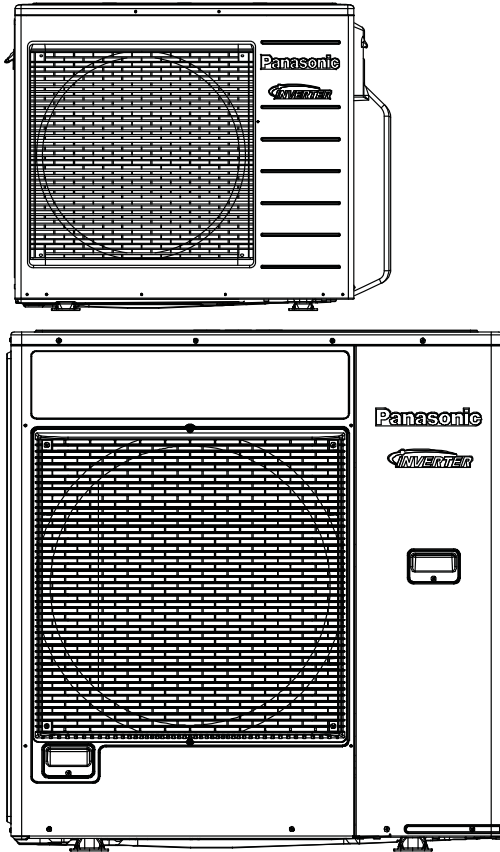


Installation Manual

Air Conditioner

Outdoor Unit
CU-3E19RBU
CU-4E24RBU

Destination
U.S.A.
Canada




Please file and use this manual together with the service manual for Model No. CS-E9RKUAW CS-E12RKUAW CS-E18RKUAW, CS-E24RKUAW, CS-ME7RKUA, CS-E12RB4UW, CS-E18RB4UW, CS-ME5RKUA, Order No. PAPAMY1501049CE, PAPAMY1503094CE, PAPAMY1503095CE, PAPAMY1505112CE.

WARNING

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

IMPORTANT SAFETY NOTICE

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

PRECAUTION OF LOW TEMPERATURE

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

Panasonic[®]

■ APPLICABLE INDOOR UNITS

● Wall Mounted Type

Multi-Outdoor Unit \ Indoor Unit		CS-MKS7NKH	CS-MKS9NKH	CS-MKS12NKH	CS-MKS18NKH	CS-MKS24NKH
		3-Room	CU-3KS19NBU	YES	YES	YES
4-Room	CU-4KS24NBU	YES	YES	YES	YES	YES
4-Room	CU-4KS31NBU	YES	YES	YES	YES	YES

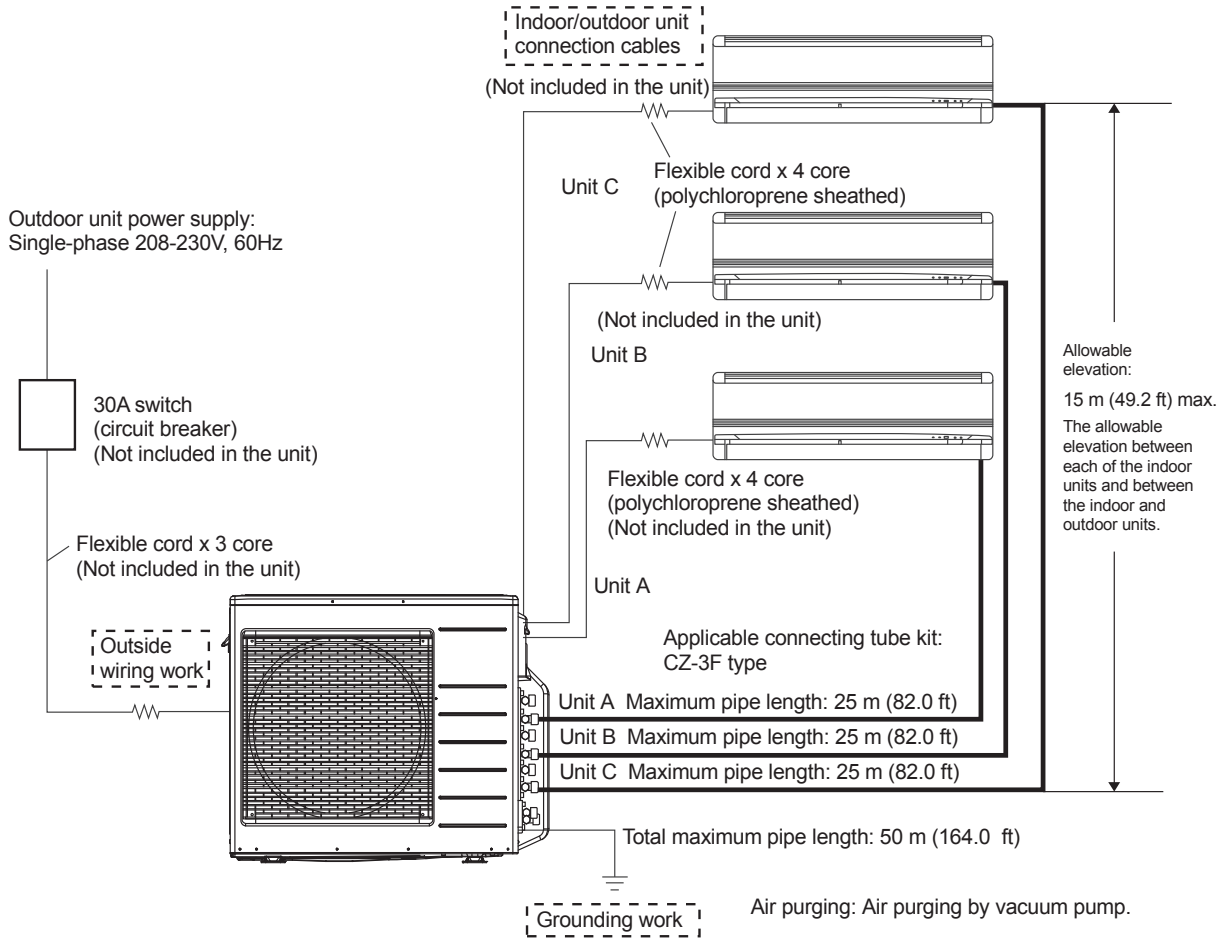
● Semi-Concealed Type

Multi-Outdoor Unit \ Indoor Unit		CS-MKS9NB4U & CZ-18BT1U	CS-MKS12NB4U & CZ-18BT1U	CS-KS18NB4UW & CZ-18BT1U
		3-Room	CU-3KS19NBU	YES
4-Room	CU-4KS24NBU	YES	YES	YES
4-Room	CU-4KS31NBU	YES	YES	YES

9. Installation Information

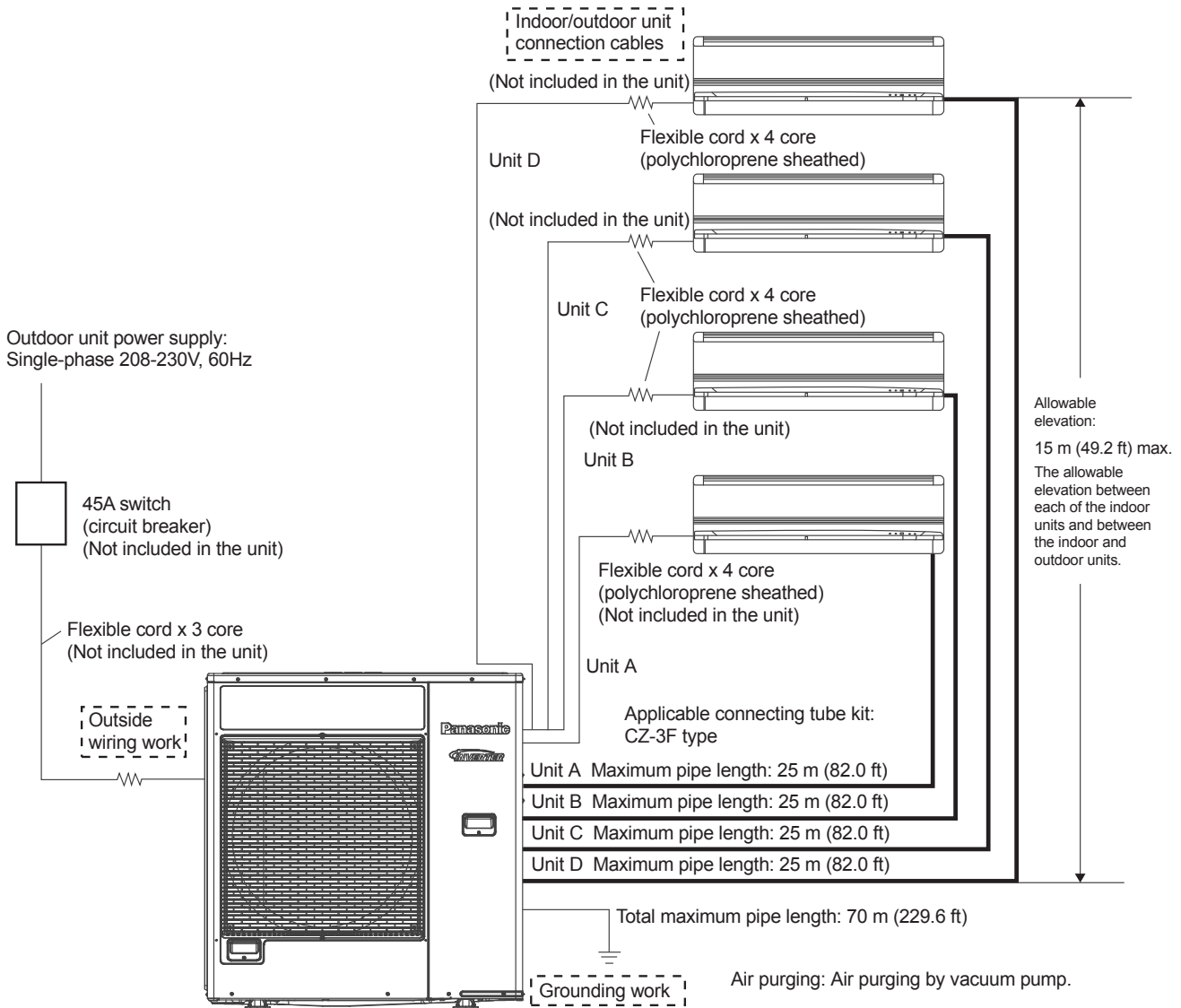
9.1 CU-3E19RBU

9.1.1 Check Points



9.2 CU-4E24RBU

9.2.1 Check Points



10. Installation Instruction

10.1 CU-3E19RBU

10.1.1 Select The Best Location

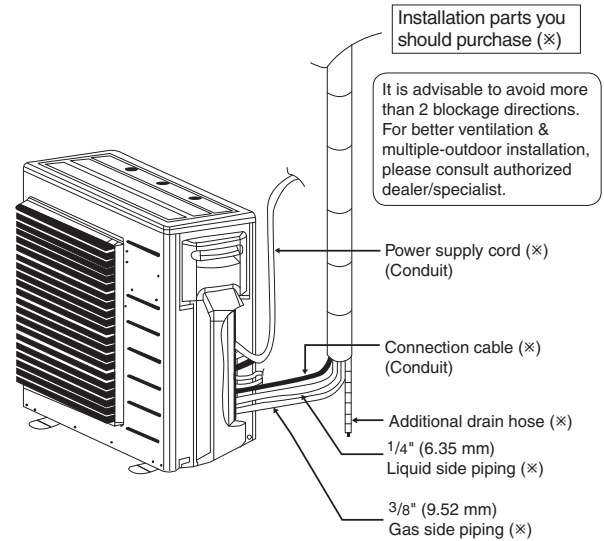
- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- Recommended installation height for outdoor unit should be above the seasonal snow level.

Refrigerant piping size	
Outdoor Unit	CU-3E19**
Liquid - side	ø1/4" (ø6.35 mm) thickness 1/32" (t0.8 mm)
Gas - side	ø3/8" (ø9.52 mm) thickness 1/32" (t0.8 mm)

Outdoor Unit	CU-3E19**
Min. total piping length for additional gas	98.4 ft (30 m)

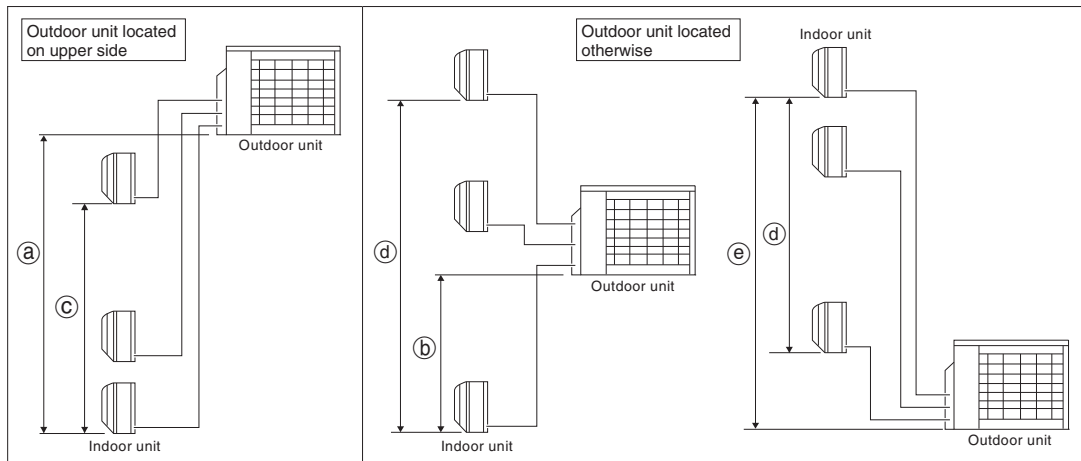
- If total piping length of all indoor units exceeds the minimum length listed above, additionally charge with 0.2 oz (20g) of refrigerant (R410A) for each additional feet (meter) of piping.

10.1.1.1 Outdoor Unit Installation Diagram



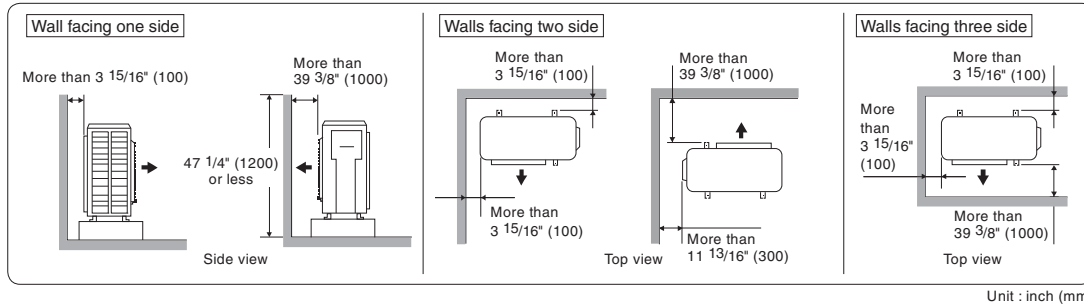
- This illustration is for explanation purposes only.
- * Note: Respective indoor unit installation procedure shall refer to instruction manual provided in the indoor unit packaging.

Allowable piping length			
Outdoor Unit			CU-3E19***
Allowable piping length of each indoor unit (min. ~ max.)			9.8 ft ~ 82.0 ft (3 m ~ 25 m)
Allowable total piping length of all indoor unit			164.0 ft (50 m) or less
Height difference between indoor and outdoor unit	Outdoor unit located on upper side	a	49.2 ft (15 m) or less
	Outdoor unit located otherwise	b	24.6 ft (7.5 m) or less
	Outdoor unit located otherwise	e	49.2 ft (15 m) or less
Height difference between indoor unit	Outdoor unit located on upper side	c	24.6 ft (7.5 m) or less
	Outdoor unit located otherwise	d	49.2 ft (15 m) or less



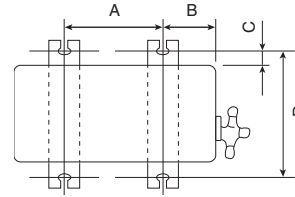
Outdoor Unit Installation Guidelines

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



10.1.2 Install The Outdoor Unit

- After selecting the best location, start installation to Indoor/Outdoor Unit Installation Diagram.
 1. Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut (ø13/32" (ø10 mm)).
 2. When installing on a roof, please consider strong winds and earthquakes.
 3. Please fasten the installation stand firmly with bolt or nails.



Model	A	B	C	D
CU-3E19***	24-1/8" (613 mm)	5-5/32" (131 mm)	5/8" (16 mm)	14-3/16" (360.5 mm)

10.1.3 Connect The Piping

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

Connecting The Piping To Outdoor Unit

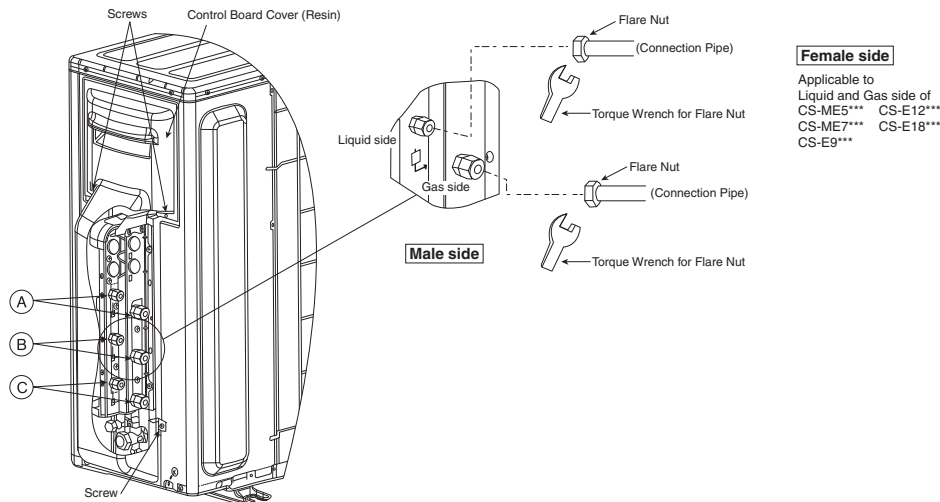
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe.

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

Do not over tighten, over tightening may cause gas leakage	
Piping size	Torque
1/4" [6.35 mm]	13.3 lbf•ft [18 N•m (1.8 kgf•m)]
3/8" [9.52 mm]	31.0 lbf•ft [42 N•m (4.3 kgf•m)]
1/2" [12.7 mm]	40.6 lbf•ft [55 N•m (5.6 kgf•m)]
5/8" [15.88 mm]	47.9 lbf•ft [65 N•m (6.6 kgf•m)]
3/4" [19.05 mm]	73.8 lbf•ft [100 N•m (10.2 kgf•m)]

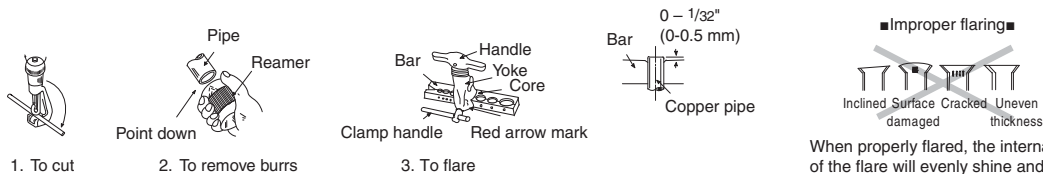
Gas Leak Checking

Pressure test to system to 400 PSIG with dry nitrogen, in stages. Thoroughly leak check the system. If the pressure holds, release the nitrogen and proceed to section 10.1.4.



CUTTING AND FLARING THE PIPING

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

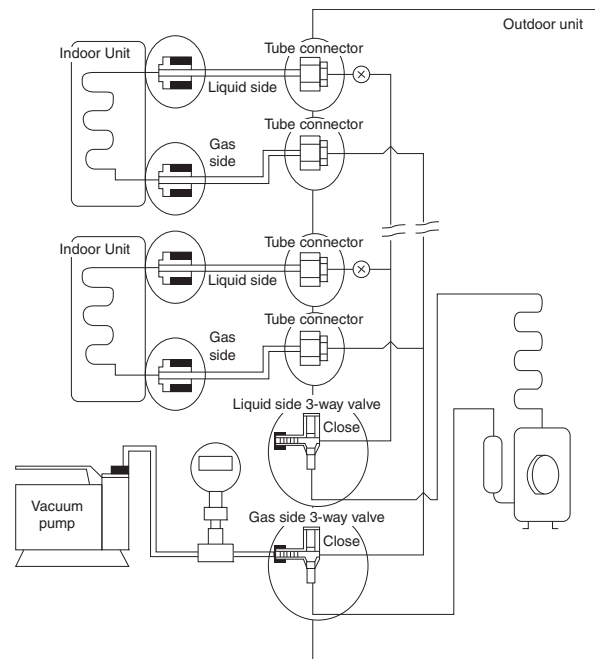


When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

10.1.4 Evacuation Of The Equipment

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

1. Connect a charging hose with a push pin to the Low side of a charging set and the service port of the gas side 3-way valve.
2. Connect the micron gauge between vacuum pump and service port of outdoor units.
3. Turn on the power switch of the vacuum pump and make sure that connect digital micron gauge and to pull down to a value of 500 microns.
4. To make sure micron gauge a value 500 microns and close the low side valve of the charging set and turn off the vacuum pump.
5. Disconnect the vacuum pump house from the service port of the 3-way valve.
6. Tighten the service port caps of gas side 3-way valve at a torque of 13.3 lbf·ft (18 N·m) with a torque wrench.
7. Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to "Open" using a hexagonal wrench (5/32" (4 mm)).
8. Mount valve caps onto the 2-way valve and 3-way valve.
 - o Be sure to check for gas leakage.

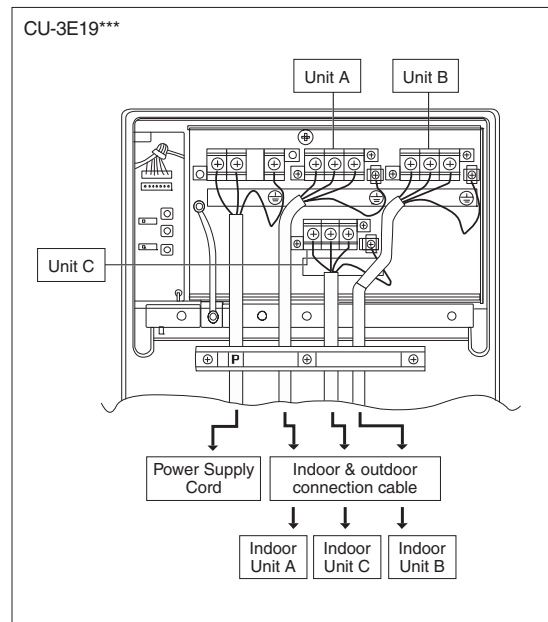
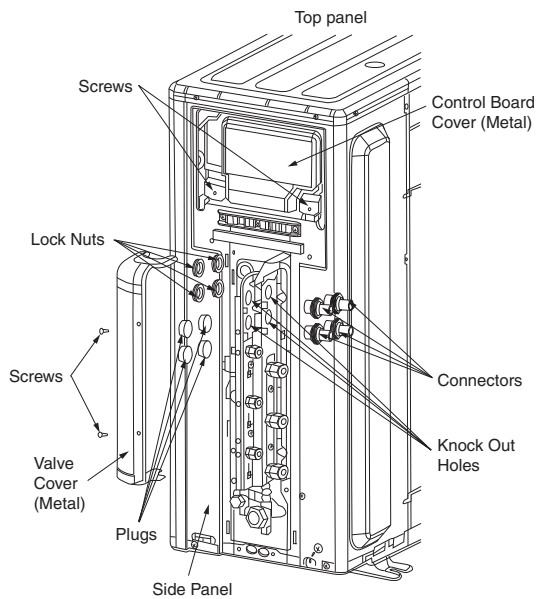
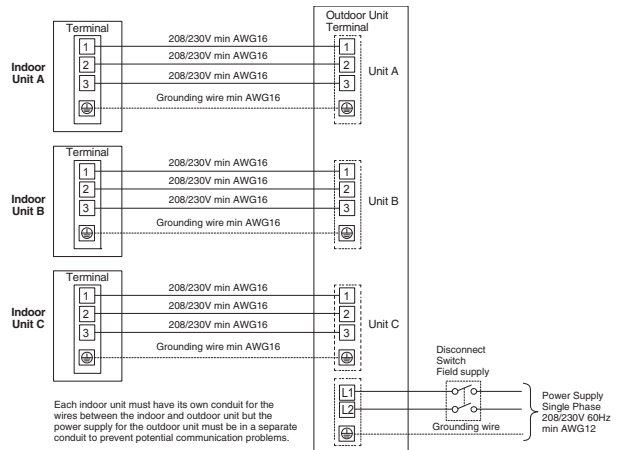


CAUTION

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

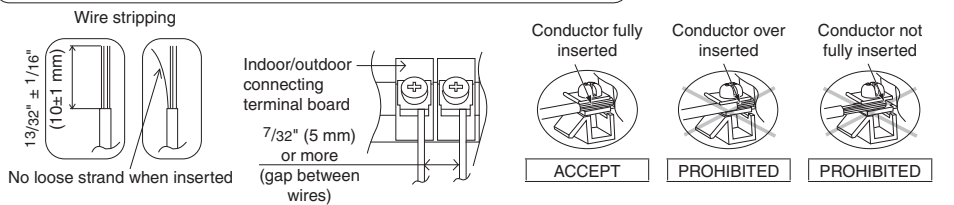
10.1.5 Connect The Cable To The Outdoor Unit

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



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


WIRE STRIPPING AND CONNECTING REQUIREMENT



This equipment must be properly earthed.

- Ground wire must be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reasons.

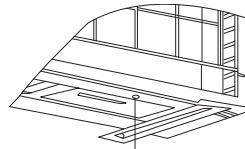
10.1.6 Heat Insulation


 CAUTION	Use a material with good heat-resistant properties as the heat insulation for the pipes. Be sure to insulate both the gas-side and liquid-side pipes. If the pipes are not adequately insulated, condensation or water leakages may occur.
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Liquid-side pipes	Material shall withstand 248°F (120°C) or higher
Gas-side pipes	

10.1.7 Disposal Of Outdoor Unit Drain Water

- If a drain elbow is used, the unit should be placed on a stand which is taller than 1-31/32" (50 mm).
- If the unit is used in an area where temperature falls below 32°F (0°C) for 2 or 3 days in succession, it is recommended not to use a drain elbow, for the drain water freezes and the fan will not rotate.



Drain elbow →  Install the hose at an angle so that the water smoothly flows out.

10.2 CU-4E24RBU

10.2.1 Select The Best Location

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

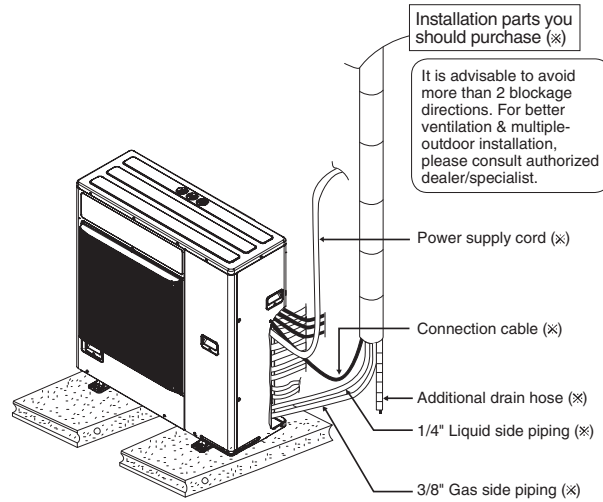
Refrigerant piping size	
Outdoor Unit	CU-4E24***
Liquid - side	ø1/4" (ø6.35 mm) thickness 1/32" (t0.8 mm)
Gas - side	ø3/8" (ø9.52 mm) thickness 1/32" (t0.8 mm) (ø1/2" (ø12.7 mm) thickness 1/32" (t0.8 mm))

* In the case of indoor unit is CS-E24***, a gas-pipe of ø1/2" (ø12.7 mm) thickness 1/32" (t0.8 mm) must be used together with CZ-MA2P (pipe size expander)

Outdoor Unit	CU-4E24***
Min. total piping length for additional gas	147.6 ft (45 m)

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

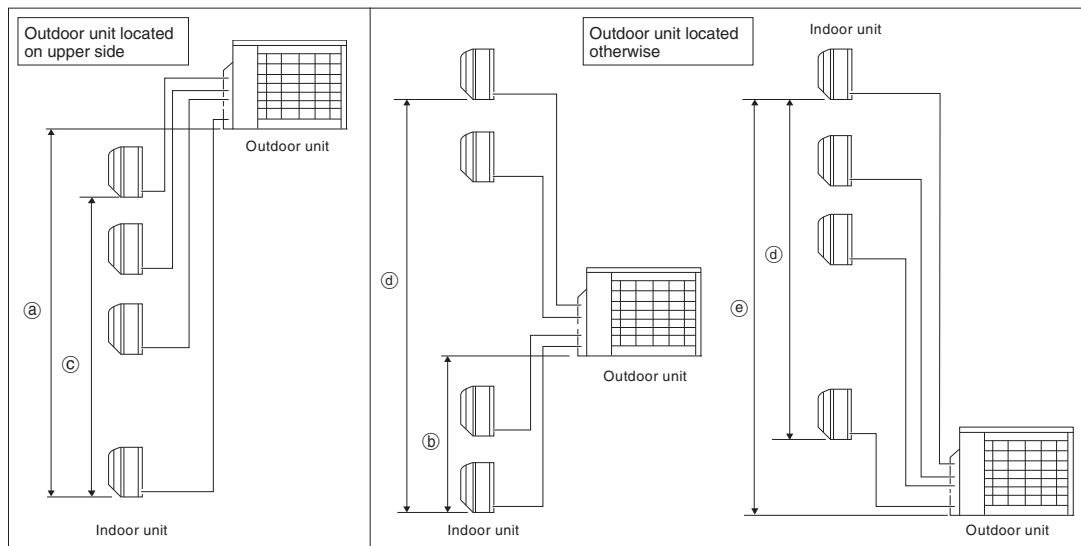
10.2.1.1 Outdoor Unit Installation Diagram



- This illustration is for explanation purposes only.

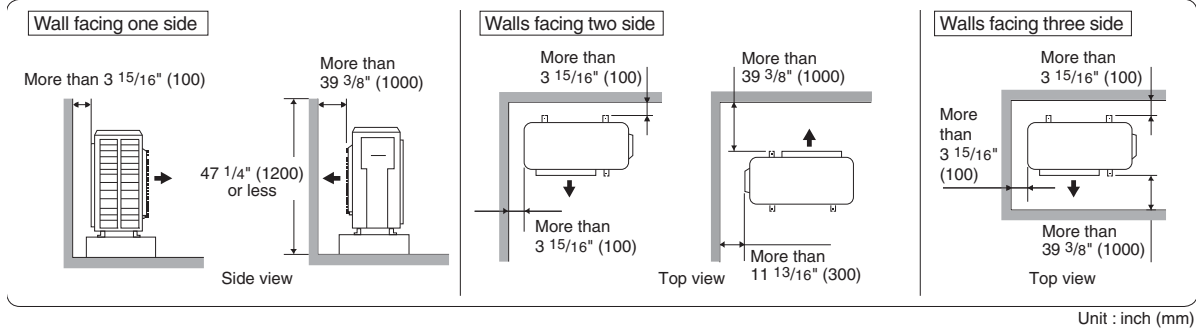
* Note:
Respective indoor unit installation procedure shall refer to instruction manual provided in the indoor unit packaging.

Allowable piping length			
Outdoor Unit		CU-4E24***	
Allowable piping length of each indoor unit (min. ~ max.)		9.8 ft ~ 82.0 ft (3 m ~ 25 m)	
Allowable total piping length of all indoor unit		229.6 ft (70 m) or less	
Height difference between indoor and outdoor unit	Outdoor unit located on upper side	a	49.2 ft (15 m) or less
	Outdoor unit located otherwise	b	24.6 ft (7.5 m) or less
	Outdoor unit located otherwise	c	49.2 ft (15 m) or less
Height difference between indoor unit	Outdoor unit located on upper side	c	24.6 ft (7.5 m) or less
	Outdoor unit located otherwise	d	49.2 ft (15 m) or less



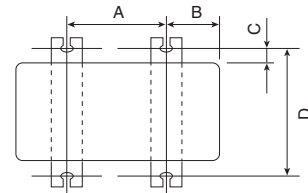
Outdoor Unit Installation Guidelines

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



10.2.2 Install The Outdoor Unit

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



Model	A	B	C	D
CU-4E24***	24-13/32" (620 mm)	6-11/16" (170 mm)	25/32" (20 mm)	14-31/32" (380.5 mm)

10.2.3 Connect The Piping

- Remove the cabinet side plate (metal) from the unit by loosening six screws.

Connecting The Piping To Outdoor Unit

Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe.

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

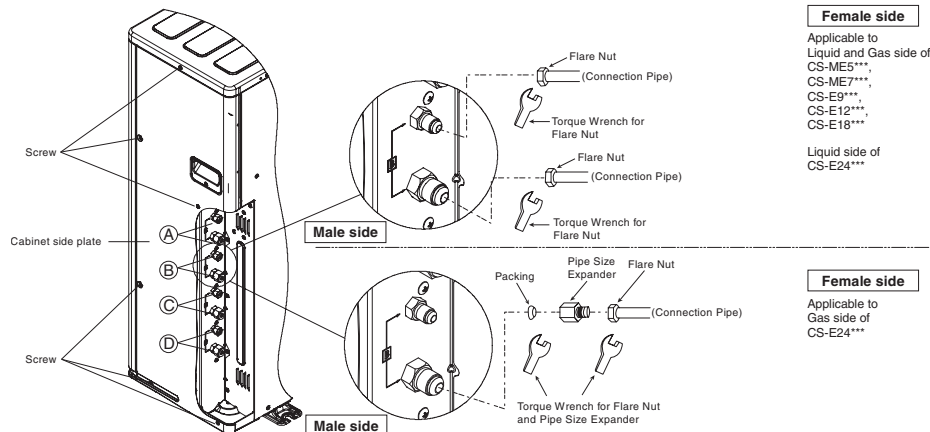
Do not over tighten, over tightening may cause gas leakage	
Piping size	Torque
1/4" [6.35 mm]	13.3 lbf·ft [18 N·m (1.8 kgf·m)]
3/8" [9.52 mm]	31.0 lbf·ft [42 N·m (4.3 kgf·m)]
1/2" [12.7 mm]	40.6 lbf·ft [55 N·m (5.6 kgf·m)]
5/8" [15.88 mm]	47.9 lbf·ft [65 N·m (6.6 kgf·m)]
3/4" [19.05 mm]	73.8 lbf·ft [100 N·m (10.2 kgf·m)]

Gas Leak Checking

Pressure test to system to 400 PSIG with dry nitrogen, in stages.

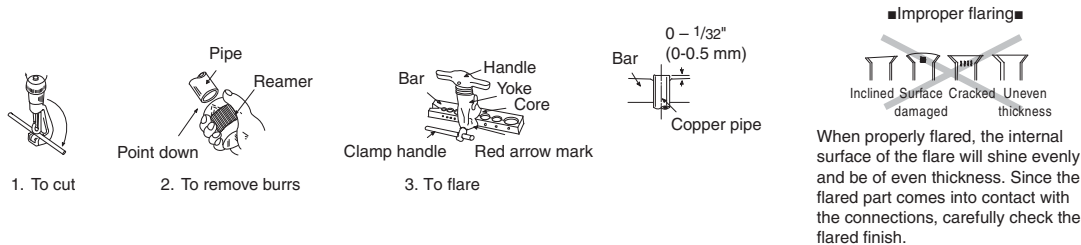
Thoroughly leak check the system.

If the pressure holds, release the nitrogen and proceed to section 10.2.4.



CUTTING AND FLARING THE PIPING

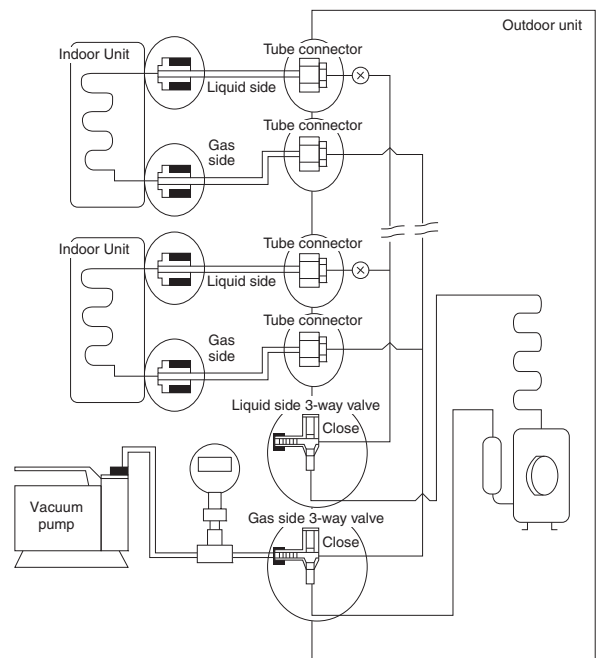
1. Please cut using pipe cutter and then remove the burrs.
2. Remove the burrs by using a reamer. If burrs are not removed, gas leakage may occur.
Turn the piping end down to avoid the metal powder entering the pipe.
3. Please make flare after inserting the flare nut onto the copper pipes.



10.2.4 Evacuation Of The Equipment

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

1. Connect a charging hose with a push pin to the Low side of a charging set and the service port of the gas side 3-way valve.
2. Connect the micron gauge between vacuum pump and service port of outdoor units.
3. Turn on the power switch of the vacuum pump and make sure to connect the digital micron gauge and to lower to a value of 500 microns.
4. Make sure micron gauge indicates a value of 500 microns and close the low side valve of the charging set and turn off the vacuum pump.
5. Disconnect the vacuum pump house from the service port of the 3-way valve.
6. Tighten the service port caps of gas side 3-way valve at a torque of 13.3 lbf•ft (18 N•m) with a torque wrench.
7. Remove the valve caps of both the 2-way valve and 3-way valve. Position both of the valves to "Open" using a hexagonal wrench (5/32" (4 mm)).
8. Mount valve caps onto the 2-way valve and 3-way valve.
 - Be sure to check for gas leakage.

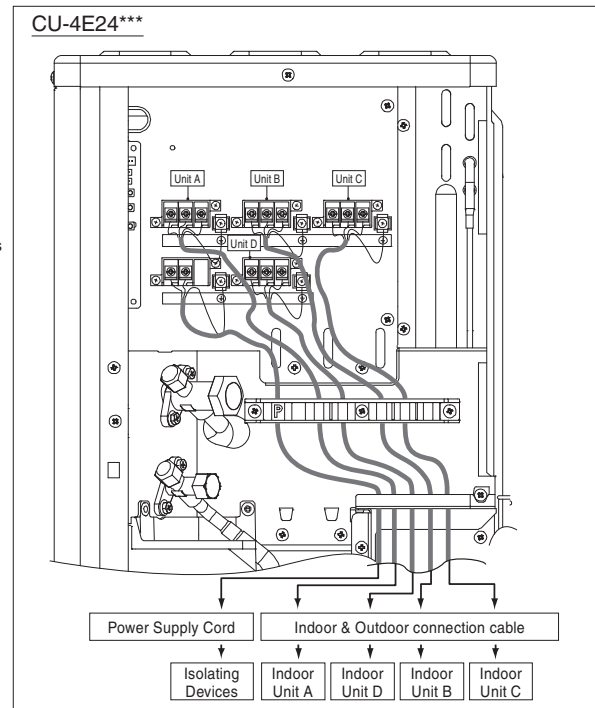
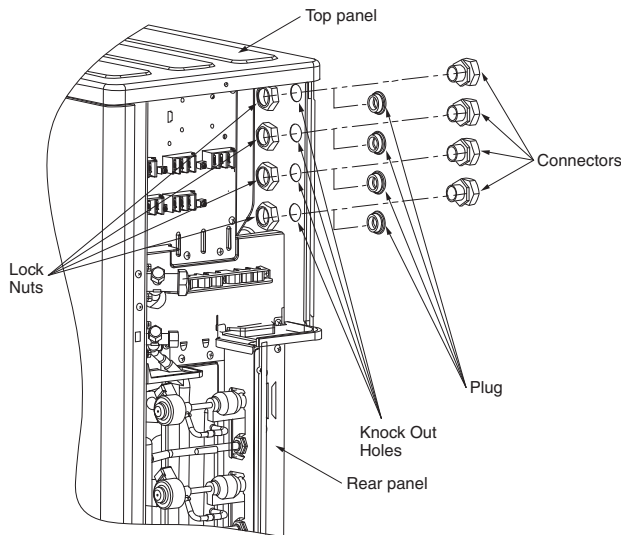
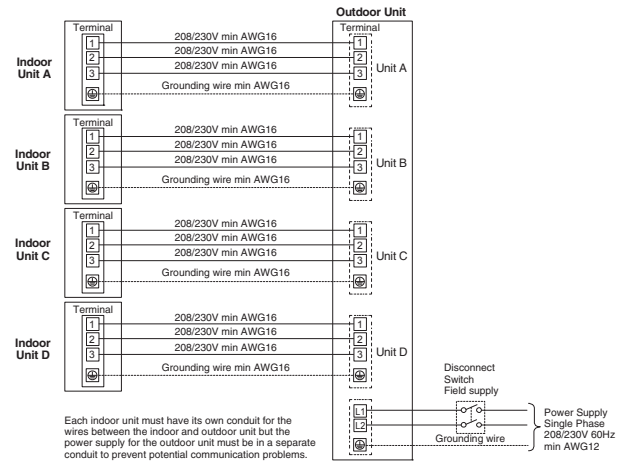


CAUTION

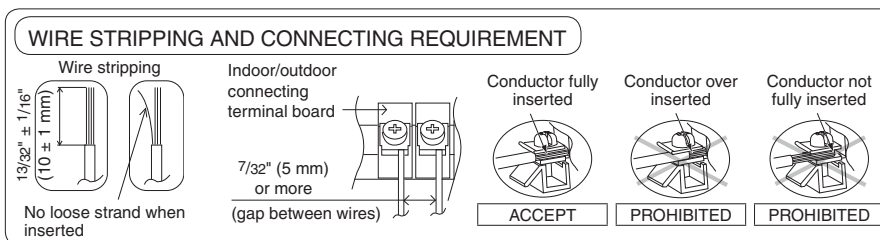
- If micron gauge value does not descend 500 microns, take the following measures:
 - If the leak stops when the piping connections are tightened further, continue working from step ③.
 - If the leak does not stop when the connections are retightened, repair location of leak.
 - Do not release refrigerant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

10.2.5 Connect The Cable To The Outdoor Unit

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




6. For wire stripping and connection requirement, refer to the diagram below.
7. Secure the power supply cord and connection cables onto the control board with the holder.
8. Fix the cabinet side plate (metal) back to the original position with screws.



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

10.2.6 Heat Insulation

 CAUTION	Use a material with good heat-resistant properties as the heat insulation for the pipes. Be sure to insulate both the gas-side and liquid-side pipes. If the pipes are not adequately insulated, condensation or water leakages may occur.
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Liquid-side pipes	Material shall withstand 248°F (120°C) or higher
Gas-side pipes	

10.2.7 Disposal Of Outdoor Unit Drain Water

- If a drain elbow is used, the unit should be placed on a stand which is taller than 1-31/32" (50 mm).
- If the unit is used in an area where temperature falls below 32°F (0°C) for 2 or 3 days in succession, it is recommended not to use a drain elbow, for the drain water freezes and the fan will not rotate.

