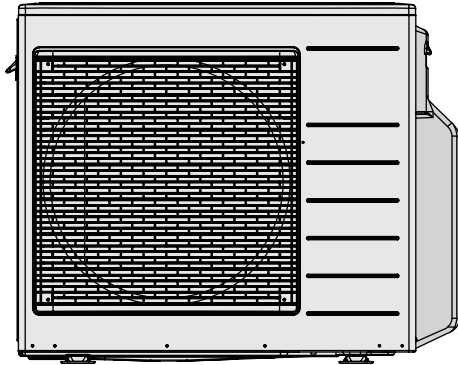


Service Manual

Air Conditioner



**Outdoor Unit
CU-2E18SBU**

Please file and use this manual together with the service manual for Model No. CS-ME5RKUA CS-ME7RKUA, CS-E9RKUA CS-E12RKUA, CS-ME9SB4U, CS-E12RB4UW, CS-ME5SD3UA CS-ME7SD3UA, CS-E9SD3UAW CS-E12SD3UAW, Order No. PAPAMY1503085CE, PAPAMY1501049CE, PAPAMY1604059CE, PAPAMY1503095CE, PAPAMY1604056CE, PAPAMY1604052CE.

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 product or products dealt with in this service information by anyone else could result in serious injury or death.

PRECAUTION OF LOW TEMPERATURE



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

TABLE OF CONTENTS



	PAGE		PAGE
1. Safety Precautions	3	13.16 Compressor Discharge High Pressure Protection Control	27
2. Specifications	5	14. Servicing Mode	28
2.1 CU-2E18SBU	5	14.1 CU-2E18SBU	28
3. Dimensions	8	15. Troubleshooting Guide	30
4. Refrigeration Cycle Diagram	9	15.1 Self Diagnosis Function	30
5. Block Diagram	10	16. Disassembly and Assembly Instructions	33
6. Wiring Connection Diagram	11	16.1 Outdoor Unit Removal Procedure	33
7. Electronic Circuit Diagram	12	17. Technical Data	36
8. Printed Circuit Board	13	17.1 Cool Mode Performance Data	36
8.1 Main Printed Circuit Board	13	17.2 Heat Mode Performance Data	38
8.2 Noise Filter Printed Circuit Board	14	18. Service Data	40
8.3 Display Printed Circuit Board	14	18.1 Operation Characteristics	40
9. Installation Information	15	19. Exploded View and Replacement Parts List	44
9.1 Check Points	15		
10. Installation Instruction	16		
10.1 Accessories Supplied with Outdoor Unit	16		
10.2 Cutting and Flaring the Piping	16		
10.3 Select the Best Location	17		
10.4 Install the Outdoor Unit	18		
10.5 Connect the Piping	18		
10.6 Evacuation of the Equipment	19		
10.7 Connect the Cable to the Outdoor Unit	20		
10.8 Heat Insulation	20		
11. Operation Control	21		
11.1 Cooling Operation	21		
11.2 Heating Operation	22		
12. Simultaneous Operation Control	23		
13. Protection Control	24		
13.1 Freeze Prevention Control (Cool)	24		
13.2 Dew Prevention Control (Cool)	24		
13.3 Electronic Parts Temperature Rise Protection 1 (Cool)	24		
13.4 Electronic Parts Temperature Rise Protection 2 (Cool)	24		
13.5 Cooling Overload Control (Cool)	25		
13.6 Heating Overload Control (Heat)	25		
13.7 Extreme Low Temperature Compressor Low Pressure Protection Control (Heat)	25		
13.8 Deice Control	26		
13.9 Time Delay Safety Control (Restart Control)	26		
13.10 30 seconds Force Operation	26		
13.11 Total Current Control	26		
13.12 IPM (power transistor) Protection Control	26		
13.13 Compressor Protection Control (Gas leak detection control 1)	27		
13.14 Compressor Protection Control (Gas leak detection control 2)	27		
13.15 Valve Close Detection Control	27		

1. Safety Precautions













- Read the following "SAFETY PRECAUTIONS" carefully before installation.
- Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be 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 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 only.







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

	Symbol with white background denotes item that is PROHIBITED from doing.
	Symbol with dark background denotes item that must be carried out.

- Carry out test running to confirm that no abnormality occurs after the installation. 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 install outdoor unit near handrail of veranda. When installing air-conditioner unit on veranda of a high rise building, child may climb up to outdoor unit and cross over the handrail causing an accident. 
2.	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. 
3.	Do not tie up the power supply cord into a bundle by band. Abnormal temperature rise on power supply cord may happen. 
4.	Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.  
5.	Do not sit or step on the unit, you may fall down accidentally.  
6.	Keep plastic bag (packaging material) away from small children, it may cling to nose and mouth and prevent breathing. 
7.	When installing or relocating 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. 
8.	Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury etc. 
9.	<ul style="list-style-type: none"> • 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 for copper pipes used with R410A must be more than 1/32" (0.8 mm). Never use copper pipes thinner than 1/32" (0.8 mm). • It is desirable that the amount of residual oil less than 0.0008 oz/ft (40 mg/10 m). 
10.	Engage authorized dealer or specialist for installation. If installation done by the user is incorrect, it will cause water leakage, electrical shock or fire.
11.	Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.
12.	Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.
13.	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.
14.	For installation work, follow all electrical, building, plumbing, local codes, regulations and these installation instructions. If electrical circuit capacity is not enough or a defect is found in electrical work, it will cause electrical shock or fire.
15.	Do not use spliced wires for indoor/outdoor connection cable. Use the specified indoor/outdoor connection cable, refer to instruction INDOOR/OUTDOOR UNIT ELECTRICAL WIRING and connect tightly for indoor/outdoor connection. Clamp the cable so that no external force will have impact on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.
16.	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 fire or electrical shock.
17.	This equipment must installed with an Earth Leakage Circuit Breaker (ELCB) or Ground Fault Current Interrupter (GFCI) or Appliance Leakage Current Interrupter (ALCI) that has been certified by an NRTL Certified Testing Agency and that is suitable for the voltages and amperages involved. Otherwise, it may cause electrical shock and fire in case of equipment breakdown.

18.	During installation, install the refrigerant piping properly before running the compressor. Operation of compressor without fixing refrigeration piping and valves at opened condition will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
19.	During pump down operation, stop the compressor before removing the refrigeration piping. Removal of refrigeration piping 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.
20.	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.
21.	After completion of installation, confirm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant comes into contact with fire.
22.	Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when the refrigerant comes into contact with fire.
23.	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 electrical shock in case of equipment breakdown or insulation breakdown.

 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.	Do not release refrigerant during piping work for installation, re-installation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite. 
3.	Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc. 
4.	Do not touch the sharp aluminium fin, sharp parts may cause injury.  
5.	Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
6.	Select an installation location which is easy for maintenance.
7.	Power supply connection to the room air conditioner. Power supply cord shall be UL listed or CSA approved 3 conductor with minimum AWG12 wires. Power supply point should be in an 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. Fix power supply connection to a circuit breaker for permanent connection. Use NRTL approved fuse or circuit breaker (rating refers to name plate) for permanent connection.
8.	Installation work. It may take two people to carry out the installation work.

2. Specifications

2.1 CU-2E18SBU

Item		Unit	OUTDOOR UNIT	
Indoor Unit Combination			2.5kW + 2.5kW	
Power Source			1 Phase, 208 – 230V, 60Hz (Power supply from outdoor unit)	
Cooling Operation	Capacity		kW	4.89 (2.10 ~ 5.86)
			BTU/h	16700 (7200 ~ 20000)
	Electrical Data	Running Current	A	6.6 - 6.0
		Power Input	kW	1.33 (0.36 ~ 1.69)
		EER	W/W	3.68 (5.83 ~ 3.47)
	Noise		BTU/hW	12.55 (20.00 ~ 11.85)
		Sound Pressure Level	dB-A	48
		Sound Power Level	dB	62
Power Factor		%	97 / 96	
Heating Operation	Capacity		kW	5.94 (2.11 ~ 7.20)
			BTU/h	20200 (7200 ~ 24600)
	Electrical Data	Running Current	A	8.5 - 7.8
		Power Input	kW	1.75 (0.40 ~ 2.18)
		COP	W/W	3.38 (5.28 ~ 3.30)
	Noise		BTU/hW	11.50 (18.00 ~ 11.30)
		Sound Pressure Level	dB-A	49
		Sound Power Level	dB	63
Power Factor		%	99 / 98	
Maximum Current		A	13.6	
Maximum Input Power		W	3.04k	
Starting Current		A	8.5	
Minimum Circuit Ampacity		A	20	
Dimension	Height	mm (inch)	795 (31-5/16)	
	Width	mm (inch)	875 + 95 (34-15/32 + 3-3/4)	
	Depth	mm (inch)	320 (12-5/8)	
Net Weight		kg (lb)	71 (157)	
Connection cable			3 + 1 (Earth) ϕ 1.5 mm ²	
Pipe Length Range (1 room)		m (ft)	3 ~ 25 (9.8 ~ 82.0)	
Maximum Pipe Length (Total Room)		m (ft)	50 (164.0)	
Refrigerant Pipe Diameter	Liquid Side	mm (inch)	6.35 (1/4)	
	Gas Side	mm (inch)	9.52 (3/8)	
Compressor	Type		Hermetic Motor	
	Motor Type		DC Brushless (4-poles)	
	Rated Output	W	1.30k	
Air Circulation	Type		Propeller Fan	
	Motor Type		DC Brushless (8-poles)	
	Rated Output	W	60	
Fan Speed	High	RPM	580	
Heat Exchanger	Type		Plate fin configuration forced draft type	
	Tube Material		Copper	
	Fin Material		Aluminum (Blue Coat)	
	Row/Stage		2/36	
	FPI		19	

Item		Unit	OUTDOOR UNIT		
Air Volume	High	m ³ /min (ft ³ /min)	41.0 (1447)		
Refrigerant Control Device			Expansion Valve		
Refrigerant Oil		cm ³	FV50S (900)		
Refrigerant (R410A)		g (oz)	2.23k (78.7)		
			Dry Bulb	Wet Bulb	
Indoor Operation Range	Cooling	Maximum	°C (°F)	32 (89.6)	23 (73.4)
		Minimum	°C (°F)	16 (60.8)	11 (51.8)
	Heating	Maximum	°C (°F)	30 (86.0)	—
		Minimum	°C (°F)	16 (60.8)	—
Outdoor Operation Range	Cooling	Maximum	°C (°F)	46 (114.8)	26 (78.8)
		Minimum	°C (°F)	-10 (14.0)	— / —
	Heating	Maximum	°C (°F)	24 (75.2)	18 (64.4)
		Minimum	°C (°F)	-15 (5.0)	-16 (3.2)

Note

- Specifications are subject to change without notice for further improvement.
- **Multi split combination possibility:**
 - A single outdoor unit enables air conditioning of up to two separate rooms for CU-2E18SBU.

		Outdoor Unit	
		CU-2E18SBU	
		A	B
Wall	1.6 kW	CS-ME5RKUA, CS-ME5SD3UA	• •
	2.0 kW	CS-ME7RKUA, CS-ME7SD3UA	• •
	2.5 kW	CS-E9RKUAW, CS-ME9SB4U, CS-E9SD3UAW	• •
	3.2 kW	CS-E12RKUAW, CS-E12RB4UW, CS-E12SD3UAW	• •
Capacity range of connectable indoor units		From 3.2 kW to 6.4 kW	
Piping Length	1 room maximum pipe length (m (ft))	25 (82.0)	
	Allowable elevation (m (ft))	15 (49.2)	
	Total allowable pipe length (m (ft))	50 (164.0)	
	Total pipe length for maximum chargeless length (m (ft))	20 (65.6)	
	Additional gas amount over chargeless length (g/m (oz/ft))	20 (0.2)	
		Note: "•" : Available	

Remarks for CU-2E18SBU

- At least two indoor units must be connected.
- The total nominal cooling capacity of indoor units 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-2E18SBU. (Total nominal capacity of indoor units is between 3.2 kW to 6.4 kW)
1) Two CS-E9RKUAW only. (Total nominal cooling capacity is 5.0 kW)
2) One CS-E9RKUAW and one CS-E12RKUAW. (Total nominal cooling capacity is 5.7 kW)

- Specifications are subject to change without notice for further improvement.

	Indoor unit capacity	Total	Cooling Capacity (kW)				Input Power (W)		EER W/W	SEER	Current, 230V (A)	Moisture Removal Volume (l/h)
	Cooling		Room A	Room B	Total	min ~ max	Rating	min ~ max				
2 Room	1.6 + 1.6	3.2	1.620	1.620	3.24	2.10 ~ 3.89	770	360 ~ 960	4.20	19.00	3.6	0.3 + 0.3
	1.6 + 2.0	3.6	1.613	2.017	3.63	2.10 ~ 4.36	860	360 ~ 1110	4.22	19.00	4.0	0.3 + 0.4
	1.6 + 2.5	4.1	1.616	2.524	4.14	2.10 ~ 4.97	1030	360 ~ 1370	4.02	19.00	4.7	0.3 + 0.5
	1.6 + 3.2	4.8	1.610	3.220	4.83	2.10 ~ 5.80	1290	360 ~ 1680	3.74	19.00	5.8	0.3 + 0.6
	2.0 + 2.0	4.0	2.010	2.010	4.02	2.10 ~ 4.82	980	360 ~ 1310	4.10	19.00	4.5	0.4 + 0.4
	2.0 + 2.5	4.5	2.013	2.517	4.53	2.10 ~ 5.44	1210	360 ~ 1580	3.74	19.00	5.5	0.4 + 0.5
	2.0 + 3.2	5.2	1.881	3.009	4.89	2.10 ~ 5.86	1330	360 ~ 1690	3.68	19.00	6.0	0.4 + 0.6
	2.5 + 2.5	5.0	2.445	2.445	4.89	2.10 ~ 5.86	1330	360 ~ 1690	3.68	19.00	6.0	0.5 + 0.5
	2.5 + 3.2	5.7	2.145	2.745	4.89	2.10 ~ 5.86	1330	360 ~ 1690	3.68	19.00	6.0	0.5 + 0.6
3.2 + 3.2	6.4	2.445	2.445	4.89	2.10 ~ 5.86	1330	360 ~ 1690	3.68	19.00	6.0	0.6 + 0.6	

	Indoor unit capacity	Total	Cooling Capacity (BTU/hr)				Input Power (W)		EER Btu/h.W	SEER	Current, 230V (A)	Moisture Removal Volume (l/h)
	Cooling		Room A	Room B	Total	min ~ max	Rating	min ~ max				
2 Room	1.6 + 1.6	3.2	5500	5500	11000	7200 ~ 13300	770	360 ~ 960	14.25	19.00	3.6	0.3 + 0.3
	1.6 + 2.0	3.6	5511	6889	12400	7200 ~ 14900	860	360 ~ 1110	14.40	19.00	4.0	0.3 + 0.4
	1.6 + 2.5	4.1	5502	8598	14100	7200 ~ 16900	1030	360 ~ 1370	13.65	19.00	4.7	0.3 + 0.5
	1.6 + 3.2	4.8	5500	11000	16500	7200 ~ 19800	1290	360 ~ 1680	12.75	19.00	5.8	0.3 + 0.6
	2.0 + 2.0	4.0	6850	6850	13700	7200 ~ 16400	980	360 ~ 1310	13.95	19.00	4.5	0.4 + 0.4
	2.0 + 2.5	4.5	6844	8556	15400	7200 ~ 18500	1210	360 ~ 1580	12.70	19.00	5.5	0.4 + 0.5
	2.0 + 3.2	5.2	6423	10277	16700	7200 ~ 20000	1330	360 ~ 1690	12.55	19.00	6.0	0.4 + 0.6
	2.5 + 2.5	5.0	8350	8350	16700	7200 ~ 20000	1330	360 ~ 1690	12.55	19.00	6.0	0.5 + 0.5
	2.5 + 3.2	5.7	7325	9375	16700	7200 ~ 20000	1330	360 ~ 1690	12.55	19.00	6.0	0.5 + 0.6
3.2 + 3.2	6.4	8350	8350	16700	7200 ~ 20000	1330	360 ~ 1690	12.55	19.00	6.0	0.6 + 0.6	

- Specifications are subject to change without notice for further improvement.

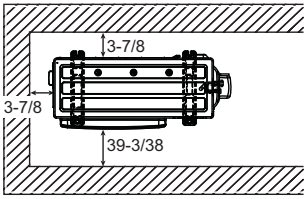
	Indoor unit capacity	Total	Heating Capacity (kW)				Input Power (W)		COP W/W	HSPF		Current, 230V (A)	Moisture Removal Volume (l/h)
	Heating		Room A	Room B	Total	min ~ max	Rating	min ~ max		Region IV	Region V		
2 Room	1.6 + 1.6	3.2	2.350	2.350	4.70	2.11 ~ 5.64	1450	400 ~ 1770	3.24	9.50	8.50	6.5	
	1.6 + 2.0	3.6	2.329	2.911	5.24	2.11 ~ 6.29	1600	400 ~ 2020	3.26	9.50	8.50	7.2	
	1.6 + 2.5	4.1	2.181	3.409	5.59	2.11 ~ 6.71	1740	400 ~ 2170	3.20	9.50	8.50	7.8	
	1.6 + 3.2	4.8	1.980	3.960	5.94	2.11 ~ 7.13	1800	400 ~ 2340	3.30	9.50	8.50	8.0	
	2.0 + 2.0	4.0	2.890	2.890	5.78	2.11 ~ 6.94	1770	400 ~ 2260	3.26	9.50	8.50	7.8	
	2.0 + 2.5	4.5	2.640	3.300	5.94	2.11 ~ 7.13	1870	400 ~ 2360	3.16	9.50	8.50	8.3	
	2.0 + 3.2	5.2	2.285	3.655	5.94	2.11 ~ 7.20	1750	400 ~ 2180	3.38	9.50	8.50	7.8	
	2.5 + 2.5	5.0	2.970	2.970	5.94	2.11 ~ 7.20	1750	400 ~ 2180	3.38	9.50	8.50	7.8	
	2.5 + 3.2	5.7	2.605	3.335	5.94	2.11 ~ 7.20	1750	400 ~ 2180	3.38	9.50	8.50	7.8	
3.2 + 3.2	6.4	2.970	2.970	5.94	2.11 ~ 7.20	1750	400 ~ 2180	3.38	9.50	8.50	7.8		

	Indoor unit capacity	Total	Heating Capacity (BTU/hr)				Input Power (W)		COP Btu/h.W	HSPF		Current, 230V (A)	Moisture Removal Volume (l/h)
	Heating		Room A	Room B	Total	min ~ max	Rating	min ~ max		Region IV	Region V		
2 Room	1.6 + 1.6	3.2	8000	8000	16000	7200 ~ 19200	1450	400 ~ 1770	11.00	9.50	8.50	6.5	
	1.6 + 2.0	3.6	7956	9944	17900	7200 ~ 21400	1600	400 ~ 2020	11.15	9.50	8.50	7.2	
	1.6 + 2.5	4.1	7454	11646	19100	7200 ~ 22800	1740	400 ~ 2170	10.95	9.50	8.50	7.8	
	1.6 + 3.2	4.8	6733	13467	20200	7200 ~ 24400	1800	400 ~ 2340	11.20	9.50	8.50	8.0	
	2.0 + 2.0	4.0	9850	9850	19700	7200 ~ 23600	1770	400 ~ 2260	11.10	9.50	8.50	7.8	
	2.0 + 2.5	4.5	8978	11222	20200	7200 ~ 24400	1870	400 ~ 2360	10.80	9.50	8.50	8.3	
	2.0 + 3.2	5.2	7769	12431	20200	7200 ~ 24600	1750	400 ~ 2180	11.50	9.50	8.50	7.8	
	2.5 + 2.5	5.0	10100	10100	20200	7200 ~ 24600	1750	400 ~ 2180	11.50	9.50	8.50	7.8	
	2.5 + 3.2	5.7	8860	11340	20200	7200 ~ 24600	1750	400 ~ 2180	11.50	9.50	8.50	7.8	
3.2 + 3.2	6.4	10100	10100	20200	7200 ~ 24600	1750	400 ~ 2180	11.50	9.50	8.50	7.8		

- Specifications are subject to change without notice for further improvement.

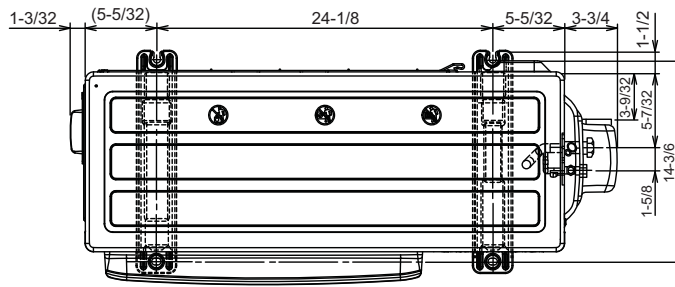
3. Dimensions

Space necessary for installation

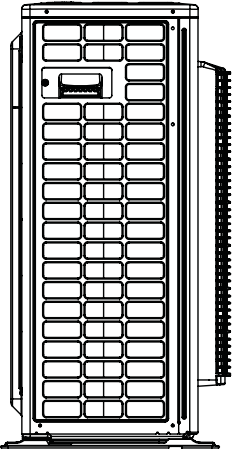


Anchor Bolt Pitch
14-13/64 x 24-1/8

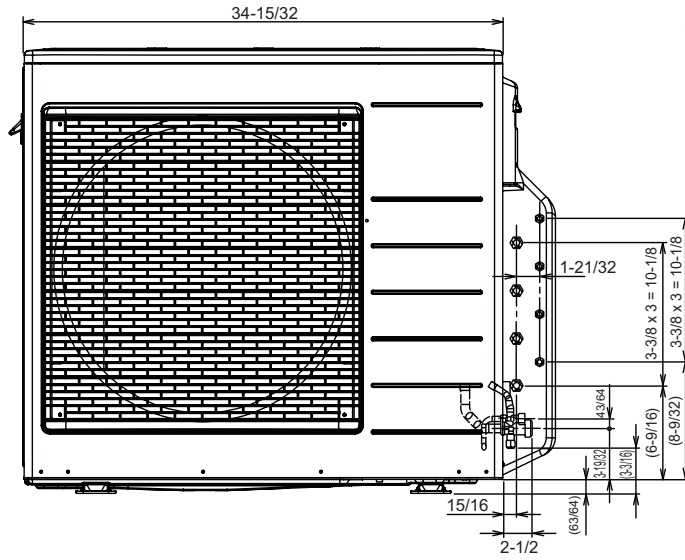
<Top View>



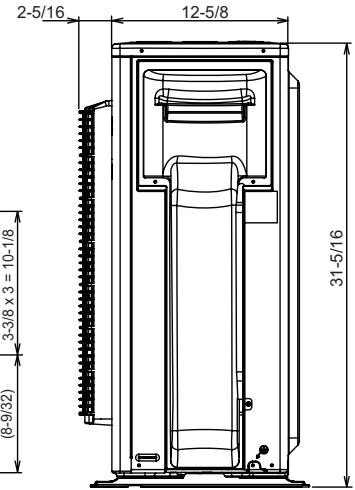
<Side View>



<Front View>

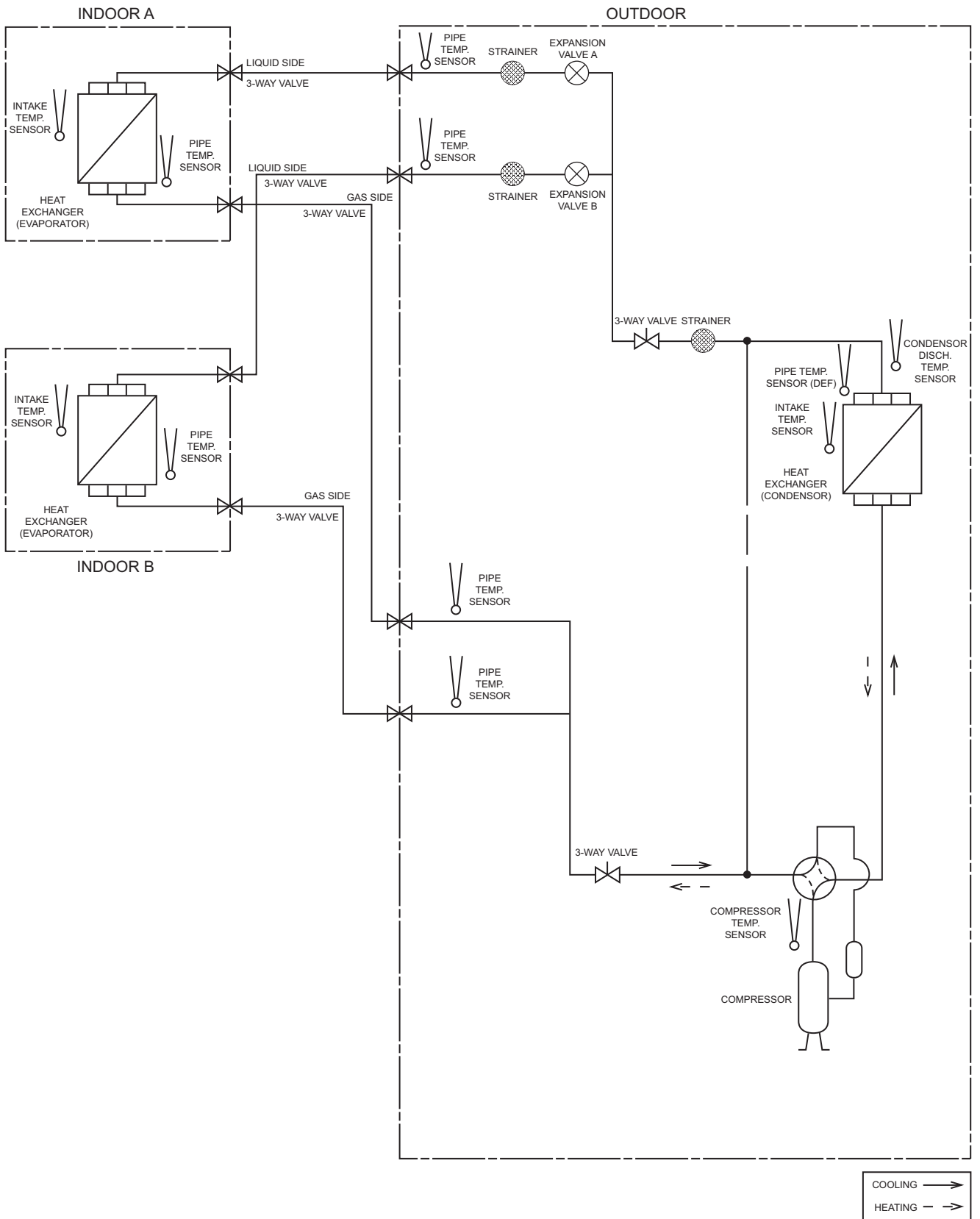


<Side View>

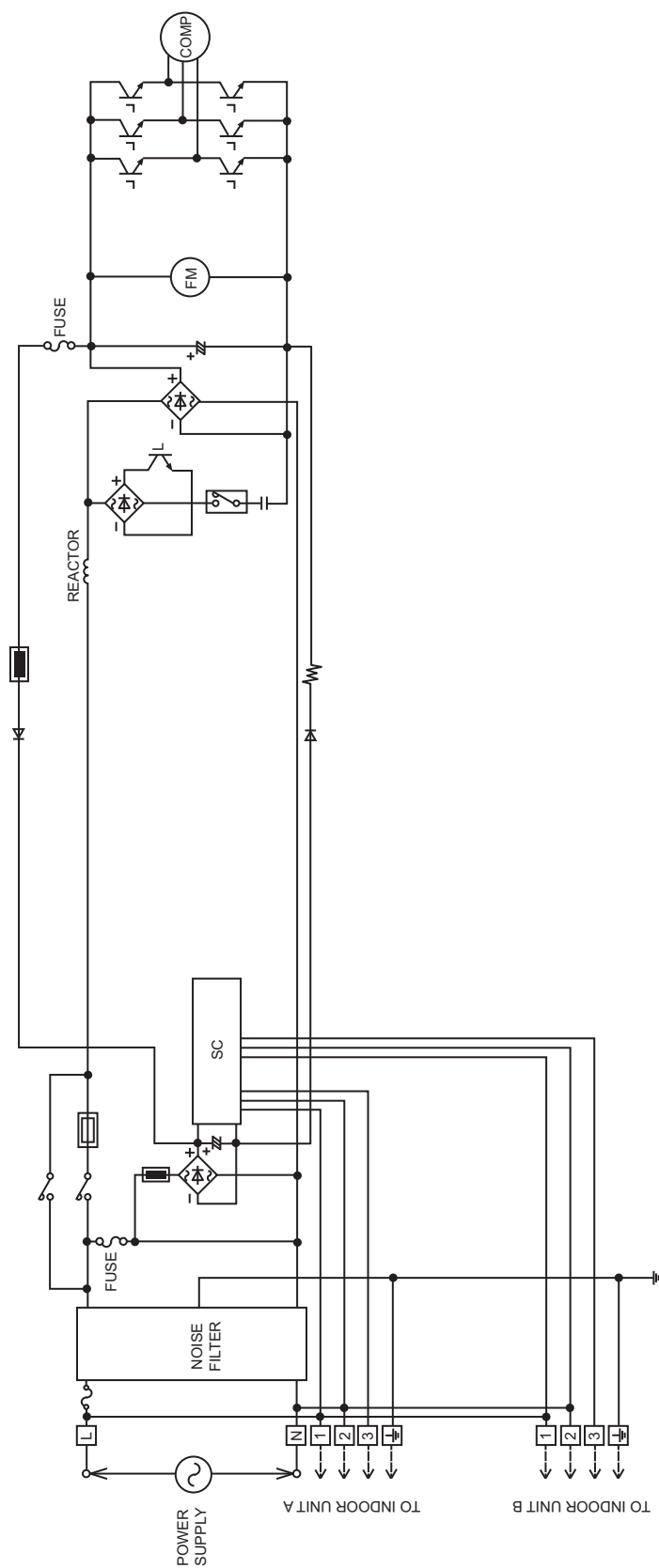


Unit: inch

4. Refrigeration Cycle Diagram



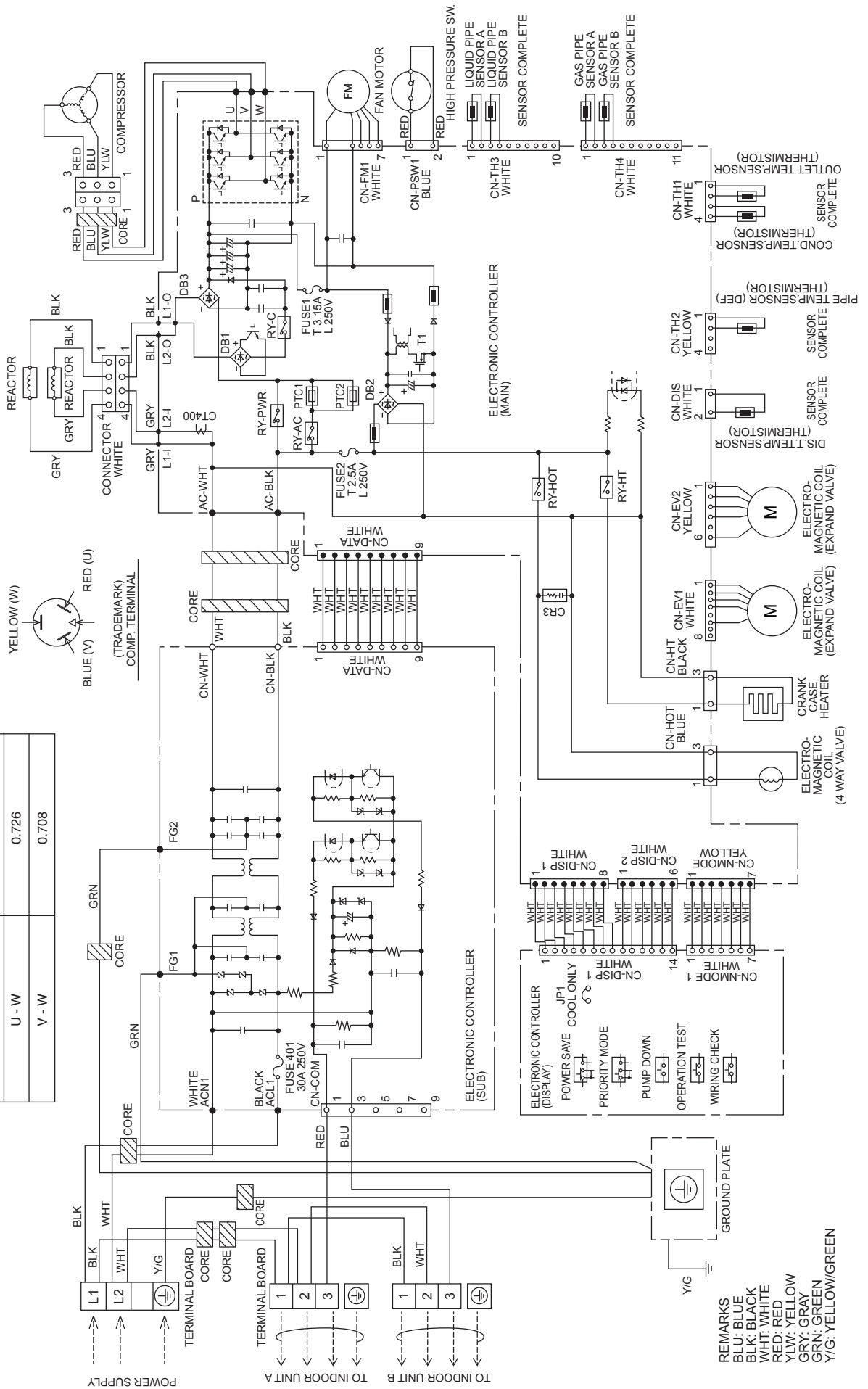
5. Block Diagram



6. Wiring Connection Diagram

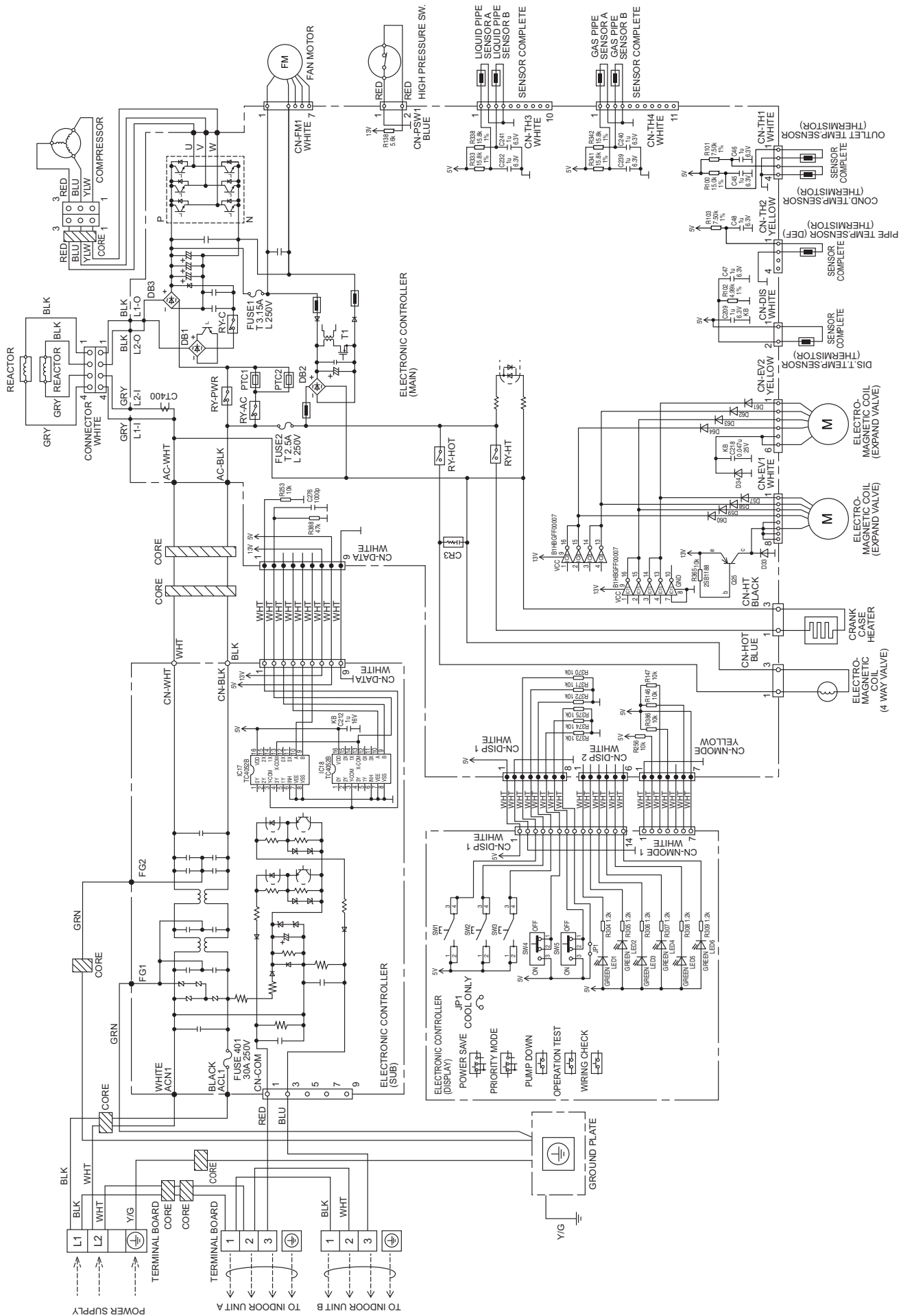
Resistance of Compressor Windings

CONNECTION	5KD184XAB21 (Ω)
U - V	0.720
U - W	0.726
V - W	0.708



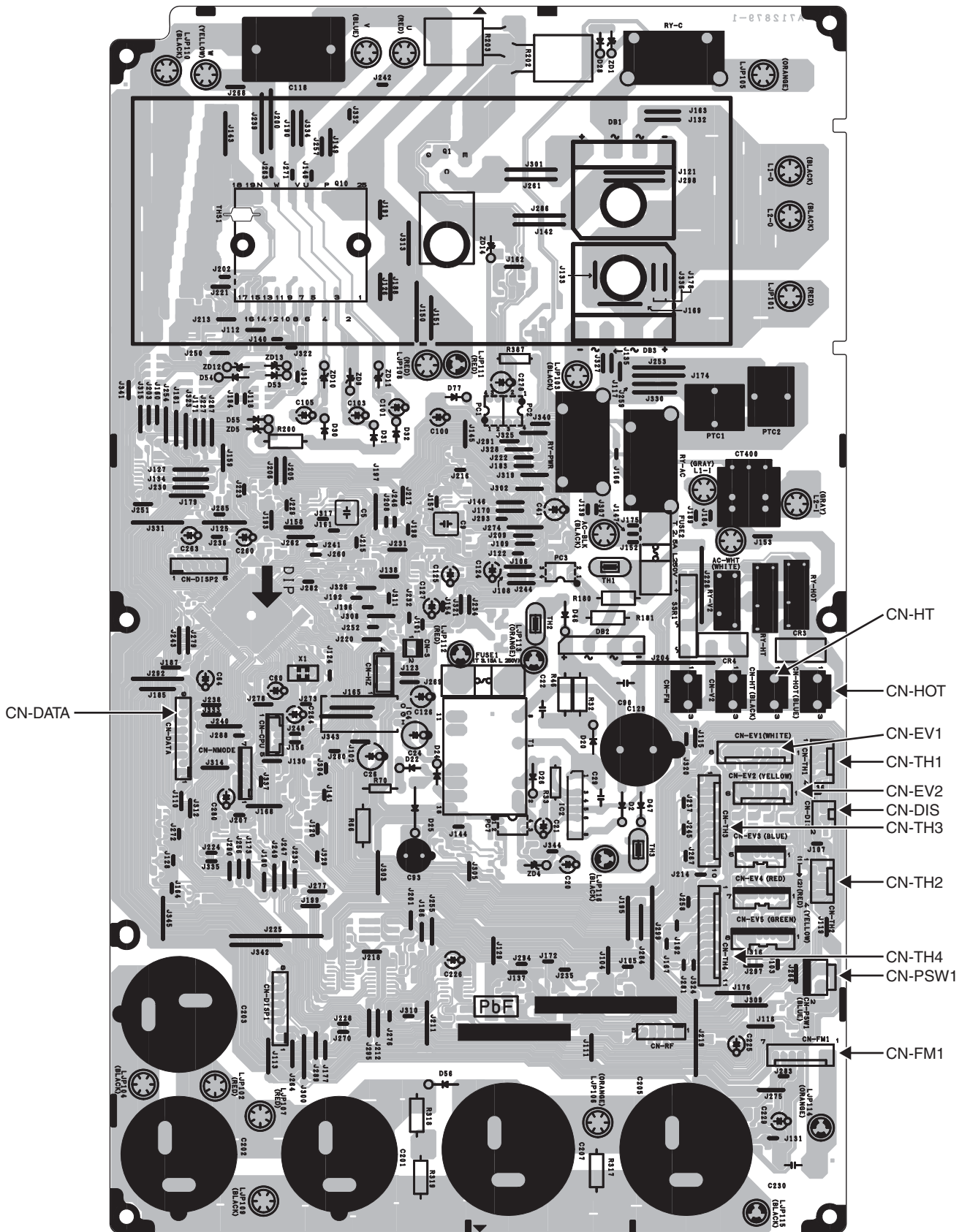
REMARKS
 BLU: BLUE
 BLK: BLACK
 WHT: WHITE
 RED: RED
 YLW: YELLOW
 GRY: GRAY
 GRN: GREEN
 Y/G: YELLOW/GREEN

7. Electronic Circuit Diagram

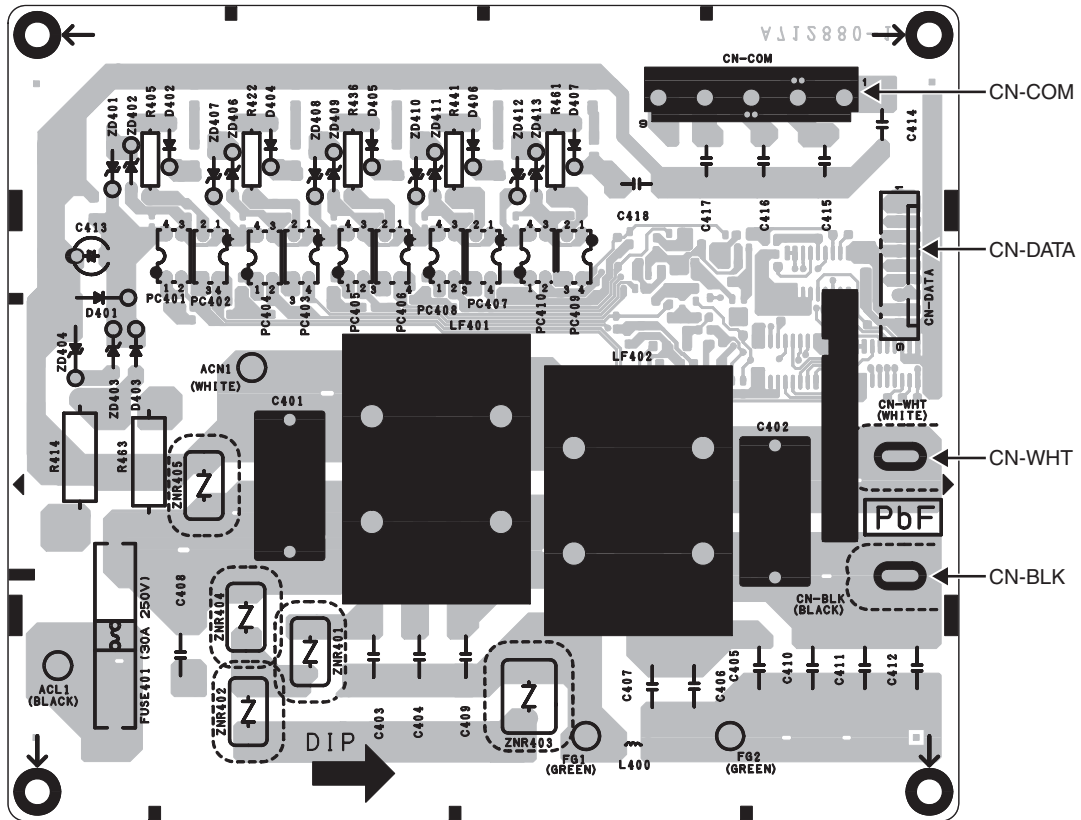


8. Printed Circuit Board

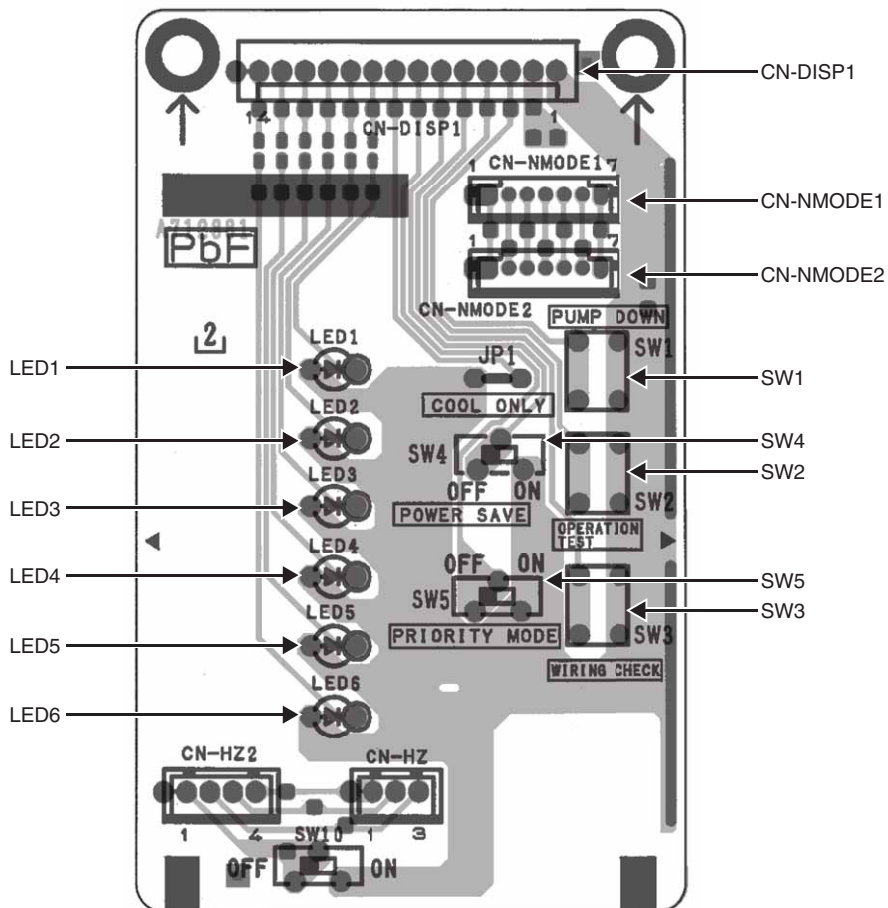
8.1 Main Printed Circuit Board



8.2 Noise Filter Printed Circuit Board

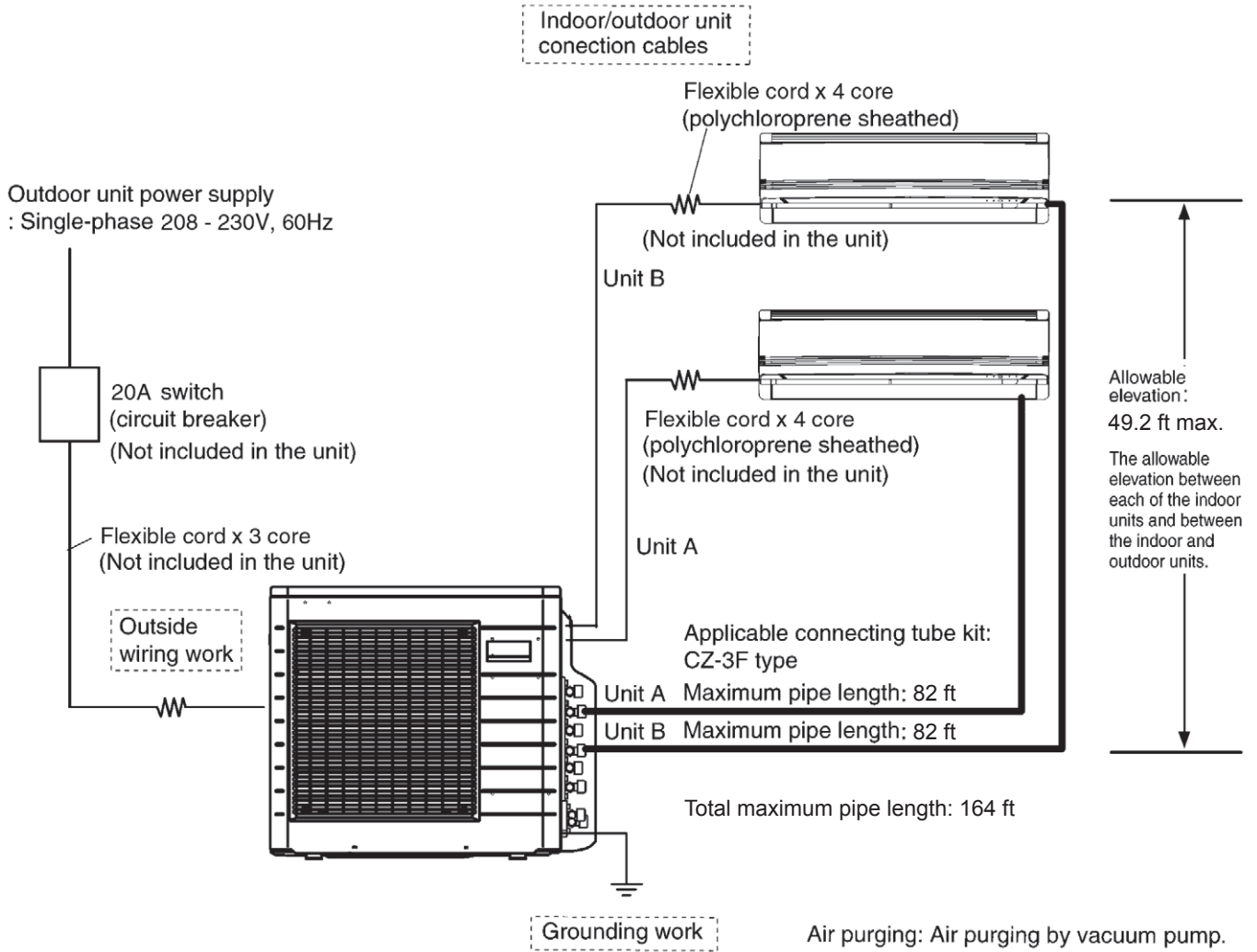


8.3 Display Printed Circuit Board



9. Installation Information

9.1 Check Points



QUICK GUIDE PIPING AND ELECTRICAL SPECIFICATION

Indoor (ID) & Outdoor (OD) units: Possible Combination Patterns	Capacity (Btu/h)	Refrigerant	Piping size		Standard pipe length	Max. Elevation	Min. pipe length for each ID unit	Max. from OD to each ID unit	Max. total length	Min. total pipe length for additional gas	Additional refrigerant	Power supply	Power supply wire size	OD-ID connection wire size
			Gas	Liquid										
Outdoor (OD): CU-2E18SBU Indoor (ID): 2 UNITS OF CS-E9RKUAW	16700	R410A	Ø3/8" (Ø9.52mm)	Ø1/4" (Ø6.35mm)	24.6 ft	See Step 1	9.8 ft	82.0 ft	164.0 ft	65.6 ft	0.2 oz / ft	208/230V 60 Hz MCA 20A MOP 25A	AWG12	AWFG16
Outdoor (OD): CU-2E18SBU Indoor (ID): 2 UNITS OF CS-E12RKUAW														
Outdoor (OD): CU-2E18SBU Indoor (ID): 1 UNIT OF CS-E9RKUAW + 1 UNIT OF CS-E12RKUAW														

Example:

If total piping length of all installed indoor units is at 68.6 ft, the quantity of additional refrigerant should be 0.6 oz
 $(68.6 - 65.6) \text{ ft} \times 0.2 \text{ oz/ft} = 0.6 \text{ oz.}$


10. Installation Instruction

• IMPORTANT

This product has been designed and manufactured to meet ENERGY STAR® criteria for energy efficiency when matched with appropriate coil components. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow the manufacturer's refrigerant charging and air flow instructions. **Failure to confirm proper charge and airflow may reduce energy efficiency and shorten equipment life.**

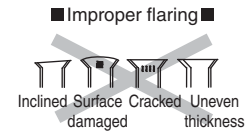
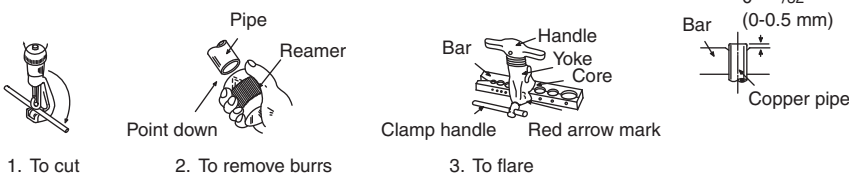
10.1 Accessories Supplied with Outdoor Unit

- The following parts are supplied as accessories with each outdoor unit. Check that all accessory parts are present before installing the outdoor unit.

HEAT PUMP-TYPES ONLY			
Part name	Qty.	Diagram	Application
Drain elbow	1		For connecting the drain pipe

10.2 Cutting and Flaring the Piping

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



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

10.3 Select the Best Location

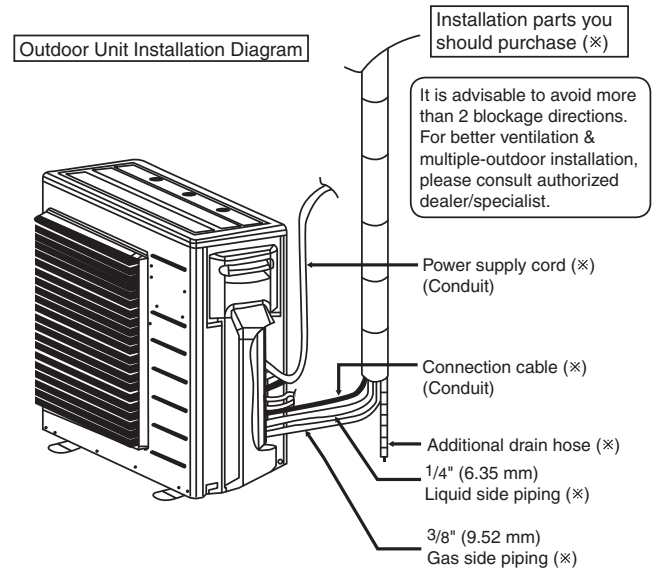
10.3.1 Outdoor Unit

- 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.
- Recommended installation height for outdoor unit should be above the seasonal snow level.

Refrigerant piping size	
Outdoor Unit	CU-2E18**
Liquid - side	ø1/4" (ø6.35 mm) thickness 1/32" (t0.8 mm)
Gas - side	ø3/8" (ø9.52 mm) thickness 1/32" (t0.8 mm)

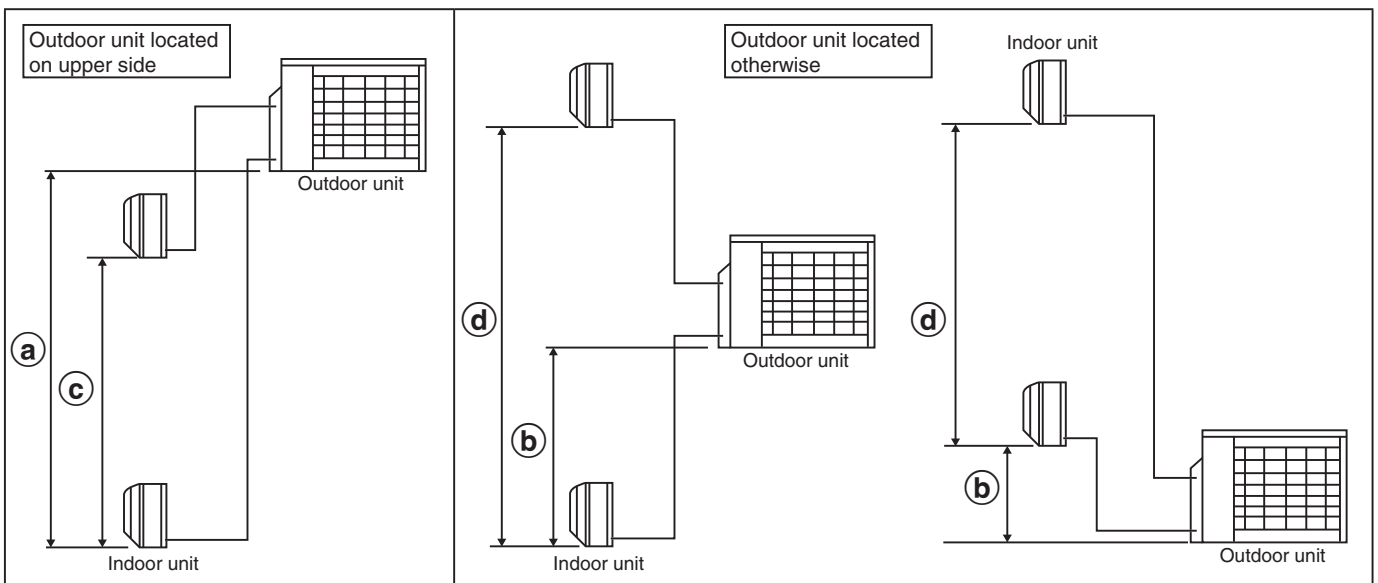
Outdoor Unit	CU-2E18**
Min. total piping length for additional gas	65.6 ft (20 m)

- If total piping length of all indoor units exceeds the minimum length listed above, additionally charge with 0.2 oz (20 g) of refrigerant (R410A) for each additional feet (meter) of piping.



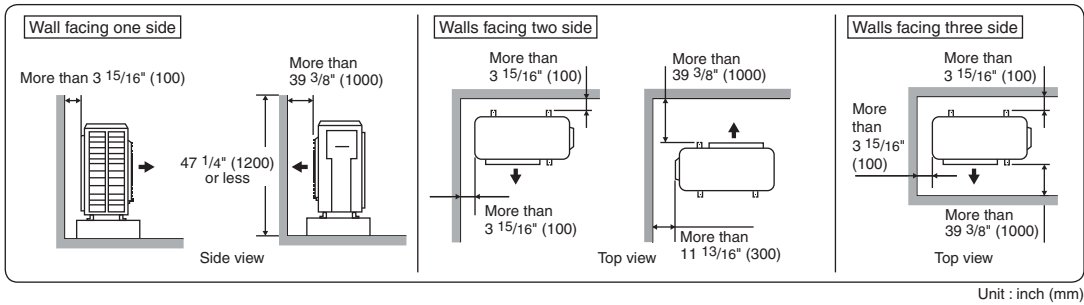
- This illustration is for explanation purposes only.
- * Note: Respective indoor unit installation procedure shall refer to instruction manual provided in the indoor unit packaging.

Allowable piping length			
Outdoor Unit			CU-2E18***
Allowable piping length of each indoor unit (min. ~ max.)			9.8 ft ~ 82.0 ft (3 m ~ 25 m)
Allowable total piping length of all indoor units			164.0 ft (50 m) or less
Height difference between indoor and outdoor units	Outdoor unit located on upper side	Ⓐ	49.2 ft (15 m) or less
	Outdoor unit located otherwise	Ⓑ	24.6 ft (7.5 m) or less
Height difference between indoor units	Outdoor unit located on upper side	Ⓒ	24.6 ft (7.5 m) or less
	Outdoor unit located otherwise	Ⓓ	49.2 ft (15 m) or less



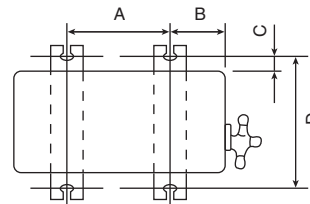
Outdoor Unit Installation Guidelines

- Where a wall or other obstacle is in the path of outdoor unit's intake or exhaust airflow, follow the installation guidelines below.
- For any of the below installation patterns, the wall height on the exhaust side should be 47 1/4" (1200 mm) or less.



10.4 Install the Outdoor Unit

- After selecting the best location, start installation to Indoor/Outdoor Unit Installation Diagram.
 - 1 Fix the unit on concrete or rigid frame firmly and horizontally with bolt nut ($\phi 13/32$ " ($\phi 10$ mm)).
 - 2 When installing on a roof, please consider strong winds and earthquakes.
 - 3 Please fasten the installation stand firmly with bolt or nails.



Model	A	B	C	D
CU-2E18***	24 1/8" (613 mm)	5 5/32" (131 mm)	5/8" (16 mm)	14 3/16" (360.5 mm)

10.5 Connect the Piping

- Remove the control board cover (resin) from the outdoor unit by loosening three screws.

Connecting the Piping to Outdoor Unit

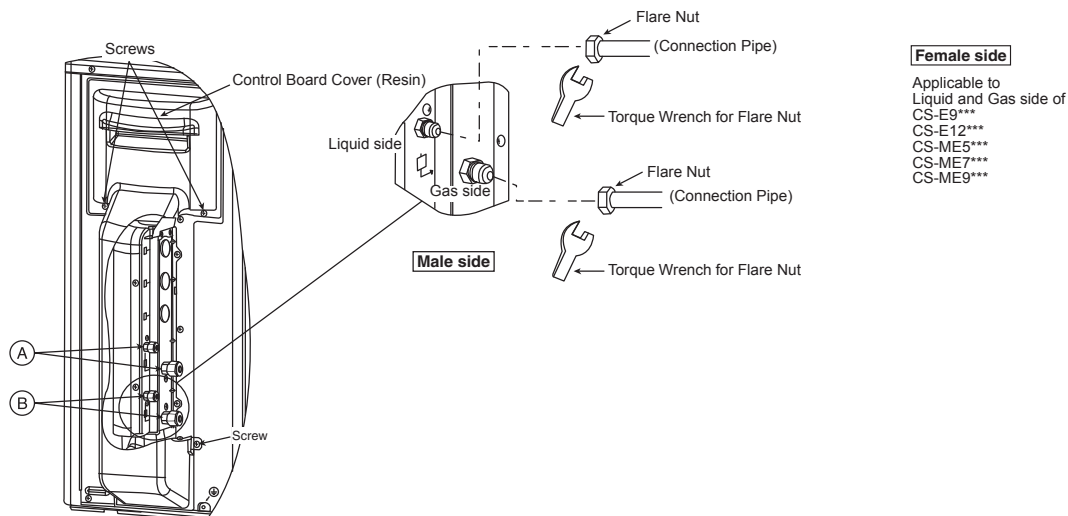
Decide piping length and then cut by using pipe cutter.

Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe.

Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

Do not overtighten, over tightening may cause gas leakage.

Piping size	Torque
1/4" (6.35 mm)	13.3 lbf•ft [18 N•m (1.8 kgf•m)]
3/8" (9.52 mm)	31.0 lbf•ft [42 N•m (4.3 kgf•m)]
1/2" (12.7 mm)	40.6 lbf•ft [55 N•m (5.6 kgf•m)]
5/8" (15.88 mm)	47.9 lbf•ft [65 N•m (6.6 kgf•m)]
3/4" (19.05 mm)	73.8 lbf•ft [100 N•m (10.2 kgf•m)]



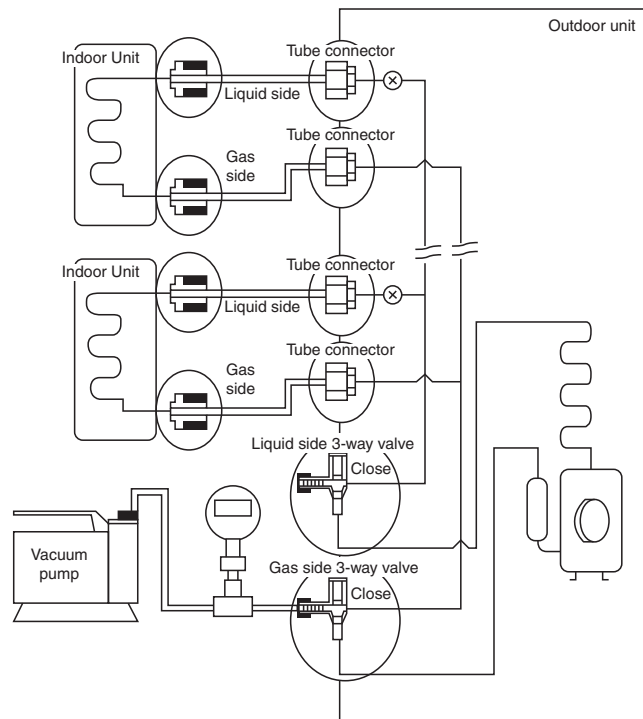
Gas Leak Checking

Pressure test to system to 400 PSIG with dry nitrogen, in stages. Thoroughly leak check the system. If the pressure holds, release the nitrogen and proceed to section 10.7.

10.6 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 gas side 3-way valve.
- 2 Connect the micron gauge between vacuum pump and service port of outdoor units.
- 3 Turn on the power switch of the vacuum pump and make sure that connect digital micron gauge and to pull down to a value of 500 microns.
- 4 To make sure micron gauge a value 500 microns and close the low side valve of the charging set and turn off the vacuum pump.
- 5 Disconnect the vacuum pump house from the service port of the 3-way valve.
- 6 Tighten the service port caps of gas side 3-way valve at a torque of 13.3 lbf•ft (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 (5/32" (4 mm)).
- 8 Mount valve caps onto the 2-way valve and 3-way valve.
 - Be sure to check for gas leakage.

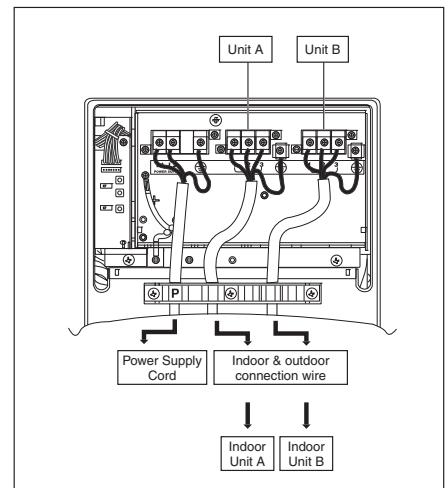
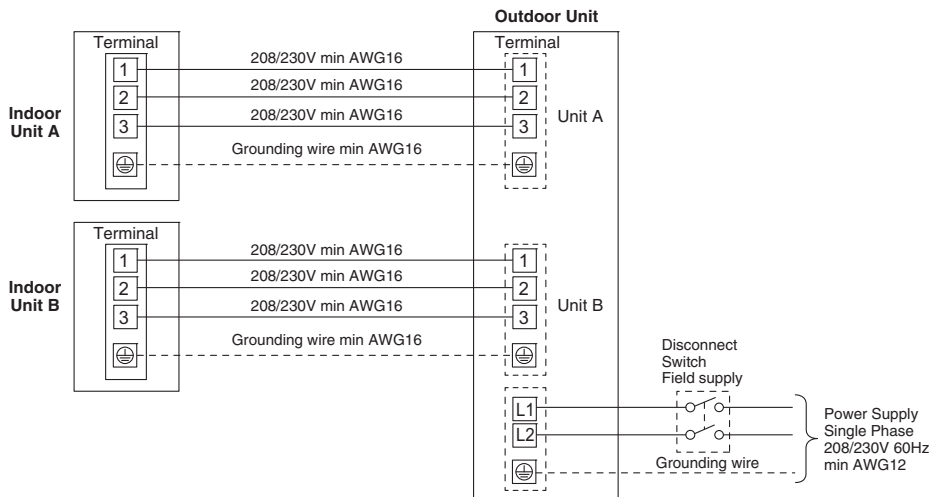
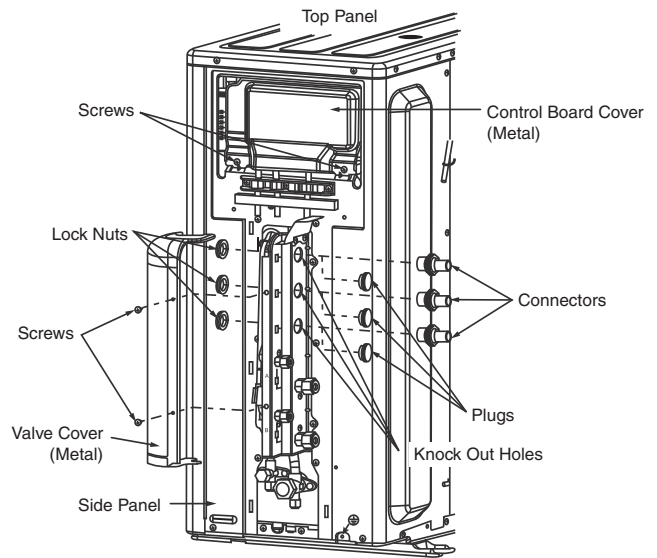


CAUTION

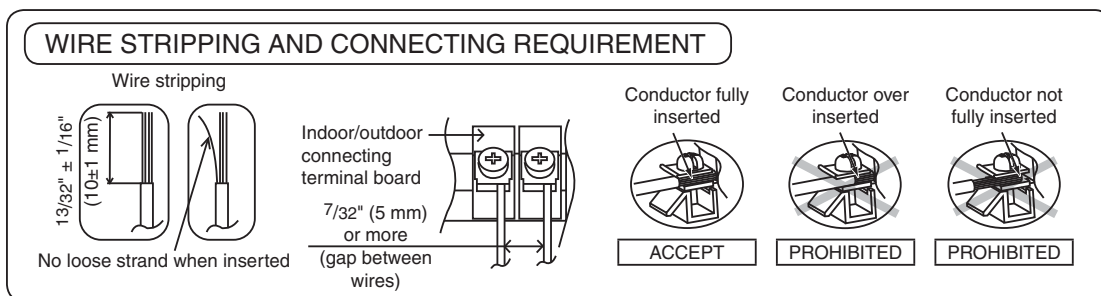
- If micron gauge value does not descend 500 microns, take the following measures:
 - If the leak stops when the piping connections are tightened further, continue working from step ③.
 - If the leak does not stop when the connections are retightened, repair location of leak.
 - Do not release refrigerant during piping work for installation and reinstallation.
 - Take care when handling the liquid refrigerant, it may cause frostbite.

10.7 Connect the Cable to the Outdoor Unit

- 1 Remove Control Board Cover (Metal) by loosening 2 screws.
- 2 Remove Valve Cover (Metal) by loosening 2 screws.
- 3 Remove Plugs.
- 4 Fix the conduit connectors to the knock out holes with lock-nuts, then secure them.
- 5 Connecting wire between indoor unit and outdoor unit should be UL listed or CSA approved 4 conductor wires minimum AWG16 in accordance with local electric codes.
- 6 Wire Connection to the power supply (208/230V 60Hz) through circuit breaker.
 - Connect the UL listed or CSA approved wires minimum AWG12 to the terminal board, and connect to other end of the wires to circuit breaker.
- 7 Connect the power supply cord and connecting wires between indoor unit and outdoor unit according to the diagram as shown.



- 8 For wire stripping and connection requirement, refer to the diagram below.
- 9 Secure the power supply cord and connection cables onto the control board with the holder.
- 10 Attach the control board cover (metal and resin) and valve cover back to the original position with screw.



- ⚡ This equipment must be properly earthed.
 - Earth wire must be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reasons.

10.8 Heat Insulation

	Use a material with good heat-resistant properties as the heat insulation for the pipes. Be sure to insulate both the gas-side and liquid-side pipes. If the pipes are not adequately insulated, condensation or water leakages may occur.
--	--

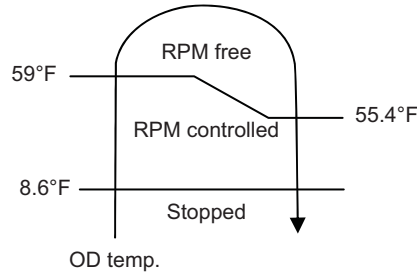
Liquid-side pipes	Material shall withstand 248°F (120°C) or higher
Gas-side pipes	

11. Operation Control

11.1 Cooling Operation

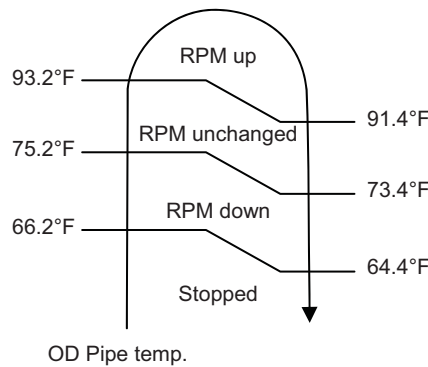
11.1.1 Outdoor fan control

- When cooling operation is enabled, based on outdoor ambient temperature, fan motor control will be adjusted according to figure below:



11.1.2 Annual Cooling control

- This control is to enable cooling operation when outdoor ambient temperature is low.
- Control start conditions:
 - Cooling operation is activated with compressor ON.
 - Outdoor ambient temperature is less than 59°F
- Control contents:
 - When the above conditions are fulfilled, based on outdoor pipe temperature, the outdoor fan motor will operate according to figure below:

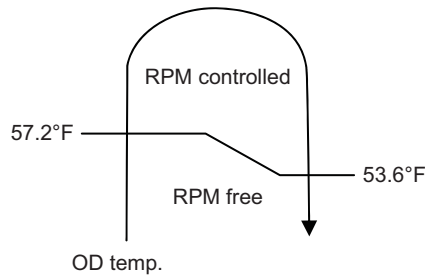


- To improve the judgment accuracy during annual cooling control, outdoor ambient temperature sampling for 2 minutes will be activated every 35 minutes under designated fan speed.
- Control stop conditions:
 - When either one of the start conditions are not complied.

11.2 Heating Operation

11.2.1 Outdoor fan control

- When heating operation is enabled, based on outdoor ambient temperature, fan motor control will be adjusted according to figure below:



- To improve the judgment accuracy, indoor room temperature sampling starts when any indoor unit has stopped capability supplied (heating thermo-off) during heating operation with compressor ON, outdoor unit will send signal to all thermo-off indoor units to ON fan motor and get room temperature sample.
- To prevent discharge temperature drop at indoor units which is ON when sampling the room temperature of heating thermo-off units, the outdoor fan speed will be adjusted accordingly.
- However, if indoor room temperature is high compare to remote control setting temperature, sampling of corresponding indoor unit will be cancelled.

11.2.2 Powerful Operation 1

- During cooling operation, this control is to concentrate outdoor unit capability to the powerful operation enabled indoor unit by temporary stop the capability supply to low load demand indoor units.
- Operation start condition:
 - Powerful operation ON for targeted indoor unit
- Operation content:
 - If other indoor units (where Powerful operation are OFF) achieve setting temperature continuously for 1 minute after received powerful command from indoor unit, then capability supply to other indoor units are stopped for minimum 3 minutes.
Capability supply stop period follows powerful operation period.
- Operation stops when comply either one of the following conditions:
 - When other indoor units (where Powerful operation are OFF) is lower than setting temperature.
 - When the powerful operation is OFF for all indoor units.
 - When Quiet operation received from 1 indoor unit.
 - When protection control starts.

11.2.3 Powerful Operation 2

- During cooling / heating operation, this control is to provide fast cooling / heating operation compare to normal operation.
- Operation start if all condition below are complied:
 - Powerful operation ON for indoor unit.
 - Not under Annual Cooling control.
- Operation content:
 - Outdoor fan speed will adjust automatically.
 - Compressor frequency will adjust automatically.
- Operation stop when comply either one of the follow conditions:
 - When the powerful operation is OFF for all indoor units.
 - When annual cooling control activated.

12. Simultaneous Operation Control

1 Operation modes which can be selected using the remote control unit:

Automatic, Cooling, Soft Dry, Heating, e-ion operation mode.

2 Types of operations modes which can be performed simultaneously

- Cooling operation and cooling, Soft Dry or e-ion operation
- Heating operation and heating operation

3 Types of operation modes which cannot be performed simultaneously

- While a cooling operation is in progress, a heating operation cannot be performed by an indoor unit in another room. In the room where the operation button for cooling was pressed first, the operation is continued. In the room where the operation button for heating was pressed afterward, the operation lamp of the indoor unit blinks, where the attempt is made to establish the heating operation. Its fan is stopped, and the air does not discharged.
- While a heating operation is in progress, a cooling operation cannot be performed by an indoor unit in another room. In the room where the operation button for heating was pressed first, the operation is continued. In the room where the operation button for cooling was pressed afterward, the operation lamp of the indoor unit blinks, where the attempt is made to establish the cooling operation. Its fan is stopped, and the air does not discharged.

4 Operation mode priority control

- The operation mode designated first by the indoor unit has priority.
- If the priority indoor unit stops operation or initiates the e-ion operation, the priority is transferred to other indoor units.

“Waiting” denotes the standby status in which the operation lamp LED blinks (ON for 2.5 sec. and OFF for 0.5 sec.), and the fan is stopped.

		B ROOM			
		Non Priority Unit (2nd. ON)			
A ROOM		Cooling	Soft Dry	Heating	e-ion
Priority Unit (1st. ON)	Cooling	C	C	Waiting	E
	Soft Dry	D	D	Waiting	E
	Heating	H	H	H	Stop
	e-ion *	E	E	Stop	E

* In the e-ion mode, priority is transferred to a non-priority unit.

Note

- C: Cooling operation mode
- D: Soft Dry operation mode
- H: Heating operation mode
- E: e-ion operation mode

13. Protection Control

13.1 Freeze Prevention Control (Cool)

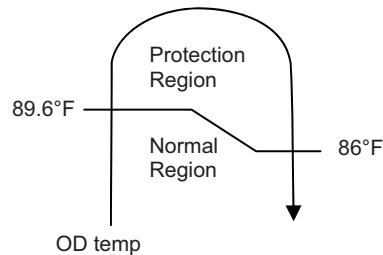
- When received freeze prevention signal from indoor unit, the compressor frequency changes according to indoor heat exchanger temperature.
- When indoor unit request capability OFF due to freeze condition , immediately the capability supply to targeted indoor unit stops.

13.2 Dew Prevention Control (Cool)

- When received dew prevention signal from indoor unit, the compressor frequency changes according to indoor intake temperature and indoor heat exchanger temperature.

13.3 Electronic Parts Temperature Rise Protection 1 (Cool)

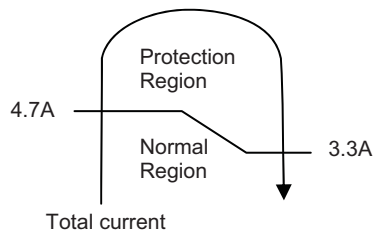
- This control prevents electronic parts temperature rise during cooling overload condition.
- Start conditions:
 - Outdoor ambient temperature is at protection region as shown in figure below:



- Outdoor unit total current is above 5.5A
- Control content
 - Outdoor fan speed is adjusted accordingly.
- Control stop condition
 - When outdoor ambient temperature is back to normal region.
- During this control, outdoor fan speed does not reduce for Quiet operation.

13.4 Electronic Parts Temperature Rise Protection 2 (Cool)

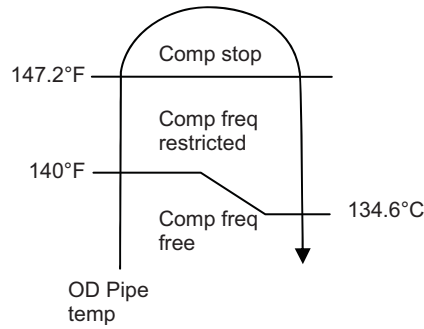
- This control prevents electronic parts temperature rise during cooling/dry operation.
- Start conditions:
 - Total current is at protection region as shown in figure below:



- Control content
 - Outdoor fan speed is adjusted accordingly.
- Control stop conditions
 - When total current is back to normal region.
- During this control, outdoor fan speed does not reduce for Quiet operation.

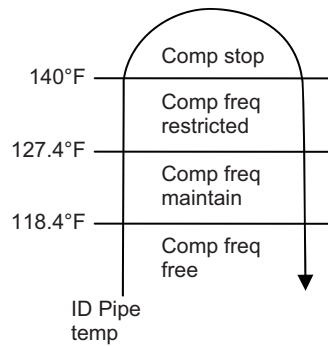
13.5 Cooling Overload Control (Cool)

- This control detect outdoor pipe temperature and perform the compressor frequency restriction during cooling operation.

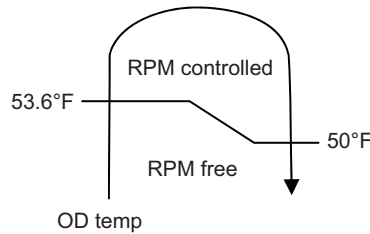


13.6 Heating Overload Control (Heat)

- This control detect indoor pipe temperature and perform the compressor frequency restriction during heating operation.

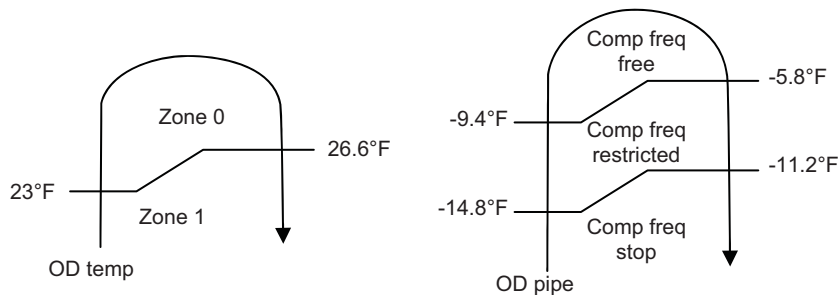


- This control detect outdoor ambient temperature and perform the fan speed adjustment during heating operation.



13.7 Extreme Low Temperature Compressor Low Pressure Protection Control (Heat)

- This control is to prevent low pressure drops too low during extremely low outdoor ambient temperature to improve the compressor reliability.
- During heating operation, when outdoor ambient temperature is in Zone 1, this control will be activated. Compressor frequency restriction will be based on outdoor piping temperature.



13.8 Deice Control

- When outdoor pipe temperature and outdoor air temperature is low, deice operation starts where indoor fan motor and outdoor fan motor stop, indoor unit horizontal vane close and operation LED blink with compressor ON.

13.9 Time Delay Safety Control (Restart Control)

- The compressor will not restart within three minutes after compressor is stopped.
- This control is not applicable if the power supply reset or after deice condition.

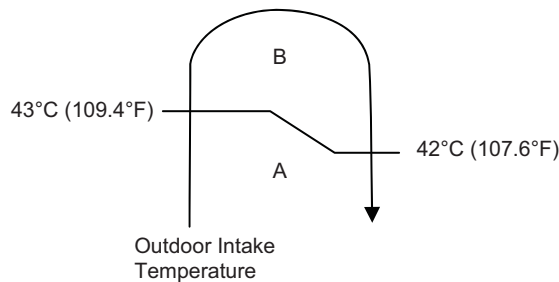
13.10 30 seconds Force Operation

- Once the compressor starts operation, it will not stop its operation for 30 seconds in order to cycle back compressor oil.
- However, it can be stopped using remote control or Auto OFF/ON button at indoor unit.

13.11 Total Current Control

- By referring to table below, during normal (default) operation, the running current refer to Hi values and during Power Save Mode, the running current refer to Lo values.
- When the outdoor unit total running current (AC) exceeds X value, compressor frequency will decrease.
- If the running current does not exceed X value for 5 seconds, compressor frequency will increase.
- However, if total outdoor unit running current exceeds Y value, compressor will be stopped immediately for 3 minutes.

Operation Mode	CU-2E18SBU	
	X (A)	Y (A)
Cooling/Soft Dry (A)	12.2	17.5
Cooling/Soft Dry (B)	11.5	17.5
Heating	13.2	17.5



13.12 IPM (power transistor) Protection Control

- Overheating Prevention Control
 - If IPM temperature rises to 176°F, outdoor fan speed will be increased.
 - When the IPM temperature rises to 203°F, compressor operation will stop immediately.
 - Compressor operation restarts when temperature decreases to 194°F.
 - If IPM temperature detected less than -22°F, IPM is judged as open circuit ("F96" is indicated).
- DC peak current control
 - When IPM DC current exceeds set value of 30.0 ± 3.0 A, the compressor will stop.
 - If the DC peak current detected within 30 seconds after operation starts, compressor will restart after 1 minute.
 - If the DC peak current detected 30 seconds or more after operation starts, compressor will restart after 2 minutes.
 - Within 30 seconds after compressor restarts, if the DC peak current is exceeded set value continuously for 7 times, all indoor and outdoor relays will be cut off ("F99" is indicated).
- Error reset can be done by power supply reset.

13.13 Compressor Protection Control (Gas leak detection control 1)

- Control start conditions
 - For 5 minutes, the compressor continuously operates and total current is low.
 - During Cooling or Soft Dry operation:
Indoor intake temperature — indoor piping temperature is below 39.2°F.
 - During Heating operation:
Indoor pipe temperature — indoor intake temperature is below 37.4°F.
 - Not during deice control.
 - Compressor ON with maximum frequency.
- Control content
 - Compressor stops (and restart after 3 minutes)
 - If the conditions above happen 4 times within 60 minutes, the unit will stop operation (“F91” is indicated).

13.14 Compressor Protection Control (Gas leak detection control 2)

- This control detect gas leakage condition to prevent compressor damage.
- Control start condition
 - All connected indoor units capability supply ON.
 - Compressor ON with maximum frequency.
 - Not during annual cooling.
 - Compressor discharge temperature high.
- Control content
 - Compressor OFF during this control (“F91” is memorized in EEPROM)
 - If the above conditions happen 2 times within 60 minutes, indoor units’ Timer LED will blinks (“F91” is indicated at all indoor units)

13.15 Valve Close Detection Control

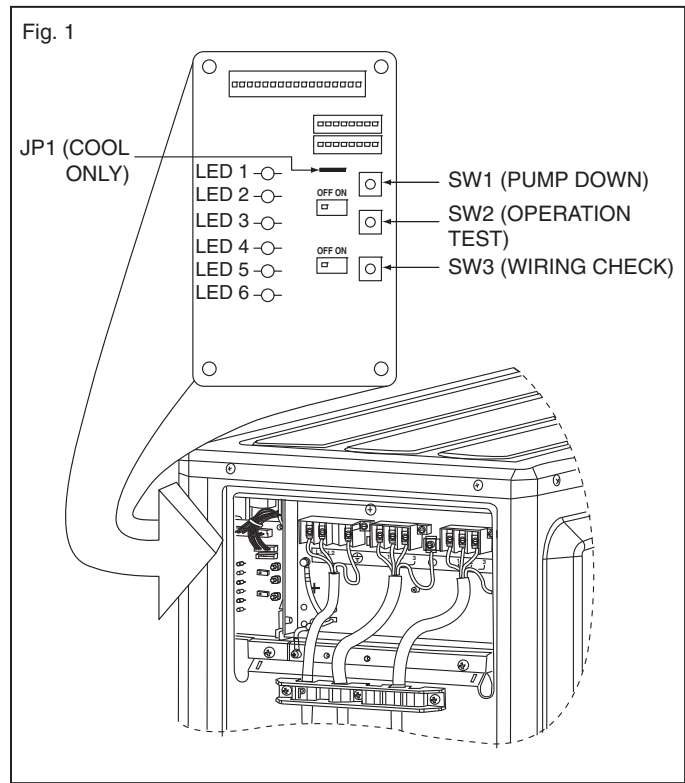
- This control detects 3-way valve close condition to prevent damage to refrigerant cycle.
- Start conditions:
 - For all connected indoor units, if Indoor intake temperature — indoor piping temperature are between 28.4°F and 35.6°F continuously for 5 minutes after compressor ON at first cooling operation.
 - The first cooling operation is defined as cooling operation is ON for less than 8 minutes after new installation or after pump down.
- Control content
 - During this control, compressor stop, indoor units’ Timer LED will blink. (“F91” is indicated at indoor units)
- Error reset can be done by power supply reset or reset by using remote control.

13.16 Compressor Discharge High Pressure Protection Control

- This control protect by using high pressure switch during operation.
- Start conditions
 - High pressure switch is activated (from normally close to open) when outdoor operation mode is cooling or heating during compressor running.
- Control 1 content
 - Compressor stop when high pressure switch is opened and restart after high pressure switch closed. If this condition happen 4 times within 30 minutes, “F94” is indicated.
 - After 30 minutes, counter is reset if this condition does not happen for 4 times.
- Control 1 stop conditions
 - Power supply reset
 - Reset by using remote control

14. Servicing Mode

14.1 CU-2E18SBU



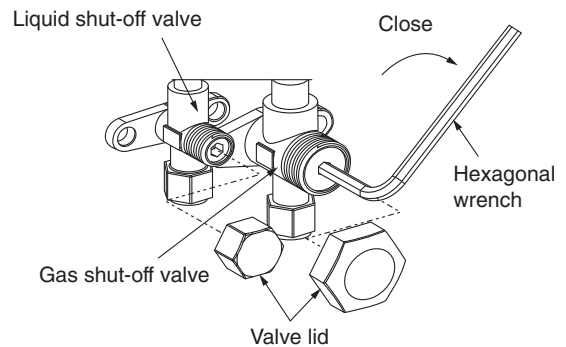
14.1.1 Pump down operation (SW1)

- Operate the pump down process according to the following procedure
 - Confirm the valve on the liquid side and gas side are open.
 - Press PUMP DOWN button (SW1) on the Service PCB inside the outdoor unit for more than 5 seconds. Pump down (cooling) operation is performed for 15 minutes.
 - Set the liquid side 3 way valve to close position and wait until the pressure gauge indicates 1.45PSI (0.1kg/cm²G).
 - Immediate set the gas side valve to close position and then press the PUMP DOWN button (SW1) to stop the pump down operation.

NOTE: Pump down operation will stop automatically after 15 minutes if PUMP DOWN switch (SW1) is not pressed again. Pump down operation is not started within 3 minutes after compressor is stopped.

LED	2	3	4	5	Message
Status	○	○	○	○	Pump down operation in progress
	○	○	○		3 minutes before operation end
	○	○			2 minutes before operation end
	○				1 minute before operation end
					Pump down operation end

○: Flashing



14.1.2 Test Run operation

- Test operation can be carried out using TEST OPERATION button (SW2) on the Service PCB inside the outdoor unit.
- For Cooling test, press the TEST OPERATION button (SW2) for 5 seconds or more but less than 10 seconds, LED1 and LED 2 will illuminate when shift into cooling test operation.
- For Heating test, press the TEST OPERATION button (SW2) for more than 10 seconds, LED 1 and LED 3 will illuminate when shift into heating test operation.
- Press the TEST OPERATION button (SW2) again to cancel test operation.

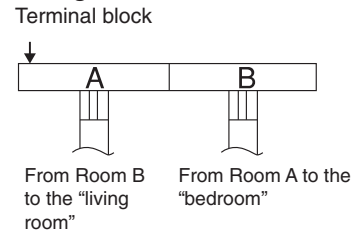
14.1.3 Wiring Error check

- The unit capable to correct the wiring error automatically by following procedures.
 - Confirm the valve on the liquid side and gas side is open.
 - Press WIRING CHECK button (SW3) on the Service PCB inside the outdoor unit for more than 10 seconds to start wiring check operation.
 - Wiring check process will complete in approximately 10 minutes. However, wiring check operation will not start within 3 minutes after compressor is stopped. When outdoor air temperature is less than 41°F or unit has abnormality, wiring check will not start. (See NOTE 2)
- The LED 2 to LED 6 in Service PCB inside the outdoor unit indicate the possibility of the correction as shown in the table below:

LED	2	3	4	5	6	Message
Room	A	B	-	-	-	
Status	All flashing					Automatic correction impossible
	LED2, 4, 6 and LED 3, 5 alternatively flashing					Wiring check in progress
	Flashing one after another					Automatic correction completed
	Other than above					Unit has abnormality (NOTE 4)

- If automatic correct is impossible, check the indoor unit wiring and piping manually.

Wiring automatic correct example



Wiring error check

LED lighting sequence after a wiring correction.
Order of LED flashing: 3--> 2

NOTE:

- For two rooms connection, LED 4 and 5 are not illuminated after wiring operation complete.
- If the outdoor air temperature is less than 41°F or unit has abnormality, wiring operation will not start.
- After wiring check operation is complete, LED indication will illuminated until normal operation starts.
- Follow the product diagnosis procedure.
- When LED 1 only illuminate, indicates that outdoor unit is operating normally.

14.1.4 Power Save Mode

- Power Save Mode can be enabled by pushing POWER SAVE switch (SW4) to ON before power supply ON.
- When Power Save Mode is ON, the unit can be operate at lower running current where the breaker capacity not achieve the requirement.

14.1.5 Mode priority function

- Mode priority function can be enabled by pushing MODE PRIORITY switch (SW5) to ON before power supply ON.
- When Mode Priority Function is ON, the mode priority is given to higher capacity indoor units.

14.1.6 Cooling only function

- The unit capable to limit the operation mode to Cooling Mode only (Heating mode disabled) by cutting JP1 (COOL ONLY) before power supply ON.
- This function prevent wrong operation during the unit installed in server room.
- This function could be disabled again by short the JP1 (COOL ONLY) before power supply ON.

15. Troubleshooting Guide

15.1 Self Diagnosis Function

- The display screen of wireless remote control unit and the self-diagnosis LEDs (green) on the outdoor printed circuit board in the outdoor unit can be used to identify the location of the problem. Refer to the table below to identify and solve the cause of the problem, and then re-start the air conditioner system.
- If the problem is solved and operation returns to normal. LED 1 illuminates and others LED are off.

Diagnosis display	Abnormality or protection control	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1	Abnormality judgement	Protection operation	Problem	Check location
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	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Indoor/outdoor connection wire Indoor/outdoor PCB Specification and combination table in catalogue
H15	Compressor temperature sensor abnormality					○	○	Continuous for 5s	—	Compressor temperature sensor open or short circuit	<ul style="list-style-type: none"> Compressor temperature sensor lead wire and connector
H16	Outdoor current transformer (CT) abnormality				○		○	—	—	Current transformer faulty or compressor faulty	<ul style="list-style-type: none"> Outdoor PCB faulty or compressor faulty
H27	Outdoor air temperature sensor abnormality				○	○		Continuous for 5s	—	Outdoor air temperature sensor open or short circuit	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Outdoor heat exchanger temperature sensor 1 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	<ul style="list-style-type: none"> Outdoor heat exchanger temperature sensor 2 lead wire and connector
H33	Indoor/outdoor misconnection abnormality			○			○	—	—	Indoor and outdoor rated voltage different	<ul style="list-style-type: none"> Indoor and outdoor units check
H36	Outdoor gas pipe temperature sensor abnormality			○		○		Continuous for 5s	Heating protection operation only	Outdoor gas pipe temperature sensor open or short circuit	<ul style="list-style-type: none"> Outdoor gas pipe temperature sensor lead wire and connector

Diagnosis display	Abnormality or protection control	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1	Abnormality judgement	Protection operation	Problem	Check location
H37	Outdoor liquid pipe temperature sensor abnormality			○		○	○	Continuous for 5s	Cooling protection operation only	Outdoor liquid pipe temperature sensor open or short circuit	<ul style="list-style-type: none"> Outdoor liquid pipe temperature sensor lead wire and connector
H64	Outdoor high pressure sensor abnormality			○	○			Continuous for 1 minutes	—	High pressure sensor open circuit during compressor stop	<ul style="list-style-type: none"> High pressure sensor Lead wire and connector
H97	Outdoor fan motor mechanism lock			○	○		○	2 times happen within 30 minutes	—	Outdoor fan motor lock or feedback abnormal	<ul style="list-style-type: none"> Outdoor fan motor lead wire and connector Fan motor lock or block
H98	Indoor high pressure protection			○	○	○		—	—	Indoor high pressure protection (Heating)	<ul style="list-style-type: none"> Check indoor heat exchanger Air filter dirty Air circulation short circuit
H99	Indoor operating unit freeze protection			○	○	○		—	—	Indoor freeze protection (Cooling)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Outdoor PCB faulty
F91	Refrigeration cycle abnormality		○			○		2 times happen within 20 minutes	—	Refrigeration cycle abnormal	<ul style="list-style-type: none"> Insufficient refrigerant or valve close
F93	Compressor abnormal revolution		○			○	○	4 times happen within 20 minutes	—	Compressor abnormal revolution	<ul style="list-style-type: none"> Power transistor module faulty or compressor lock
F94	Compressor discharge pressure overshoot protection		○		○			4 times happen within 30 minutes	—	Compressor discharge pressure overshoot	<ul style="list-style-type: none"> Check refrigeration system
F95	Outdoor cooling high pressure protection		○		○		○	4 times happen within 20 minutes	—	Cooling high pressure protection	<ul style="list-style-type: none"> Check refrigeration system Outdoor air circuit

Diagnosis display	Abnormality or protection control	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1	Abnormality judgement	Protection operation	Problem	Check location
F96	Power transistor module overheating protection		○		○	○		4 times happen within 30 minutes	—	Power transistor module overheat	<ul style="list-style-type: none"> • PCB faulty • Outdoor air circuit (fan motor)
F97	Compressor overheating protection		○		○	○	○	3 times happen within 30 minutes	—	Compressor overheat	<ul style="list-style-type: none"> • Insufficient refrigerant
F98	Total running current protection		○	○				3 times happen within 20 minutes	—	Total current protection	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Power transistor module faulty or compressor lock

LED 1 illuminate is indicated that outdoor unit is operating normally. If the LED 1 is switched off or flashing, check the power supply and self-diagnosis indication.

● -----	Illuminate
○ -----	Flashing
Blank -----	OFF

16. Disassembly and Assembly Instructions



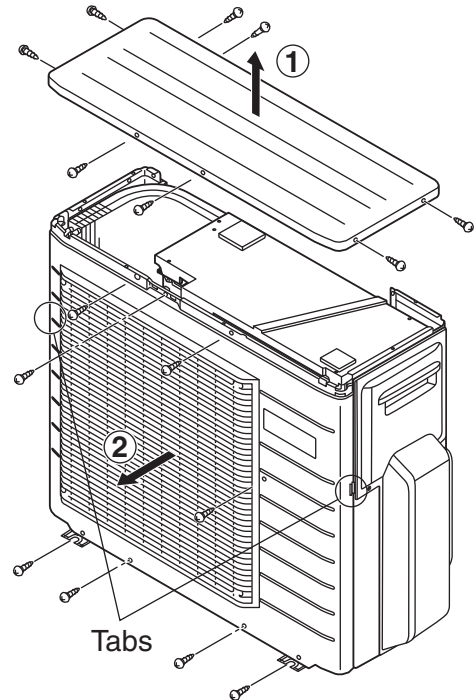
High Voltage are generated in the electrical parts area by the capacitor. Ensure that the capacitor has discharged sufficiently before proceeding with repair work. Failure to heed this caution may result in electric shocks.

16.1 Outdoor Unit Removal Procedure

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

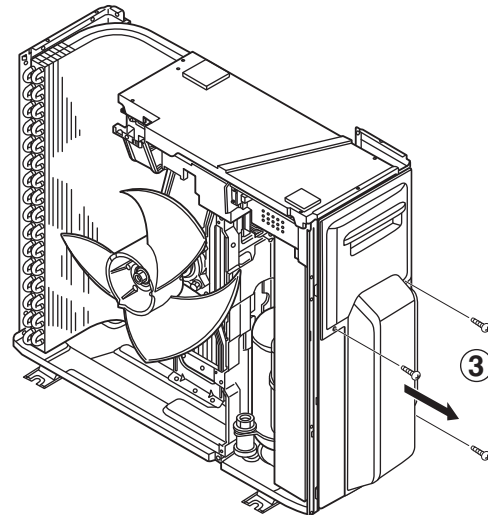
16.1.1 Removing the Cabinet Top Plate and Cabinet Front Plate

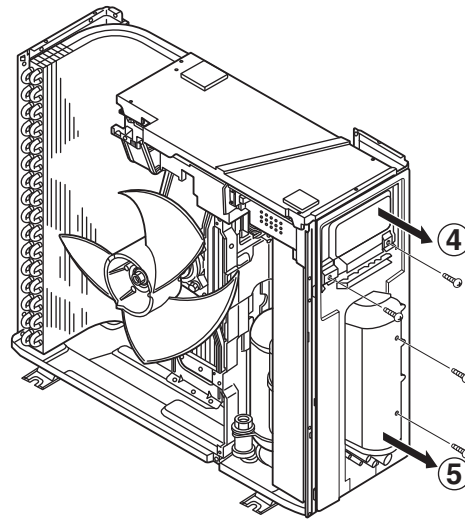
- 1 Remove the cabinet top plate (remove the 8 screws).
- 2 Remove the 8 screws (1 on the center, 3 at the top and 4 at the bottom) securing the cabinet front plate, release the 2 hooks (1 each at the left and right), and pull the cabinet front plate toward front side.



16.1.2 Remove the Control Board Cover and Particular Plates

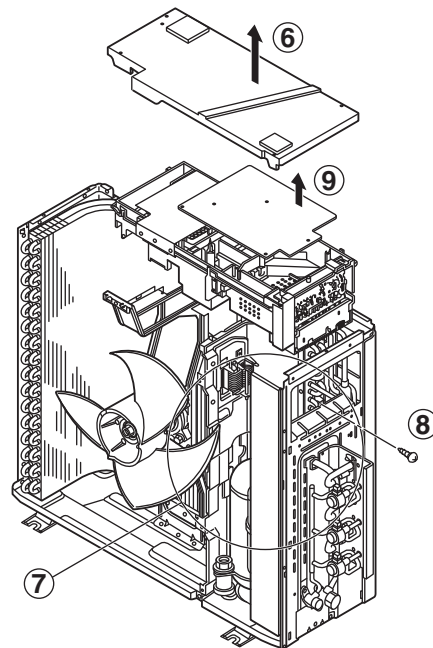
- 3 Remove the control board cover (remove 3 screws).
- 4 Remove the particular plate (remove 2 screws).
- 5 Remove the particular plate (remove 2 screws).





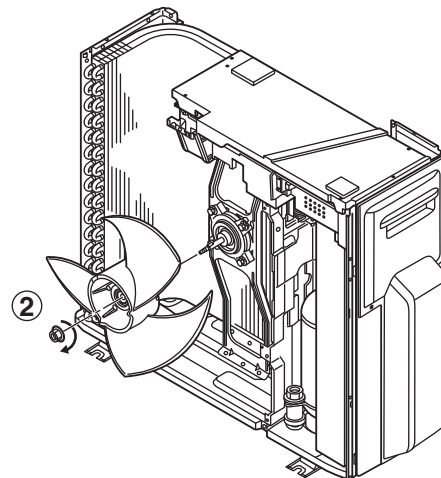
16.1.3 Removing the Control P.C. Board

- 6 Remove the drip proof cover.
- 7 Disconnect the connectors (lead wires of the compressor, sensor, and others).
- 8 Remove the screw at the right side of the control box, and pull out the entire control box.
- 9 Release the control P.C. Board tab to remove the control P.C. Board.

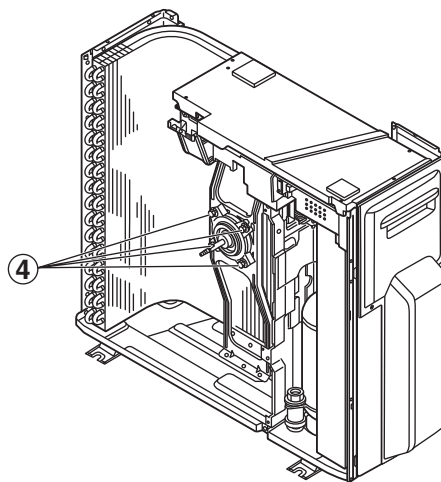


16.1.4 Removing the Propeller Fan and Fan Motor

- 1 Follow the steps in 16.1.1 for removing the cabinet top plate and cabinet front plate.
- 2 Remove the propeller fan by removing the nut turning clockwise at its center.



- 3 Disconnect the fan motor connector from the control P.C. Board.
- 4 Loosen the 4 fan motor mounting screws then remove the fan motor.



17. Technical Data

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

17.1 Cool Mode Performance Data

Unit setting: Standard piping length, Hi Fan, Cool mode at 60.8°F

Voltage: 208-230V

Combination (Capacity) (kW)	Outdoor Air Temp. °C (°F) DB	Indoor Air Temp. °C (°F) WB											
		16 (60.8)		17.5 (63.5)		18 (64.4)		19 (66.2)		22 (71.6)		24 (75.2)	
		TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
1.6 + 1.6	22 (71.6)	3.97	0.62	4.09	0.61	4.13	0.61	4.21	0.60	4.64	0.60	4.92	0.59
	25 (77)	3.93	0.71	4.06	0.71	4.11	0.71	4.20	0.71	4.63	0.71	4.92	0.72
	29 (84.2)	3.83	0.81	3.98	0.82	4.03	0.82	4.13	0.83	4.55	0.84	4.84	0.85
	32 (89.6)	3.73	0.88	3.88	0.89	3.93	0.89	4.03	0.90	4.44	0.91	4.72	0.92
	35 (95)	3.60	0.94	3.75	0.95	3.79	0.95	3.89	0.96	4.28	0.97	4.54	0.97
	40 (104)	3.33	1.02	3.45	1.03	3.49	1.03	3.58	1.03	3.92	1.02	4.14	1.01
	43 (109.4)	3.13	1.06	3.23	1.06	3.27	1.06	3.34	1.06	3.63	1.03	3.83	1.01
	46 (114.8)	2.90	1.10	2.98	1.08	3.01	1.08	3.07	1.07	3.31	1.02	3.47	0.98
1.6 + 2.0	22 (71.6)	4.45	0.72	4.59	0.71	4.63	0.70	4.72	0.70	5.20	0.69	5.51	0.68
	25 (77)	4.40	0.82	4.56	0.82	4.61	0.82	4.71	0.82	5.19	0.82	5.51	0.83
	29 (84.2)	4.30	0.94	4.46	0.95	4.52	0.95	4.62	0.95	5.10	0.97	5.42	0.98
	32 (89.6)	4.18	1.02	4.35	1.03	4.40	1.03	4.51	1.04	4.98	1.06	5.29	1.07
	35 (95)	4.04	1.09	4.20	1.10	4.25	1.10	4.36	1.11	4.80	1.12	5.09	1.13
	40 (104)	3.73	1.18	3.87	1.19	3.92	1.19	4.01	1.19	4.39	1.18	4.64	1.17
	43 (109.4)	3.50	1.23	3.62	1.23	3.67	1.22	3.75	1.22	4.07	1.19	4.29	1.16
	46 (114.8)	3.25	1.27	3.34	1.25	3.38	1.25	3.44	1.24	3.71	1.17	3.89	1.13
1.6 + 2.5	22 (71.6)	5.07	0.89	5.23	0.87	5.28	0.87	5.38	0.86	5.92	0.85	6.28	0.84
	25 (77)	5.02	1.01	5.19	1.01	5.25	1.01	5.37	1.01	5.92	1.02	6.28	1.02
	29 (84.2)	4.90	1.16	5.08	1.17	5.15	1.17	5.27	1.18	5.82	1.20	6.18	1.21
	32 (89.6)	4.76	1.25	4.95	1.27	5.02	1.27	5.14	1.28	5.67	1.30	6.02	1.32
	35 (95)	4.60	1.34	4.78	1.35	4.85	1.36	4.97	1.37	5.47	1.38	5.80	1.39
	40 (104)	4.25	1.46	4.41	1.47	4.46	1.47	4.57	1.47	5.00	1.46	5.29	1.45
	43 (109.4)	4.00	1.52	4.13	1.51	4.18	1.51	4.27	1.51	4.64	1.47	4.89	1.44
	46 (114.8)	3.71	1.56	3.81	1.55	3.85	1.54	3.92	1.53	4.23	1.45	4.43	1.40
1.6 + 3.2	22 (71.6)	5.92	1.09	6.10	1.07	6.16	1.07	6.28	1.05	6.91	1.04	7.33	1.03
	25 (77)	5.86	1.24	6.06	1.24	6.13	1.24	6.26	1.24	6.90	1.25	7.33	1.25
	29 (84.2)	5.71	1.42	5.93	1.43	6.01	1.44	6.15	1.44	6.79	1.47	7.21	1.48
	32 (89.6)	5.56	1.54	5.78	1.56	5.86	1.56	6.00	1.57	6.62	1.60	7.03	1.61
	35 (95)	5.37	1.64	5.58	1.66	5.66	1.67	5.80	1.68	6.38	1.69	6.77	1.70
	40 (104)	4.96	1.79	5.15	1.80	5.21	1.80	5.34	1.81	5.84	1.79	6.17	1.77
	43 (109.4)	4.66	1.86	4.82	1.86	4.88	1.85	4.98	1.85	5.42	1.80	5.71	1.76
	46 (114.8)	4.33	1.92	4.45	1.89	4.49	1.89	4.57	1.87	4.93	1.78	5.17	1.71
2.0 + 2.0	22 (71.6)	4.92	0.85	5.07	0.84	5.12	0.83	5.22	0.82	5.74	0.81	6.09	0.81
	25 (77)	4.87	0.97	5.04	0.97	5.09	0.96	5.20	0.96	5.74	0.97	6.09	0.98
	29 (84.2)	4.75	1.11	4.93	1.12	4.99	1.12	5.11	1.13	5.64	1.15	5.99	1.16
	32 (89.6)	4.62	1.20	4.81	1.21	4.87	1.22	4.99	1.23	5.50	1.25	5.84	1.26
	35 (95)	4.46	1.28	4.64	1.30	4.70	1.30	4.82	1.31	5.31	1.32	5.63	1.33
	40 (104)	4.12	1.40	4.28	1.40	4.33	1.40	4.43	1.41	4.85	1.39	5.13	1.38
	43 (109.4)	3.87	1.45	4.01	1.45	4.05	1.45	4.14	1.44	4.50	1.40	4.75	1.37
	46 (114.8)	3.60	1.50	3.70	1.48	3.73	1.47	3.80	1.46	4.10	1.39	4.30	1.34

Combination (Capacity) (kW)	Outdoor Air Temp. °C (°F) DB	Indoor Air Temp. °C (°F) WB											
		16 (60.8)		17.5 (63.5)		18 (64.4)		19 (66.2)		22 (71.6)		24 (75.2)	
		TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
2.0 + 2.5	22 (71.6)	5.55	1.02	5.72	1.01	5.78	1.00	5.89	0.99	6.48	0.98	6.88	0.97
	25 (77)	5.49	1.16	5.68	1.16	5.75	1.16	5.87	1.16	6.48	1.17	6.88	1.18
	29 (84.2)	5.36	1.33	5.56	1.35	5.63	1.35	5.77	1.36	6.37	1.38	6.76	1.40
	32 (89.6)	5.22	1.45	5.42	1.46	5.49	1.47	5.63	1.48	6.21	1.50	6.59	1.52
	35 (95)	5.03	1.55	5.24	1.56	5.30	1.57	5.44	1.58	5.99	1.59	6.35	1.60
	40 (104)	4.65	1.68	4.83	1.69	4.89	1.69	5.00	1.70	5.48	1.68	5.79	1.67
	43 (109.4)	4.37	1.75	4.52	1.74	4.57	1.74	4.67	1.74	5.08	1.69	5.36	1.66
2.0 + 3.2	22 (71.6)	5.98	1.09	6.16	1.08	6.22	1.07	6.35	1.06	6.98	1.05	7.41	1.04
	25 (77)	5.92	1.25	6.12	1.24	6.19	1.24	6.33	1.24	6.98	1.25	7.41	1.26
	29 (84.2)	5.77	1.43	5.99	1.44	6.07	1.44	6.22	1.45	6.86	1.48	7.29	1.49
	32 (89.6)	5.62	1.55	5.84	1.56	5.92	1.57	6.07	1.58	6.69	1.61	7.10	1.62
	35 (95)	5.42	1.65	5.64	1.67	5.71	1.68	5.86	1.69	6.45	1.70	6.84	1.71
	40 (104)	5.01	1.80	5.20	1.81	5.26	1.81	5.39	1.82	5.90	1.80	6.24	1.78
	43 (109.4)	4.71	1.87	4.87	1.87	4.93	1.86	5.03	1.86	5.48	1.81	5.77	1.77
2.5 + 2.5	22 (71.6)	5.98	1.09	6.16	1.08	6.22	1.07	6.35	1.06	6.98	1.05	7.41	1.04
	25 (77)	5.92	1.25	6.12	1.24	6.19	1.24	6.33	1.24	6.98	1.25	7.41	1.26
	29 (84.2)	5.77	1.43	5.99	1.44	6.07	1.44	6.22	1.45	6.86	1.48	7.29	1.49
	32 (89.6)	5.62	1.55	5.84	1.56	5.92	1.57	6.07	1.58	6.69	1.61	7.10	1.62
	35 (95)	5.42	1.65	5.64	1.67	5.71	1.68	5.86	1.69	6.45	1.70	6.84	1.71
	40 (104)	5.01	1.80	5.20	1.81	5.26	1.81	5.39	1.82	5.90	1.80	6.24	1.78
	43 (109.4)	4.71	1.87	4.87	1.87	4.93	1.86	5.03	1.86	5.48	1.81	5.77	1.77
2.5 + 3.2	22 (71.6)	5.98	1.09	6.16	1.08	6.22	1.07	6.35	1.06	6.98	1.05	7.41	1.04
	25 (77)	5.92	1.25	6.12	1.24	6.19	1.24	6.33	1.24	6.98	1.25	7.41	1.26
	29 (84.2)	5.77	1.43	5.99	1.44	6.07	1.44	6.22	1.45	6.86	1.48	7.29	1.49
	32 (89.6)	5.62	1.55	5.84	1.56	5.92	1.57	6.07	1.58	6.69	1.61	7.10	1.62
	35 (95)	5.42	1.65	5.64	1.67	5.71	1.68	5.86	1.69	6.45	1.70	6.84	1.71
	40 (104)	5.01	1.80	5.20	1.81	5.26	1.81	5.39	1.82	5.90	1.80	6.24	1.78
	43 (109.4)	4.71	1.87	4.87	1.87	4.93	1.86	5.03	1.86	5.48	1.81	5.77	1.77
3.2 + 3.2	22 (71.6)	5.98	1.09	6.16	1.08	6.22	1.07	6.35	1.06	6.98	1.05	7.41	1.04
	25 (77)	5.92	1.25	6.12	1.24	6.19	1.24	6.33	1.24	6.98	1.25	7.41	1.26
	29 (84.2)	5.77	1.43	5.99	1.44	6.07	1.44	6.22	1.45	6.86	1.48	7.29	1.49
	32 (89.6)	5.62	1.55	5.84	1.56	5.92	1.57	6.07	1.58	6.69	1.61	7.10	1.62
	35 (95)	5.42	1.65	5.64	1.67	5.71	1.68	5.86	1.69	6.45	1.70	6.84	1.71
	40 (104)	5.01	1.80	5.20	1.81	5.26	1.81	5.39	1.82	5.90	1.80	6.24	1.78
	43 (109.4)	4.71	1.87	4.87	1.87	4.93	1.86	5.03	1.86	5.48	1.81	5.77	1.77
46 (114.8)	4.37	1.93	4.50	1.91	4.54	1.90	4.62	1.88	4.98	1.79	5.22	1.72	

(Dry bulb value based on 46% humidity)

TC - Total Cooling Capacity (kW)

IP - Input Power (kW)

17.2 Heat Mode Performance Data

Unit setting: Standard piping length, Hi Fan, Heat mode at 68°F
Voltage: 208-230V

Combination (Capacity) (kW)	Indoor Air Temp. °C (°F) DB	Outdoor Air Temp. °C (°F) WB													
		15 (59)		10 (50)		6 (42.8)		0 (32)		-5 (23)		-10 (14)		-15 (5)	
		TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
1.6 + 1.6	16 (60.8)	11.11	1.28	7.78	1.57	6.17	1.74	5.12	1.90	4.70	1.98	4.54	1.97	4.09	1.88
	18 (64.4)	11.02	1.33	7.58	1.59	5.90	1.76	4.80	1.91	4.37	2.00	4.29	2.01	4.00	1.96
	20 (68)	10.94	1.37	7.39	1.61	5.64	1.77	4.47	1.92	4.04	2.02	4.04	2.06	3.92	2.03
	21 (69.8)	10.82	1.40	7.23	1.63	5.53	1.78	4.49	1.92	4.22	2.03	4.26	2.06	4.07	2.04
	22 (71.6)	10.70	1.43	7.07	1.65	5.43	1.80	4.51	1.93	4.39	2.03	4.49	2.06	4.22	2.04
	24 (75.2)	10.46	1.49	6.74	1.69	5.21	1.82	4.55	1.94	4.73	2.03	4.94	2.06	4.51	2.05
1.6 + 2.0	16 (60.8)	12.39	1.46	8.67	1.79	6.88	1.99	5.71	2.16	5.24	2.26	5.06	2.24	4.56	2.14
	18 (64.4)	12.29	1.51	8.46	1.82	6.58	2.00	5.35	2.18	4.88	2.28	4.78	2.29	4.47	2.23
	20 (68)	12.20	1.57	8.25	1.84	6.29	2.02	4.99	2.19	4.51	2.31	4.50	2.35	4.37	2.32
	21 (69.8)	12.07	1.60	8.06	1.87	6.17	2.03	5.01	2.20	4.70	2.31	4.76	2.35	4.54	2.33
	22 (71.6)	11.93	1.64	7.88	1.89	6.05	2.05	5.03	2.20	4.89	2.32	5.01	2.35	4.70	2.33
	24 (75.2)	11.66	1.71	7.52	1.93	5.81	2.08	5.07	2.22	5.28	2.32	5.51	2.35	5.03	2.34
1.6 + 2.5	16 (60.8)	13.21	1.57	9.25	1.92	7.34	2.14	6.09	2.33	5.59	2.43	5.40	2.41	4.86	2.30
	18 (64.4)	13.12	1.62	9.02	1.95	7.02	2.15	5.71	2.34	5.20	2.45	5.10	2.47	4.76	2.40
	20 (68)	13.02	1.68	8.80	1.98	6.71	2.17	5.32	2.35	4.81	2.48	4.80	2.52	4.67	2.49
	21 (69.8)	12.87	1.72	8.60	2.00	6.58	2.19	5.34	2.36	5.02	2.48	5.07	2.52	4.84	2.50
	22 (71.6)	12.73	1.76	8.41	2.03	6.45	2.20	5.36	2.37	5.22	2.49	5.34	2.52	5.02	2.50
	24 (75.2)	12.44	1.83	8.02	2.08	6.20	2.23	5.41	2.38	5.63	2.49	5.88	2.53	5.37	2.51
1.6 + 3.2	16 (60.8)	14.04	1.69	9.83	2.07	7.80	2.30	6.47	2.51	5.94	2.62	5.73	2.60	5.16	2.48
	18 (64.4)	13.94	1.75	9.59	2.10	7.46	2.32	6.06	2.52	5.53	2.65	5.42	2.66	5.06	2.58
	20 (68)	13.83	1.82	9.35	2.13	7.13	2.34	5.65	2.53	5.11	2.68	5.10	2.72	4.96	2.69
	21 (69.8)	13.68	1.86	9.14	2.16	6.99	2.36	5.68	2.54	5.33	2.68	5.39	2.72	5.15	2.69
	22 (71.6)	13.53	1.90	8.94	2.19	6.86	2.37	5.70	2.55	5.55	2.68	5.68	2.72	5.33	2.70
	24 (75.2)	13.22	1.98	8.52	2.24	6.59	2.41	5.75	2.57	5.98	2.69	6.25	2.73	5.71	2.71
2.0 + 2.0	16 (60.8)	13.67	1.63	9.57	2.00	7.59	2.23	6.30	2.42	5.78	2.53	5.58	2.51	5.03	2.40
	18 (64.4)	13.56	1.69	9.33	2.03	7.27	2.24	5.90	2.43	5.38	2.56	5.27	2.57	4.93	2.50
	20 (68)	13.46	1.75	9.10	2.06	6.94	2.26	5.50	2.45	4.98	2.58	4.97	2.62	4.83	2.60
	21 (69.8)	13.32	1.79	8.90	2.09	6.81	2.28	5.53	2.46	5.19	2.59	5.25	2.63	5.01	2.60
	22 (71.6)	13.17	1.83	8.70	2.11	6.68	2.29	5.55	2.46	5.40	2.59	5.53	2.63	5.19	2.61
	24 (75.2)	12.87	1.91	8.30	2.16	6.41	2.33	5.60	2.48	5.82	2.60	6.08	2.63	5.56	2.61
2.0 + 2.5	16 (60.8)	14.04	1.70	9.83	2.09	7.80	2.32	6.47	2.53	5.94	2.64	5.73	2.62	5.16	2.50
	18 (64.4)	13.94	1.77	9.59	2.12	7.46	2.34	6.06	2.54	5.53	2.67	5.42	2.68	5.06	2.61
	20 (68)	13.83	1.83	9.35	2.15	7.13	2.36	5.65	2.56	5.11	2.70	5.10	2.74	4.96	2.71
	21 (69.8)	13.68	1.87	9.14	2.18	6.99	2.38	5.68	2.56	5.33	2.70	5.39	2.74	5.15	2.72
	22 (71.6)	13.53	1.91	8.94	2.21	6.86	2.39	5.70	2.57	5.55	2.71	5.68	2.74	5.33	2.72
	24 (75.2)	13.22	1.99	8.52	2.26	6.59	2.43	5.75	2.59	5.98	2.71	6.25	2.75	5.71	2.73
2.0 + 3.2	16 (60.8)	14.18	1.57	9.93	1.93	7.87	2.15	6.54	2.34	6.00	2.44	5.79	2.42	5.22	2.31
	18 (64.4)	14.07	1.63	9.68	1.96	7.54	2.16	6.12	2.35	5.58	2.47	5.47	2.48	5.11	2.41
	20 (68)	13.97	1.69	9.44	1.99	7.20	2.18	5.71	2.36	5.16	2.49	5.15	2.53	5.01	2.51
	21 (69.8)	13.81	1.73	9.23	2.01	7.06	2.20	5.73	2.37	5.38	2.50	5.44	2.53	5.20	2.51
	22 (71.6)	13.66	1.77	9.02	2.04	6.93	2.21	5.76	2.38	5.60	2.50	5.73	2.54	5.39	2.51
	24 (75.2)	13.35	1.84	8.61	2.09	6.65	2.24	5.81	2.39	6.04	2.51	6.31	2.54	5.76	2.52

Combination (Capacity) (kW)	Indoor Air Temp. °C (°F) DB	Outdoor Air Temp. °C (°F) WB													
		15 (59)		10 (50)		6 (42.8)		0 (32)		-5 (23)		-10 (14)		-15 (5)	
		TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
2.5 + 2.5	16 (60.8)	14.18	1.57	9.93	1.93	7.87	2.15	6.54	2.34	6.00	2.44	5.79	2.42	5.22	2.31
	18 (64.4)	14.07	1.63	9.68	1.96	7.54	2.16	6.12	2.35	5.58	2.47	5.47	2.48	5.11	2.41
	20 (68)	13.97	1.69	9.44	1.99	7.20	2.18	5.71	2.36	5.16	2.49	5.15	2.53	5.01	2.51
	21 (69.8)	13.81	1.73	9.23	2.01	7.06	2.20	5.73	2.37	5.38	2.50	5.44	2.53	5.20	2.51
	22 (71.6)	13.66	1.77	9.02	2.04	6.93	2.21	5.76	2.38	5.60	2.50	5.73	2.54	5.39	2.51
	24 (75.2)	13.35	1.84	8.61	2.09	6.65	2.24	5.81	2.39	6.04	2.51	6.31	2.54	5.76	2.52
2.5 + 3.2	16 (60.8)	14.18	1.57	9.93	1.93	7.87	2.15	6.54	2.34	6.00	2.44	5.79	2.42	5.22	2.31
	18 (64.4)	14.07	1.63	9.68	1.96	7.54	2.16	6.12	2.35	5.58	2.47	5.47	2.48	5.11	2.41
	20 (68)	13.97	1.69	9.44	1.99	7.20	2.18	5.71	2.36	5.16	2.49	5.15	2.53	5.01	2.51
	21 (69.8)	13.81	1.73	9.23	2.01	7.06	2.20	5.73	2.37	5.38	2.50	5.44	2.53	5.20	2.51
	22 (71.6)	13.66	1.77	9.02	2.04	6.93	2.21	5.76	2.38	5.60	2.50	5.73	2.54	5.39	2.51
	24 (75.2)	13.35	1.84	8.61	2.09	6.65	2.24	5.81	2.39	6.04	2.51	6.31	2.54	5.76	2.52
3.2 + 3.2	16 (60.8)	14.18	1.57	9.93	1.93	7.87	2.15	6.54	2.34	6.00	2.44	5.79	2.42	5.22	2.31
	18 (64.4)	14.07	1.63	9.68	1.96	7.54	2.16	6.12	2.35	5.58	2.47	5.47	2.48	5.11	2.41
	20 (68)	13.97	1.69	9.44	1.99	7.20	2.18	5.71	2.36	5.16	2.49	5.15	2.53	5.01	2.51
	21 (69.8)	13.81	1.73	9.23	2.01	7.06	2.20	5.73	2.37	5.38	2.50	5.44	2.53	5.20	2.51
	22 (71.6)	13.66	1.77	9.02	2.04	6.93	2.21	5.76	2.38	5.60	2.50	5.73	2.54	5.39	2.51
	24 (75.2)	13.35	1.84	8.61	2.09	6.65	2.24	5.81	2.39	6.04	2.51	6.31	2.54	5.76	2.52

TC - Total Heating Capacity (kW)

IP - Input Power (kW)

18. Service Data

18.1 Operation Characteristics

• Cooling Characteristic

[Condition] Room temperature: 81°F (DBT), 66°F (WBT)

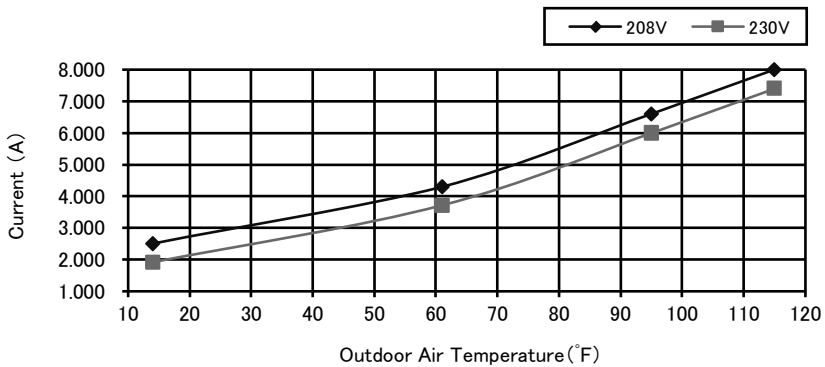
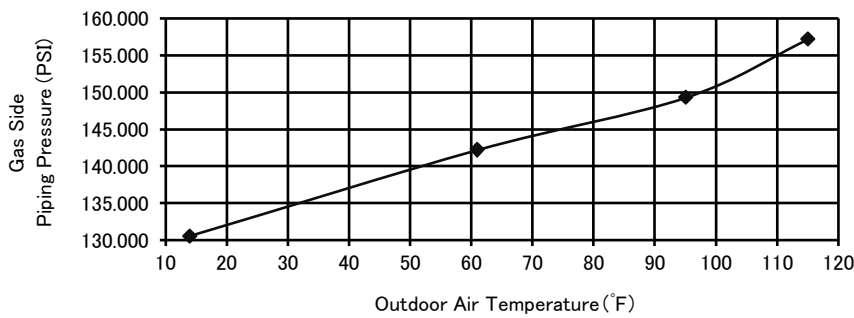
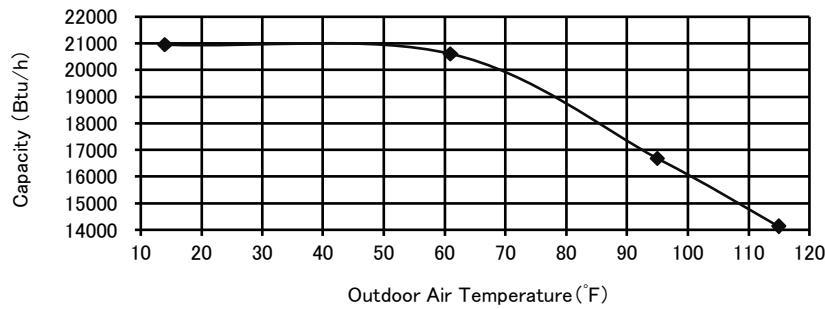
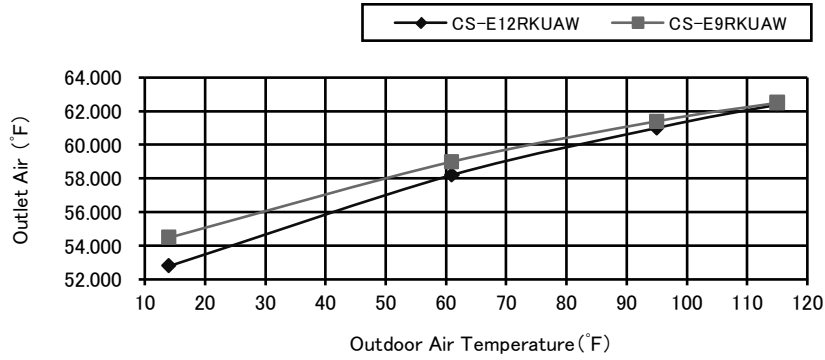
Operation condition: High fan speed

Piping Length: 24.6ft

Compressor Freq: Fc

Voltage: 208-230V

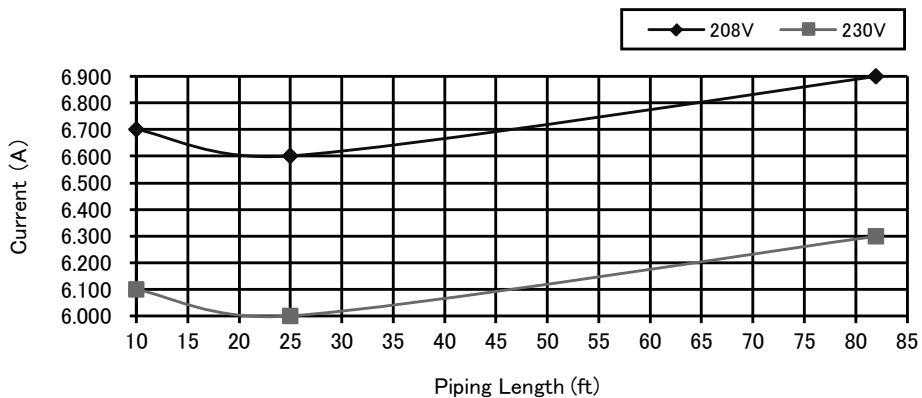
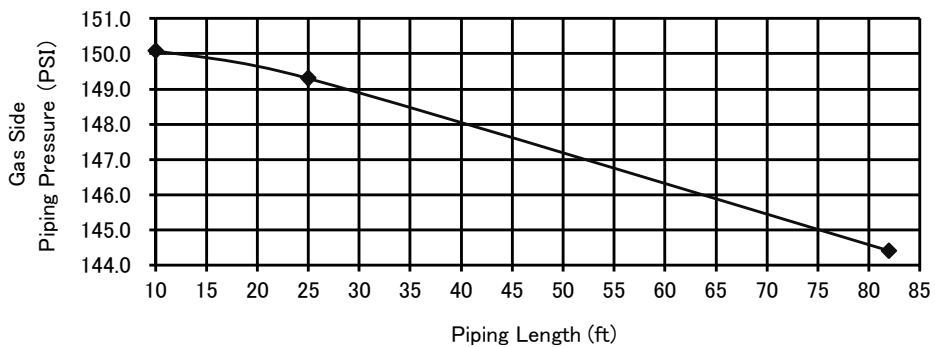
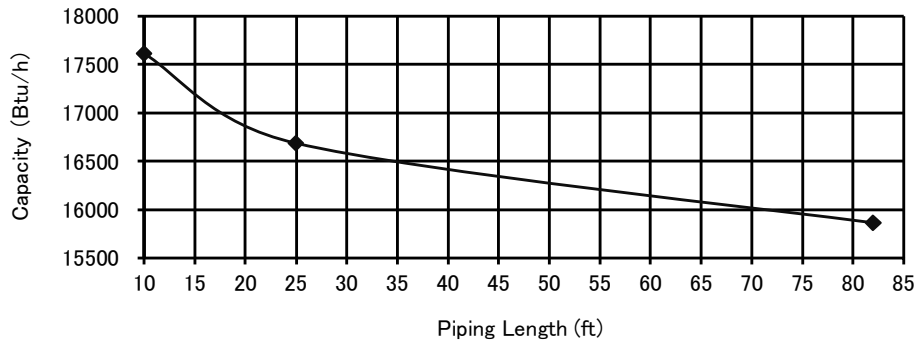
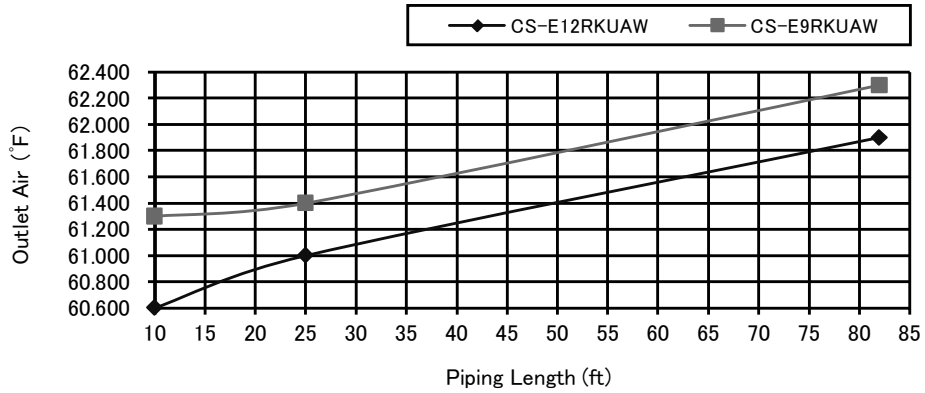
A) Indoor unit capacity: Cooling (3.2 + 2.5: CS-E12RKUAW + CS-E9RKUAW), service mode frequency = 47Hz



• **Piping Length Characteristic Cooling**

[Condition] Room temperature: 81°F (DBT), 66°F (WBT)
 Operation condition: High fan speed
 Outdoor temperature: 95°F (DBT)
 Compressor Freq: Fc
 Voltage: 208-230V

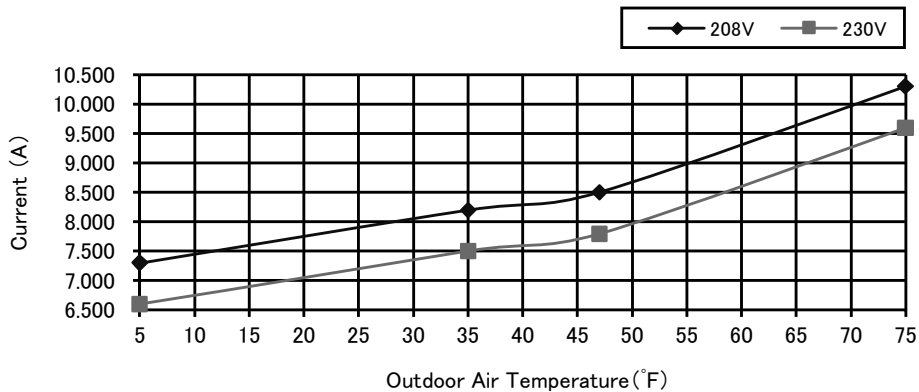
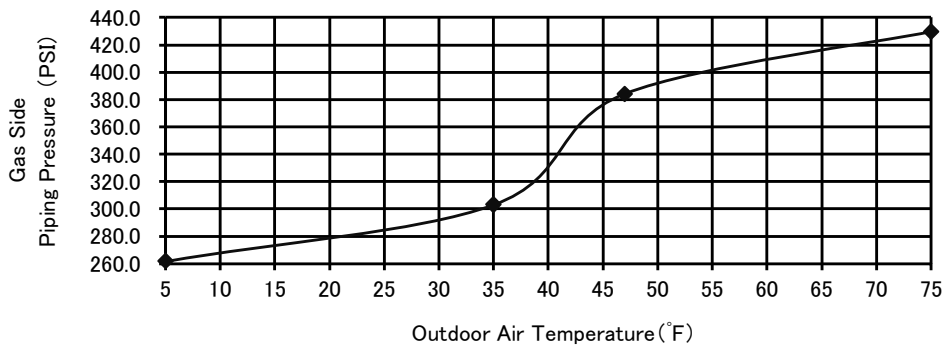
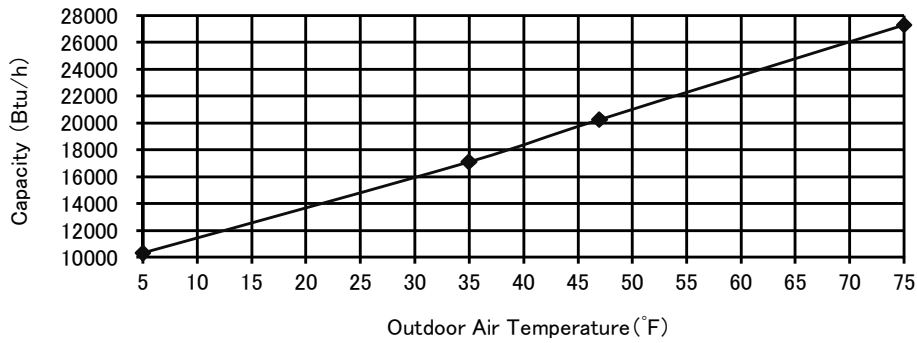
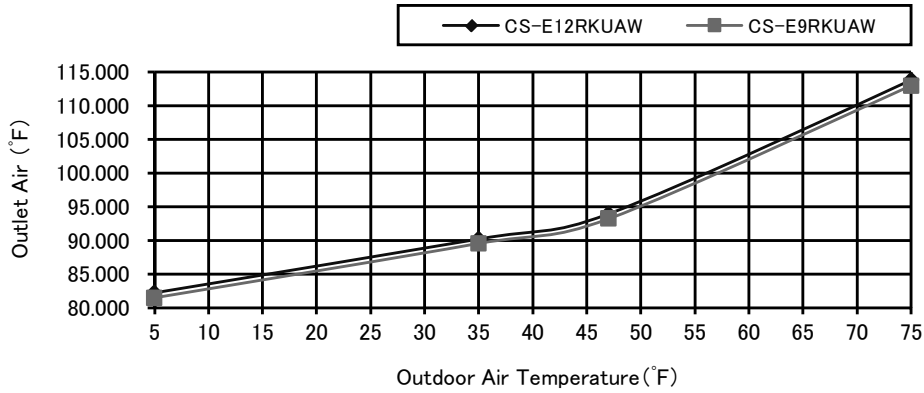
A) Indoor unit capacity: Cooling (3.2 + 2.5: CS-E12RKUAW + CS-E9RKUAW), service mode frequency = 47Hz



• **Heating Characteristic**

[Condition] Room temperature: 70°F (DBT)
 Operation condition: High fan speed
 Piping Length: 24.6ft
 Compressor Freq: Fh
 Voltage: 208-230V

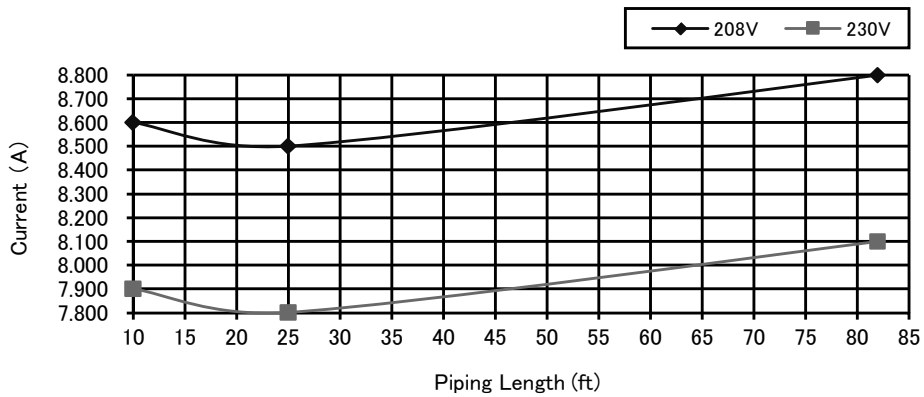
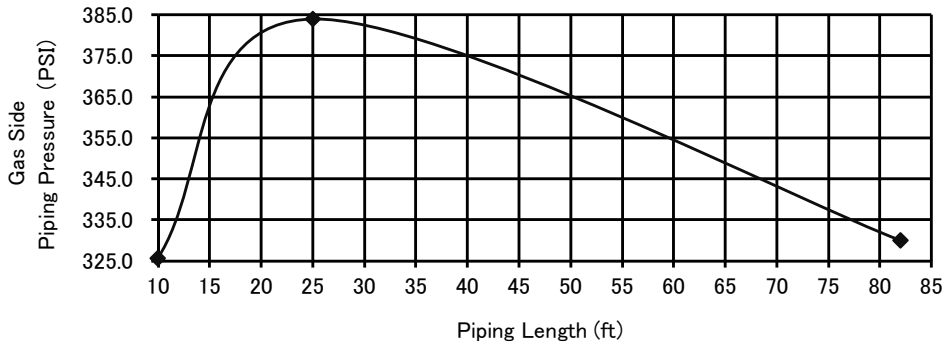
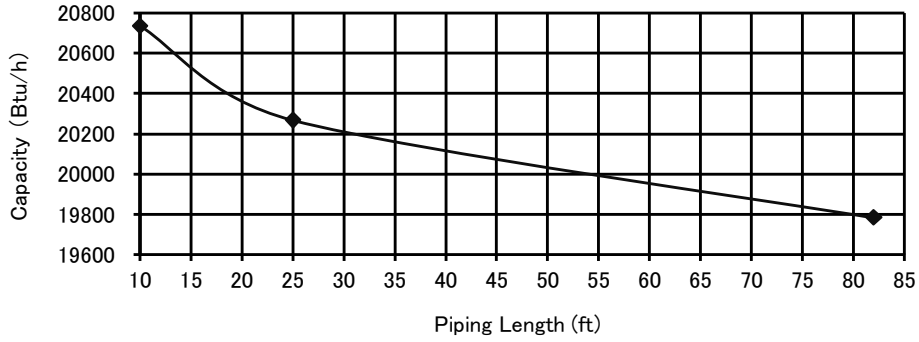
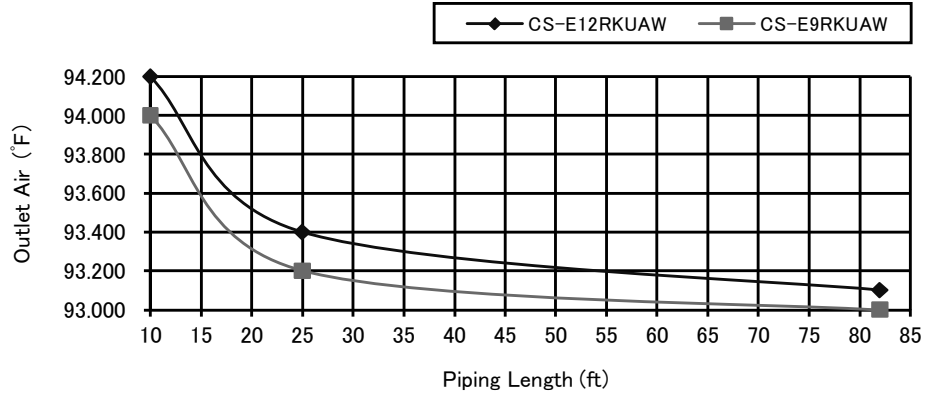
A) Indoor unit capacity: Heating (3.2 + 2.5: CS-E12RKUAW + CS-E9RKUAW), service mode frequency = 64Hz



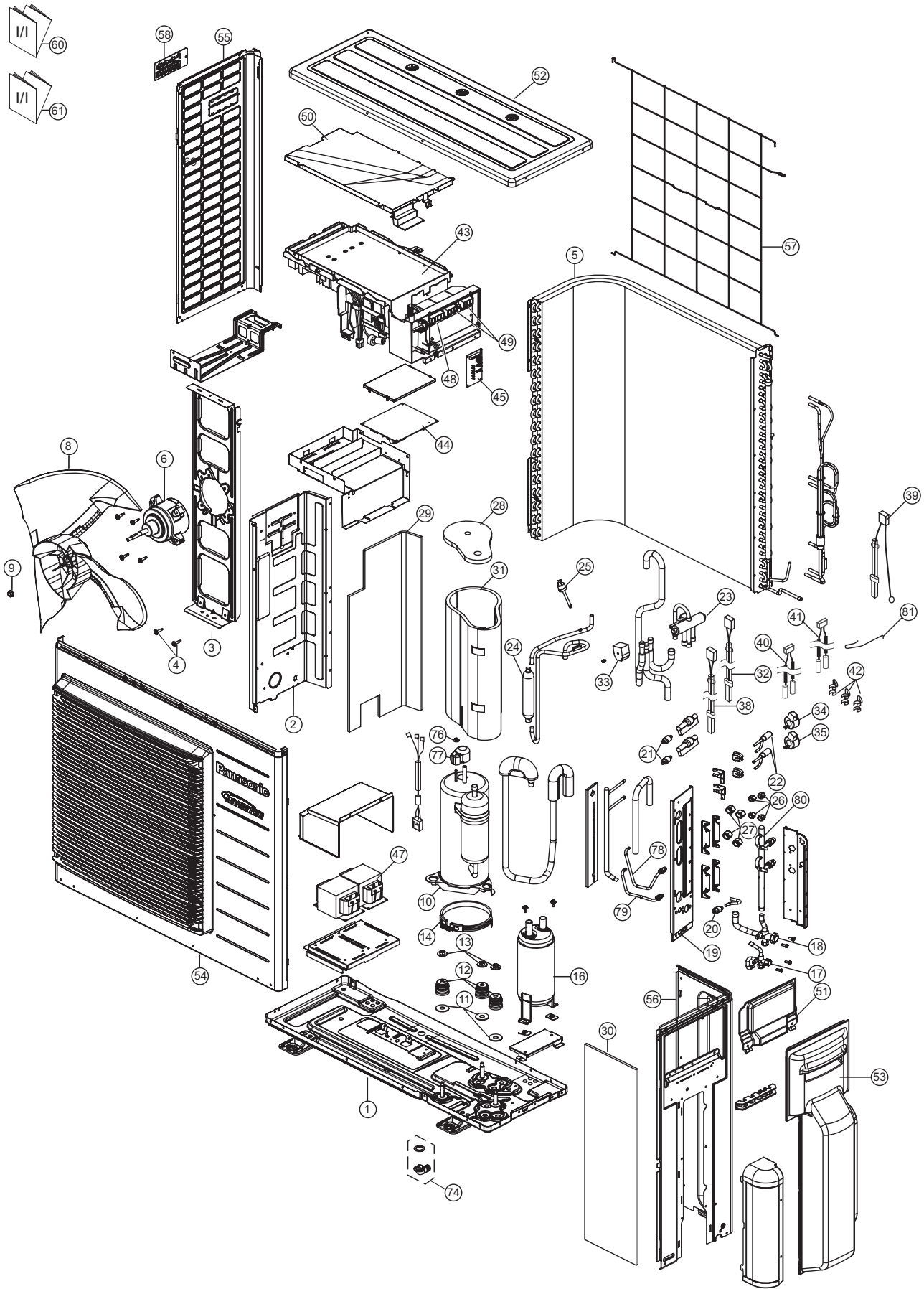
• **Piping Length Characteristic Heating**

[Condition] Room temperature: 70°F (DBT)
 Operation condition: High fan speed
 Outdoor temperature: 47°F (DBT), 43°F (WBT)
 Compressor Freq: Fh
 Voltage: 208-230V

A) Indoor unit capacity: Heating (3.2 + 2.5: CS-E12RKUAW + CS-E9RKUAW), service mode frequency = 64Hz



19. Exploded View and Replacement Parts List



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.	DESCRIPTION & NAME	Q'TY	CU-2E18SBU	REMARK
	1	CHASSY ASSY	1	CWD52K1239A	
	2	SOUND PROOF BOARD	1	CWH151230	
	3	FAN MOTOR BRACKET	1	CWD541127	
	4	SCREW - FAN MOTOR BRACKET	3	CWH551217	
	5	CONDENSER COMPLETE	1	ACXB32C00870	
	6	FAN MOTOR	1	EHDS80CAC	O
	8	PROPELLER FAN ASSY	1	CWH00K1006	
	9	NUT - PROPELLER FAN	1	CWH561092	
	10	COMPRESSOR	1	5KD184XAB21	O
	11	PACKING	3	CWB81043	
	12	BUSHING - COMPRESSOR MOUNT	3	CWH50055	
	13	NUT - COMPRESSOR MOUNT	3	CWH561049	
	14	HEATER	1	CWA341067	
	16	ACCUMULATOR	1	CWB131050	
	17	3-WAY VALVE (LIQUID)	1	CWB011601	O
	18	3-WAY VALVE (GAS)	1	CWB011602	O
	19	HOLDER COUPLING	1	CWH351259	
	20	STRAINER	1	CWB111062	
	21	STRAINER	2	CWB111063	
	22	EXPANSION VALVE	2	CWB051029	O
	23	4-WAYS VALVE	1	CWB001057	O
	24	DISCHARGE MUFFLER	1	CWB121042	
	25	HEATING PRESSURE SWITCH	1	CWA101007	O
	26	FLARE NUT (1/4)	2	CWT251030	
	27	FLARE NUT (3/8)	2	CWT251031	
	28	SOUND PROOF MATERIAL	1	CWG302246	
	29	SOUND PROOR MATERIAL	1	CWG302520	
	30	SOUND PROOR MATERIAL	1	CWG302521	
	31	SOUND PROOR MATERIAL	1	CWG302522	
	32	SENSOR COMPLETE (CN-DIS)	1	CWA50C2722	
	33	V-COIL COMPLETE (CN-HOT)	1	CWA43C2392	O
	34	V-COIL COMPLETE (CN-EV1)	1	CWA43C2381	O
	35	V-COIL COMPLETE (CN-EV2)	1	CWA43C2382	O
	38	SENSOR COMPLETE (CN-TH2)	1	CWA50C2723	O
	39	SENSOR COMPLETE (CN-TH1)	1	CWA50C2710	O
	40	SENSOR COMPLETE (CN-TH4)	1	CWA50C2691	O
	41	SENSOR COMPLETE (CN-TH3)	1	CWA50C2692	O
	42	HOLDER SENSOR	3	CWH32074	
	43	ELECTRONIC CONTROLLER - MAIN	1	ACXA73C03250R	O
	44	ELECTRONIC CONT. - NOISE FILTER	1	CWA745975	O
	45	ELECTRONIC CONTROLLER - DISPLAY	1	CWA746115	O
	47	REACTOR	2	G0C403J00001	
	48	TERMINAL BOARD ASSY (L1, L2)	1	CWA28K1195	
	49	TERMINAL BOARD ASSY (1, 2, 3)	2	CWA28K1196	
	50	CONTROL BOARD COVER	1	CWH131333	
	51	CONTROL BOARD COVER	1	CWH131364	
	52	CABINET TOP PLATE	1	CWE031131A	
	53	CONTROL BOARD COVER CO.	1	CWH13C1209	
	54	CABINET FRONT PLATE ASSY	1	CWE06K1071	
	55	CABINET SIDE PLATE (L)	1	CWE041490A	

SAFETY	REF. NO.	DESCRIPTION & NAME	Q'TY	CU-2E18SBU	REMARK
	56	CABINET SIDE PLATE	1	CWE041499A	
	57	WIRE NET	1	CWD041128A	
	58	HANDLE	1	CWE161010	
	60	INSTALLATION INSTRUCTION	1	ACXF60-02470	
	61	INSTALLATION INSTRUCTION	1	ACXF60-02480	
	74	ACCESSORY CO. (DRAIN ELBOW)	1	CWG87C900	
	76	NUT - TERMINAL COVER	1	CWH7080300J	
	77	TERMINAL COVER	1	CWH171035	
	78	TUBE ASSY (LIQUID 1)	1	CWT026284	
	79	TUBE ASSY (LIQUID 2)	1	CWT026285	
	80	MANIFOLD TUBE ASSY (GAS)	1	CWT07K1522	
	81	SPRING FOR SENSOR	4	CWH711010	

(Note)

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