Order No: PAPAMY1312010CE

Service Manual

Air Conditioner

Indoor Unit	Outdoor Unit
CS-E7QKEW	CU-E7QKE
CS-E9QKEW	CU-E9QKE
CS-E12QKEW	CU-E12QKE
CS-E15QKEW	CU-E15QKE
CS-E18QKEW	CU-E18QKE
CS-E21QKEW	CU-E21QKE
CS-E24QKEW	CU-E24QKE
CS-XE7QKEW	CU-E7QKE
CS-XE9QKEW	CU-E9QKE
CS-XE12QKEW	CU-E12QKE
CS-XE18QKEW	CU-E18QKE
CS-E28QKES	CU-E28QKE

Destination
EU
E.Europe
L.America
Turkey
Croatia
S.Africa

⚠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.

⚠ PRECAUTION OF LOW TEMPERATURE

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigerant circuit.

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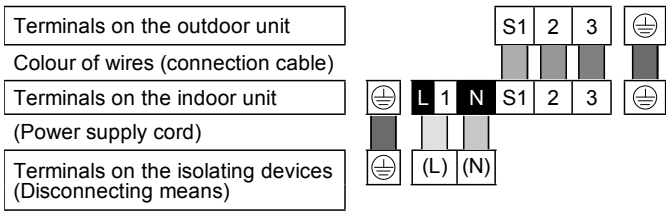
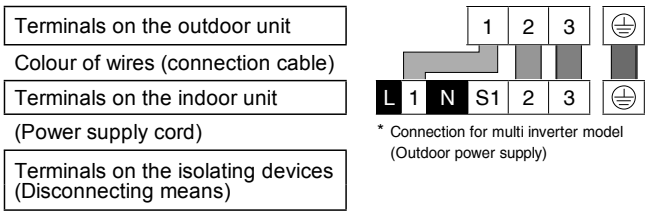
⚠ CAUTION

Before performing any of the electrical installation works, please verify on which of the intended connection use. Generally there are 2 types of indoor-outdoor connections:

Ⓐ Single Connection (Single Indoor Unit connects with Single Outdoor Unit)

Ⓑ Multiple Connection (Multiple Indoor Unit connect with Single Outdoor Unit)

Both connections have different connecting methods. Any mismatch connections will result in malfunctions.
The following illustration demonstrates the correct electrical works for both type.

Ⓐ (Single Connection)	Ⓑ (Multiple Connection)
	

Please refer to the provided Installation Instructions for the detailed procedures for connecting cables to Indoor Unit.

TABLE OF CONTENTS

1. Safety Precautions 4

2. Specifications 6

3. Features 33

4. Location of Controls and Components 34

4.1 Indoor Unit 34
4.2 Outdoor Unit 34
4.3 Remote Control 34

5. Dimensions 35

5.1 Indoor Unit 35
5.2 Outdoor Unit 37

6. Refrigeration Cycle Diagram 40

6.1 CU-E7QKE CU-E9QKE CU-E12QKE CU-E15QKE 40
6.2 CU-E18QKE 41
6.3 CU-E21QKE 42
6.4 CU-E24QKE CU-E28QKE 43

7. Block Diagram 44

7.1 CU-E7QKE 44
7.2 CU-E9QKE CU-E12QKE CU-E15QKE 45
7.3 CU-E18QKE CU-E21QKE 46
7.4 CU-E24QKE CU-E28QKE 47

8. Wiring Connection Diagram 48

8.1 Indoor Unit 48
8.2 Outdoor Unit 50

9. Electronic Circuit Diagram 55

9.1 Indoor Unit 55
9.2 Outdoor Unit 56

10. Printed Circuit Board 61

10.1 Indoor Unit 61
10.2 Outdoor Unit 64
10.3 Noise Filter Printed Circuit Board 69

11. Installation Instruction 70

11.1 Select the Best Location 70
11.2 Indoor Unit 71
11.3 Outdoor Unit 76

12. Installation Instruction 80

12.1 Select the Best Location 80
12.2 Indoor Unit 81
12.3 Outdoor Unit 86

13. Operation Control 89

13.1 Basic Function 89
13.2 Indoor Fan Motor Operation 90
13.3 Outdoor Fan Motor Operation 91
13.4 Airflow Direction 92
13.5 Quiet operation (Cooling Mode/Cooling area of Dry Mode) 93
13.6 Quiet operation (Heating) 94
13.7 Powerful Mode Operation 94
13.8 Timer Control 95
13.9 Auto Restart Control 95
13.10 Indication Panel 95
13.11 nanoe-G Operation 96
13.12 In-filter Deactivation Operation 98
13.13 Mild Dry Cooling Operation 99
13.14 AUTO COMFORT and ECONAVI Operation 99

14. Operation Control (For Multi Split Connection) 107

14.1 Cooling operation 107
14.2 Soft Dry Operation 107
14.3 Heating Operation 107
14.4 Automatic Operation 108
14.5 Indoor Fan Motor Operation 108
14.6 Powerful Mode Operation 108
14.7 Auto restart control 108
14.8 Indication Panel 108
14.9 Mild Dry Cooling Operation 108

15. Protection Control 109

15.1 Protection Control For All Operations 109
15.2 Protection Control For Cooling & Soft Dry Operation 111
15.3 Protection Control For Heating Operation 112

16. Servicing Mode 113

16.1 Auto OFF/ON Button 113
16.2 Heat Only Operation 114
16.3 Remote Control Button 115

17. Troubleshooting Guide 116

17.1 Refrigeration Cycle System 116
17.2 Breakdown Self Diagnosis Function 118
17.3 Error Codes Table 119
17.4 Self-diagnosis Method 121

18. Disassembly and Assembly Instructions 149

18.1 CS-E7QK CS-E9QK CS-E12QK CS-E15QK CS-XE7QK CS-XE9QK CS-XE12QK 149
18.2 CS-E18QK CS-E21QK CS-E24QK CS-E28QK CS-XE18QK 154
18.3 Outdoor Electronic Controller Removal Procedure 159

19. Technical Data 163

19.1 Cool Mode Performance Data 163
19.2 Heat Mode Performance Data 165

20. Service Data 167

20.1 Cool Mode Outdoor Air Temperature Characteristic 167
20.2 Heat Mode Outdoor Air Temperature Characteristic 175
20.3 Piping Length Correction Factor 183

21. Exploded View and Replacement Parts List 185

21.1 Indoor Unit 185
21.2 Outdoor Unit 195

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 run 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.	• For R410A model, use piping, flare nut and tools which is specified for R410A refrigerant. Using of existing (R22) piping, flare nut and tools may cause abnormally high pressure in the refrigerant cycle (piping), and possibly result in explosion and injury. • Thickness or copper pipes used with R410A must be more than 0.8 mm. Never use copper pipes thinner than 0.8 mm. • It is desirable that the amount of residual oil less than 40 mg/10 m.	⃠
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).	

	⚠ WARNING
20.	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.)
21.	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.
22.	Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when refrigerant contacts with fire.
23.	Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.
24.	Must not use other parts except original parts described in catalog and manual.
25.	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.	Power supply connection to the room air conditioner. Use power supply cord 3 × 1.5 mm² (3/4 ~ 1.75HP) 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 (3/4 ~ 1.75HP) or 16A (2.0 ~ 2.5HP) 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 (3/4 ~ 2.25HP) 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-E28QKES CU-E28QKE only** 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. Specifications

Model			Indoor	CS-E7QKEW, CS-XE7QKEW			CS-E9QKEW, CS-XE9QKEW		
			Outdoor	CU-E7QKE			CU-E9QKE		
Performance Test Condition				EUROVENT			EUROVENT		
Power Supply			Phase, Hz	Single, 50			Single, 50		
			V	230			230		
				Min.	Mid.	Max.	Min.	Mid.	Max.
Cooling	Capacity		kW	0.75	2.05	2.40	0.85	2.50	3.00
			BTU/h	2560	6990	8180	2900	8530	10200
			Kcal/h	650	1760	2060	730	2150	2580
	Running Current		A	–	2.20	–	–	2.35	–
	Input Power		W	240	460	565	245	525	715
	Annual Consumption		kWh	–	230	–	–	263	–
	EER		W/W	3.13	4.46	4.25	3.47	4.76	4.20
			BTU/hW	10.67	15.20	14.48	11.84	16.25	14.27
			Kcal/hW	2.71	3.83	3.65	2.98	4.10	3.61
	ErP	Pdesign	kW	2.1			2.5		
		SEER	(W/W)	6.9			6.9		
		Annual Consumption	kWh	107			127		
		Class		A++			A++		
	Power Factor		%	–	91	–	–	97	–
	Indoor Noise (H / L / QLo)		dB-A	37 / 24 / 20			39 / 25 / 20		
			Power Level dB	53 / –			55 / –		
	Outdoor Noise (H / L)		dB-A	45 / –			46 / –		
			Power Level dB	60 / –			61 / –		
Heating	Capacity		kW	0.70	2.80	4.00	0.80	3.40	5.00
			BTU/h	2390	9550	13600	2730	11600	17100
			Kcal/h	600	2410	3440	690	2920	4300
	Running Current		A	–	2.80	–	–	3.20	–
	Input Power		W	180	625	1.00k	190	720	1.27k
	COP		W/W	3.89	4.48	4.00	4.21	4.72	3.94
			BTU/hW	13.89	15.28	13.60	14.37	16.11	13.46
			Kcal/hW	3.33	3.86	3.44	3.63	4.06	3.39
	ErP	Pdesign	kW	2.1			2.7		
		Tbivalent	°C	-10			-10		
		SCOP	(W/W)	4.4			4.7		
		Annual Consumption	kWh	668			804		
		Class		A+			A++		
	Power Factor		%	–	97	–	–	98	–
	Indoor Noise (H / L / QLo)		dB-A	38 / 25 / 20			40 / 27 / 20		
			Power Level dB	54 / –			56 / –		
	Outdoor Noise (H / L)		dB-A	46 / –			47 / –		
			Power Level dB	61 / –			62 / –		
Low Temp. : Capacity (kW) / I.Power (W) / COP				2.90 / 880 / 3.30			3.62 / 1.12k / 3.23		
Extr Low Temp. : Capacity (kW) / I.Power (W) / COP				2.38 / 890 / 2.67			2.95 / 1.15k / 2.57		
Max Current (A) / Max Input Power (W)				4.40 / 1.00k			5.6 / 1.27k		
Starting Current (A)				2.80			3.20		

Model				Indoor	CS-E7QKEW, CS-XE7QKEW	CS-E9QKEW, CS-XE9QKEW
				Outdoor	CU-E7QKE	CU-E9QKE
Compressor	Type				Hermetic Motor (Rotary)	Hermetic Motor (Rotary)
	Motor Type				Brushless (6 poles)	Brushless (6 poles)
	Output Power			W	650	700
Indoor Fan	Type				Cross-Flow Fan	Cross-Flow Fan
	Material				ASG33	ASG33
	Motor Type				DC / Transistor (8-poles)	DC / Transistor (8-poles)
	Input Power			W	44.9	44.9
	Output Power			W	40	40
	Speed	QLo	Cool	rpm	610	570
			Heat	rpm	630	630
		Lo	Cool	rpm	670	680
			Heat	rpm	730	800
		Me	Cool	rpm	840	880
			Heat	rpm	900	990
		Hi	Cool	rpm	1010	1080
			Heat	rpm	1070	1180
		SHi	Cool	rpm	1040	1110
			Heat	rpm	1100	1210
Outdoor Fan	Type				Propeller Fan	Propeller Fan
	Material				PP	PP
	Motor Type				DC (8-poles)	DC (8-poles)
	Input Power			W	–	–
	Output Power			W	40	40
	Speed	Hi	Cool	rpm	720	770
			Heat	rpm	720	750
Moisture Removal				L/h (Pt/h)	1.3 (2.7)	1.5 (3.2)
Indoor Airflow		QLo	Cool	m^3/min (ft^3/min)	6.64 (234)	6.45 (228)
			Heat	m^3/min (ft^3/min)	6.59 (233)	6.55 (231)
		Lo	Cool	m^3/min (ft^3/min)	7.46 (263)	7.85 (277)
			Heat	m^3/min (ft^3/min)	7.89 (279)	8.52 (301)
		Me	Cool	m^3/min (ft^3/min)	9.77 (345)	10.39 (367)
			Heat	m^3/min (ft^3/min)	10.09 (356)	10.70 (378)
		Hi	Cool	m^3/min (ft^3/min)	12.10 (425)	12.80 (450)
			Heat	m^3/min (ft^3/min)	12.30 (435)	12.90 (455)
		SHi	Cool	m^3/min (ft^3/min)	12.49 (441)	13.32 (470)
			Heat	m^3/min (ft^3/min)	12.78 (451)	13.24 (468)
Outdoor Airflow		Hi	Cool	m^3/min (ft^3/min)	33.9 (1195)	29.8 (1050)
			Heat	m^3/min (ft^3/min)	33.9 (1195)	29.8 (1050)
Refrigeration Cycle	Control Device				Expansion Valve	Expansion Valve
	Refrigerant Oil			cm^3	FV50S (320)	FV50S (320)
	Refrigerant Type			g (oz)	R410A, 850 (30.0)	R410A, 1.02k (36.0)
Dimension	Height (I/D / O/D)			mm (inch)	295 (11-5/8) / 542 (21-11/32)	295 (11-5/8) / 542 (21-11/32)
	Width (I/D / O/D)			mm (inch)	870 (34-9/32) / 780 (30-23/32)	870 (34-9/32) / 780 (30-23/32)
	Depth (I/D / O/D)			mm (inch)	255 (10-1/16) / 289 (11-13/32)	255 (10-1/16) / 289 (11-13/32)
Weight	Net (I/D / O/D)			kg (lb)	10 (22) / 31 (68)	10 (22) / 33 (73)

Model			Indoor	CS-E7QKEW, CS-XE7QKEW		CS-E9QKEW, CS-XE9QKEW	
			Outdoor	CU-E7QKE		CU-E9QKE	
Piping	Pipe Diameter (Liquid / Gas)		mm (inch)	6.35 (1/4) / 9.52 (3/8)		6.35 (1/4) / 9.52 (3/8)	
	Standard length		m (ft)	5.0 (16.4)		5.0 (16.4)	
	Length range (min – max)		m (ft)	3 (9.8) ~ 15 (49.2)		3 (9.8) ~ 15 (49.2)	
	I/D & O/D Height different		m (ft)	15.0 (49.2)		15.0 (49.2)	
	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 × 17 × 17, 2 × 17 × 21 (XE7QKEW)		2 × 17 × 17, 2 × 17 × 21 (XE9QKEW)	
	Size (W × H × L)		mm	636.5 × 357 × 25.4		636.5 × 357 × 25.4	
Outdoor Heat Exchanger	Fin Material			Aluminium		Aluminium	
	Fin Type			Corrugated Fin		Corrugated Fin	
	Row × Stage × FPI			1 × 20 × 19		2 × 24 × 17	
	Size (W × H × L)		mm	22 × 508 × 708.4		36.4 × 504 × 713:684	
Air Filter	Material			Polypropelene		Polypropelene	
	Type			One-touch		One-touch	
Power Supply				Indoor		Indoor	
Power Supply Cord			A	Nil		Nil	
Thermostat				Electronic Contol		Electronic Contol	
Protection Device				Electronic Contol		Electronic Contol	
				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	-10	–	-10	–
	Heating		Maximum °C	24	18	24	18
			Minimum °C	-15	-16	-15	-16

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. Heating low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor 2/1°C
4. Heating extreme low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor -7/-8°C
5. Standby power consumption ≤10.0w (when switched OFF by remote control, except under self protection control).
6. Specifications are subjected to change without prior notice for further improvement.

Model			Indoor	CS-E12QKEW, CS-XE12QKEW			CS-E15PKEW		
			Outdoor	CU-E12QKE			CU-E15QKE		
Performance Test Condition				EUROVENT			EUROVENT		
Power Supply			Phase, Hz	Single, 50			Single, 50		
			V	230			230		
				Min.	Mid.	Max.	Min.	Mid.	Max.
Cooling	Capacity		kW	0.85	3.50	4.00	0.85	4.20	5.00
			BTU/h	2900	11900	13600	2900	14300	17100
			Kcal/h	730	3010	3440	730	3610	4300
	Running Current		A	–	3.8	–	–	5.5	–
	Input Power		W	250	835	1.05k	260	1.24k	1.54k
	Annual Consumption		kWh	-	418	–	–	620	–
	EER		W/W	3.40	4.19	3.81	3.27	3.39	3.25
			BTU/hW	11.60	14.25	12.95	11.15	11.53	11.10
			Kcal/hW	2.92	3.60	3.28	2.81	2.91	2.79
	ErP	Pdesign	kW	3.5			4.2		
		SEER	(W/W)	7.6			6.6		
		Annual Consumption	kWh	161			223		
		Class		A++			A++		
	Power Factor		%	–	96	–	–	98	–
	Indoor Noise (H / L / QLo)		dB-A	42 / 28 / 20			43 / 31 / 25		
			Power Level dB	58 / –			59 / –		
	Outdoor Noise (H / L)		dB-A	48 / –			49 / –		
			Power Level dB	63 / –			64 / –		
Heating	Capacity		kW	0.80	4.00	6.00	0.80	5.30	6.80
			BTU/h	2730	13600	20500	2730	18100	23200
			Kcal/h	690	3440	5160	690	4560	5850
	Running Current		A	–	3.9	–	–	6.3	–
	Input Power		W	190	840	1.60k	190	1.42k	1.92k
	COP		W/W	4.21	4.76	3.75	4.21	3.73	3.54
			BTU/hW	14.37	16.19	12.81	14.37	12.75	12.08
			Kcal/hW	3.63	4.10	3.23	3.63	3.21	3.05
	ErP	Pdesign	kW	3.2			3.6		
		Tbivalent	°C	-10			-10		
		SCOP	(W/W)	4.8			4.0		
		Annual Consumption	kWh	933			1260		
		Class		A++			A+		
	Power Factor		%	–	94	–	–	98	–
	Indoor Noise (H / L / QLo)		dB-A	42 / 33 / 20			43 / 35 / 29		
			Power Level dB	58 / –			59 / –		
	Outdoor Noise (H / L)		dB-A	50 / –			51 / –		
			Power Level dB	65 / –			66 / –		
Low Temp. : Capacity (kW) / I.Power (W) / COP				4.47 / 1.42k / 3.15			4.93 / 1.70k / 2.90		
Extr Low Temp. : Capacity (kW) / I.Power (W) / COP				3.45 / 1.40k / 2.46			4.11 / 1.71k / 2.40		
Max Current (A) / Max Input Power (W)				7.4 / 1.60k			8.5 / 1.92k		
Starting Current (A)				3.9			6.3		

Model				Indoor	CS-E12QKEW, CS-XE12QKEW	CS-E15PKEW
				Outdoor	CU-E12QKE	CU-E15QKE
Compressor	Type				Hermetic Motor (Rotary)	Hermetic Motor (Rotary)
	Motor Type				Brushless (6 poles)	Brushless (6 poles)
	Output Power			W	700	700
Indoor Fan	Type				Cross-Flow Fan	Cross-Flow Fan
	Material				ASG33	ASG33
	Motor Type				DC / Transistor (8-poles)	DC / Transistor (8-poles)
	Input Power			W	44.9	44.9
	Output Power			W	40	40
	Speed	QLo	Cool	rpm	570	690
			Heat	rpm	630	820
		Lo	Cool	rpm	740	810
			Heat	rpm	970	980
		Me	Cool	rpm	930	1010
			Heat	rpm	1090	1110
		Hi	Cool	rpm	1130	1210
			Heat	rpm	1210	1250
		SHi	Cool	rpm	1160	1250
			Heat	rpm	1240	1290
Outdoor Fan	Type				Propeller Fan	Propeller Fan
	Material				PP	PP
	Motor Type				DC (8-poles)	DC (8-poles)
	Input Power			W	–	–
	Output Power			W	40	40
	Speed	Hi	Cool	rpm	870	900
			Heat	rpm	890	910
Moisture Removal				L/h (Pt/h)	2.0 (4.2)	2.4 (5.1)
Indoor Airflow		QLo	Cool	m^3/min (ft^3/min)	6.45 (228)	7.42 (262)
			Heat	m^3/min (ft^3/min)	6.77 (239)	9.04 (319)
		Lo	Cool	m^3/min (ft^3/min)	8.61 (304)	8.98 (317)
			Heat	m^3/min (ft^3/min)	10.84 (383)	11.11 (392)
		Me	Cool	m^3/min (ft^3/min)	11.09 (392)	11.59 (409)
			Heat	m^3/min (ft^3/min)	12.01 (424)	12.86 (454)
		Hi	Cool	m^3/min (ft^3/min)	13.40 (475)	14.20 (500)
			Heat	m^3/min (ft^3/min)	13.70 (485)	14.60 (515)
		SHi	Cool	m^3/min (ft^3/min)	13.96 (493)	14.72 (520)
			Heat	m^3/min (ft^3/min)	14.07 (497)	15.12 (534)
Outdoor Airflow		Hi	Cool	m^3/min (ft^3/min)	35.1 (1240)	33.3 (1175)
			Heat	m^3/min (ft^3/min)	36.0 (1270)	33.3 (1175)
Refrigeration Cycle	Control Device				Expansion Valve	Expansion Valve
	Refrigerant Oil			cm^3	FV50S (320)	FV50S (320)
	Refrigerant Type			g (oz)	R410A, 1.15k (40.6)	R410A, 1.02k (36.0)
Dimension	Height (I/D / O/D)			mm (inch)	295 (11-5/8) / 619 (24-3/8)	295 (11-5/8) / 619 (24-3/8)
	Width (I/D / O/D)			mm (inch)	870 (34-9/32) / 824 (32-15/32)	870 (34-9/32) / 824 (32-15/32)
	Depth (I/D / O/D)			mm (inch)	255 (10-1/16) / 299 (11-25/32)	255 (10-1/16) / 299 (11-25/32)
Weight	Net (I/D / O/D)			kg (lb)	10 (22) / 35 (77)	10 (22) / 33 (73)

Model			Indoor	CS-E12QKEW, CS-XE12QKEW		CS-E15PKEW	
			Outdoor	CU-E12QKE		CU-E15QKE	
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)	5.0 (16.4)		5.0 (16.4)	
	Length range (min – max)		m (ft)	3 (9.8) ~ 15 (49.2)		3 (9.8) ~ 15 (49.2)	
	I/D & O/D Height different		m (ft)	15.0 (49.2)		15.0 (49.2)	
	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 × 17 × 21		2 × 17 × 21	
	Size (W × H × L)		mm	636.5 × 357 × 25.4		636.5 × 357 × 25.4	
Outdoor Heat Exchanger	Fin Material			Aluminium		Aluminium	
	Fin Type			Corrugated Fin		Corrugated Fin	
	Row × Stage × FPI			2 × 28 × 17		2 × 28 × 17	
	Size (W × H × L)		mm	36.38 × 588 × 781.3:752.7		36.38 × 588 × 606.6	
Air Filter	Material			Polypropelene		Polypropelene	
	Type			One-touch		One-touch	
Power Supply				Indoor		Indoor	
Power Supply Cord			A	Nil		Nil	
Thermostat				Electronic Contol		Electronic Contol	
Protection Device				Electronic Contol		Electronic Contol	
				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	-10	–	-10	–
		Heating	Maximum °C	24	18	24	18
			Minimum °C	-15	-16	-15	-16

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. Heating low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor 2/1°C
4. Heating extreme low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor -7/-8°C
5. Standby power consumption ≤10.0w (when switched OFF by remote control, except under self protection control).
6. Specifications are subjected to change without prior notice for further improvement.

Model			Indoor	CS-E18QKEW, CS-XE18QKEW			CS-E21QKEW		
			Outdoor	CU-E18QKE			CU-E21QKE		
Performance Test Condition				EUROVENT			EUROVENT		
Power Supply			Phase, Hz	Single, 50			Single, 50		
			V	230			230		
				Min.	Mid.	Max.	Min.	Mid.	Max.
Cooling	Capacity		kW	0.98	5.00	6.00	0.98	6.30	7.10
			BTU/h	3340	17100	20500	3340	21500	24200
			Kcal/h	840	4300	5160	840	5420	6110
	Running Current		A	–	6.4	–	–	9.7	–
	Input Power		W	280	1.44k	1.99k	280	2.18k	2.50k
	Annual Consumption		kWh	–	720	–	–	1090	–
	EER		W/W	3.50	3.47	3.02	3.50	2.89	2.84
			BTU/hW	11.93	11.88	10.30	11.93	9.86	9.68
			Kcal/hW	3.00	2.99	2.59	3.00	2.49	2.44
	ErP	Pdesign	kW	5.0			6.3		
		SEER	(W/W)	6.9			6.5		
		Annual Consumption	kWh	254			339		
		Class		A++			A++		
	Power Factor		%	–	98	–	–	98	–
	Indoor Noise (H / L / QLo)		dB-A	44 / 37 / 34			45 / 37 / 34		
			Power Level dB	60 / –			61 / –		
	Outdoor Noise (H / L)		dB-A	47 / –			48 / –		
			Power Level dB	61 / –			62 / –		
Heating	Capacity		kW	0.98	5.80	8.00	0.98	7.20	8.50
			BTU/h	3340	19800	27300	3340	24600	29000
			Kcal/h	840	4990	6880	840	6190	7310
	Running Current		A	–	6.8	–	–	9.4	–
	Input Power		W	340	1.52k	2.57k	340	2.09k	2.73k
	COP		W/W	2.88	3.82	3.11	2.88	3.44	3.11
			BTU/hW	9.82	13.03	10.62	9.82	11.77	10.62
			Kcal/hW	2.47	3.28	2.68	2.47	2.96	2.68
	ErP	Pdesign	kW	4.4			4.6		
		Tbivalent	°C	-10			-10		
		SCOP	(W/W)	4.2			4.0		
		Annual Consumption	kWh	1467			1610		
		Class		A+			A+		
	Power Factor		%	–	97	–	–	97	–
	Indoor Noise (H / L / QLo)		dB-A	44 / 37 / 34			45 / 37 / 34		
			Power Level dB	60 / –			61 / –		
	Outdoor Noise (H / L)		dB-A	47 / –			49 / –		
			Power Level dB	61 / –			63 / –		
Low Temp. : Capacity (kW) / I.Power (W) / COP				5.80 / 2.27k / 2.56			6.16 / 2.42k / 2.55		
Extr Low Temp. : Capacity (kW) / I.Power (W) / COP				4.98 / 2.39k / 2.08			5.24 / 2.52k / 2.08		
Max Current (A) / Max Input Power (W)				11.3 / 2.57k			11.9 / 2.73k		
Starting Current (A)				6.8			9.7		

Model				Indoor	CS-E18QKEW, CS-XE18QKEW	CS-E21QKEW
				Outdoor	CU-E18QKE	CU-E21QKE
Compressor	Type				Hermetic Motor (Rotary)	Hermetic Motor (Rotary)
	Motor Type				Brushless (4 poles)	Brushless (4 poles)
	Output Power			W	900	900
Indoor Fan	Type				Cross-Flow Fan	Cross-Flow Fan
	Material				ASG33	ASG33
	Motor Type				DC / Transistor (8-poles)	DC / Transistor (8-poles)
	Input Power			W	80.0	80.0
	Output Power			W	40	40
	Speed	QLo	Cool	rpm	880	880
			Heat	rpm	860	860
		Lo	Cool	rpm	940	940
			Heat	rpm	970	970
		Me	Cool	rpm	1030	1050
			Heat	rpm	1100	1170
		Hi	Cool	rpm	1130	1160
			Heat	rpm	1240	1380
		SHi	Cool	rpm	1260	1290
			Heat	rpm	1300	1420
Outdoor Fan	Type				Propeller Fan	Propeller Fan
	Material				PP	PP
	Motor Type				DC (8-poles)	DC (8-poles)
	Input Power			W	–	–
	Output Power			W	40	40
	Speed	Hi	Cool	rpm	640	700
			Heat	rpm	640	680
Moisture Removal				L/h (Pt/h)	2.8 (5.9)	3.5 (7.4)
Indoor Airflow		QLo	Cool	m^3/min (ft^3/min)	14.03 (495)	14.03 (495)
			Heat	m^3/min (ft^3/min)	13.68 (483)	12.01 (424)
		Lo	Cool	m^3/min (ft^3/min)	15.08 (532)	15.08 (532)
			Heat	m^3/min (ft^3/min)	15.60 (551)	13.70 (484)
		Me	Cool	m^3/min (ft^3/min)	16.83 (594)	17.00 (600)
			Heat	m^3/min (ft^3/min)	17.53 (619)	16.85 (595)
		Hi	Cool	m^3/min (ft^3/min)	17.9 (630)	18.9 (670)
			Heat	m^3/min (ft^3/min)	19.3 (680)	20.0 (705)
		SHi	Cool	m^3/min (ft^3/min)	19.00 (671)	21.20 (749)
			Heat	m^3/min (ft^3/min)	20.30 (717)	20.61 (728)
Outdoor Airflow		Hi	Cool	m^3/min (ft^3/min)	39.2 (1385)	41.7 (1470)
			Heat	m^3/min (ft^3/min)	37.9 (1340)	40.4 (1425)
Refrigeration Cycle	Control Device				Expansion Valve	Expansion Valve
	Refrigerant Oil			cm^3	FV50S (450)	FV50S (450)
	Refrigerant Type			g (oz)	R410A, 1.24k (43.8)	R410A, 1.32k (46.6)
Dimension	Height (I/D / O/D)			mm (inch)	295 (11-5/8) / 695 (27-3/8)	295 (11-5/8) / 695 (27-3/8)
	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)	255 (10-1/16) / 320 (12-5/8)	255 (10-1/16) / 320 (12-5/8)
Weight	Net (I/D / O/D)			kg (lb)	13 (29) / 46 (101)	13 (29) / 47 (104)

Model			Indoor	CS-E18QKEW, CS-XE18QKEW		CS-E21QKEW	
			Outdoor	CU-E18QKE		CU-E21QKE	
Piping	Pipe Diameter (Liquid / Gas)		mm (inch)	6.35 (1/4) / 12.70 (1/2)		6.35 (1/4) / 12.70 (1/2)	
	Standard length		m (ft)	5.0 (16.4)		5.0 (16.4)	
	Length range (min – max)		m (ft)	3 (9.8) ~ 20 (65.6)		3 (9.8) ~ 20 (65.6)	
	I/D & O/D Height different		m (ft)	15.0 (49.2)		15.0 (49.2)	
	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 × 17 × 17		2 × 17 × 17	
	Size (W × H × L)		mm	836.5 × 357 × 25.4		836.5 × 357 × 25.4	
Outdoor Heat Exchanger	Fin Material			Aluminium		Aluminium	
	Fin Type			Corrugated Fin (Pre Coat)		Corrugated Fin (Pre Coat)	
	Row × Stage × FPI			2 × 31 × 19		2 × 31 × 19	
	Size (W × H × L)		mm	36.4 × 651 × 854.5:824.5		36.4 × 651 × 854.5:824.5	
Air Filter	Material			Polypropelene		Polypropelene	
	Type			One-touch		One-touch	
Power Supply				Indoor		Indoor	
Power Supply Cord			A	Nil		Nil	
Thermostat				Electronic Contol		Electronic Contol	
Protection Device				Electronic Contol		Electronic Contol	
				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	-10	–	-10	–
		Heating	Maximum °C	24	18	24	18
			Minimum °C	-15	-16	-15	-16

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. Heating low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor 2/1°C
4. Heating extreme low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor -7/-8°C
5. Standby power consumption ≤10.0w (when switched OFF by remote control, except under self protection control).
6. Specifications are subjected to change without prior notice for further improvement.

Model			Indoor	CS-E24QKEW			CS-E28QKES		
			Outdoor	CU-E24QKE			CU-E28QKE		
Performance Test Condition				EUROVENT			EUROVENT		
Power Supply			Phase, Hz	Single, 50			Single, 50		
			V	230			230		
				Min.	Mid.	Max.	Min.	Mid.	Max.
Cooling	Capacity		kW	0.98	6.80	8.10	0.98	7.65	8.60
			BTU/h	3340	23200	27600	3340	26100	29300
			Kcal/h	840	5850	6970	840	6580	7400
	Running Current		A	-	9.5	-	-	11.5	-
	Input Power		W	380	2.08k	2.65k	380	2.52k	2.92k
	Annual Consumption		kWh	-	1040	-	-	1260	-
	EER		W/W	2.58	3.27	3.06	2.58	3.04	2.95
			BTU/hW	8.79	11.15	10.42	8.79	10.36	10.03
			Kcal/hW	2.21	2.81	2.63	2.21	2.61	2.53
	ErP	Pdesign	kW	6.8			7.7		
		SEER	(W/W)	6.1			6.0		
		Annual Consumption	kWh	390			449		
		Class		A++			A+		
	Power Factor		%	–	95	–	–	95	–
	Indoor Noise (H / L / QLo)		dB-A	47 / 38 / 35			49 / 38 / 35		
			Power Level dB	63 / –			65 / –		
	Outdoor Noise (H / L)		dB-A	52 / –			53 / –		
			Power Level dB	66 / –			67 / –		
Heating	Capacity		kW	0.98	8.60	9.90	0.98	9.60	11.00
			BTU/h	3340	29300	33800	3340	32700	37500
			Kcal/h	840	7400	8510	840	8260	9460
	Running Current		A	–	11.7	–	–	14.5	–
	Input Power		W	450	2.58k	3.10k	450	3.24k	3.65k
	COP		W/W	2.18	3.33	3.19	2.18	2.96	3.01
			BTU/hW	7.42	11.36	10.90	7.42	10.09	10.27
			Kcal/hW	1.87	2.87	2.75	1.87	2.55	2.59
	ErP	Pdesign	kW	5.5			6.0		
		Tbivalent	°C	-10			-10		
		SCOP	(W/W)	3.9			3.8		
		Annual Consumption	kWh	1974			2211		
		Class		A			A		
	Power Factor		%	–	96	–	–	97	–
	Indoor Noise (H / L / QLo)		dB-A	47 / 38 / 35			48 / 38 / 35		
			Power Level dB	63 / –			64 / –		
	Outdoor Noise (H / L)		dB-A	52 / –			53 / –		
			Power Level dB	66 / –			67 / –		
Low Temp. : Capacity (kW) / I.Power (W) / COP				7.17 / 2.74k / 2.62			7.97 / 3.23k / 2.47		
Extr Low Temp. : Capacity (kW) / I.Power (W) / COP				6.13 / 2.76k / 2.22			6.77 / 3.36k / 2.01		
Max Current (A) / Max Input Power (W)				14.4 / 3.10k			15.5 / 3.65k		
Starting Current (A)				11.70			14.50		

Model				Indoor	CS-E24QKEW	CS-E28QKES
				Outdoor	CU-E24QKE	CU-E28QKE
Compressor						
	Type				Hermetic Motor (Rotary)	Hermetic Motor (Rotary)
	Motor Type				Brushless (4 poles)	Brushless (4 poles)
	Output Power			W	1.7k	1.7k
Indoor Fan						
	Type				Cross-Flow Fan	Cross-Flow Fan
	Material				ASG33	ASG33
	Motor Type				DC / Transistor (8-poles)	DC / Transistor (8-poles)
	Input Power			W	104.0	104.0
	Output Power			W	40	40
	Speed	QLo	Cool	rpm	880	880
			Heat	rpm	990	990
		Lo	Cool	rpm	1020	1020
			Heat	rpm	1100	1100
		Me	Cool	rpm	1140	1180
			Heat	rpm	1230	1250
		Hi	Cool	rpm	1270	1350
			Heat	rpm	1360	1400
		SHi	Cool	rpm	1340	1390
			Heat	rpm	1400	1430
Outdoor Fan						
	Type				Propeller Fan	Propeller Fan
	Material				PP	PP
	Motor Type				DC (8-poles)	DC (8-poles)
	Input Power			W	–	–
	Output Power			W	60	60
	Speed	Hi	Cool	rpm	660	690
			Heat	rpm	640	650
Moisture Removal				L/h (Pt/h)	3.9 (8.2)	4.5 (9.5)
Indoor Airflow		QLo	Cool	m^3/min (ft^3/min)	13.13 (464)	13.40 (473)
			Heat	m^3/min (ft^3/min)	15.20 (537)	15.20 (537)
		Lo	Cool	m^3/min (ft^3/min)	15.52 (548)	15.70 (554)
			Heat	m^3/min (ft^3/min)	17.00 (600)	17.00 (600)
		Me	Cool	m^3/min (ft^3/min)	17.66 (624)	18.50 (653)
			Heat	m^3/min (ft^3/min)	19.10 (674)	19.40 (685)
		Hi	Cool	m^3/min (ft^3/min)	19.8 (700)	21.1 (745)
			Heat	m^3/min (ft^3/min)	21.2 (750)	21.9 (775)
		SHi	Cool	m^3/min (ft^3/min)	21.00 (742)	21.7 (767)
			Heat	m^3/min (ft^3/min)	21.90 (775)	22.4 (790)
Outdoor Airflow		Hi	Cool	m^3/min (ft^3/min)	50.2 (1770)	54.5 (1925)
			Heat	m^3/min (ft^3/min)	50.2 (1770)	54.5 (1925)
Refrigeration Cycle	Control Device				Expansion Valve	Expansion Valve
	Refrigerant Oil			cm^3	FV50S (800)	FV50S (800)
	Refrigerant Type			g (oz)	R410A, 1.80k (63.5)	R410A, 1.80k (63.5)
Dimension	Height (I/D / O/D)			mm (inch)	295 (11-5/8) / 795 (31-5/16)	295 (11-5/8) / 795 (31-5/16)
	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)	255 (10-1/16) / 320 (12-5/8)	255 (10-1/16) / 320 (12-5/8)
Weight	Net (I/D / O/D)			kg (lb)	13 (29) / 67 (148)	13 (29) / 67 (148)

Model			Indoor	CS-E24QKEW		CS-E28QKES	
			Outdoor	CU-E24QKE		CU-E28QKE	
Piping	Pipe Diameter (Liquid / Gas)		mm (inch)	6.35 (1/4) / 15.88 (5/8)		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) ~ 30 (98.4)		3 (9.8) ~ 30 (98.4)	
	I/D & O/D Height different		m (ft)	20.0 (65.6)		20.0 (65.6)	
	Additional Gas Amount		g/m (oz/ft)	30 (0.3)		30 (0.3)	
	Length for Additional Gas		m (ft)	10 (32.8)		10 (32.8)	
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 × 17 × 21		2 × 17 × 21	
	Size (W × H × L)		mm	836.5 × 357 × 25.4		836.5 × 357 × 25.4	
Outdoor Heat Exchanger	Fin Material			Aluminium (Pre Coat)		Aluminium (Pre Coat)	
	Fin Type			Corrugated Fin		Corrugated Fin	
	Row × Stage × FPI			2 × 30 × 19		2 × 30 × 19	
	Size (W × H × L)		mm	38.1 × 762 × 895.8:865.8		38.1 × 762 × 895.8:865.8	
Air Filter	Material			Polypropelene		Polypropelene	
	Type			One-touch		One-touch	
Power Supply				Indoor		Indoor	
Power Supply Cord			A	Nil		Nil	
Thermostat				Electronic Contol		Electronic Contol	
Protection Device				Electronic Contol		Electronic Contol	
				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	-10	–	-10	–
		Heating	Maximum °C	24	18	24	18
			Minimum °C	-15	-16	-15	-16

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. Heating low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor 2/1°C
4. Heating extreme low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor -7/-8°C
5. Standby power consumption ≤10.0w (when switched OFF by remote control, except under self protection control).
6. Specifications are subjected to change without prior notice for further improvement.

- **Multi Split Combination Possibility:**
  - A single outdoor unit enables air conditioning of up to two separate rooms for CU-2E15PBE, CU-2E18PBE.
  - A single outdoor unit enables air conditioning of up to three separate rooms for CU-3E18PBE.
  - A single outdoor unit enables air conditioning of up to four separate rooms for CU-4E23PBE, CU-4E27PBE.

CONNECTABLE INDOOR UNIT			OUTDOOR UNIT													
			CU-2E15PBE		CU-2E18PBE		CU-3E18PBE			CU-4E23PBE				CU-4E27PBE			
ROOM			A	B	A	B	A	B	C	A	B	C	D	A	B	C	D
TYPE																	
Wall	2.0kW	CS-E7QKE CS-XE7QKEW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	2.5kW	CS-E9QKE CS-XE9QKEW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3.0kW	CS-E12QKE CS-XE12QKEW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3.2kW	CS-E15QKE	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●
	5.0kW	CS-E18QKE CS-XE18QKEW	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●
	6.0kW	CS-E21QKE	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–
Capacity range of connectable indoor units			From 4.0kW to 5.6kW		From 4.0kW to 6.4kW					From 4.5kW to 9.0kW				From 4.5kW to 11.0 kW			
Pipe length	1 room maximum pipe length (m)		20		20					25				25			
	Allowable elevation (m)		10		10					10				15			
	Total allowable pipe length (m)		30		30					50				60			
	Total pipe length for maximum chargeless length (m)		20		20					30				30			
	Additional gas amount over chargeless length (g/m)		20		20					20				20			

Note: "●" : Available

Remarks for CU-2E15PBE / CU-2E18PBE

1. At least two indoor units must be connected.
2. The total nominal cooling capacity of indoor unit that will be connected to outdoor unit must be within connectable capacity range of indoor unit. (as shown in the table above)
   Example: The indoor units' combination below is possible to connect to CU-2E15PBE. (Total nominal capacity of indoor units is between 4.0kW to 5.6kW)
   1) Two CS-E7QKEW only. (Total nominal cooling capacity is 4.0kW)
   2) One CS-E7QKEW and one CS-E9QKEW. (Total nominal cooling capacity is 4.5kW)

Remarks for CU-3E18PBE / CU-4E23PBE / CU-4E27PBE

1. At least two indoor units must be connected.
2. The total nominal cooling capacity of indoor unit that will be connected to outdoor unit must be within connectable capacity range of indoor unit. (as shown in the table above)
   Example: The indoor units' combination below is possible to connect to CU-3E18PBE. (Total nominal capacity of indoor units is between 4.5kW to 9.0kW)
   1) Two CS-E9QKEW only. (Total nominal cooling capacity is 5.0kW)
   2) Three CS-E12QKEW. (Total nominal cooling capacity is 9.6kW)

- **Multi Split Combination Possibility:**
  - A single outdoor unit enables air conditioning of up to four separate rooms for CU-4E27PBE.
  - A single outdoor unit enables air conditioning of up to five separate rooms for CU-5E34PBE.

CONNECTABLE INDOOR UNIT			OUTDOOR UNIT								
			CU-4E27PBE				CU-5E34PBE				
ROOM			A	B	C	D	A	B	C	D	E
TYPE											
Wall	2.0kW	CS-E7QKEW CS-XE7QKEW	●	●	●	●	●	●	●	●	●
	2.5kW	CS-E9QKEW CS-XE9QKEW	●	●	●	●	●	●	●	●	●
	3.2kW	CS-E12QKEW CS-XE12QKEW	●	●	●	●	●	●	●	●	●
	4.0kW	CS-E15QKEW	●	●	●	●	●	●	●	●	●
	5.0kW	CS-E18QKEW CS-XE18QKEW	●	●	●	●	●	●	●	●	●
	6.0kW	CS-E21QKEW	●	●	●	●	●	●	●	●	●
	7.0kW	CS-E24QKEW	●	●	●	●	●	●	●	●	●
Capacity range of connectable indoor units			From 4.5kW to 13.6kW				From 4.5kW to 17.5kW				
Pipe length	1 room maximum pipe length (m)		25				25				
	Allowable elevation (m)		15				15				
	Total allowable pipe length (m)		70				80				
	Total pipe length for maximum chargeless length (m)		45				45				
	Additional gas amount over chargeless length (g/m)		20				20				

Note: "●" : Available

Remarks for CU-4E27PBE / CU-5E34PBE

1. At least two indoor units must be connected.
2. The total nominal cooling capacity of indoor unit that will be connected to outdoor unit must be within connectable capacity range of indoor unit. (as shown in the table above)
   Example: The indoor units' combination below is possible to connect to CU-4E27PBE. (Total nominal capacity of indoor units is between 4.5kW to 13.6kW)
   1) Two CS-E9QKEW only. (Total nominal cooling capacity is 5.0kW)
   2) Three CS-E12QKEW. (Total nominal cooling capacity is 9.6kW)

- **Indoor Unit : CS-E7/9/12QKEW**
- **Outdoor Unit : CU-2E15PBE**

2Room		1Room	
Indoor Unit Capacity (kW)	**Total Indoor Capacity (kW)**	**Indoor Unit Capacity (kW)**	**Total Indoor Capacity (kW)**
1.6+1.6	3.2	1.6	1.6
1.6+2.0	3.6	2.0	2.0
1.6+2.5	4.1	2.5	2.5
1.6+2.8	4.4	2.8	2.8
1.6+3.2	4.8	3.2	3.2
2.0+2.0	4.0		
2.0+2.5	4.5		
2.0+2.8	4.8		
2.0+3.2	5.2		
2.5+2.5	5.0		
2.5+2.8	5.3		
2.8+2.8	5.6		

- **Indoor Unit : CS-E7/9/12QKEW**
- **Outdoor Unit : CU-2E18PBE**

2Room		1Room	
Indoor Unit Capacity (kW)	**Total Indoor Capacity (kW)**	**Indoor Unit Capacity (kW)**	**Total Indoor Capacity (kW)**
1.6+1.6	3.2	1.6	1.6
1.6+2.0	3.6	2.0	2.0
1.6+2.5	4.1	2.5	2.5
1.6+2.8	4.4	2.8	2.8
1.6+3.2	4.8	3.2	3.2
2.0+2.0	4.0		
2.0+2.5	4.5		
2.0+2.8	4.8		
2.0+3.2	5.2		
2.5+2.5	5.0		
2.5+2.8	5.3		
2.5+3.2	5.7		
2.8+2.8	5.6		
2.8+3.2	6.0		
3.2+3.2	6.4		

- Cooling capacities are based on indoor temperature of 8.0°F DRY BULB, 67°F WET BULB and outdoor air temperature of 9.5°F DRY BULB, 7.5°F WET BULB.
- Specifications are subject to change without notice for further improvement.

- **Indoor Unit : CS-E7/9/12/15/18QKEW**
- **Outdoor Unit : CU-3E18PBE**

3Room		2Room		1Room	
Indoor Unit Capacity (kW)	**Total Indoor Capacity (kW)**	**Indoor Unit Capacity (kW)**	**Total Indoor Capacity (kW)**	**Indoor Unit Capacity (kW)**	**Total Indoor Capacity (kW)**
1.6+1.6+1.6	4.8	1.6+1.6	3.2	1.6	1.6
1.6+1.6+2.0	5.2	1.6+2.0	3.6	2.0	2.0
1.6+1.6+2.5	5.7	1.6+2.5	4.1	2.5	2.5
1.6+1.6+2.8	6.0	1.6+2.8	4.4	2.8	2.8
1.6+1.6+3.2	6.4	1.6+3.2	4.8	3.2	3.2
1.6+1.6+4.0	7.2	1.6+4.0	5.6	4.0	4.0
1.6+1.6+5.0	8.2	1.6+5.0	6.6	5.0	5.0
1.6+2.0+2.0	5.6	2.0+2.0	4.0		
1.6+2.0+2.5	6.1	2.0+2.5	4.5		
1.6+2.0+2.8	6.4	2.0+2.8	4.8		
1.6+2.0+3.2	6.8	2.0+3.2	5.2		
1.6+2.0+4.0	7.6	2.0+4.0	6.0		
1.6+2.0+5.0	8.6	2.0+5.0	7.0		
1.6+2.5+2.5	6.6	2.5+2.5	5.0		
1.6+2.5+2.8	6.9	2.5+2.8	5.3		
1.6+2.5+3.2	7.3	2.5+3.2	5.7		
1.6+2.5+4.0	8.1	2.5+4.0	6.5		
1.6+2.8+2.8	7.2	2.5+5.0	7.5		
1.6+2.8+3.2	7.6	2.8+2.8	5.6		
1.6+2.8+4.0	8.4	2.8+3.2	6.0		
1.6+3.2+3.2	8.0	2.8+4.0	6.8		
1.6+3.2+4.0	8.8	2.8+5.0	7.8		
2.0+2.0+2.0	6.0	3.2+3.2	6.4		
2.0+2.0+2.5	6.5	3.2+4.0	7.2		
2.0+2.0+2.8	6.8	3.2+5.0	8.2		
2.0+2.0+3.2	7.2	4.0+4.0	8.0		
2.0+2.0+4.0	8.0	4.0+5.0	9.0		
2.0+2.0+5.0	9.0				
2.0+2.5+2.5	7.0				
2.0+2.5+2.8	7.3				
2.0+2.5+3.2	7.7				
2.0+2.5+4.0	8.5				
2.0+2.8+2.8	7.6				
2.0+2.8+3.2	8.0				
2.0+2.8+4.0	8.8				
2.0+3.2+3.2	8.4				
2.5+2.5+2.5	7.5				
2.5+2.5+2.8	7.8				
2.5+2.5+3.2	8.2				
2.5+2.5+4.0	9.0				
2.5+2.8+2.8	8.1				
2.5+2.8+3.2	8.5				
2.5+3.2+3.2	8.9				
2.8+2.8+2.8	8.4				
2.8+2.8+3.2	8.8				

- Cooling capacities are based on indoor temperature of 8.0°F DRY BULB, 67°F WET BULB and outdoor air temperature of 9.5°F DRY BULB, 7.5°F WET BULB.
- Specifications are subject to change without notice for further improvement.

- **Indoor Unit : CS-E7/9/12/15/18/21QKEW**
- **Outdoor Unit : CU-4E23PBE**

4Room		3Room		2Room		1Room	
Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)	Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)	Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)	Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)
1.6+1.6+1.6+1.6	6.4	1.6+1.6+1.6	4.8	1.6+1.6	3.2	1.6	1.6
1.6+1.6+1.6+2.0	6.8	1.6+1.6+2.0	5.2	1.6+2.0	3.6	2.0	2.0
1.6+1.6+1.6+2.5	7.3	1.6+1.6+2.5	5.7	1.6+2.5	4.1	2.5	2.5
1.6+1.6+1.6+2.8	7.6	1.6+1.6+2.8	6.0	1.6+2.8	4.4	2.8	2.8
1.6+1.6+1.6+3.2	8.0	1.6+1.6+3.2	6.4	1.6+3.2	4.8	3.2	3.2
1.6+1.6+1.6+4.0	8.8	1.6+1.6+4.0	7.2	1.6+4.0	5.6	4.0	4.0
1.6+1.6+1.6+5.0	9.8	1.6+1.6+5.0	8.2	1.6+5.0	6.6	5.0	5.0
1.6+1.6+1.6+6.0	10.8	1.6+1.6+6.0	9.2	1.6+6.0	7.6	6.0	6.0
1.6+1.6+2.0+2.0	7.2	1.6+2.0+2.0	5.6	2.0+2.0	4.0		
1.6+1.6+2.0+2.5	7.7	1.6+2.0+2.5	6.1	2.0+2.5	4.5		
1.6+1.6+2.0+2.8	8.0	1.6+2.0+2.8	6.4	2.0+2.8	4.8		
1.6+1.6+2.0+3.2	8.4	1.6+2.0+3.2	6.8	2.0+3.2	5.2		
1.6+1.6+2.0+4.0	9.2	1.6+2.0+4.0	7.6	2.0+4.0	6.0		
1.6+1.6+2.0+5.0	10.2	1.6+2.0+5.0	8.6	2.0+5.0	7.0		
1.6+1.6+2.5+2.5	8.2	1.6+2.0+6.0	9.6	2.0+6.0	8.0		
1.6+1.6+2.5+2.8	8.5	1.6+2.5+2.5	6.6	2.5+2.5	5.0		
1.6+1.6+2.5+3.2	8.9	1.6+2.5+2.8	6.9	2.5+2.8	5.3		
1.6+1.6+2.5+4.0	9.7	1.6+2.5+3.2	7.3	2.5+3.2	5.7		
1.6+1.6+2.5+5.0	10.7	1.6+2.5+4.0	8.1	2.5+4.0	6.5		
1.6+1.6+2.8+2.8	8.8	1.6+2.5+5.0	9.1	2.5+5.0	7.5		
1.6+1.6+2.8+3.2	9.2	1.6+2.5+6.0	10.1	2.5+6.0	8.5		
1.6+1.6+2.8+4.0	10.0	1.6+2.8+2.8	7.2	2.8+2.8	5.6		
1.6+1.6+2.8+5.0	11.0	1.6+2.8+3.2	7.6	2.8+3.2	6.0		
1.6+1.6+3.2+3.2	9.6	1.6+2.8+4.0	8.4	2.8+4.0	6.8		
1.6+1.6+3.2+4.0	10.4	1.6+2.8+5.0	9.4	2.8+5.0	7.8		
1.6+2.0+2.0+2.0	7.6	1.6+2.8+6.0	10.4	2.8+6.0	8.8		
1.6+2.0+2.0+2.5	8.1	1.6+3.2+3.2	8.0	3.2+3.2	6.4		
1.6+2.0+2.0+2.8	8.4	1.6+3.2+4.0	8.8	3.2+4.0	7.2		
1.6+2.0+2.0+3.2	8.8	1.6+3.2+5.0	9.8	3.2+5.0	8.2		
1.6+2.0+2.0+4.0	9.6	1.6+3.2+6.0	10.8	3.2+6.0	9.2		
1.6+2.0+2.0+5.0	10.6	1.6+4.0+4.0	9.6	4.0+4.0	8.0		
1.6+2.0+2.5+2.5	8.6	1.6+4.0+5.0	10.6	4.0+5.0	9.0		
1.6+2.0+2.5+2.8	8.9	2.0+2.0+2.0	6.0	4.0+6.0	10.0		
1.6+2.0+2.5+3.2	9.3	2.0+2.0+2.5	6.5	5.0+5.0	10.0		
1.6+2.0+2.5+4.0	10.1	2.0+2.0+2.8	6.8	5.0+6.0	11.0		
1.6+2.0+2.8+2.8	9.2	2.0+2.0+3.2	7.2				
1.6+2.0+2.8+3.2	9.6	2.0+2.0+4.0	8.0				
1.6+2.0+2.8+4.0	10.4	2.0+2.0+5.0	9.0				
1.6+2.0+3.2+3.2	10.0	2.0+2.0+6.0	10.0				
1.6+2.0+3.2+4.0	10.8	2.0+2.5+2.5	7.0				
1.6+2.5+2.5+2.5	9.1	2.0+2.5+2.8	7.3				
1.6+2.5+2.5+2.8	9.4	2.0+2.5+3.2	7.7				
1.6+2.5+2.5+3.2	9.8	2.0+2.5+4.0	8.5				
1.6+2.5+2.5+4.0	10.6	2.0+2.5+5.0	9.5				
1.6+2.5+2.8+2.8	9.7	2.0+2.5+6.0	10.5				
1.6+2.5+2.8+3.2	10.1	2.0+2.8+2.8	7.6				
1.6+2.5+2.8+4.0	10.9	2.0+2.8+3.2	8.0				
1.6+2.5+3.2+3.2	10.5	2.0+2.8+4.0	8.8				
1.6+2.8+2.8+2.8	10.0	2.0+2.8+5.0	9.8				
1.6+2.8+2.8+3.2	10.4	2.0+2.8+6.0	10.8				
1.6+2.8+3.2+3.2	10.8	2.0+3.2+3.2	8.4				
2.0+2.0+2.0+2.0	8.0	2.0+3.2+4.0	9.2				
2.0+2.0+2.0+2.5	8.5	2.0+3.2+5.0	10.2				
2.0+2.0+2.0+2.8	8.8	2.0+4.0+4.0	10.0				
2.0+2.0+2.0+3.2	9.2	2.0+4.0+5.0	11.0				
2.0+2.0+2.0+4.0	10.0	2.5+2.5+2.5	7.5				
2.0+2.0+2.0+5.0	11.0	2.5+2.5+2.8	7.8				
2.0+2.0+2.5+2.5	9.0	2.5+2.5+3.2	8.2				
2.0+2.0+2.5+2.8	9.3	2.5+2.5+4.0	9.0				
2.0+2.0+2.5+3.2	9.7	2.5+2.5+5.0	10.0				
2.0+2.0+2.5+4.0	10.5	2.5+2.5+6.0	11.0				
2.0+2.0+2.8+2.8	9.6	2.5+2.8+2.8	8.1				
2.0+2.0+2.8+3.2	10.0	2.5+2.8+3.2	8.5				
2.0+2.0+2.8+4.0	10.8	2.5+2.8+4.0	9.3				
2.0+2.0+3.2+3.2	10.4	2.5+2.8+5.0	10.3				
2.0+2.5+2.5+2.5	9.5	2.5+3.2+3.2	8.9				
2.0+2.5+2.5+2.8	9.8	2.5+3.2+4.0	9.7				
2.0+2.5+2.5+3.2	10.2	2.5+3.2+5.0	10.7				
2.0+2.5+2.5+4.0	11.0	2.5+4.0+4.0	10.5				
2.0+2.5+2.8+2.8	10.1	2.8+2.8+2.8	8.4				

2.0+2.5+2.8+3.2	10.5	2.8+2.8+3.2	8.8				
2.0+2.5+3.2+3.2	10.9	2.8+2.8+4.0	9.6				
2.0+2.8+2.8+2.8	10.4	2.8+2.8+5.0	10.6				
2.0+2.8+2.8+3.2	10.8	2.8+3.2+3.2	9.2				
2.5+2.5+2.5+2.5	10.0	2.8+3.2+4.0	10.0				
2.5+2.5+2.5+2.8	10.3	2.8+3.2+5.0	11.0				
2.5+2.5+2.5+3.2	10.7	2.8+4.0+4.0	10.8				
2.5+2.5+2.8+2.8	10.6	3.2+3.2+3.2	9.6				
2.5+2.5+2.8+3.2	11.0	3.2+3.2+4.0	10.4				
2.5+2.8+2.8+2.8	10.9						

- **Indoor Unit : CS-E7/9/12/15/18/21/24QKEW**
- **Outdoor Unit : CU-4E27PBE**

4Room		3Room		2Room		1Room	
Indoor Unit Capacity (kW)	**Total Indoor Capacity (kW)**	**Indoor Unit Capacity (kW)**	**Total Indoor Capacity (kW)**	**Indoor Unit Capacity (kW)**	**Total Indoor Capacity (kW)**	**Indoor Unit Capacity (kW)**	**Total Indoor Capacity (kW)**
1.6+1.6+1.6+1.6	6.4	1.6+1.6+1.6	4.8	1.6+1.6	3.2	1.6	1.6
1.6+1.6+1.6+2.0	6.8	1.6+1.6+2.0	5.2	1.6+2.0	3.6	2.0	2.0
1.6+1.6+1.6+2.5	7.3	1.6+1.6+2.5	5.7	1.6+2.5	4.1	2.5	2.5
1.6+1.6+1.6+2.8	7.6	1.6+1.6+2.8	6.0	1.6+2.8	4.4	2.8	2.8
1.6+1.6+1.6+3.2	8.0	1.6+1.6+3.2	6.4	1.6+3.2	4.8	3.2	3.2
1.6+1.6+1.6+4.0	8.8	1.6+1.6+4.0	7.2	1.6+4.0	5.6	4.0	4.0
1.6+1.6+1.6+5.0	9.8	1.6+1.6+5.0	8.2	1.6+5.0	6.6	5.0	5.0
1.6+1.6+1.6+6.0	10.8	1.6+1.6+6.0	9.2	1.6+6.0	7.6	6.0	6.0
1.6+1.6+1.6+7.0	11.8	1.6+1.6+7.0	10.2	1.6+7.0	8.6	7.0	7.0
1.6+1.6+2.0+2.0	7.2	1.6+2.0+2.0	5.6	2.0+2.0	4.0		
1.6+1.6+2.0+2.5	7.7	1.6+2.0+2.5	6.1	2.0+2.5	4.5		
1.6+1.6+2.0+2.8	8.0	1.6+2.0+2.8	6.4	2.0+2.8	4.8		
1.6+1.6+2.0+3.2	8.4	1.6+2.0+3.2	6.8	2.0+3.2	5.2		
1.6+1.6+2.0+4.0	9.2	1.6+2.0+4.0	7.6	2.0+4.0	6.0		
1.6+1.6+2.0+5.0	10.2	1.6+2.0+5.0	8.6	2.0+5.0	7.0		
1.6+1.6+2.0+6.0	11.2	1.6+2.0+6.0	9.6	2.0+6.0	8.0		
1.6+1.6+2.0+7.0	12.2	1.6+2.0+7.0	10.6	2.0+7.0	9.0		
1.6+1.6+2.5+2.5	8.2	1.6+2.5+2.5	6.6	2.5+2.5	5.0		
1.6+1.6+2.5+2.8	8.5	1.6+2.5+2.8	6.9	2.5+2.8	5.3		
1.6+1.6+2.5+3.2	8.9	1.6+2.5+3.2	7.3	2.5+3.2	5.7		
1.6+1.6+2.5+4.0	9.7	1.6+2.5+4.0	8.1	2.5+4.0	6.5		
1.6+1.6+2.5+5.0	10.7	1.6+2.5+5.0	9.1	2.5+5.0	7.5		
1.6+1.6+2.5+6.0	11.7	1.6+2.5+6.0	10.1	2.5+6.0	8.5		
1.6+1.6+2.5+7.0	12.7	1.6+2.5+7.0	11.1	2.5+7.0	9.5		
1.6+1.6+2.8+2.8	8.8	1.6+2.8+2.8	7.2	2.8+2.8	5.6		
1.6+1.6+2.8+3.2	9.2	1.6+2.8+3.2	7.6	2.8+3.2	6.0		
1.6+1.6+2.8+4.0	10.0	1.6+2.8+4.0	8.4	2.8+4.0	6.8		
1.6+1.6+2.8+5.0	11.0	1.6+2.8+5.0	9.4	2.8+5.0	7.8		
1.6+1.6+2.8+6.0	12.0	1.6+2.8+6.0	10.4	2.8+6.0	8.8		
1.6+1.6+2.8+7.0	13.0	1.6+2.8+7.0	11.4	2.8+7.0	9.8		
1.6+1.6+3.2+3.2	9.6	1.6+3.2+3.2	8.0	3.2+3.2	6.4		
1.6+1.6+3.2+4.0	10.4	1.6+3.2+4.0	8.8	3.2+4.0	7.2		
1.6+1.6+3.2+5.0	11.4	1.6+3.2+5.0	9.8	3.2+5.0	8.2		
1.6+1.6+3.2+6.0	12.4	1.6+3.2+6.0	10.8	3.2+6.0	9.2		
1.6+1.6+3.2+7.0	13.4	1.6+3.2+7.0	11.8	3.2+7.0	10.2		
1.6+1.6+4.0+4.0	11.2	1.6+4.0+4.0	9.6	4.0+4.0	8.0		
1.6+1.6+4.0+5.0	12.2	1.6+4.0+5.0	10.6	4.0+5.0	9.0		
1.6+1.6+4.0+6.0	13.2	1.6+4.0+6.0	11.6	4.0+6.0	10.0		
1.6+1.6+5.0+5.0	13.2	1.6+4.0+7.0	12.6	4.0+7.0	11.0		
1.6+2.0+2.0+2.0	7.6	1.6+5.0+5.0	11.6	5.0+5.0	10.0		
1.6+2.0+2.0+2.5	8.1	1.6+5.0+6.0	12.6	5.0+6.0	11.0		
1.6+2.0+2.0+2.8	8.4	1.6+5.0+7.0	13.6	5.0+7.0	12.0		
1.6+2.0+2.0+3.2	8.8	1.6+6.0+6.0	13.6	6.0+6.0	12.0		
1.6+2.0+2.0+4.0	9.6	2.0+2.0+2.0	6.0	6.0+7.0	13.0		
1.6+2.0+2.0+5.0	10.6	2.0+2.0+2.5	6.5				
1.6+2.0+2.0+6.0	11.6	2.0+2.0+2.8	6.8				
1.6+2.0+2.0+7.0	12.6	2.0+2.0+3.2	7.2				
1.6+2.0+2.5+2.5	8.6	2.0+2.0+4.0	8.0				
1.6+2.0+2.5+2.8	8.9	2.0+2.0+5.0	9.0				
1.6+2.0+2.5+3.2	9.3	2.0+2.0+6.0	10.0				
1.6+2.0+2.5+4.0	10.1	2.0+2.0+7.0	11.0				
1.6+2.0+2.5+5.0	11.1	2.0+2.5+2.5	7.0				
1.6+2.0+2.5+6.0	12.1	2.0+2.5+2.8	7.3				
1.6+2.0+2.5+7.0	13.1	2.0+2.5+3.2	7.7				
1.6+2.0+2.8+2.8	9.2	2.0+2.5+4.0	8.5				
1.6+2.0+2.8+3.2	9.6	2.0+2.5+5.0	9.5				
1.6+2.0+2.8+4.0	10.4	2.0+2.5+6.0	10.5				
1.6+2.0+2.8+5.0	11.4	2.0+2.5+7.0	11.5				
1.6+2.0+2.8+6.0	12.4	2.0+2.8+2.8	7.6				

1.6+2.0+2.8+7.0	13.4	2.0+2.8+3.2	8.0				
1.6+2.0+3.2+3.2	10.0	2.0+2.8+4.0	8.8				
1.6+2.0+3.2+4.0	10.8	2.0+2.8+5.0	9.8				
1.6+2.0+3.2+5.0	11.8	2.0+2.8+6.0	10.8				
1.6+2.0+3.2+6.0	12.8	2.0+2.8+7.0	11.8				
1.6+2.0+4.0+4.0	11.6	2.0+3.2+3.2	8.4				
1.6+2.0+4.0+5.0	12.6	2.0+3.2+4.0	9.2				
1.6+2.0+4.0+6.0	13.6	2.0+3.2+5.0	10.2				
1.6+2.0+5.0+5.0	13.6	2.0+3.2+6.0	11.2				
1.6+2.5+2.5+2.5	9.1	2.0+3.2+7.0	12.2				
1.6+2.5+2.5+2.8	9.4	2.0+4.0+4.0	10.0				
1.6+2.5+2.5+3.2	9.8	2.0+4.0+5.0	11.0				
1.6+2.5+2.5+4.0	10.6	2.0+4.0+6.0	12.0				
1.6+2.5+2.5+5.0	11.6	2.0+4.0+7.0	13.0				
1.6+2.5+2.5+6.0	12.6	2.0+5.0+5.0	12.0				
1.6+2.5+2.5+7.0	13.6	2.0+5.0+6.0	13.0				
1.6+2.5+2.8+2.8	9.7	2.5+2.5+2.5	7.5				
1.6+2.5+2.8+3.2	10.1	2.5+2.5+2.8	7.8				
1.6+2.5+2.8+4.0	10.9	2.5+2.5+3.2	8.2				
1.6+2.5+2.8+5.0	11.9	2.5+2.5+4.0	9.0				
1.6+2.5+2.8+6.0	12.9	2.5+2.5+5.0	10.0				
1.6+2.5+3.2+3.2	10.5	2.5+2.5+6.0	11.0				
1.6+2.5+3.2+4.0	11.3	2.5+2.5+7.0	12.0				
1.6+2.5+3.2+5.0	12.3	2.5+2.8+2.8	8.1				
1.6+2.5+3.2+6.0	13.3	2.5+2.8+3.2	8.5				
1.6+2.5+4.0+4.0	12.1	2.5+2.8+4.0	9.3				
1.6+2.5+4.0+5.0	13.1	2.5+2.8+5.0	10.3				
1.6+2.8+2.8+2.8	10.0	2.5+2.8+6.0	11.3				
1.6+2.8+2.8+3.2	10.4	2.5+2.8+7.0	12.3				
1.6+2.8+2.8+4.0	11.2	2.5+3.2+3.2	8.9				
1.6+2.8+2.8+5.0	12.2	2.5+3.2+4.0	9.7				
1.6+2.8+2.8+6.0	13.2	2.5+3.2+5.0	10.7				
1.6+2.8+3.2+3.2	10.8	2.5+3.2+6.0	11.7				
1.6+2.8+3.2+4.0	11.6	2.5+3.2+7.0	12.7				
1.6+2.8+3.2+5.0	12.6	2.5+4.0+4.0	10.5				
1.6+2.8+3.2+6.0	13.6	2.5+4.0+5.0	11.5				
1.6+2.8+4.0+4.0	12.4	2.5+4.0+6.0	12.5				
1.6+2.8+4.0+5.0	13.4	2.5+4.0+7.0	13.5				
1.6+3.2+3.2+3.2	11.2	2.5+5.0+5.0	12.5				
1.6+3.2+3.2+4.0	12.0	2.5+5.0+6.0	13.5				
1.6+3.2+3.2+5.0	13.0	2.8+2.8+2.8	8.4				
1.6+3.2+4.0+4.0	12.8	2.8+2.8+3.2	8.8				
1.6+4.0+4.0+4.0	13.6	2.8+2.8+4.0	9.6				
2.0+2.0+2.0+2.0	8.0	2.8+2.8+5.0	10.6				
2.0+2.0+2.0+2.5	8.5	2.8+2.8+6.0	11.6				
2.0+2.0+2.0+2.8	8.8	2.8+2.8+7.0	12.6				
2.0+2.0+2.0+3.2	9.2	2.8+3.2+3.2	9.2				
2.0+2.0+2.0+4.0	10.0	2.8+3.2+4.0	10.0				
2.0+2.0+2.0+5.0	11.0	2.8+3.2+5.0	11.0				
2.0+2.0+2.0+6.0	12.0	2.8+3.2+6.0	12.0				
2.0+2.0+2.0+7.0	13.0	2.8+3.2+7.0	13.0				
2.0+2.0+2.5+2.5	9.0	2.8+4.0+4.0	10.8				
2.0+2.0+2.5+2.8	9.3	2.8+4.0+5.0	11.8				
2.0+2.0+2.5+3.2	9.7	2.8+4.0+6.0	12.8				
2.0+2.0+2.5+4.0	10.5	2.8+5.0+5.0	12.8				
2.0+2.0+2.5+5.0	11.5	3.2+3.2+3.2	9.6				
2.0+2.0+2.5+6.0	12.5	3.2+3.2+4.0	10.4				
2.0+2.0+2.5+7.0	13.5	3.2+3.2+5.0	11.4				
2.0+2.0+2.8+2.8	9.6	3.2+3.2+6.0	12.4				
2.0+2.0+2.8+3.2	10.0	3.2+3.2+7.0	13.4				
2.0+2.0+2.8+4.0	10.8	3.2+4.0+4.0	11.2				
2.0+2.0+2.8+5.0	11.8	3.2+4.0+5.0	12.2				
2.0+2.0+2.8+6.0	12.8	3.2+4.0+6.0	13.2				
2.0+2.0+3.2+3.2	10.4	3.2+5.0+5.0	13.2				
2.0+2.0+3.2+4.0	11.2	4.0+4.0+4.0	12.0				
2.0+2.0+3.2+5.0	12.2	4.0+4.0+5.0	13.0				
2.0+2.0+3.2+6.0	13.2						
2.0+2.0+4.0+4.0	12.0						
2.0+2.0+4.0+5.0	13.0						
2.0+2.5+2.5+2.5	9.5						
2.0+2.5+2.5+2.8	9.8						
2.0+2.5+2.5+3.2	10.2						
2.0+2.5+2.5+4.0	11.0						
2.0+2.5+2.5+5.0	12.0						
2.0+2.5+2.5+6.0	13.0						
2.0+2.5+2.8+2.8	10.1						
2.0+2.5+2.8+3.2	10.5						

2.0+2.5+2.8+4.0	11.3						
2.0+2.5+2.8+5.0	12.3						
2.0+2.5+2.8+6.0	13.3						
2.0+2.5+3.2+3.2	10.9						
2.0+2.5+3.2+4.0	11.7						
2.0+2.5+3.2+5.0	12.7						
2.0+2.5+4.0+4.0	12.5						
2.0+2.5+4.0+5.0	13.5						
2.0+2.8+2.8+2.8	10.4						
2.0+2.8+2.8+3.2	10.8						
2.0+2.8+2.8+4.0	11.6						
2.0+2.8+2.8+5.0	12.6						
2.0+2.8+2.8+6.0	13.6						
2.0+2.8+3.2+3.2	11.2						
2.0+2.8+3.2+4.0	12.0						
2.0+2.8+3.2+5.0	13.0						
2.0+2.8+4.0+4.0	12.8						
2.0+3.2+3.2+3.2	11.6						
2.0+3.2+3.2+4.0	12.4						
2.0+3.2+3.2+5.0	13.4						
2.0+3.2+4.0+4.0	13.2						
2.5+2.5+2.5+2.5	10.0						
2.5+2.5+2.5+2.8	10.3						
2.5+2.5+2.5+3.2	10.7						
2.5+2.5+2.5+4.0	11.5						
2.5+2.5+2.5+5.0	12.5						
2.5+2.5+2.5+6.0	13.5						
2.5+2.5+2.8+2.8	10.6						
2.5+2.5+2.8+3.2	11.0						
2.5+2.5+2.8+4.0	11.8						
2.5+2.5+2.8+5.0	12.8						
2.5+2.5+3.2+3.2	11.4						
2.5+2.5+3.2+4.0	12.2						
2.5+2.5+3.2+5.0	13.2						
2.5+2.5+4.0+4.0	13.0						
2.5+2.8+2.8+2.8	10.9						
2.5+2.8+2.8+3.2	11.3						
2.5+2.8+2.8+4.0	12.1						
2.5+2.8+2.8+5.0	13.1						
2.5+2.8+3.2+3.2	11.7						
2.5+2.8+3.2+4.0	12.5						
2.5+2.8+3.2+5.0	13.5						
2.5+2.8+4.0+4.0	13.3						
2.5+3.2+3.2+3.2	12.1						
2.5+3.2+3.2+4.0	12.9						
2.8+2.8+2.8+2.8	11.2						
2.8+2.8+2.8+3.2	11.6						
2.8+2.8+2.8+4.0	12.4						
2.8+2.8+2.8+5.0	13.4						
2.8+2.8+3.2+3.2	12.0						
2.8+2.8+3.2+4.0	12.8						
2.8+2.8+4.0+4.0	13.6						
2.8+3.2+3.2+3.2	12.4						
2.8+3.2+3.2+4.0	13.2						
3.2+3.2+3.2+3.2	12.8						
3.2+3.2+3.2+4.0	13.6						

- **Indoor Unit : CS-E7/9/12/15/18/21/24QKEW**
- **Outdoor Unit : CU-5E34PBE**

5Room		4Room		3Room		2Room		1Room	
Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)	Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)	Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)	Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)	Indoor Unit Capacity (kW)	Total Indoor Capacity (kW)
1.6+1.6+1.6+1.6+1.6	8.0	1.6+1.6+1.6+1.6	6.4	1.6+1.6+1.6	4.8	1.6+1.6	3.2	1.6	1.6
1.6+1.6+1.6+1.6+2.0	8.4	1.6+1.6+1.6+2.0	6.8	1.6+1.6+2.0	5.2	1.6+2.0	3.6	2.0	2.0
1.6+1.6+1.6+1.6+2.5	8.9	1.6+1.6+1.6+2.5	7.3	1.6+1.6+2.5	5.7	1.6+2.5	4.1	2.5	2.5
1.6+1.6+1.6+1.6+2.8	9.2	1.6+1.6+1.6+2.8	7.6	1.6+1.6+2.8	6.0	1.6+2.8	4.4	2.8	2.8
1.6+1.6+1.6+1.6+3.2	9.6	1.6+1.6+1.6+3.2	8.0	1.6+1.6+3.2	6.4	1.6+3.2	4.8	3.2	3.2
1.6+1.6+1.6+1.6+4.0	10.4	1.6+1.6+1.6+4.0	8.8	1.6+1.6+4.0	7.2	1.6+4.0	5.6	4.0	4.0
1.6+1.6+1.6+1.6+5.0	11.4	1.6+1.6+1.6+5.0	9.8	1.6+1.6+5.0	8.2	1.6+5.0	6.6	5.0	5.0
1.6+1.6+1.6+1.6+6.0	12.4	1.6+1.6+1.6+6.0	10.8	1.6+1.6+6.0	9.2	1.6+6.0	7.6	6.0	6.0
1.6+1.6+1.6+1.6+7.0	13.4	1.6+1.6+1.6+7.0	11.8	1.6+1.6+7.0	10.2	1.6+7.0	8.6	7.0	7.0
1.6+1.6+1.6+2.0+2.0	8.8	1.6+1.6+2.0+2.0	7.2	1.6+2.0+2.0	5.6	2.0+2.0	4.0		
1.6+1.6+1.6+2.0+2.5	9.3	1.6+1.6+2.0+2.5	7.7	1.6+2.0+2.5	6.1	2.0+2.5	4.5		

1.6+1.6+1.6+2.0+2.8	9.6	1.6+1.6+2.0+2.8	8.0	1.6+2.0+2.8	6.4	2.0+2.8	4.8		
1.6+1.6+1.6+2.0+3.2	10.0	1.6+1.6+2.0+3.2	8.4	1.6+2.0+3.2	6.8	2.0+3.2	5.2		
1.6+1.6+1.6+2.0+4.0	10.8	1.6+1.6+2.0+4.0	9.2	1.6+2.0+4.0	7.6	2.0+4.0	6.0		
1.6+1.6+1.6+2.0+5.0	11.8	1.6+1.6+2.0+5.0	10.2	1.6+2.0+5.0	8.6	2.0+5.0	7.0		
1.6+1.6+1.6+2.0+6.0	12.8	1.6+1.6+2.0+6.0	11.2	1.6+2.0+6.0	9.6	2.0+6.0	8.0		
1.6+1.6+1.6+2.0+7.0	13.8	1.6+1.6+2.0+7.0	12.2	1.6+2.0+7.0	10.6	2.0+7.0	9.0		
1.6+1.6+1.6+2.5+2.5	9.8	1.6+1.6+2.5+2.5	8.2	1.6+2.5+2.5	6.6	2.5+2.5	5.0		
1.6+1.6+1.6+2.5+2.8	10.1	1.6+1.6+2.5+2.8	8.5	1.6+2.5+2.8	6.9	2.5+2.8	5.3		
1.6+1.6+1.6+2.5+3.2	10.5	1.6+1.6+2.5+3.2	8.9	1.6+2.5+3.2	7.3	2.5+3.2	5.7		
1.6+1.6+1.6+2.5+4.0	11.3	1.6+1.6+2.5+4.0	9.7	1.6+2.5+4.0	8.1	2.5+4.0	6.5		
1.6+1.6+1.6+2.5+5.0	12.3	1.6+1.6+2.5+5.0	10.7	1.6+2.5+5.0	9.1	2.5+5.0	7.5		
1.6+1.6+1.6+2.5+6.0	13.3	1.6+1.6+2.5+6.0	11.7	1.6+2.5+6.0	10.1	2.5+6.0	8.5		
1.6+1.6+1.6+2.5+7.0	14.3	1.6+1.6+2.5+7.0	12.7	1.6+2.5+7.0	11.1	2.5+7.0	9.5		
1.6+1.6+1.6+2.8+2.8	10.4	1.6+1.6+2.8+2.8	8.8	1.6+2.8+2.8	7.2	2.8+2.8	5.6		
1.6+1.6+1.6+2.8+3.2	10.8	1.6+1.6+2.8+3.2	9.2	1.6+2.8+3.2	7.6	2.8+3.2	6.0		
1.6+1.6+1.6+2.8+4.0	11.6	1.6+1.6+2.8+4.0	10.0	1.6+2.8+4.0	8.4	2.8+4.0	6.8		
1.6+1.6+1.6+2.8+5.0	12.6	1.6+1.6+2.8+5.0	11.0	1.6+2.8+5.0	9.4	2.8+5.0	7.8		
1.6+1.6+1.6+2.8+6.0	13.6	1.6+1.6+2.8+6.0	12.0	1.6+2.8+6.0	10.4	2.8+6.0	8.8		
1.6+1.6+1.6+2.8+7.0	14.6	1.6+1.6+2.8+7.0	13.0	1.6+2.8+7.0	11.4	2.8+7.0	9.8		
1.6+1.6+1.6+3.2+3.2	11.2	1.6+1.6+3.2+3.2	9.6	1.6+3.2+3.2	8.0	3.2+3.2	6.4		
1.6+1.6+1.6+3.2+4.0	12.0	1.6+1.6+3.2+4.0	10.4	1.6+3.2+4.0	8.8	3.2+4.0	7.2		
1.6+1.6+1.6+3.2+5.0	13.0	1.6+1.6+3.2+5.0	11.4	1.6+3.2+5.0	9.8	3.2+5.0	8.2		
1.6+1.6+1.6+3.2+6.0	14.0	1.6+1.6+3.2+6.0	12.4	1.6+3.2+6.0	10.8	3.2+6.0	9.2		
1.6+1.6+1.6+3.2+7.0	15.0	1.6+1.6+3.2+7.0	13.4	1.6+3.2+7.0	11.8	3.2+7.0	10.2		
1.6+1.6+1.6+4.0+4.0	12.8	1.6+1.6+4.0+4.0	11.2	1.6+4.0+4.0	9.6	4.0+4.0	8.0		
1.6+1.6+1.6+4.0+5.0	13.8	1.6+1.6+4.0+5.0	12.2	1.6+4.0+5.0	10.6	4.0+5.0	9.0		
1.6+1.6+1.6+4.0+6.0	14.8	1.6+1.6+4.0+6.0	13.2	1.6+4.0+6.0	11.6	4.0+6.0	10.0		
1.6+1.6+1.6+4.0+7.0	15.8	1.6+1.6+4.0+7.0	14.2	1.6+4.0+7.0	12.6	4.0+7.0	11.0		
1.6+1.6+1.6+5.0+5.0	14.8	1.6+1.6+5.0+5.0	13.2	1.6+5.0+5.0	11.6	5.0+5.0	10.0		
1.6+1.6+1.6+5.0+6.0	15.8	1.6+1.6+5.0+6.0	14.2	1.6+5.0+6.0	12.6	5.0+6.0	11.0		
1.6+1.6+1.6+5.0+7.0	16.8	1.6+1.6+5.0+7.0	15.2	1.6+5.0+7.0	13.6	5.0+7.0	12.0		
1.6+1.6+1.6+6.0+6.0	16.8	1.6+1.6+6.0+6.0	15.2	1.6+6.0+6.0	13.6	6.0+6.0	12.0		
1.6+1.6+2.0+2.0+2.0	9.2	1.6+1.6+6.0+7.0	16.2	1.6+6.0+7.0	14.6	6.0+7.0	13.0		
1.6+1.6+2.0+2.0+2.5	9.7	1.6+1.6+7.0+7.0	17.2	1.6+7.0+7.0	15.6	7.0+7.0	14.0		
1.6+1.6+2.0+2.0+2.8	10.0	1.6+2.0+2.0+2.0	7.6	2.0+2.0+2.0	6.0				
1.6+1.6+2.0+2.0+3.2	10.4	1.6+2.0+2.0+2.5	8.1	2.0+2.0+2.5	6.5				
1.6+1.6+2.0+2.0+4.0	11.2	1.6+2.0+2.0+2.8	8.4	2.0+2.0+2.8	6.8				
1.6+1.6+2.0+2.0+5.0	12.2	1.6+2.0+2.0+3.2	8.8	2.0+2.0+3.2	7.2				
1.6+1.6+2.0+2.0+6.0	13.2	1.6+2.0+2.0+4.0	9.6	2.0+2.0+4.0	8.0				
1.6+1.6+2.0+2.0+7.0	14.2	1.6+2.0+2.0+5.0	10.6	2.0+2.0+5.0	9.0				
1.6+1.6+2.0+2.5+2.5	10.2	1.6+2.0+2.0+6.0	11.6	2.0+2.0+6.0	10.0				
1.6+1.6+2.0+2.5+2.8	10.5	1.6+2.0+2.0+7.0	12.6	2.0+2.0+7.0	11.0				
1.6+1.6+2.0+2.5+3.2	10.9	1.6+2.0+2.5+2.5	8.6	2.0+2.5+2.5	7.0				
1.6+1.6+2.0+2.5+4.0	11.7	1.6+2.0+2.5+2.8	8.9	2.0+2.5+2.8	7.3				
1.6+1.6+2.0+2.5+5.0	12.7	1.6+2.0+2.5+3.2	9.3	2.0+2.5+3.2	7.7				
1.6+1.6+2.0+2.5+6.0	13.7	1.6+2.0+2.5+4.0	10.1	2.0+2.5+4.0	8.5				
1.6+1.6+2.0+2.5+7.0	14.7	1.6+2.0+2.5+5.0	11.1	2.0+2.5+5.0	9.5				
1.6+1.6+2.0+2.8+2.8	10.8	1.6+2.0+2.5+6.0	12.1	2.0+2.5+6.0	10.5				
1.6+1.6+2.0+2.8+3.2	11.2	1.6+2.0+2.5+7.0	13.1	2.0+2.5+7.0	11.5				
1.6+1.6+2.0+2.8+4.0	12.0	1.6+2.0+2.8+2.8	9.2	2.0+2.8+2.8	7.6				
1.6+1.6+2.0+2.8+5.0	13.0	1.6+2.0+2.8+3.2	9.6	2.0+2.8+3.2	8.0				
1.6+1.6+2.0+2.8+6.0	14.0	1.6+2.0+2.8+4.0	10.4	2.0+2.8+4.0	8.8				
1.6+1.6+2.0+2.8+7.0	15.0	1.6+2.0+2.8+5.0	11.4	2.0+2.8+5.0	9.8				
1.6+1.6+2.0+3.2+3.2	11.6	1.6+2.0+2.8+6.0	12.4	2.0+2.8+6.0	10.8				
1.6+1.6+2.0+3.2+4.0	12.4	1.6+2.0+2.8+7.0	13.4	2.0+2.8+7.0	11.8				
1.6+1.6+2.0+3.2+5.0	13.4	1.6+2.0+3.2+3.2	10.0	2.0+3.2+3.2	8.4				
1.6+1.6+2.0+3.2+6.0	14.4	1.6+2.0+3.2+4.0	10.8	2.0+3.2+4.0	9.2				
1.6+1.6+2.0+3.2+7.0	15.4	1.6+2.0+3.2+5.0	11.8	2.0+3.2+5.0	10.2				
1.6+1.6+2.0+4.0+4.0	13.2	1.6+2.0+3.2+6.0	12.8	2.0+3.2+6.0	11.2				
1.6+1.6+2.0+4.0+5.0	14.2	1.6+2.0+3.2+7.0	13.8	2.0+3.2+7.0	12.2				
1.6+1.6+2.0+4.0+6.0	15.2	1.6+2.0+4.0+4.0	11.6	2.0+4.0+4.0	10.0				
1.6+1.6+2.0+4.0+7.0	16.2	1.6+2.0+4.0+5.0	12.6	2.0+4.0+5.0	11.0				
1.6+1.6+2.0+5.0+5.0	15.2	1.6+2.0+4.0+6.0	13.6	2.0+4.0+6.0	12.0				
1.6+1.6+2.0+5.0+6.0	16.2	1.6+2.0+4.0+7.0	14.6	2.0+4.0+7.0	13.0				
1.6+1.6+2.0+5.0+7.0	17.2	1.6+2.0+5.0+5.0	13.6	2.0+5.0+5.0	12.0				
1.6+1.6+2.0+6.0+6.0	17.2	1.6+2.0+5.0+6.0	14.6	2.0+5.0+6.0	13.0				
1.6+1.6+2.5+2.5+2.5	10.7	1.6+2.0+5.0+7.0	15.6	2.0+5.0+7.0	14.0				
1.6+1.6+2.5+2.5+2.8	11.0	1.6+2.0+6.0+6.0	15.6	2.0+6.0+6.0	14.0				
1.6+1.6+2.5+2.5+3.2	11.4	1.6+2.0+6.0+7.0	16.6	2.0+6.0+7.0	15.0				
1.6+1.6+2.5+2.5+4.0	12.2	1.6+2.5+2.5+2.5	9.1	2.0+7.0+7.0	16.0				
1.6+1.6+2.5+2.5+5.0	13.2	1.6+2.5+2.5+2.8	9.4	2.5+2.5+2.5	7.5				
1.6+1.6+2.5+2.5+6.0	14.2	1.6+2.5+2.5+3.2	9.8	2.5+2.5+2.8	7.8				
1.6+1.6+2.5+2.5+7.0	15.2	1.6+2.5+2.5+4.0	10.6	2.5+2.5+3.2	8.2				
1.6+1.6+2.5+2.8+2.8	11.3	1.6+2.5+2.5+5.0	11.6	2.5+2.5+4.0	9.0				
1.6+1.6+2.5+2.8+3.2	11.7	1.6+2.5+2.5+6.0	12.6	2.5+2.5+5.0	10.0				
1.6+1.6+2.5+2.8+4.0	12.5	1.6+2.5+2.5+7.0	13.6	2.5+2.5+6.0	11.0				
1.6+1.6+2.5+2.8+5.0	13.5	1.6+2.5+2.8+2.8	9.7	2.5+2.5+7.0	12.0				

1.6+1.6+2.5+2.8+6.0	14.5	1.6+2.5+2.8+3.2	10.1	2.5+2.8+2.8	8.1				
1.6+1.6+2.5+2.8+7.0	15.5	1.6+2.5+2.8+4.0	10.9	2.5+2.8+3.2	8.5				
1.6+1.6+2.5+3.2+3.2	12.1	1.6+2.5+2.8+5.0	11.9	2.5+2.8+4.0	9.3				
1.6+1.6+2.5+3.2+4.0	12.9	1.6+2.5+2.8+6.0	12.9	2.5+2.8+5.0	10.3				
1.6+1.6+2.5+3.2+5.0	13.9	1.6+2.5+2.8+7.0	13.9	2.5+2.8+6.0	11.3				
1.6+1.6+2.5+3.2+6.0	14.9	1.6+2.5+3.2+3.2	10.5	2.5+2.8+7.0	12.3				
1.6+1.6+2.5+3.2+7.0	15.9	1.6+2.5+3.2+4.0	11.3	2.5+3.2+3.2	8.9				
1.6+1.6+2.5+4.0+4.0	13.7	1.6+2.5+3.2+5.0	12.3	2.5+3.2+4.0	9.7				
1.6+1.6+2.5+4.0+5.0	14.7	1.6+2.5+3.2+6.0	13.3	2.5+3.2+5.0	10.7				
1.6+1.6+2.5+4.0+6.0	15.7	1.6+2.5+3.2+7.0	14.3	2.5+3.2+6.0	11.7				
1.6+1.6+2.5+4.0+7.0	16.7	1.6+2.5+4.0+4.0	12.1	2.5+3.2+7.0	12.7				
1.6+1.6+2.5+5.0+5.0	15.7	1.6+2.5+4.0+5.0	13.1	2.5+4.0+4.0	10.5				
1.6+1.6+2.5+5.0+6.0	16.7	1.6+2.5+4.0+6.0	14.1	2.5+4.0+5.0	11.5				
1.6+1.6+2.8+2.8+2.8	11.6	1.6+2.5+4.0+7.0	15.1	2.5+4.0+6.0	12.5				
1.6+1.6+2.8+2.8+3.2	12.0	1.6+2.5+5.0+5.0	14.1	2.5+4.0+7.0	13.5				
1.6+1.6+2.8+2.8+4.0	12.8	1.6+2.5+5.0+6.0	15.1	2.5+5.0+5.0	12.5				
1.6+1.6+2.8+2.8+5.0	13.8	1.6+2.5+5.0+7.0	16.1	2.5+5.0+6.0	13.5				
1.6+1.6+2.8+2.8+6.0	14.8	1.6+2.5+6.0+6.0	16.1	2.5+5.0+7.0	14.5				
1.6+1.6+2.8+2.8+7.0	15.8	1.6+2.5+6.0+7.0	17.1	2.5+6.0+6.0	14.5				
1.6+1.6+2.8+3.2+3.2	12.4	1.6+2.8+2.8+2.8	10.0	2.5+6.0+7.0	15.5				
1.6+1.6+2.8+3.2+4.0	13.2	1.6+2.8+2.8+3.2	10.4	2.5+7.0+7.0	16.5				
1.6+1.6+2.8+3.2+5.0	14.2	1.6+2.8+2.8+4.0	11.2	2.8+2.8+2.8	8.4				
1.6+1.6+2.8+3.2+6.0	15.2	1.6+2.8+2.8+5.0	12.2	2.8+2.8+3.2	8.8				
1.6+1.6+2.8+3.2+7.0	16.2	1.6+2.8+2.8+6.0	13.2	2.8+2.8+4.0	9.6				
1.6+1.6+2.8+4.0+4.0	14.0	1.6+2.8+2.8+7.0	14.2	2.8+2.8+5.0	10.6				
1.6+1.6+2.8+4.0+5.0	15.0	1.6+2.8+3.2+3.2	10.8	2.8+2.8+6.0	11.6				
1.6+1.6+2.8+4.0+6.0	16.0	1.6+2.8+3.2+4.0	11.6	2.8+2.8+7.0	12.6				
1.6+1.6+2.8+4.0+7.0	17.0	1.6+2.8+3.2+5.0	12.6	2.8+3.2+3.2	9.2				
1.6+1.6+2.8+5.0+5.0	16.0	1.6+2.8+3.2+6.0	13.6	2.8+3.2+4.0	10.0				
1.6+1.6+2.8+5.0+6.0	17.0	1.6+2.8+3.2+7.0	14.6	2.8+3.2+5.0	11.0				
1.6+1.6+3.2+3.2+3.2	12.8	1.6+2.8+4.0+4.0	12.4	2.8+3.2+6.0	12.0				
1.6+1.6+3.2+3.2+4.0	13.6	1.6+2.8+4.0+5.0	13.4	2.8+3.2+7.0	13.0				
1.6+1.6+3.2+3.2+5.0	14.6	1.6+2.8+4.0+6.0	14.4	2.8+4.0+4.0	10.8				
1.6+1.6+3.2+3.2+6.0	15.6	1.6+2.8+4.0+7.0	15.4	2.8+4.0+5.0	11.8				
1.6+1.6+3.2+3.2+7.0	16.6	1.6+2.8+5.0+5.0	14.4	2.8+4.0+6.0	12.8				
1.6+1.6+3.2+4.0+4.0	14.4	1.6+2.8+5.0+6.0	15.4	2.8+4.0+7.0	13.8				
1.6+1.6+3.2+4.0+5.0	15.4	1.6+2.8+5.0+7.0	16.4	2.8+5.0+5.0	12.8				
1.6+1.6+3.2+4.0+6.0	16.4	1.6+2.8+6.0+6.0	16.4	2.8+5.0+6.0	13.8				
1.6+1.6+3.2+4.0+7.0	17.4	1.6+2.8+6.0+7.0	17.4	2.8+5.0+7.0	14.8				
1.6+1.6+3.2+5.0+5.0	16.4	1.6+3.2+3.2+3.2	11.2	2.8+6.0+6.0	14.8				
1.6+1.6+3.2+5.0+6.0	17.4	1.6+3.2+3.2+4.0	12.0	2.8+6.0+7.0	15.8				
1.6+1.6+4.0+4.0+4.0	15.2	1.6+3.2+3.2+5.0	13.0	2.8+7.0+7.0	16.8				
1.6+1.6+4.0+4.0+5.0	16.2	1.6+3.2+3.2+6.0	14.0	3.2+3.2+3.2	9.6				
1.6+1.6+4.0+4.0+6.0	17.2	1.6+3.2+3.2+7.0	15.0	3.2+3.2+4.0	10.4				
1.6+1.6+4.0+5.0+5.0	17.2	1.6+3.2+4.0+4.0	12.8	3.2+3.2+5.0	11.4				
1.6+2.0+2.0+2.0+2.0	9.6	1.6+3.2+4.0+5.0	13.8	3.2+3.2+6.0	12.4				
1.6+2.0+2.0+2.0+2.5	10.1	1.6+3.2+4.0+6.0	14.8	3.2+3.2+7.0	13.4				
1.6+2.0+2.0+2.0+2.8	10.4	1.6+3.2+4.0+7.0	15.8	3.2+4.0+4.0	11.2				
1.6+2.0+2.0+2.0+3.2	10.8	1.6+3.2+5.0+5.0	14.8	3.2+4.0+5.0	12.2				
1.6+2.0+2.0+2.0+4.0	11.6	1.6+3.2+5.0+6.0	15.8	3.2+4.0+6.0	13.2				
1.6+2.0+2.0+2.0+5.0	12.6	1.6+3.2+5.0+7.0	16.8	3.2+4.0+7.0	14.2				
1.6+2.0+2.0+2.0+6.0	13.6	1.6+3.2+6.0+6.0	16.8	3.2+5.0+5.0	13.2				
1.6+2.0+2.0+2.0+7.0	14.6	1.6+4.0+4.0+4.0	13.6	3.2+5.0+6.0	14.2				
1.6+2.0+2.0+2.5+2.5	10.6	1.6+4.0+4.0+5.0	14.6	3.2+5.0+7.0	15.2				
1.6+2.0+2.0+2.5+2.8	10.9	1.6+4.0+4.0+6.0	15.6	3.2+6.0+6.0	15.2				
1.6+2.0+2.0+2.5+3.2	11.3	1.6+4.0+4.0+7.0	16.6	3.2+6.0+7.0	16.2				
1.6+2.0+2.0+2.5+4.0	12.1	1.6+4.0+5.0+5.0	15.6	3.2+7.0+7.0	17.2				
1.6+2.0+2.0+2.5+5.0	13.1	1.6+4.0+5.0+6.0	16.6	4.0+4.0+4.0	12.0				
1.6+2.0+2.0+2.5+6.0	14.1	1.6+5.0+5.0+5.0	16.6	4.0+4.0+5.0	13.0				
1.6+2.0+2.0+2.5+7.0	15.1	2.0+2.0+2.0+2.0	8.0	4.0+4.0+6.0	14.0				
1.6+2.0+2.0+2.8+2.8	11.2	2.0+2.0+2.0+2.5	8.5	4.0+4.0+7.0	15.0				
1.6+2.0+2.0+2.8+3.2	11.6	2.0+2.0+2.0+2.8	8.8	4.0+5.0+5.0	14.0				
1.6+2.0+2.0+2.8+4.0	12.4	2.0+2.0+2.0+3.2	9.2	4.0+5.0+6.0	15.0				
1.6+2.0+2.0+2.8+5.0	13.4	2.0+2.0+2.0+4.0	10.0	4.0+5.0+7.0	16.0				
1.6+2.0+2.0+2.8+6.0	14.4	2.0+2.0+2.0+5.0	11.0	4.0+6.0+6.0	16.0				
1.6+2.0+2.0+2.8+7.0	15.4	2.0+2.0+2.0+6.0	12.0	4.0+6.0+7.0	17.0				
1.6+2.0+2.0+3.2+3.2	12.0	2.0+2.0+2.0+7.0	13.0	5.0+5.0+5.0	15.0				
1.6+2.0+2.0+3.2+4.0	12.8	2.0+2.0+2.5+2.5	9.0	5.0+5.0+6.0	16.0				
1.6+2.0+2.0+3.2+5.0	13.8	2.0+2.0+2.5+2.8	9.3	5.0+5.0+7.0	17.0				
1.6+2.0+2.0+3.2+6.0	14.8	2.0+2.0+2.5+3.2	9.7	5.0+6.0+6.0	17.0				
1.6+2.0+2.0+3.2+7.0	15.8	2.0+2.0+2.5+4.0	10.5						
1.6+2.0+2.0+4.0+4.0	13.6	2.0+2.0+2.5+5.0	11.5						
1.6+2.0+2.0+4.0+5.0	14.6	2.0+2.0+2.5+6.0	12.5						
1.6+2.0+2.0+4.0+6.0	15.6	2.0+2.0+2.5+7.0	13.5						
1.6+2.0+2.0+4.0+7.0	16.6	2.0+2.0+2.8+2.8	9.6						
1.6+2.0+2.0+5.0+5.0	15.6	2.0+2.0+2.8+3.2	10.0						
1.6+2.0+2.0+5.0+6.0	16.6	2.0+2.0+2.8+4.0	10.8						

1.6+2.0+2.5+2.5+2.5	11.1	2.0+2.0+2.8+5.0	11.8						
1.6+2.0+2.5+2.5+2.8	11.4	2.0+2.0+2.8+6.0	12.8						
1.6+2.0+2.5+2.5+3.2	11.8	2.0+2.0+2.8+7.0	13.8						
1.6+2.0+2.5+2.5+4.0	12.6	2.0+2.0+3.2+3.2	10.4						
1.6+2.0+2.5+2.5+5.0	13.6	2.0+2.0+3.2+4.0	11.2						
1.6+2.0+2.5+2.5+6.0	14.6	2.0+2.0+3.2+5.0	12.2						
1.6+2.0+2.5+2.5+7.0	15.6	2.0+2.0+3.2+6.0	13.2						
1.6+2.0+2.5+2.8+2.8	11.7	2.0+2.0+3.2+7.0	14.2						
1.6+2.0+2.5+2.8+3.2	12.1	2.0+2.0+4.0+4.0	12.0						
1.6+2.0+2.5+2.8+4.0	12.9	2.0+2.0+4.0+5.0	13.0						
1.6+2.0+2.5+2.8+5.0	13.9	2.0+2.0+4.0+6.0	14.0						
1.6+2.0+2.5+2.8+6.0	14.9	2.0+2.0+4.0+7.0	15.0						
1.6+2.0+2.5+2.8+7.0	15.9	2.0+2.0+5.0+5.0	14.0						
1.6+2.0+2.5+3.2+3.2	12.5	2.0+2.0+5.0+6.0	15.0						
1.6+2.0+2.5+3.2+4.0	13.3	2.0+2.0+5.0+7.0	16.0						
1.6+2.0+2.5+3.2+5.0	14.3	2.0+2.0+6.0+6.0	16.0						
1.6+2.0+2.5+3.2+6.0	15.3	2.0+2.0+6.0+7.0	17.0						
1.6+2.0+2.5+3.2+7.0	16.3	2.0+2.5+2.5+2.5	9.5						
1.6+2.0+2.5+4.0+4.0	14.1	2.0+2.5+2.5+2.8	9.8						
1.6+2.0+2.5+4.0+5.0	15.1	2.0+2.5+2.5+3.2	10.2						
1.6+2.0+2.5+4.0+6.0	16.1	2.0+2.5+2.5+4.0	11.0						
1.6+2.0+2.5+4.0+7.0	17.1	2.0+2.5+2.5+5.0	12.0						
1.6+2.0+2.5+5.0+5.0	16.1	2.0+2.5+2.5+6.0	13.0						
1.6+2.0+2.5+5.0+6.0	17.1	2.0+2.5+2.5+7.0	14.0						
1.6+2.0+2.8+2.8+2.8	12.0	2.0+2.5+2.8+2.8	10.1						
1.6+2.0+2.8+2.8+3.2	12.4	2.0+2.5+2.8+3.2	10.5						
1.6+2.0+2.8+2.8+4.0	13.2	2.0+2.5+2.8+4.0	11.3						
1.6+2.0+2.8+2.8+5.0	14.2	2.0+2.5+2.8+5.0	12.3						
1.6+2.0+2.8+2.8+6.0	15.2	2.0+2.5+2.8+6.0	13.3						
1.6+2.0+2.8+2.8+7.0	16.2	2.0+2.5+2.8+7.0	14.3						
1.6+2.0+2.8+3.2+3.2	12.8	2.0+2.5+3.2+3.2	10.9						
1.6+2.0+2.8+3.2+4.0	13.6	2.0+2.5+3.2+4.0	11.7						
1.6+2.0+2.8+3.2+5.0	14.6	2.0+2.5+3.2+5.0	12.7						
1.6+2.0+2.8+3.2+6.0	15.6	2.0+2.5+3.2+6.0	13.7						
1.6+2.0+2.8+3.2+7.0	16.6	2.0+2.5+3.2+7.0	14.7						
1.6+2.0+2.8+4.0+4.0	14.4	2.0+2.5+4.0+4.0	12.5						
1.6+2.0+2.8+4.0+5.0	15.4	2.0+2.5+4.0+5.0	13.5						
1.6+2.0+2.8+4.0+6.0	16.4	2.0+2.5+4.0+6.0	14.5						
1.6+2.0+2.8+4.0+7.0	17.4	2.0+2.5+4.0+7.0	15.5						
1.6+2.0+2.8+5.0+5.0	16.4	2.0+2.5+5.0+5.0	14.5						
1.6+2.0+2.8+5.0+6.0	17.4	2.0+2.5+5.0+6.0	15.5						
1.6+2.0+3.2+3.2+3.2	13.2	2.0+2.5+5.0+7.0	16.5						
1.6+2.0+3.2+3.2+4.0	14.0	2.0+2.5+6.0+6.0	16.5						
1.6+2.0+3.2+3.2+5.0	15.0	2.0+2.5+6.0+7.0	17.5						
1.6+2.0+3.2+3.2+6.0	16.0	2.0+2.8+2.8+2.8	10.4						
1.6+2.0+3.2+3.2+7.0	17.0	2.0+2.8+2.8+3.2	10.8						
1.6+2.0+3.2+4.0+4.0	14.8	2.0+2.8+2.8+4.0	11.6						
1.6+2.0+3.2+4.0+5.0	15.8	2.0+2.8+2.8+5.0	12.6						
1.6+2.0+3.2+4.0+6.0	16.8	2.0+2.8+2.8+6.0	13.6						
1.6+2.0+3.2+5.0+5.0	16.8	2.0+2.8+2.8+7.0	14.6						
1.6+2.0+4.0+4.0+4.0	15.6	2.0+2.8+3.2+3.2	11.2						
1.6+2.0+4.0+4.0+5.0	16.6	2.0+2.8+3.2+4.0	12.0						
1.6+2.5+2.5+2.5+2.5	11.6	2.0+2.8+3.2+5.0	13.0						
1.6+2.5+2.5+2.5+2.8	11.9	2.0+2.8+3.2+6.0	14.0						
1.6+2.5+2.5+2.5+3.2	12.3	2.0+2.8+3.2+7.0	15.0						
1.6+2.5+2.5+2.5+4.0	13.1	2.0+2.8+4.0+4.0	12.8						
1.6+2.5+2.5+2.5+5.0	14.1	2.0+2.8+4.0+5.0	13.8						
1.6+2.5+2.5+2.5+6.0	15.1	2.0+2.8+4.0+6.0	14.8						
1.6+2.5+2.5+2.5+7.0	16.1	2.0+2.8+4.0+7.0	15.8						
1.6+2.5+2.5+2.8+2.8	12.2	2.0+2.8+5.0+5.0	14.8						
1.6+2.5+2.5+2.8+3.2	12.6	2.0+2.8+5.0+6.0	15.8						
1.6+2.5+2.5+2.8+4.0	13.4	2.0+2.8+5.0+7.0	16.8						
1.6+2.5+2.5+2.8+5.0	14.4	2.0+2.8+6.0+6.0	16.8						
1.6+2.5+2.5+2.8+6.0	15.4	2.0+3.2+3.2+3.2	11.6						
1.6+2.5+2.5+2.8+7.0	16.4	2.0+3.2+3.2+4.0	12.4						
1.6+2.5+2.5+3.2+3.2	13.0	2.0+3.2+3.2+5.0	13.4						
1.6+2.5+2.5+3.2+4.0	13.8	2.0+3.2+3.2+6.0	14.4						
1.6+2.5+2.5+3.2+5.0	14.8	2.0+3.2+3.2+7.0	15.4						
1.6+2.5+2.5+3.2+6.0	15.8	2.0+3.2+4.0+4.0	13.2						
1.6+2.5+2.5+3.2+7.0	16.8	2.0+3.2+4.0+5.0	14.2						
1.6+2.5+2.5+4.0+4.0	14.6	2.0+3.2+4.0+6.0	15.2						
1.6+2.5+2.5+4.0+5.0	15.6	2.0+3.2+4.0+7.0	16.2						
1.6+2.5+2.5+4.0+6.0	16.6	2.0+3.2+5.0+5.0	15.2						
1.6+2.5+2.5+5.0+5.0	16.6	2.0+3.2+5.0+6.0	16.2						
1.6+2.5+2.8+2.8+2.8	12.5	2.0+3.2+5.0+7.0	17.2						
1.6+2.5+2.8+2.8+3.2	12.9	2.0+3.2+6.0+6.0	17.2						
1.6+2.5+2.8+2.8+4.0	13.7	2.0+4.0+4.0+4.0	14.0						

1.6+2.5+2.8+2.8+5.0	14.7	2.0+4.0+4.0+5.0	15.0						
1.6+2.5+2.8+2.8+6.0	15.7	2.0+4.0+4.0+6.0	16.0						
1.6+2.5+2.8+2.8+7.0	16.7	2.0+4.0+4.0+7.0	17.0						
1.6+2.5+2.8+3.2+3.2	13.3	2.0+4.0+5.0+5.0	16.0						
1.6+2.5+2.8+3.2+4.0	14.1	2.0+4.0+5.0+6.0	17.0						
1.6+2.5+2.8+3.2+5.0	15.1	2.0+5.0+5.0+5.0	17.0						
1.6+2.5+2.8+3.2+6.0	16.1	2.5+2.5+2.5+2.5	10.0						
1.6+2.5+2.8+3.2+7.0	17.1	2.5+2.5+2.5+2.8	10.3						
1.6+2.5+2.8+4.0+4.0	14.9	2.5+2.5+2.5+3.2	10.7						
1.6+2.5+2.8+4.0+5.0	15.9	2.5+2.5+2.5+4.0	11.5						
1.6+2.5+2.8+4.0+6.0	16.9	2.5+2.5+2.5+5.0	12.5						
1.6+2.5+2.8+5.0+5.0	16.9	2.5+2.5+2.5+6.0	13.5						
1.6+2.5+3.2+3.2+3.2	13.7	2.5+2.5+2.5+7.0	14.5						
1.6+2.5+3.2+3.2+4.0	14.5	2.5+2.5+2.8+2.8	10.6						
1.6+2.5+3.2+3.2+5.0	15.5	2.5+2.5+2.8+3.2	11.0						
1.6+2.5+3.2+3.2+6.0	16.5	2.5+2.5+2.8+4.0	11.8						
1.6+2.5+3.2+3.2+7.0	17.5	2.5+2.5+2.8+5.0	12.8						
1.6+2.5+3.2+4.0+4.0	15.3	2.5+2.5+2.8+6.0	13.8						
1.6+2.5+3.2+4.0+5.0	16.3	2.5+2.5+2.8+7.0	14.8						
1.6+2.5+3.2+4.0+6.0	17.3	2.5+2.5+3.2+3.2	11.4						
1.6+2.5+3.2+5.0+5.0	17.3	2.5+2.5+3.2+4.0	12.2						
1.6+2.5+4.0+4.0+4.0	16.1	2.5+2.5+3.2+5.0	13.2						
1.6+2.5+4.0+4.0+5.0	17.1	2.5+2.5+3.2+6.0	14.2						
1.6+2.8+2.8+2.8+2.8	12.8	2.5+2.5+3.2+7.0	15.2						
1.6+2.8+2.8+2.8+3.2	13.2	2.5+2.5+4.0+4.0	13.0						
1.6+2.8+2.8+2.8+4.0	14.0	2.5+2.5+4.0+5.0	14.0						
1.6+2.8+2.8+2.8+5.0	15.0	2.5+2.5+4.0+6.0	15.0						
1.6+2.8+2.8+2.8+6.0	16.0	2.5+2.5+4.0+7.0	16.0						
1.6+2.8+2.8+2.8+7.0	17.0	2.5+2.5+5.0+5.0	15.0						
1.6+2.8+2.8+3.2+3.2	13.6	2.5+2.5+5.0+6.0	16.0						
1.6+2.8+2.8+3.2+4.0	14.4	2.5+2.5+5.0+7.0	17.0						
1.6+2.8+2.8+3.2+5.0	15.4	2.5+2.5+6.0+6.0	17.0						
1.6+2.8+2.8+3.2+6.0	16.4	2.5+2.8+2.8+2.8	10.9						
1.6+2.8+2.8+3.2+7.0	17.4	2.5+2.8+2.8+3.2	11.3						
1.6+2.8+2.8+4.0+4.0	15.2	2.5+2.8+2.8+4.0	12.1						
1.6+2.8+2.8+4.0+5.0	16.2	2.5+2.8+2.8+5.0	13.1						
1.6+2.8+2.8+4.0+6.0	17.2	2.5+2.8+2.8+6.0	14.1						
1.6+2.8+2.8+5.0+5.0	17.2	2.5+2.8+2.8+7.0	15.1						
1.6+2.8+3.2+3.2+3.2	14.0	2.5+2.8+3.2+3.2	11.7						
1.6+2.8+3.2+3.2+4.0	14.8	2.5+2.8+3.2+4.0	12.5						
1.6+2.8+3.2+3.2+5.0	15.8	2.5+2.8+3.2+5.0	13.5						
1.6+2.8+3.2+3.2+6.0	16.8	2.5+2.8+3.2+6.0	14.5						
1.6+2.8+3.2+4.0+4.0	15.6	2.5+2.8+3.2+7.0	15.5						
1.6+2.8+3.2+4.0+5.0	16.6	2.5+2.8+4.0+4.0	13.3						
1.6+2.8+4.0+4.0+4.0	16.4	2.5+2.8+4.0+5.0	14.3						
1.6+2.8+4.0+4.0+5.0	17.4	2.5+2.8+4.0+6.0	15.3						
1.6+3.2+3.2+3.2+3.2	14.4	2.5+2.8+4.0+7.0	16.3						
1.6+3.2+3.2+3.2+4.0	15.2	2.5+2.8+5.0+5.0	15.3						
1.6+3.2+3.2+3.2+5.0	16.2	2.5+2.8+5.0+6.0	16.3						
1.6+3.2+3.2+3.2+6.0	17.2	2.5+2.8+5.0+7.0	17.3						
1.6+3.2+3.2+4.0+4.0	16.0	2.5+2.8+6.0+6.0	17.3						
1.6+3.2+3.2+4.0+5.0	17.0	2.5+3.2+3.2+3.2	12.1						
1.6+3.2+4.0+4.0+4.0	16.8	2.5+3.2+3.2+4.0	12.9						
2.0+2.0+2.0+2.0+2.0	10.0	2.5+3.2+3.2+5.0	13.9						
2.0+2.0+2.0+2.0+2.5	10.5	2.5+3.2+3.2+6.0	14.9						
2.0+2.0+2.0+2.0+2.8	10.8	2.5+3.2+3.2+7.0	15.9						
2.0+2.0+2.0+2.0+3.2	11.2	2.5+3.2+4.0+4.0	13.7						
2.0+2.0+2.0+2.0+4.0	12.0	2.5+3.2+4.0+5.0	14.7						
2.0+2.0+2.0+2.0+5.0	13.0	2.5+3.2+4.0+6.0	15.7						
2.0+2.0+2.0+2.0+6.0	14.0	2.5+3.2+4.0+7.0	16.7						
2.0+2.0+2.0+2.0+7.0	15.0	2.5+3.2+5.0+5.0	15.7						
2.0+2.0+2.0+2.5+2.5	11.0	2.5+3.2+5.0+6.0	16.7						
2.0+2.0+2.0+2.5+2.8	11.3	2.5+4.0+4.0+4.0	14.5						
2.0+2.0+2.0+2.5+3.2	11.7	2.5+4.0+4.0+5.0	15.5						
2.0+2.0+2.0+2.5+4.0	12.5	2.5+4.0+4.0+6.0	16.5						
2.0+2.0+2.0+2.5+5.0	13.5	2.5+4.0+4.0+7.0	17.5						
2.0+2.0+2.0+2.5+6.0	14.5	2.5+4.0+5.0+5.0	16.5						
2.0+2.0+2.0+2.5+7.0	15.5	2.5+4.0+5.0+6.0	17.5						
2.0+2.0+2.0+2.8+2.8	11.6	2.5+5.0+5.0+5.0	17.5						
2.0+2.0+2.0+2.8+3.2	12.0	2.8+2.8+2.8+2.8	11.2						
2.0+2.0+2.0+2.8+4.0	12.8	2.8+2.8+2.8+3.2	11.6						
2.0+2.0+2.0+2.8+5.0	13.8	2.8+2.8+2.8+4.0	12.4						
2.0+2.0+2.0+2.8+6.0	14.8	2.8+2.8+2.8+5.0	13.4						
2.0+2.0+2.0+2.8+7.0	15.8	2.8+2.8+2.8+6.0	14.4						
2.0+2.0+2.0+3.2+3.2	12.4	2.8+2.8+2.8+7.0	15.4						
2.0+2.0+2.0+3.2+4.0	13.2	2.8+2.8+3.2+3.2	12.0						
2.0+2.0+2.0+3.2+5.0	14.2	2.8+2.8+3.2+4.0	12.8						

2.0+2.0+2.0+3.2+6.0	15.2	2.8+2.8+3.2+5.0	13.8						
2.0+2.0+2.0+3.2+7.0	16.2	2.8+2.8+3.2+6.0	14.8						
2.0+2.0+2.0+4.0+4.0	14.0	2.8+2.8+3.2+7.0	15.8						
2.0+2.0+2.0+4.0+5.0	15.0	2.8+2.8+4.0+4.0	13.6						
2.0+2.0+2.0+4.0+6.0	16.0	2.8+2.8+4.0+5.0	14.6						
2.0+2.0+2.0+4.0+7.0	17.0	2.8+2.8+4.0+6.0	15.6						
2.0+2.0+2.0+5.0+5.0	16.0	2.8+2.8+4.0+7.0	16.6						
2.0+2.0+2.0+5.0+6.0	17.0	2.8+2.8+5.0+5.0	15.6						
2.0+2.0+2.5+2.5+2.5	11.5	2.8+2.8+5.0+6.0	16.6						
2.0+2.0+2.5+2.5+2.8	11.8	2.8+3.2+3.2+3.2	12.4						
2.0+2.0+2.5+2.5+3.2	12.2	2.8+3.2+3.2+4.0	13.2						
2.0+2.0+2.5+2.5+4.0	13.0	2.8+3.2+3.2+5.0	14.2						
2.0+2.0+2.5+2.5+5.0	14.0	2.8+3.2+3.2+6.0	15.2						
2.0+2.0+2.5+2.5+6.0	15.0	2.8+3.2+3.2+7.0	16.2						
2.0+2.0+2.5+2.5+7.0	16.0	2.8+3.2+4.0+4.0	14.0						
2.0+2.0+2.5+2.8+2.8	12.1	2.8+3.2+4.0+5.0	15.0						
2.0+2.0+2.5+2.8+3.2	12.5	2.8+3.2+4.0+6.0	16.0						
2.0+2.0+2.5+2.8+4.0	13.3	2.8+3.2+4.0+7.0	17.0						
2.0+2.0+2.5+2.8+5.0	14.3	2.8+3.2+5.0+5.0	16.0						
2.0+2.0+2.5+2.8+6.0	15.3	2.8+3.2+5.0+6.0	17.0						
2.0+2.0+2.5+2.8+7.0	16.3	2.8+4.0+4.0+4.0	14.8						
2.0+2.0+2.5+3.2+3.2	12.9	2.8+4.0+4.0+5.0	15.8						
2.0+2.0+2.5+3.2+4.0	13.7	2.8+4.0+4.0+6.0	16.8						
2.0+2.0+2.5+3.2+5.0	14.7	2.8+4.0+5.0+5.0	16.8						
2.0+2.0+2.5+3.2+6.0	15.7	3.2+3.2+3.2+3.2	12.8						
2.0+2.0+2.5+3.2+7.0	16.7	3.2+3.2+3.2+4.0	13.6						
2.0+2.0+2.5+4.0+4.0	14.5	3.2+3.2+3.2+5.0	14.6						
2.0+2.0+2.5+4.0+5.0	15.5	3.2+3.2+3.2+6.0	15.6						
2.0+2.0+2.5+4.0+6.0	16.5	3.2+3.2+3.2+7.0	16.6						
2.0+2.0+2.5+4.0+7.0	17.5	3.2+3.2+4.0+4.0	14.4						
2.0+2.0+2.5+5.0+5.0	16.5	3.2+3.2+4.0+5.0	15.4						
2.0+2.0+2.5+5.0+6.0	17.5	3.2+3.2+4.0+6.0	16.4						
2.0+2.0+2.8+2.8+2.8	12.4	3.2+3.2+4.0+7.0	17.4						
2.0+2.0+2.8+2.8+3.2	12.8	3.2+3.2+5.0+5.0	16.4						
2.0+2.0+2.8+2.8+4.0	13.6	3.2+3.2+5.0+6.0	17.4						
2.0+2.0+2.8+2.8+5.0	14.6	3.2+4.0+4.0+4.0	15.2						
2.0+2.0+2.8+2.8+6.0	15.6	3.2+4.0+4.0+5.0	16.2						
2.0+2.0+2.8+2.8+7.0	16.6	3.2+4.0+4.0+6.0	17.2						
2.0+2.0+2.8+3.2+3.2	13.2	3.2+4.0+5.0+5.0	17.2						
2.0+2.0+2.8+3.2+4.0	14.0	4.0+4.0+4.0+4.0	16.0						
2.0+2.0+2.8+3.2+5.0	15.0	4.0+4.0+4.0+5.0	17.0						
2.0+2.0+2.8+3.2+6.0	16.0								
2.0+2.0+2.8+3.2+7.0	17.0								
2.0+2.0+2.8+4.0+4.0	14.8								
2.0+2.0+2.8+4.0+5.0	15.8								
2.0+2.0+2.8+4.0+6.0	16.8								
2.0+2.0+2.8+5.0+5.0	16.8								
2.0+2.0+3.2+3.2+3.2	13.6								
2.0+2.0+3.2+3.2+4.0	14.4								
2.0+2.0+3.2+3.2+5.0	15.4								
2.0+2.0+3.2+3.2+6.0	16.4								
2.0+2.0+3.2+3.2+7.0	17.4								
2.0+2.0+3.2+4.0+4.0	15.2								
2.0+2.0+3.2+4.0+5.0	16.2								
2.0+2.0+3.2+4.0+6.0	17.2								
2.0+2.0+3.2+5.0+5.0	17.2								
2.0+2.0+4.0+4.0+4.0	16.0								
2.0+2.0+4.0+4.0+5.0	17.0								
2.0+2.5+2.5+2.5+2.5	12.0								
2.0+2.5+2.5+2.5+2.8	12.3								
2.0+2.5+2.5+2.5+3.2	12.7								
2.0+2.5+2.5+2.5+4.0	13.5								
2.0+2.5+2.5+2.5+5.0	14.5								
2.0+2.5+2.5+2.5+6.0	15.5								
2.0+2.5+2.5+2.5+7.0	16.5								
2.0+2.5+2.5+2.8+2.8	12.6								
2.0+2.5+2.5+2.8+3.2	13.0								
2.0+2.5+2.5+2.8+4.0	13.8								
2.0+2.5+2.5+2.8+5.0	14.8								
2.0+2.5+2.5+2.8+6.0	15.8								
2.0+2.5+2.5+2.8+7.0	16.8								
2.0+2.5+2.5+3.2+3.2	13.4								
2.0+2.5+2.5+3.2+4.0	14.2								
2.0+2.5+2.5+3.2+5.0	15.2								
2.0+2.5+2.5+3.2+6.0	16.2								
2.0+2.5+2.5+3.2+7.0	17.2								
2.0+2.5+2.5+4.0+4.0	15.0								

2.0+2.5+2.5+4.0+5.0	16.0								
2.0+2.5+2.5+4.0+6.0	17.0								
2.0+2.5+2.5+5.0+5.0	17.0								
2.0+2.5+2.8+2.8+2.8	12.9								
2.0+2.5+2.8+2.8+3.2	13.3								
2.0+2.5+2.8+2.8+4.0	14.1								
2.0+2.5+2.8+2.8+5.0	15.1								
2.0+2.5+2.8+2.8+6.0	16.1								
2.0+2.5+2.8+2.8+7.0	17.1								
2.0+2.5+2.8+3.2+3.2	13.7								
2.0+2.5+2.8+3.2+4.0	14.5								
2.0+2.5+2.8+3.2+5.0	15.5								
2.0+2.5+2.8+3.2+6.0	16.5								
2.0+2.5+2.8+3.2+7.0	17.5								
2.0+2.5+2.8+4.0+4.0	15.3								
2.0+2.5+2.8+4.0+5.0	16.3								
2.0+2.5+2.8+4.0+6.0	17.3								
2.0+2.5+2.8+5.0+5.0	17.3								
2.0+2.5+3.2+3.2+3.2	14.1								
2.0+2.5+3.2+3.2+4.0	14.9								
2.0+2.5+3.2+3.2+5.0	15.9								
2.0+2.5+3.2+3.2+6.0	16.9								
2.0+2.5+3.2+4.0+4.0	15.7								
2.0+2.5+3.2+4.0+5.0	16.7								
2.0+2.5+4.0+4.0+4.0	16.5								
2.0+2.5+4.0+4.0+5.0	17.5								
2.0+2.8+2.8+2.8+2.8	13.2								
2.0+2.8+2.8+2.8+3.2	13.6								
2.0+2.8+2.8+2.8+4.0	14.4								
2.0+2.8+2.8+2.8+5.0	15.4								
2.0+2.8+2.8+2.8+6.0	16.4								
2.0+2.8+2.8+2.8+7.0	17.4								
2.0+2.8+2.8+3.2+3.2	14.0								
2.0+2.8+2.8+3.2+4.0	14.8								
2.0+2.8+2.8+3.2+5.0	15.8								
2.0+2.8+2.8+3.2+6.0	16.8								
2.0+2.8+2.8+4.0+4.0	15.6								
2.0+2.8+2.8+4.0+5.0	16.6								
2.0+2.8+3.2+3.2+3.2	14.4								
2.0+2.8+3.2+3.2+4.0	15.2								
2.0+2.8+3.2+3.2+5.0	16.2								
2.0+2.8+3.2+3.2+6.0	17.2								
2.0+2.8+3.2+4.0+4.0	16.0								
2.0+2.8+3.2+4.0+5.0	17.0								
2.0+2.8+4.0+4.0+4.0	16.8								
2.0+3.2+3.2+3.2+3.2	14.8								
2.0+3.2+3.2+3.2+4.0	15.6								
2.0+3.2+3.2+3.2+5.0	16.6								
2.0+3.2+3.2+4.0+4.0	16.4								
2.0+3.2+3.2+4.0+5.0	17.4								
2.0+3.2+4.0+4.0+4.0	17.2								
2.5+2.5+2.5+2.5+2.5	12.5								
2.5+2.5+2.5+2.5+2.8	12.8								
2.5+2.5+2.5+2.5+3.2	13.2								
2.5+2.5+2.5+2.5+4.0	14.0								
2.5+2.5+2.5+2.5+5.0	15.0								
2.5+2.5+2.5+2.5+6.0	16.0								
2.5+2.5+2.5+2.5+7.0	17.0								
2.5+2.5+2.5+2.8+2.8	13.1								
2.5+2.5+2.5+2.8+3.2	13.5								
2.5+2.5+2.5+2.8+4.0	14.3								
2.5+2.5+2.5+2.8+5.0	15.3								
2.5+2.5+2.5+2.8+6.0	16.3								
2.5+2.5+2.5+2.8+7.0	17.3								
2.5+2.5+2.5+3.2+3.2	13.9								
2.5+2.5+2.5+3.2+4.0	14.7								
2.5+2.5+2.5+3.2+5.0	15.7								
2.5+2.5+2.5+3.2+6.0	16.7								
2.5+2.5+2.5+4.0+4.0	15.5								
2.5+2.5+2.5+4.0+5.0	16.5								
2.5+2.5+2.5+4.0+6.0	17.5								
2.5+2.5+2.5+5.0+5.0	17.5								
2.5+2.5+2.8+2.8+2.8	13.4								
2.5+2.5+2.8+2.8+3.2	13.8								
2.5+2.5+2.8+2.8+4.0	14.6								
2.5+2.5+2.8+2.8+5.0	15.6								
2.5+2.5+2.8+2.8+6.0	16.6								

2.5+2.5+2.8+3.2+3.2	14.2								
2.5+2.5+2.8+3.2+4.0	15.0								
2.5+2.5+2.8+3.2+5.0	16.0								
2.5+2.5+2.8+3.2+6.0	17.0								
2.5+2.5+2.8+4.0+4.0	15.8								
2.5+2.5+2.8+4.0+5.0	16.8								
2.5+2.5+3.2+3.2+3.2	14.6								
2.5+2.5+3.2+3.2+4.0	15.4								
2.5+2.5+3.2+3.2+5.0	16.4								
2.5+2.5+3.2+3.2+6.0	17.4								
2.5+2.5+3.2+4.0+4.0	16.2								
2.5+2.5+3.2+4.0+5.0	17.2								
2.5+2.5+4.0+4.0+4.0	17.0								
2.5+2.8+2.8+2.8+2.8	13.7								
2.5+2.8+2.8+2.8+3.2	14.1								
2.5+2.8+2.8+2.8+4.0	14.9								
2.5+2.8+2.8+2.8+5.0	15.9								
2.5+2.8+2.8+2.8+6.0	16.9								
2.5+2.8+2.8+3.2+3.2	14.5								
2.5+2.8+2.8+3.2+4.0	15.3								
2.5+2.8+2.8+3.2+5.0	16.3								
2.5+2.8+2.8+3.2+6.0	17.3								
2.5+2.8+2.8+4.0+4.0	16.1								
2.5+2.8+2.8+4.0+5.0	17.1								
2.5+2.8+3.2+3.2+3.2	14.9								
2.5+2.8+3.2+3.2+4.0	15.7								
2.5+2.8+3.2+3.2+5.0	16.7								
2.5+2.8+3.2+4.0+4.0	16.5								
2.5+2.8+3.2+4.0+5.0	17.5								
2.5+2.8+4.0+4.0+4.0	17.3								
2.5+3.2+3.2+3.2+3.2	15.3								
2.5+3.2+3.2+3.2+4.0	16.1								
2.5+3.2+3.2+3.2+5.0	17.1								
2.5+3.2+3.2+4.0+4.0	16.9								
2.8+2.8+2.8+2.8+2.8	14.0								
2.8+2.8+2.8+2.8+3.2	14.4								
2.8+2.8+2.8+2.8+4.0	15.2								
2.8+2.8+2.8+2.8+5.0	16.2								
2.8+2.8+2.8+2.8+6.0	17.2								
2.8+2.8+2.8+3.2+3.2	14.8								
2.8+2.8+2.8+3.2+4.0	15.6								
2.8+2.8+2.8+3.2+5.0	16.6								
2.8+2.8+2.8+4.0+4.0	16.4								
2.8+2.8+2.8+4.0+5.0	17.4								
2.8+2.8+3.2+3.2+3.2	15.2								
2.8+2.8+3.2+3.2+4.0	16.0								
2.8+2.8+3.2+3.2+5.0	17.0								
2.8+2.8+3.2+4.0+4.0	16.8								
2.8+3.2+3.2+3.2+3.2	15.6								
2.8+3.2+3.2+3.2+4.0	16.4								
2.8+3.2+3.2+3.2+5.0	17.4								
2.8+3.2+3.2+4.0+4.0	17.2								
3.2+3.2+3.2+3.2+3.2	16.0								
3.2+3.2+3.2+3.2+4.0	16.8								

- Cooling capacities are based on indoor temperature of 8.0°F DRY BULB, 67°F WET BULB and outdoor air temperature of 9.5°F DRY BULB, 7.5°F WET BULB.
- Specifications are subject to change without notice for further improvement.

3. Features

- **Inverter Technology**
  - Wider output power range
  - Energy saving
  - Quick Cooling
  - Quick Heating
  - More precise temperature control

- **Environment Protection**
  - Non-ozone depletion substances refrigerant (R410A)

- **Long Installation Piping**
  - Long piping up to 15 meters (0.75 ~ 1.75HP) and 20 meters (2.0 ~ 2.25HP) during single split connection only
  - CS/CU-E24/28QK, long piping up to 30 meter

- **Easy to use remote control**

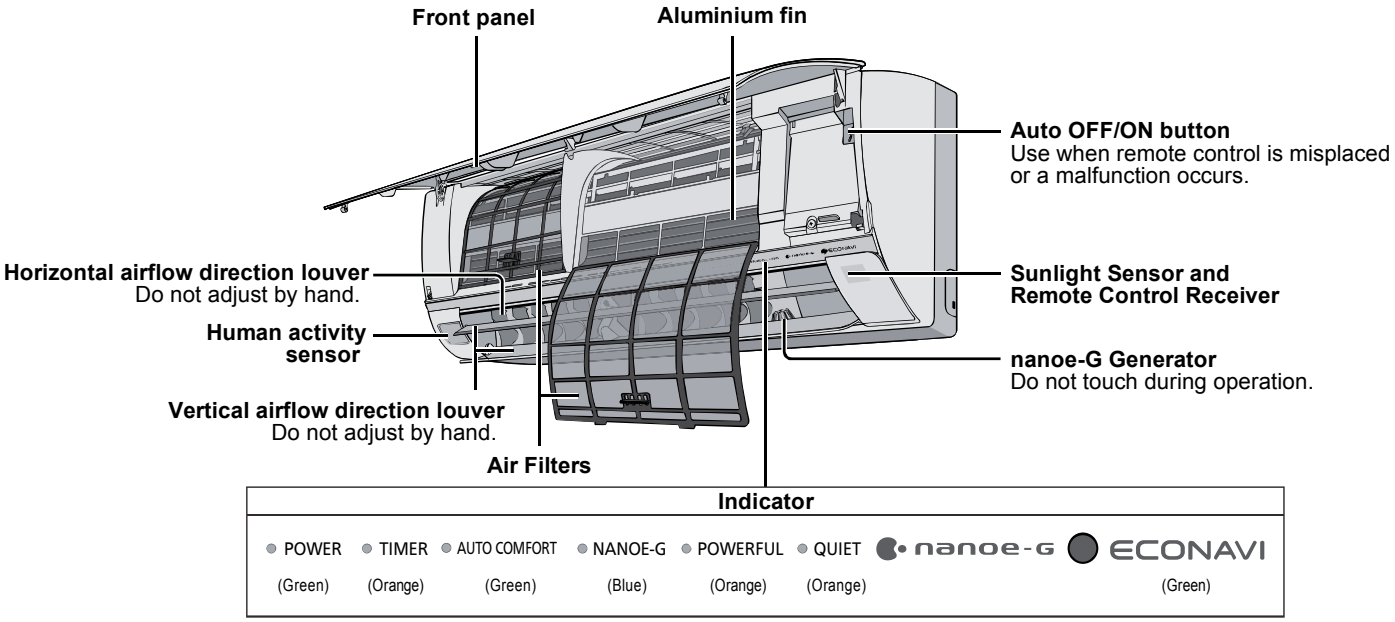
- **Quality Improvement**
  - Random auto restart after power failure for safety restart operation
  - Gas leakage protection
  - Prevent compressor reverse cycle
  - Inner protector to protect compressor
  - Noise prevention during soft dry operation

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

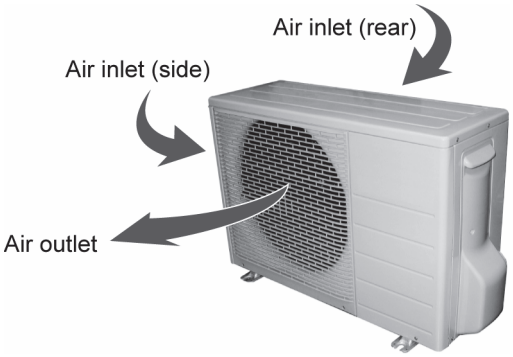
- **Serviceability Feature**
  - Activation and Deactivation Method for Heating Only Mode
  - Breakdown Self Diagnosis function

4. Location of Controls and Components

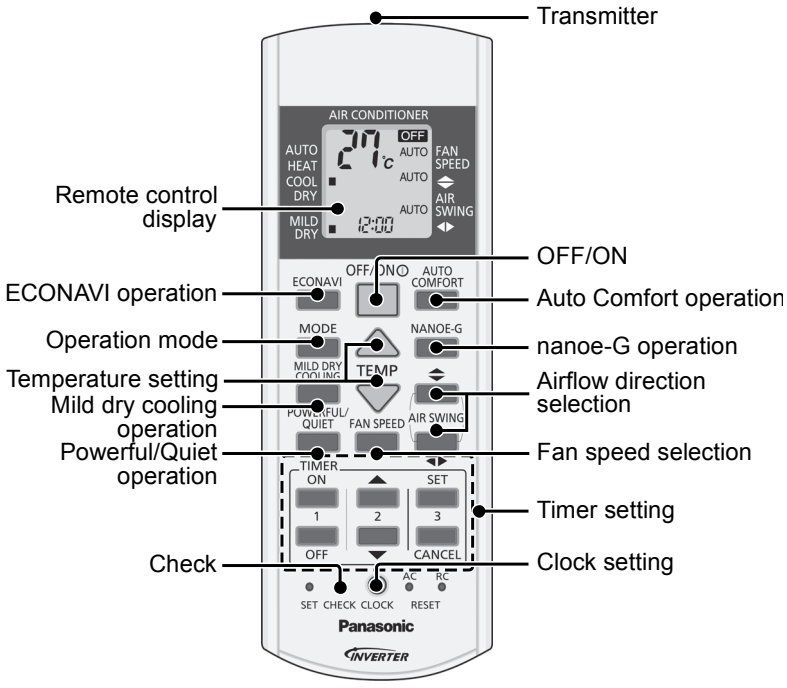
4.1 Indoor Unit



4.2 Outdoor Unit



4.3 Remote Control

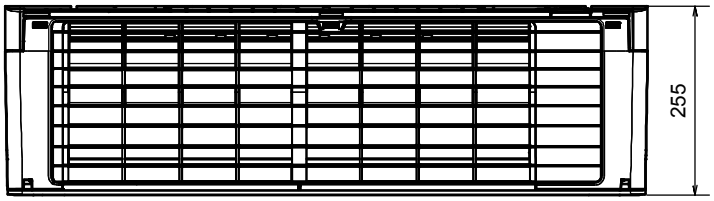


5. Dimensions

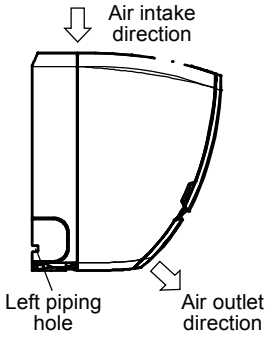
5.1 Indoor Unit

5.1.1 CS-E7QK CS-E9QK CS-E12QK CS-E15QK CS-XE7QK CS-XE9QK CS-XE12QK

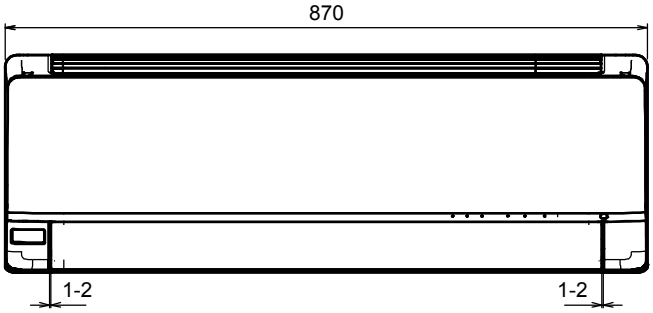
<Top View>



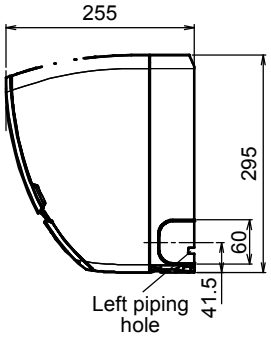
<Side View>



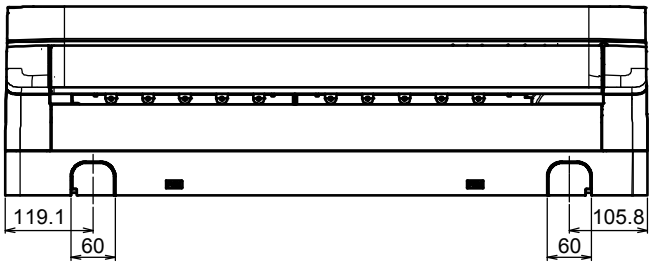
<Front View>



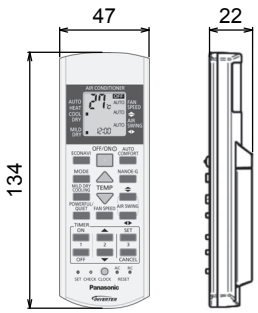
<Side View>



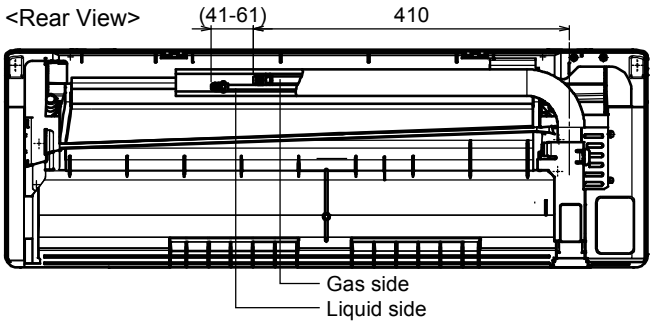
<Bottom View>



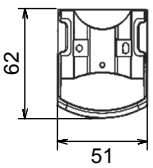
<Remote Control>



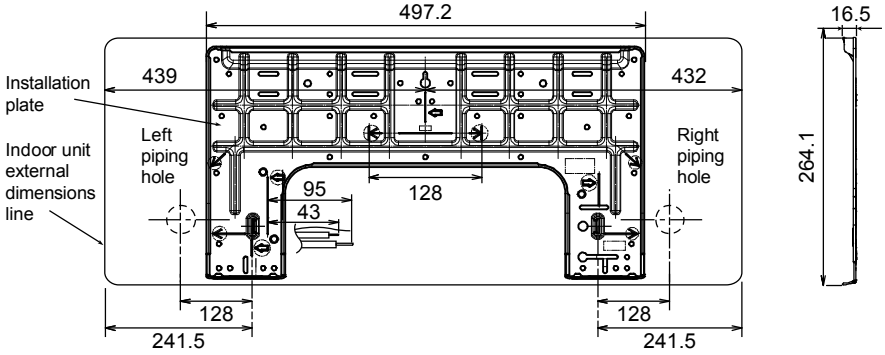
<Rear View>



<Remote Control Holder>



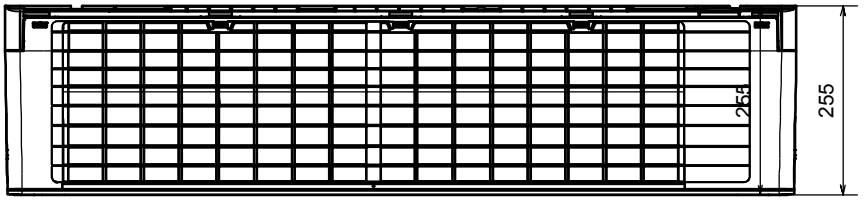
Relative position between the indoor unit and the installation plate <Front View>



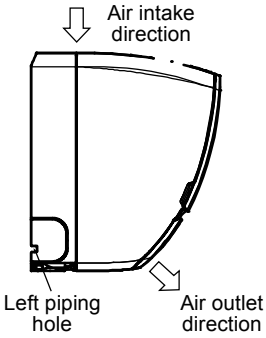
Unit : mm

5.1.2 CS-E18QK CS-E21QK CS-E24QK CS-E28QK CS-XE18QK

<Top View>

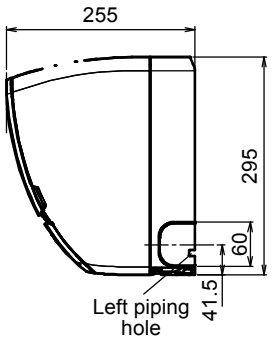


<Side View>



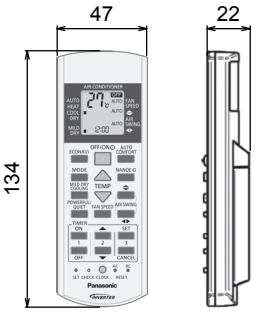
<Front View>

<Side View>

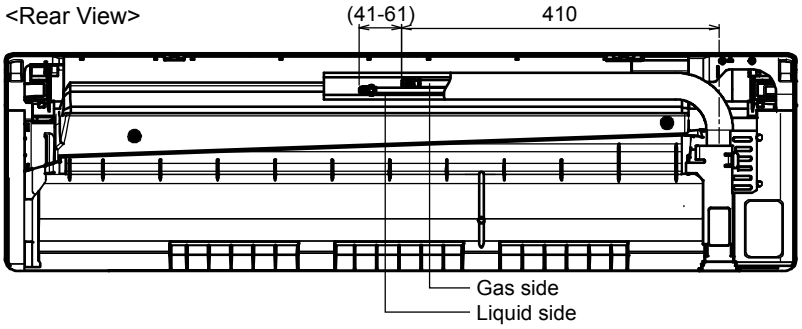


<Bottom View>

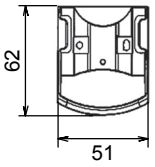
<Remote Control>



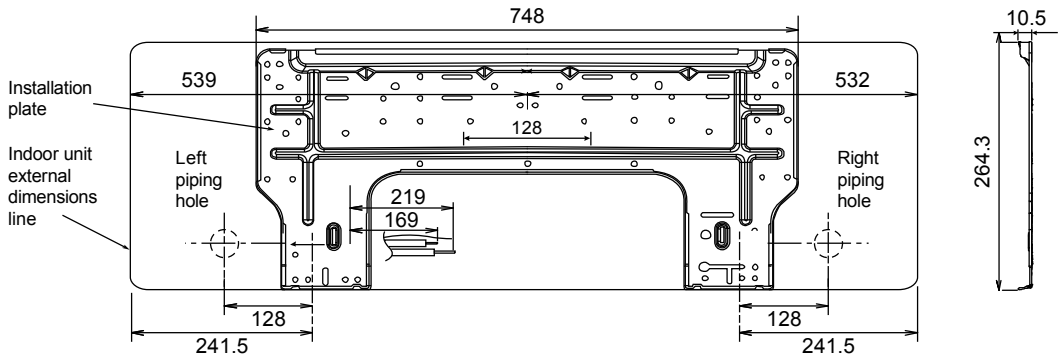
<Rear View>



<Remote Control Holder>

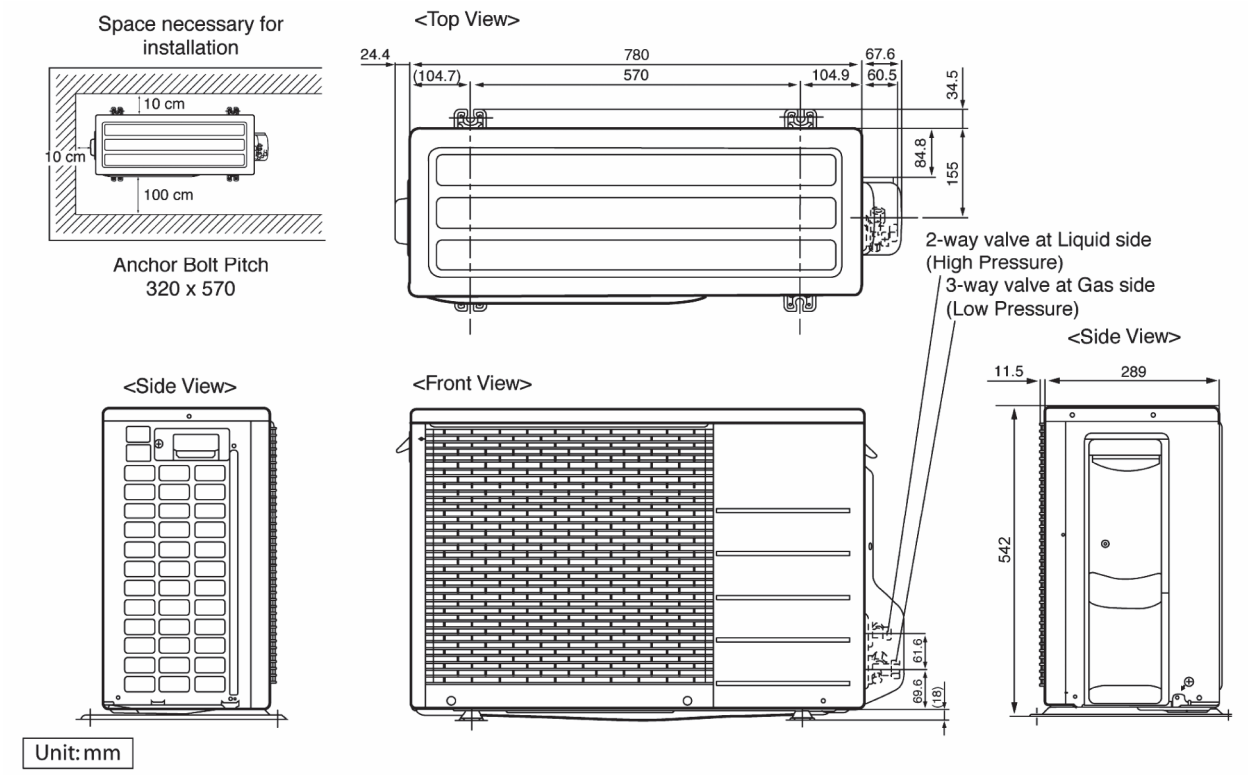


Relative position between the indoor unit and the installation plate <Front View>

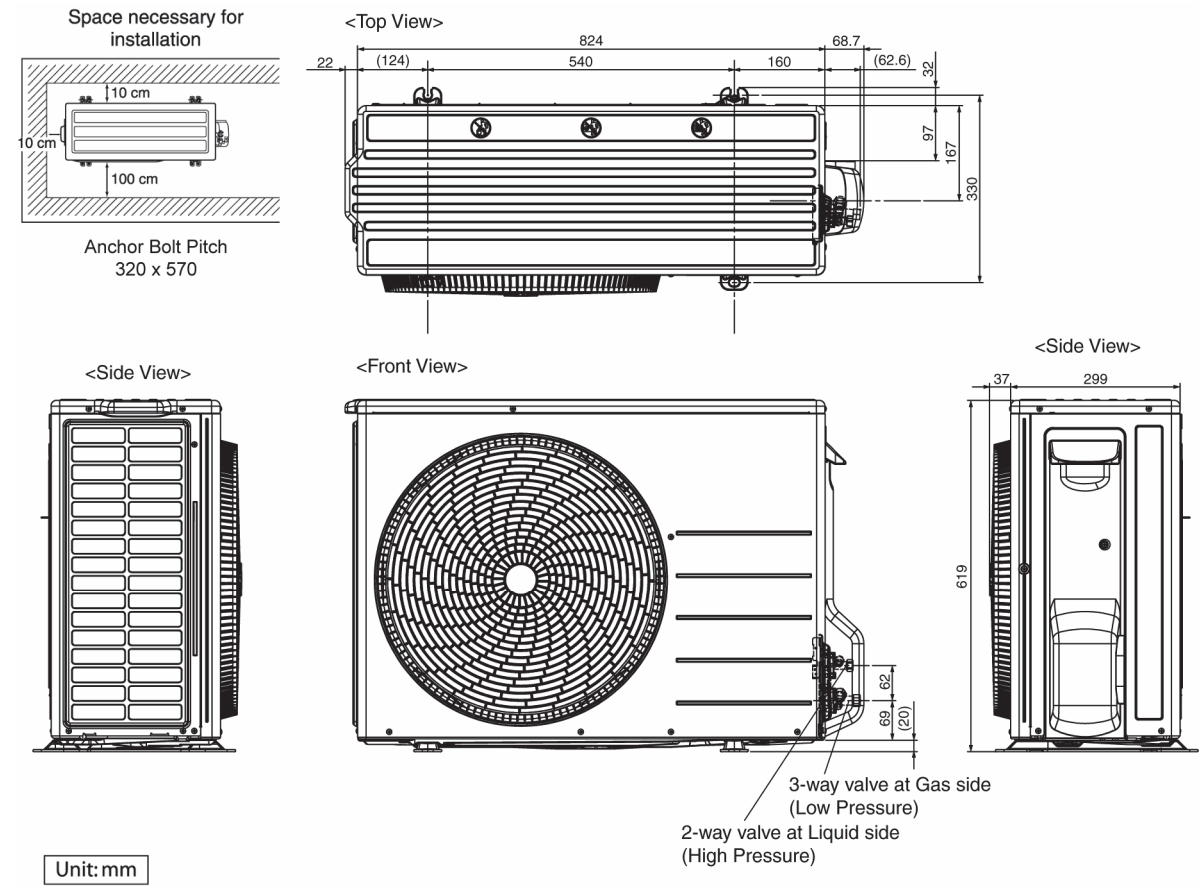


5.2 Outdoor Unit

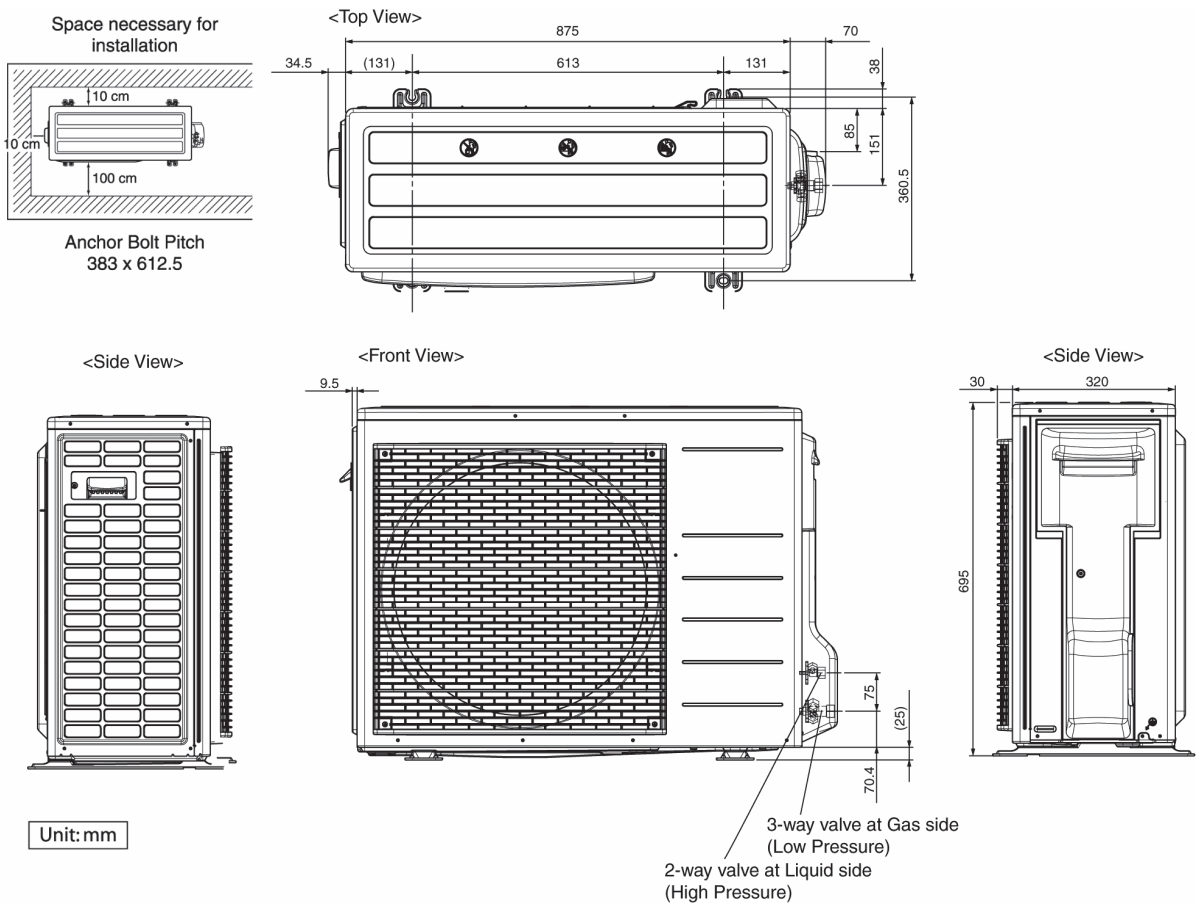
5.2.1 CU-E7QKE CU-E9QKE



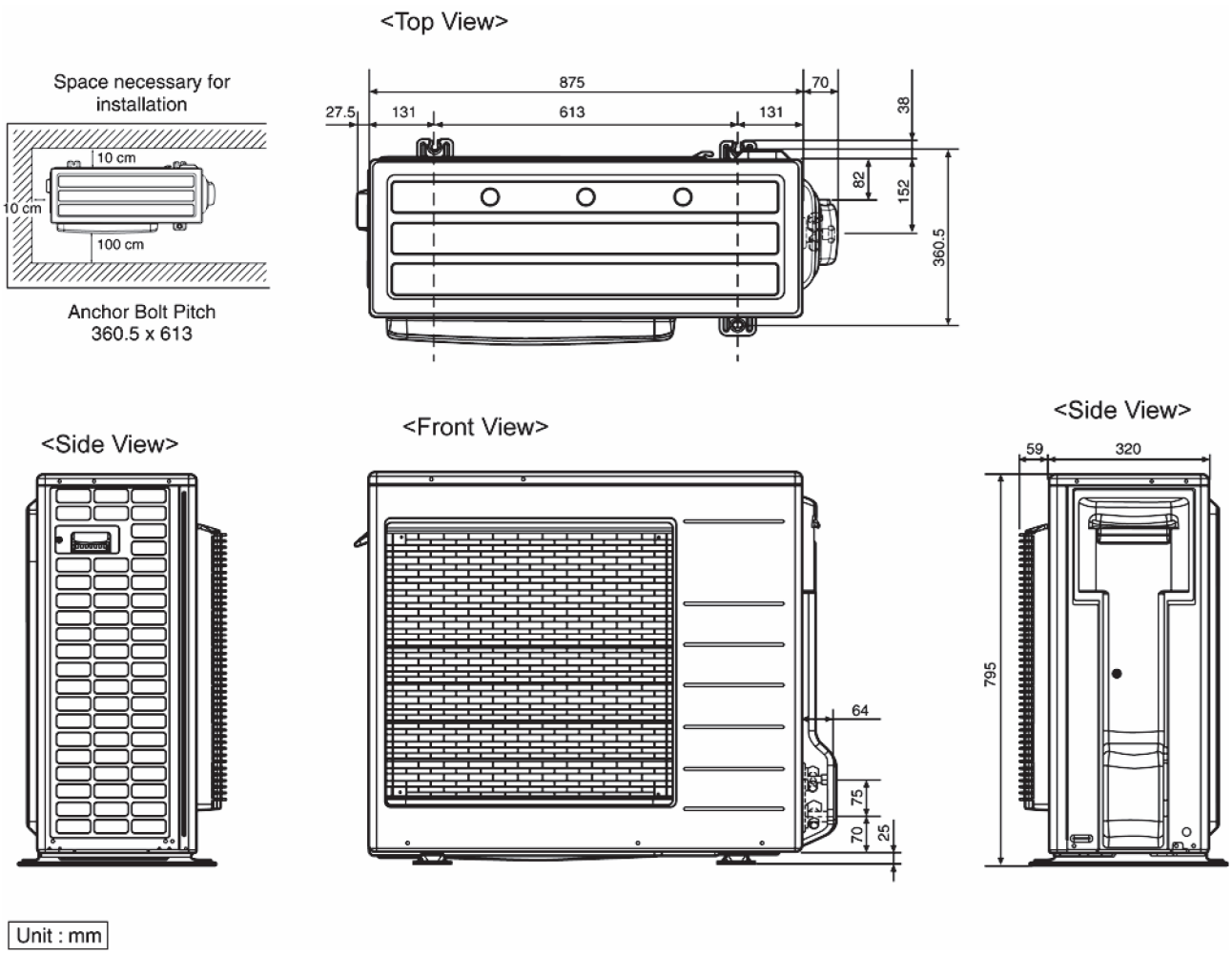
5.2.2 CU-E12QKE CU-E15QKE



5.2.3 CU-E18QKE CU-E21QKE



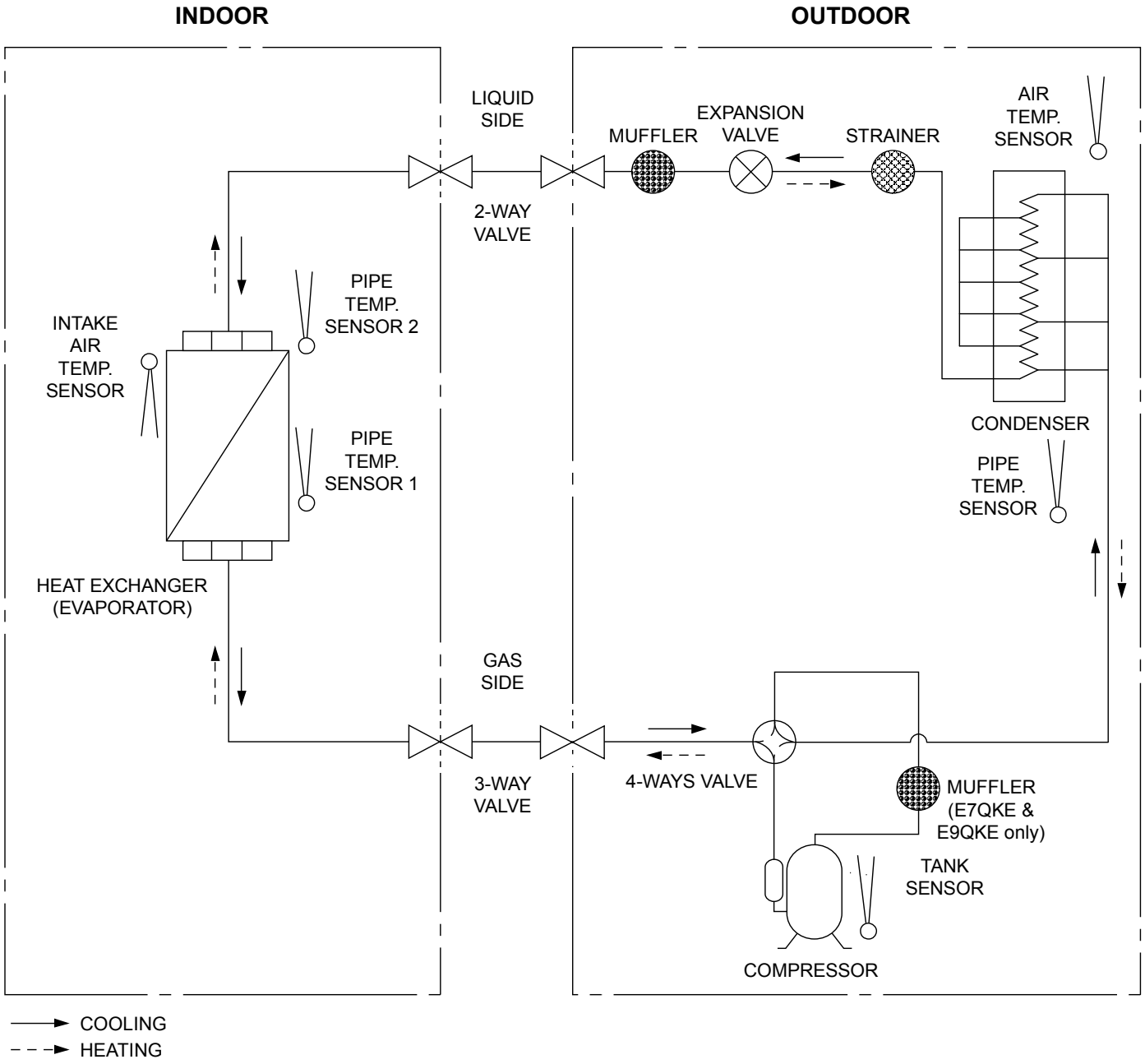
5.2.4 CU-E24QKE CU-E28QKE



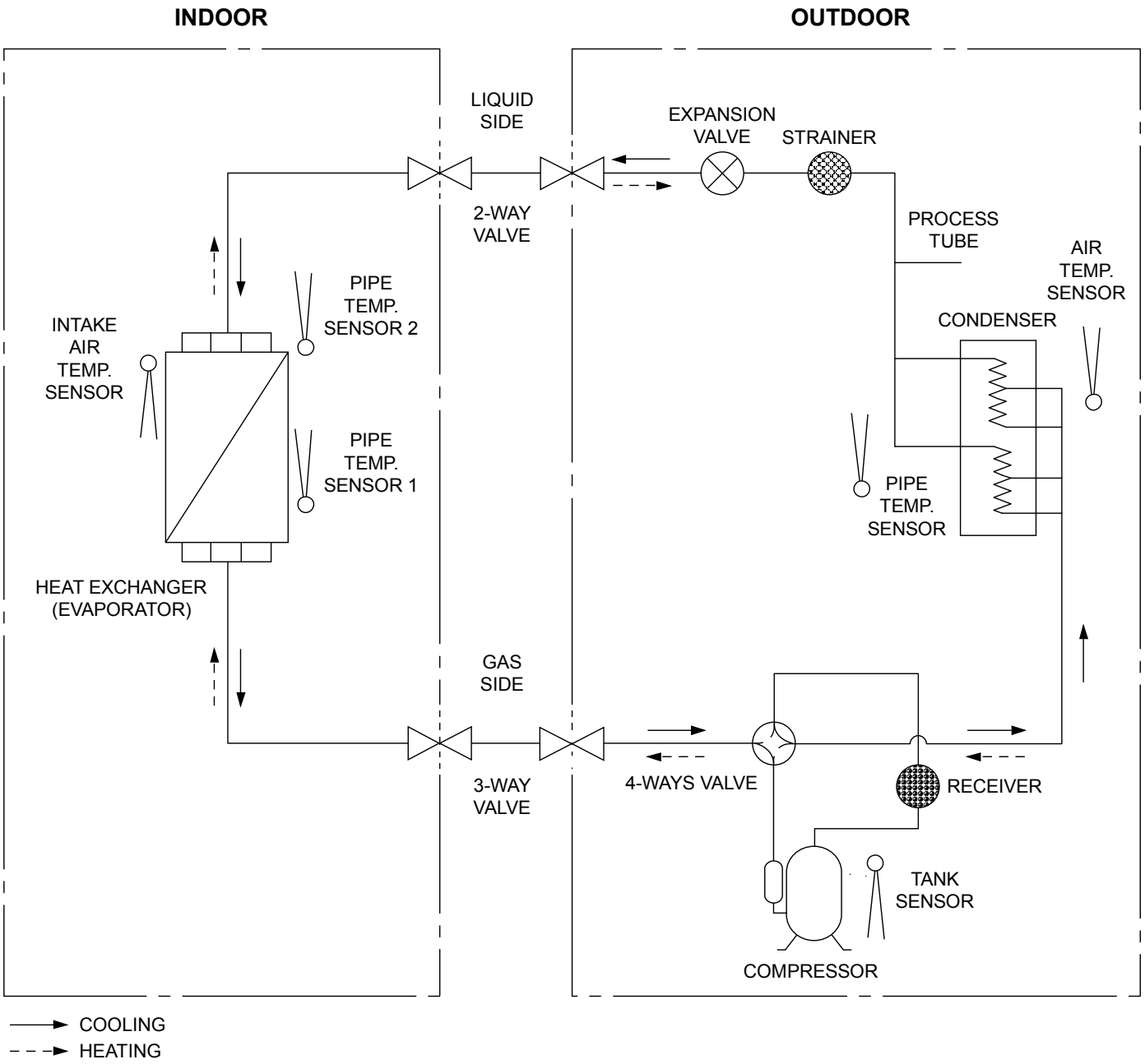
Unit : mm

6. Refrigeration Cycle Diagram

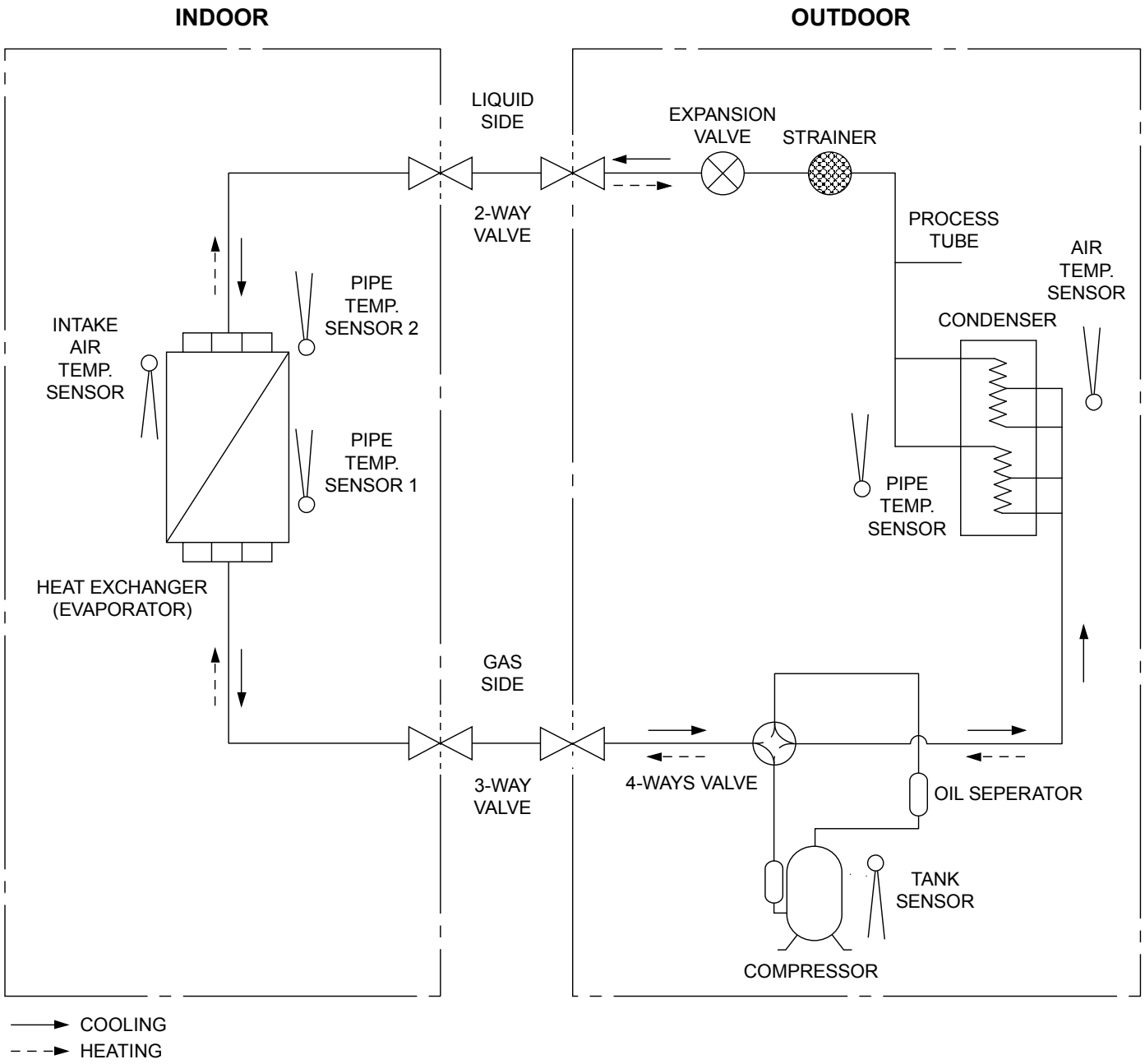
6.1 CU-E7QKE CU-E9QKE CU-E12QKE CU-E15QKE



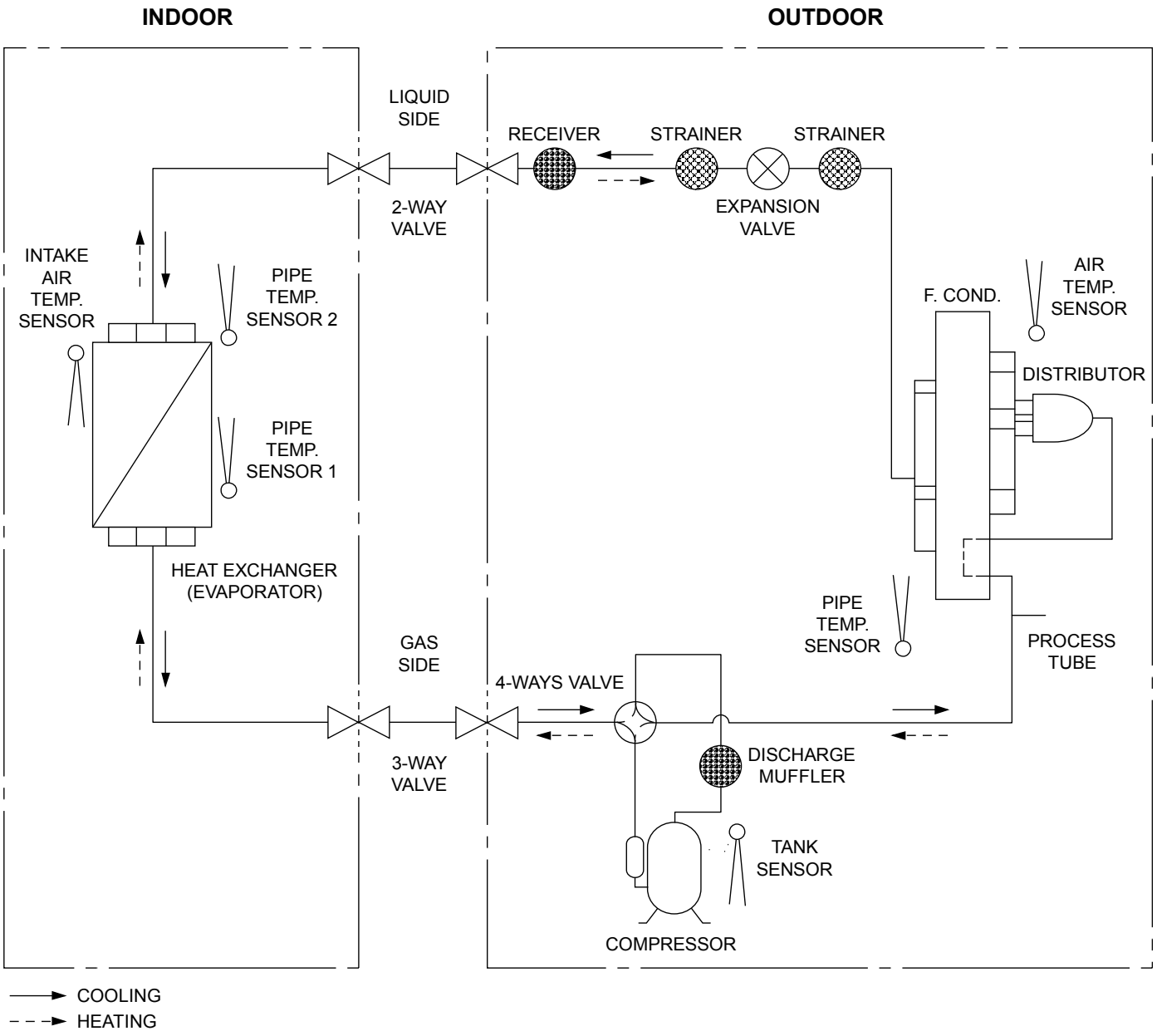
6.2 CU-E18QKE


INDOOR
OUTDOOR
LIQUID SIDE
EXPANSION VALVE
STRAINER
2-WAY VALVE
PROCESS TUBE
AIR TEMP. SENSOR
CONDENSER
PIPE TEMP. SENSOR 2
INTAKE AIR TEMP. SENSOR
PIPE TEMP. SENSOR 1
PIPE TEMP. SENSOR
HEAT EXCHANGER (EVAPORATOR)
GAS SIDE
3-WAY VALVE
4-WAYS VALVE
RECEIVER
TANK SENSOR
COMPRESSOR
COOLING
HEATING

6.3 CU-E21QKE

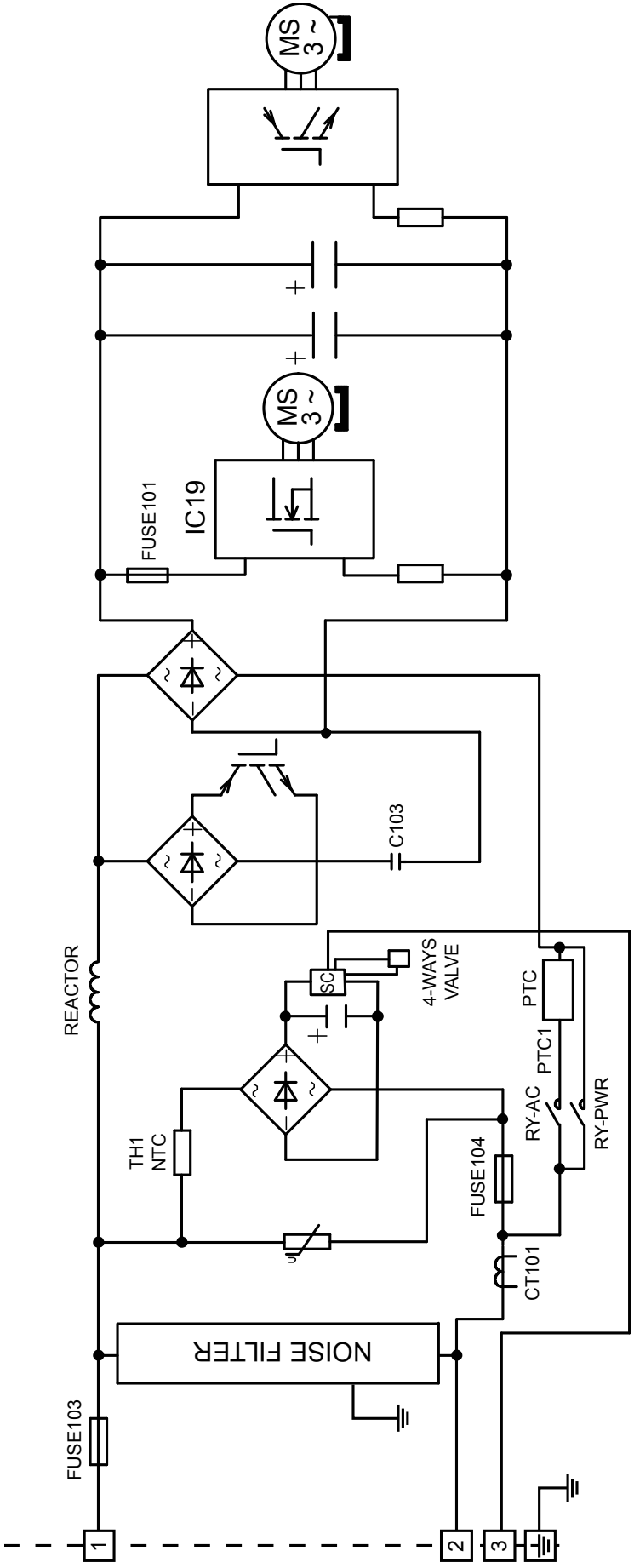

INDOOR
OUTDOOR
LIQUID SIDE
EXPANSION VALVE
STRAINER
2-WAY VALVE
PROCESS TUBE
AIR TEMP. SENSOR
CONDENSER
PIPE TEMP. SENSOR 2
INTAKE AIR TEMP. SENSOR
PIPE TEMP. SENSOR 1
PIPE TEMP. SENSOR
HEAT EXCHANGER (EVAPORATOR)
GAS SIDE
3-WAY VALVE
4-WAYS VALVE
OIL SEPERATOR
TANK SENSOR
COMPRESSOR
COOLING
HEATING

6.4 CU-E24QKE CU-E28QKE

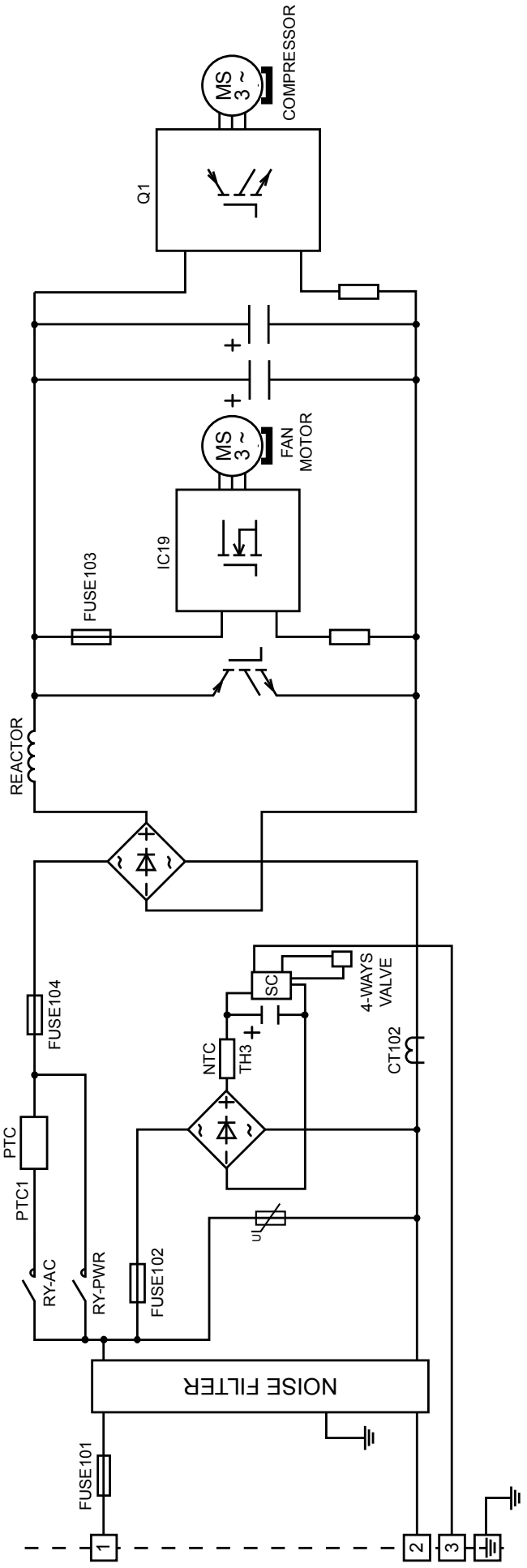


7. Block Diagram

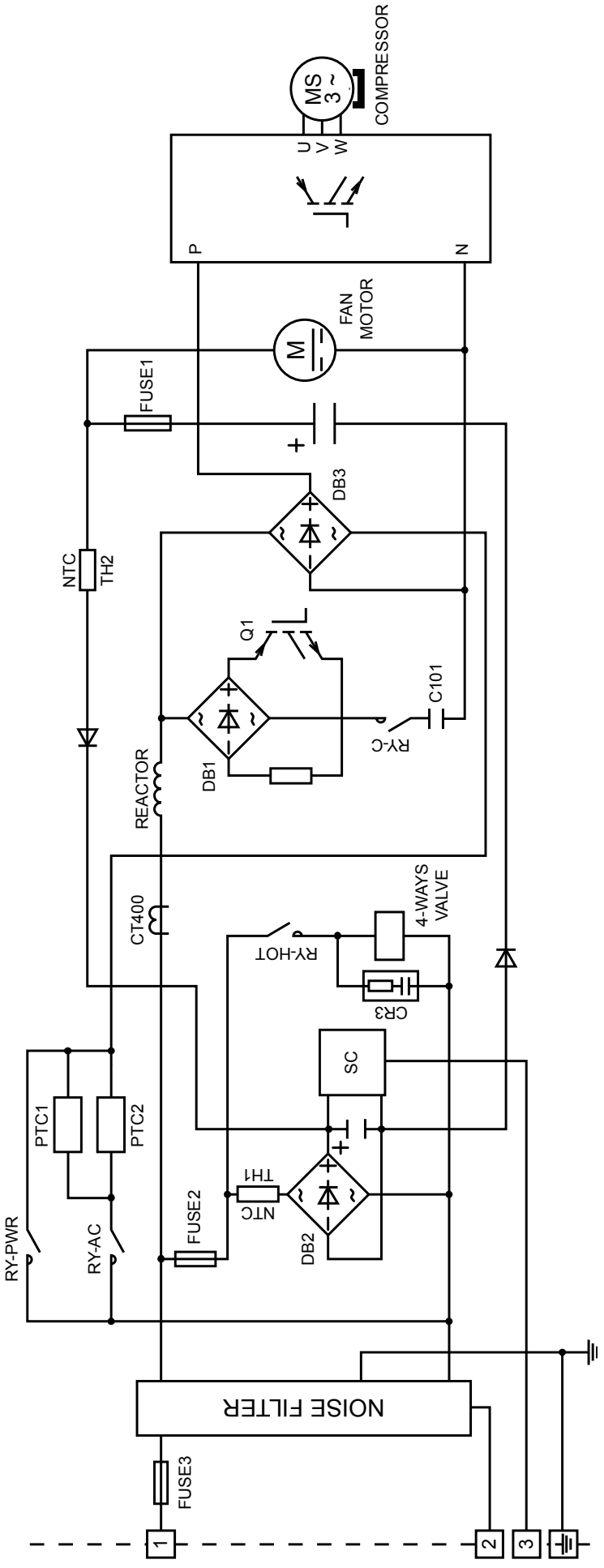
7.1 CU-E7QKE



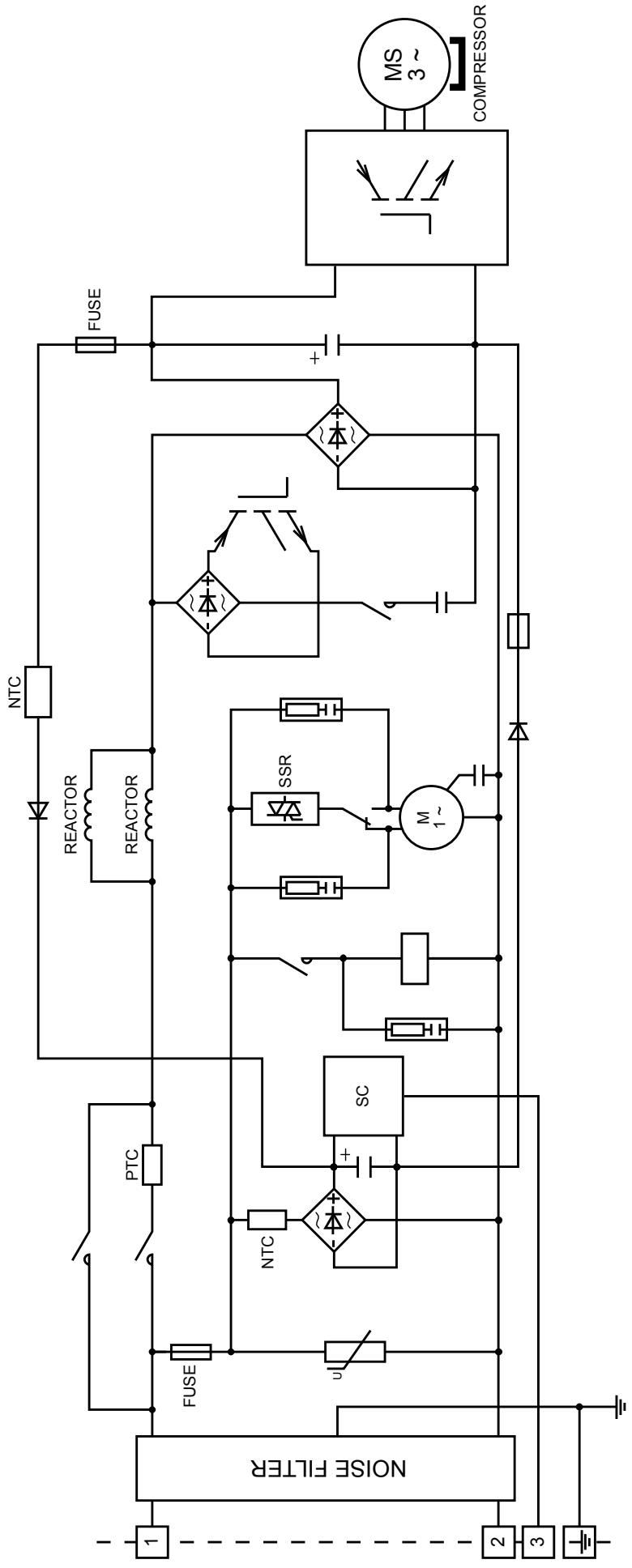
7.2 CU-E9QKE CU-E12QKE CU-E15QKE



7.3 CU-E18QKE CU-E21QKE



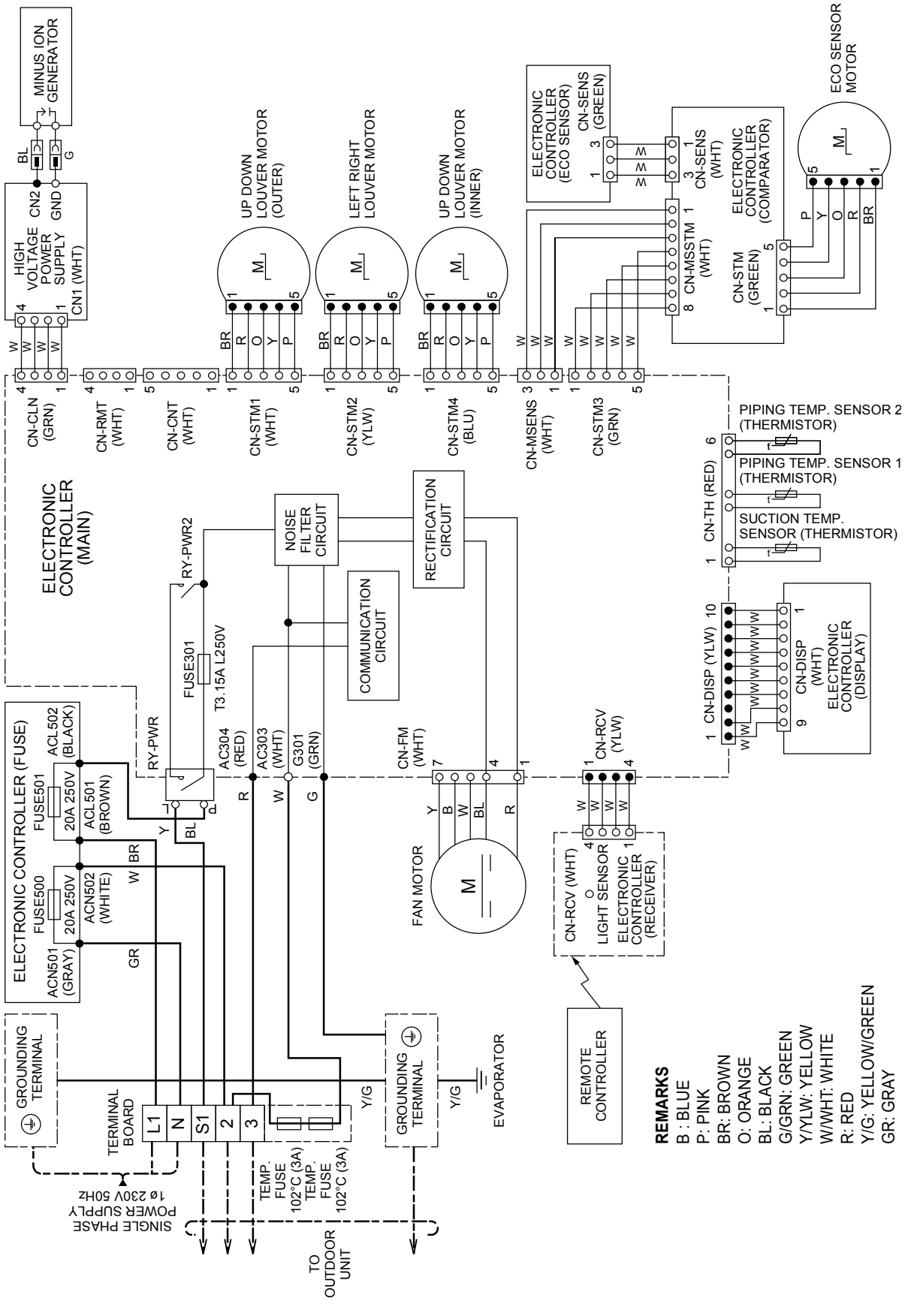
7.4 CU-E24QKE CU-E28QKE



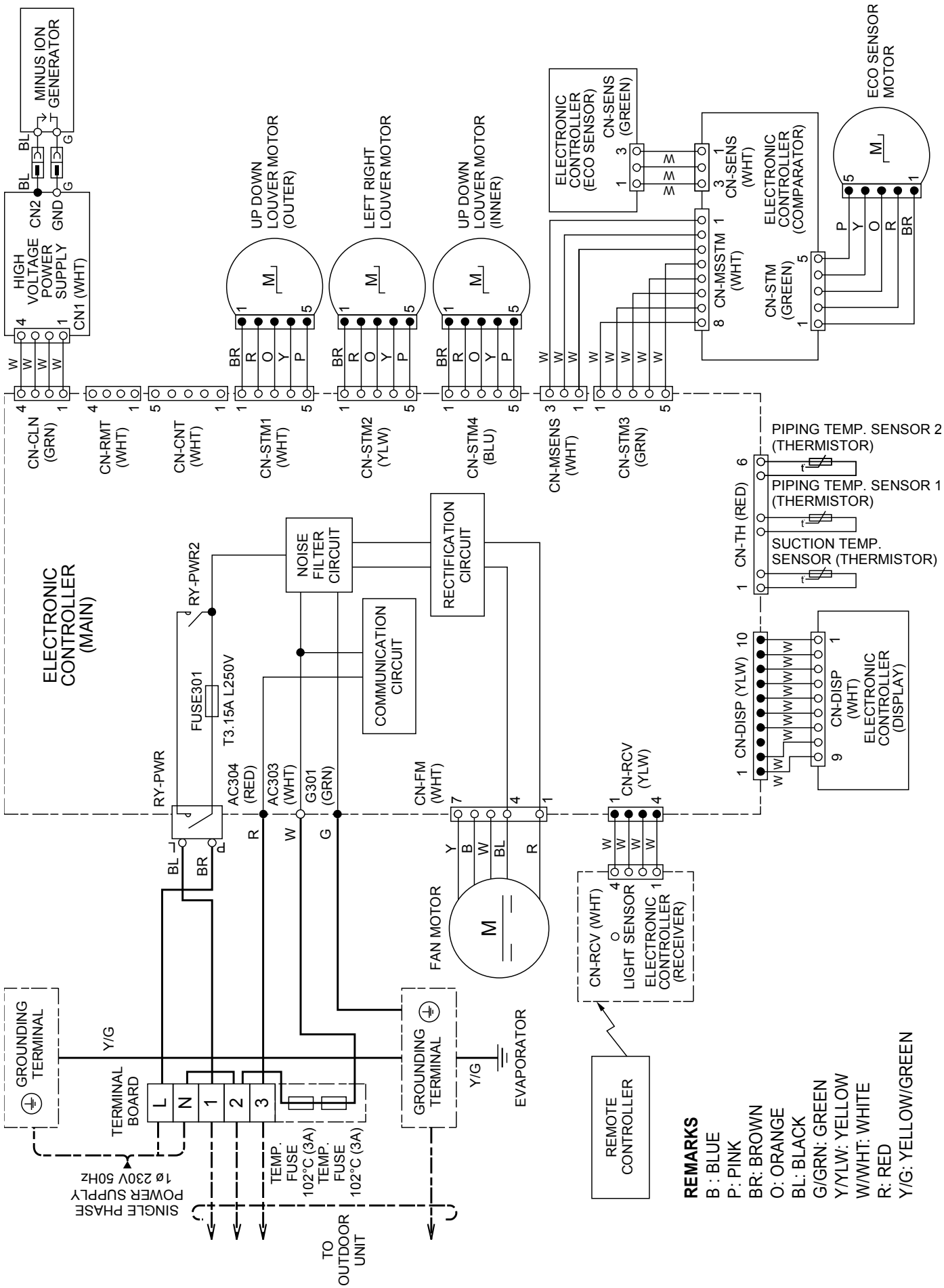
8. Wiring Connection Diagram

8.1 Indoor Unit

8.1.1 CS-E7QK CS-E9QK CS-E12QK CS-E15QK CS-E18QK CS-E21QK CS-E24QK CS-XE7QK CS-XE9QK CS-XE12QK CS-XE18QK

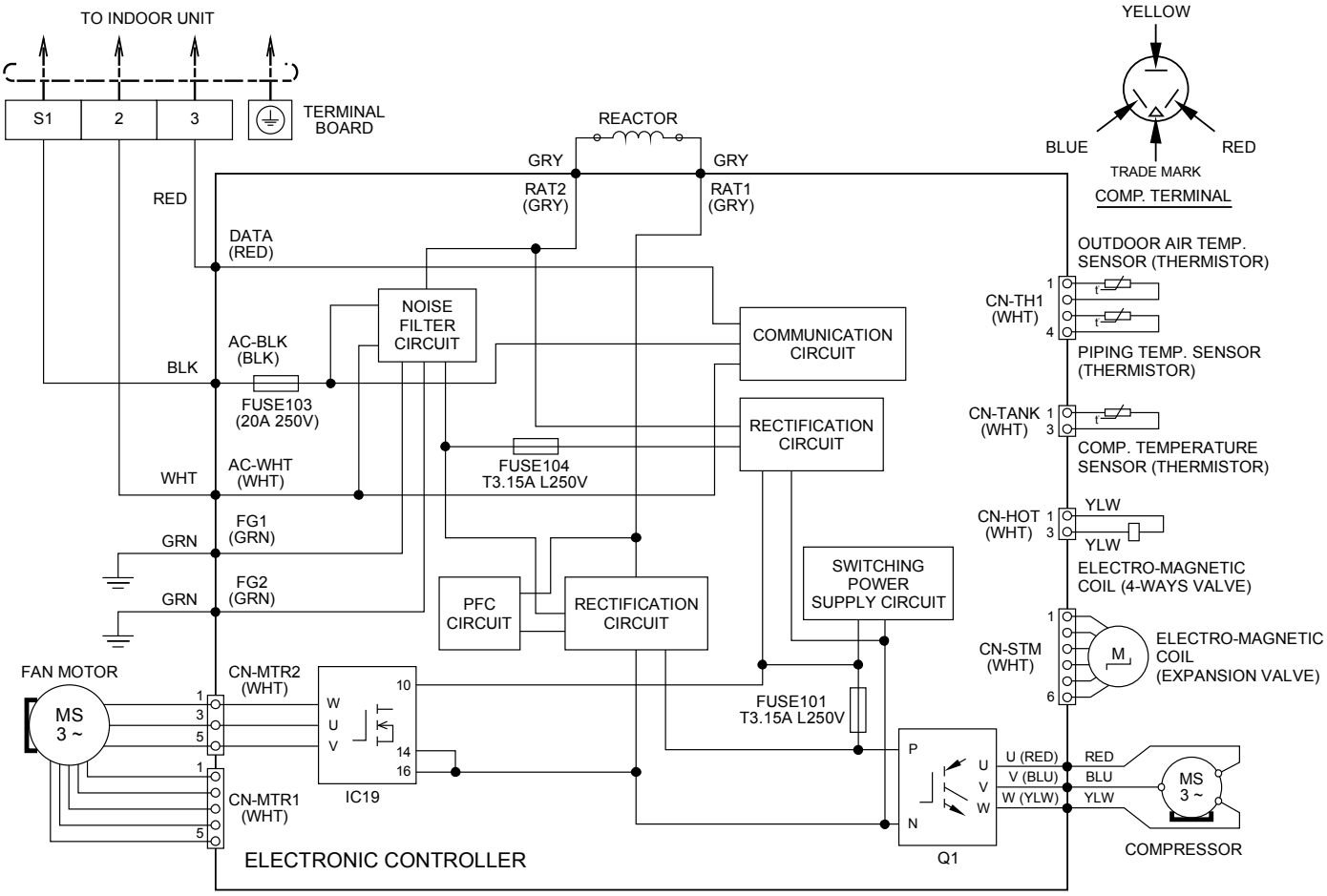


8.1.2 CS-E28QKES



8.2 Outdoor Unit

8.2.1 CU-E7QKE



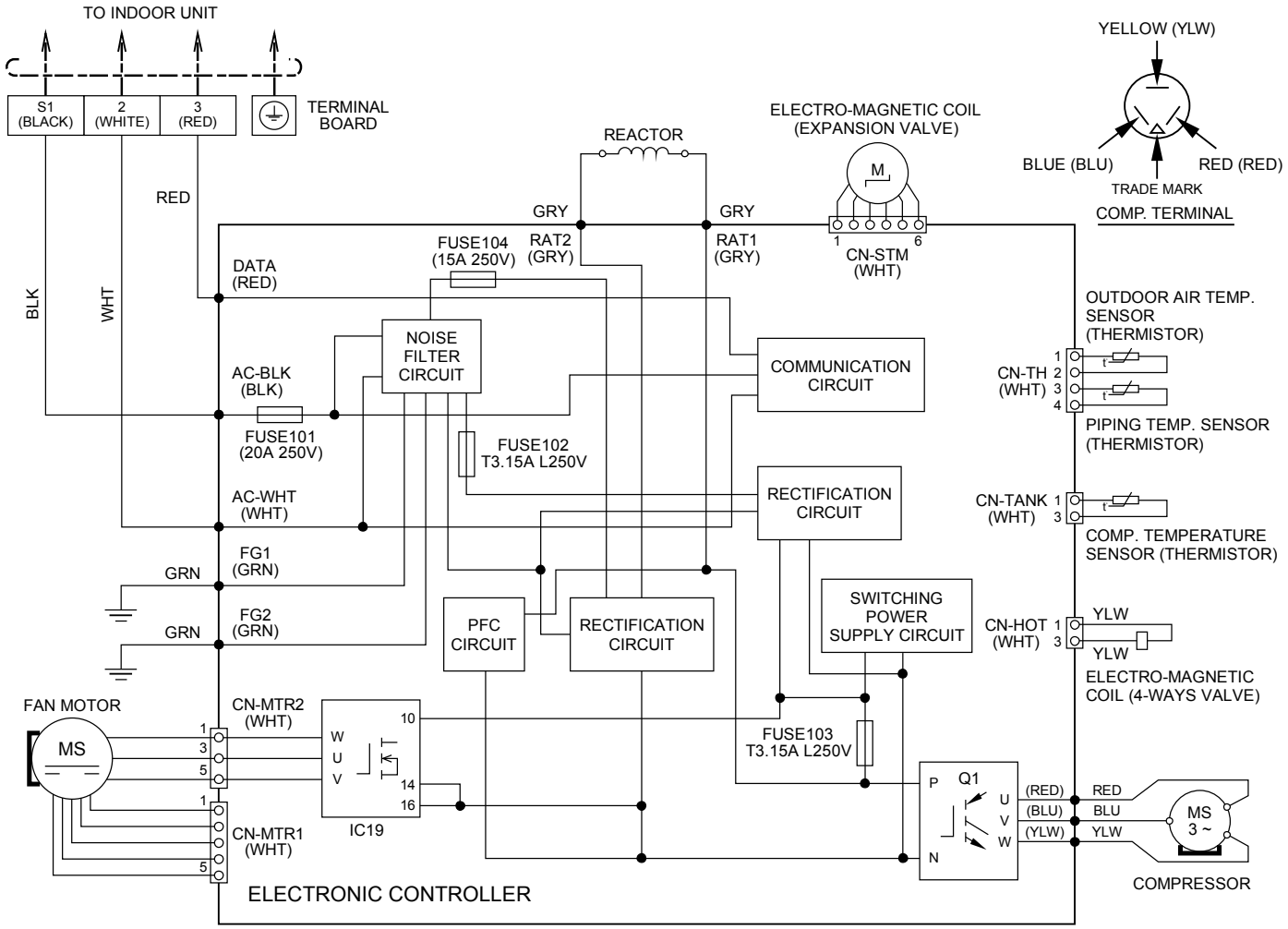
REMARKS
BLUE: (BLU) BLACK: (BLK) WHITE: (WHT) RED: (RED)
YELLOW: (YLW) GRAY: (GRY) GREEN: (GRN) ORANGE: (ORG)

Resistance of Compressor Windings

MODEL	CU-E7QKE
CONNECTION	5RS092XCD21 (Ω)
U-V	1.152
U-W	1.152
V-W	1.152

Note: Resistance at 20°C of ambient temperature.

8.2.2 CU-E9QKE CU-E12QKE CU-E15QKE



REMARKS

BLACK: (BLK) WHITE: (WHT) YELLOW: (YLW) ORANGE: (ORG)
YELLOW/GREEN: (YLW/GRN) BLUE: (BLU) RED: (R) BROWN: (BRW)

Resistance of Compressor Windings

MODEL	CU-E9QKE
CONNECTION	5RS102XBC21 (Ω)
U-V	0.858
U-W	0.858
V-W	0.858

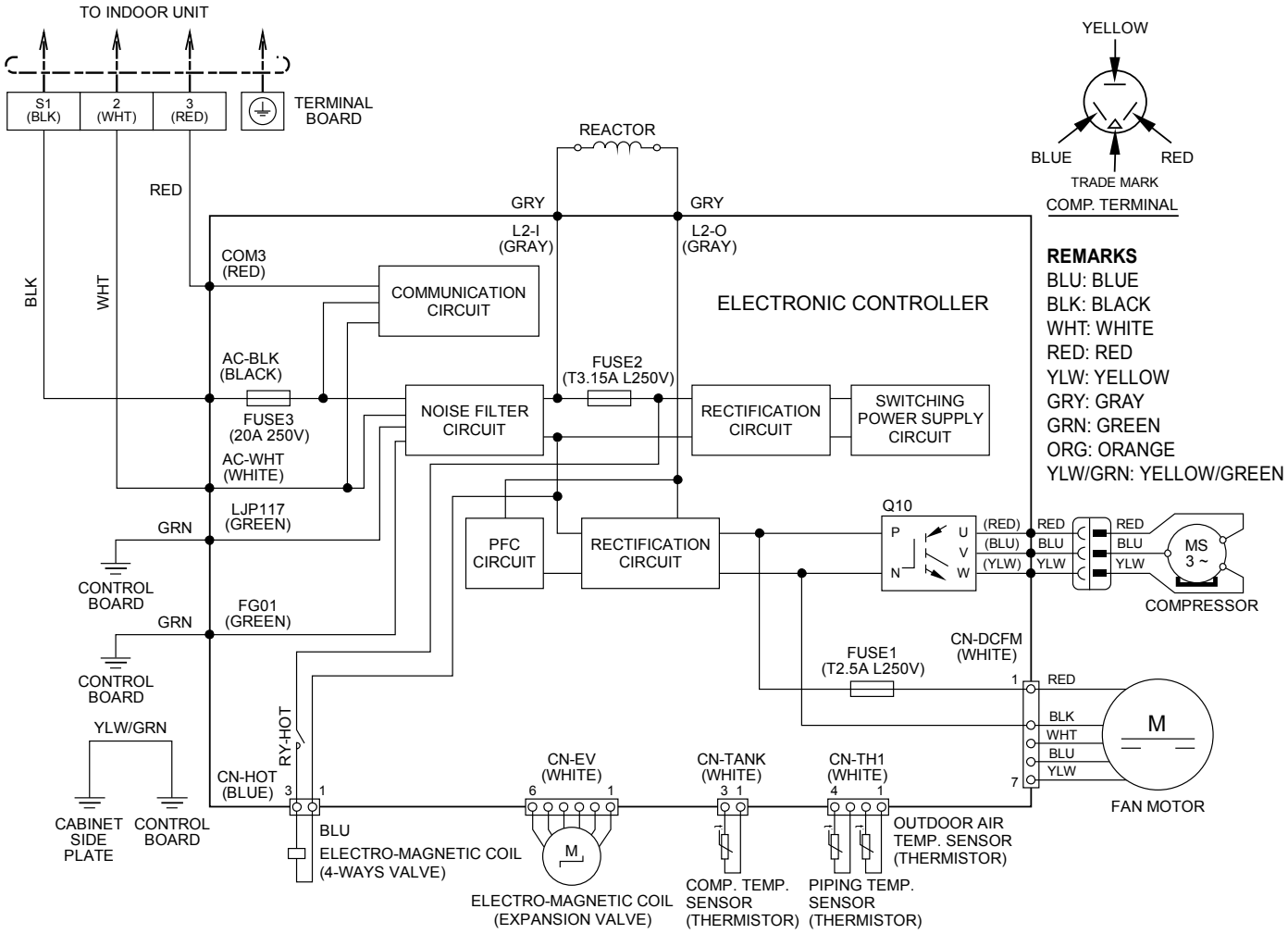
Note: Resistance at 20°C of ambient temperature.

Resistance of Compressor Windings

MODEL	CU-E12QKE / CU-E15QKE
CONNECTION	5RS102XNA21 (Ω)
U-V	1.211
U-W	1.211
V-W	1.211

Note: Resistance at 20°C of ambient temperature.

8.2.3 CU-E18QKE CU-E21QKE

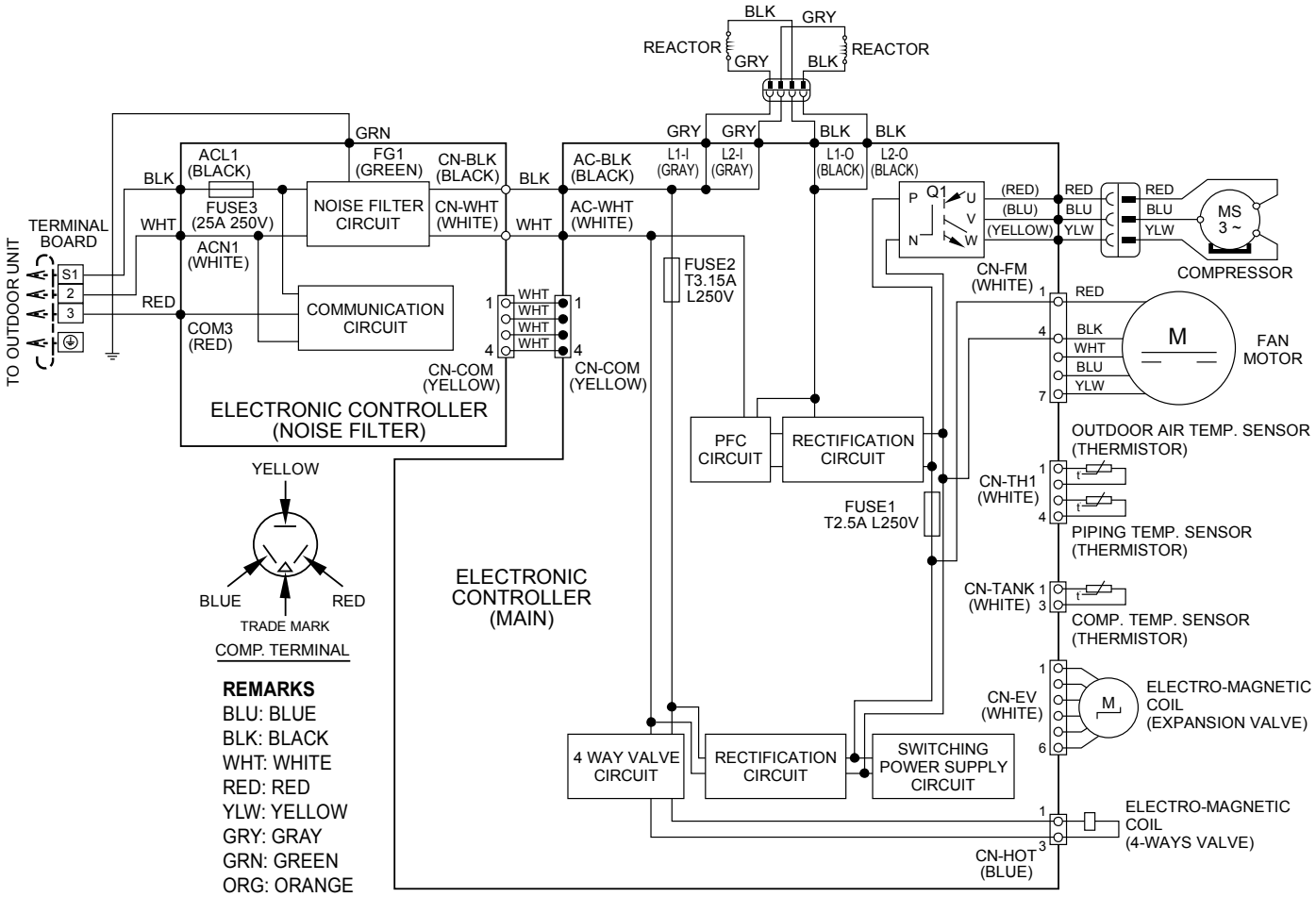


Resistance of Compressor Windings

MODEL	CU-E18QKE / CU-E21QKE
CONNECTION	5RD132XBA21 (Ω)
U-V	1.897
U-W	1.907
V-W	1.882

Note: Resistance at 20°C of ambient temperature.

8.2.4 CU-E24QKE

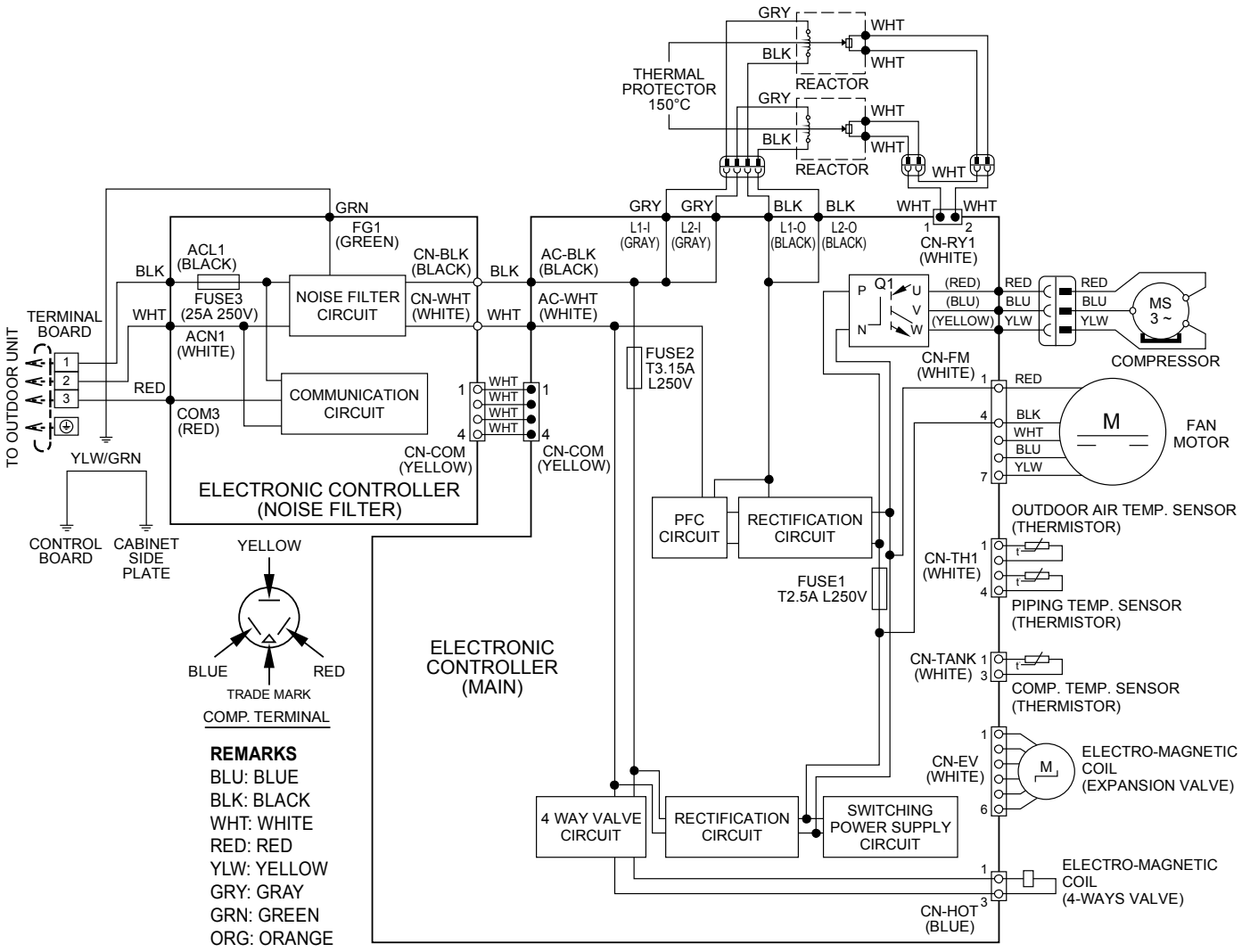


Resistance of Compressor Windings

MODEL	CU-E24QKE
CONNECTION	5KD240XAF21 (Ω)
U-V	0.720
U-W	0.726
V-W	0.708

Note: Resistance at 20°C of ambient temperature.

8.2.5 CU-E28QKE



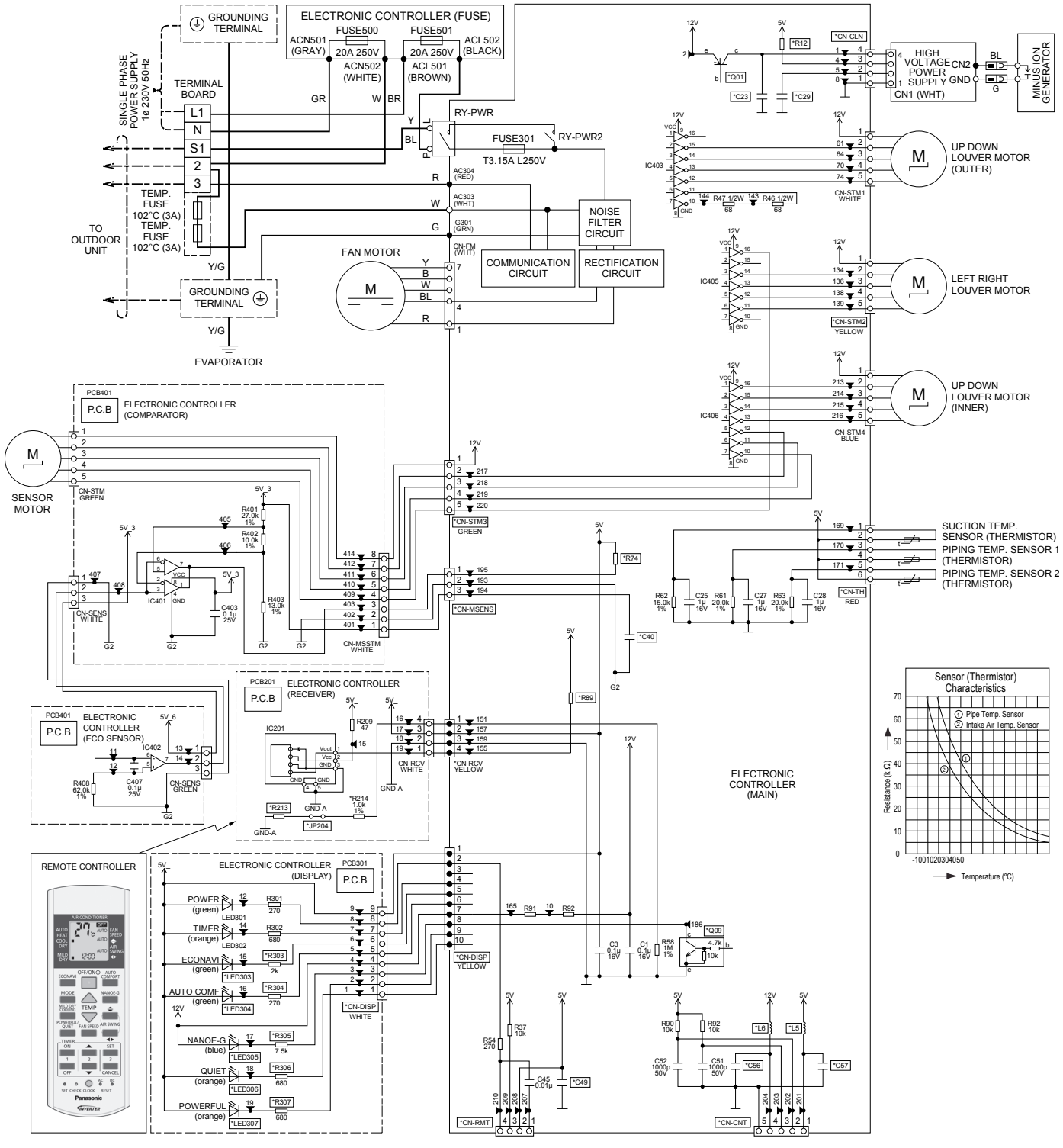
Resistance of Compressor Windings

MODEL	CU-E28QKE
CONNECTION	5KD240XAF21 (Ω)
U-V	0.720
U-W	0.726
V-W	0.708

Note: Resistance at 20°C of ambient temperature.

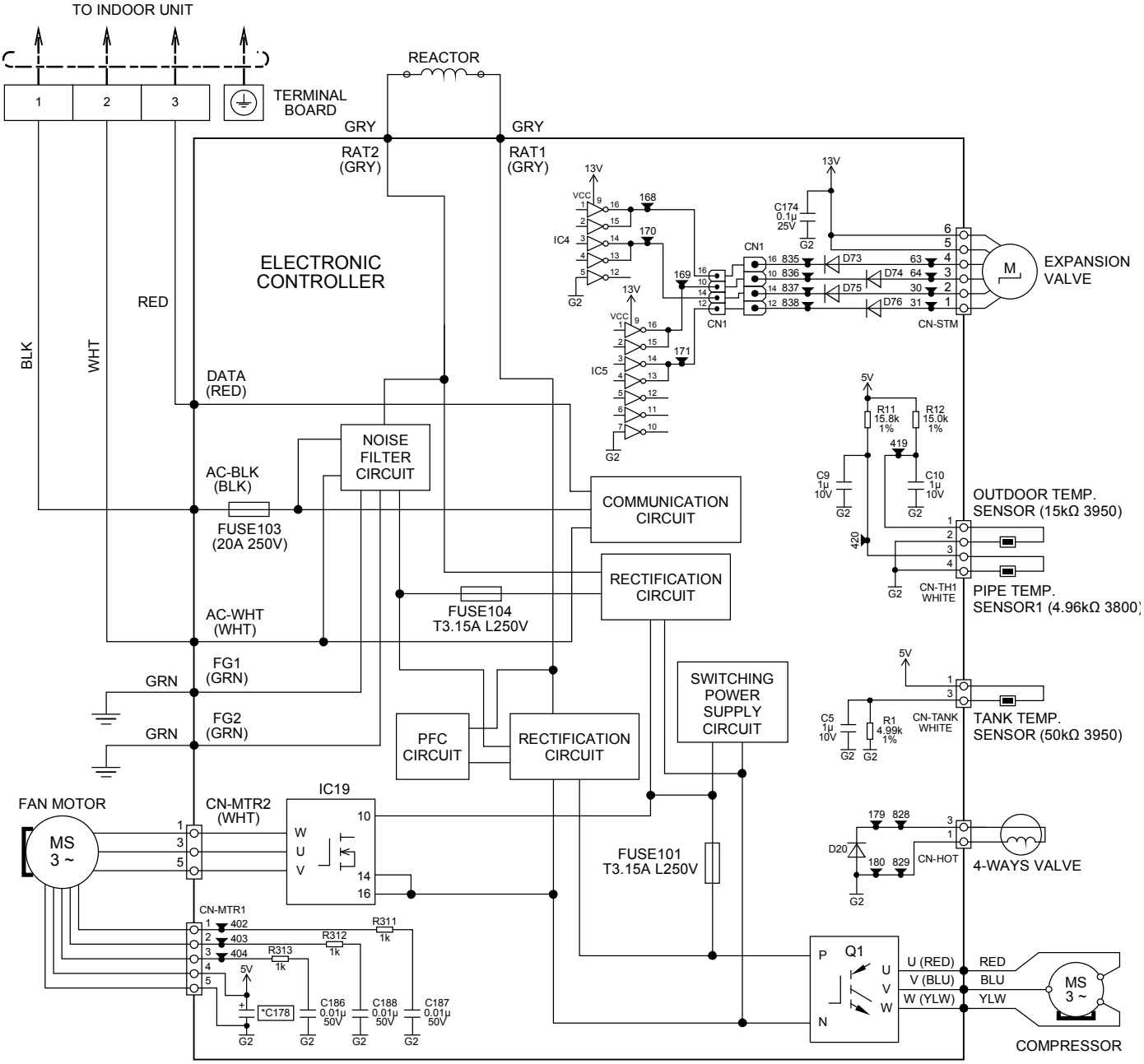
9. Electronic Circuit Diagram

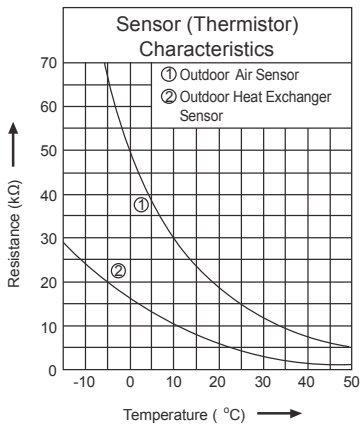
9.1 Indoor Unit

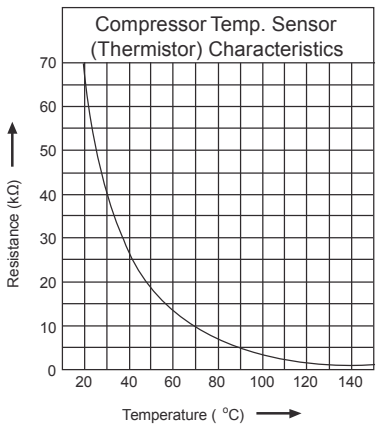


9.2 Outdoor Unit

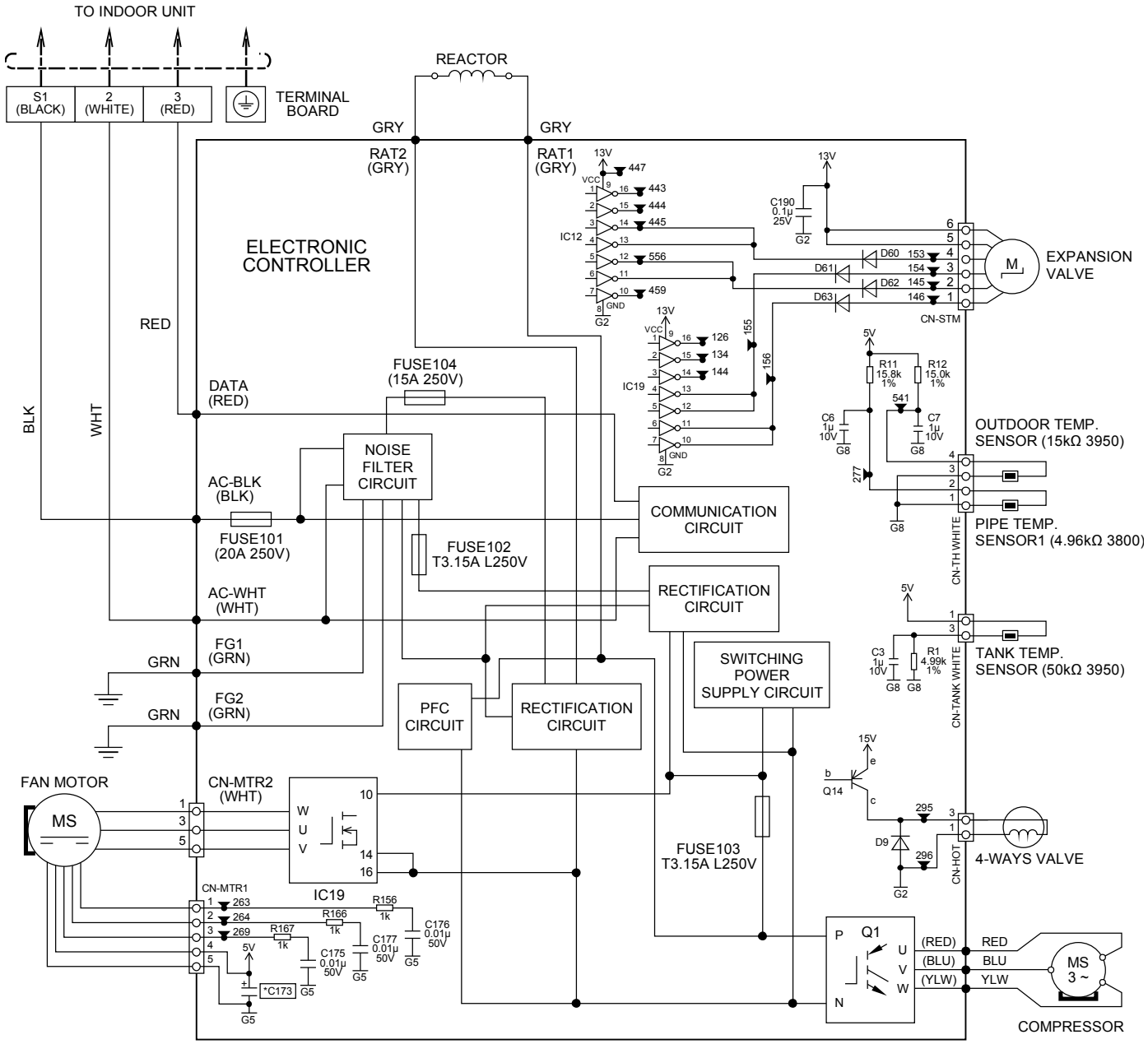
9.2.1 CU-E7QKE

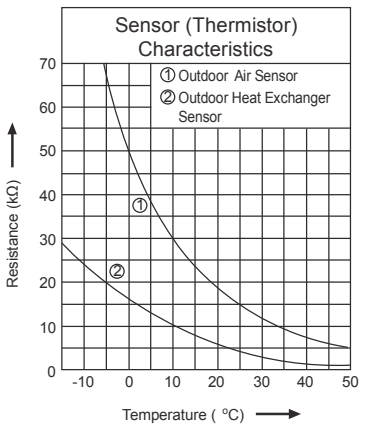


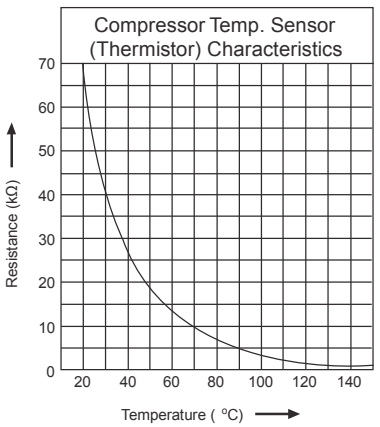




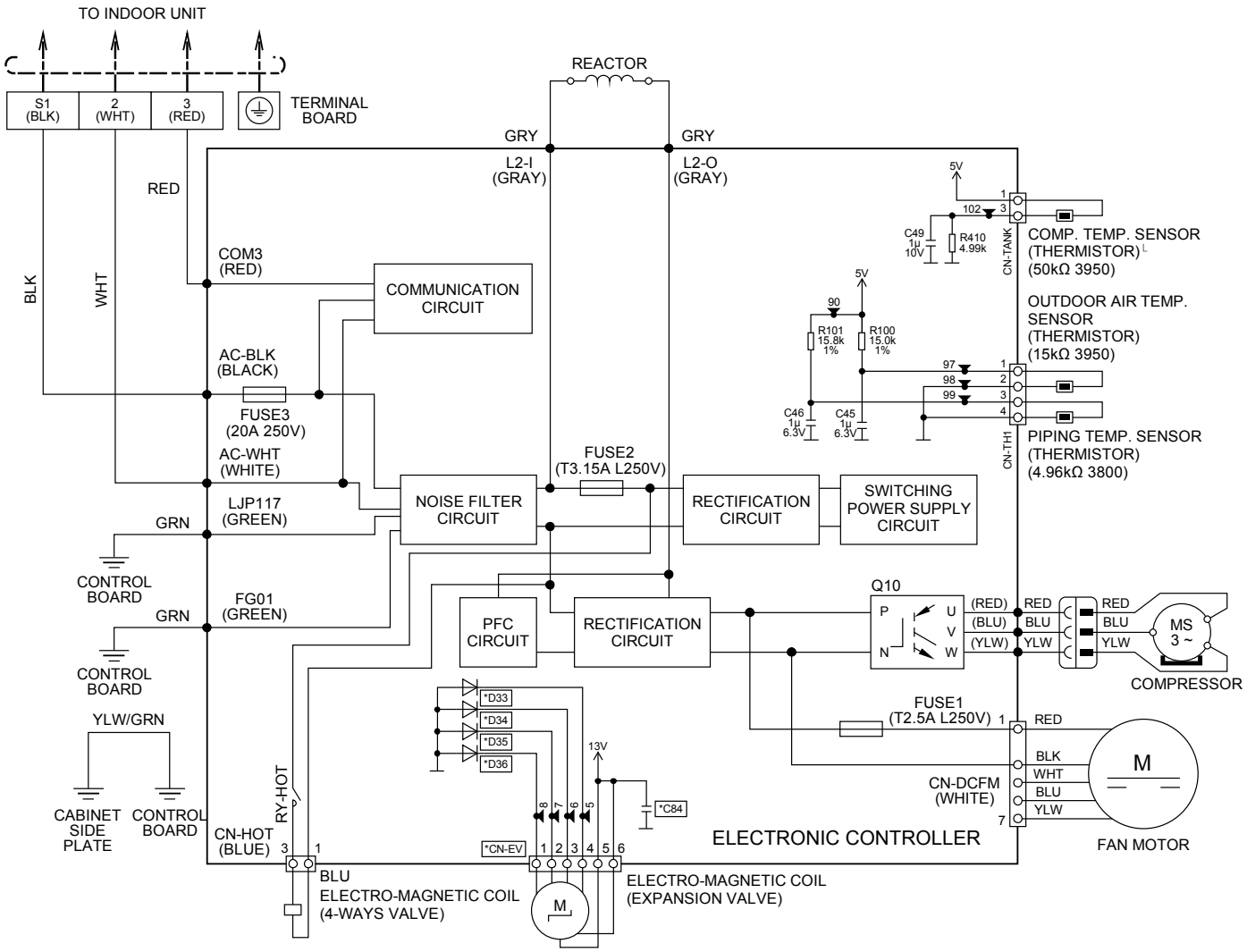
9.2.2 CU-E9QKE CU-E12QKE CU-E15QKE

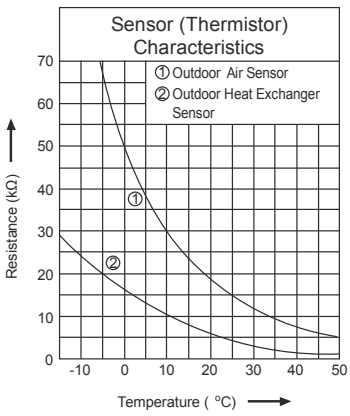


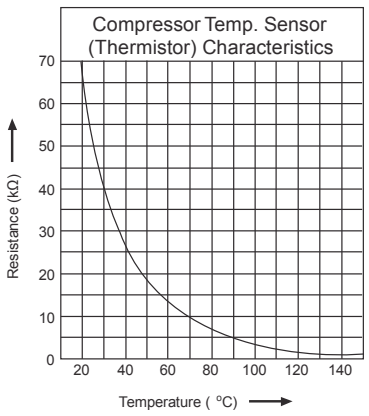




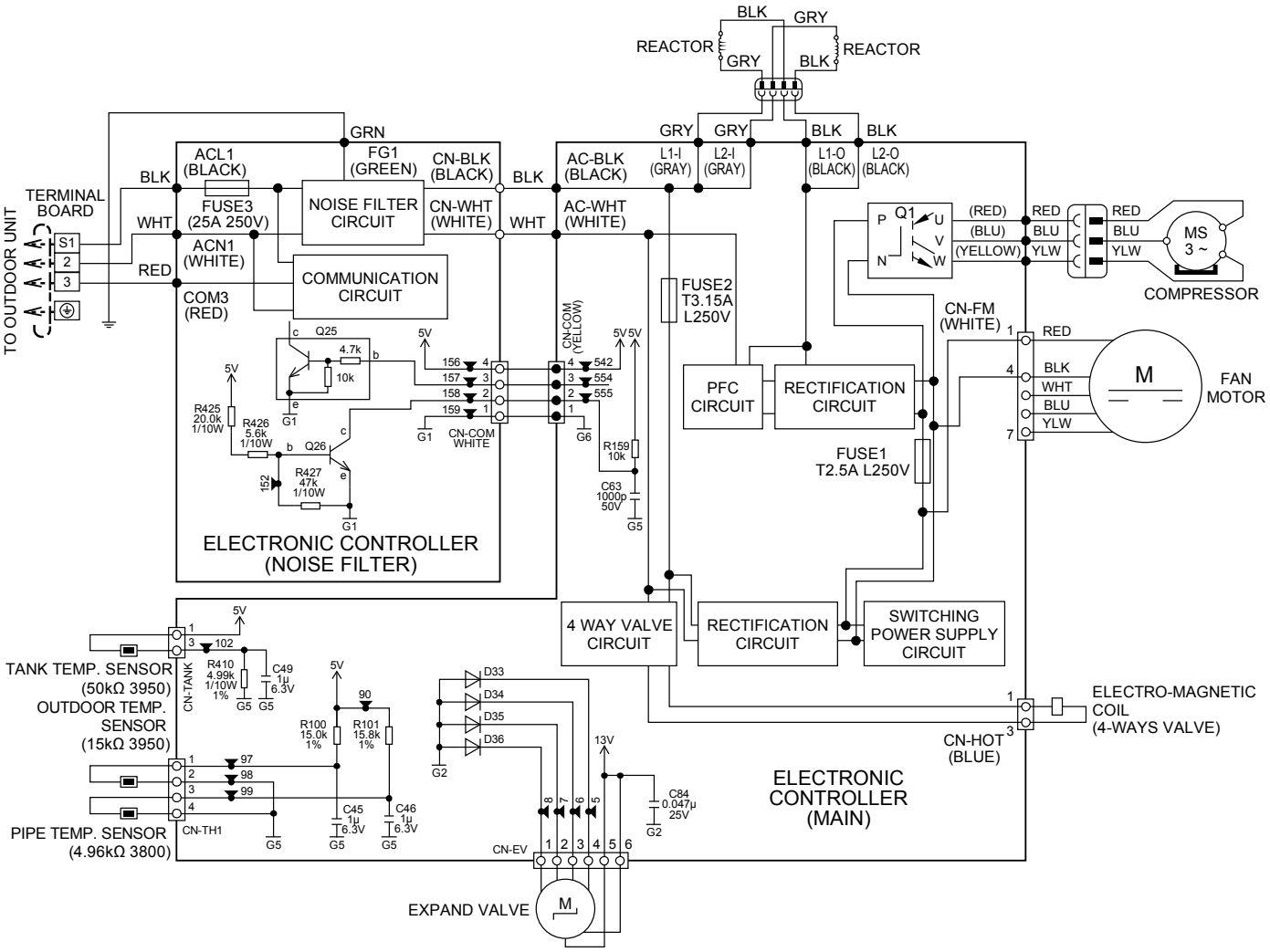
9.2.3 CU-E18QKE CU-E21QKE

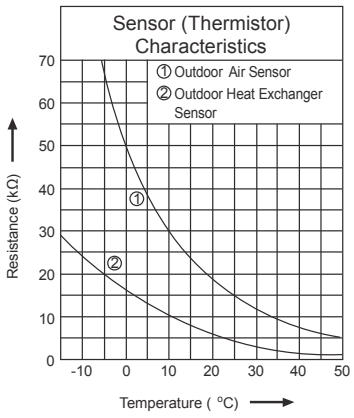


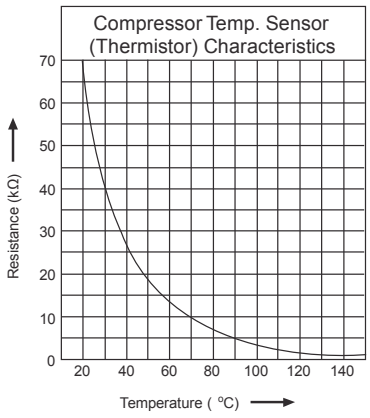




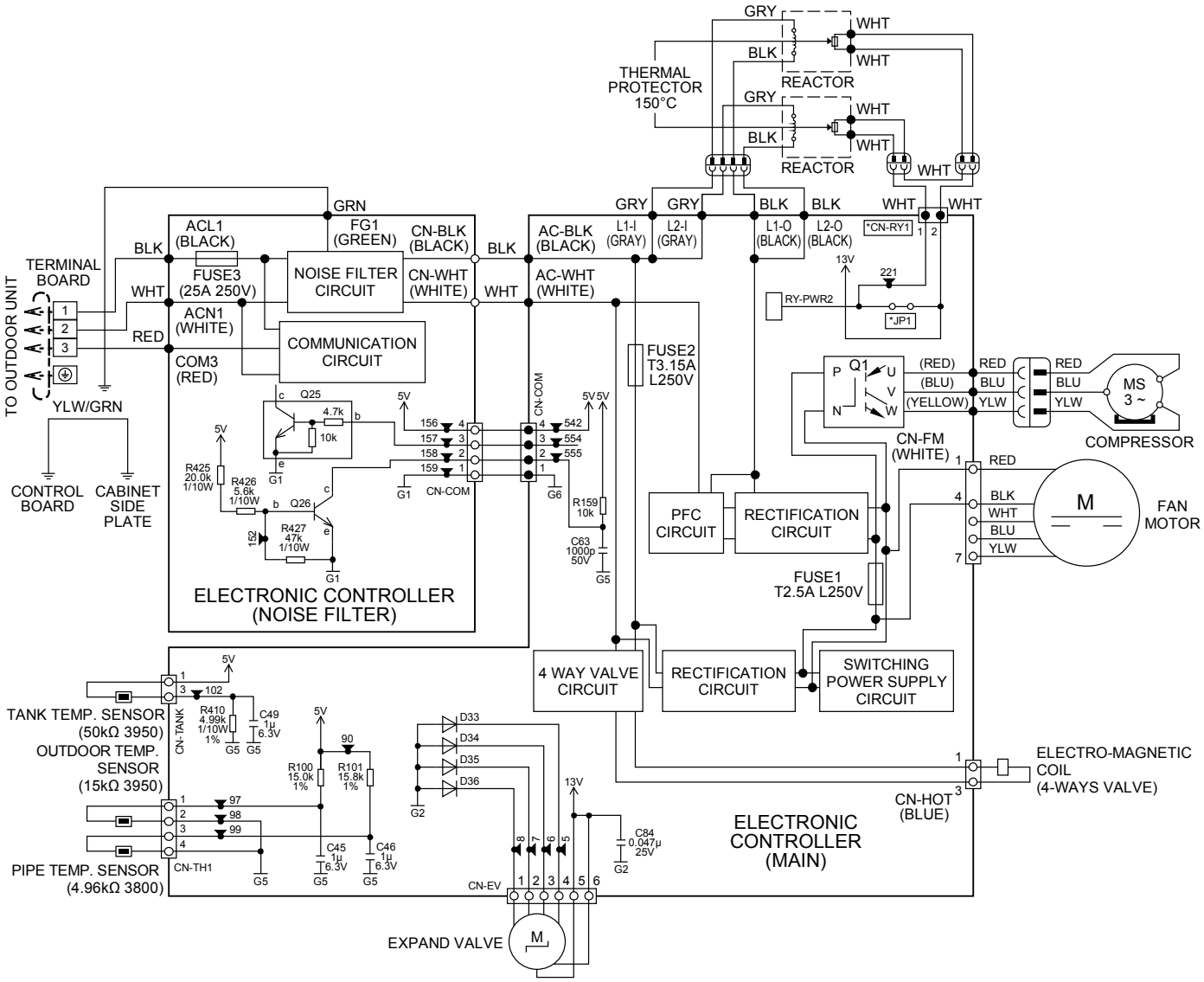
9.2.4 CU-E24QKE

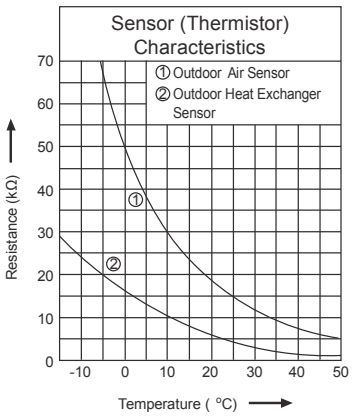


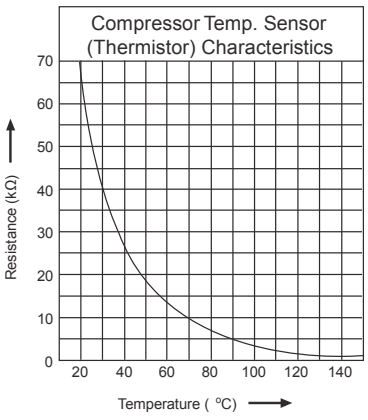




9.2.5 CU-E28QKE



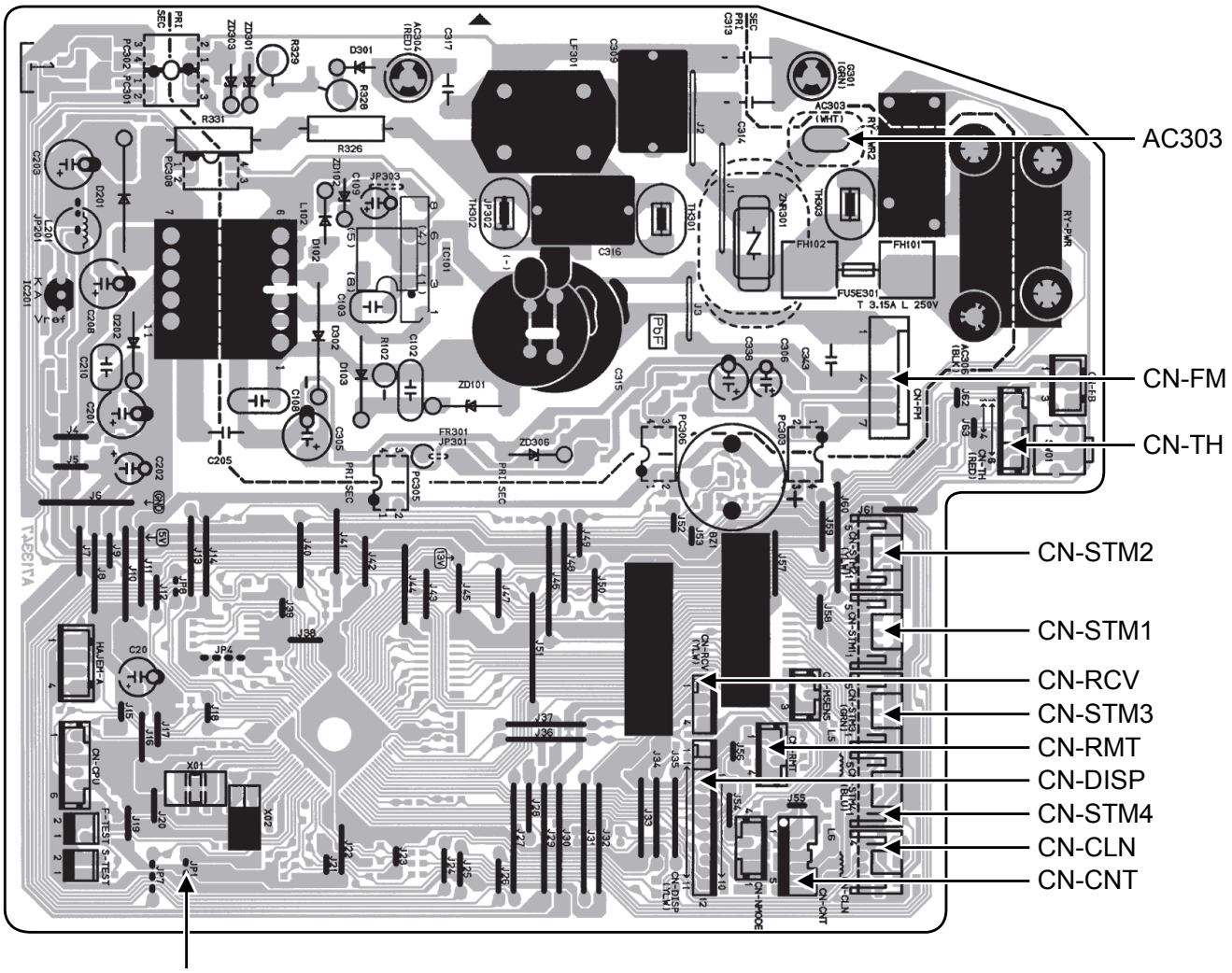




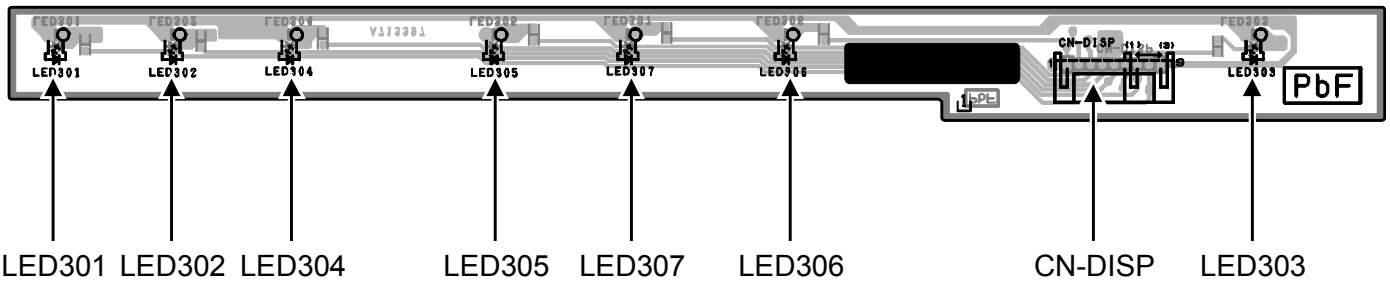
10. Printed Circuit Board

10.1 Indoor Unit

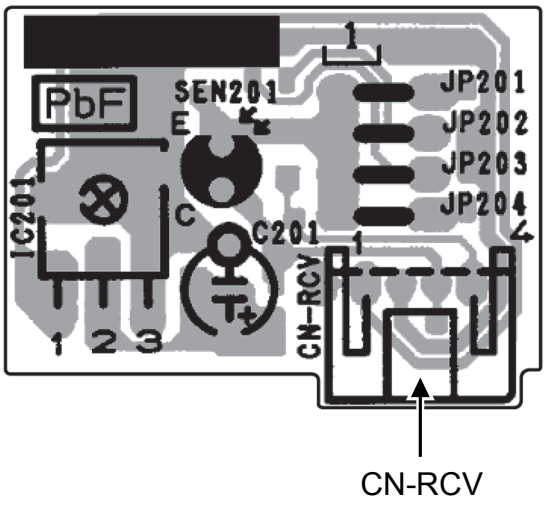
10.1.1 Main Printed Circuit Board



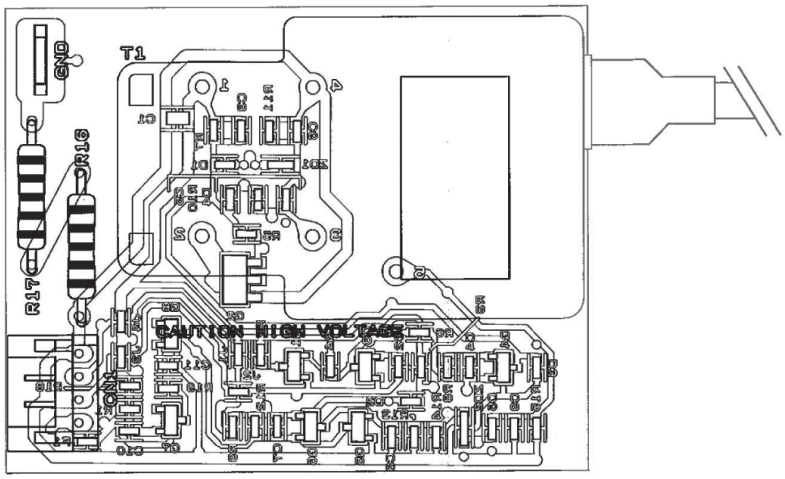
10.1.2 Indicator Printed Circuit Board



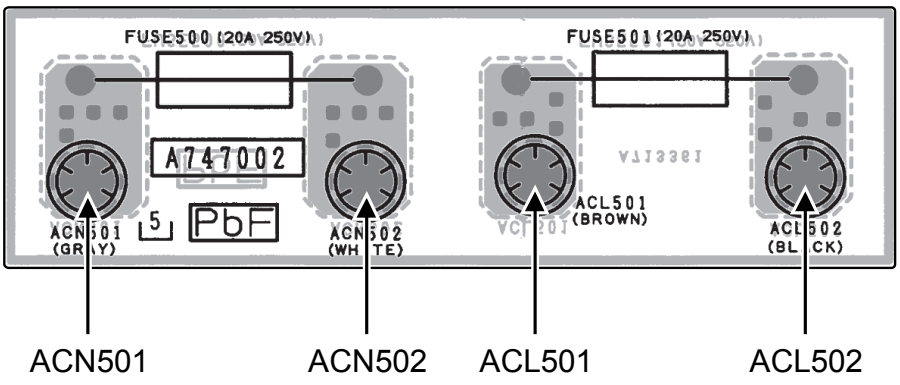
10.1.3 Receiver Printed Circuit Board



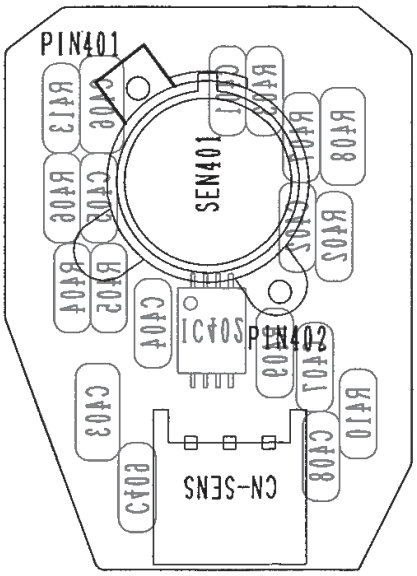
10.1.4 High Voltage Power Supply Printed Circuit Board



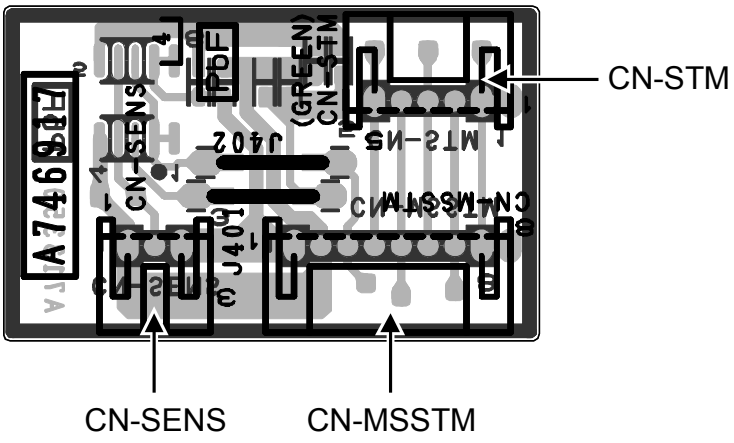
10.1.5 Fuse Printed Circuit Board



10.1.6 Human Activity Sensor Printed Circuit Board

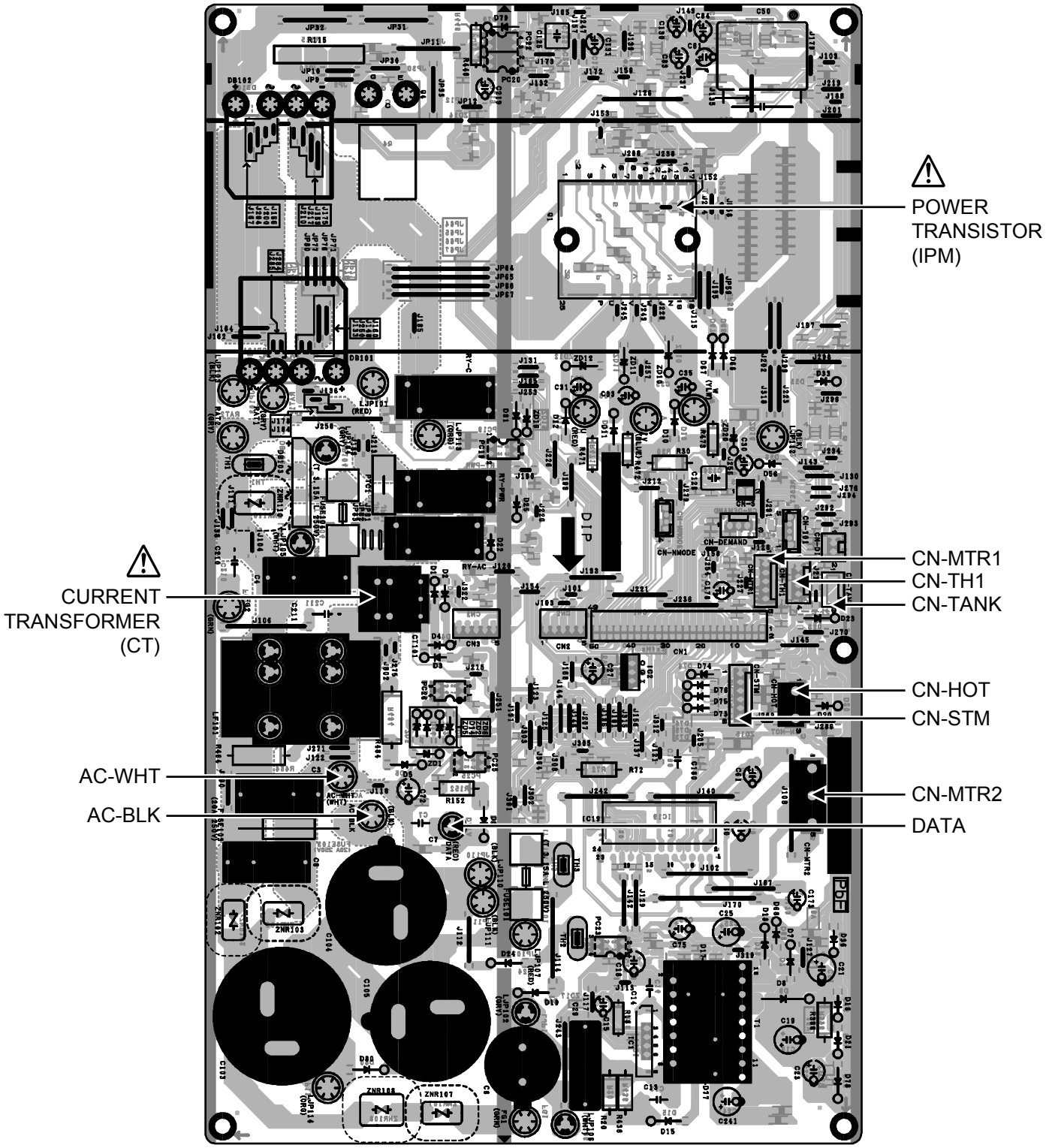


10.1.7 Comparator Printed Circuit Board

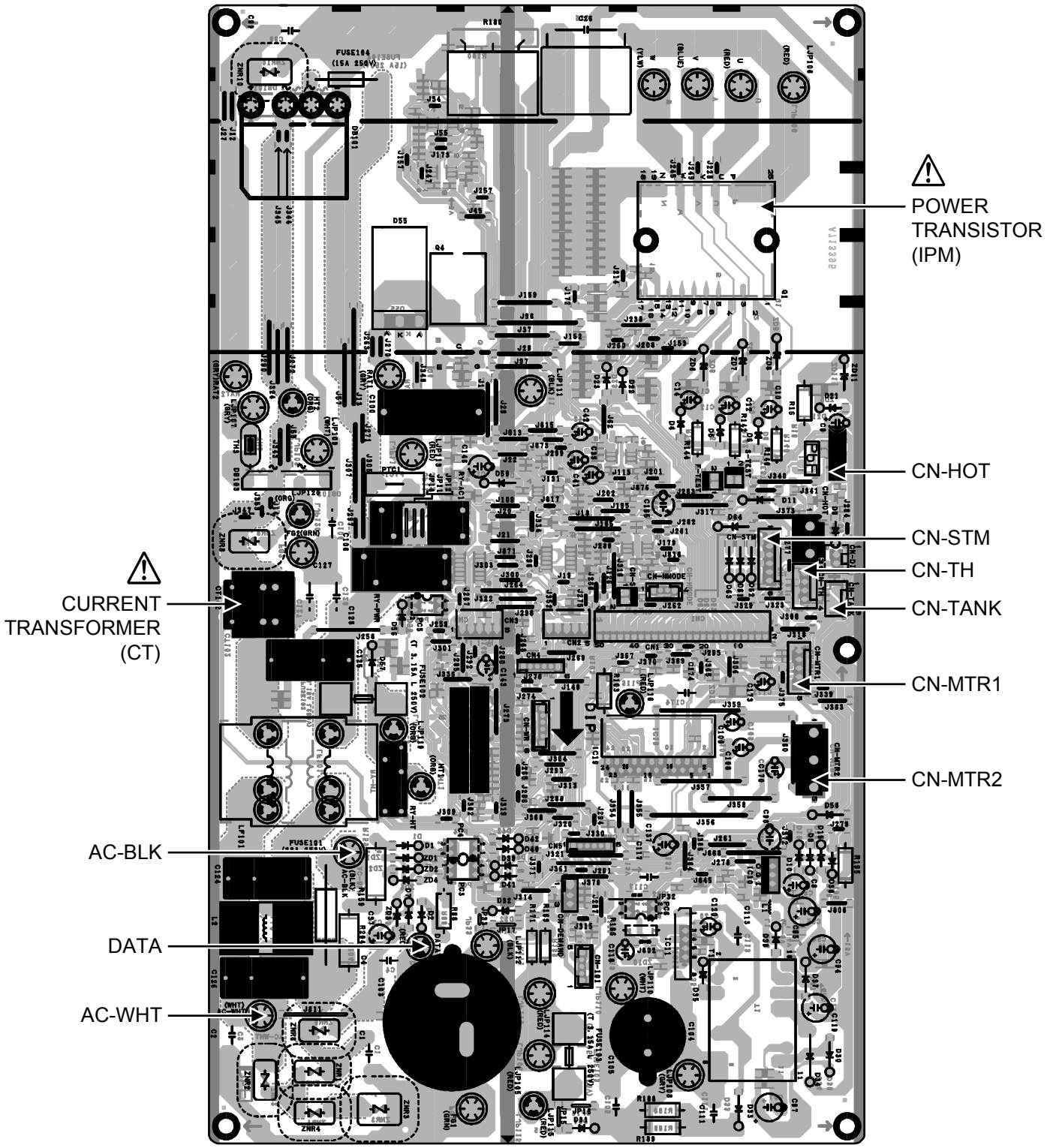


10.2 Outdoor Unit

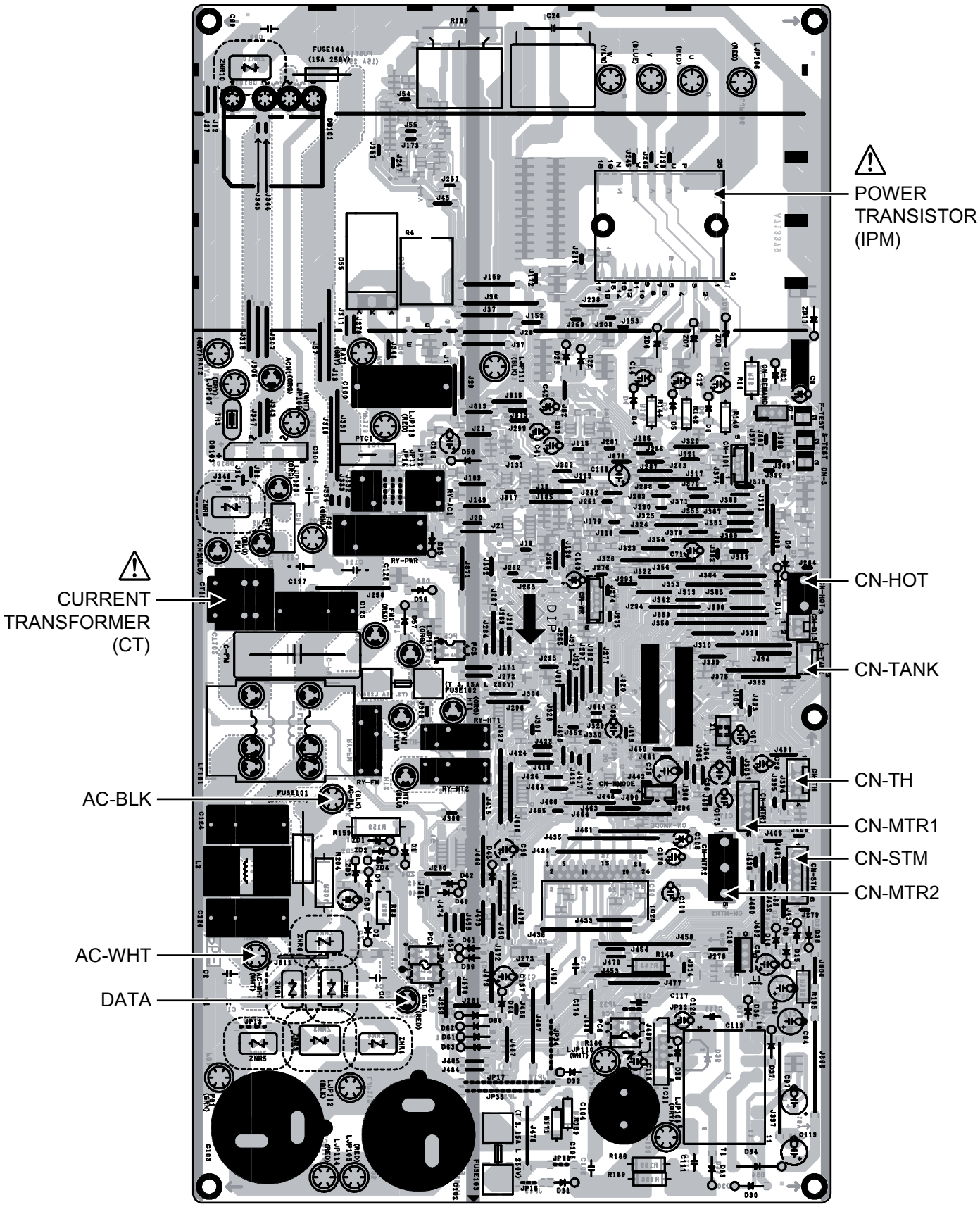
10.2.1 CU-E7QKE



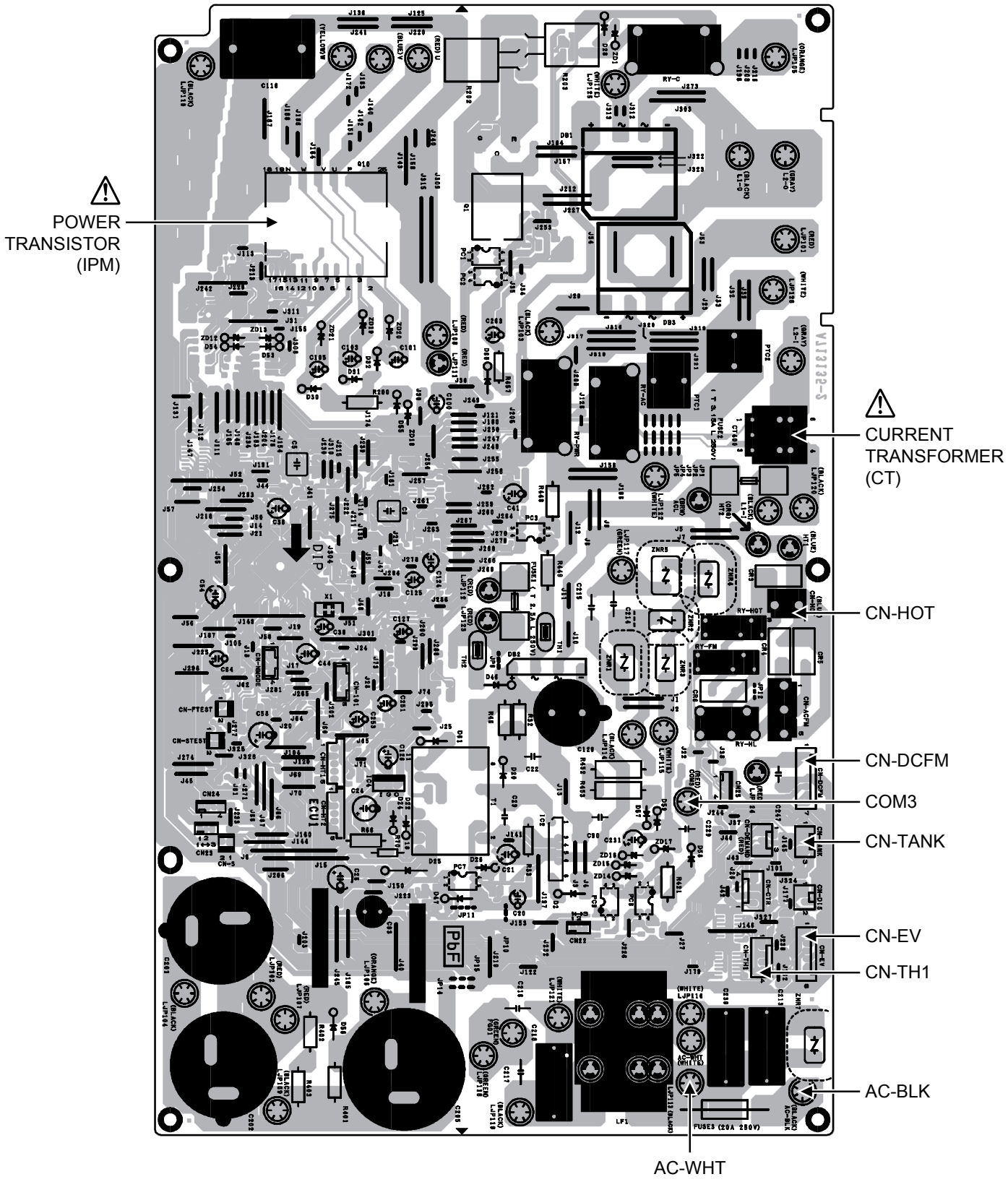
10.2.2 CU-E9QKE



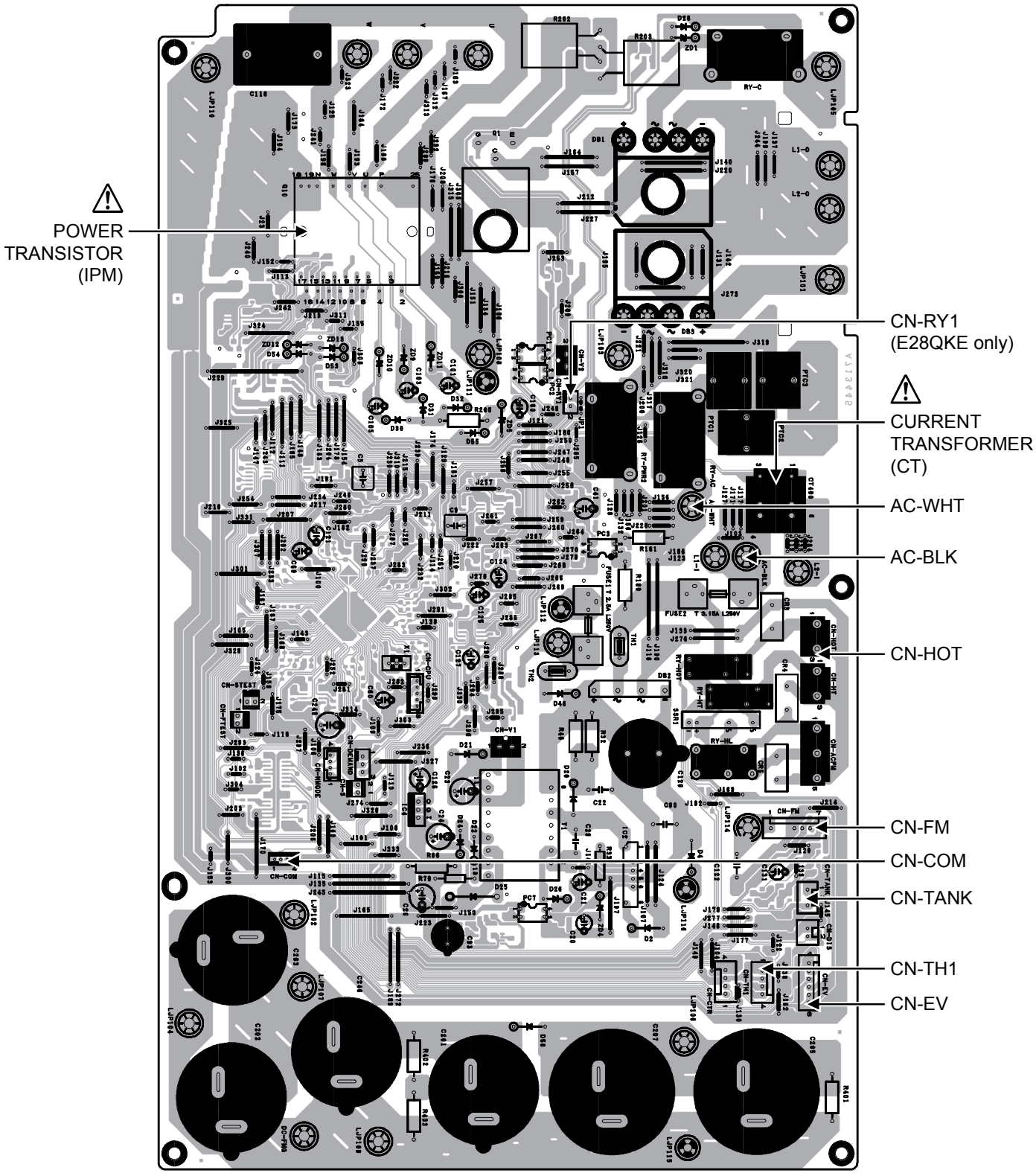
10.2.3 CU-E12QKE CU-E15QKE



10.2.4 CU-E18QKE CU-E21QKE

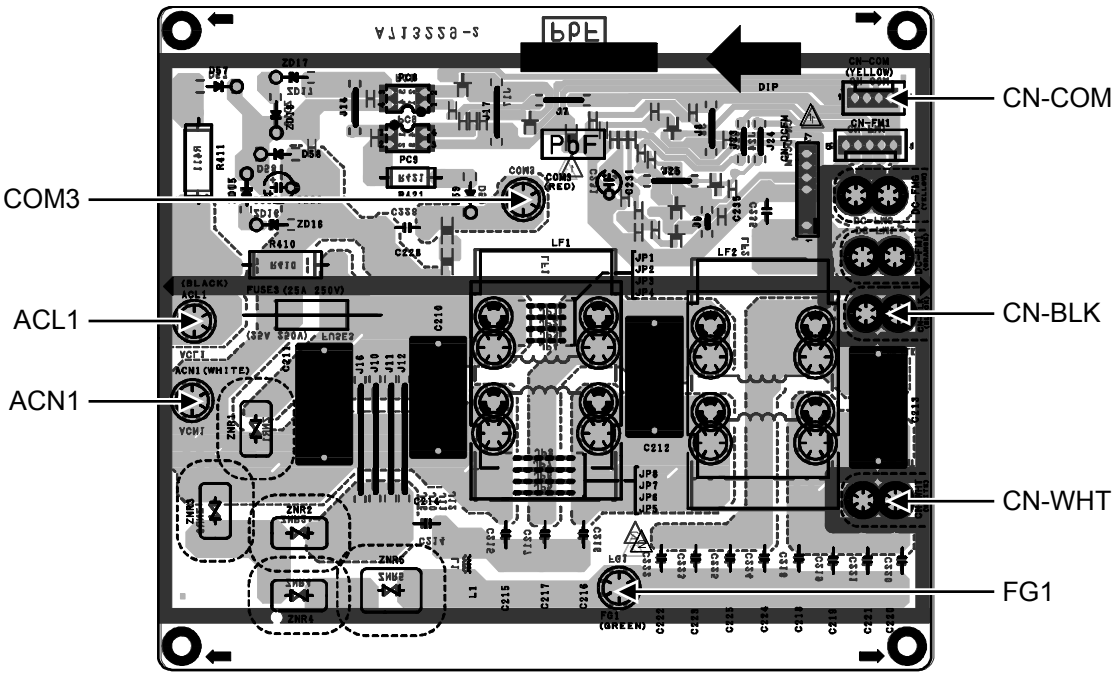


10.2.5 CU-E24QKE CU-E28QKE



10.3 Noise Filter Printed Circuit Board

10.3.1 CU-E24QKE CU-E28QKE



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.

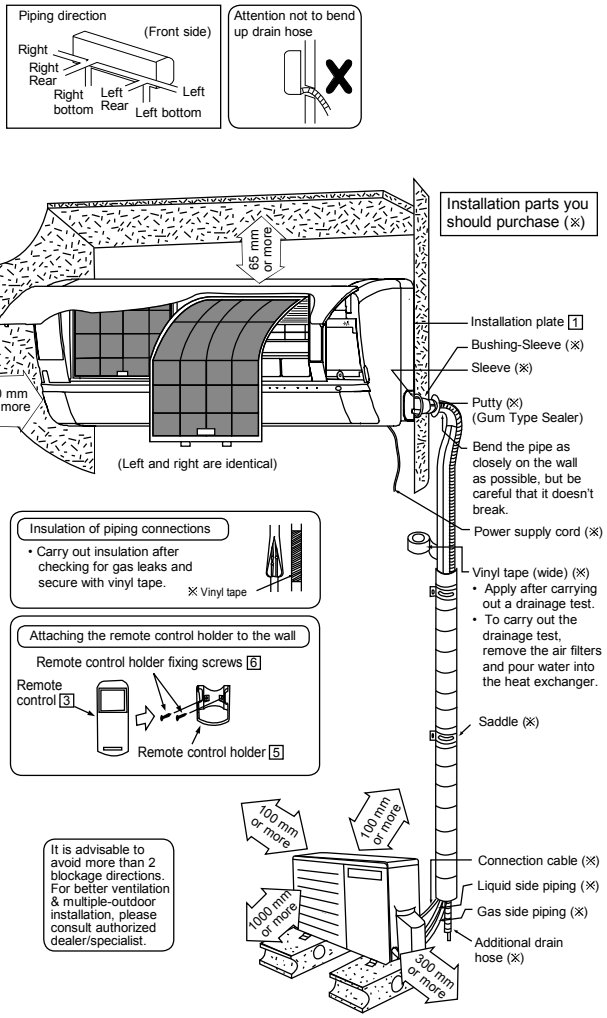
11.1.2 Outdoor Unit

- 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						
E7***, XE7***	3/4HP	9.52mm (3/8")	6.35mm (1/4")	5	15	3	15	20	7.5
E9***, XE9***	1.0HP				15	3	15	20	7.5
E9***, XE12***	1.5HP				15	3	15	20	7.5
E15***, XE15***	1.75HP	12.7mm (1/2")			15	3	15	20	7.5
E18***, XE18***	2.0HP				15	3	20	20	7.5
E21***, XE21***	2.25HP				15	3	20	20	7.5
E24***	2.5HP	15.88mm (5/8")			20	3	30	30	10

Example: For E9***
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

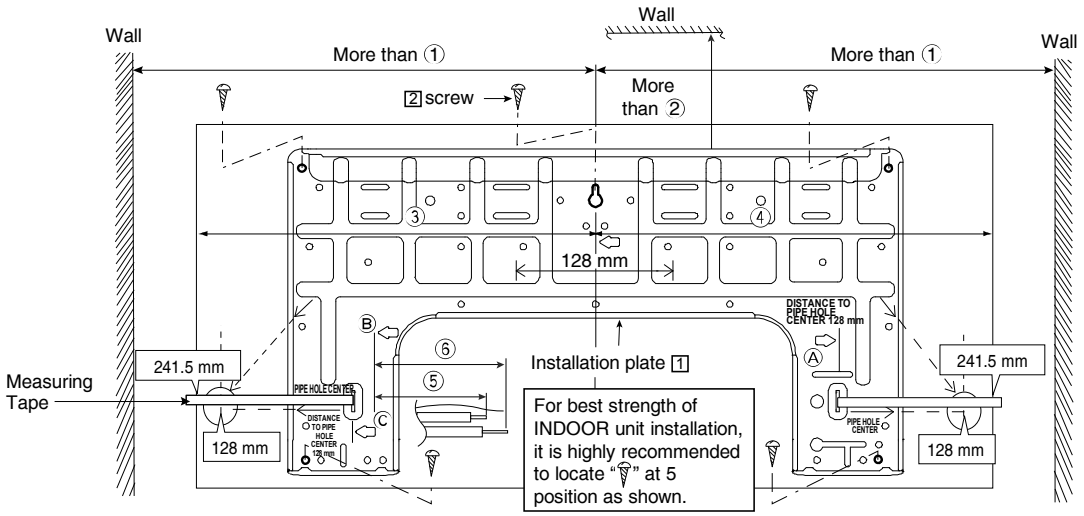


- This illustration is for explanation purposes only. The indoor unit will actually face a different way

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
E7***, XE7***, E9***, XE9*** E12***, XE12*** E15***, XE15***	490 mm	82 mm	439 mm	432 mm	43 mm	95 mm
E18***,XE18***, E21***,XE21*** E24***	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 center to unit's left side is ③.
From installation plate center 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.
- Line according to the left and right side of the installation plate. The meeting point of the extended line is the center of the hole. Another method is by 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.
- Drill the piping hole at either the right or the left and the hole should be slightly slanting to the outdoor side.

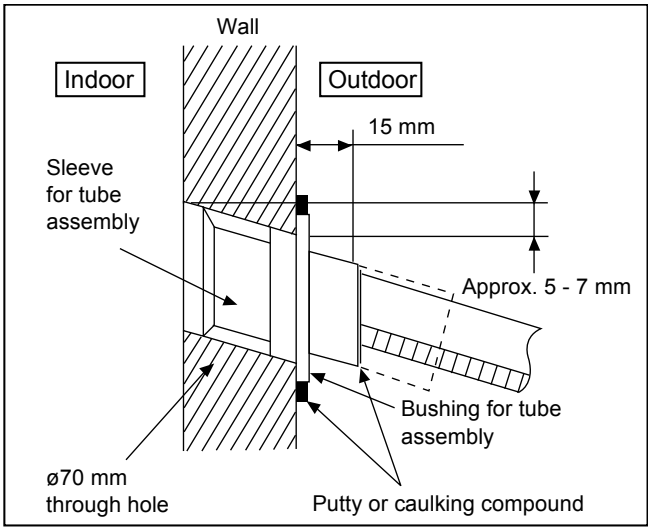
11.2.2 To Drill a Hole in the Wall and Install a Sleeve of Piping

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

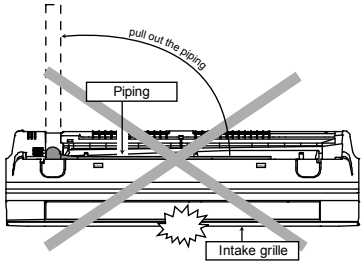
❗ When the wall is hollow, please be sure to use the sleeve for tube assembly to prevent dangers caused by mice biting the connection cable.

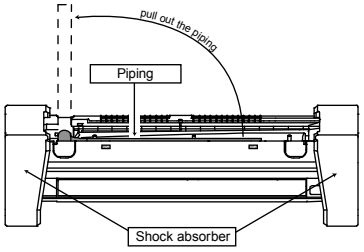
4 Finish by sealing the sleeve with putty or caulking compound at the final stage.



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 cord 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

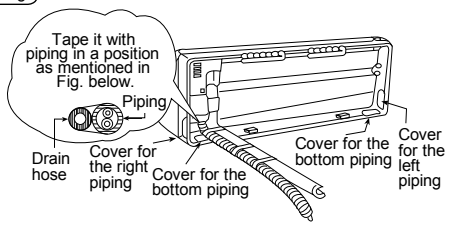
- Please refer to "Connecting the piping" column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

Step-7	Insulate and finish the piping

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

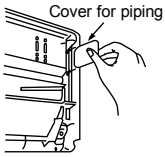
Step-8	Secure the Indoor Unit

Right Rear piping

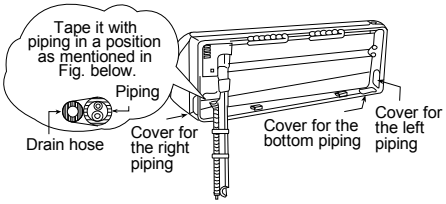


How to keep the cover

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.)

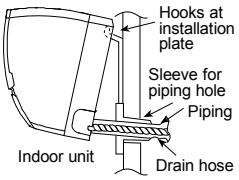


Right and Right Bottom piping



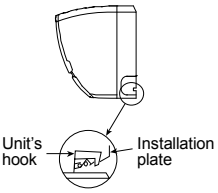
Install the indoor unit

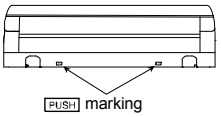
Hook the indoor unit onto the upper portion of installation plate. (Engage the indoor unit with the upper edge of the installation plate).
Ensure the hooks are properly seated on the installation plate by moving it in left and right.



Secure the Indoor Unit

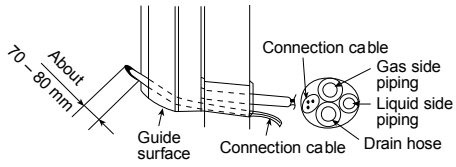
1. Press the lower left and right side of the unit against the installation plate until hooks engages with their slot (sound click).





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.

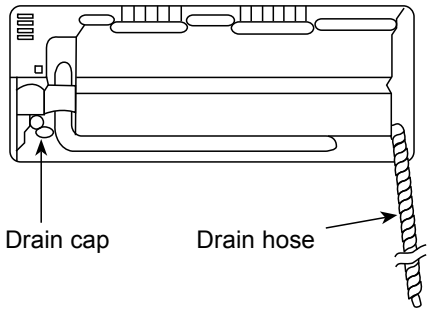
Insert the connection cable

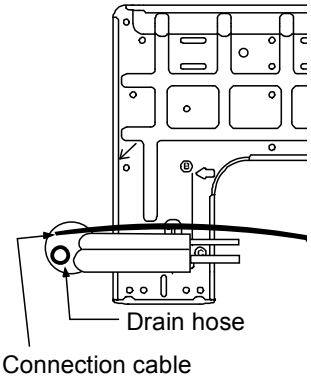


(This can be used for left rear piping and left bottom piping also.)

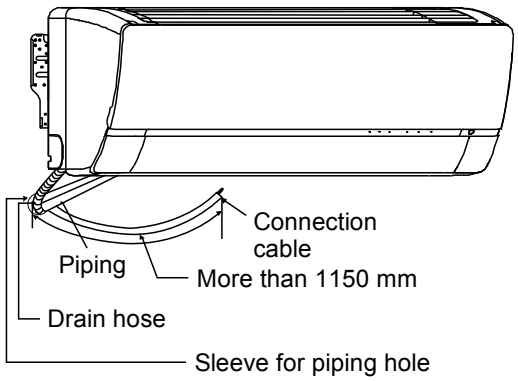
Replace the drain hose

Rear view for left piping installation

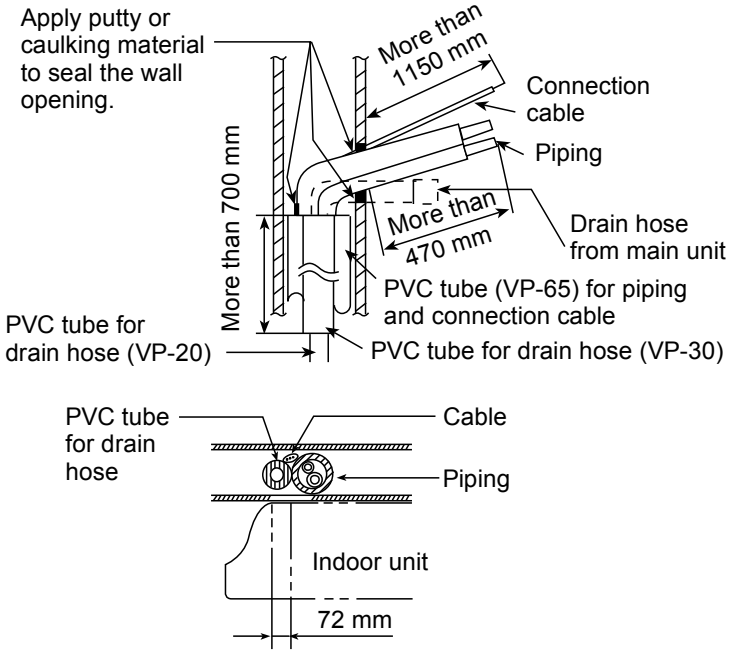




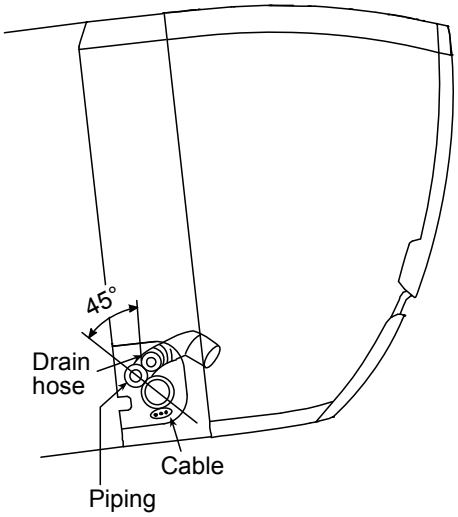
Adjust the piping slightly downwards.



- 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.



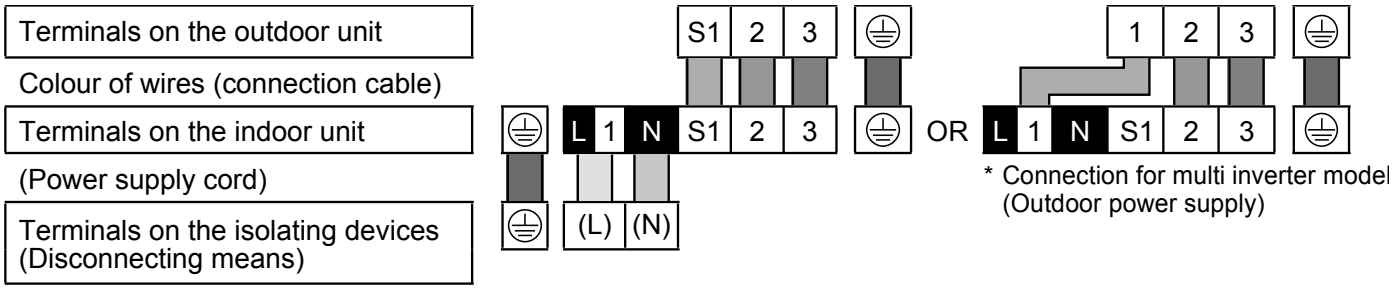
(For the right piping, follow the same procedure)

11.2.4 Connect the Cable to the Indoor Unit

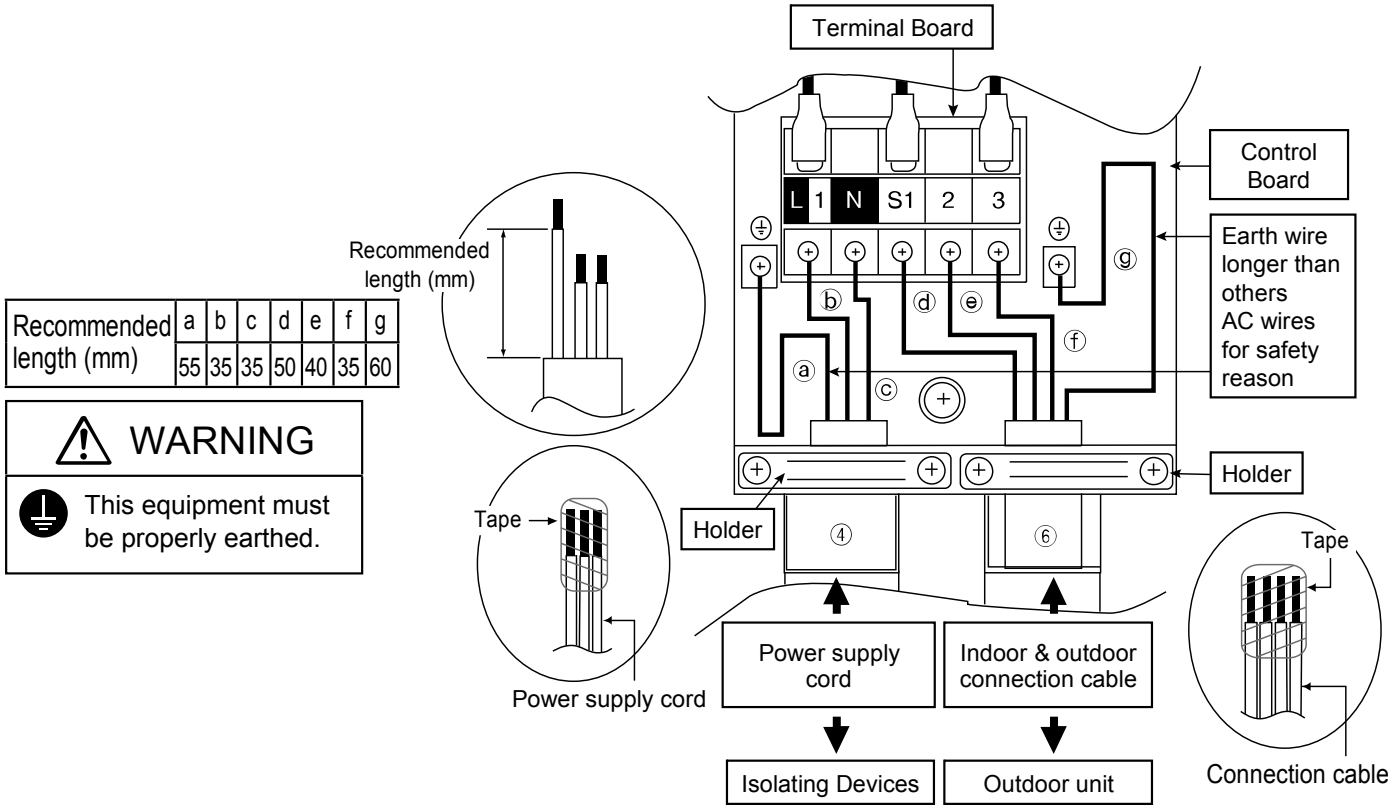
The power supply cord, indoor and outdoor unit connection cable can be connected without removing the front grille.

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 approved type polychloroprene sheathed **power supply cord** 3 × 1.5 mm^2 (3/4 ~ 1.75HP), 3 × 2.5 mm^2 (2.0 ~ 2.5HP) type designation 60245 IEC 57 or heavier cord to the terminal board, and connect the others end of the cord 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 with earth pin rated 15/16/20A. 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 4 × 1.5 mm^2 (3/4 ~ 1.75HP) or 4 × 2.5 mm^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. Allowable connection cable length of each indoor unit shall be 30 m or less.
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.



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.



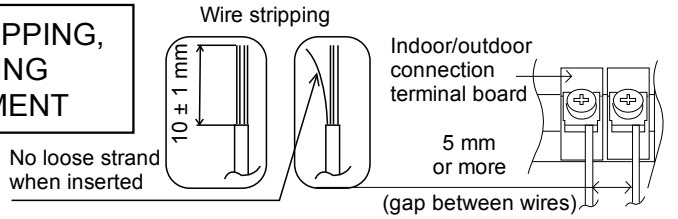
Recommended length (mm)	a	b	c	d	e	f	g
	55	35	35	50	40	35	60

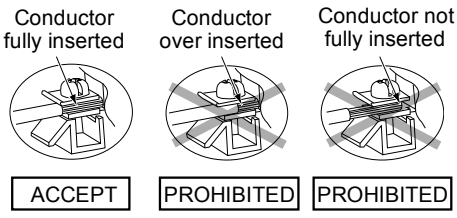
⚠ WARNING

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.

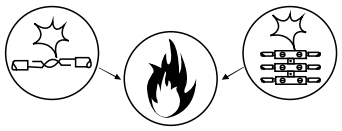
WIRE STRIPPING, CONNECTING REQUIREMENT



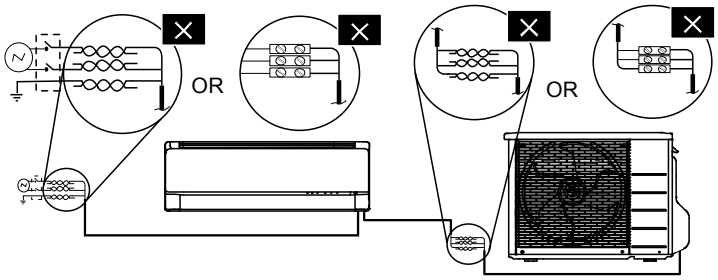


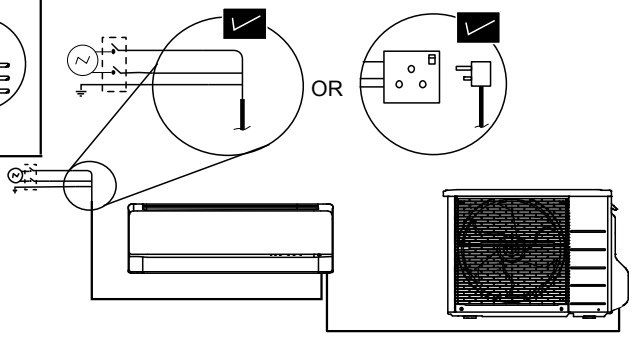
WARNING

RISK OF FIRE
JOINING OF WIRES MAY CAUSE OVERHEATING AND FIRE.



Do not joint wires



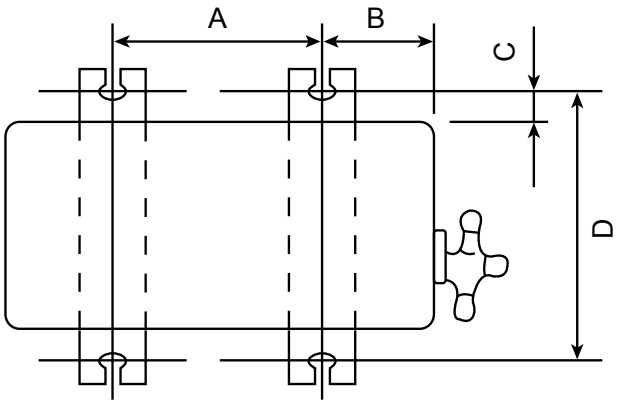


- Use complete wire without joining.
- Use approved socket and plug with earth pin.
- Wire connection in this area must follow to national wiring rules.

11.3 Outdoor Unit

11.3.1 Install the Outdoor Unit

- After selecting the best location, start installation according 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
E7***	570 mm	105 mm	18.5 mm	320 mm
E9***				
E12***	540 mm	160 mm	18.5 mm	330 mm
E15***				
E18***	613 mm	131 mm	16 mm	360.5 mm
E21***				
E24***				

11.3.2 Connect the Piping

11.3.2.1 Connecting the Piping to Indoor

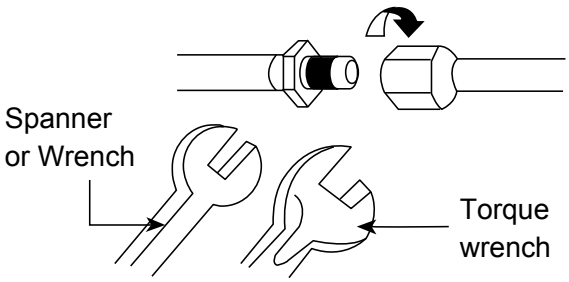
Please make flare after inserting flare nut (locate at joint portion, of tube assembly) onto the copper pipe. (In case of using long piping)
Connect the piping

- 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.

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)]

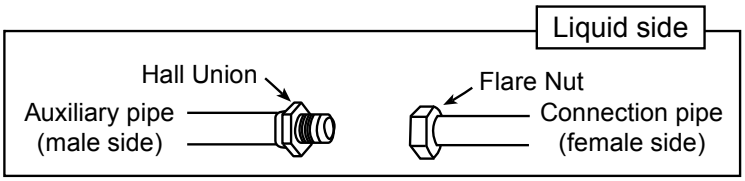
11.3.2.2 Connecting the Piping to Outdoor

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



11.3.2.3 Connecting the Piping to Outdoor Multi

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.

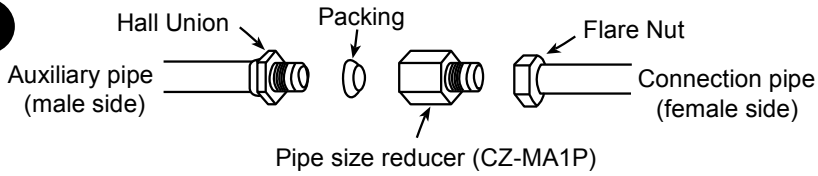


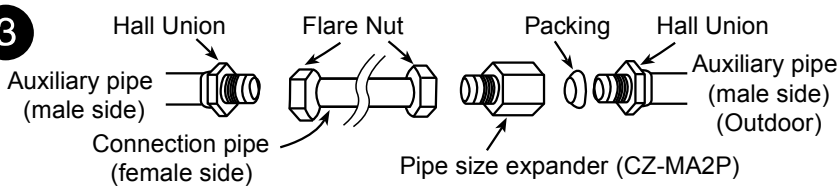
* For Gas side piping please refer table and diagram below

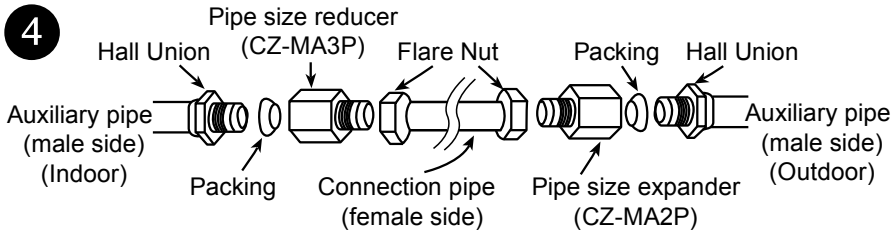
Outdoor Multi combination model		Pipe size (refer to diagram)
CS-E7***, CS-XE7***, CS-E9***, CS-XE9***, CS-E12***, CS-XE12***	CU-2E15***, CU-2E18***, CU-3E18***, CU-4E23***, CU-4E27***, CU-5E34***	❶
CS-E15***, CS-XE15***, CS-E18***, CS-XE18***	CU-3E18***, CU-4E23***, CU-4E27***, CU-5E34***	❷ (CZ-MA1P)
CS-E21***, CS-XE21***	CU-4E23***, CU-4E27***, CU-5E34***	❸ (CZ-MA2P)
CS-E24***	CU-4E27***, CU-5E34***	❹ (CZ-MA2P) & (CZ-MA3P)

Gas side

❶

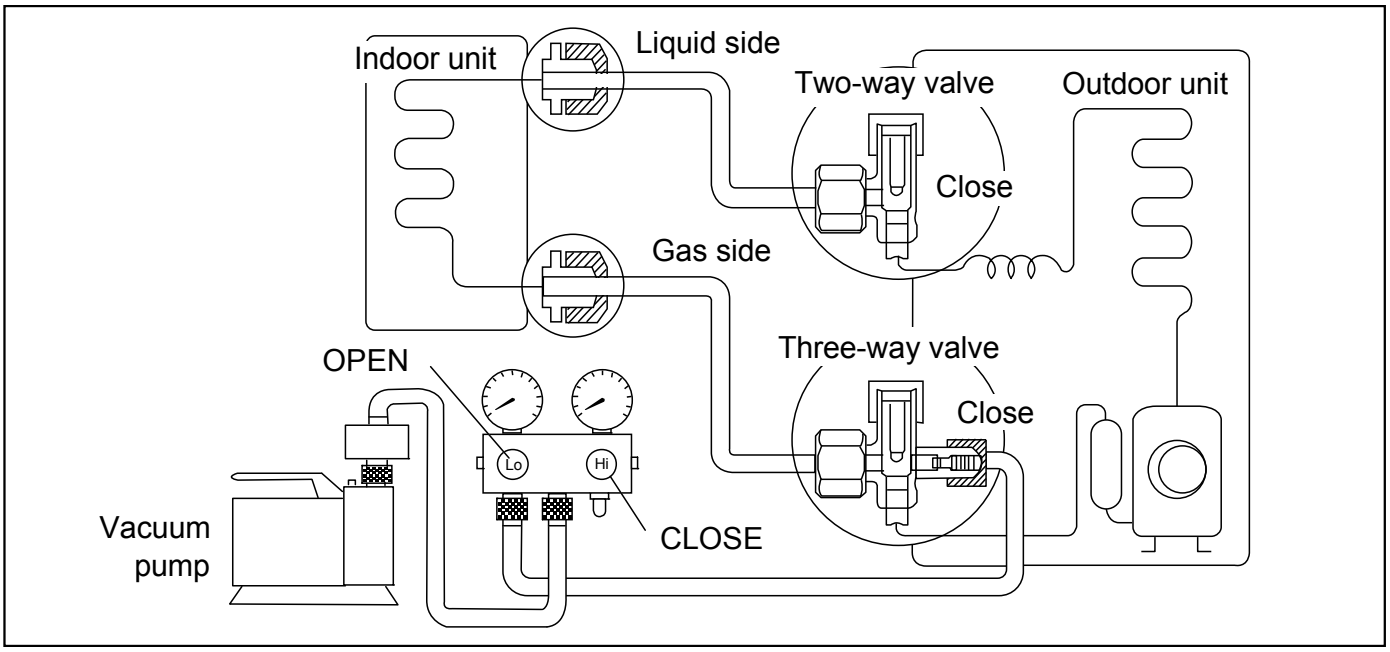

❷


❸


❹


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.



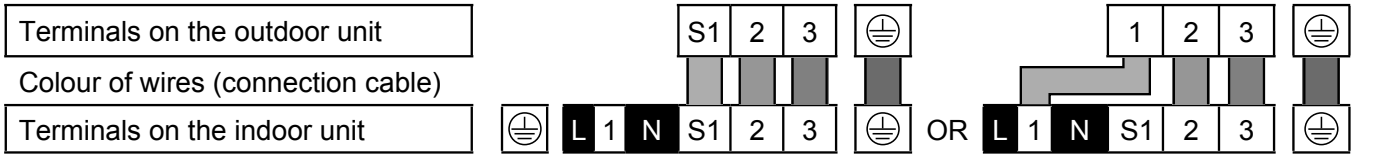
1 Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
   - Be sure to connect the end of the charging hose with the push pin to the service port.
2 Connect the center hose of the charging set to a vacuum pump.
3 Turn on the power switch of 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:

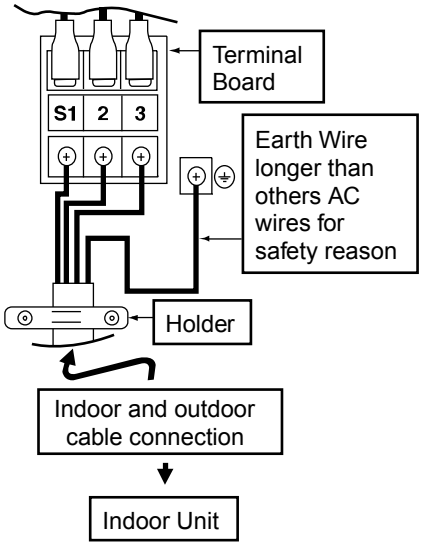
- If the leak stops when the piping connections are tightened further, continue working from step ③.
- If the leak does not stop when the connections are retightened, repair location of leak.
- Do not release refrigerant during piping work for installation and reinstallation.
- Take care of the liquid 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 4 × 1.5 mm^2 (3/4 ~ 1.75HP) or 4 × 2.5 mm^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. Allowable connection cable length of each indoor unit shall be 30 m or less.



3 Secure the cable onto the control board with the holder (clamper).
4 Attach the control board cover back to the original position with screw.
5 For wire stripping and connection requirement, refer to instruction 11.2.4 of indoor unit.



⚠ WARNING
This equipment must be properly earthed.

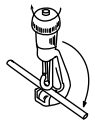
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reason.

11.3.5 Piping Insulation

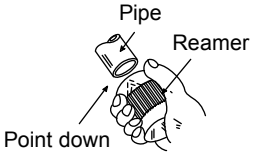
1 Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
2 If drain hose or connecting piping is in the room (where dew may form), please increase the insulation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

11.3.5.1 Cutting and flaring the piping

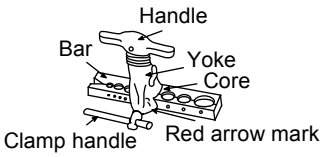
1 Please cut using pipe cutter and then remove the burrs.
2 Remove the burrs by using reamer. If burrs are not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
3 Please make flare after inserting the flare nut onto the copper pipes.



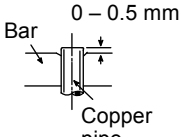
1. To cut

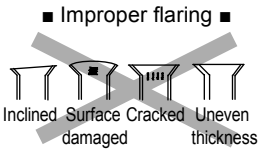


2. To remove burrs



3. To flare





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-E28QKES CU-E28QKE 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.

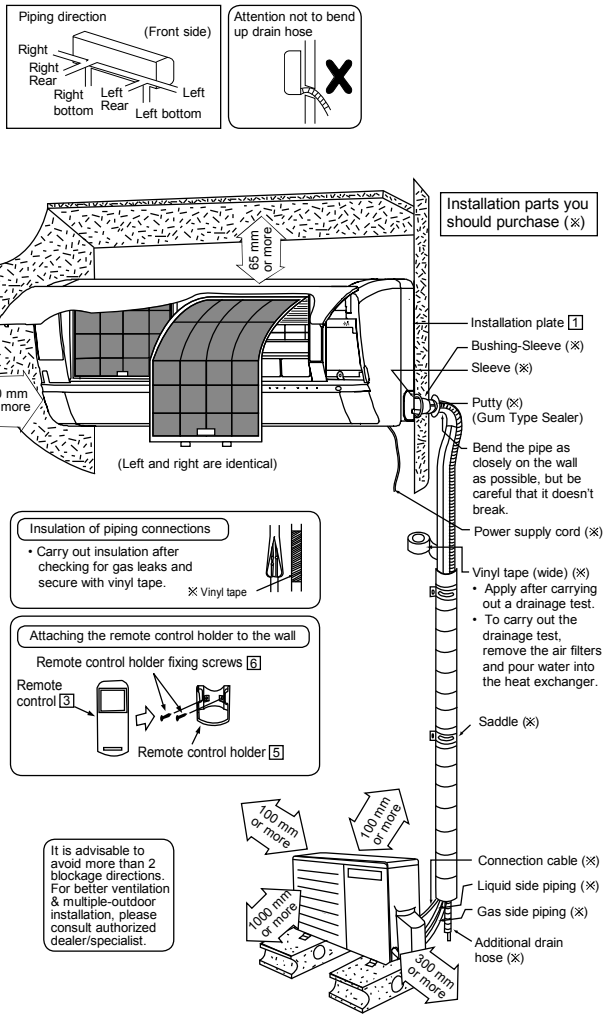
12.1.2 Outdoor Unit

- 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						
E28***	3.0HP	15.88mm (5/8")	6.35mm (1/4")	5	20	3	30	30	10

Example: For E28***
If the unit is installed at 15 m distance, the quantity of additional refrigerant should be 150 g .... (15-10) m × 30 g/m = 150 g.

12.1.3 Indoor/Outdoor Unit Installation Diagram

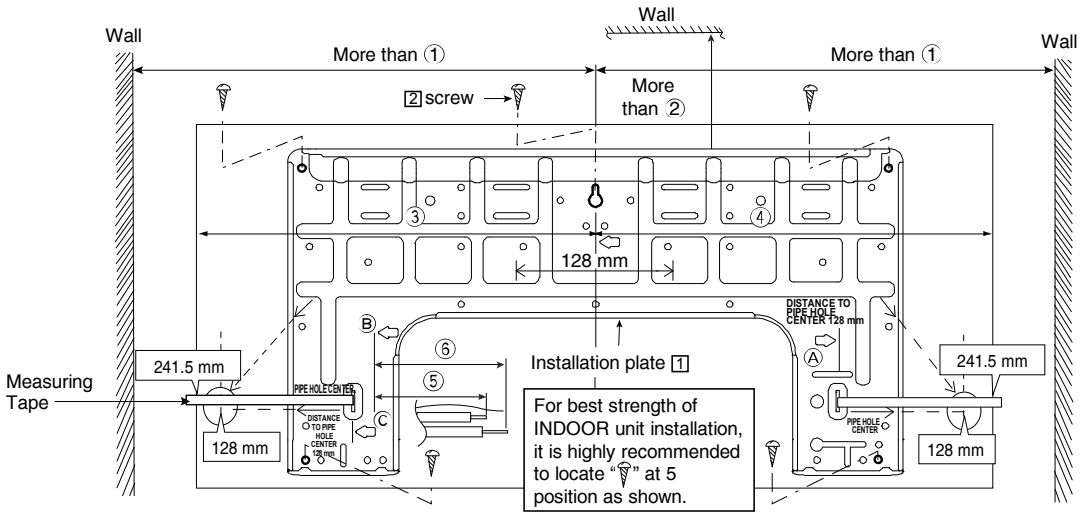


- This illustration is for explanation purposes only. The indoor unit will actually face a different way

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
E28***	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 center to unit's left side is ③.
From installation plate center 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.
- Line according to the left and right side of the installation plate. The meeting point of the extended line is the center of the hole. Another method is by 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.
- Drill the piping hole at either the right or the left and the hole should be slightly slanting to the outdoor side.

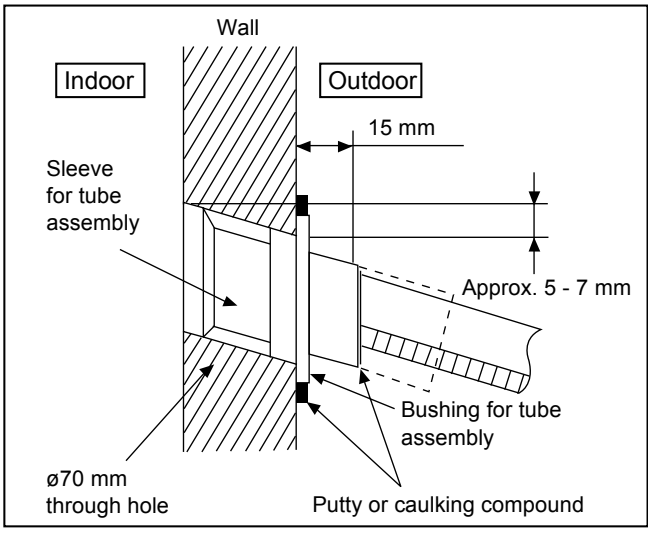
12.2.2 To Drill a Hole in the Wall and Install a Sleeve of Piping

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

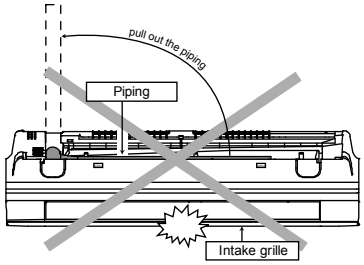
When the wall is hollow, please be sure to use the sleeve for tube assembly to prevent dangers caused by mice biting the connection cable.

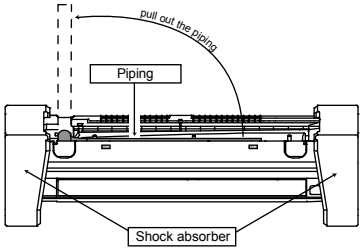
4 Finish by sealing the sleeve with putty or caulking compound at the final stage.



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 cord 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

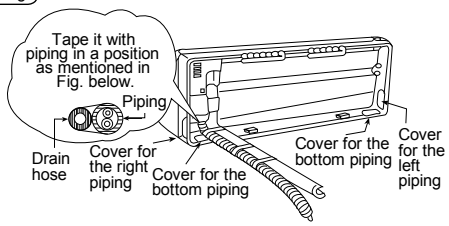
- Please refer to "Connecting the piping" column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

Step-7	Insulate and finish the piping

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

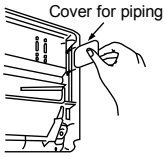
Step-8	Secure the Indoor Unit

Right Rear piping

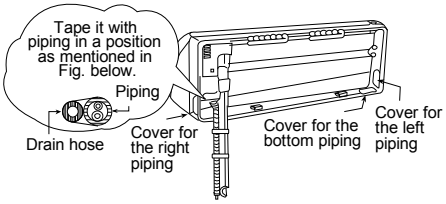


How to keep the cover

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.)

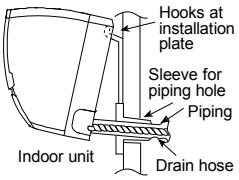


Right and Right Bottom piping



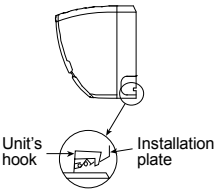
Install the indoor unit

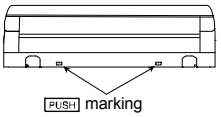
Hook the indoor unit onto the upper portion of installation plate. (Engage the indoor unit with the upper edge of the installation plate).
Ensure the hooks are properly seated on the installation plate by moving it in left and right.



Secure the Indoor Unit

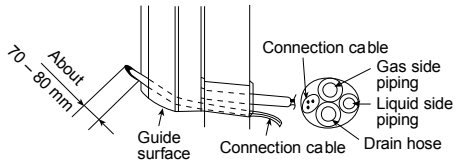
1. Press the lower left and right side of the unit against the installation plate until hooks engages with their slot (sound click).





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.

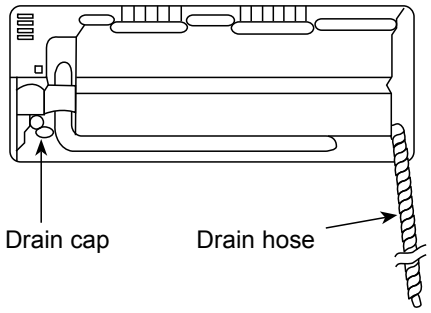
Insert the connection cable

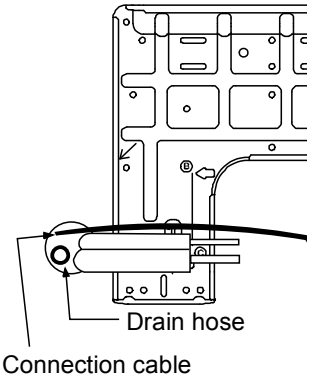


(This can be used for left rear piping and left bottom piping also.)

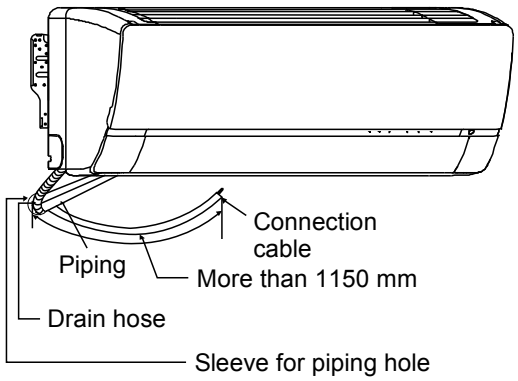
Replace the drain hose

Rear view for left piping installation

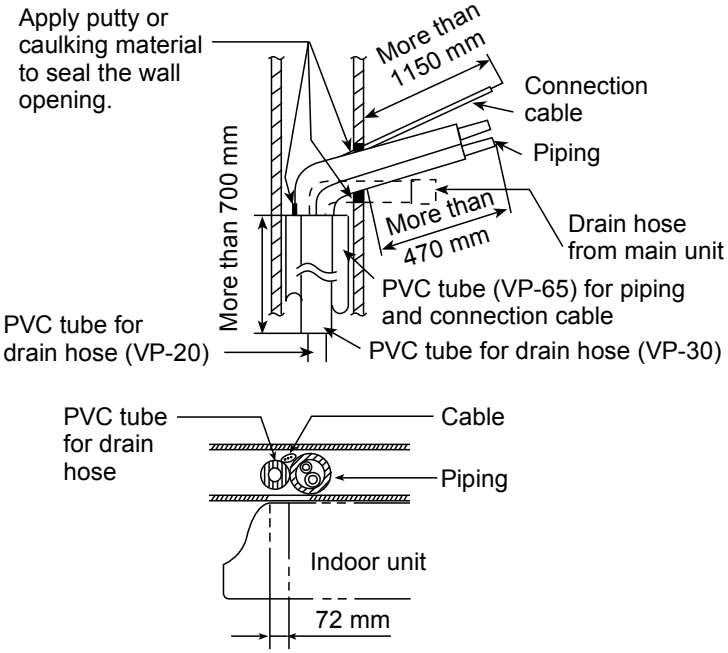




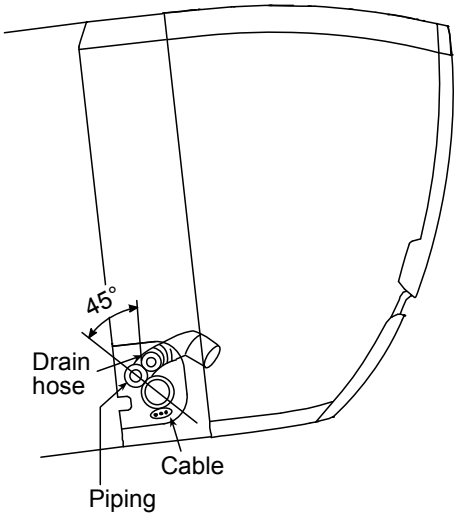
Adjust the piping slightly downwards.



- 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.



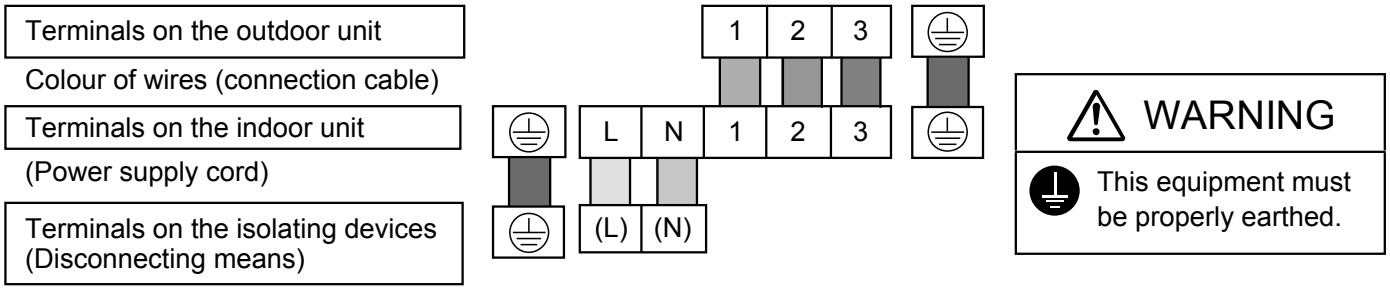
(For the right piping, follow the same procedure)

12.2.4 Connect the Cable to the Indoor Unit

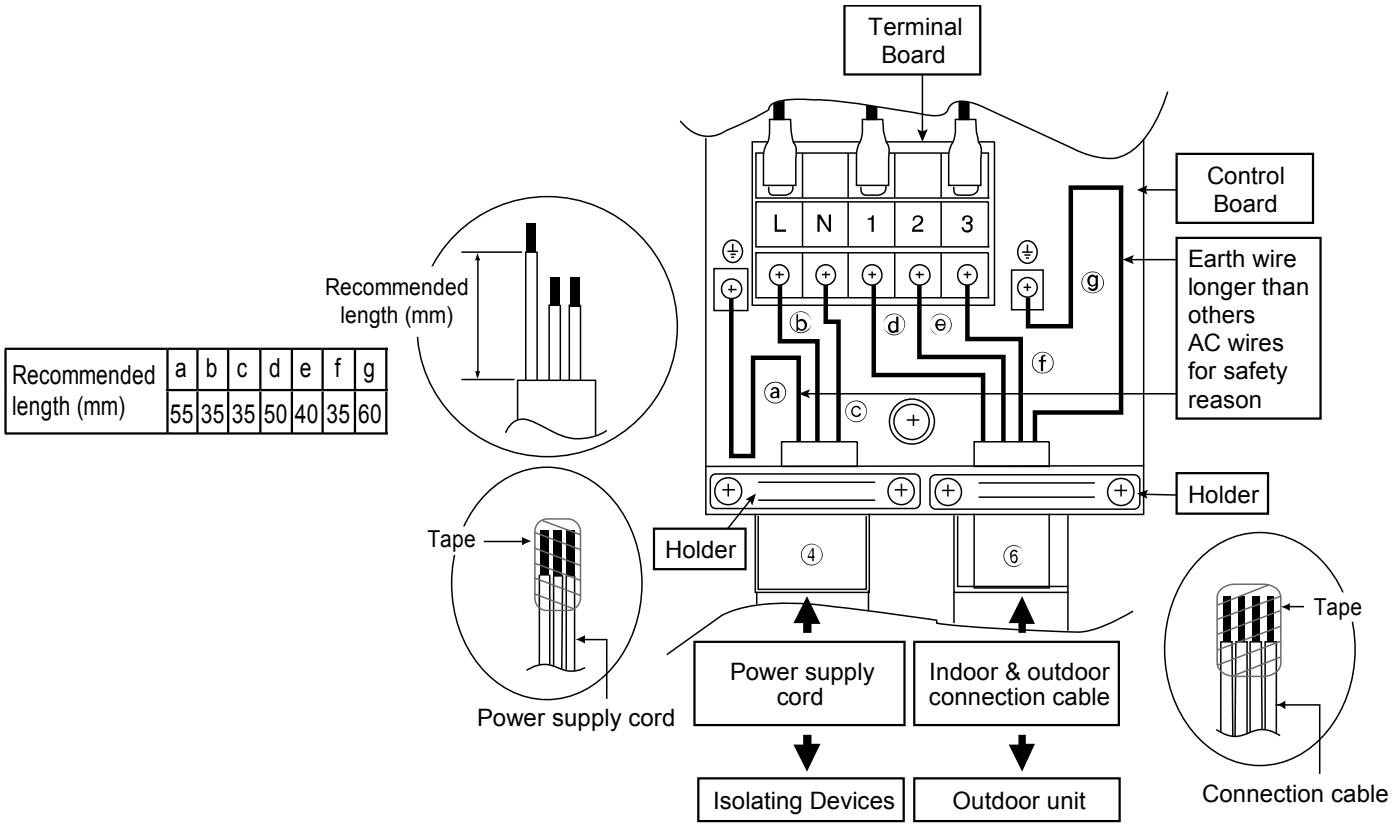
The power supply cord, indoor and outdoor unit connection cable can be connected without removing the front grille.

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 approved type 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 cord 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 with earth pin rated 25A. 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 4 × 4.0 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. Allowable connection cable length of each indoor unit shall be 30 m or less.
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.



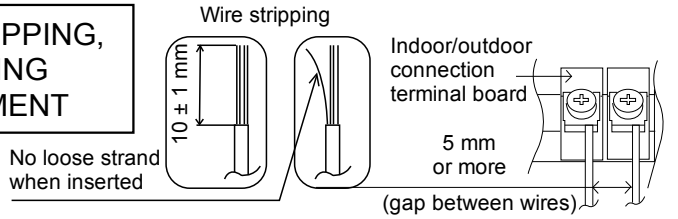
8 Secure the power supply cord and connection cable onto the control board with the holder.
9 Close grille door by tighten with screw and close the front panel.

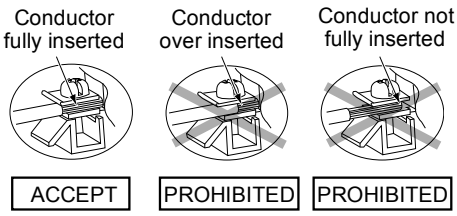


Recommended length (mm)	a	b	c	d	e	f	g
	55	35	35	50	40	35	60

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 other AC wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the anchorage.

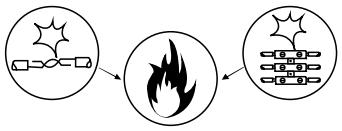
WIRE STRIPPING, CONNECTING REQUIREMENT



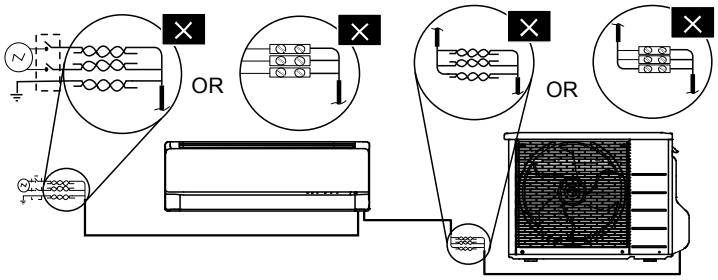


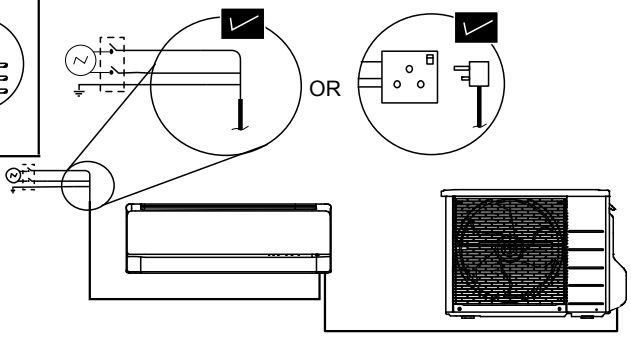
WARNING

RISK OF FIRE
JOINING OF WIRES MAY CAUSE OVERHEATING AND FIRE.



Do not joint wires



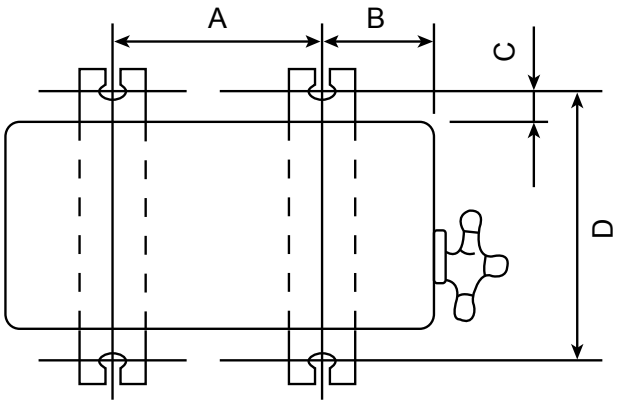


- Use complete wire without joining.
- Use approved socket and plug with earth pin.
- Wire connection in this area must follow to national wiring rules.

12.3 Outdoor Unit

12.3.1 Install the Outdoor Unit

- After selecting the best location, start installation according 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
E28***	613 mm	131 mm	16 mm	360.5 mm

12.3.2 Connect the Piping

12.3.2.1 Connecting the Piping to Indoor

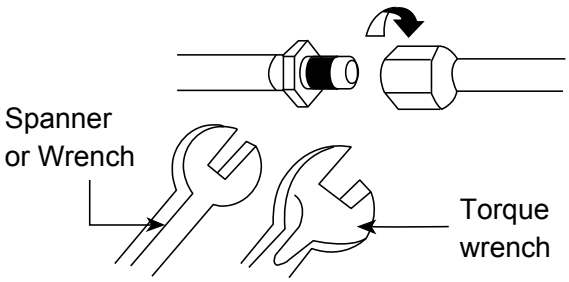
Please make flare after inserting flare nut (locate at joint portion, of tube assembly) onto the copper pipe. (In case of using long piping)
Connect the piping

- 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.

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)]

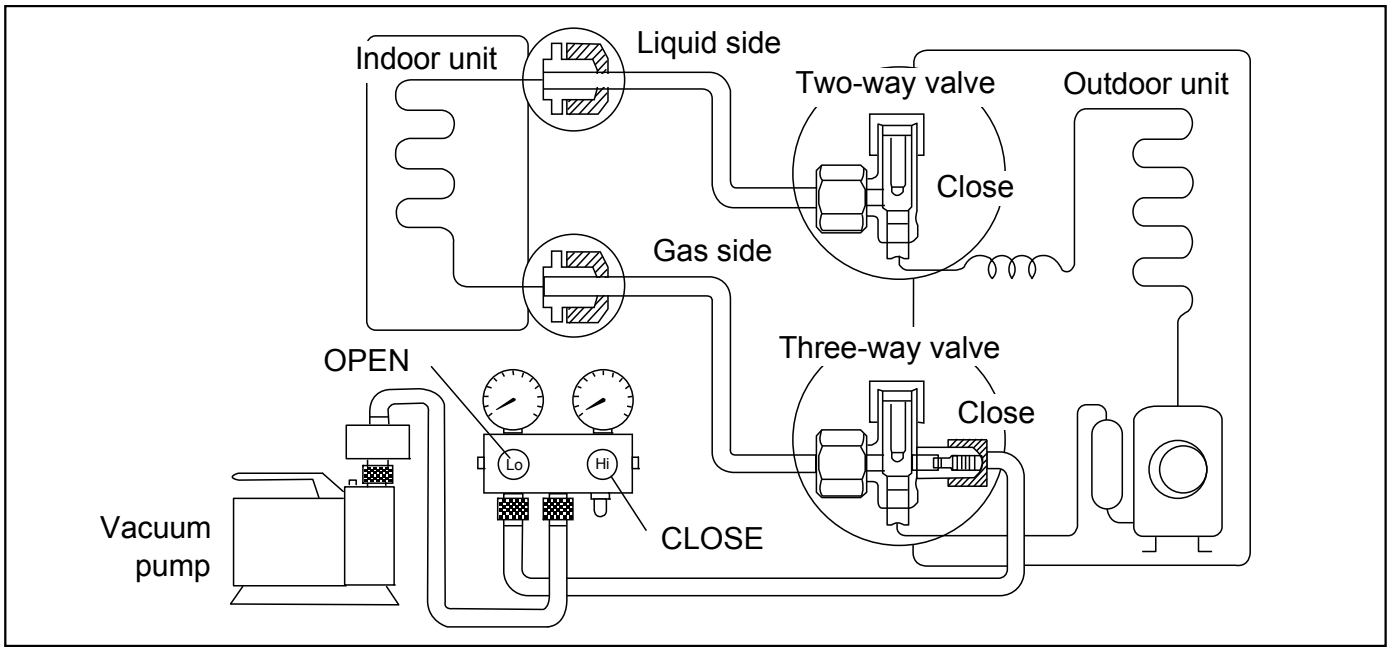
12.3.2.2 Connecting the Piping to Outdoor

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



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:

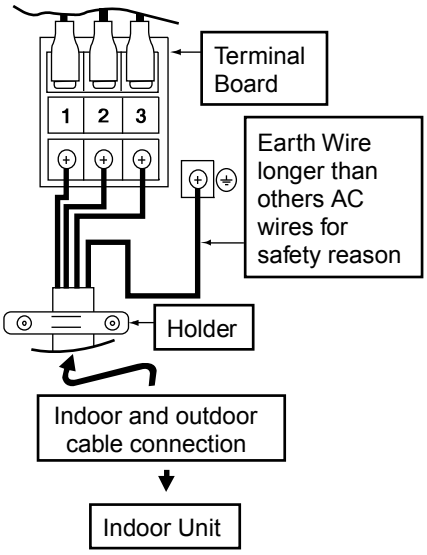
- If the leak stops when the piping connections are tightened further, continue working from step ③.
- If the leak does not stop when the connections are retightened, repair location of leak.
- Do not release refrigerant during piping work for installation and reinstallation.
- Take care of the liquid 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 **Connection cable** between indoor unit and outdoor unit shall be approved polychloroprene sheathed 4 × 4.0 mm^2 (3.0HP) 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. Allowable connection cable length of each indoor unit shall be 30 m or less.

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

3 Secure the cable onto the control board with the holder (clamper).
4 Attach the control board cover back to the original position with screw.
5 For wire stripping and connection requirement, refer to instruction 12.2.4 of indoor unit.



⚠ WARNING
⏚ This equipment must be properly earthed.

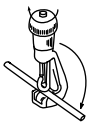
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reason.

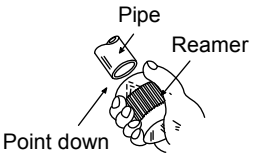
12.3.5 Piping Insulation

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.

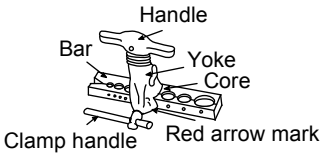
12.3.5.1 Cutting and flaring the piping

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.

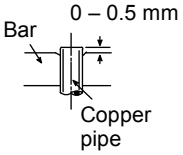

1. To cut

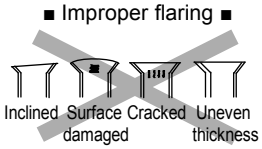


2. To remove burrs



3. To flare





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.

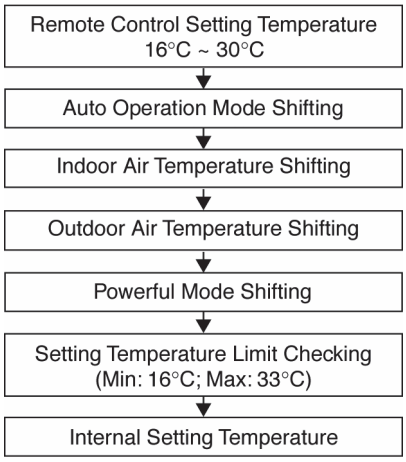
13. Operation Control

13.1 Basic Function

Inverter control, which equipped with a microcomputer in determining the most suitable operating mode as time passes, automatically adjusts output power for maximum comfort always. In order to achieve the suitable operating mode, the microcomputer maintains the set temperature by measuring the temperature of the environment and performing temperature shifting. The compressor at outdoor unit is operating following the frequency instructed by the microcomputer at indoor unit that judging the condition according to internal setting temperature and intake air temperature.

13.1.1 Internal Setting Temperature

Once the operation starts, remote control setting temperature will be taken as base value for temperature shifting processes. These shifting processes are depending on the air conditioner settings and the operation environment. The final shifted value will be used as internal setting temperature and it is updated continuously whenever the electrical power is supplied to the unit.



13.1.2 Cooling Operation

13.1.2.1 Thermostat control

- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature < -1.5°C continue for 3 minutes.
- When compressor is OFF (Thermostat OFF) and AUTO FAN is set, the fan will stop periodically.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature > Compressor OFF point.

13.1.3 Soft Dry Operation

13.1.3.1 Thermostat control

- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature < -2.0°C continue for 3 minutes.
- When compressor is OFF (Thermostat OFF) and AUTO FAN is set, the fan will stop periodically.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature > Compressor OFF point.

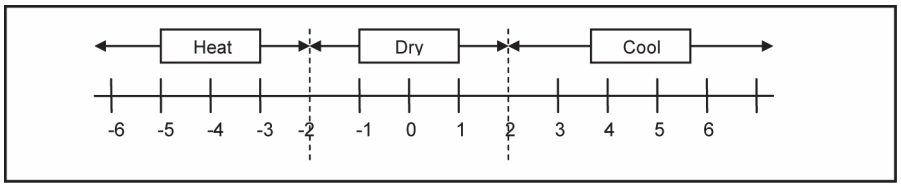
13.1.4 Heating Operation

13.1.4.1 Thermostat control

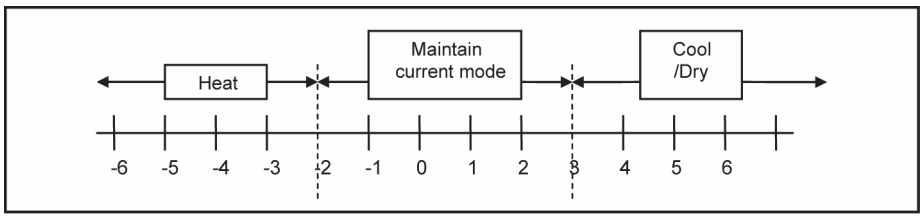
- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature > +2.0°C continue for 3 minutes.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature < Compressor OFF point.

13.1.5 Automatic Operation

- This mode can be set using remote control and the operation is decided by remote control setting temperature, remote control operation mode and indoor intake air temperature.
- During operation mode judgment, indoor fan motor (with speed of Lo-) is running for 30 seconds to detect the indoor intake air temperature.
- Every 10 minutes, the indoor temperature is judged.
- For the 1st judgment
  - If indoor intake temperature - remote control setting temperature ≥ 2°C, COOL mode is decided.
  - If -2°C ≤ indoor intake temperature - remote control setting temperature < 2°C, DRY mode is decided.
  - If indoor intake temperature - remote control setting temperature < -2°C, HEAT mode is decided.



- For the 2nd judgment onwards
  - If indoor intake temperature - remote control setting temperature ≥ 3°C, if previous operate in DRY mode, then continue in DRY mode. otherwise COOL mode is decided.
  - If -2°C ≤ indoor intake temperature - remote control setting temperature < 3°C, maintain with previous mode.
  - If indoor intake temperature - remote control setting temperature < -2°C, HEAT mode is decided.



13.2 Indoor Fan Motor Operation

13.2.1 Basic Rotation Speed (rpm)

A. Basic Rotation Speed (rpm)

i. Manual Fan Speed

[Cooling, Dry]

- Fan motor's number of rotation is determined according to remote control setting.

Remote control	○	○	○	○	○
Tab	Hi	Me+	Me	Me-	Lo

[Heating]

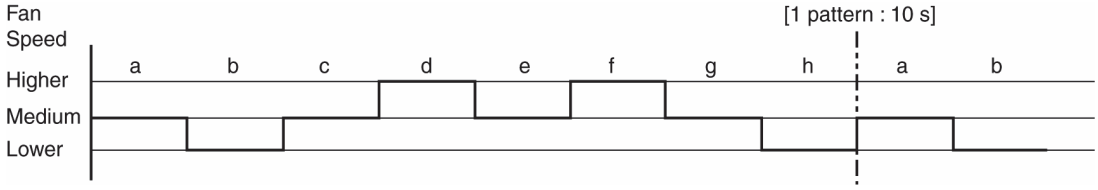
- Fan motor's number of rotation is determined according to remote control setting.

Remote control	○	○	○	○	○
Tab	SHi	Me+	Me	Me-	Lo

ii Auto Fan Speed

[Cooling, Dry]

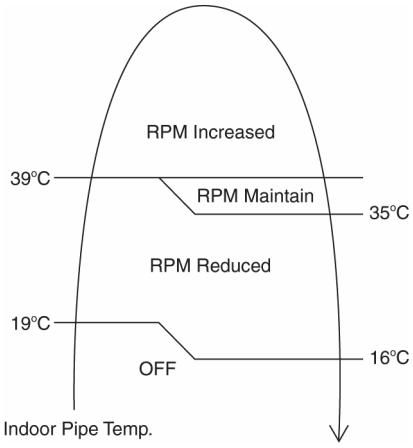
- According to room temperature and setting temperature, indoor fan speed is determined automatically.
- When set temperature is not achieved, the indoor fan will operate according to pattern below.



- When set temperature achieved, the indoor fan speed will be fixed. When thermostat off, the fan stop periodically.

[Heating]

- According to indoor pipe temperature, automatic heating fan speed is determined as follows.

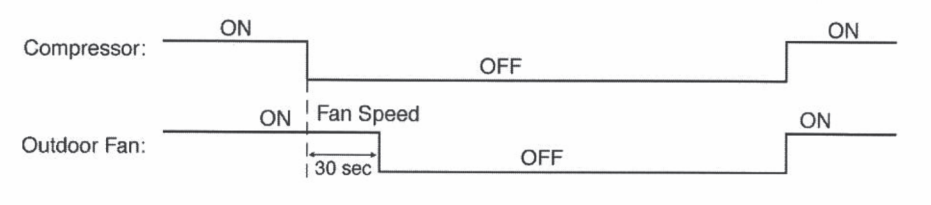


B. Feedback control

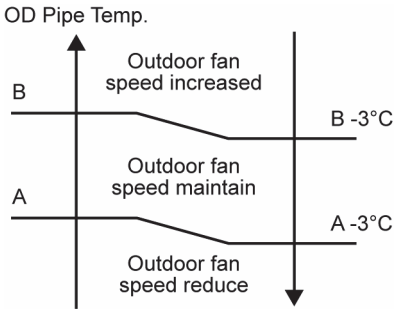
- Immediately after the fan motor started, feedback control is performed once every second.
- During fan motor on, if fan motor feedback ≥ 2550 rpm or < 50 rpm continue for 10 seconds, then fan motor error counter increase, fan motor is then stop and restart. If the fan motor counter becomes 7 times, then H19 - fan motor error is detected. Operation stops and cannot on back.

13.3 Outdoor Fan Motor Operation

- It starts when compressor starts operation and it stops 30 seconds after compressor stops operation.

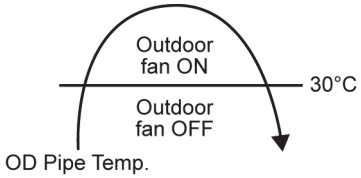


- During cooling operation, and outdoor ambient temperature is below 8°C, outdoor fan speed will be controlled according to outdoor piping temperature as following:



	OD Pipe Temperature
A	26°C
B	33°C

- During above condition, when indoor heat exchanger temperature is below 5°C, the outdoor fan will stop according to outdoor piping temperature as following:



13.4 Airflow Direction

- There are two types of airflow, vertical airflow (directed by horizontal vane) and horizontal airflow (directed by vertical vanes).
- Control of airflow direction can be automatic (angles of direction is determined by operation mode, heat exchanger temperature and intake air temperature) and manual (angles of direction can be adjusted using remote control).

13.4.1 Vertical Airflow

CS-E7QKEW CS-E9QKEW CS-E12QKEW CS-E15QKEW

Operation Mode	Airflow Direction		Upper Vane Angle (°)					Lower Vane Angle (°)				
			1	2	3	4	5	1	2	3	4	5
Heating	Auto with Heat Exchanger Temperature	A	25					17				
		B	55					37				
		C	25					17				
	Summer House		55					37				
	Manual		20	45	55	65	70	17	27	37	47	56
Cooling	Auto		45 ~ 70					2 ~ 39				
	Manual		20	25	50	55	70	2	7	17	27	39
Soft Dry	Auto		45 ~ 70					2 ~ 39				
	Manual		20	25	50	55	70	2	7	17	27	39

CS-E18QKEW CS-E21QKEW CS-E24QKES CS-E28QKES

Operation Mode	Airflow Direction		Upper Vane Angle (°)					Lower Vane Angle (°)				
			1	2	3	4	5	1	2	3	4	5
Heating	Auto with Heat Exchanger Temperature	A	25					17				
		B	55					32				
		C	25					17				
	Summer House		55					37				
	Manual		20	45	55	65	70	17	25	32	42	55
Cooling	Auto		45 ~ 70					2 ~ 36				
	Manual		20	25	50	55	70	2	8	18	27	36
Soft Dry	Auto		45 ~ 70					2 ~ 36				
	Manual		20	25	50	55	70	2	8	18	27	36

1. Automatic vertical airflow direction can be set using remote control; the vane swings up and down within the angles as stated above. For heating mode operation, the angle of the vane depends on the indoor heat exchanger temperature as Figure 1 below. It does not swing during fan motor stop. When the air conditioner is stopped using remote control, the vane will shift to close position.
2. Manual vertical airflow direction can be set using remote control; the angles of the vane are as stated above and the positions of the vane are as Figure 2 below. When the air conditioner is stopped using remote control, the vane will shift to close position.

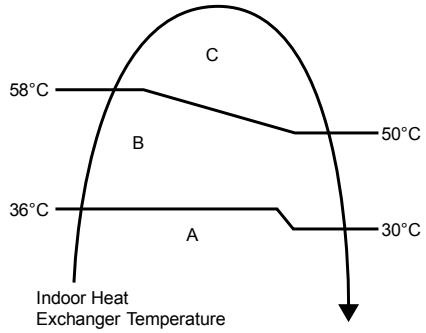


Figure 1

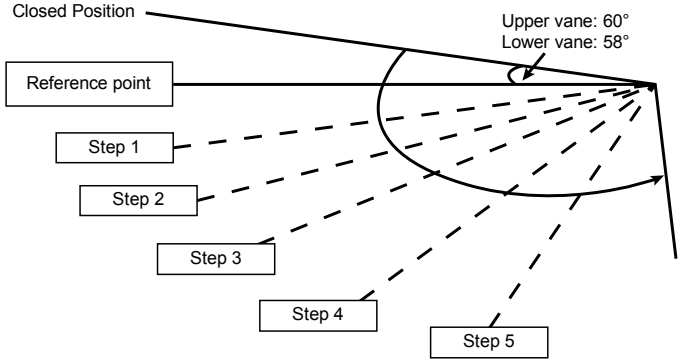


Figure 2

13.4.2 Horizontal Airflow

- Automatic horizontal airflow direction can be set using remote control; the vane swings left and right within the angles as stated below. For heating mode operation, the angle of the vane depends on the indoor heat exchanger temperature as Figure 1 below. It does not swing during fan motor stop.

Operation Mode		Vane Angle (°)
Heating, with heat exchanger temperature	A	65 ~115
	B	90
Cooling and soft dry		65 ~115

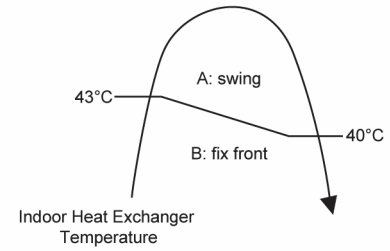


Figure 1

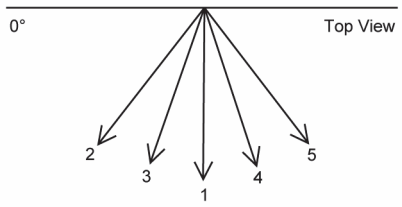


Figure 2

- Manual horizontal airflow direction can be set using remote control; the angles of the vane are as stated below and the positions of the vane are as Figure 2 above.

Pattern	1	2	3	4	5
Airflow Direction Patterns at Remote Control					
Vane Angle (°)	90	65	77.5	102.5	115

CS-E7/9/12/15QK CS-XE7/9/12QK

Pattern	1	2	3	4	5
Airflow Direction Patterns at Remote Control					
Vane Angle (°)	90	70	80	100	110

CS-E18/21/24/28QK CS-XE18QK

13.5 Quiet operation (Cooling Mode/Cooling area of Dry Mode)

- Purpose
  - To provide quiet cooling operation compare to normal operation.

- Control condition
  - Quiet operation start condition
    - When “POWERFUL/QUIET” button at remote control is pressed twice. POWERFUL/QUIET LED illuminates.

  - Quiet operation stop condition
    - When one of the following conditions is satisfied, quiet operation stops:
      - POWERFUL/QUIET button is pressed again.
      - Stop by OFF/ON switch.
      - Timer “off” activates.
      - AUTO COMFORT button is pressed.
      - ECONAVI button is pressed.
      - Mild Dry Cooling button is pressed.
    - When quiet operation is stopped, operation is shifted to normal operation with previous setting.
    - When fan speed is changed, quiet operation is shifted to quiet operation of the new fan speed.
    - When operation mode is changed, quiet operation is shifted to quiet operation of the new mode.
    - During quiet operation, if timer “on” activates, quiet operation maintains.
    - After off, when on back, quiet operation is not memorised.

- Control contents
  - Fan speed is changed from normal setting to quiet setting of respective fan speed.
    Fan speed for quiet operation is reduced from setting fan speed.

13.6 Quiet operation (Heating)

- Purpose
  - To provide quiet heating operation compare to normal operation.

- Control condition
  - Quiet operation start condition
    - When “POWERFUL/QUIET” button at remote control is pressed.
      POWERFUL/QUIET LED illuminates.

  - Quiet operation stop condition
    - When one of the following conditions is satisfied, quiet operation stops:
      - POWERFUL/QUIET button is pressed again.
      - Stop by OFF/ON switch.
      - Timer “off” activates.
      - AUTO COMFORT button is pressed.
      - ECONAVI button is pressed.
      - Mild Dry Cooling button is pressed.
    - When quiet operation is stopped, operation is shifted to normal operation with previous setting.
    - When fan speed is changed, quiet operation is shifted to quiet operation of the new fan speed.
    - When operation mode is changed, quiet operation is shifted to quiet operation of the new mode, except fan mode only.
    - During quiet operation, if timer “on” activates, quiet operation maintains.
    - After off, when on back, quiet operation is not memorised.

- Control contents
  - Fan speed manual
    - Fan speed is changed from normal setting to quiet setting of respective fan speed.
    - Fan speed for quiet operation is reduced from setting fan speed.
  - Fan Speed Auto
    - Indoor FM RPM depends on pipe temp sensor of indoor heat exchanger.

13.7 Powerful Mode Operation

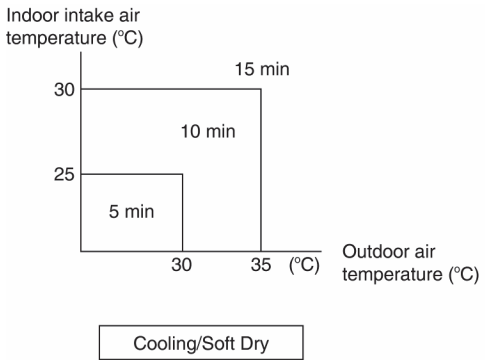
- When the powerful mode is selected, the internal setting temperature will shift lower up to 2°C (for Cooling/Soft Dry) or higher up to 3.5°C (for Heating) than remote control setting temperature for 20 minutes to achieve the setting temperature quickly.

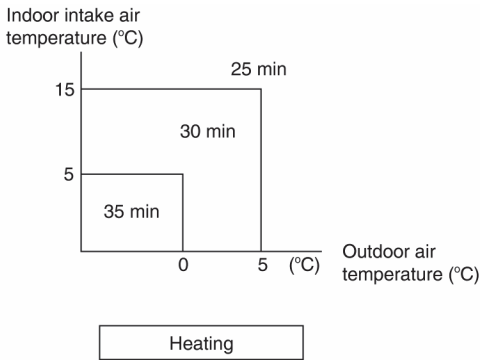
13.8 Timer Control

- There are 2 sets of ON and OFF timer available to turn the unit ON or OFF at different preset time.
- If more than one timer had been set, the upcoming timer will be displayed and will activate in sequence.

13.8.1 ON Timer Control

- ON timer 1 and ON timer 2 can be set using remote control, the unit with timer set will start operate earlier than the setting time.
  This is to provide a comfortable environment when reaching the set ON time.
- 60 minutes before the set time, indoor (at fan speed of Lo-) and outdoor fan motor start operate for 30 seconds to determine the indoor intake air temperature and outdoor air temperature in order to judge the operation starting time.
- From the above judgment, the decided operation will start operate earlier than the set time as shown below.





13.8.2 OFF Timer Control

OFF timer 1 and OFF timer 2 can be set using remote control, the unit with timer set will stop operate at set time.

13.9 Auto Restart Control

- When the power supply is cut off during the operation of air conditioner, the compressor will re-operate within three to four minutes (there are 10 patterns between 2 minutes 58 seconds and 3 minutes 52 seconds to be selected randomly) after power supply resumes.
- This type of control is not applicable during ON/OFF Timer setting.
- This control can be omitted by open the circuit of JP1 at indoor unit printed circuit board.

13.10 Indication Panel

LED	POWER	TIMER	POWERFUL/QUIET	nanoe-G	ECONAVI	AUTO COMFORT
Color	Green	Orange	Orange	Blue	Green	Green
Light ON	Operation ON	Timer Setting ON	POWERFUL/QUIET Mode ON	nanoe-G ON	ECONAVI ON	AUTO COMFORT ON
Light OFF	Operation OFF	Timer Setting OFF	POWERFUL/QUIET Mode OFF	nanoe-G OFF	ECONAVI OFF	AUTO COMFORT OFF

Note:

- If POWER LED is blinking, the possible operation of the unit are Hot Start, during Deice operation, operation mode judgment, or ON timer sampling.
- If Timer LED is blinking, there is an abnormality operation occurs.

13.11 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.

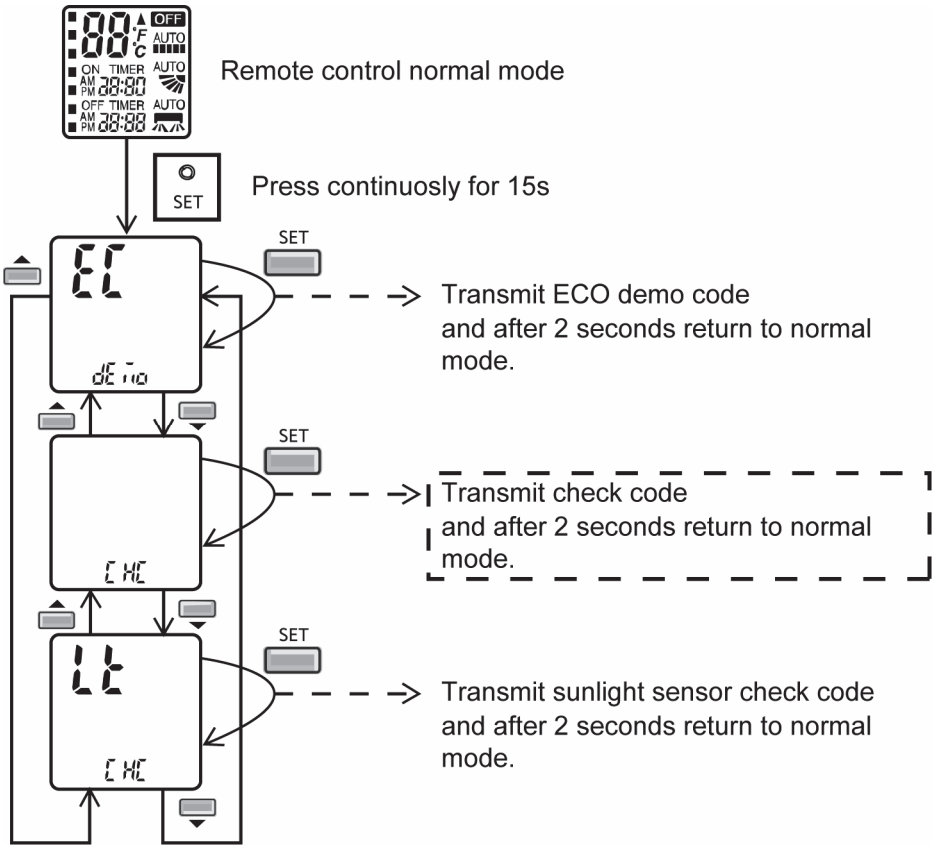
- Timer control
  - When ON Timer activates when unit stops, previous operation resumes and restored last saved nanoe-G operation status.
  - When ON Timer activates during any operation, no change on current operation.
  - When OFF Timer activates during any operation, all operation stops and the latest 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
      - Switch off the power supply and unplug before cleaning.
      - Connect the connector or stop operation to cancel the blinking.
      - Clean the dirty nanoe-G generator with 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.

13.12 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 approximately 600rpm for 30 minutes then stop.
    2. During fan operation, horizontal vane will fixed at 20° 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 : Long Beep
  - Disable in-filter deactivation operation : Short beep

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

13.13 Mild Dry Cooling Operation

- This operation helps to prevent decreases in room humidity while maintaining the setting temperature.
- During unit running at Cooling operation mode, if “Mild Dry Cooling” button is pressed, Mild Dry Cooling operation starts and Mild Dry Cooling indicators turns ON at remote control display.
- Mild dry cooling operation is unavailable when the unit is operating Auto mode and Soft Dry model operation.
- Mild dry cooling operation is cancelled when the unit turned OFF, Mild Dry Cooling button is pressed again or when the operation mode changed from Cooling to other mode.
- ECONAVI, Powerful, Quiet and Mild Dry Cooling mode cannot function at the same time, the unit will follows the operation according to the last signal received.
- During this operation, the compressor frequency changes according to operating condition to prevent room humidity decreases and when AUTO AIR SWING is set, the vertical airflow direction fixed at lower limit position.

13.14 AUTO COMFORT and ECONAVI Operation

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

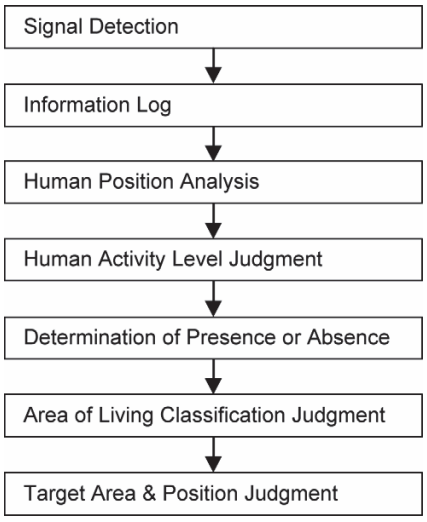
- AUTO COMFORT stop conditions:
  - When AUTO COMFORT button is pressed again.
  - When unit is OFF by OFF/ON button.
  - When unit is OFF when OFF TIMER activates.
  - When unit is OFF by AUTO OFF/ON button at indoor unit.
  - When POWERFUL, QUIET operation activates.
  - When ◄► button is pressed.

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

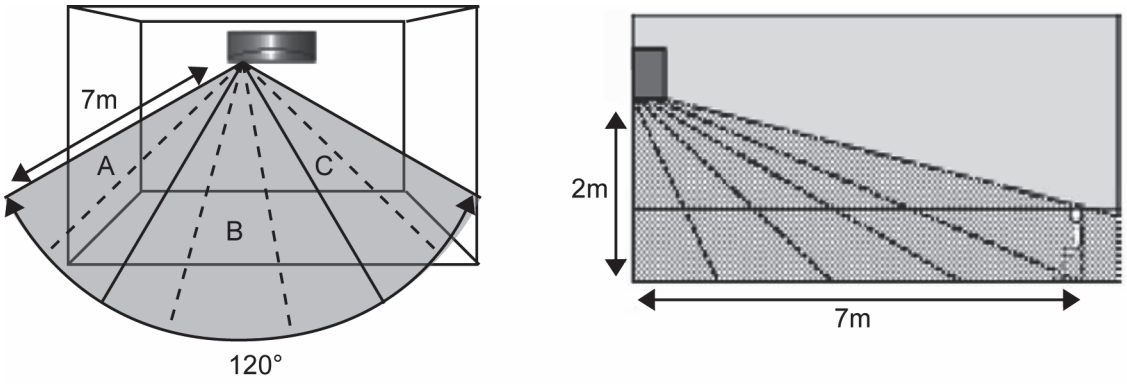
- ECONAVI stop conditions:
  - When ECONAVI button is pressed again.
  - When unit is OFF by OFF/ON button.
  - When unit is OFF when OFF TIMER activates.
  - When unit is OFF by AUTO OFF/ON button at indoor unit.
  - When POWERFUL, QUIET operation activates.
  - When ◄► button is pressed.

13.14.1 Human Activity Sensor

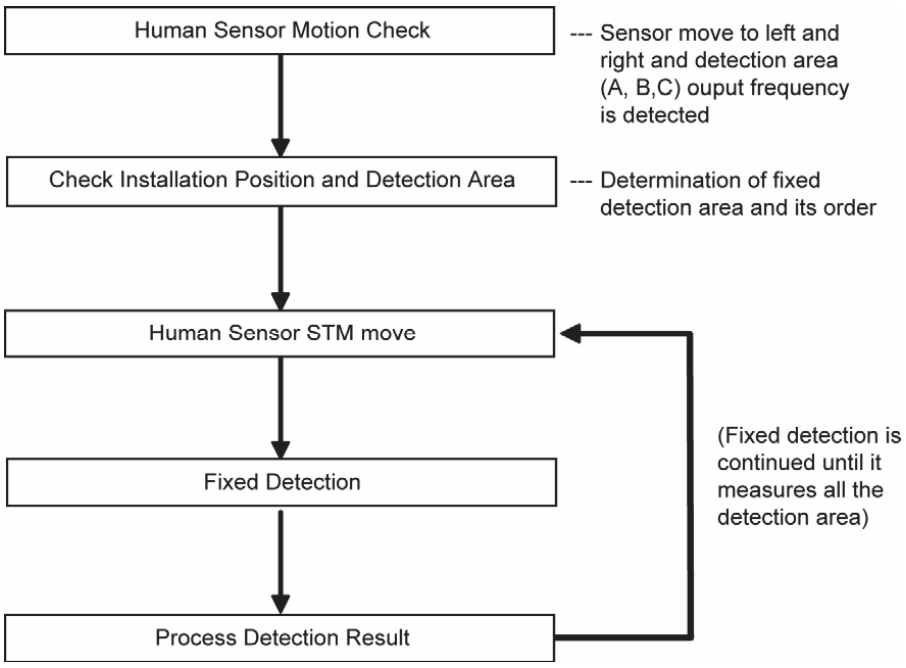
- Area of human availability, activity level and absent is judged based on pulses by using infrared sensor. The internal setting temperature shift, fan speed and horizontal airflow direction are adjusted in order to provide comfort environment while maintain the energy saving level.
- Human activity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



13.14.1.1 Signal Detection



- Presumption flow of human position.
  - Detection outline.



13.14.1.2 Information Log

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

13.14.1.3 Human Position Analysis

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

13.14.1.4 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 40 minutes or more, the status of human absence is judged.

13.14.1.5 Determination of Presence or Absence

- Human presence status shall be determined based on the human presence status of each area.
- When all area has been detected absent for more than 40 minutes then it will judge as absence.

13.14.1.6 Area of Living Classification Judgment

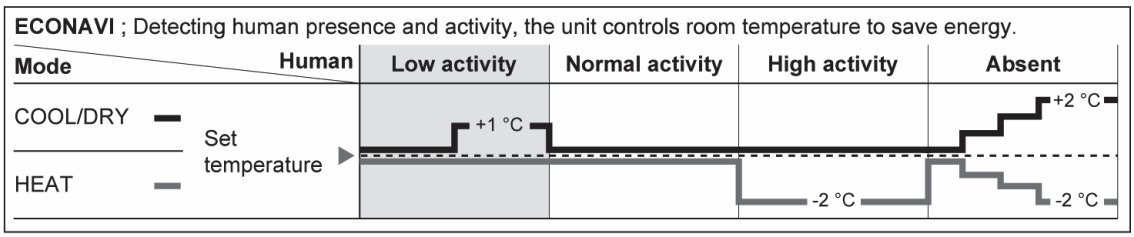
- The system is able to judge area of living according to human activity database, classified as following:
  - (Zone I) Living Area – In front of television, dining table, etc.
  - (Zone II) Walkway – Human detection is relatively less.
  - (Zone III) Non-Living Area – Near windows, wall, etc.

13.14.1.7 Target Area and Position Judgment

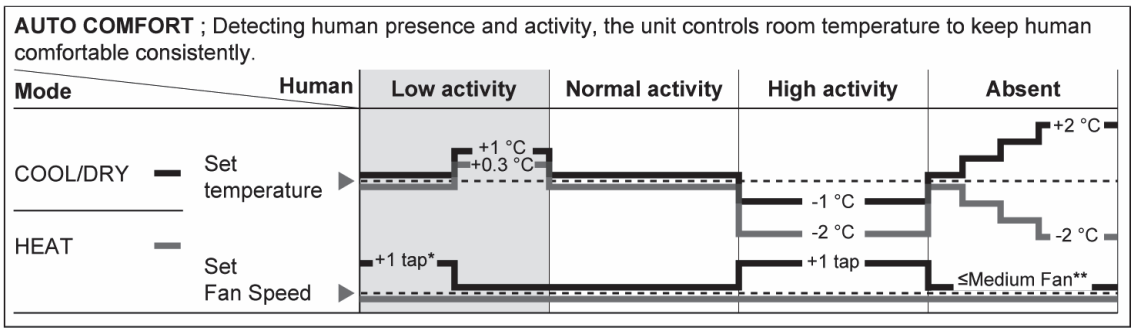
- By default, the system will judge the indoor unit installation position according to human activities and will reset the louver center position::
  - Non-Living Area at Position A – Indoor unit installed at left side of the room.
  - Non-Living Area at Position C – Indoor unit installed at right side of the room.
  - Other than above – Indoor unit installed at center of the room.
- Every 4 hours, the Judgment will restart.
- Target area is judged according to human position analysis result.

13.14.1.8 Setting Temperature and Fan Speed Shift

ECONAVI



AUTO COMFORT



* 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.

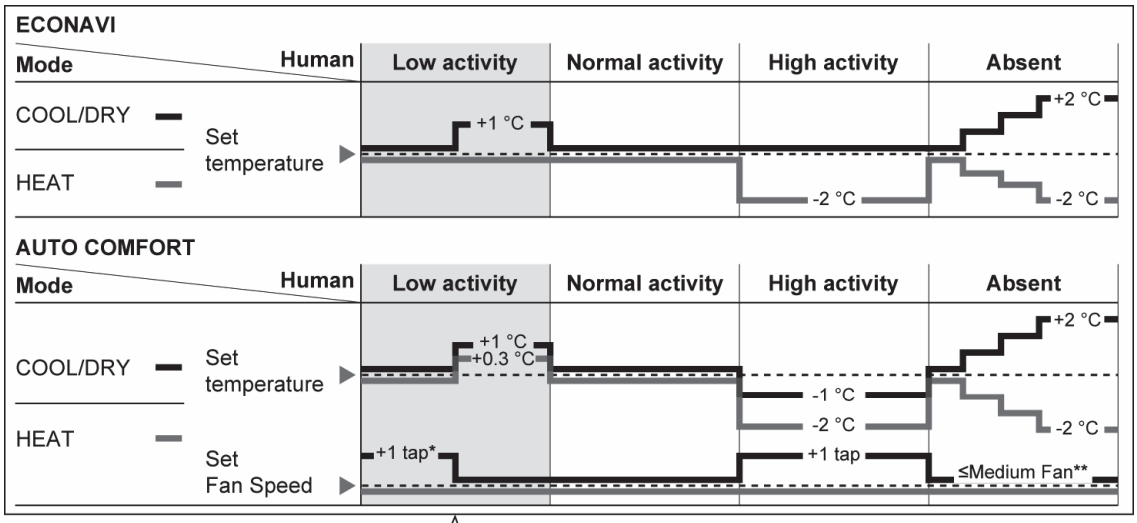
13.14.1.9 Rhythmic Temperature Wave Operation

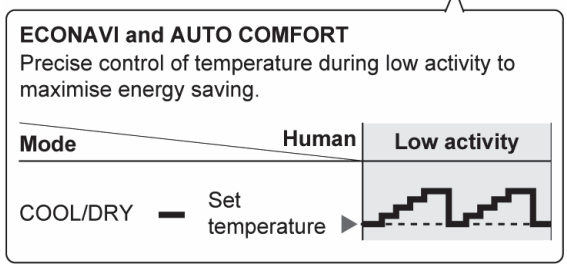
- To further maximize the energy saving during ECONAVI or AUTO COMFORT operates at low activity level.

- Start condition
  - The unit is operates in Cool or Dry mode under ECONAVI or AUTO COMFORT operation, and
  - Human activity sensor detects low activity level, and
  - Neuro stable zone continuously for 60 minutes.

- Stop condition
  - Unit is off, or
  - ECONAVI or AUTO COMFORT is off, or
  - Human activity sensor detects high activity level or absent, or

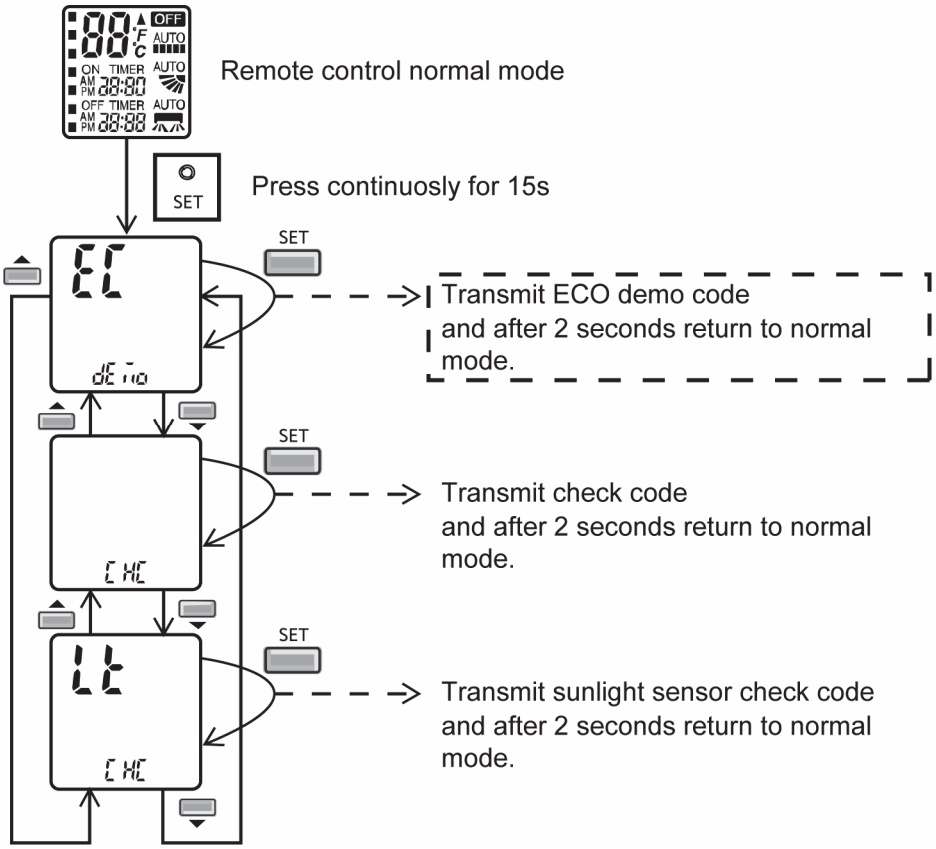
- Control contents
  - When all start conditions complied, set temperature will shift accordingly as following:





13.14.1.10 ECONAVI and AUTO COMFORT Demo Mode

- To enable ECO DEMO mode:



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

13.14.1.11 Human Activity Sensor Abnormality

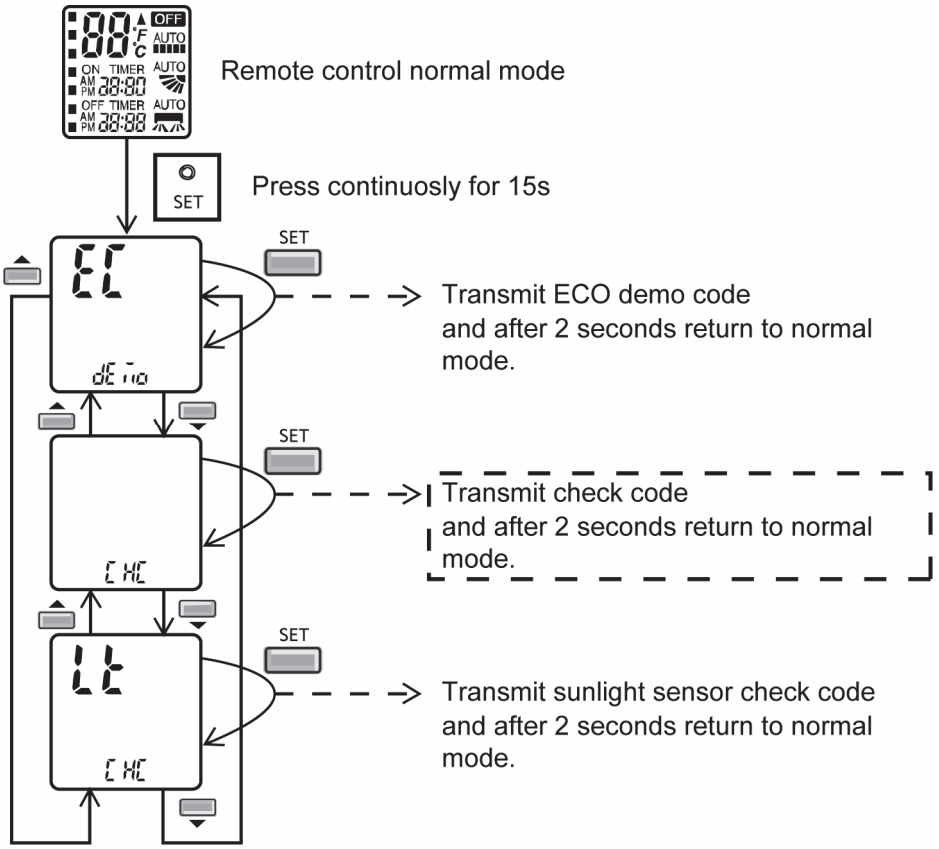
- Abnormality detection:
  - Connector disconnection / Wire cut abnormality
    - Sensor judge Hi level continuously for 25 seconds
  - Circuit abnormality
    - 70 seconds after power ON, if human activity sensor judge Lo level continuously for 25 seconds

- 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, H59 occurred – No TIMER indicator blinking.

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

13.14.1.12 Human Activity Sensor Check Mode

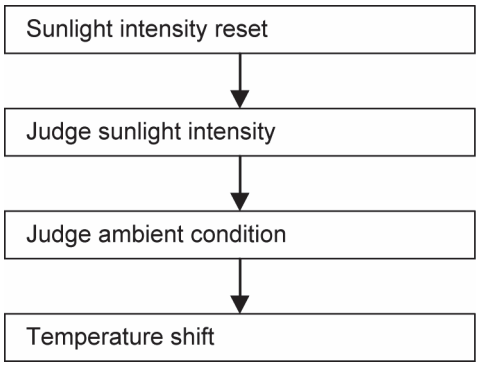
- To enable human activity sensor abnormality check mode:



- 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.

13.14.2 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

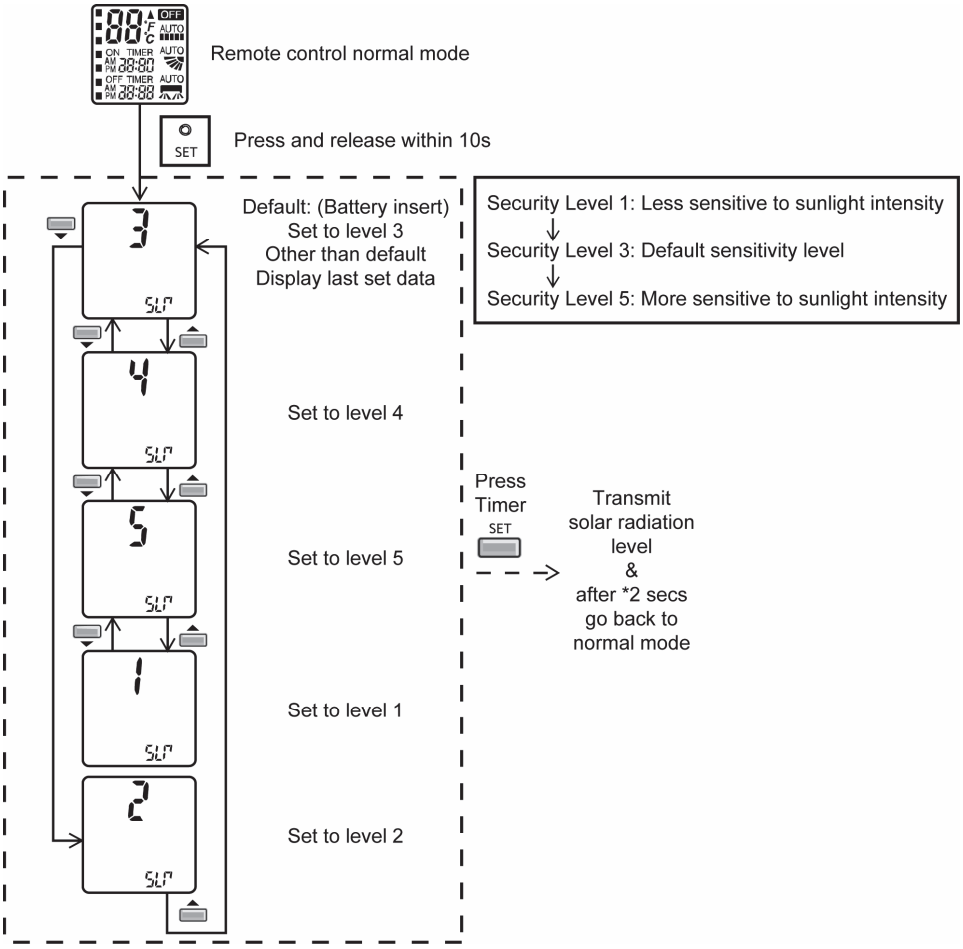


13.14.2.1 Sunlight Intensity Reset

- 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.

13.14.2.2 Judge Sunlight Intensity

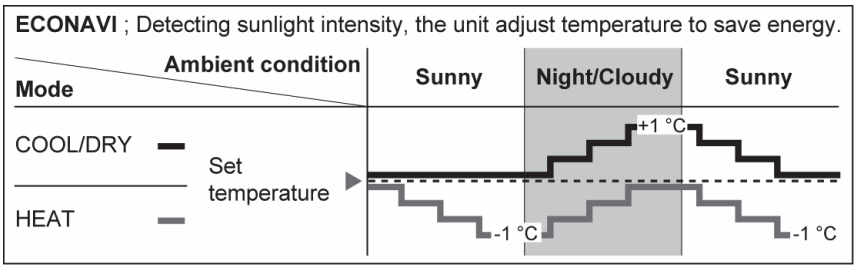
- Based on sunlight sensor output voltage, the sunlight intensity value will be computed and logged to sunlight intensity database.
- The sunlight sensor sensitivity could be adjusted:



13.14.2.3 Judge Ambient Condition

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

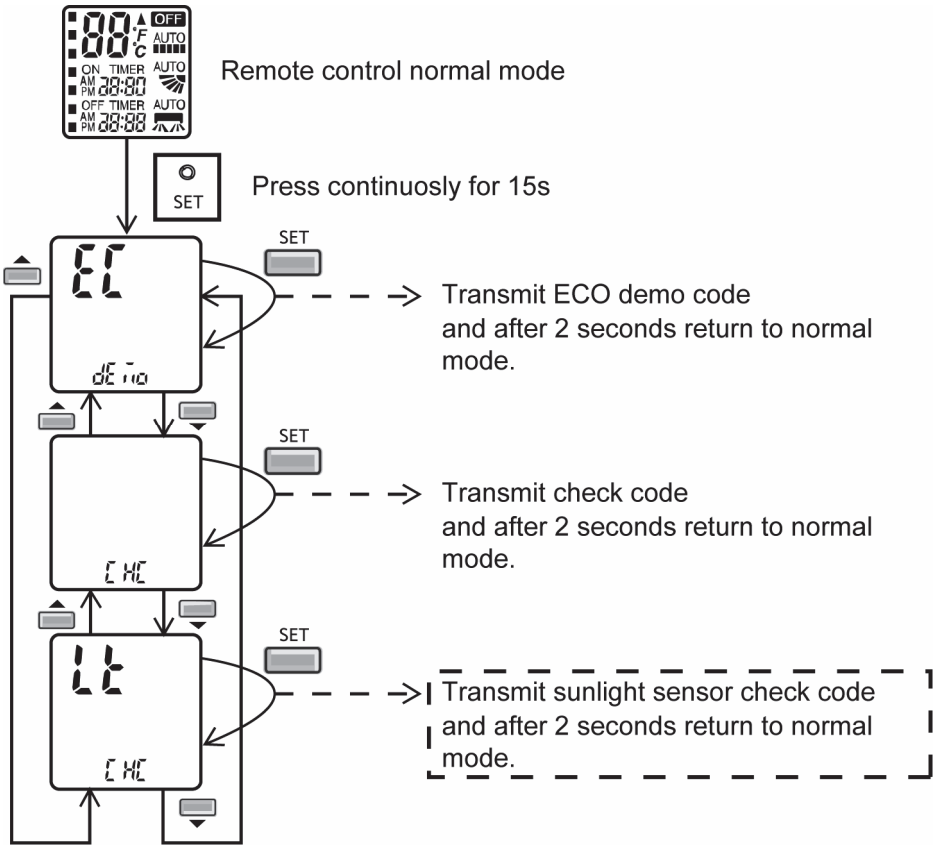
13.14.2.4 Temperature Shift



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

13.14.2.5 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. Please check for error code.

13.14.2.6 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. H70 occurred.
  - No TIMER indicator or ECONAVI indicator blink.
- When error code happened, the unit is able to operate without sunlight sensor.

14. Operation Control (For Multi Split Connection)

During multi split connection, indoor unit's operation controls are same with single split connection unless specified in this chapter.

14.1 Cooling operation

14.1.1 Thermostat control

- Capability supply to indoor unit is OFF (Expansion valve closed) when Intake Air Temperature — Internal setting temperature < -2.0°C.
- Capability resume supply to indoor unit after waiting for 3 minutes, if the Intake Air temperature — Internal setting temperature > Capability supply OFF point.

14.2 Soft Dry Operation

14.2.1 Thermostat control

- Capability supply to indoor unit is OFF (Expansion valve closed) when Intake Air Temperature — Internal setting temperature < -3.0°C.
- Capability resume to indoor unit after waiting for 3 minutes, if the Intake Air temperature — Internal setting temperature > Capability supply OFF point.

14.3 Heating Operation

14.3.1 Thermostat control

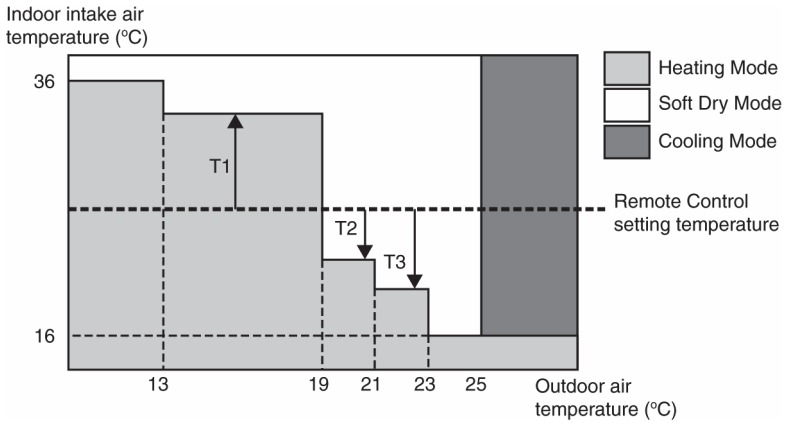
- Capability supply to indoor unit is OFF (Expansion valve closed) when Intake Air Temperature — Internal setting temperature > +1.0°C.
- During this condition, the indoor fan is stopped if compressor is ON.
- Capability resume supply to indoor unit after waiting for 3 minutes, if the Intake Air Temperature — Internal setting temperature < Capability supply OFF point.

14.3.2 Temperature Sampling Control

- Temperature sampling is controlled by outdoor unit where room temperature for all power supply ON indoor unit could be obtained.
- When capability supply to the indoor unit is OFF and the compressor is ON, the indoor fan motor is stopped. During this condition, 15 seconds after sampling signal from outdoor unit is received, the indoor fan start operation at low fan speed.
- However, within first 4 minutes of capability stopped supply to the indoor unit, even sampling signal is received, the sampling control is cancelled.

14.4 Automatic Operation

- This mode can be set using remote control and the operation is decided by remote control setting temperature, remote control operation mode, indoor intake and outdoor air temperature.
- During operation mode judgment, indoor fan motor (with speed of -Lo) and outdoor fan motor are running for 30 seconds to detect the indoor intake and outdoor air temperature. The operation mode is decided based on below chart.



- Every 180 minutes, the indoor and outdoor temperature is judge. Based on remote control setting temperature, the value of T1 will increase up to 10°C, T2 will decrease by 3°C and T3 will decrease up to 8°C.

14.5 Indoor Fan Motor Operation

14.5.1 Residual Heat Removal Control

- To prevent high pressure at indoor unit, when heating mode thermostat-off condition or power supply OFF, indoor fan continue to operate at controlled fan speed for maximum 30 seconds then stop.

14.6 Powerful Mode Operation

- When the power mode is selected, the internal setting temperature will shift lower up to 4°C for Cooling/Soft Dry or higher up to 6°C for heating than remote control setting temperature, the powerful operation continue until user cancel the Powerful operation by pressing powerful button again.

14.7 Auto restart control

- When the power supply is cut off during the operation of air conditioner, the compressor will re-operate between three to four minutes (10 patterns to be selected randomly) after power resume.
- During multi split connection, Indoor unit will resume previous mode, include unit standby mode.

14.8 Indication Panel

LED	POWER	TIMER	POWERFUL/QUIET	nanoe-G	ECONAVI	AUTO COMFORT
Color	Green	Orange	Orange	Blue	Green	Green
Light ON	Operation ON	Timer Setting ON	POWERFUL/QUIET Mode ON	nanoe-G ON	ECONAVI ON	AUTO COMFORT ON
Light OFF	Operation OFF	Timer Setting OFF	POWERFUL/QUIET Mode OFF	nanoe-G OFF	ECONAVI OFF	AUTO COMFORT OFF

Note:

- If POWER LED is blinking (0.5 seconds ON, 0.5 second OFF), the possible operation of the unit are during Indoor Residual Heat Removal, Hot Start, during Deice operation, operation mode judgment, or ON timer sampling.
- If POWER LED is blinking (2.5 seconds ON, 0.5 second OFF), the unit is in standby mode.
- If TIMER LED is blinking, there is an abnormality operation occurs.

14.9 Mild Dry Cooling Operation

- During multi split connection, Mild Dry Cooling Operation is disabled.

15. Protection Control

15.1 Protection Control For All Operations

15.1.1 Restart Control (Time Delay Safety Control)

- The Compressor will not turn on within 3 minutes from the moment operation stops, although the unit is turned on again by pressing OFF/ON button at remote control within this period.
- This control is not applicable if the power supply is cut off and on again.
- This phenomenon is to balance the pressure inside the refrigerant cycle.

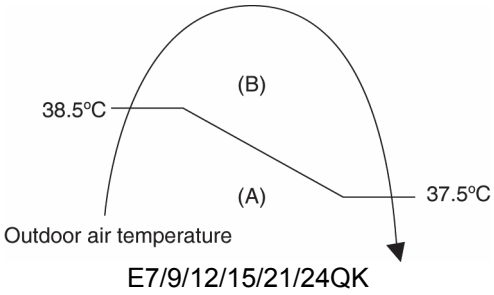
15.1.2 Total Running Current

1 When the outdoor unit total running current (AC) exceeds X value, the frequency instructed for compressor operation will be decreased.
2 If the running current does not exceed X value for 5 seconds, the frequency instructed will be increased.
3 However, if total outdoor unit running current exceeds Y value, compressor will be stopped immediately for 3 minutes.

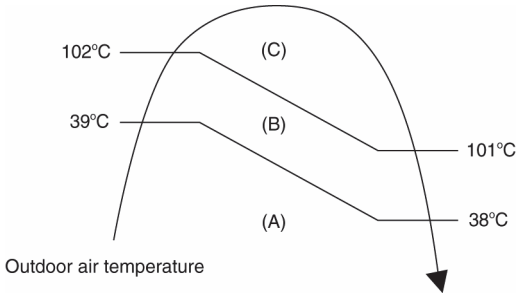
Model	E7QKE		E9QKE		E12QKE		E15QKE		E18QKE	
Operation Mode	X (A)	Y (A)	X (A)	Y (A)	X (A)	Y (A)	X (A)	Y (A)	X (A)	Y (A)
Cooling / Soft Dry (A)	3.69	14.98	4.25	15.02	6.3	15.02	7.94	15.02	11.73	14.67
Cooling / Soft Dry (B)	3.24		3.78		5.84		7.42		8.91	
Cooling / Soft Dry (C)	3.24		3.78		5.84		7.42		8.82	
Heating	3.86		4.89		7.19		8.16		9.99	

Model	E21QKE		E24QKE		E28QKE	
Operation Mode	X (A)	Y (A)	X (A)	Y (A)	X (A)	Y (A)
Cooling / Soft Dry (A)	12.19	14.67	14.44	19.04	14.86	19.04
Cooling / Soft Dry (B)	11.03		11.87		13.76	
Cooling / Soft Dry (C)	11.03		11.87		13.76	
Heating	11.73		12.82		14.95	

4 The first 30 minutes of cooling operation, (A) will be applied.



E7/9/12/15/21/24QK



E28QK

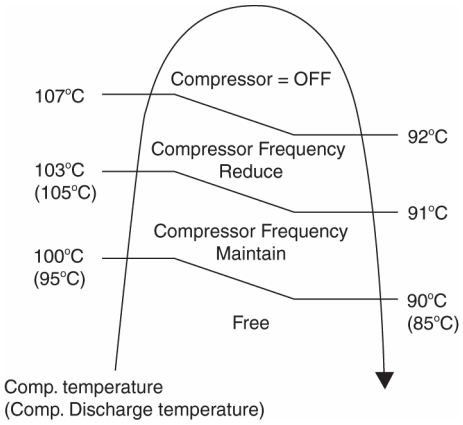
15.1.3 IPM (Power transistor) Prevention Control

- Overheating Prevention Control
  1 When the IPM temperature rises to 110°C (E28QK) and 120°C (E7/9/12/15/24/24QK), compressor operation will stop immediately.
  2 Compressor operation restarts after 3 minutes the temperature decreases to 95°C (E28QK) 110°C.
  3 If this condition repeats continuously 4 times within 20 minutes, timer LED will be blinking (“F96” is indicated).

- DC Peak Current Control
  1 When electric current to IPM exceeds set value of 16.0 ± 2.0A (E7/9/12/15QK) and 30.0 ± 3.0A (E18/21/24/28QK), the compressor will stop operate. Then, operation will restart after 3 minutes.
  2 If the set value is exceeded again more than 30 seconds after the compressor starts, the operation will restart after 1 minute.
  3 If the set value exceeded again within 30 seconds after the compressor starts, the operation will restart after 1 minute. If this condition repeats continuously for 7 times, all indoor and outdoor relays will be cut off, timer LED will be blinking (“F99” is indicated).

15.1.4 Compressor Overheating Prevention Control

- Instructed frequency for compressor operation will be regulated by compressor discharge temperature. The changes of frequency are as below.
- If compressor discharge temperature exceeds 107°C, compressor will be stopped, occurs 4 times per 20 minutes, timer LED will be blinking. (“F97” is indicated.)



15.1.5 Low Pressure Prevention Control (Gas Leakage Detection)

- Control start conditions
  - For 5 minutes, the compressor continuously operates and outdoor total current is between 0.75A and 0.95A (E7/9/12/15QK), 1.38A and 1.65A (E18/21/24/28QK).
  - During Cooling and Soft Dry operations:
    Indoor suction temperature - indoor piping temperature is below 4°C.
  - During Heating operations :
    Indoor piping temperature - indoor suction is under 5°C.
- Control contents
  - Compressor stops (and restart after 3 minutes).
  - If the conditions above happen 2 times within 20 minutes, the unit will:
    - Stop operation
    - Timer LED blinks and “F91” indicated.

15.1.6 Low Frequency Protection Control 1

- When the compressor operate at frequency lower than 24 Hz continued for 20 minutes, the operation frequency will be changed to 23 Hz for 2 minutes.

15.1.7 Low Frequency Protection Control 2

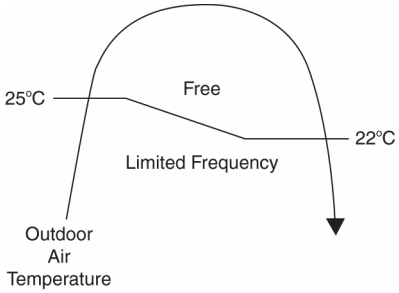
- When all the below conditions comply, the compressor frequency will change to lower frequency.

Temperature, T, for:	Cooling/Soft Dry	Heating
Indoor intake air (°C)	T < 14 or T ≥ 30	T < 14 or T ≥ 28
Outdoor air (°C)	T < 13 or T ≥ 38	T < 4 or T ≥ 24
Indoor heat exchanger (°C)	T < 30	T ≥ 0

15.2 Protection Control For Cooling & Soft Dry Operation

15.2.1 Outdoor Air Temperature Control

- The compressor operating frequency is regulated in accordance to the outdoor air temperature as shown in the diagram below.
- This control will begin 1 minute after the compressor starts.
- Compressor frequency will adjust base on outdoor air temperature.



15.2.2 Cooling Overload Control

- Detects the Outdoor pipe temperature and carry out below restriction/limitation (Limit the compressor Operation frequency).
- The compressor stop if outdoor pipe temperature exceeds 61°C (E7/9/12/15QK), 63°C (E18/21QK), 65°C (E24/28QK).
- If the compressor stops 4 times in 20 minutes, Timer LED blinking (F95 indicated: outdoor high pressure rise protection).

15.2.3 Freeze Prevention Control 1

- When indoor heat exchanger temperature is lower than 0°C continuously for 6 minutes, compressor will stop operating.
- Compressor will resume its operation 3 minutes after the indoor heat exchanger is higher than 5°C.
- At the same time, indoor fan speed will be higher than during its normal operation.
- If indoor heat exchanger temperature is higher than 5°C for 5 minutes, the fan speed will return to its normal operation.

15.2.4 Freeze Prevention Control 2

- Control start conditions
  - During Cooling operation and soft dry operation
    - During thermo OFF condition, indoor intake temperature is less than 10°C or
    - Compressor stops for freeze prevention control
  - Either one of the conditions above occurs 5 times in 60 minutes.
- Control contents
  - Operation stops
  - Timer LED blinks and “H99” indicated

15.2.5 Dew Prevention Control 1

- To prevent dew formation at indoor unit discharge area.
- This control will be activated if:
  - Outdoor air temperature and Indoor pipe temperature judgment by microcontroller is fulfilled.
  - When Cooling or Dry mode is operated more than 20 minutes or more.
- This control stopped if:
  - Compressor stopped.
  - Remote control setting changed (fan speed / temperature).
  - Outdoor air temperature and indoor intake temperature changed.
- Fan speed will be adjusted accordingly in this control.

15.2.6 Odor Cut Control

- To reduce the odor released from the unit.
  - Start Condition
    - AUTO FAN Speed is selected during COOL or DRY operation.
    - During freeze prevention control and timer preliminary operation, this control is not applicable.
  - Control content
    - Depends on compressor conditions:
      1. Compressor OFF → Compressor ON.
         The indoor unit fan stops temporarily and then starts to blow at minimum airflow for 30 seconds.
      2. Compressor ON → Compressor OFF.
         The indoor unit fan stops for 90 seconds and then blows at minimum airflow for 20 seconds.

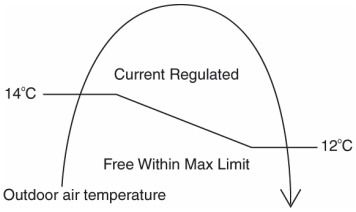
15.3 Protection Control For Heating Operation

15.3.1 Intake Air Temperature Control

Compressor will operate at limited freq., if indoor intake air temperature is 30°C or above.

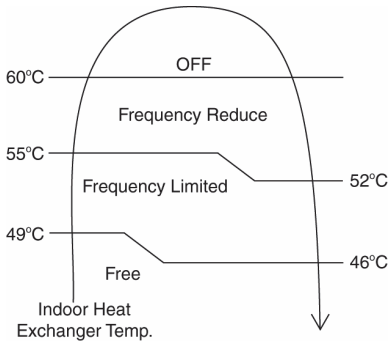
15.3.2 Outdoor Air Temperature Control

- The Max current value is regulated when the outdoor air temperature rise above 14°C (E7/9/12/15QK) and 14°C (E18/21QK) in order to avoid compressor overloading.



15.3.3 Overload Protection Control

- The compressor operating frequency is regulated in accordance to indoor heat exchanger temperature as shown below.
- If the heat exchanger temperature exceeds 60°C, compressor will stop.



15.3.4 Low Temperature Compressor Oil Return Control

- In heating operation, if the outdoor temperature falls below -10°C when compressor starts, the compressor frequency will be regulated up to 600 seconds.

15.3.5 Cold Draught Prevention Control

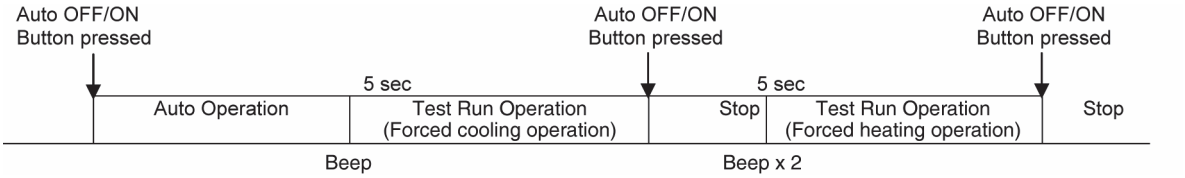
- When indoor pipe temperature is low, cold draught operation starts where indoor fan speed will be reduced.

15.3.6 Deice Operation

- When outdoor pipe temperature and outdoor air temperature is low, deice operation start where indoor fan motor and outdoor fan motor stop and operation LED blinks.

16. Servicing Mode

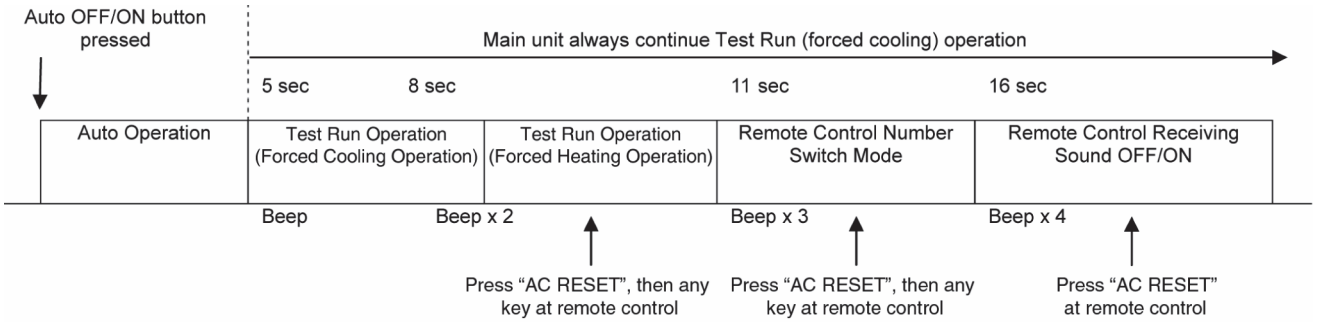
16.1 Auto OFF/ON Button



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.

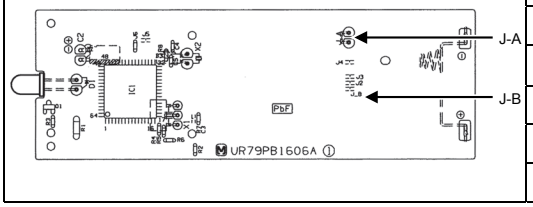
2 TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)
The Test Run operation will be activated if the Auto OFF/ON button is pressed continuously for more than 5 seconds. A “beep” sound will heard at the fifth seconds, in order to identify the starting of Test Run operation (Forced cooling operation). Within 5 minutes after Forced cooling operation start, the Auto OFF/ON button is pressed for more than 5 seconds. A 2 “beep” sounds will heard at the fifth seconds, in order to identify the starting of Forced heating operation.

The Auto OFF/ON button may be used together with remote control to set / change the advance setting of air conditioner operation.



3 REMOTE CONTROL NUMBER SWITCH MODE
The Remote Control Number Switch Mode will be activated if the Auto OFF/ON button is pressed continuously for more than 11 seconds (3 “beep” sounds will occur at 11th seconds to identify the Remote Control Number Switch Mode is in standby condition) and press “AC RESET” button and then press any button at remote control to transmit and store the desired transmission code to the EEPROM.

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 (J-A)	Jumper B (J-B)	Remote Control No.
Short	Open	A (Default)
Open	Open	B
Short	Short	C
Open	Short	D

- During Remote Control Number Switch Mode, press any button at remote control to transmit and store the transmission code to the EEPROM.

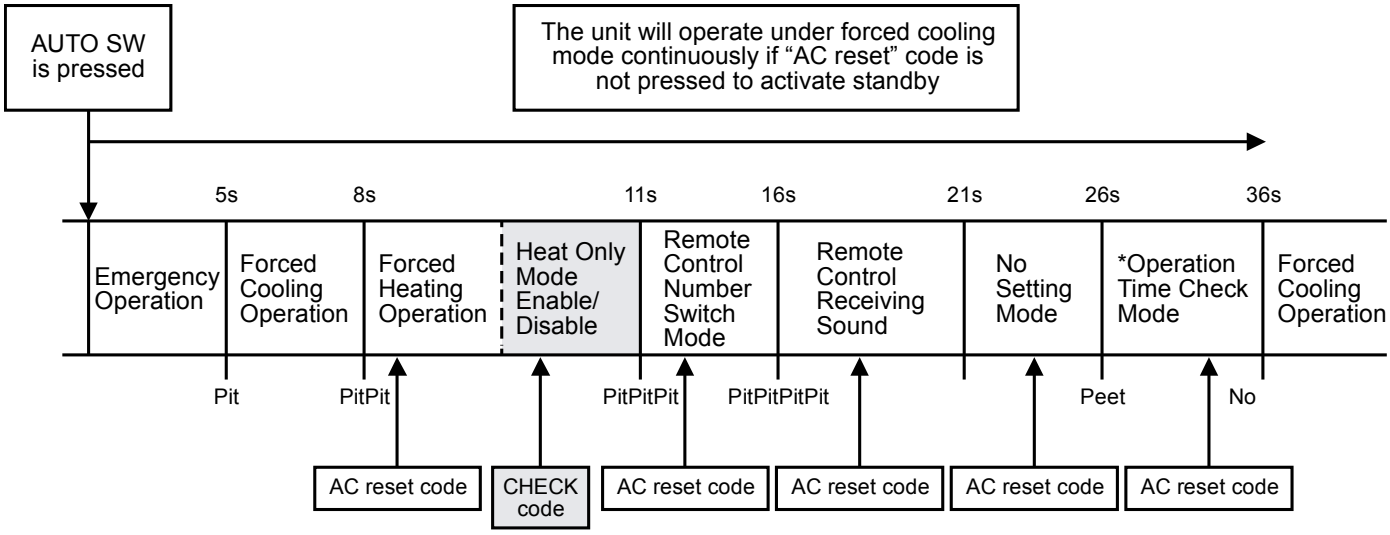
4 REMOTE CONTROL RECEIVING SOUND OFF/ON MODE
The Remote Control Receiving Sound OFF/ON Mode will be activated if the Auto OFF/ON button is pressed continuously for more than 16 seconds (4 “beep” sounds will occur at 16th seconds to identify the Remote Control Receiving Sound Off/On Mode is in standby condition) and press “AC Reset” button at remote control.

Press “Auto OFF/ON button” to toggle remote control receiving sound.
- Short “beep”: Turn OFF remote control receiving sound.
- Long “beep”: Turn ON 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.

16.2 Heat Only Operation

16.2.1 How to Activate/Deactivate Heat only Operation



- To enable the “Heat Only” mode, press the AUTO OFF/ON SW for more than 8s and less than 11s, “Pit Pit" sound will be heard, then release the AUTO OFF/ON SW and press remote controller CHECK button. A short “Pit” sound will be heard. “Heat Only” mode is now enable.
- To disable the “Heat Only” mode, press the AUTO OFF/ON SW for more than 8s and less than 11s, “Pit Pit” sound will be heard, then release the AUTO OFF/ON SW and press remote controller CHECK button. A long “Pit” sound will be heard. “Heat Only” mode is now disable.
- To pump down the unit during Heat Only Operation press AUTO switch for 5 seconds.

16.2.2 Operation mode during Heating Only Operation

- The table below shows the operation mode comparison when Heating Only Operation Mode Activated and Deactivated.

Operation Mode	Heating Only Operation Mode Activated	Heating Only Operation Mode Deactivated
AUTO	After 30s sampling, regardless of the indoor intake or outdoor intake temperature judgment, the unit will run Heating operation.	After 30s sampling, the unit will judge the operation mode base on remote controller temperature setting and Indoor Intake Sensor (New Auto Mode) or Outdoor Intake Sensor (Old Auto Mode).
HEAT	The unit will run Heating operation.	The unit will run Heating operation.
COOL	The unit will stop and Power LED blinking.	The unit will run Cooling operation.
DRY	The unit will stop and Power LED blinking.	The unit will run Cooling Dry operation.
NANOE-G Stand-alone	The unit will stop and Power LED blinking.	The unit will run Nanoe-G Stand-alone operation.
Force Cooling	The unit will run Force Cooling Operation for X_CTRYTM [15] minutes	The unit will run Force Cooling operation.
Force Heating	The unit will run Force Heating operation.	The unit will run Force Heating operation.
AUTO (with Timer)	The unit will turn ON by the timer and run Auto Operation. After 30s sampling, regardless of the indoor intake or outdoor intake temperature judgment, the unit will run Heating operation.	The unit will turn ON by the timer and run Auto Operation. After 30s sampling, the unit will judge the operation mode base on remote controller temperature setting and Indoor Intake Sensor (New Auto Mode) or Outdoor Intake Sensor (Old Auto Mode).
HEAT (with Timer)	The unit will turn ON by the timer and run Heating Operation.	The unit will turn ON by the timer and run Heating Operation.
COOL (with Timer)	The unit will not turn ON by the timer. Power LED blinking.	The unit will turn ON by the timer and run Cooling Operation.
DRY (with Timer)	The unit will not turn ON by the timer. Power LED blinking.	The unit will turn ON by the timer and run Cooling Dry Operation.
Cooling Test Mode	The unit will stop and Power LED blinking.	The unit will operate according to specify Cooling test mode operation parameter.
Heating Test Mode	The unit will operate according to specify Heating test mode operation parameter.	The unit will operate according to specify Heating test mode operation parameter.

16.3 Remote Control Button

16.3.1 SET Button

- To check 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 changed.

16.3.2 RESET (RC)

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

16.3.3 RESET (AC)

- To restore the unit’s setting to factory default.
  - Press once to restore the unit’s setting.

16.3.4 TIMER ▲

- To change indoor unit indicator’s LED intensity.
  - Press continuously for 5 seconds.

16.3.5 TIMER ▼

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

17. Troubleshooting Guide

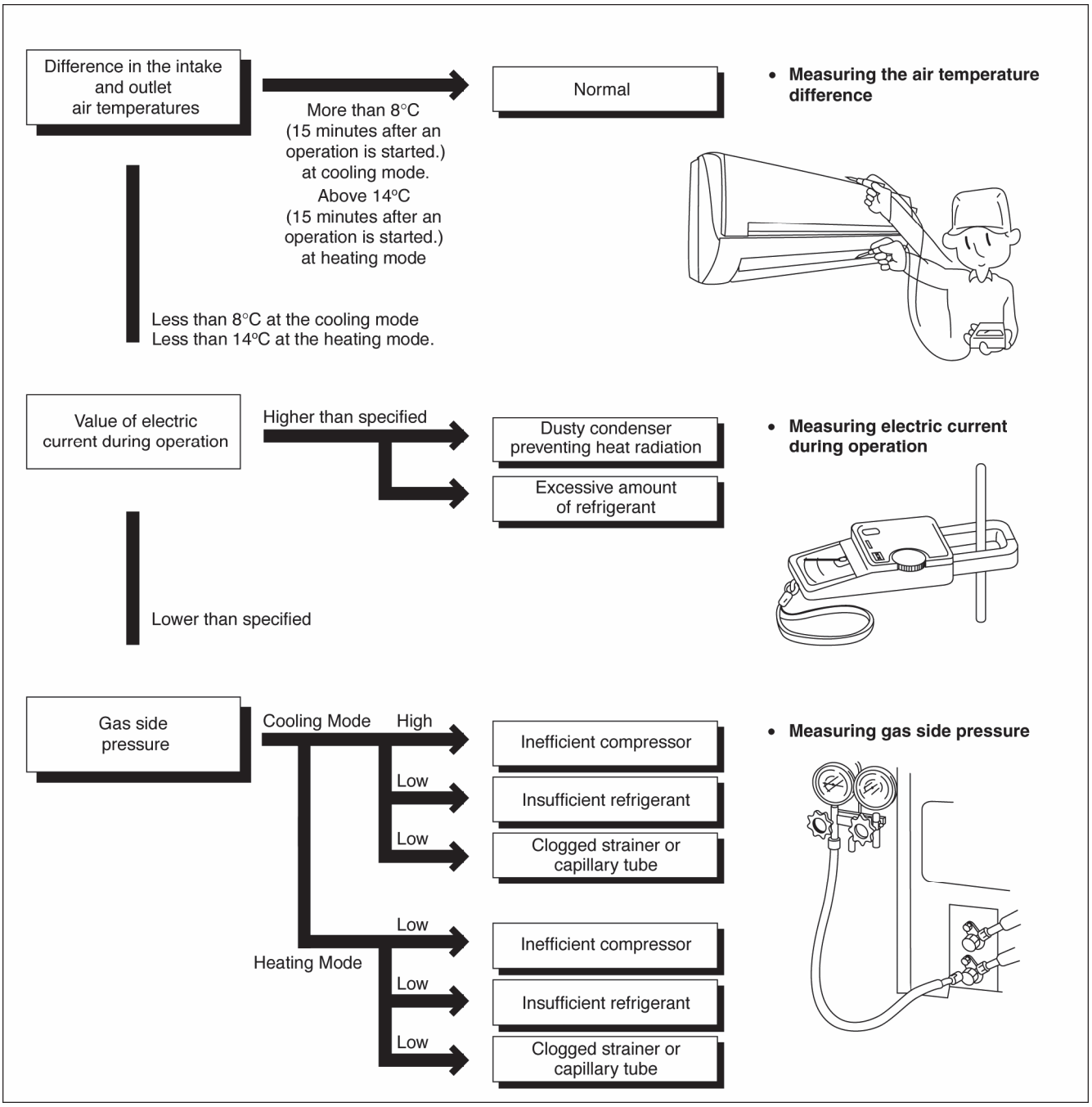
17.1 Refrigeration Cycle System

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	0.9 ~ 1.2 (9 ~ 12)	12 ~ 16
Heating Mode	2.3 ~ 2.9 (23 ~ 29)	36 ~ 45

*Condition: • Indoor fan speed = High
• Outdoor temperature 35°C at the cooling mode and 7°C at the heating mode
• Compressor operates at rated frequency



17.1.1 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.

17.2 Breakdown Self Diagnosis Function

17.2.1 Self Diagnosis Function (Three Digits Alphanumeric Code)

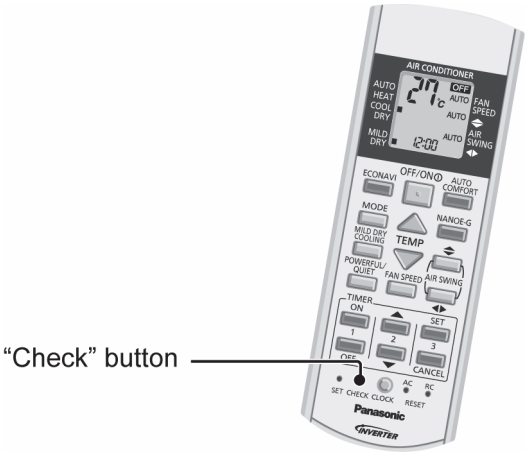
- Once abnormality has occurred during operation, the unit will stop its operation, and Timer LED blinks.
- Although Timer LED goes off when power supply is turned off, if the unit is operated under a breakdown condition, the LED will light up again.
- In operation after breakdown repair, the Timer LED will no more blink. The last error code (abnormality) will be stored in IC memory.

17.2.2 To Make a Diagnosis

1 Timer LED start to blink and the unit automatically stops the operation.
2 Press the CHECK button on the remote controller continuously for 5 seconds.
3 "- -" will be displayed on the remote controller display.
Note: Display only for "- -". (No transmitting signal, no receiving sound and no Power LED blinking.)
4 Press the "TIMER" ▲ or ▼ button on the remote controller. The code "H00" (no abnormality) will be displayed and signal will be transmitted to the main unit.
5 Every press of the button (up or down) will increase abnormality numbers and transmit abnormality code signal to the main unit.
6 When the latest abnormality code on the main unit and code transmitted from the remote controller are matched, power LED will light up for 30 seconds and a beep sound (continuously for 4 seconds) will be heard. If no codes are matched, power LED will light up for 0.5 seconds and no sound will be heard.
7 The breakdown diagnosis mode will be canceled unless pressing the CHECK button continuously for 5 seconds or operating the unit for 30 seconds.
8 The LED will be off if the unit is turned off or the RESET button on the main unit is pressed.

17.2.3 To Display Memorized Error Code (Protective Operation)

1 Turn power on.
2 Press the CHECK button on the remote controller continuously for 5 seconds.
3 "- -" will be displayed on the remote controller display.
Note: Display only for "- -". (No transmitting signal, no receiving sound and no Power LED blinking.)
4 Press the "TIMER" ▲ or ▼ button on the remote controller. The code "H00" (no abnormality) will be displayed and signal will be transmitted to the main unit. The power LED lights up. If no abnormality is stored in the memory, three beeps sound will be heard.
5 Every press of the button (up or down) will increase abnormality numbers and transmit abnormality code signal to the main unit.
6 When the latest abnormality code on the main unit and code transmitted from the remote controller are matched, power LED will light up for 30 seconds and a beep sound (continuously for 4 seconds) will be heard. If no codes are matched, power LED will light up for 0.5 seconds and no sound will be heard.
7 The breakdown diagnosis mode will be canceled unless pressing the CHECK button continuously for 5 seconds or operating the unit for 30 seconds.
8 The same diagnosis can be repeated by turning power on again.



17.2.4 To Clear Memorized Error Code after Repair (Protective Operation)

1 Turn power on (in standby condition).
2 Press the AUTO button for 5 seconds (A beep receiving sound) on the main unit to operate the unit at Forced Cooling Operation modes.
3 Press the CHECK button on the remote controller for about 1 second with a pointed object to transmit signal to main unit. A beep sound is heard from main unit and the data is cleared.

17.2.5 Temporary Operation (Depending On Breakdown Status)

1 Press the AUTO button (A beep receiving sound) on the main unit to operate the unit. (Remote control will become possible.)
2 The unit can temporarily be used until repaired.

17.3 Error Codes Table

Diagnosis display	Abnormality / Protection control	Abnormality Judgment	Protection Operation	Problem	Check location
H00	No memory of failure	—	Normal operation	—	—
H11	Indoor/outdoor abnormal communication	After operation for 1 minute	Indoor fan only operation can start by entering into force cooling operation	Indoor/outdoor communication not establish	• Indoor/outdoor wire terminal • Indoor/outdoor PCB • Indoor/outdoor connection wire
H12	Indoor unit capacity unmatched	90s after power supply	—	Total indoor capability more than maximum limit or less than minimum limit, or number of indoor unit less than two	• Indoor/outdoor connection wire • Indoor/outdoor PCB • Specification and combination table in catalogue
H14	Indoor intake air temperature sensor abnormality	Continuous for 5s	—	Indoor intake air temperature sensor open or short circuit	• Indoor intake air temperature sensor lead wire and connector
H15	Compressor temperature sensor abnormality	Continuous for 5s	—	Compressor temperature sensor open or short circuit	• Compressor temperature sensor lead wire and connector
H16	Outdoor current transformer (CT) abnormality	—	—	Current transformer faulty or compressor faulty	• Outdoor PCB faulty or compressor faulty
H19	Indoor fan motor merchanism lock	Continuous happen for 7 times	—	Indoor fan motor lock or feedback abnormal	• Fan motor lead wire and connector • Fan motor lock or block
H23	Indoor heat exchanger temperature sensor abnormality	Continuous for 5s	—	Indoor heat exchanger temperature sensor open or short circuit	• Indoor heat exchanger temperature sensor lead wire and connector
H24	Indoor heat exchanger temperature sensor 2 abnormality	Continuous for 5s	—	Indoor heat exchanger temperature sensor 2 open or short circuit	• Indoor heat exchanger temperature sensor 2 lead wire and connector
H25	Indoor ion device abnormality	Port is ON for 10s during ion device off	—	—	• ion device PCB
H27	Outdoor air temperature sensor abnormality	Continuous for 5s	—	Outdoor air temperature sensor open or short circuit	• Outdoor air temperature sensor lead wire and connector
H28	Outdoor heat exchanger temperature sensor 1 abnormality	Continuous for 5s	—	Outdoor heat exchanger temperature sensor 1 open or short circuit	• Outdoor heat exchanger temperature sensor 1 lead wire and connector
H30	Outdoor discharge pipe temperature sensor abnormality	Continuous for 5s	—	Outdoor discharge pipe temperature sensor open or short circuit	• Outdoor discharge pipe temperature sensor lead wire and connector
H32	Outdoor heat exchanger temperature sensor 2 abnormality	Continuous for 5s	—	Outdoor heat exchanger temperature sensor 2 open or short circuit	• Outdoor heat exchanger temperature sensor 2 lead wire and connector
H33	Indoor / outdoor misconnection abnormality	—	—	Indoor and outdoor rated voltage different	• Indoor and outdoor units check
H34	Outdoor heat sink temperature sensor abnormality	Continuous for 2s	—	Outdoor heat sink temperature sensor open or short circuit	• Outdoor heat sink sensor
H36	Outdoor gas pipe temperature sensor abnormality	Continuous for 5s	Heating protection operation only	Outdoor gas pipe temperature sensor open or short circuit	• Outdoor gas pipe temperature sensor lead wire and connector
H37	Outdoor liquid pipe temperature sensor abnormality	Continuous for 5s	Cooling protection operation only	Outdoor liquid pipe temperature sensor open or short circuit	• Outdoor liquid pipe temperature sensor lead wire and connector
H38	Indoor/Outdoor mismatch (brand code)	—	—	Brand code not match	• Check indoor unit and outdoor unit
H39	Abnormal indoor operating unit or standby units	3 times happen within 40 minutes	—	Wrong wiring and connecting pipe, expansion valve abnormality, indoor heat exchanger sensor open circuit	• Check indoor/outdoor connection wire and connection pipe • Indoor heat exchanger sensor lead wire and connector • Expansion valve and lead wire and connector

Diagnosis display	Abnormality / Protection control	Abnormality Judgment	Protection Operation	Problem	Check location
H41	Abnormal wiring or piping connection	—	—	Wrong wiring and connecting pipe, expansion valve abnormality	• Check indoor/outdoor connection wire and connection pipe • Expansion valve and lead wire and connector
H59	ECONAVI sensor abnormality	Continuous for 25s	—	ECONAVI sensor open or short circuit	• ECONAVI sensor (defective or disconnected) • ECONAVI PCB
H64	Outdoor high pressure sensor abnormality	Continuous for 1 minutes	—	High pressure sensor open circuit during compressor stop	• High pressure sensor • Lead wire and connector
H70	Light sensor abnormality	Continuous for 24 hours, 15days	—	Light sensor open or short circuit	• Light sensor (defective or disconnected)
H97	Outdoor fan motor mechanism lock	2 times happen within 30 minutes	—	Outdoor fan motor lock or feedback abnormal	• Outdoor fan motor lead wire and connector • Fan motor lock or block
H98	Indoor high pressure protection	—	—	Indoor high pressure protection (Heating)	• Check indoor heat exchanger • Air filter dirty • Air circulation short circuit
H99	Indoor operating unit freeze protection	—	—	Indoor freeze protection (Cooling)	• Check indoor heat exchanger • Air filter dirty • Air circulation short circuit
F11	4-way valve switching abnormality	4 times happen within 30 minutes	—	4-way valve switching abnormal	• 4-way valve • Lead wire and connector
F17	Indoor standby units freezing abnormality	3 times happen within 40 minutes	—	Wrong wiring and connecting pipe, expansion valve leakage, indoor heat exchanger sensor open circuit	• Check indoor/outdoor connection wire and pipe • Indoor heat exchanger sensor lead wire and connector • Expansion valve lead wire and connector
F90	Power factor correction (PFC) circuit protection	4 times happen within 10 minutes	—	Power factor correction circuit abnormal	• Outdoor PCB faulty
F91	Refrigeration cycle abnormality	2 times happen within 20 minutes	—	Refrigeration cycle abnormal	• Insufficient refrigerant or valve close
F93	Compressor abnormal revolution	4 times happen within 20 minutes	—	Compressor abnormal revolution	• Power transistor module faulty or compressor lock
F94	Compressor discharge overshoot protection	4 times happen within 30 minutes	—	Compressor discharge pressure overshoot	• Check refrigeration system
F95	Outdoor cooling high pressure protection	4 times happen within 20 minutes	—	Cooling high pressure protection	• Check refrigeration system • Outdoor air circuit
F96	Power transistor module overheating protection	4 times happen within 30 minutes	—	Power transistor module overheat	• PCB faulty • Outdoor air circuit (fan motor)
F97	Compressor overheating protection	3 times happen within 30 minutes	—	Compressor overheat	• Insufficient refrigerant
F98	Total running current protection	3 times happen within 20 minutes	—	Total current protection	• Check refrigeration system • Power source or compressor lock
F99	Outdoor direct current (DC) peak detection	Continuous happen for 7 times	—	Power transistor module current protection	• Power transistor module faulty or compressor lock

17.4 Self-diagnosis Method

17.4.1 H11 (Indoor/Outdoor Abnormal Communication)

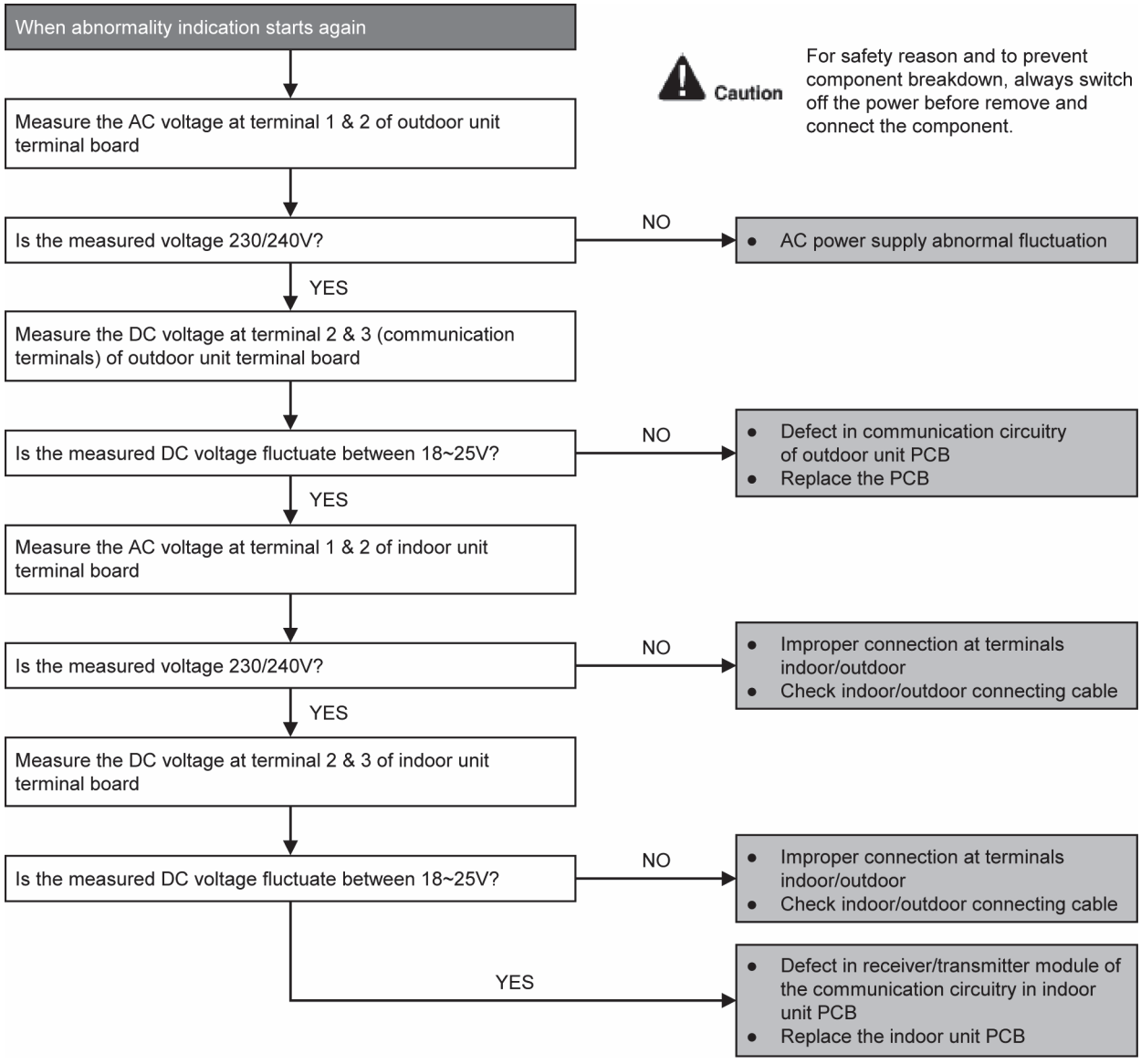
Malfunction Decision Conditions

- During startup and operation of cooling and heating, the data received from outdoor unit in indoor unit signal transmission is checked whether it is normal.

Malfunction Caused

- Faulty indoor unit PCB.
- Faulty outdoor unit PCB.
- Indoor unit-outdoor unit signal transmission error due to wiring error.
- Indoor unit-outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units.

Troubleshooting



17.4.2 H12 (Indoor/Outdoor Capacity Rank Mismatched)

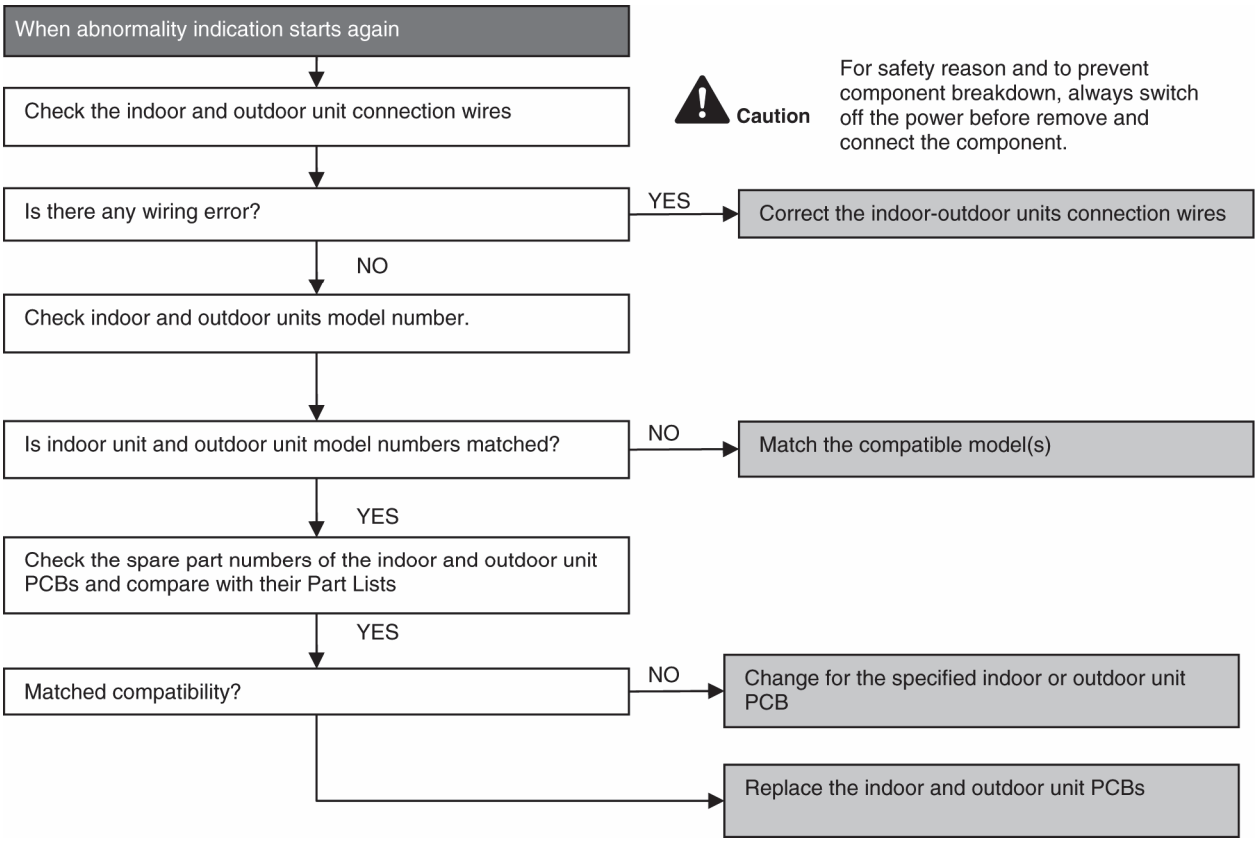
Malfunction Decision Conditions

- During startup, error code appears when different types of indoor and outdoor units are interconnected.

Malfunction Caused

- Wrong models interconnected.
- Wrong indoor unit or outdoor unit PCBs mounted.
- Indoor unit or outdoor unit PCBs defective.
- Indoor-outdoor unit signal transmission error due to wrong wiring.
- Indoor-outdoor unit signal transmission error due to breaking of wire 3 in the connection wires between the indoor and outdoor units.

Troubleshooting



17.4.3 H14 (Indoor Intake Air Temperature Sensor Abnormality)

Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the indoor intake air temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting

When abnormality indication starts again

Check the connector connection:
- Turn off the power
- Check the connector connection

Caution For safety reason and to prevent component breakdown, always switch off the power before remove and connect the component.

Is the connector connection normal?

NO
- Connector poor contact
- Correct the connection

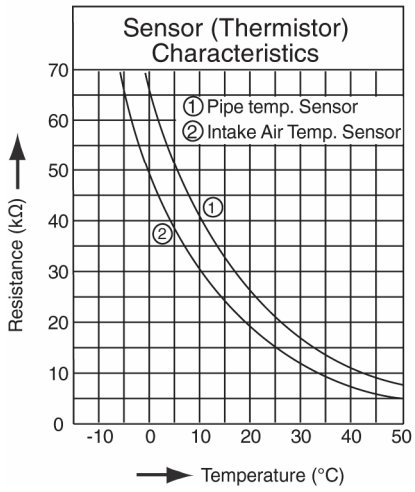
YES

Check the indoor intake air temperature sensor:
- Plug out connector from the indoor unit PCB
- Measure the resistance of the indoor intake air temperature sensor

Is the measured resistance of the indoor intake air temperature sensor matches the value specified in its characteristic chart?

NO
- Defect in indoor intake air temperature sensor
- Replace the indoor intake air temperature sensor

YES
- Defect in indoor unit PCB
- Replace the indoor unit PCB



17.4.4 H15 (Compressor Temperature Sensor Abnormality)

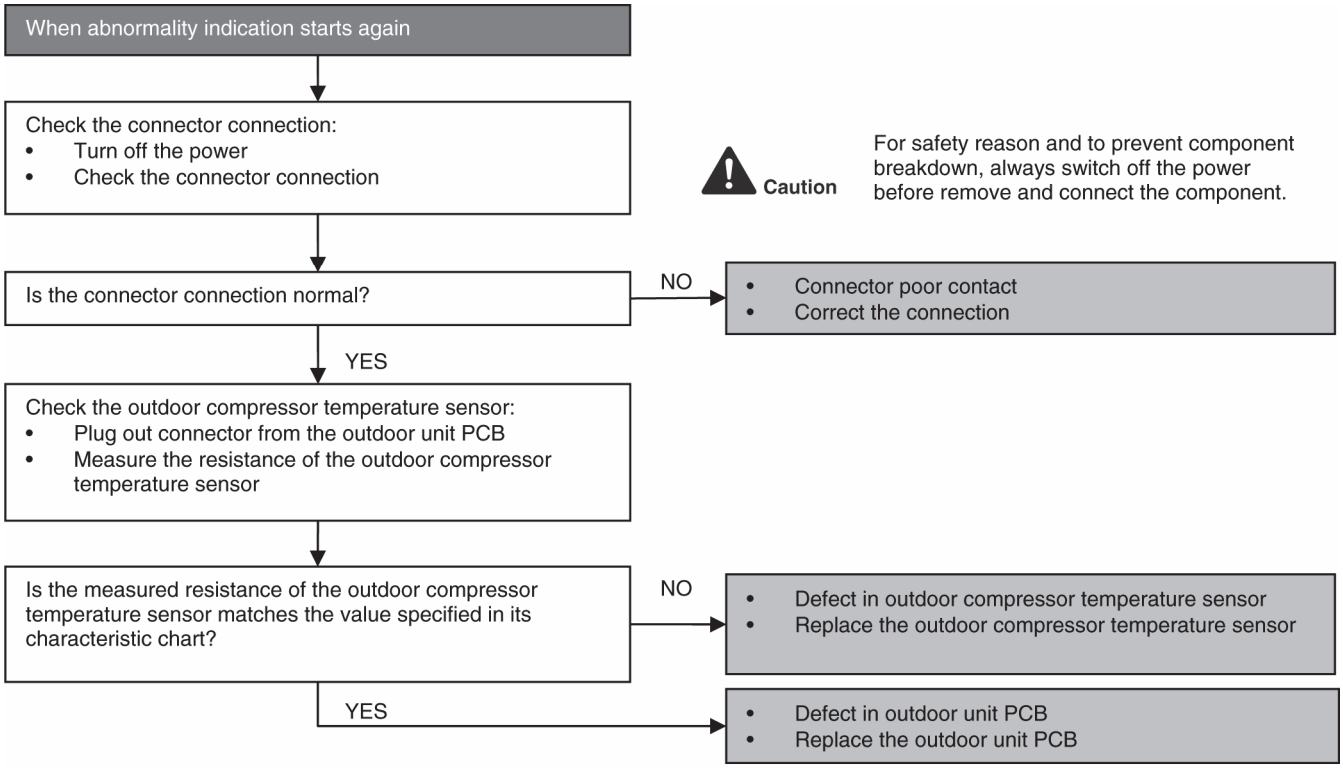
Malfunction Decision Conditions

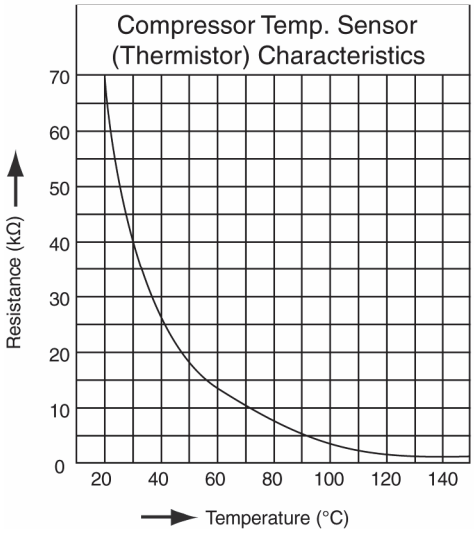
- During startup and operation of cooling and heating, the temperatures detected by the outdoor compressor temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting





17.4.5 H16 (Outdoor Current Transformer)

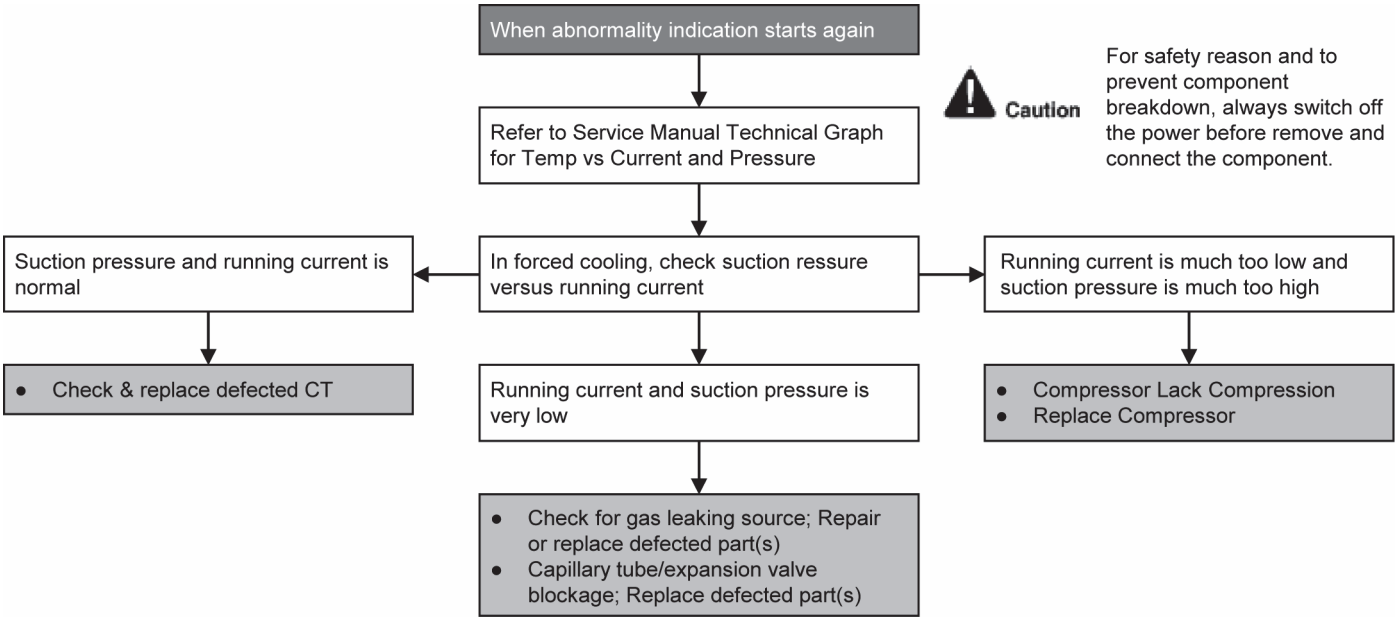
Malfunction Decision Conditions

- An input current, detected by Current Transformer CT, is below threshold value when the compressor is operating at certain frequency value for 3 minutes.

Malfunction Caused

- Lack of gas
- Broken CT (current transformer)
- Broken Outdoor PCB

Troubleshooting



17.4.6 H19 (Indoor Fan Motor – DC Motor Mechanism Locked)

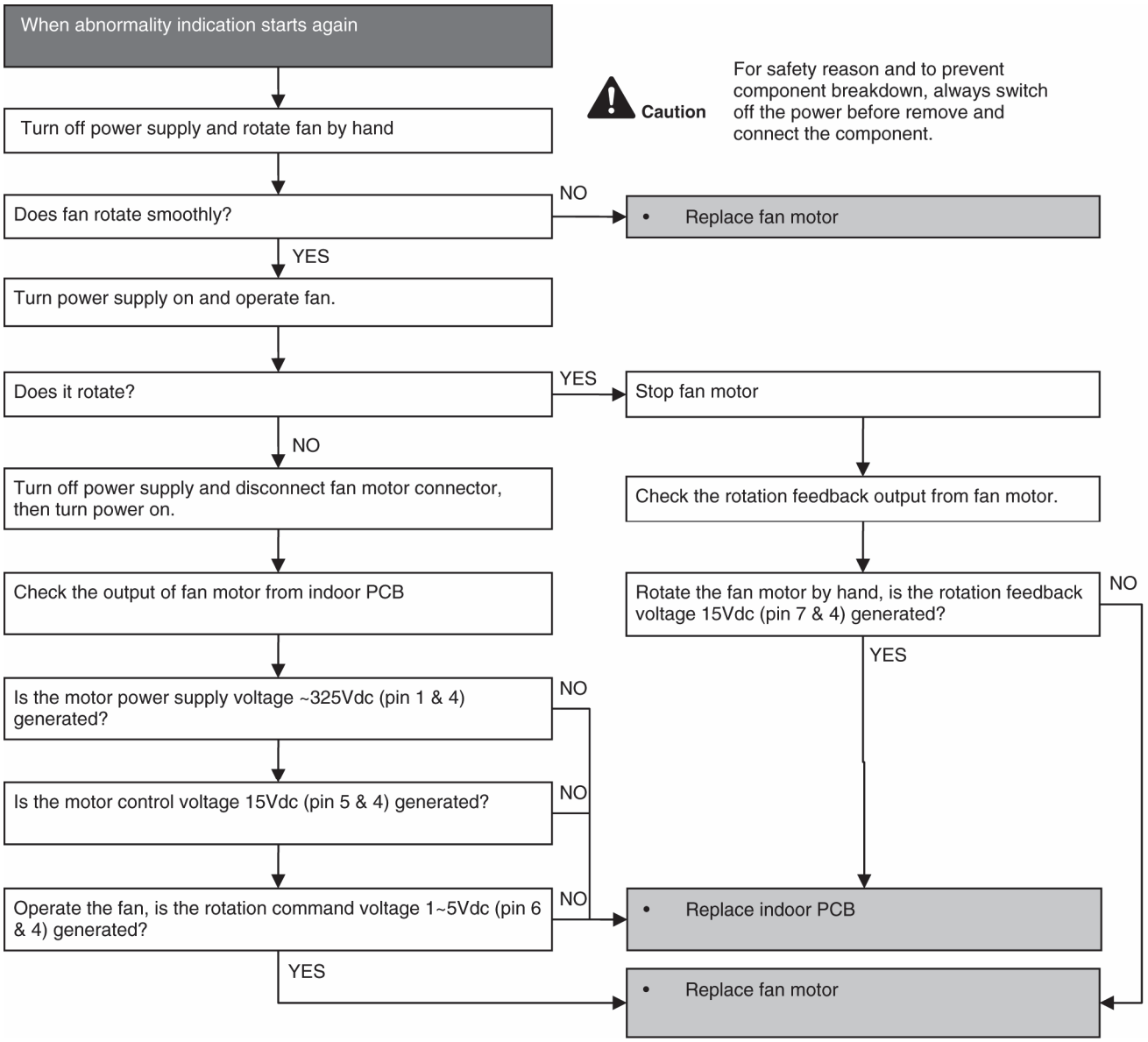
Malfunction Decision Conditions

- The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor (feedback of rotation > 2550rpm or < 50rpm)

Malfunction Caused

- Operation stops due to short circuit inside the fan motor winding.
- Operation stops due to breaking of wire inside the fan motor.
- Operation stops due to breaking of fan motor lead wires.
- Operation stops due to Hall IC malfunction.
- Operation error due to faulty indoor unit PCB.

Troubleshooting



17.4.7 H23 (Indoor Pipe Temperature Sensor Abnormality)

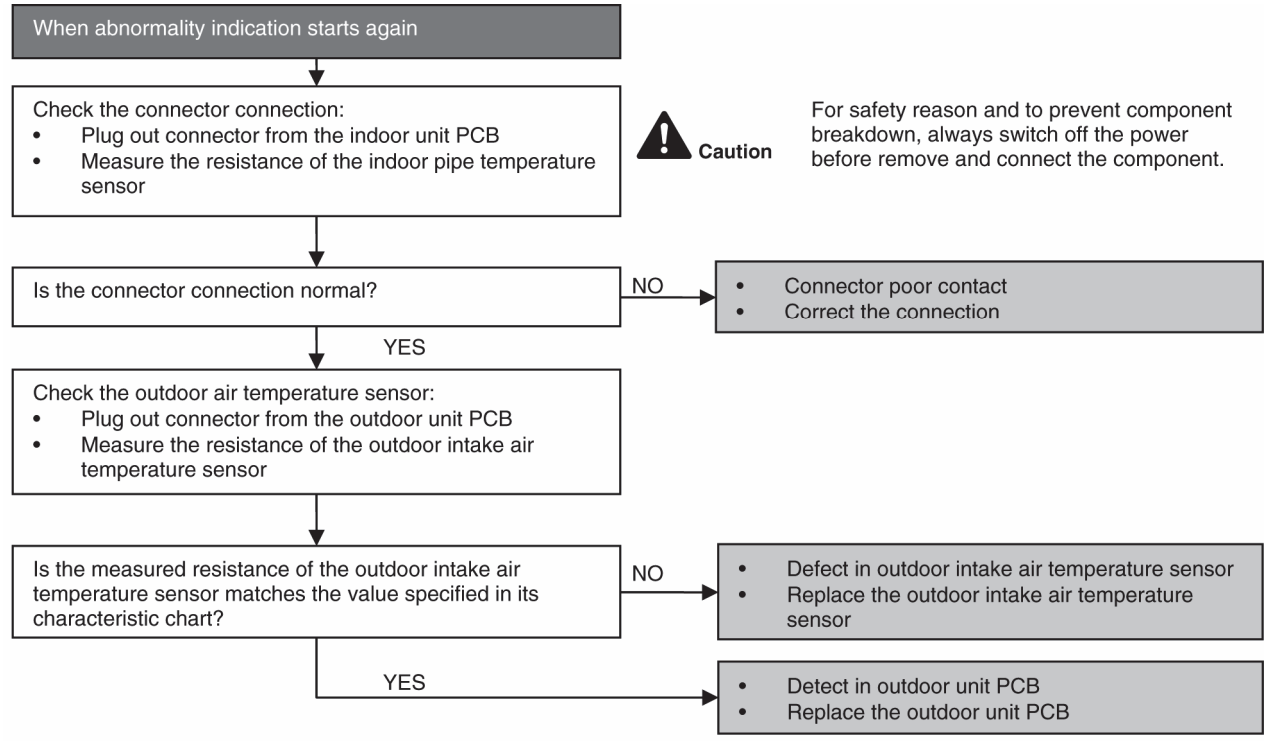
Malfunction Decision Conditions

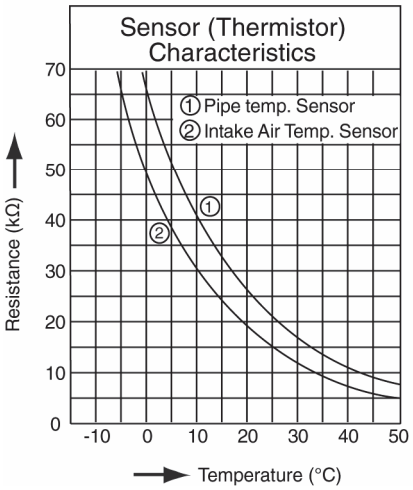
- During startup and operation of cooling and heating, the temperatures detected by the indoor heat exchanger temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting





17.4.8 H27 (Outdoor Air Temperature Sensor Abnormality)

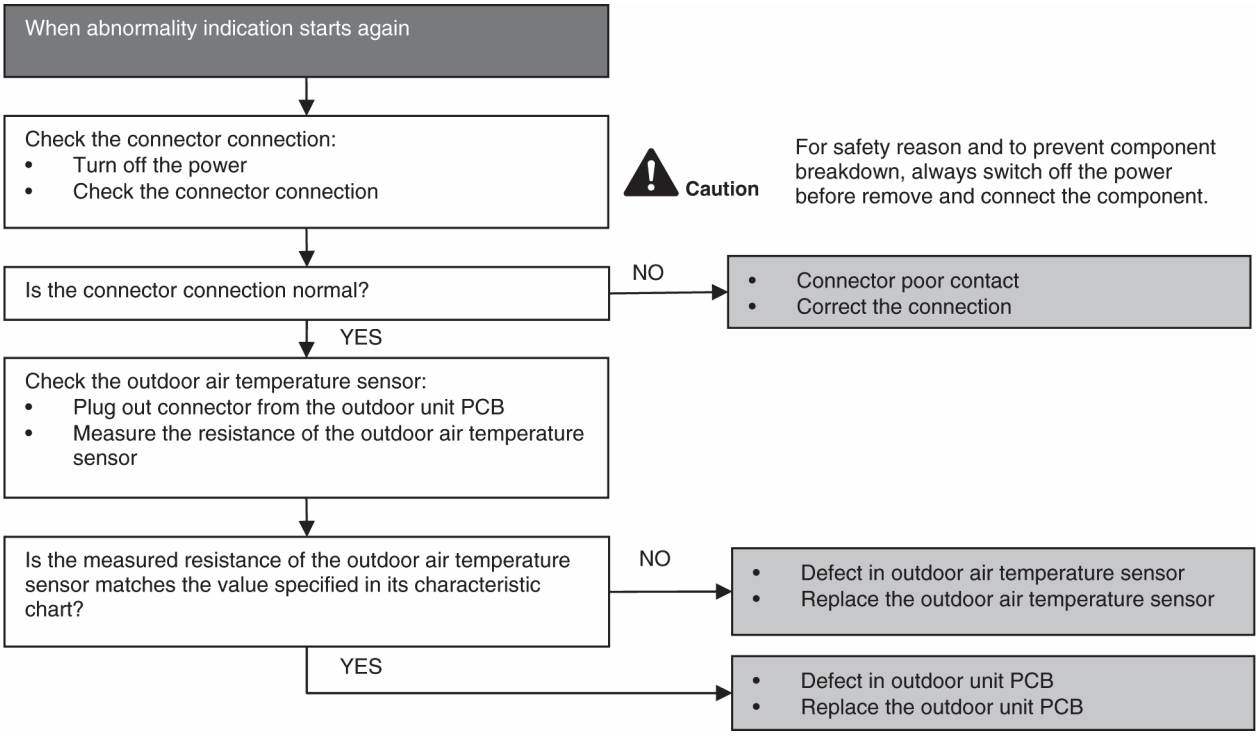
Malfunction Decision Conditions

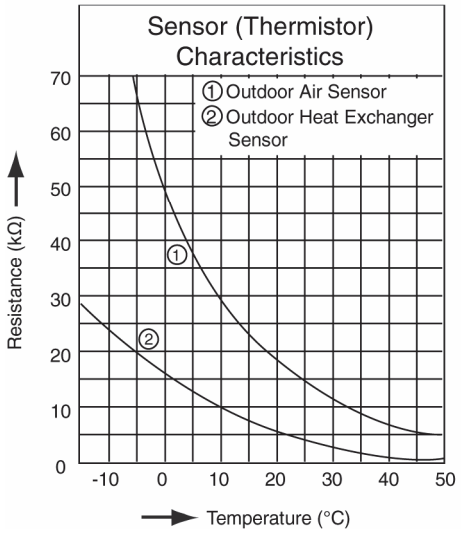
- During startup and operation of cooling and heating, the temperatures detected by the outdoor air temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting





17.4.9 H28 (Outdoor Pipe Temperature Sensor Abnormality)

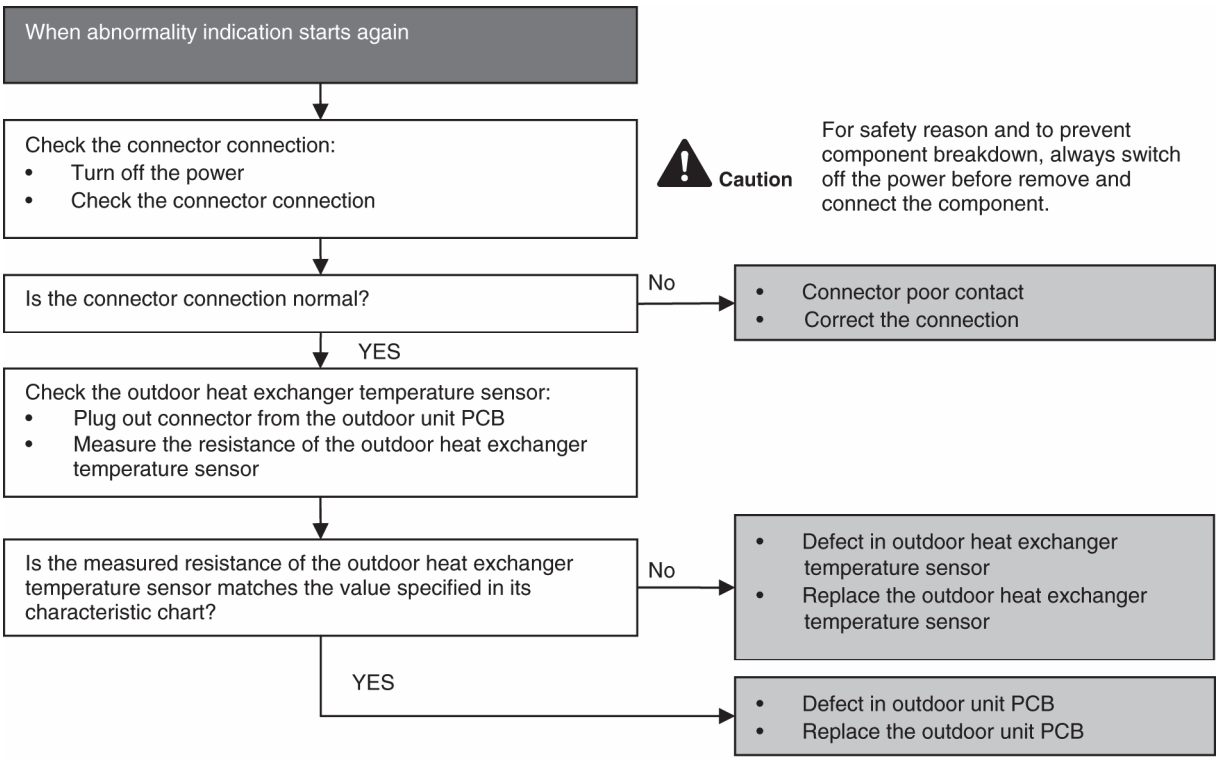
Malfunction Decision Conditions

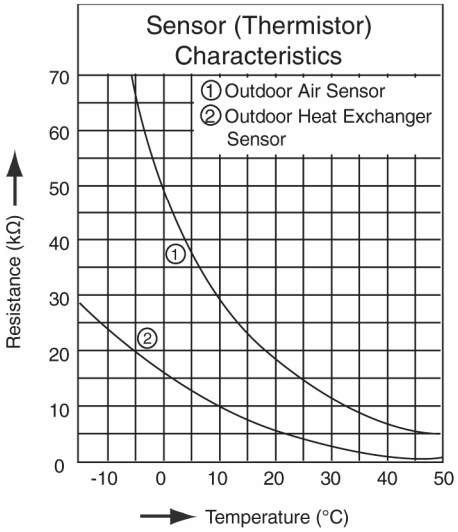
- During startup and operation of cooling and heating, the temperatures detected by the outdoor pipe temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting





17.4.10 H30 (Compressor Discharge Temperature Sensor Abnormality)

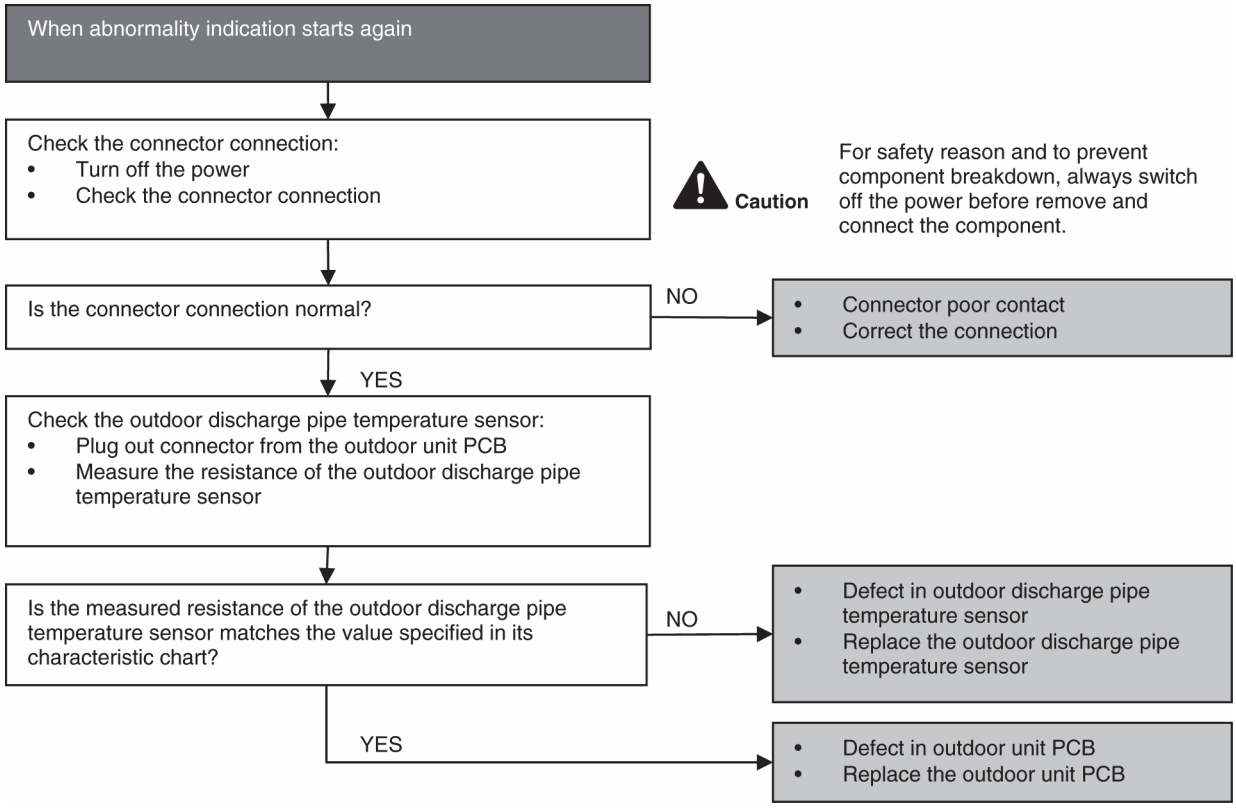
Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the outdoor discharge pipe temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting



17.4.11 H32 (Outdoor Heat Exchanger Temperature Sensor 2 Abnormality)

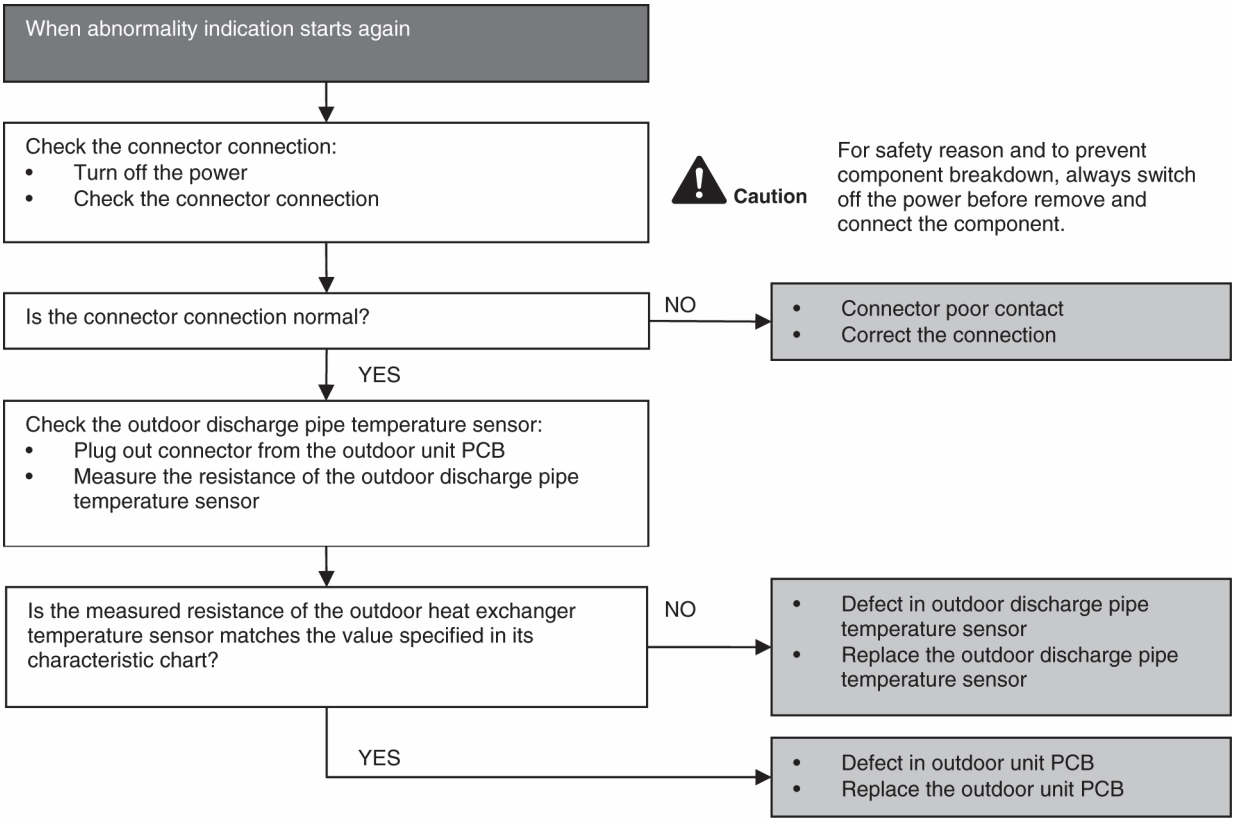
Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the outdoor heat exchanger temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting



17.4.12 H33 (Unspecified Voltage between Indoor and Outdoor)

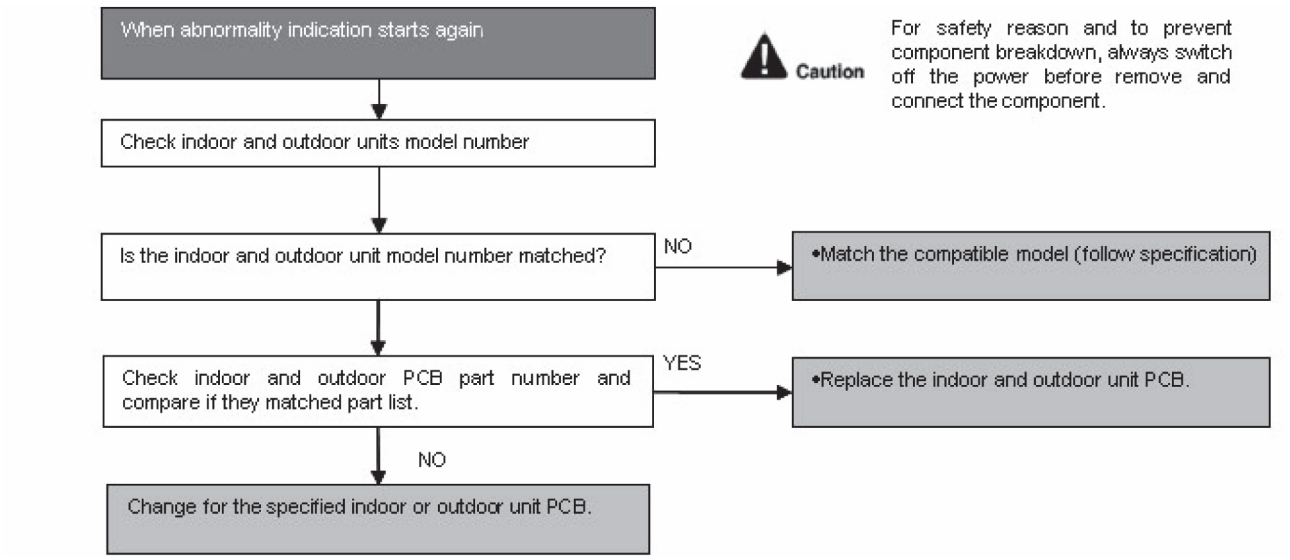
Malfunction Decision Conditions

- The supply power is detected for its requirement by the indoor/outdoor transmission.

Malfunction Caused

- Wrong models interconnected.
- Wrong indoor unit and outdoor unit PCBs used.
- Indoor unit or outdoor unit PCB defective.

Troubleshooting



17.4.13 H34 (Outdoor Heat Sink Temperature Sensor Abnormality)

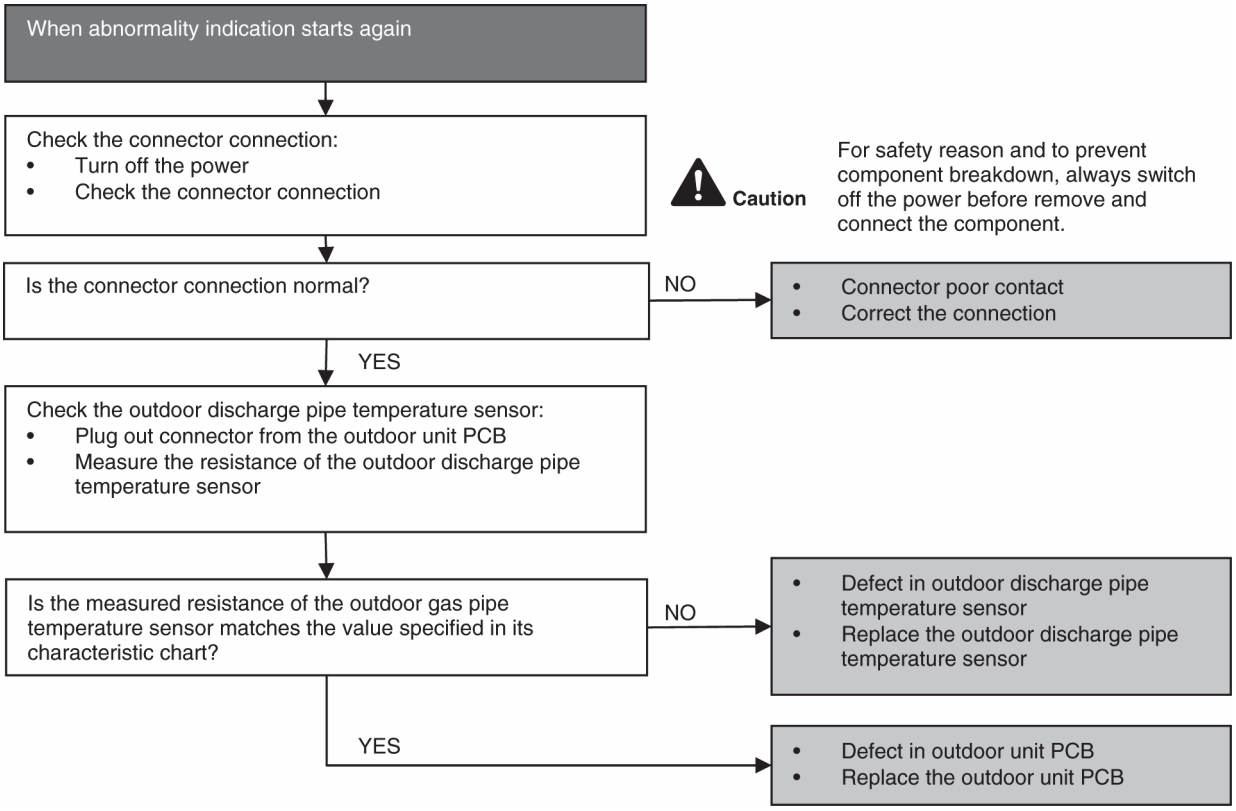
Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the outdoor heat sink temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting



17.4.14 H36 (Outdoor Gas Pipe Sensor Abnormality)

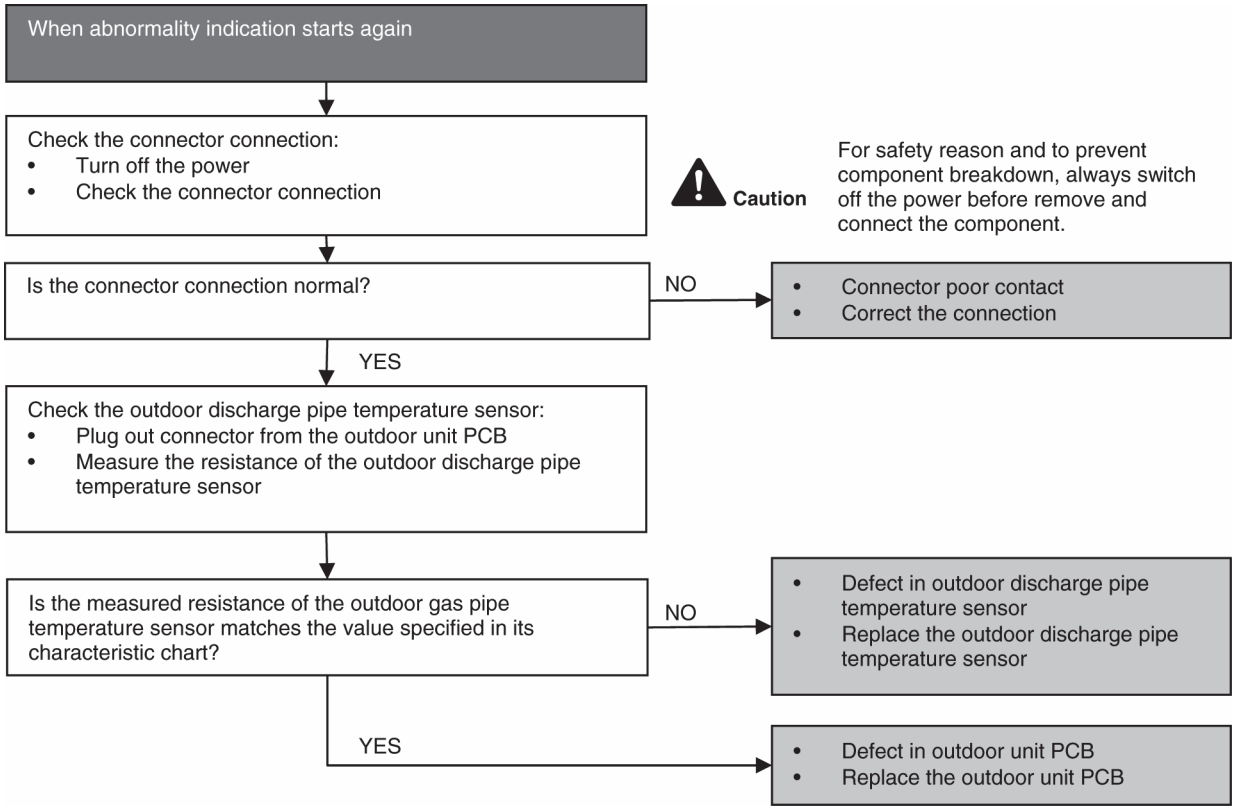
Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the outdoor gas pipe temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting



17.4.15 H37 (Outdoor Liquid Pipe Temperature Sensor Abnormality)

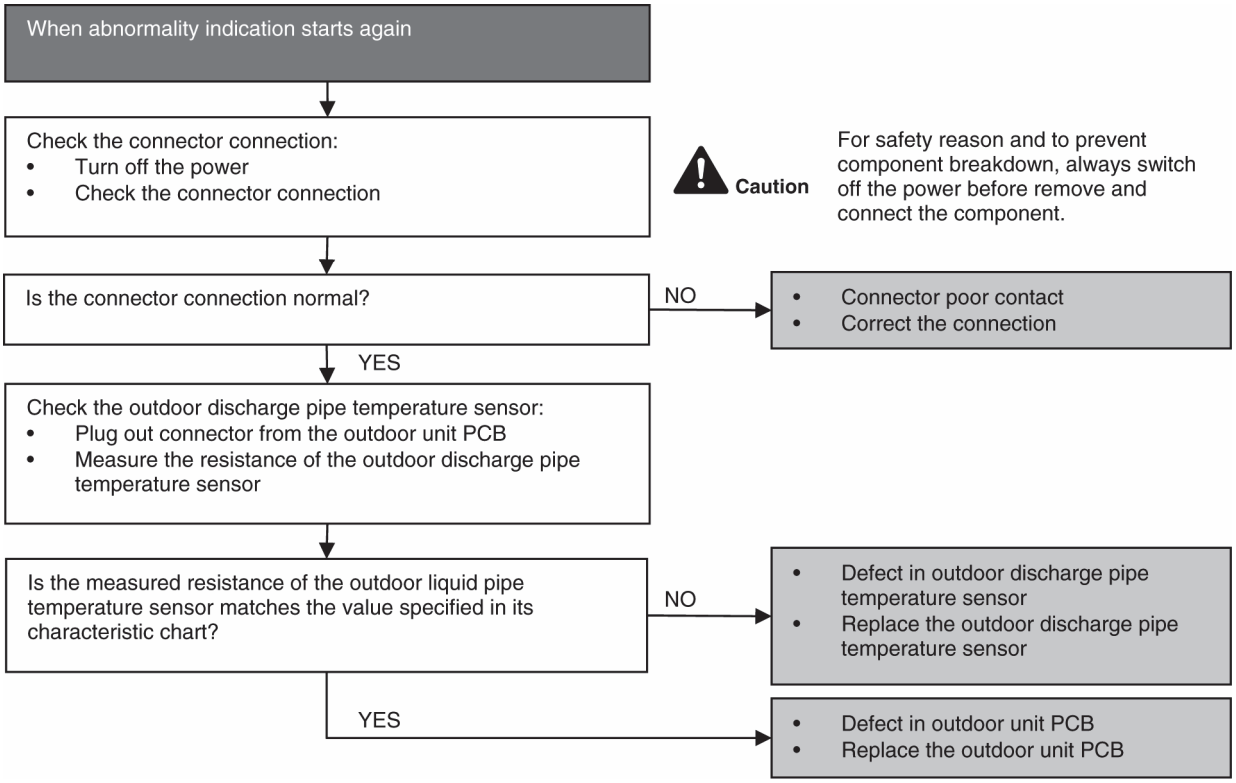
Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the outdoor liquid pipe temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting



17.4.16 H97 (Outdoor Fan Motor – DC Motor Mechanism Locked)

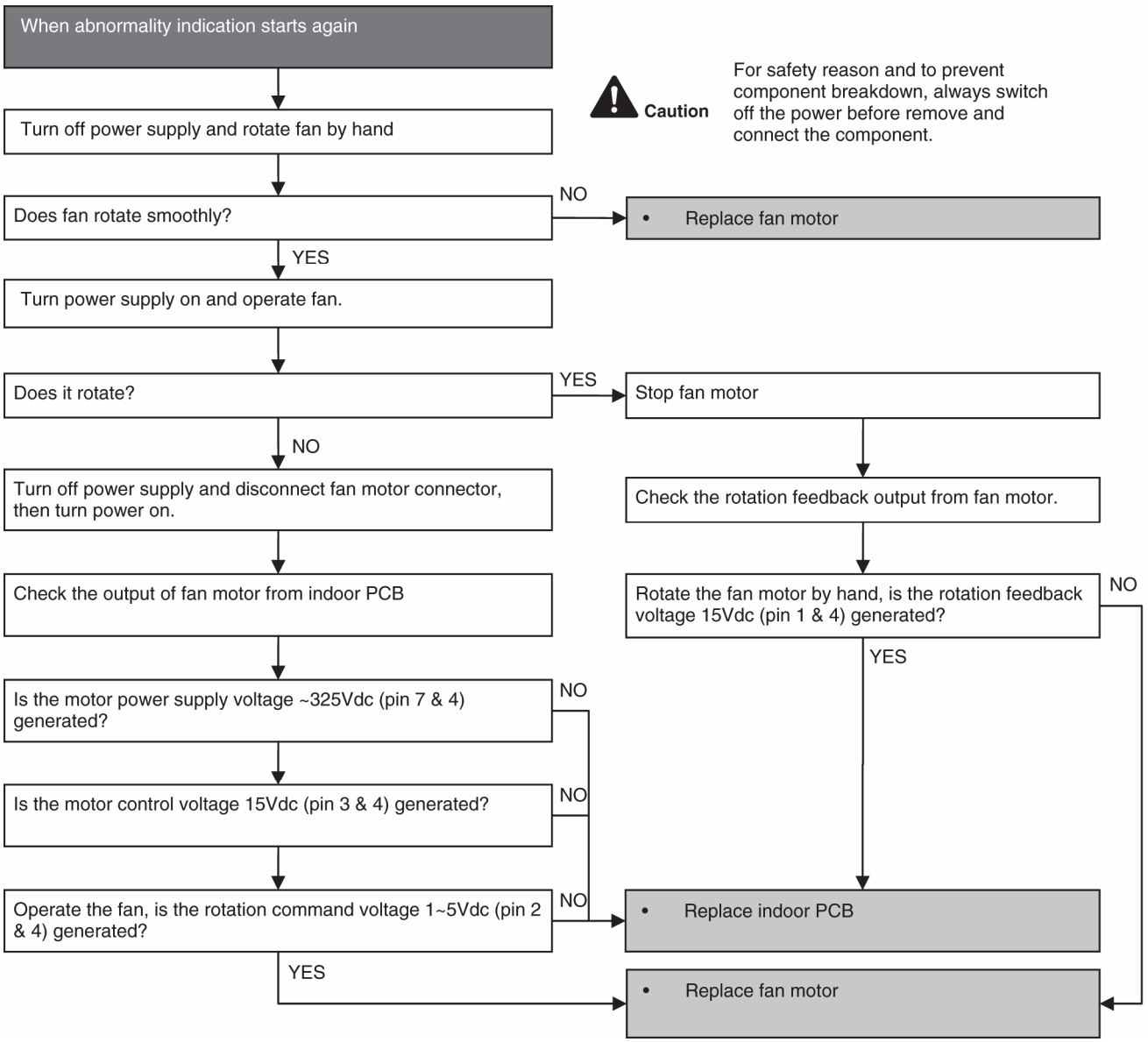
Malfunction Decision Conditions

- The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor.

Malfunction Caused

- Operation stops due to short circuit inside the fan motor winding.
- Operation stops due to breaking of wire inside the fan motor.
- Operation stops due to breaking of fan motor lead wires.
- Operation stops due to Hall IC malfunction.
- Operation error due to faulty outdoor unit PCB.

Troubleshooting



17.4.17 H98 (Error Code Stored in Memory and no alarm is triggered / no TIMER LED flashing)

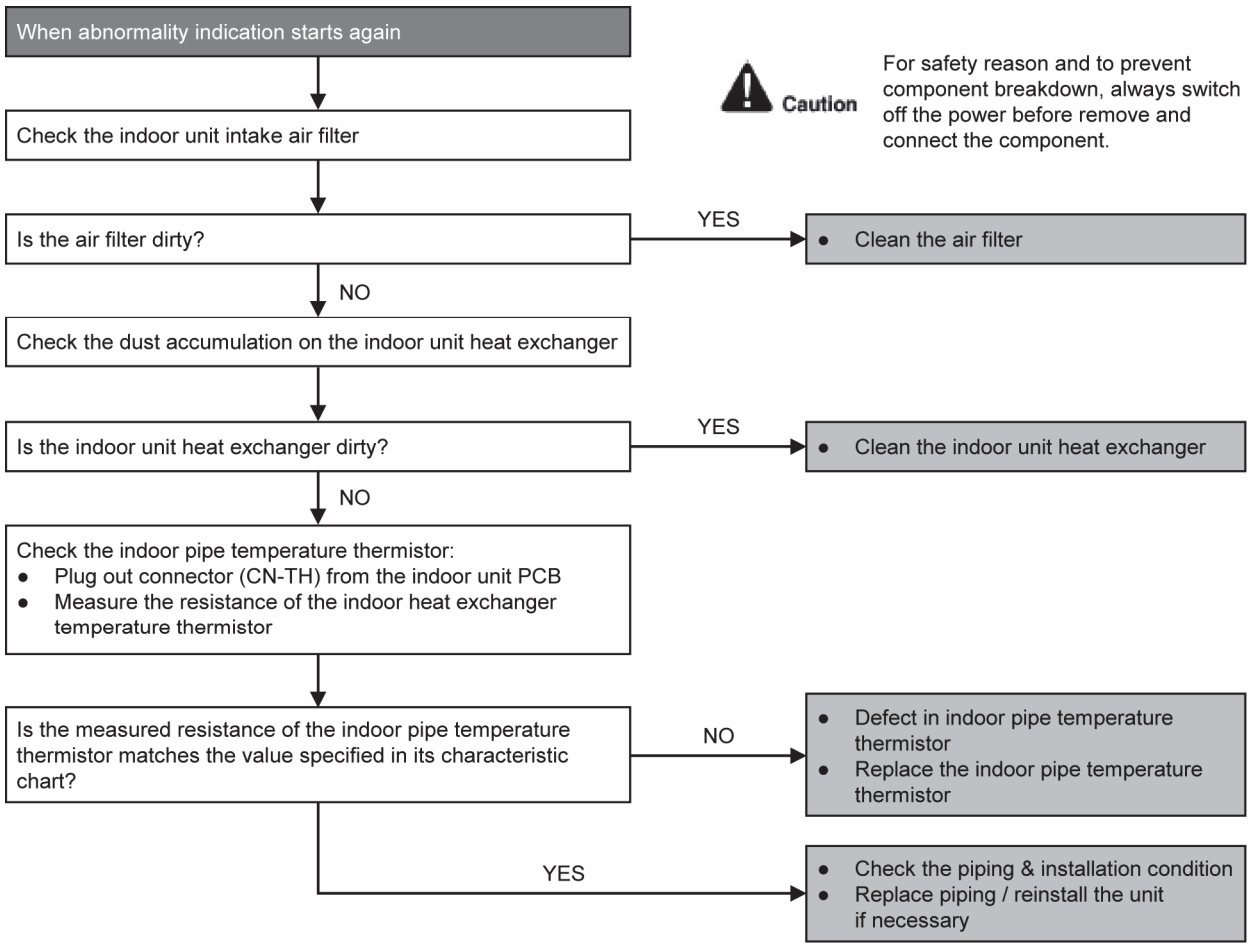
Malfunction Decision Conditions

- Indoor high pressure is detected when indoor heat exchanger is detecting very high temperature when the unit is operating in heating operation.
- Phenomena: unit is stopping and re-starting very often in heating mode

Malfunction Caused

- Indoor heat exchanger thermistor
- Clogged air filter or heat exchanger
- Over-bent pipe (liquid side)

Troubleshooting



17.4.18 H99 (Indoor Freeze Prevention Protection: Cooling or Soft Dry)

Error Code will not display (no Timer LED blinking) but store in EEPROM

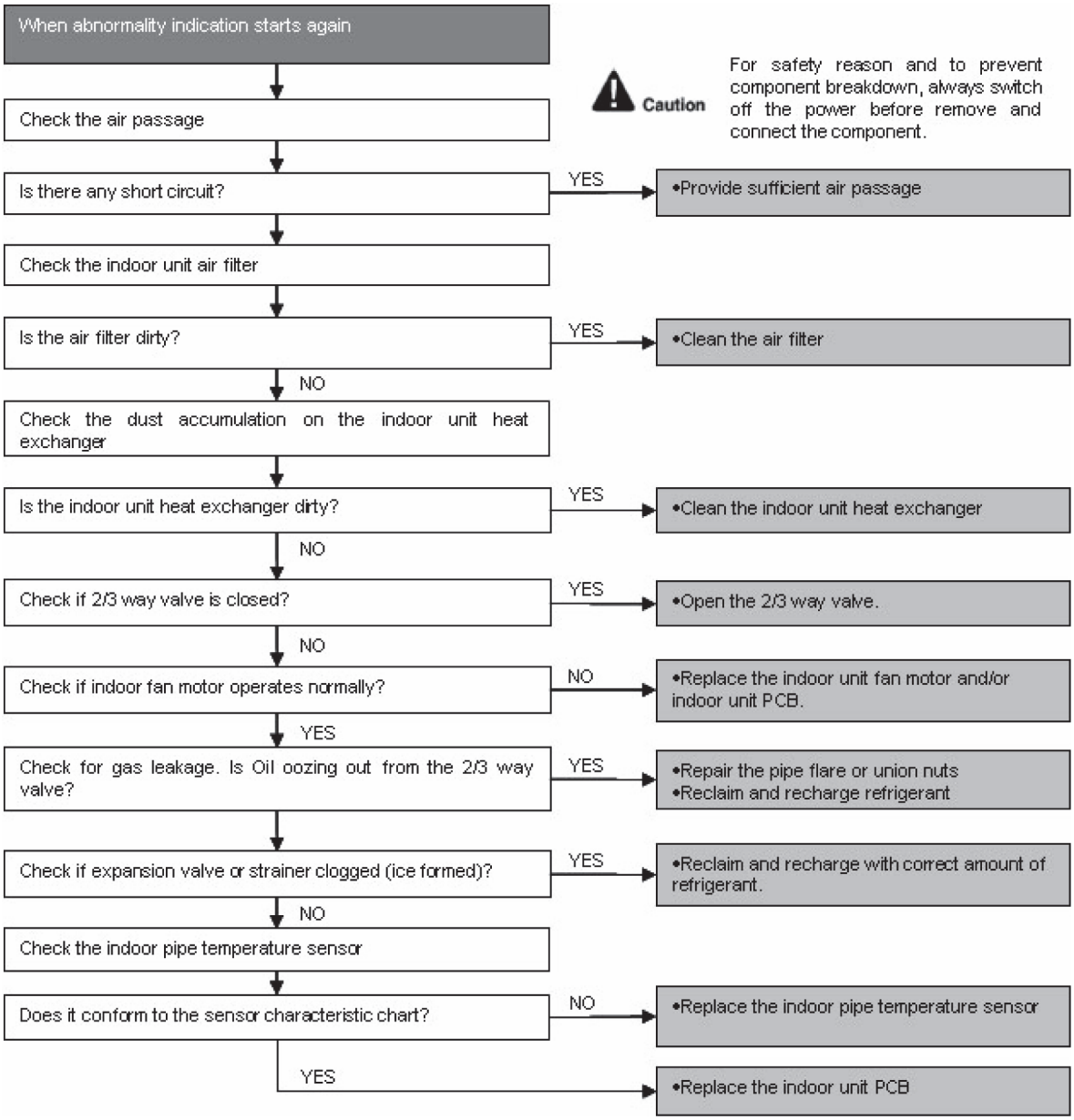
Malfunction Decision Conditions

- Freeze prevention control takes place (when indoor pipe temperature is lower than 2°C)

Malfunction Caused

- Air short circuit at indoor unit
- Clogged indoor unit air filter
- Dust accumulation on the indoor unit heat exchanger
- 2/3 way valve closed
- Faulty indoor unit fan motor
- Refrigerant shortage (refrigerant leakage)
- Clogged expansion valve or strainer
- Faulty indoor pipe temperature sensor
- Faulty indoor unit PCB

Troubleshooting



17.4.19 F11 (4-way Valve Switching Failure)

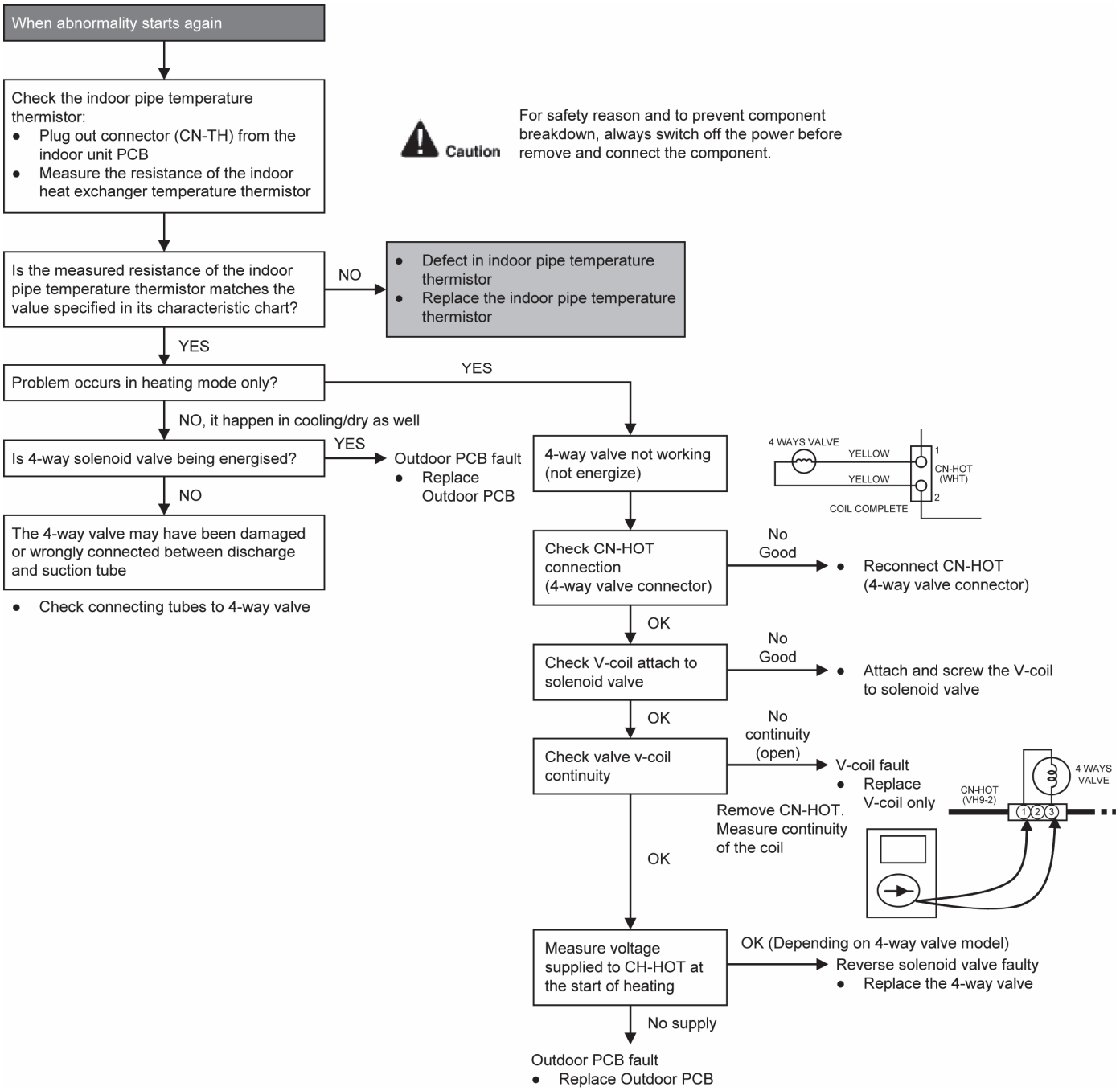
Malfunction Decision Conditions

- When indoor heat exchanger is cold during heating (except deice) or when indoor heat exchanger is hot during cooling and compressor operating, the 4-way valve is detected as malfunction.

Malfunction Caused

- Indoor heat exchanger (pipe) thermistor
- 4-way valve malfunction

Troubleshooting



* Check gas side pipe – for hot gas flow in cooling mode

17.4.20 F17 (Indoor Standby Units Freezing Abnormality)

Malfunction Decision Conditions

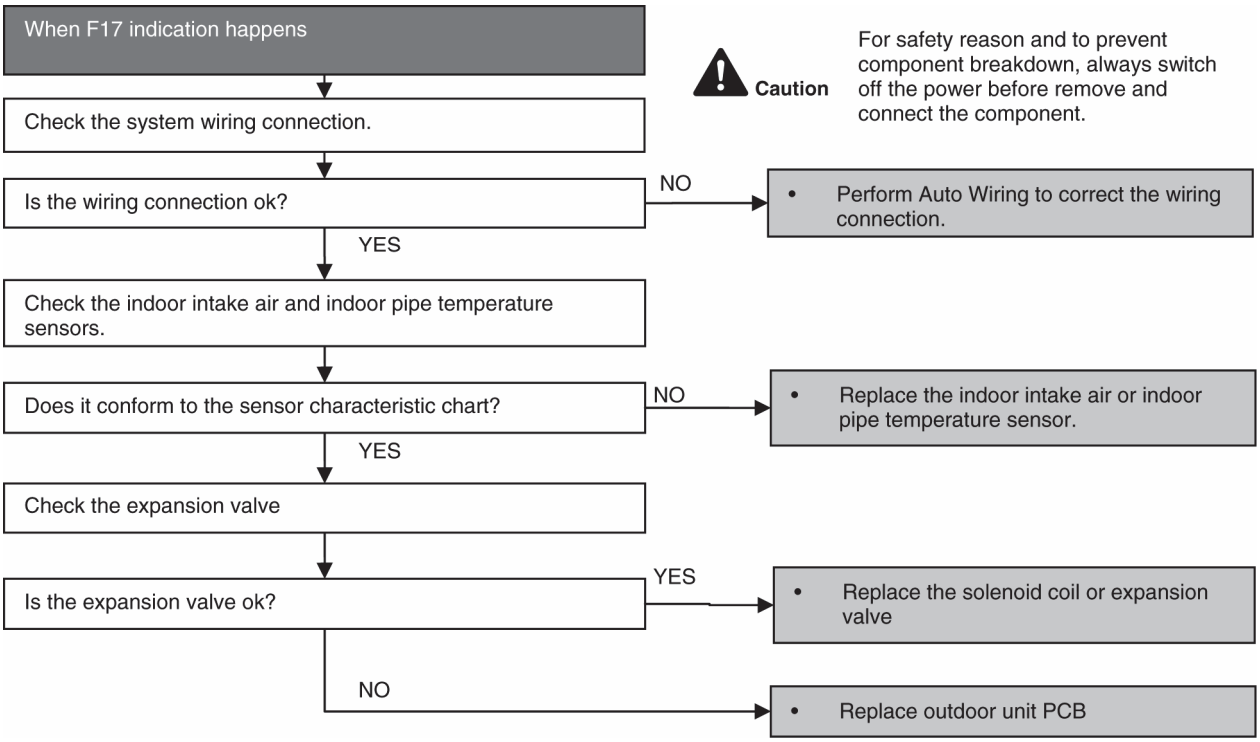
- When the different between indoor intake air temperature and indoor pipe temperature is above 10°C or indoor pipe temperature is below -1.0°C.

  Remark:
  When the indoor standby unit is freezing, the outdoor unit transfers F17 error code to the corresponding indoor unit and H39 to other indoor unit(s).

Malfunction Caused

- Wrong wiring connection
- Faulty sensor
- Faulty expansion valve

Troubleshooting



17.4.21 F90 (Power Factor Correction Protection)

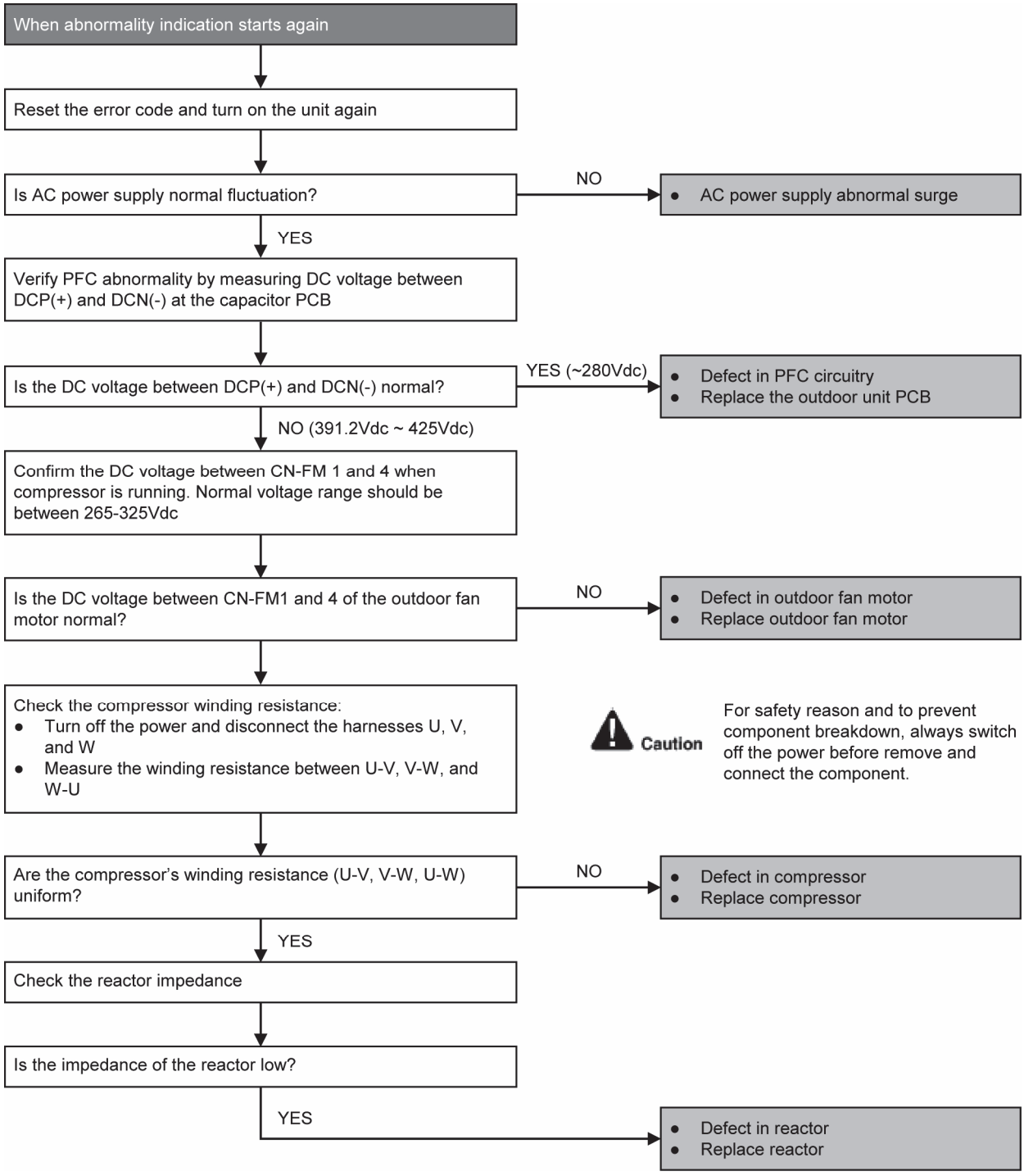
Malfunction Decision Conditions

- To maintain DC voltage level supply to power transistor.
- To detect high DC voltage level after rectification.

Malfunction Caused

- During startup and operation of cooling and heating, when Power Factor Correction (PFC) protection circuitry at the outdoor unit main PCB senses abnormal DC voltage level for power transistors.
- When DC voltage detected is LOW, transistor switching will turn ON by controller to push-up the DC level.
- When DC voltage detected is HIGH (391Vdc – 425Vdc), active LOW signal will send by the controller to turn OFF relay RY-C.

Troubleshooting



17.4.22 F91 (Refrigeration Cycle Abnormality)

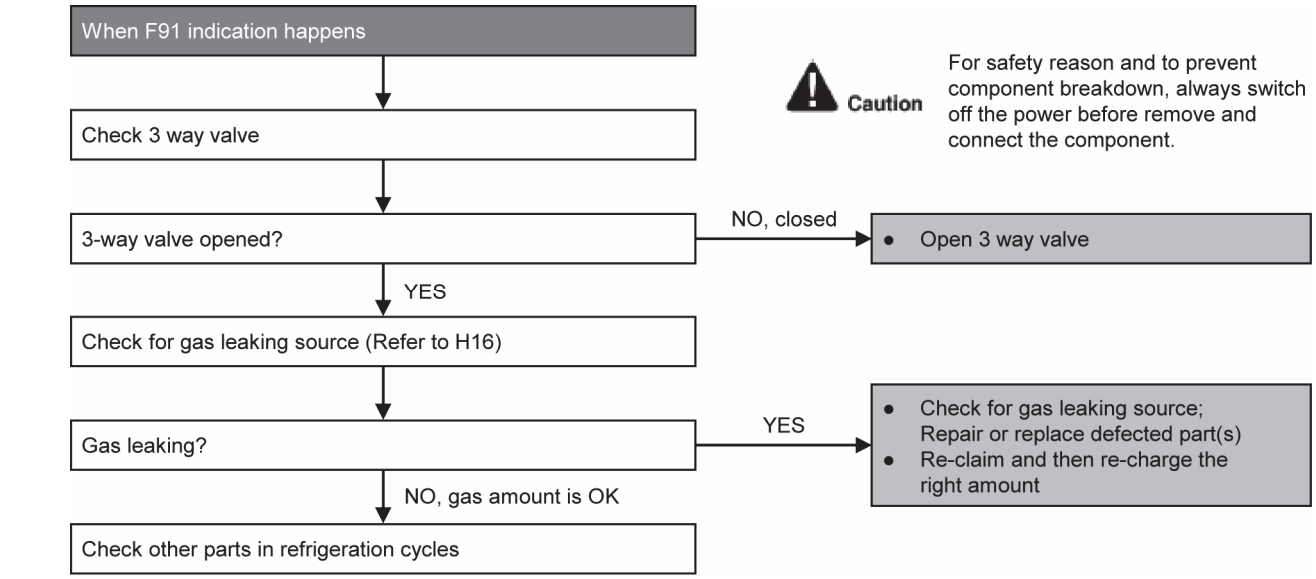
Malfunction Decision Conditions

- The input current is low while the compressor is running at higher than the setting frequency.

Malfunction Caused

- Lack of gas.
- 3-way valve close.

Troubleshooting



17.4.23 F93 (Compressor Rotation Failure)

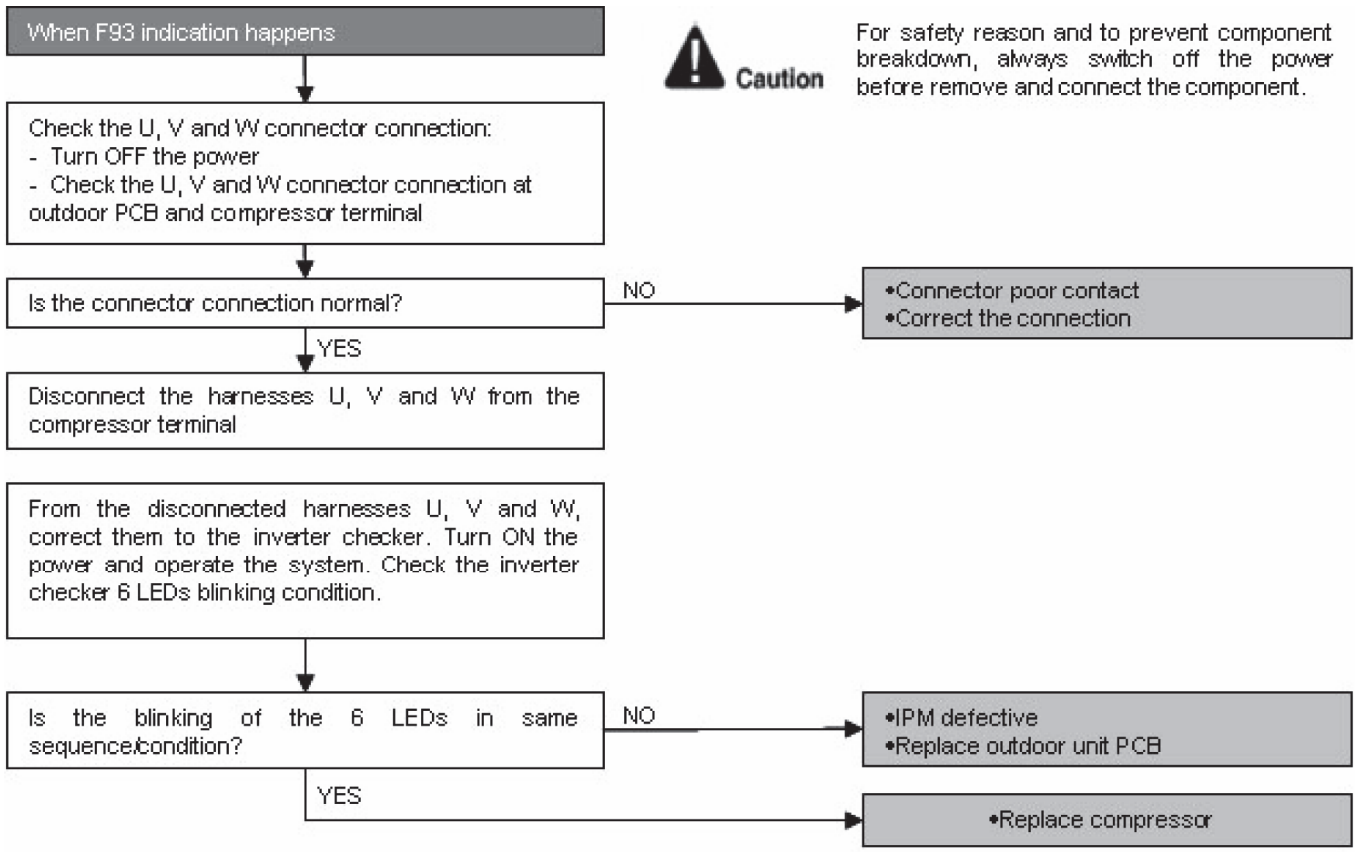
Malfunction Decision Conditions

- A compressor rotation failure is detected by checking the compressor running condition through the position detection circuit.

Malfunction Caused

- Compressor terminal disconnect
- Faulty Outdoor PCB
- Faulty compressor

Troubleshooting



17.4.24 F95 (Outdoor High Pressure Protection: Cooling or Soft Dry)

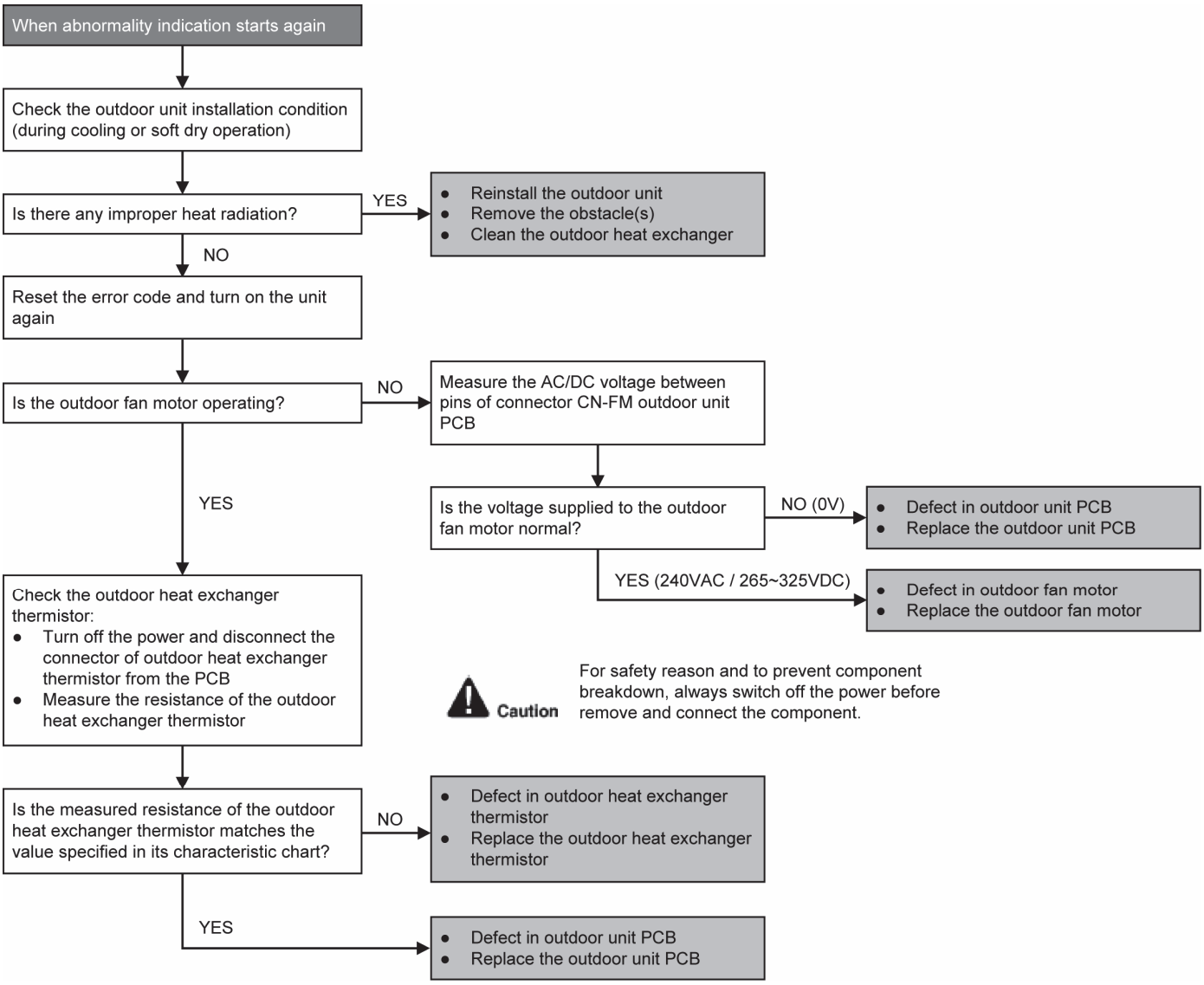
Malfunction Decision Conditions

- During operation of cooling or soft dry, when outdoor unit heat exchanger high temperature data is detected by the outdoor unit heat exchanger thermistor.

Malfunction Caused

- Outdoor heat exchanger temperature rise due to short-circuit of hot discharge air flow.
- Outdoor heat exchanger temperature rise due to defective of outdoor fan motor.
- Outdoor heat exchange temperature rise due to defective outdoor heat exchanger thermistor.
- Outdoor heat exchanger temperature rise due to defective of outdoor unit PCB.

Troubleshooting



17.4.25 F96 (IPM Overheating)

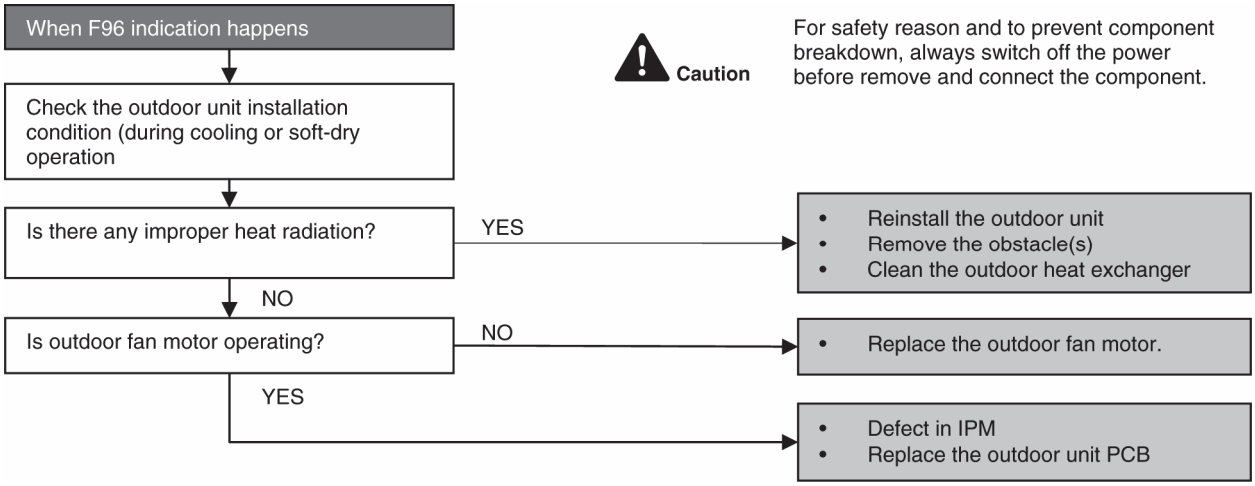
Malfunction Decision Conditions

- During operating of cooling and heating, when IPM temperature data (100°C) is detected by the IPM temperature sensor.
  Multi Models only
  - Compressor Overheating: During operation of cooling and heating, when the compressor OL is activated.
  - Heat Sink Overheating: During operation of cooling and heating, when heat sink temperature data (90°C) is detected by the heat sink temperature sensor.

Malfunction Caused

- IPM overheats due to short circuit of hot discharge air flow.
- IPM overheats due to defective of outdoor fan motor.
- IPM overheats due to defective of internal circuitry of IPM.
- IPM overheats due to defective IPM temperature sensor.
  Multi Models Only
  - Compressor OL connector poor contact.
  - Compressor OL faulty.

Troubleshooting



17.4.26 F97 (Compressor Overheating)

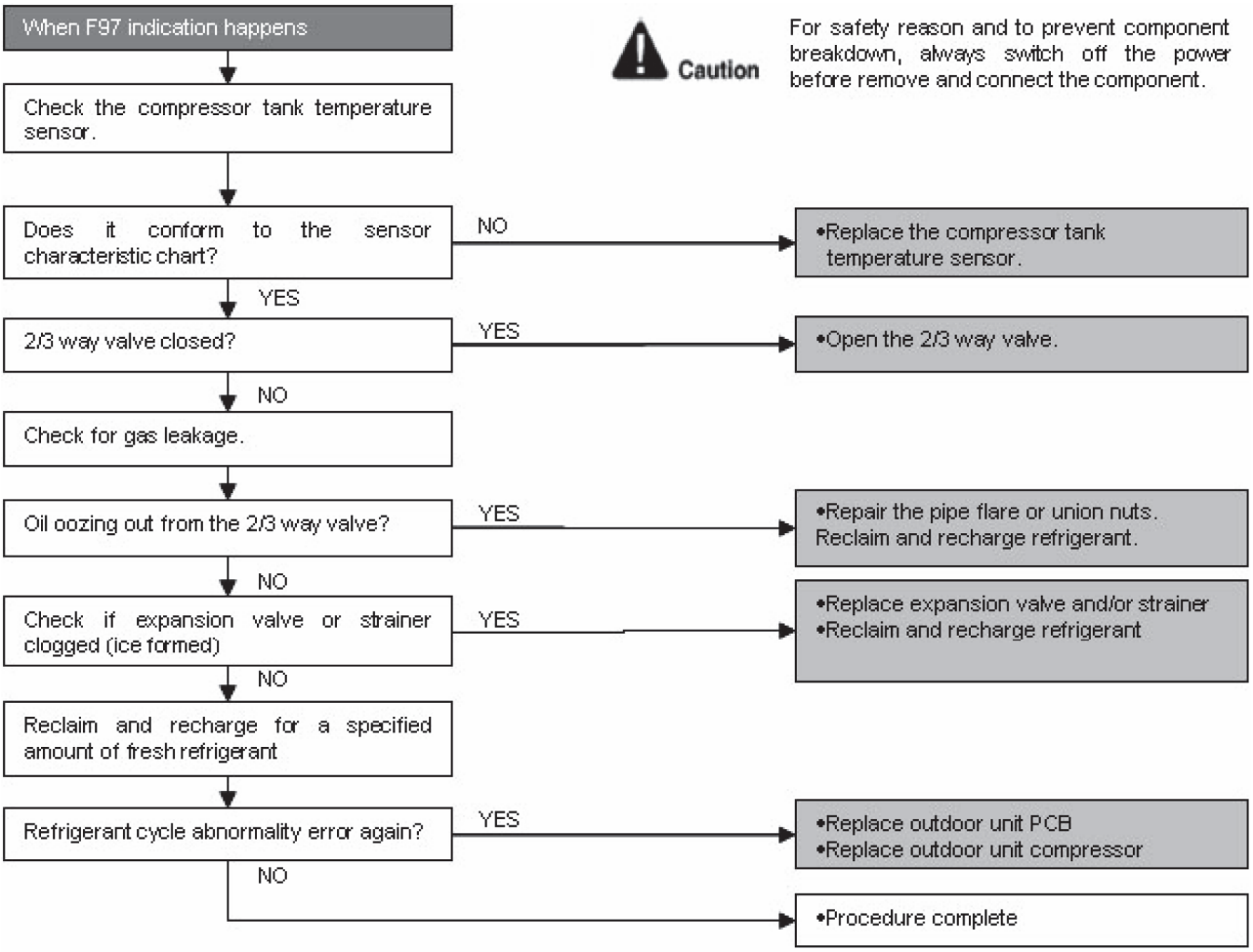
Malfunction Decision Conditions

- During operation of cooling and heating, when compressor tank temperature data (112°C) is detected by the compressor tank temperature sensor.

Malfunction Caused

- Faulty compressor tank temperature sensor
- 2/3 way valve closed
- Refrigerant shortage (refrigerant leakage)
- Faulty outdoor unit PCB
- Faulty compressor

Troubleshooting



17.4.27 F98 (Input Over Current Detection)

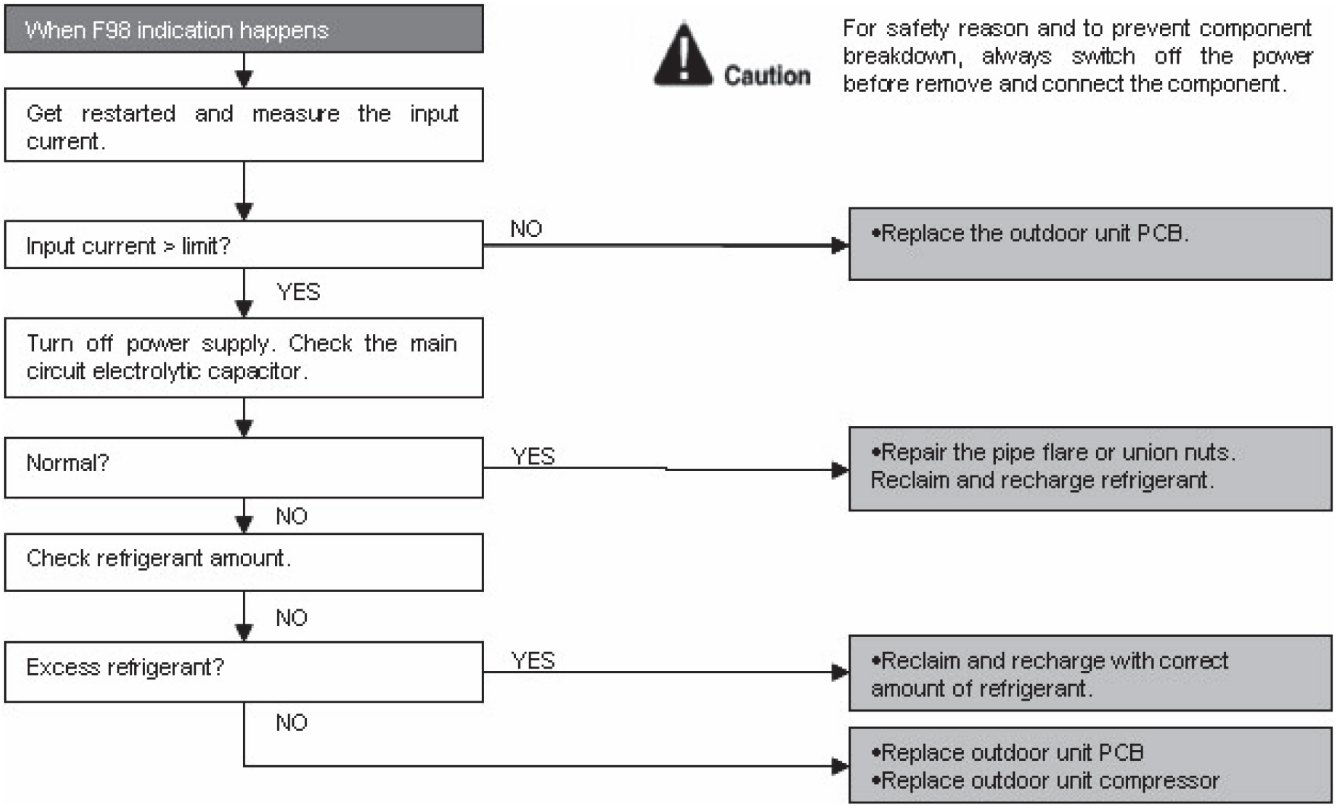
Malfunction Decision Conditions

- During operation of cooling and heating, when an input over-current (X value in Total Running Current Control) is detected by checking the input current value being detected by current transformer (CT) with the compressor running.

Malfunction Caused

- Excessive refrigerant.
- Faulty outdoor unit PCB.

Troubleshooting



17.4.28 F99 (DC Peak Detection)

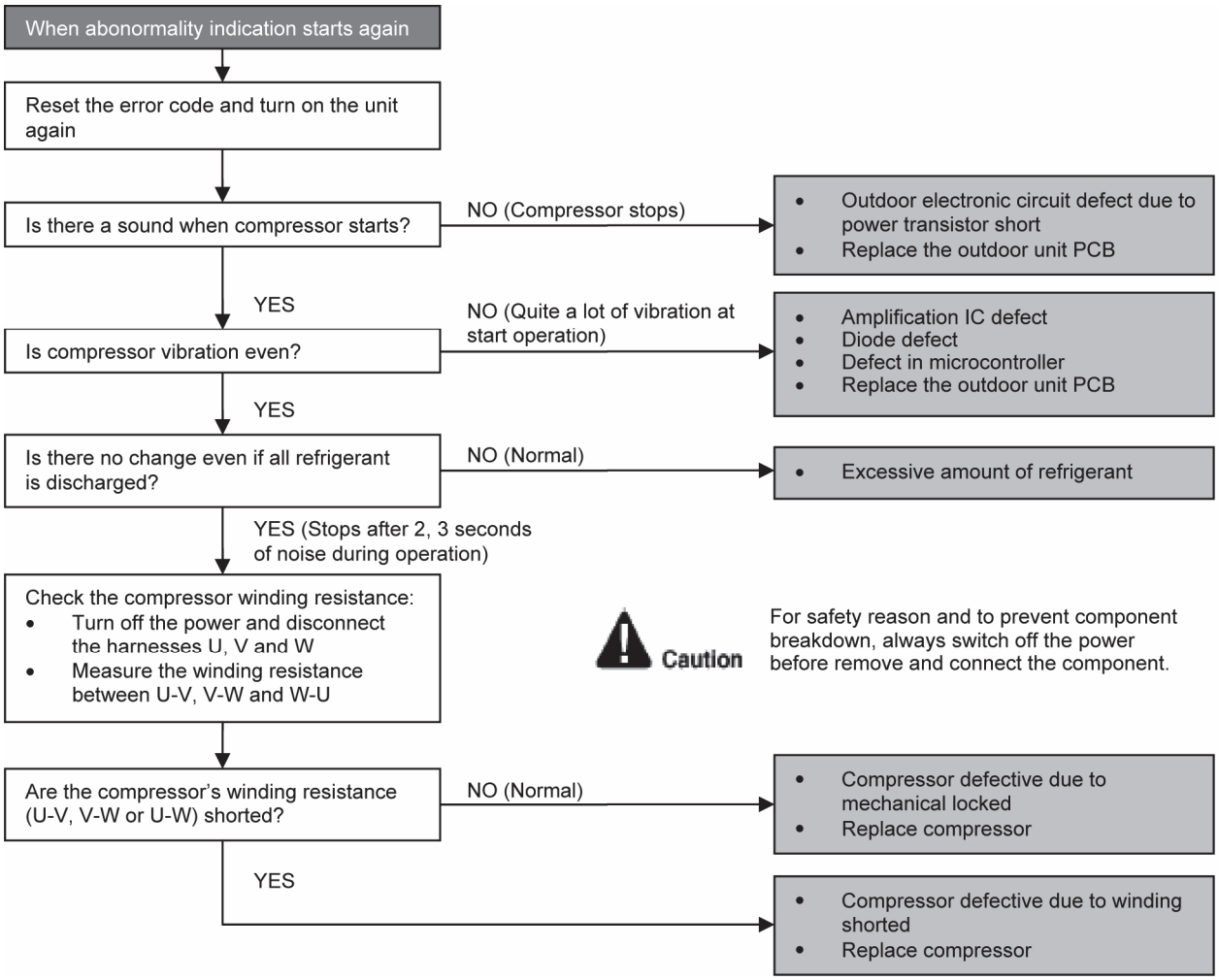
Malfunction Decision Conditions

During startup and operation of cooling and heating, when inverter DC peak data is received by the outdoor internal DC Peak sensing circuitry.

Malfunction Caused

- DC current peak due to compressor failure.
- DC current peak due to defective power transistor(s).
- DC current peak due to defective outdoor unit PCB.
- DC current peak due to short circuit.

Troubleshooting



18. 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.

18.1 CS-E7QK CS-E9QK CS-E12QK CS-E15QK CS-XE7QK CS-XE9QK CS-XE12QK

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

18.1.1.1 To remove front grille

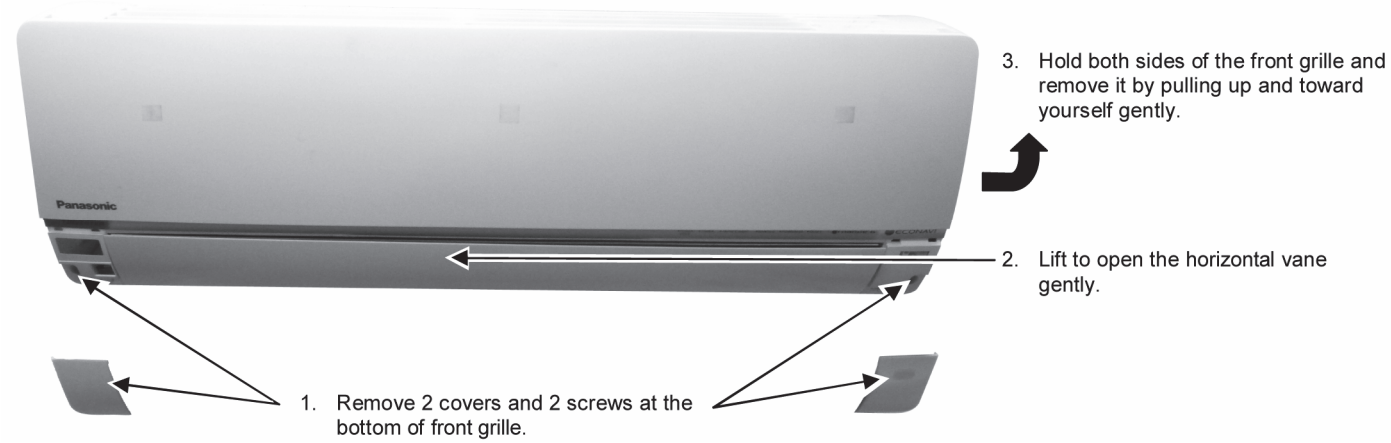


Figure 1

18.1.1.2 To remove electronic controller

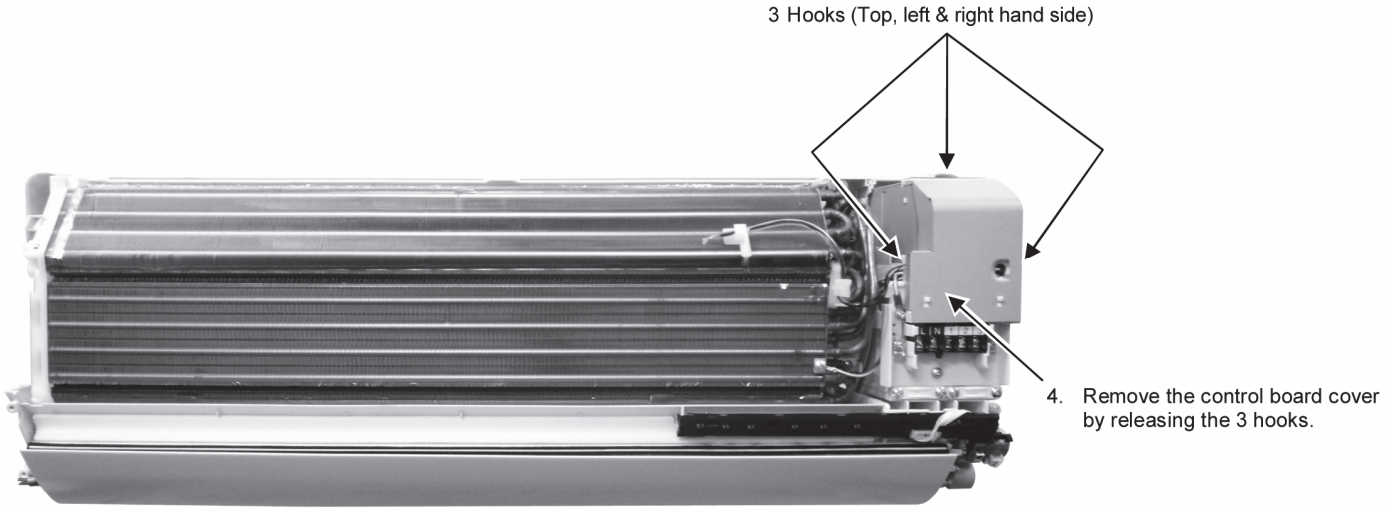


Figure 2

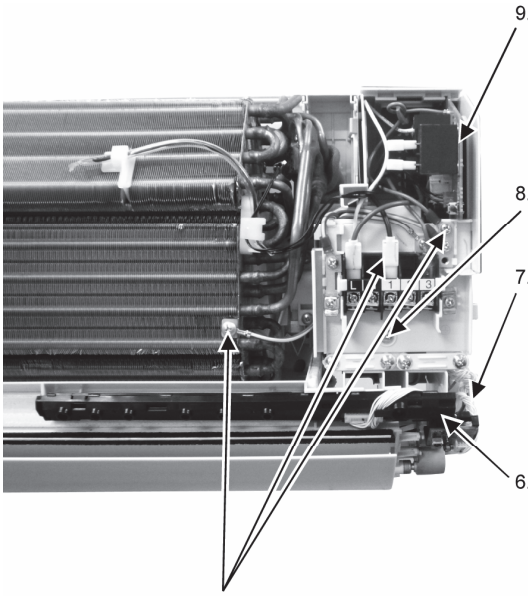


Figure 3

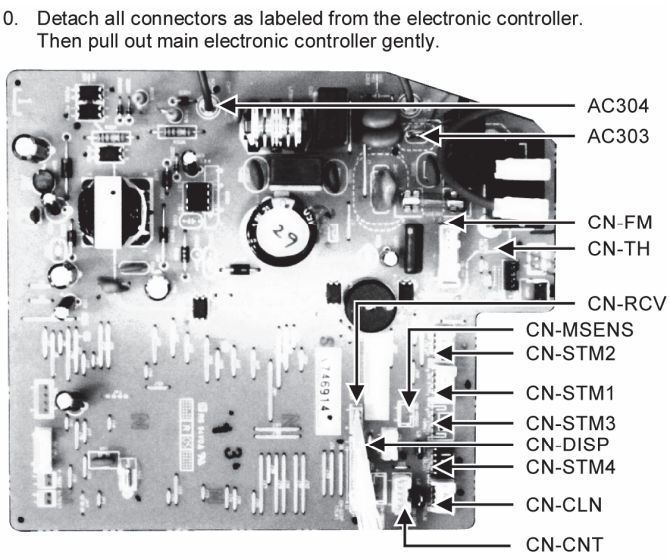
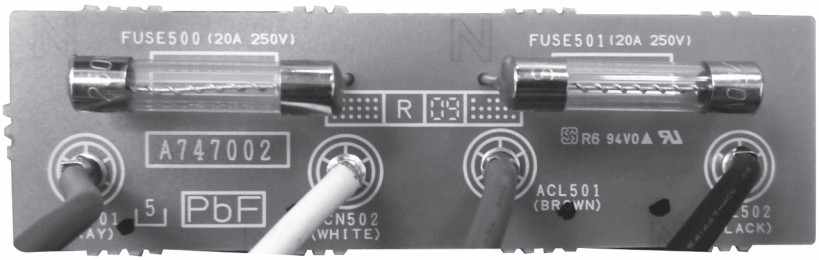


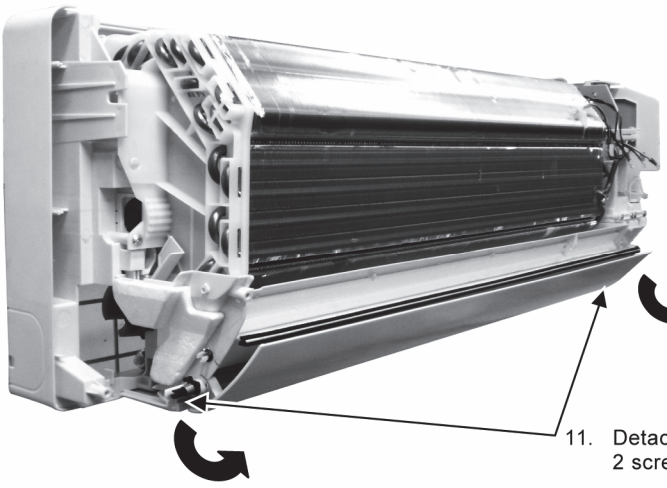
Figure 4



16. Detach CN501 (Gray), CN502 (White) and ACL501 (Brown) from terminal board. Detach ACL502 (Black) from RY-PWR.

Figure 5

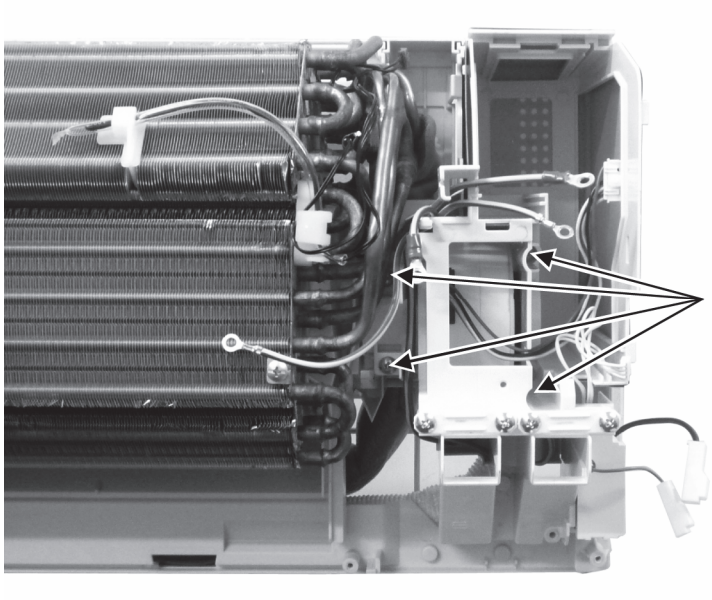
18.1.1.3 To remove discharge grille



13. Then pull the discharge grille downward gently to dismantle it.

Figure 6

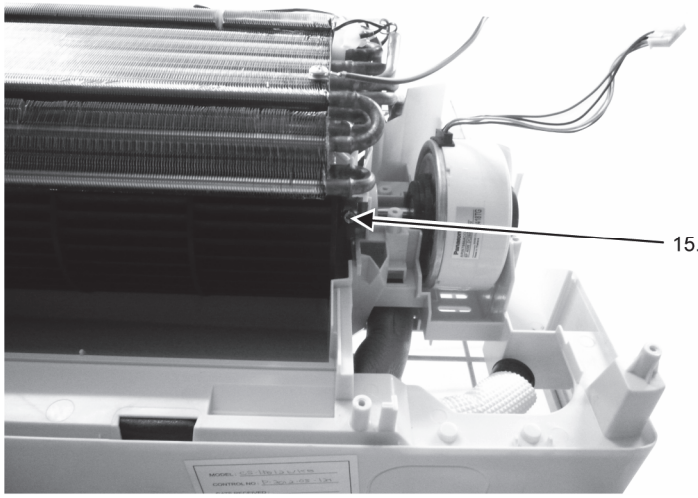
18.1.1.4 To remove control board



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

Figure 7

18.1.1.5 To remove cross flow fan and indoor fan motor



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

Figure 8

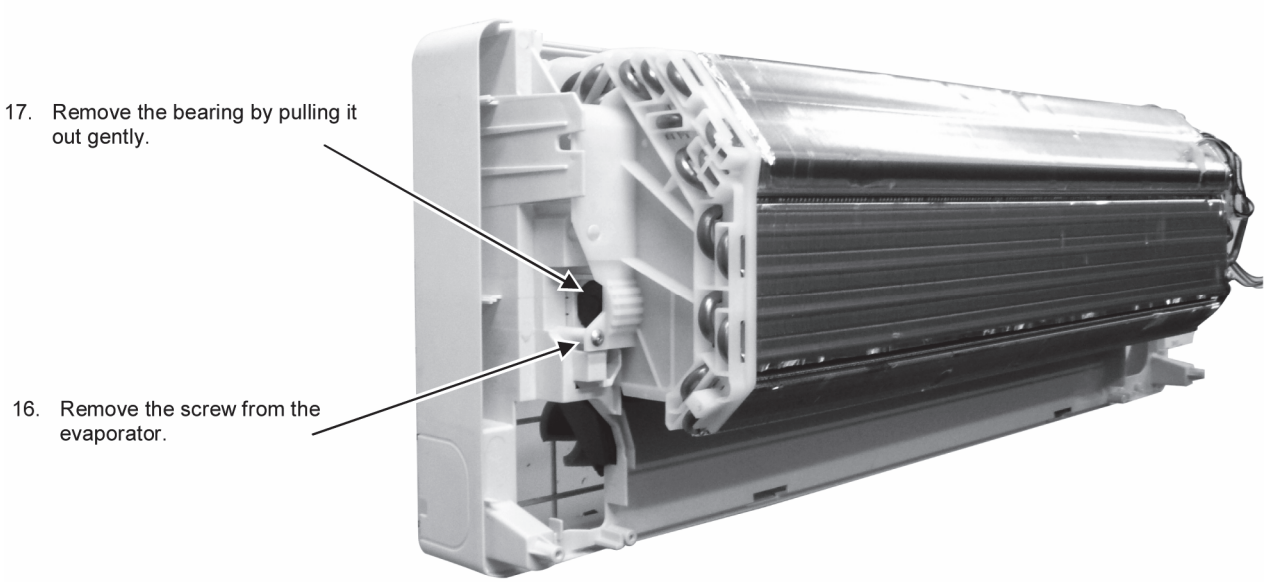


Figure 9

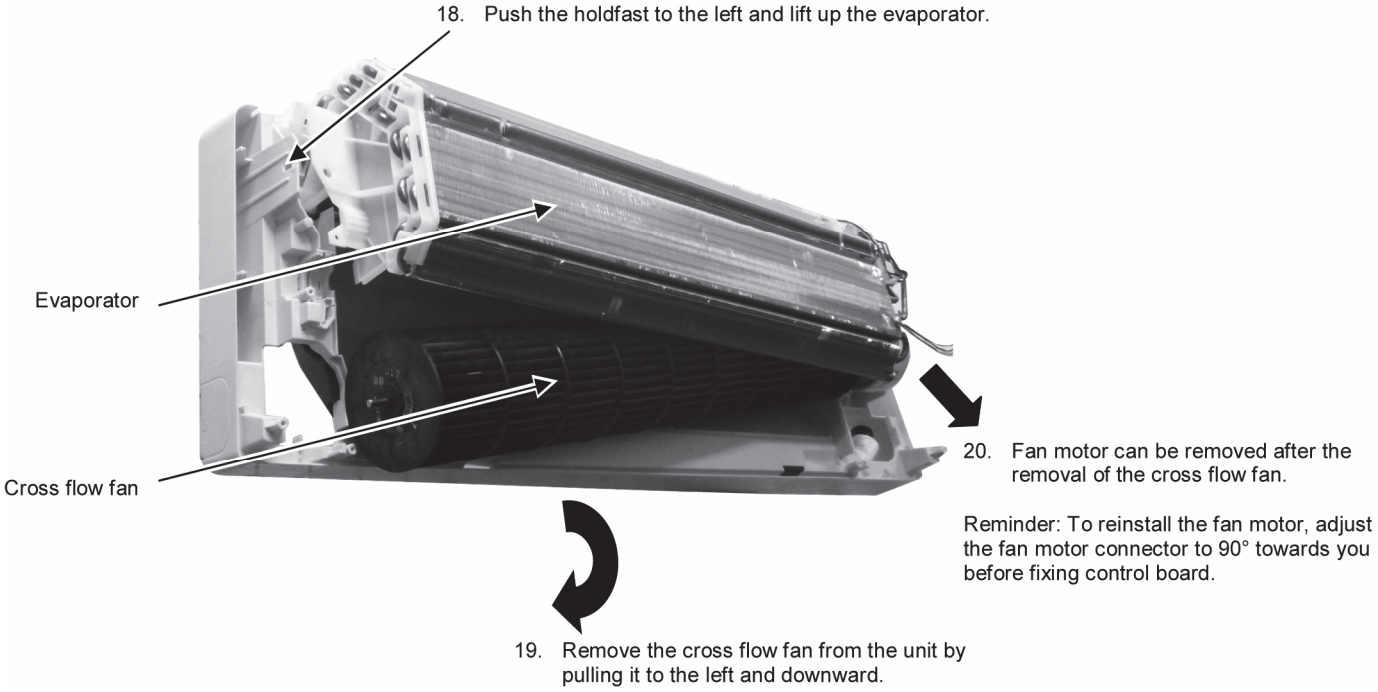


Figure 10

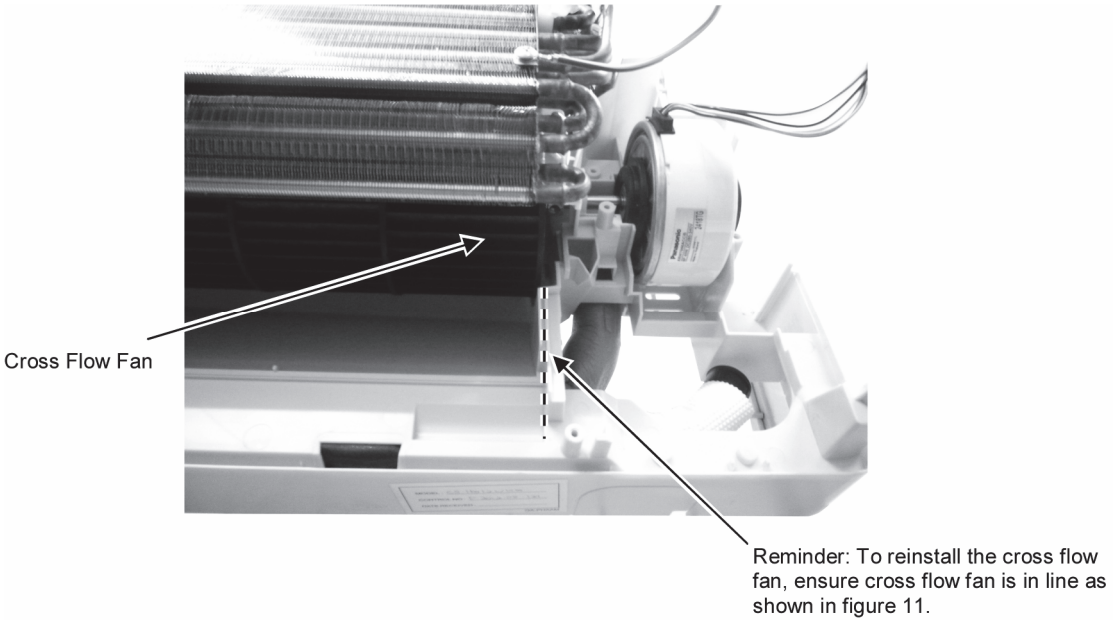

Cross Flow Fan
Reminder: To reinstall the cross flow fan, ensure cross flow fan is in line as shown in figure 11.

Figure 11

18.2 CS-E18QK CS-E21QK CS-E24QK CS-E28QK CS-XE18QK

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

18.2.1.1 To remove front grille

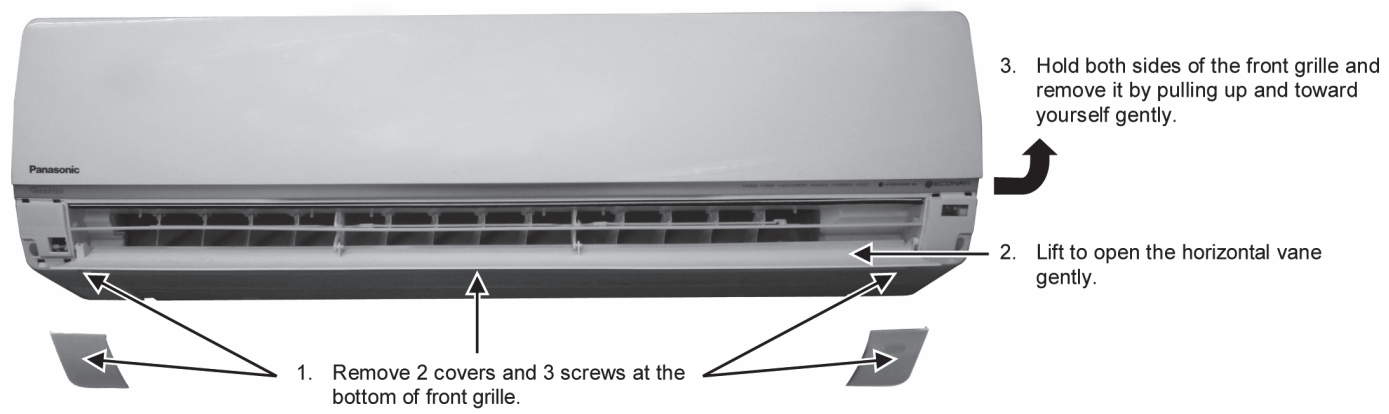


Figure 12

18.2.1.2 To remove horizontal vane

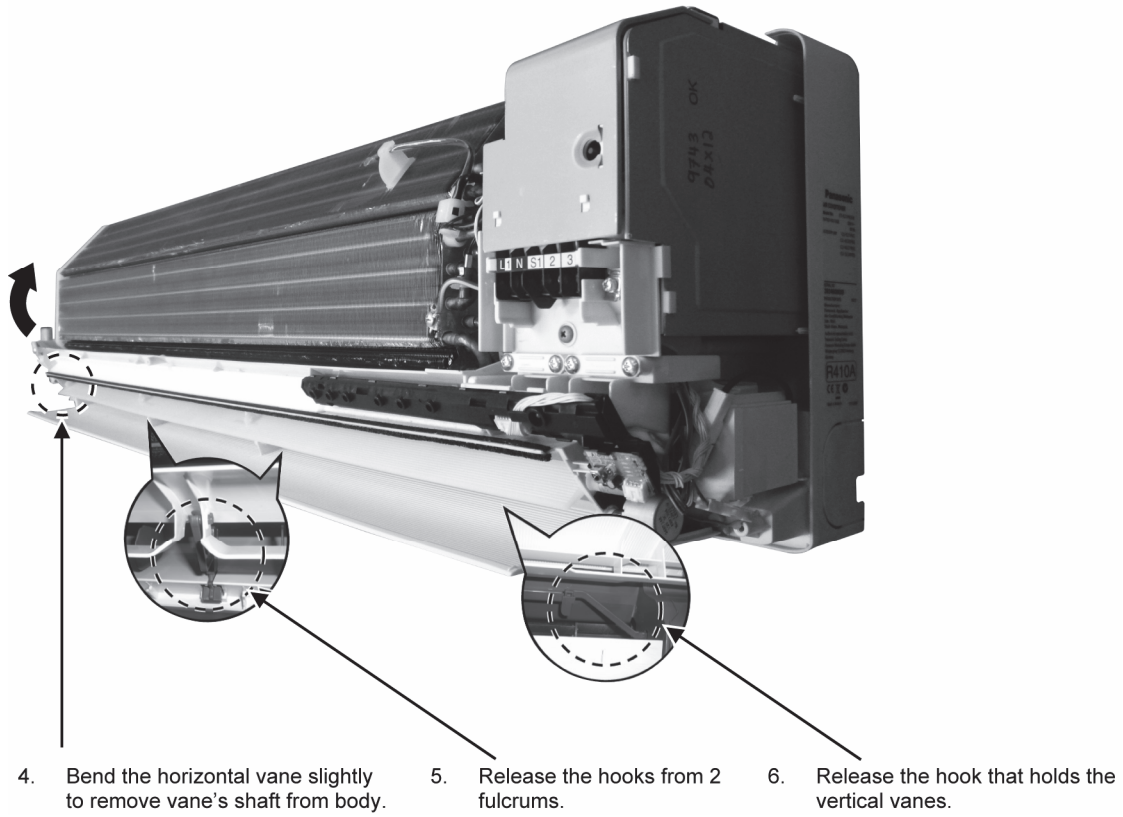


Figure 13

18.2.1.3 To remove power electronic controller

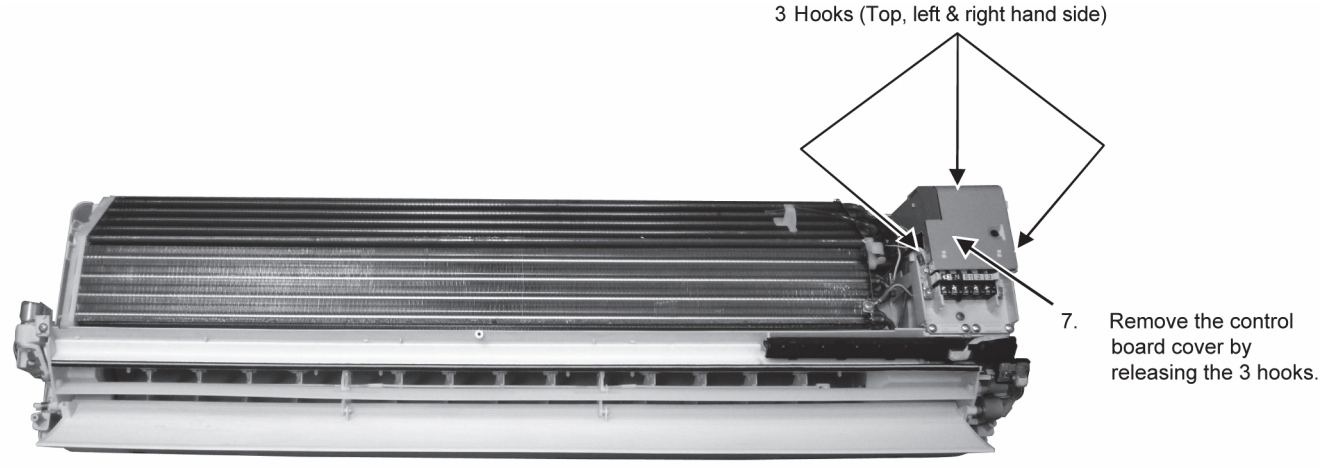
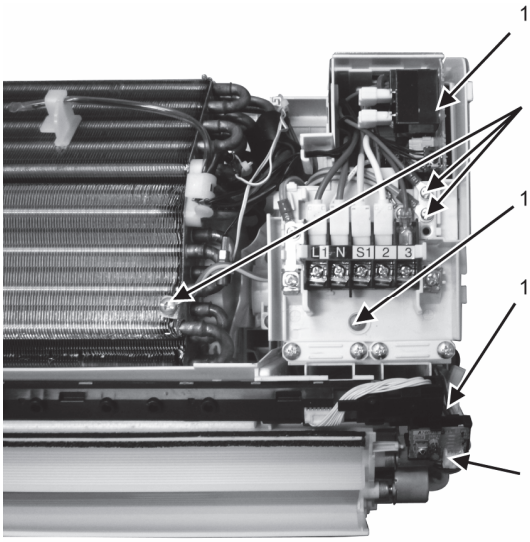


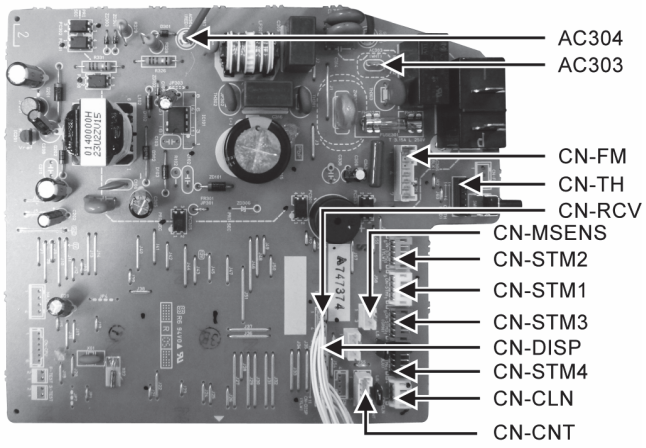
Figure 14



12. Pull out the main electronic controller halfway.
8. Detach the Earth wire.
11. Remove screw to remove terminal board complete.
10. Detach the connectors CN2 (Black), GND (Green), and CN1 (White) then remove the high voltage generator.
9. Remove the indicator complete then detach the connectors CN-DISP and CN-RCV.

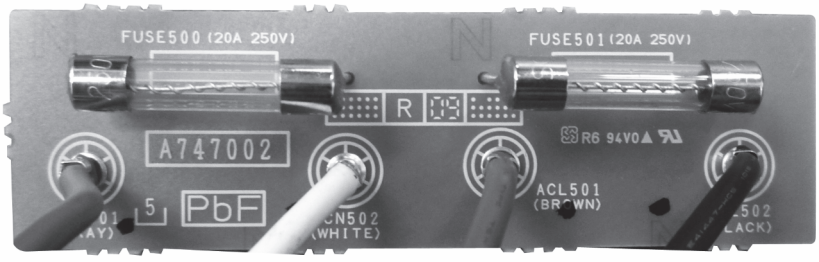
Figure 15

13. Detach all connectors as labeled from the electronic controller. Then pull out main electronic controller gently.



14. Detach AC303 (WHT), RY-PWR connector (Black and Yellow) from the electronic controller.
15. Detach AC304 (RED) from Terminal Board.

Figure 16



16. Detach CN501 (Gray), CN502 (White) and ACL501 (Brown) from terminal board. Detach ACL502 (Black) from RY-PWR. (For E18/21/24QKE)

Figure 17

18.2.1.4 To remove discharge grille

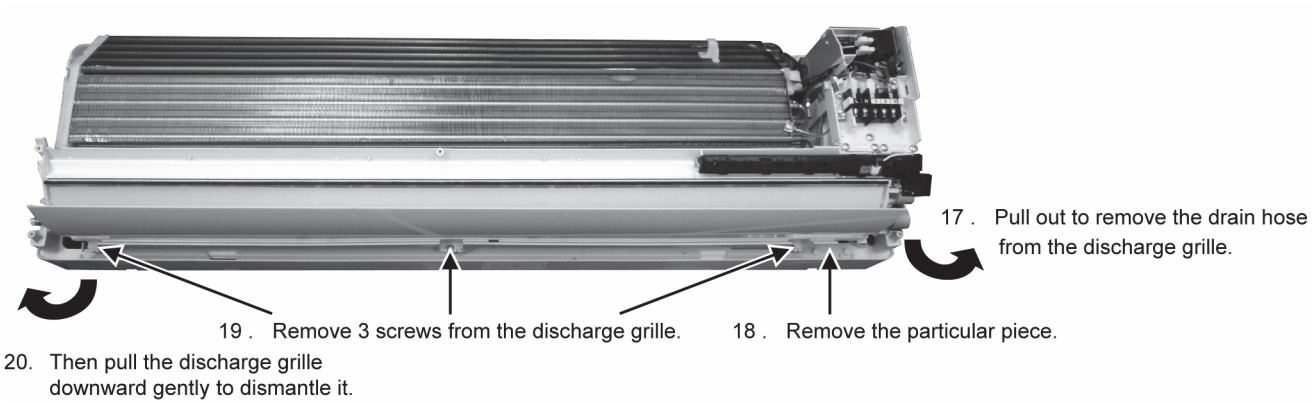


Figure 18

18.2.1.5 To remove control board

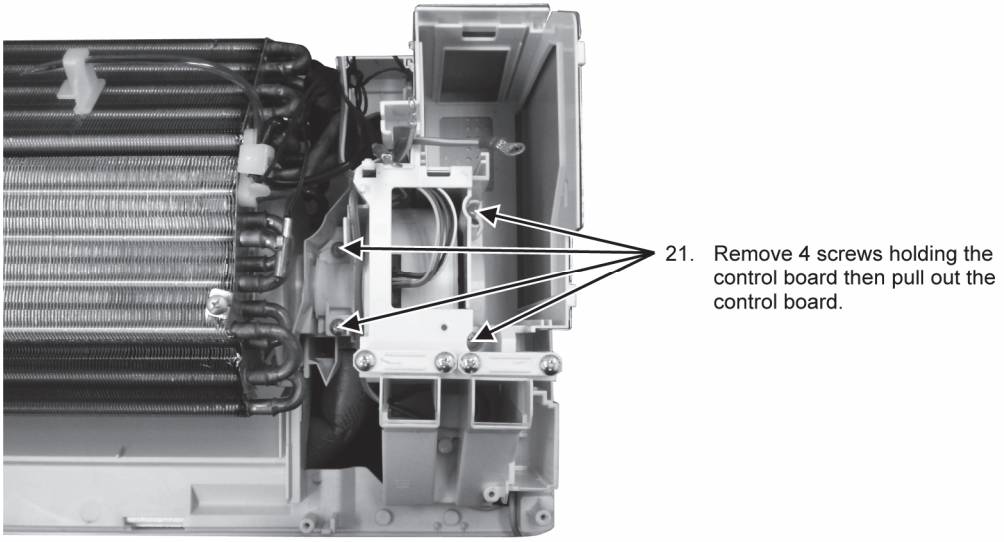


Figure 19

18.2.1.6 To remove cross flow fan and indoor fan motor

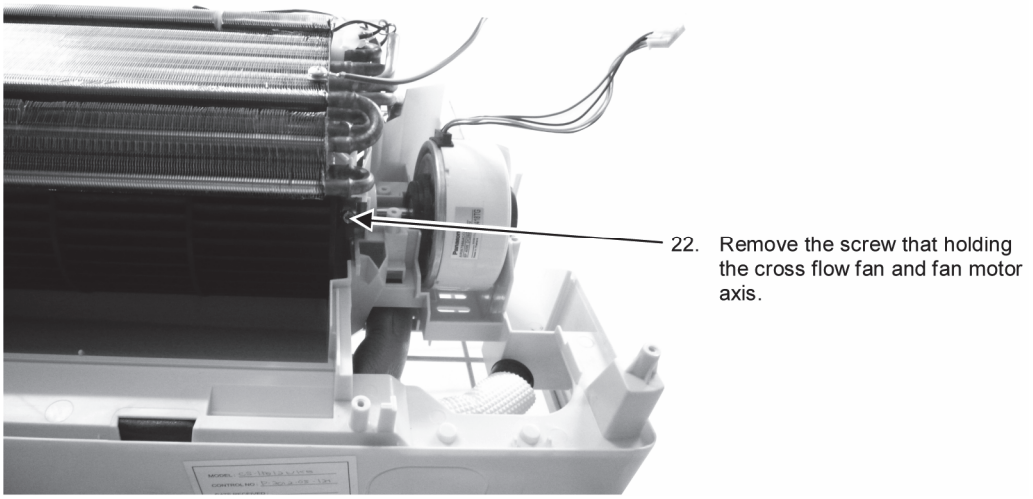


Figure 20

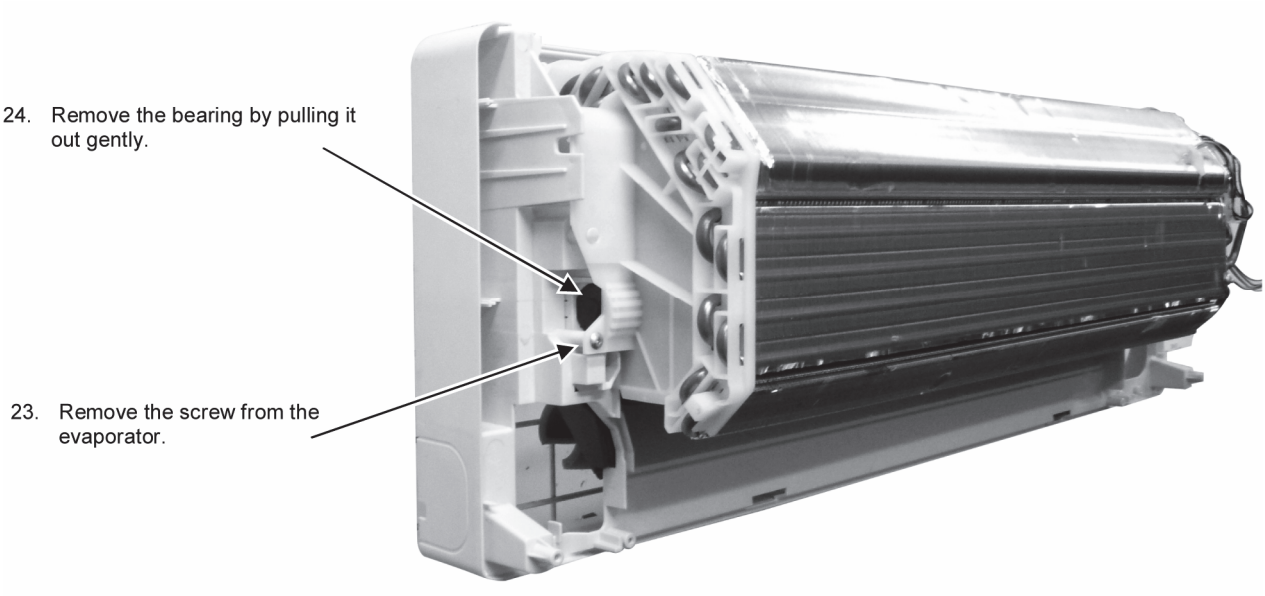


Figure 21

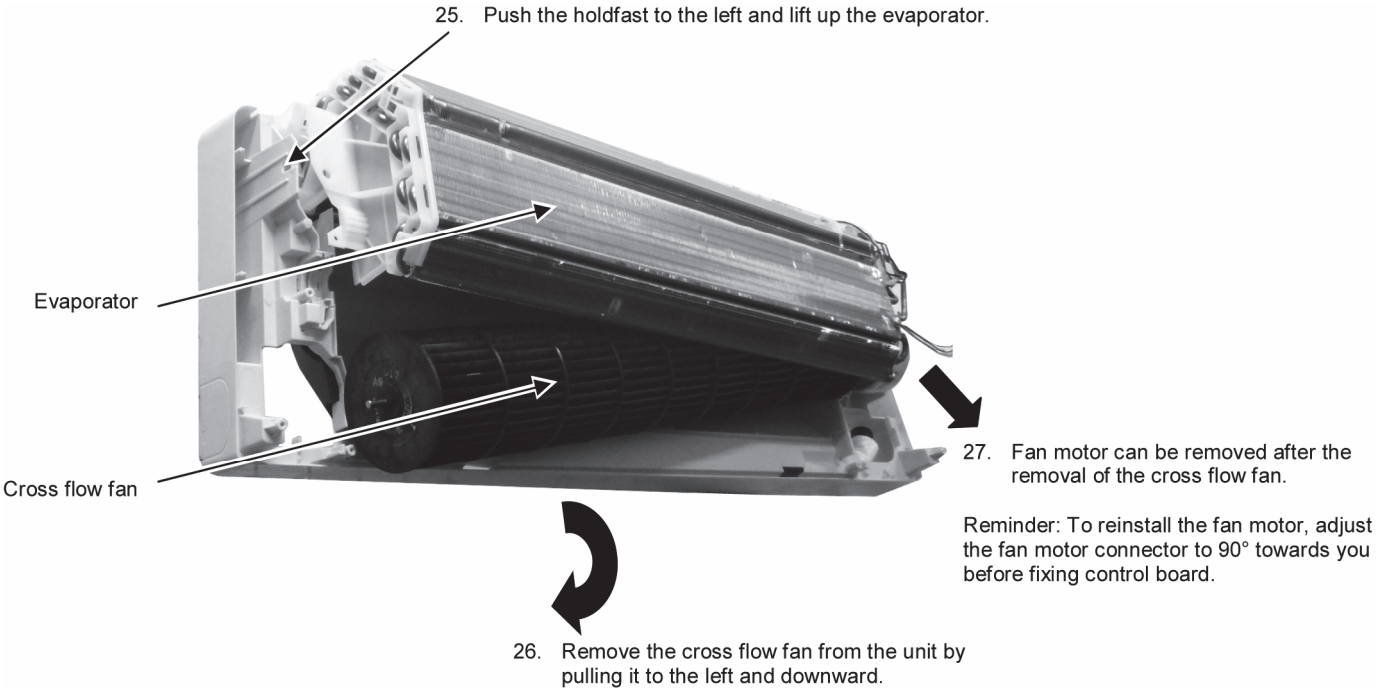


Figure 22

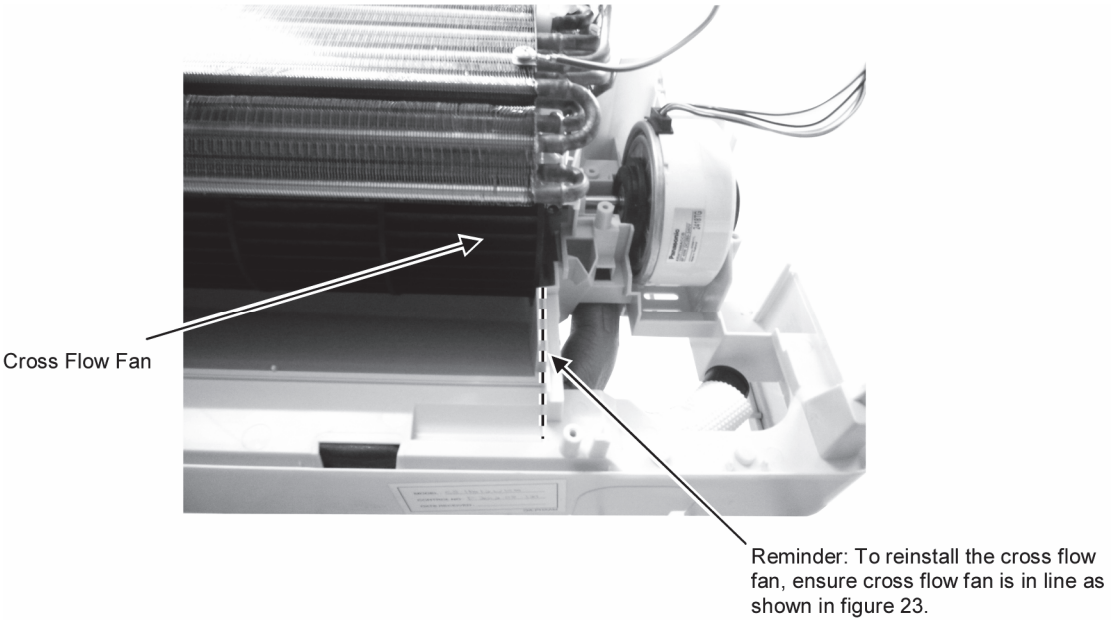

Cross Flow Fan
Reminder: To reinstall the cross flow fan, ensure cross flow fan is in line as shown in figure 23.

Figure 23

18.3 Outdoor Electronic Controller Removal Procedure

18.3.1 CU-E7QKE CU-E9QKE

⚠ Caution! When handling electronic controller, be careful of electrostatic discharge.

1 Remove the 3 screws of the Top Panel.

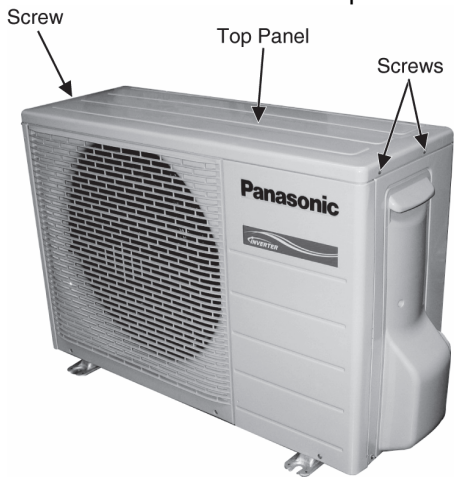


Fig. 1

2 Remove the 6 screws of the Front Panel.

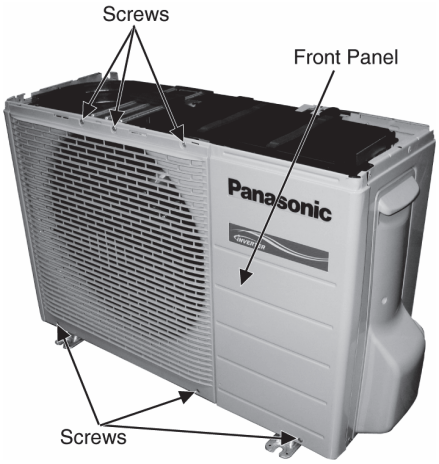


Fig. 2

3 Remove the screw of the Terminal Board Cover.

4 Remove the Top Cover of the Control Board by 4 hooks.

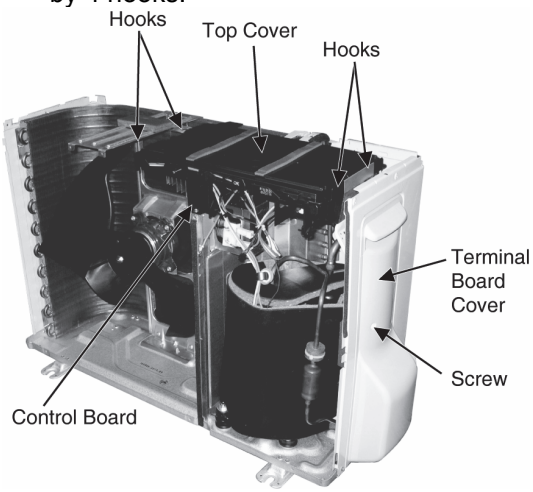


Fig. 3

5 Remove the Control Board as follows:

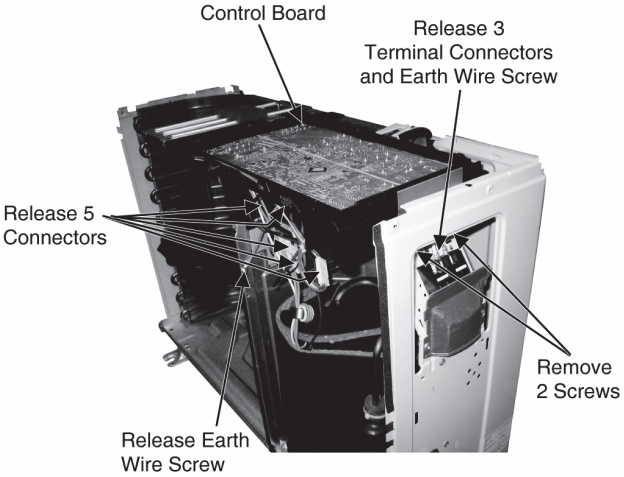


Fig. 4

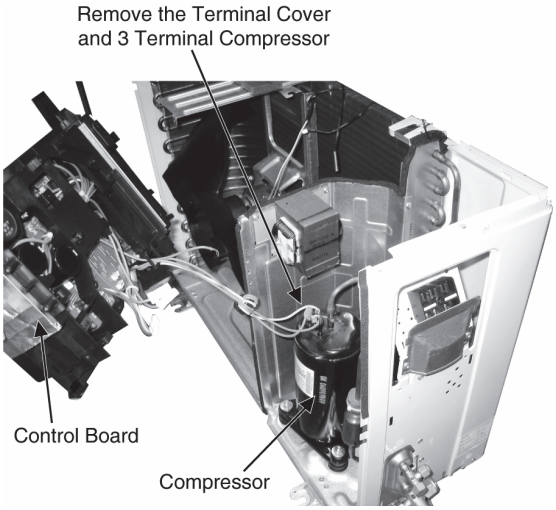


Fig. 5

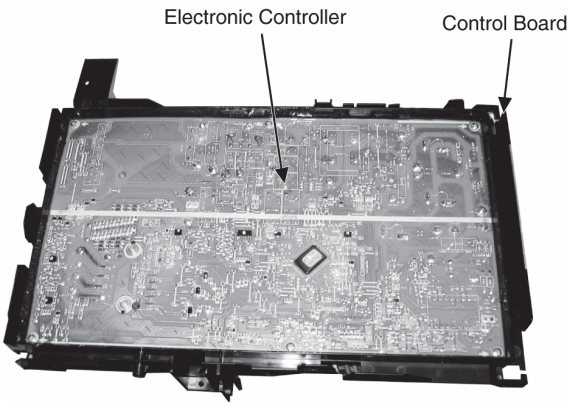


Fig. 6

18.3.2 CU-E12QKE CU-E15QKE

⚠ Caution! When handling electronic controller, be careful of electrostatic discharge.

1 Remove the 5 screws of the Top Panel.

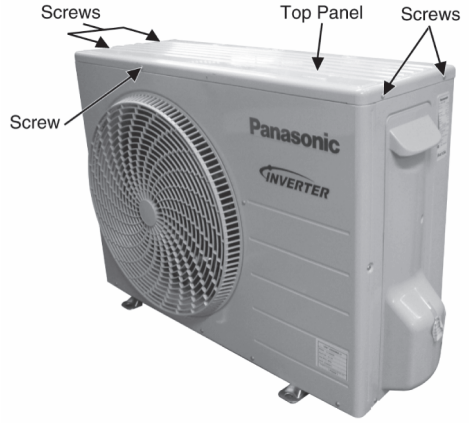


Fig. 1

2 Remove the 8 screws of the Front Panel.

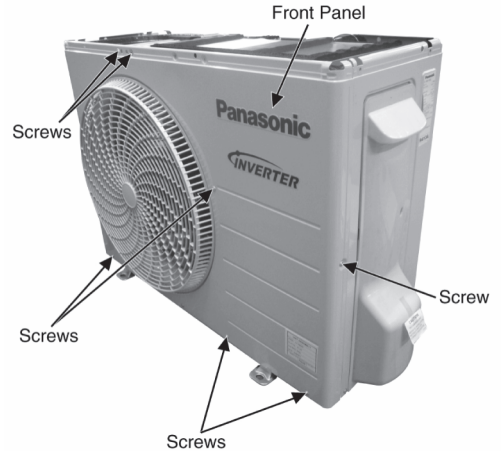


Fig. 2

3 Remove the screw of the Terminal Board Cover.

4 Remove the Top Cover of the Control Board by 4 hooks.

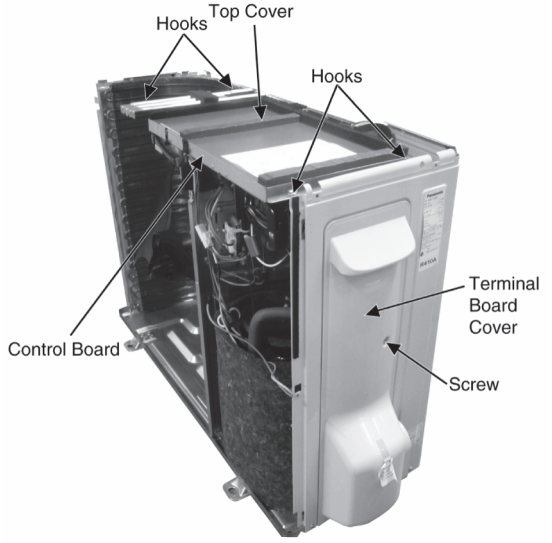


Fig. 3

5 Remove the Control Board as follows:

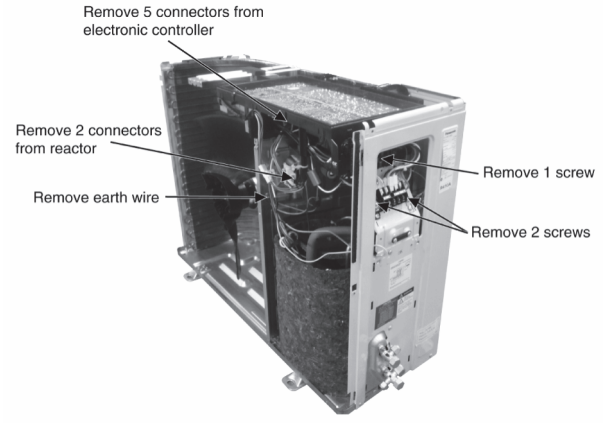


Fig. 4

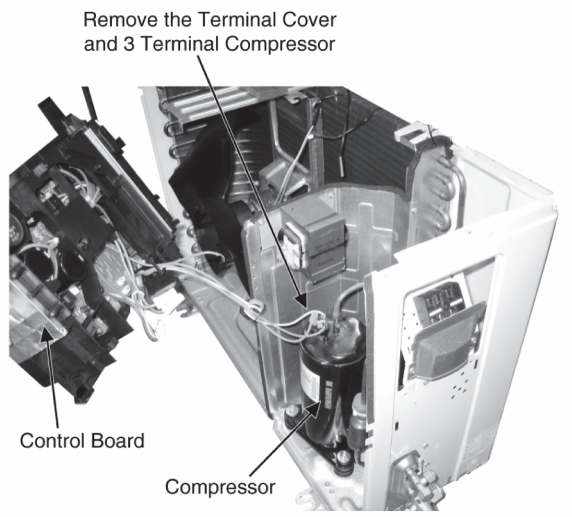


Fig. 5

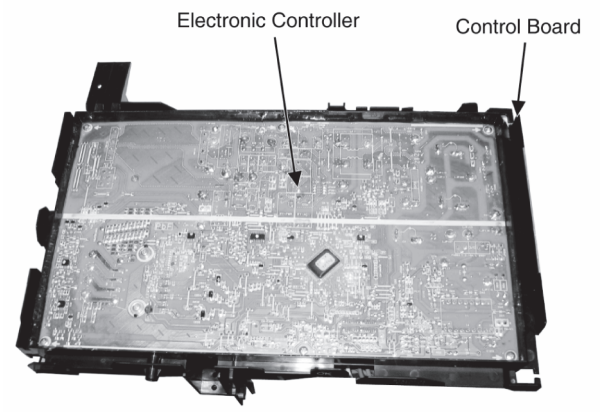


Fig. 6

18.3.3 CU-E18QKE CU-E21QKE

1 Remove the 8 screws of the Top Panel.

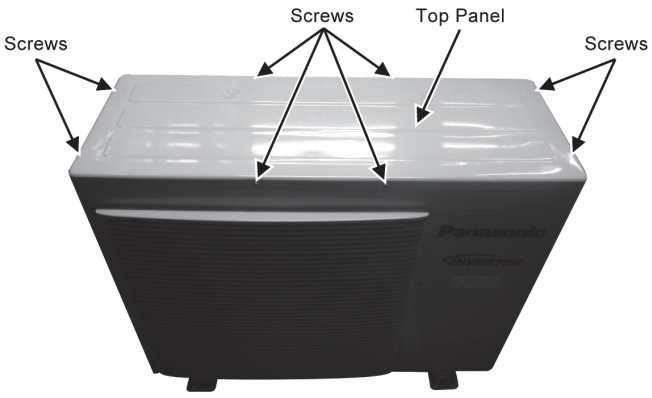


Fig. 1

2 Remove the 8 screws of the Front Panel.

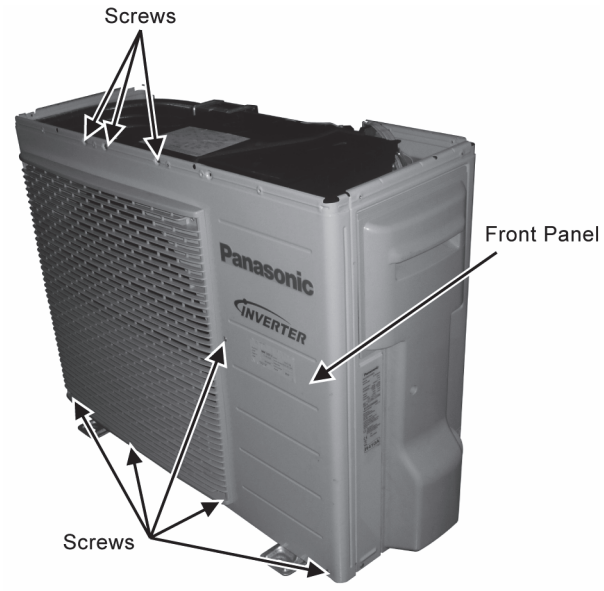


Fig. 2

3 Remove the Top Cover of the Electronic Controller.

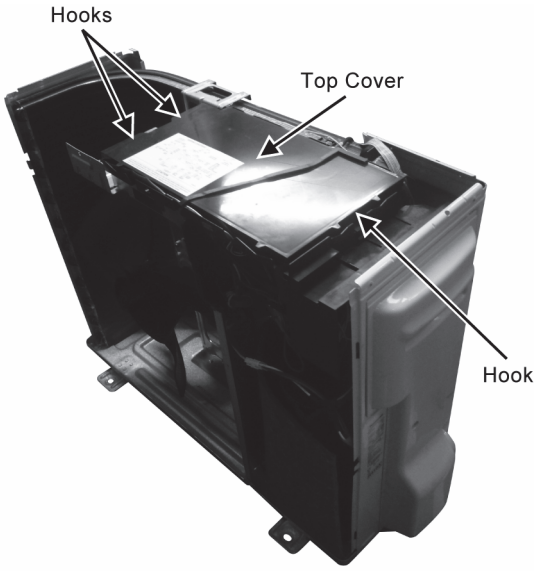


Fig. 3

4 Remove the Control Board.

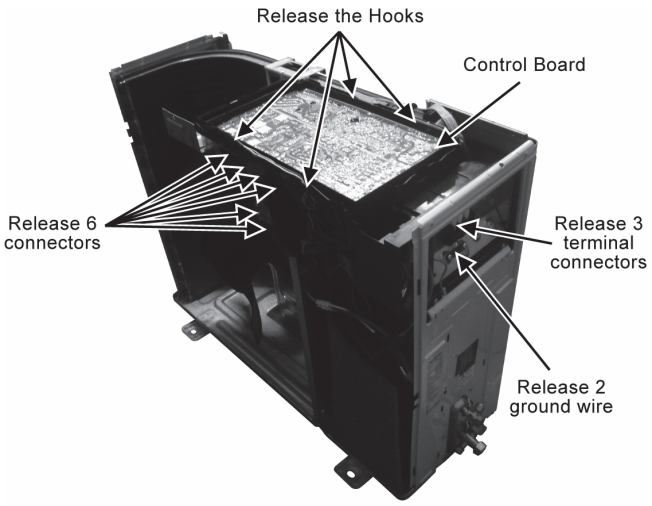


Fig. 4

5 Remove the 6 screws of the Electronic Controller.

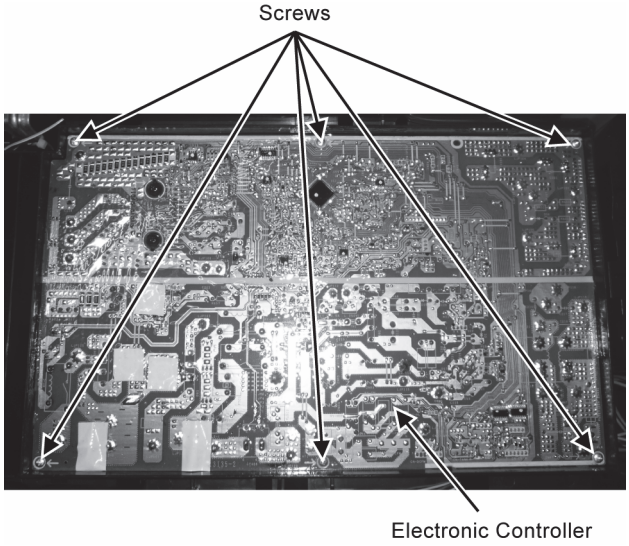


Fig. 5

⚠ Caution! When handling electronic controller, be careful of electrostatic discharge.

18.3.4 CU-E24QKE CU-E28QKE

1 Remove the 8 screws of the Top Panel.

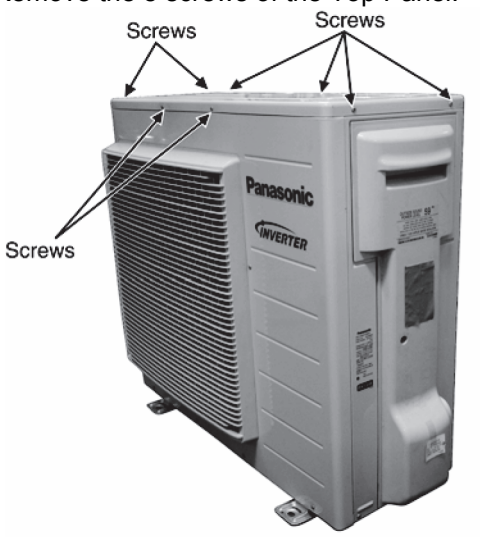


Fig. 1

2 Remove the 8 screws of the Front Panel.

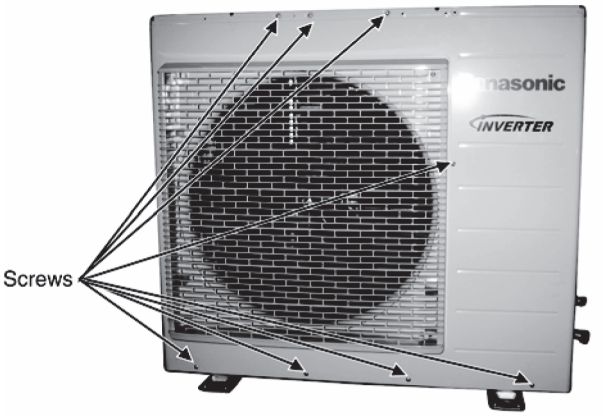


Fig. 2

3 Remove the Top Cover of the Electronic Controller.

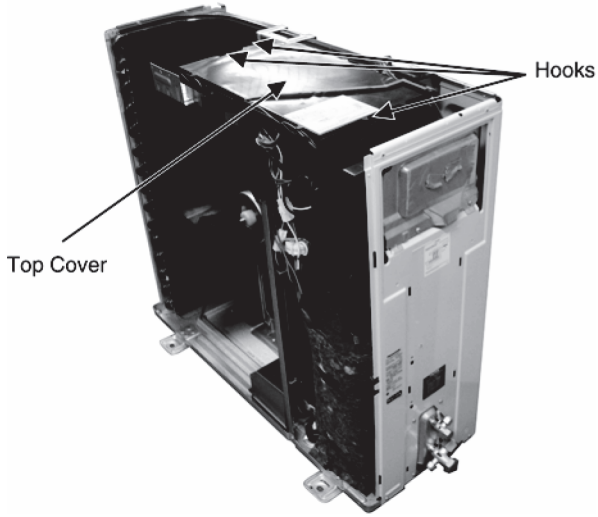


Fig. 3

4 Remove the Control Board.

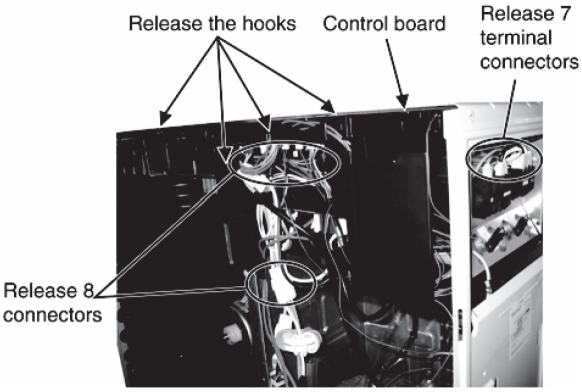


Fig. 4

5 Remove the 6 screws of the Electronic Controller.

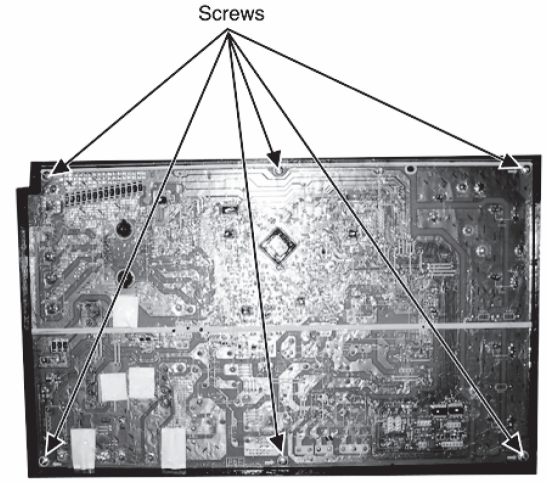


Fig. 5

⚠ Caution! When handling electronic controller, be careful of electrostatic discharge.

19. Technical Data

Technical data provided are based on the air conditioner running under free frequency.

19.1 Cool Mode Performance Data

Unit setting: Standard piping length, Hi Fan, Cool mode at 16°C
Voltage: 230V

19.1.1 CS-E7QKEW/CU-E7QKE

Indoor (°C)		Outdoor DB (°C)																				
DB	WB	-10			-7			0			5			16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	2298	2167	322	2237	2110	359	2277	2177	324	2251	2152	349	2417	2164	260	2269	2119	349	2050	2030	460
	22.0	2428	1540	342	2562	1583	274	2433	1556	333	2543	1601	283	2496	1547	258	2476	1488	334	2183	1409	452
23	15.7	2150	2129	307	2106	2085	343	2070	2049	340	2270	2247	311	2143	2122	291	2055	2035	358	1889	1870	466
	18.4	2262	1535	315	2192	1510	354	2182	1502	341	2232	1530	328	2267	1531	281	2258	1500	348	1938	1455	460
20	13.3	2043	2023	332	1954	1935	362	1962	1943	352	1741	1724	275	1403	1389	129	1588	1572	271	1736	1719	468
	15.8	2106	1526	339	2066	1507	334	2103	1509	338	1833	1378	261	1821	1349	247	2012	1468	357	1764	1396	463

(Dry bulb value based on 46% humidity)

19.1.2 CS-E9QKEW/CU-E9QKE

Indoor (°C)		Outdoor DB (°C)																				
DB	WB	-10			-7			0			5			16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	2802	2658	367	2728	2588	410	2777	2671	370	2745	2639	398	2947	2654	296	2767	2599	398	2500	2490	525
	22.0	2961	1889	390	3124	1941	313	2967	1909	380	3102	1964	323	3043	1897	295	3020	1825	381	2662	1729	516
23	15.7	2622	2596	350	2568	2542	392	2524	2499	388	2768	2741	355	2614	2587	332	2507	2481	409	2304	2281	532
	18.4	2758	1882	359	2673	1852	404	2661	1843	390	2722	1877	374	2764	1878	320	2754	1840	398	2363	1784	525
20	13.3	2492	2467	379	2383	2359	413	2393	2369	402	2124	2103	314	1711	1694	147	1937	1918	309	2117	2096	534
	15.8	2568	1872	386	2519	1849	381	2564	1850	386	2235	1690	297	2221	1655	282	2453	1801	407	2151	1713	529

(Dry bulb value based on 46% humidity)

19.1.3 CS-E12QKEW/CU-E12QKE

Indoor (°C)		Outdoor DB (°C)																				
DB	WB	-10			-7			0			5			16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	3387	3016	556	3537	3087	508	3655	3138	456	3636	3126	507	4291	3456	555	3917	3279	683	3500	3107	835
	22.0	3886	2466	486	3722	2355	549	4002	2465	476	3724	2355	533	4628	2749	557	4260	2595	690	3862	1941	846
23	15.7	3053	2905	548	3080	2948	549	3020	2885	548	3163	3075	484	3745	3398	551	3419	3212	671	3061	3046	814
	18.4	3414	2342	502	3271	2284	552	3539	2415	477	3418	2342	505	4087	2682	552	3759	2500	678	3369	2345	829
20	13.3	2789	2762	524	2653	2627	578	2725	2698	559	2712	2704	563	2833	2805	339	2881	2840	522	2778	2751	746
	15.8	2782	2112	605	2953	2184	548	2867	2141	581	3199	2306	484	3786	2616	550	3452	2431	669	3104	1250	812

(Dry bulb value based on 46% humidity)

CS-E15QKEW/CU-E15QKE

Indoor (°C)		Outdoor DB (°C)																				
DB	WB	-10			-7			0			5			16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	4065	3395	826	4245	3474	754	4386	3531	677	4364	3518	753	5149	3889	824	4701	3690	1014	4200	3497	1240
	22.0	4663	2775	722	4466	2650	815	4802	2774	707	4469	2650	791	5554	3093	827	5112	2920	1025	4635	2184	1256
23	15.7	3664	3269	814	3696	3317	815	3624	3247	814	3796	3461	719	4494	3824	818	4103	3615	996	3673	3428	1209
	18.4	4096	2636	745	3925	2570	820	4247	2718	708	4102	2635	750	4905	3018	820	4510	2814	1007	4043	2639	1231
20	13.3	3347	3169	778	3184	3066	859	3270	3111	830	3254	3043	837	3400	3192	504	3457	3196	775	3334	3164	1107
	15.8	3339	2377	898	3543	2458	813	3441	2409	863	3839	2595	718	4543	2944	816	4143	2736	994	3724	1407	1206

(Dry bulb value based on 46% humidity)

CS-E18QKEW/CU-E18QKE

Indoor (°C)		Outdoor DB (°C)																				
DB	WB	-10			-7			0			5			16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	6007	4597	1007	6273	4705	919	5819	4539	1083	6017	4602	998	5916	4602	992	5504	4350	1247	5000	4205	1440
	22.0	6891	3757	880	6600	3589	993	6371	3565	1131	6161	3466	1049	6381	3660	995	5986	3443	1261	5517	2627	1459
23	15.7	5286	4386	1111	5332	4451	1112	5451	4419	1025	5388	4407	1057	5486	4431	992	5093	4257	1223	4576	4052	1520
	18.4	5910	3536	1017	5663	3448	1120	6387	3699	892	5823	3356	1103	5987	3497	994	5598	3314	1236	5037	3119	1548
20	13.3	4654	4157	1102	4426	4022	1216	4485	4037	812	4482	4058	902	4796	4217	830	4770	4212	1222	4219	3897	1494
	15.8	4652	3117	1272	4926	3224	1152	4718	3126	844	5288	3460	774	6408	3890	1346	5716	3605	1569	4713	1733	1627

(Dry bulb value based on 46% humidity)

CS-E21QKEW/CU-E21QKE

Indoor (°C)		Outdoor DB (°C)																				
DB	WB	-10			-7			0			5			16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	6919	4967	1329	7254	5104	1196	6682	4890	1380	7581	5440	1511	7454	5440	1502	6936	5143	1888	6300	4971	2180
	22.0	7287	3728	966	6983	3562	1098	6666	3500	1181	7763	4097	1588	8040	4327	1507	7542	4070	1908	6952	3105	2209
23	15.7	5489	4272	1166	5566	4359	1208	5660	4304	1066	6789	5210	1600	6912	5238	1502	6417	5032	1852	5765	4790	2302
	18.4	6207	3484	1042	5948	3398	1218	6734	3659	897	7337	3967	1670	7544	4133	1505	7054	3917	1872	6347	3687	2344
20	13.3	4760	3989	1155	4518	3852	1433	4550	3842	884	5647	4797	1365	6043	4985	1257	6010	4979	1851	5316	4606	2262
	15.8	5046	3180	1379	5096	3130	1350	4818	2994	925	6662	4090	1172	8073	4599	2037	7202	4262	2375	5938	2048	2463

(Dry bulb value based on 46% humidity)

CS-E24QKEW/CU-E24QKE

Indoor (°C)		Outdoor DB (°C)																				
DB	WB	-10			-7			0			5			16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	8169	5631	1454	8531	5763	1328	7914	5560	1565	8183	5637	1441	8046	5637	1433	7486	5329	1801	6800	5151	2080
	22.0	9371	4603	1271	8976	4396	1435	8665	4367	1634	8380	4246	1515	8678	4484	1437	8140	4217	1821	7504	3218	2107
23	15.7	7189	5372	1604	7252	5452	1607	7414	5413	1481	7328	5399	1526	7461	5428	1433	6926	5215	1767	6223	4963	2196
	18.4	8037	4332	1469	7701	4224	1618	8687	4531	1289	7919	4111	1593	8143	4283	1436	7614	4059	1786	6850	3821	2236
20	13.3	6329	5092	1592	6019	4927	1757	6099	4945	1172	6095	4971	1303	6522	5165	1199	6487	5159	1766	5738	4773	2158
	15.8	6312	3819	1838	6699	3950	1664	6416	3829	1219	7191	4239	1119	8714	4765	1944	7774	4416	2266	6410	2122	2350

(Dry bulb value based on 46% humidity)

CS-E28QKEW/CU-E28QKE

Indoor (°C)		Outdoor DB (°C)																			
DB	WB	-10			-7			0			5			16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	9191	6255	1762	9598	6402	1608	8904	6177	1896	9206	6262	1746	9052	6262	1736	8422	5920	2182	7650	5722	2520
	22.0	10543	5113	1539	10099	4883	1738	9748	4852	1979	9427	4716	1835	9763	4981	1742	9158	4685	2206	8442	3575	2553
23	15.7	8088	5968	1944	8158	6056	1946	8340	6014	1794	8244	5997	1849	8393	6030	1736	7792	5793	2141	7001	5514	2661
	18.4	9042	4812	1779	8664	4692	1960	9772	5034	1562	8909	4567	1930	9161	4758	1740	8565	4509	2164	7707	4245	2709
20	13.3	7120	5657	1928	6772	5473	2129	6862	5494	1420	6857	5522	1578	7337	5738	1453	7298	5732	2139	6455	5303	2614
	15.8	7102	4242	2226	7536	4388	2016	7218	4254	1477	8090	4709	1355	9804	5294	2355	8746	4906	2746	7211	2358	2848

(Dry bulb value based on 46% humidity)

19.2 Heat Mode Performance Data

Unit setting: Standard piping length, Hi Fan, Heat mode at 30°C
Voltage: 230V

19.2.1 CS- E7QKEW/CU-E7QKE

Indoor (°C)	Outdoor WB (°C)									
DB	-10		-7		2		7		12	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24	1617	784	2226	893	2819	897	2811	630	3052	649
20	1704	773	2380	890	2900	880	2800	625	3226	635
16	1376	754	2445	881	3137	887	3005	641	3148	624

19.2.2 CS- E9QKEW/CU-E9QKE

Indoor (°C)	Outdoor WB (°C)									
DB	-10		-7		2		7		12	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24	2272	1020	2759	1154	3519	1142	3414	726	3707	747
20	2394	1006	2950	1150	3620	1120	3400	720	3918	731
16	1933	981	3031	1138	3916	1129	3649	739	3822	719

19.2.3 CS- E12QKEW/CU-E12QKE

Indoor (°C)	Outdoor WB (°C)									
DB	-10		-7		2		7		12	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24	2683	1192	3439	1455	4406	1481	3897	888	4289	946
20	2762	1149	3450	1400	4470	1420	4000	840	4460	908
16	2579	1098	3480	1338	4518	1360	4099	794	4579	860

19.2.4 CS- E15QKEW/CU-E15QKE

Indoor (°C)	Outdoor WB (°C)									
DB	-10		-7		2		7		12	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24	3011	1466	4097	1777	4859	1774	5163	1501	5683	1600
20	3100	1413	4110	1710	4930	1700	5300	1420	5909	1535
16	2895	1350	4146	1635	4983	1628	5432	1342	6068	1454

19.2.5 CS- E18QKEW/CU-E18QKE

Indoor (°C)	Outdoor WB (°C)									
DB	-10		-7		2		7		12	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24	3760	1916	4965	2484	5717	2368	5650	1607	6219	1712
20	3871	1846	4980	2390	5800	2270	5800	1520	6466	1643
16	3615	1764	5023	2285	5862	2174	5944	1437	6640	1556

19.2.6 CS- E21QKEW/CU-E21QKE

Indoor (°C)	Outdoor WB (°C)									
DB	-10		-7		2		7		12	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24	3963	2113	5224	2619	6072	2525	7014	2209	7720	2355
20	4080	2036	5240	2520	6160	2420	7200	2090	8027	2259
16	3810	1946	5285	2409	6226	2318	7379	1976	8243	2139

19.2.7 CS- E24QKEW/CU-E24QKE

Indoor (°C)	Outdoor WB (°C)									
DB	-10		-7		2		7		12	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24	4734	2320	6111	2868	7067	2858	8378	2727	9221	2907
20	4873	2236	6130	2760	7170	2740	8600	2580	9588	2789
16	4550	2137	6183	2638	7247	2624	8814	2439	9845	2641

19.2.8 CS- E28QKEW/CU-E28QKE

Indoor (°C)	Outdoor WB (°C)									
DB	-15/-10		-7		2		7		12	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24	5459	3122	6749	3492	7856	3370	9352	3425	10293	3650
20	5620	3009	6770	3360	7970	3230	9600	3240	10703	3503
16	5248	2876	6829	3212	8056	3093	9838	3063	10990	3317

TC - Total Cooling Capacity (kW)
SHC - Sensible Heat Capacity (kW)
IP - Input Power (kW)

20. Service Data

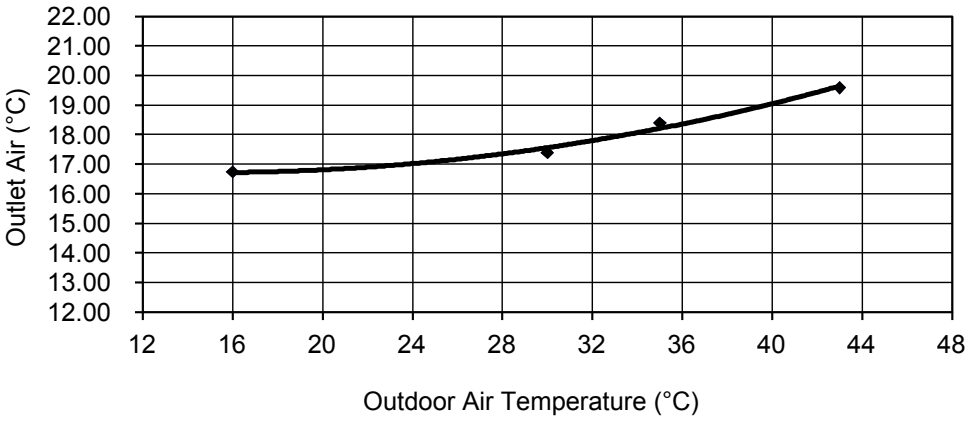
Service data provided are based on the air conditioner running under rated frequency during forced cooling / forced heating mode.

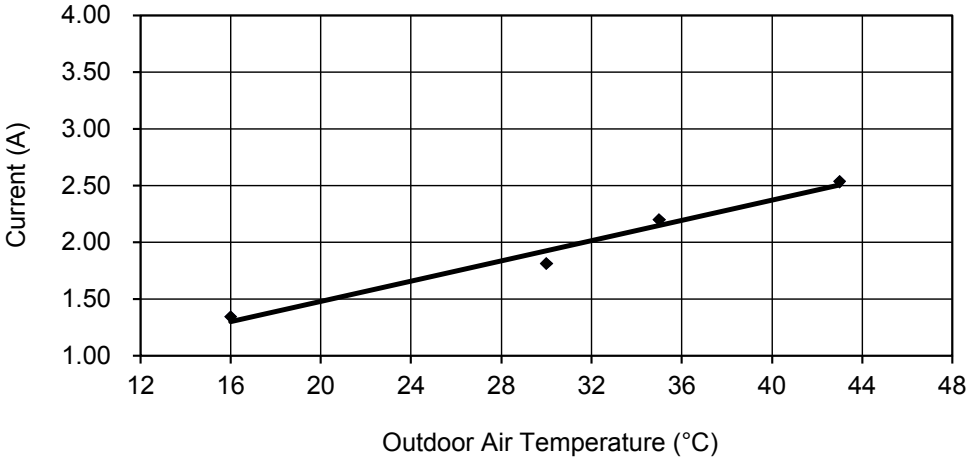
20.1 Cool Mode Outdoor Air Temperature Characteristic

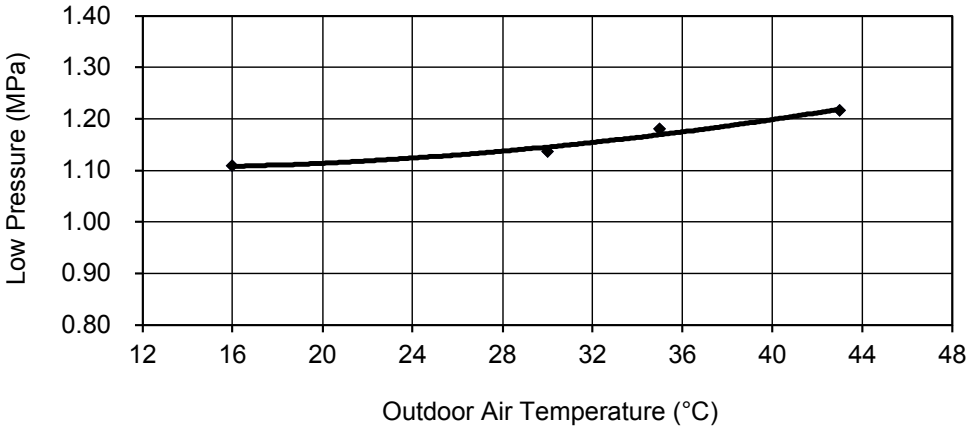
Condition

- Indoor room temperature: 27°C DryBulb/19°C Wet Bulb
- Unit setting: Standard piping length, forced cooling at 16°C, Hi fan
- Compressor frequency: Rated for cooling operation
- Piping length: 5m
- Voltage: 230V

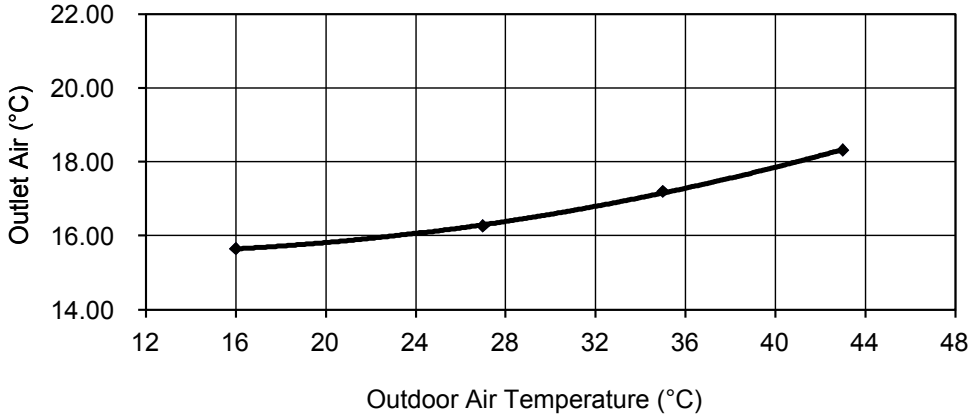
20.1.1 CS/CU-E7QKE

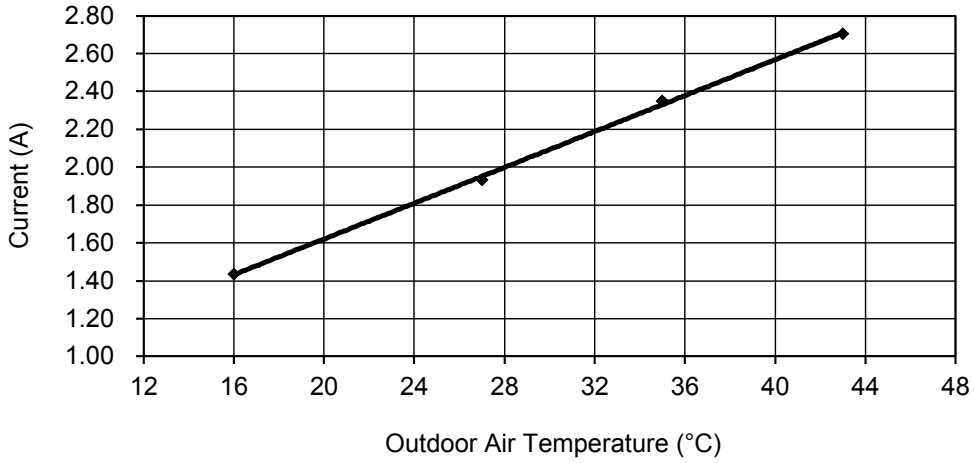


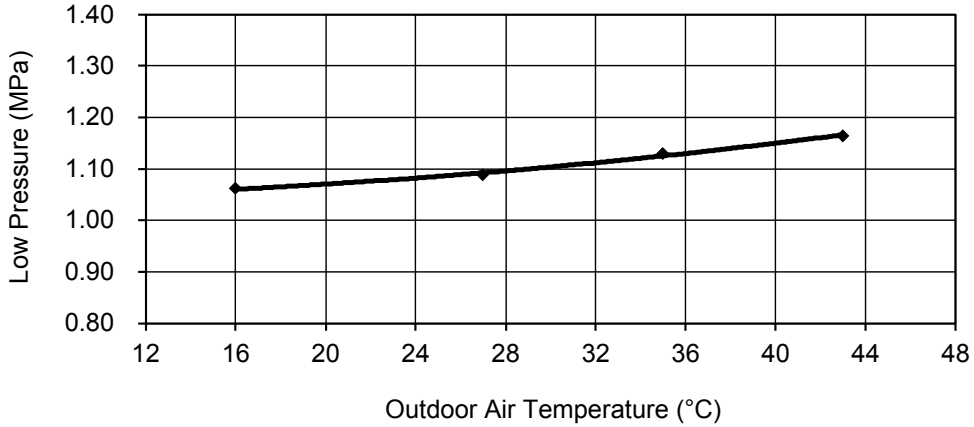




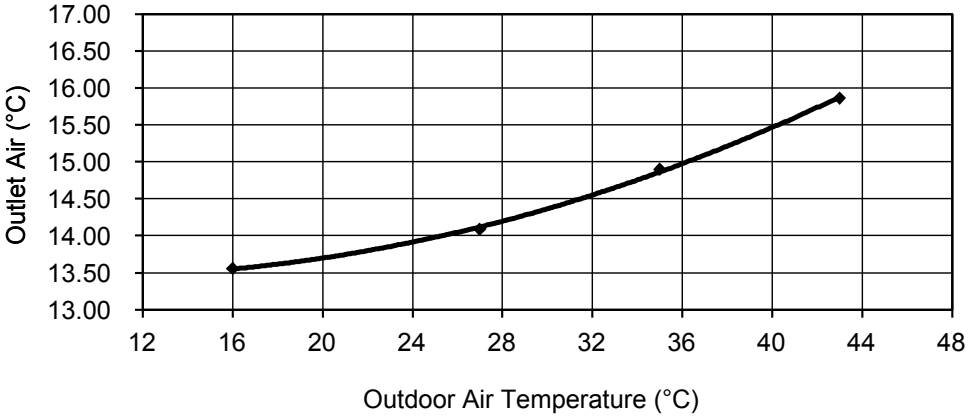
20.1.2 CS/CU-E9QKE

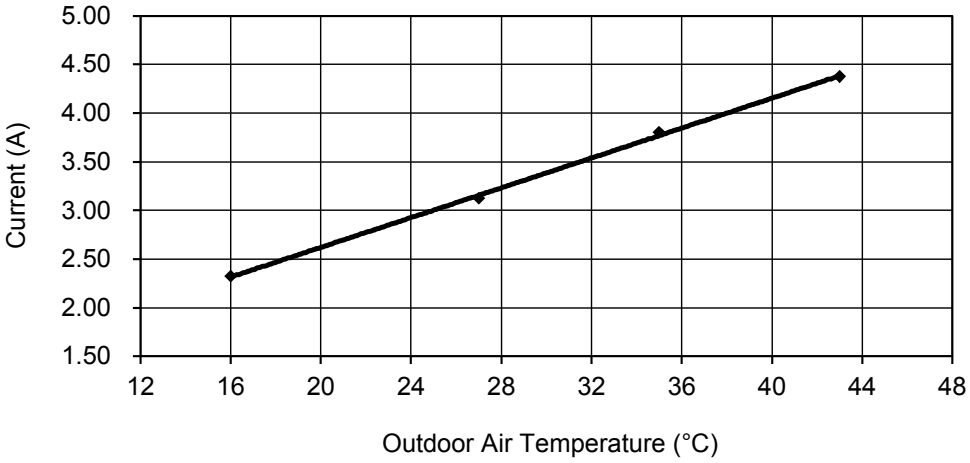


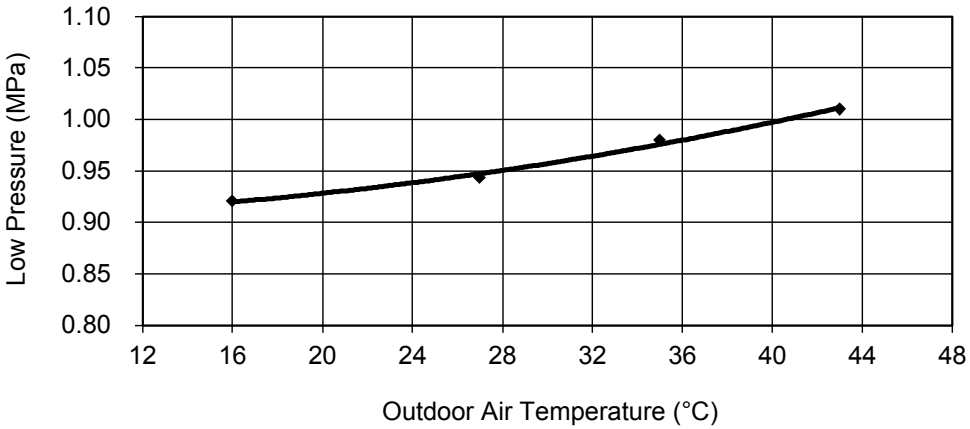




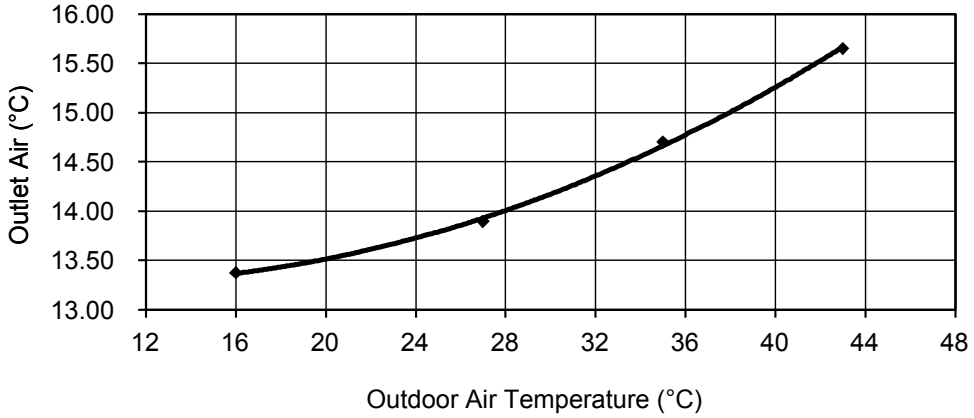
20.1.3 CS/CU-E12QKE

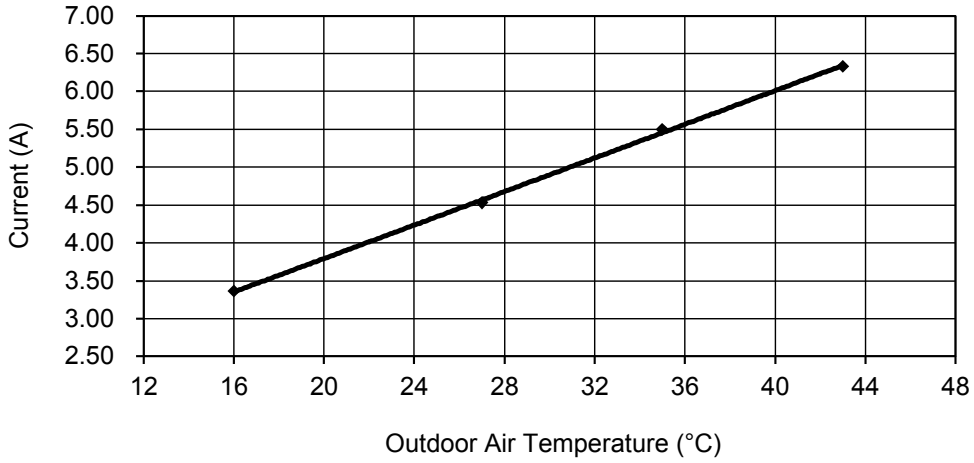


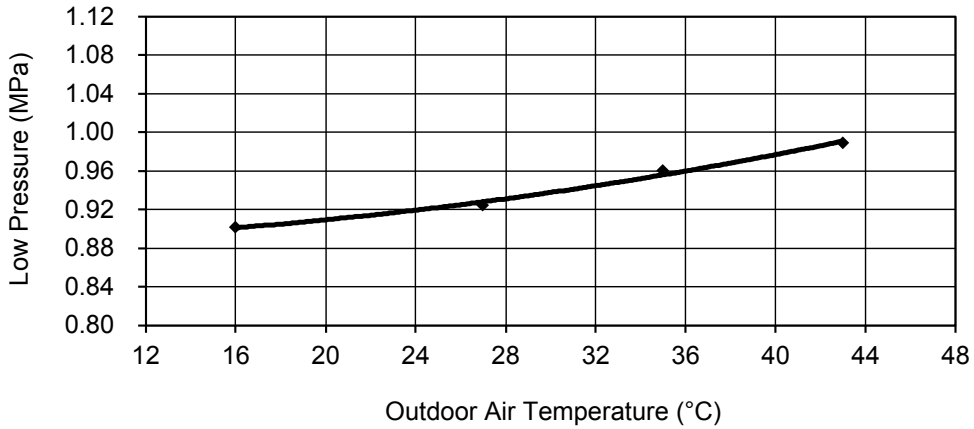




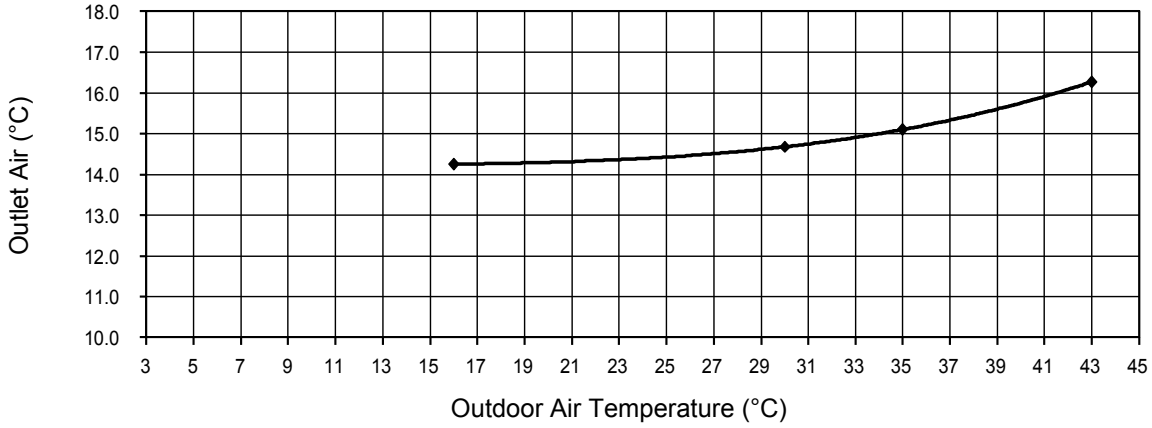
20.1.4 CS/CU-E15QKE

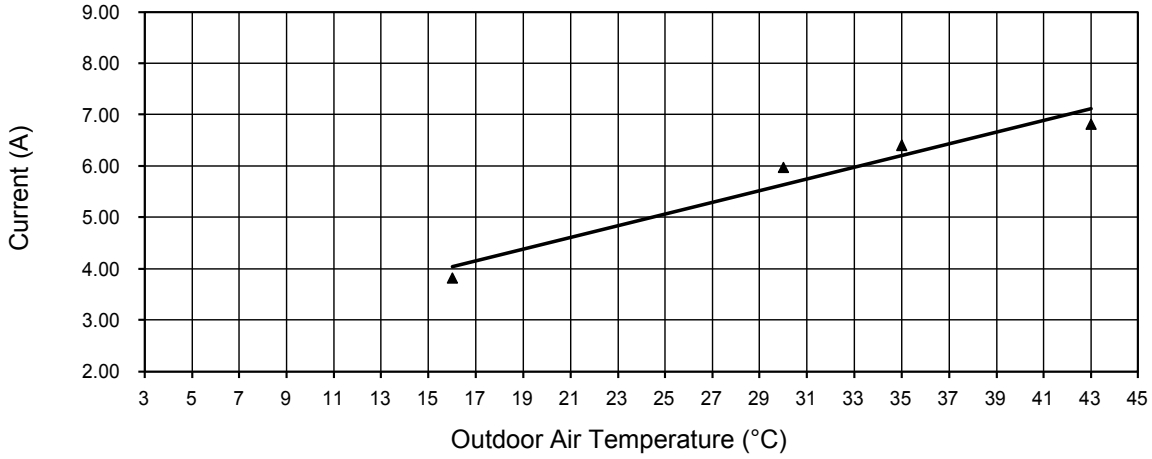


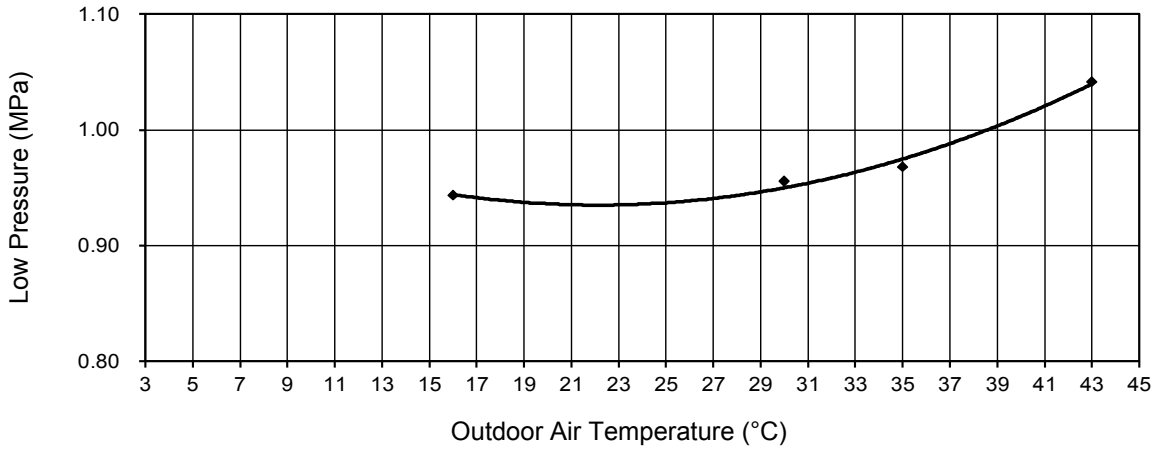




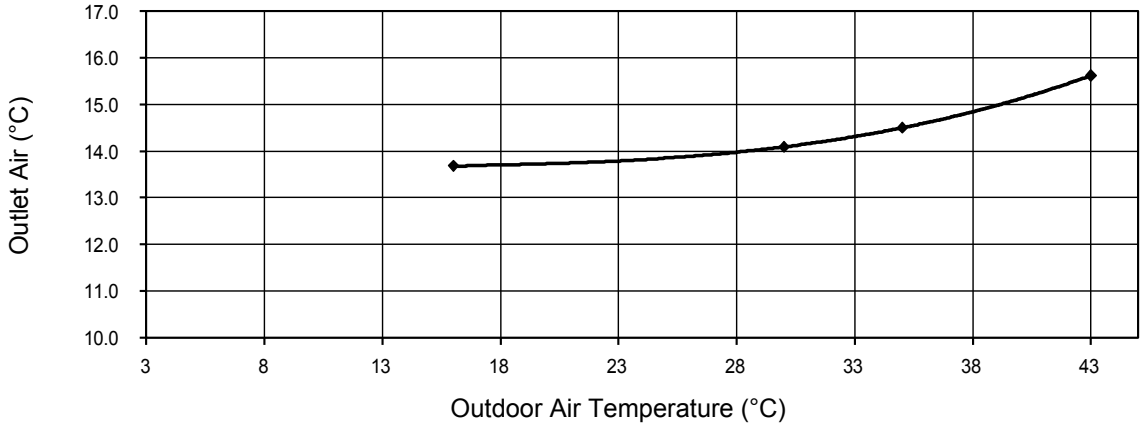
20.1.5 CS/CU-E18QKE

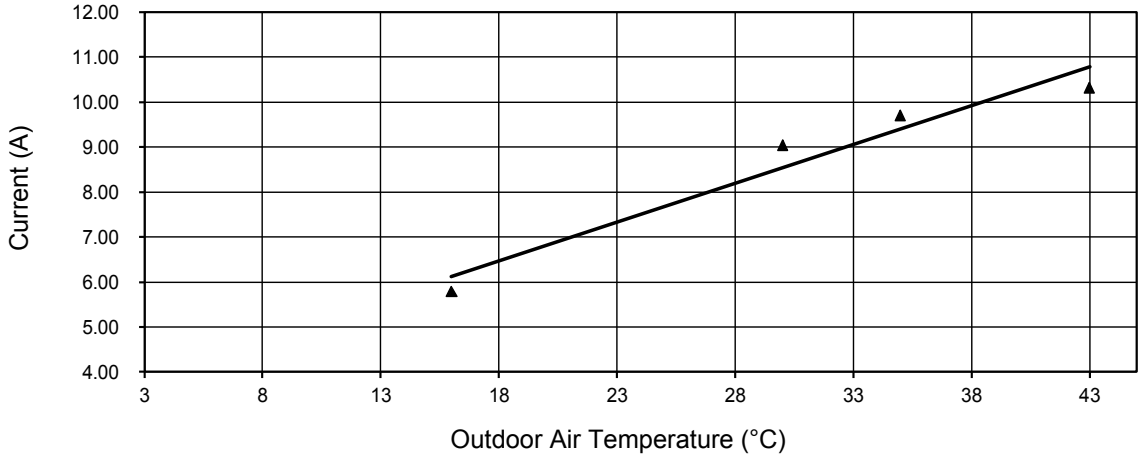


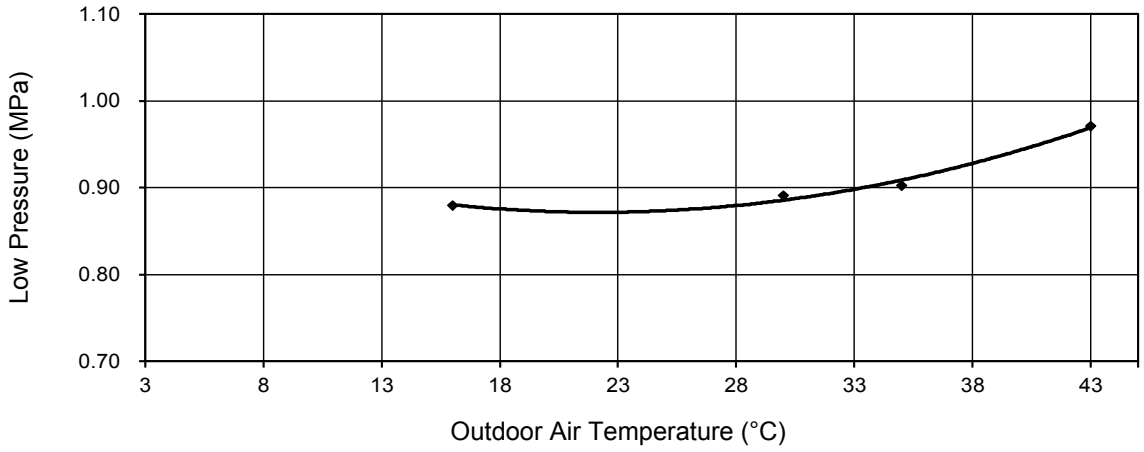




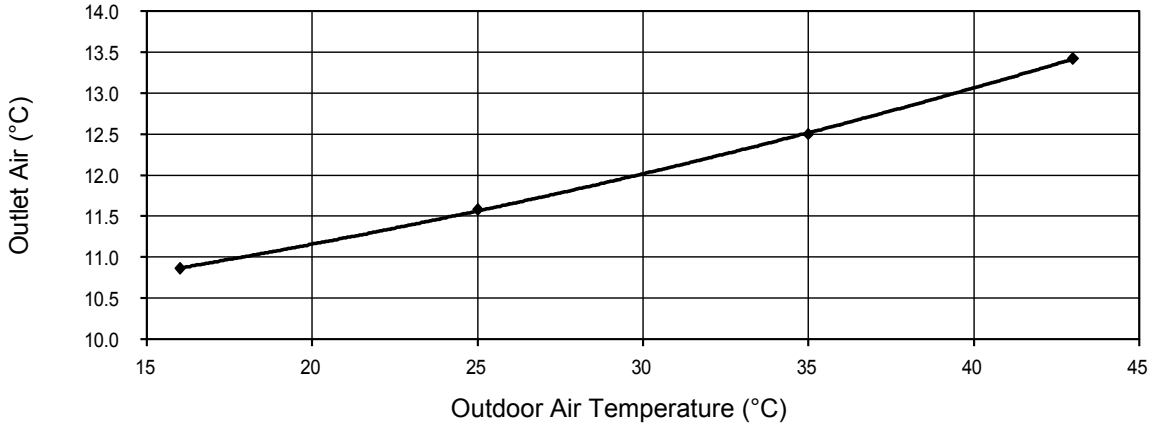
20.1.6 CS/CU-E21QKE

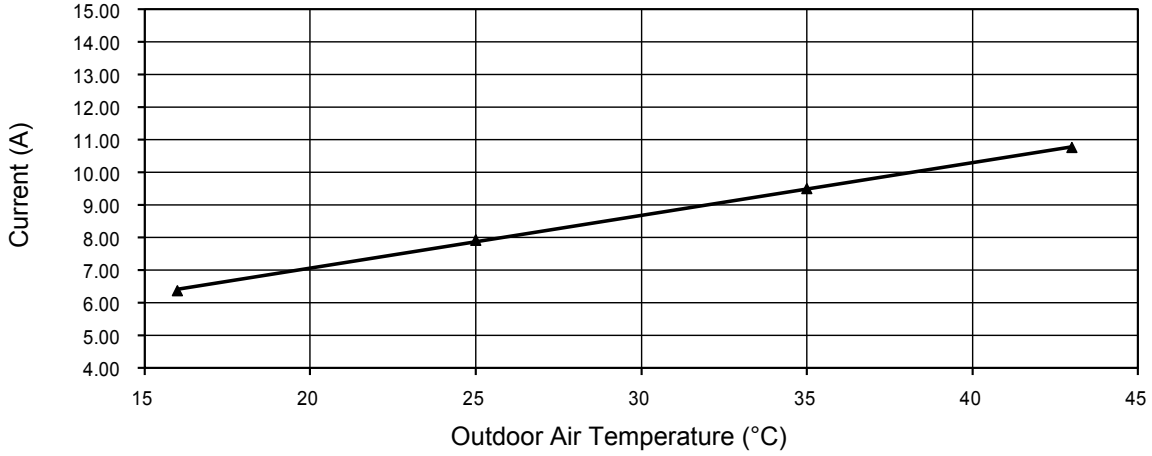


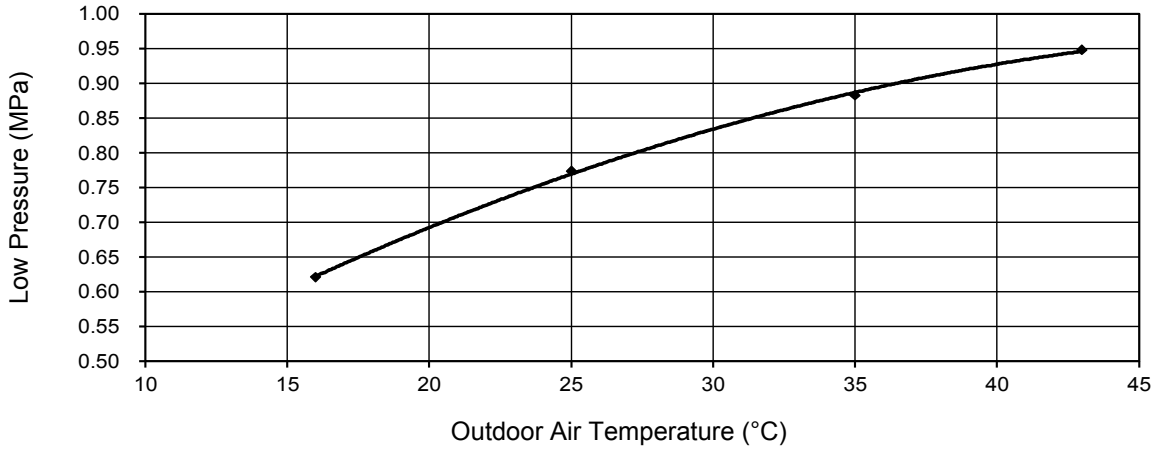




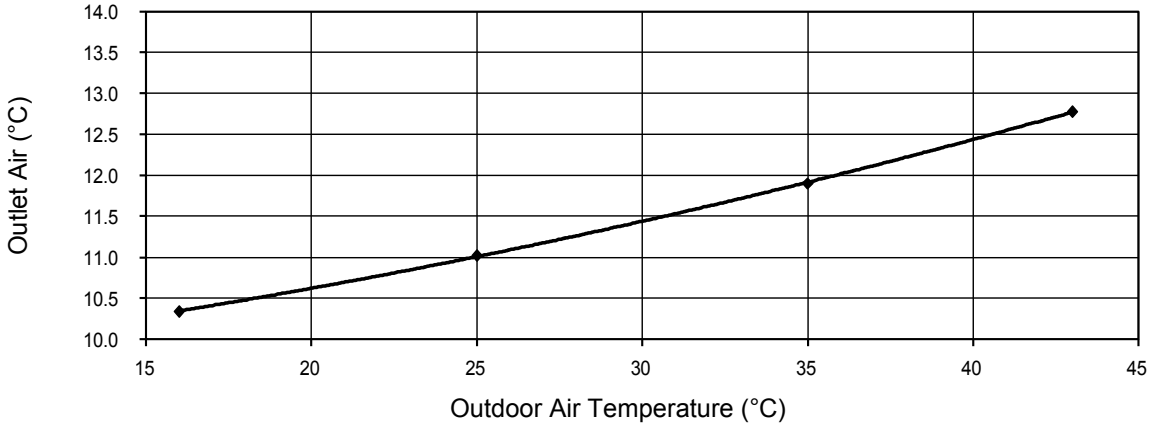
20.1.7 CS/CU-E24QKE

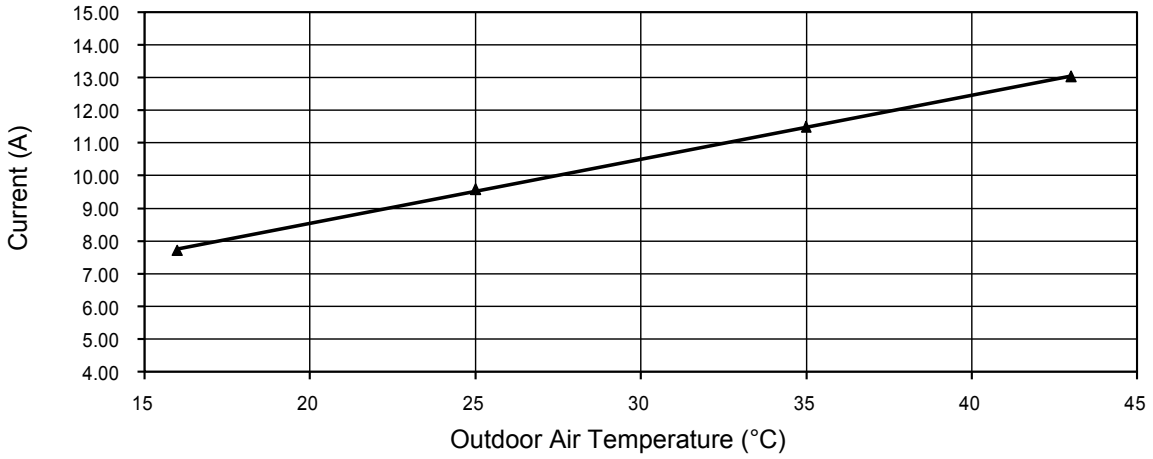


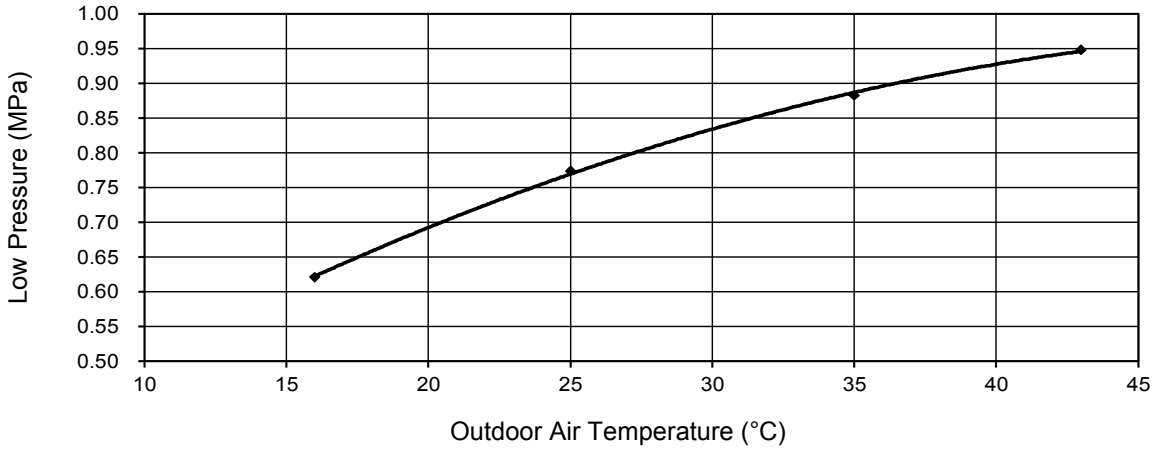




20.1.8 CS/CU-E28QKE





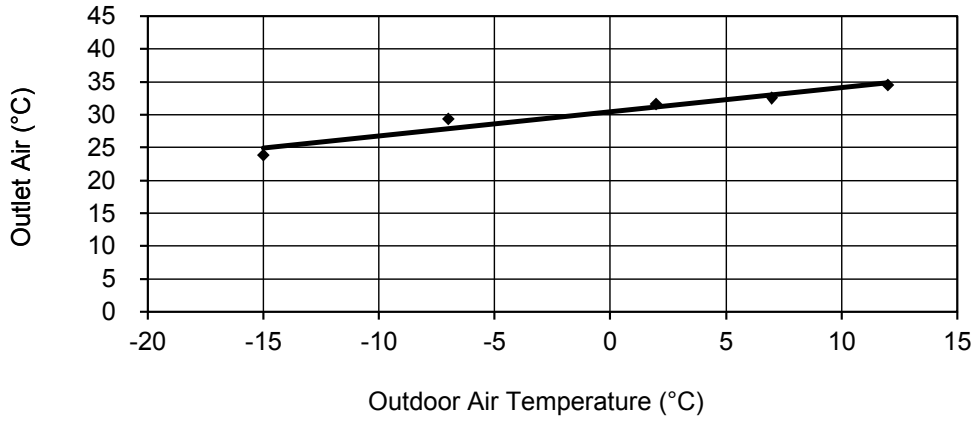


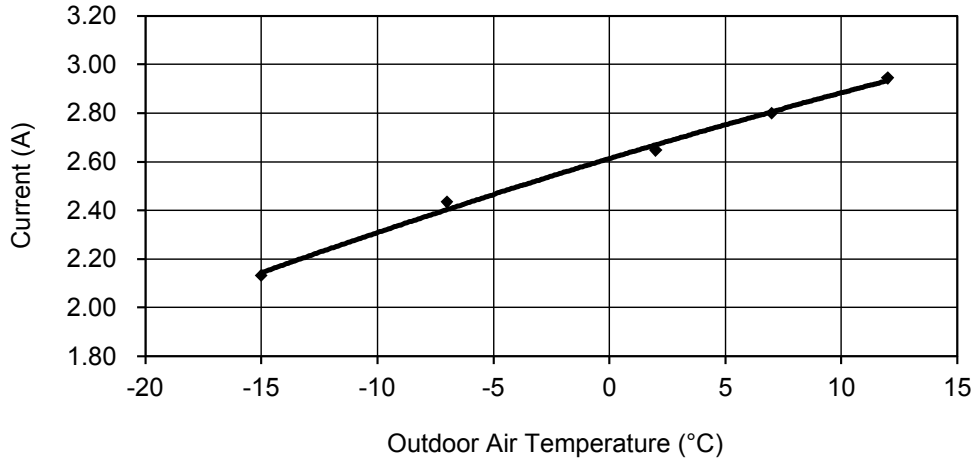
20.2 Heat Mode Outdoor Air Temperature Characteristic

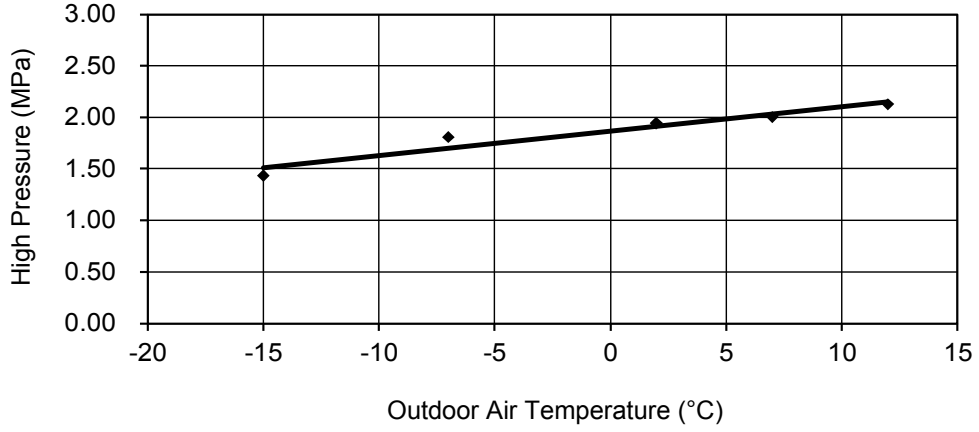
Condition

- Indoor room temperature: 20°C DryBulb/ -°C Wet Bulb
- Unit setting: Standard piping length, forced heating at 30°C, Hi fan
- Compressor frequency: Rated for Heating operation
- Piping length: 5m
- Voltage: 230V

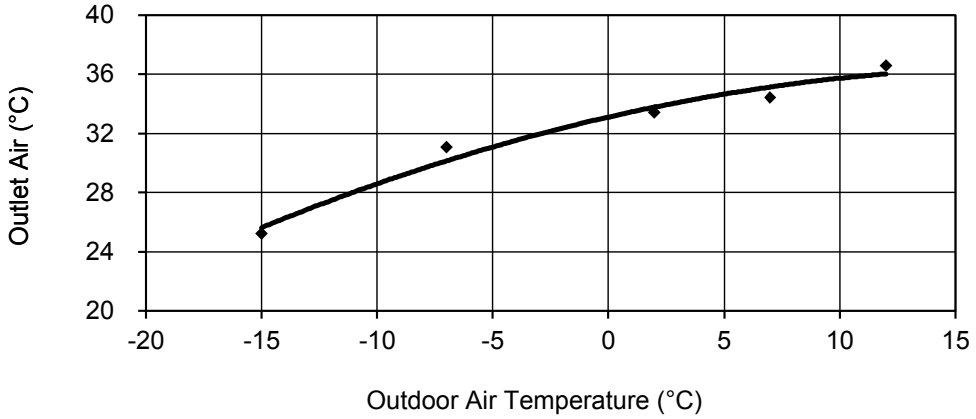
20.2.1 CS/CU-E7QKE

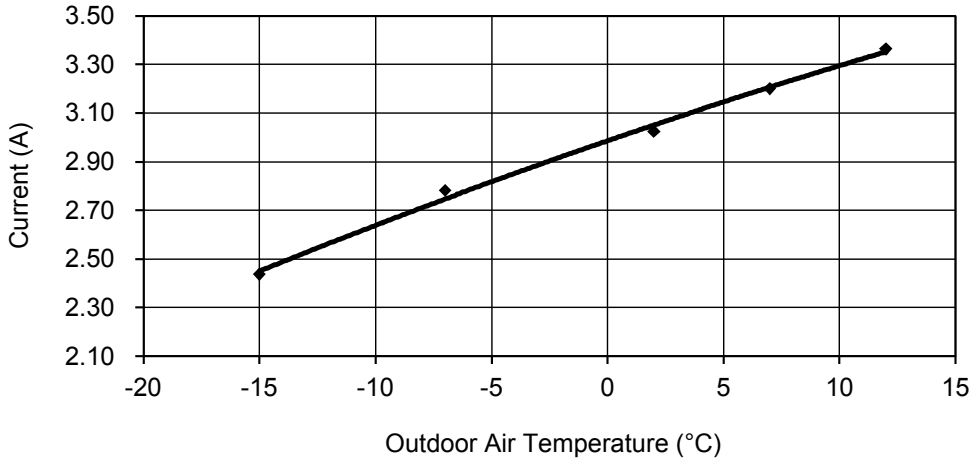


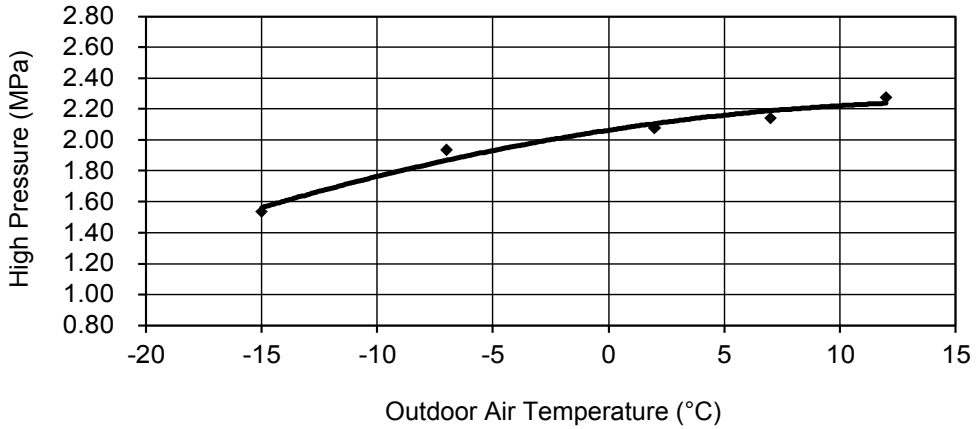




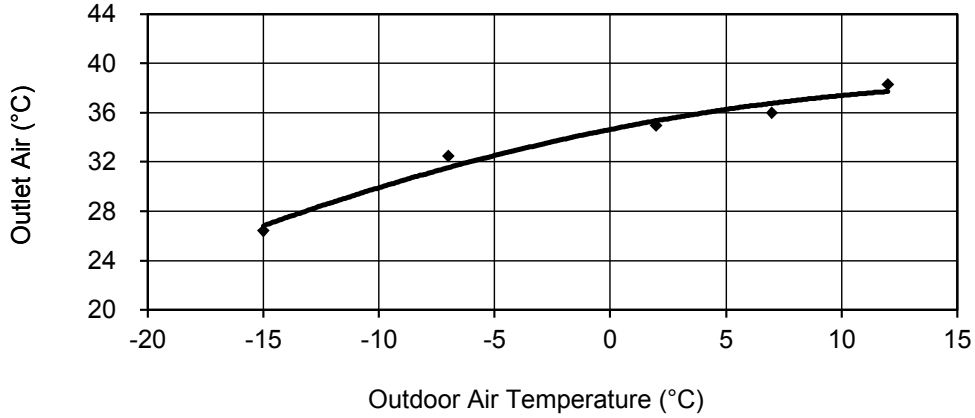
20.2.2 CS/CU-E9QKE

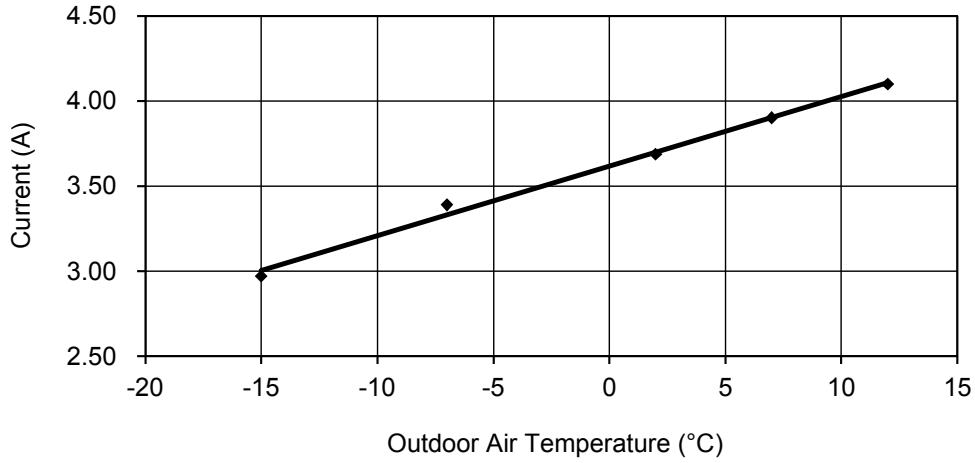


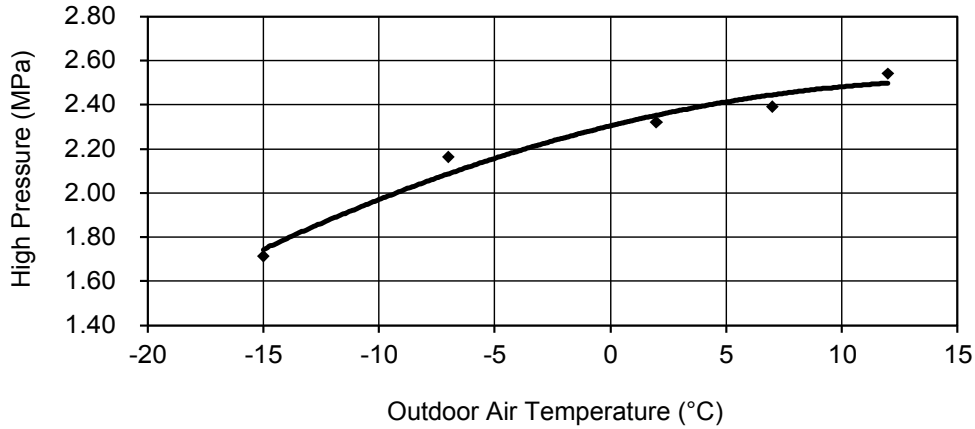




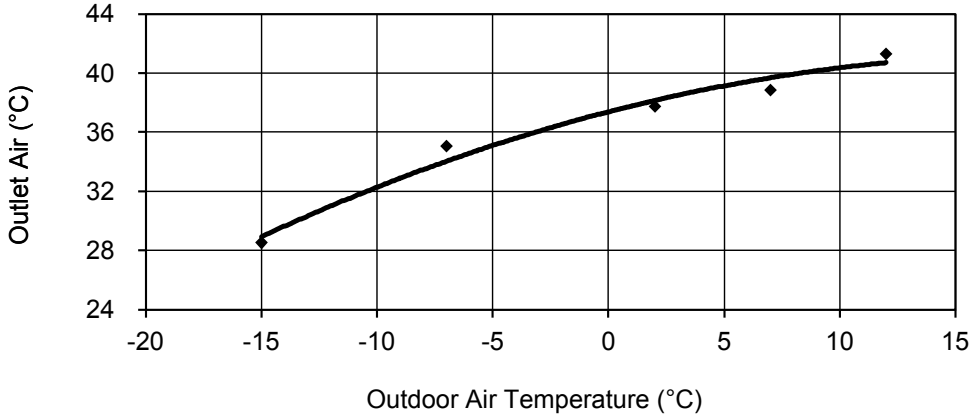
20.2.3 CS/CU-E12QKE

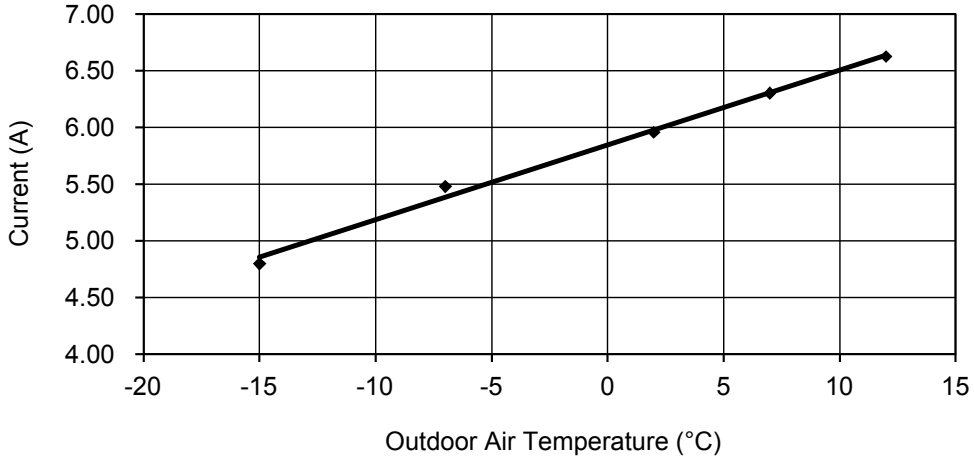


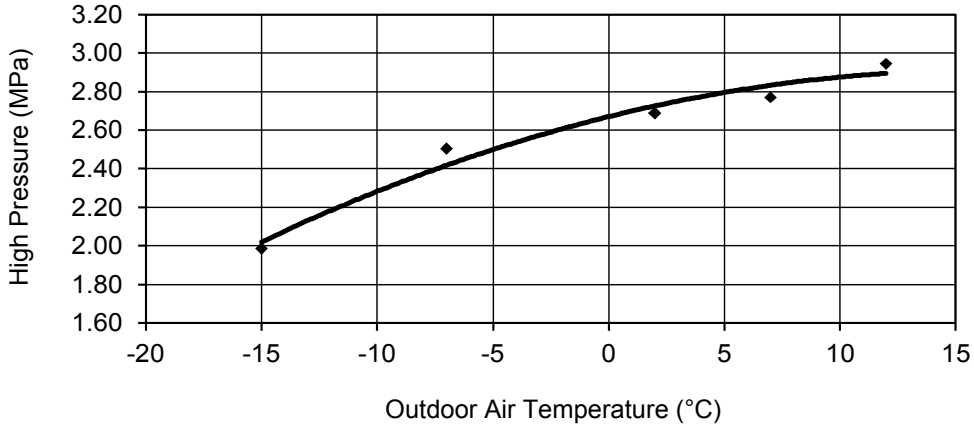




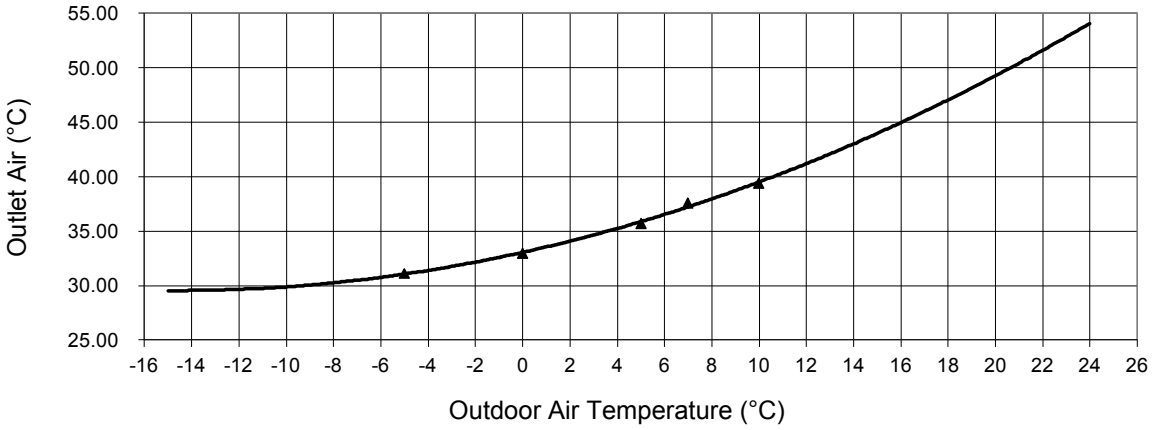
20.2.4 CS/CU-E15QKE

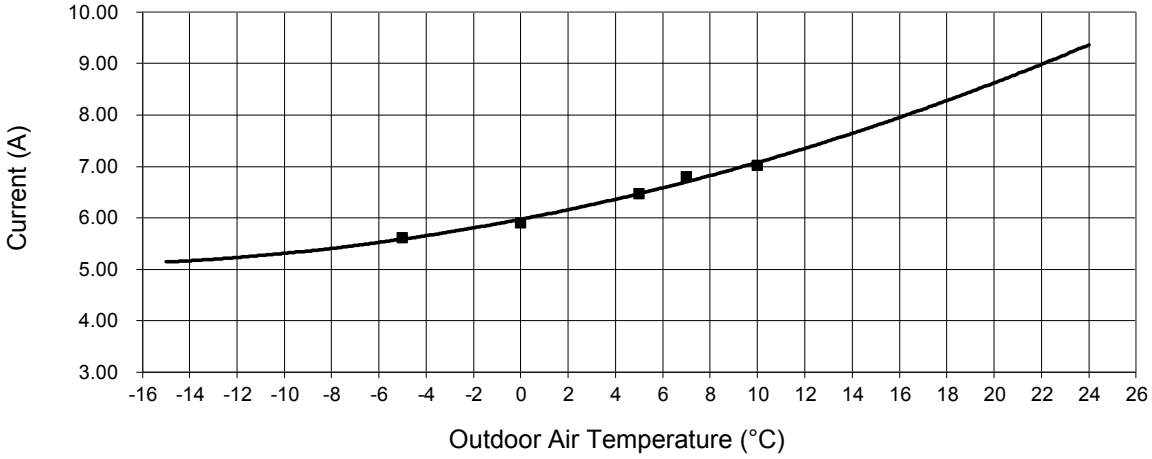


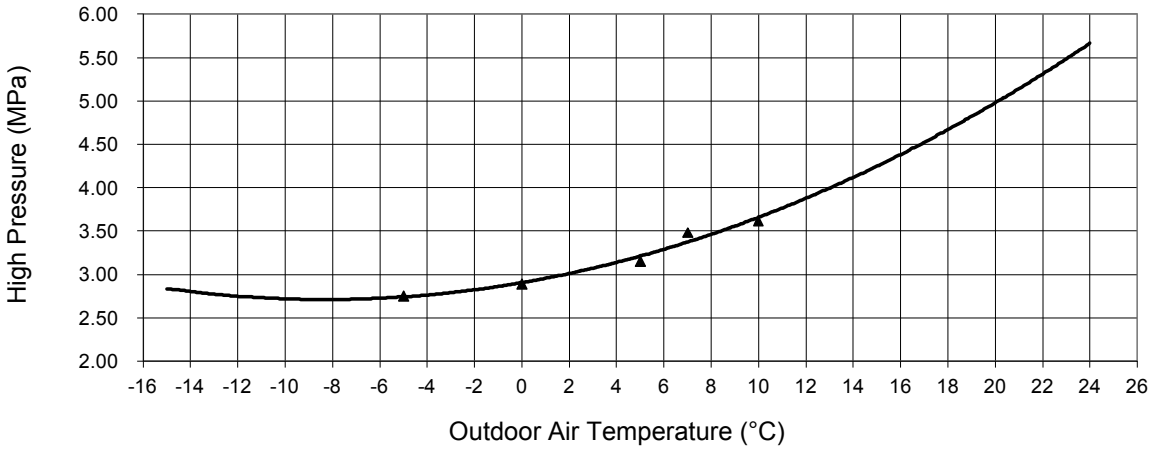




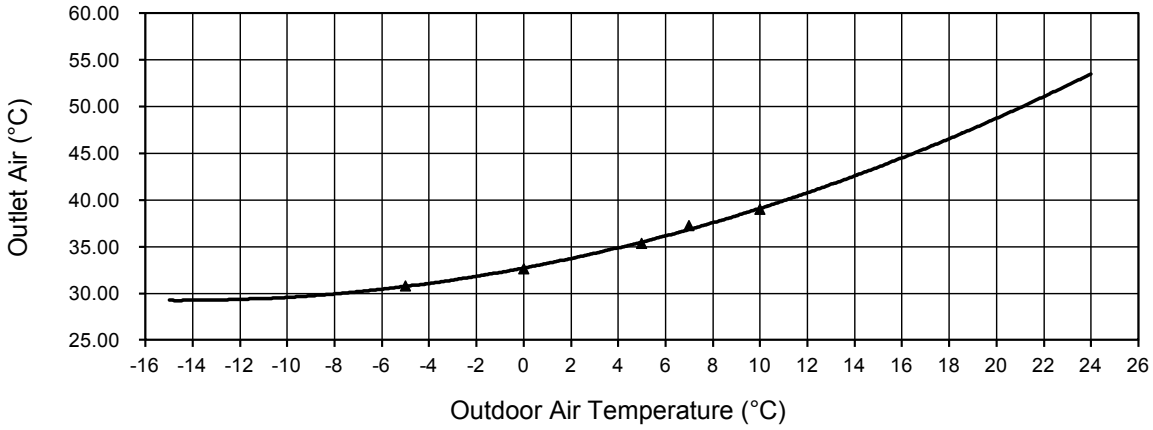
20.2.5 CS/CU-E18QKE

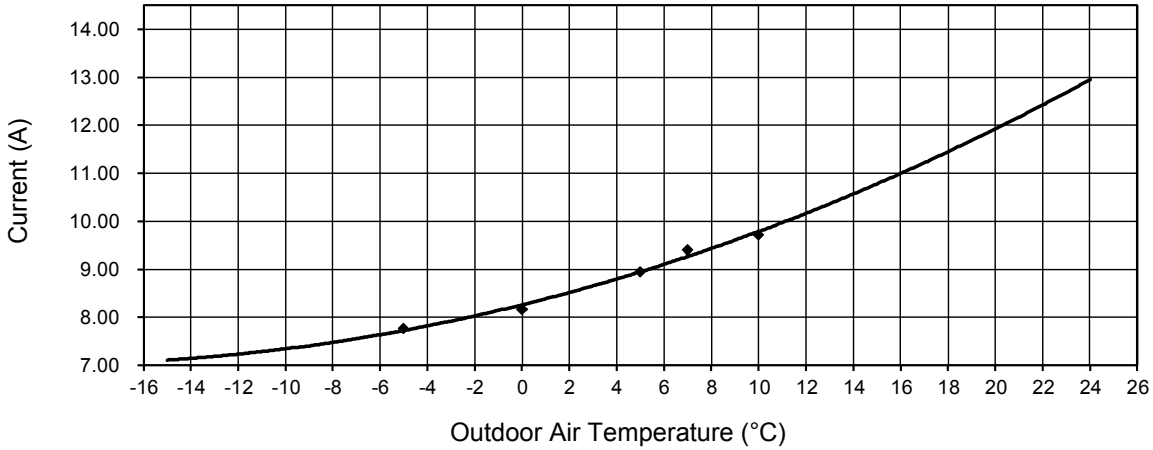


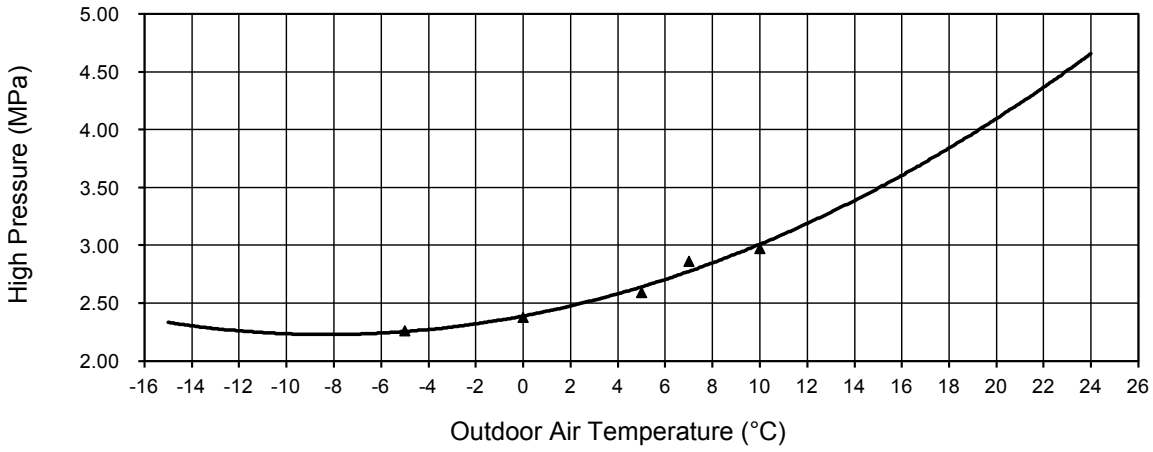




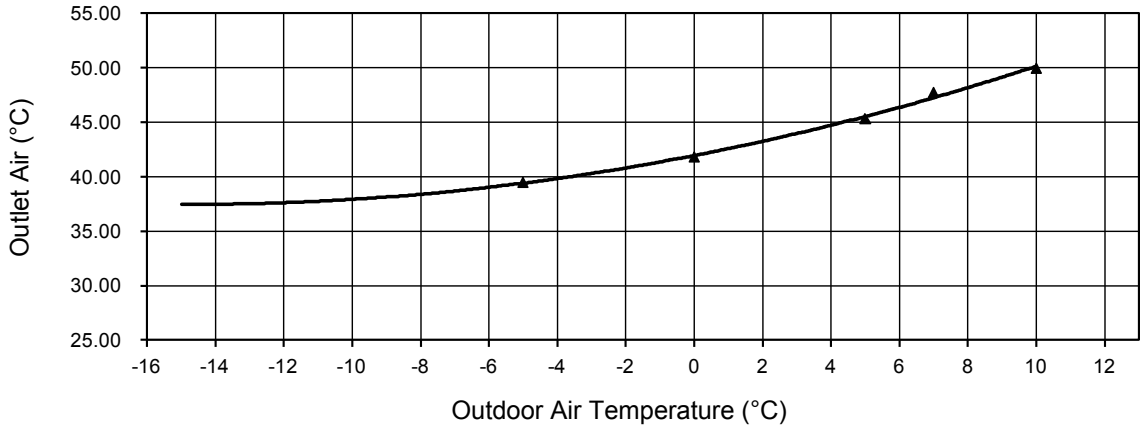
20.2.6 CS/CU-E21QKE

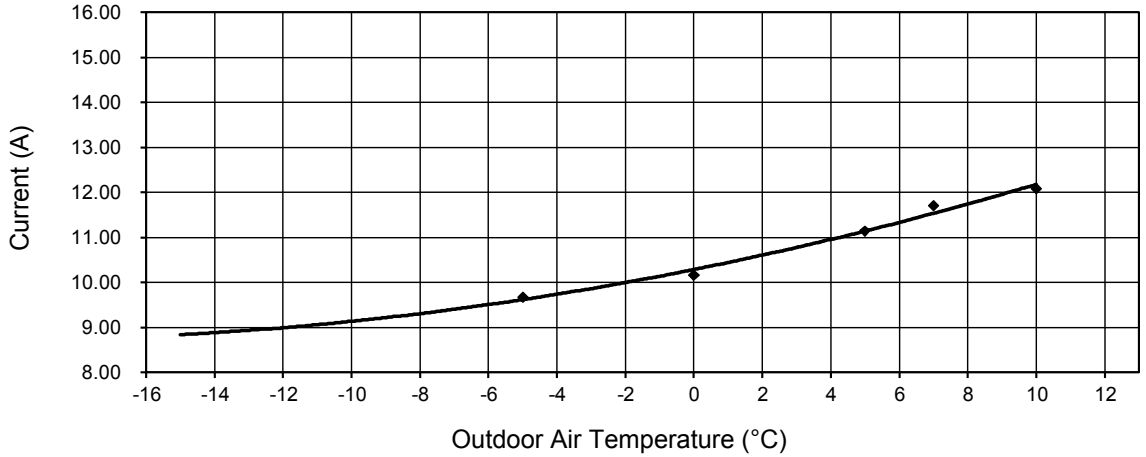


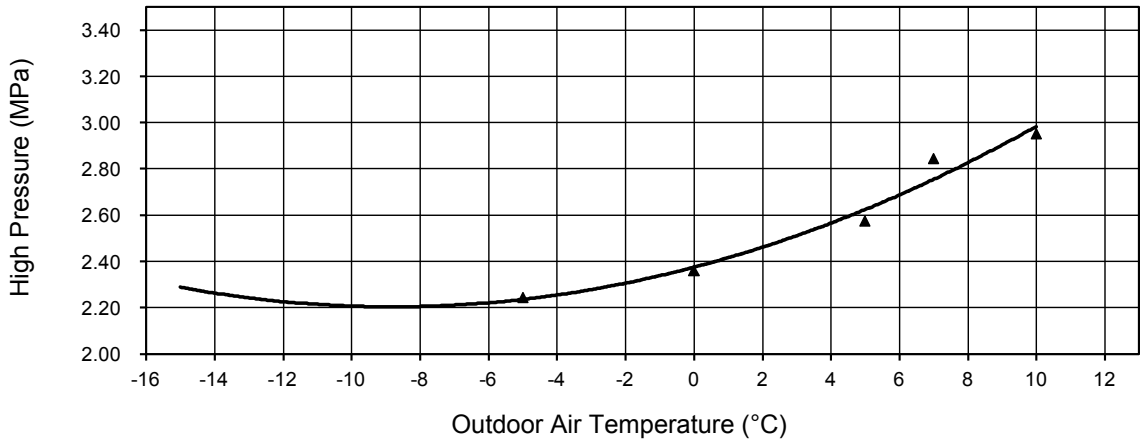




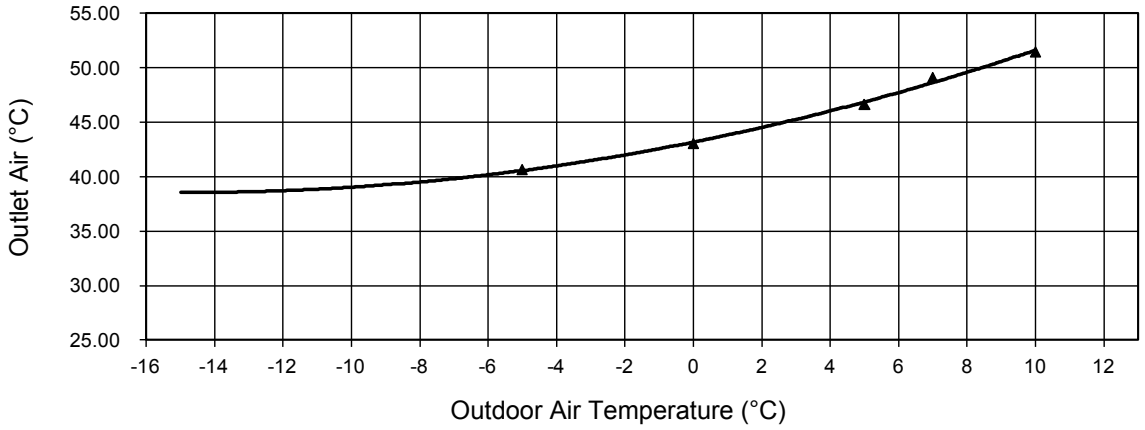
20.2.7 CS/CU-E24QKE

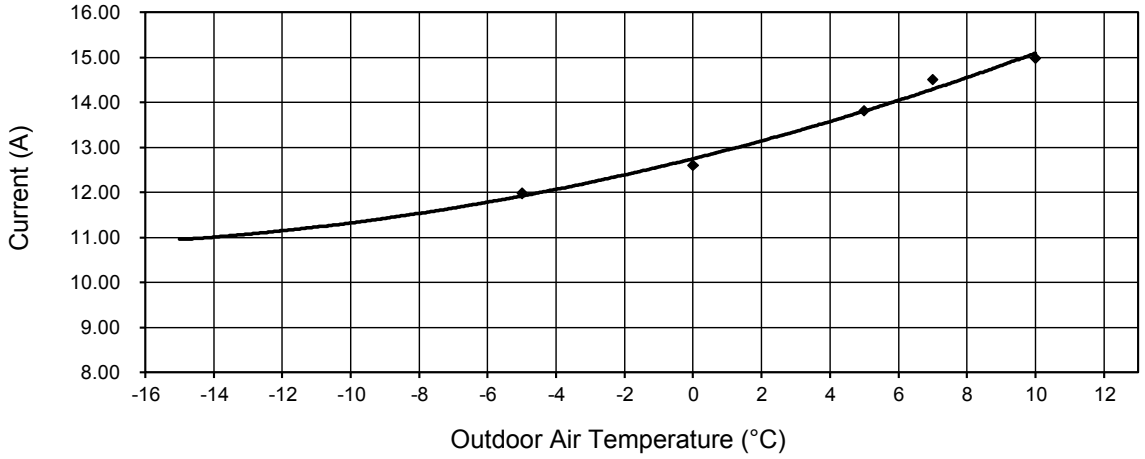


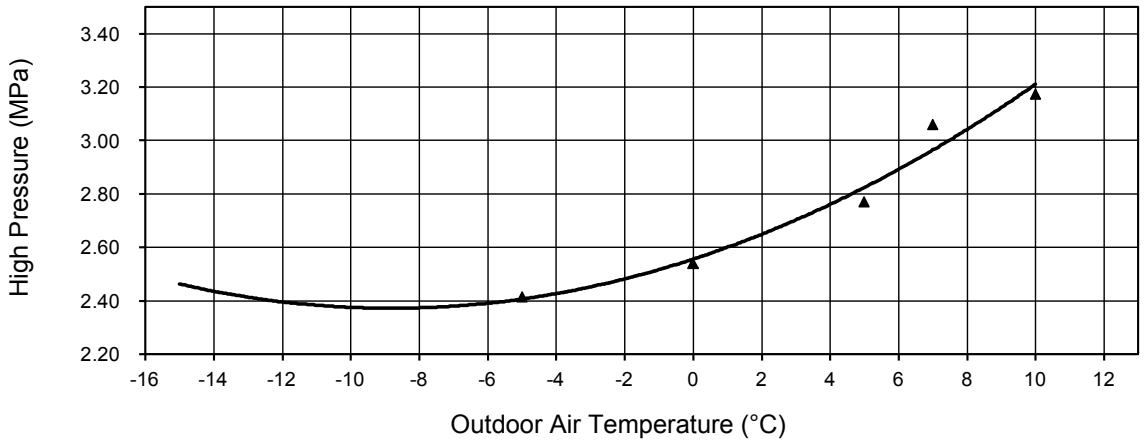




20.2.8 CS/CU-E28QKE



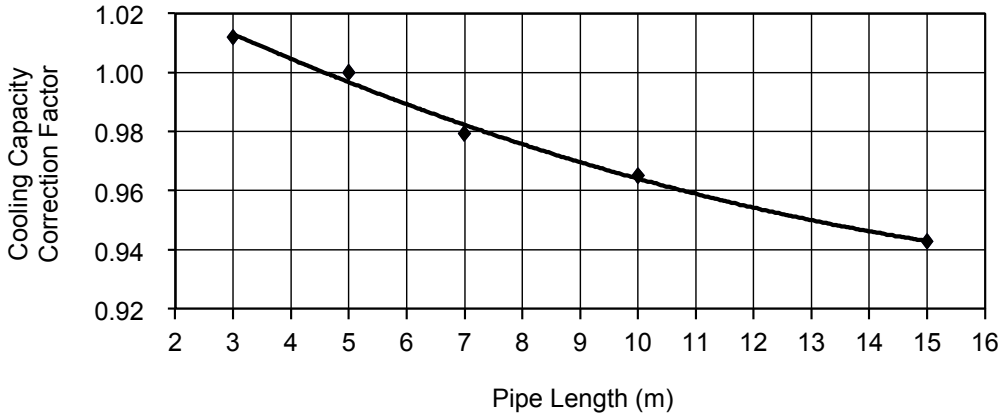


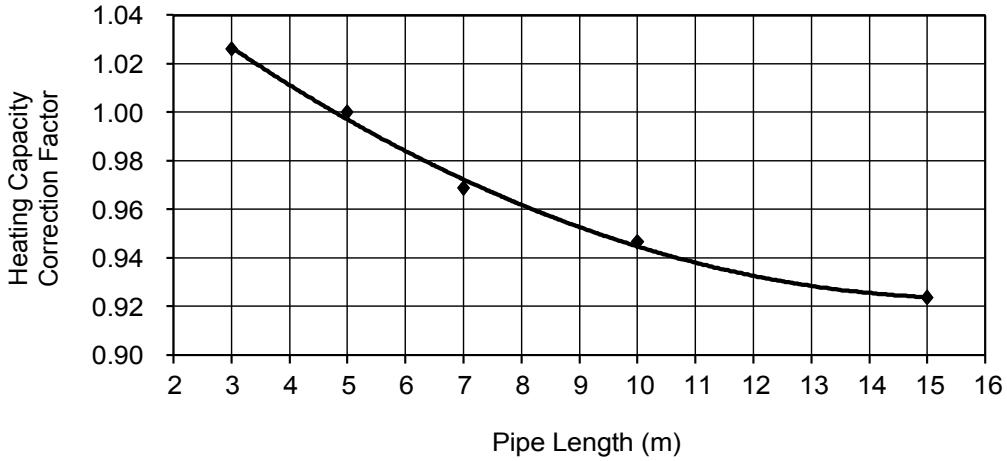


20.3 Piping Length Correction Factor

The characteristic of the unit has to be corrected in accordance with the piping length.

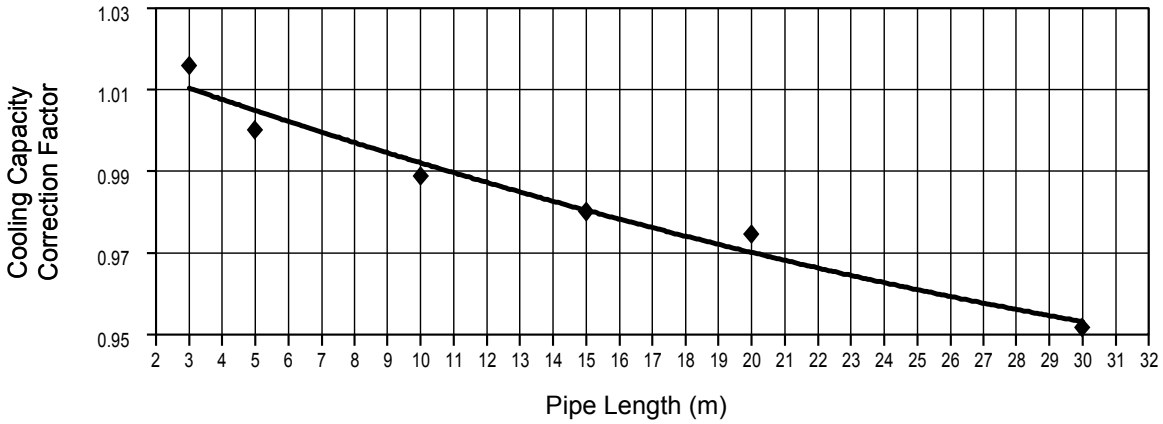
20.3.1 CS/CU-E7QKE CS/CU-E9QKE CS/CU-E12QKE CS/CU-E15QKE

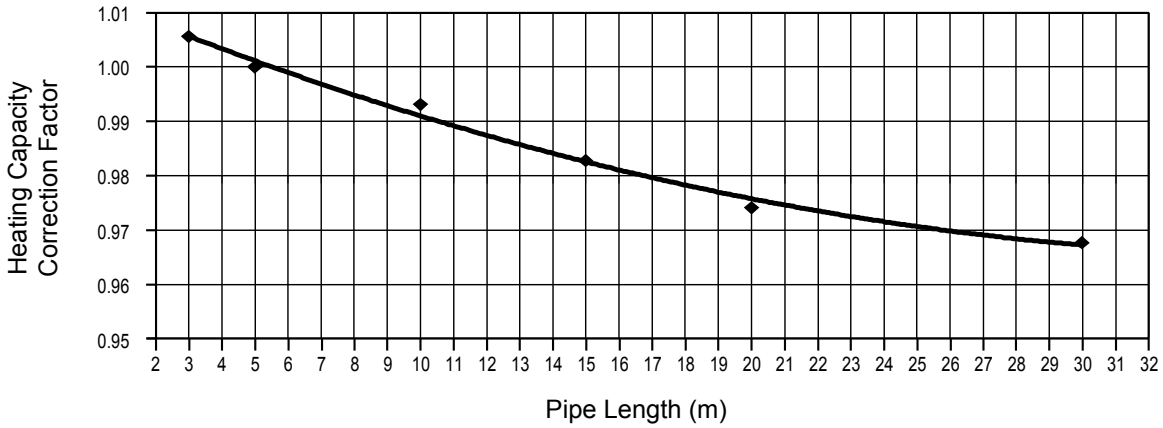




Note: The graphs show the factor after added right amount of additional refrigerant.

20.3.2 CS/CU-E18QKE CS/CU-E21QKE CS/CU-E24QKE CS/CU-E28QKE



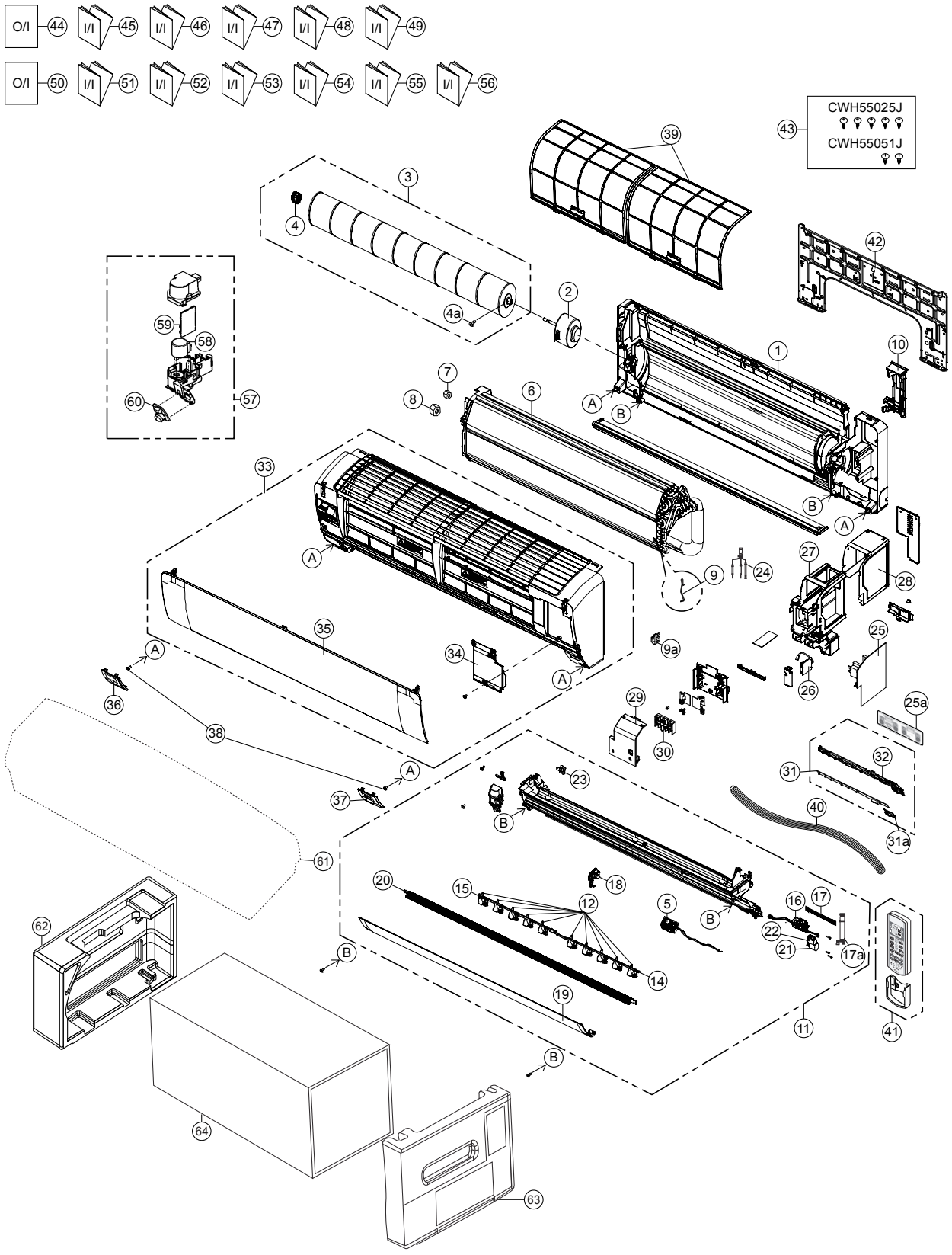


Note: The graphs show the factor after added right amount of additional refrigerant.

21. Exploded View and Replacement Parts List

21.1 Indoor Unit

21.1.1 CS-E7QKEW CS-E9QKEW CS-E12QKEW CS-E15QKEW CS-XE7QKEW CS-XE9QKEW CS-XE12QKEW



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-E7QKEW	CS-E9QKEW	CS-E12QKEW	CS-E15QKEW	REMARK
	1	CHASSIS COMPLETE	1	CWD50C1832	←	←	←	
⚠	2	FAN MOTOR	1	ARW7667AC	←	ARW7676AC	ARW7667AC	O
	3	CROSS-FLOW FAN COMPLETE	1	CWH02C1137	←	←	←	
	4	BEARING ASSY	1	CWH64K1010	←	←	←	
	4a	SCREW - CROSS-FLOW FAN	1	CWH551146	←	←	←	
	5	GENERATOR COMPLETE	1	CWH94C0048	←	←	←	
	6	EVAPORATOR	1	CWB30C4257	CWB30C4542	←	CWB30C4650	
	7	FLARE NUT (LIQUID)	1	CWT251030	←	←	←	
	8	FLARE NUT (GAS)	1	CWT251031	←	←	CWT251032	
	9	CLIP FOR SENSOR	2	CWH711019	←	←	←	
	10	BACK COVER CHASSIS	1	CWD933463	←	←	←	
	11	DISCHARGE GRILLE COMPLETE	1	CWE20C3307	←	←	←	
	12	VERTICAL VANE	10	CWE241389	←	←	←	
	14	CONNECTING BAR	1	CWE261261	←	←	←	
	15	CONNECTING BAR	1	CWE261262	←	←	←	
⚠	16	AIR SWING MOTOR	1	CWA98K1020	←	←	←	O
	17	LEAD WIRE - COMPLETE (ECO)	1	CWA68C0784	←	←	←	
	17a	LEAD WIRE - COMPLETE	1	CWA68C0786	←	←	←	
	18	FULCRUM	1	CWH621157	←	←	←	
	19	HORIZONTAL VANE COMPLETE	1	CWE24C1422	←	←	←	
	20	HORIZONTAL VANE COMPLETE	1	CWE24C1421	←	←	←	
⚠	21	AIR SWING MOTOR	1	CWA981241	←	←	←	O
⚠	22	AIR SWING MOTOR	1	CWA981299	←	←	←	O
	23	CAP - DRAIN TRAY	1	CWH521259	←	←	←	
	24	SENSOR COMPLETE	1	CWA50C2663	←	←	←	O
⚠	25	ELECTRONIC CONTROLLER - MAIN	1	CWA73C8101	CWA73C8102	CWA73C8103	CWA73C8104	O
⚠	25a	ELECTRONIC CONTROLLER - FUSE	1	CWA747002	←	←	←	O
⚠	26	ELECTRONIC CONTROLLER - HVU	1	N0GE1F000005	←	←	←	O
	27	CONTROL BOARD CASING	1	CWH102456	←	←	←	
	28	CONTROL BOARD TOP COVER	1	CWH131531	←	←	←	
	29	CONTROL BOARD FRONT COVER CO.	1	CWH13C1286	←	←	←	
⚠	30	TERMINAL BOARD COMPLETE	1	CWA28C2590	CWA28C2591	←	←	
⚠	31	ELECTRONIC CONTROLLER - INDICATOR	1	CWA747110	←	←	←	O
⚠	31a	ELECTRONIC CONTROLLER - RECEIVER	1	CWA746916	←	←	←	O
	32	INDICATOR HOLDER	1	CWD933466	←	←	←	
	33	FRONT GRILLE COMPLETE	1	CWE11C5437	CWE11C5766	←	CWE11C5437	O
	34	GRILLE DOOR COMPLETE	1	CWE14C1099	←	←	←	
	35	INTAKE GRILLE COMPLETE	1	CWE22K1610	←	←	←	
	36	DECORATION BASE ASS'Y (LEFT)	1	CWE35K1166	←	←	←	
	37	DECORATION BASE COMPLETE (RIGHT)	1	CWE351326	←	←	←	
	38	SCREW - FRONT GRILLE	2	XTT4+16CFJ	←	←	←	
	39	AIR FILTER	2	CWD001326	←	←	←	O
	40	DRAIN HOSE	1	CWH851173	←	←	←	
	41	REMOTE CONTROL COMPLETE	1	CWA75C4179	←	←	←	O
	42	INSTALLATION PLATE	1	CWH361134	←	←	←	
	43	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C1705	←	←	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-E7QKEW	CS-E9QKEW	CS-E12QKEW	CS-E15QKEW	REMARK
	44	OPERATING INSTRUCTION	1	CWF569453	←	←	←	
	45	INSTALLATION INSTRUCTION	1	CWF616242	←	←	←	
	46	INSTALLATION INSTRUCTION	1	CWF616243	←	←	←	
	47	INSTALLATION INSTRUCTION	1	CWF616244	←	←	←	
	48	INSTALLATION INSTRUCTION	1	CWF616245	←	←	←	
	49	INSTALLATION INSTRUCTION	1	CWF616246	←	←	←	
	50	OPERATING INSTRUCTION	1	CWF569454	←	←	←	
	51	INSTALLATION INSTRUCTION	1	CWF616247	←	←	←	
	52	INSTALLATION INSTRUCTION	1	CWF616248	←	←	←	
	53	INSTALLATION INSTRUCTION	1	CWF616249	←	←	←	
	54	INSTALLATION INSTRUCTION	1	CWF616250	←	←	←	
	55	INSTALLATION INSTRUCTION	1	CWF616251	←	←	←	
	56	INSTALLATION INSTRUCTION	1	CWF616252	←	←	←	
	57	SENSOR COMPLETE (ECO)	1	CWA50C3005	←	←	←	O
⚠	58	AIR SWING MOTOR (ECO)	1	CWA981298	←	←	←	O
⚠	59	ELECTRONIC CONTROLLER (COMPARATOR)	1	CWA746917	←	←	←	O
⚠	60	ELECTRONIC CONTROLLER	1	CWA747279	←	←	←	O
	61	BAG	1	CWG861515	←	←	←	
	62	SHOCK ABSORBER (L)	1	CWG713484	←	←	←	
	63	SHOCK ABSORBER (R)	1	CWG713485	←	←	←	
	64	C.C.CASE	1	CWG568553	←	←	←	

(NOTE)

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

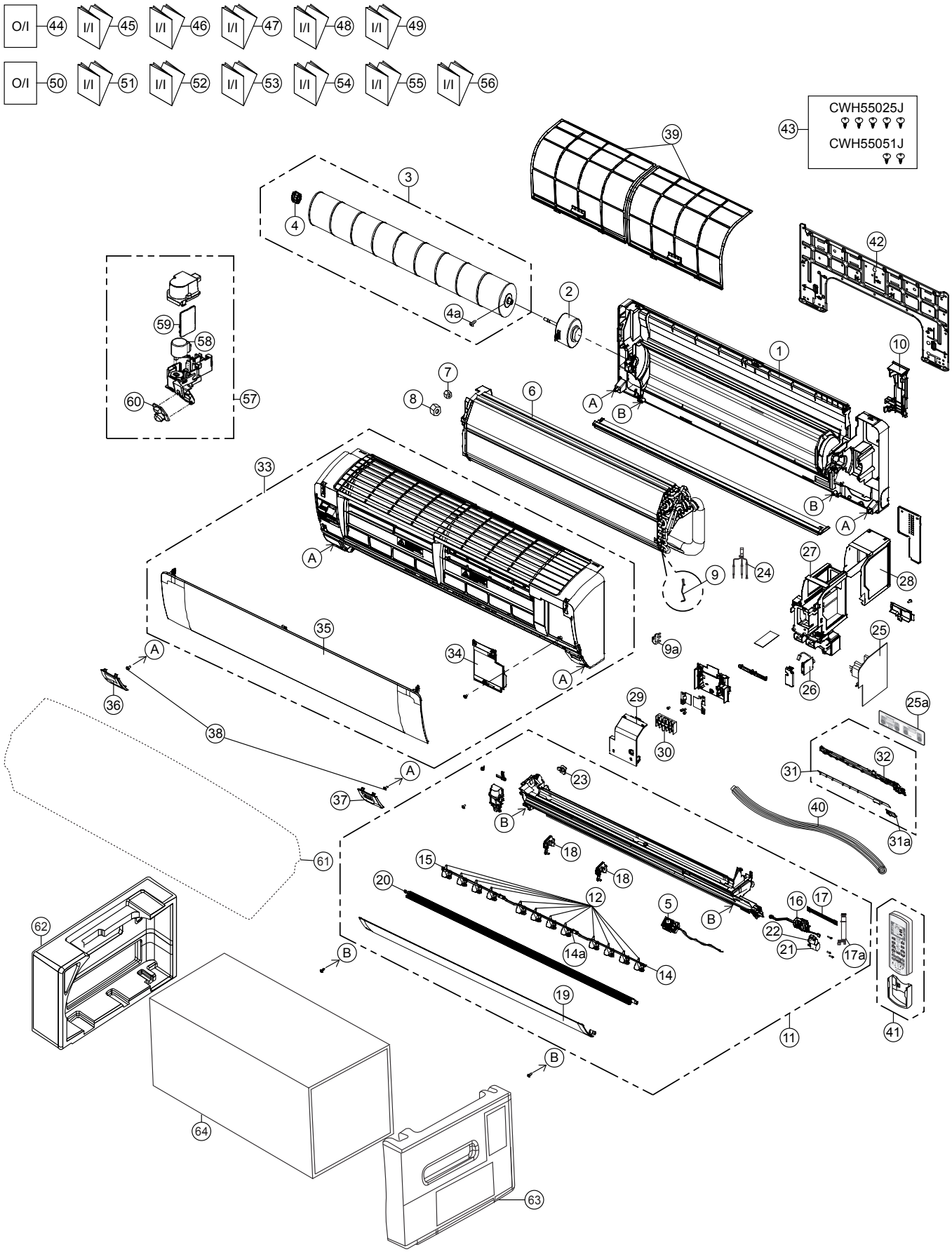
SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-XE7QKEW	CS-XE9QKEW	CS-XE12QKEW	REMARK
	1	CHASSIS COMPLETE	1	CWD50C1731	←	←	
⚠	2	FAN MOTOR	1	ARW7667AC	←	ARW7676AC	O
	3	CROSS-FLOW FAN COMPLETE	1	CWH02C1137	←	←	
	4	BEARING ASSY	1	CWH64K1010	←	←	
	4a	SCREW - CROSS-FLOW FAN	1	CWH551146	←	←	
	5	GENERATOR COMPLETE	1	CWH94C0048	←	←	
	6	EVAPORATOR	1	CWB30C4257	CWB30C4542	←	
	7	FLARE NUT (LIQUID)	1	CWT251030	←	←	
	8	FLARE NUT (GAS)	1	CWT251031	←	←	
	9	CLIP FOR SENSOR	2	CWH711019	←	←	
	10	BACK COVER CHASSIS	1	CWD933463A	←	←	
	11	DISCHARGE GRILLE COMPLETE	1	CWE20C3322	←	←	
	12	VERTICAL VANE	10	CWE241389	←	←	
	14	CONNECTING BAR	1	CWE261261	←	←	
	15	CONNECTING BAR	1	CWE261262	←	←	
⚠	16	AIR SWING MOTOR	1	CWA98K1020	←	←	O
	17	LEAD WIRE - COMPLETE (ECO)	1	CWA68C0784	←	←	
	17a	LEAD WIRE - COMPLETE	1	CWA68C0786	←	←	
	18	FULCRUM	1	CWH621157	←	←	
	19	HORIZONTAL VANE COMPLETE	1	CWE24C1431	←	←	
	20	HORIZONTAL VANE COMPLETE	1	CWE24C1421	←	←	
⚠	21	AIR SWING MOTOR	1	CWA981241	←	←	O
⚠	22	AIR SWING MOTOR	1	CWA981299	←	←	O
	23	CAP - DRAIN TRAY	1	CWH521259	←	←	
	24	SENSOR COMPLETE	1	CWA50C2663	←	←	O
⚠	25	ELECTRONIC CONTROLLER - MAIN	1	CWA73C8101	CWA73C8102	CWA73C8103	O
⚠	25a	ELECTRONIC CONTROLLER - FUSE	1	CWA747002	←	←	O
⚠	26	ELECTRONIC CONTROLLER - HVU	1	N0GE1F000005	←	←	O
	27	CONTROL BOARD CASING	1	CWH102456	←	←	
	28	CONTROL BOARD TOP COVER	1	CWH131531	←	←	
	29	CONTROL BOARD FRONT COVER CO.	1	CWH13C1286	←	←	
⚠	30	TERMINAL BOARD COMPLETE	1	CWA28C2590	CWA28C2591	←	
⚠	31	ELECTRONIC CONTROLLER - INDICATOR	1	CWA747110	←	←	O
⚠	31a	ELECTRONIC CONTROLLE R-RECEIVER	1	CWA746916	←	←	O
	32	INDICATOR HOLDER	1	CWD933466	←	←	
	33	FRONT GRILLE COMPLETE	1	CWE11C5438	←	CWE11C5780	O
	34	GRILLE DOOR COMPLETE	1	CWE14C1102	←	←	
	35	INTAKE GRILLE COMPLETE	1	CWE22K1611	←	←	
	36	DECORATION BASE (LEFT)	1	CWE35K1133	←	←	
	37	DECORATION BASE (RIGHT)	1	CWE35C1192	←	←	
	38	SCREW - FRONT GRILLE	2	XTT4+16CFJ	←	←	
	39	AIR FILTER	2	CWD001326	←	←	O
	40	DRAIN HOSE	1	CWH851173	←	←	
	41	REMOTE CONTROL COMPLETE	1	CWA75C4179	←	←	O
	42	INSTALLATION PLATE	1	CWH361134	←	←	
	43	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C1705	←	←	
	44	OPERATING INSTRUCTION	1	CWF569453	←	←	
	45	INSTALLATION INSTRUCTION	1	CWF616242	←	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-XE7QKEW	CS-XE9QKEW	CS-XE12QKEW	REMARK
	46	INSTALLATION INSTRUCTION	1	CWF616243	←	←	
	47	INSTALLATION INSTRUCTION	1	CWF616244	←	←	
	48	INSTALLATION INSTRUCTION	1	CWF616245	←	←	
	49	INSTALLATION INSTRUCTION	1	CWF616246	←	←	
	50	OPERATING INSTRUCTION	1	CWF569454	←	←	
	51	INSTALLATION INSTRUCTION	1	CWF616247	←	←	
	52	INSTALLATION INSTRUCTION	1	CWF616248	←	←	
	53	INSTALLATION INSTRUCTION	1	CWF616249	←	←	
	54	INSTALLATION INSTRUCTION	1	CWF616250	←	←	
	55	INSTALLATION INSTRUCTION	1	CWF616251	←	←	
	56	INSTALLATION INSTRUCTION	1	CWF616252	←	←	
	57	SENSOR COMPLETE (ECO)	1	CWA50C3005	←	←	O
⚠	58	AIR SWING MOTOR (ECO)	1	CWA981298	←	←	O
⚠	59	ELECTRONIC CONTROLLER (COMPARATOR)	1	CWA746917	←	←	O
⚠	60	ELECTRONIC CONTROLLER	1	CWA747279	←	←	O
	61	BAG	1	CWG861515	←	←	
	62	SHOCK ABSORBER (L)	1	CWG713484	←	←	
	63	SHOCK ABSORBER (R)	1	CWG713485	←	←	
	64	C.C.CASE	1	CWG568553	←	←	

(NOTE)

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

21.1.2 CS-E18QKEW CS-E21QKEW CS-E24QKEW CS-E28QKES CS-XE18QKEW



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-E18QKEW	CS-E21QKEW	CS-E24QKEW	CS-E28QKES	REMARK
	1	CHASSIS COMPLETE	1	CWD50C1742	←	←	←	
⚠	2	FAN MOTOR	1	ARW7676AC	←	←	←	O
	3	CROSS-FLOW FAN COMPLETE	1	CWH02C1136	←	←	←	
	4	BEARING ASSY	1	CWH64K1010	←	←	←	
	4a	SCREW - CROSS-FLOW FAN	1	CWH551146	←	←	←	
	5	GENERATOR COMPLETE	1	CWH94C0048	←	←	←	
	6	EVAPORATOR	1	CWB30C4217	←	CWB30C4218	←	
	4	FLARE NUT (LIQUID)	1	CWT251030	←	←	←	
	8	FLARE NUT (GAS)	1	CWT251032	←	CWT251033	←	
	9	CLIP FOR SENSOR	2	CWH711019	←	←	←	
	10	BACK COVER CHASSIS	1	CWD933463	←	←	←	
	11	DISCHARGE GRILLE COMPLETE	1	CWE20C3320	←	←	←	
	12	VERTICAL VANE	12	CWE241389	←	←	←	
	14	CONNECTING BAR (RIGHT)	1	CWE261269	←	←	←	
	14a	CONNECTING BAR (MIDDLE)	1	CWE261268	←	←	←	
	15	CONNECTING BAR (LEFT)	1	CWE261267	←	←	←	
⚠	16	AIR SWING MOTOR	1	CWA98K1021	←	←	←	O
	17	LEAD WIRE - COMPLETE (ECO)	1	CWA68C0784	←	←	←	
	17a	LEAD WIRE - COMPLETE	1	CWA68C0822	←	←	←	
	18	FULCRUM	2	CWH621150	←	←	←	
	19	HORIZONTAL VANE COMPLETE	1	CWE24C1433	←	←	←	
	20	HORIZONTAL VANE COMPLETE	1	CWE24C1434	←	←	←	
⚠	21	AIR SWING MOTOR	1	CWA981304	←	←	←	O
⚠	22	AIR SWING MOTOR	1	CWA981299	←	←	←	O
	23	CAP - DRAIN TRAY	1	CWH521259	←	←	←	
	24	SENSOR COMPLETE	1	CWA50C2663	←	←	←	O
⚠	25	ELECTRONIC CONTROLLER - MAIN	1	CWA73C8105	CWA73C8106	CWA73C8107	CWA73C8108	O
⚠	25a	ELECTRONIC CONTROLLER - FUSE	1	CWA747002	←	←	-	O
⚠	26	ELECTRONIC CONTROLLER - HVU	1	N0GE1F000005	←	←	←	O
	27	CONTROL BOARD CASING	1	CWH102456	←	←	←	
	28	CONTROL BOARD TOP COVER	1	CWH131531	←	←	←	
	29	CONTROL BOARD FRONT COVER CO.	1	CWH13C1286	←	←	←	
⚠	30	TERMINAL BOARD COMPLETE	1	CWA28C2593	←	←	CWA28C2365	
⚠	31	ELECTRONIC CONTROLLER - INDICATOR	1	CWA747110	←	←	←	O
⚠	31a	ELECTRONIC CONTROLLER - RECEIVER	1	CWA746916	←	←	←	O
	32	INDICATOR HOLDER	1	CWD933466	←	←	←	
	33	FRONT GRILLE COMPLETE	1	CWE11C5440	←	CWE11C5441	←	O
	34	GRILLE DOOR COMPLETE	1	CWE14C1099	←	←	←	
	35	INTAKE GRILLE COMPLETE	1	CWE22K1613	←	←	←	
	36	DECORATION BASE (LEFT)	1	CWE35K1166	←	←	←	
	37	DECORATION BASE (RIGHT)	1	CWE351326	←	←	←	
	38	SCREW - FRONT GRILLE	3	XTT4+16CFJ	←	←	←	
	39	AIR FILTER	2	CWD001338	←	←	←	O
	40	DRAIN HOSE	1	CWH851173	←	←	←	
	41	REMOTE CONTROL COMPLETE	1	CWA75C4179	←	←	←	O
	42	INSTALLATION PLATE	1	CWH361098	←	←	←	
	43	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C1705	←	←	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-E18QKEW	CS-E21QKEW	CS-E24QKEW	CS-E28QKES	REMARK
	44	OPERATING INSTRUCTION	1	CWF569453	←	←	CWF569455	
	45	INSTALLATION INSTRUCTION	1	CWF616242	←	←	CWF616253	
	46	INSTALLATION INSTRUCTION	1	CWF616243	←	←	CWF616254	
	47	INSTALLATION INSTRUCTION	1	CWF616244	←	←	CWF616255	
	48	INSTALLATION INSTRUCTION	1	CWF616245	←	←	CWF616256	
	49	INSTALLATION INSTRUCTION	1	CWF616246	←	←	CWF616257	
	50	OPERATING INSTRUCTION	1	CWF569454	←	←	CWF569456	
	51	INSTALLATION INSTRUCTION	1	CWF616247	←	←	CWF616258	
	52	INSTALLATION INSTRUCTION	1	CWF616248	←	←	CWF616259	
	53	INSTALLATION INSTRUCTION	1	CWF616249	←	←	CWF616260	
	54	INSTALLATION INSTRUCTION	1	CWF616250	←	←	CWF616261	
	55	INSTALLATION INSTRUCTION	1	CWF616251	←	←	CWF616262	
	56	INSTALLATION INSTRUCTION	1	CWF616252	←	←	CWF616263	
	57	SENSOR COMPLETE (ECO)	1	CWA50C3046	←	←	←	O
⚠	58	AIR SWING MOTOR (ECO)	1	CWA981298	←	←	←	O
⚠	59	ELECTRONIC CONTROLLER (COMPARATOR)	1	CWA746917	←	←	←	O
⚠	60	ELECTRONIC CONTROLLER	1	CWA747279	←	←	←	O
	61	BAG	1	CWG861498	←	←	←	
	62	SHOCK ABSORBER (L)	1	CWG713484	←	←	←	
	63	SHOCK ABSORBER (R)	1	CWG713485	←	←	←	
	64	C.C.CASE	1	CWG568553	←	←	←	

(NOTE)

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

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-XE18QKEW	REMARK
	1	CHASSIS COMPLETE	1	CWD50C1743	
⚠	2	FAN MOTOR	1	ARW7676AC	O
	3	CROSS-FLOW FAN COMPLETE	1	CWH02C1136	
	4	BEARING ASSY	1	CWH64K1010	
	4a	SCREW - CROSS-FLOW FAN	1	CWH551146	
	5	GENERATOR COMPLETE	1	CWH94C0048	
	6	EVAPORATOR	1	CWB30C4217	
	7	FLARE NUT (LIQUID)	1	CWT251030	
	8	FLARE NUT (GAS)	1	CWT251032	
	9	CLIP FOR SENSOR	1	CWH711019	
	10	BACK COVER CHASSIS	1	CWD933463A	
	11	DISCHARGE GRILLE COMPLETE	1	CWE20C3321	
	12	VERTICAL VANE	12	CWE241389	
	14	CONNECTING BAR	1	CWE261269	
	14a	CONNECTING BAR	1	CWE261268	
	15	CONNECTING BAR	1	CWE261267	
⚠	16	AIR SWING MOTOR	1	CWA98K1021	O
	17	LEAD WIRE - COMPLETE (ECO)	1	CWA68C0784	
	17a	LEAD WIRE - COMPLETE	1	CWA68C0822	
	18	FULCRUM	2	CWH621150	
	19	HORIZONTAL VANE COMPLETE	1	CWE24C1467	
	20	HORIZONTAL VANE COMPLETE	1	CWE24C1434	
⚠	21	AIR SWING MOTOR	1	CWA981304	O
⚠	22	AIR SWING MOTOR	1	CWA981299	O
	23	CAP - DRAIN TRAY	1	CWH521259	
	24	SENSOR COMPLETE	1	CWA50C2663	O
⚠	25	ELECTRONIC CONTROLLER - MAIN	1	CWA73C8105	O
⚠	25a	ELECTRONIC CONTROLLER - FUSE	1	CWA747002	O
⚠	26	ELECTRONIC CONTROLLER - HVU	1	N0GE1F000005	O
	27	CONTROL BOARD CASING	1	CWH102456	
	28	CONTROL BOARD TOP COVER	1	CWH131531	
	29	CONTROL BOARD FRONT COVER CO.	1	CWH13C1286	
⚠	30	TERMINAL BOARD COMPLETE	1	CWA28C2593	
⚠	31	ELECTRONIC CONTROLLER - INDICATOR	1	CWA747110	O
⚠	31a	ELECTRONIC CONTROLLER - RECEIVER	1	CWA746916	O
	32	INDICATOR HOLDER	1	CWD933466	
	33	FRONT GRILLE COMPLETE	1	CWE11C5442	O
	34	GRILLE DOOR COMPLETE	1	CWE14C1102	
	35	INTAKE GRILLE COMPLETE	1	CWE22K1614	
	36	DECORATION BASE (LEFT)	1	CWE35K1133	
	37	DECORATION BASE (RIGHT)	1	CWE35C1192	
	38	SCREW - FRONT GRILLE	3	XTT4+16CFJ	
	39	AIR FILTER	2	CWD001338	O
	40	DRAIN HOSE	1	CWH851173	
	41	REMOTE CONTROL COMPLETE	1	CWA75C4179	O
	42	INSTALLATION PLATE	1	CWH361098	
	43	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C1705	
	44	OPERATING INSTRUCTION	1	CWF569453	
	45	INSTALLATION INSTRUCTION	1	CWF616242	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-XE18QKEW	REMARK
	46	INSTALLATION INSTRUCTION	1	CWF616243	
	47	INSTALLATION INSTRUCTION	1	CWF616244	
	48	INSTALLATION INSTRUCTION	1	CWF616245	
	49	INSTALLATION INSTRUCTION	1	CWF616246	
	50	OPERATING INSTRUCTION	1	CWF569454	
	51	INSTALLATION INSTRUCTION	1	CWF616247	
	52	INSTALLATION INSTRUCTION	1	CWF616248	
	53	INSTALLATION INSTRUCTION	1	CWF616249	
	54	INSTALLATION INSTRUCTION	1	CWF616250	
	55	INSTALLATION INSTRUCTION	1	CWF616251	
	56	INSTALLATION INSTRUCTION	1	CWF616252	
	57	SENSOR COMPLETE (ECO)	1	CWA50C3046	
⚠	58	AIR SWING MOTOR (ECO)	1	CWA981298	O
⚠	59	ELECTRONIC CONTROLLER	1	CWA746917	O
⚠	60	ELECTRONIC CONTROLLER	1	CWA747279	O
	61	BAG	1	CWG861498	
	62	SHOCK ABSORBER (L)	1	CWG713484	
	63	SHOCK ABSORBER (R)	1	CWG713485	
	64	C.C.CASE	1	CWG568510	

(NOTE)

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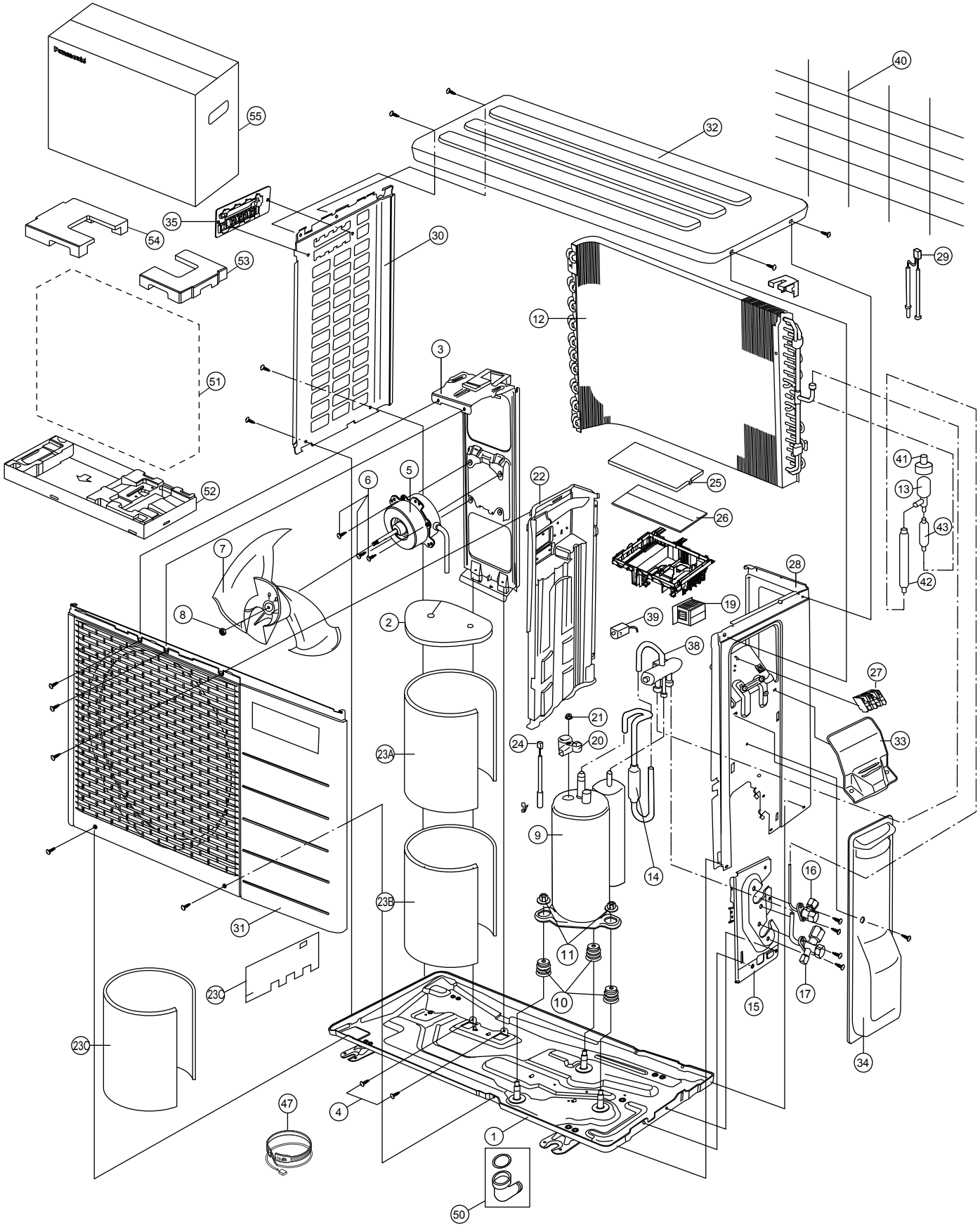
21.2 Outdoor Unit

21.2.1 CU-E7QKE CU-E9QKE



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-E7QKE	CU-E9QKE	REMARK
	1	CHASSIS COMPLETE	1	CWD50K2073	←	
	2	SOUND PROOF MATERIAL	1	CWG302314	←	
	3	FAN MOTOR BRACKET	1	CWD541089	←	
	4	SCREW - FAN MOTOR BRACKET	2	CWH551217	←	
⚠	5	FAN MOTOR	1	ARS6411AC	←	O
	6	SCREW - FAN MOTOR MOUNT	4	CWH55252J	←	
	7	PROPELLER FAN ASSY	1	CWH03K1010	←	
	8	NUT - PROPELLER FAN	1	CWH56053J	←	
⚠	9	COMPRESSOR	1	5RS092XCD21	5RS102XBC21	O
	10	ANTI - VIBRATION BUSHING	3	CWH50077	←	
	11	NUT - COMPRESSOR MOUNT	3	CWH56000J	←	
	12	CONDENSER	1	CWB32C2985	CWB32C3797	
	13	EXPANSION VALVE	1	CWB051055	←	
	14	DISCHARGE MUFFLER (4 W.VALVE)	1	CWB121010	←	
	15	HOLDER COUPLING	1	CWH351233	←	
	16	2-WAYS VALVE (LIQUID)	1	CWB021180J	CWB021589	O
	17	3-WAY VALVE (GAS)	1	CWB011374	←	O
⚠	19	REACTOR	1	G0C193J00002	G0C103J00029	O
	20	TERMINAL COVER	1	CWH171039A	←	
	21	NUT - TERMINAL COVER	1	CWH7080300J	←	
	22	SOUND PROOF BOARD	1	CWH151172	←	
	23A	SOUND PROOF MATERIAL	1	CWG302315	←	
	23B	SOUND PROOF MATERIAL	1	CWG302316	←	
	23C	SOUND PROOF MATERIAL	1	CWG302317	←	
	24	SENSOR CO-COMP TEMP	1	CWA50C2205	←	O
	25	CONTROL BOARD COVER - TOP	1	CWH131264	←	
⚠	26	ELECTRONIC CONTROLLER - MAIN	1	CWA73C8408R	CWA73C8409R	O
⚠	27	TERMINAL BOARD ASSY	1	CWA28K1298	←	O
	28	CABINET SIDE PLATE CO. (RIGHT)	1	CWE04C1116	←	
	29	SENSOR CO - AIR TEMP AND PIPE TEMP	1	CWA50C3077	CWA50C3080	O
	30	CABINET SIDE PLATE	1	CWE041248A	←	
	31	CABINET FRONT PLATE CO.	1	CWE06C1039	CWE06C1136	
	32	CABINET TOP PLATE	1	CWE031014A	←	
	33	PLATE - C. B. COVER TERMINAL	1	CWH131301	←	
	34	CONTROL BOARD COVER CO.	1	CWH13C1211	←	
	35	HANDLE	1	CWE161010	←	
	38	4-WAYS VALVE	1	CWB001063	←	
⚠	39	V-COIL COMPLETE (4-WAY VALVE)	1	CWA43C2431	←	O
	40	WIRE NET	1	CWD041161A	←	O
⚠	41	V-COIL COMPLETE (EXP.VALVE)	1	CWA43C2257	←	O
	42	DISCHARGE MUFFLER	1	CWB121021	←	
	43	STRAINER	1	CWB11094	←	
	50	BAG - COMPLETE	1	CWG87C900	←	
	51	BAG	1	CWG861078	←	
	52	BASE BOARD-COMPLETE	1	CWG62C1095	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-E7QKE	CU-E9QKE	REMARK
	53	SHOCK ABSORBER (RIGHT)	1	CWG712969	←	
	54	SHOCK ABSORBER (LEFT)	1	CWG712970	←	
	55	C.C.CASE	1	CWG568356	←	

(NOTE)

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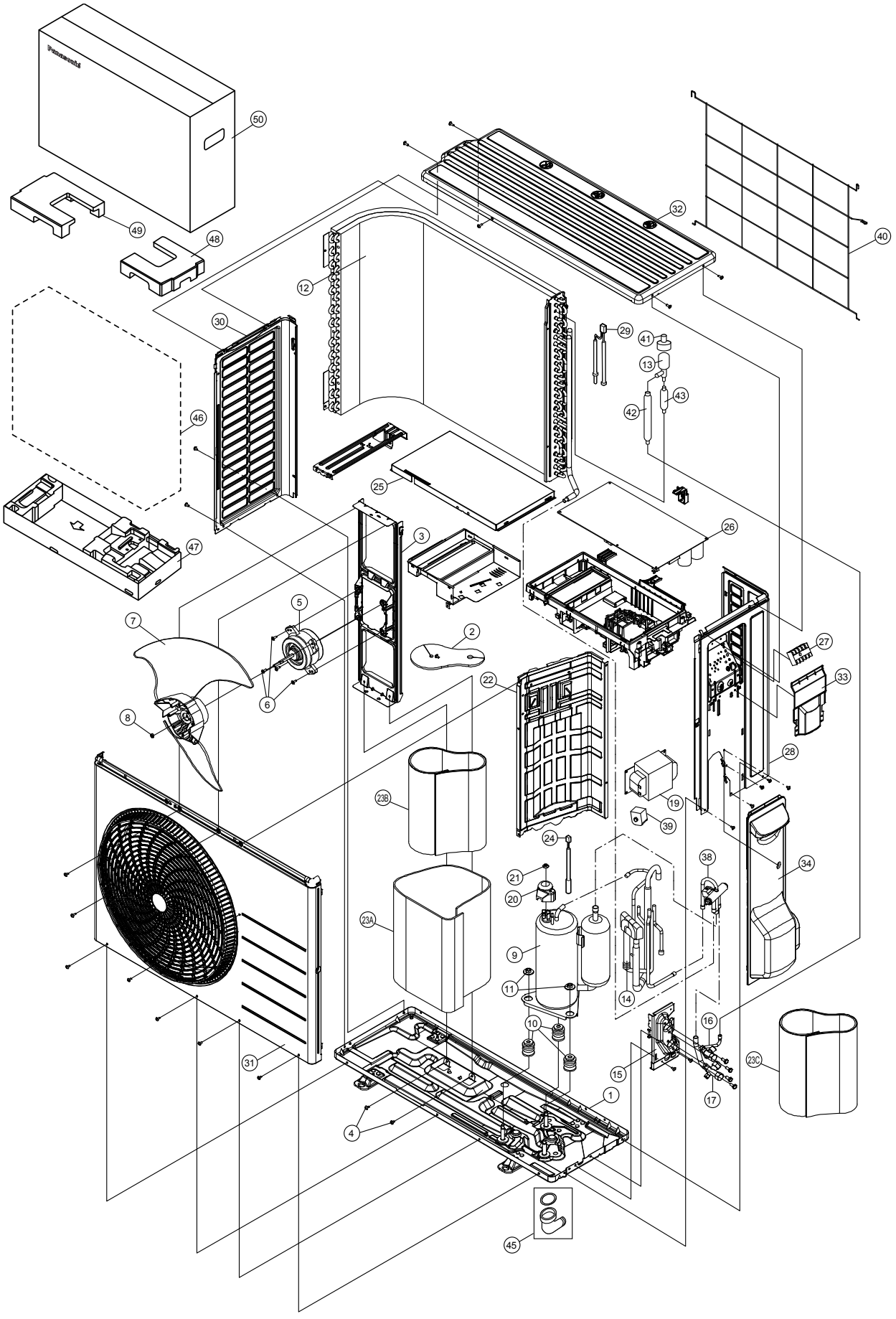
21.2.2 CU-E12QKE CU-E15QKE



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.

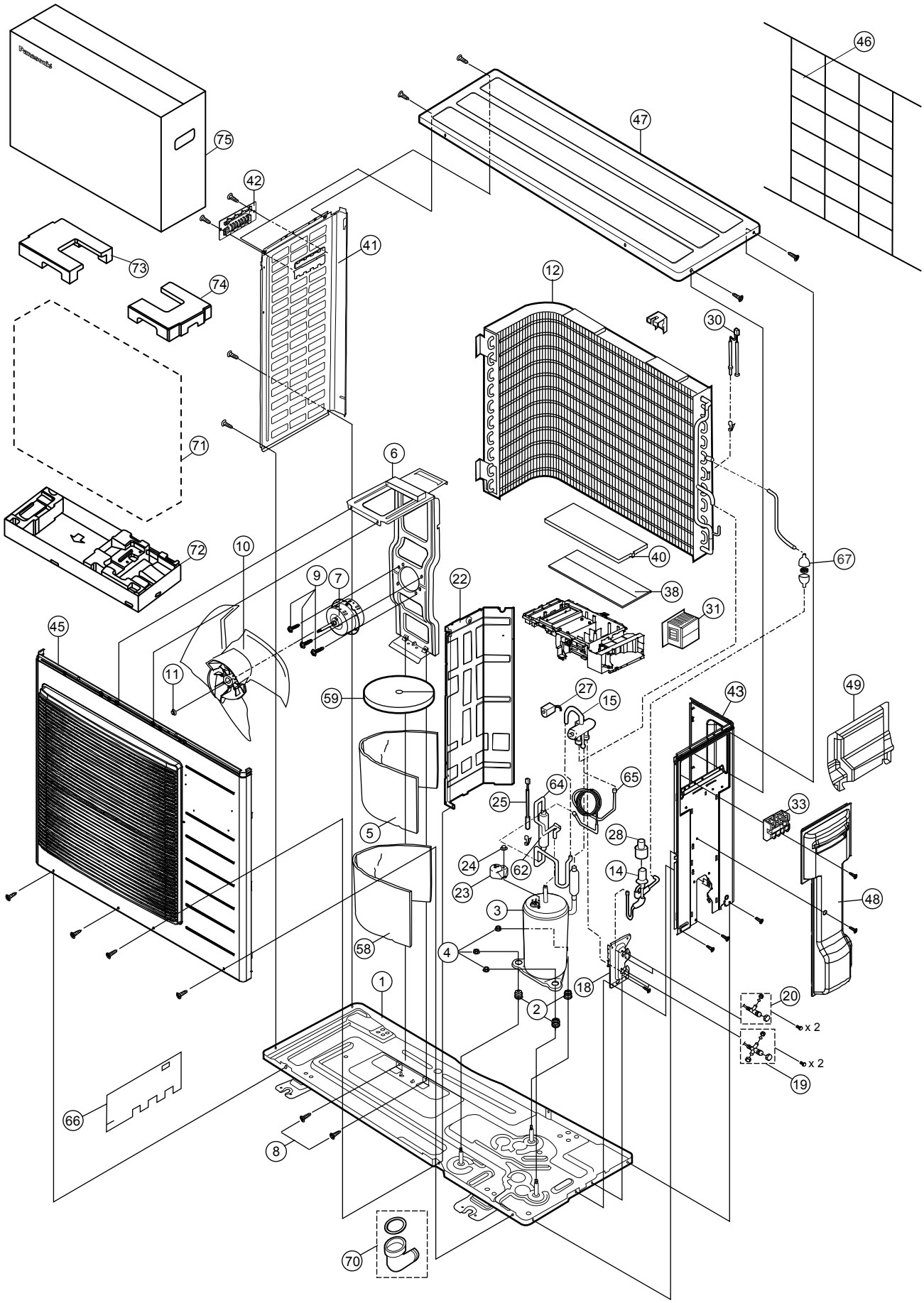
SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-E12QKE	CU-E15QKE	REMARK
	1	CHASSIS COMPLETE	1	CWD52K1277	←	
	2	SOUND PROOF MATERIAL	1	CWG302719	←	
	3	FAN MOTOR BRACKET	1	CWD541167	←	
	4	SCREW - FAN MOTOR BRACKET	2	CWH551217	←	
⚠	5	FAN MOTOR	1	ARS6411AC	←	O
	6	SCREW - FAN MOTOR MOUNT	4	CWH55252J	←	
	7	PROPELLER FAN ASSY	1	CWH03K1066	←	
	8	NUT - PROPELLER FAN	1	CWH56053J	←	
⚠	9	COMPRESSOR	1	5RS102XNA21	←	O
	10	ANTI - VIBRATION BUSHING	3	CWH50077	←	
	11	NUT - COMPRESSOR MOUNT	3	CWH56000J	←	
	12	CONDENSER	1	CWB32C3883	CWB32C3681	
	13	EXPANSION VALVE	1	CWB051055	←	
	14	DISCHARGE MUFFLER (4 W.VALVE)	1	CWB121010	←	
	15	HOLDER COUPLING	1	CWH351233	←	
	16	2-WAYS VALVE (LIQUID)	1	CWB021180J	CWB021589	O
	17	3-WAY VALVE (GAS)	1	CWB011374	CWB011344	O
⚠	19	REACTOR	1	G0C103J00029	←	O
	20	TERMINAL COVER	1	CWH171039A	←	
	21	NUT - TERMINAL COVER	1	CWH7080300J	←	
	22	SOUND PROOF BOARD	1	CWH151274	←	
	23A	SOUND PROOF MATERIAL	1	CWG302317	-	
	23B	SOUND PROOF MATERIAL	1	CWG302701	←	
	23C	SOUND PROOF MATERIAL	1	CWG302726	←	
	24	SENSOR CO-COMP TEMP	1	CWA50C2894	←	O
	25	CONTROL BOARD COVER - TOP	1	CWH131473	←	
⚠	26	ELECTRONIC CONTROLLER - MAIN	1	CWA73C8410R	CWA73C8411R	O
⚠	27	TERMINAL BOARD ASSY	1	CWA28K1298	←	O
	28	CABINET SIDE PLATE CO. (RIGHT)	1	CWE04C1296	←	
	29	SENSOR CO - AIR TEMP AND PIPE TEMP	1	CWA50C3078	CWA50C3079	O
	30	CABINET SIDE PLATE	1	CWE041579A	CWE041580A	
	31	CABINET FRONT PLATE CO.	1	CWE06C1360	←	
	32	CABINET TOP PLATE	1	CWE031148A	←	
	33	PLATE - C. B. COVER TERMINAL	1	CWH131470A	←	
	34	CONTROL BOARD COVER CO.	1	CWH13C1253	←	
	38	4-WAYS VALVE	1	CWB001063	←	
⚠	39	V-COIL COMPLETE (4-WAY VALVE)	1	CWA43C2447	←	O
	40	WIRE NET	1	CWD041200A	←	O
⚠	41	V-COIL COMPLETE (EXP.VALVE)	1	CWA43C2257	←	O
	42	DISCHARGE MUFFLER	1	CWB121021	←	
	43	STRAINER	1	CWB11094	←	
	45	BAG - COMPLETE	1	CWG87C900	←	
	46	BAG	1	CWG861078	←	
	47	BASE BOARD - COMPLETE	1	CWG62C1144	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-E12QKE	CU-E15QKE	REMARK
	48	SHOCK ABSORBER (RIGHT)	1	CWG713415	←	
	49	SHOCK ABSORBER (LEFT)	1	CWG713416	←	
	50	C.C.CASE	1	CWG568358	←	

(NOTE)

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

21.2.3 CU-E18QKE CU-E21QKE



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-E18QKE	CU-E21QKE	REMARK
	1	CHASSIS COMPLETE	1	CWD52K1261	←	
	2	ANTI - VIBRATION BUSHING	3	CWH50077	←	
⚠	3	COMPRESSOR	1	5RD132XBA21	←	O
	4	NUT - COMPRESSOR MOUNT	3	CWH56000J	←	
	5	SOUND PROOF MATERIAL	1	CWG302744	←	
	6	FAN MOTOR BRACKET	1	CWD541153	←	
⚠	7	FAN MOTOR	1	ARW8401AC	←	O
	8	SCREW - FAN MOTOR BRACKET	2	CWH551217	←	
	9	SCREW - FAN MOTOR MOUNT	4	CWH551106J	←	
	10	PROPELLER FAN ASSY	1	CWH03K1065	←	
	11	NUT - PROPELLER FAN	1	CWH56053J	←	
	12	CONDENSER	1	CWB32C3764	CWB32C3371	
	14	EXPANSION VALVE	1	CWB051016J	←	
	15	4-WAYS VALVE	1	CWB001026J	←	
	18	HOLDER COUPLING	1	CWH351227	←	
	19	3-WAY VALVE (GAS)	1	CWB011338	←	O
	20	2-WAYS VALVE (LIQUID)	1	CWB021454	←	O
	22	SOUND PROOF BOARD	1	CWH151257	←	
	23	TERMINAL COVER	1	CWH171039A	←	
	24	NUT - TERMINAL COVER	1	CWH7080300J	←	
	25	SENSOR CO - COMP. TEMP	1	CWA50C2185	←	O
⚠	27	V-COIL COMPLETE (4-WAY VALVE)	1	CWA43C2169J	←	O
⚠	28	V-COIL COMPLETE (EXP.VALVE)	1	CWA43C2257	←	O
	30	SENSOR-COMPLETE	1	CWA50C2517	←	O
⚠	31	REACTOR	1	G0C203J00003	←	O
⚠	33	TERMINAL BOARD ASSY	1	CWA28K1298	←	O
⚠	38	ELECTRONIC CONTROLLER - MAIN	1	CWA73C8125R	CWA73C8126R	O
	40	CONTROL BOARD COVER - TOP	1	CWH131333	←	
	41	CABINET SIDE PLATE CO. (LEFT)	1	CWE041520A	←	
	42	HANDLE	1	CWE161010	←	
	43	CABINET SIDE PLATE (RIGHT)	1	CWE041555A	←	
	45	CABINET FRONT PLATE CO.	1	CWE06K1077	←	
	46	WIRE NET	1	CWD041155A	←	
	47	CABINET TOP PLATE	1	CWE031083A	←	
	48	CONTROL BOARD COVER - COMPLETE	1	CWH13C1238	←	
	49	CONTROL BOARD COVER	1	CWH131409A	←	
	58	SOUND PROOF MATERIAL	1	CWG302636	CWG302638	
	59	SOUND PROOF MATERIAL	1	CWG302630	←	
	62	RECEIVER	1	CWB14011	-	
	64	OIL SEPARATOR	-	-	CWB161003	
	65	CAPILLARY TUBE ASSY	-	-	CWB15K1487	
	66	SOUND PROOF MATERIAL	1	CWG302632	CWG302600	
	67	STRAINER	1	CWB11094	←	
	70	BAG-COMPLETE	1	CWG87C900	←	
	71	BAG	1	CWG861461	←	
	72	BASE BOARD - COMPLETE	1	CWG62C1131	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-E18QKE	CU-E21QKE	REMARK
	73	SHOCK ABSORBER (LEFT)	1	CWG713217	←	
	74	SHOCK ABSORBER (RIGHT)	1	CWG713218	←	
	75	C.C.CASE	1	CWG568359	←	

(NOTE)

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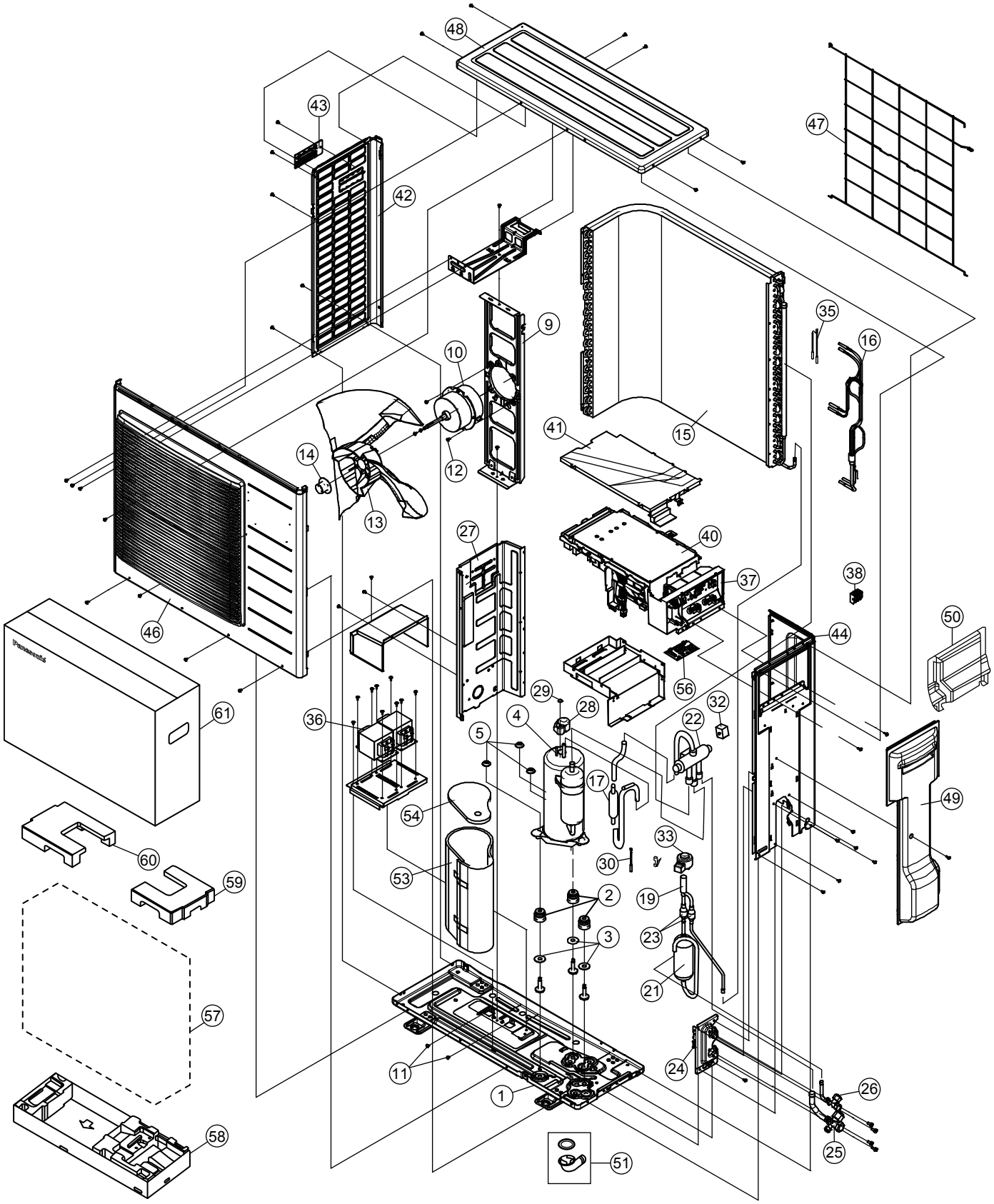
21.2.4 CU-E24QKE CU-E28QKE



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-E24QKE	CU-E28QKE	REMARK
	1	CHASSIS COMPLETE	1	CWD52K1190	←	
	2	ANTI - VIBRATION BUSHING	3	CWH50055	←	
	3	PACKING	3	CWB81043	←	
⚠	4	COMPRESSOR	1	5KD240XAF21	←	O
	5	NUT - COMPRESSOR MOUNT	3	CWH561049	←	
	9	FAN MOTOR BRACKET	1	CWD541127	←	
⚠	10	FAN MOTOR	1	EHDS80C60AC	←	O
	11	SCREW - FAN MOTOR BRACKET	2	CWH551217	←	
	12	SCREW - FAN MOTOR MOUNT	4	CWH551323	←	
	13	PROPELLER FAN ASSY	1	CWH00K1006	←	
	14	NUT - PROPELLER FAN	1	CWH561092	←	
	15	CONDENSER	1	CWB32C2714	CWB32C3706	
	16	TUBE ASSY CO. (CAP TUBE)	1	CWT01C5953	CWT01C5849	
	17	DISCHARGE MUFFLER	1	CWB121013	←	
	19	EXPANSION VALVE	1	CWB051018J	←	
	21	RECEIVER	1	CWB14017	←	
	22	4-WAYS VALVE	1	CWB001026J	←	
	23	STRAINER	2	CWB111032	←	
	24	HOLDER COUPLING	1	CWH351228	←	
	25	3-WAY VALVE (GAS)	1	CWB011363	←	O
	26	2-WAYS VALVE (LIQUID)	1	CWB021434	←	O
	27	SOUND PROOF BOARD	1	CWH151197	←	
	28	TERMINAL COVER	1	CWH171039A	←	
	29	NUT - TERMINAL COVER	1	CWH7080300J	←	
	30	SENSOR CO - COMP. TEMP	1	CWA50C2185	←	O
⚠	32	V-COIL COMPLETE (4-WAY VALVE)	1	CWA43C2169J	←	O
⚠	33	V-COIL COMPLETE (EXP.VALVE)	1	CWA43C2258	←	O
	35	SENSOR - COMPLETE	1	CWA50C2517	←	O
⚠	36	REACTOR	2	G0C403J00001	G0C423J00001	O
⚠	38	TERMINAL BOARD ASSY	1	CWA28K1298	CWA28K1036J	O
⚠	40	ELECTRONIC CONTROLLER - MAIN	1	CWA73C8122R	CWA73C8123R	O
	41	CONTROL BOARD COVER - TOP	1	CWH131333	←	
	42	CABINET SIDE PLATE CO. (LEFT)	1	CWE041317A	←	
	43	HANDLE	1	CWE161010	←	
	44	CABINET SIDE PLATE	1	CWE041319A	←	
	46	CABINET FRONT PLATE CO.	1	CWE06K1063	←	
	47	WIRE NET	1	CWD041128A	←	
	48	CABINET TOP PLATE	1	CWE031083A	←	
	49	CONTROL BOARD COVER - COMPLETE	1	CWH13C1185	←	
	50	CONTROL BOARD COVER	1	CWH131332	←	
	51	BAG - COMPLETE	1	CWG87C900	←	
	53	SOUND PROOF MATERIAL	1	CWG302245	←	
	54	SOUND PROOF MATERIAL	1	CWG302246	←	
⚠	56	ELECTRONIC CONTROLLER - NF	1	CWA747379	←	O
	57	BAG	1	CWG861154	←	
	58	BASE BOARD - COMPLETE	1	CWG62C1081	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-E24QKE	CU-E28QKE	REMARK
	59	SHOCK ABSORBER (RIGHT)	1	CWG712879	←	
	60	SHOCK ABSORBER (LEFT)	1	CWG712880	←	
	61	C.C.CASE	1	CWG568361	←	

(Note)
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