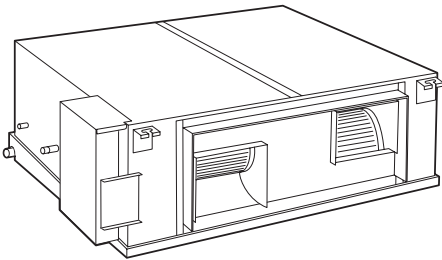



TECHNICAL DATA & SERVICE MANUAL

R410A

DC Inverter

Indoor Unit	Outdoor Unit
 <p data-bbox="323 1377 587 1429">Type E1 S-200PE1E8, S-250PE1E8</p>	 <p data-bbox="1007 1404 1273 1429">U-200PE1E8, U-250PE1E8</p>

IMPORTANT!

Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- This product is intended for professional use. Permission from the power supplier is required when installing the 200 – 250 Type outdoor unit that is connected to a 16 A distribution network.
- If this equipment has been installed in a residential area and any problems caused by high harmonic waves occurred, attach a recommended harmonic filter to the equipment. For details about a suitable harmonic filter, please contact your sales distributors.
- Pay close attention to all warning and caution notices given in this manual.



WARNING

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



CAUTION

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

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.


SPECIAL PRECAUTIONS

WARNING When Wiring



ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death**.
- **Ground the unit** following local electrical codes.

- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.
- Provide a power outlet to be used exclusively for each unit, and a power supply disconnect, circuit breaker and earth leakage breaker for overcurrent protection should be provided in the exclusive line.
- To prevent possible hazards from insulation failure, the unit must be grounded. 

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing...

...In a Room

Properly insulate any tubing run inside a room to prevent “sweating” that can cause dripping and water damage to walls and floors.

...In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

...In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

...In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.


When Connecting Refrigerant Tubing




- When performing piping work do not mix air except for specified refrigerant (R410A) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle.
- Refrigerant gas leakage may cause fire.
- Ventilate the room well, in the event that is refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of poisonous gas.
- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.
- Do not leak refrigerant while piping work for an installation or re-installation, and while repairing refrigeration parts. Handle liquid refrigerant carefully as it may cause frostbite.

When Servicing







- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring. 
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.



- Do not clean inside the indoor and outdoor units by users. Engage authorized dealer or specialist for cleaning.
- In case of malfunction of this appliance, do not repair by yourself. Contact the sales dealer or service dealer for repair.
- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may get hurt. 
- Ventilate any enclosed areas when installing or testing the refrigeration system. Escaped refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of poisonous gas.

Others



- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may hurt. 
- Do not sit or step on the unit, you may fall down accidentally. 
- Do not stick any object into the FAN CASE. You may be injured and the unit may be damaged. 


Check of Density Limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its density will not exceed a set limit.

The refrigerant (R410A), which is used in the air conditioner, is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws imposed to protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its density should rise excessively. Suffocation from leakage of refrigerant is almost non-existent. With the recent increase in the number of high density buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, and energy conservation by curtailing heat and carrying power, etc.

Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared to conventional individual air conditioners. If a single unit of the multi air conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its density does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

In a room where the density may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device. The density is as given below.

Total amount of refrigerant (kg)

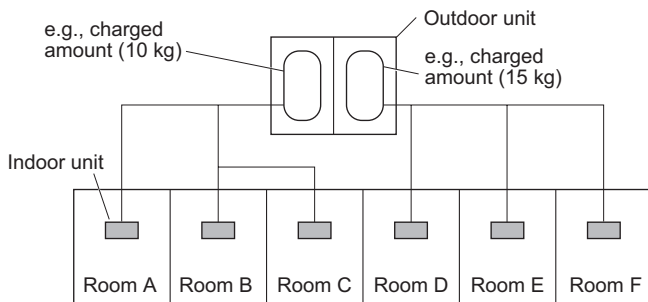
$$\text{Min. volume of the indoor unit installed room (m}^3\text{)} < \text{Density limit (kg/m}^3\text{)}$$

The density limit of refrigerant which is used in multi air conditioners is 0.3 kg/m³ (ISO 5149).

NOTE

- If there are 2 or more refrigerating systems in a single refrigerating device, the amount of refrigerant should be as charged in each independent device.

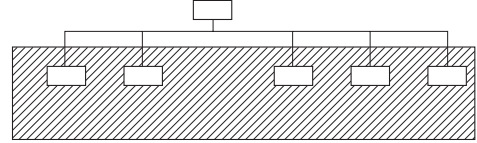
For the amount of charge in this example:



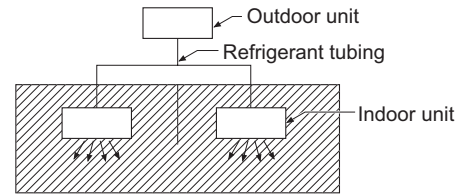
The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.
The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.

- The standards for minimum room volume are as follows.

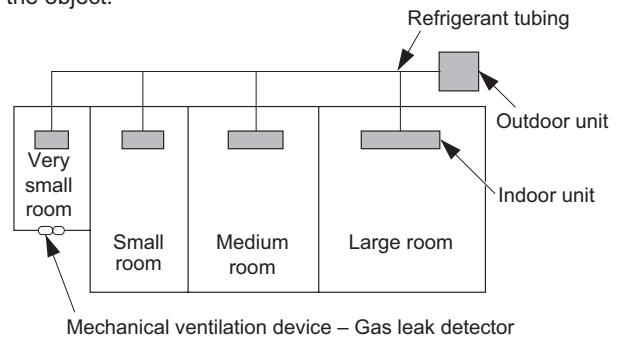
- (1) No partition (shaded portion)



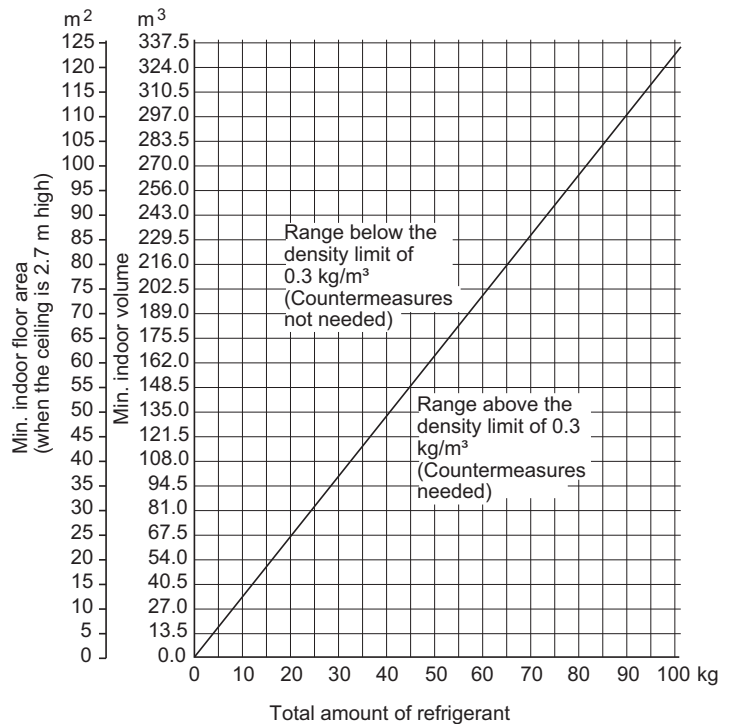
- (2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



- (3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



- The minimum indoor floor space compared with the amount of refrigerant is roughly as follows: (When the ceiling is 2.7 m high)



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Single-Type

1-1. Unit Specifications

High Static Pressure Ducted Type S-200PE1E8 / U-200PE1E8

MODEL No.	Indoor Unit		S-200PE1E8					
	Outdoor Unit		U-200PE1E8					
POWER SOURCE	Indoor Unit		220-230-240V, 50/60Hz, single-phase					
	Outdoor Unit		380-400-415V, 50/60Hz, 3-phase					
PERFORMANCE			Cooling			Heating		
Capacity [min~max]	kW		20.0 [6.0~22.4]			22.4 [6.0~25.0]		
	BTU / h		68,200 [20,500~76,400]			76,400 [20,500~85,300]		
Air circulation (Hi / Me / Lo)	m ³ / h		3,360 / 3,190 / 2,980					
Moisture removal (High)	Liters / h		11.1			-		
External static pressure (High)	Pa (mmAg)		176 (18)					
ELECTRICAL RATINGS								
Voltage ratings	V		380	400	415	380	400	415
Available voltage range	V		342~456(outdoor) 198~264(indoor)					
Running amperes*	A		11.4	11.0	10.7	10.4	10.1	9.8
Max-Running amperes**	A		-	-	-	-	-	-
Power input	kW		7.09	7.12	7.15	6.47	6.50	6.53
C.O.P	W / W		2.82	2.81	2.80	3.46	3.45	3.43
Max.Starting amperes	A		-	-	-	-	-	-
FEATURES								
Controls / Thermostat control			Microprocessor / I.C.thermostat					
Timer			ON / OFF 72-hours					
Fan speeds Indoor / Outdoor			3 and Automatic control / Variable					
Airflow direction (Indoor)			-					
Air filter			Field supply					
Remote controller (Option)			Wired: CZ-RTC2 / Wireless: CZ-RWSC2					
Refrigerant control			-					
Drain pump (Drain connection)			25A Male screw (No Drain Pump)					
Compressor			Rotary					
Operation sound	Indoor - Hi / Me / Lo	dB-A	48 / 47 / 46					
	Outdoor - Hi	dB-A	57			57		
Color (Approximate value)	Indoor		-					
	Outdoor		Munsell 1Y 8.5 / 0.5					
REFRIGERANT TUBING			Indoor unit			Outdoor unit		
Limit of tubing length		m (ft.)	100 (328)					
Limit of tubing length at shipment		m (ft.)	5~30(16~98)					
Limit of elevation difference between the two units		m (ft.)	Outdoor unit is higher than indoor unit: 30 (98) Outdoor unit is lower than indoor unit: 30 (98)					
Refrigerant tube outer diameter	Liquid tube	mm (in.)	9.52 (3 / 8)			9.52 (3 / 8)		
	Gas tube	mm (in.)	25.4 (1)*1			25.4 (1)*1		
Refrigerant amount at shipment		kg	-			R410A - 5.3		
DIMENSIONS & WEIGHT			Indoor unit			Outdoor unit		
Unit dimensions	Height	mm (in.)	467 (18-12 / 32)			1526 (60-5 / 64)		
	Width	mm (in.)	1,428 (56-7 / 32)			940 (37-1 / 64)		
	Depth	mm (in.)	1,230 (48-14 / 32)			340 (13-25 / 64)		
Package dimensions	Height	mm (in.)	614 (24-11 / 64)			1676 (65-63 / 64)		
	Width	mm (in.)	1,536 (60-15 / 32)			1076 (42-23 / 64)		
	Depth	mm (in.)	1,339 (52-23 / 32)			420 (16-17 / 32)		
Net weight		kg (lb.)	110 (243)			118 (260)		
Shipping weight		kg (lb.)	134 (295)			128 (282)		
Shipping volume		m ³ (cu.ft)	1.268 (44.8)			0.757 (26.7)		

NOTE

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

*1 There are two types of supplied tubings. The one tubing port ϕ 19.05 (flare process) is connected to the flared connection of the gas port side's service valve. The other "L" shaped tubing port is brazed in connection after cutting the tube at the proper length. Then make a brazing connection to the main tubing (ϕ 25.4).

Cooling:

Rating conditions (*): Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Full load conditions (**): Indoor air temperature 32°C DB/23°C WB, Outdoor air temperature 43°C DB

Heating:

Rating conditions (*): Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB
Full load conditions (**): Indoor air temperature 24°C DB, Outdoor air temperature 24°C DB/15.5°C WB

Single-Type

1-1. Unit Specifications

High Static Pressure Ducted Type S-250PE1E8 / U-250PE1E8

MODEL No.	Indoor Unit		S-250PE1E8					
	Outdoor Unit		U-250PE1E8					
POWER SOURCE	Indoor Unit		220-230-240V, 50/60Hz, single-phase					
	Outdoor Unit		380-400-415V, 50/60Hz, 3-phase					
PERFORMANCE			Cooling			Heating		
Capacity [min~max]	kW		25.0 [6.0~28.0]			28.0 [6.0~31.5]		
	BTU / h		85,300 [20,500~95,500]			95,500 [20,500~107,500]		
Air circulation (Hi / Me / Lo)	m ³ / h		4,320 / 4,200 / 3,960					
Moisture removal (High)	Liters / h		13.9			-		
External static pressure (High)	Pa (mmAg)		216 (22): at shipment 235 (24): using the booster cable					
ELECTRICAL RATINGS								
Voltage ratings	V		380	400	415	380	400	415
Available voltage range	V		342~456(outdoor) 198~264(indoor)					
Running amperes*	A		15.3	14.8	14.3	13.1	12.6	12.3
Max-Running amperes**	A		-	-	-	-	-	-
Power input	kW		9.49	9.55	9.61	8.14	8.20	8.26
C.O.P	W / W		2.63	2.62	2.60	3.44	3.41	3.39
Max.Starting amperes	A		-	-	-	-	-	-
FEATURES								
Controls / Thermostat control			Microprocessor / I.C.thermostat					
Timer			ON / OFF 72-hours					
Fan speeds Indoor / Outdoor			3 and Automatic control / Variable					
Airflow direction (Indoor)			-					
Air filter			Field supply					
Remote controller (Option)			Wired: CZ-RTC2 / Wireless: CZ-RWSC2					
Refrigerant control			-					
Drain pump (Drain connection)			25A Male screw (No Drain Pump)					
Compressor			Rotary					
Operation sound	Indoor - Hi / Me / Lo	dB-A	51 / 50 / 49					
	Outdoor - Hi	dB-A	57			58		
Color (Approximate value)	Indoor		-					
	Outdoor		Munsell 1Y 8.5 / 0.5					
REFRIGERANT TUBING			Indoor unit			Outdoor unit		
Limit of tubing length		m (ft.)	100 (328)					
Limit of tubing length at shipment		m (ft.)	5~30(16~98)					
Limit of elevation difference between the two units		m (ft.)	Outdoor unit is higher than indoor unit: 30 (98) Outdoor unit is lower than indoor unit: 30 (98)					
Refrigerant tube outer diameter	Liquid tube	mm (in.)	12.7 (1 / 2)			12.7 (1 / 2)		
	Gas tube	mm (in.)	25.4 (1)			25.4 (1)*1		
Refrigerant amount at shipment		kg	-			R410A - 6.5		
DIMENSIONS & WEIGHT			Indoor unit			Outdoor unit		
Unit dimensions	Height	mm (in.)	467 (18-12 / 32)			1526 (60-5 / 64)		
	Width	mm (in.)	1,428 (56-7 / 32)			940 (37-1 / 64)		
	Depth	mm (in.)	1,230 (48-14 / 32)			340 (13-25 / 64)		
Package dimensions	Height	mm (in.)	614 (24-11 / 64)			1676 (65-63 / 64)		
	Width	mm (in.)	1,536 (60-15 / 32)			1076 (42-23 / 64)		
	Depth	mm (in.)	1,339 (52-23 / 32)			420 (16-17 / 32)		
Net weight		kg (lb.)	120 (256)			128 (282)		
Shipping weight		kg (lb.)	144 (317)			138 (304)		
Shipping volume		m ³ (cu.ft)	1.268 (44.8)			0.757 (26.7)		

NOTE

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

*1 There are two types of supplied tubings. The one tubing port ø19.05 (flare process) is connected to the flared connection of the gas port side's service valve. The other "L" shaped tubing port is brazed in connection after cutting the tube at the proper length. Then make a brazing connection to the main tubing (ø25.4).

Cooling:

Rating conditions (*): Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Full load conditions (**): Indoor air temperature 32°C DB/23°C WB, Outdoor air temperature 43°C DB

Heating:

Rating conditions (*): Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB
Full load conditions (**): Indoor air temperature 24°C DB, Outdoor air temperature 24°C DB/15.5°C WB

1-2. Major Component Specifications

(A) Indoor Units

High Static Pressure Ducted Type S-200PE1E8

MODEL No.		S-200PE1E8	
Source		220 - 230 - 240V, single-phase, 50/60Hz	
Controller P.C.B. Ass'y		CR-UXRP71B-P (Microprocessor)	
Fan (Number...diameter)	mm	Centrifugal (2...ø220)	
Fan motor			
Model...Nominal output	W	KFC4X-201B5P...180W	
Power source		220 - 230 - 240V, single-phase, 50Hz	
No. of pole...r.p.m. (230V, High)	rpm	4P...1,012	
Coil resistance (Ambient temperature 20°C)	Ω	BRN – WHT : 13.75 WHT – VLT : 4.47 VLT – ORG : 1.20	ORG – YEL : 2.21 YEL – BLK : 10.33 BLK – PNK : 12.90
Safety device			
Operating temperature	Open °C	130 ± 5	
	Close °C	(115 ± 5)	
Run capacitor	VAC, μF	450 VAC, 7.0 μF	
Electronic expansion valve			
Coil		–	
Coil resistance (at 20°C)	Ω	–	
Valve body		–	
Heat exchanger			
Coil		Aluminium plate fin / Copper tube	
Rows...fin pitch	mm	3...2.0	
Face area	m ²	0.540	

1-2. Major Component Specifications

(A) Indoor Units

High Static Pressure Ducted Type S-250PE1E8

MODEL No.		S-250PE1E8	
Source		220 - 230 - 240V, single-phase, 50Hz	
Controller P.C.B. Ass'y		CR-UXRP71B-P (Microprocessor)	
Fan (Number...diameter)	mm	Centrifugal (2...ø250)	
Fan motor			
Model...Nominal output	W	KFC4X-401B3P...400W	
Power source		220 - 230 - 240V, single-phase, 50Hz	
No. of pole...r.p.m. (230V, High)	rpm	4P...1,211	
Coil resistance (Ambient temperature 20°C)	Ω	BRN – WHT : 6,159 WHT – VLT : 1.08 VLT – ORG : 0.77	ORG – YEL : 0.87 YEL – BLK : 2.87 BLK – PNK : 5.98
Safety device			
Operating temperature	Open °C	130 ± 5	
	Close °C	(115 ± 5)	
Run capacitor	VAC, μF	450 VAC, 5.0 μF	
Electronic expansion valve			
Coil		–	
Coil resistance (at 20°C)	Ω	–	
Valve body		–	
Heat exchanger			
Coil		Aluminium plate fin / Copper tube	
Rows...fin pitch	mm	3...2.0	
Face area	m ²	0.655	

1-2. Major Component Specifications

(B) Outdoor Units

U-200PE1E8

MODEL No.		U-200PE1E8	
Source		380-400-415V, 3-phase, 50/60Hz	
Controller P.C.B. Ass'y		CR-C906VH8P (Microprocessor)	
Control circuit fuse		20A	
Compressor			
Model....number		C-9RVN273H0K	
Source		246V (DC) / 3-phase / 60Hz (Inverter drive)	
Nominal output	W	4,200	
Compressor oil	cc	1,400	
Coil resistance (Ambient temperature 25°C)	Ω	C – R : 0.552 C – S : 0.552	R – S : 0.552
Safety control			
Overload relay models		Discharge temperature control	
Operation temperature	Open °C	-	
	Close °C	-	
Crank case heater	W	25	
Refrigerant amount at shipment		kg	R410A - 5.3
High pressure switch			
Set pressure	OFF	MPa	4.15 ⁰ _{-0.15}
	ON	MPa	3.15 ± 0.3
Fan			
Number...diameter	mm	2...ø490	
Air circulation	m ³ / h	7,740	
Fan speeds (Max.)		~860 rpm (Inverter drive control)	
Fan motor			
Model No.		SIC-71FW-D8120	
Source		~280V / 3-phase	
No. of pole		8	
Nominal output	W	120	
Safety device		-	
Operating temperature	Open °C	-	
	Close °C	-	
Run capacitor	VAC, μF	-	
Heat exchanger			
Coil		Aluminium plate fin / Copper tube	
Rows...fin pitch	mm	2...1.4	
Face area	m ²	1.27	

1-2. Major Component Specifications

(B) Outdoor Units

U-250PE1E8

MODEL No.		U-250PE1E8	
Source		380-400-415V, 3-phase, 50/60Hz	
Controller P.C.B. Ass'y		CR-C906VH8P (Microprocessor)	
Control circuit fuse		20A	
Compressor			
Model....number		C-9RVN393H0U	
Source		282V (DC) / 3-phase / 60Hz (Inverter drive)	
Nominal output	W	5,500	
Compressor oil	cc	1,900	
Coil resistance (Ambient temperature 25°C)	Ω	C – R : 0.608 C – S : 0.608	R – S : 0.608
Safety control			
Overload relay models		Discharge temperature control	
Operation temperature	Open °C	-	
	Close °C	-	
Crank case heater	W	25	
Refrigerant amount at shipment		kg	R410A - 6.5
High pressure switch			
Set pressure	OFF	MPa	4.15 ⁰ _{-0.15}
	ON	MPa	3.15 ± 0.3
Fan			
Number...diameter	mm	2...ø490	
Air circulation	m ³ / h	7,080	
Fan speeds (Max.)		~860 rpm (Inverter drive control)	
Fan motor			
Model No.		SIC-71FW-D8120	
Source		~280V / 3-phase	
No. of pole		8	
Nominal output	W	120	
Safety device			
Operating temperature	Open °C	-	
	Close °C	-	
Run capacitor	VAC, μF	-	
Heat exchanger			
Coil		Aluminium plate fin / Copper tube	
Rows...fin pitch	mm	3...1.4	
Face area	m ²	1.27	

1-3. Other Component Specifications

Outdoor Units U-200PE1E8

MODEL No.	Outdoor Unit	U-200PE1E8
Power Transformer		–
Rated	Source	VAC, Hz
	Secondary	
	Coil resistance	Ω
	Thermal cut off temperature	
	Thermistor (Coil / Air sensor): TH1, TH2, TH3, TH4	
Resistance	kΩ	–10°C: 23.7±5%
		20°C: 6.5±5%
		–5°C: 18.8±5%
		30°C: 4.4±5%
		0°C: 15.0±5%
		40°C: 3.1±5%
		5°C: 12.1±5%
		45°C: 2.6±5%
		10°C: 9.7±5%
		50°C: 2.1±5%
Thermistor (Discharge gas sensor): TH5		CM-12
Resistance	kΩ	60°C: 12.4±5%
		90°C: 4.6±5%
		70°C: 8.7±5%
		100°C: 3.4±7%
		75°C: 7.4±5%
		110°C: 2.5±7%
		80°C: 6.3±5%
		120°C: 1.9±7%
		85°C: 5.3±5%
		130°C: 1.5±7%
Relay (Comp. Magnetic Contactor)		
Coil rated	VAC	–
Contact rating	VAC, A	–
Coil resistance (at 20°C)	Ω	–
Sol-Control-Valve		
Sol-control-valve		UKV-25D18
Magnetic coil		UKV-A053 (062), DC 12V
4 way valve		
4 way valve		STF-0401G
Electro magnetic coil		STF-01AI518A1, AC 220-240 V, 50Hz / 60Hz

1-3. Other Component Specifications

Outdoor Units U-250PE1E8

MODEL No.	Outdoor Unit	U-250PE1E8
Power Transformer		–
Rated	Source	VAC, Hz
	Secondary	
	Coil resistance	Ω
	Thermal cut off temperature	
	Thermistor (Coil / Air sensor): TH1, TH2, TH3, TH4	
Resistance	k Ω	–10°C: 23.7±5% 20°C: 6.5±5%
		–5°C: 18.8±5% 30°C: 4.4±5%
		0°C: 15.0±5% 40°C: 3.1±5%
		5°C: 12.1±5% 45°C: 2.6±5%
		10°C: 9.7±5% 50°C: 2.1±5%
Thermistor (Discharge gas sensor): TH5		CM-12
Resistance	k Ω	60°C: 12.4±5% 90°C: 4.6±5%
		70°C: 8.7±5% 100°C: 3.4±7%
		75°C: 7.4±5% 110°C: 2.5±7%
		80°C: 6.3±5% 120°C: 1.9±7%
		85°C: 5.3±5% 130°C: 1.5±7%
Relay (Comp. Magnetic Contactor)		
Coil rated	VAC	–
Contact rating	VAC, A	–
Coil resistance (at 20°C)	Ω	–
Sol-Control-Valve		
Sol-control-valve		UKV-25D18
Magnetic coil		UKV-U030E, DC 12 V
4 way valve		
4 way valve		STF-0712G
Electro magnetic coil		STF-01AI518A1, AC 220-240 V, 50Hz / 60Hz

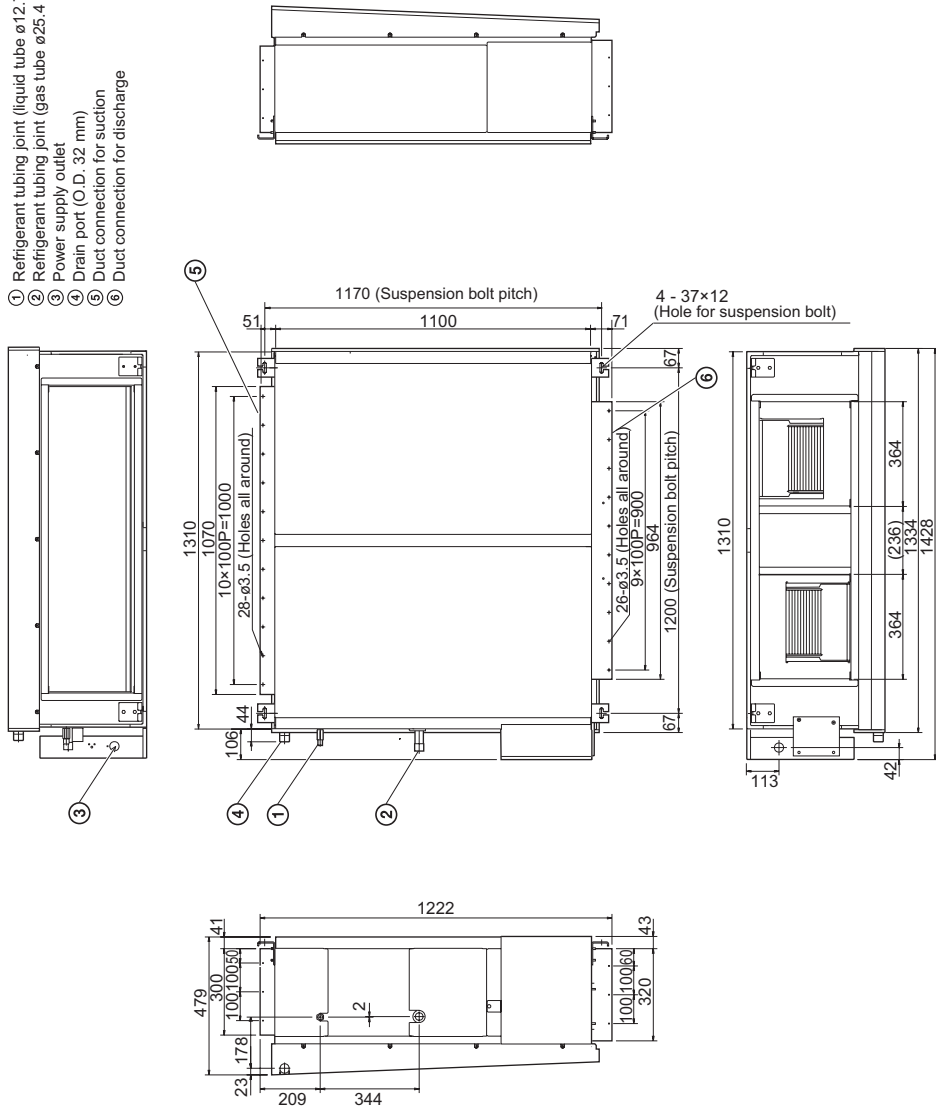
1-4. Dimensional Data

(A) Indoor Units: High Static Pressure Ducted Type

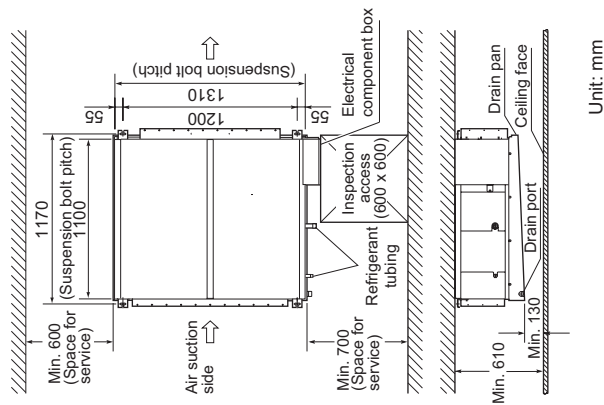
S-200PE1E8

S-250PE1E8

- ① Refrigerant tubing joint (liquid tube $\phi 12.7$ mm) (Flare nut)
- ② Refrigerant tubing joint (gas tube $\phi 25.4$ mm) (Brazing)
- ③ Power supply outlet
- ④ Drain port (O.D. 32 mm)
- ⑤ Duct connection for suction
- ⑥ Duct connection for discharge



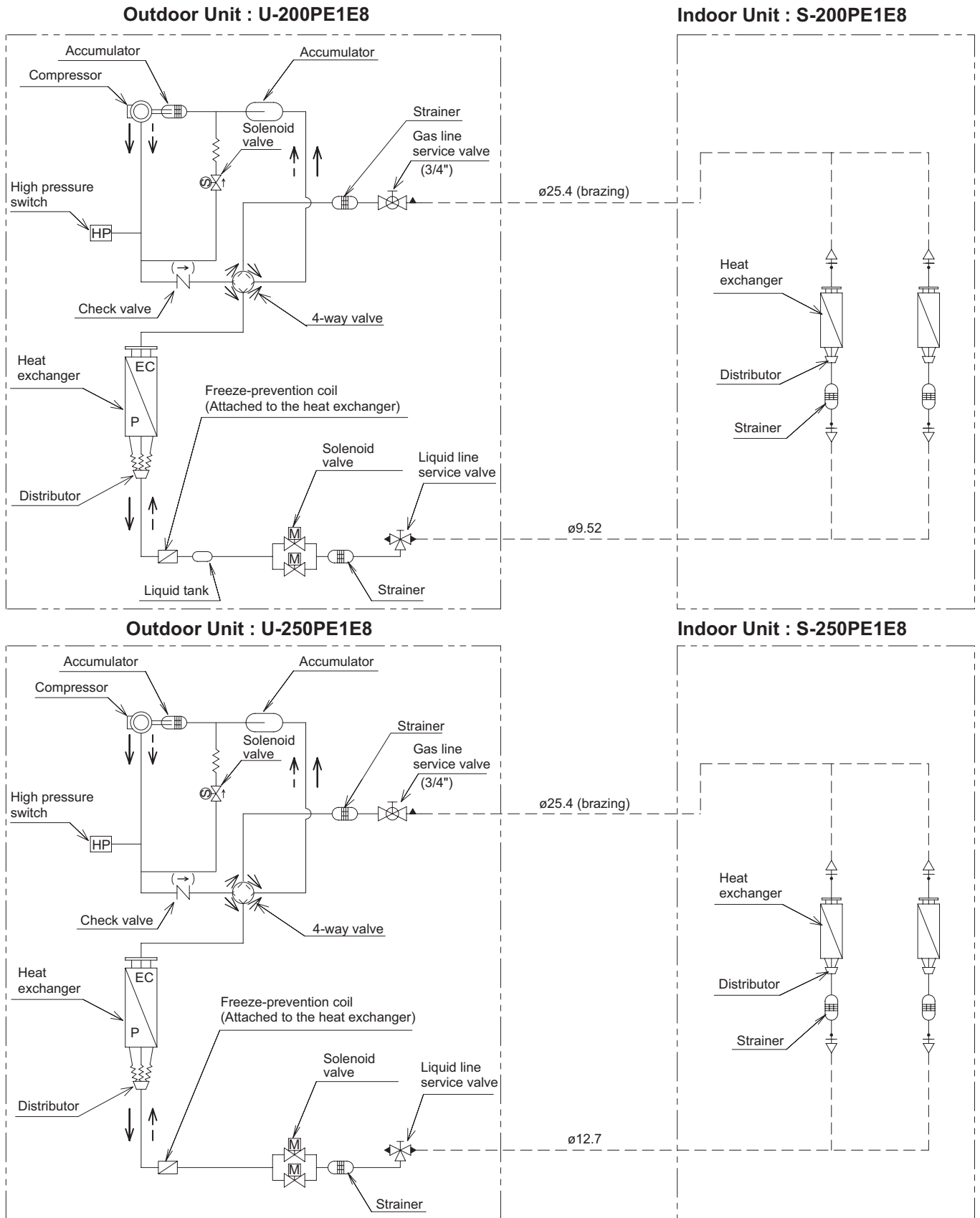
Unit: mm



Unit: mm

1-5. Refrigerant Flow Diagram

← Cooling cycle
 ← - - Heating cycle



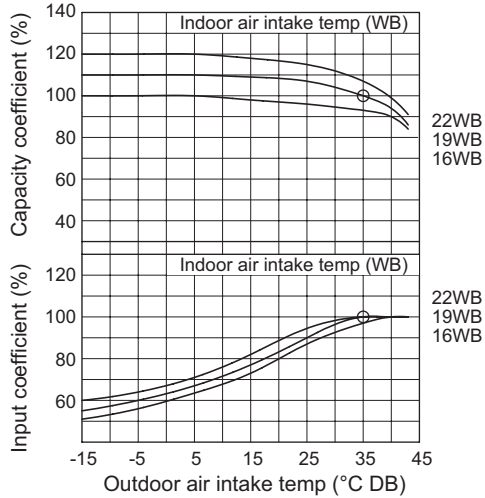
1-6. Operating Range

	Temperature	Indoor air intake temp.	Outdoor air intake temp.
Cooling	Maximum	32°C DB / 23°C WB	43°C DB
	Minimum	18°C DB / 14°C WB	-15°C DB
Heating	Maximum	30°C DB / - WB	15°C WB
	Minimum	-	-20°C WB

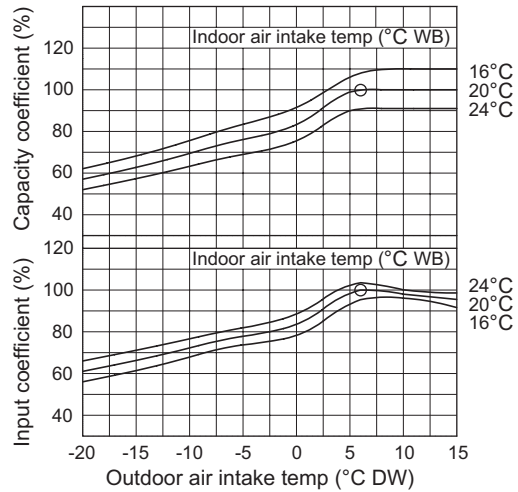
1-7. Capacity Correction Graph According to Temperature Condition

U-200PE1E8 / U-250PE1E8 (For 50 Hz and 60 Hz)

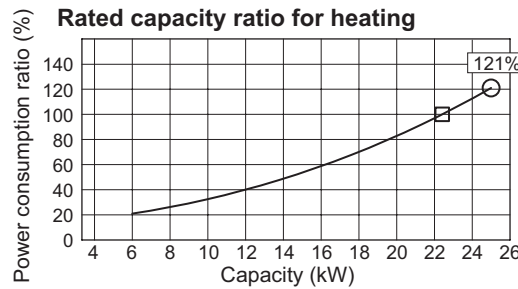
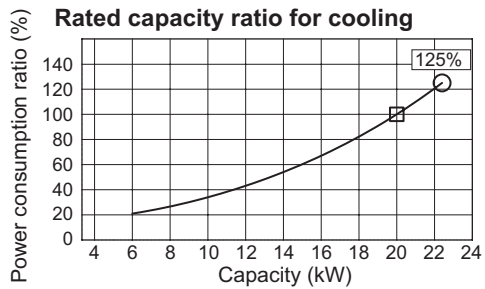
① Cooling capacity ratio (maximum capacity)



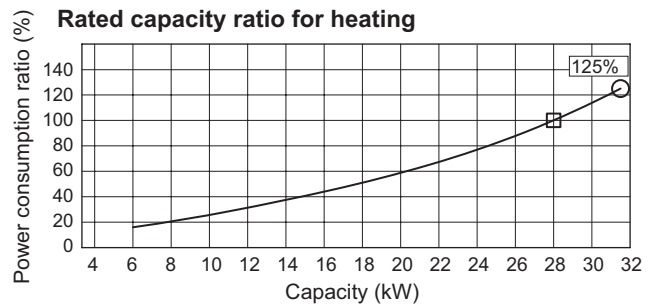
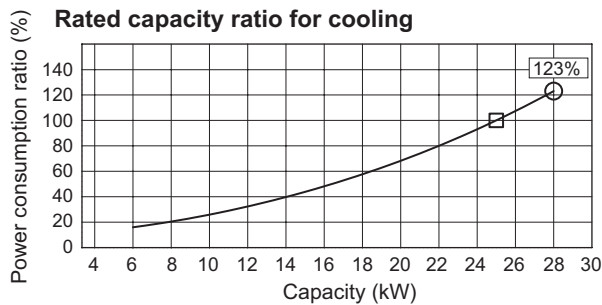
Heating capacity ratio (maximum capacity)



② U-200PE1E8



② U-250PE1E8



NOTE 1

- The graphs "①" of the characteristics show the value under the following conditions.
 Equivalent tubing length : 7.5m
 Difference of elevation : 0m
 Wind speed : High
- "○" marking indicates the maximum capacity / maximum power consumption under the JIS condition.
 Maximum capacity indicates the maximum value in the parentheses of the specifications (cooling and heating capacity).
- The characteristic of heating capacity excludes the decline of capacity when frosting (including defrost drive).

NOTE 2

- The graphs "②" of the characteristics show the value under the following conditions.
 Equivalent tubing length : 7.5m
 Difference of elevation : 0m
 Wind speed : High
- "□" marking indicates the rated capacity / rated power consumption under the JIS condition.
 "○" marking indicates the maximum capacity / maximum power consumption under the JIS condition.
- The characteristic of heating capacity excludes the decline of capacity when frosting (including defrost drive).

Outdoor unit heating capacity correction coefficient during of frosting/defrosting (RH approximately 85%)

Outdoor intake air temperature °C WB	-20	-15	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Correction coefficient	1.0	1.0	0.97	0.96	0.96	0.95	0.94	0.91	0.89	0.88	0.87	0.87	0.87	0.88	0.89	0.91	0.92	0.95	1.0

To calculate the heating capacity with consideration for frosting/defrosting operation, multiply the heating capacity found from the capacity graph by the correction coefficient from the table above.

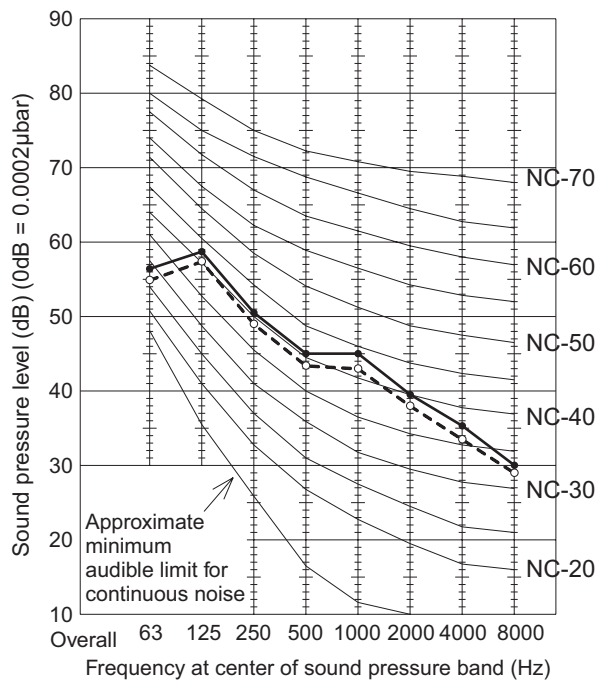
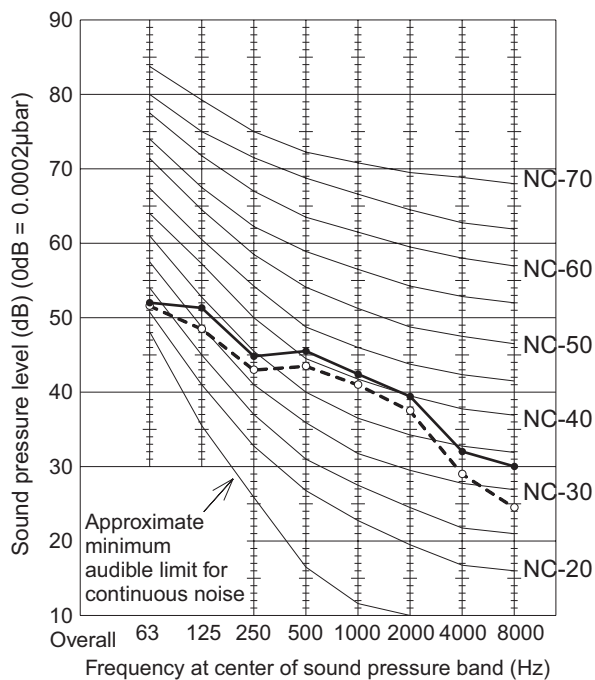
1-8. Noise Criterion Curves

High Static Pressure Ducted Type

—●— Strong
 - -○- - Weak

MODEL	: S-200PE1E8
SOUND LEVEL	: STRONG 48 dB(A)
CONDITION	WEAK 45 dB(A)
CONDITION	: Under the unit 1.5 m

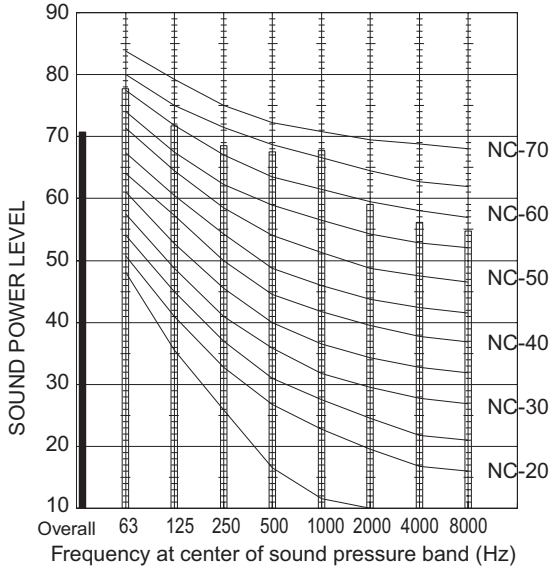
MODEL	: S-250PE1E8
SOUND LEVEL	: STRONG 50 dB(A)
CONDITION	WEAK 48 dB(A)
CONDITION	: Under the unit 1.5 m



1-8. Noise Criterion Curves

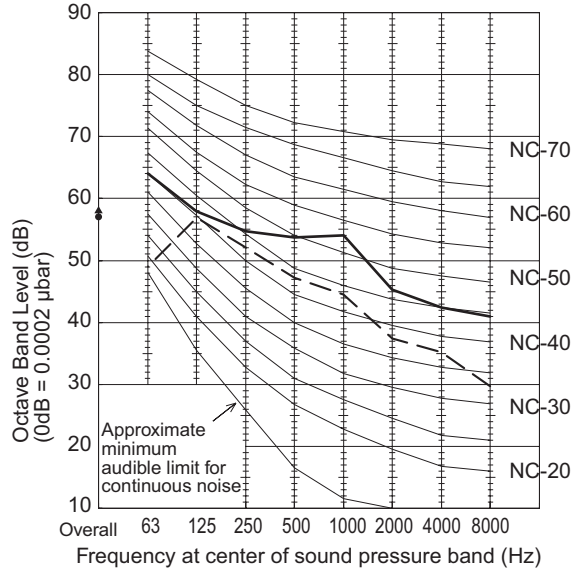
(B) Outdoor Unit

MODEL : U-200PE1E8
 SOUND : 71 dB(A)
 POWER LEVEL : Cooling



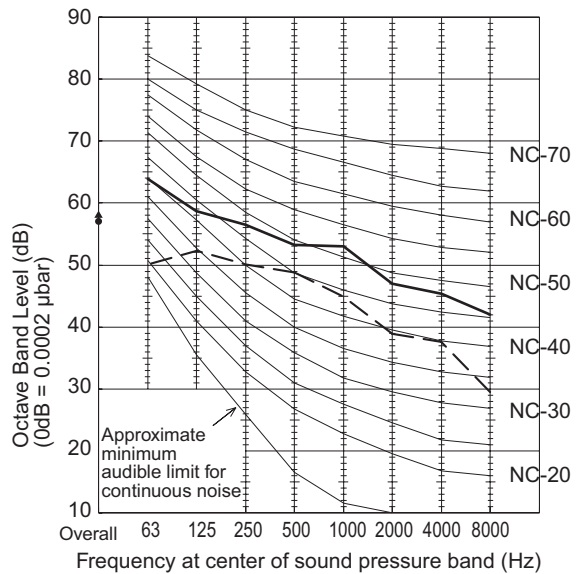
COOLING

MODEL : U-200PE1E8
 SOUND LEVEL : STANDARD 57 dB(A)
 QUIET MODE 50 dB(A)
 CONDITION : 1 m in front at height of 1.5 m



HEATING

MODEL : U-200PE1E8
 SOUND LEVEL : STANDARD 57 dB(A)
 QUIET MODE 50 dB(A)
 CONDITION : 1 m in front at height of 1.5 m



REMARKS:

1. Value obtained in the actual place where the unit is installed may be slightly higher than the values shown in this graph because of the conditions of operation, the structure of the building, the background noise and other factors.
2. The test results were obtained from an anechoic room.

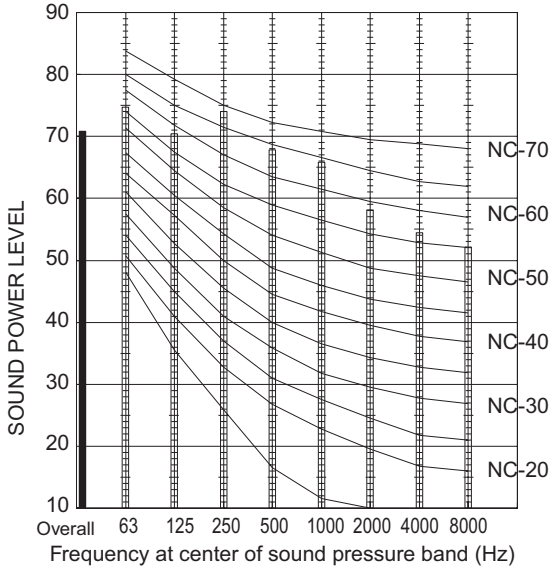
NOTE

To evaluate "Noise level" the maximum number of the measured OCTAVE BAND SOUND PRESSURE LEVEL is used. Read the number on each BAND CENTER FREQUENCIES (horizontal axis) ranging from 63 Hz to 8000 Hz and select the maximum value (vertical axis) among them.

1-8. Noise Criterion Curves

(B) Outdoor Unit

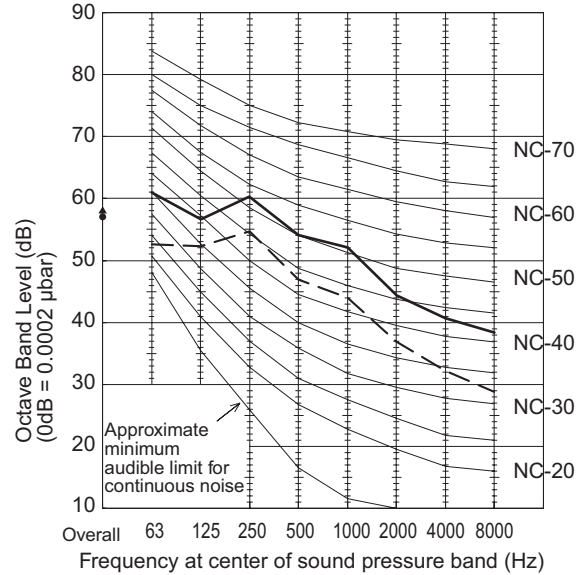
MODEL : U-250PE1E8
 SOUND : 71 dB(A)
 POWER LEVEL : Cooling



COOLING

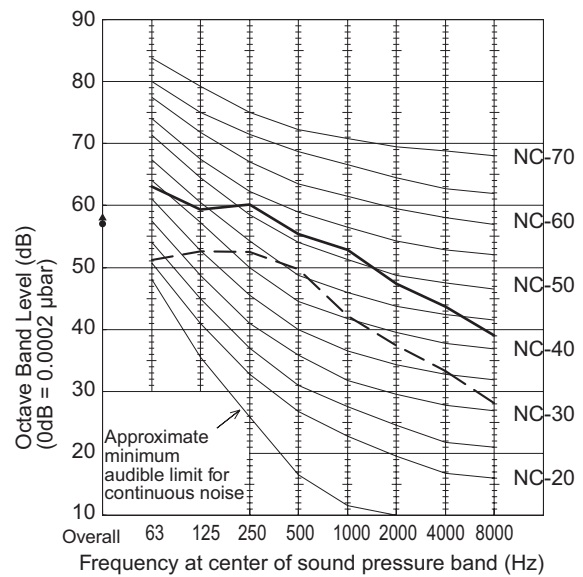
— Standard
 - - - Quiet mode

MODEL : U-250PE1E8
 SOUND LEVEL : STANDARD 57 dB(A)
 QUIET MODE 50 dB(A)
 CONDITION : 1 m in front at height of 1.5 m



HEATING

MODEL : U-250PE1E8
 SOUND LEVEL : STANDARD 58 dB(A)
 QUIET MODE 50 dB(A)
 CONDITION : 1 m in front at height of 1.5 m



REMARKS:

- Value obtained in the actual place where the unit is installed may be slightly higher than the values shown in this graph because of the conditions of operation, the structure of the building, the background noise and other factors.
- The test results were obtained from an anechoic room.

NOTE

To evaluate "Noise level" the maximum number of the measured OCTAVE BAND SOUND PRESSURE LEVEL is used. Read the number on each BAND CENTER FREQUENCIES (horizontal axis) ranging from 63 Hz to 8000 Hz and select the maximum value (vertical axis) among them.

1-9. ELECTRICAL WIRING

● General Precautions on Wiring

- (1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.
- (2) Provide a power outlet to be used exclusively for each unit and a circuit breaker for overcurrent protection should be provided in the exclusive line.
- (3) To prevent possible hazards from insulation failure, the unit must be grounded.
- (4) Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.
- (5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- (6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.
- (7) Regulations on wire diameters differ from locality to locality. For field wiring rules, please refer to your LOCAL ELECTRICAL CODES before beginning.

You must ensure that installation complies with all relevant rules and regulations.

- (8) To prevent malfunction of the air conditioner caused by electrical noise, care must be taken when wiring as follows:
 - The remote control wiring and the inter-unit control wiring should be wired apart from the inter-unit power wiring.
 - Use shielded wires for inter-unit control wiring between units and ground the shield on both sides.
- (9) If the power supply cord of this appliance is damaged, it must be replaced by a repair shop designated by the manufacturer, because special-purpose tools are required.

Recommended Wire Length and Wire Diameter for Power Supply System

Outdoor unit (3-Phase)

	(A) Power supply		Time delay fuse or circuit capacity
	Wire size	Max. length	
U-200PE1E8	14 mm ²	116 m	15 A
U-250PE1E8	14 mm ²	96 m	20 A

Indoor unit

	(B) Power supply	Time delay fuse or circuit capacity
	2.5 mm ²	
S-200PE1E8	Max. 50/30 m	10/16 A
S-250PE1E8		

Control wiring

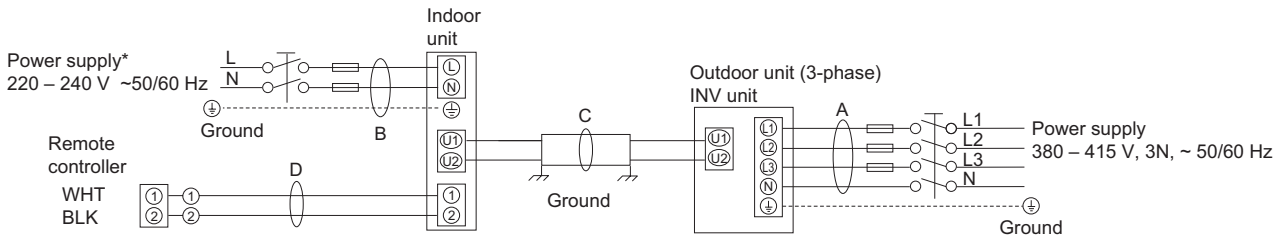
(C) Inter-unit (between outdoor and indoor units) control wiring	(D) Remote control wiring
0.75 mm ² (AWG #18) Use shielded wiring*1	0.75 mm ² (AWG #18)
Max. 1,000 m	Max. 500 m*2

NOTE

*1 With ring-type wire terminal.

*2 When the type "E1" is used with maximum length of 500 m for group control, and if the remote controller for the group control is wireless, the maximum length will be 400 m.

■ Wiring System Diagrams

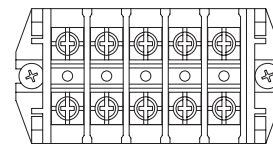


NOTE

- (1) Refer to “Recommended Wire Length and Wire Diameter for Power Supply System” for the explanation of “A”, “B”, “C” and “D” in the above diagrams.
- (2) The basic connection diagram of the indoor unit shows the 7P terminal board, so the terminal boards in your equipment may differ from the diagram.
- (3) Refrigerant Circuit (R.C.) address should be set before turning the power on.

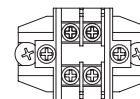
Outdoor Unit

5P terminal board



L1 L2 L3 N
Power supply

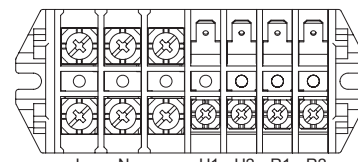
2P terminal board



Unit Control Line

Indoor Unit

7P terminal board



L N U1 U2 R1 R2
Power supply Unit control wiring Remote controller line

E1 Type



- (1) When linking the outdoor units in a network, disconnect the terminal extended from the short plug (CN003, 2P Black, location: right bottom on the outdoor main control PCB) from all outdoor units except any one of the outdoor units. (When shipping: In shorted condition.)
- (2) Do not install the inter-unit control wiring in a way that forms a loop. (Fig. 1-1)

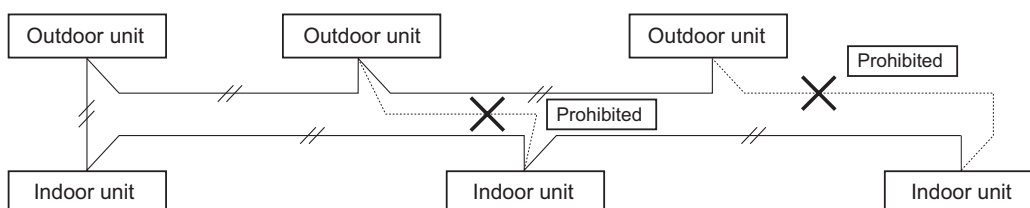


Fig. 1-1

- (3) Use shielded wires for inter-unit control wiring (c) and ground the shield on both sides, otherwise misoperation from noise may occur. (Fig. 1-2)
Connect wiring as shown in Wiring System Diagram.”

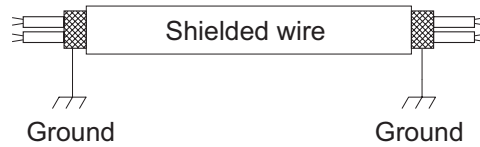


Fig. 1-2

- (4) Use the standard power supply cables for Europe (such as H05RN-F or H07RN-F which conform to CENELEC (HAR) rating specifications) or use the cables based on IEC standard. (245 IEC57, 245 IEC66)

**WARNING**

Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, ensure that all wiring is tightly connected.

When connecting each power wire to the terminal, follow the instructions on “How to connect wiring to the terminal” and fasten the wire securely with the fixing screw of the terminal plate.

How to connect wiring to the terminal**■ For stranded wiring**

- (1) Cut the wire end with cutting pliers, then strip the insulation to expose the stranded wiring about 10 mm and tightly twist the wire ends. (Fig. 1-3)
- (2) Using a Phillips head screwdriver, remove the terminal screw(s) on the terminal plate.
- (3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring pressure terminal.
- (4) Place the ring pressure terminal, and replace and tighten the removed terminal screw using a screwdriver. (Fig. 1-4)

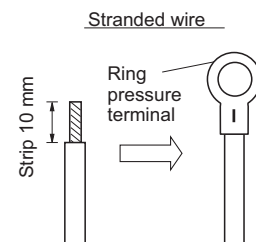


Fig. 1-3

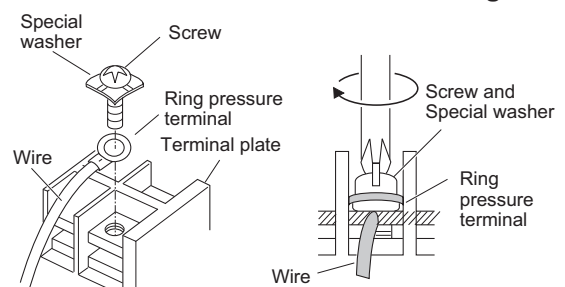


Fig. 1-4

■ Examples of shield wires

- (1) Remove cable coat not to scratch braided shield. (Fig. 1-5)
- (2) Unbraid the braided shield carefully and twist the unbraided shield wires tightly together. Insulate the shield wires by covering them with an insulation tube or wrapping insulation tape around them. (Fig. 1-6)
- (3) Remove coat of signal wire. (Fig. 1-7)
- (4) Attach ring pressure terminals to the signal wires and the shield wires insulated in Step (2). (Fig. 1-8)



Fig. 1-5

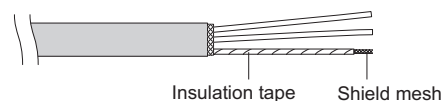


Fig. 1-6

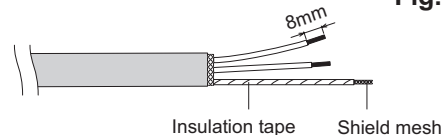


Fig. 1-7

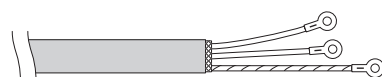
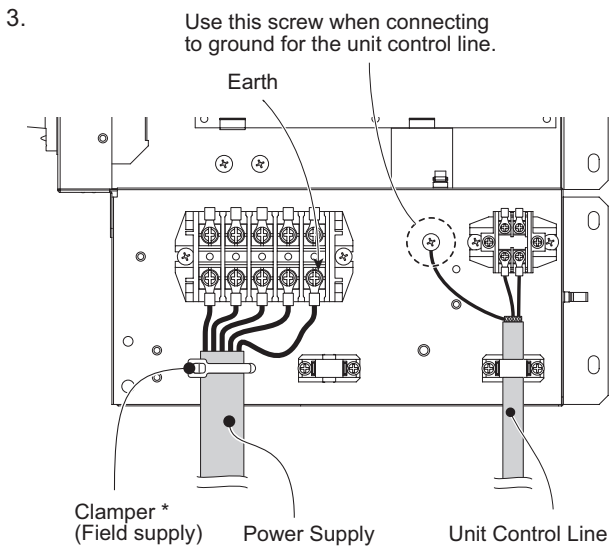
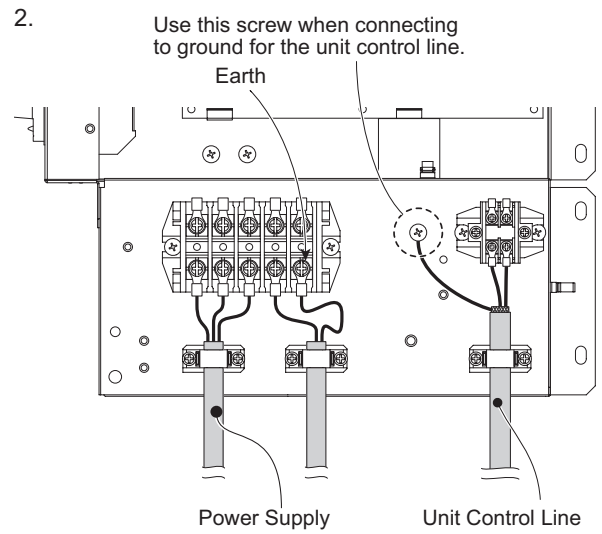
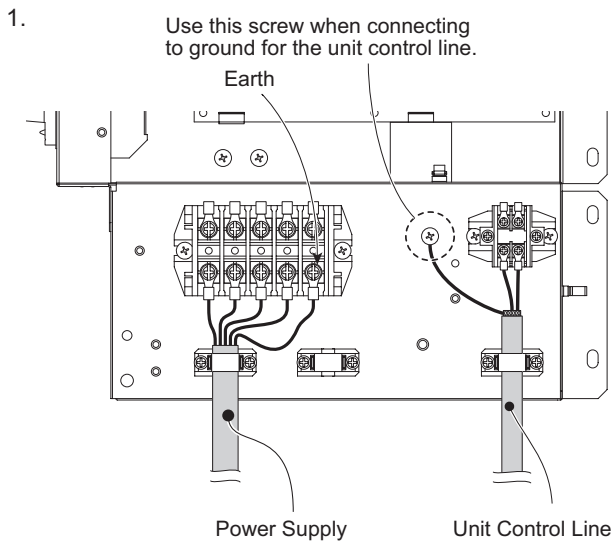


Fig. 1-8

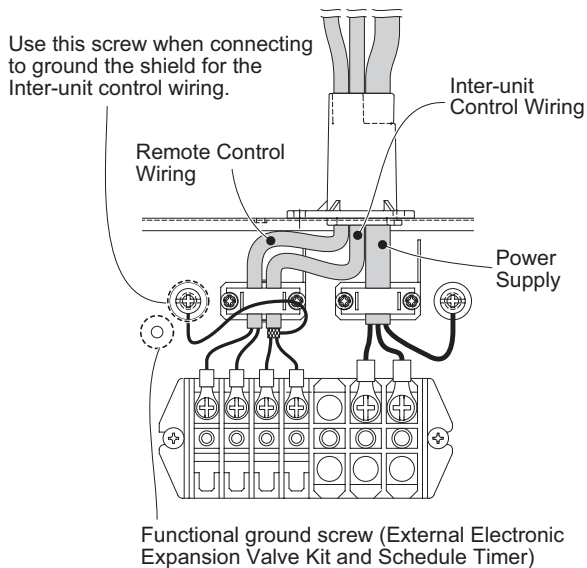
■ Wiring sample

Outdoor Unit



* First remove the attached resin fixture. Then lead the clamper (field supply) through the screw hole and fix the power supply wire.

Indoor Unit



1-10. Installation Instructions

■ Outdoor Unit

1. Tubing Length

Single type

- During tubing work, try to make both the tubing length (L) and the difference in elevation (H1) as short as possible. Refer to Table 1-1.

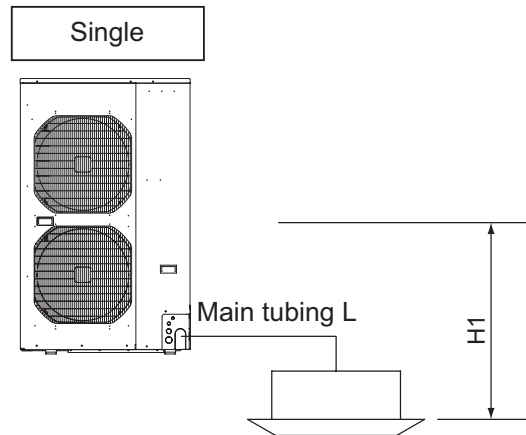


Table 1-1 Tubing Data for Models (Single)

Tubing Data		Models	U-200PE1E8	U-250PE1E8
Tubing size outer diameter	Liquid tube mm (in.)		9.52 (3/8)	12.7 (1/2)
	Gas tube mm (in.)		25.4	
Limit of tubing length (L)		(m)	100	
Height Differential of Indoor / Outdoor Units (H1)	Outdoor unit is placed higher	(m)	30	
	Outdoor unit is placed lower	(m)	30	
Max. allowable tubing length at shipment		(m)	5 - 30	
Required additional refrigerant		(g/m)	40*	80*
Refrigerant charged at shipment		(kg)	5.3	6.5

No additional charge of compressor oil is necessary.

* If the total tubing length exceeds 30 m, charge the amount of refrigerant as shown above in "Required additional refrigerant" for every 1 m in excess of 30 m for outdoor units.



CAUTION

1. This unit requires no additional refrigerant charge up to tubing length 30 m. In case of more than 30 m, additional refrigerant charge is required. Refer to Table 1-1.
2. In case of multi type installation, indoor units should be installed within the same room. If multi type indoor units are installed in different rooms, temperature control may develop problems because thermostat operation must follow the thermostat condition of 1 indoor unit only (the main unit).



WARNING

Always check the gas density for the room in which the unit is installed.

2. Check of limit density

When installing an air conditioner in a room, it is necessary to ensure that even if the refrigerant gas accidentally escapes, its density does not exceed the limit level.

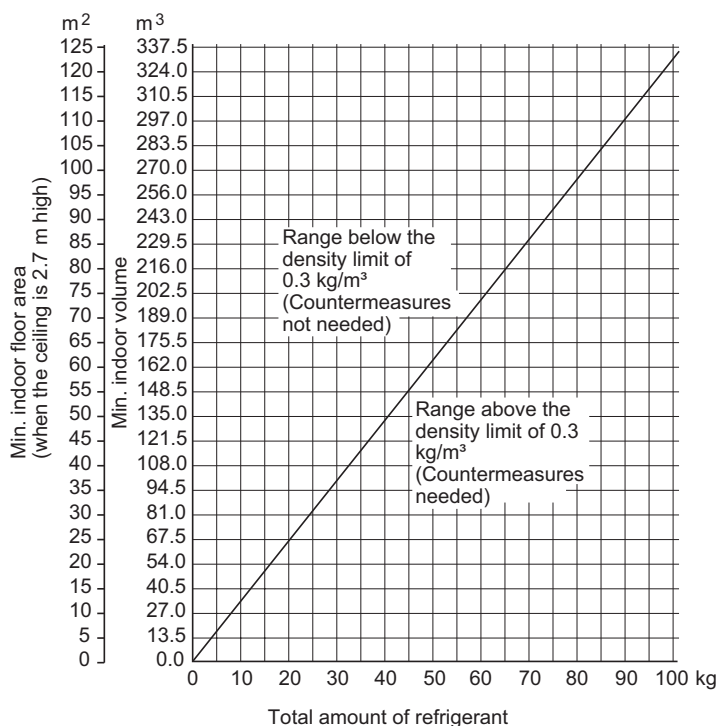
If the density might exceed the limit level, it is necessary to set up an opening between it and the adjacent room, or to install mechanical ventilation which is interlocked with a leak detector.

$$\frac{\text{(Total refrigerant charged amount: kg)}}{\text{(Min. indoor volume where the indoor unit is installed: m}^3\text{)}} \leq \text{Limit density } 0.3 \text{ (kg/m}^3\text{)}$$

The limit density of refrigerant which is used in this unit is 0.3 kg/m³ (ISO 5149).

The shipped outdoor unit comes charged with the amount of refrigerant fixed for each type, so add it to the amount that is charged at the field. (For the refrigerant charge amount at shipment, refer to the unit's nameplate.)

Minimum indoor volume & floor area relative to the amount of refrigerant are roughly as given in the following table.



CAUTION

Pay special attention to any location, such as a basement or recessed area, etc. where leaked refrigerant can collect, since refrigerant gas is heavier than air.

3. SELECTING THE INSTALLATION SITE



CAUTION

- When moving the unit during or after unpacking, make sure to lift it by holding its lifting lugs. Do not exert any pressure on other parts, especially the refrigerant piping, drain piping and flange parts.
- If you think the humidity inside the ceiling might exceed 30°C and RH 80%, reinforce the insulation on the unit body. Use glass wool or polyethylene foam as insulation so that it is no thicker than 10 mm and fits inside the ceiling opening.

Outdoor Unit

AVOID :

- Heat sources and exhaust fans, etc. (Fig. 1-9)
- Damp, humid or uneven locations.

DO :

- Choose a place as cool as possible.
- Choose a place that is well ventilated and outside air temperature does not exceed maximum 45°C constantly.
- Allow enough room around the unit for air intake/exhaust and possible maintenance. (Fig. 1-10)
- Use lug bolts or equal to bolt down unit, reducing vibration and noise.
- If cooling operation is to be used when the outdoor air temperature is -5°C or below, install a duct on the outdoor unit.

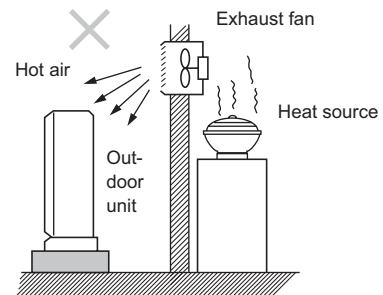
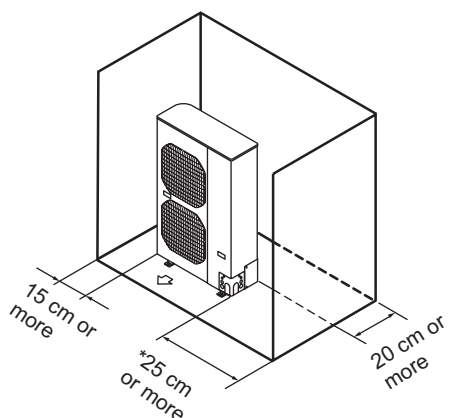


Fig. 1-9

Installation space

Install the outdoor unit with a sufficient space around the outdoor unit for operation and maintenance.

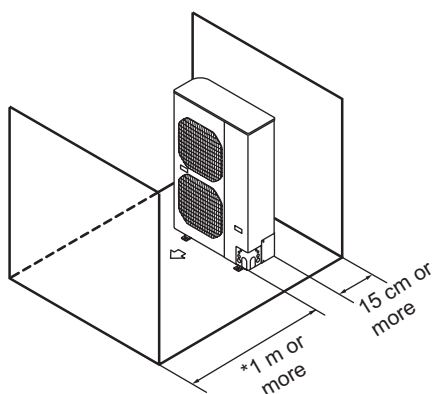
(1) Obstructions on the left side, right side and rear side (Front side and above the unit are opened). (Fig. 1-10)



* Necessary space is required to unscrew on the rear side for maintenance and if a sufficient maintenance space is provided on the rear side (40 cm), the space of over 15 cm is enough at the right side.

Fig. 1-10

(2) Obstructions on the front side and rear side (Left side, right side and above the unit are opened). (Fig. 1-11)



* For compressor replacement, 50 cm or more is required on the front side even when using the air discharge chamber.

Fig. 1-11

(3) Obstructions on the front side and above the unit (Left side, right side and rear side are opened). (Fig. 1-12)

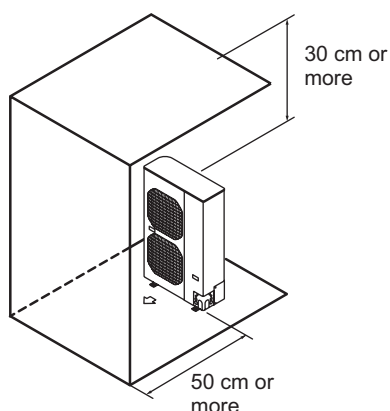


Fig. 1-12

In case of multiple installations

- Provide a solid base (concrete block, 10 × 40 cm beams or equal), a minimum of 15 cm above ground level to reduce humidity and protect the unit against possible water damage and decreased service life. (Fig. 1-13)
- Use lug bolts or equal to bolt down unit, reducing vibration and noise.

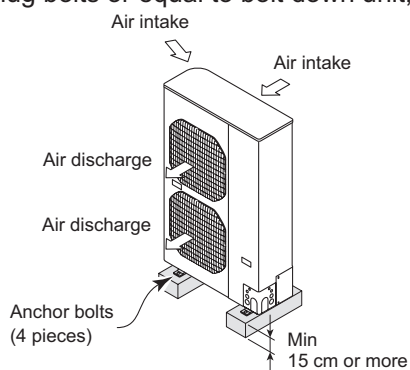


Fig. 1-13

Air Discharge Chamber for Top Discharge

Be sure to install the air discharge chamber in the field when:

- It is difficult to keep a space of min. 1 m between the air discharge outlet and an obstacle.
- The air discharge outlet is facing to the sidewalk and discharged hot air annoys the passers-by. (Fig. 1-14)

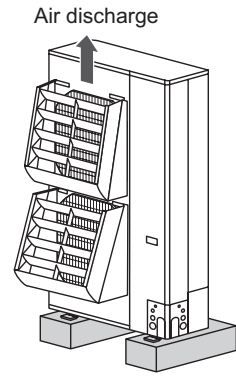


Fig. 1-14

Installing the Unit in Heavy Snow Areas

In locations with strong wind, snow-proof ducting should likewise be fitted and direct exposure to the wind should be avoided as much as possible.

Countermeasures against snow and wind

In regions with snow and strong wind, the following problems may occur when the outdoor unit is not provided with a platform and snow-proof ducting: (Fig. 1-15):

- The outdoor fan may not run and damage of the unit may be caused.
- There may be no air flow.
- The tubing may freeze and burst.
- The condenser pressure may drop because of strong wind, and the indoor unit may freeze.

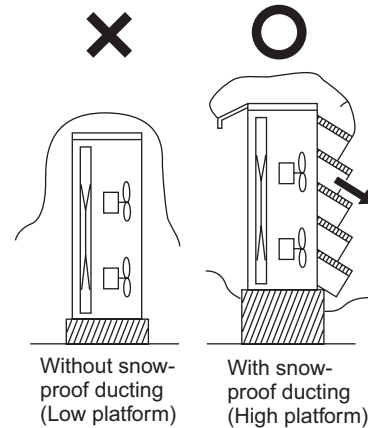


Fig. 1-15

In regions with significant snowfall, the outdoor unit should be provided with a platform and snow-proof duct.

Precautions for Installation in Heavy Snow Areas

- (1) The platform should be higher than the max. snow depth. (Fig. 1-15)
- (2) The 2 anchoring feet of the outdoor unit should be used for the platform, and the platform should be installed beneath the air intake side of outdoor unit.
- (3) The platform foundation must be firm and the unit must be secured with anchor bolts.
- (4) In case of installation on a roof subject to strong wind, countermeasures must be taken to prevent the unit from being blown over.

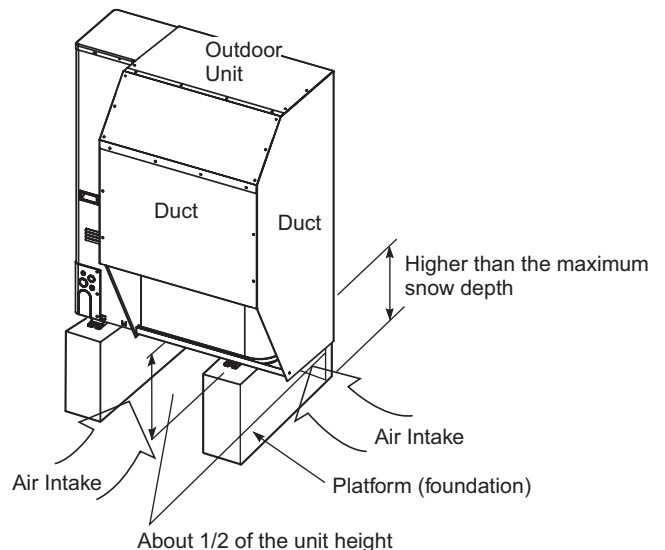
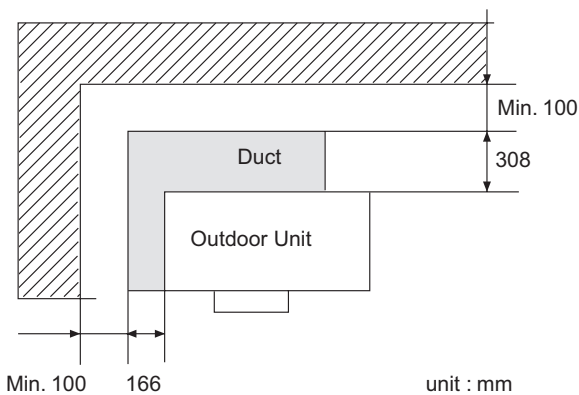


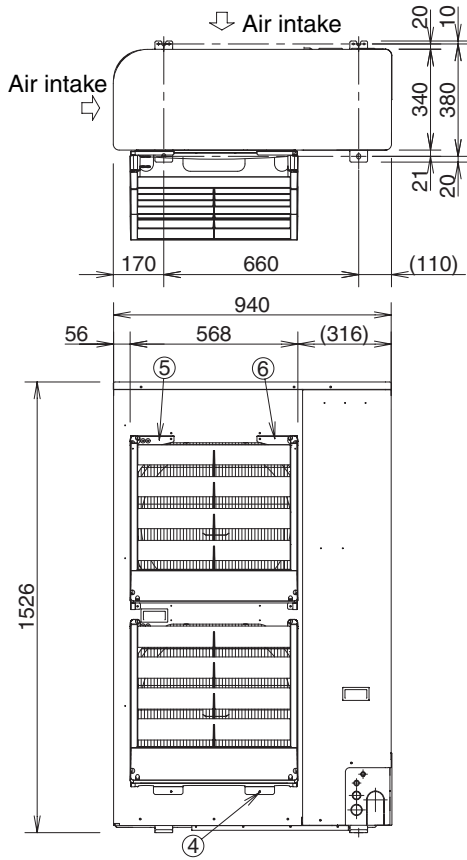
Fig. 1-16

4. Dimensions of Air-Discharge Chamber :

In snowy regions, if there is concern that snow may enter the air discharge chamber, remove the base of the chamber before using.

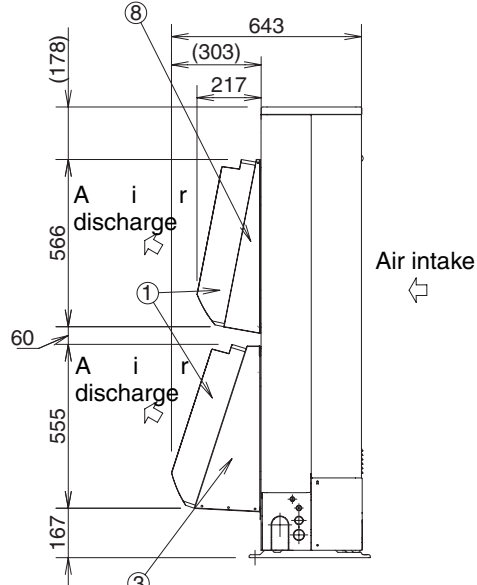
Reference diagram for U-200PE1E8 / U-250PE1E8

Unit: mm



①	Air discharge support	
②	Downward, Left side installation fixture	T1.0
③	Downward, Right side installation fixture	T1.0
④	Downward, Center side installation fixture	T1.0
⑤	Upward, Left side installation fixture	T1.0
⑥	Upward, Right side installation fixture	T1.0
⑦	Upward, Left side installation fixture	T1.0
⑧	Upward, Right side installation fixture	T1.0

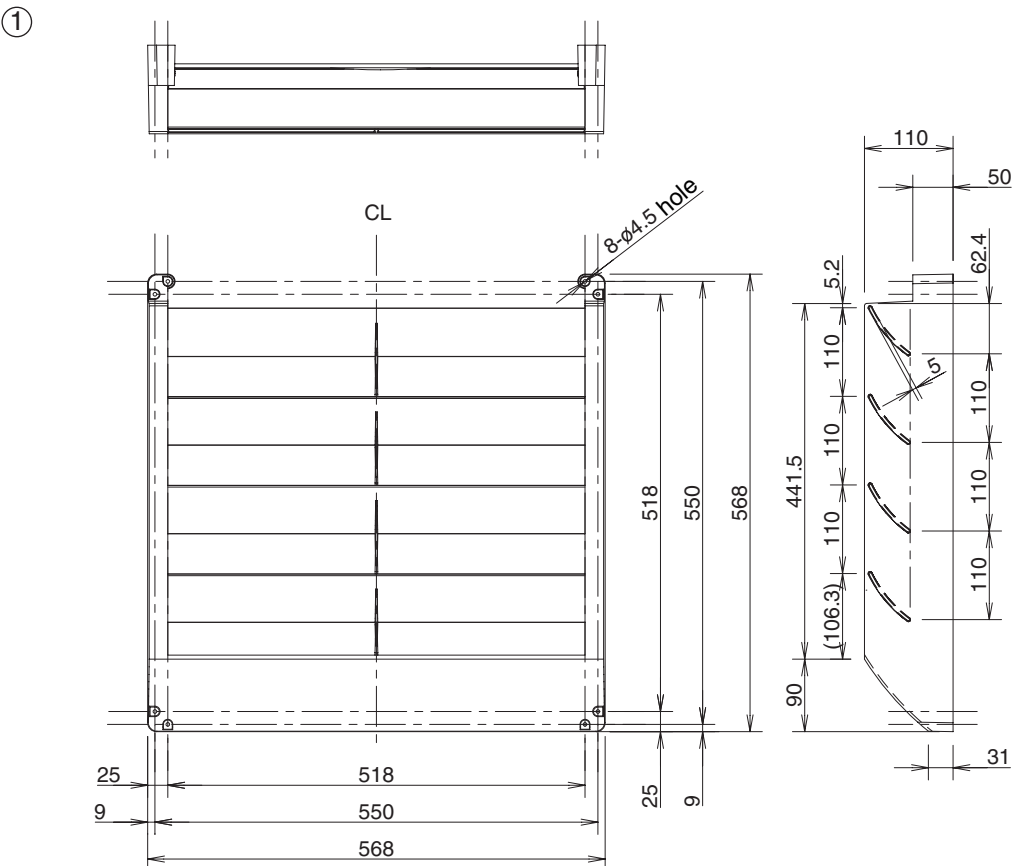
(Reverse side ⑦)



(Reverse side ②)

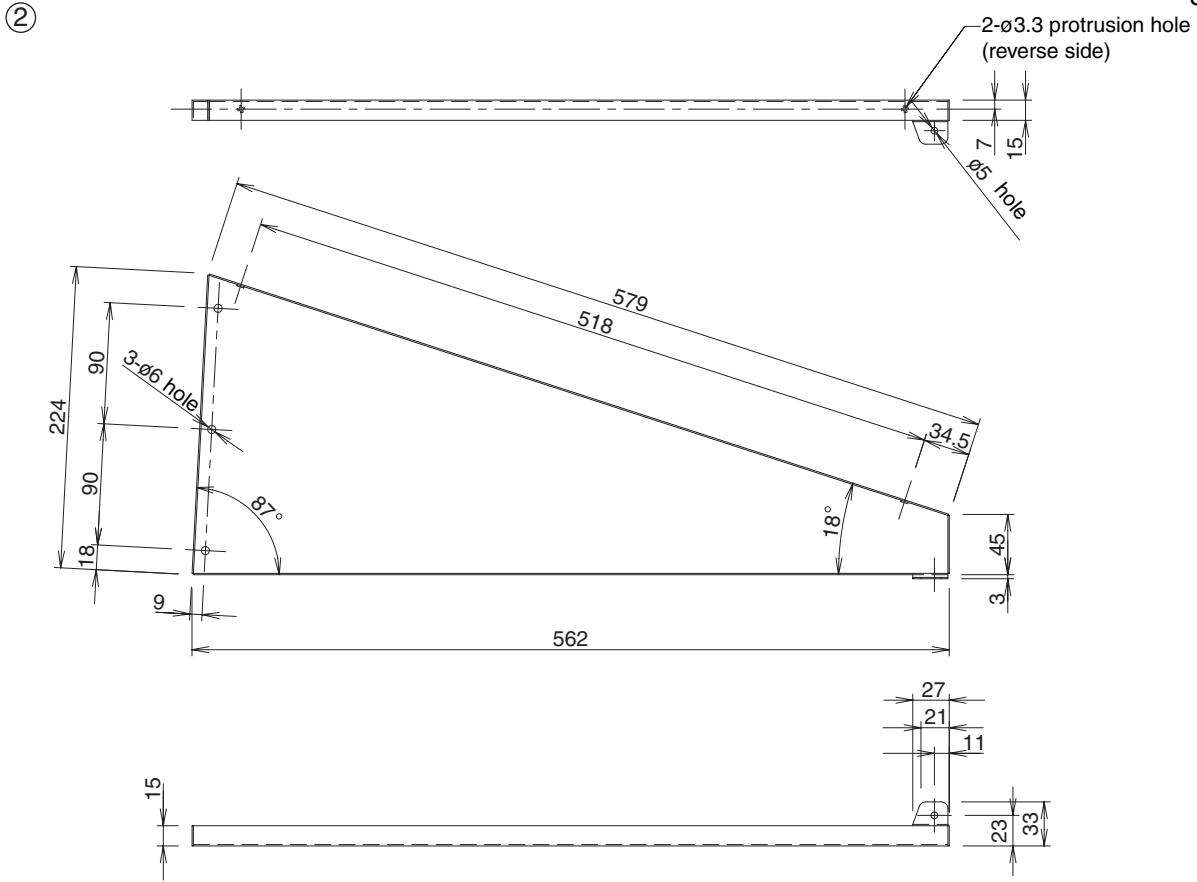
Reference diagram for air-discharge support (field supply) :

Unit: mm



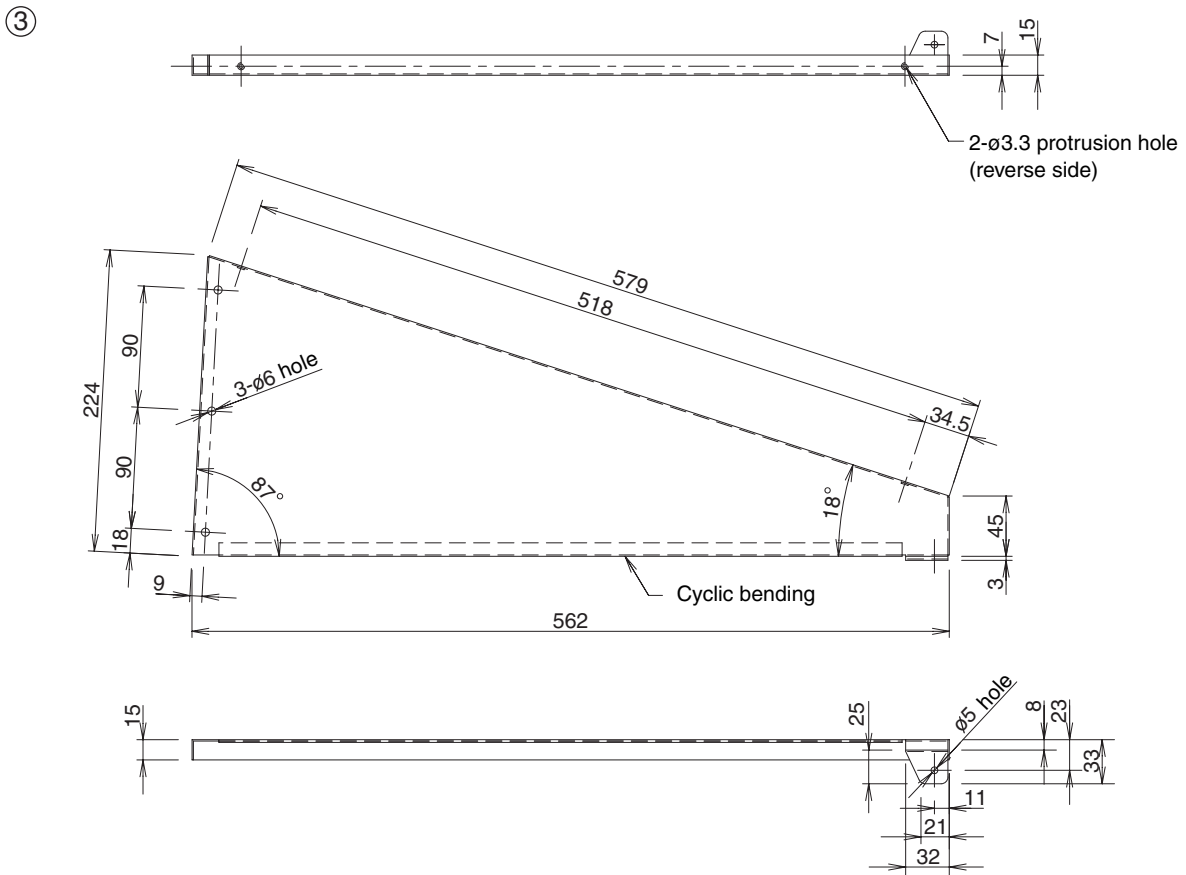
Reference diagram for downward left side installation fixture (field supply) :

Unit: mm



Reference diagram for downward right side installation fixture (field supply) :

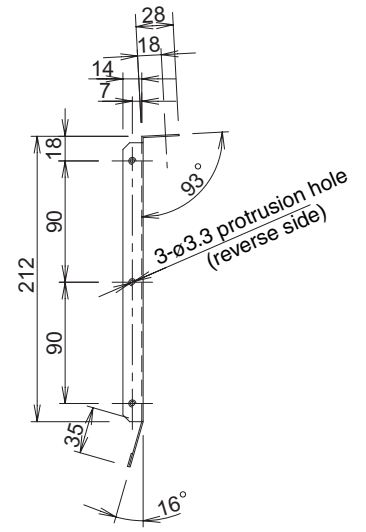
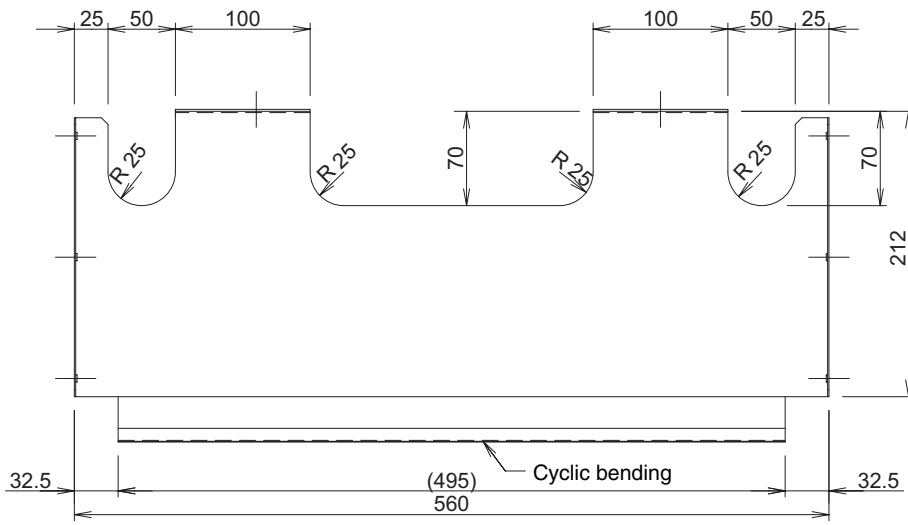
Unit: mm



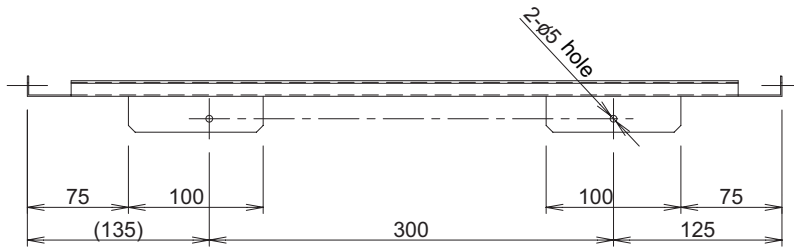
Reference diagram for downward center side installation fixture (field supply) :

Unit: mm

④



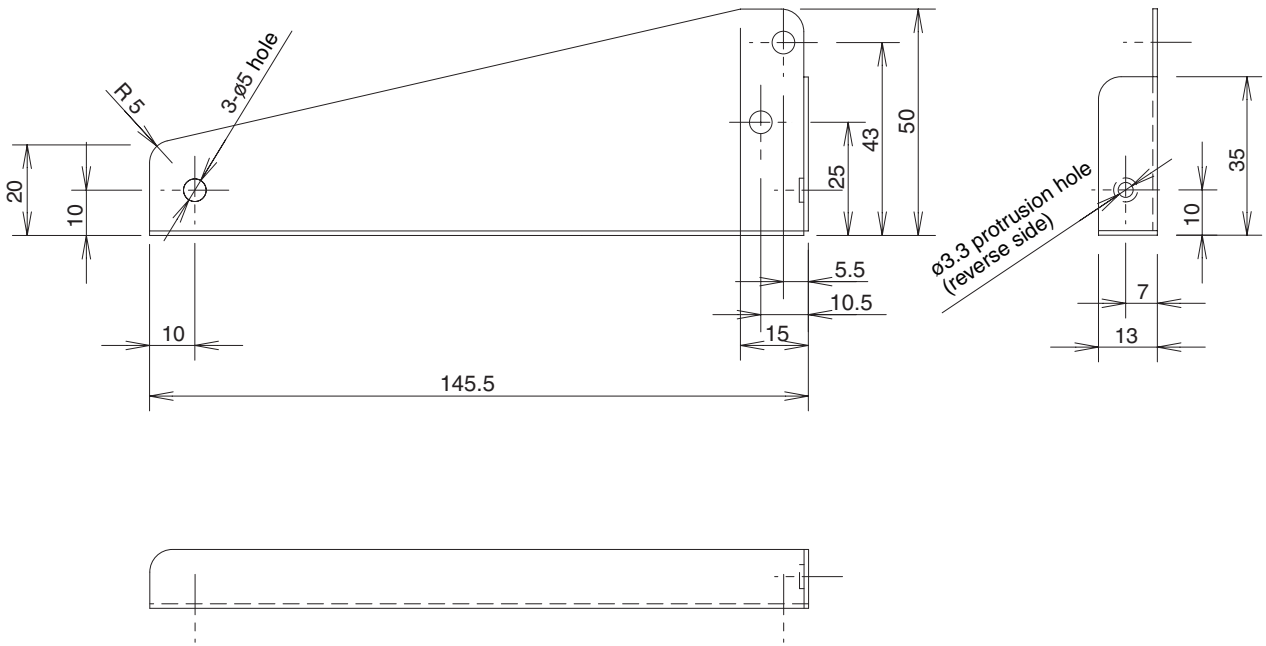
Same on reverse side



Reference diagram for upward left side installation fixture (field supply) :

Unit: mm

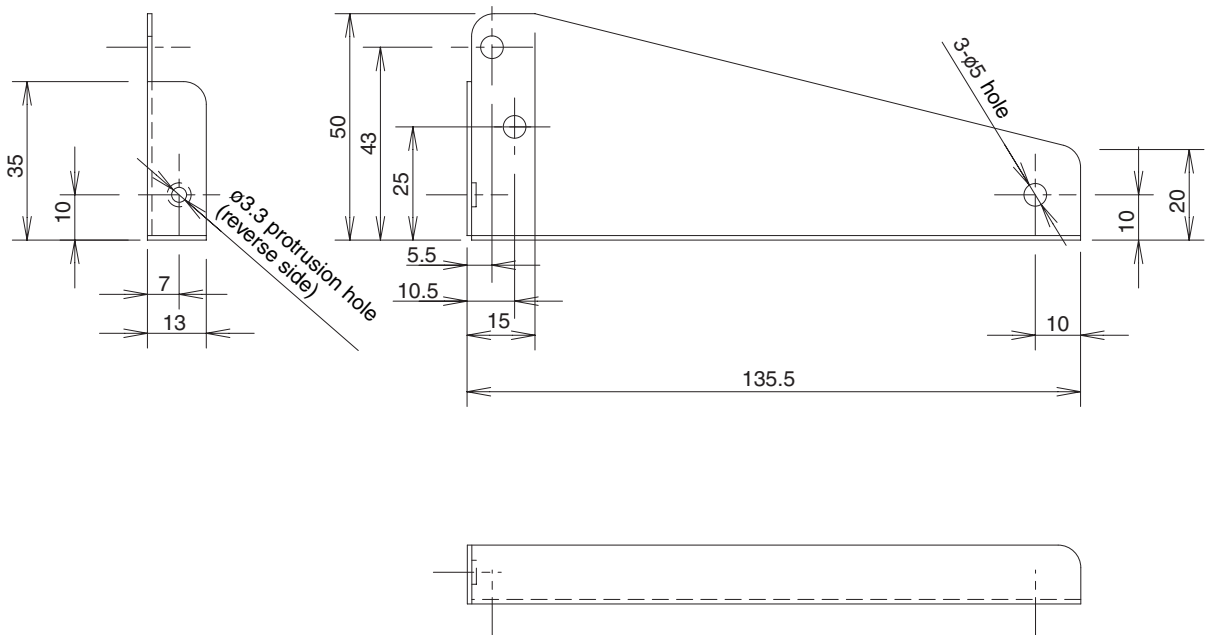
⑤



Reference diagram for upward right side installation fixture (field supply) :

Unit: mm

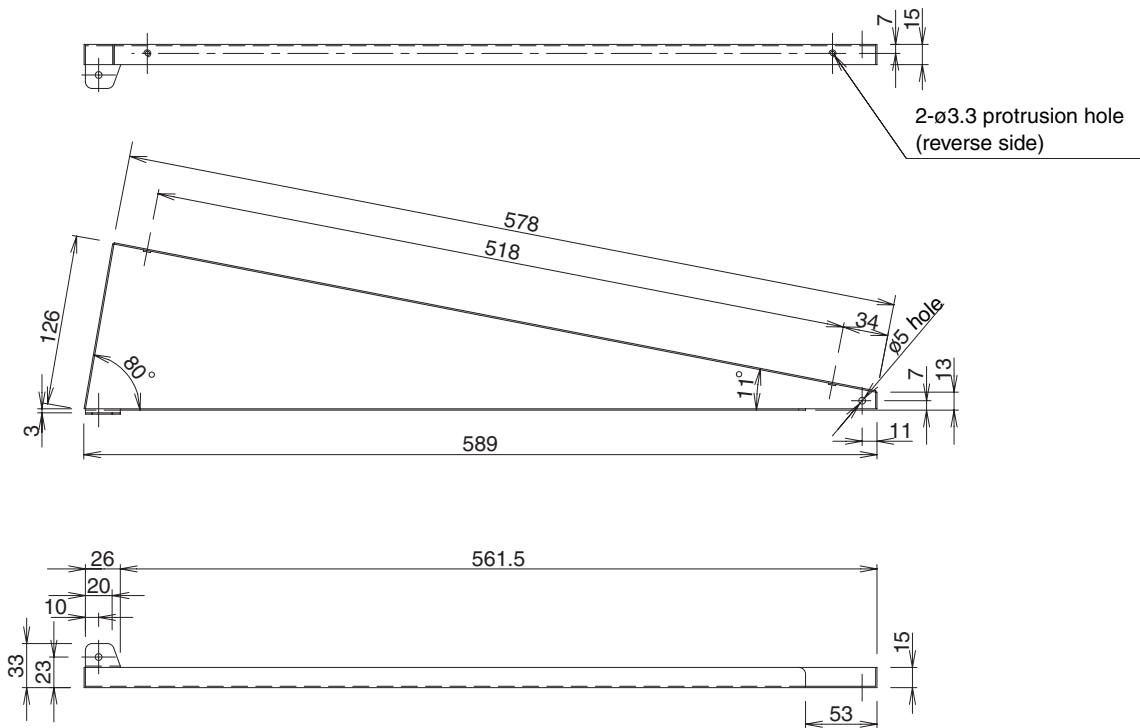
⑥



Reference diagram for upward left side installation fixture (field supply) :

Unit: mm

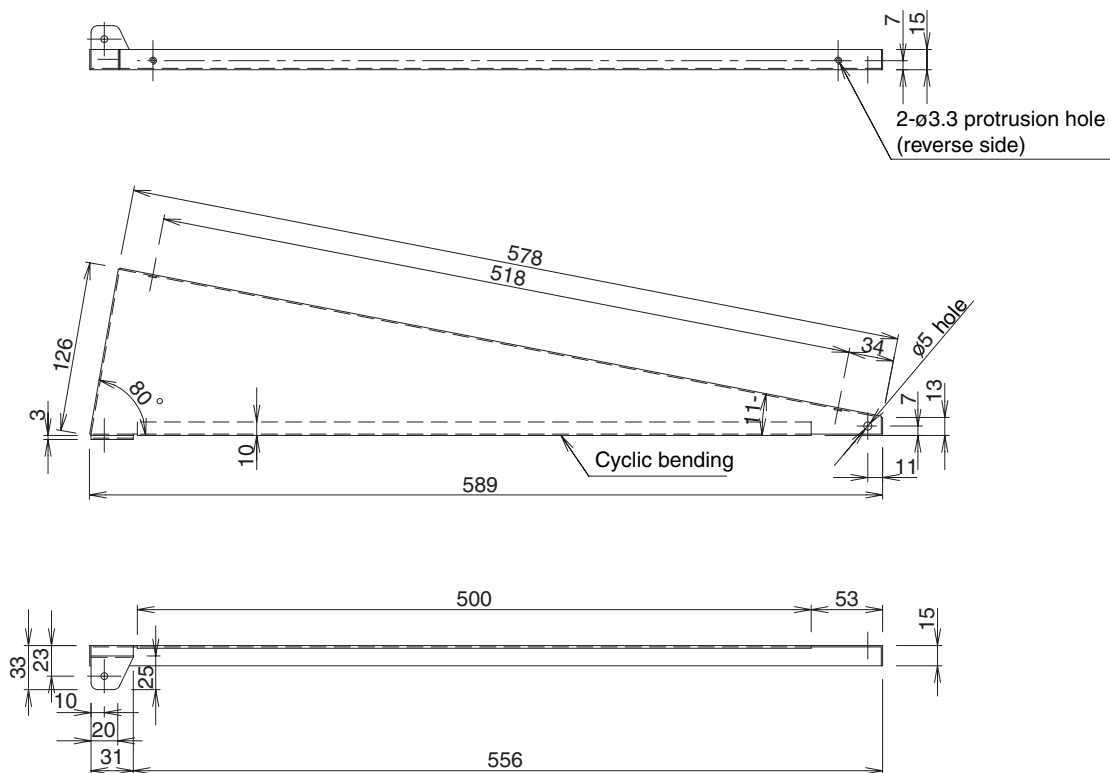
⑦



Reference diagram for upward right side installation fixture (field supply) :

Unit: mm

⑧



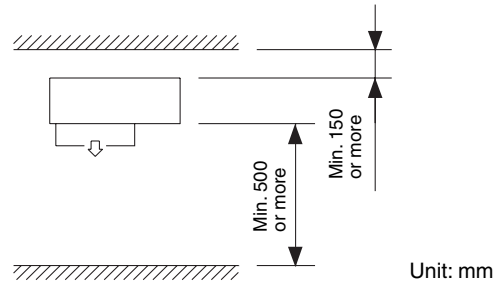
Reference diagram for air-discharge chamber (field supply)

The models of U-200PE1E8 / U-250PE1E8 with Air-Discharge Chamber

Required space around outdoor unit

If the air discharge chamber is used, the space shown below must be secured around the outdoor unit.
 If the unit is used without the required space, a protective device may activate, preventing the unit from operating.

(1) Single-unit installation

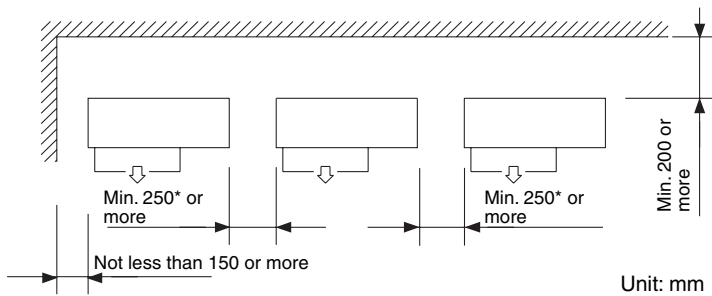


CAUTION

The top and both sides must remain open.
 If there are obstacles to the front and rear of the outdoor unit, the obstacle at either the front or rear must be no taller than the height of the outdoor unit.

(2) Multiple-unit installation

Installation in lateral rows



NOTE

- The amount of space required for removing the screws on the rear of the unit.
 If in case the sufficient space for maintenance is ensured on the rear of the outdoor unit, installation is possible with the space of both sides of not less than 150mm where marked with * mark.

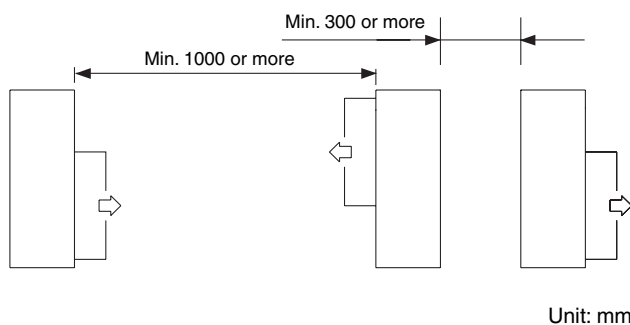


CAUTION

The front and top must remain open.
 The obstacles must be no taller than the height of the outdoor unit.

Installation in front-rear rows

Installation with intakes facing intakes or outlets facing outlets



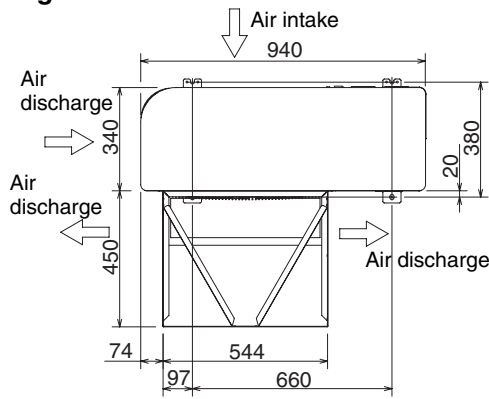
CAUTION

The front and both sides must remain open.

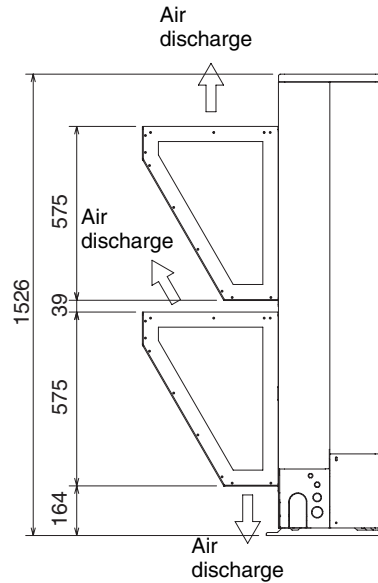
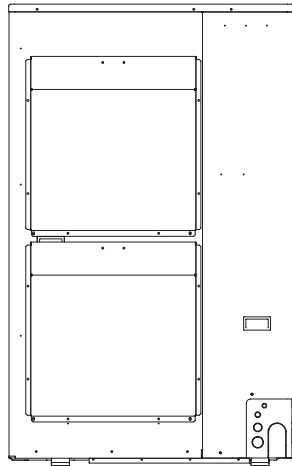
5. Dimensions of Wind-proof Duct :

In snowy regions, if there is concern that snow may enter the wind-proof duct, remove the base of the chamber before using.

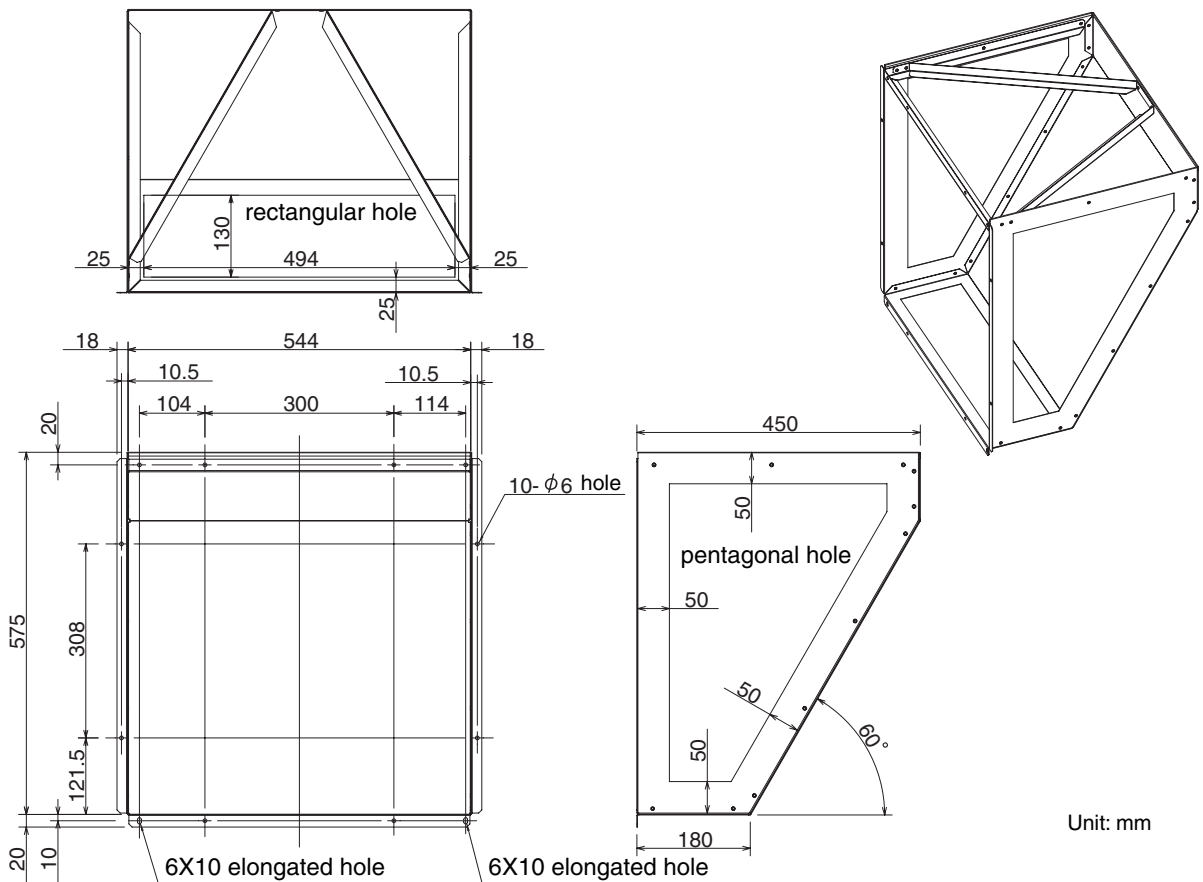
Reference diagram for U-200PE1E8 / U-250PE1E8



Unit: mm



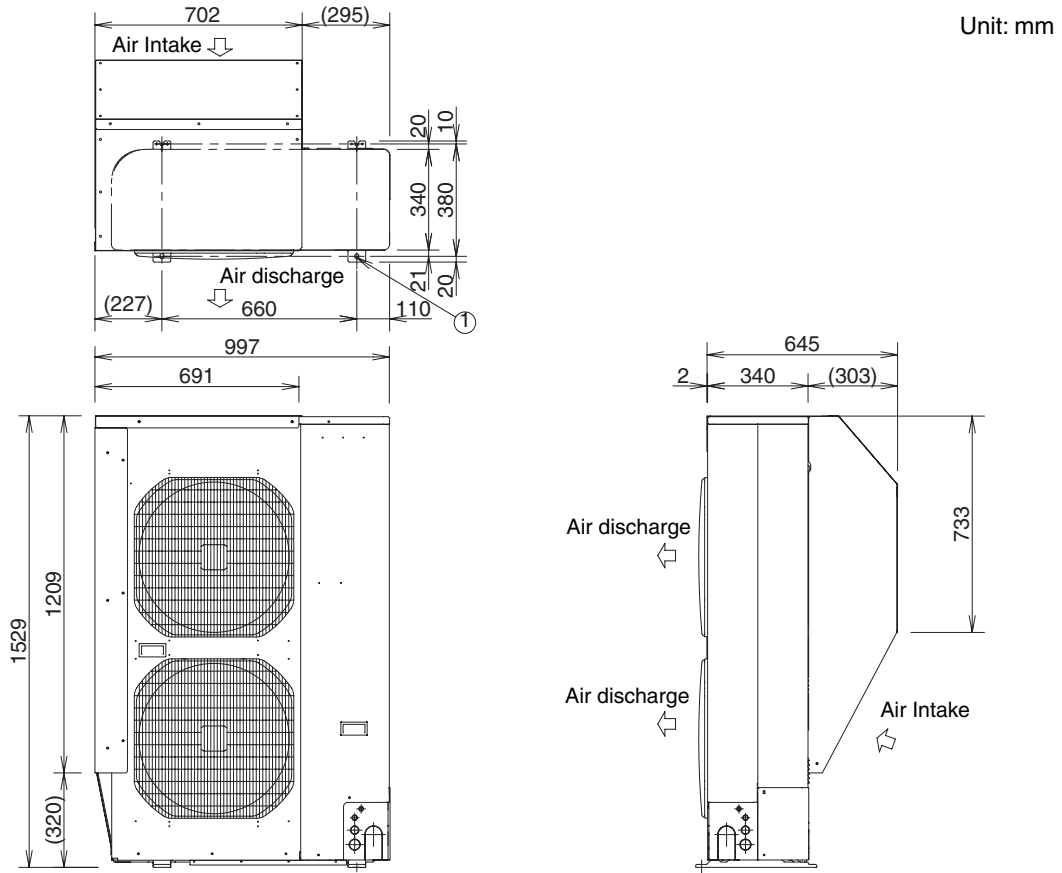
Reference diagram for wind-proof duct (field supply) :



Unit: mm

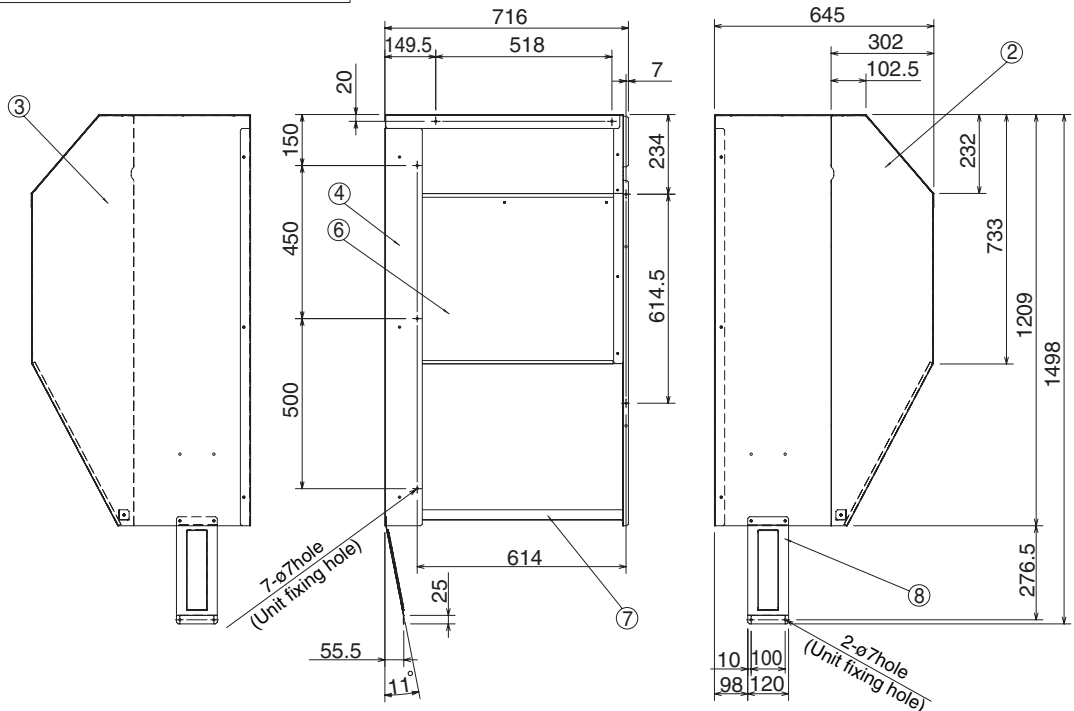
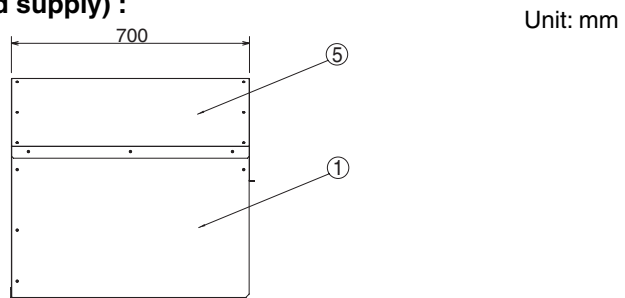
6. Dimensions of Snow-proof Duct :

Reference diagram for U-200PE1E8 / U-250PE1E8



Reference diagram for snow-proof duct (field supply) :

①	Unit top, snow-proof duct
②	Unit right side
③	Unit left side
④	Unit front side
⑤	Unit reverse side
⑥	Unit reverse side
⑦	Unit reverse sides, reinforcement brackets for snow-proof vent
⑧	Unit reverse sides, reinforcement brackets for snow-proof duct



Reference diagram for snow-proof duct - 1

Space requirements for setting - (1)

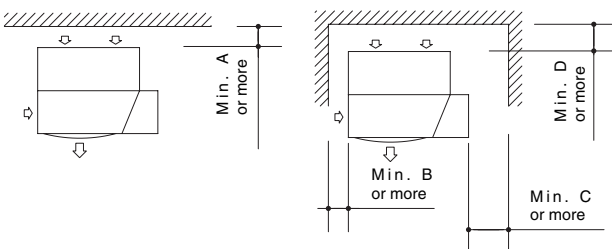
The models of U-200PE1E8 / U-250PE1E8 with snow-proof duct

Unit: mm

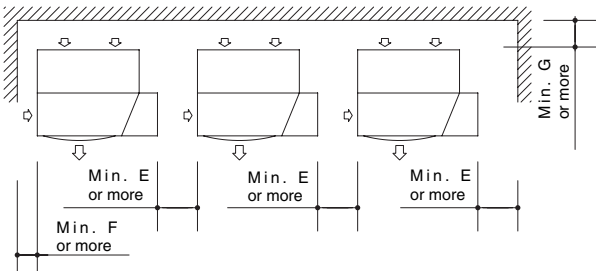
[Obstacle to the rear of unit]

● **Top is open:**

(1) Single-unit installation (2) Obstacles on both sides



(3) Multiple-unit installation (2 or more units)



Outdoor unit	A	B	C	D	E	F	G
U-200PE1E8 / U-250PE1E8	150	150	250*	200	250*	150	200

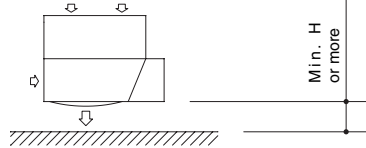
Unit : mm

Notes: 1. In cases 2 and 3 the height of the obstacle must be no taller than the height of the outdoor unit.
 2. The amount of space required for removing the screw on the rear of the unit. If in case the sufficient space for maintenance is ensured on the rear of the outdoor unit, installation is possible with the space of both sides of not less than 150mm where marked with * mark.

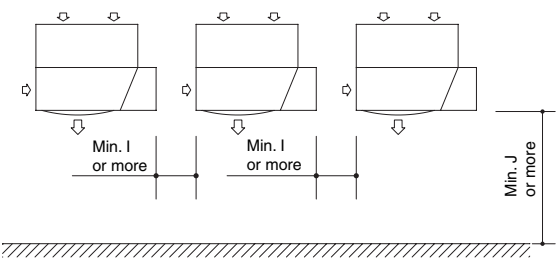
[Obstacle to the front of unit]

● **Top is open:**

(1) Single-unit installation



(2) Multiple-unit installation (2 or more units)

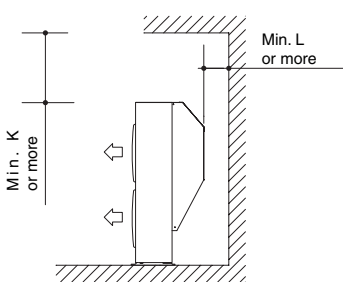


Outdoor unit	H	I	J
U-200PE1E8 / U-250PE1E8	500	250*	1000

Unit : mm

Note: The amount of space required for removing the screw on the rear of the unit. If in case the sufficient space for maintenance is ensured on the rear of the outdoor unit, installation is possible with the space of both sides of not less than 150mm where marked with * mark.

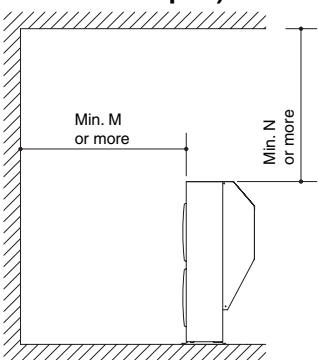
● **Top is blocked by an obstacle: (Both sides are open)**



Outdoor unit	K	L
U-200PE1E8 / U-250PE1E8	500	150

Unit : mm

● **Top is blocked by an obstacle: (Both sides are open)**



Outdoor unit	M	N
U-200PE1E8 / U-250PE1E8	500	300

Unit : mm

Reference diagram for snow-proof duct - 2

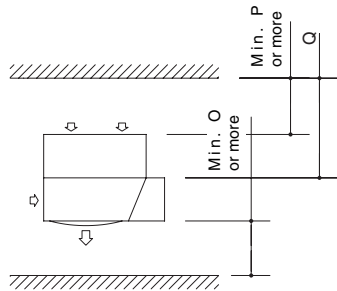
Space requirements for setting - (2)

The models of U-200PE1E8 / U-250PE1E8 with snow-proof duct

[Obstacles to the front and rear of unit]

- The top and both sides must remain open. Either the obstacle to the front or the obstacle to the rear must be no taller than the height of the outdoor unit.

(1) Single-unit installation



Dimension Q

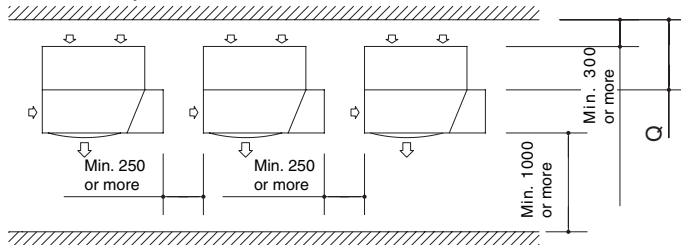
If a snow protection duct is attached after the unit is installed, verify that dimension Q is 500 mm or more.

Outdoor unit	O	P
U-200PE1E8 / U-250PE1E8	1000	150

Unit : mm

(2) Obstacles on both sides

Installation is possible with the maximum 3 outdoor units.

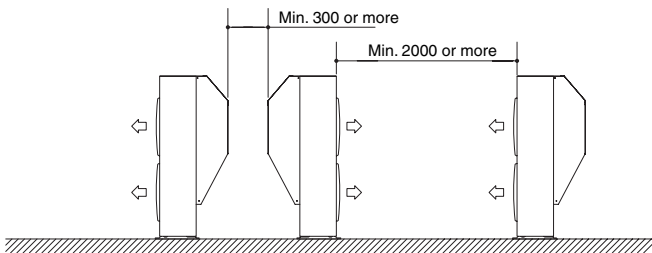


Unit : mm

Note : The amount of space required for removing the screw on the rear of the unit.
If in case the sufficient space for maintenance is ensured on the rear of the outdoor unit, installation is possible with the space of both sides of not less than 150mm where marked with * mark.

[Installation in front-rear rows]

- The top and both sides must remain open. Either the obstacle to the front or the obstacle to the rear must be no taller than the height of the outdoor unit.



Unit : mm

7. HOW TO INSTALL THE OUTDOOR UNIT

1. Installing the Outdoor Unit

- Use concrete or a similar material to make the base, and ensure good drainage.
- Ordinarily, ensure a base height of 5 cm or more. If a drain pipe is used, or for use in cold-weather regions, ensure a height of 15 cm or more at the feet on both sides of the unit. (In this case, leave clearance below the unit for the drain pipe, and to prevent freezing of drainage water in cold-weather regions.)
- Refer to Fig. 1-17 for the anchor bolt dimensions.
- Be sure to anchor the feet with anchor bolts (M10). In addition, use anchoring washers on the top side. (Use large square 32 × 32 SUS washers with JIS nominal diameter of 10.) (Field supply)

2. Drainage Work

Follow the procedure below to ensure adequate draining for the outdoor unit.

- For the drain port dimensions, refer to Fig. 1-17.
- Ensure a base height of 15 cm or more at the feet on both sides of the unit.

3. Routing the Tubing and Wiring

- The tubing and wiring can be extended out in 4 directions: front, rear, right, and down.
 - The service valves are housed inside the unit. To access them, remove the inspection panel. (To remove the inspection panel, remove the 3 screws, then slide the panel downward and pull it toward you.)
- (1) If the routing direction is through the front, rear, or right, use a nipper or similar tool to cut out the knockout holes for the inter-unit control wiring outlet, power wiring outlet, and tubing outlet from the appropriate covers A and B.
 - (2) If the routing direction is down, use a nipper or similar tool to cut out the lower flange from cover A. (Fig. 1-18)

For 8 and 10 HP unit

Unit: mm

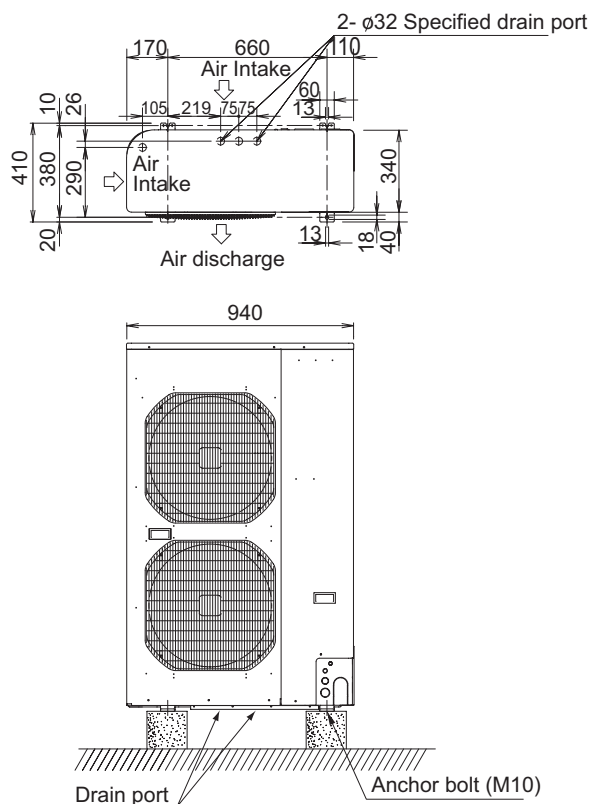


Fig. 1-17

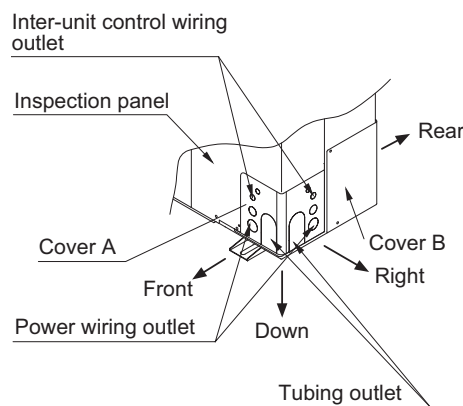


Fig. 1-18



1. Route the tubing so that it does not contact the compressor, panel, or other parts inside the unit. Increased noise will result if the tubing contacts these parts.
2. When routing the tubing, use a tube bender to bend the tubes.
3. In cold-weather regions, in order to prevent drainage water from freezing, do not install the drain socket cap. Also take steps to prevent water from accumulating around the unit.

■ Indoor Unit

8. SELECTING THE INSTALLATION SITE



CAUTION

- When moving the unit during or after unpacking, make sure to lift it by holding its lifting lugs. Do not exert any pressure on other parts, especially the refrigerant piping, drain piping and flange parts.
- If you think the humidity inside the ceiling might exceed 30°C and RH 80%, reinforce the insulation on the unit body. Use glass wool or polyethylene foam as insulation so that it is no thicker than 10 mm and fits inside the ceiling opening.

Indoor Unit

AVOID:

- Areas where leakage of flammable gas may be expected.
- Places where large amounts of oil mist exist.
- Direct sunlight.
- Locations near heat sources which may affect the performance of the unit.
- Locations where external air may enter the room directly. This may cause “condensation” on the air discharge ports, causing them to spray or drip water.
- Locations where the remote controller will be splashed with water or affected by dampness or humidity.
- Installing the remote controller behind curtains or furniture.
- Locations where high-frequency emissions are generated.
- Places where blocks air passages.
- Places where the false ceiling is not noticeably on an incline.

DO:

- Select an appropriate position from which every corner of the room can be uniformly cooled.
- Select a location where the ceiling is strong enough to support the weight of the unit.
- Select a location where tubing and drain pipe have the shortest run to the outdoor unit.
- Allow room for operation and maintenance as well as unrestricted airflow around the unit.
- Install the unit within the maximum elevation difference above or below the outdoor unit and within a total tubing length (L) from the outdoor unit as detailed in Table 1-1.
- Allow room for mounting the remote controller about 1m off the floor, in an area that is not in direct sunlight or in the flow of cool air from the indoor unit.
- Places where optimum air distribution can be ensured.
- Places where sufficient clearance for maintenance and service can be ensured. (See the figures on the right side.)

9. HOW TO INSTALL THE INDOOR UNIT

■ High Static Pressure Ducted Type (E1 Type)

1. Required Minimum Space for Installation and Service (200, 250 Types)

The installation instructions that come with the indoor unit describe how to use it in combination with the U-200PE1E8 and U-250PE1E8 outdoor units.

Please refer to the following when using it in combination with the U-200PE1E8 and U-250PE1E8 outdoor units.

- This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from below.
- The minimum space for installation and service is shown in Fig. 1-19.

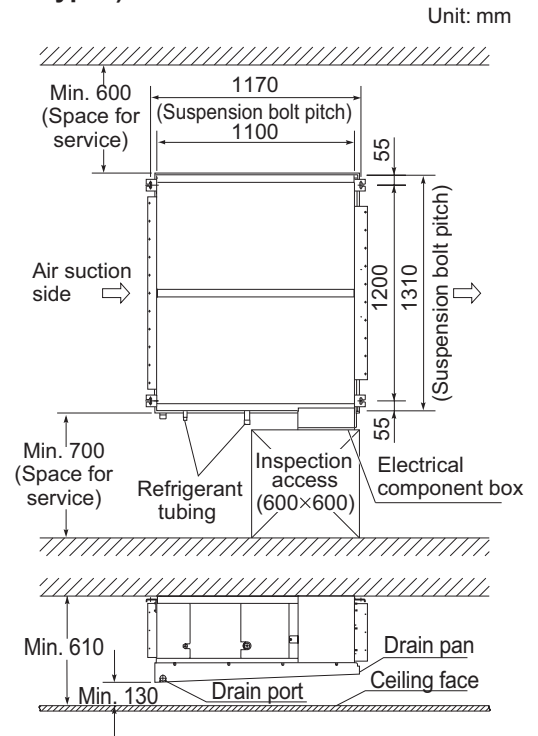


Fig. 1-19

- It is recommended that space be provided (600 × 600 mm) for checking and servicing the electrical system.
- Fig. 1-20 shows the detailed dimensions of the indoor unit.

Unit: mm

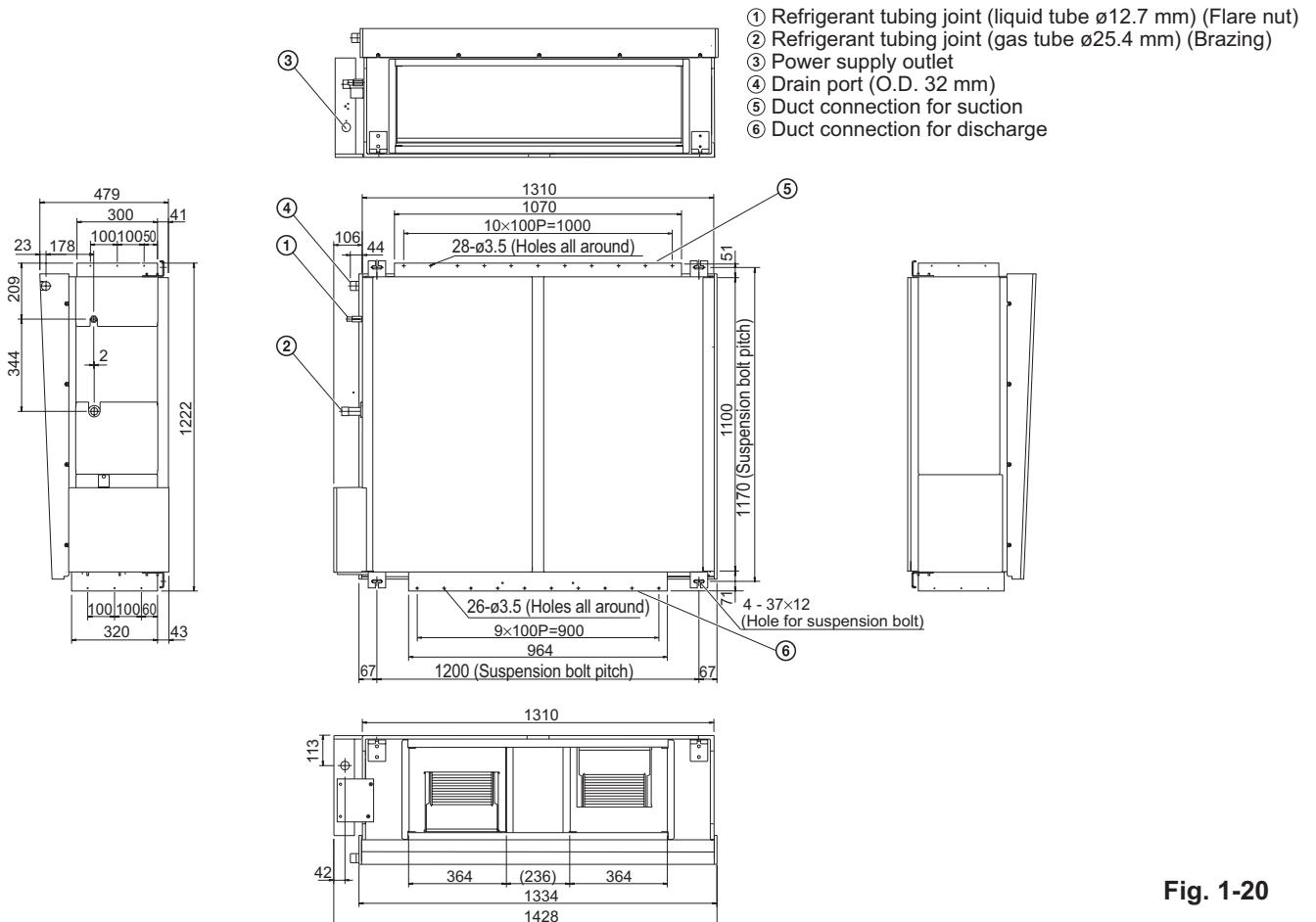


Fig. 1-20

2. Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts as shown in Fig. 1-21

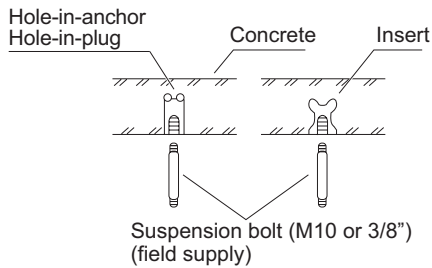


Fig. 1-21

- Use existing ceiling supports or construct a suitable support as shown in Fig. 1-22.

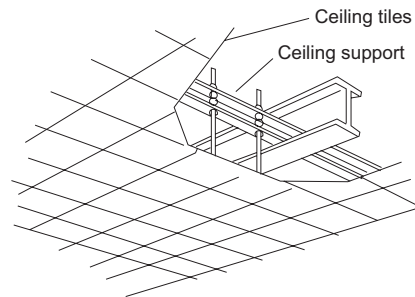


Fig. 1-22

or



WARNING

It is important that you use extreme care in supporting the indoor unit inside the ceiling. Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each attached suspension bolt.

- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data given previously. (Figs. 1-19 and 1-20)
Tubing must be laid and connected inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing into position for connection to the unit before placing the unit inside the ceiling.
- (2) Screw in the suspension bolts allowing them to protrude from the ceiling as shown in Fig. 1-21.
(Cut the ceiling material, if necessary.)
- (3) Suspend and fix the indoor unit using the 2 hexagonal nuts (field supply) and special washers (supplied with the unit) as shown in Fig. 1-23.

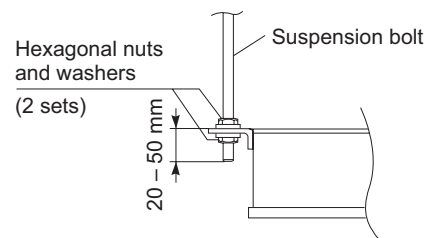


Fig. 1-23

3. Installing the Refrigerant Tubing

The size of the refrigerant tubing is as shown in Table 1-2.

Table 1-2

	200 Type	250 Type
Gas tube (mm)	ø25.4 (Braze connection)	ø25.4 (Braze connection)
Liquid tube (mm)	ø9.52 (Flare connection)	ø12.7 (Flare connection)

- When brazing the gas tubing, cool the tubing with dampened shopcloths as you work, as shown in Fig. 1-24, to protect the unit's thermistor from the heat generated by brazing.

The tube connector that comes with the Type 250 indoor unit cannot be used in combination with this outdoor unit. Use in combination with the U-250PE1E8.

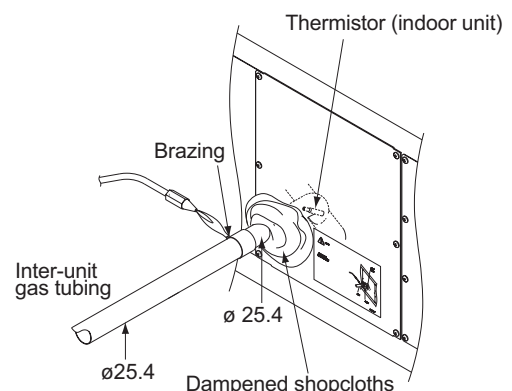
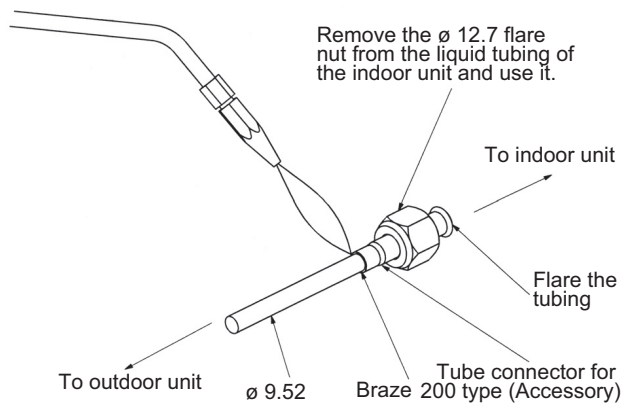


Fig. 1-24

- The type 200 indoor unit comes with a tube connector that is for liquid tubing. Configure as shown in the illustration and connect it. When flaring the tube, put the flare nut onto it first and then flare it.



- Be sure to insulate both the gas tubing and liquid tubing. In addition, wrap the supplied insulation material around the tubing joints, and fasten in place with vinyl tape or other means. Failure to insulate the tubing may result in water leakage from condensation.
- Plug all gaps at tube through-holes in the unit with insulation or a similar substance to prevent air leakage. (Fig. 1-25)

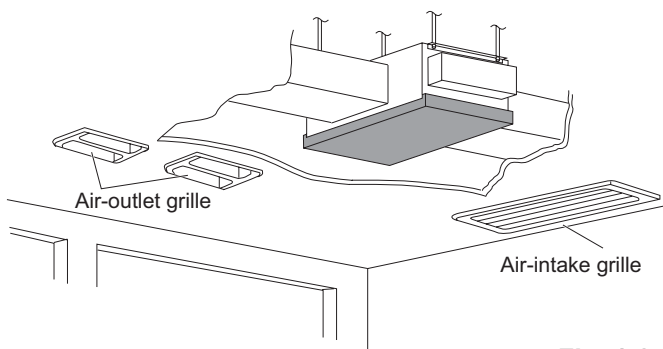


Fig. 1-25

4. Installing the Drain Pipe

- (1) Prepare standard hard PVC pipe (O.D. 32 mm) for the drain and use the supplied drain socket to prevent water leaks. The PVC pipe must be purchased separately. When doing this, apply adhesive for the PVC pipe at the connection point.

1-11. HOW TO PROCESS TUBING

The liquid tubing side is connected by a flare nut, and the gas tubing side is connected by brazing.

1. Connecting the Refrigerant Tubing

Use of the Flaring Method

Many of conventional split system air conditioners employ the flaring method to connect refrigerant tubes that run between indoor and outdoor units.

In this method, the copper tubes are flared at each end and connected with flare nuts.

Flaring Procedure with a Flare Tool

- (1) Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 30 – 50 cm longer than the tubing length you estimate.
- (2) Remove burrs at each end of the copper tubing with a tube reamer or file. This process is important and should be done carefully to make a good flare. Be sure to keep any contaminants (moisture, dirt, metal filings, etc.) from entering the tubing. (Figs. 1-26 and 1-27)

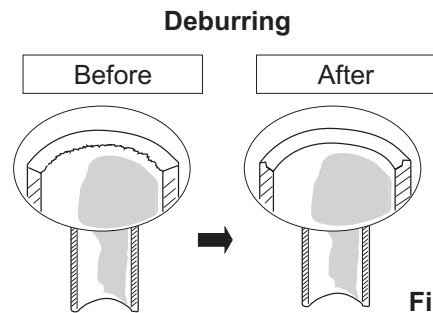


Fig. 1-26

NOTE

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube. (Fig. 1-27)

- (3) Remove the flare nut from the unit and be sure to mount it on the copper tube.

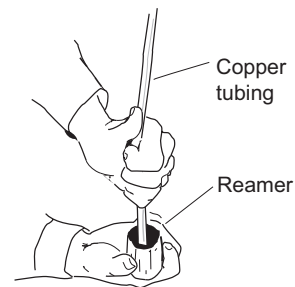


Fig. 1-27

- (4) Make a flare at the end of the copper tube with a flare tool. (Fig. 1-28)

NOTE

A good flare should have the following characteristics:

- inside surface is glossy and smooth
- edge is smooth
- tapered sides are of uniform length

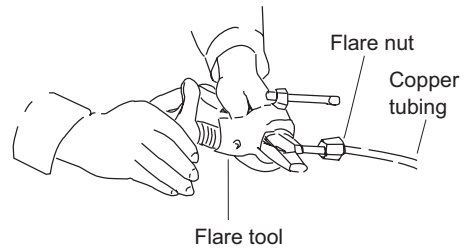
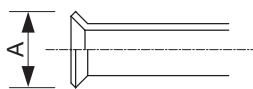


Fig. 1-28

Flare size: A (mm)



Copper tubing (Outer dia.)	A $\begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$
ø6.35	9.1
ø9.52	13.2
ø12.7	16.6
ø15.88	19.7
ø19.05	24.0

Caution Before Connecting Tubes Tightly

- (1) Apply a sealing cap or water-proof tape to prevent dust or water from entering the tubes before they are used.
 - (2) Be sure to apply refrigerant lubricant (ether oil) to the inside of the flare nut before making piping connections. This is effective for reducing gas leaks. (Fig. 1-29)
 - (3) For proper connection, align the union tube and flare tube straight with each other, then screw on the flare nut lightly at first to obtain a smooth match. (Fig. 1-30)
- Adjust the shape of the liquid tube using a tube bender at the installation site and connect it to the liquid tubing side valve using a flare.

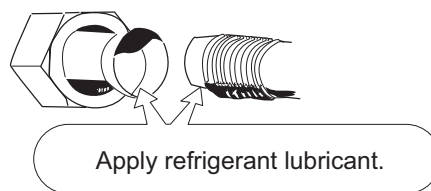


Fig. 1-29

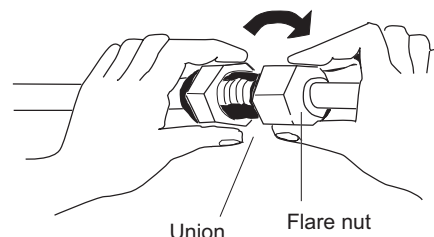


Fig. 1-30

Cautions During Brazing

- Replace air inside the tube with nitrogen gas to prevent copper oxide film from forming during the brazing process. (Oxygen, carbon dioxide and Freon are not acceptable.)
- Do not allow the tubing to get too hot during brazing. The nitrogen gas inside the tubing may overheat, causing refrigerant system valves to become damaged. Therefore allow the tubing to cool when brazing.
- Use a reducing valve for the nitrogen cylinder.
- Do not use agents intended to prevent the formation of oxide film. These agents adversely affect the refrigerant and refrigerant oil, and may cause damage or malfunctions.

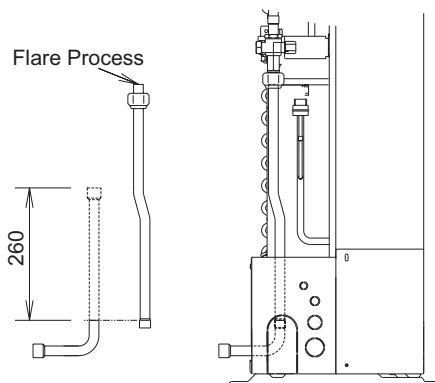
2. Connecting Tubing Between Indoor and Outdoor Units

(1) Preparing the Tubing.

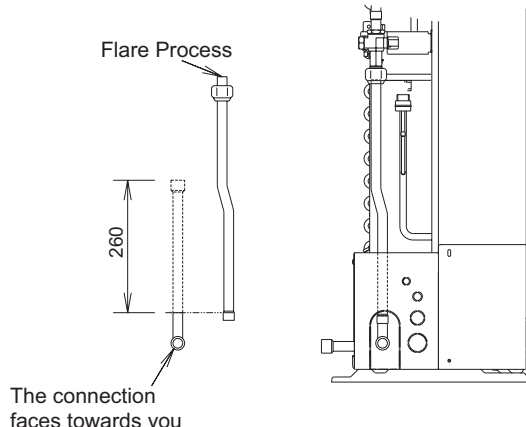
- The tubing of the gas main has a diameter of $\varnothing 25.4$, but the connection to the service valve of the outdoor unit has a diameter of $\varnothing 19.05$, so a flare has to be used. Consequently, be sure to use the enclosed joint tube and reducing joint tube in making connections (brazed).
- Align the joint tube in the direction the tubing comes out and refer to the following references “Examples of Making Tube Connections” 1 to 4 in cutting it to the required length and then braze it.
- To protect the wiring and parts inside the unit, perform the brazing outside the unit. Also, take note that each of the joint tubes in 1 to 3 have to be installed in a specific direction, so make sure they are as depicted in the figure when you braze them.

Examples of Making Tube Connections

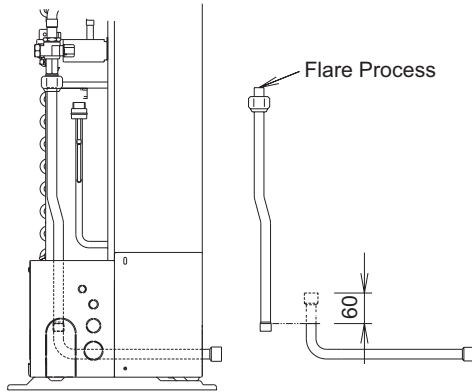
1. Out Front



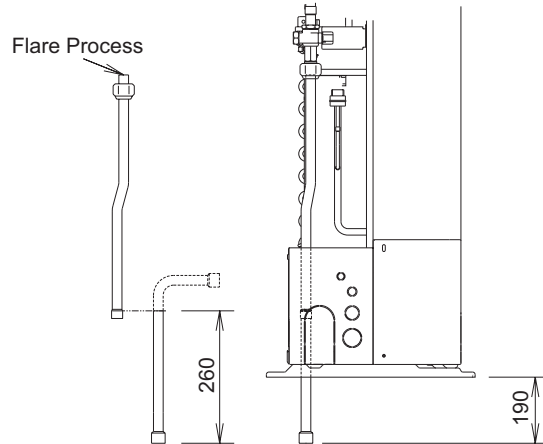
2. Out Right



3. Out Rear



4. Out Bottom



- The $\varnothing 25.4$ gas main will not pass easily into the opening for coolant pipes in the pipe cover, so make sure you connect the $\varnothing 25.4$ pipe with the $\varnothing 19.05$ pipe outside of the outdoor unit.

- (2) Tightly connect the indoor-side refrigerant tubing extended from the wall with the outdoor-side tubing.
- (3) To fasten the flare nuts, apply specified torque.

- When removing the flare nuts from the tubing connections, or when tightening them after connecting the tubing, be sure to use 2 monkey wrenches or spanners. (Fig. 1-31) If the flare nuts are over-tightened, the flare may be damaged, which could result in refrigerant leakage and cause injury or asphyxiation to room occupants.
- When removing or tightening the gas tube flare nut, use 2 adjustable wrenches together: one at the gas tube flare nut, and the other at part A. (Fig. 1-32)
- For the flare nuts at tubing connections, be sure to use the flare nuts that were supplied with the unit, or else flare nuts for R410A (type 2). The refrigerant tubing that is used must be of the correct wall thickness as shown in the table below.

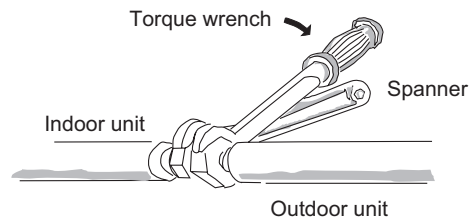


Fig. 1-31

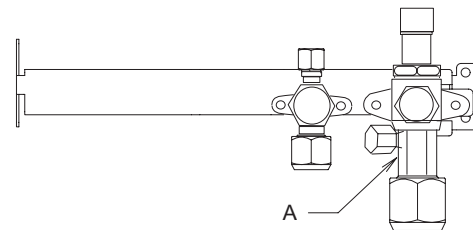


Fig. 1-32

Tube diameter	Tightening torque (approximate)	Tube thickness
$\varnothing 6.35$ (1/4")	14 – 18 N · m (140 – 180 kgf · cm)	0.8 mm
$\varnothing 9.52$ (3/8")	34 – 42 N · m (340 – 420 kgf · cm)	0.8 mm
$\varnothing 12.7$ (1/2")	49 – 55 N · m (490 – 550 kgf · cm)	0.8 mm
$\varnothing 15.88$ (5/8")	68 – 82 N · m (680 – 820 kgf · cm)	1.0 mm
$\varnothing 19.05$ (3/4")	100 – 120 N · m (1000 – 1200 kgf · cm)	1.2 mm

Because the pressure is approximately 1.6 times higher than conventional refrigerant pressure, the use of ordinary flare nuts (type 1) or thin-walled tubes may result in tube rupture, injury, or asphyxiation caused by refrigerant leakage.

- In order to prevent damage to the flare caused by over-tightening of the flare nuts, use the table above as a guide when tightening.
- When tightening the flare nut on the liquid tube, use an adjustable wrench with a nominal handle length of 200 mm.
- Do not use a spanner to tighten the valve stem caps. Doing so may damage the valves.
- Depending on the installation conditions, applying excessive torque may cause the nuts to crack.

Precautions for Packed Valve Operation

- If the packed valve is left for a long time with the valve stem cap removed, refrigerant will leak from the valve. Therefore, do not leave the valve stem cap removed. (Fig. 1-33)
- Use a torque wrench to securely tighten the valve stem cap.
- Valve stem cap tightening torque:

Charging port	8 – 10 N • m (80 – 100 kgf • cm)	
Valve stem cap	ø9.52	19 – 21 N • m (190 – 210 kgf • cm)
	ø12.7	25 – 30 N • m (250 – 300 kgf • cm)
	ø19.05	13 – 14 N • m (130 – 140 kgf • cm)

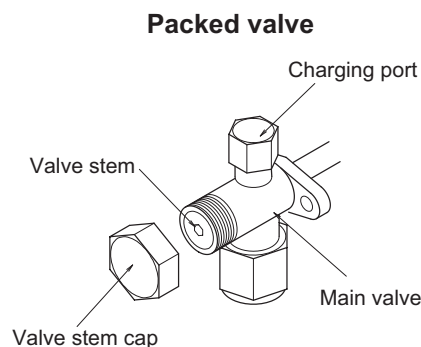


Fig. 1-33

3. Insulating the Refrigerant Tubing

Tubing Insulation

- Thermal insulation must be applied to all units tubing, including distribution joint (purchased separately).
- * For gas tubing, the insulation material must be heat resistant to 120°C or above. For other tubing, it must be heat resistant to 80°C or above.

Insulation material thickness must be 10 mm or greater. If the conditions inside the ceiling exceed DB 30°C and RH 70%, increase the thickness of the gas tubing insulation material by 1 step.

Two tubes arranged together

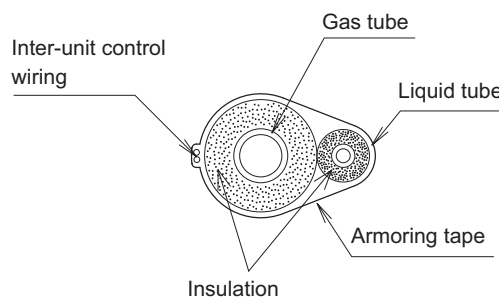


Fig. 1-34



CAUTION

If the exterior of the outdoor unit valves has been finished with a square duct covering, make sure you allow sufficient space to access the valves and to allow the panels to be attached and removed.

Taping the flare nuts

Wind the white insulation tape around the flare nuts at the gas tube connections. Then cover up the tubing connections with the flare insulator, and fill the gap at the union with the supplied black insulation tape. Finally, fasten the insulator at both ends with the supplied vinyl clamps. (Fig. 1-35)

Insulation material

The material used for insulation must have good insulation characteristics, be easy to use, be age resistant, and must not easily absorb moisture.

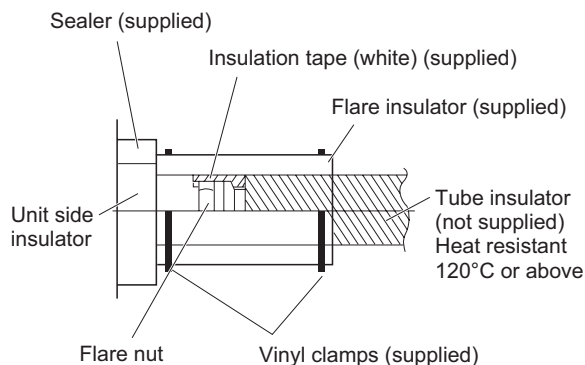


Fig. 1-35



CAUTION

After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack. Never grasp the drain or refrigerant connecting outlets when moving the unit.

4. Taping the Tubes

- (1) At this time, the refrigerant tubes (and electrical wiring if local codes permit) should be taped together with armoring tape in 1 bundle. To prevent condensation from overflowing the drain pan, keep the drain hose separate from the refrigerant tubing.
- (2) Wrap the armoring tape from the bottom of the outdoor unit to the top of the tubing where it enters the wall. As you wrap the tubing, overlap half of each previous tape turn.
- (3) Clamp the tubing bundle to the wall, using 1 clamp approx. each meter. (Fig. 1-36)

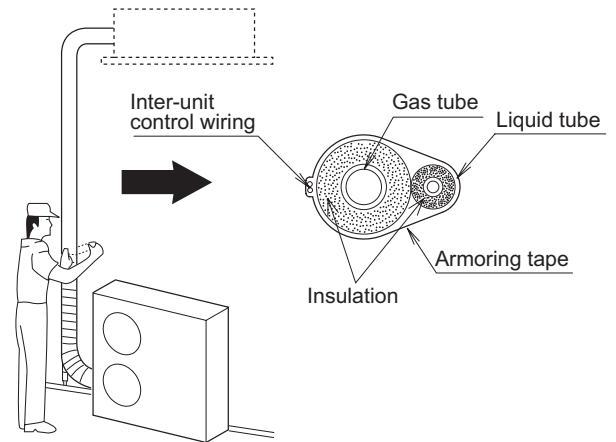


Fig.1-36

NOTE

Do not wind the armoring tape too tightly since this will decrease the heat insulation effect. Also ensure that the condensation drain hose splits away from the bundle and drips clear of the unit and the tubing.

5. Finishing the Installation

After finishing insulating and taping over the tubing, use sealing putty to seal off the hole in the wall to prevent rain and draft from entering. (Fig. 1-37)

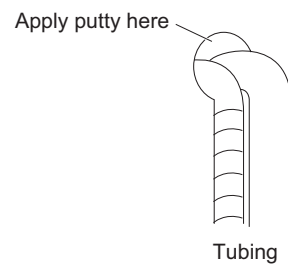


Fig.1-37

1-12. LEAK TEST, EVACUATION AND ADDITIONAL REFRIGERANT CHARGE

Perform an air-tightness test for this package A/C. Check that there is no leakage from any of the connections.

Air and moisture in the refrigerant system may have undesirable effects as indicated below.

- pressure in the system rises
- operating current rises
- cooling (or heating) efficiency drops
- moisture in the refrigerant circuit may freeze and block capillary tubing
- water may lead to corrosion of parts in the refrigerant system

Therefore, the indoor unit and tubing between the indoor and outdoor unit must be leak tested and evacuated to remove any noncondensables and moisture from the system. (Figs. 1-38 and 1-39)

Manifold gauge

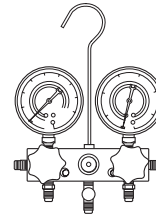


Fig. 1-38

Vacuum pump

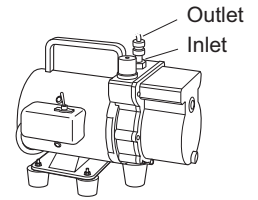


Fig. 1-39

■ Air Purging with a Vacuum Pump (for Test Run) Preparation

Check that each tube (both liquid and gas tubes) between the indoor and outdoor units has been properly connected and all wiring for the test run has been completed. Remove the valve caps from both the gas and liquid service valves on the outdoor unit. Note that both liquid and gas tube service valves on the outdoor unit are kept closed at this stage. (Fig. 1-40)

- The refrigerant charge at the time of shipment is only guaranteed sufficient for a tubing length of up to 30 m. The tubing may exceed this length, up to the maximum permitted length; however, an additional charge is necessary for the amount that the tubing exceeds 30 m. (No additional refrigerating machine oil is needed.)

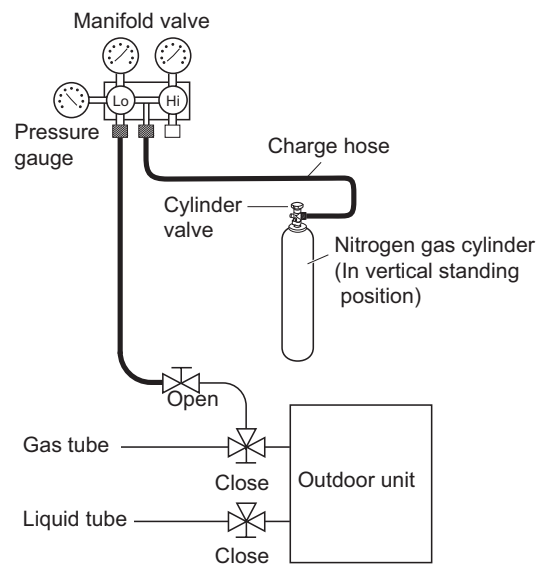


Fig. 1-40

1. Leak Test

- (1) With the service valves on the outdoor unit closed, remove the 7.94 mm flare nut and its bonnet on the gas tube service valve. (Save for reuse.)
- (2) Attach a manifold valve (with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.



CAUTION

Use a manifold valve for air purging. If it is not available, use a stop valve for this purpose. The “Hi” knob of the manifold valve must always be kept closed.

- (3) Pressurize the system up to 4.15 MPa (42 kgf/cm²G) with dry nitrogen gas and close the cylinder valve when the gauge reading reaches 4.15 MPa (42 kgf/cm²G). Then, test for leaks with liquid soap.



CAUTION

To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than the bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

- (4) Do a leak test of all joints of the tubing (both indoor and outdoor) and both gas and liquid service valves. Bubbles indicate a leak. Wipe off the soap with a clean cloth after a leak test.
- (5) After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.

2. Evacuation

Be sure to use a vacuum pump that includes a function for prevention of back-flow, in order to prevent back-flow of pump oil into the unit tubing when the pump is stopped.

- Perform vacuuming of the indoor unit and tubing.

Connect the vacuum pump to the gas tube valve and apply vacuum at a pressure of -101kPa (-755 mmHg , 5 Torr) or below.

Continue vacuum application for a minimum of 1 hour after the pressure reaches -101kPa (-755 mmHg , 5 Torr).
- (1) Attach the charge hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit. Confirm that the “Lo” knob of the manifold valve is open. Then, run the vacuum pump.
- (2) When the desired vacuum is reached, close the “Lo” knob of the manifold valve and turn off the vacuum pump. Confirm that the gauge pressure is under -101 kPa (-755 mmHg , 5 Torr) after 4 to 5 minutes of vacuum pump operation. (Fig. 1-41)

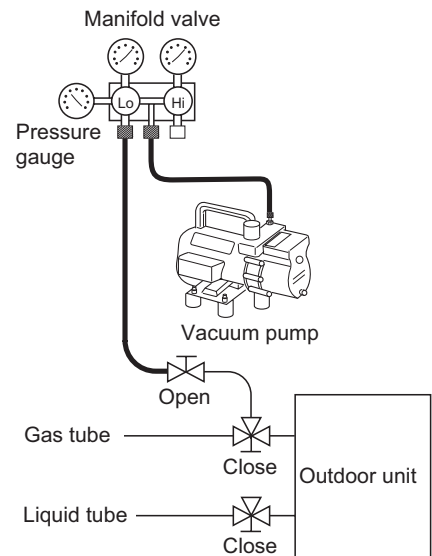


Fig. 1-41



CAUTION

Use a cylinder specifically designed for use with R410A.

3. Charging Additional Refrigerant

- Charging additional refrigerant (calculated from the liquid tube length as shown in “Amount of additional refrigerant charge”) using the liquid tube service valve. (Fig. 1-42)
 - Use a balance to measure the refrigerant accurately.
 - If the additional refrigerant charge amount cannot be charged at once, charge the remaining refrigerant in liquid form by using the gas tube service valve with the system in Cooling mode at the time of test run. (Fig. 1-43)
- * If an additional refrigerant charge has been performed, list the refrigerant tubing length and amount of additional refrigerant charge on the product label (inside the panel).

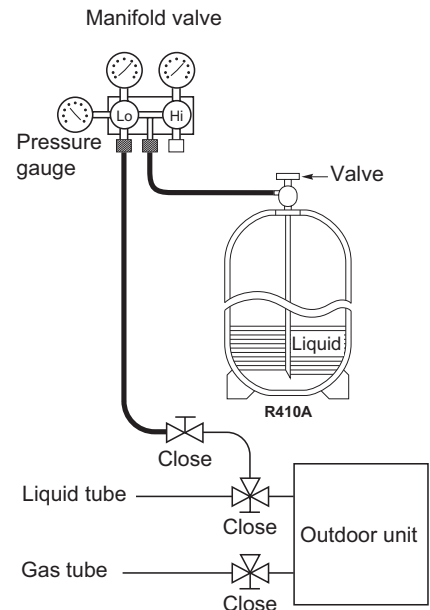


Fig. 1-42

4. Finishing the Job

- (1) With a hex wrench, turn the liquid tube service valve stem counterclockwise to fully open the valve.
- (2) Turn the gas tube service valve stem counterclockwise to fully open the valve.



CAUTION

To avoid gas from leaking when removing the charge hose, make sure the stem of the gas tube is turned all the way out (“BACK SEAT”) position.

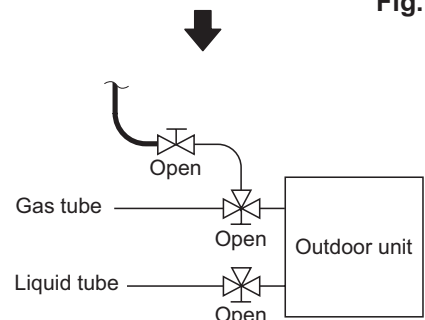


Fig. 1-43

- (3) Loosen the charge hose connected to the gas tube service port (7.94 mm) slightly to release the pressure, and then remove the hose.
- (4) Replace the 7.94 mm flare nut and its bonnet on the gas tube service port and fasten the flare nut securely with an adjustable wrench or box wrench.

This process is very important to prevent gas from leaking from the system.
- (5) Replace the valve caps at both gas and liquid service valves and fasten them securely.

2. TEST RUN

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2-1. Preparing for Test Run

● **Before attempting to start the air conditioner, check the following:**

- (1) All loose matter is removed from the cabinet especially steel filings, bits of wire, and clips.
- (2) The control wiring is correctly connected and all electrical connections are tight.
- (3) The protective spacers for the compressor used for transportation have been removed. If not, remove them now.
- (4) The transportation pads for the indoor fan have been removed. If not, remove them now.
- (5) The power has been supplied to the unit for at least 5 hours before starting the compressor. The bottom of the compressor should be warm to the touch and the crankcase heater around the feet of the compressor should be hot to the touch. (Fig. 2-1)
- (6) Both the gas and liquid tube service valves are open. If not, open them now. (Fig. 2-2)
- (7) Request that the customer be present for the test run. Explain the contents of the instruction manual, and then have the customer actually operate the system.
- (8) Be sure to give the instruction manual and warranty certificate to the customer.
- (9) When replacing the control PCB, be sure to make all the same settings on the new PCB as were in use before replacement. The existing EEPROM is not changed, and is connected to the new control PCB.

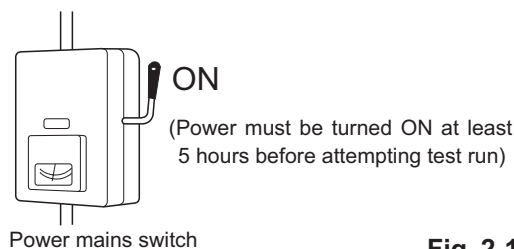


Fig. 2-1

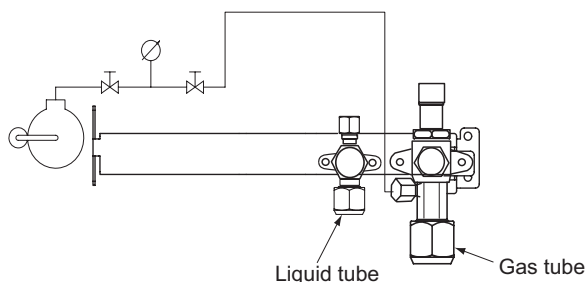


Fig. 2-2

■ E1 Type

2-2. Caution

- **This unit may be used in a single-type refrigerant system where 1 outdoor unit is connected to 1 indoor unit.**
- **The indoor and outdoor unit control PCB utilizes a semiconductor memory element (EEPROM). The settings required for operation were made at the time of shipment. Only the correct combinations of indoor and outdoor units can be used.**
- **This test run section describes primarily the procedure when using the wired remote controller.**

2-3. Test Run Procedure

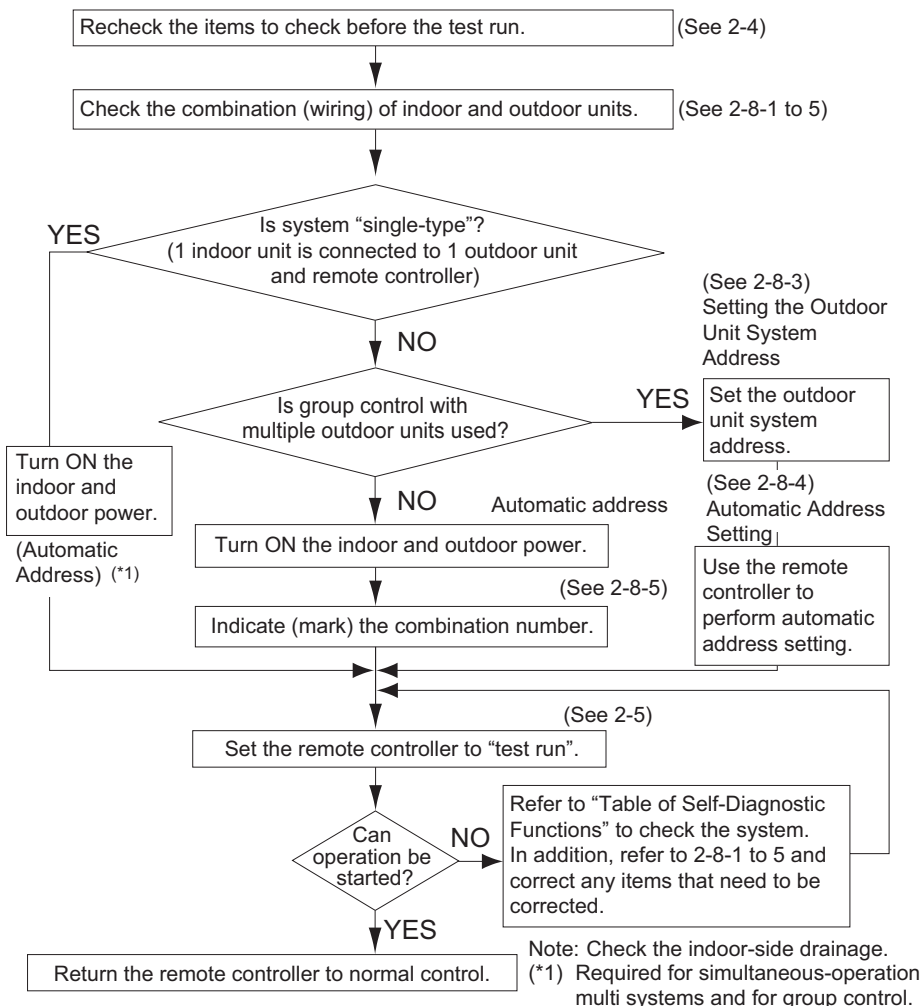




Fig. 2-3


2-4. Items to Check Before the Test Run

- (1) Turn the remote power switch ON at least 12 hours in advance in order to energize the crankcase heater.
- (2) Fully open the closed valves on the liquid-tube and gas-tube sides.

2-5. Test Run Using the Remote Controller

- (1) Press and hold the remote controller  button for 4 seconds or longer. Then press the  button.
 - “TEST” appears in the LCD display during the test run.
 - Temperature control is not possible when test run mode is engaged. (This mode places a large load on the devices. Use it only when performing the test run.)
- (2) Use either Heating or Cooling mode to perform the test run.

NOTE The outdoor unit will not operate for approximately 3 minutes after the power is turned ON or after it stops operating.

- (3) If normal operation is not possible, a code appears on the remote controller LCD display. Refer to “2-7. Table of Self-Diagnostic Functions and Corrections”, and correct the problem.
- (4) After the test run is completed, press the  button again. Check that “TEST” disappears from the LCD display. (This remote controller includes a function that cancels test run mode after a 60-minute timer has elapsed, in order to prevent continuous test run operation.)
- (5) For the test run of an inverter outdoor unit, operate the compressors for a minimum of 10 minutes (in order to check for open phase).
 - * When performing a test run using a wired remote controller, operation is possible without attaching the cassette-type ceiling panel. (“P09” will not be displayed.)

2-6. Precautions

- Request that the customer be present when the test run is performed. At this time, explain the operation manual and have the customer perform the actual steps.
- Be sure to pass the manuals and warranty certificate to the customer.
- Check that the 220 – 240 V AC power is not connected to the inter-unit control wiring connector terminal.
- * If 220 – 240 V AC is accidentally applied, the indoor or outdoor unit control PCB fuse will blow in order to protect the PCB. Correct the wiring connections, then disconnect the 2P connectors that are connected to the PCB, and replace them with 2P connectors. If operation is still not possible after changing the brown connectors, try cutting the varistor. (Be sure to turn the power OFF before performing this work.)

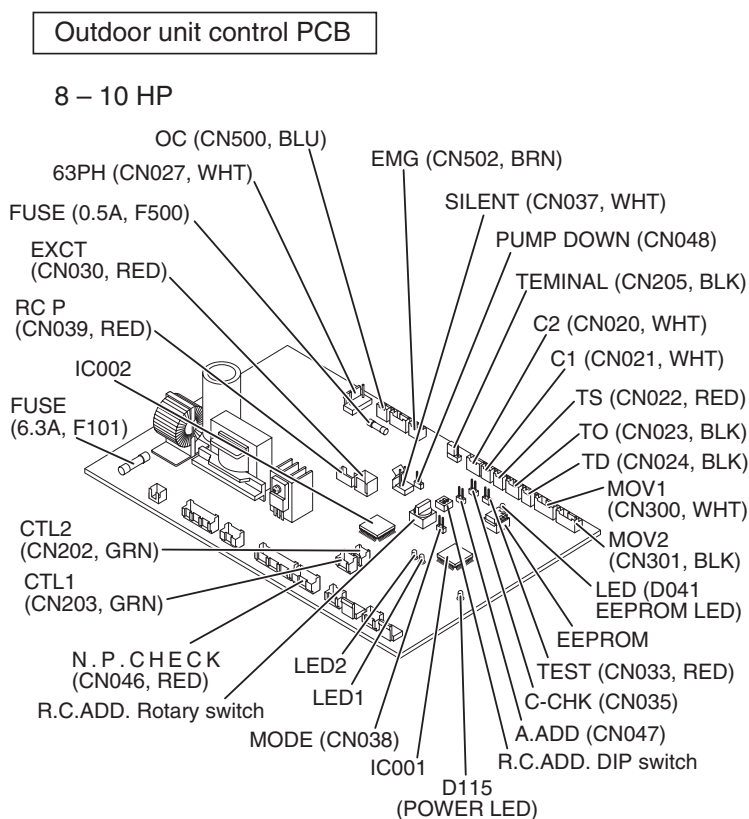


Fig. 2-4

2-7. Table of Self-Diagnostic Functions and Corrections (E1 Type)

Wired remote controller display	Indoor unit receiver lamp	Cause				Simultaneous-operation multi system (flexible combination)	Control by main-sub remote controllers	Correction
		1:1 connection (single type)	Group connection					
Nothing is displayed	Nothing is displayed	<ul style="list-style-type: none"> Remote controller is not connected correctly. Indoor unit power is not ON. 	<ul style="list-style-type: none"> Remote controller is not connected with indoor unit correctly Indoor unit power is not ON. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Connect the remote controller correctly. Turn ON the indoor unit power. 	
E01 displayed		<ul style="list-style-type: none"> Automatic address setting has not been completed. Inter-unit control wiring is cut or is not connected correctly. Remote controller is not connected correctly (remote controller receiving failure). 	<ul style="list-style-type: none"> Automatic address setting has not been completed. Inter-unit control wiring is cut or is not connected correctly. Remote controller is not connected with indoor unit correctly. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check the remote controller and inter-unit control wiring. Perform automatic address setting(See 2-8-4). 	
E02 displayed	Operating lamp is blinking.	<ul style="list-style-type: none"> Remote controller is not connected correctly (failure in transmission from remote controller to indoor unit). 	<ul style="list-style-type: none"> Remote controller is not connected with indoor unit correctly. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Connect the remote controller correctly. 	
E09 displayed						<ul style="list-style-type: none"> 2 remote controllers are set as the main remote controller. 	<ul style="list-style-type: none"> Refer to 2-8-5 Main-sub remote Control, and make the correct settings. 	
E14 displayed				<ul style="list-style-type: none"> Remote controller communication wiring is cut or is not connected correctly. 	<ul style="list-style-type: none"> Remote controller communication wiring is cut or is not connected correctly. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check the remote controller communication wiring. Perform automatic address setting again. 	
E04 displayed		<ul style="list-style-type: none"> Indoor-outdoor inter-unit wiring is not connected correctly. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Connect the wiring correctly. 	
E06 displayed				<ul style="list-style-type: none"> Indoor-outdoor inter-unit wiring is cut or is not connected correctly. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Refer to 2-8 System Control, and make the correct settings. 	
E15 displayed	Standby lamp is blinking.	<ul style="list-style-type: none"> Indoor unit capacity is too low. 	<ul style="list-style-type: none"> Indoor-outdoor inter-unit wiring is cut or is not connected correctly. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check that the total capacities of the indoor and outdoor units are appropriate. 	
E16 displayed		<ul style="list-style-type: none"> Indoor unit capacity is too high. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check that the indoor unit power is ON, and that the inter-unit control wiring is connected correctly. 	
E20 displayed		<ul style="list-style-type: none"> No serial signal is being received at all from the indoor units. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check that the indoor unit power is ON, and that the inter-unit control wiring is connected correctly. 	
P05 displayed	Operation lamp and Standby lamp are blinking alternately.	<ul style="list-style-type: none"> Reversed phase in the outdoor unit single-phase or open phase in the outdoor unit 3-phase power. Insufficient gas 	<ul style="list-style-type: none"> Reversed phase in the outdoor unit single-phase or open phase in the 3-phase power at one of the outdoor units in the group. 	<ul style="list-style-type: none"> Reversed phase in the outdoor unit single-phase or open phase in the outdoor unit 3-phase power. CT sensor is disconnected or there is a problem with the circuit. 	<ul style="list-style-type: none"> Reversed phase in the outdoor unit single-phase or open phase in the outdoor unit 3-phase power. CT sensor is disconnected or there is a problem with the circuit. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Reverse 2 phases of the outdoor unit 3-phase power and connect them correctly. Check that the CT sensor is not disconnected, and make sure it is inserted. Fill up the gas appropriately. 	
L02 displayed	Both the Operation lamp and Standby lamp are blinking together.	<ul style="list-style-type: none"> Indoor-outdoor unit type mismatch. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check that the indoor and outdoor unit types are correct. 	
L07 displayed				<ul style="list-style-type: none"> Remote controller communication wiring is connected to the indoor unit, however it is set for individual operation. 	<ul style="list-style-type: none"> Remote controller communication wiring is connected to the indoor unit, however it is set for individual operation. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Perform automatic address setting (See 2-8). 	
P09 displayed	Timer lamp and Standby lamp are blinking alternately.	<ul style="list-style-type: none"> The indoor unit ceiling panel connector is not connected correctly. 	<ul style="list-style-type: none"> Ceiling panel connector at one of the indoor units in the group is not connected correctly. 	<ul style="list-style-type: none"> Indoor unit ceiling panel connector is not connected correctly. 	<ul style="list-style-type: none"> Indoor unit ceiling panel connector is not connected correctly. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Connect the indoor unit ceiling panel connector correctly. 	
P12 displayed		<ul style="list-style-type: none"> Indoor unit DC fan trouble. 	<ul style="list-style-type: none"> DC fan trouble at one of the indoor units in the group. 	<ul style="list-style-type: none"> Indoor unit fan trouble. 	<ul style="list-style-type: none"> Indoor unit fan trouble. 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check whether the fan holder is loose. Check the wiring between the DC fan and the PCB. 	
P15 displayed	Operation lamp and Standby lamp are blinking alternately.	<ul style="list-style-type: none"> No gas 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check the refrigerant cycle (for gas leaks). 	

2-8. System Control

System control refers to the link wiring connection for control of simultaneous-operation multi systems, group control, and main-sub remote controller control.

2-8-1. Basic wiring diagram

Single type

- Be careful to avoid miswiring when connecting the wires.

(Miswiring will damage the units.)

(for 3-phase outdoor unit)

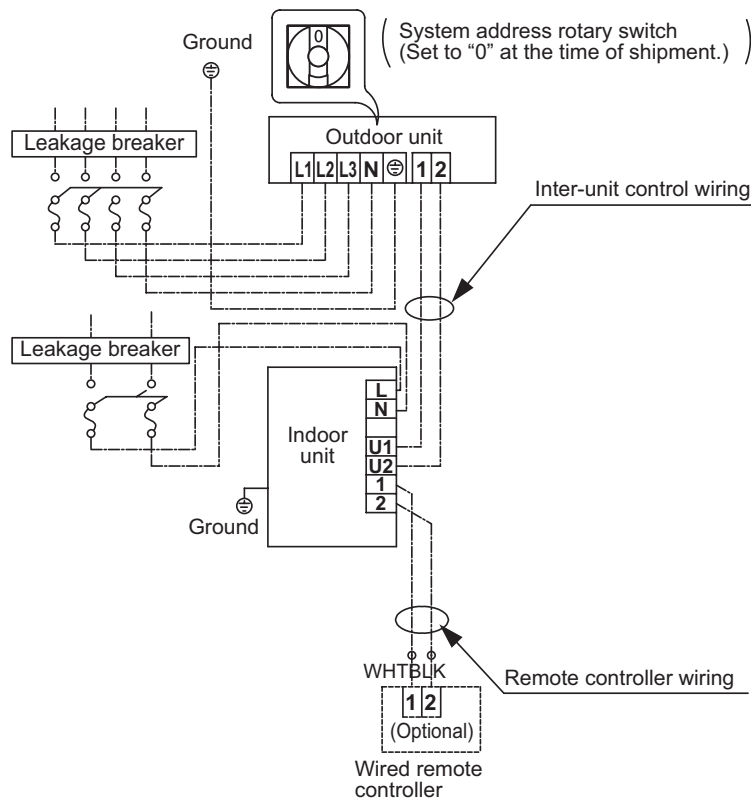


Fig. 2-5

(Wiring procedure)

- (1) Connect the remote controller to the indoor unit remote controller wiring terminal plate (1, 2). (Remote controller wiring)
- (2) Connect the indoor units (U1, U2) and the outdoor units (1, 2). Connect the other outdoor units and indoor units (with different refrigerant systems) in the same way. (Inter-unit control wiring)
Connect the remote controller communication wiring to the indoor units (U1, U2) for each refrigerant system. (Inter-unit control wiring)
- (3) Connect the remote controller communication wiring (2 wires) from the remote controller wiring terminal plate (1, 2) on the indoor unit (unit where the remote controller is connected) to the remote controller terminal plates (1, 2) on the other indoor units. (Remote controller communication wiring)
- (4) Turn ON both the indoor and outdoor unit power and perform automatic address setting from the remote controller. (For the automatic address setting procedure, refer to 2-8-4.)

NOTE

- * Models with auxiliary heaters cannot be used for communication wiring of the indoor unit power wires. (Use a pull box to divide the wiring.)
Be sure to use the indoor unit temperature sensor (body sensor) when using this control. (Status at shipment.)

2-8-2. Setting the outdoor unit system addresses

For basic wiring diagram (Set the system address: 1)

Outdoor unit control PCB 8 – 10 HP

System address rotary switch
(Set to "0" at time of shipment)

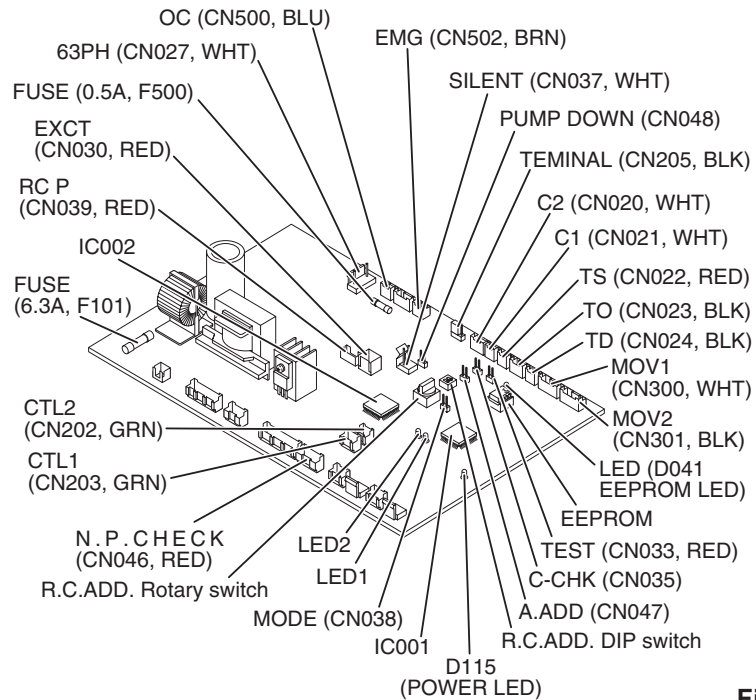
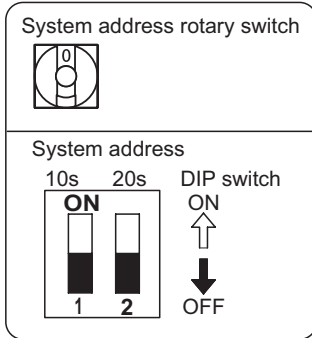


Fig. 2-6

System address No.	System address 10s digit (2P DIP switch)	System address 1s place (Rotary switch)
0 Automatic address (Setting at shipment = "0")	Both OFF ON OFF ↑ ↓	"0" setting
1 (If outdoor unit is No. 1)	Both OFF ON OFF ↑ ↓	"1" setting

2-8-3. Automatic address setting using the remote controller

When the outdoor unit shown in "2-8-1. Basic wiring diagram" is used for group control of multiple units, use the remote controller to perform automatic address setting.

(During automatic address setting, "SETTING" blinks on the remote controller display.)

- Press the remote controller timer time button and button simultaneously. (Hold for 4 seconds or longer.) Then press the button. (Item code "AA" appears: All systems automatic address setting.) (Automatic address setting is performed in sequence for all outdoor units from No. 1 to No. 30. When automatic address setting is completed, the units return to normal stopped status.)
- To select each refrigerant system individually and perform automatic address setting, press the remote controller timer time button and button simultaneously. (Hold for 4 seconds or longer.) Then press either of the temperature setting / buttons. (Item code "A1" appears: Individual system automatic address setting) Use either the or button to select the outdoor unit to perform automatic address setting for. (R.C.1 is displayed.) Then press the button. (Automatic address setting is performed for refrigerant system 1.) When automatic address setting for system 1 is completed, the system returns to normal stopped status. Again press the remote controller timer time button and the button simultaneously. Then in the same way as above (use the button to display "R.C.2"), select the next system and perform automatic address setting.

2-8-4. Indicating (marking) the indoor and outdoor unit combination number

Indicate (mark) the number after automatic address setting is completed.

- So that the combination of each indoor unit can be easily checked when multiple units are installed, ensure that the indoor and outdoor unit numbers correspond to the system address number on the outdoor unit control PCB, and use a magic marker or similar means which cannot be easily erased to indicate the numbers in an easily visible location on the indoor units (near the indoor unit nameplates).

Example: (Outdoor) 1 - (Indoor) 1
(Outdoor) 2 - (Indoor) 1

- These numbers will be needed for maintenance. Be sure to indicate them.

* Use the remote controller to check the addresses of the indoor units. Press and hold the button and button for 4 seconds or longer (simple settings mode).

Then press the **UNIT** button and select the indoor address. (Each time the button is pressed, the address changes as follows: 1-1, 1-2, ... 2-1, 2-2,) The indoor unit fan operates only at the selected indoor unit.

Confirm that correct fan is operating, and indicate the address on the indoor unit.

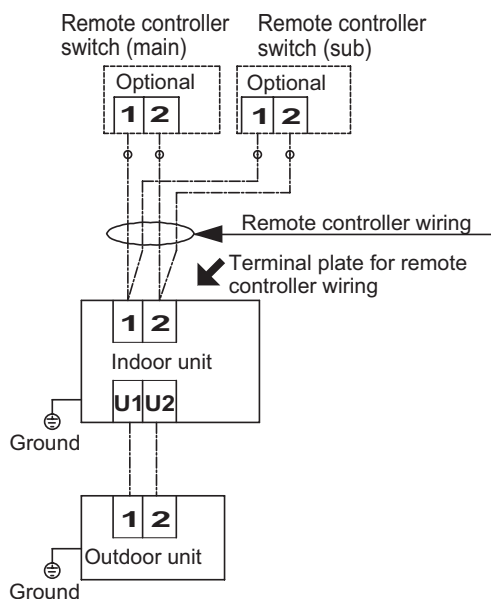
Press the button again to return to the normal remote controller mode.

For details, refer to the separate manual.

2-8-5. Main-sub remote controller control

Control using 2 remote controller switches Main-sub remote controller control refers to the use of 2 remote controllers to control 1 or multiple indoor units. (A maximum of 2 remote controllers can be connected.)

● Connecting 2 remote controllers to control 1 indoor unit



● Remote controller setting mode

To set the remote controller main/sub setting or change the sensor, follow the steps below.

- Press both and buttons on the remote controller for more than 4 seconds together.
- Select CODE No. with / () buttons.
- Change DATA with / (TIMER) buttons.
- Press . Finally, press .

DATA is memorized in the RCU. (DATA setting will not be changed even when the power is turned off.) Make sure to set [Normal] for RCU. CK.

CODE ITEM	ITEM	DATA	
		00 00	00 0 1
01	RCU. Main/Sub	Sub	Main
02	Clock display	24 hours	12 hours (AM/PM)
08	RCU. CK	RCU. CK	Normal
0A	Room temperature sensor	Main unit	RCU

2-9. Test Run Procedure

2

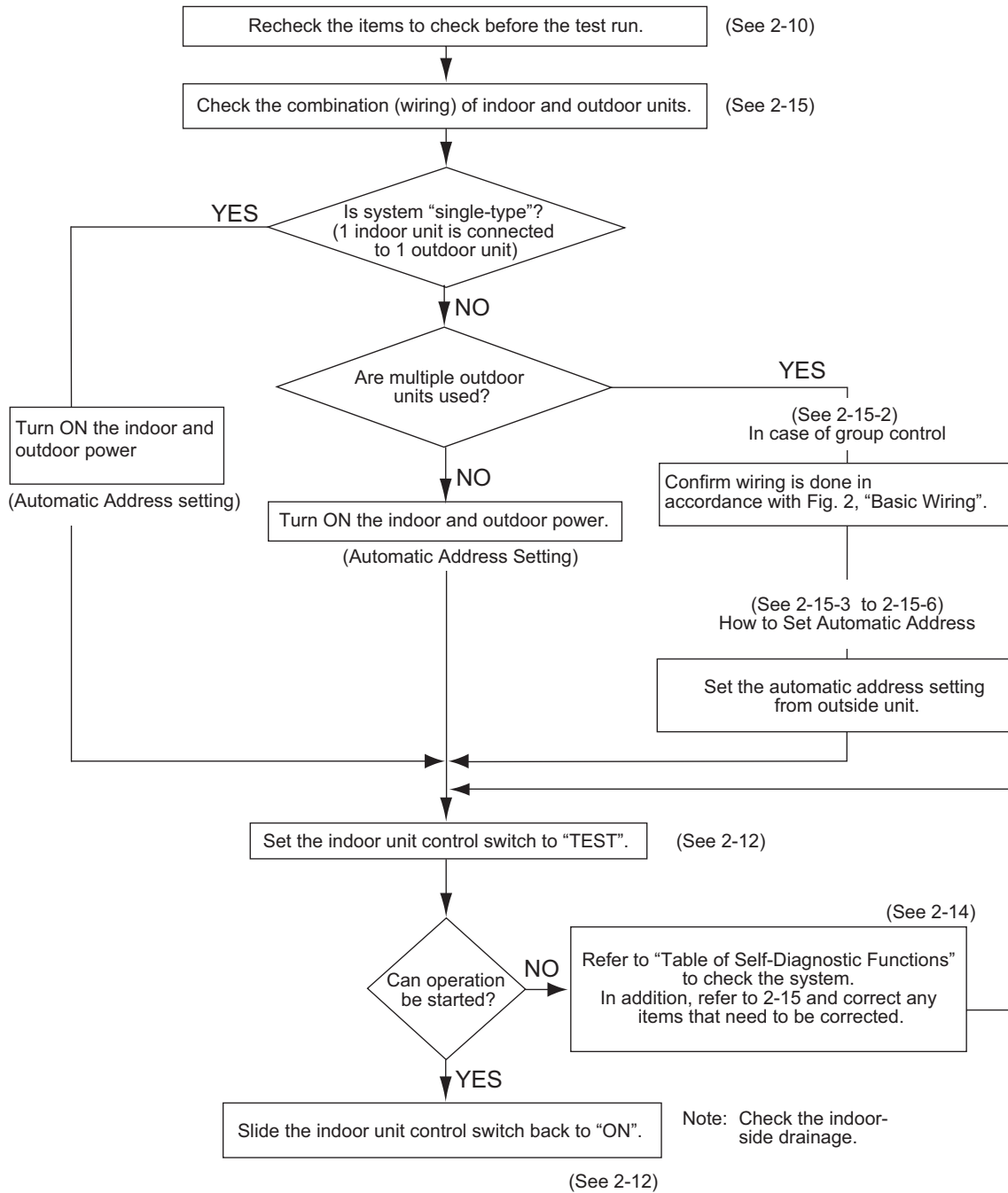




Fig. 2-7

2-10. Items to Check Before the Test Run

- (1) Turn the remote power switch ON at least 12 hours in advance in order to energize the crankcase heater.
- (2) Fully open the closed valves on the liquid-tube and gas-tube sides.

2-11. Preparation for Test Run

2-11-1. Switching the temperature sensor

- Temperature sensors are contained in the indoor unit and wireless remote controller. One or the other of the temperature sensors is used for operation.
- If  (body sensor) appears on the LCD display of the wireless remote controller, then the indoor unit body sensor is used for operation.
To switch to the remote controller sensor, open the remote controller cover and press the SENSOR button once. The  (body sensor) display disappears and the remote control sensor is used for operation.

NOTE

- Even if the remote controller sensor is selected, the sensor will be automatically switched to the indoor unit body sensor if no temperature signal has been received from the remote controller for 10 minutes. Install the remote controller in a position where the signal can be reliably received by the unit.
- When group control is engaged, be sure to use the body sensor.

2-11-2. Using the remote controller

- Face the remote controller toward the receiver (on the main unit). (Fig. 2-8)
- The signal can be received up to a distance of approximately 8 m.
Use this distance as a guide.
This distance may vary somewhat depending on the battery capacity and other factors.
- Be sure that there are no objects between the remote controller and the receiver which may block the signal.
- The unit beeps when a signal is received correctly. (For operation start only, the unit beeps twice.)
- Do not drop, throw, or wash the remote controller.
- Do not place the remote controller in locations exposed to direct sunlight or nearby a stove.

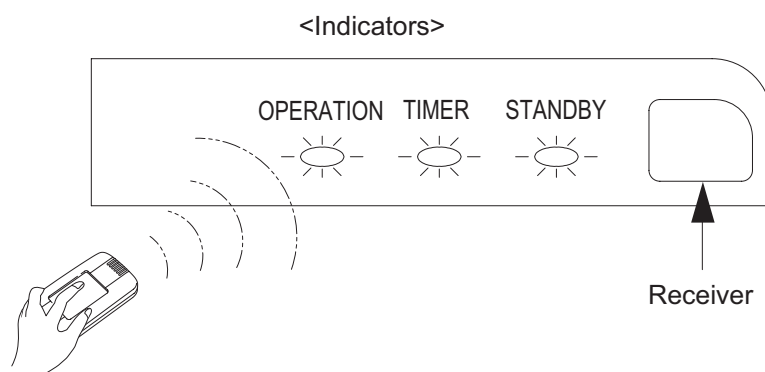


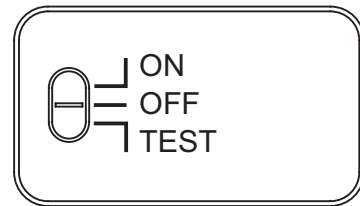
Fig. 2-8

2-12. Test Run

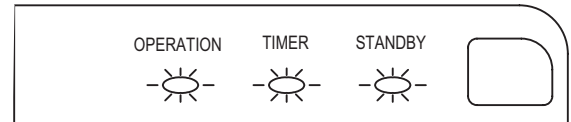
Using the control unit

- (1) Change the indoor control unit switch from "ON" → "TEST".
(The outdoor unit will not operate for 3 minutes after the power is turned ON and after operation is stopped.)
- (2) All the indicator lamps blink while the test run is in progress.
- (3) Temperature control is not possible during the test run.
- (4) If correct operation is not possible, the trouble will be indicated by the indicator lamps. Refer to "Table of Self Diagnostic Functions and Corrections" and correct the problem.
- (5) After the test is completed, change the control unit switch from "TEST" → "ON". Confirm that the indicator lamps have stopped blinking. (A function is included which cancels the test run after a 60-minute timer has elapsed, in order to prevent continuous test run operation.)

Indoor control unit switch



Indicator lamps



NOTE

- This mode places a large load on the devices. Use it only for performing test runs.
- A test run is not possible if the power is turned ON with the switch in the TEST position. After the power has been turned ON, change the switch once to ON or OFF, then switch it back to the TEST position.

2-13. Precautions

- Request that the customer be present when the test run is performed. At this time, explain the operation manual and have the customer perform the actual steps. Be sure to pass the manuals and warranty certificate to the customer.

- Check that the 220 – 240 V AC wiring is not connected to the inter-unit control wiring connector terminal.

* If 220 – 240 V AC is accidentally applied, the indoor or outdoor unit control PCB fuse (0.5 A for both indoor and outdoor units) will blow in order to protect the PCB. Correct the wiring connections, then disconnect the 2P connectors (indoor: blue) (outdoor: blue, serial 1) that are connected to the PCB, and replace them with 2P connectors (indoor: brown) (outdoor: brown, serial 2).

If operation is still not possible after changing the brown connectors, try cutting the varistor (black) (both indoor and outdoor). (Be sure to turn the power OFF before performing this work.) (Fig. 2-9)

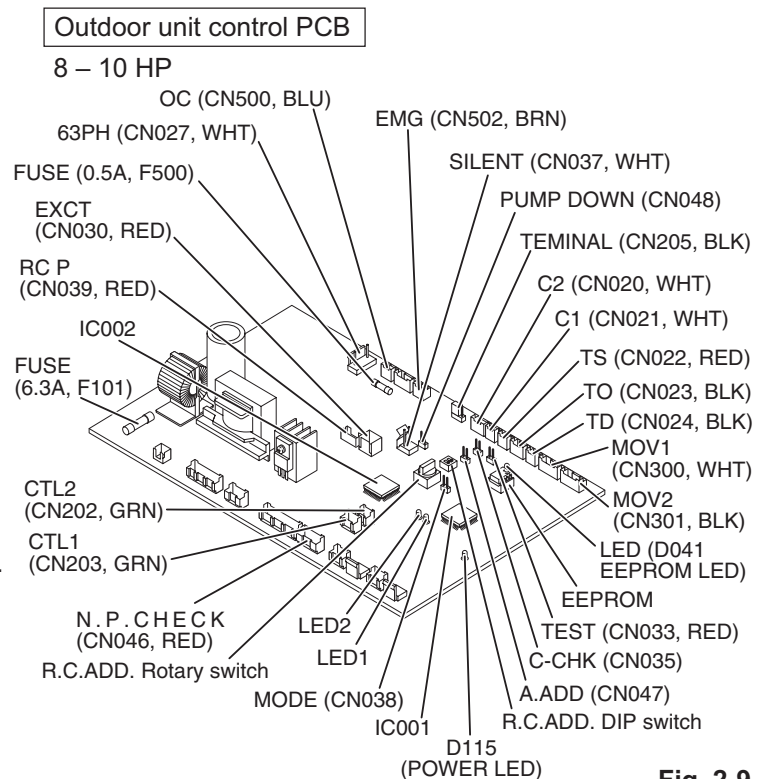


Fig. 2-9

2-14. Table of Self-Diagnostic Functions and Corrections

Wired remote controller display (Field supply)	Indoor unit receiver lamp	Cause		Correction
		1:1 connection (Single type)	Group connection (Simultaneous multi system)	
Nothing is displayed	Nothing is displayed	<ul style="list-style-type: none"> Indoor operation switch is OFF. Indoor unit power is not ON. 	<ul style="list-style-type: none"> Same at left. 	<ul style="list-style-type: none"> Set the indoor operation switch ON. Turn ON the indoor unit power.
E01 displayed	Operating lamp is blinking.	<ul style="list-style-type: none"> Automatic address setting has not been completed. Inter-unit control wiring is cut or is not connected correctly. 	<ul style="list-style-type: none"> Same at left. 	<ul style="list-style-type: none"> Check the inter-unit control wiring. Perform automatic address setting (See 2-15).
E14 displayed		<ul style="list-style-type: none"> Remote controller communication wiring is cut or is not connected correctly. 	<ul style="list-style-type: none"> Check the remote controller communication wiring. Perform automatic address setting again. 	
E04 displayed	Standby lamp is blinking.	<ul style="list-style-type: none"> Indoor-outdoor inter-unit wiring is not connected correctly. 	<ul style="list-style-type: none"> Same at left. 	<ul style="list-style-type: none"> Connect the wiring correctly.
E06 displayed		<ul style="list-style-type: none"> Inter-unit control wiring is cut or is not connected correctly. 	<ul style="list-style-type: none"> Refer to 2-15 System Control, and make the correct settings. 	
E15 displayed		<ul style="list-style-type: none"> Indoor unit capacity is too low. 	<ul style="list-style-type: none"> Same at left. 	<ul style="list-style-type: none"> Check that the total capacities of the indoor and outdoor units are appropriate.
E16 displayed		<ul style="list-style-type: none"> Indoor unit capacity is too high. 	<ul style="list-style-type: none"> Same at left. 	<ul style="list-style-type: none"> Reverse 2 phases of the outdoor unit 3-phase power and connect them correctly.
P05 displayed	Operation lamp and Standby lamp are blinking alternately.	<ul style="list-style-type: none"> Reversed phase in the outdoor unit single-phase or open phase in the outdoor unit 3-phase power. 	<ul style="list-style-type: none"> Same at left. 	<ul style="list-style-type: none"> Connect the units correctly.
L02 displayed	Both the Operation lamp and Standby lamp are blinking together.	<ul style="list-style-type: none"> Indoor-outdoor unit type mismatch. 	<ul style="list-style-type: none"> Same at left. 	<ul style="list-style-type: none"> Connect the units correctly.
L13 displayed		<ul style="list-style-type: none"> Indoor-outdoor units are not setting correctly. 	<ul style="list-style-type: none"> Same at left. 	<ul style="list-style-type: none"> Connect the units correctly.
L04 displayed		<ul style="list-style-type: none"> Outdoor unit address is duplicated. 	<ul style="list-style-type: none"> Connect the units correctly. 	
L07 displayed		<ul style="list-style-type: none"> Remote controller communication wiring is connected to the indoor unit, however, it is set for individual operation. 	<ul style="list-style-type: none"> Perform automatic address setting (See 2-15). 	
P15 displayed	Operation lamp and Standby lamp are blinking alternately.	<ul style="list-style-type: none"> No gas 	<ul style="list-style-type: none"> Same at left 	<ul style="list-style-type: none"> Check the refrigerant cycle (for gas leaks).

2-15. System Control

System control refers to the link wiring connection for control of simultaneous-operation multi systems, group control, and main-sub remote controller control.

2-15-1. Basic wiring diagram 1

Single type

- Be careful to avoid miswiring when connecting the wires. (Miswiring will damage the units.)

(for 3-phase outdoor unit)

Example: Using a wireless remote controller with a system

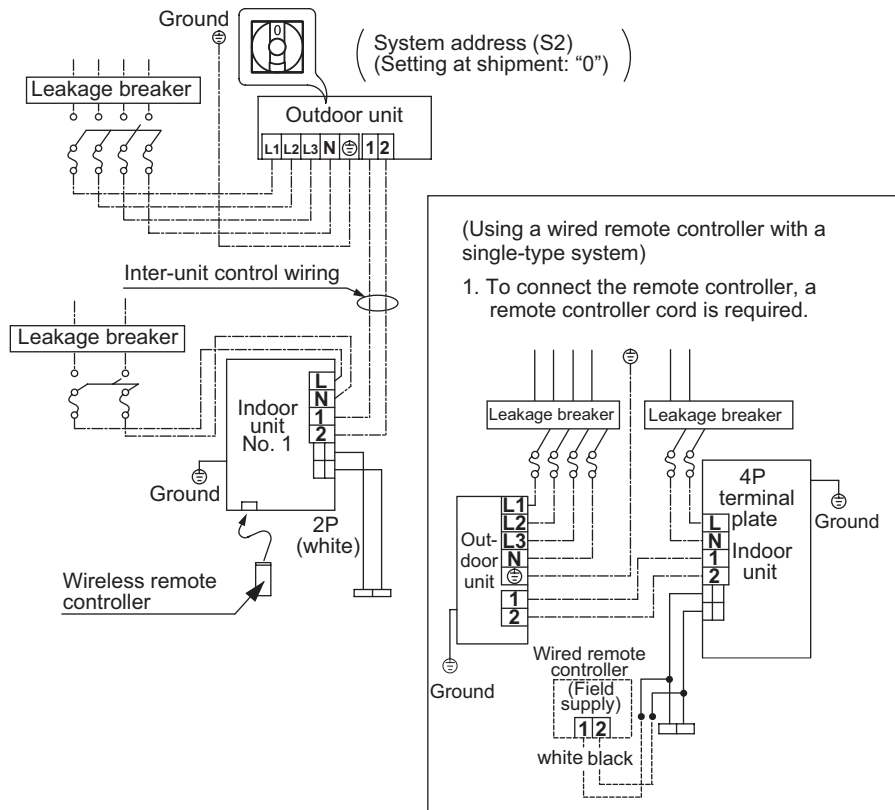


Fig. 2-10

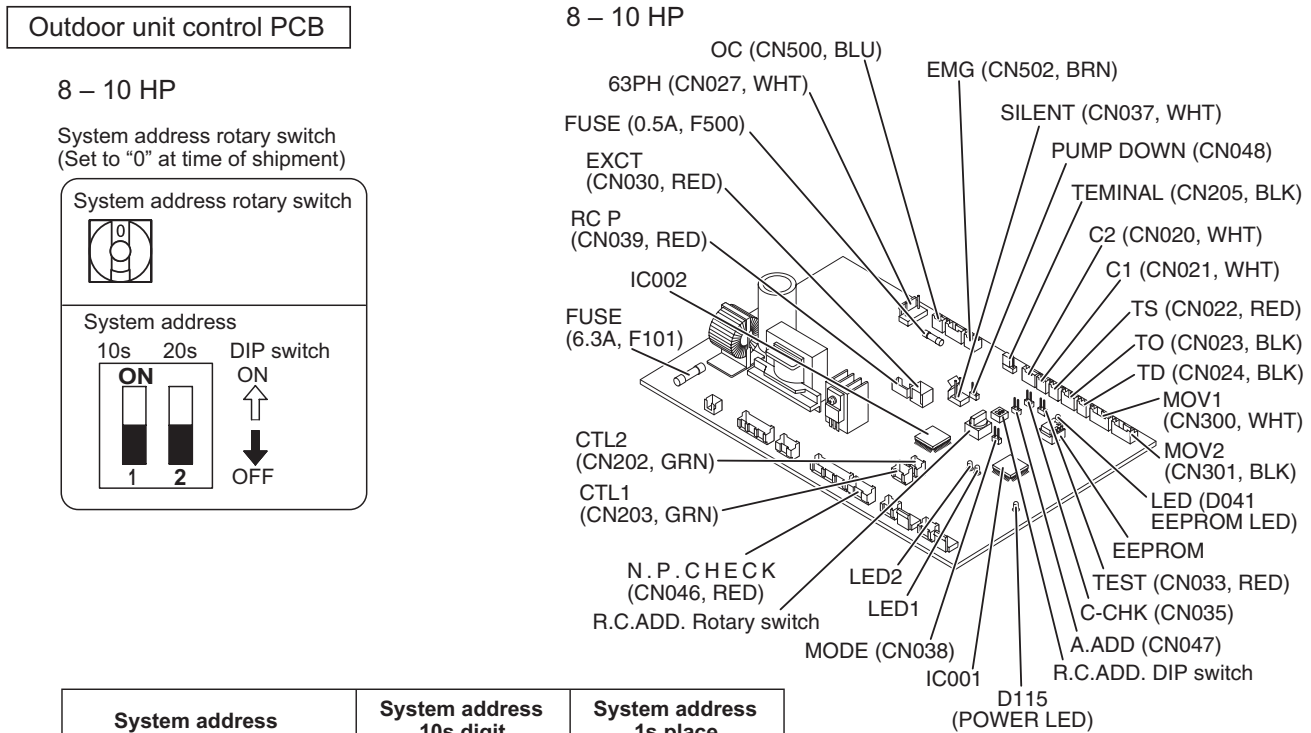
(Wiring procedure)

- (1) Connect the communication wiring to 1 and 2 on the remote controller wiring terminal plate for units.
- (2) Connect the inter-unit control wiring to 1 and 2 on the No.1 indoor unit terminal plate, and to 1 and 2 on the outdoor unit terminal plate. Also connect the inter-unit control wiring between the indoor units.
- (3) When the indoor and outdoor unit power is turned ON, automatic address setting is performed (when there is only 1 outdoor unit or when the system address is "0").

NOTE * If the system address is "0", automatic address setting is performed when the power is turned ON (in the case shown in Basic wiring diagram 1). This requires approximately 4 – 5 minutes (when the outdoor / indoor unit ratio is 1:1 as shown in Basic wiring diagram 1). During automatic address setting, LED 1 and 2 on the outdoor unit control PCB blink alternately. These LED turn OFF when automatic address setting is completed.

2-15-2. Setting the outdoor unit system address

For basic wiring diagram (Set the system address: 1)



System address No.	System address 10s digit (2P DIP switch)	System address 1s place (Rotary switch)
0 Automatic address (Setting at shipment = "0")	Both OFF 	"0" setting
1 (If outdoor unit is No. 1)	Both OFF 	"1" setting

Fig. 2-11

2-15-3. Automatic address setting from the outdoor unit

- If the power can be turned ON separately for the indoor and outdoor units in the system (indoor unit addresses can be set without operating the compressor):
 - (1) Turn ON the indoor and outdoor unit power for refrigerant system 1.
Press and hold the automatic address setting button (black) for 1 second or longer at the outdoor unit where the power was turned ON.

↓

 Communication for automatic address setting begins. LED 1 and 2 on the outdoor unit control PCB blink alternately, and turn OFF when address setting is completed.

↓ <Approximately 4 – 5 minutes are required.>
 - (2) Next, turn ON the power only at the indoor and outdoor units in a different system.
Press the automatic address setting button (black) on the outdoor unit.

↓

 LED 1 and 2 on the outdoor unit control PCB blink alternately, and turn OFF when address setting is completed. Repeat the same procedure for each system and complete automatic address setting.

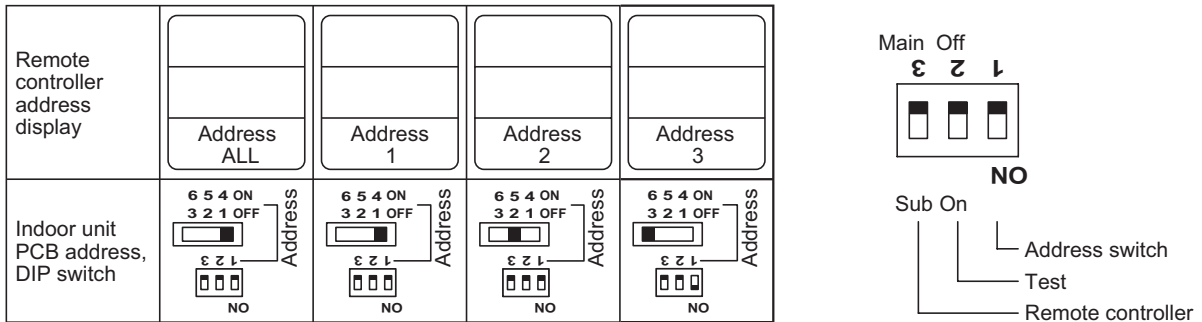
↓
 - (3) Operation using the remote controller is now possible.

2-15-4. Indoor unit remote controller main-sub setting

- If a wired remote controller is used, set the wired remote controller to “Sub”. If 2 wireless remote controllers are used, set the wireless PCB (DIP switch) on the second remote controller to “Sub”.

2-15-5. Indoor unit address setting

- If multiple single-type units are installed in the same room, the addresses can be set to prevent signal interference. By coordinating the numbers of the indoor unit (wireless PCB) and remote controller addresses, up to 6 indoor units can be controlled independently by their respective remote controllers. Independent control is not possible when a simultaneous-operation multi system is used.
- Checking the addresses
 Press the remote controller address button to display the current address on the remote controller display. If this address matches the indoor unit (wireless PCB) address, the buzzer will sound. (If ALL is set, the buzzer will always sound.)
 If ALL is set, operation is possible regardless of the indoor unit address.
 Point the remote controller toward the receiver (indoor unit) that you wish to operate, and send the operation signal.
- Remote controller address setting
 Press and hold the address button for 4 seconds or longer to display the address on the remote controller display. The current address starts blinking. The address changes each time the remote controller address button is pressed : ALL → 1 → 2 → 3 → ... → 6.
 Set the address to match the remote controller you wish to operate.
 When the SET button is pressed, the address stops blinking and displays for 5 seconds. The buzzer sounds if the address matches the indoor unit.



For address switches 1, 2, and 3, turn DIP switch 1 to OFF.
 For address switches 4, 5, and 6, turn DIP switch 1 to ON.

Fig. 2-12

■ E1 Type (for Link Wiring)

2-16. Caution

This unit may be used in a single-type refrigerant system where 1 outdoor unit is connected to 1 indoor unit.

- This test run explanation describes primarily the procedure when using the wired remote controller.
- If link wiring is used, set the outdoor unit system address to allow the combination of indoor and outdoor units to be identified. At the same time, indicate the indoor-outdoor unit combination number in a location where it can be checked easily (near the indoor unit nameplates). (This number will be required for subsequent maintenance. Refer to 2-21-2, 3, 4.)
- Request that the customer be present when the test run is performed. At this time, explain the operation manual and have the customer perform the actual steps.
- Be sure to pass the manuals and warranty certificate to the customer.
- Check that the 220 – 240 V AC wiring is not connected to the inter-unit control wiring connector terminal. If 220 – 240 V AC is accidentally applied, the indoor or outdoor unit control PCB fuse will blow in order to protect the PCB. Correct the wiring connections, then disconnect the 2P connectors (indoor: blue, OC) (outdoor: blue, serial 1) that are connected to the PCB, and replace them with 2P connectors (indoor: brown, EMG) (outdoor: brown, serial 2). If operation is still not possible after changing the brown connectors, try cutting the varistor (black). (Be sure to turn the power OFF before performing this work.)

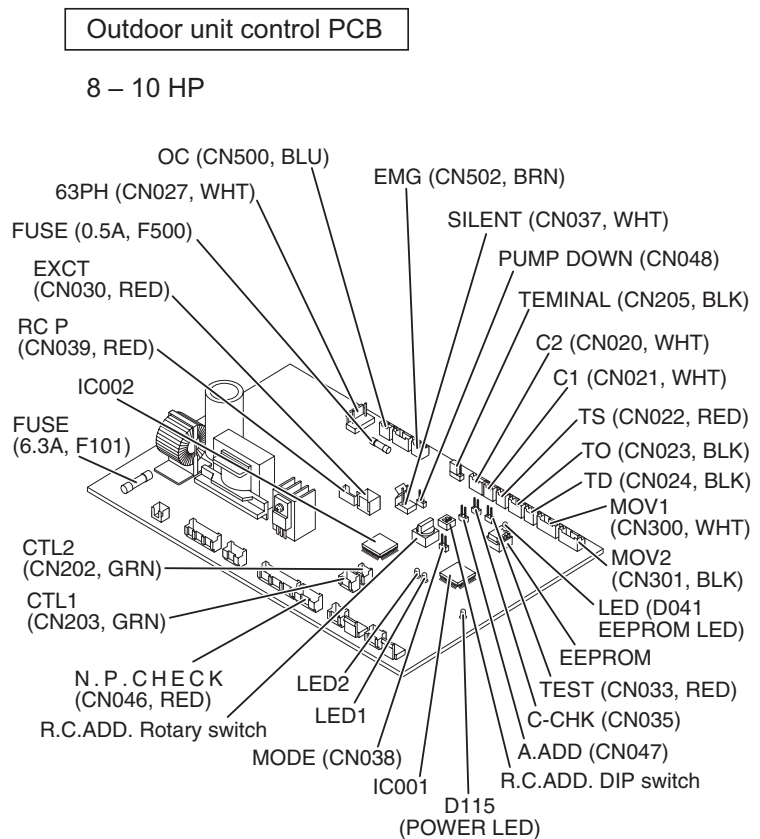


Fig. 2-13

2-17. Test Run Procedure

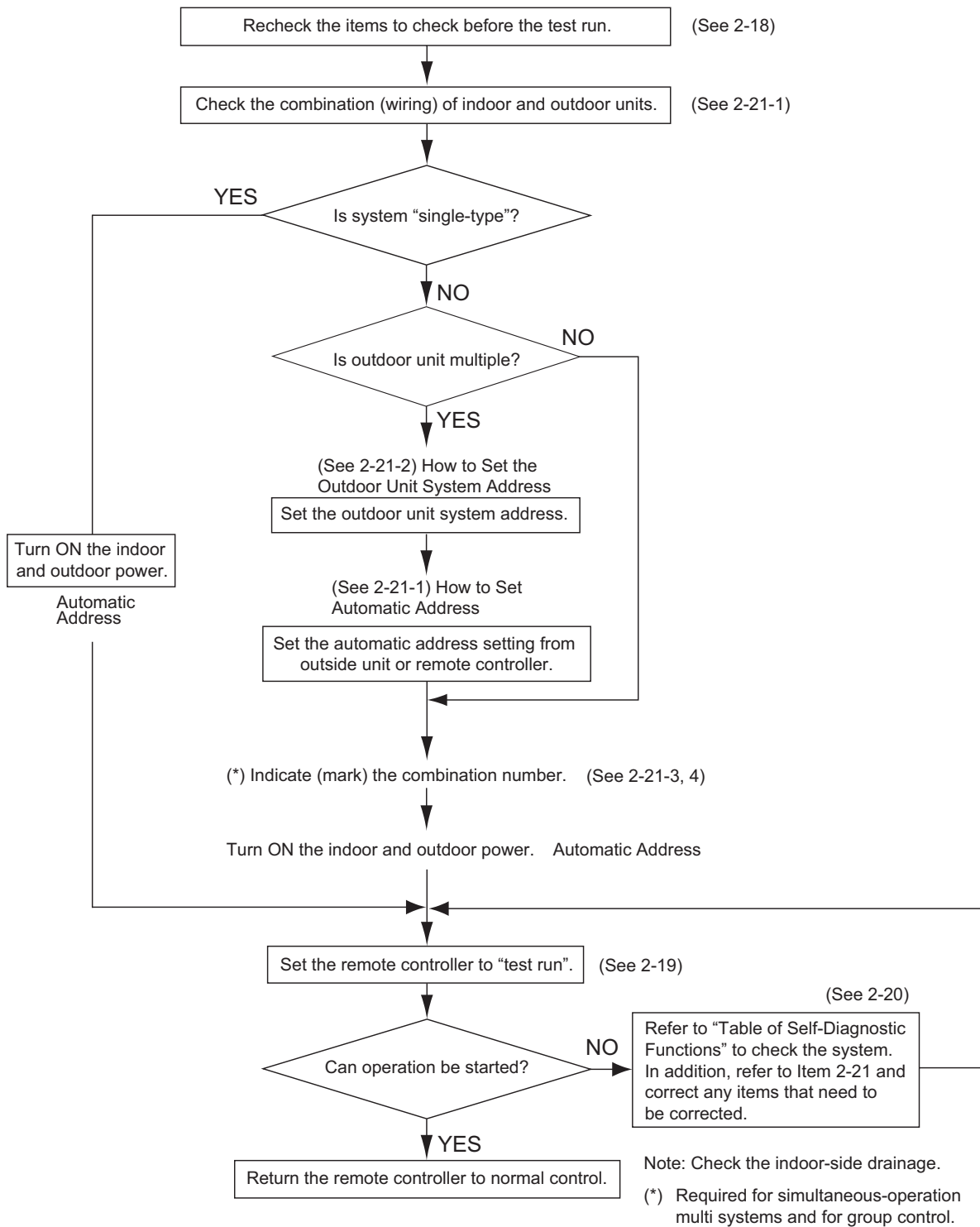




Fig. 2-14

2-18. Items to Check Before the Test Run

- (1) Turn the remote power switch ON at least 12 hours in advance in order to energize the crank case heater.
- (2) Fully open the closed valves on the liquid-tube and gas-tube sides.


2-19. Test Run Using the Remote Controller

- (1) Press and hold the remote controller  button for 4 seconds or longer. Then press the  button.
 - “TEST” appears in the LCD display during the test run.
 - Temperature control is not possible when test run mode is engaged.
(This mode places a large load on the devices. Use it only when performing the test run.)

- (2) Use either Heating or Cooling mode to perform the test run.

NOTE

The outdoor unit will not operate for approximately 3 minutes after the power is turned ON or after it stops operating.

- (3) If normal operation is not possible, a code appears on the remote controller LCD display. Refer to “2-20. Table of Self-Diagnostic Functions and Corrections” and correct the problem.
- (4) After the test run is completed, press the  button again.
Check that “TEST” disappears from the LCD display.
(This remote controller includes a function that cancels test run mode after a 60-minute timer has elapsed, in order to prevent continuous test run operation.)
- (5) For the test run of an inverter outdoor unit, operate the compressors for a minimum of 10 minutes (in order to check for open phase).
 - * When performing a test run using a wired remote controller, operation is possible without attaching the cassette-type ceiling panel. (“P09” will not be displayed.)

2-20. Table of Self-Diagnostic Functions and Corrections (E1 Type)

Wired remote controller display	Indoor unit receiver lamp	Cause	Correction
		Group connection and simultaneous-operation multi system	
Nothing is displayed	Nothing is displayed.	<ul style="list-style-type: none"> • Remote controller is not connected with indoor unit correctly. • Indoor unit power is not ON. 	Connect the remote controller correctly. Turn ON the indoor unit power.
E01 displayed	Operation lamp is blinking.	<ul style="list-style-type: none"> • Automatic address setting has not been completed. • Inter-unit control wiring is cut or is not connected correctly. • Remote controller is not connected with indoor unit correctly. 	Check the remote controller and inter-unit control wiring. Perform automatic address setting (2-21).
E02 displayed		<ul style="list-style-type: none"> • Remote controller is not connected with indoor unit correctly. 	Connect the remote controller correctly.
E14 displayed		<ul style="list-style-type: none"> • Remote controller communication wiring is cut or is not connected correctly. 	Check the remote controller communication wiring. Perform automatic address setting again.
E04 displayed	Standby lamp is blinking.	<ul style="list-style-type: none"> • Indoor-outdoor inter-unit wiring is not connected correctly. 	Connect the wiring correctly.
E06 displayed		<ul style="list-style-type: none"> • Inter-unit control wiring is cut or is not connected correctly. 	Refer to 2-21-1. Basic wiring diagram, and make the correct setting.
E15 displayed		<ul style="list-style-type: none"> • Indoor unit capacity is too low. 	Check that the total capacities of the indoor and outdoor units are appropriate.
E16 displayed		<ul style="list-style-type: none"> • Indoor unit capacity is too high. 	
P05 displayed	Operation lamp and Standby lamp are blinking alternately.	<ul style="list-style-type: none"> • Reversed phase at one of the outdoor units in the group. • Insufficient gas 	Reverse 2 phases of the outdoor unit 3-phase power and connect them correctly. Fill up the gas appropriately.
P09 displayed	Timer lamp and Standby lamp are blinking alternately.	<ul style="list-style-type: none"> • Ceiling panel connector at one of the indoor units in the group is not connected correctly. 	Connect the indoor unit ceiling panel connector correctly.
P12 displayed		<ul style="list-style-type: none"> • DC fan trouble at one of the indoor units in the group. 	Check whether the fan holder is loose. Check the wiring between the DC fan and the PCB.
L02 displayed	Both the Operation lamp and Standby lamp are blinking together.	<ul style="list-style-type: none"> • Indoor-outdoor unit type mismatch. 	Check that the indoor and outdoor unit types are correct.
L07 displayed		<ul style="list-style-type: none"> • Remote controller communication wiring is connected to the indoor unit, however it is set for individual operation. 	Perform automatic address setting (2-21).
L10 displayed		<ul style="list-style-type: none"> • Check outdoor operation with separate maintenance-use remote controller. 	

2-21. Automatic Address Setting

2-21-1. Basic wiring diagram

● Link wiring

NOTE

- A terminal plug (black) is attached to each of the outdoor unit control PCBs.
At only one outdoor unit, leave the terminal plug short-circuit socket on the “Yes” side.
At all the other outdoor units, change the socket (from “Yes” to “No”).
- A maximum of 8 indoor units can be connected to 1 remote controller for group control.

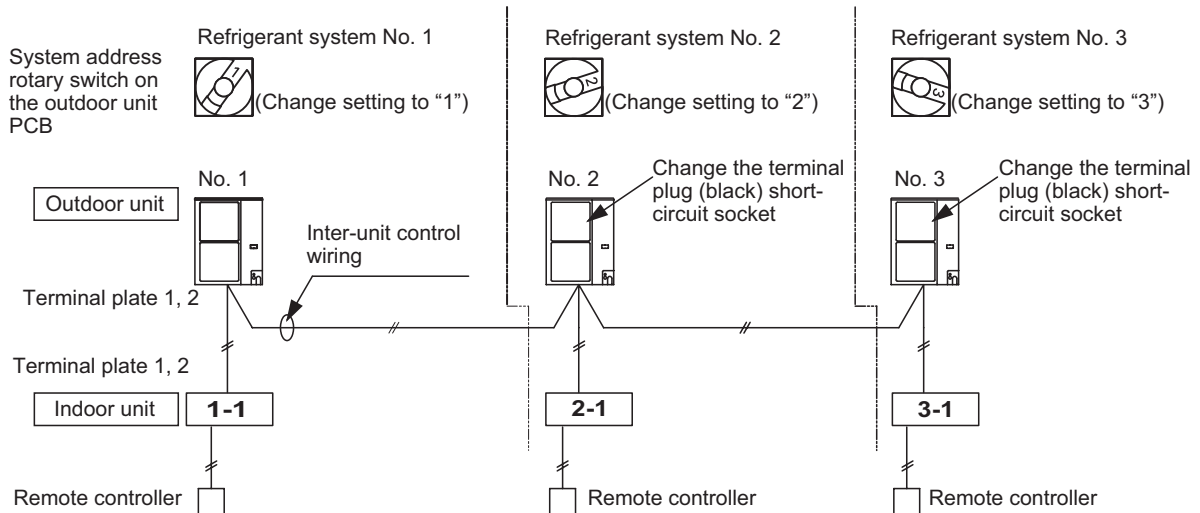


Fig. 2-15

Automatic address setting from the outdoor unit

Case 1

- If the power can be turned ON separately for the indoor and outdoor units in the system, the indoor unit addresses can be set without running the compressor.

(1) Turn on the indoor and outdoor unit power for refrigerant system 1.

Press and hold the automatic address setting button (black) for 1 second or longer at the outdoor unit where the power was turned ON.



Communication for automatic address setting begins.



LED 1 and 2 on the outdoor unit control PCB blink alternately, and turn OFF when address setting is completed.

↓ <Approximately 4 – 5 minutes are required.>

(2) Next, turn ON the power only at the indoor and outdoor units in a different system.

Press the automatic address setting button (black) on the outdoor unit.



LED 1 and 2 on the outdoor unit control PCB blink alternately, and turn OFF when address setting is completed.



Repeat the same procedure for each system and complete automatic address setting.



(3) Operation using the remote controller is now possible.

Case 2

- If the power cannot be turned ON separately for the indoor and outdoor units in the system:
The compressors must be run in order to automatically set the indoor unit addresses.
Therefore perform this step after completing the refrigerant tubing work.

(1) Turn ON the power to the indoor and outdoor units in all refrigerant systems.



When setting addresses in cooling mode

(2) Short-circuit the mode-change pin at the outdoor unit where automatic address setting will be performed.
Then press the automatic address setting button (black).



When setting addresses in heating mode

(2) Press the automatic address setting button (black) at the outdoor unit where automatic address setting will be performed.



(3) LED 1 and 2 blink alternately. The compressors begin running in Cooling (or Heating) mode.
Communication for automatic address setting begins, using the temperature changes at the indoor units.

<All indoor units are in operating status.>



Address setting is completed when the compressors stop and the LED indicators turn OFF.

<Approximately 15 minutes is required for 1 system.>

If address setting fails, LED 1 and 2 blink simultaneously and the alarm contents are displayed at the remote controller.

(4) After 1 system is completed, be sure to press the automatic address setting button (black) at the other outdoor units to complete automatic address setting in the same way for each system.

(5) Operation using the remote controller is now possible.

Automatic address setting using the remote controller



Case 3

- If the power can be turned ON separately for the indoor and outdoor units in each system
(indoor unit addresses can be set without running the compressor):




Individual system automatic address setting : Display item code "A1".

(1) Press the remote controller timer time  button and  button simultaneously.
(Hold for 4 seconds or longer.)



(2) Then press either the temperature setting  or  button.
(Confirm that the item code is "A1".)



(3) Use either the  or  button to select the outdoor unit to perform automatic address setting for.
Then press the  button.

("R.C.1" is displayed, and automatic address setting is performed for refrigerant system 1.)

When automatic address setting for system 1 is completed, the units return to normal stopped status.

<Approximately 4 – 5 minutes are required.>



During automatic address setting, "SETTING" blinks on the remote controller display.

This display disappears when address setting is completed.


Case 4

- If the power cannot be turned ON separately for the indoor and outdoor units in each system:
(The compressors must be run in order to automatically set the indoor unit addresses.
Therefore perform this step after completing the refrigerant tubing work.)

All-systems automatic address setting: Display item code "AA".

(1) Press the remote controller timer time  button and  button simultaneously. (Hold for 4 seconds or longer.)



(2) Next press the  button.

(Automatic address setting is performed in sequence for all outdoor units from No. 1 to No. 30.

When automatic address setting is completed, the units return to normal stopped status.)

<Approximately 15 minutes is required for each system.>



During automatic address setting, "SETTING" blinks on the remote controller display.

This display disappears when address setting is completed.

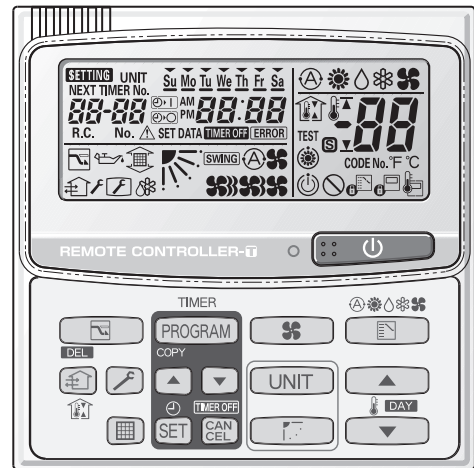


Fig. 2-16

2-21-2. Setting outdoor unit system addresses

For the basic wiring diagram (Set the system addresses: 1, 2, 3...)

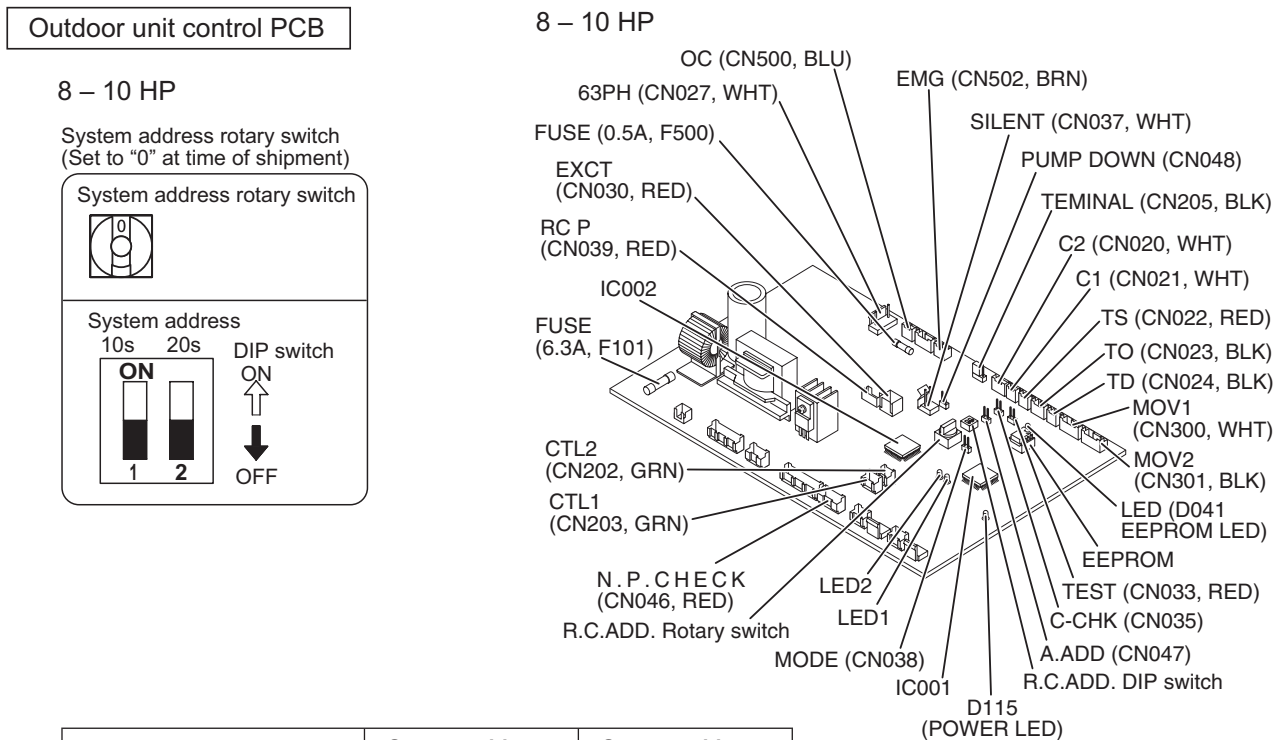









Fig. 2-17

System address No.	System address 10s digit (2P DIP switch)	System address 1s place (Rotary switch)
0 Automatic address (Setting at shipment = "0")	Both OFF 	"0" setting 
1 (If outdoor unit is No. 1)	Both OFF 	"1" setting 


2-21-3. Checking indoor unit addresses

Use the remote controller to check the addresses of the indoor units. Press and hold the  button and  button for 4 seconds or longer (simple settings mode, "ALL" appears on the remote controller). Then press the  button and select the indoor address.

(For the system addresses of the No. 1 outdoor unit, each time the button is pressed, the address changes as follows: 1-1, 1-2, ...)

The indoor unit fan operates only at the selected indoor unit.

Confirm the indoor unit address. (For the system addresses of the No. 2 outdoor unit, the displayed addresses are 2-1, 2-2, ...)

Press the  button again to return to the normal remote controller mode.

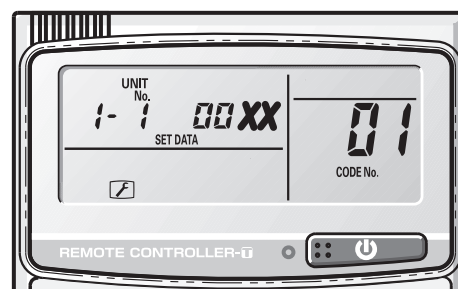


Fig. 2-18

2-21-4. Indicating (marking) the indoor and outdoor unit combination number

Indicate (mark) the number after automatic address setting is completed.

- So that the combination of each indoor unit can be easily checked when multiple units are installed, ensure that the indoor and outdoor unit numbers correspond to the system address number on the outdoor unit control PCB, and use a magic marker or similar means which cannot be easily removed to indicate the numbers in an easily visible location on the indoor units (near the indoor unit nameplates).

Example : (Outdoor) 1 – (Indoor) 1
(Outdoor) 2 – (Indoor) 1

- These numbers will be needed for maintenance. Be sure to indicate them.

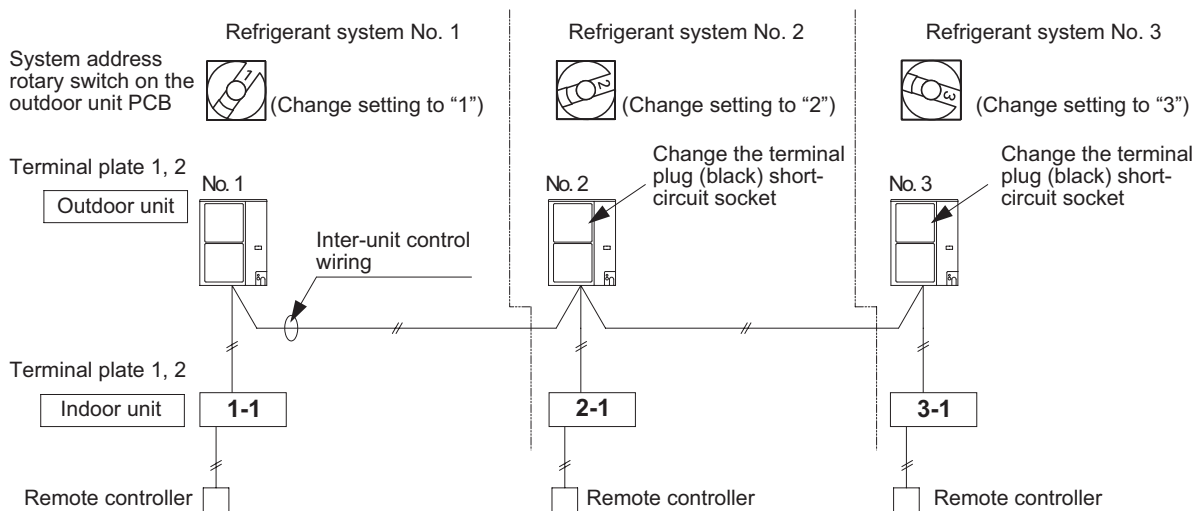
2-22. Automatic Address Setting

2-22-1. Basic wiring diagram

● Link wiring

NOTE

- A terminal plug (black) is attached to each of the outdoor unit control PCBs. At only one outdoor unit, leave the terminal plug short-circuit socket on the "Yes" side. At all the other outdoor units, change the socket (from "Yes" to "No").
- A maximum of 8 indoor units can be connected to 1 remote controller for group control.



2-22-2. Setting outdoor unit system addresses

For the basic wiring diagram (Set the system addresses: 1, 2, 3...)

Outdoor unit control PCB

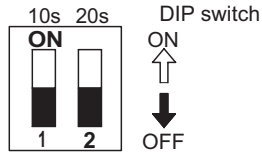
8 – 10 HP

System address rotary switch
(Set to "0" at time of shipment)

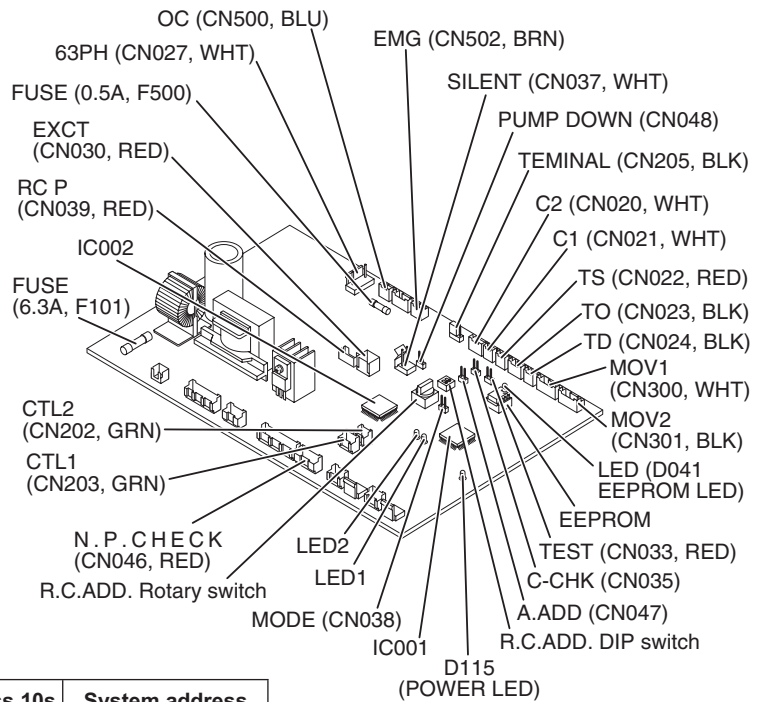
System address rotary switch



System address



8 – 10 HP



System address No.	System address 10s digit (2P DIP switch)	System address 1s place (Rotary switch)
0 Automatic address (Setting at shipment = "0")	Both OFF 	"0" setting
1 (If outdoor unit is No. 1)	Both OFF 	"1" setting

Fig. 2-20

2-22-3. Checking indoor unit addresses

Use the remote controller to check the addresses of the indoor units. Press and hold the button and button for 4 seconds or longer (simple settings mode, "ALL" appears on the remote controller). Then press the button and select the indoor address.

(For the system addresses of the No. 1 outdoor unit, each time the button is pressed, the address changes as follows: 1-1, 1-2, ...)

The indoor unit fan operates only at the selected indoor unit. Confirm the indoor unit address.

Press the button again to return to the normal remote controller mode.

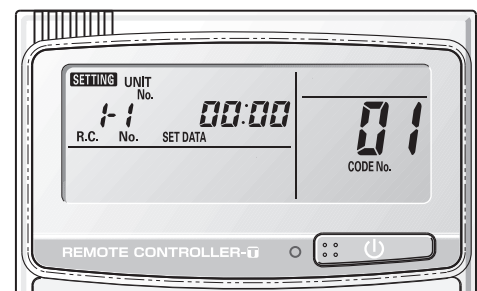


Fig. 2-21

2-22-4. Indicating (marking) the indoor and outdoor unit combination number

Indicate (mark) the number after automatic address setting is completed.

- (1) So that the combination of each indoor unit can be easily checked when multiple units are installed, ensure that the indoor and outdoor unit numbers correspond to the system address number on the outdoor unit control PCB, and use a magic marker or similar means which cannot be easily removed to indicate the numbers in an easily visible location on the indoor units (near the indoor unit nameplates).

Example : (Outdoor) 1 – (Indoor) 1
(Outdoor) 2 – (Indoor) 1

- (2) These numbers will be needed for maintenance. Be sure to indicate them.

Installing the Remote Controller

Refer to Instruction Manual attached to the optional Wireless Remote Controller.

2-23. Caution for Pump Down

Pump down means refrigerant gas in the system is returned to the outdoor unit.

Pump down is used when the unit is to be moved, or before servicing the refrigerant circuit.



CAUTION

- **This outdoor unit cannot collect more than the rated refrigerant amount as shown by the nameplate on the back.**
- **If the amount of refrigerant is more than that recommended, do not conduct a pump down. In this case use another refrigerant collecting system.**

Caution on Pump Down (Refrigerant Recovery)

NOTE

Pump down cannot be performed when the tubing length exceeds 30m.
(There is a possibility of generating the actuation of the excessive load protection system.)
In this case, collect the refrigerant by the refrigerant collecting system.

- (1) Stop the unit operation (cooling heating wind direction, etc.).
- (2) Connect the manifold gauge to the service port of the gas tube service valve.
- (3) Short-circuit the PUMP pin on the outdoor unit control PCB for over 1 second.
 - Refrigerant recovery will start and the unit starts driving.
 - During the refrigerant recovery. LED1 blinks and LED2 lights up on the outdoor unit control PCB.
 - Remote control display shows blinks.

- (4) Fully close the liquid tube service valve after 2 or 3 minutes.
Pump down will start.

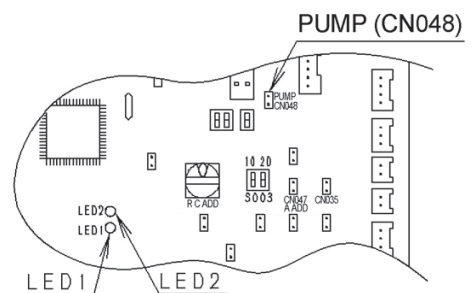
- (5) When the manifold gauge reduces to 0.2 - 0.1MPa. fully close the gas tube service valve.

Then again short-circuit the PUMP pin (CN048).
Refrigerant recovery is finished.

- If operation is continued for over 10 minutes, the unit stops even if the refrigerant recovery is not completed.
Check the liquid tube service valve closed.

- When the PUMP pin (CN048) is shorted again during refrigerant recovery the unit stops.

* For protection of the compressor do not drive until the unit tubing side becomes negative pressure.



PUMP pin (CN048) is located on the outdoor PCB as shown.



CAUTION

Pay much attention to the fan of the outdoor unit as there is danger of injury during operation.

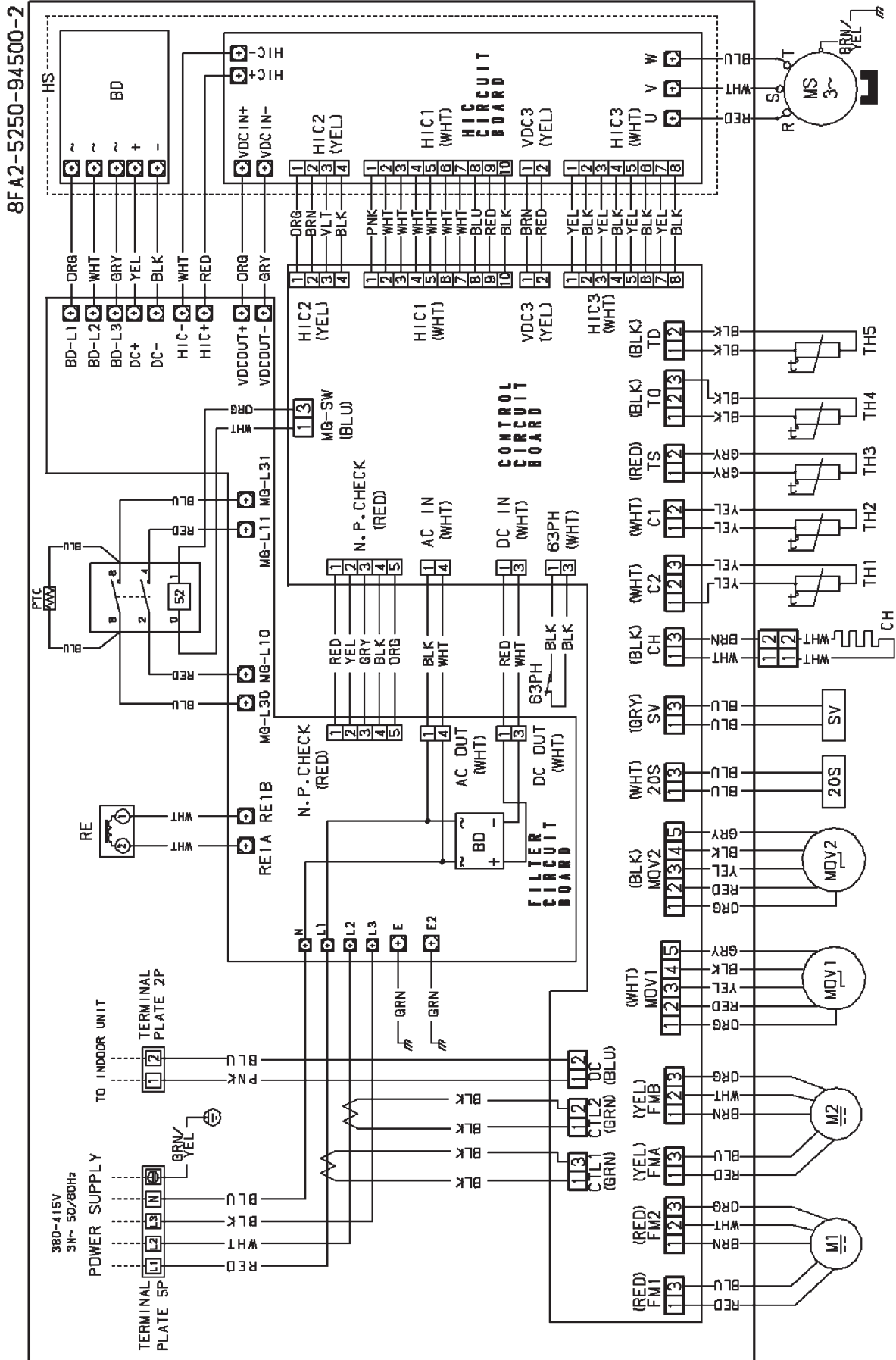
– MEMO –

3. ELECTRICAL DATA

3-1.	Outdoor Units (Electric Wiring Diagram, Schematic Diagram).....	3-2
3-2.	Indoor Units (Electric Wiring Diagram, Schematic Diagram).....	3-4
	High-Static Pressure Ducted Type	

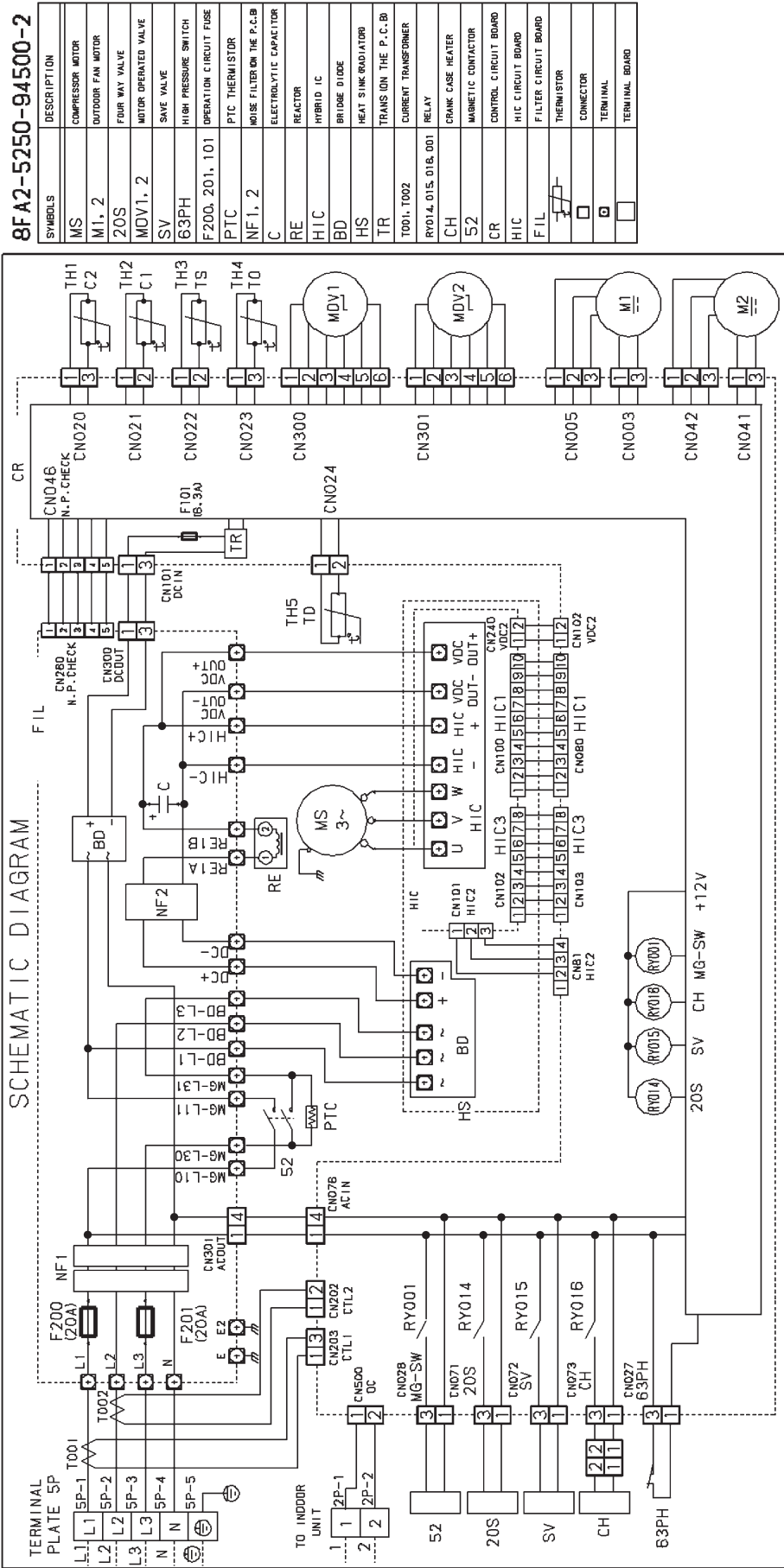
3-1. Outdoor Units

Electric Wiring Diagram U-200PE1E8 / U-250PE1E8



3-1. Outdoor Units

Schematic Diagram U-200PE1E8 / U-250PE1E8



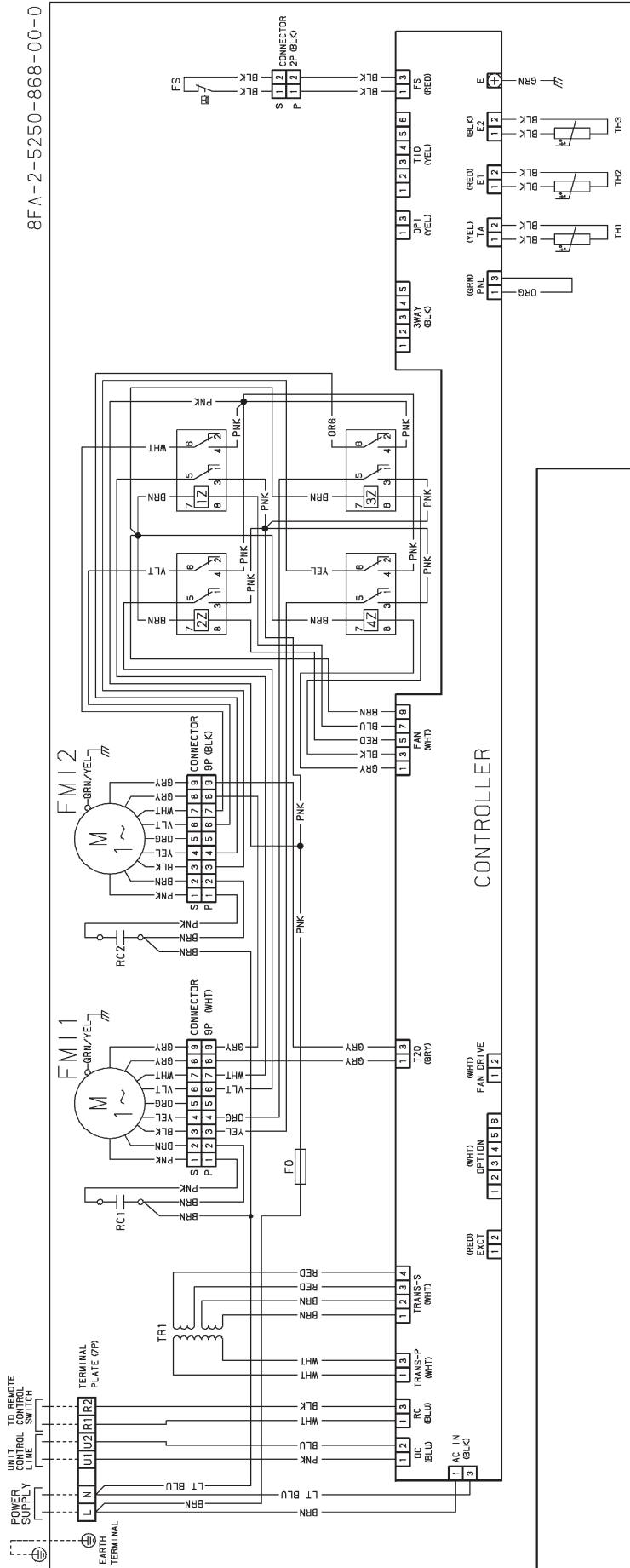
OUTDOOR UNIT HEATING & COOLING

WARNING

TURN OFF THE MAIN POWER SUPPLY SWITCH WHEN CHANGING P.C.B.. CONFIRM ALL THE L.E.D.S ON THE P.C.B. ARE OFF AND START TO REWORK. OTHERWISE YOU MAY BE KILLED BY AN ELECTRIC SHOCK.

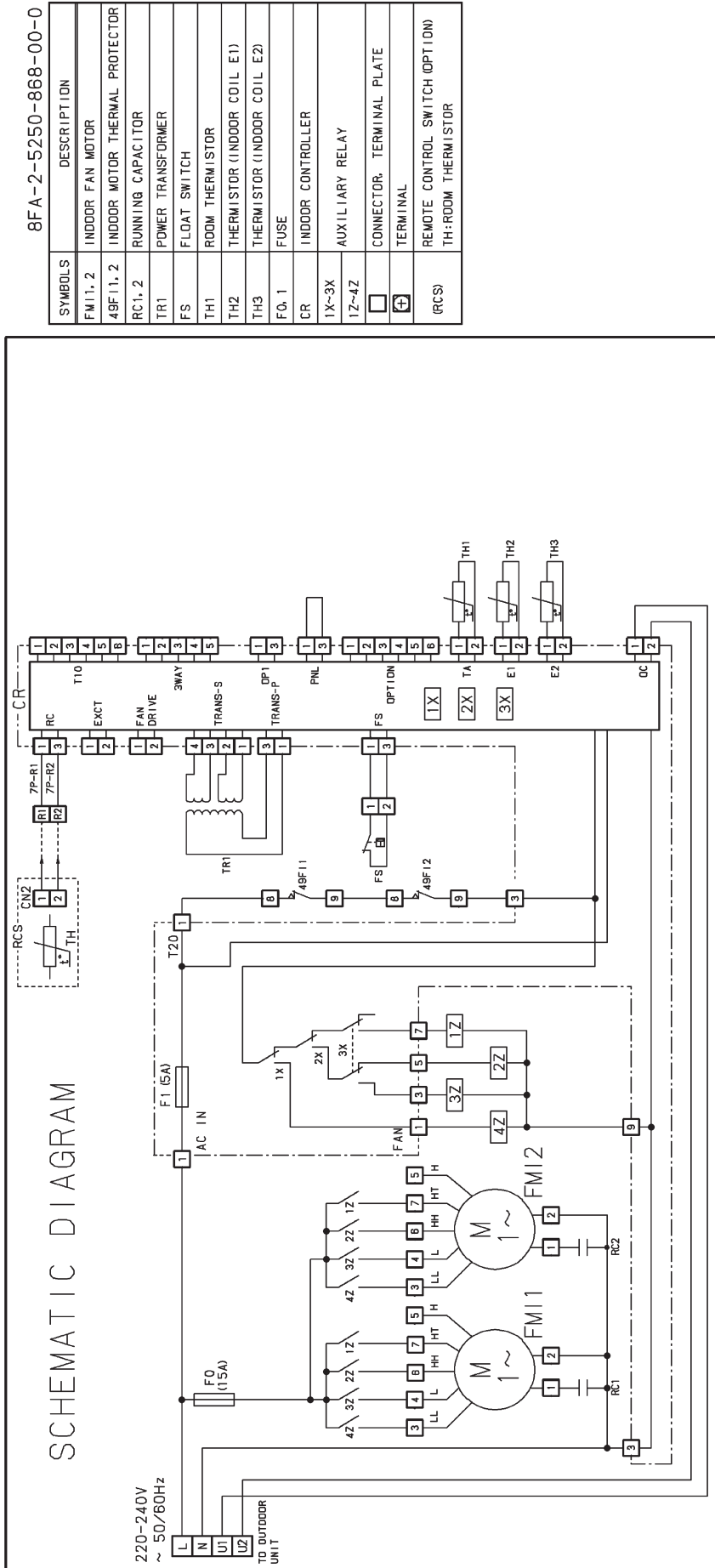
3-2. Indoor Units

■ High-Static Pressure Ducted Type S-200PE1E8 Electric Wiring Diagram



3-2. Indoor Units

High-Static Pressure Ducted Type S-200PE1E8 Schematic Diagram



3

3-2. Indoor Units

■ High-Static Pressure Ducted Type S-250PE1E8
Electric Wiring Diagram

8FA-2-5250-869-00-1

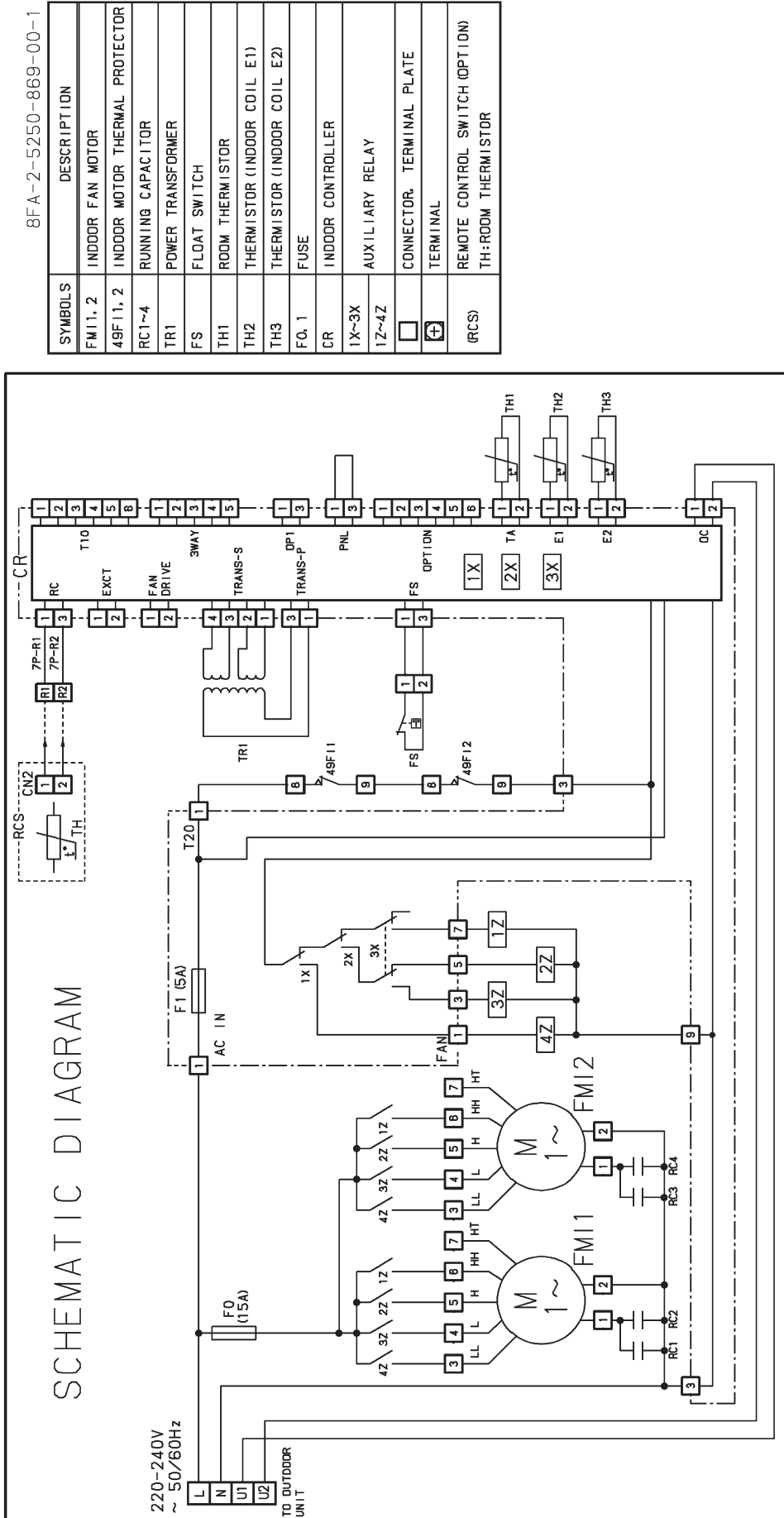
The diagram illustrates the electrical wiring for two indoor units (FM1 and FM2) connected to a central controller. The components and their connections are as follows:

- Power Supply:** L (Line), N (Neutral), and E (Earth) terminals are connected to the indoor units and the controller.
- Remote Control Line:** U1, U2, R1, and R2 terminals are connected to the indoor units and the controller.
- Earthing:** EARTH TERMINAL is connected to the ground.
- Indoor Unit (FM1 and FM2):**
 - Terminal 1: L.T. BLU
 - Terminal 2: BRN
 - Terminal 3: PNK
 - Terminal 4: BLU
 - Terminal 5: WHT
 - Terminal 6: WHT
 - Terminal 7: WHT
 - Terminal 8: RED
 - Terminal 9: RED
 - Terminal 10: BRN
 - Terminal 11: BRN
 - Terminal 12: TRANS-S (WHT)
 - Terminal 13: TRANS-S (WHT)
 - Terminal 14: TRANS-S (WHT)
 - Terminal 15: TRANS-S (WHT)
 - Terminal 16: TRANS-S (WHT)
 - Terminal 17: TRANS-S (WHT)
 - Terminal 18: TRANS-S (WHT)
 - Terminal 19: TRANS-S (WHT)
 - Terminal 20: TRANS-S (WHT)
 - Terminal 21: TRANS-S (WHT)
 - Terminal 22: TRANS-S (WHT)
 - Terminal 23: TRANS-S (WHT)
 - Terminal 24: TRANS-S (WHT)
 - Terminal 25: TRANS-S (WHT)
 - Terminal 26: TRANS-S (WHT)
 - Terminal 27: TRANS-S (WHT)
 - Terminal 28: TRANS-S (WHT)
 - Terminal 29: TRANS-S (WHT)
 - Terminal 30: TRANS-S (WHT)
 - Terminal 31: TRANS-S (WHT)
 - Terminal 32: TRANS-S (WHT)
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 - Terminal 93: TRANS-S (WHT)
 - Terminal 94: TRANS-S (WHT)
 - Terminal 95: TRANS-S (WHT)
 - Terminal 96: TRANS-S (WHT)
 - Terminal 97: TRANS-S (WHT)
 - Terminal 98: TRANS-S (WHT)
 - Terminal 99: TRANS-S (WHT)
 - Terminal 100: TRANS-S (WHT)
- Controller:**
 - Terminal 1: DC (BLU)
 - Terminal 2: RC (BLU)
 - Terminal 3: PNK
 - Terminal 4: WHT
 - Terminal 5: WHT
 - Terminal 6: WHT
 - Terminal 7: WHT
 - Terminal 8: WHT
 - Terminal 9: WHT
 - Terminal 10: WHT
 - Terminal 11: WHT
 - Terminal 12: WHT
 - Terminal 13: WHT
 - Terminal 14: WHT
 - Terminal 15: WHT
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 - Terminal 97: WHT
 - Terminal 98: WHT
 - Terminal 99: WHT
 - Terminal 100: WHT
- Other Components:**
 - RC1, RC2, RC3, RC4: Relays
 - TR1: Transformer
 - FAN: Fan
 - TH1, TH2, TH3: Thermostats
 - TH4: Thermostat
 - TH5: Thermostat
 - TH6: Thermostat
 - TH7: Thermostat
 - TH8: Thermostat
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 - TH43: Thermostat
 - TH44: Thermostat
 - TH45: Thermostat
 - TH46: Thermostat
 - TH47: Thermostat
 - TH48: Thermostat
 - TH49: Thermostat
 - TH50: Thermostat

3-6

3-2. Indoor Units

■ High-Static Pressure Ducted Type S-250PE1E8 Schematic Diagram



8FA-2-5250-869-00-1

SYMBOLS	DESCRIPTION
FM1, 2	INDOOR FAN MOTOR
49F1, 2	INDOOR MOTOR THERMAL PROTECTOR
RC1~4	RUNNING CAPACITOR
TR1	POWER TRANSFORMER
FS	FLOAT SWITCH
TH1	ROOM THERMISTOR
TH2	THERMISTOR (INDOOR COIL E1)
TH3	THERMISTOR (INDOOR COIL E2)
FO, 1	FUSE
CR	INDOOR CONTROLLER
1X~3X	AUXILIARY RELAY
1Z~4Z	CONNECTOR, TERMINAL PLATE
	TERMINAL
	REMOTE CONTROL SWITCH (OPTION)
(RCS)	TH:ROOM THERMISTOR

– MEMO –