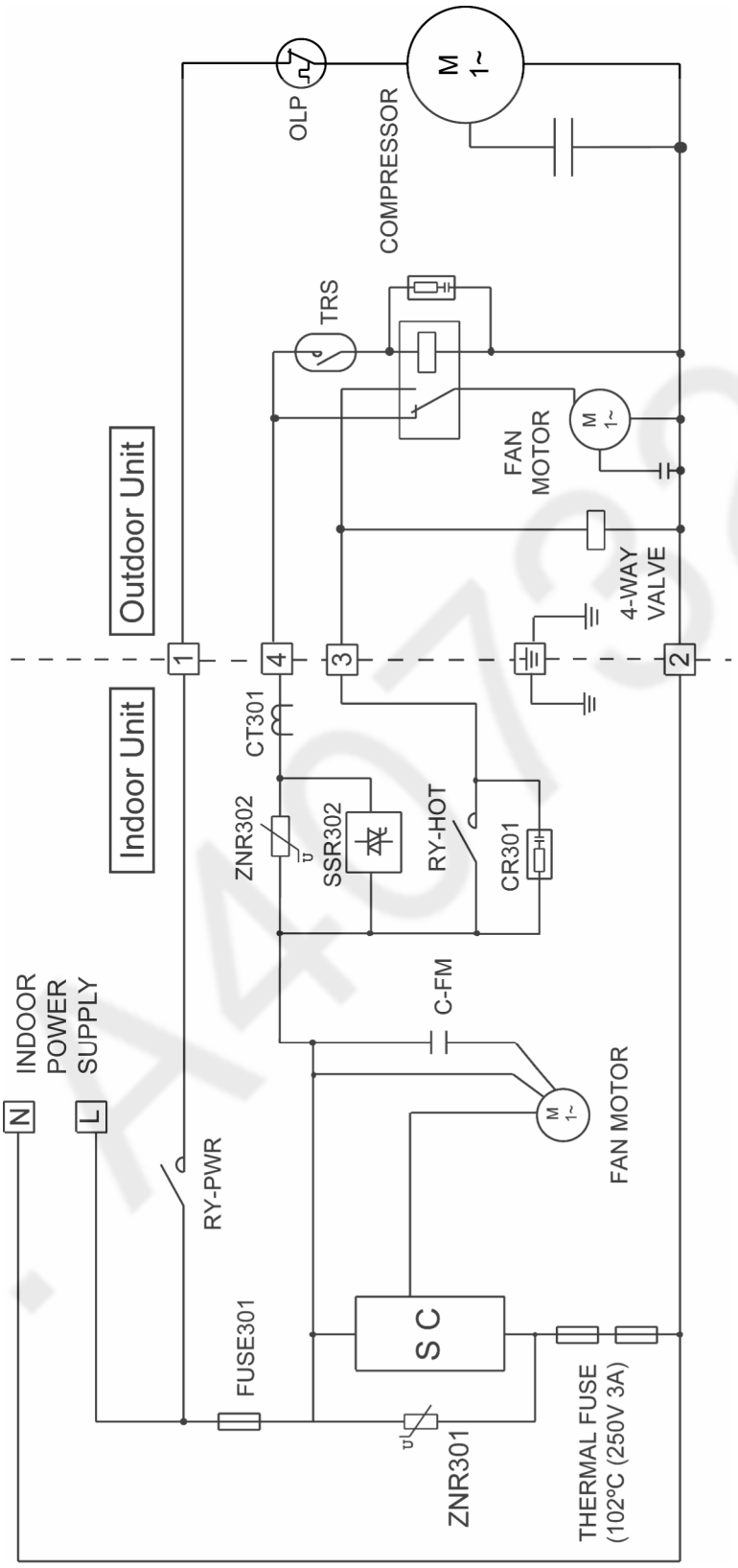


6.2 CS-A18PKD CU-A18PKD CS-A24PKD CU-A24PKD CS-A28PKD CU-A28PKD

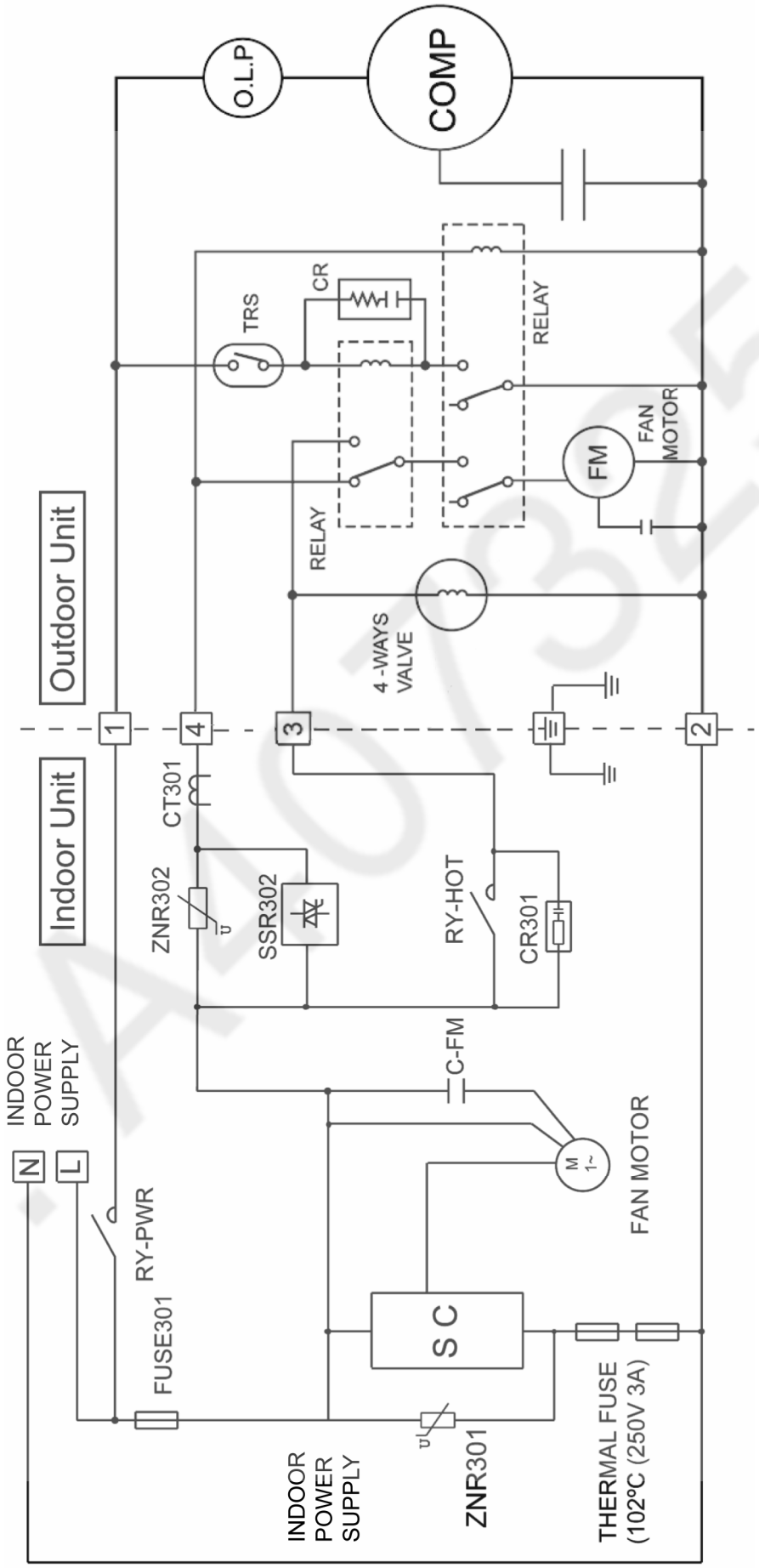


7. Block Diagram

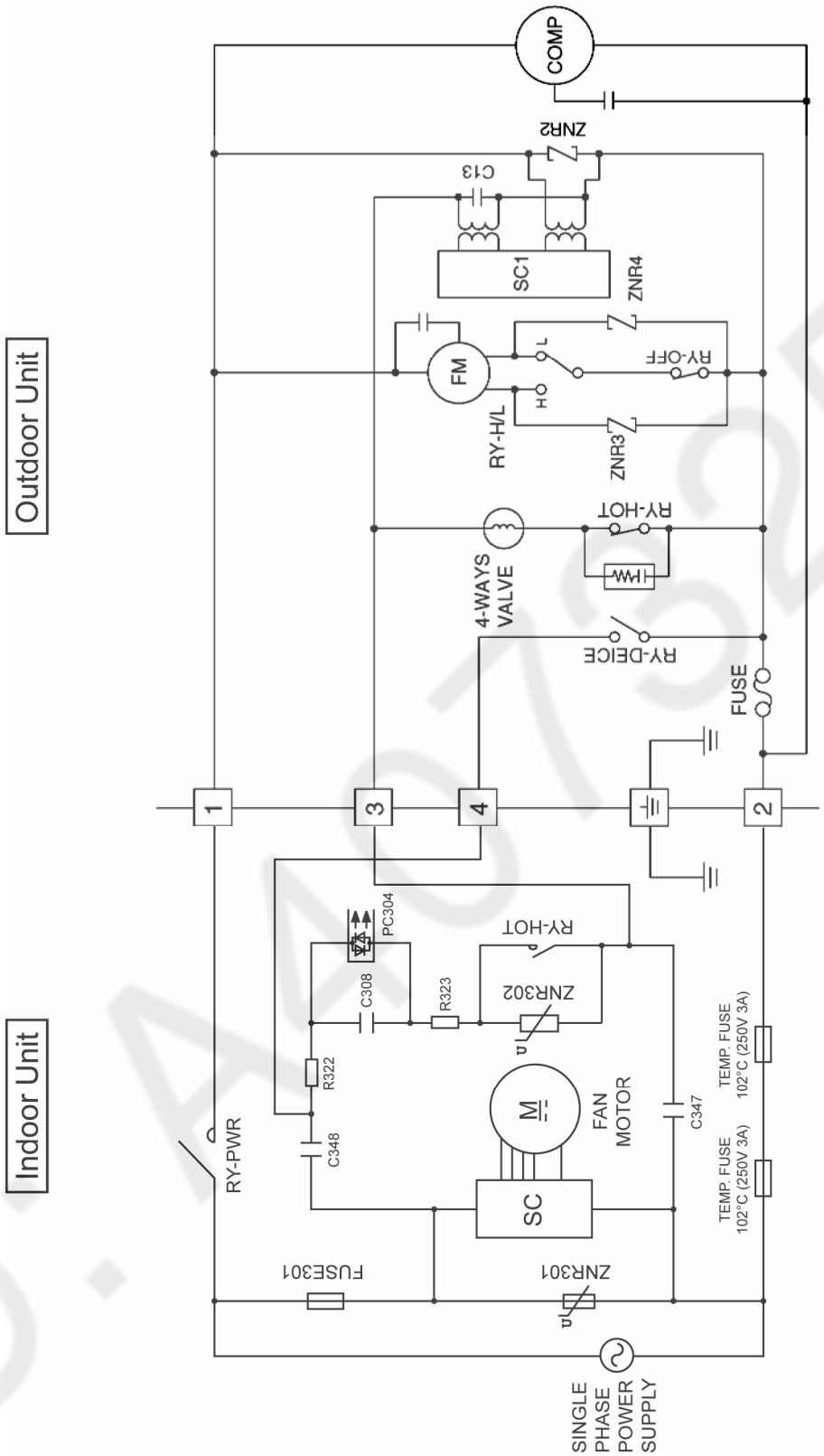
7.1 CS-A9PKD CU-A9PKD



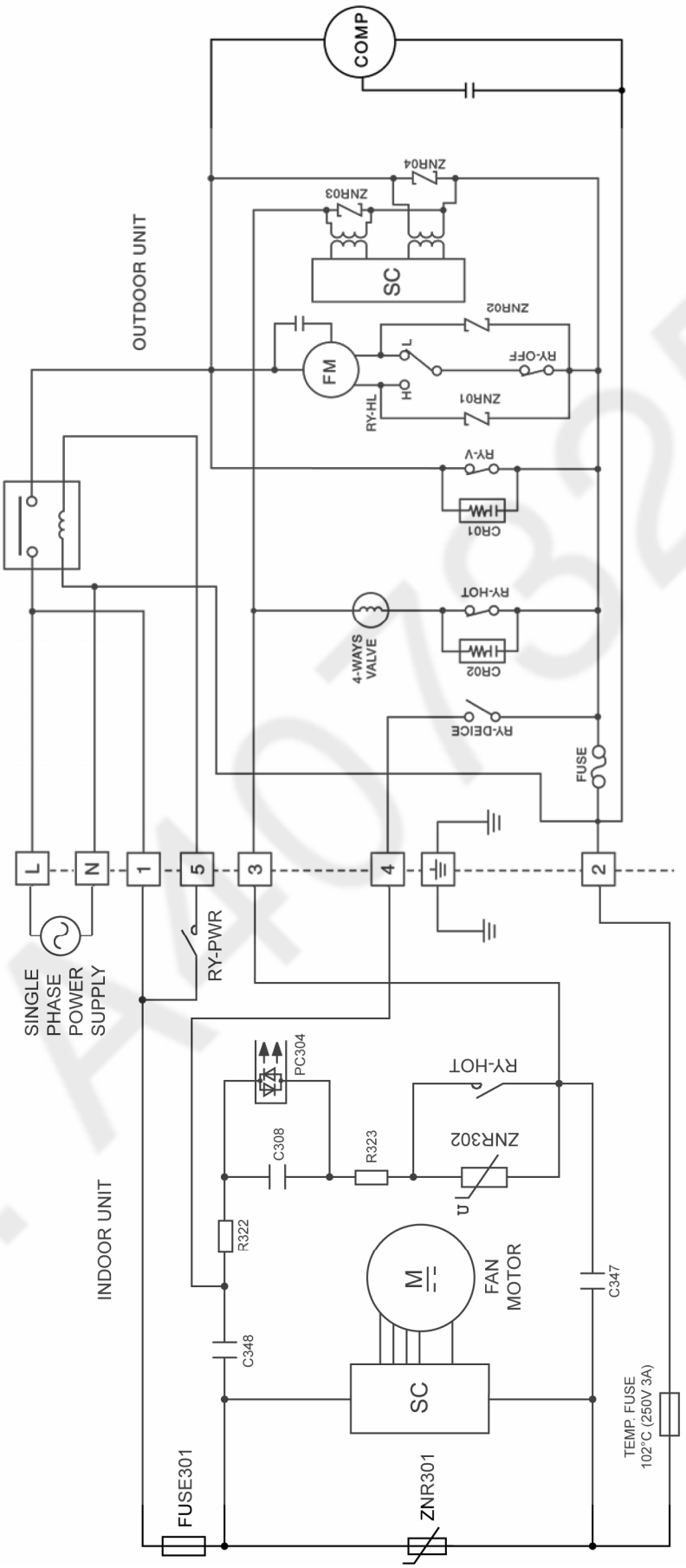
7.2 CS-A12PKD CU-A12PKD



7.3 CS-A18PKD CU-A18PKD CS-A24PKD CU-A24PKD

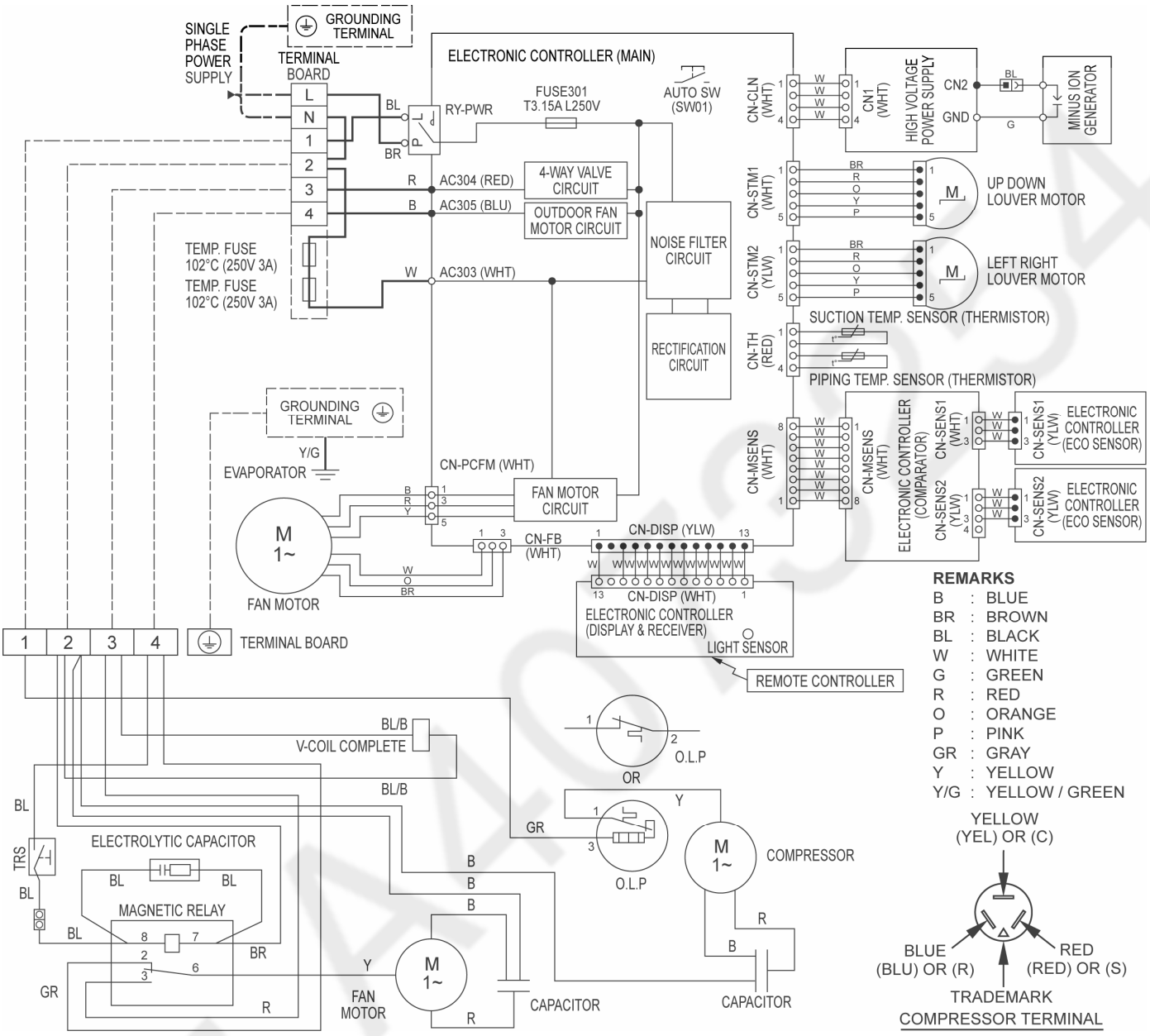


7.4 CS-A28PKD CU-A28PKD



8. Wiring Connection Diagram

8.1 CS-A9PKD CU-A9PKD



Resistance of Indoor Fan Motor Windings

MODEL	CS-A9PKD
CONNECTION	CWA921447
BLUE-YELLOW	336Ω
YELLOW-RED	306Ω

Note: Resistance at 25°C of ambient temperature.

Resistance of Compressor Windings

MODEL	CU-A9PKD
CONNECTION	2PS156D3DA02
C-R	4.228Ω
C-S	3.841Ω

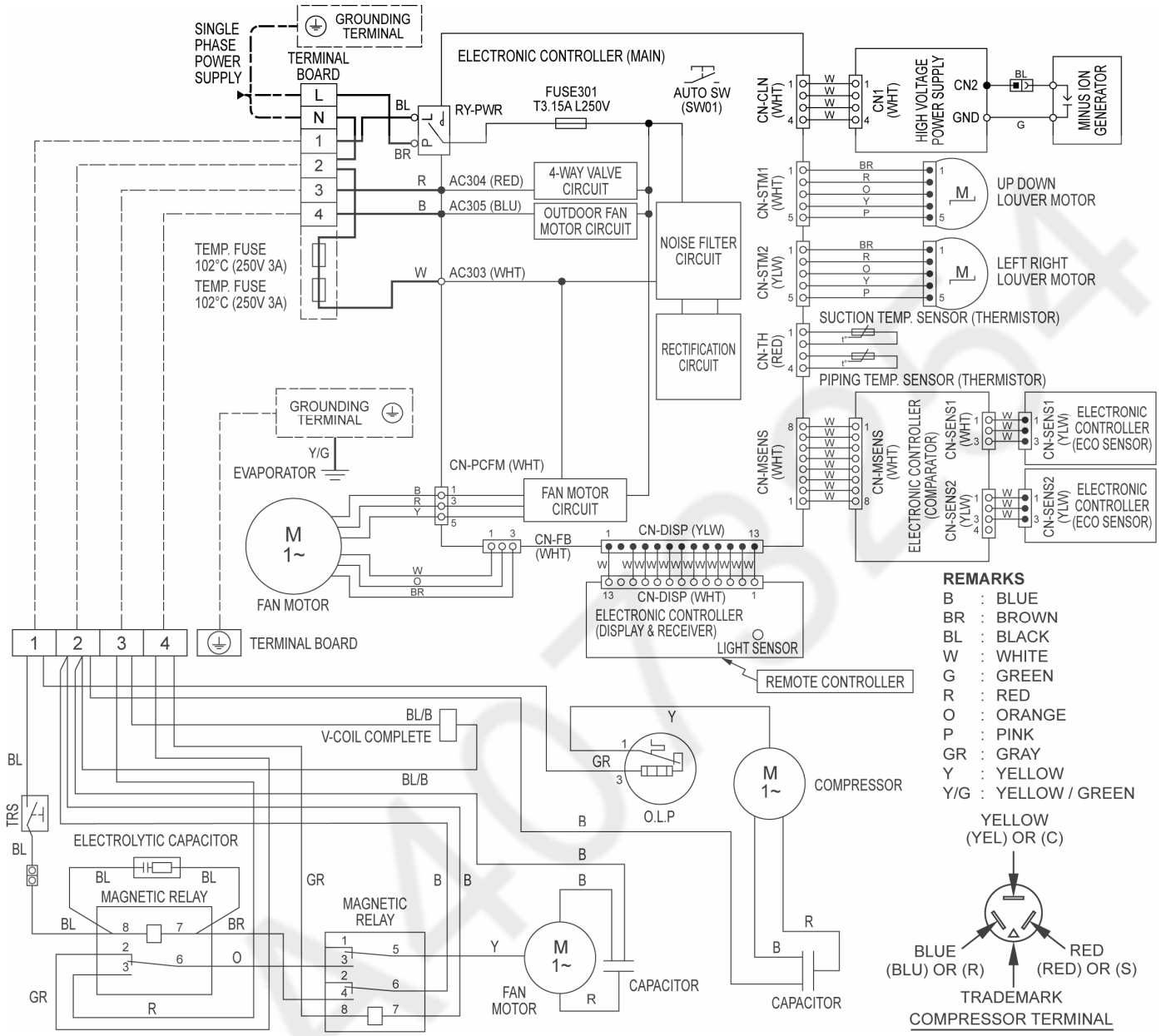
Note: Resistance at 20°C of ambient temperature.

Resistance of Outdoor Fan Motor Windings

MODEL	CU-A9PKD
CONNECTION	CWA951674
BLUE-YELLOW	396Ω
YELLOW-RED	295Ω

Note: Resistance at 20°C of ambient temperature.

8.2 CS-A12PKD CU-A12PKD



Resistance of Indoor Fan Motor Windings

MODEL	CS-A12PKD
CONNECTION	CWA921447
BLUE-YELLOW	336Ω
YELLOW-RED	306Ω

Note: Resistance at 25°C of ambient temperature.

Resistance of Compressor Windings

MODEL	CU-A12PKD
CONNECTION	2PS206D3DA06
C-R	3.252Ω
C-S	4.313Ω

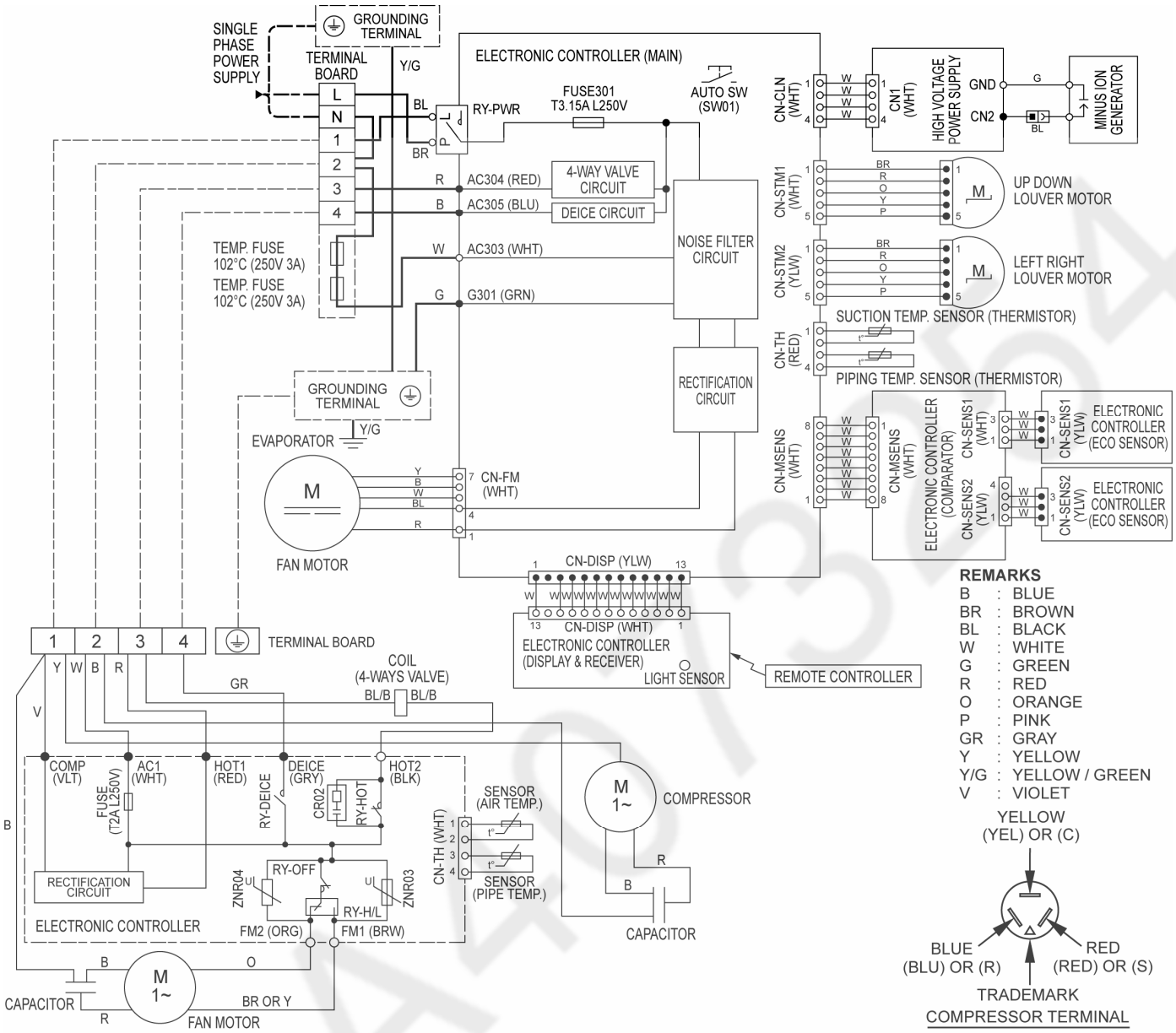
Note: Resistance at 20°C of ambient temperature.

Resistance of Outdoor Fan Motor Windings

MODEL	CU-A12PKD
CONNECTION	CWA951692
BLUE-YELLOW	276Ω
YELLOW-RED	291Ω

Note: Resistance at 20°C of ambient temperature.

8.3 CS-A18PKD CU-A18PKD CS-A24PKD CU-A24PKD



Resistance of Outdoor Fan Motor Windings

MODEL	CU-A18PKD / CU-A24PKD
CONNECTION	CWA951385J
BLUE-YELLOW	93Ω
YELLOW-ORANGE	124Ω
YELLOW-RED	98Ω

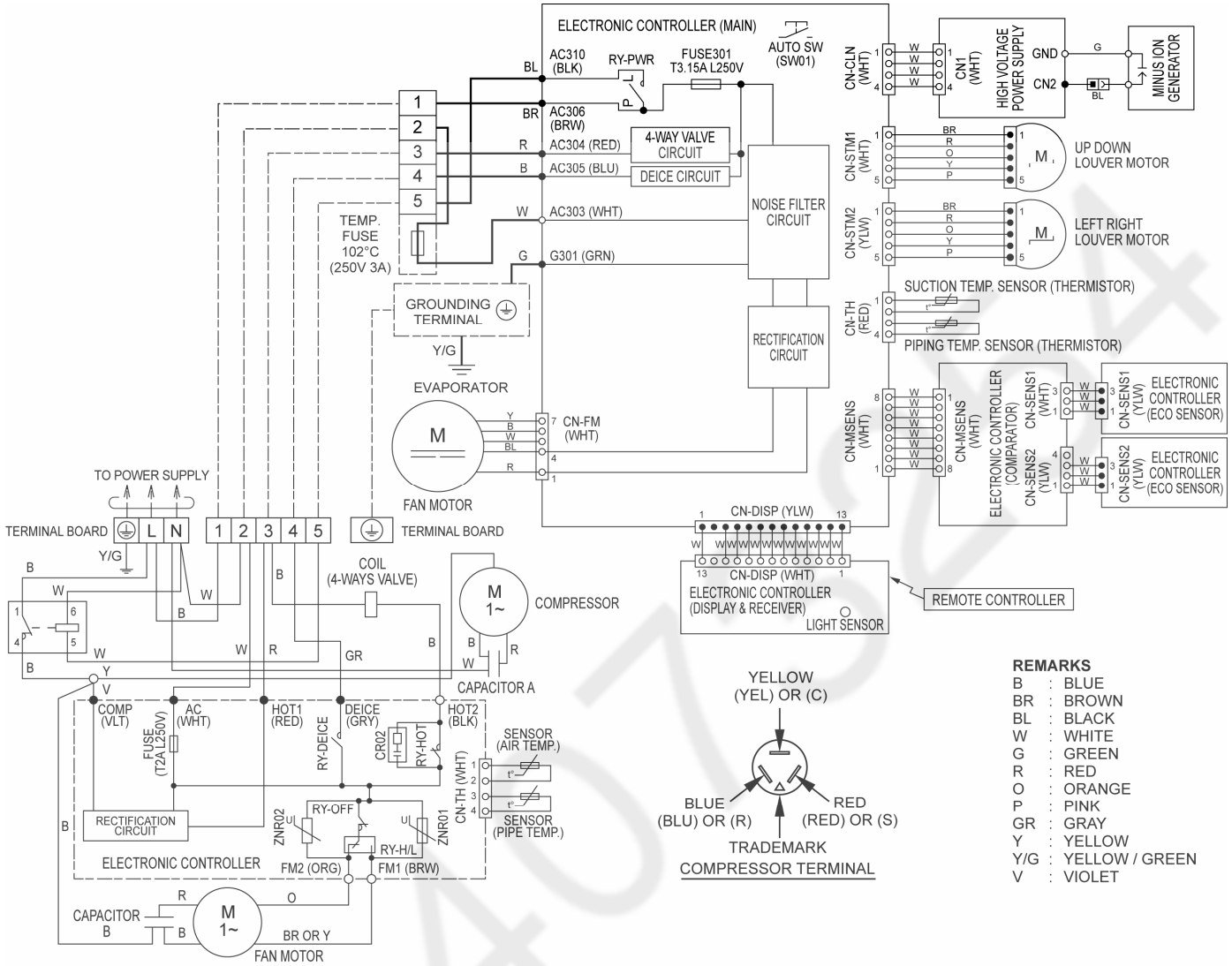
Note: Resistance at 25°C of ambient temperature.

Resistance of Compressor Windings

MODEL	CU-A18PKD	CU-A24PKD
CONNECTION	2JS318D3AA04	2JS438D3CC04
C-R	1.618Ω	1.121Ω
C-S	3.718Ω	2.535Ω

Note: Resistance at 20°C of ambient temperature.

8.4 CS-A28PKD CU-A28PKD



Resistance of Outdoor Fan Motor Windings

MODEL	CU-A28PKD
CONNECTION	CWA951294J
BLUE-YELLOW	102Ω
YELLOW-ORANGE	81Ω
YELLOW-RED	108Ω

Note: Resistance at 25°C of ambient temperature.

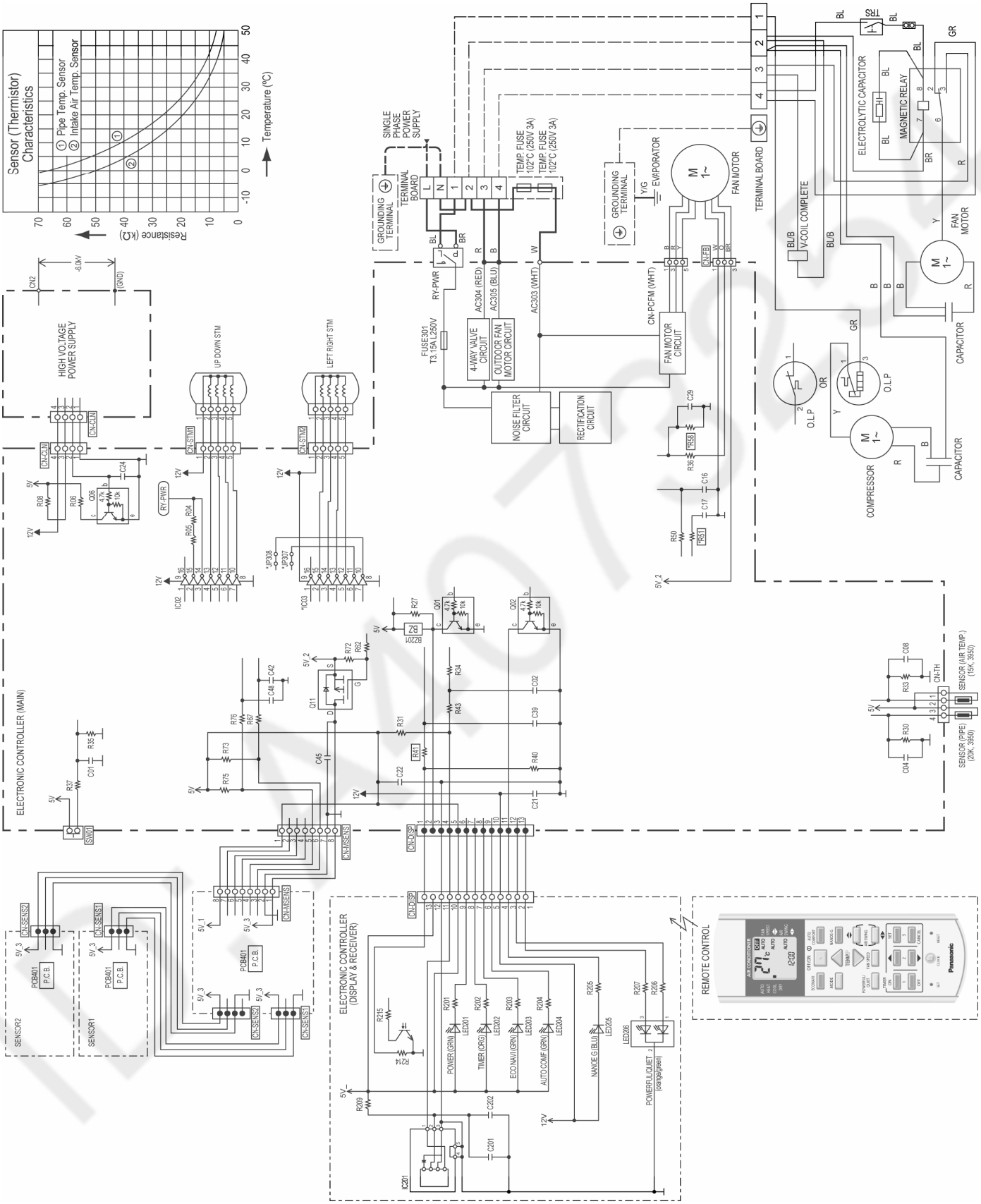
Resistance of Compressor Windings

MODEL	CU-A28PKD
CONNECTION	2JD514E3AA03
C-R	1.022Ω
C-S	2.142Ω

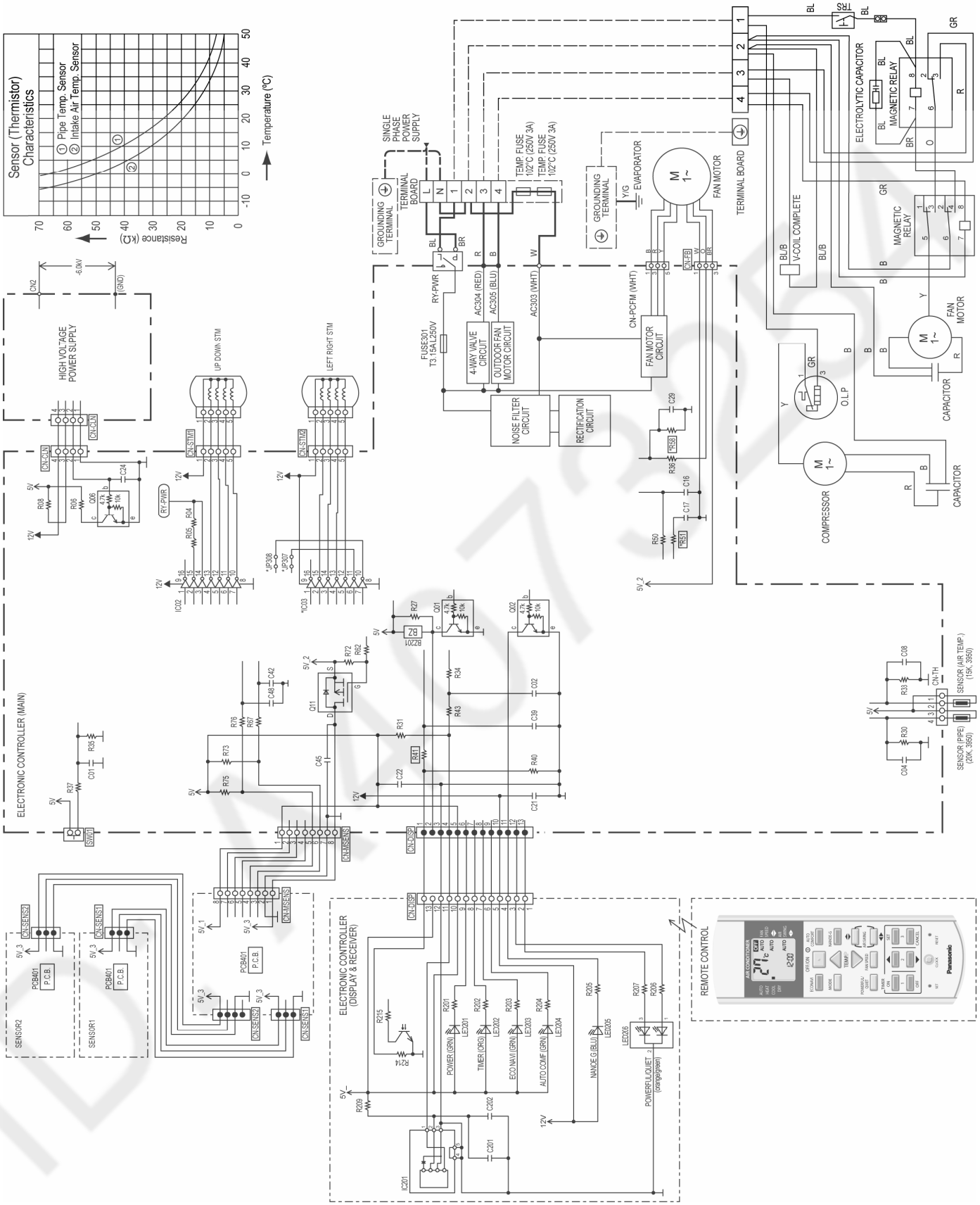
Note: Resistance at 20°C of ambient temperature.

9. Electronic Circuit Diagram

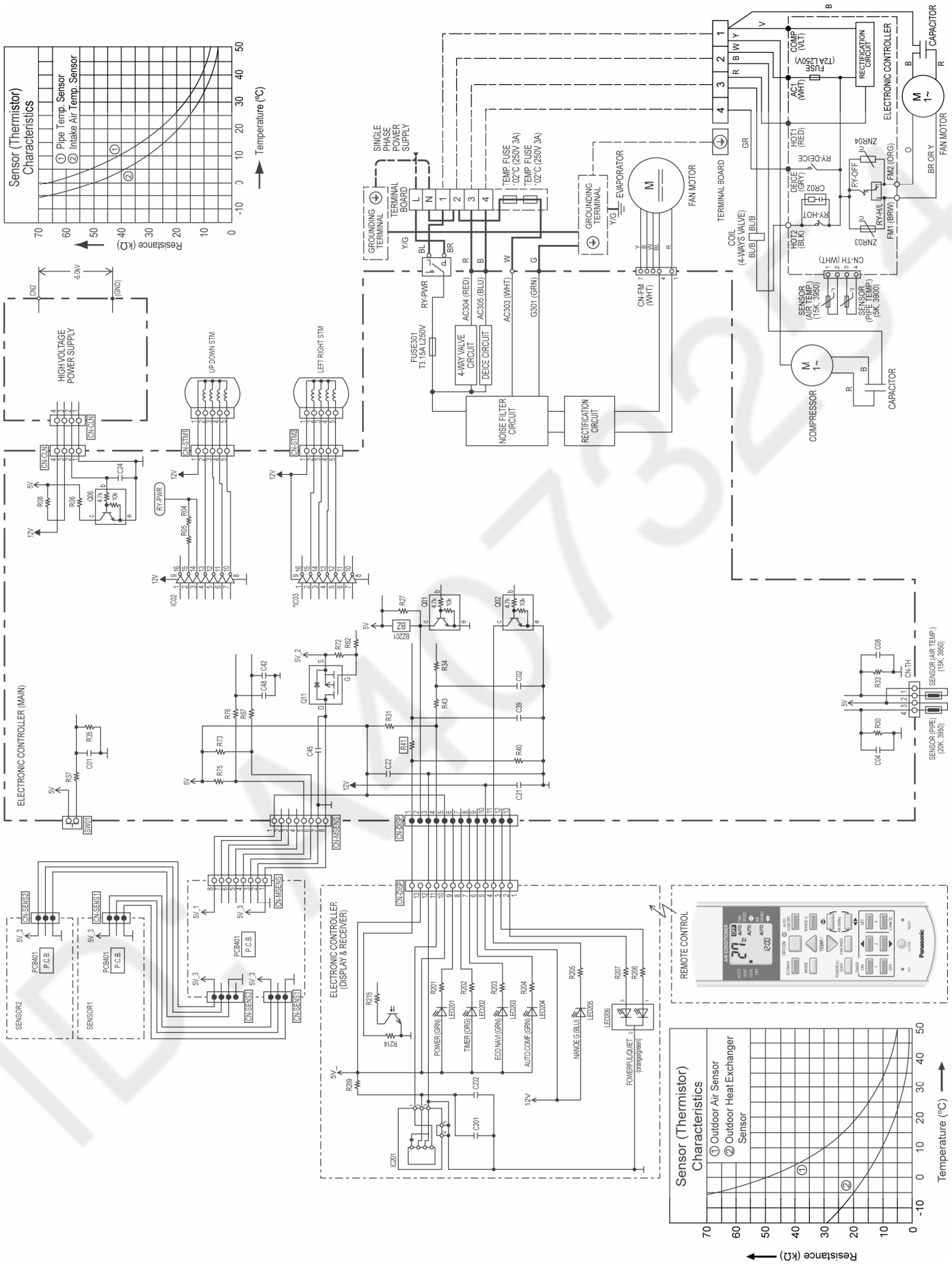
9.1 CS-A9PKD CU-A9PKD



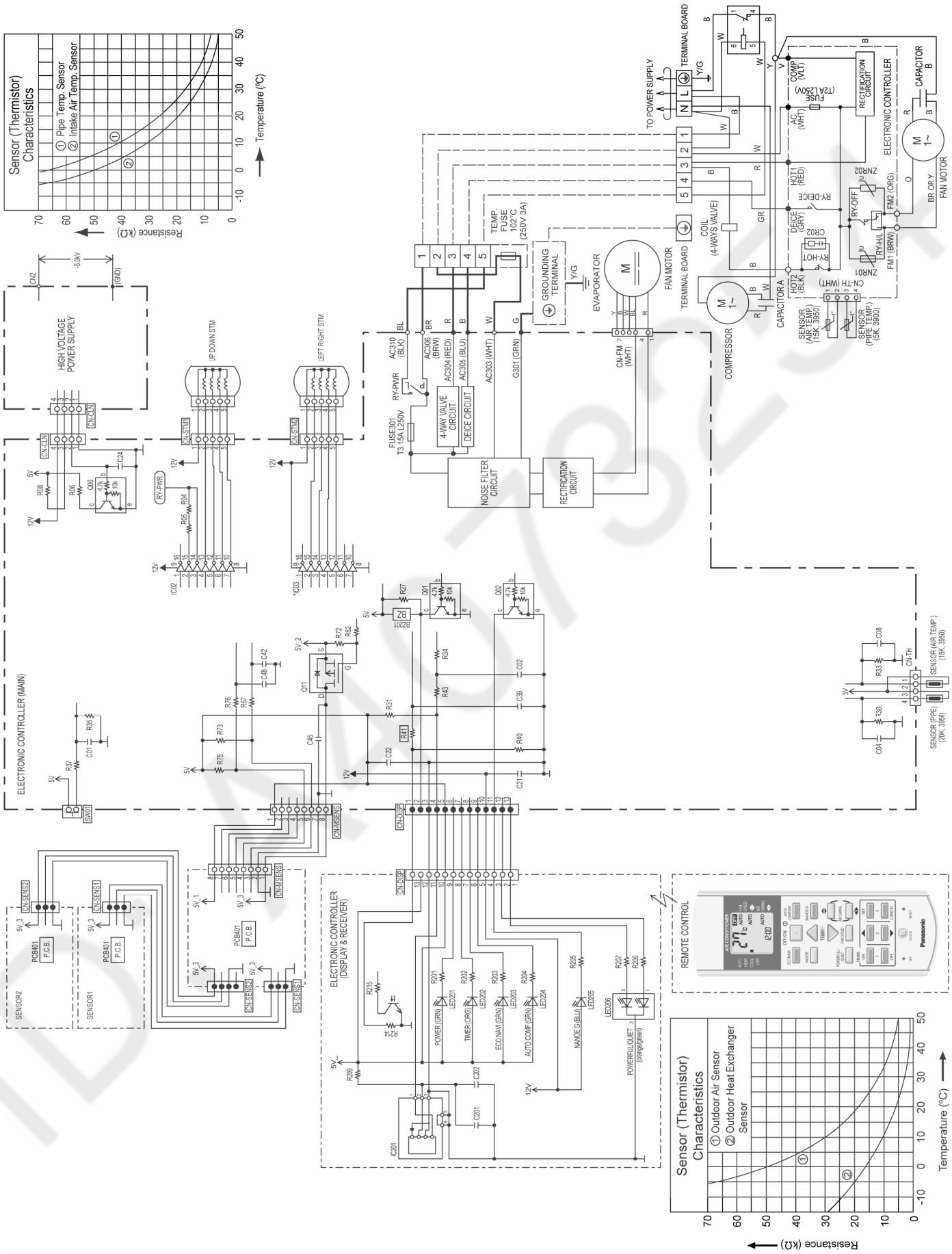
9.2 CS-A12PKD CU-A12PKD



9.3 CS-A18PKD CU-A18PKD CS-A24PKD CU-A24PKD



9.4 CS-A28PKD CU-A28PKD

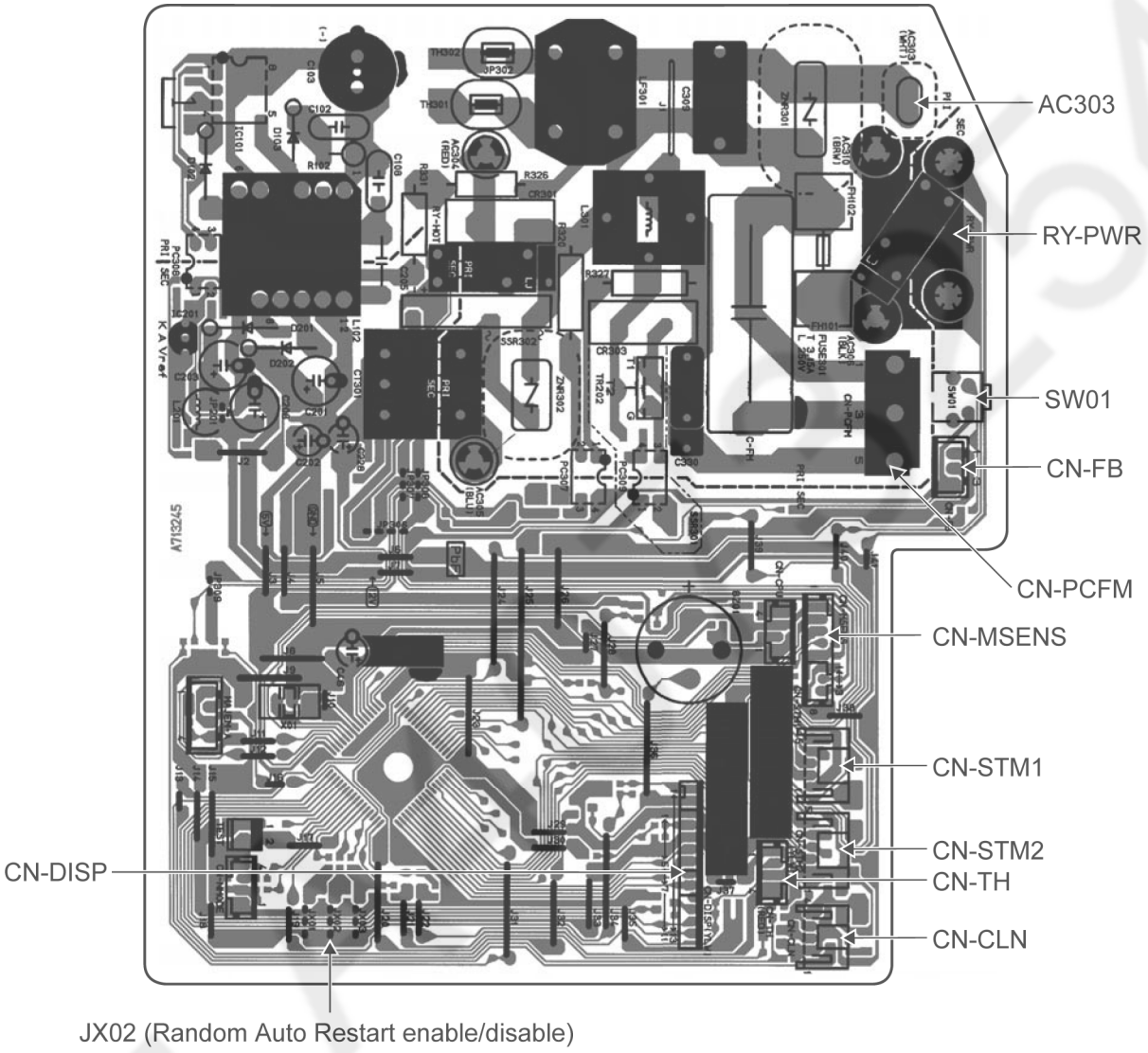


10. Printed Circuit Board

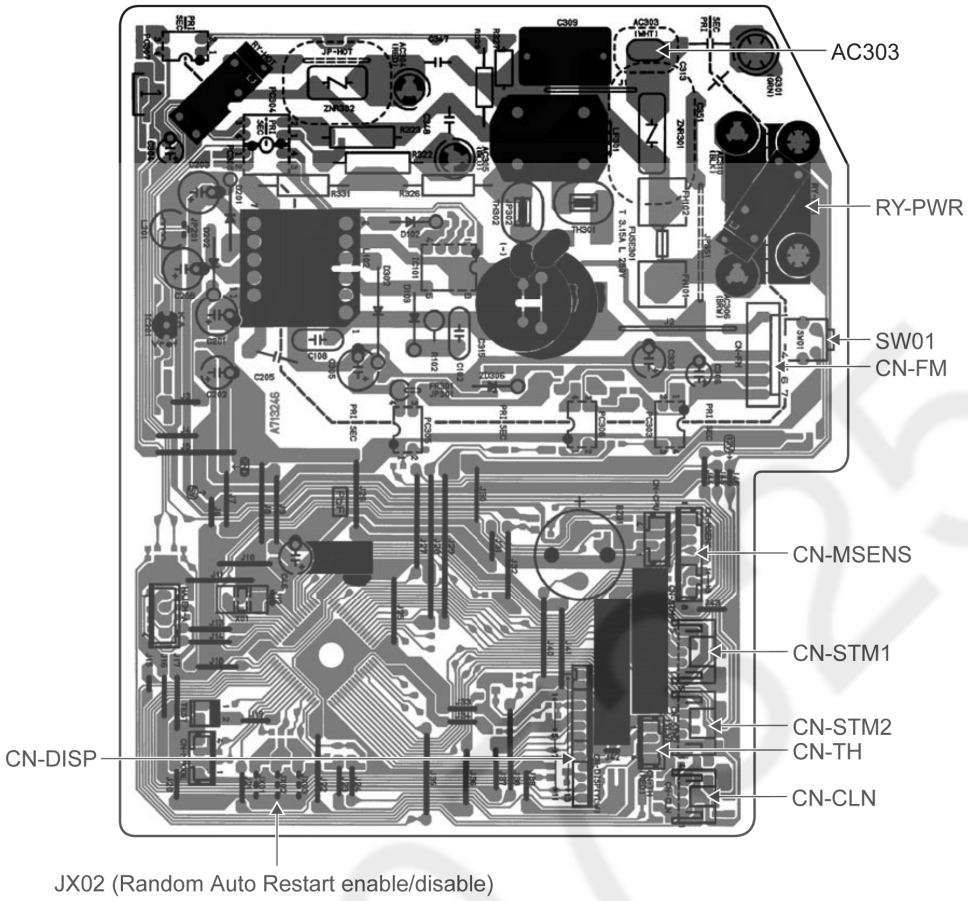
10.1 Indoor Unit

10.1.1 Main Printed Circuit Board

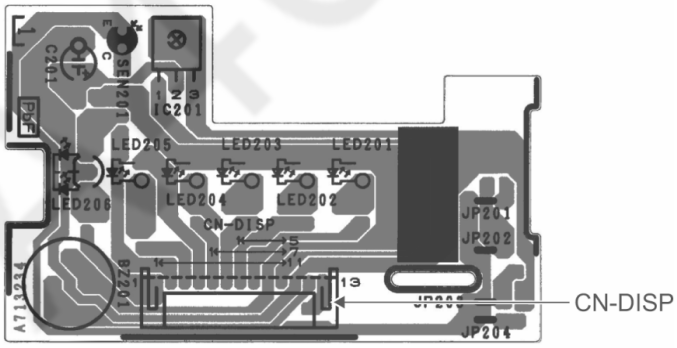
10.1.1.1 CS-A9PKD CS-A12PKD



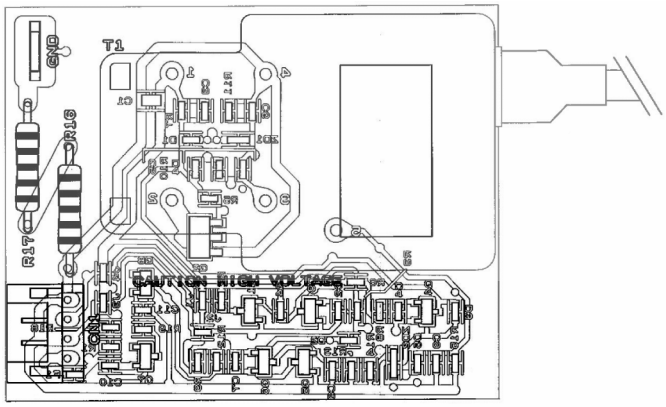
10.1.1.2 CS-A18PKD CS-A24PKD CS-A28PKD



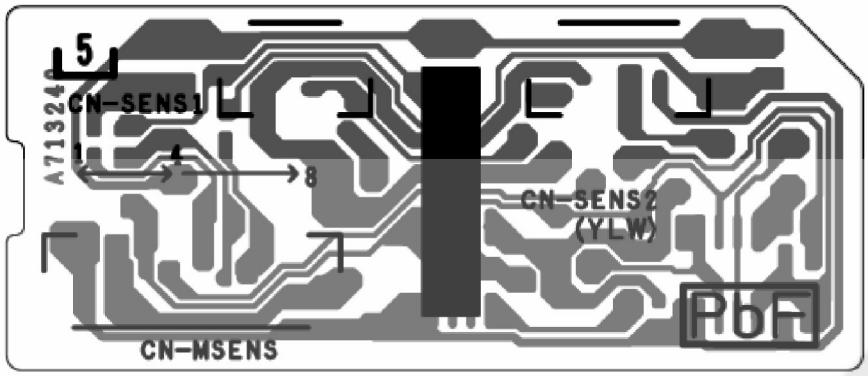
10.1.2 Indicator & Receiver Printed Circuit Board



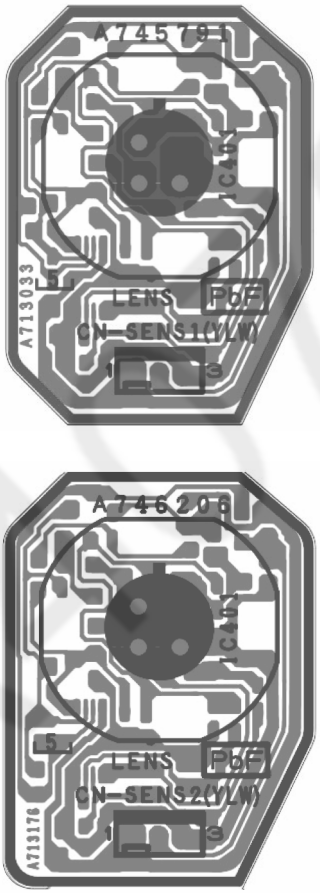
10.1.3 High Voltage Power Supply Printed Circuit Board



10.1.4 Comparator Printed Circuit Board



10.1.5 Human Activity Sensor Printed Circuit Board



11. Installation Instruction

11.1 Select the Best Location

11.1.1 Indoor Unit

- Do not install the unit in excessive oil fume area such as kitchen, workshop and etc.
- There should not be any heat source or steam near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- Recommended installation height for indoor unit shall be at least 2.5 m.

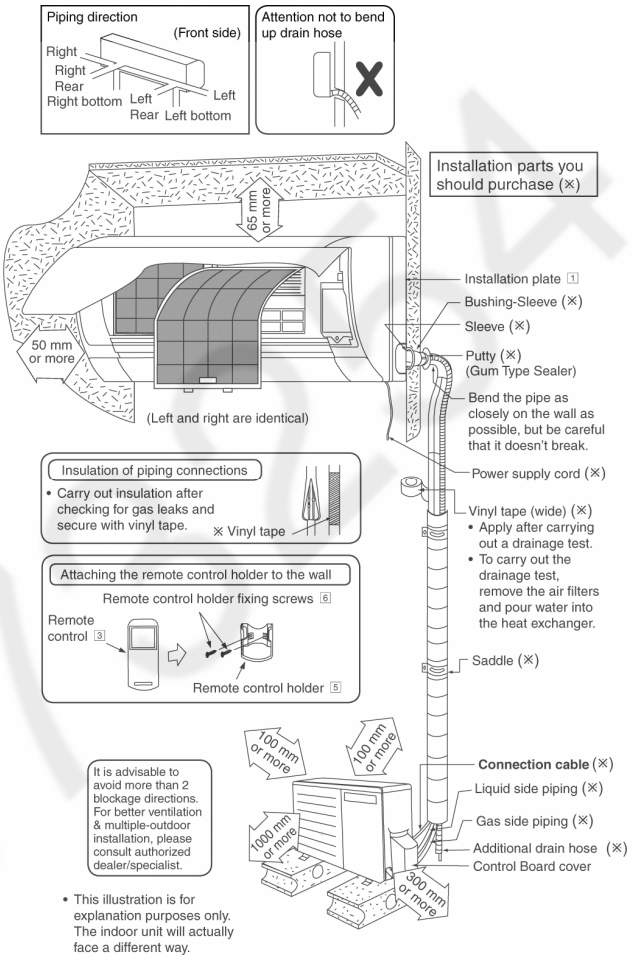
11.1.2 Outdoor Unit

- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If piping length is over the [piping length for additional gas], additional refrigerant should be added as shown in the table.

Model	Horse Power (HP)	Piping size		Std. Length (m)	Max. Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)	Piping Length for add. gas (m)
		Gas	Liquid						
A9***	1.0HP	9.52 mm (3/8")	6.35 mm (1/4")	7.5	5	3	10	20	7.5
A12***	1.5HP	12.7 mm (1/2")			5	3	15	20	7.5
A18***	2.0HP			5	20	3	25	20	7.5
A24***	2.5HP	15.88 mm (5/8")			20	3	25	30	7.5

Example: For A9***
If the unit is installed at 10 m distance, the quantity of additional refrigerant should be 50 g….(10-7.5) m × 20 g/m = 50 g.

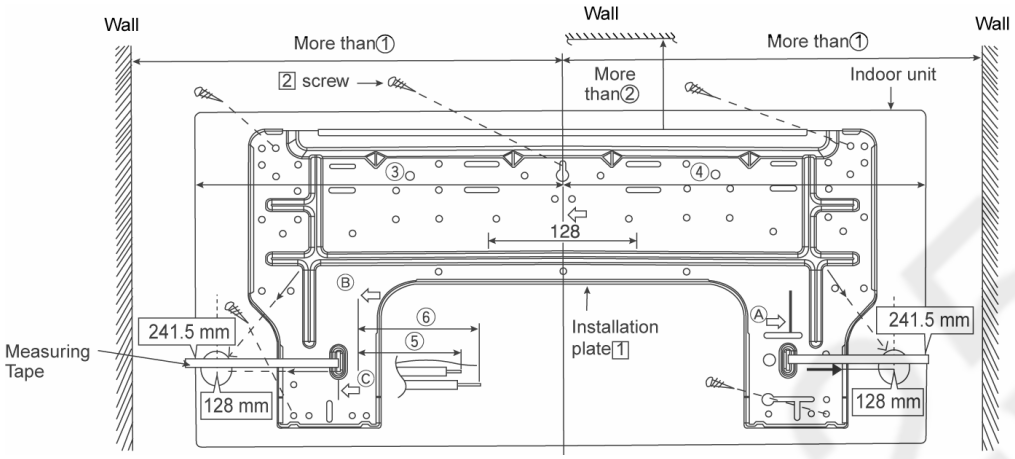
11.1.3 Indoor/Outdoor Unit Installation Diagram



11.2 Indoor Unit

11.2.1 How to Fix Installation Plate

The mounting wall shall be strong and solid enough to prevent if from the vibration.



Model	Dimension					
	①	②	③	④	⑤	⑥
A9***, A12 ***	490 mm	82 mm	439 mm	432 mm	93 mm	145 mm
A18***, A24***	590 mm	82 mm	539 mm	532 mm	219 mm	269 mm

The center of installation plate should be at more than ① at right and left of the wall.
The distance from installation plate edge to ceiling should more than ②.
From installation plate left edge to unit's left side is ③.
From installation plate right edge to unit's right side is ④.

Ⓑ : For left side piping, piping connection for liquid should be about ⑤ from this line.
: For left side piping, piping connection for gas should be about ⑥ from this line.

1 Mount the installation plate on the wall with 5 screws or more (at least 5 screws).
(If mounting the unit on the concrete wall, consider using anchor bolts.)
- Always mount the installation plate horizontally by aligning the marking-off line with the thread and using a level gauge.

2 Drill the piping plate hole with ø70 mm hole-core drill.
- Putting measuring tape at position as shown in the diagram above.
The hole center is obtained by measuring the distance namely 128 mm for left and right hole respectively. Another method is intersection point of arrow mark extension.
The meeting point of the extension arrow mark is the hole center position.
- Drill the piping hole at either the right or the left and the hole should be slightly slanting to the outdoor side. (refer to step 11.2.2)

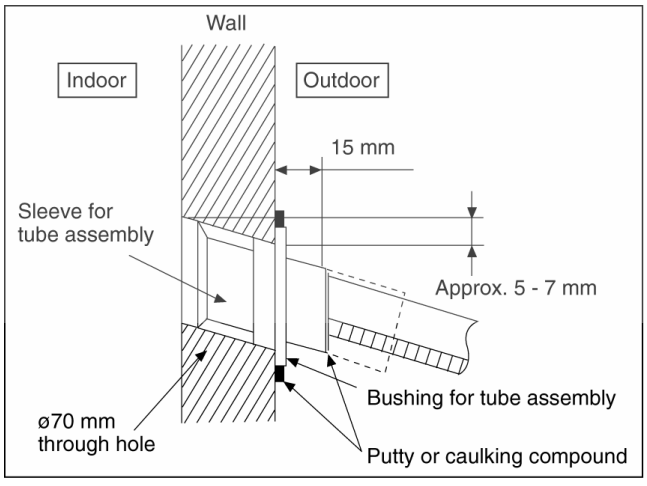
11.2.2 To Drill a Hole in the Wall and Install a Sleeve of Piping

1 Insert the piping sleeve to the hole.
2 Fix the bushing to the sleeve.
3 Cut the sleeve until it extrudes about 15 mm from the wall.

⚠ Caution

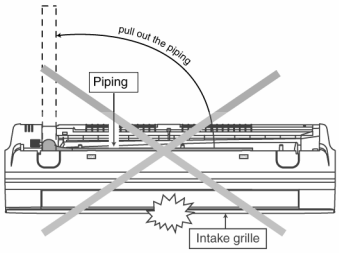
When the wall is hollow, please be sure use the sleeve for tube assembly to prevent dangers caused by mice bitting the connection cable.

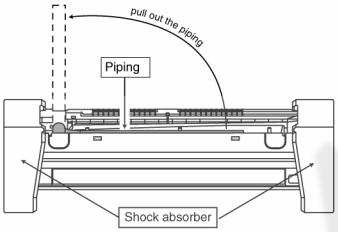
4 Finish by sealing the sleeve with putty or caulking compound at the final stage.



11.2.3 Indoor Unit Installation

- Do not turn over the unit without it's shock absorber during pull out the piping. It may cause intake grille damage.
- Use shock absorber during pull out the piping to protect the intake grille from damage.





11.2.3.1 For the right rear piping

Step-1	Pull out the Indoor piping
Step-2	Install the Indoor Unit
Step-3	Secure the Indoor Unit
Step-4	Insert the power supply cord and connection cable

- Insert the cables from bottom of the unit through the control board hole until terminal board area.

11.2.3.2 For the right and right bottom piping

Step-1	Pull out the Indoor piping
Step-2	Install the Indoor Unit
Step-3	Insert the power supply cord and connection cable

- Insert the cables from bottom of the unit through the control board hole until terminal board area.

Step-4	Secure the Indoor Unit

11.2.3.3 For the embedded piping

Step-1	Replace the drain hose
Step-2	Bend the embedded piping

- Use a spring bender or equivalent to bend the piping so that the piping is not crushed.

Step-3	Pull the connection cable into Indoor Unit

- The power supply cable and indoor unit and outdoor unit connection cable can be connected without removing the front grille.

Step-4	Cut and flare the embedded piping

- When determining the dimensions of the piping, slide the unit all the way to the left on the installation plate.
- Refer to the section “Cutting and flaring the piping”.

Step-5	Install the Indoor Unit
Step-6	Connect the piping

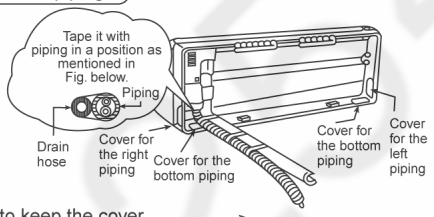
- Please refer to “Connecting the piping” column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

Step-7	Insulate and finish the piping

- Please refer to “Insulation of piping connection” column as mentioned in indoor/outdoor unit installation.

Step-8	Secure the Indoor Unit

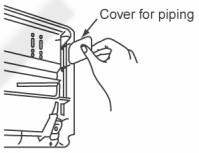
Right Rear piping



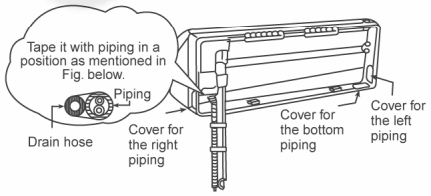
How to keep the cover

In case of the cover is cut, keep the cover at the rear of chassis as shown in the illustration for future reinstallation.

(Left, right and 2 bottom covers for piping.)

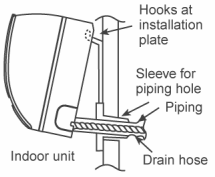


Right and Right Bottom piping



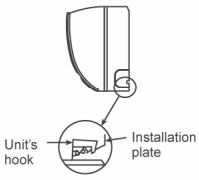
Install the indoor unit

Hook the indoor unit onto the upper portion of installation plate. (Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving it in left and right.

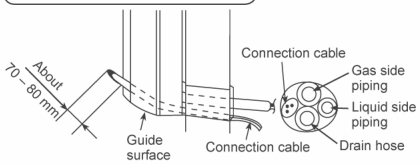


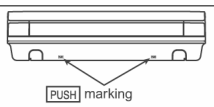
Secure the Indoor Unit

Press the lower left and right side of the unit against the installation plate until hooks engages with their slot (sound click).



Insert the connection cable



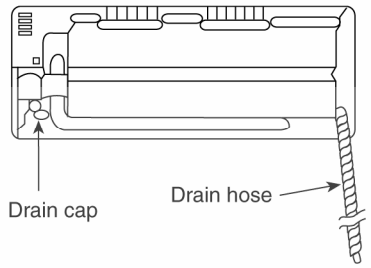


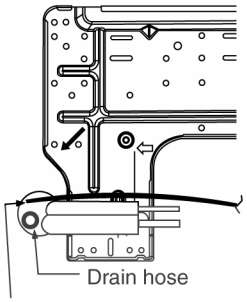
To take out the unit, push the PUSH marking at the bottom unit, and pull it slightly towards you to disengage the hooks from the unit.

(This can be used for left rear piping and bottom piping also.)

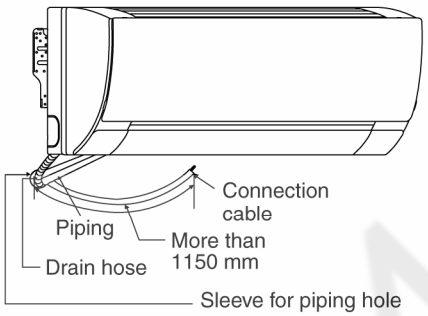
Replace the drain hose

Rear view for left piping installation

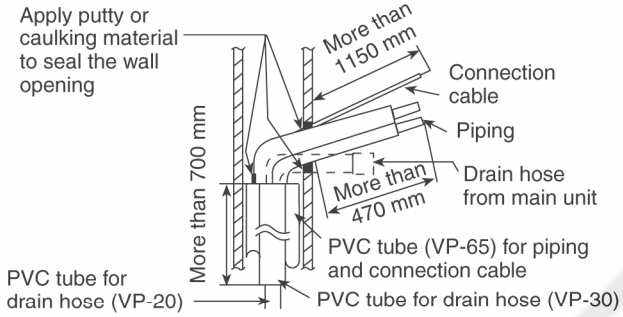


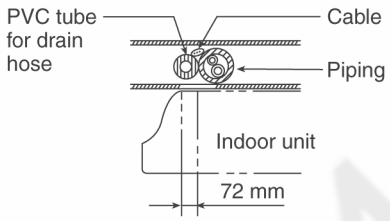


Adjust the piping slightly downwards

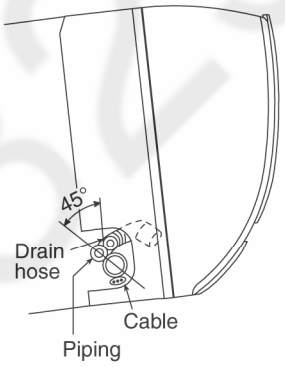


- How to pull the piping and drain hose out, in case of the embedded piping.





- In case of left piping how to insert the connection cable and drain hose.



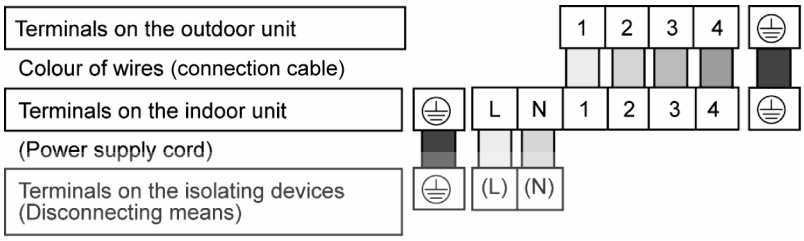
(For the right piping, follow the same procedure)

11.2.4 Connect the Cable to the Indoor Unit

The power supply cord, indoor and outdoor unit connection cable can be connected without removing the front grille.

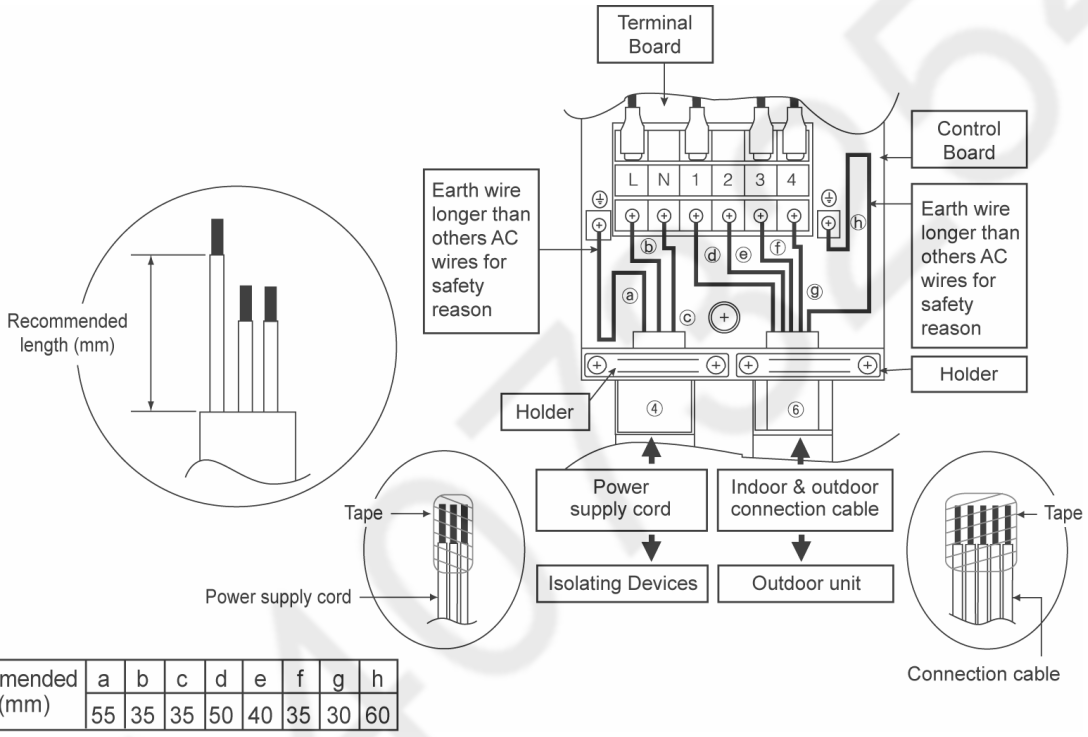
1 Install the indoor unit on the installing holder that mounted on the wall.
2 Open the front panel and grille door by loosening the screw.
3 Cable connection to the power supply through Isolating Devices (Disconnecting means).
   - Connect the approved polychloroprene sheathed **power supply cord** 3 × 1.5 mm^2 (1.0 ~ 1.5HP) or 3 × 2.5 mm^2 (2.0 ~ 2.5HP), type designation 60245 IEC 57 or heavier cord to the terminal board, and connect the other end of the cable to Isolating Devices (Disconnecting means).
   - Do not use joint power supply cord. Replace the wire if the existing wire (from concealed wiring, or otherwise) is too short.
   - In unavoidable case, joining of power supply cord between isolating devices and terminal board of air conditioner shall be done by using approved socket and plug rated 15/16A (1.0 ~ 1.5HP) or 16A (2.0HP) or 20A (2.5HP). Wiring work to both socket and plug must follow to national wiring standard.
4 Bind all the power supply cord lead wire with tape and route the power supply cord via the left escapement.
5 **Connection cable** between indoor unit and outdoor unit shall be approved polychloroprene sheathed 5 × 1.5 mm^2 (1.0 ~ 1.5HP) or 5 × 2.5 mm^2 (2.0 ~ 2.5HP) flexible cord, type designation 60245 IEC 57 or heavier cord.
6 Bind all the indoor and outdoor connection cable with tape and route the connection cable via the right escapement.

7 Remove the tapes and connect the power supply cord and connection cable between indoor unit and outdoor unit according to the diagram below.



⚠ WARNING
This equipment must be properly earthed.

8 Secure the power supply cord and connection cable onto the control board with the holder.
9 Close grille door by tighten with screw and close the front panel.

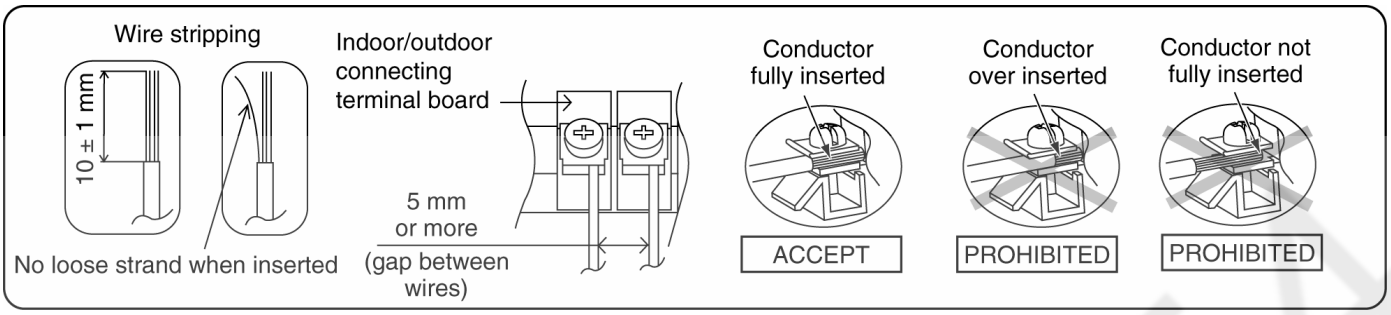


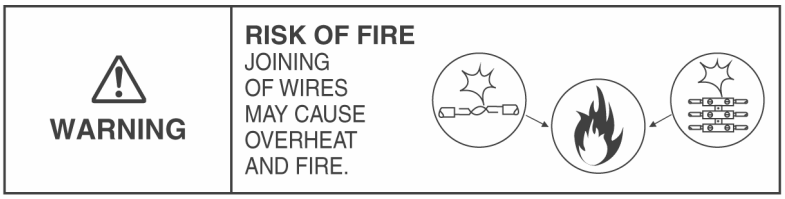
Recommended length (mm)	a	b	c	d	e	f	g	h
	55	35	35	50	40	35	30	60

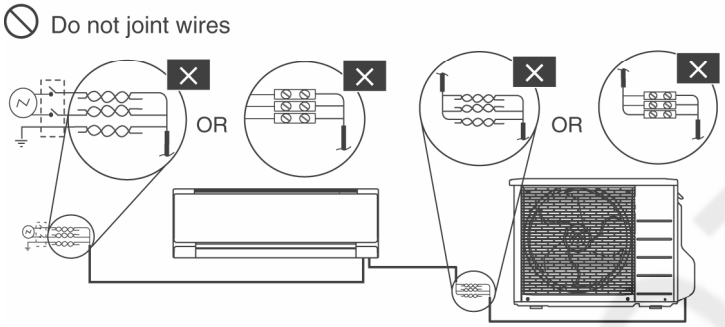
Note:

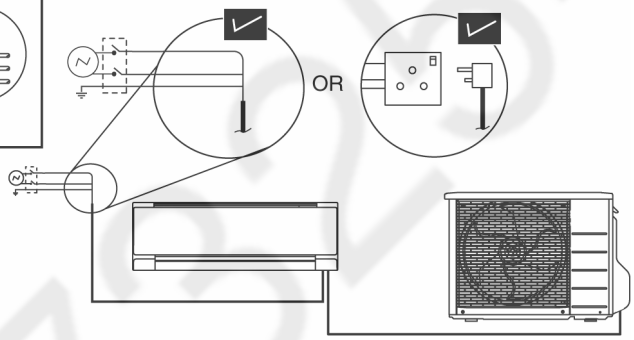
- Isolating Devices (Disconnecting means) should have minimum 3.0 mm contact gap.
- Ensure the colour of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than the other AC wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the anchorage.

11.2.5 Wire Stripping And Connecting Requirement







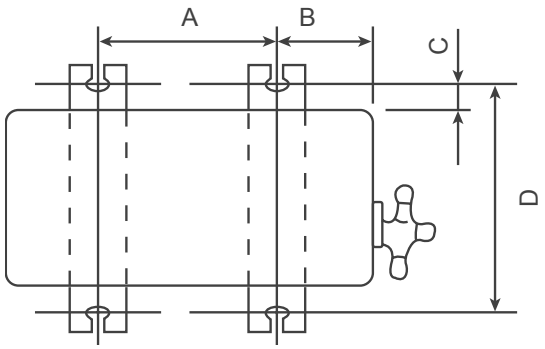


- Use complete wire without joining.
- Use approved socket and plug with earth pin.
- Wire connection in this area must follow to national wiring rules.

11.3 Outdoor Unit

11.3.1 Install the Outdoor Unit

- After selecting the best location, start installation to Indoor/Outdoor Unit Installation Diagram.
  1 Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut (ø10 mm).
  2 When installing at roof, please consider strong wind and earthquake.
  Please fasten the installation stand firmly with bolt or nails.



Model	A	B	C	D
A9***	474 mm	87 mm	18.5 mm	261 mm
A12***	570 mm	105 mm	18.5 mm	320 mm
A18***	613 mm	131 mm	16 mm	360.5 mm
A24***	612.25 mm	131 mm	19 mm	383 mm

11.3.2 Connect the Piping

11.3.2.1 Connecting the piping to indoor

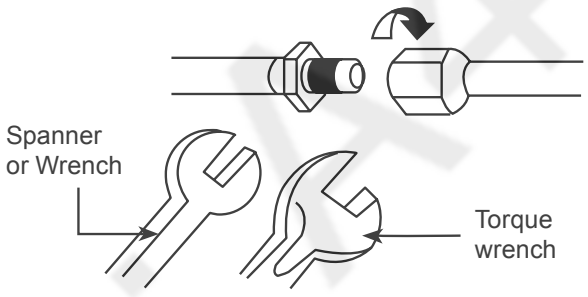
Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.

11.3.2.2 Connecting the piping to outdoor

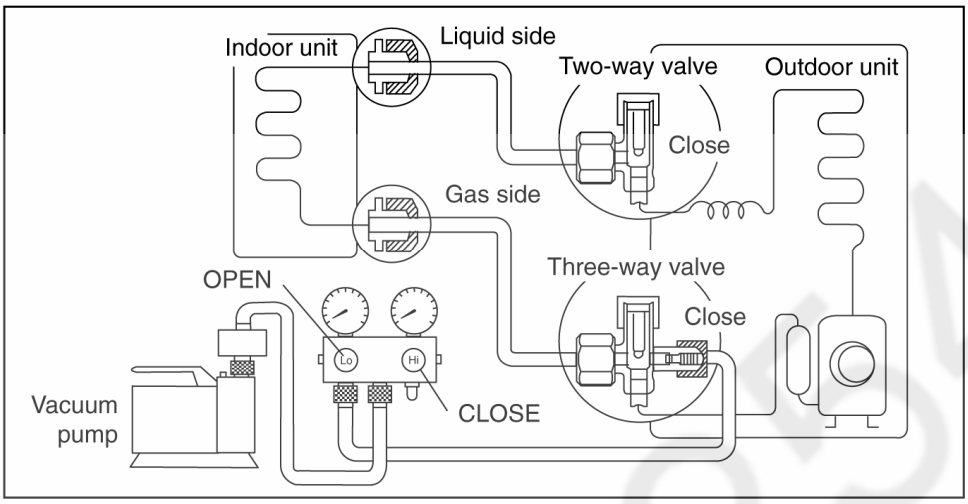
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge.
Make flare after inserting the flare nut (locate at valve) onto the copper pipe.
Align center of piping to valve and then tighten with torque wrench to the specified torque as stated in the table.



Do not overtighten, overtightening may cause gas leakage.	
Piping size	Torque
6.35 mm (1/4”)	[18 N•m (1.8 kgf.m)]
9.52 mm (3/8”)	[42 N•m (4.3 kgf.m)]
12.7 mm (1/2”)	[55 N•m (5.6 kgf.m)]
15.88 mm (5/8”)	[65 N•m (6.6 kgf.m)]
19.05 mm (3/4”)	[100 N•m (10.2 kgf.m)]

11.3.3 Evacuation of the Equipment

WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.



1 Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
   - Be sure to connect the end of the charging hose with the push pin to the service port.
2 Connect the center hose of the charging set to a vacuum pump.
3 Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.
4 Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.
   Note: BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID REFRIGERENT GAS LEAKAGE.
5 Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
6 Tighten the service port caps of the 3-way valve at a torque of 18 N•m with a torque wrench.
7 Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to “OPEN” using a hexagonal wrench (4 mm).
8 Mount valve caps onto the 2-way valve and the 3-way valve.
   - Be sure to check for gas leakage.

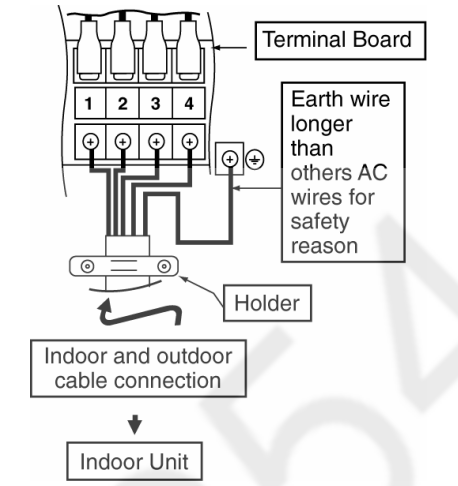
- If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa), in the step ③ above take the following measure:
- If the leak stops when the piping connections are tightened further, continue working from step ③.
- If the leak does not stop when the connections are retightened, repair location of leak.
- Do not release refrigerant during piping work for installation and reinstallation.
- Take care of the liquid refrigerant, it may cause frostbite.

11.3.4 Connect the cable to the Outdoor Unit

1 Remove the control board cover from the unit by loosening the screw.
2 **Connection cable** between indoor unit and outdoor unit shall be approved polychloroprene sheathed 5 × 1.5mm^2 (1.0 ~ 1.5HP) or 5 × 2.5mm^2 (2.0 ~ 2.5HP) flexible cord, type designation 60245 IEC 57 or heavier cord. Do not use joint connection cable. Replace the wire if the existing wire (from concealed wiring, or otherwise) is too short.

Terminals on the outdoor unit	1	2	3	4
Colour of wires				
Terminals on the indoor unit	1	2	3	4

3 Secure the cable onto the control board with the holder.
4 Attach the control board cover back to the original position with the screw.
5 For wire stripping and connection requirement, refer to instruction ⑤ of indoor unit.



⚠ **WARNING**
This equipment must be properly earthed.

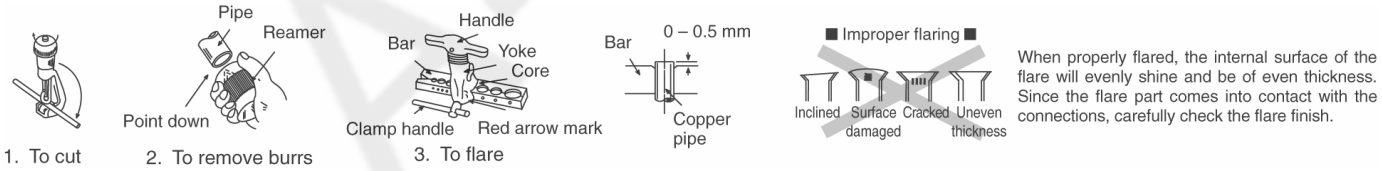
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than the other AC wires for safety reason.

11.3.5 Piping Insulation

1 Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
2 If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

11.3.5.1 Cutting and flaring the piping

1 Please cut using pipe cutter and then remove the burrs.
2 Remove the burrs by using reamer. If burrs are not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
3 Please make flare after inserting the flare nut onto the copper pipes.



When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

12. Installation Instruction

(CS-A28PKD CU-A28PKD only)

12.1 Select the Best Location

12.1.1 Indoor Unit

- Do not install the unit in excessive oil fume area such as kitchen, workshop and etc.
- There should not be any heat source or steam near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- Recommended installation height for indoor unit shall be at least 2.5 m.

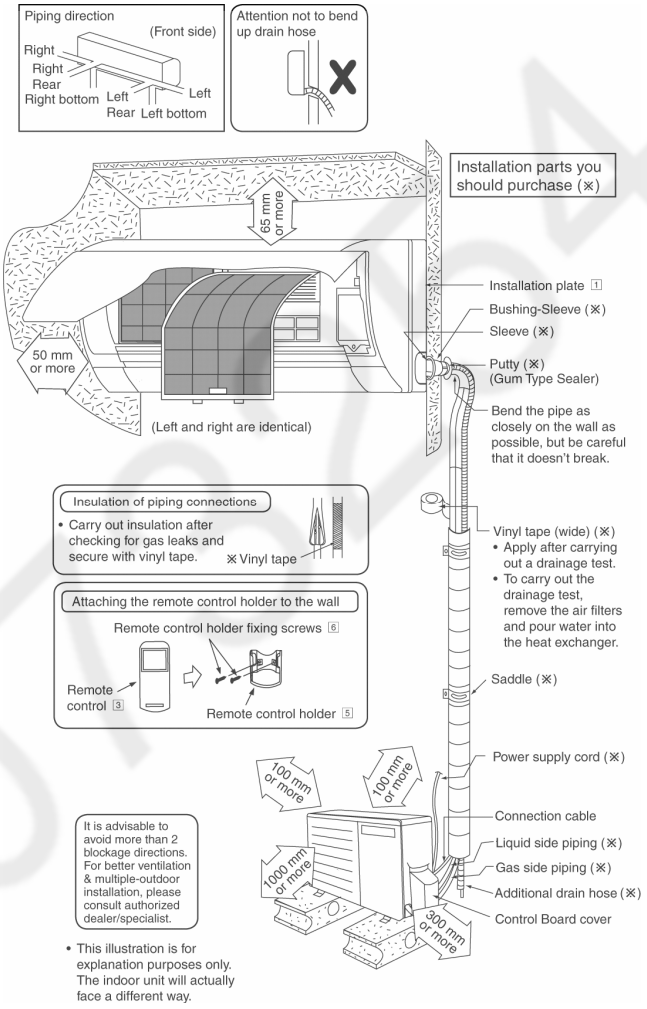
12.1.2 Outdoor Unit

- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If piping length is over the [piping length for additional gas], additional refrigerant should be added as shown in the table.

Model	Horse Power (HP)	Piping size		Std. Length (m)	Max. Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)	Piping Length for add. gas (m)
		Gas	Liquid						
A28***	3.0HP	15.88mm (5/8")	6.35mm (1/4")	5	20	3	30	30	7.5

Example: For A28***
If the unit is installed at 10 m distance, the quantity of additional refrigerant should be 75 g….(10-7.5) m × 30 g/m = 75 g.

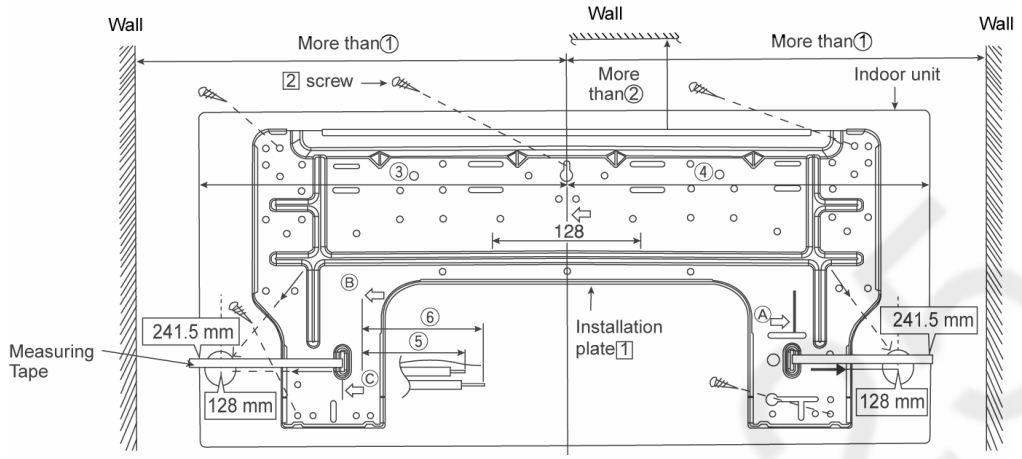
12.1.3 Indoor/Outdoor Unit Installation Diagram



12.2 Indoor Unit

12.2.1 How to Fix Installation Plate

The mounting wall shall be strong and solid enough to prevent if from the vibration.



Model	Dimension					
	①	②	③	④	⑤	⑥
A28***	590 mm	82 mm	539 mm	532 mm	169 mm	219 mm

The center of installation plate should be at more than ① at right and left of the wall.
The distance from installation plate edge to ceiling should more than ②.
From installation plate left edge to unit's left side is ③.
From installation plate right edge to unit's right side is ④.

Ⓑ : For left side piping, piping connection for liquid should be about ⑤ from this line.
: For left side piping, piping connection for gas should be about ⑥ from this line.

1 Mount the installation plate on the wall with 5 screws or more (at least 5 screws).
(If mounting the unit on the concrete wall, consider using anchor bolts.)
- Always mount the installation plate horizontally by aligning the marking-off line with the thread and using a level gauge.

2 Drill the piping plate hole with ø70 mm hole-core drill.
- Putting measuring tape at position as shown in the diagram above.
The hole center is obtained by measuring the distance namely 128 mm for left and right hole respectively. Another method is intersection point of arrow mark extension.
The meeting point of the extension arrow mark is the hole center position.
- Drill the piping hole at either the right or the left and the hole should be slightly slanting to the outdoor side. (refer to step 12.2.2)

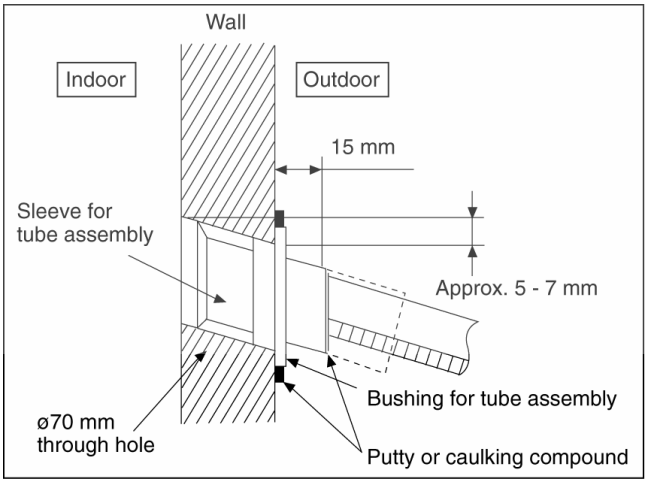
12.2.2 To Drill a Hole in the Wall and Install a Sleeve of Piping

1 Insert the piping sleeve to the hole.
2 Fix the bushing to the sleeve.
3 Cut the sleeve until it extrudes about 15 mm from the wall.

⚠ Caution

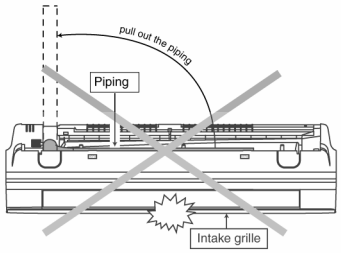
When the wall is hollow, please be sure use the sleeve for tube assembly to prevent dangers caused by mice bitting the connection cable.

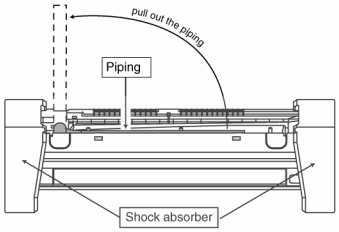
4 Finish by sealing the sleeve with putty or caulking compound at the final stage.



12.2.3 Indoor Unit Installation

- Do not turn over the unit without it's shock absorber during pull out the piping. It may cause intake grille damage.
- Use shock absorber during pull out the piping to protect the intake grille from damage.





12.2.3.1 For the right rear piping

Step-1	Pull out the Indoor piping
Step-2	Install the Indoor Unit
Step-3	Secure the Indoor Unit
Step-4	Insert the power supply cord and connection cable

- Insert the cables from bottom of the unit through the control board hole until terminal board area.

12.2.3.2 For the right and right bottom piping

Step-1	Pull out the Indoor piping
Step-2	Install the Indoor Unit
Step-3	Insert the power supply cord and connection cable

- Insert the cables from bottom of the unit through the control board hole until terminal board area.

Step-4	Secure the Indoor Unit

12.2.3.3 For the embedded piping

Step-1	Replace the drain hose
Step-2	Bend the embedded piping

- Use a spring bender or equivalent to bend the piping so that the piping is not crushed.

Step-3	Pull the connection cable into Indoor Unit

- The power supply cable and indoor unit and outdoor unit connection cable can be connected without removing the front grille.

Step-4	Cut and flare the embedded piping

- When determining the dimensions of the piping, slide the unit all the way to the left on the installation plate.
- Refer to the section "Cutting and flaring the piping".

Step-5	Install the Indoor Unit
Step-6	Connect the piping

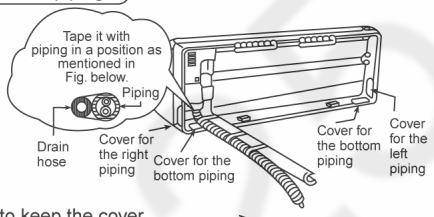
- Please refer to "Connecting the piping" column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

Step-7	Insulate and finish the piping

- Please refer to "Insulation of piping connection" column as mentioned in indoor/outdoor unit installation.

Step-8	Secure the Indoor Unit

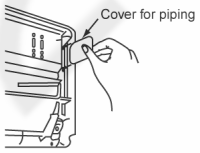
Right Rear piping



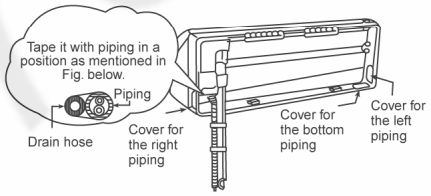
How to keep the cover

In case of the cover is cut, keep the cover at the rear of chassis as shown in the illustration for future reinstallation.

(Left, right and 2 bottom covers for piping.)

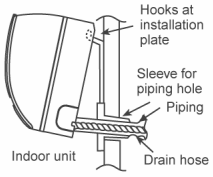


Right and Right Bottom piping



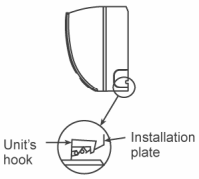
Install the indoor unit

Hook the indoor unit onto the upper portion of installation plate. (Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving it in left and right.

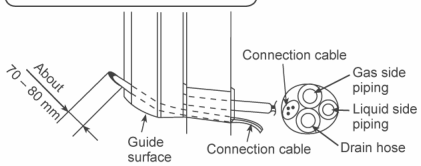


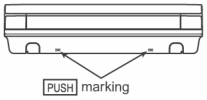
Secure the Indoor Unit

Press the lower left and right side of the unit against the installation plate until hooks engages with their slot (sound click).



Insert the connection cable



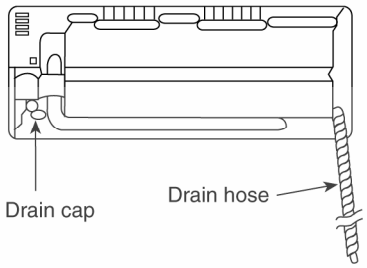


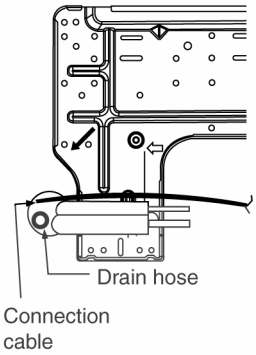
To take out the unit, push the PUSH marking at the bottom unit, and pull it slightly towards you to disengage the hooks from the unit.

(This can be used for left rear piping and bottom piping also.)

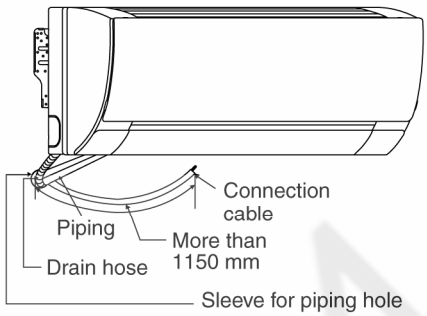
Replace the drain hose

Rear view for left piping installation

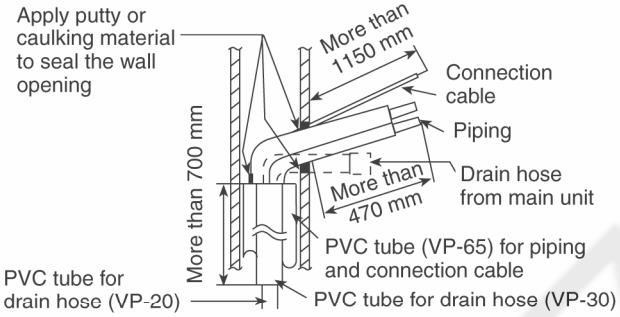


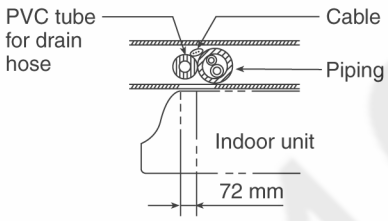


Adjust the piping slightly downwards

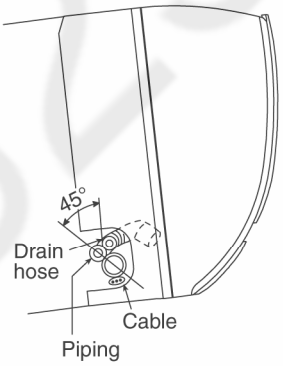


- How to pull the piping and drain hose out, in case of the embedded piping.





- In case of left piping how to insert the connection cable and drain hose.

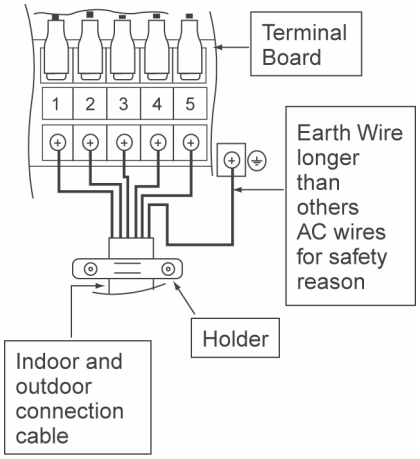


(For the right piping, follow the same procedure)

12.2.4 Connect the Cable to the Indoor Unit

1. The inside and outside connection cable can be connected without removing the front grille.
2. **Connection cable** between indoor unit and outdoor unit shall be approved polychloroprene sheathed 6 × 1.5 mm^2 flexible cord, type designation 60245 IEC 57 or heavier cord. Do not use joint connection cable. Replace the wire if the existing wire (from concealed wiring, or otherwise) is too short.

Terminals on the indoor unit	1	2	3	4	5	⏚
Colour of wires						
Terminals on the outdoor unit	1	2	3	4	5	⏚



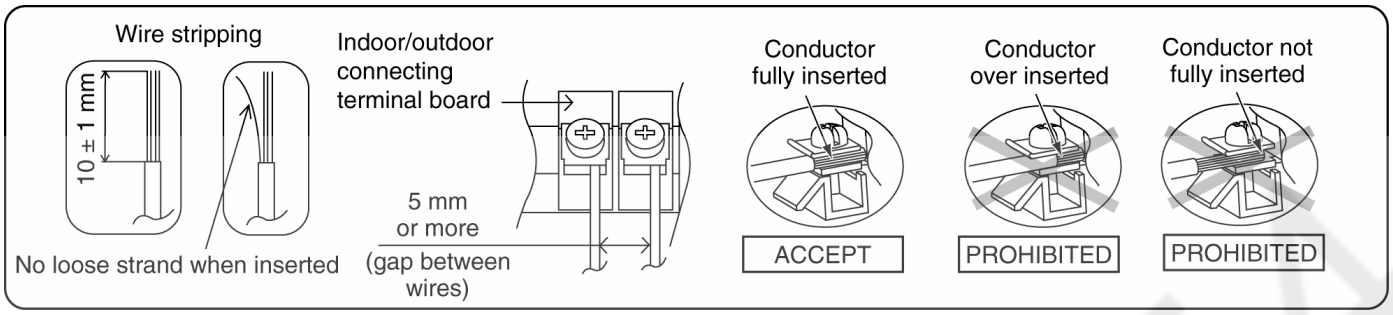
- Secure the connection cable onto the control board with the holder.

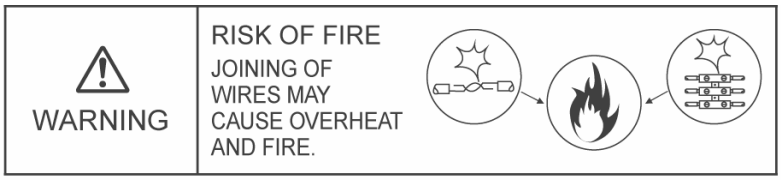
⚠ WARNING
⏚ This equipment must be properly earthed.

Note:

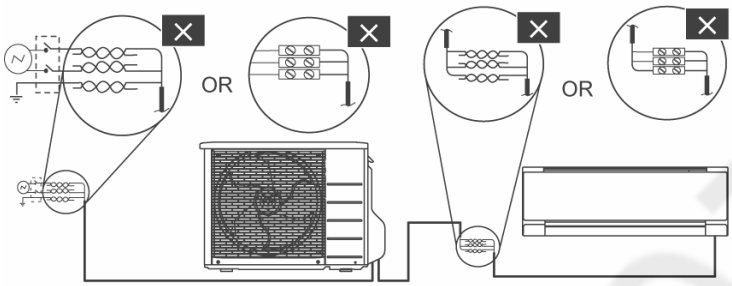
- Isolating Devices (Disconnecting means) should have minimum 3.0 mm contact gap.
- Ensure the colour of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the anchorage.

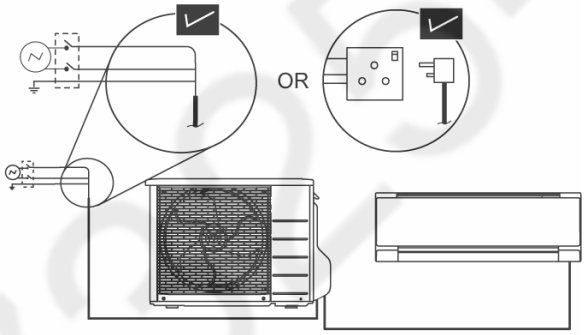
12.2.5 Wire Stripping And Connecting Requirement





Do not joint wires





Use complete wire without joining.

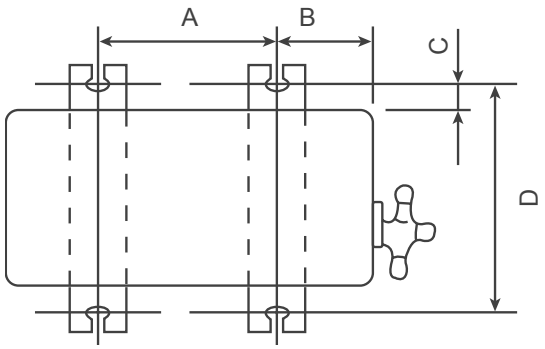
Use approved socket and plug with earth pin.

Wire connection in this area must follow to national wiring rules.

12.3 Outdoor Unit

12.3.1 Install the Outdoor Unit

- After selecting the best location, start installation to Indoor/Outdoor Unit Installation Diagram.
  1 Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut (ø10 mm).
  2 When installing at roof, please consider strong wind and earthquake.
  Please fasten the installation stand firmly with bolt or nails.



Model	A	B	C	D
A28***	612.5 mm	131 mm	19 mm	383 mm

12.3.2 Connect the Piping

12.3.2.1 Connecting the piping to indoor

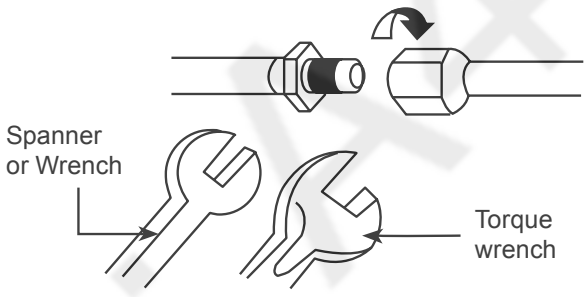
Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.

12.3.2.2 Connecting the piping to outdoor

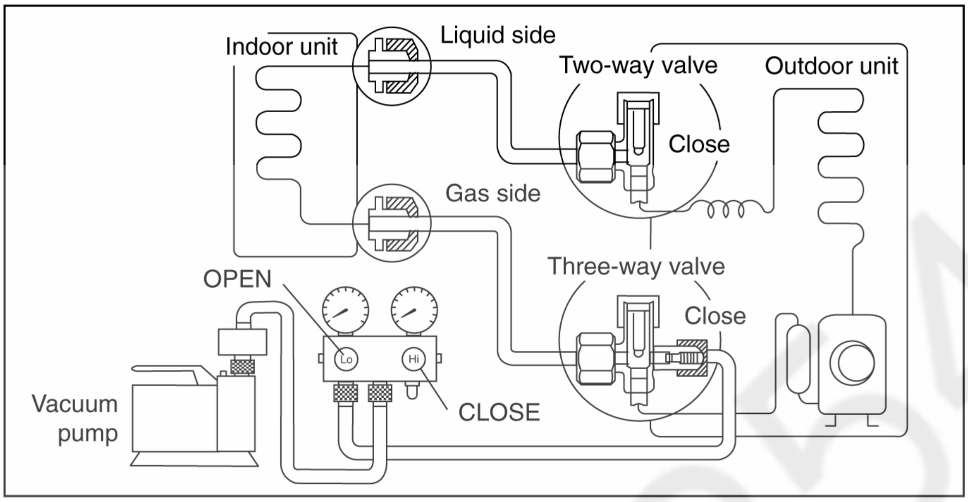
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge.
Make flare after inserting the flare nut (locate at valve) onto the copper pipe.
Align center of piping to valve and then tighten with torque wrench to the specified torque as stated in the table.



Do not overtighten, overtightening may cause gas leakage.	
Piping size	Torque
6.35 mm (1/4”)	[18 N•m (1.8 kgf.m)]
9.52 mm (3/8”)	[42 N•m (4.3 kgf.m)]
12.7 mm (1/2”)	[55 N•m (5.6 kgf.m)]
15.88 mm (5/8”)	[65 N•m (6.6 kgf.m)]
19.05 mm (3/4”)	[100 N•m (10.2 kgf.m)]

12.3.3 Evacuation of the Equipment

WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.

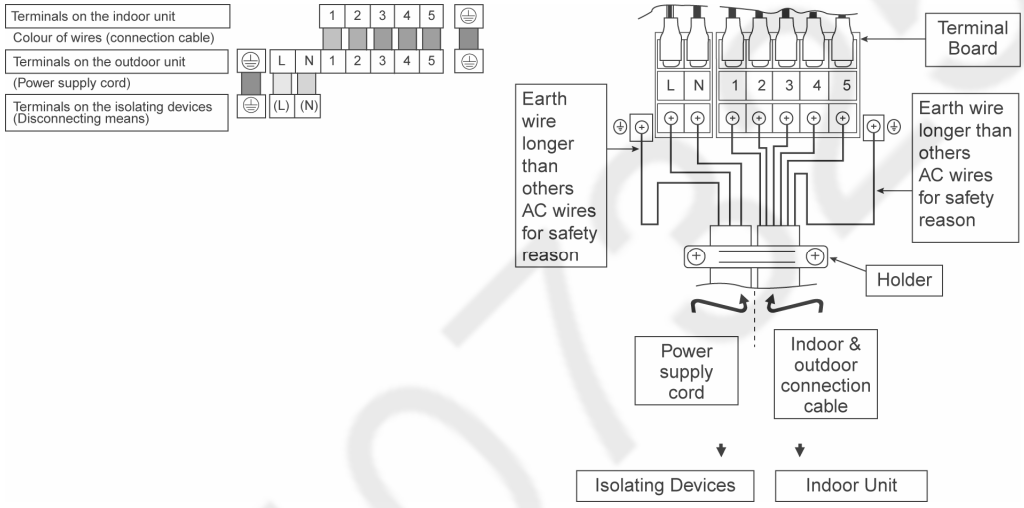


1 Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
   - Be sure to connect the end of the charging hose with the push pin to the service port.
2 Connect the center hose of the charging set to a vacuum pump.
3 Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.
4 Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.
   Note: BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID REFRIGERENT GAS LEAKAGE.
5 Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
6 Tighten the service port caps of the 3-way valve at a torque of 18 N•m with a torque wrench.
7 Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to “OPEN” using a hexagonal wrench (4 mm).
8 Mount valve caps onto the 2-way valve and the 3-way valve.
   - Be sure to check for gas leakage.

- If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa), in the step ③ above take the following measure:
- If the leak stops when the piping connections are tightened further, continue working from step ③.
- If the leak does not stop when the connections are retightened, repair location of leak.
- Do not release refrigerant during piping work for installation and reinstallation.
- Take care of the liquid refrigerant, it may cause frostbite.

12.3.4 Connect the cable to the Outdoor Unit

1 Remove the control board cover from the unit by loosening the screw.
2 Cable connection to the power supply through Isolating Devices (Disconnecting means).
   - Connect the approved polychloroprene sheathed **power supply cord** 3 × 4.0 mm^2 type designation 60245 IEC 57 or heavier cord to the terminal board, and connect the others end of the cable to Isolating Devices (Disconnecting means).
   - Do not use joint power supply cord. Replace the wire if the existing wire (from concealed wiring, or otherwise) is too short.
   - In unavoidable case, joining of power supply cord between isolating devices and terminal board of air conditioner shall be done by using approved socket and plug rated 25A. Wiring work to both socket and plug must follow to national wiring standard.
3 **Connection cable** between indoor unit and outdoor unit shall be approved polychloroprene sheathed 6 × 1.5 mm^2 flexible cord, type designation 60245 IEC 57 or heavier cord. Do not use joint connection cable. Replace the wire if the existing wire (from concealed wiring, or otherwise) is too short.
4 Connect the power supply cord and connection cable between indoor unit and outdoor unit according to the diagram below.



5 Secure the power supply cord and connection cable onto the control board with the holder.
6 Attach the control board cover back to the original position with screw.
7 For wire stripping and connection requirement, refer to instruction 12.2.4 of the indoor unit.

⚠ WARNING
⏚ This equipment must be properly earthed.

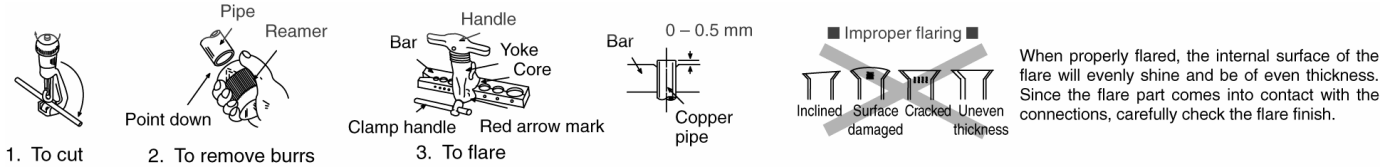
- Isolating Devices (Disconnecting means) should have minimum 3.0mm contact gap.
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reason.

12.3.5 Piping Insulation

1 Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
2 If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

12.3.5.1 Cutting and flaring the piping

1 Please cut using pipe cutter and then remove the burrs.
2 Remove the burrs by using reamer. If burrs are not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
3 Please make flare after inserting the flare nut onto the copper pipes.

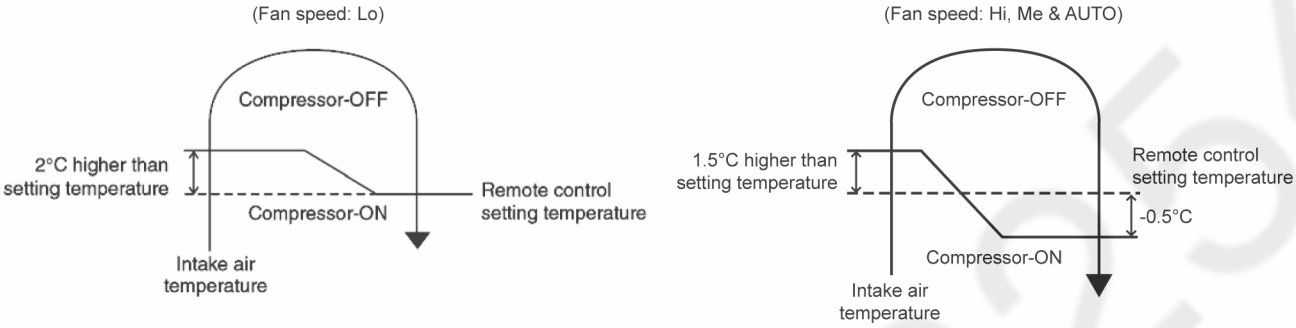


When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

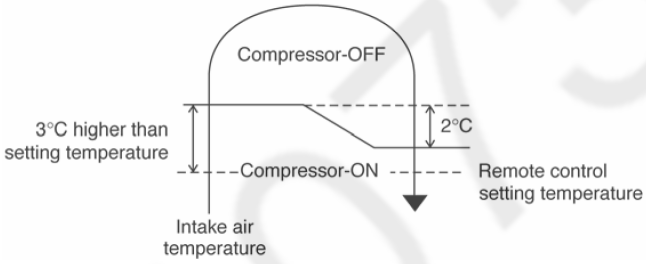
13. Operation Control

13.1 Heating Operation

- Heating operation can be set using remote control.
- This operation is applied to warm the room temperature reaches the setting temperature set on the remote control.
- The remote control setting temperature, which takes the reading of intake air temperature sensor, can be adjusted from 16°C to 30°C.
- During heating operation, the compressor will stop running and restart as shown in below figure.

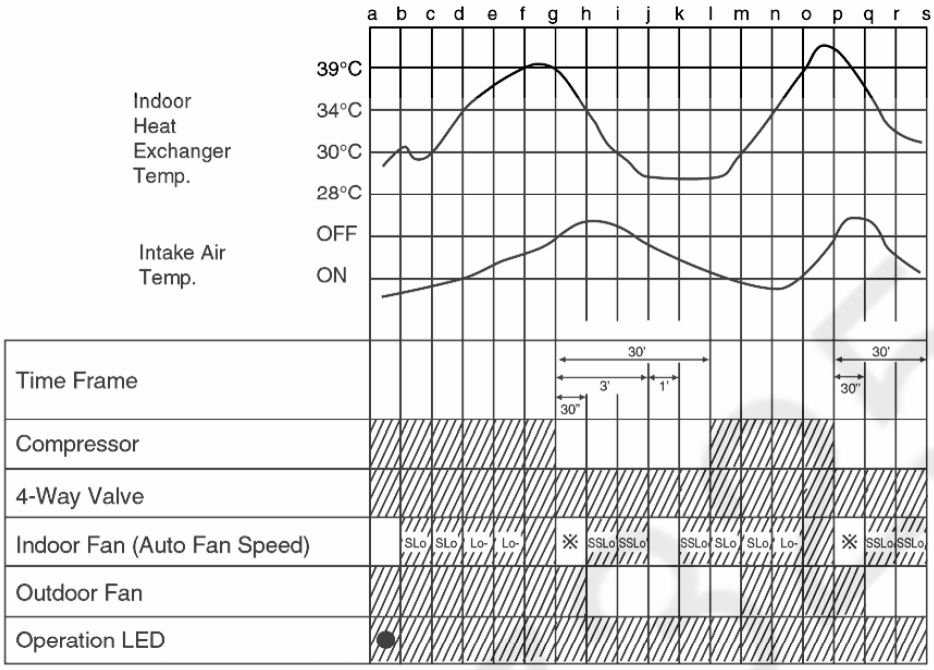


(A9/12PK)



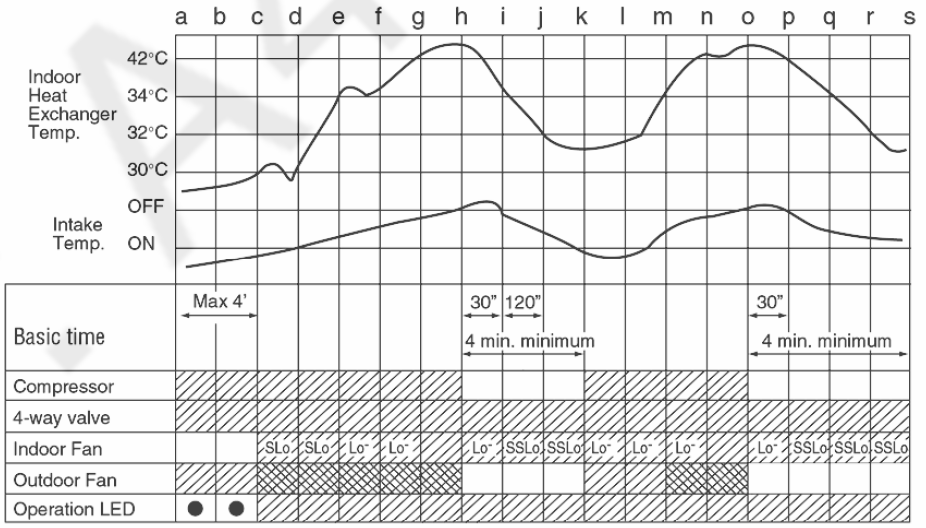
(A18/24/28PK)

13.1.1 Heating Operation Time Diagram (For CS-A9PK CU-A9PK and CS-A12PK CU-A12PK)



<Description of operation>
a – f, l – o : Hot start
g – l : 30 Minutes Time Save Control/Anti Cold Draft Control
g – h, p – q : Outdoor Fan Motor Control (30 sec. Forced Operation) after compressor stops.

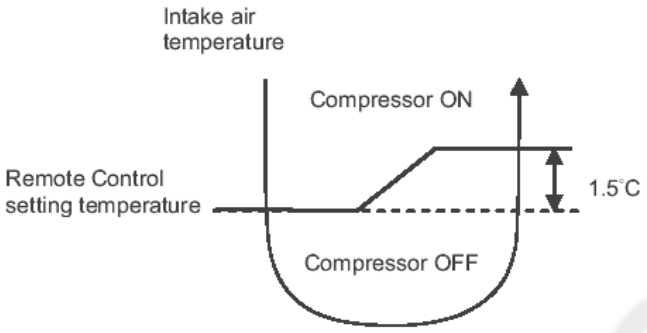
13.1.2 Heating Operation Time Diagram (For CS-A18PK CU-A18PK, CS-A24PK CU-A24PK and CS-A28PK CU-A28PK)



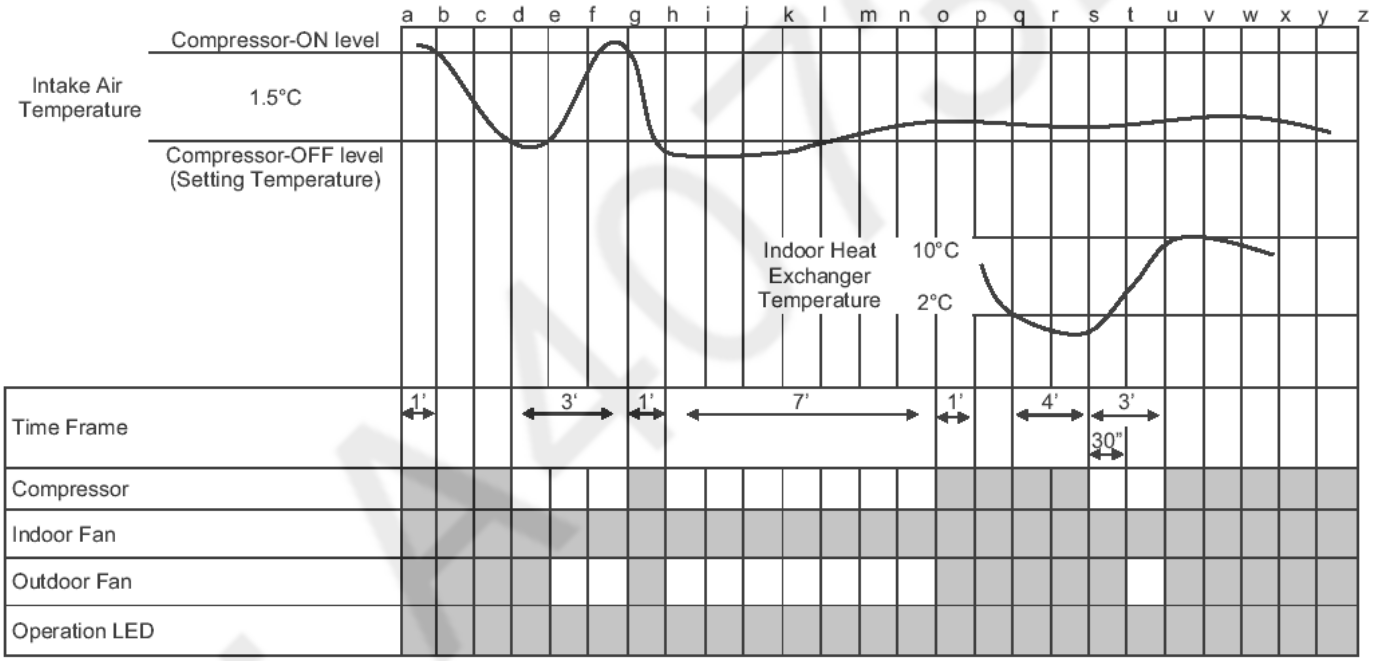
<Description of operation>
a – c : Hot start (Indoor Fan = OFF)
c – d : Hot start (Indoor Fan = SLo)
h – k, o – s : Anti Cold Draft Control

13.2 Cooling Operation

- Cooling operation can be set using remote control.
- This operation is applied to cool down the room temperature to the setting temperature set on the remote control.
- The remote control setting temperature, which takes the reading of intake air temperature sensor, can be adjusted from 16°C to 30°C.
- During cooling operation, the compressor will stop and restart as shown in figure below:



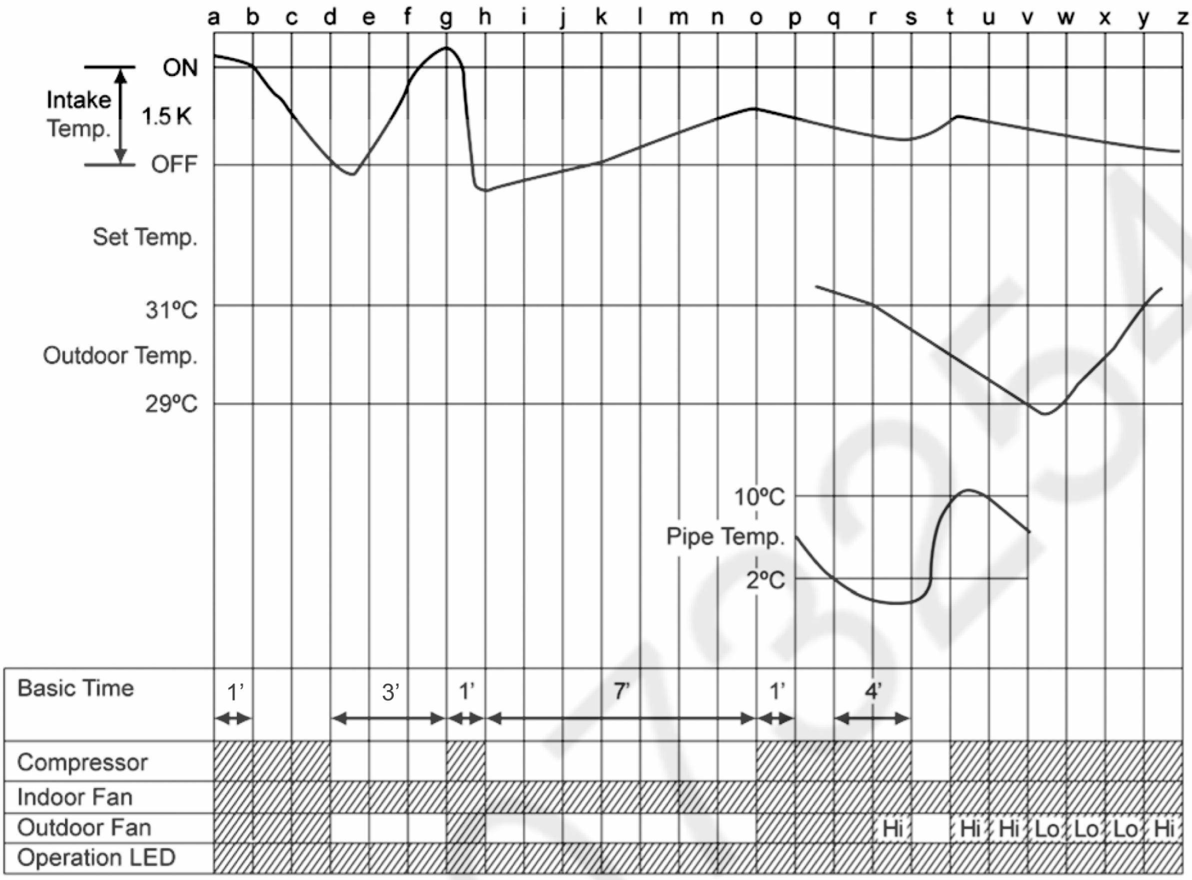
13.2.1 Cooling Operation Time Diagram (For CS-A9PK CU-A9PK and CS-A12PK CU-A12PK)



<Description of operation>

a – b, g – h	: Minimum 60 seconds forced operation	Operation
d – g, s – u	: Minimum 3 minutes restart control (Time Delay Safety Control)	
h – o	: Maximum 7 minutes time save control	Stop
q – u	: Freeze Prevention Control	

13.2.2 Cooling Operation Time Diagram (For CS-A18PK CU-A18PK, CS-A24PK CU-A24PK and CS-A28PK CU-A28PK)



<Description of operation>

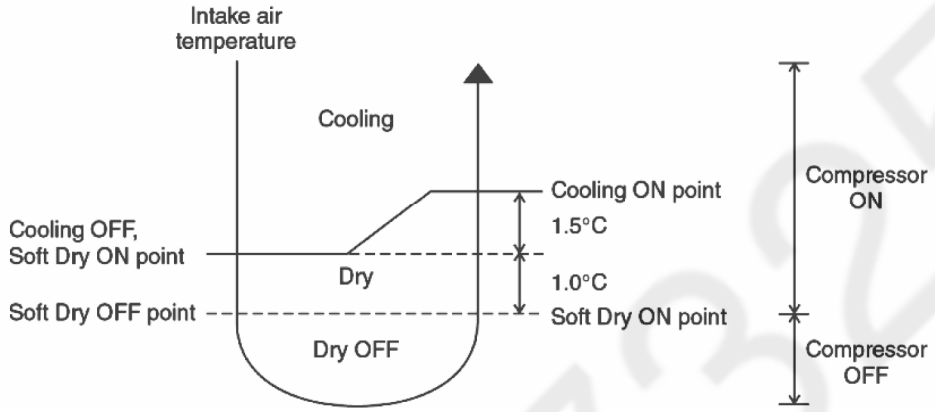
d – g	: restart control (waiting for 3 min.)
a – b, g – h, o – p	: 60 sec. Forcible operation.
h – o	: 7 min. time save control.
q – t	: freeze prevention control.
v – y	: outdoor fan control.

Operation

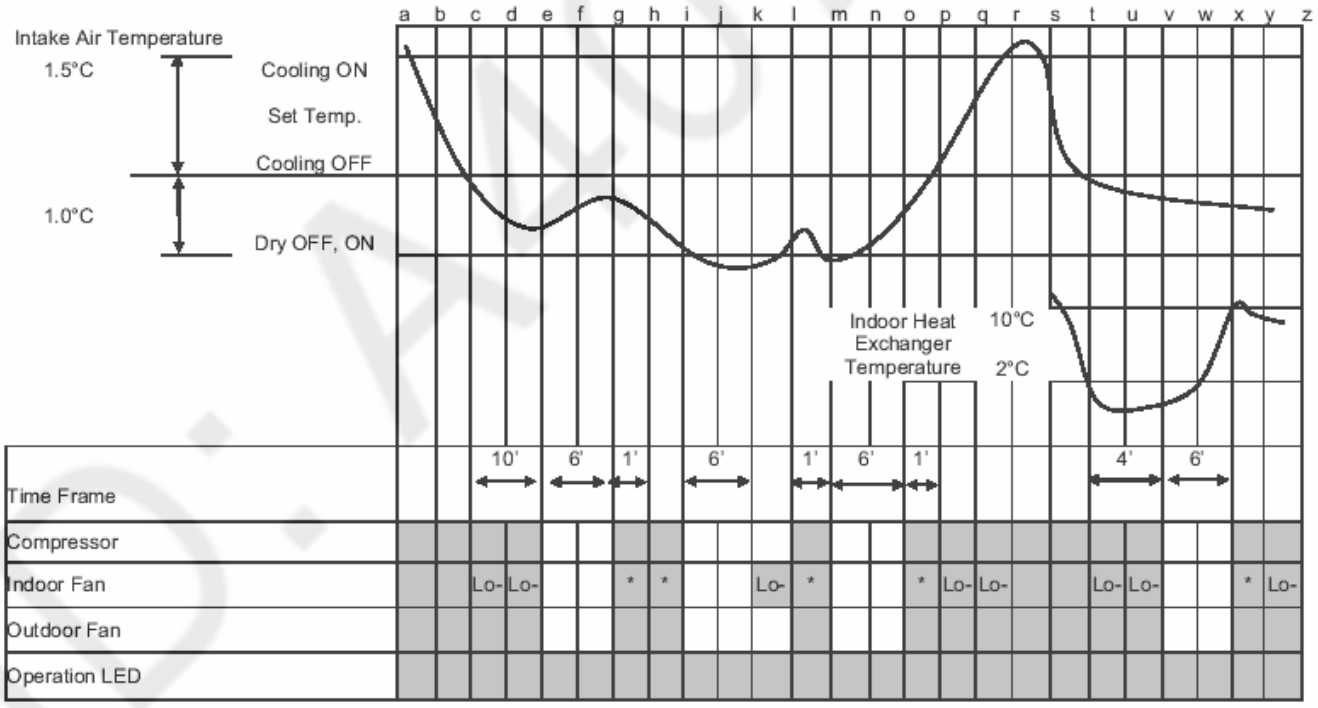
Stop

13.3 Soft Dry Operation

- Soft Dry operation can be set using remote control.
- Soft Dry operation is applied to dehumidify and to perform a gentle cooling to the room.
- This operation starts when the intake air temperature sensor reaches the setting temperature on the remote control.
- When operation begins, Soft Dry will be switched “ON” for a maximum 10 minutes, then Soft Dry operation will be turn “OFF” for a minimum 6 minutes. After that, the Soft Dry operation will be “ON” and “OFF” based on the setting temperature as shown in figure below.
- However after 3 minutes of compressor off, during Soft Dry “OFF” (within 6 minutes Soft Dry restart control), the indoor unit will start to operate at normal Cooling mode if the intake temperature is higher than Cooling “ON” point.



13.3.1 Soft Dry Operation Time Diagram (For CS-A9PK CU-A9PK and CS-A12PK CU-A12PK)



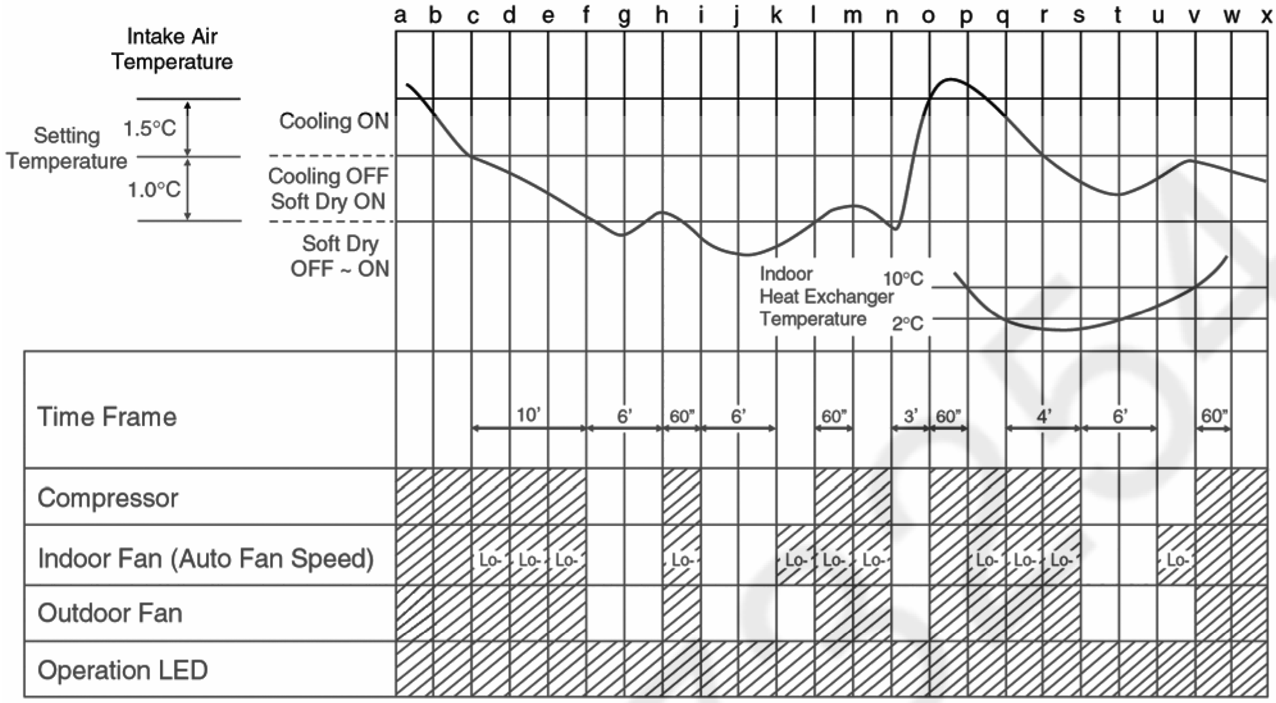
<Description of operation>

g – h, l – m, o – p	: Minimum 60 seconds forced operation
a – c	: Minimum 3 minutes restart control (Time Delay Safety Control) – Cooling operation
c – e	: 10 minutes dry operation
e – g, i – k, m – o, v – x	: Minimum 6 minutes restart control (Time Delay Safety Control) – Soft dry operation
t – x	: Freeze Prevention Control
*	: Indoor fan OFF for 40" and then rotates at Lo-

Operation

Stop

13.3.2 Soft Dry Operation Time Diagram (For CS-A18PK CU-A18PK, CS-A24PK CU-A24PK and CS-A28PK CU-A28PK)

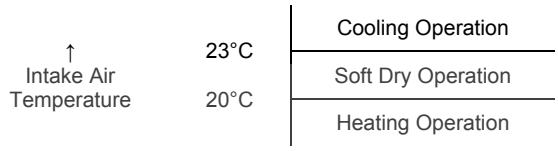


<Description of operation>

h – i, l – m, o – p, v – w : Minimum 60 seconds foreced operation
n – o : Minimum 3 minutes restart control (Time Delay Safety Control) - Cooling operation
f – h, i – k, s – u : Minimum 6 minutes restart control (Time Delay Safety Control) - Soft dry operation
q – v : Freeze Prevention Control

13.4 Automatic Operation

- Automatic operation can be set using remote control.
- This operation starts to operate with indoor fan at SLo speed for 25 seconds to judge the intake air temperature.
- After judged the temperature, the operation mode is determined by referring to the below standard.



- Then, the unit starts to operate at determined operation mode, until it is switched off using remote control, with the setting temperature as shown in table below.

	Setting Temperature (Standard)
Cooling Operation	25°C
Soft Dry Operation	22°C
Heating Operation	21°C

- Operation mode will be determine again for judgement after 1 hour of operation, if the room temperature reaches to set temperature and compressor off time is over 7 minutes 30 seconds continuously.
  * The present operation mode will be continued, if the room temperature does not reach to set temperature (Compressor keeps running) eventhough after 1 hour from automatic operation mode started.

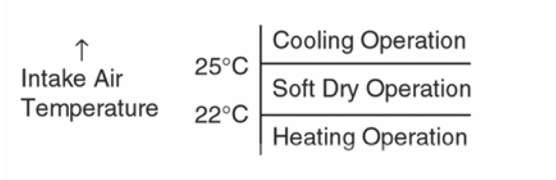
Standard for Determining Operation Mode
2nd Judgement onwards

Present Mode	Judgement		Next Mode		
			Cooling	Soft Dry	Heating
Cooling	23°C	Cooling / Heating	O (Judgement: 23°C & Above)	Not Applicable	O (Judgement: Below 23°C)
Soft Dry	20°C	Soft Dry / Heating	Not Applicable	O (Judgement: 20°C & Above)	O (Judgement: Below 20°C)
Heating	25°C	Cooling / Heating	O (Judgement: 25°C & Above)	Not Applicable	O (Judgement: Below 25°C)

- Automatic Set Temperature
  For each operation, set temperature will automatically set as shown below.
- The setting temperature for all the operations can be changed one level up or one level down from the standard temperature as shown in below table by pressing on the temperature up or temperature down button at remote control.

Operation	Hi	(Standard)	Lo
	(+2°C)	(±0°C)	(-2°C)
Cooling	27°C	25°C	23°C
Soft Dry	24°C	22°C	20°C
Heating	23°C	21°C	19°C

- The operation mode judging temperature and standard setting temperature can be increased by 2°C permanently, by open the circuit of JX03 at indoor unit's printed circuit board.



	Setting Temperature (Standard)
Cooling Operation	27°C
Soft Dry Operation	24°C
Heating Operation	23°C

13.5 Indoor Fan Speed Control

- Indoor fan speed can be set using remote control.

13.5.1 Fan Speed Rotation Chart

Fan Speed (rpm)	CS-A9PKD	CS-A12PKD
SHi	1060	1100
Hi	1020	1080
Me	850	930
HLo	750	820
CLo	710	780
Lo-	670	740
SLo	650	720
SSLo	300	300
QSHi	990	1030
QHi	950	1010
QMe	780	860
QHLo	680	750
QLo	640	710

Speed	CS-A18PKD	CS-A24PKD	CS-A28PKD
SHi	1310	1530	1520
Hi	1240	1390	1470
Me	1100	1220	1320
HLo	1060	1180	1270
CLo	1000	1100	1200
Lo-	820	910	990
SLo	630	700	780
SSLo	300	300	300
QSHi	1220	1440	1430
QHi	1150	1300	1380
QMe	1010	1130	1230
QHLo	970	1090	1180
QLo	910	1010	1110

13.5.2 Automatic Fan Speed Control

- When set to Auto Fan Speed, the fan speed is adjusted between maximum and minimum setting as shown in the table.
  - Fan speed rotates in the range of Hi, Me and Lo-.
  - Deodorizing Control will be activated.

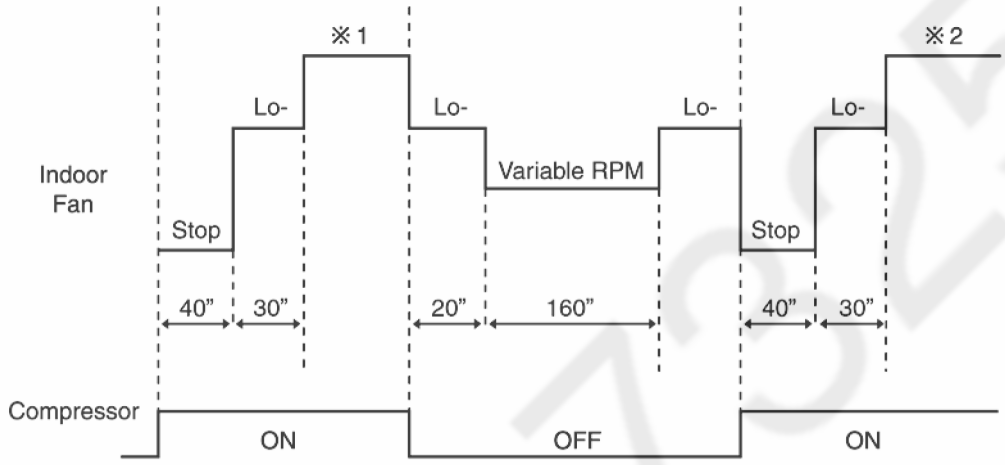
For CS-A9PKD and CS-A12PKD

Speed Mode				SHi	Hi	Me	HLo	CLo	Lo-	SLo	SSLo	Stop
Cooling	Normal	Manual	Hi		o							
			Me			o						
			Lo					o				
		Auto			o	o			o			o
	Powerful	Manual		o								
		Auto		o								
Dry	Normal	Manual							o			o
		Auto							o			o
Heating	Normal	Manual	Hi	o					o	o	o	o
			Me			o			o	o	o	o
			Lo				o		o	o	o	o
		Auto				o	o		o	o	o	o
	Powerful	Manual		o		o	o		o	o	o	o
		Auto				o	o		o	o	o	o
Auto Mode Judgment										o		
Cooling	Quiet	Manual	QHi		Hi-70							
			QMe			Me -70						
			QLo					CLo -70				
		Auto			Hi-70	Me -70			o			o
Dry	Quiet	Manual							o			o
		Auto							o			o
Heating	Quiet	Manual	QHi	SHi-70					o	o	o	o
			QMe			Me -70			o	o	o	o
			QLo				HLo-70		o	o	o	o
		Auto				Me -70	HLo-70		o	o	o	o

For CS-A18PKD, CS-A24PKD and CS-A28PKD

Speed Mode				SHi	Hi	Me	HLo	CLo	Lo-	SLo	SSLo	Stop
Cooling	Normal	Manual	Hi		o							
			Me			o						
			Lo					o				
		Auto			o	o			o			o
	Powerful	Manual		o								
		Auto		o								
Dry	Normal	Manual							o			o
		Auto							o			o
Heating	Normal	Manual	Hi	o					o	o	o	o
			Me			o			o	o	o	o
			Lo				o		o	o	o	o
		Auto				o	o		o	o	o	o
	Powerful	Manual		o		o	o		o	o	o	o
		Auto				o	o		o	o	o	o
Auto Mode Judgment										o		
Cooling	Quiet	Manual	QHi		Hi -90							
			QMe			Me -90						
			QLo					CLo -90				
		Auto			Hi -90	Me -90			o			o
Dry	Quiet	Manual							o			o
		Auto							o			o
Heating	Quiet	Manual	QHi	SHi -90					o	o	o	o
			QMe			Me -90			o	o	o	o
			QLo				HLo -170		o	o	o	o
		Auto				Me -90	HLo -170		o	o	o	o

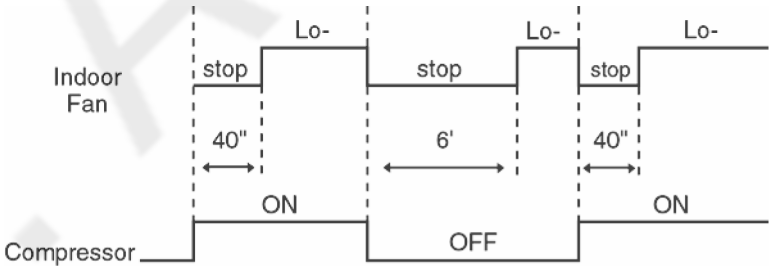
- Auto Fan Speed during cooling operation:
  1 Indoor fan will rotate alternately between off and on as shown in below diagram.
  2 At the beginning of each compressor starts operation, indoor fan speed increases gradually for deodorizing purpose.
  3 For the first time the compressor operates, indoor fan will be switched to Hi fan speed from Lo- after 70 seconds from the start of compressor. This cause the room temperature to achieve the setting temperature quickly.
  4 During compressor stops, indoor fan will operate at Lo- for the beginning 20 seconds to prevent higher volume of refrigerant in liquid form returning to the compressor.
  5 After the compressor turned off for 3 minutes, indoor fan will start to operate at Lo- to circulate the air in the room. This is to obtain the actual reading of the intake air temperature.
  6 For the resume of compressor operation, indoor fan will operate at Me fan speed to provide comfort and lesser noise environment, after 70 seconds from the restarts of compressor.



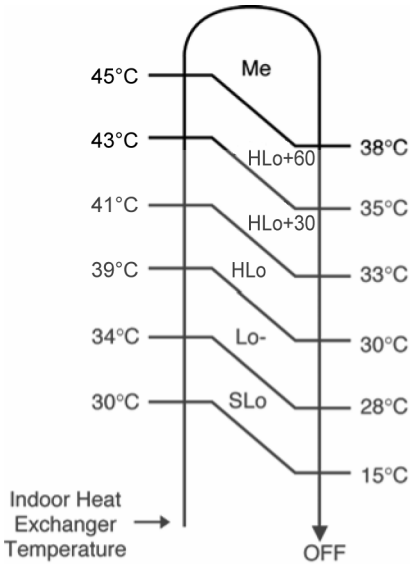
※ 1 Fan Speed is Hi until the compressor stops (when the room temperature reaches setting temperature).

※ 2 Fan Speed is Me after the compressor restarts.

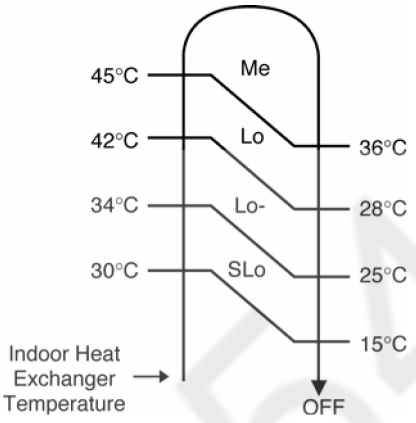
- Auto Fan Speed during Soft Dry operation.
  - Indoor fan will rotate alternately between off and Lo-.
  - At the beginning of each compressor starts operation, indoor fan will increase fan speed gradually for deodorizing purpose.
  - When compressor turned off for 6 minutes, indoor fan will start at Lo- to circulate the air in the room. This is to obtain the actual reading of intake air temperature.



- Auto Fan Speed during Heating operation.
  Indoor fan will rotate in the range of SLo → Me according to the heat exchanger temperature.



(For A9PKD and A12PKD)



(For A18PKD, A24PKD and A28PKD)

13.5.3 Manual Fan Speed Control

- Manual fan speed adjustment can be carried out by using the Fan Speed selection button at the remote control.
- There are 3 types of fan speed settings: Lo, Me, Hi.

13.5.4 Indoor Fan Motor rpm Abnormal Control

- Immediate after the fan motor is started, rpm abnormal control is performed every second.
- During fan motor on, if fan motor feedback ≥ 2550 rpm or < 50 rpm continuously for 10 seconds, the fan motor error counter increased; fan motor is then stopped and restarted. If the fan motor error counter increased to 7, then air conditioner will stop operation.

13.6 Outdoor Fan Speed Control

- There is only one speed for outdoor fan motor. (Applicable for CU-A9PK and CU-A12PK)
- There is 2 speeds for outdoor fan motor. Outdoor fan speed can be changed to Hi or Lo according to outdoor temperature. (Applicable for CU-A18PK, CU-A24PK and CU-A28PK).
- For Cooling and Soft Dry operation, when outdoor temperature reaches to 31°C (Hi-speed), 29°C (Lo-speed). (Applicable for CU-A18PK and CU-A24PK).
- For heating operation, when outdoor temperature reaches to 13.5°C (Hi-speed), 15.5°C (Lo-speed). (Applicable for CU-A18PK, CU-A24PK and CU-A28PK).
- When air conditioner is turned on, the compressor and the outdoor fan will operate simultaneously.
- Likewise, both compressor and outdoor fan will stop at the same time if the unit is turned off.

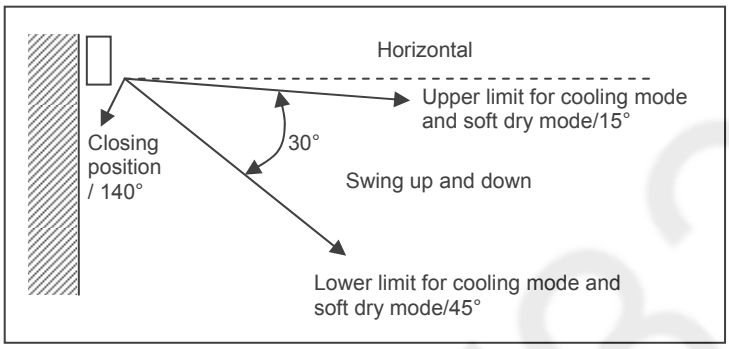
13.7 Vertical Airflow Direction Control

13.7.1 Auto Control

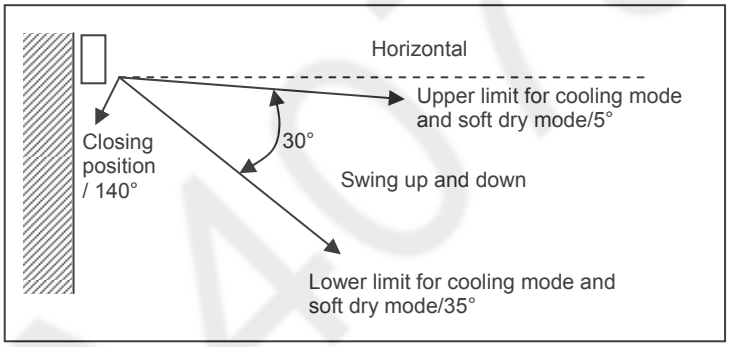
(Cooling and Soft Dry Operation Condition)

- When the vertical airflow direction is set to Auto using the remote control, the louver swings up and down as shown in the diagram.
- When stops operation using the remote control, the discharge vent is reset and stops at the closing position.
- During Cooling operation or Soft Dry operation, indoor fan motor may stop to rotate at certain periods. At that condition, the louver will stop swinging.

For CS-A9PK and CS-A12PK



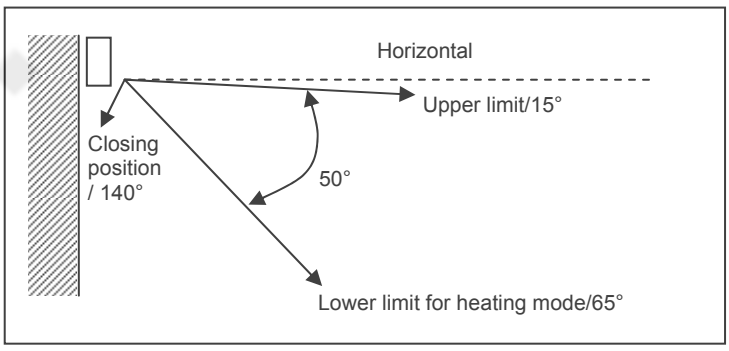
For CS-A18PK, CS-A24PK and CS-A28PK



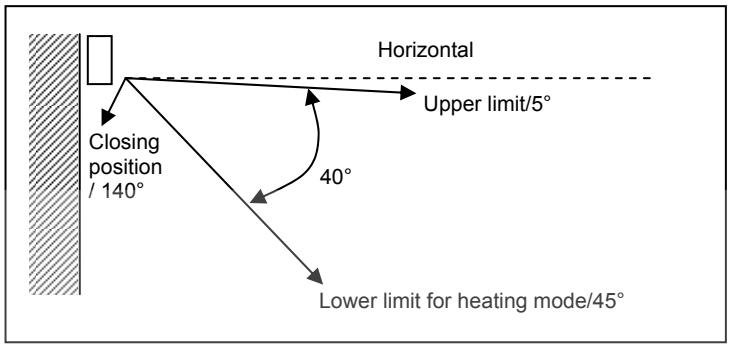
(Heating Operation condition)

- When the piping air temperature reaches 38°C, the louver is changed from upper to lower limit. When the piping air temperature falls 35°C, the louver is changed from lower to upper limit.

For CS-A9PK and CS-A12PK



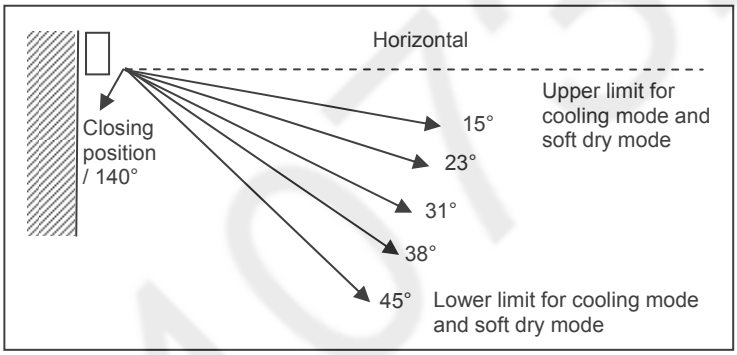
For CS-A18PK, CS-A24PK and CS-A28PK



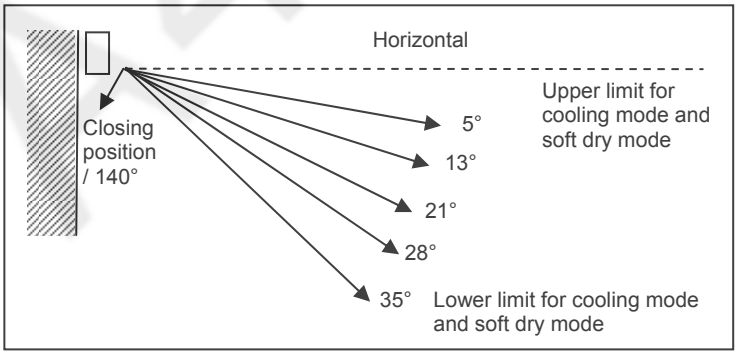
13.7.2 Manual Control

- When the vertical airflow direction is set to Manual using the remote control, the automatic airflow is released and the airflow direction louver move up and down in the range shown in the diagram.
- The louver can be adjusted by pressing the button to the desired louver position.
- When stop operation using the remote control, the discharge vent is reset, and stop at the closing position.

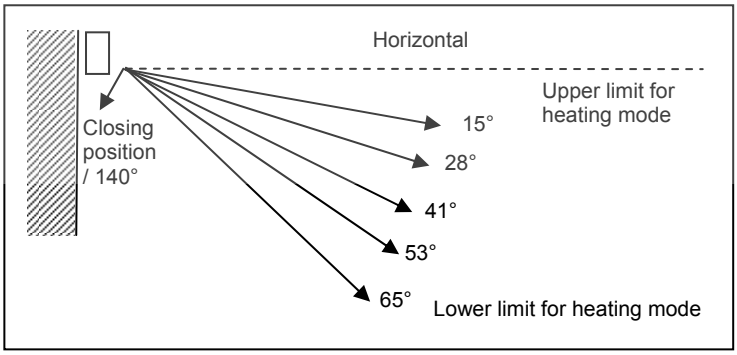
(Cooling and Soft Dry Operation Condition)
For CS-A9PK and CS-A12PK



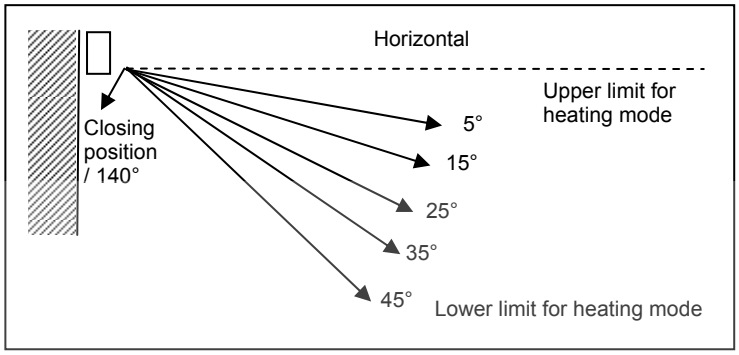
For CS-A18PK, CS-A24PK and CS-A28PK



(Heating Operation condition)
For CS-A9PK and CS-A12PK



For CS-A18PK, CS-A24PK and CS-A28PK

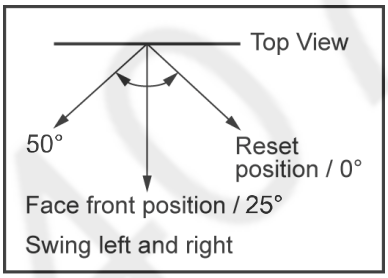


13.8 Horizontal Airflow Direction Control

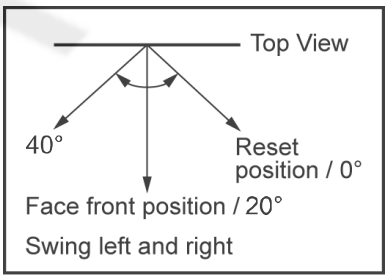
13.8.1 Auto Control

- When the horizontal airflow direction is set to Auto using the remote control, the vanes swings left and right as shown in the diagram.
- When stopped with remote control, the discharge vane is reset, and stop at the reset position.
- During Cooling operation or Soft Dry operation, indoor fan motor may stop to rotate at certain periods. At that condition, the vane will stop swinging and rest at face front position.
- During Heating operation, the piping air temperature reaches 38°C, the vanes swings left and right. When the piping air temperature falls to 35°C, the vanes will stop swing and rest at face front position.

For CS-A9PK and CS-A12PK



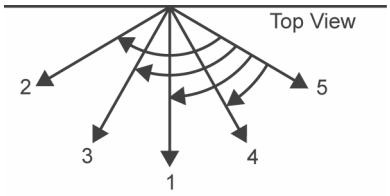
For CS-A18PK, CS-A24PK and CS-A28PK



13.8.2 Manual Control

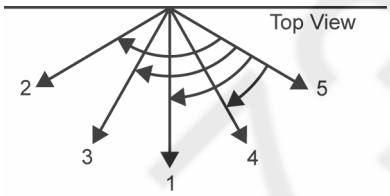
- When the horizontal airflow direction is set to Manual using the remote control, the automatic airflow is released and the airflow direction vane move left and right in the range shown in the diagram.
- The louver can be adjusted by pressing the button to the desired vane position.
- When stopped with remote control, the vanes is reset and stopped at reset position.

For CS-A9PK and CS-A12PK



Pattern	1	2	3	4	5
Airflow Direction Patterns at Remote Control					
Vane Angle (°)	25	50	37.5	12.5	0

For CS-A18PK, CS-A24PK and CS-A28PK



Pattern	1	2	3	4	5
Airflow Direction Patterns at Remote Control					
Vane Angle (°)	20	40	30	10	0

13.9 Powerful Operation

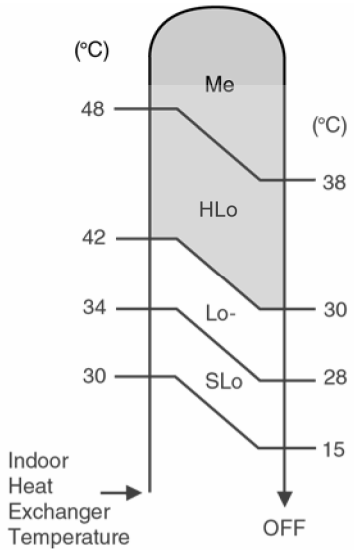
- To achieve the setting temperature quickly.

(Cooling and Soft Dry Operation condition)

- When Powerful operation is set, the setting temperature will be automatically decreased 3°C internally against the present setting temperature (Lower temperature limit: 16°C).
- This operation automatically will be running under SHi Fan Speed (Cooling).
- Vertical Airflow Direction:-
  - In “Manual” setting, the vane will automatically shift down 10° lower than previous setting.
  - In “Auto” setting, the vane will automatically swing up and down. However the lower limit will be shifted 10° downward.

(Heating Operation condition)

- When Powerful operation is set, the setting temperature will be automatically increased 3°C against the present setting temperature (Higher temperature: 30°C).
- The Fan Speed will shift as shown below:



- When the Auto Fan speed is selected, the fan speed will automatically change from SLo to Me depending to the Indoor Heat Exchanger Temperature.
- When the manual Fan Speed is selected, the fan speed will change to the fan speed setting when the Indoor Heat Exchanger Temperature reaches 42°C.

Set Fan Speed

- Vertical Airflow Direction:-
  - In “Manual” setting, the vane will automatically shift down 5° lower than previous setting.
  - In “Auto” setting, the vane will automatically shift between upper and lower limit depending on the intake air temperature as Heating Mode, Airflow Direction Auto-Control. However the upper and lower limit will be shifted 5° downward.

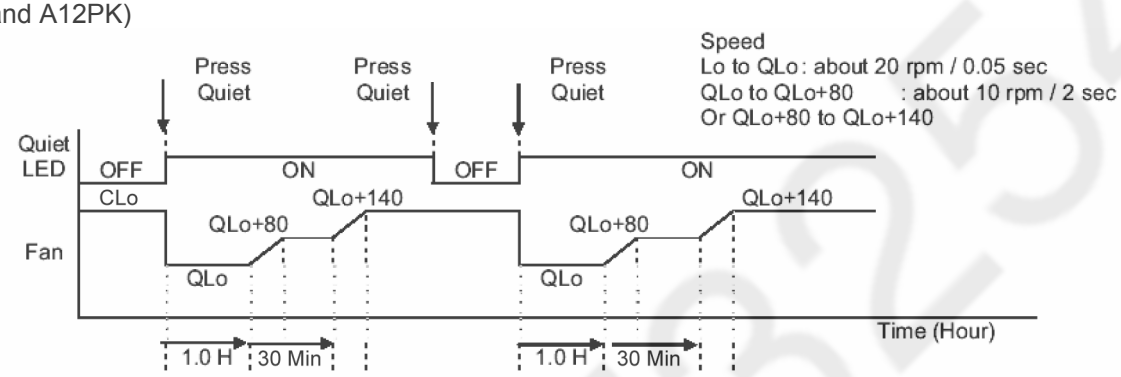
- Powerful operation stops when:-
  - Powerful operation has operate for 4 hours.
  - Powerful button is pressed again.
  - Quiet button is pressed
  - Stopped by OFF/ON operation button.
  - Timer OFF activates.
  - Operating mode is changed.

13.10 Quiet Operation

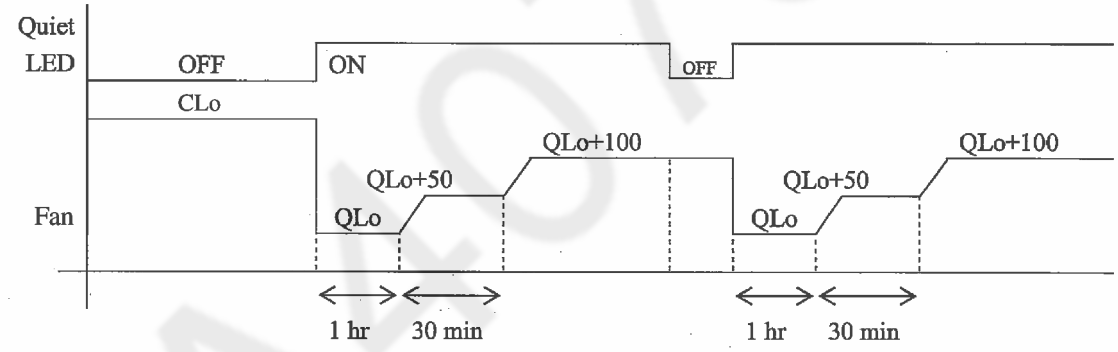
(For Cooling Operation or cooling region of Soft Dry Operation)

- To provide quiet cooling operation condition.
- Once the Quiet Operation is set at the remote control, the Quiet LED brightness will be dimmed. The sound level will reduce around 2dB(A) for Lo fan speed or 3dB(A) for Hi/Me fan speed against the present operation sound level.
- Dew formation become severe at Quite Lo Cool, therefore Quiet Lo cool operated only for 1 hour 30 minutes (1 hour QLo, 30 minutes QLo + 80rpm) (for A9PK and A12PK) and Quiet Lo cool operated only 1 hour 30 minutes (1 hour QLo, 30 minutes QLo + 50 rpm) (for A18PK, A24PK and A28PK).
- Manual Airflow Direction:
  - RPM control during Lo cool

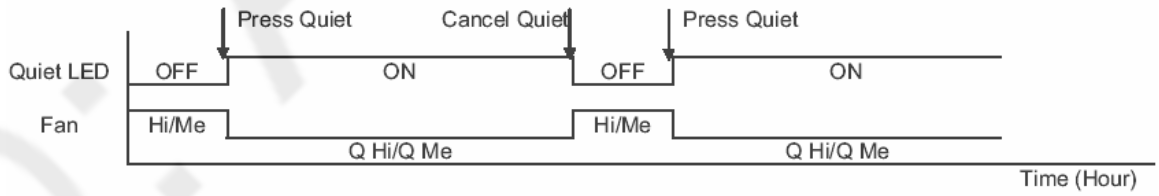
(For A9PK and A12PK)



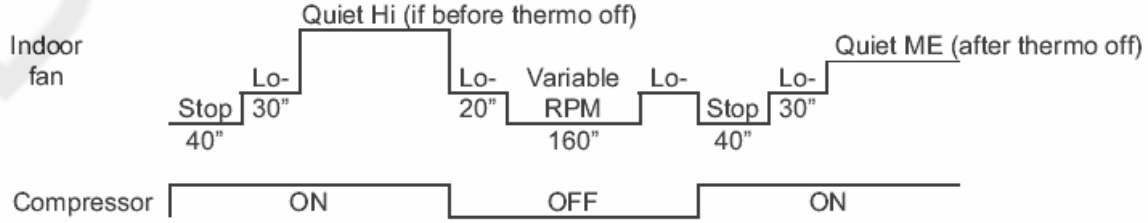
(For A18PK, A24PK and A28PK)



  - RPM control during Hi & Me cool



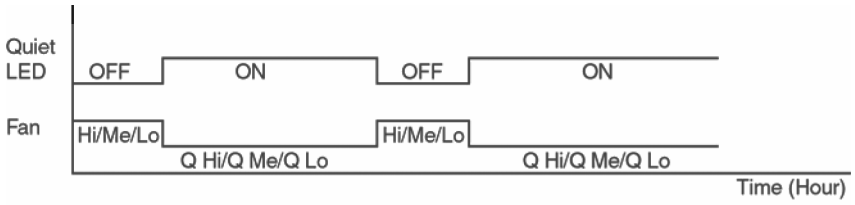
- Auto Fan Speed



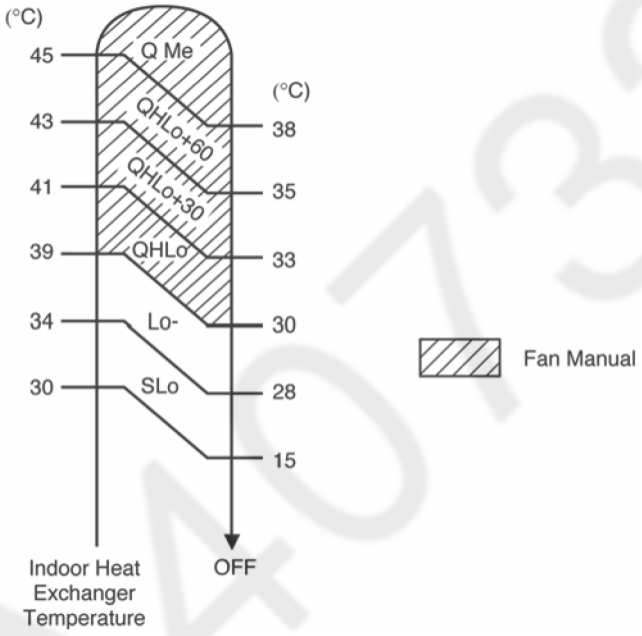
- Quiet operation stops when:
  - Quiet button is pressed again.
  - Stopped by OFF/ON operation button.
  - Timer OFF activates.
  - Operation mode button is changed.

(Heating Operation condition)

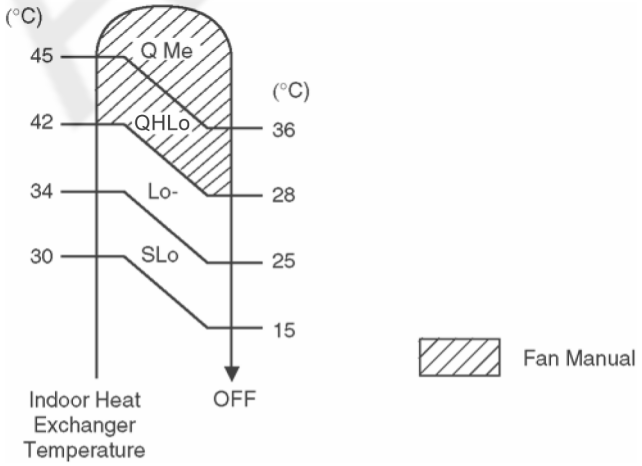
- When the Quiet Mode is set at the remote control, Quiet Mode LED illuminates. The sound level will reduce either around 2 dB (Lo) or 3 dB (Hi, Me), against the present sound level operation.
- Quiet setting of fan speed rpm refer to Indoor Fan Speed Control.
- Manual Fan Speed:-
    - Rpm control during Lo, Me & Hi Cool



- Auto Fan Speed:-
    - Rpm control depends on the piping air temperature sensor of Indoor heat exchanger



(A9/12PK)



(A18/24/28PK)

13.11 Timer Control

13.11.1 ON Timer

- When the ON Timer is set by using the remote control, the unit will start to operate slightly before the set time, so that the room will reach nearly to the set temperature by the set time.
- For Cooling and Soft Dry operation, the operation will start 15 minutes before the set time.
- For Heating operation, the operation will start 30 minutes before the set time.
- For Automatic operation, the indoor fan will operate at SLo speed for 20~25 seconds, 30 minutes before the set time to detect the intake air temperature to determine the operation mode. The operation indication lamp will blink at this time.

13.11.2 OFF Timer

- When the OFF Timer is set using the remote control, the unit will stop operate according to the desired setting.
  Notes:
  1 By pressing ON/OFF operation button, the ON Timer or OFF Timer will not be cancel.
  2 To cancel the previous timer setting, press CANCEL button.
  3 To activate the previous timer setting, press SET button.
  4 If main power supply is switched off, the Timer setting will be cancel.

13.12 Random Auto Restart Control

- If there is a power failure during operation, the air conditioner will automatically restart after 3 to 4 minutes when the power is resumed.
- It will start with previous operation mode and airflow direction.
- If there are more than one air conditioner unit in operation and power failure occur, restart time for each unit to operate will be decided randomly using 4 parameters:- intake air temperature, setting temperature, fan speed and air swing louver position.
- This Random Auto Restart Control is not available when Timer is set.
- This control can be omitted by open the circuit of JX02 at indoor unit printed circuit board.

13.13 Remote Control Signal Receiving Sound

- Short beep sound will be heard when turn ON the air conditioner or enabling other operations.
- Long beep sound will be heard when turn OFF the air conditioner or disabling other operations.

13.14 nanoe-G operation

- This operation provides clean air by producing great amount of negative ions and distribute through the discharge airflow to capture or deactivate molds, bacteria or viruses.

- nanoe-G operation start condition
  - During unit running at any operation mode, if nanoe-G operation is activated, combination operation (operation mode + nanoe-G operation) starts.
  - During unit is OFF, if nanoe-G operation is activated, nanoe-G individual operation starts.

- nanoe-G operation stop condition
  - When OFF/ON button is pressed to stop the operation.
  - When nanoe-G button is pressed.
  - When OFF Timer activates.

- nanoe-G operation pause condition
  - When indoor fan stop (during deice, odor cut control, thermostat off, etc.). nanoe-G operation resume after indoor fan restarts.
  - When indoor intake temperature ≥ 40°C. nanoe-G operation resume after indoor intake temperature ≤ 40°C continuously for 30 minutes.

- Indoor fan control
  - During any operation mode combines with nanoe-G operation, fan speed follows respective operation mode. However, nanoe-G system enabled when fan speed ≥ 500rpm to ensure proper negative ion distribution, nanoe-G system disabled when fan speed < 500 rpm.
  - During nanoe-G individual operation, only Auto Fan Speed and no Powerful operation is allowed. Even if Fan Speed button is pressed, no signal is sent to the unit and no change on remote control display. Auto Fan Speed for nanoe-G operation changes from SHi to Hi after 4 hours of operation.

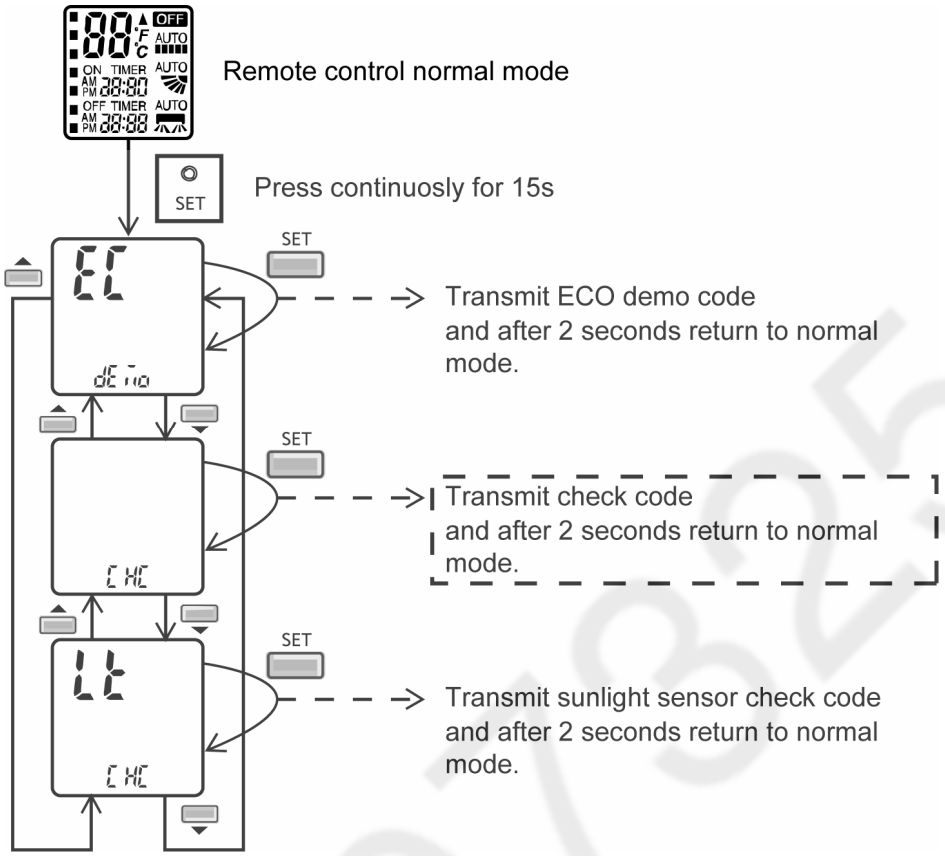
- Airflow direction control
  - During any operation mode combines with nanoe-G operation, airflow direction follows respective operation mode.
  - During nanoe-G individual operation, only Auto Air Swing is allowed. Even if Air Swing button is pressed, no signal is sent to the unit and no change on remote control display.

- Timer control
  - When ON Timer activates when unit stops, previous operation resumes and restored last saved nanoe-G operation status.
  - When ON Timer activates during any operation, no change on current operation.
  - When OFF Timer activates during any operation, all operation stops and the latest nanoe-G operation status is saved.
- Indicator
  - When nanoe-G starts, nanoe-G indicator ON.

- Remote control receiving sound
  - Normal Operation ➔ nanoe-G Operation : Beep
  - Nanoe-G Operation ➔ Normal Operation : Beep
  - Stop ➔ nanoe-G individual Operation : Beep
  - Nanoe-G individual Operation ➔ Stop : Long Beep

- Power failure
  - During nanoe-G individual operation, if power failure occurs, after power resumes, nanoe-G individual operation resumes immediately.
  - During combination operation, if power failure occurs, after power resumes, combination operation resume immediately.

- nanoe-G check mode
  - To enable nanoe-G check mode, during nanoe-G operation ON:



  - If there is abnormal discharge, nanoe-G indicator blinks immediately.

- Error detection control
  When nanoe-G indicator blinks, it indicates error listed below:
  - Nanoe-G connector at main PCB open
    - Judgment method
      - During nanoe-G operation, nanoe-G connector at main PCB is opened.
    - Troubleshooting method
      - Connect the connector or stop operation to cancel the blinking.
      - Switch off the power supply and unplug before cleaning.
      - Clean the nanoe-G generator with dry cotton bud.
  - Abnormal discharge error
    - Judgment method
      - During nanoe-G operation, the nanoe-G system has abnormal discharge due to short-circuit caused by water or dust adhesion and so forth, with Lo-feedback voltage (at microcontroller).
      - When abnormal discharge occurred, every 30 minutes the unit supplies power to the nanoe-G system.
      - When abnormal discharge occurs for 24 times continuously, nanoe-G indicator blinks.
    - Troubleshooting method
      - Press nanoe-G button or OFF/ON button to stop the operation and check the nanoe-G connector at PCB.
      - After that, press nanoe-G button again to confirm the nanoe-G indicator do not blinks.
      - The 24 timer counter will be clear after 10 minutes of normal operation or when operation stops.

- Error reset method
  - Press OFF/ON button to OFF the operation.
  - Press AUTO OFF/ON button at indoor unit to OFF the operation.
  - OFF Timer activates.
  - Power supply reset.

- nanoe-G breakdown error
  - Judgment method
    - Hi-feedback voltage (at microcontroller) supplied to the nanoe-G system when nanoe-G operation is OFF; nanoe-G breakdown error show immediately.
    - It is due to indoor PCB or nanoe-G high voltage power supply damage.
    - Operations except nanoe-G continue. Both Timer indicator and nanoe-G indicator blink.

  - Troubleshooting method
    - Press nanoe-G button or OFF/ON button to stop the operation.
    - Change nanoe-G high voltage power supply or main PCB.
    - When Lo-feedback voltage supplied to nanoe-G system during nanoe-G operation ON, nanoe-G indicator and Timer indicator stop blinking.

13.15 In-filter Deactivation Operation

- This operation helps to deactivate virus and bacteria on filter after the unit turned off using nanoe-G generator.

- In-filter deactivation start condition
  - nanoe-G is ON before the unit is turned off either by OFF/ON button or OFF Timer.
  - Elapsed time from previous in-filter deactivation operation is more than 24hrs.
  - Unit operation time before unit is turned off is more than 2 hours or accumulated unit operation time achieves 4hrs if unit operation time less than 2hours.

- In-filter deactivation stop condition
  - The unit is turned on.
  - nanoe-G generator operation time during in-filter deactivation operation has achieved 120 minutes.
  - The unit received disable signal from remote control.
  - Nanoe-G abnormality occurs.

- Control contents:
  - When the unit operate in Cool or Dry mode before turned off.
    1. The unit will operate fan operation, fan motor will operate at 500rpm for 30 minutes then stop.
    2. During fan operation, horizontal vane will fixed at 115° for 30 minutes then close.
    3. After 30 minutes the unit will continue with common control.
  - Common control.
    - nanoe-G generator will operate for 120 minutes.

- Timer control
  - When ON Timer activates during in filter deactivation operation, in-filter deactivation operation stops.
  - When OFF Timer activates during in filter deactivation operation, in-filter operation will continue.

- Indicator
  - nanoe-G indicator ON.
  - Power indicator OFF.

- Enable or disable selection
  - Press NANOE-G button continuously for 5 seconds to disable or enable in-filter deactivation operation.

- Remote control receiving sound
  - Enable in-filter deactivation operation : Beep
  - Disable in-filter deactivation operation : Long beep

- Power failure
  - During in-filter operation, if power failure occurs, after power resumes in-filter deactivation operation will not resume.

13.16 AUTO COMFORT and ECONAVI Operation

- AUTO COMFORT start condition:
  - When AUTO COMFORT button is pressed.

- AUTO COMFORT stop conditions:
  - When AUTO COMFORT button is pressed again.
  - When unit is OFF by OFF/ON button.
  - When unit is OFF when OFF TIMER activates.
  - When unit is OFF by AUTO OFF/ON button at indoor unit.
  - When POWERFUL, QUIET operation activates.
  - When ◄► button is pressed.

- ECONAVI start condition:
  - When ECONAVI button is pressed.

- ECONAVI stop conditions:
  - When ECONAVI button is pressed again.
  - When unit is OFF by OFF/ON button.
  - When unit is OFF when OFF TIMER activates.
  - When unit is OFF by AUTO OFF/ON button at indoor unit.
  - When POWERFUL, QUIET operation activates.
  - When ◄► button is pressed.

13.16.1 Human Activity Sensor

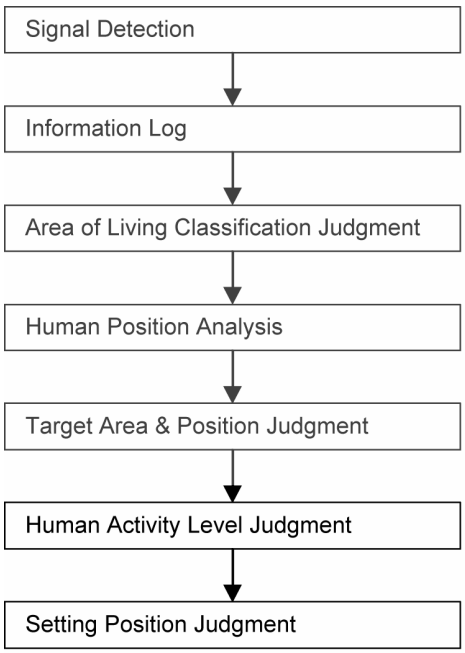
- Area of human availability, activity level and absent is judged based on pulses by using 2 infrared sensors. The internal setting temperature shift, fan speed and horizontal airflow direction are adjusted in order to provide comfort environment while maintain the energy saving level.

- AUTO COMFORT / ECONAVI initialization

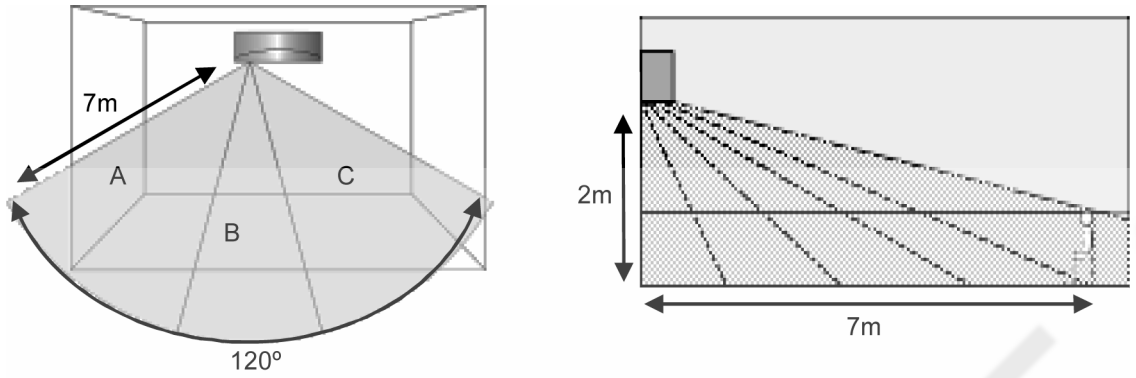
	Initialize indication	Human Activity Sensor			
1	0 – 2 seconds		□	□	□
2	2 – 3 seconds		■	■	■
3	3 – 70 seconds	I	■	□	■
		II	■	■	□
		III	■	□	■
		IV	□	■	■
		Repeat Step I to IV			

* □ Indicator ON, ■ Indicator OFF

- Human activity judgment is as following



13.16.1.1 Signal Detection



- Human Activity sensor will turns on according to infrared sensors signal detection.

Signal detection		Possible detected human position area	Human Activity Indicator		
Sensor 1	Sensor 2		Left	Center	Right
1	0	C	■	■	□
0	1	A	□	■	■
1	1	B	■	□	■
		A & C	■	□	■
		B & C	■	□	■
		A & C	■	□	■
		A, B & C	■	□	■
0	0	–	■	■	■

* □ Indicator ON, ■ Indicator OFF

- However, once the Human Activity Indicator is ON, it will maintain ON status for 5 seconds. If there is no signal detection from either infrared sensor, the final display condition will be kept until absence status.

13.16.1.2 Information Log

- The signal from Infrared sensors will be log to human activity database for further analysis.

13.16.1.3 Area of Living Classification Judgment

- The system is able to judge area of living according to human activity database, classified as following:
  - Living Area – In front of television, dining table, etc.
  - Walkway – Human detection is relatively less.
  - Non-Living Area – near windows, wall, etc.

13.16.1.4 Human Position Analysis

- According to Area of Living, frequency of activity and indoor unit intake temperature, the system will analyze the human position away from the indoor unit.

13.16.1.5 Target Area and Position Judgment

- The system will judge the indoor unit installation position according to human activity Non-Living Area:
  - Non-Living Area at Position A – Indoor unit installed at left side of the room.
  - Non-Living Area at Position C – Indoor unit installed at right side of the room.
  - Other than above – Indoor unit installed at center of the room.
- Every 4 hours, the Target Area and Position Judgment will restart.

13.16.1.6 Human Activity Level Judgment

- Human Activity Level is judged based on the frequency of pulses detected by the infrared sensors within a timeframe. The activity level will be categorized into High, Normal, Low level.
- When a pulse is detected within this timeframe, the status of human presence is judged.
- When there is no signal detection continues for 20 minutes or more, the status of human absence is judged.

13.16.1.7 Setting Position Judgment

- According to installation position when there is only one activity area detected, the horizontal airflow direction louver position is fixed according to chart below:

Target area	Horizontal airflow direction louver position		
	Left installation	Center installation	Right installation
A	3	2	2
B	1	1	1
C	5	5	4

- Louver position refer to horizontal airflow direction control.
- When 2 activity areas have been detected, according to Human Activity Level, the timing of horizontal airflow direction louver steps at the targeted activity areas is judged.

Operation mode	Activity level difference	Louver stop time
Cooling	1 level	Higher Activity level ≈ 60 seconds Lower Activity level ≈ 30 seconds
	2 levels	Higher Activity level ≈ 60 seconds Lower Activity level ≈ 8 seconds
Heating	1 level	Higher Activity level ≈ 8 seconds Lower Activity level ≈ 30 seconds
	2 levels	Higher Activity level ≈ 8 seconds Lower Activity level ≈ 60 seconds

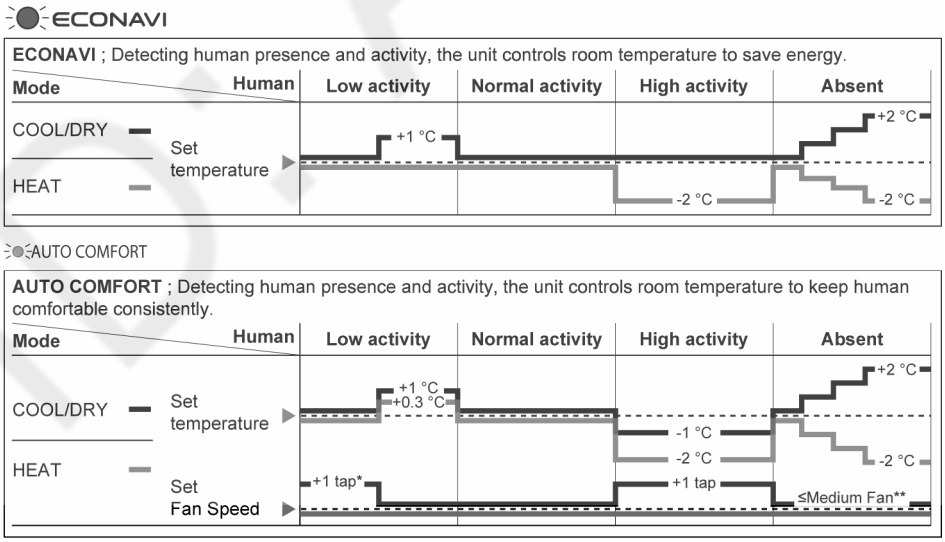
- When 3 activity areas have been detected, according to Human Activity Level the timing of horizontal airflow louver steps at the targeted activity areas is judged.

Operation mode	Activity level	Louver stop time
Cooling	Hi Me Lo	≈ 45 seconds ≈ 30 seconds ≈ 20 seconds
Heating	Hi Me Lo	≈ 20 seconds ≈ 30 seconds ≈ 45 seconds

- When 3 activity areas have same activity level, the horizontal airflow direction louver will swing left and right.

13.16.1.8 Setting Temperature and Fan Speed Shift

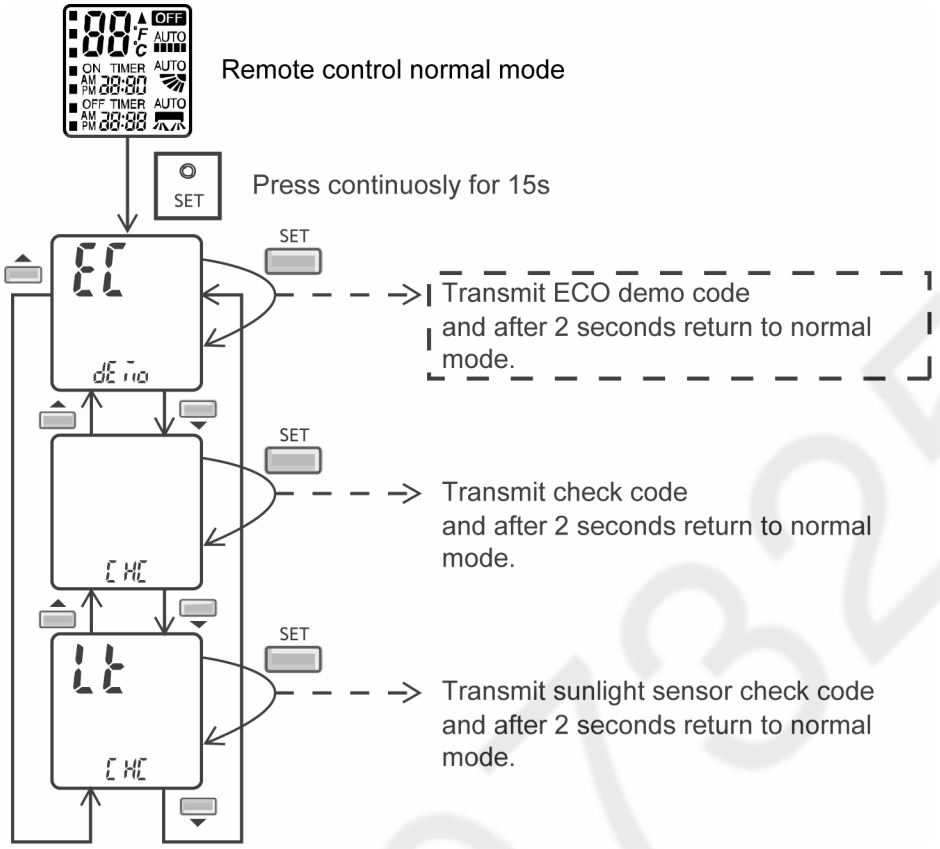
- Heating Dual Sensor



* During low activity, fan speed 1 tap up for first 15 minutes or until set temperature is reached.
** During human absence, maximum fan speed for COOL/DRY mode is medium fan.

13.16.1.9 ECONAVI Demo Mode

- To enable ECO DEMO mode, during unit is OFF (power standby):



- To disable ECO Demo MODE:
  - Transmit ECO Demo signal again.

- Operation details

Infrared sensor		Human Activity Sensor			Vane position	Fan speed
Sensor 1	Sensor 2	Left	Center	Right		
1	0	■	■	□	5	HI
1	1	■	□	■	Auto Swing	HI
0	1	□	■	■	1	HI
0	0	■	■	■	Auto Swing	LO

- The target area will maintain for 5 seconds before changeover to next detection.
- If no activity detection, the last action will maintain for 30 seconds before changeover to human absence status.

13.16.1.10 Human Activity Sensor Abnormality

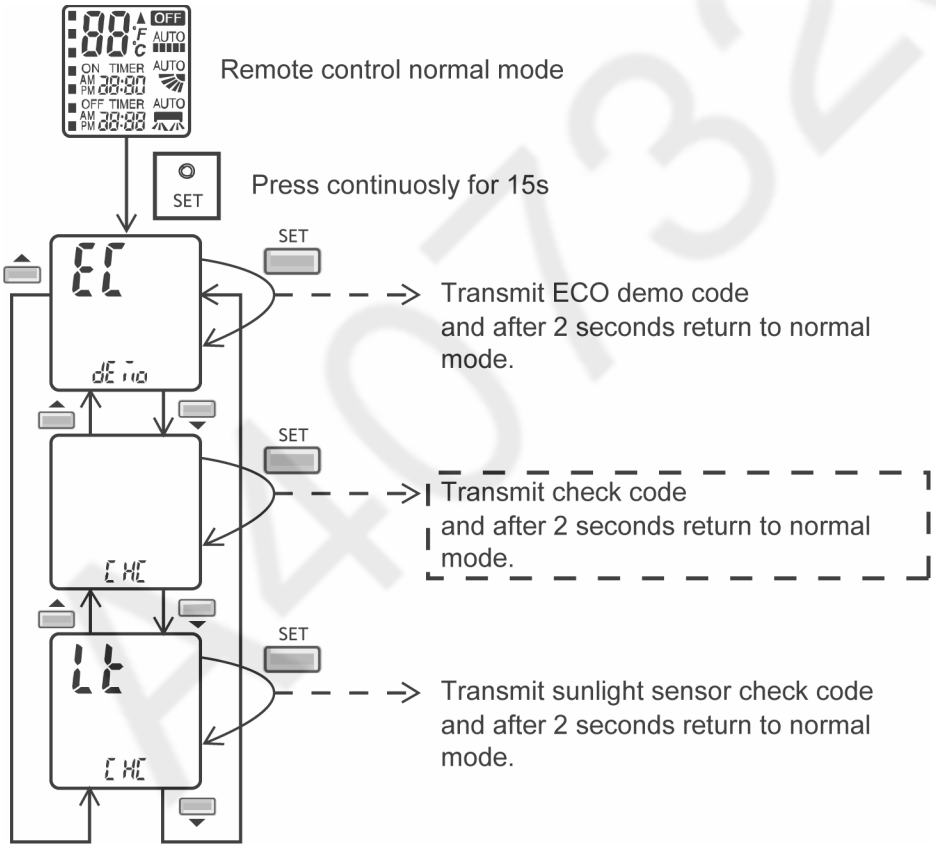
- Abnormality detection:
  - Connector disconnection / Wire cut abnormality
    - Sensor judge Hi level continuously for 25 seconds
  - Circuit abnormality
    - 70 seconds after power ON, if human activity sensor judge Lo level continuously for 25 seconds

- Error Code judgment
  - When abnormality happened, internal counter increase by 1 time.
  - Human activity sensor power OFF, retry after 5 seconds.
  - When the human activity sensor maintains normal condition for 120 seconds, the counter reset or AC reset.
  - When abnormality counter reached 4 times, No TIMER indicator blinking.

- When error code happened, the unit is able to operate without AUTO COMFORT / ECONAVI.

13.16.1.11 Human Activity Sensor Check Mode

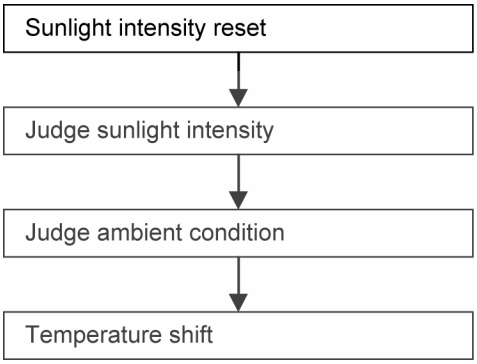
- To enable human activity sensor check mode, during ECONAVI operation ON:



- During ECONAVI is ON, when CHECK signal received, if either sensors has abnormality, the 4 times abnormality counter is ignored, ECONAVI Indicator will blink immediately and error code is memorized.
- The unit could operate without ECONAVI or AUTO COMFORT.
- The ECONAVI indicator blinking could be cancelled by pressing ECONAVI button again.
- If the human activity sensor has no abnormality, the CHECK process will end and continue with normal operation.

13.16.2 Sunlight Sensor

- During ECONAVI operation, the sunlight sensor detects sunlight intensity coming through windows and differentiates between sunny and cloudy or night to further optimize energy saving by adjusting the temperature.
- Sunlight judgment is as following

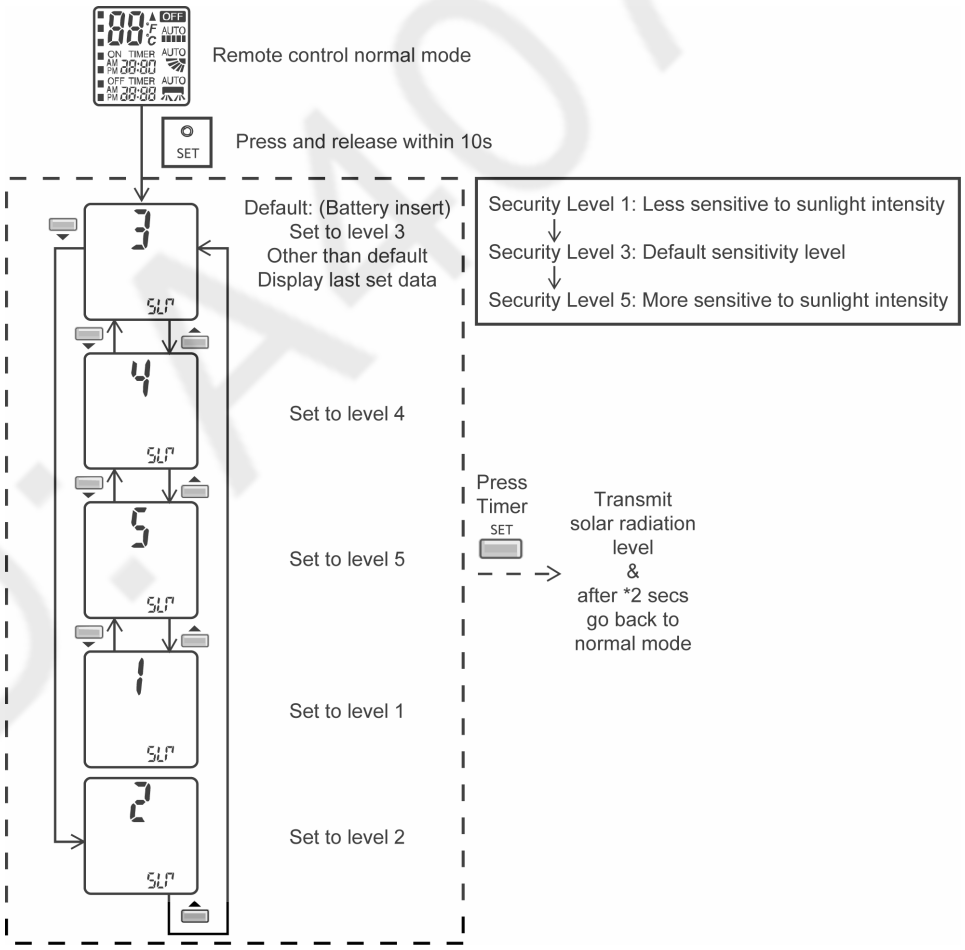


13.16.2.1 Sunlight Intensity Reset

- The sunlight intensity will to reset to zero (no sunlight condition) when
  - Each time ECONAVI is activated.
  - Setting temperature is changed.
  - Operation mode is changed.

13.16.2.2 Judge Sunlight Intensity

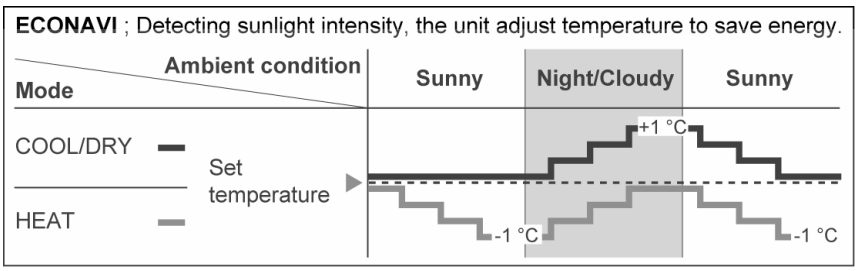
- Based on sunlight sensor output voltage, the sunlight intensity value will be computed and logged to sunlight intensity database.
- The sunlight sensor sensitivity could be adjusted:



13.16.2.3 Judge Ambient Condition

- According to sunlight intensity over a period of time, the system will analyze the ambient condition is sunny, cloudy or night.

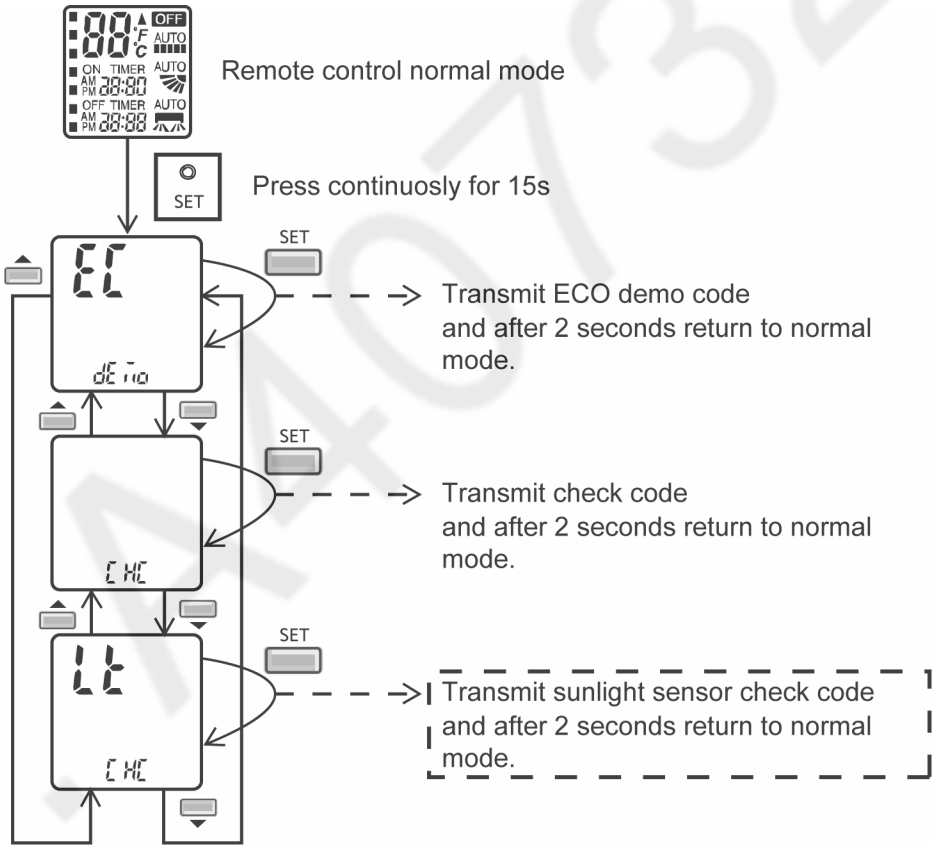
13.16.2.4 Temperature Shift



- In a room without window or with thick curtain, the sunlight sensor will judge as cloudy/night.

13.16.2.5 Sunlight Sensor Check Mode

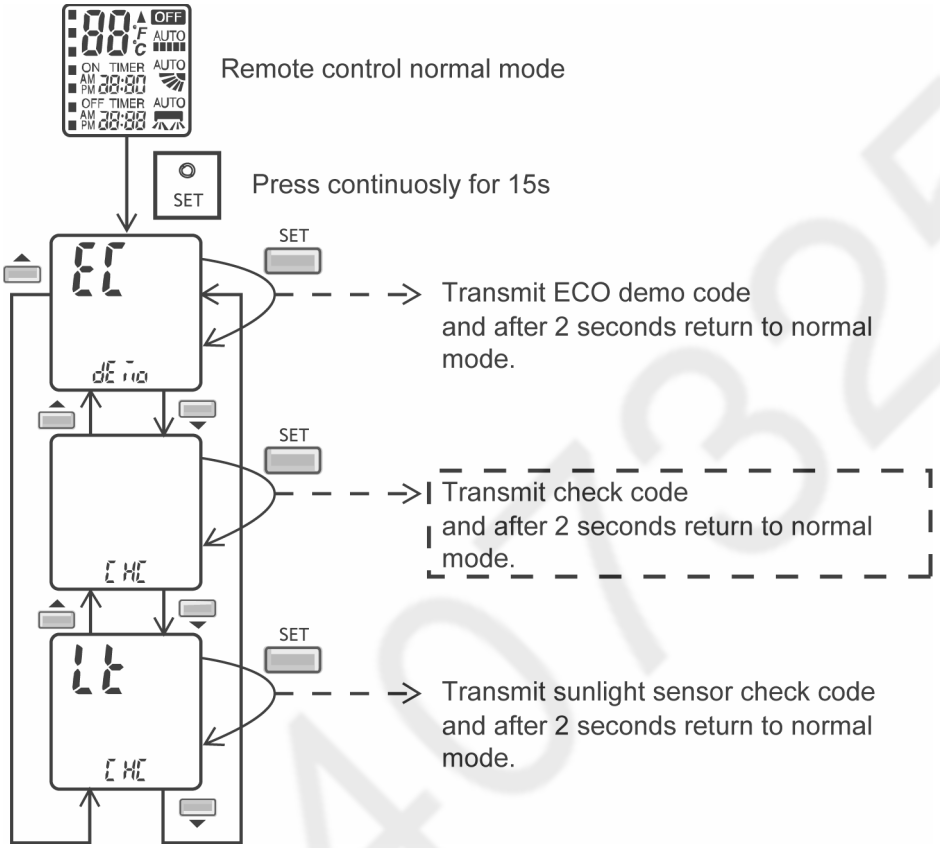
- To enable sunlight sensor check mode, during unit is OFF (power standby):



- Operation details
  - The sunlight sensor check mode will be operated for 5 minutes.
  - During check mode, the ON and OFF timer will be memorized but it operation be ignored.
  - During check mode, if the sunlight sensor check code is retransmitted, the 5 minutes counter will be reset.
  - During check mode, if sunlight sensor detected the sunlight intensity value above minimum level, the ECONAVI indicator turns ON. Else if sunlight sensor detected sunlight intensity value below minimum level, the ECONAVI indicator is OFF.
- To disable sunlight sensor check mode
  - After check mode is ended (5 minutes counter elapsed), press AUTO OFF/ON button at indoor unit.
  - If the sunlight sensor detected sunlight intensity is at abnormal range, the check mode will be ended.

13.16.2.6 Sunlight Sensor Abnormality

- Abnormality detection:
  - When ECONAVI is ON, if the sunlight intensity value below minimum level continuously for 24 hours, the sunlight sensor disconnection error counter will increase by 1 time. If the ECONAVI is OFF, the 24 hours timer will be reset, but the sunlight sensor disconnection error counter will not be reset.
- Error Code judgment
  - When sunlight sensor disconnection error counter reached 15 times, sunlight sensor is judged as abnormal.
  - No ECONAVI indicator blink. Until ECO check code sent during ECONAVI operation ON, the ECONAVI indicator will blinks.



- When error code happened, the unit is able to operate without sunlight sensor.

14. Protection Control

(For A9/12PK)

14.1 Restart Control (Time Delay Safety Control)

- When the thermo-off temperature (temperature which compressor stops to operate) is reached during: -
  - Cooling/Heating operation - the compressor stops for 3 minutes (minimum) before resume operation.
  - Soft Dry operation - the compressor stops for 6 minutes (minimum) before resume operation.
- If the operation is stopped by the remote control, the compressor will not turn on within 3 minutes from the moment operation stop, although the unit is turn on again within the period.
- This phenomenon is to balance the pressure inside the refrigerant cycle.

14.2 7 Minutes Time Save Control

- The compressor will start automatically if it has stopped for 7 minutes and the intake air temperature falls between the compressor ON temperature and compressor OFF temperature during the period.
- This phenomenon is to reduce the built up humidity inside a room.

14.3 60 Seconds Forced Operation

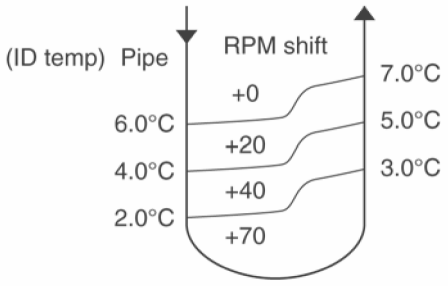
- Once the air conditioner is turned on, the compressor will not stop within 60 seconds in a normal operation although the intake air temperature has reached the thermo-off temperature. However, force stop by pressing the OFF/ON operation button at the remote control is permitted.
- The reason for the compressor to force operate at minimum 60 seconds is to allow the refrigerant oil run in a full cycle and return back to the outdoor unit.

14.4 Starting Current Control

- When the compressor, outdoor fan motor and indoor fan motor are simultaneously started, the indoor fan motor will start to operate at 1.6 second later.
- The reason of the difference is to reduce the starting current flow.

14.5 Freeze Prevention Control

- To protect indoor heat exchanger from freezing and to prevent higher volume of refrigerant in liquid form return to compressor.
- This control will activate when the temperature of indoor heat exchanger falls below 2°C continuously for more than 4 minutes.
- The current fan speed will change to freeze prevention speed after 70 seconds compressor on. When indoor pipe temperature reaches certain temperature for 5 sec. the speed will be increased as in below figure.



- Compressor will turn off when indoor temperature falls below 2°C for more than 4 minutes. It will restart again when indoor heat exchanger temperature rises to 10°C.
- Restart control (Time Delay Safety Control) will be applied in this control.

14.6 Compressor Reverse Rotation Protection Control

- If the compressor is operating continuously for 5 minutes or longer and the temperature difference between intake air and indoor heat exchanger is 2.5°C (cooling mode)/5°C (heating mode) or less for continuous 2 minutes, compressor will stop and restart automatically.
- Time Delay Safety Control is activated before the compressor restart.

▲T = Indoor heat exchange temperature - Intake air temperature (heating mode)
▲T = Intake air temperature - Indoor heat exchanger temperature (cooling mode)

- This is to prevent compressor from rotate reversely when there is an instantaneous power failure.
- If this condition happens continuously for 5 times within 50 minutes, unit will turn OFF with TIMER LED blinks.
- The 5 Times counter can be reset when either one of the following condition happen:
  - Unit is OFF by remote control or AUTO OFF/ON button.
  - Indoor intake temperature – Indoor piping temperature > 5°C for one minute or more.
  - Operation mode change.

- The unit could be ON by pressing OFF/ON button at remote control but the TIMER LED will continue blinking.

- TIMER LED blinking will be reset if:
  - Indoor intake temperature – Indoor piping temperature > 5°C for one minute or more.
  - Power supply reset.

14.7 Dew Prevention Control

- To prevent dew formation at indoor unit discharge area.
- This control will be activated if:-
  - Cooling mode or Quiet mode.
  - Remote Control setting temperature is less than 25°C.
  - Fan speed is at CLo or QLo.
  - Room temperature is constant (±1°C) for 30 minutes.
  - Compressor is continuously running.
- Fan speed and angle of horizontal louver (vertical airflow angle) will be adjusted accordingly in this control.
  - Fan speed will be increased slowly if the unit is in quiet mode but no change in normal cooling mode.
- Dew prevention stop condition.
  - Remote control setting temperature is more than 25°C.
  - Fan speed is not set at CLo or QLo.
  - Select Powerful operation.

14.8 30 Minutes Time Save Control

- The compressor will start automatically if it has stopped for 30 minutes and the intake air temperature falls between the compressor OFF temperature and compressor ON temperature during the period.
- This is to maintain the room temperature as set. Despite of this, it is to prevent a wrong judgement of intake air temperature due to poor installation near the sensor area.

14.9 Compressor Overload Protection Control

Outdoor Fan Control

- If the temperature of the indoor heat exchanger rises to 51°C, outdoor fan stops. The outdoor fan restarts when the indoor heat exchanger temperature falls to 49°C.

Compressor high pressure protection

- If the indoor heat exchanger becomes 65°C or more, the compressor will stop and restart automatically. (Time Delay Safety Control - 4 minutes waiting).
- This is to reduce the pressure, as to reduce the indoor heat exchanger temp. Nevertheless, is to protect the compressor from overload of too high temperature.

14.10 4-Way Valve Control

- 4-way valve always on during Heating operation. (except deicing operation)
- When the unit is switched off by remote control during Heating operation, the 4-way valve stay at Heating position for 5 minutes.
- This is to prevent the refrigerant flow process sound for being occur.

14.11 Outdoor Fan Motor Control

- When compressor stops (reaches room temperature), outdoor fan will operate for 30 seconds (forced operation).
- This is to release the heat and to obtain the lowest pressure as fast as possible.

14.12 Hot Start Control

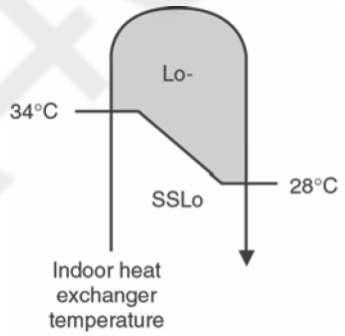
- Hot start control is to prevent cool air discharge into room when heating operating starts.
- Hot start is executed after heating operation starts and deice operation is completed.
- Indoor fan control during hot start is shown below:

Indoor Pipe Temperature	Indoor Fan
≤ 30°C	OFF
30°C < t ≤ 34°C	SLo
t ≥ 34°C	Lo-

- When indoor pipe temperature over 34°C or maximum 240 seconds, hot start is completed.
- During hot start and for 30 seconds after hot start completed, intake thermostat is ignored and no Thermo OFF.

14.13 Cold Draft Prevention Control

- This operation is to prevent the Cold Draft during Heating mode operation.
- The operation will start when compressor OFF (Thermo OFF) during Heating operation.
- For the first 30 sec. from compressor OFF (Thermo OFF), Indoor fan speed will operate accordingly to the Indoor heat exchanger temperature as shown below:



- After 30 sec. from compressor OFF (thermo OFF), Indoor fan will run at SSLo speed only.
- Anti Cold Draft Control will stop when:
  - Intake temperature < set temperature. (Time Delay Safety Control 4 minutes waiting is valid)
  - 30 Minutes Time Save Control activates.

14.14 Deice Control

Deice starts to prevent frosting at outdoor heat exchanger.

- Normal Deice
  Deice operations detection commences after 30 minutes of Heating operation starts or 60 minutes after previous deice operation. If the TRS (Thermal Reed Switch) senses the outdoor piping temperature drops to -3°C (TRS CLOSE) or less for 50 sec. continuously during compressor is in operation, deice will start.
  (There is no detection during Outdoor Fan stops.)

- Overload Deice
  During heating operation, if the outdoor Fan OFF duration (due to overload protection control) is accumulated up to 60 minutes and after compressor starts for 1 minutes, deice starts.

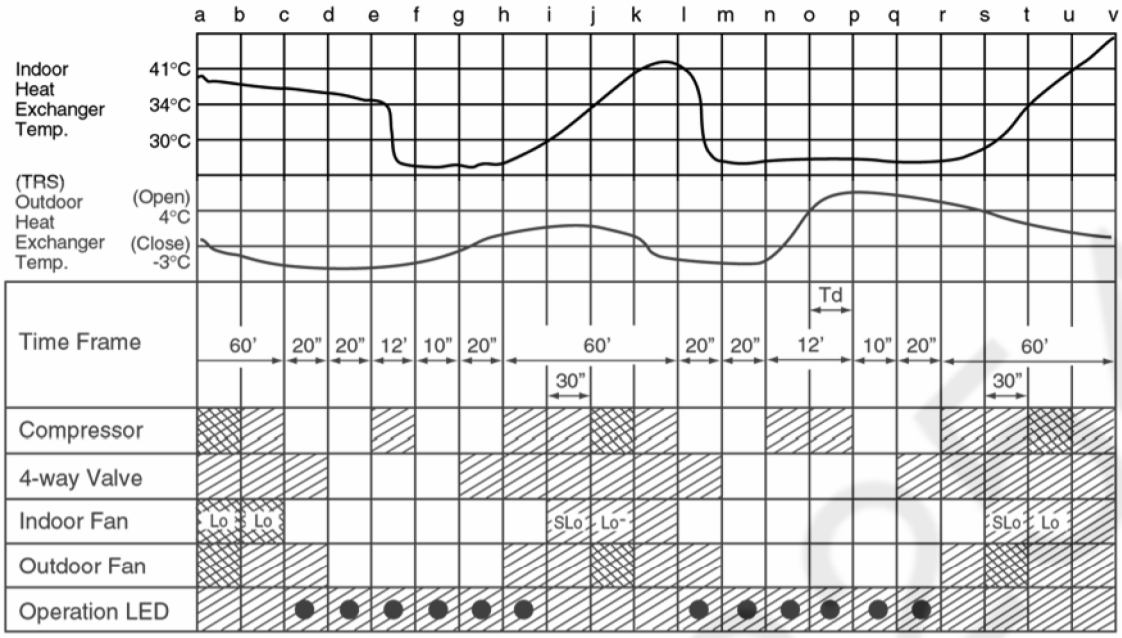
- Deice ends when
  1. 12 minutes after deicing operation starts;
  2. TRS senses the outdoor piping temperature rises to 4°C (TRS OPEN).

  ※ Deice will not end immediately as time delay (Td) is valid as shown below:

Time taken from deicing starts to TRS OPEN (T)	Deice recovery time	Td (seconds)
T ≤ 1 minute	1 min. wait (Min.)	0
1 minutes < T < 3 minutes	T	0
3 minutes < T < 8 minutes	T + 60 sec.	60
8 minutes < T < 11 minutes	T + 120 sec.	120
T > 11 minutes	12 min. wait (Max.)	-

- Once deice operation starts, it will not end for 60 seconds.
- After deice operation, compressor stops for 30 seconds and 4-way valve stays at cooling position for 10 seconds.

Normal Deice Time Diagram

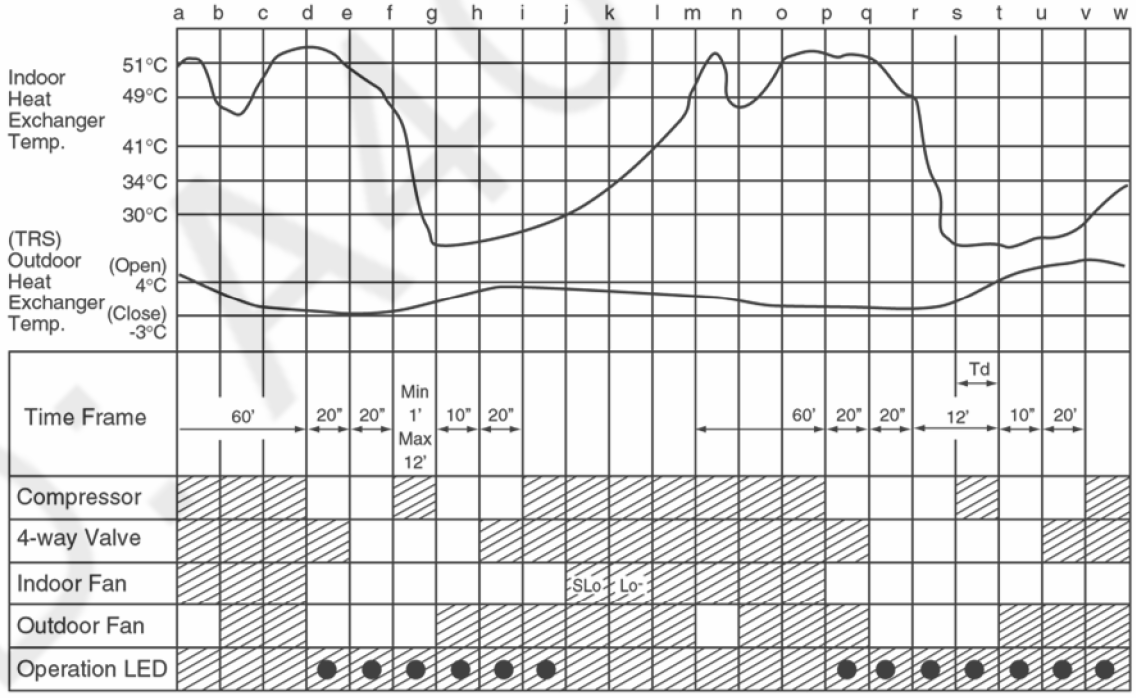


<Description of operation>

a – c	:	Deicing operation judging condition established
c – e, l – n	:	Deicing operation (timer detected)
e – h	:	Deice operation (timer detected)
h – i, r – s	:	Hot start (no thermo OFF)
i – j, s – t	:	No thermo OFF (after finished hot start)
n – r	:	Deicing operation (TRS detected)

● : Blinking
Operation
Stop
Operation or Stop
Td : Time Delay

Overload Deice Time Diagram



<Description of operation>

a – d, m – p	:	Overload control. (intergrate)
d – f, p – r	:	Preparation time for Deicing
f – i	:	Overload deicing (timer detected)
i – j	:	Hot start (indoor fan OFF)
j – k	:	Hot start (indoor fan SLo)
r – t	:	Overload control (TRS detected)

● : Blinking
Operation
Stop
Td : Time Delay

(For A18/24/28PK)

14.15 Restart Control (Time Delay Safety Control)

- When the thermo-off temperature (temperature which compressor stops to operate) is reached during:-
  - Cooling / Heating operation - the compressor stops for 3 minutes (minimum) before resume operation.
  - Soft Dry operation - the compressor stops for 6 minutes (minimum) before resume operation.
- If the operation is stopped by the remote control, the compressor will not turn on within 3 minutes from the moment operation stop, although the unit is turn on again within the period.
- This phenomenon is to balance the pressure inside the refrigerant cycle.

14.16 7 Minutes Time Save Control

- The compressor will start automatically if it has stopped for 7 minutes and the intake air temperature falls between the compressor ON temperature and compressor OFF temperature during the period.
- This phenomenon is to reduce the built up humidity inside a room.

14.17 60 Seconds Forced Operation

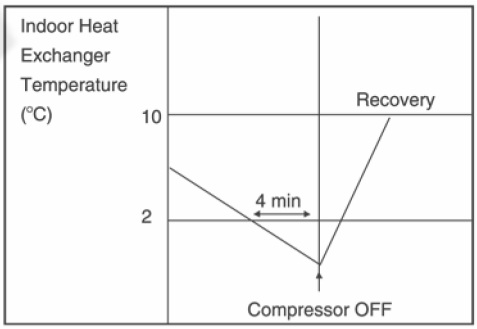
- Once the air conditioner is turned on, the compressor will not stop within 60 seconds in a normal operation although the intake air temperature has reached the thermo-off temperature. However, force stop by pressing the OFF/ON operation button at the remote control is permitted.
- The reason for the compressor to force operate at minimum 60 seconds is to allow the refrigerant oil run in a full cycle and return back to the outdoor unit.

14.18 Starting Current Control

- When the compressor, outdoor fan motor and indoor fan motor are simultaneously started, the indoor fan motor will start to operate at 1.6 second later.
- The reason of the difference is to reduce the starting current flow.

14.19 Freeze Prevention Control

- If the temperature of the indoor heat exchanger falls below 2°C continuously for 4 minutes or more, the compressor turns off.
  The fan speed setting remains the same.
- This phenomenon is to protect the indoor heat exchanger from freezing and to prevent higher volume of refrigerant in liquid form returning to the compressor.
- Compressor will restart again when the indoor heat exchanger temperature rises to 10°C (Recovery).
- Restart control (Time Delay Safety Control) will be applied in this Control if the recovery time is too short.



14.20 Compressor Reverse Rotation Protection Control

- If the compressor is operating continuously for 5 minutes or longer and the temperature difference between intake air and indoor heat exchanger is 2.5°C (cooling mode)/5°C (heating mode) or less for continuous 2 minutes, compressor will stop and restart automatically.
- Time Delay Safety Control is activated before the compressor restart.

▲T = Indoor heat exchange temperature - Intake air temperature (heating mode)
▲T = Intake air temperature - Indoor heat exchanger temperature (cooling mode)

- This is to prevent compressor from rotate reversely when there is an instantaneous power failure.
- If this condition happens continuously for 5 times within 50 minutes, unit will turn OFF with TIMER LED blinks.
- The 5 Times counter can be reset when either one of the following condition happen:
  - Unit is OFF by remote control or AUTO OFF/ON button.
  - Indoor intake temperature – Indoor piping temperature > 5°C for one minute or more.
  - Operation mode change.

- The unit could be ON by pressing OFF/ON button at remote control but the TIMER LED will continue blinking.

- TIMER LED blinking will be reset if:
  - Indoor intake temperature – Indoor piping temperature > 5°C for one minute or more.
  - Power supply reset.

14.21 Dew Prevention Control

- To prevent dew formation at indoor unit discharge area.
- This control starts if:
  - Cooling mode or Quiet mode is activated.
  - Remote Control setting temperature is less than 25°C.
  - Fan speed is at Lo or QLo.
  - Room temperature is constant (±1°C) for 30 minutes.
  - Compressor is continuously running.
- Fan speed, angle of horizontal louver (vertical airflow angle) and angle of vertical louver (horizontal airflow angle) will be adjusted accordingly in this control.
  - Fan speed will be increased slowly if the unit is in quiet mode and Lo fan speed.
  - The angle of horizontal louver will be changed as table below:
  - The angle of vertical louver will be changed as table below:
- Dew prevention stop condition
  - Remote control setting temperature is more than 25°C.
  - Fan speed is not set to Lo or QLo.
  - Select Powerful operation.

14.22 Overload Protection Control

- Outdoor Fan Control
  - If the temperature of the Outdoor Heat Exchanger less than -3°C, Outdoor Fan is ON. The Outdoor Fan stop, when Outdoor Heat Exchanger temperature is Tb or more according to Outdoor Air Temperature region as table below:
    The Outdoor Fan restarts when the indoor heat exchanger temperature falls to 49°C.

Outdoor Air Temperature	< 10°C	≥ 10°C ~ < 15°C	≥ 5°C ~ < 20°C	≥ 20°C ~ < 25°C	≥ 25°C	Outdoor Fan OFF
Tb	≥ 5°C	≥ 3°C	≥ 1.5°C	≥ 0.5°C	≥ -0.5°C	

  During starting of Heating mode and after deice, Outdoor Fan ON for 90 sec. (Hi).

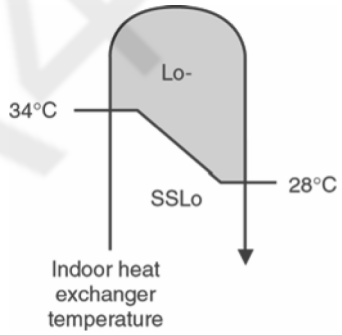
- Compressor High Pressure Control
  - If the indoor heat exchanger becomes 68°C or more, the compressor will stop and restart automatically.
  - Time Delay Safety Control is activated before the compressor restart.

14.23 4-Way Valve Control

- 4-way valve always on during Heating operation. (except deicing operation)
- When the unit is switched off by remote control during Heating operation, the 4-way valve stay at Heating position for 5 minutes.
- This is to prevent the refrigerant flow process sound for being occur.

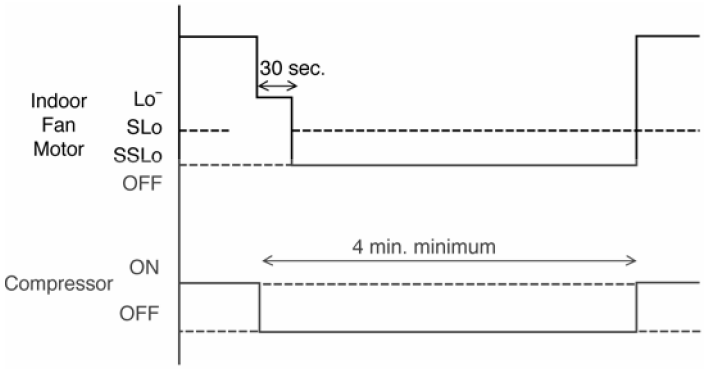
14.24 Hot Start Control

- This operation is to prevent the Cold Draft during Heating mode operation.
- The operation will start when compressor OFF (Thermo OFF) during Heating operation.
- For the first 2 mins. from compressor OFF (Thermo OFF), Indoor fan speed will operate accordingly to the Indoor heat exchanger temperature as shown below:



- After 2 mins. from compressor OFF (thermo OFF), Indoor fan will run at SSLo speed only.
- Anti Cold Draft Control will stop when:
  - Intake temperature < set temperature. (Time Delay Safety Control 4 minutes waiting is valid)
  - 30 Minutes Time Save Control activates.

14.25 Cold Draft Prevention Control



When COMP = Thermal OFF, indoor fan speed immediately changed to Lo⁻ for 30 sec., follow by SSLo speed until COMP = ON.

14.26 Deice Control

Deice starts to prevent frosting at outdoor heat exchanger.

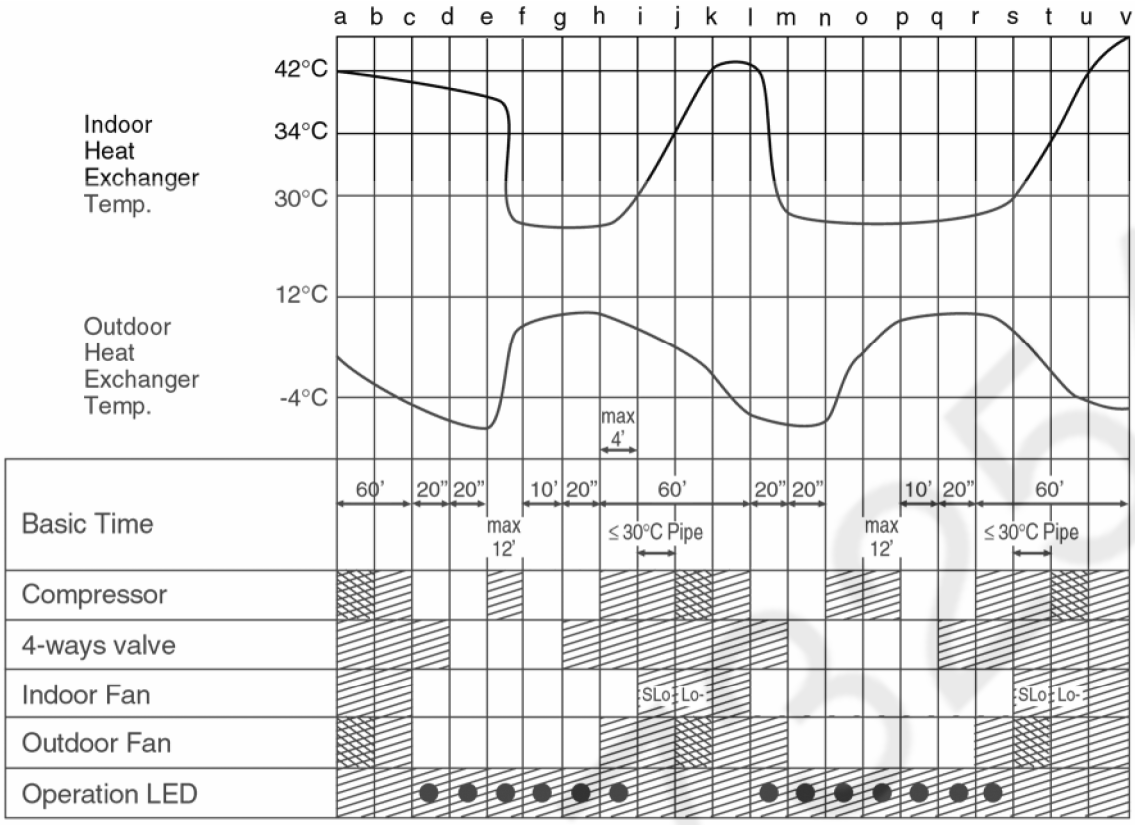
- Normal Deice
  Deice operation detection commences in Heating operation starts or 60 minutes after previous deice operation. If the outdoor piping temperature drops to -4°C for 50 sec. continuously during compressor is in operation, deice will start.
  (There is no detection during Outdoor Fan stops.)

- Overload Deice
- During heating operation, if the outdoor Fan OFF duration (due to overload protection control) is accumulated up to 60 minutes and after compressor starts for 1 minute, deice starts.

- Deice ends when
  (a) 12 minutes after deicing operation starts;
  (b) The outdoor piping temperature rises to about 12°C.

- After deice operation, compressor stops for 30 seconds and 4-way valve stays at cooling position for 10 seconds.

a) Normal Deice Time Diagram

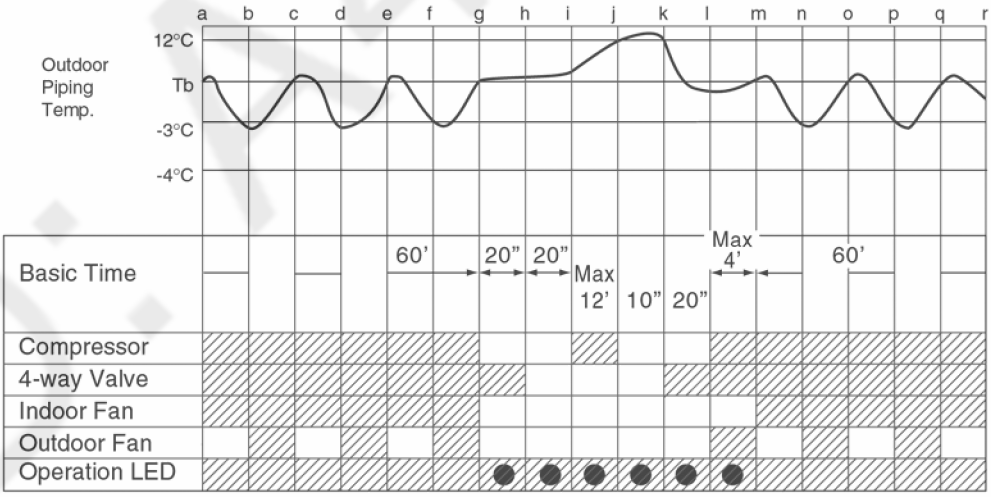


<Description of operation>

a – c	:	Deicing operation judging condition established
c – e, l – n	:	Preparation time
e – h	:	Deicing operation (timer detected)
h – i, r – s	:	Hot start (no thermo OFF)
i – j, s – t	:	No thermo OFF (after finished hot start)

● : Blinking
Operation
Stop
Operation or stop

b) Overload Deice Time Diagram



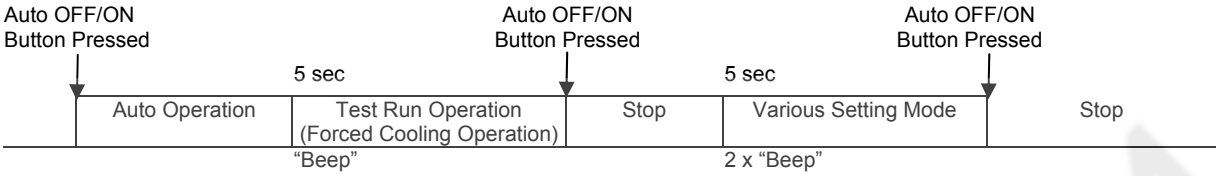
<Description of operation>

a – i	:	Overload control
i – l	:	Overload deicing
l – m	:	Hot start
m – r	:	Overload control
g – i	:	Preparation for overload deicing (For normal R22 control, operation for g – i is not included, applicable only for new refrigerant model).

● : Blinking
Operation
Stop

15. Servicing Mode

15.1 Auto OFF/ON Button

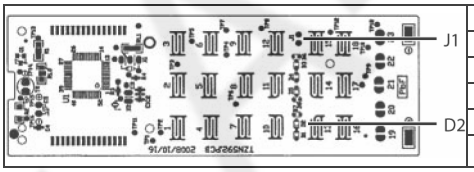


1 AUTO OPERATION MODE
The Auto Operation will be activated immediately once the Auto OFF/ON button is pressed. This operation can be used to operate air conditioner with limited function if remote control is misplaced or malfunction.

2 TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)
The Test Run Operation will be activated if the Auto OFF/ON button is pressed continuously for more than 5 seconds. A "beep" sound will be heard at the fifth seconds, in order to identify the starting of this operation.

3 VARIOUS SETTING MODE
The Various Setting Mode will be activated if (within 20 seconds of Test Run Operation) the Auto OFF/ON button is pressed for more than 5 seconds. 2 "beep" sounds will be heard to identify the starting of this operation.
Under Various Setting Mode, user could perform the following operation:
i. Press Auto OFF/ON button to toggle remote control receiving sound.
- Short "beep": Turn ON remote control receiving sound.
- Long "beep": Turn OFF remote control receiving sound.

After Auto OFF/ON button is pressed, the 20 seconds counter for Remote Control Receiving Sound OFF/ON Mode is restarted.
ii. Remote Control Number Switch.
- There are 4 types of remote control transmission code could be selected and stored in EEPROM of indoor unit. The indoor unit will only operate when received signal with same transmission code from remote control. This could prevent signal interference when there are 2 or more indoor units installed nearby together.
- To change remote control transmission code, short or open jumpers at the remote control printed circuit board. .



Remote Control Printed Circuit Board		
Jumper A (J1)	Jumper B (D2)	Remote Control No.
Short	Open	A (Default)
Open	Open	B
Short	*Short with diode	C
Open	*Short with diode	D

*Diode is field supplied. Part number: SOD-323 IN4148WS/LMDL914T1G

- During Various Setting Mode, press any button at remote control to transmit and store the desired transmission code to the EEPROM.
- After signal is received, the Various Setting Mode is cancelled and return to normal operation.
- If there is no code is transmitted of Auto OFF/ON button is not pressed within 20 seconds, the Various Setting Mode will be cancelled.

15.2 Remote Control Button

15.2.1 SET Button

- To check current remote control transmission code and store the transmission code to EEPROM:
  - Press “Set” button continuously for 10 seconds by using pointer.
  - Press “Timer Set” button until a “beep” sound is heard as confirmation of transmission code change.

15.2.2 RESET (RC)

- To clear and restore the remote control setting to factory default.
  - Press once to clear the memory

15.2.3 TIMER ▲

- To change indoor unit indicators’ intensity:
  - Press continuously for 5 seconds.

15.2.4 TIMER ▼

- To change remote control display from Degree Celsius (°C) to Degree Fahrenheit (°F)
  - Press continuously for 10 seconds.

16. Troubleshooting Guide

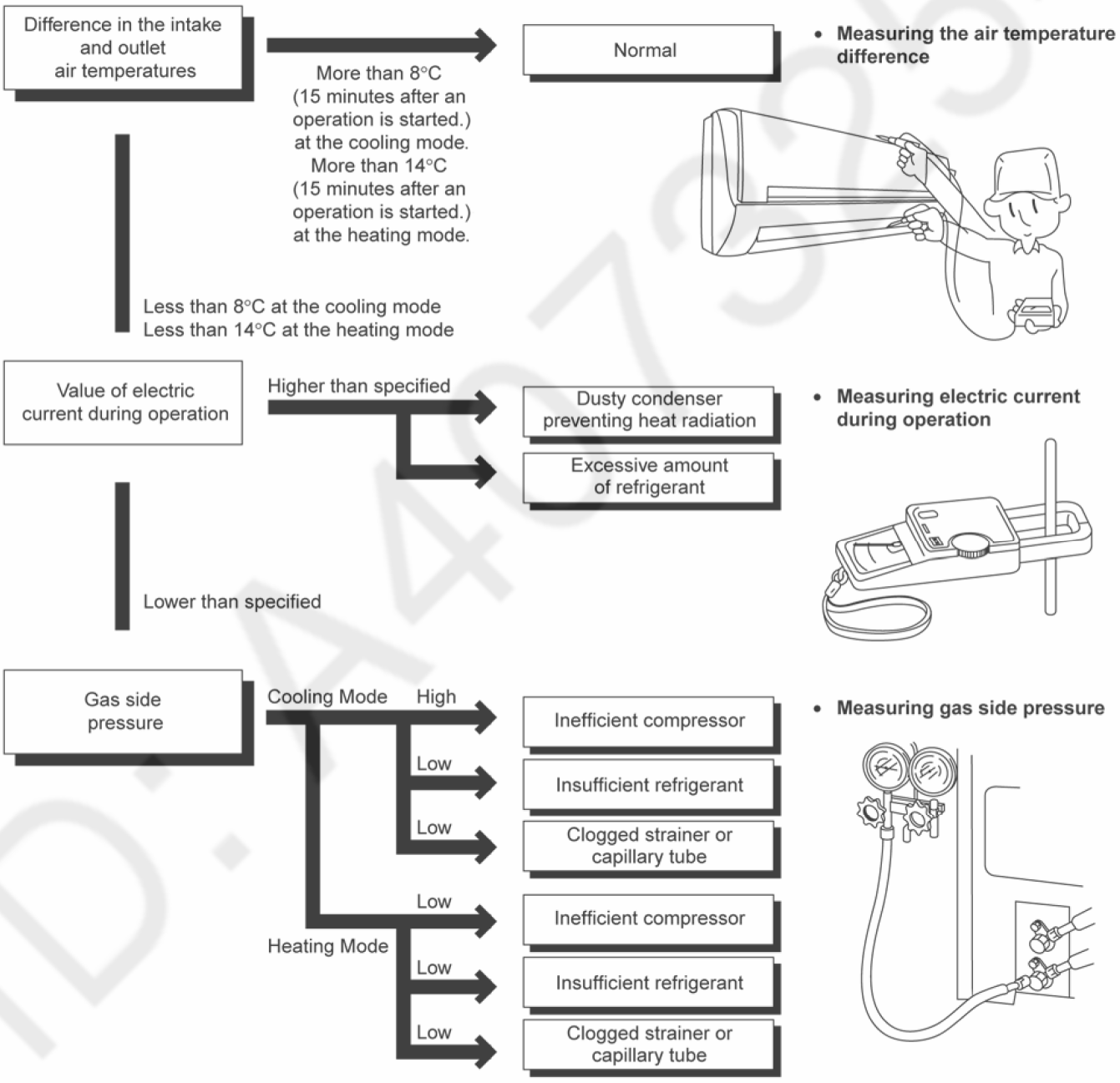
16.1 Refrigeration cycle system

In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor and a fan.
The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table on the right.

Normal Pressure and Outlet Air Temperature (Standard)

	Gas Pressure Mpa (kg/cm^2G)	Outlet air Temperature (°C)
Cooling Mode	0.4 ~ 0.6 (4 ~ 6)	12 ~ 16
Heating Mode	1.5 ~ 2.1 (15 ~ 21)	36 ~ 45

Condition: Indoor fan speed = High
Outdoor temperature 35°C at the cooling mode and 7°C at the heating mode



- **Measuring the air temperature difference**

- **Measuring electric current during operation**

- **Measuring gas side pressure**

16.1.1 Relationship between the condition of the air conditioner and pressure and electric current

Condition of the air conditioner	Cooling Mode			Heating Mode		
	Low Pressure	High Pressure	Electric current during operation	Low Pressure	High Pressure	Electric current during operation
Insufficient refrigerant (gas leakage)	↘	↘	↘	↘	↘	↘
Clogged capillary tube or strainer	↘	↘	↘	↘	↘	↘
Short circuit in the indoor unit	↘	↘	↘	↗	↗	↗
Heat radiation deficiency of the outdoor unit	↗	↗	↗	↘	↘	↘
Inefficient compression	↗	↘	↘	↗	↘	↘

- Carry out the measurement of pressure, electric current, and temperature fifteen minutes after an operation is started.

16.1.2 Diagnosis methods of a malfunction of a compressor and 4-way Valve

Nature of fault	Symptom
Insufficient compressing of a compressor	• Electric current during operation becomes approximately 20% lower than the normal value. • The discharge tube of the compressor becomes abnormally hot (normally 70°C to 90°C). • The different between high pressure and low pressure becomes almost zero.
Locked compressor	• Electric current reaches a high level abnormally, and the value exceeds the limit of an ammeter. In some cases, a breaker turns off. • The compressor has a humming sound.
Insufficient switches of the 4-way valve	• Electric current during operation becomes approximately 80% lower than the normal value. • The temperature different between from the discharge tube to the 4-way valve and from suction tube to the 4-way valve becomes almost zero.

17. Disassembly and Assembly Instructions

WARNING

High Voltage is generated in the electrical parts area by the capacitor. Ensure that the capacitor has discharged sufficiently before proceeding with repair work. Failure to heed this caution may result in electric shocks.

17.1 CS-A9PKD CS-A12PKD

17.1.1 Indoor Electronic Controllers, Cross Flow Fan and Indoor Fan Motor Removal Procedures

17.1.1.1 To remove front grille

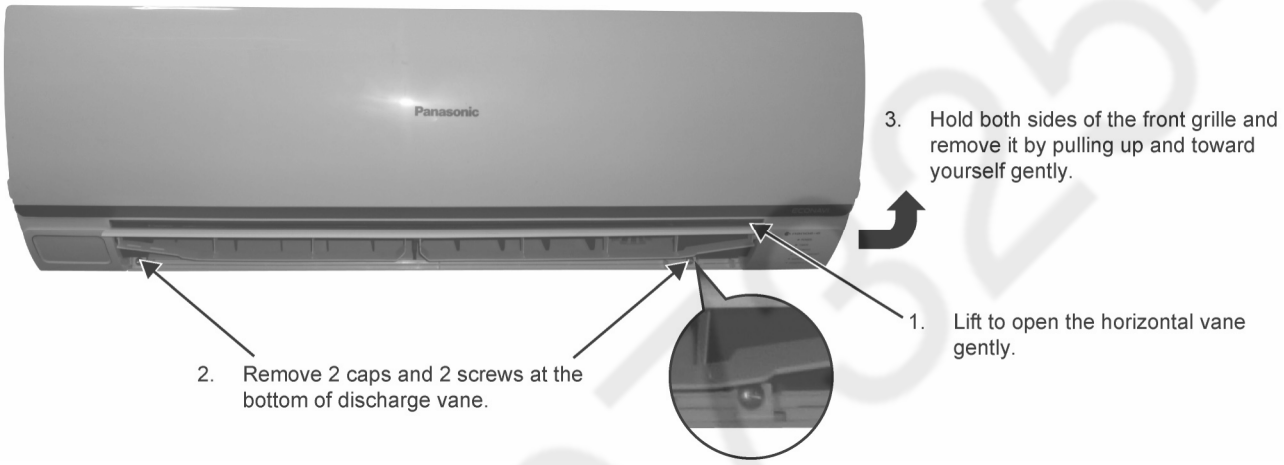


Figure 1

17.1.1.2 To remove electronic controller

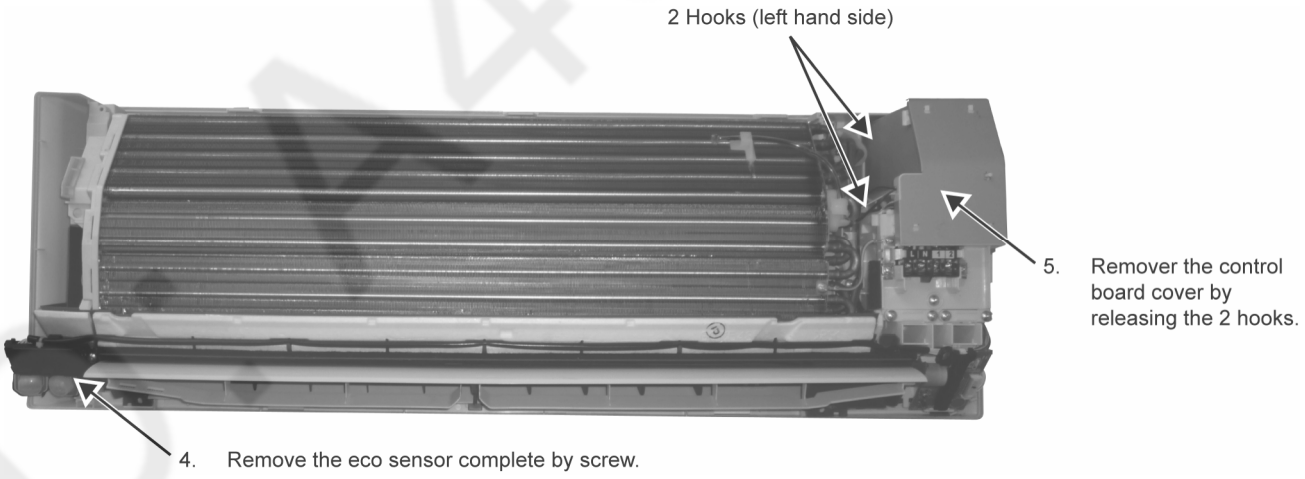


Figure 2

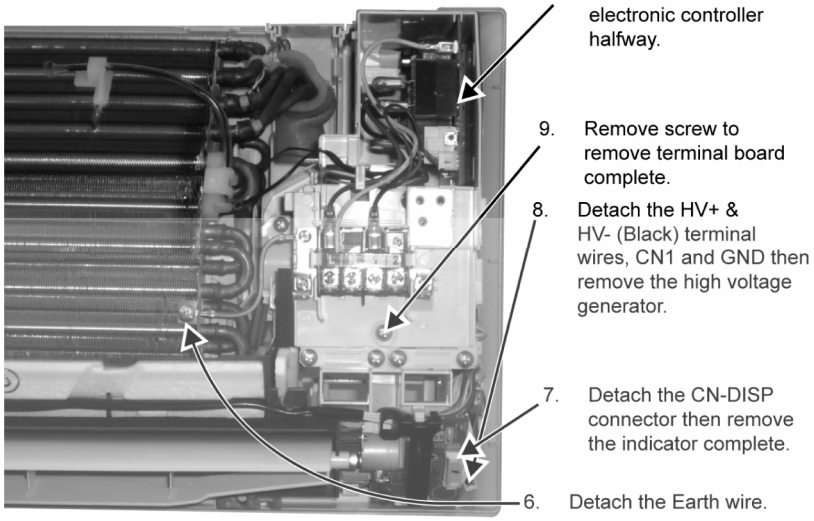


Figure 3

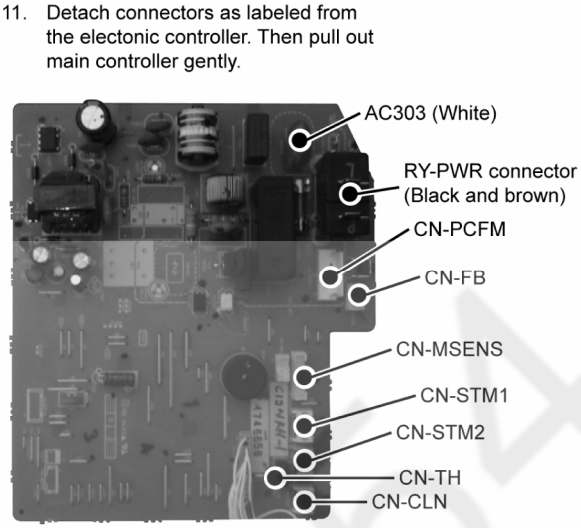


Figure 4

17.1.1.3 To remove discharge grille

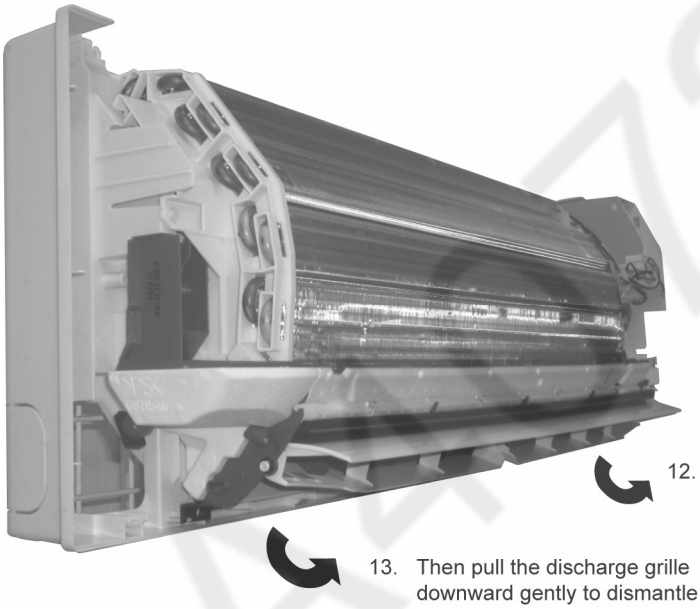
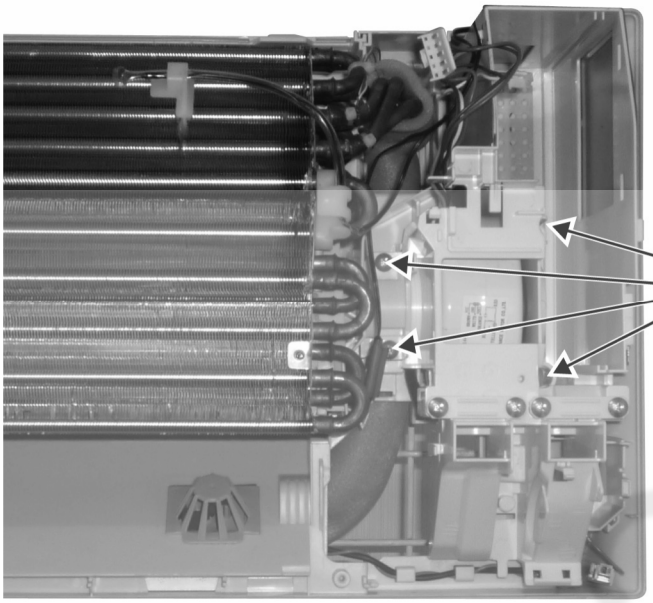


Figure 5

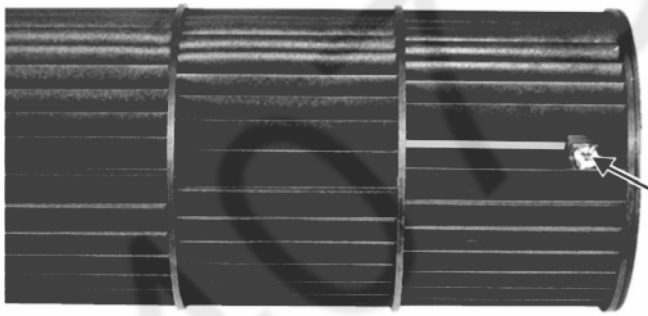
17.1.1.4 To remove control board



14. Remove the 4 screws holding the control board then pull out the control board.

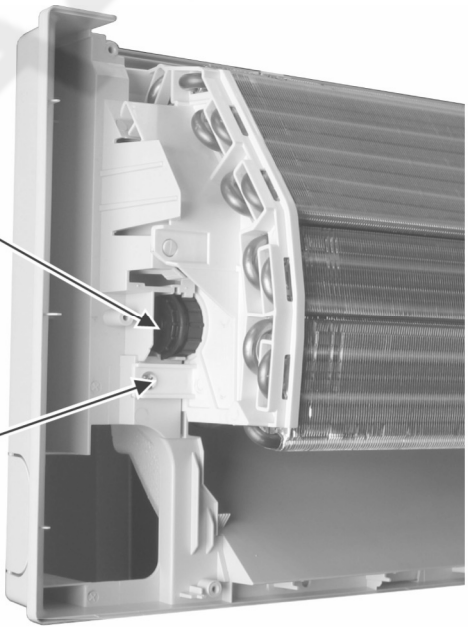
Figure 6

17.1.1.5 To remove cross flow fan and indoor fan motor



15. Remove the screw that holding the cross flow fan and fan motor axis.

Figure 7

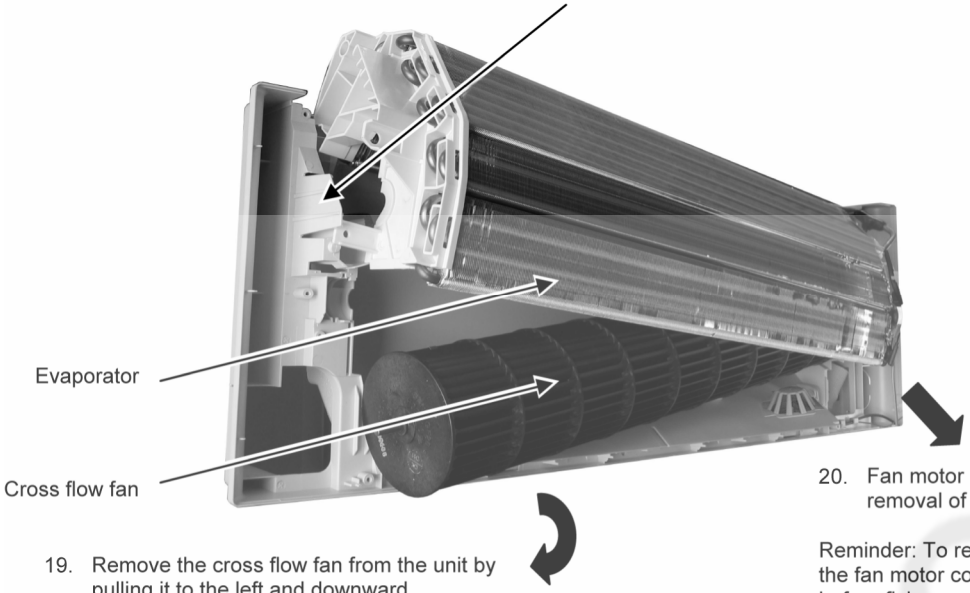


17. Remove the bearing by pulling it out gently

16. Remove the screw from the evaporator.

Figure 8

18. Push the holdfast to the left and lift up the evaporator.

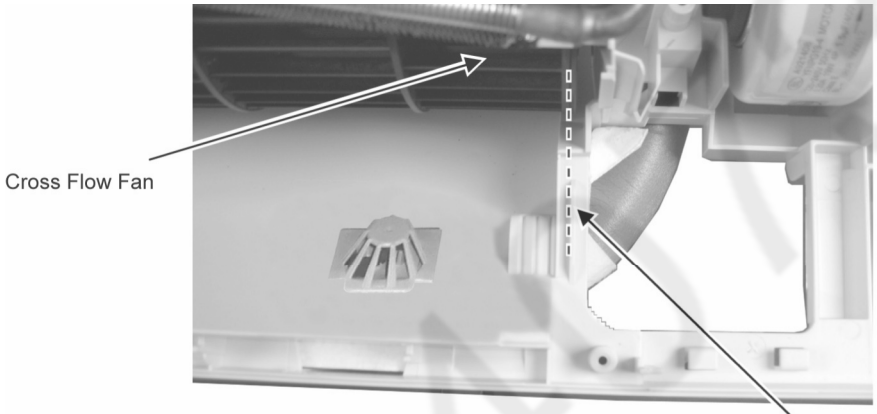


19. Remove the cross flow fan from the unit by pulling it to the left and downward.

20. Fan motor can be removed after the removal of cross flow fan.

Reminder: To reinstall the fan motor, adjust the fan motor connector to 45° towards you before fixing control board.

Figure 9



Reminder: To reinstall the cross flow fan, ensure cross flow fan is in line as shown in figure 10.

Figure 10

WARNING

High Voltage is generated in the electrical parts area by the capacitor. Ensure that the capacitor has discharged sufficiently before proceeding with repair work. Failure to heed this caution may result in electric shocks.

17.2 CS-A18PKD CS-A24PKD CS-A28PKD

17.2.1 Indoor Electronic Controllers, Cross Flow Fan and Indoor Fan Motor Removal Procedures

17.2.1.1 To remove front grille

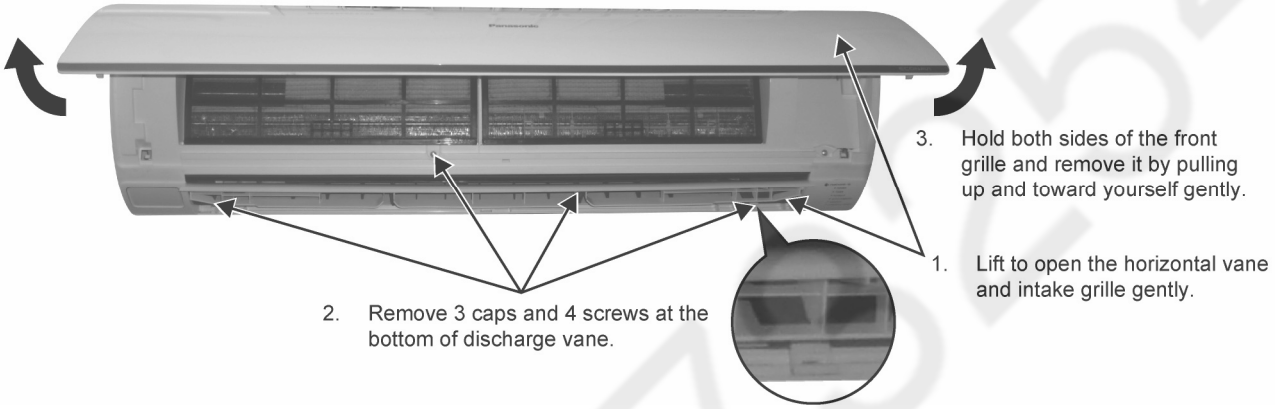


Figure 11

17.2.1.2 To remove horizontal vane

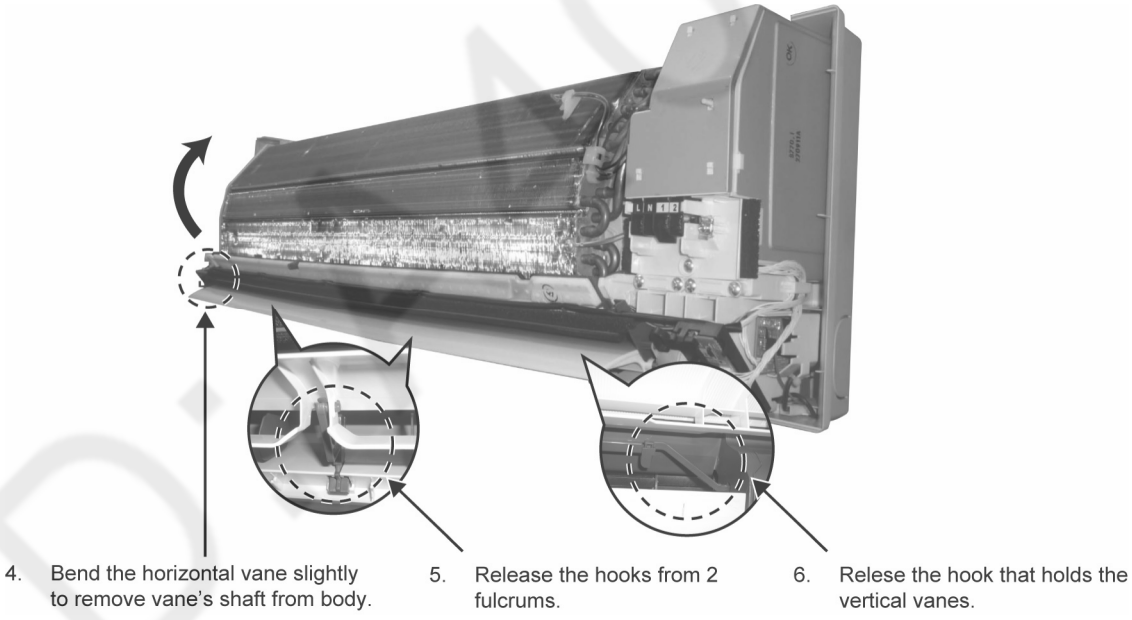


Figure 12

17.2.1.3 To remove electronic controller

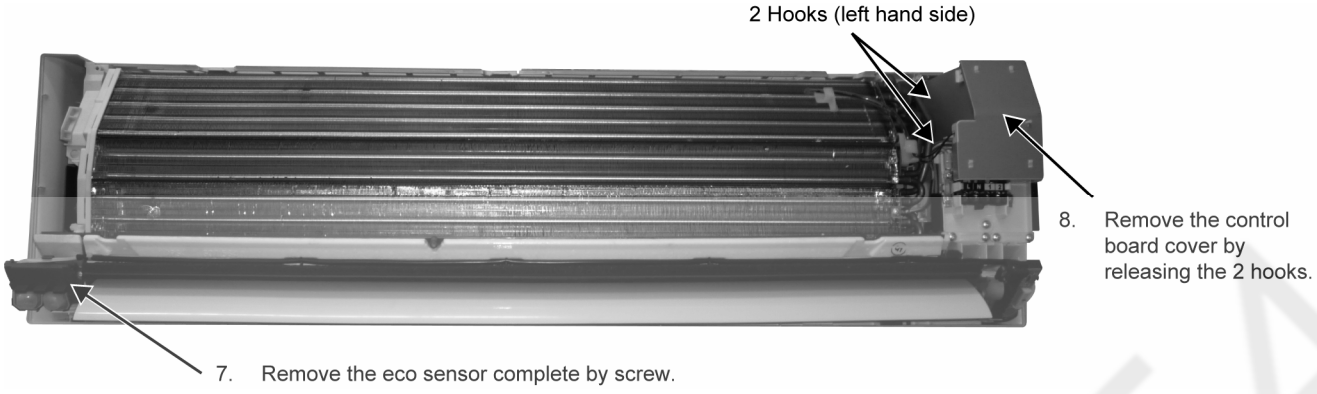


Figure 13

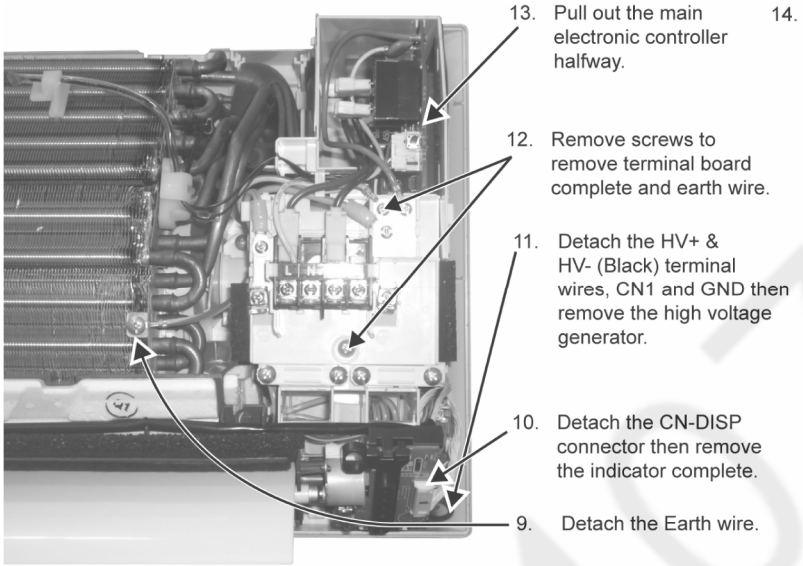


Figure 14

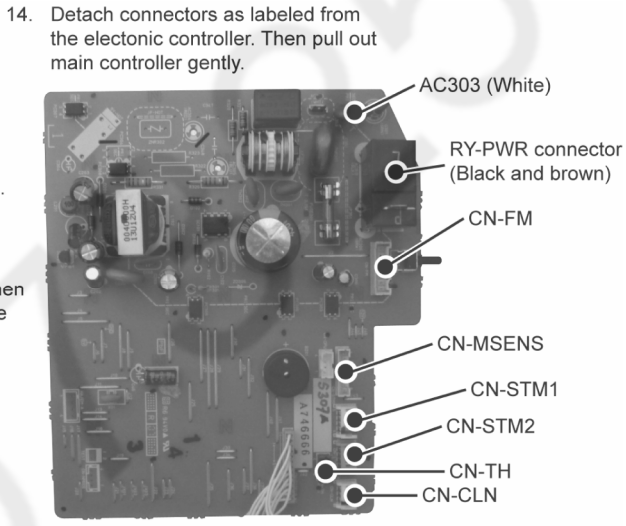


Figure 15

17.2.1.4 To remove discharge grille

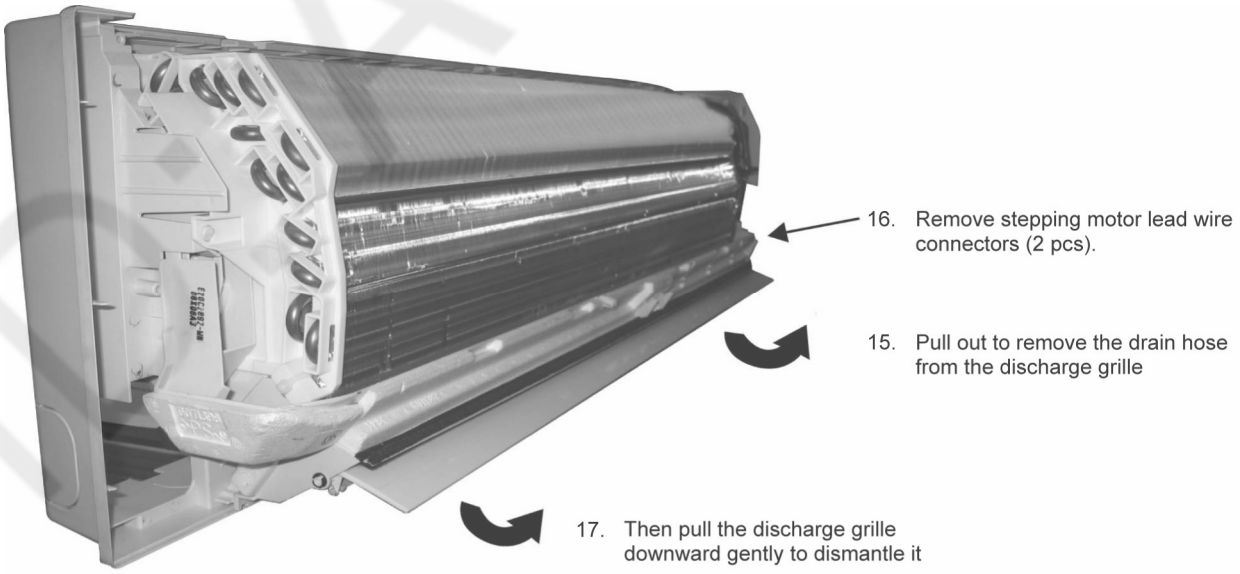
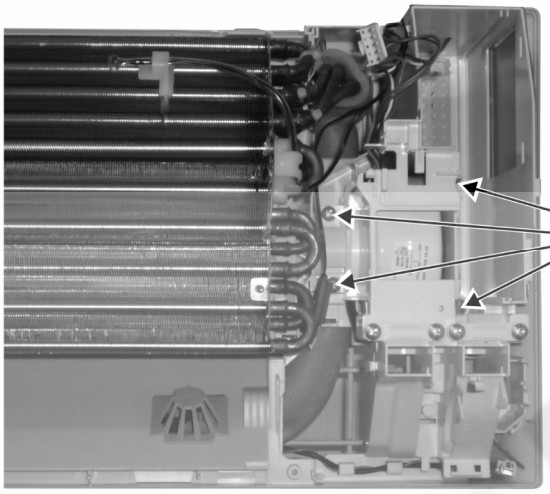


Figure 16

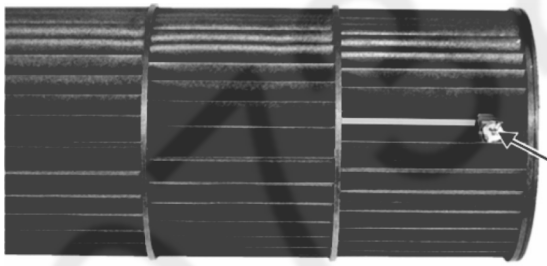
17.2.1.5 To remove control board



18. Remove the 4 screws holding the control board then pull out the control board.

Figure 17

17.2.1.6 To remove cross flow fan and indoor fan motor



19. Remove the screw that holding the cross flow fan and fan motor axis.

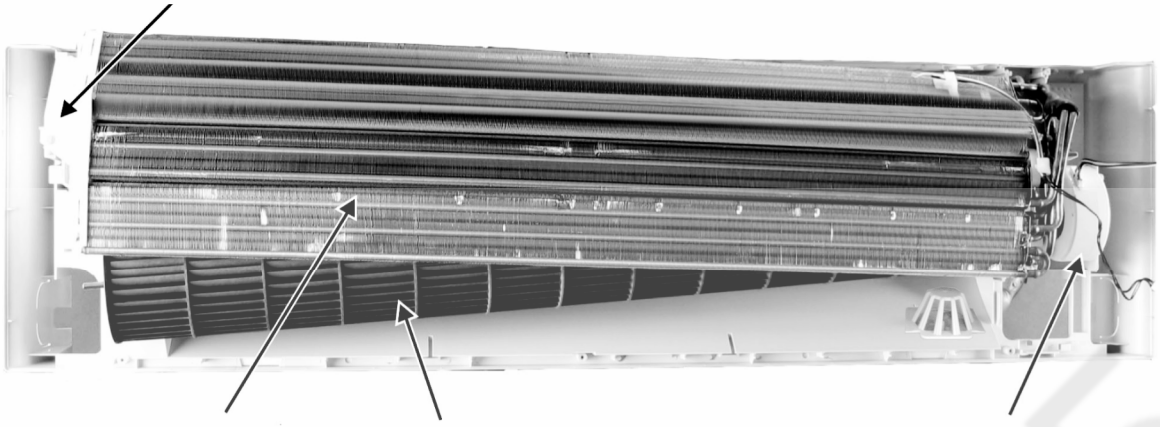
Figure 18

21. Remove the bearing by pulling it out gently

20. Remove the screw from the evaporator.

Figure 19

22. Push the holdfast to the left and lift up the evaporator.

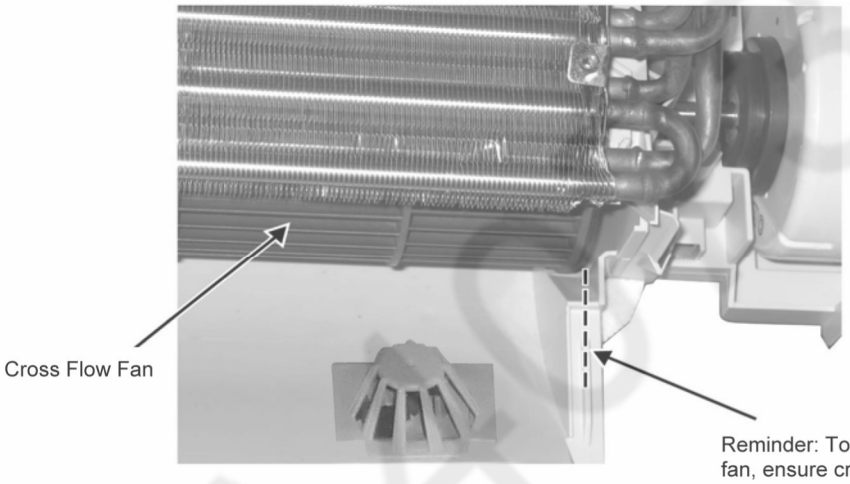


23. Remove the cross flow fan from the unit by pulling it to the left and downward.

24. Fan motor can be removed after the removal of cross flow fan.

Reminder: To reinstall the fan motor, adjust the fan motor connector to 45° towards you before fixing control board.

Figure 20



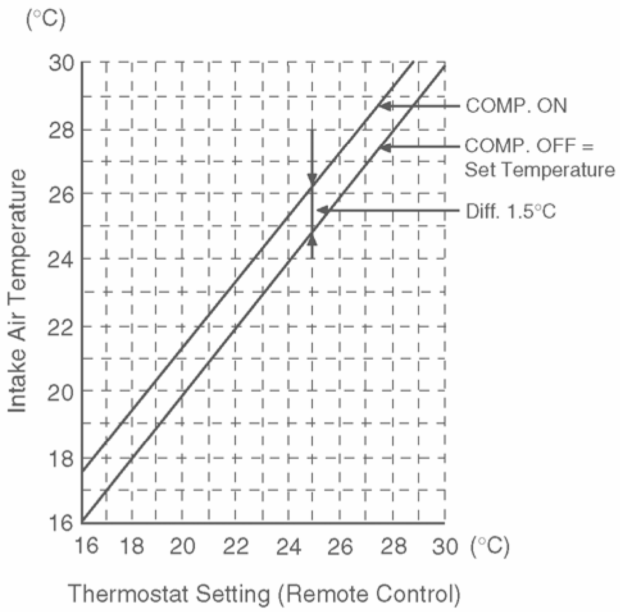
Reminder: To reinstall the cross flow fan, ensure cross flow fan is in line as shown in figure 21.

Figure 21

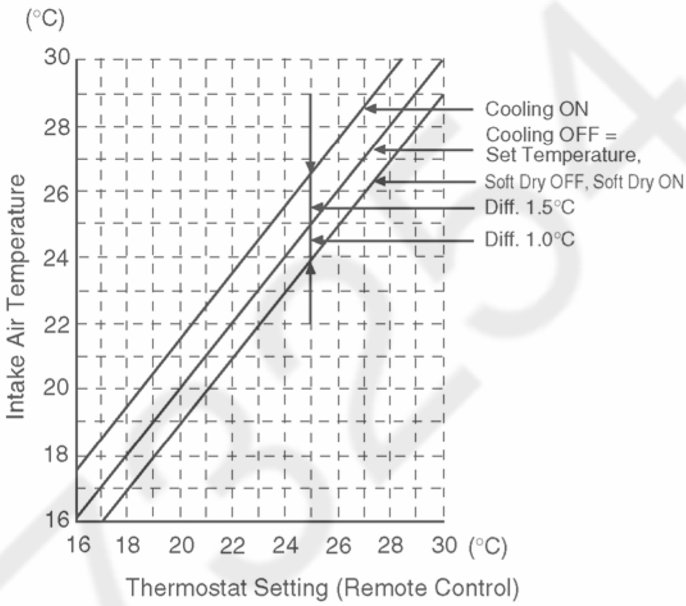
18. Technical Data

18.1 Thermostat Characteristics

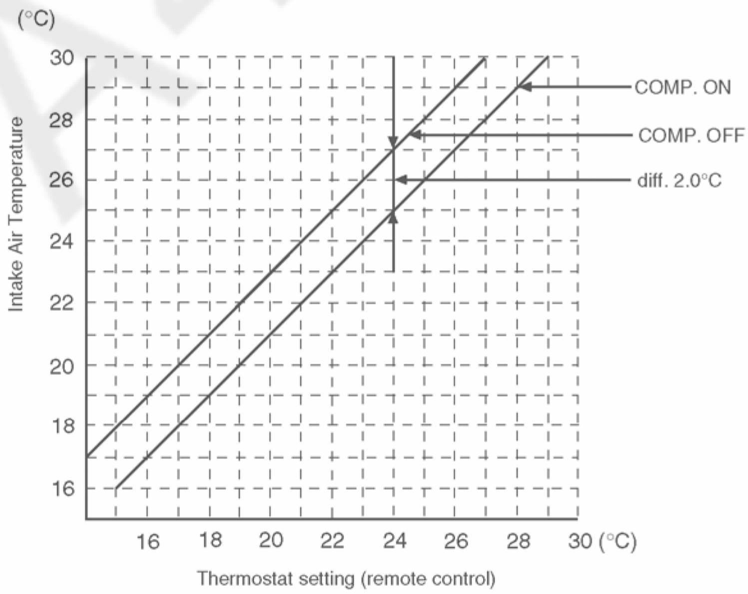
- **Cooling**



- **Soft Dry**



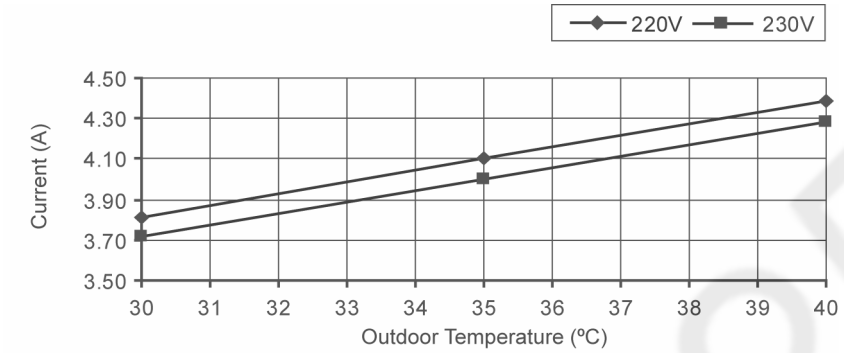
- **Heating**

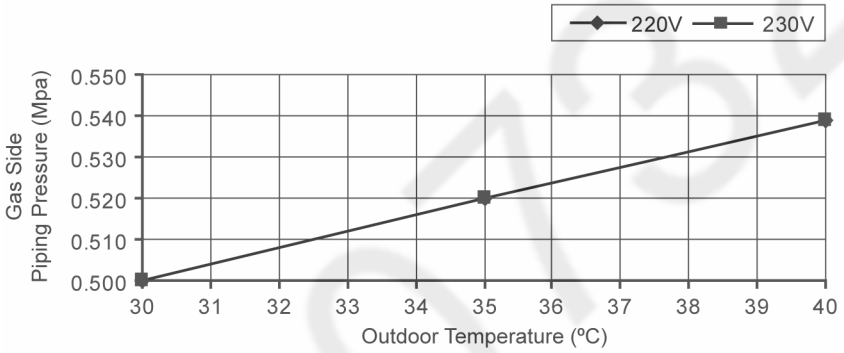


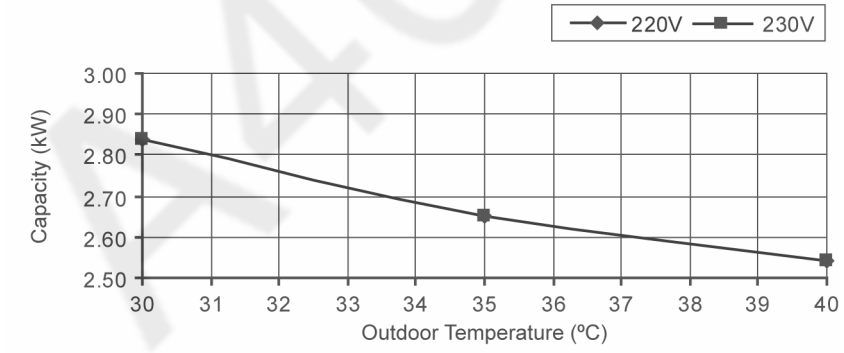
18.2 Operation Characteristics

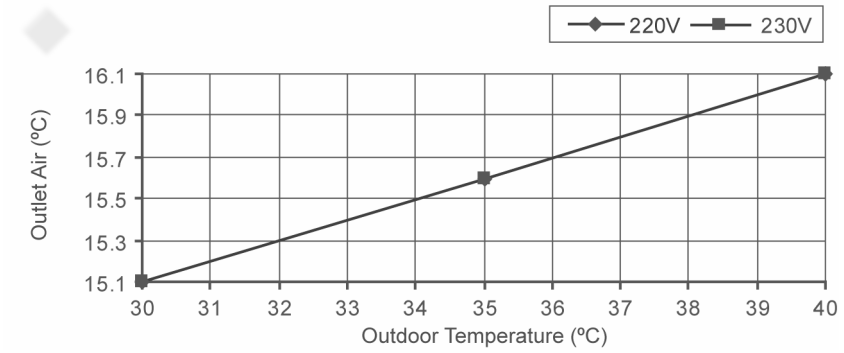
18.2.1 CS-A9PKD CU-A9PKD

- Cooling Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Piping length: 7.5m

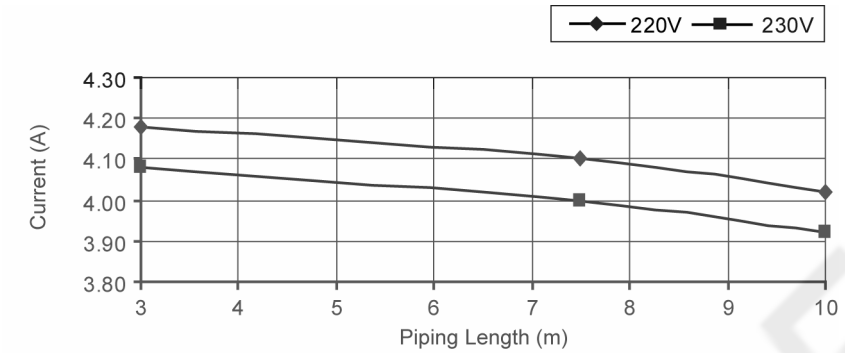


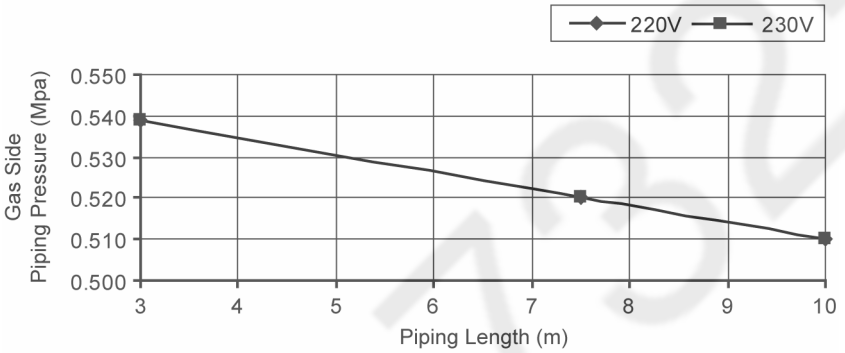


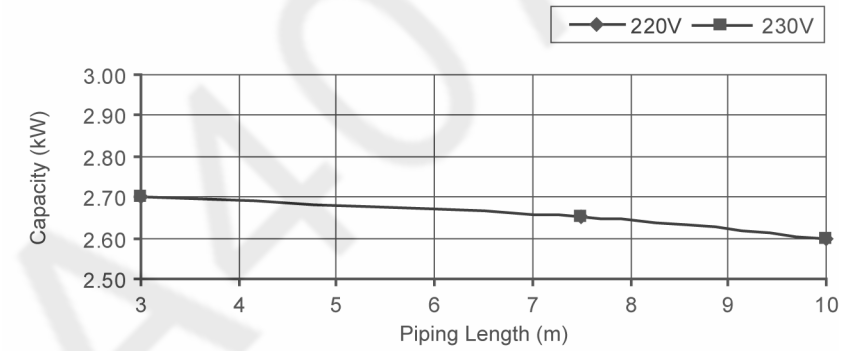


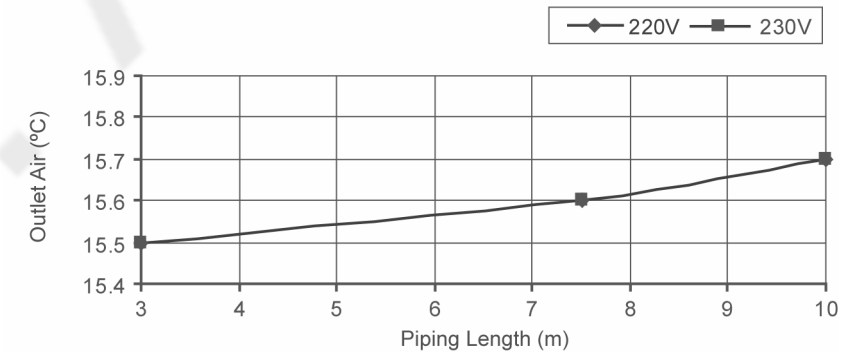


- Piping Length Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Outdoor temperature: 35/24°C

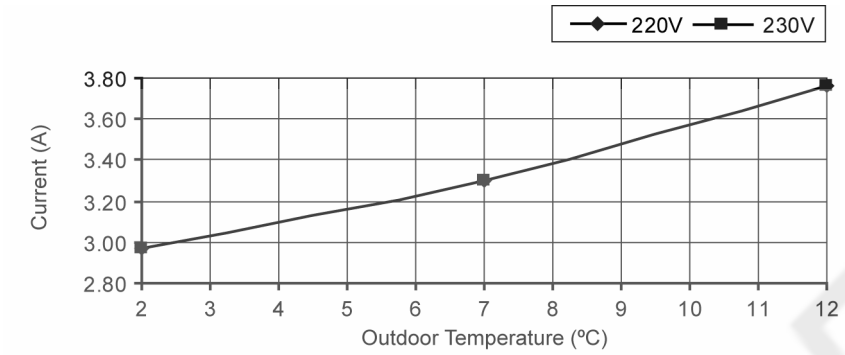


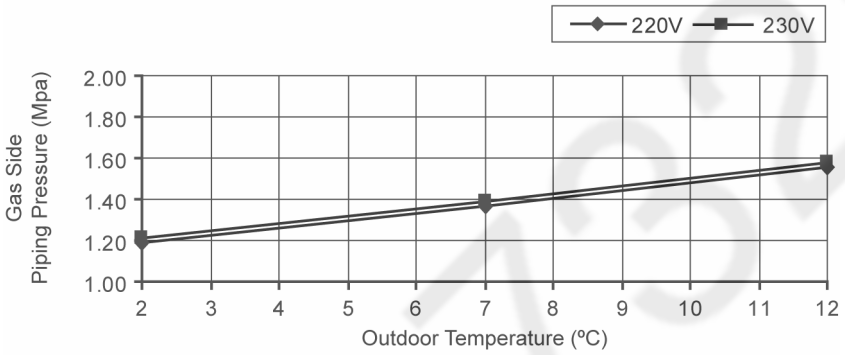


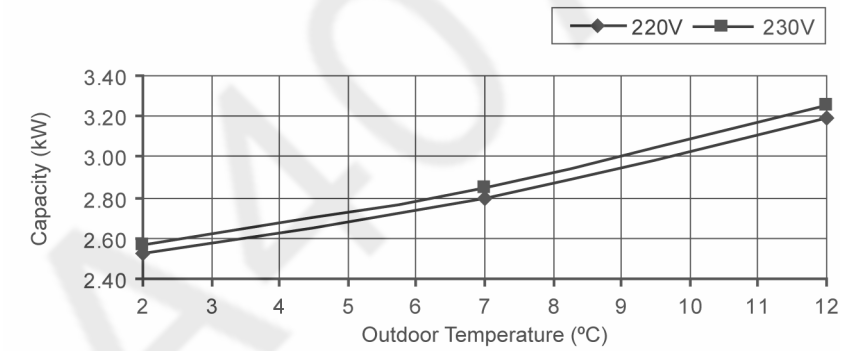


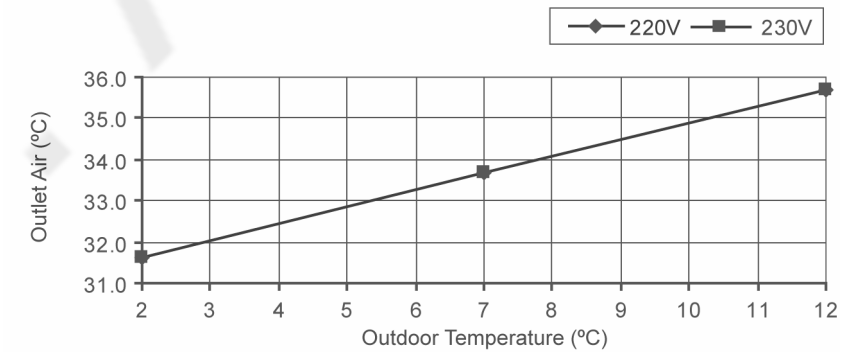


- Heating Characteristic
  - Room temperature: 20°C
  - Operation condition: High fan speed
  - Piping length: 7.5m

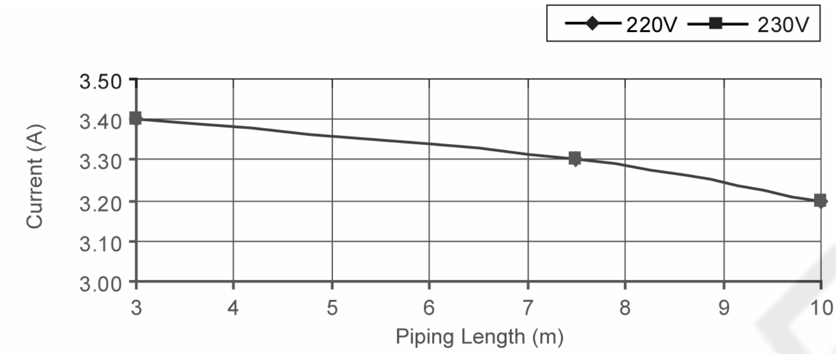


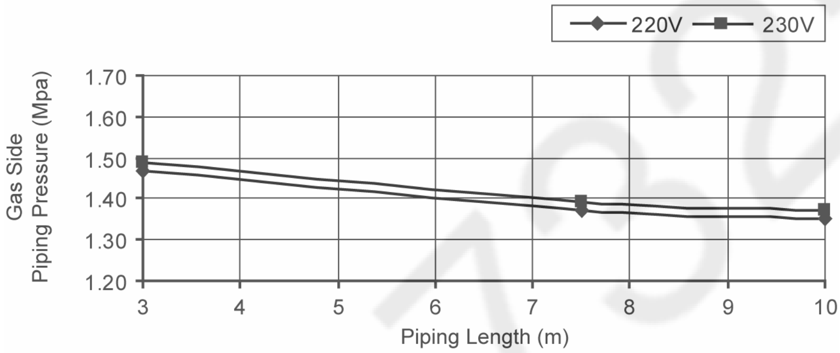


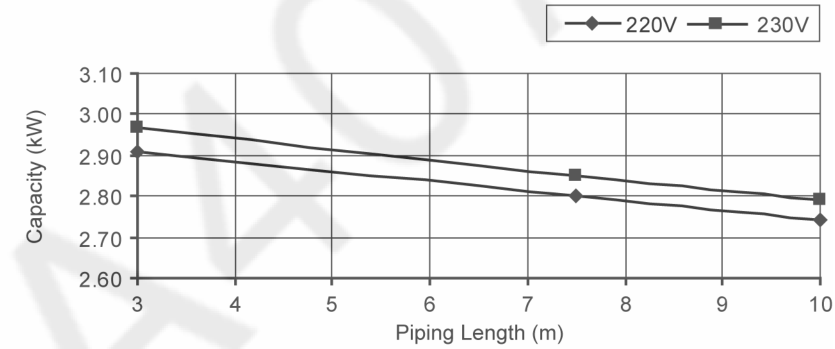


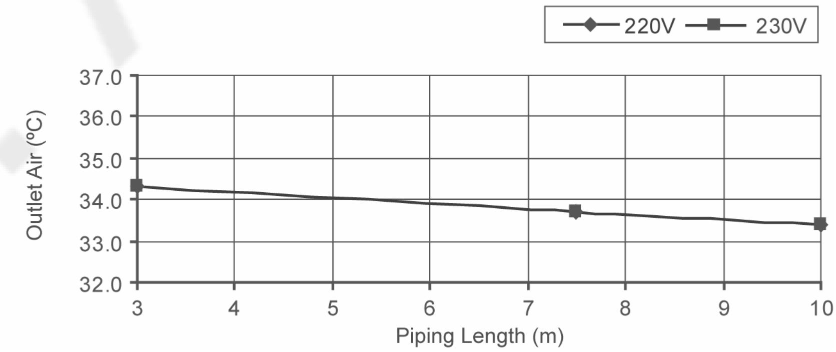


- Piping Length Characteristic
  - Room temperature: 20°C
  - Operation condition: High fan speed
  - Outdoor temperature: 7/6°C



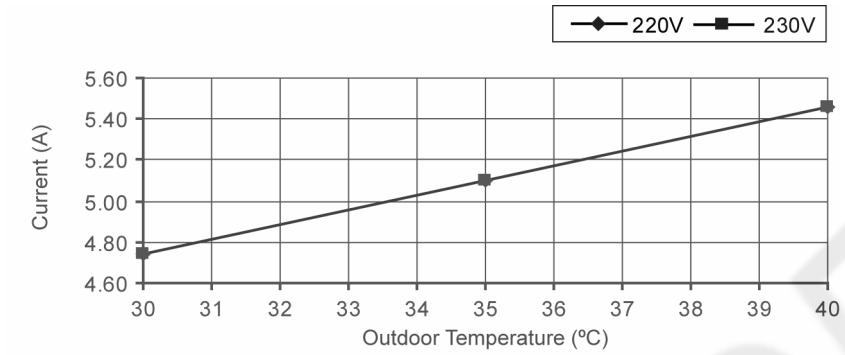


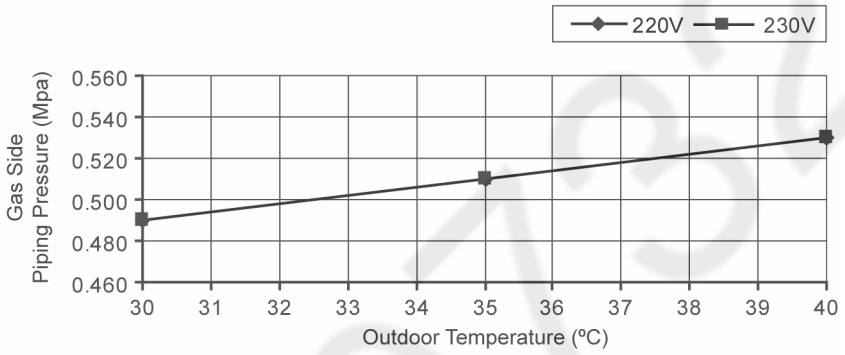


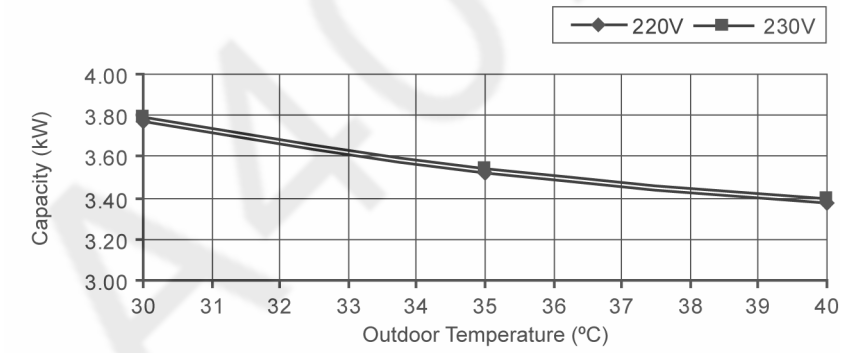


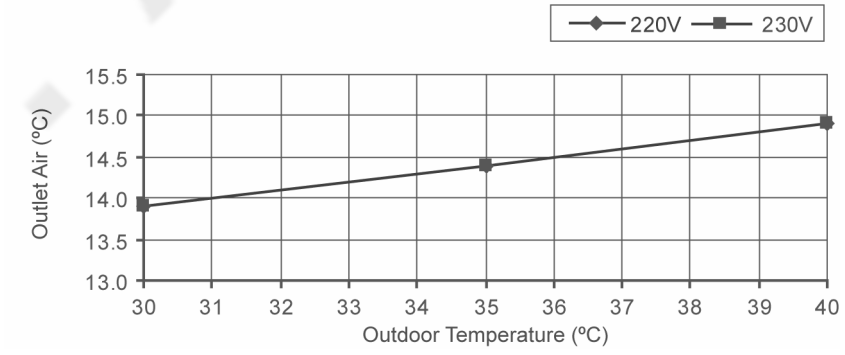
18.2.2 CS-A12PKD CU-A12PKD

- Cooling Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Piping length: 7.5m

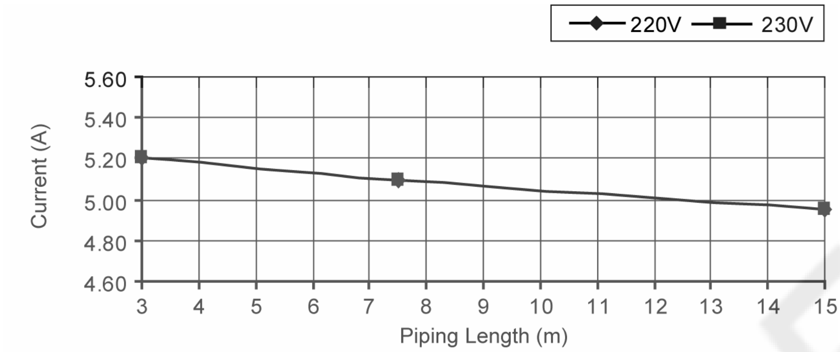


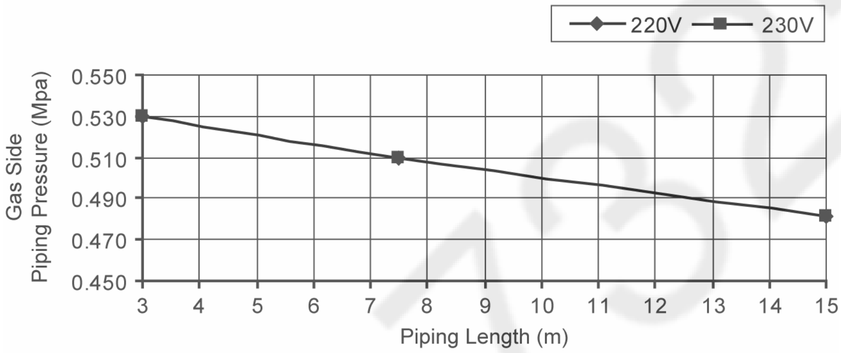


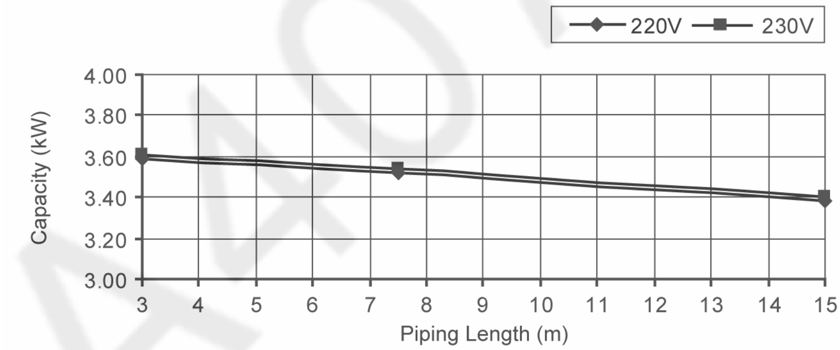


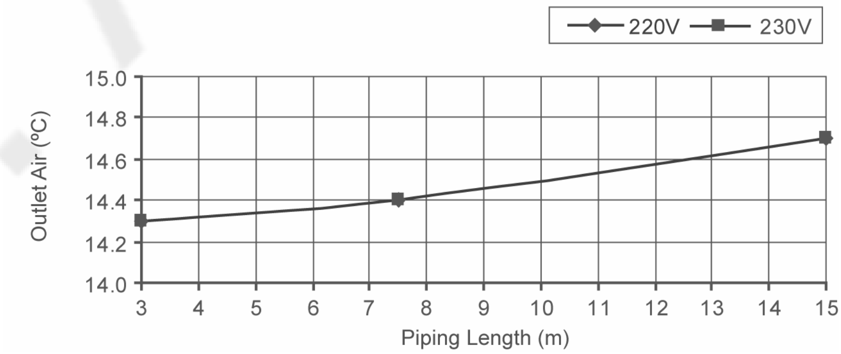


- Piping Length Characteristic
    - Room temperature: 27°C (DBT), 19°C (WBT)
    - Operation condition: High fan speed
    - Outdoor temperature: 35/24°C

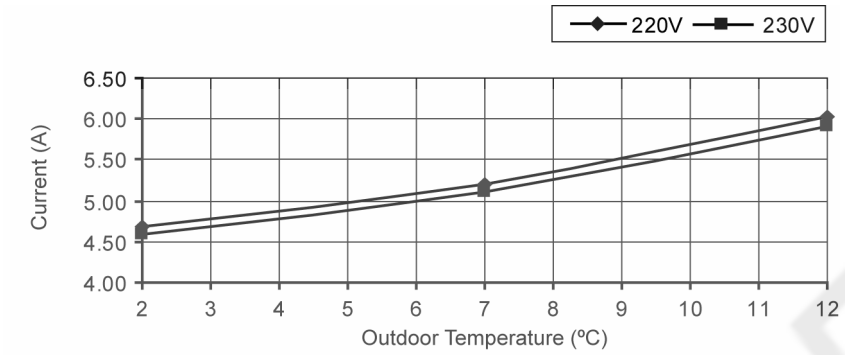


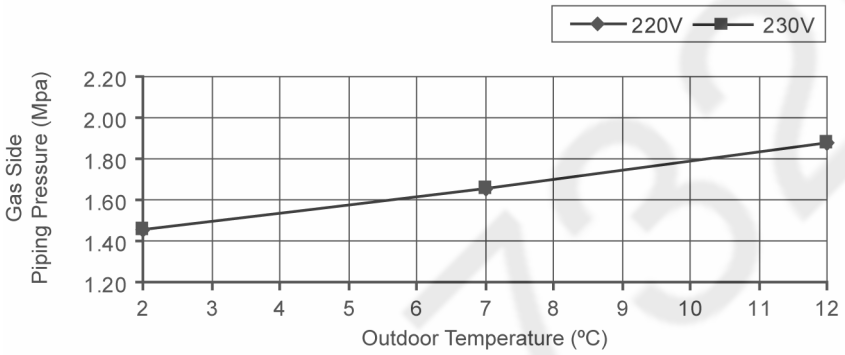


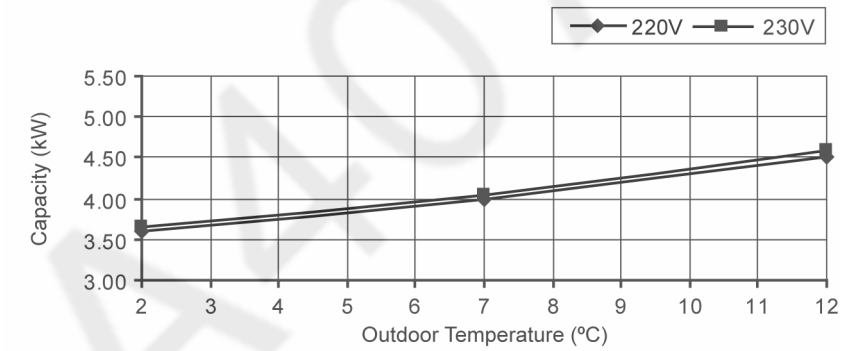


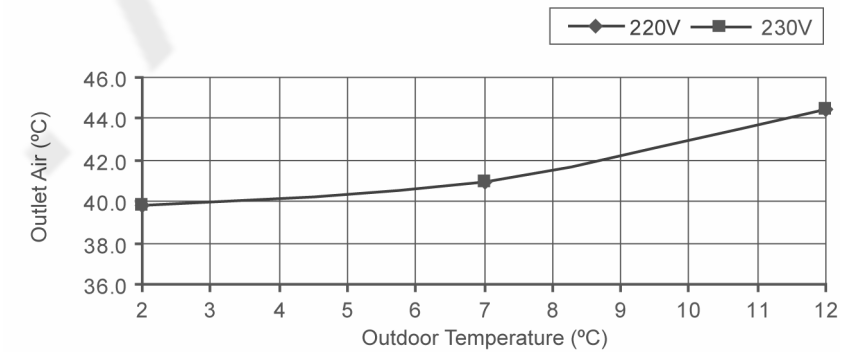


- Heating Characteristic
  - Room temperature: 20°C
  - Operation condition: High fan speed
  - Piping length: 7.5m

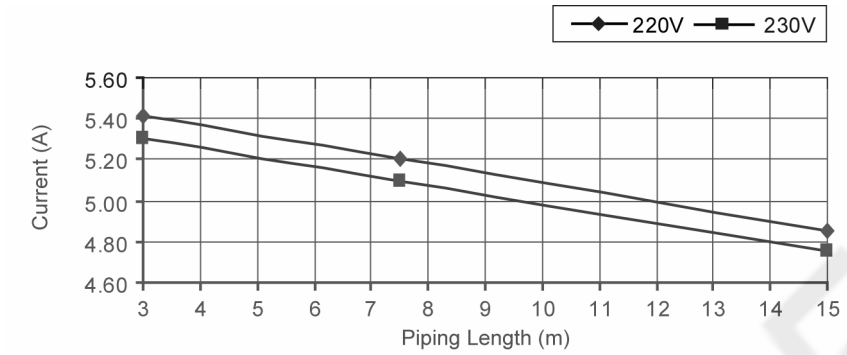


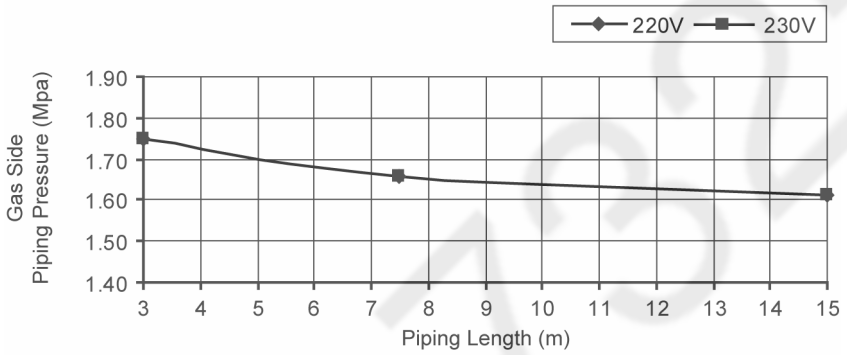


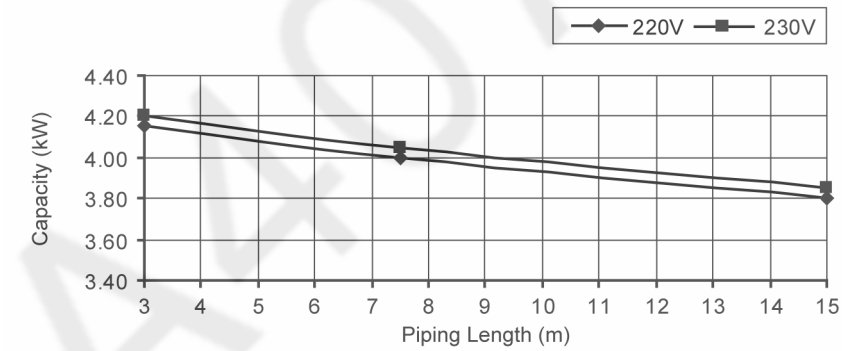


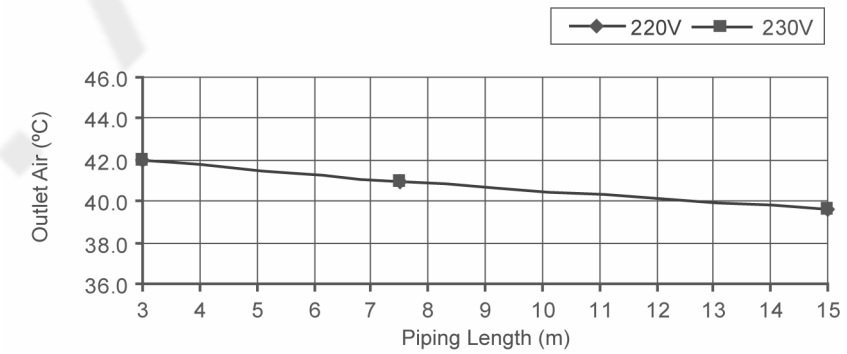


- Piping Length Characteristic
  - Room temperature: 20°C
  - Operation condition: High fan speed
  - Outdoor temperature: 7/6°C



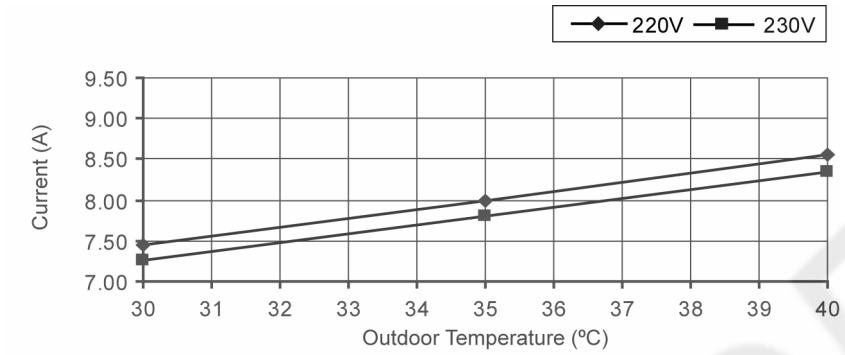


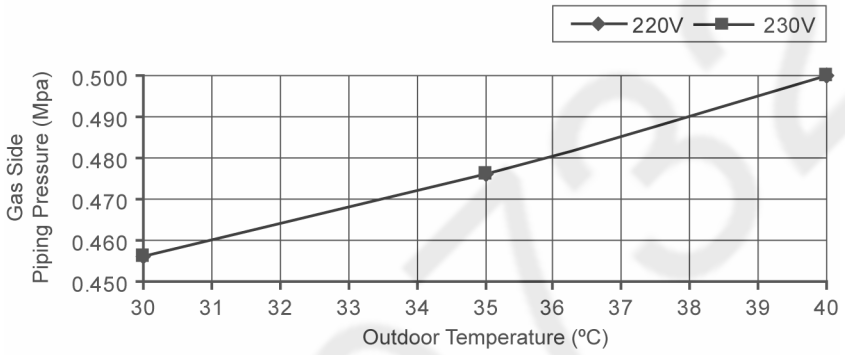


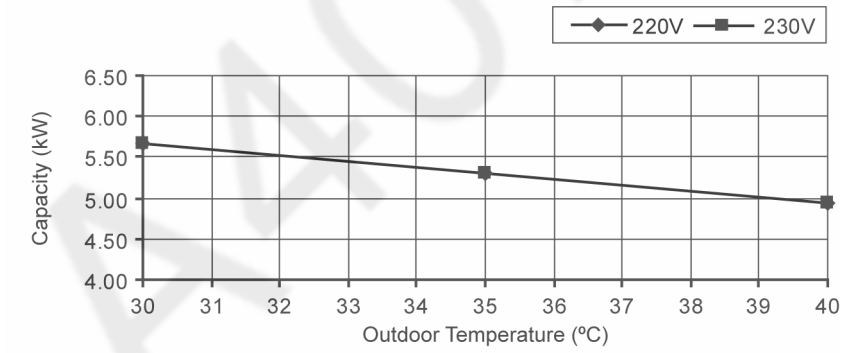


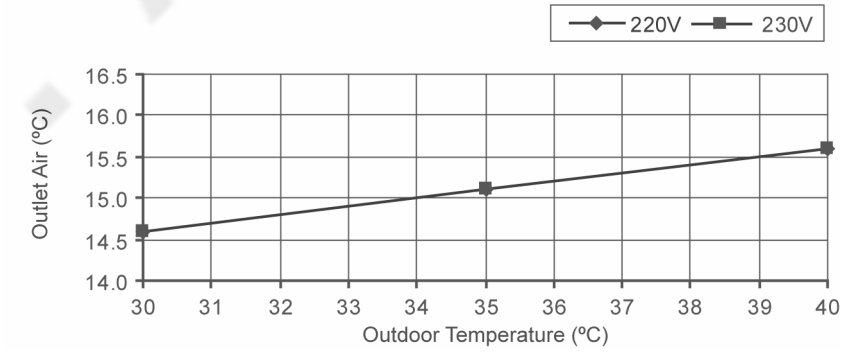
18.2.3 CS-A18PKD CU-A18PKD

- Cooling Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Piping length: 5.0m

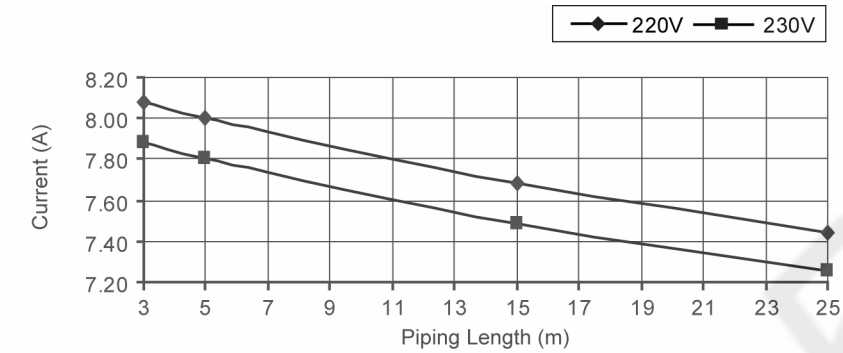


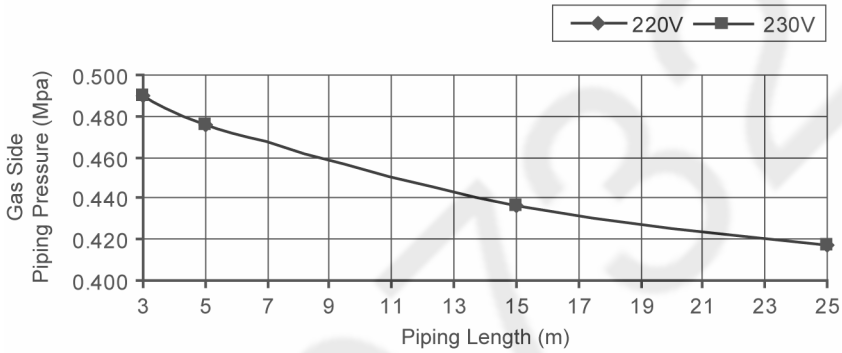


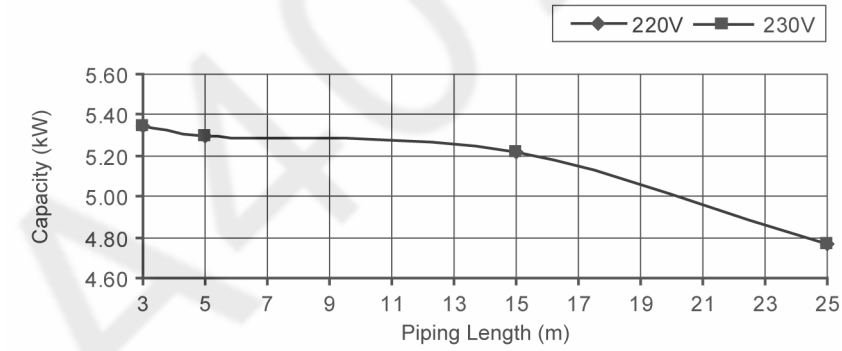


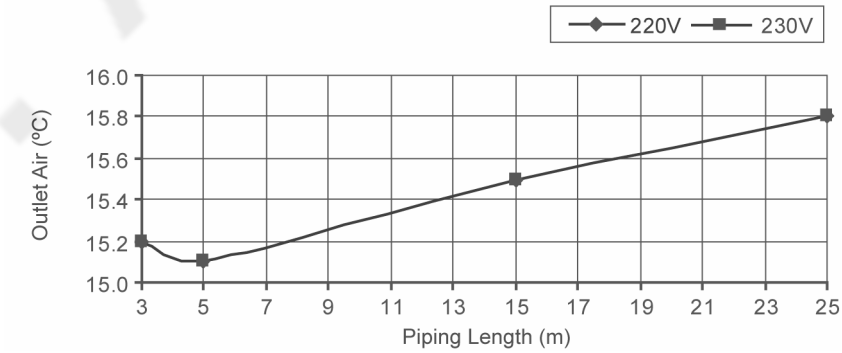


- Piping Length Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Outdoor temperature: 35°C (DBT), 24°C (WBT)
  - Piping length: 5.0m

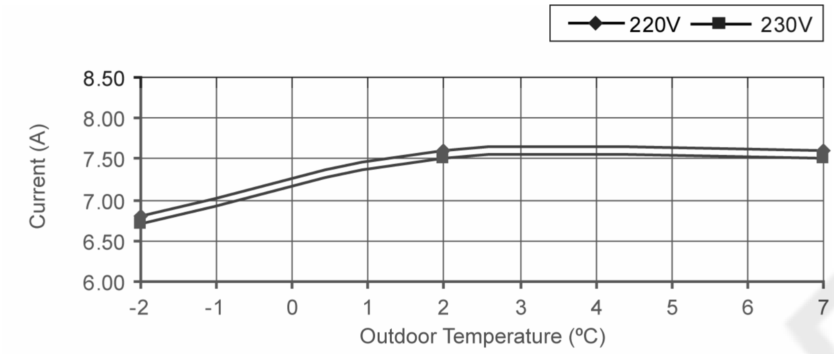


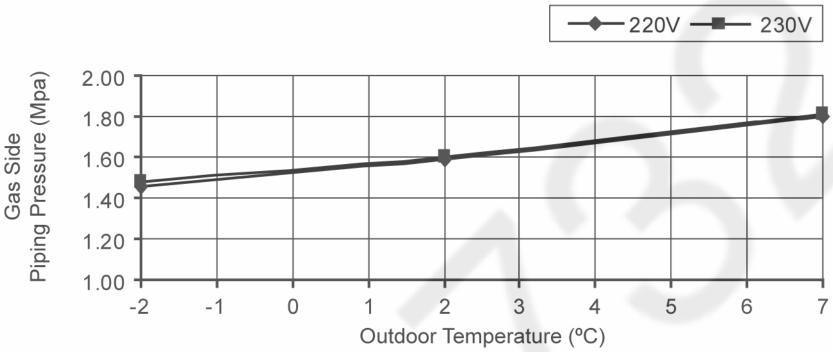


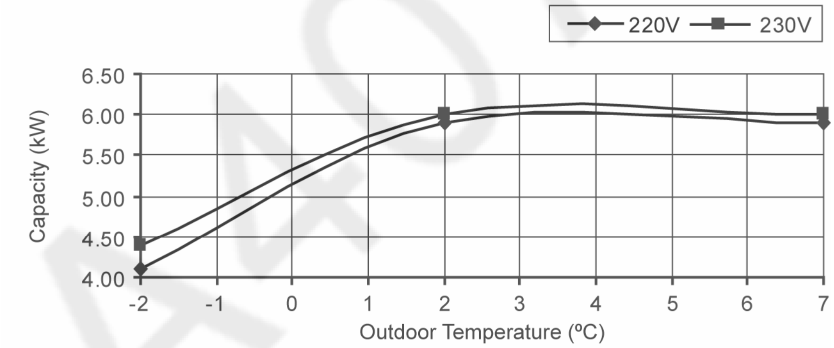


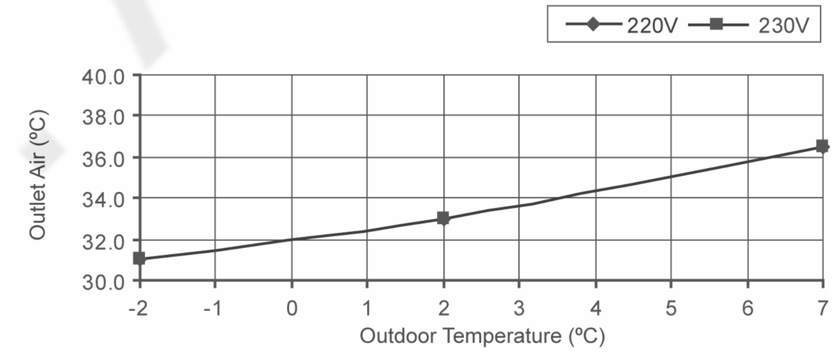


- Heating Characteristic
    - Room temperature: 20°C (DBT)
    - Operation condition: High fan speed
    - Piping length: 5.0m

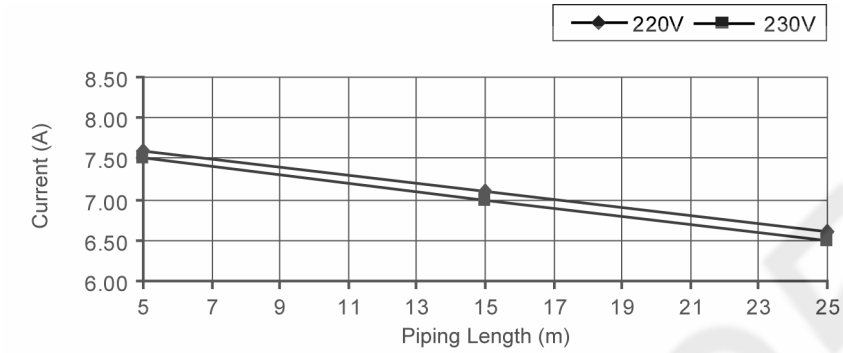


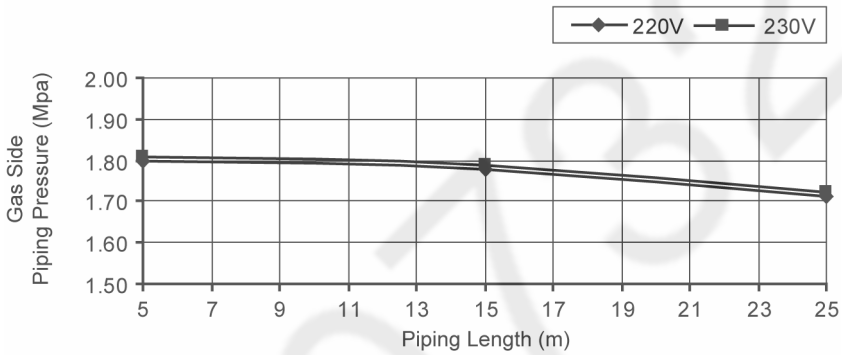


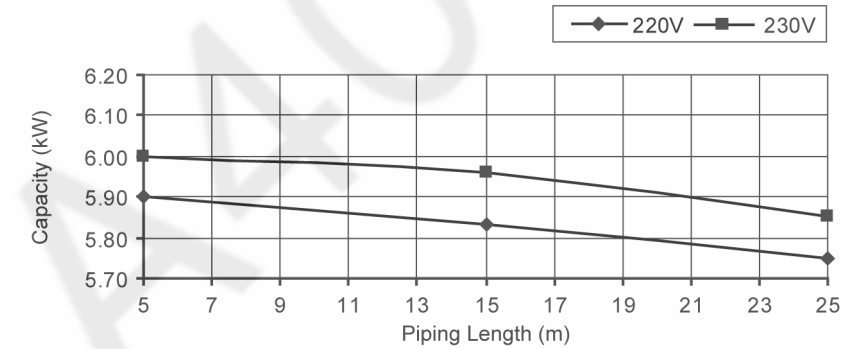


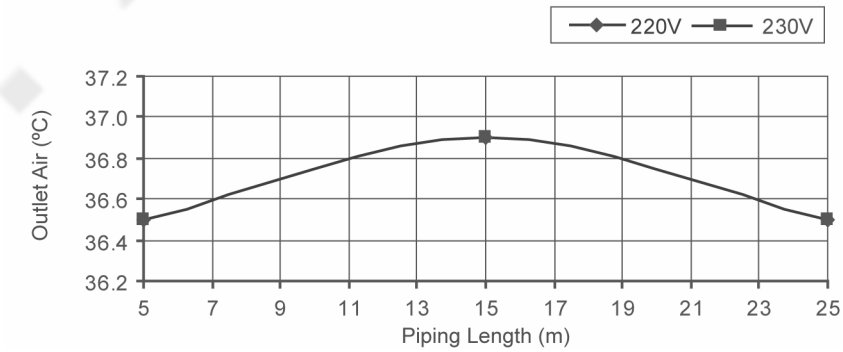


- Piping Length Characteristic
  - Room temperature: 20°C (DBT)
  - Operation condition: High fan speed
  - Outdoor temperature: 7°C (DBT), 6°C (WBT)
  - Piping length: 5.0m



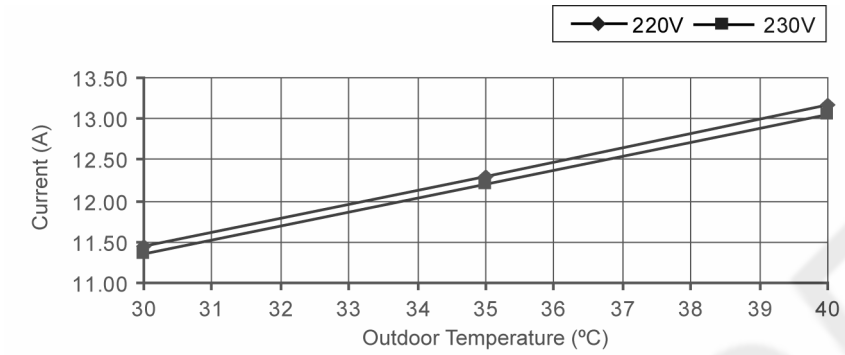


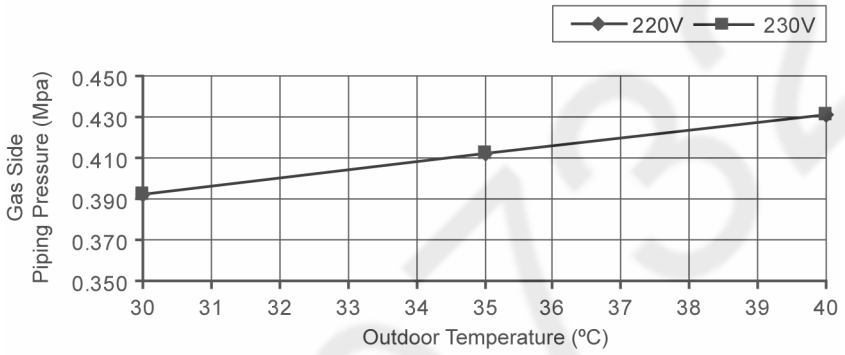


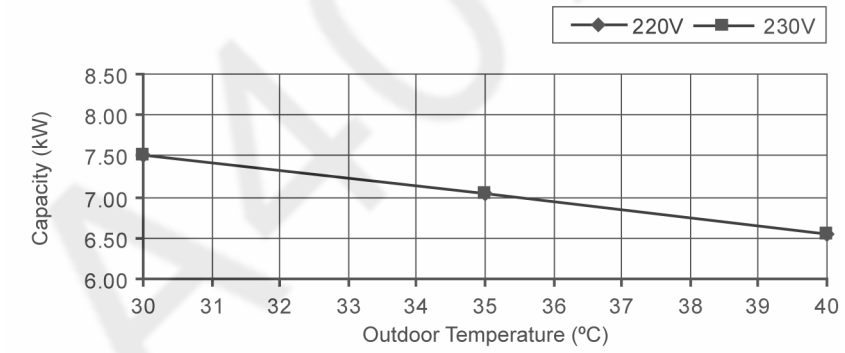


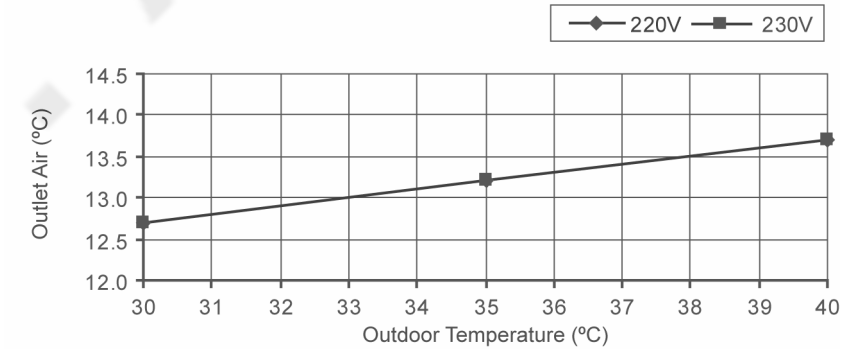
18.2.4 CS-A24PKD CU-A24PKD

- Cooling Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Piping length: 5.0m

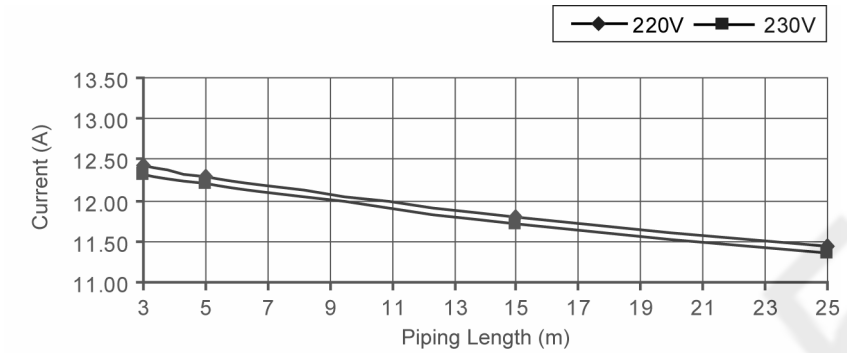


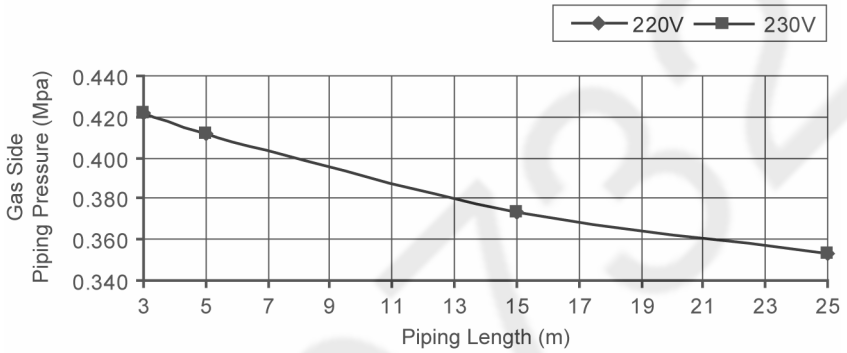


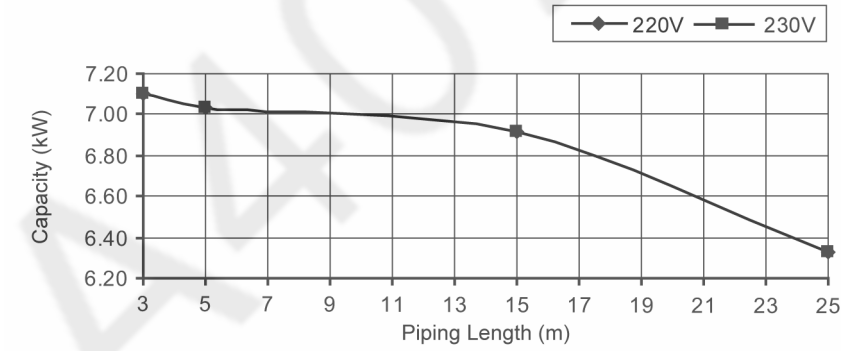


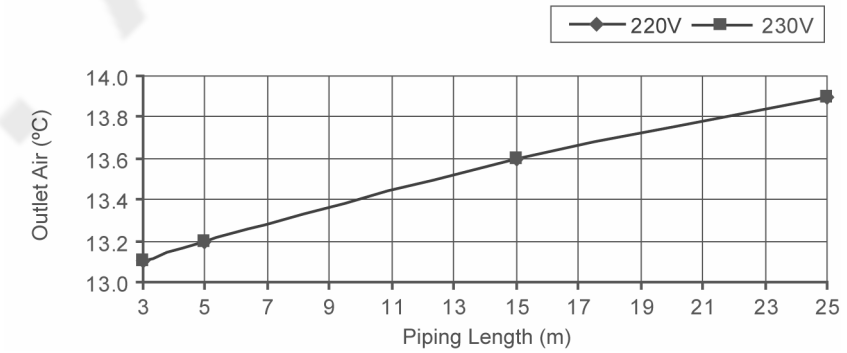


- Piping Length Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Outdoor temperature: 35°C (DBT), 24°C (WBT)
  - Piping length: 5.0m

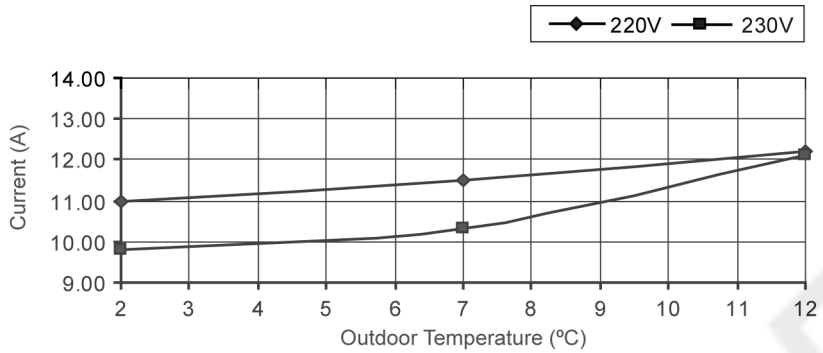


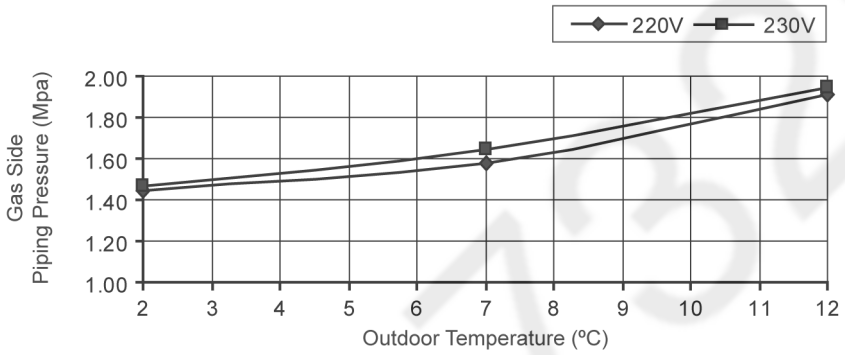


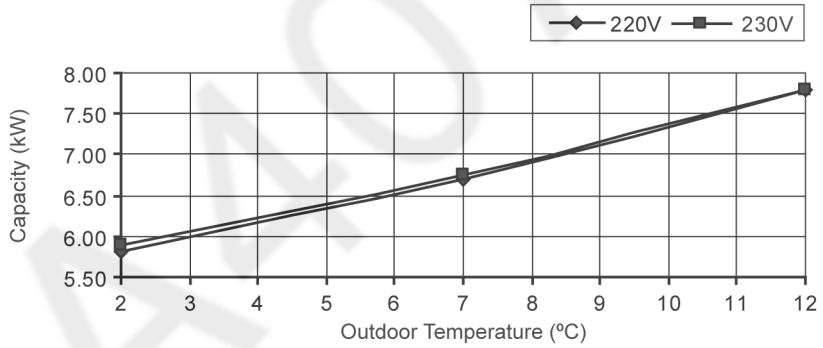


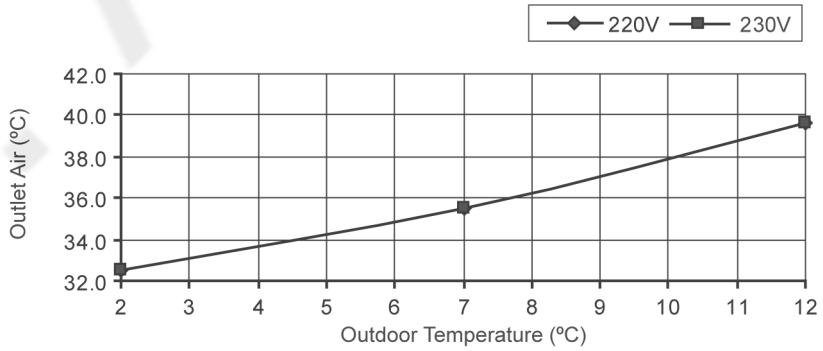


- Heating Characteristic
  - Room temperature: 20°C (DBT)
  - Operation condition: High fan speed
  - Piping length: 5.0m

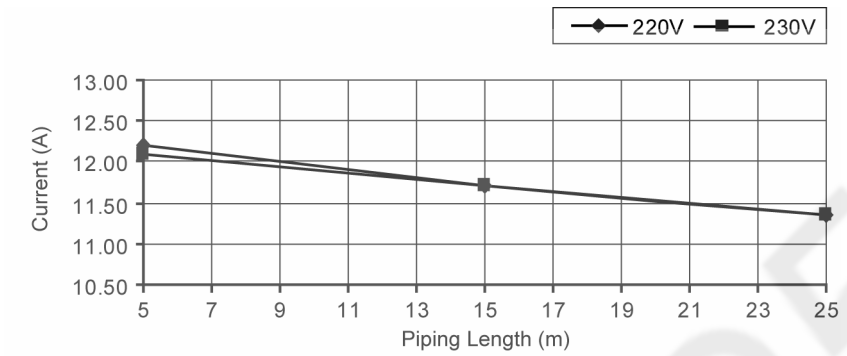


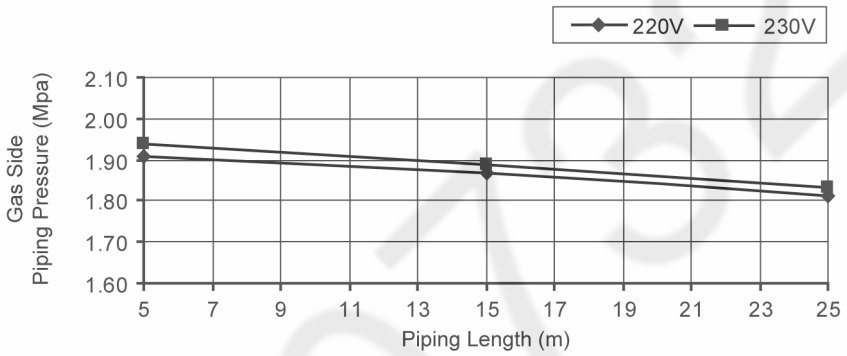


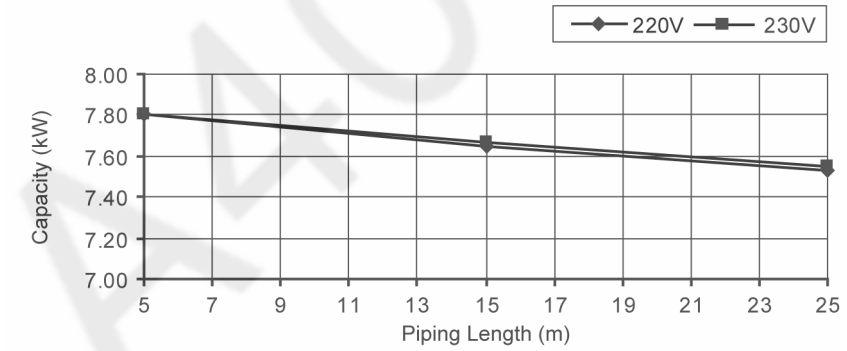


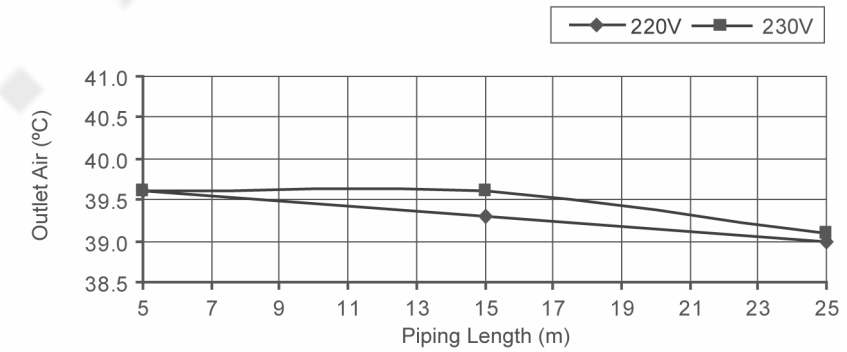


- Piping Length Characteristic
  - Room temperature: 20°C (DBT)
  - Operation condition: High fan speed
  - Outdoor temperature: 7°C (DBT), 6°C (WBT)
  - Piping length: 5.0m



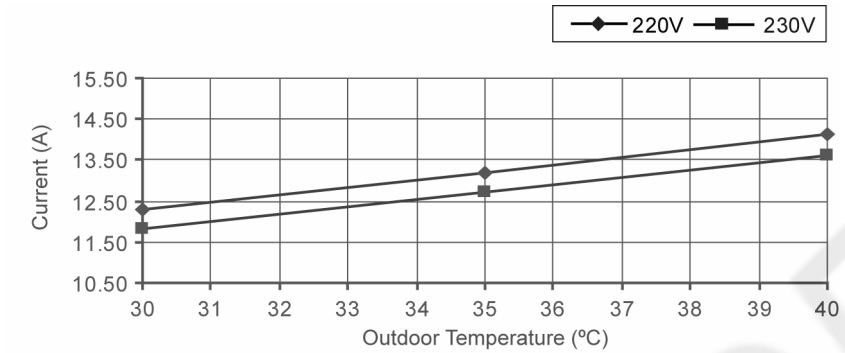


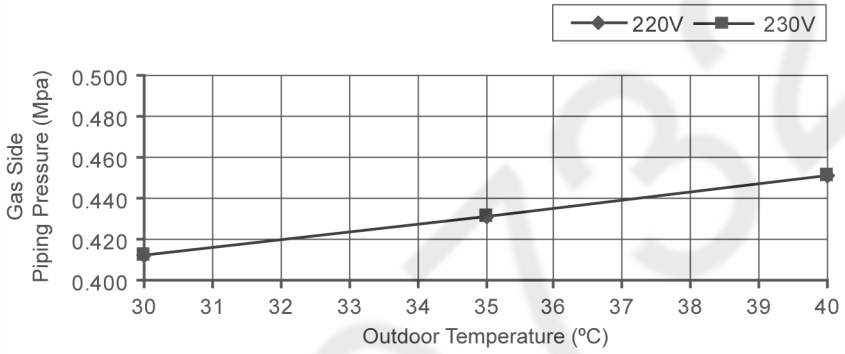


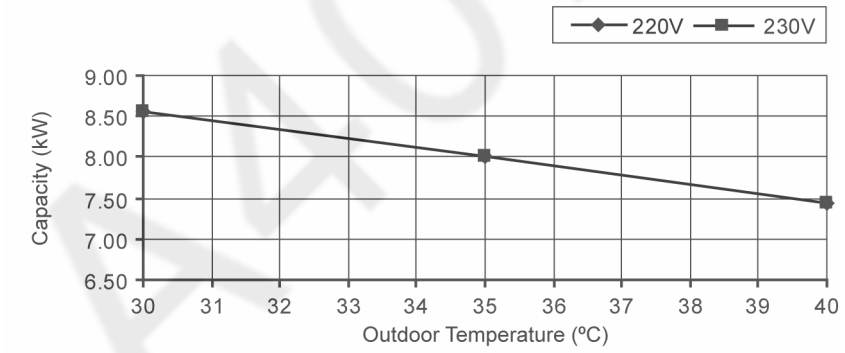


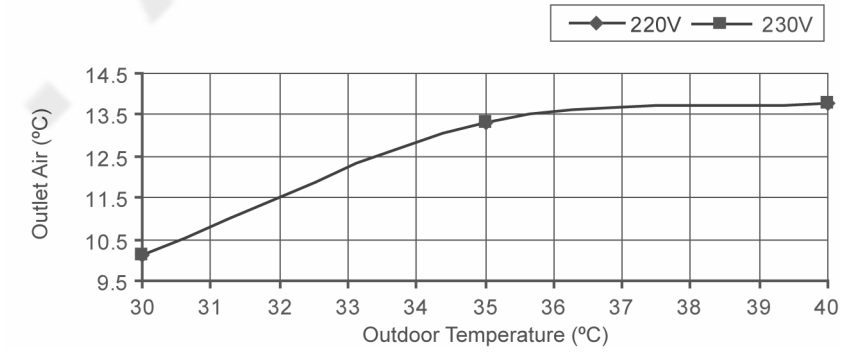
18.2.5 CS-A28PKD CU-A28PKD

- Cooling Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Piping length: 5.0m

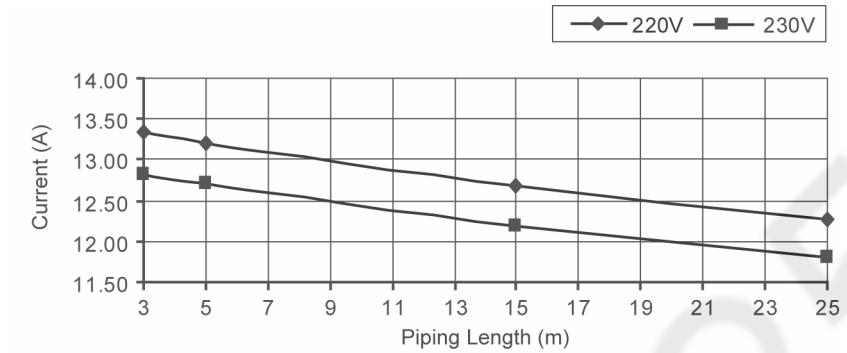


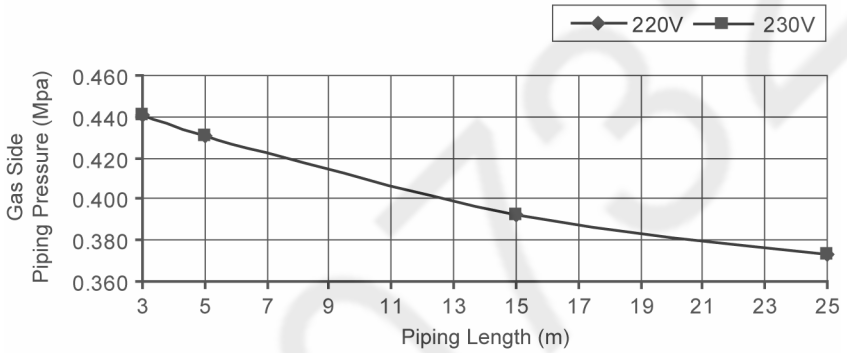


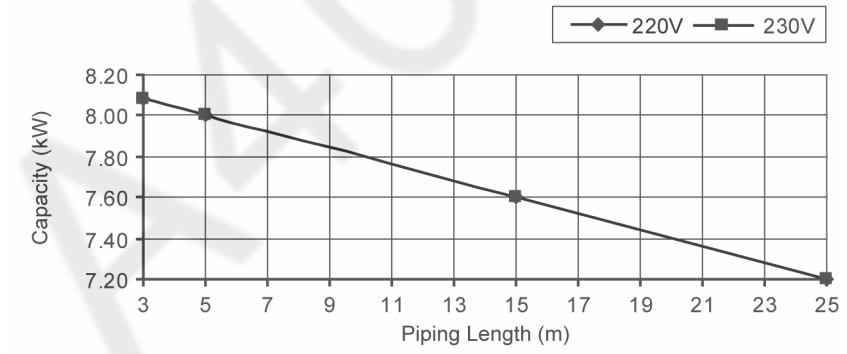


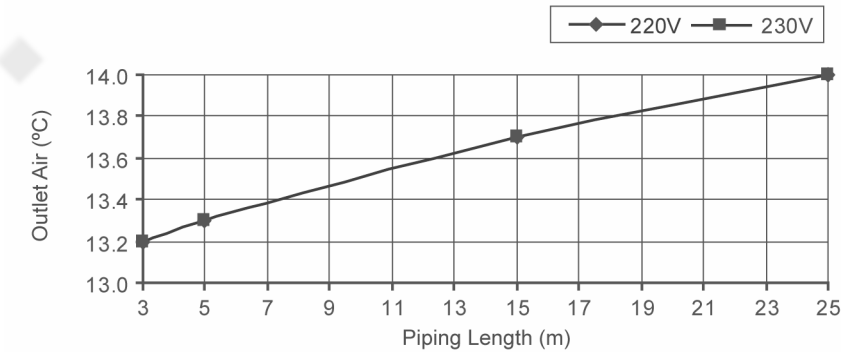


- Piping Length Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Outdoor temperature: 35°C (DBT), 24°C (WBT)
  - Piping length: 5.0m

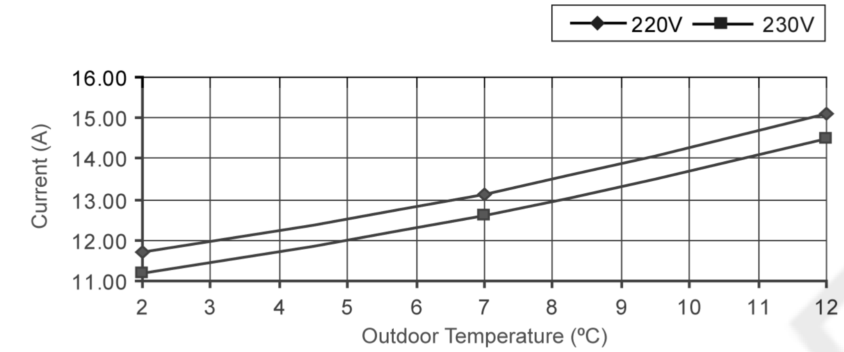


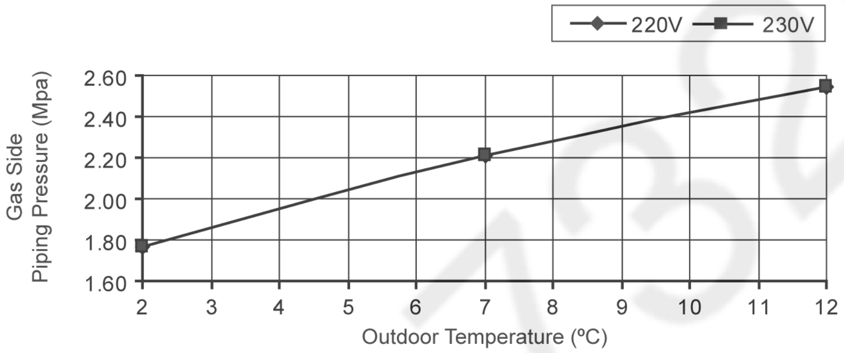


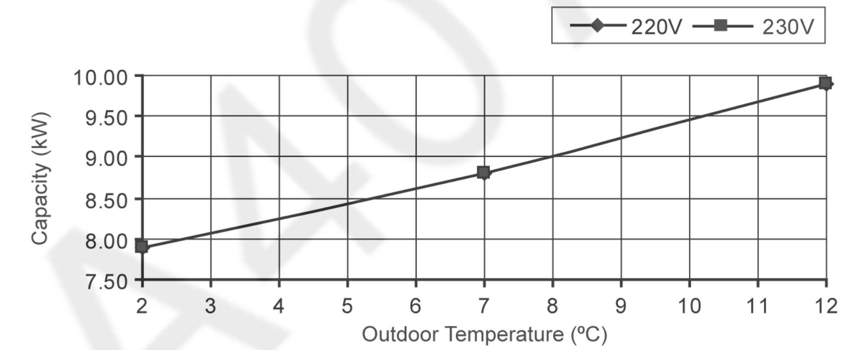


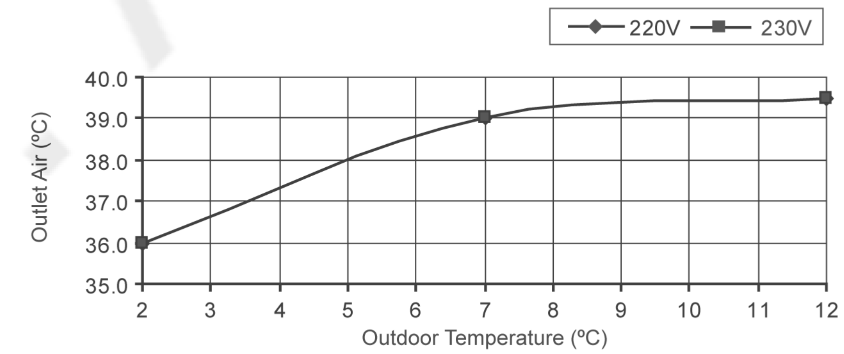


- Heating Characteristic
    - Room temperature: 20°C (DBT)
    - Operation condition: High fan speed
    - Piping length: 5.0m

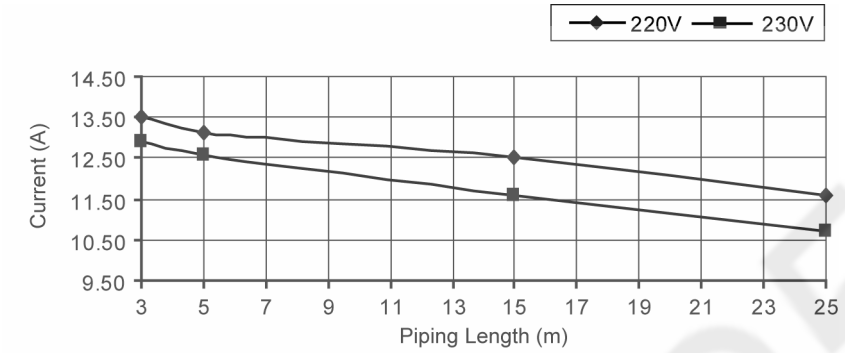


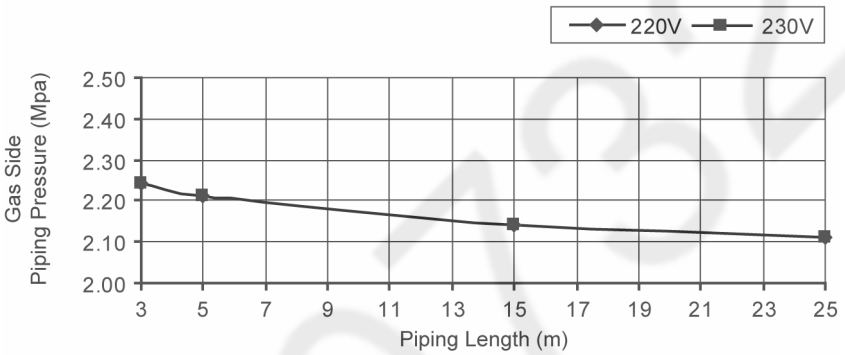


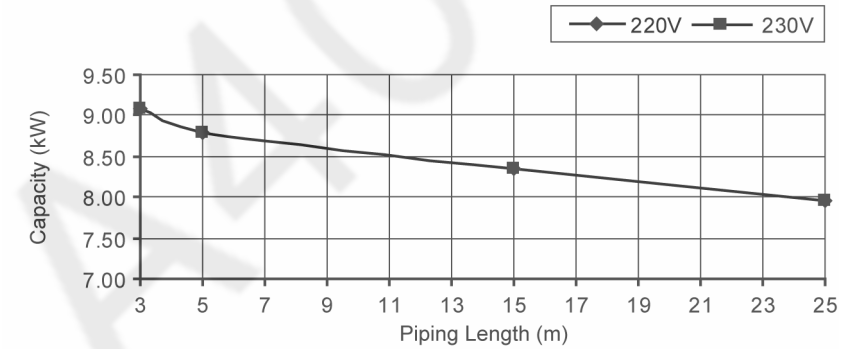


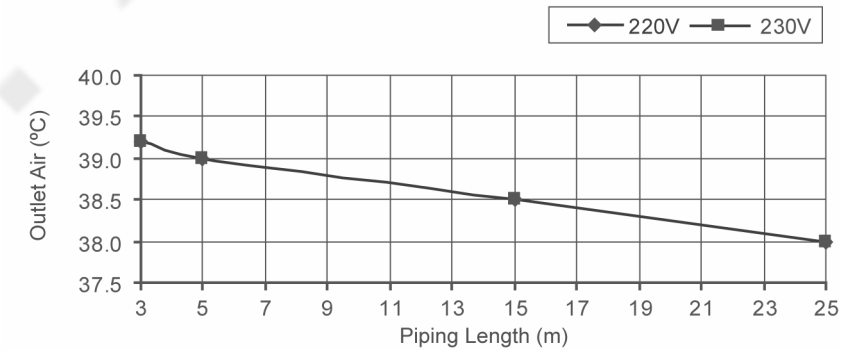


- Piping Length Characteristic
  - Room temperature: 20°C (DBT)
  - Operation condition: High fan speed
  - Outdoor temperature: 7°C (DBT), 6°C (WBT)
  - Piping length: 5.0m





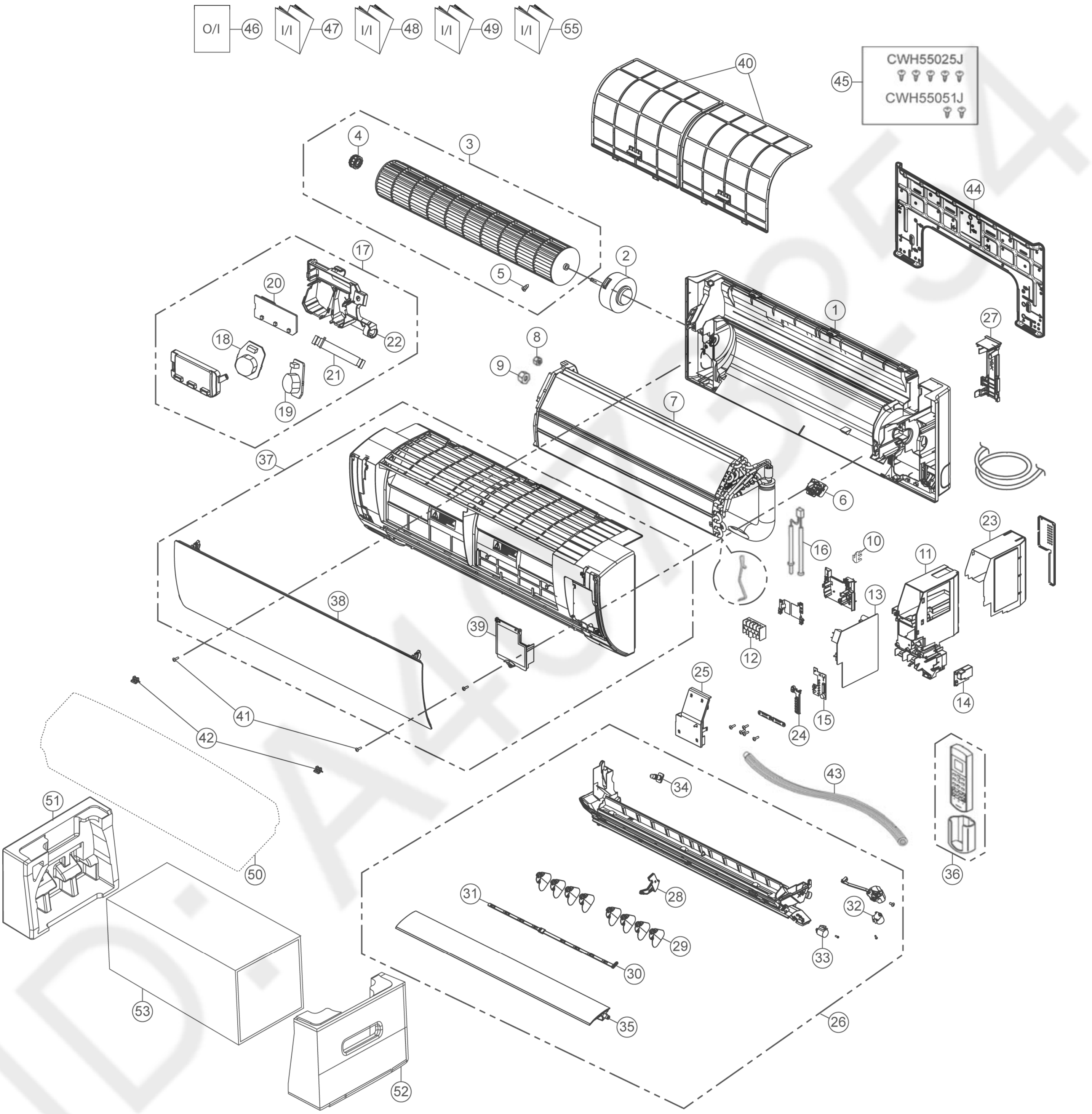




19. Exploded View and Replacement Parts List

19.1 Indoor Unit

19.1.1 CS-A9PKD CS-A12PKD



Note
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

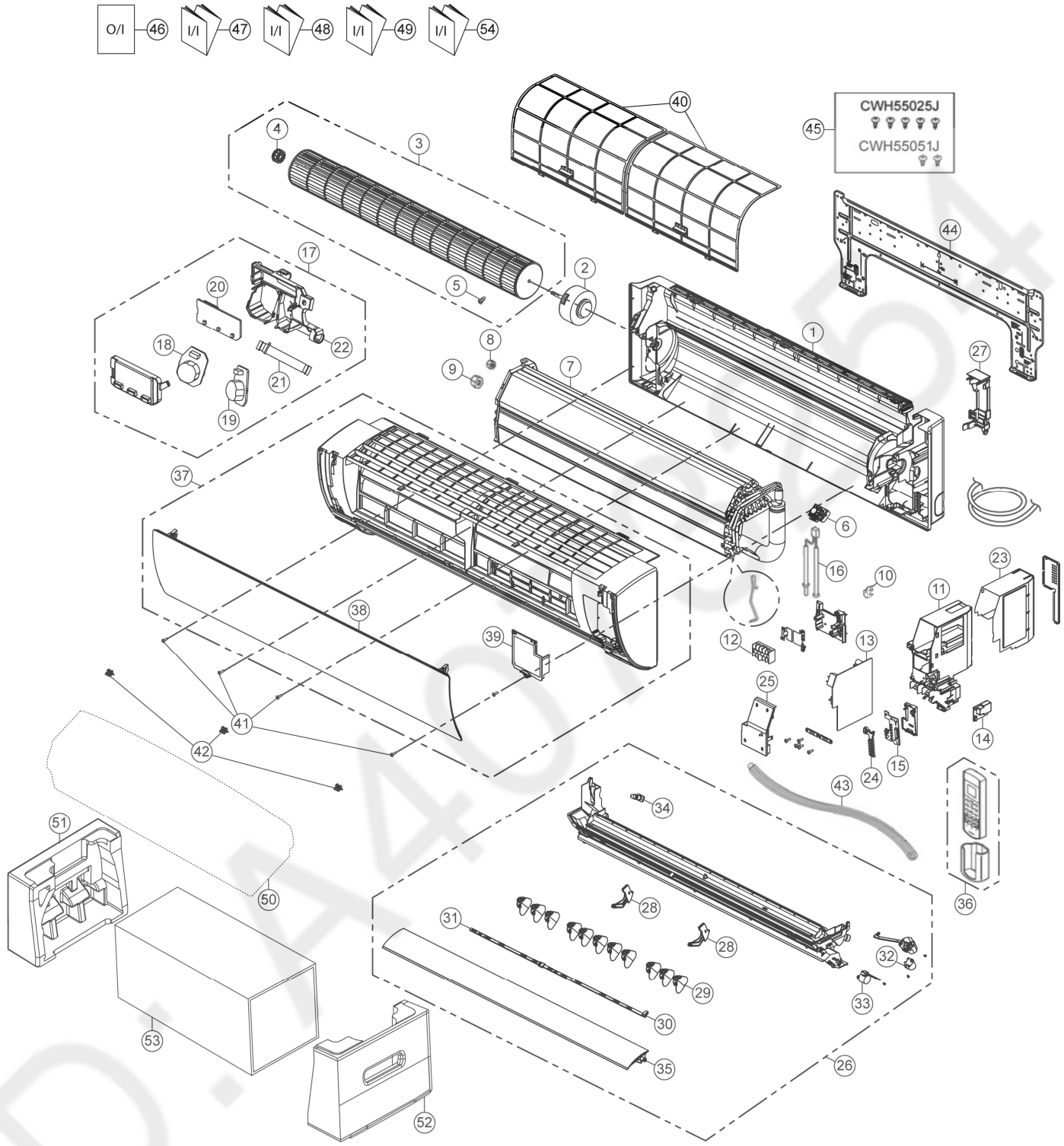
SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-A9PKD	CS-A12PKD	REMARK
	1	CHASSIS COMPLETE	1	CWD50C1653	←	
⚠	2	FAN MOTOR	1	CWA921447	←	O
	3	CROSS FLOW FAN COMPLETE	1	CWH02C1149	←	
	4	BEARING ASS'Y	1	CWH64K007	←	
	5	SCREW - CROSS FLOW FAN	1	CWH551146	←	
	6	ION GENERATOR	1	CWH94C0043	←	
	7	EVAPORATOR	1	CWB30C4418	CWB30C4403	
	8	FLARE NUT (LIQUID)	1	CWT251026	←	
	9	FLARE NUT (GAS)	1	CWT251061	CWT251062	
	10	HOLDER SENSOR	1	CWH32142	←	
	11	CONTROL BOARD CASING	1	CWH102449	←	
⚠	12	TERMINAL BOARD COMPLETE	1	CWA28C2432	CWA28C2424	O
⚠	13	ELECTRONIC CONTROLLER - MAIN	1	CWA73C7629	CWA73C7630	O
⚠	14	ELECTRONIC CONTROLLER - HVU	1	N0GE1F000002	←	O
⚠	15	ELECTRONIC CONTROLLER - INDICATOR	1	CWA746635	←	O
	16	SENSOR COMPLETE	1	CWA50C2122	←	O
	17	SENSOR COMPLETE (ECO)	1	CWA50C2809	←	O
⚠	18	ELECTRONIC CONTROLLER (ECO SENSOR - L)	1	CWA745791	←	O
⚠	19	ELECTRONIC CONTROLLER (ECO SENSOR - R)	1	CWA746206	←	O
⚠	20	ELECTRONIC CONTROLLER (COMPARATOR)	1	CWA746653	←	O
	21	LEAD WIRE - PCB ECO	1	CWA67C9785	←	
	22	CONTROL BOARD CASING FOR PCB ECO	1	CWD933407	←	
	23	CONTROL BOARD TOP COVER	1	CWH131467	←	
	24	INDICATOR HOLDER	1	CWD933406	←	
	25	CONTROL BOARD FRONT COVER	1	CWH13C1247	←	
	26	DISCHARGE GRILLE COMPLETE	1	CWE20C3235	←	
	27	BACK COVER CHASSIS	1	CWD933233	←	
	28	FULCRUM	1	CWH621131	←	
	29	VERTICAL VANE	8	CWE241374	←	
	30	CONNECTING BAR (RIGHT)	1	CWE261250	←	
	31	CONNECTING BAR (LEFT)	1	CWE261256	←	
	32	A.S.MOTOR, DC SINGLE 12V 300OHM	1	CWA98K1016	←	O
	33	A.S.MOTOR, DC SINGLE 12V 300OHM	1	CWA981264	←	O
	34	CAP - DRAIN TRAY	1	CWH521259	←	
	35	HORIZONTAL VANE	1	CWE24C1385	←	
	36	REMOTE CONTROL COMPLETE	1	CWA75C4204	←	O
	37	FRONT GRILLE COMPLETE	1	CWE11C5212	←	O
	38	INTAKE GRILLE COMPLETE	1	CWE22C1730	←	
	39	GRILLE DOOR	1	CWE14C1090	←	
	40	AIR FILTER	2	CWD001279	←	
	41	SCREW - FRONT GRILLE	2	XTT4+16CFJ	←	
	42	CAP - FRONT GRILLE	2	CWH521227	←	
	43	DRAIN HOSE	1	CWH851173	←	
	44	INSTALLATION PLATE	1	CWH361134	←	
	45	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C1705	←	
	46	OPERATING INSTRUCTION	1	CWF568955	←	
	47	INSTALLATION INSTRUCTION	1	CWF615793	←	
	48	INSTALLATION INSTRUCTION	1	CWF615795	←	
	49	INSTALLATION INSTRUCTION	1	CWF615794	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-A9PKD	CS-A12PKD	REMARK
	50	BAG	1	CWG861497	←	
	51	SHOCK ABSORBER (LEFT)	1	CWG713386	←	
	52	SHOCK ABSORBER (RIGHT)	1	CWG713387	←	
	53	C.C.CASE	1	CWG569049	CWG569050	
	55	INSTALLATION INSTRUCTION	1	CWF615796	←	

(Note)

- All parts are supplied from PAPAMY, Malaysia (Vendor Code: 00029488).
- “O” marked parts are recommended to be kept in stock.

19.1.2 CS-A18PKD CS-A24PKD CS-A28PKD



Note
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-A18PKD	CS-A24PKD	CS-A28PKD	REMARK
	1	CHASSIS COMPLETE	1	CWD50C1654	←	←	
⚠	2	FAN MOTOR	1	ARW7671AC	ARW7627AC	←	O
	3	CROSS FLOW FAN COMPLETE	1	CWH02C1150	←	←	
	4	BEARING ASS'Y	1	CWH64K007	←	←	
	5	SCREW - CROSS FLOW FAN	1	CWH551146	←	←	
	6	ION GENERATOR	1	CWH94C0043	←	←	
	7	EVAPORATOR	1	CWB30C4005	CWB30C3817	CWB30C3767	
	8	FLARE NUT (LIQUID)	1	CWT251026	←	←	
	9	FLARE NUT (GAS)	1	CWT251062	CWT251036	←	
	10	HOLDER SENSOR	1	CWH32142	←	←	
	11	CONTROL BOARD CASING	1	CWH102449	←	←	
⚠	12	TERMINAL BOARD COMPLETE	1	CWA28C2366	CWA28C2367	CWA28C2462	O
⚠	13	ELECTRONIC CONTROLLER - MAIN	1	CWA73C7631	CWA73C7632	CWA73C7634	O
⚠	14	ELECTRONIC CONTROLLER - HVU	1	N0GE1F000002	←	←	O
⚠	15	ELECTRONIC CONTROLLER - INDICATOR	1	CWA746635	←	←	O
	16	SENSOR COMPLETE	1	CWA50C2122	CWA50C2782	←	O
	17	SENSOR COMPLETE (ECO)	1	CWA50C2826	←	←	O
⚠	18	ELECTRONIC CONTROLLER (ECO SENSOR - L)	1	CWA745791	←	←	O
⚠	19	ELECTRONIC CONTROLLER (ECO SENSOR - R)	1	CWA746206	←	←	O
⚠	20	ELECTRONIC CONTROLLER (COMPARATOR)	1	CWA746653	←	←	O
	21	LEAD WIRE - PCB ECO	1	CWA67C9934	←	←	
	22	CONTROL BOARD CASING FOR PCB ECO	1	CWD933407A	←	←	
	23	CONTROL BOARD TOP COVER	1	CWH131467	←	←	
	24	INDICATOR HOLDER	1	CWD933406	←	←	
	25	CONTROL BOARD FRONT COVER	1	CWH13C1247	←	←	
	26	DISCHARGE GRILLE COMPLETE	1	CWE20C3242	←	←	
	27	BACK COVER CHASSIS	1	CWD933031	←	←	
	28	FULCRUM	2	CWH621138	←	←	
	29	VERTICAL VANE	11	CWE241374	←	←	
	30	CONNECTING BAR (RIGHT)	1	CWE261257	←	←	
	31	CONNECTING BAR (LEFT)	1	CWE261258	←	←	
	32	A.S.MOTOR, DC SINGLE 12V 300OHM	1	CWA98K1018	←	←	O
	33	A.S.MOTOR, DC SINGLE 12V 300OHM	1	CWA981241	←	←	O
	34	CAP - DRAIN TRAY	1	CWH521259	←	←	
	35	HORIZONTAL VANE	1	CWE24C1392	←	←	
	36	REMOTE CONTROL COMPLETE	1	CWA75C4204	←	←	O
	37	FRONT GRILLE COMPLETE	1	CWE11C5222	CWE11C5223	CWE11C5159	O
	38	INTAKE GRILLE COMPLETE	1	CWE22C1741	←	←	
	39	GRILLE DOOR	1	CWE14C1090	←	←	
	40	AIR FILTER	2	CWD001283	←	←	
	41	SCREW - FRONT GRILLE	4	XTT4+16CFJ	←	←	
	42	CAP - FRONT GRILLE	3	CWH521227	←	←	
	43	DRAIN HOSE	1	CWH851173	←	←	
	44	INSTALLATION PLATE	1	CWH361098	←	←	
	45	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C1705	←	←	
	46	OPERATING INSTRUCTION	1	CWF568955	←	←	
	47	INSTALLATION INSTRUCTION	1	CWF615793	←	CWF615806	
	48	INSTALLATION INSTRUCTION	1	CWF615795	←	CWF615808	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-A18PKD	CS-A24PKD	CS-A28PKD	REMARK
	49	INSTALLATION INSTRUCTION	1	CWF615794	←	CWF615807	
	50	BAG	1	CWG861498	←	←	
	51	SHOCK ABSORBER	1	CWG713402	←	←	
	52	SHOCK ABSORBER	1	CWG713403	←	←	
	53	C.C.CASE	1	CWG569051	CWG569052	CWG569053	
	54	INSTALLATION INSTRUCTION	1	CWF615796	←	CWF615809	

(Note)

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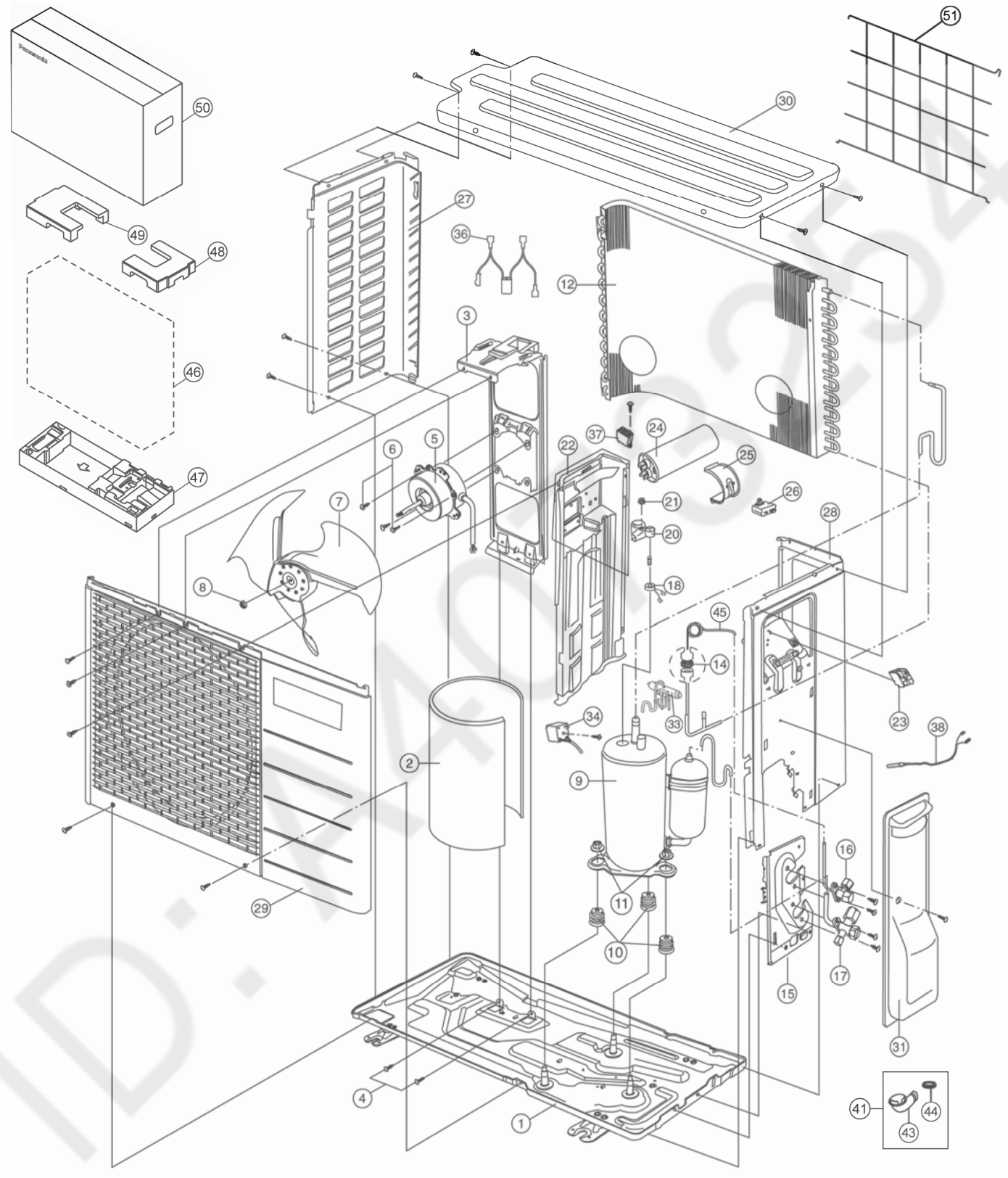
- “O” marked parts are recommended to be kept in stock.

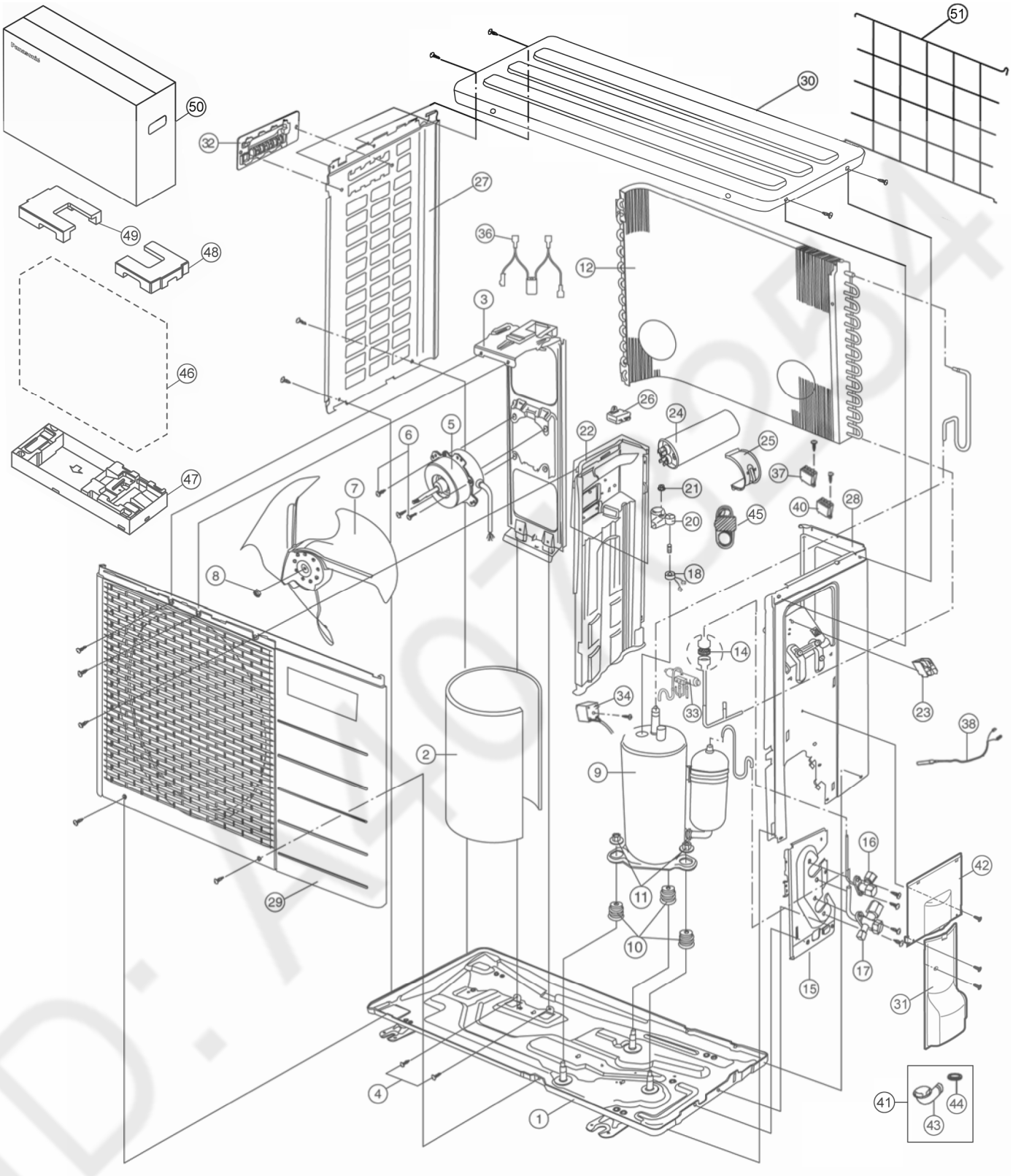
19.2 Outdoor Unit

19.2.1 CU-A9PKD



Note
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

19.2.2 CU-A12PKD



Note
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-A9PKD	CU-A12PKD	REMARK
	1	CHASSIS ASSY	1	CWD50K2112	CWD52K1308	
	2	SOUND PROOF MATERIAL	1	CWG302255	CWG302110	
	3	FAN MOTOR BRACKET	1	CWD541075	CWD541157	
	4	SCREW - FAN MOTOR BRACKET	2	CWH551217	←	
⚠	5	FAN MOTOR	1	CWA951674	CWA951692	O
	6	SCREW - FAN MOTOR MOUNT	3	CWH55252J	CWH55406J	
	7	PROPELLER FAN ASSY	1	CWH03K1020	CWH03K1010	
	8	NUT - PROPELLER FAN	1	CWH56053J	←	
⚠	9	COMPRESSOR	1	2PS156D3DA02	2PS206D3DA06	O
	10	ANTI-VIBRATION BUSHING	3	CWH50077	CWH50077	
	11	NUT - COMPRESSOR MOUNT	3	CWH56000J	CWH56000J	
	12	CONDENSER	1	CWB32C2987	CWB32C2418	
	14	STRAINER	1	CWB11025	←	
	15	HOLDER - COUPLING	1	CWH351222	CWH351233	
	16	2 WAYS VALVE (LIQUID)	1	CWB021573	CWB021117	O
	17	3 WAYS VALVE (GAS)	1	CWB011685	CWB011105	O
	18	OVERLOAD PROTECTOR WITH WIRE	1	CWA67C6142	CWA68C0379	
	20	TERMINAL COVER	1	CWH171011	←	
	21	NUT-TERMINAL COVER	1	CWH7080300J	←	
	22	SOUND PROOF BOARD	1	CWH151074	CWH151023	
⚠	23	TERMINAL BOARD ASSY	1	CWA28C2267	CWA28C2286	O
⚠	24	CAPACITOR - COMP	1	F0GAH306A004	DS401306CPNE	O
	25	HOLDER - CAPACITOR	1	CWH301035	CWH30060	
⚠	26	CAPACITOR - FM	1	F0GAH205A009	←	O
	27	CABINET SIDE PLATE (L)	1	CWE041110A	CWE041248A	
	28	CABINET SIDE PLATE CO.	1	CWE04C1042	CWE04C1118	
	29	CABINET FRONT PLATE ASSY	1	CWE06K1048	CWE06K1034	
	30	CABINET TOP PLATE	1	CWE031041A	CWE031014A	
	31	CONTROL BOARD COVER COMP.	1	CWH13C1099	CWH13C1064	
	32	HANDLE	-	-	CWE161010	
	33	4 WAYS VALVE	1	CWB001055	CWB001061	
⚠	34	V-COIL COMPLETE (4-WAYS VALVE)	1	CWA43C2187	CWA43C2553	
	36	ELECTROLYTIC CAPACITOR CO.	1	CWA32C1003	CWA32C067	O
	37	ELECTRO MAGNETIC SWITCH	1	CWA00059	←	O
	38	TEMPERATURE RELAY, 276V	1	CWA14C1009	←	O
	40	ELECTRO MAGNETIC RELAY	-	-	K6A2C7A00002	O
	41	ACCESSORY CO. (DRAIN ELBOW)	1	CWG87C900	←	
	42	PLATE - C. B. COVER TERMINAL	-	-	CWH131295	
	43	FLEXIBLE PIPE (L-TUBE)	1	CWH5850080	←	
	44	PACKING - L.TUBE	1	CWB81012	←	
	45	TUBE ASSY (CHK.VALVE, CAP.TUBE)	1	CWB15K1283	CWT01C5473	
	46	BAG	1	CWG861216	CWG861078	
	47	BASE BOARD - COMPLETE	1	CWG62C1046	CWG62C1095	
	48	SHOCK ABSORBER (RIGHT)	1	CWG712435	CWG712969	
	49	SHOCK ABSORBER (LEFT)	1	CWG712437	CWG712970	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-A9PKD	CU-A12PKD	REMARK
	50	C.C.CASE	1	CWG568886	CWG568887	
	51	WIRE NET	1	CWD041057A	CWD041111A	

(Note)

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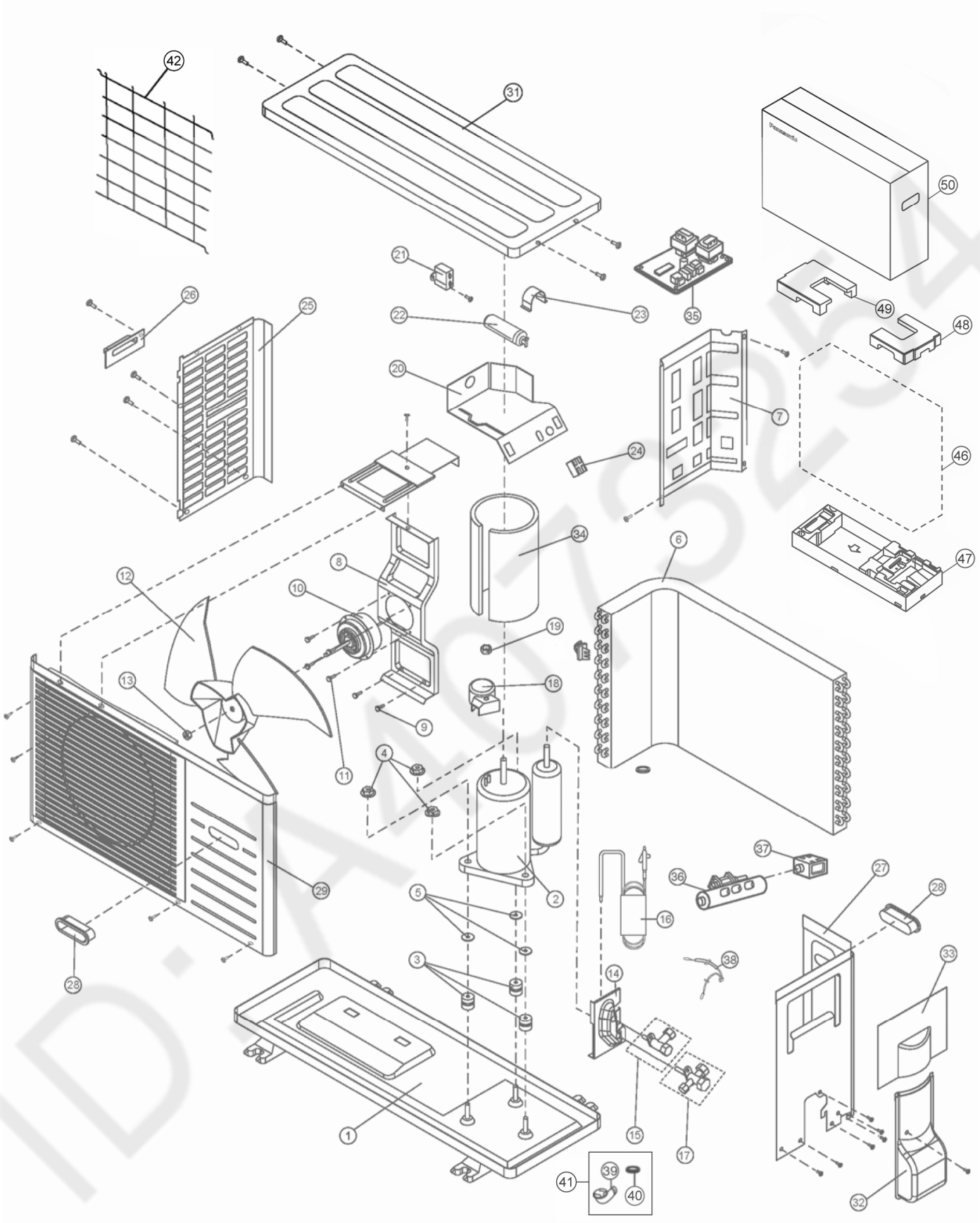
19.2.3 CU-A18PKD CU-A24PKD



Note
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-A18PKD	CU-A24PKD	REMARK
	1	CHASSIS ASSY	1	CWD52K1270	CWD50K2087	
⚠	2	COMPRESSOR	1	2JS318D3AA04	2JS438D3CC04	O
	3	ANTI - VIBRATION BUSHING	3	CWH50055	←	
	4	NUT - COMPRESSOR MOUNT	3	CWH561049	←	
	5	PACKING	3	CWB81043	←	
	6	CONDENSER	1	CWB32C3667	CWB32C2679	
	7	SOUND PROOF BOARD	1	CWH151267	CWH151051	
	8	FAN MOTOR BRACKET	1	CWD541154	CWD541055	
	9	SCREW - FAN MOTOR BRACKET	2	CWH551217	←	
⚠	10	FAN MOTOR	1	CWA951385J	←	O
	11	SCREW - FAN MOTOR MOUNT	4	CWH55252J	←	
	12	PROPELLER FAN ASSY	1	CWH03K1017	←	
	13	NUT - PROPELLER FAN	1	CWH561092	←	
	14	HOLDER - COUPLING	1	CWH351225	←	
	15	2 WAYS VALVE (LIQUID)	1	CWB021117	CWB021483	O
	16	TUBE ASSY (CHK.VALVE, CAP.TUBE)	1	CWT01C6339	CWT01C4944	
	17	3 WAYS VALVE (GAS)	1	CWB011212	CWB011213	O
	18	TERMINAL COVER	1	CWH171012	←	
	19	NUT - TERMINAL COVER	1	CWH7080300J	←	
	20	CONTROL BOARD CASING	1	CWH102451	CWH102206	
⚠	21	CAPACITOR - FM	1	DS441355NPQA	F0GAH355A009	O
⚠	22	CAPACITOR - COMP	1	CWA312079	←	O
	23	HOLDER - CAPACITOR	1	CWH30060	←	
⚠	24	TERMINAL BOARD ASSY	1	CWA28K1063J	CWA28K1070J	O
	25	CABINET SIDE PLATE (L)	1	CWE041520A	CWE041255A	
	26	HANDLE	1	CWE161010	←	
	27	CABINET SIDE PLATE CO.	1	CWE041574A	CWE041083A	
	28	HANDLE	2	-	CWE16000E	
	29	CABINET FRONT PLATE ASSY	1	CWE06K1077	CWE06K1043	
	31	CABINET TOP PLATE	1	CWE031083A	CWE03K1009A	
	32	CONTROL BOARD COVER COMP.	1	CWH13C1238	CWH131168	
	33	PLATE - C. B. COVER TERMINAL	1	CWH131409A	CWH131169A	
	34	SOUND PROOF MATERIAL	1	CWG302221	←	
⚠	35	ELECTRONIC CONTROLLER - MAIN	1	CWA743367	←	O
	36	4 WAYS VALVE	1	CWB001026J	CWB001056	
⚠	37	V-COIL COMPLETE (4-WAYS VALVE)	1	CWA43C2121J	←	
	38	SENSOR COMPLETE (COMP. DISC.)	1	CWA50C2396	←	O
	39	FLEXIBLE PIPE (L-TUBE)	1	CWH5850080	←	
	40	PACKING - L.TUBE	1	CWB81012	←	
	41	ACCESSORY CO.(DRAIN ELBOW)	1	CWG87C900	←	
	42	WIRE NET	1	CWD041160A	CWD041041A	
	46	BAG	1	CWG861461	CWG861154	
	47	BASE BOARD - COMPLETE	1	CWG62C1131	CWG62C1105	
	48	SHOCK ABSORBER (RIGHT)	1	CWG713218	CWG713123	
	49	SHOCK ABSORBER (LEFT)	1	CWG713217	CWG713124	
	50	C.C.CASE	1	CWG568888	CWG568889	

(Note)

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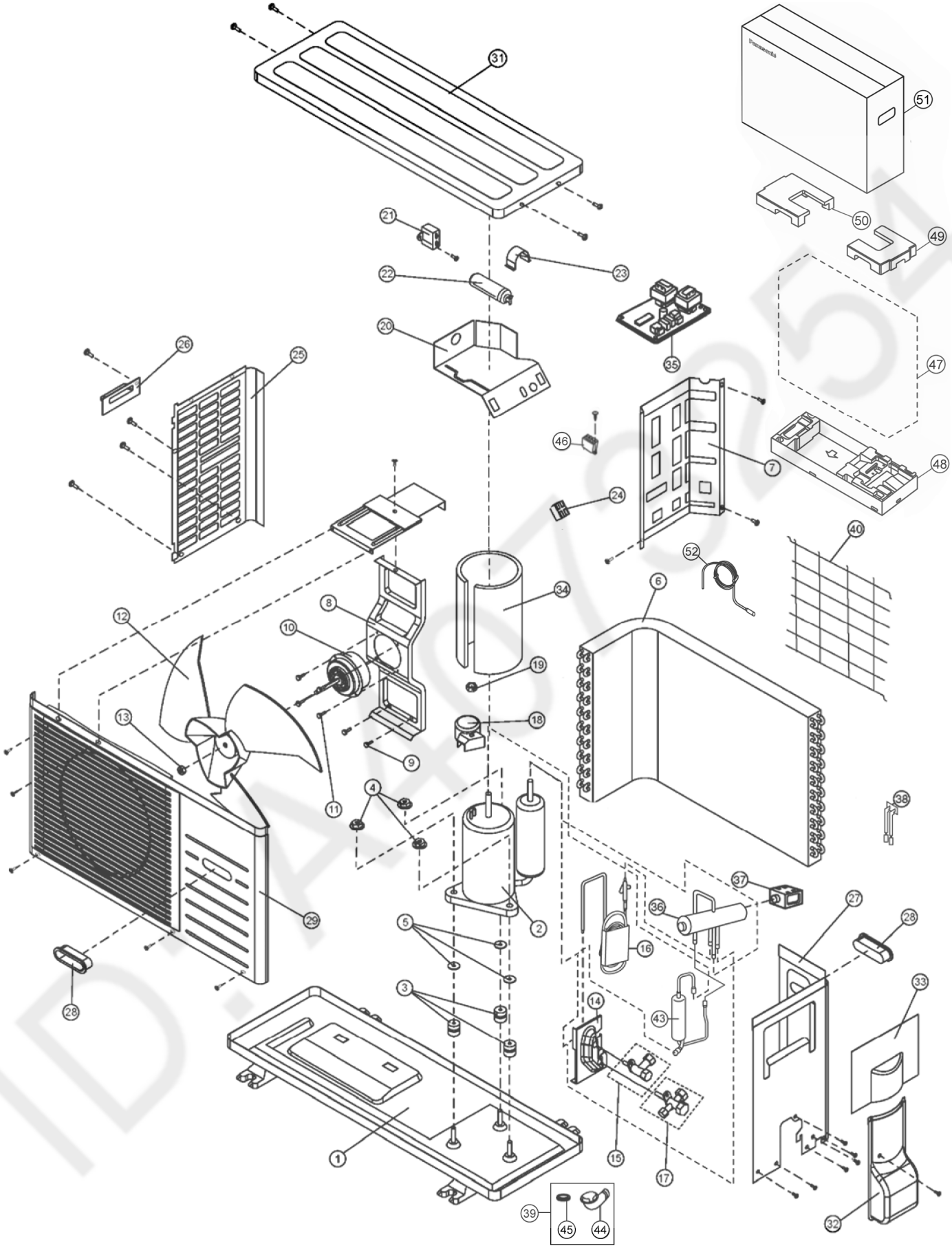
19.2.4 CU-A28PKD



Note
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-A28PKD	REMARK
	1	CHASSIS ASSY	1	CWD50K2087	
⚠	2	COMPRESSOR	1	2JD514E3AA03	O
	3	ANTI - VIBRATION BUSHING	3	CWH50055	
	4	NUT - COMPRESSOR MOUNT	3	CWH561049	
	5	PACKING	3	CWB81043	
	6	CONDENSER	1	CWB32C2681	
	7	SOUND PROOF BOARD	1	CWH151056	
	8	FAN MOTOR BRACKET	1	CWD541055	
	9	SCREW - FAN MOTOR BRACKET	2	CWH551217	
⚠	10	FAN MOTOR	1	CWA951294J	O
	11	SCREW - FAN MOTOR MOUNT	4	CWH55252J	
	12	PROPELLER FAN ASSY	1	CWH03K1017	
	13	NUT - PROPELLER FAN	1	CWH561092	
	14	HOLDER - COUPLING	1	CWH351225	
	15	2 WAYS VALVE (LIQUID)	1	CWB021361	O
	16	TUBE ASSY (CHK.VALVE, CAP.TUBE)	1	CWT01C4697	
	17	3 WAYS VALVE (GAS)	1	CWB011484	O
	18	TERMINAL COVER	1	CWH171012	
	19	NUT - TERMINAL COVER	1	CWH7080300J	
	20	CONTROL BOARD CASING	1	CWH102206	
⚠	21	CAPACITOR - FM	1	DS441355NPQA	O
⚠	22	CAPACITOR - COMP	1	CWA312088	O
	23	HOLDER - CAPACITOR	1	CWH30071	
⚠	24	TERMINAL BOARD ASSY	1	CWA28K1058J	O
	25	CABINET SIDE PLATE (L)	1	CWE041082A	
	26	HANDLE	1	CWE161010	
	27	CABINET SIDE PLATE CO.	1	CWE041100A	
	28	HANDLE	2	CWE16000E	
	29	CABINET FRONT PLATE ASSY	1	CWE06K1045	
	31	CABINET TOP PLATE	1	CWE03K1011A	
	32	CONTROL BOARD COVER COMP.	1	CWH131168	
	33	PLATE - C. B. COVER TERMINAL	1	CWH131169A	
	34	SOUND PROOF MATERIAL	1	CWG302230	
⚠	35	ELECTRONIC CONTROLLER - MAIN	1	CWA743378	O
	36	4 WAYS VALVE	1	CWB001046	
⚠	37	V-COIL COMPLETE (4-WAYS VALVE)	1	CWA43C2321	
	38	SENSOR COMPLETE (COMP. DISC.)	1	CWA50C2396	O
	39	ACCESSORY CO.(DRAIN ELBOW)	1	CWG87C900	
	40	WIRE NET	1	CWD041041A	
	43	OIL SEPARATER ASSY	1	CWB16K1018	
	44	FLEXIBLE PIPE (L-TUBE)	1	CWH5850080	
	45	PACKING - L.TUBE	1	CWB81012	
	46	ELECTRO MAGNETIC SWITCH	1	CWA00192	
	47	BAG	1	CWG861154	
	48	BASE BOARD - COMPLETE	1	CWG62C1105	
	49	SHOCK ABSORBER (RIGHT)	1	CWG713123	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-A28PKD	REMARK
	50	SHOCK ABSORBER (LEFT)	1	CWG713124	
	51	C.C.CASE	1	CWG568890	
	52	TUBE ASS'Y	1	CWT025826	

(Note)

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