

## Required tools for Installation Works

1 Phillips screw driver	7 Reamer	12 Megameter	40.6 lbf.ft
2 Level gauge	8 Knife	13 Multimeter	47.9 lbf.ft
3 Electric drill, hole core drill (ø2 3/4")	9 Gas leak detector	14 Torque wrench	73.8 lbf.ft
4 Hexagonal wrench (5/32")	10 Measuring tape	15 Vacuum pump	13.3 lbf.ft
5 Spanner	11 Thermometer	16 Digital Micron Gauge	31.0 lbf.ft
6 Pipe cutter			

## SAFETY PRECAUTIONS

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

<b>⚠ WARNING</b>	This indication shows the possibility of causing death or serious injury.
<b>⚠ CAUTION</b>	This indication shows the possibility of causing injury or damage to properties only.

The items to be followed are classified by the symbols:

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

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

## ⚠ WARNING

- Do not install outdoor unit near handrail of veranda. When installing air-conditioner unit on veranda of a high rise building, child may climb up to outdoor unit and cross over the handrail causing an accident.
- Do not use unspecified cord, modified cord, joint cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire.
- Do not tie up the power supply cord into a bundle by band. Abnormal temperature rise on power supply cord may happen.
- Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.
- Do not sit or step on the unit, you may fall down accidentally.
- Keep plastic bag (packaging material) away from small children, it may cling to nose and mouth and prevent breathing.
- When installing or relocating air conditioner, do not let any substance other than the specified refrigerant, eg. air etc. mix into refrigeration cycle (piping). Mixing of air etc will cause abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
- Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury etc.
- For R410A model, use piping, flare nut and tools which is specified for R410A refrigerant. Using of existing (R22) piping, flare nut and tools may cause abnormally high pressure in the refrigerant cycle (piping), and possibly result in explosion and injury.
  - Thickness of copper pipes used with R410A must be more than 1/32". Never use copper pipes thinner than 1/32".
  - It is desirable that the amount of residual oil is less than 0.0008 oz./ft.
- Engage authorized dealer or specialist for installation. If installation done by the user is incorrect, it will cause water leakage, electrical shock or fire.
- Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.
- Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.
- Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
- For installation work, follow all electrical, building, plumbing, local codes, regulations and these installation instructions. If electrical circuit capacity is not enough or a defect is found in electrical work, it will cause electrical shock or fire.
- Do not use spliced wires for indoor / outdoor connection cable. Use the specified indoor / outdoor connection cable, refer to instruction ⑤ **INDOOR/OUTDOOR UNIT ELECTRICAL WIRING** and connect tightly for indoor/outdoor connection. Clamp the cable so that no external force will have impact on the terminal. If connection or wiring is not perfect, it will cause heatup or fire at the connection.
- Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause fire or electrical shock.
- This equipment must be installed with an Earth Leakage Circuit Breaker (ELCB) or Ground Fault Current Interrupter (GFCI) or Appliance Leakage Current Interrupter (ALCI) that has been certified by an NRTL Certified Testing Agency and that is suitable for the voltages and amperages involved. Otherwise, it may cause electrical shock and fire in case of equipment breakdown.
- During installation, install the refrigerant piping properly before running the compressor. Operation of compressor without fixing refrigeration piping and valves at opened condition will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
- During pump down operation, stop the compressor before removing the refrigeration piping. Removal of refrigeration piping while compressor is operating and valves are opened will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
- Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.
- After completion of installation, confirm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant comes into contact with fire.
- Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when the refrigerant comes into contact with fire.
- This equipment must be properly earthed. Earth line must not be connected to gas pipe, water pipe, earth of lightning rod and telephone. Otherwise, it may cause electrical shock in case of equipment breakdown or installation breakdown.

## ⚠ CAUTION

- Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.
- Do not release refrigerant during piping work for installation, re-installation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
- Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.
- Do not touch the sharp aluminium fin, sharp parts may cause injury.
- Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
- Select an installation location which is easy for maintenance.
- Power supply connection to the room air conditioner.
  - Power supply cord shall be UL listed or CSA approved 3 conductor with minimum AWG12 wires.
  - Power supply point should be in an easily accessible place for power disconnection in case of emergency.
  - In some countries, permanent connection of this air conditioner to the power supply is prohibited.
  - Fix power supply connection to a circuit breaker for permanent connection.
  - Use NRTL approved fuse or circuit breaker (rating refers to name plate) for permanent connection.
- Installation work.
  - It may need two people to carry out the installation work.

## ACCESSORIES SUPPLIED WITH OUTDOOR UNIT

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

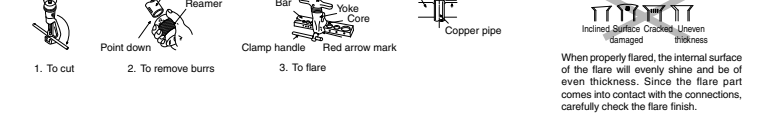
HEAT PUMP-TYPES ONLY			
Part name	Qty.	Diagram	Application
Drain elbow	1		For connecting the drain pipe

## CUTTING AND FLARING THE PIPING

- Please cut using pipe cutter and then remove the burrs.
- Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused.

Turn the piping end down to avoid the metal powder entering the pipe.

- Please make flare after inserting the flare nut onto the copper pipes.

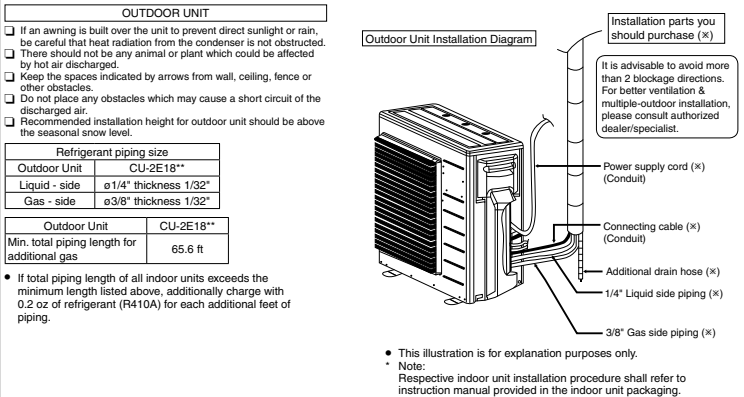


## QUICK GUIDE PIPING &amp; ELECTRICAL SPECIFICATION

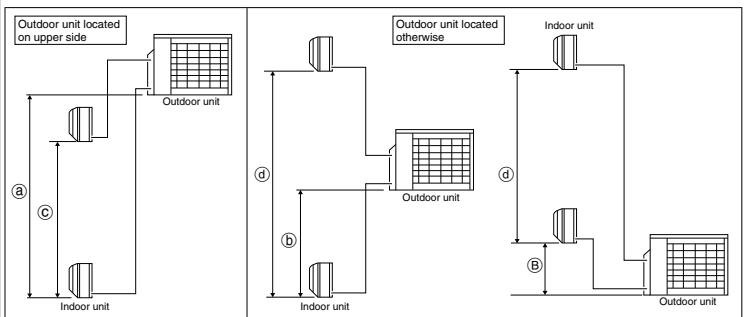
Indoor (I) & Outdoor (O) units: Possible Combination Patterns	Capacity (Btu/h)	Refrigerant	Piping size		Max. Elevation	Min. pipe length for each ID unit	Max. from OD to each ID	Max. total length	Min. total pipe length for additional gas	Additional refrigerant	Power supply	Power supply wire size	OD-ID connection wire size
			Gas	Liquid									
Outdoor (OD): CU-2E18BU Indoor (I): 2 UNITS OF CS-E12NKUAW	16700	R410A	ø3/8" (ø9.52mm)	ø1/4" (ø6.35mm)	24.6 ft	See Step 1	9.8 ft	82.0 ft	164.0 ft	65.6 ft	0.2 oz / ft MCA 20A MOP 25A	AWG12	AWG16
Outdoor (OD): CU-2E18BU Indoor (I): 2 UNITS OF CS-E12NKUAW													
Outdoor (OD): CU-2E18BU Indoor (I): 1 UNIT OF CS-E12NKUAW + 1 UNIT OF CS-E12NKUAW													

Example:  
If total piping length of all installed indoor units is at 68.6 ft, the quantity of additional refrigerant should be 0.6 oz ..... (68.6 - 65.6) ft x 0.2 oz / ft = 0.6 oz.

## 1 SELECT THE BEST LOCATION

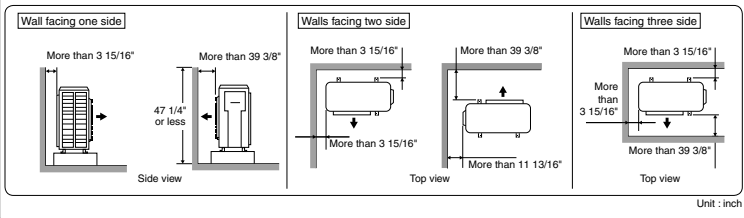


Allowable piping length			
Outdoor Unit		CU-2E18**	
Allowable piping length of each indoor unit (min. ~ max.)		9.8 ft ~ 82.0 ft	
Allowable total piping length of all indoor unit		164.0 ft or less	
Height difference between indoor and outdoor unit	Outdoor unit located on upper side	(a)	49.2 ft or less
	Outdoor unit located otherwise	(b)	24.6 ft or less
Height difference between indoor unit	Outdoor unit located on upper side	(c)	24.6 ft or less
	Outdoor unit located otherwise	(d)	49.2 ft 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" or less.



## 2 INSTALL THE OUTDOOR UNIT

- After selecting the best location, start installation to Indoor/Outdoor Unit Installation Diagram.

- Fix the unit on concrete or rigid frame firmly and horizontally with bolt nut (ø13/32").
- When installing on a roof, please consider strong winds and earthquakes.
- Please fasten the installation stand firmly with bolt or nails.

Model	A	B	C	D
CU-2E18**	24-1/8"	5-5/32"	5/8"	14-3/16"

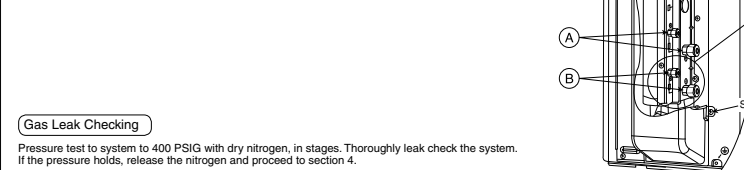
## 3 CONNECT THE PIPING

- 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 overtighten, over tightening may cause gas leakage.	
Piping size	Torque
1/4" (0.02 ft)	[18 N·m (13.3 lbf. ft)]
3/8" (0.03 ft)	[42 N·m (31.0 lbf. ft)]
1/2" (0.04 ft)	[55 N·m (40.6 lbf. ft)]
5/8" (0.05 ft)	[65 N·m (47.9 lbf. ft)]
3/4" (0.06 ft)	[100 N·m (73.8 lbf. ft)]



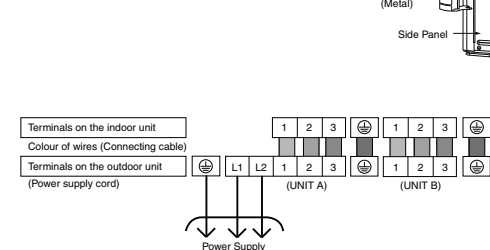
## Gas Leak Checking

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 4.

## OUTDOOR UNIT

## 5 CONNECT THE CABLE TO THE OUTDOOR UNIT

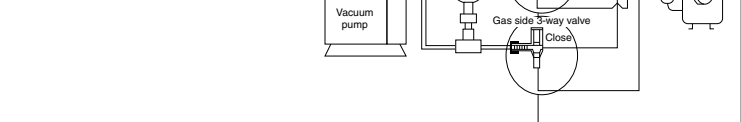
- Remove Control Board Cover (Metal) by loosening 2 screws.
- Remove Valve Cover (Metal) by loosening 2 screws.
- Remove Plugs.
- Fix the conduit connectors to the knock out holes with lock-nuts, then secure them.
- Connecting wire between indoor unit and outdoor unit should be UL listed or CSA approved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



## 4 EVACUATION OF THE EQUIPMENT

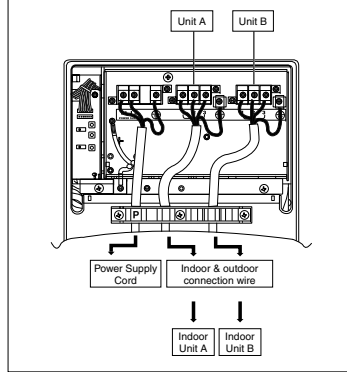
WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.

- 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.
- Connect the micron gauge between vacuum pump and service port of outdoor units.
- 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.
- Make sure micron gauge a value 500 microns and close the low side valve of the charging set and turn off the vacuum pump.
- Disconnect the vacuum pump house from the service port of the 3-way valve.
- Tighten the service port caps of gas side 3-way valve at a torque of 13.3 lbf.ft with a torque wrench.
- 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").
- Mount valve caps onto the 2-way valve and 3-way valve.
  - Be sure to check for gas leakage.



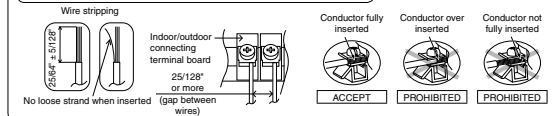
## ⚠ CAUTION

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



- For wire stripping and connection requirement, refer to the diagram below.
- Secure the power supply cord and connecting cables onto the control board with the holder.
- 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.

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

## 6 HEAT INSULATION

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

## DISPOSAL OF OUTDOOR UNIT DRAIN WATER

- If a drain elbow is used, the unit should be placed on a stand which is taller than 5 cm.
- If the unit is used in an area where temperature falls below 32°F 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.

## PUMP DOWN OPERATION

- Operate the pump down according to the following procedures.
  - Confirm the valve on the liquid side and gas side is open.
  - Press PUMP DOWN switch (SW1) on the display printed circuit board for more than 5 seconds. Pump down (cooling) operation is performed for 15 minutes.
  - Set the liquid side 3-way valve to close position and wait until the pressure gauge indicates 1.45 PSI.
  - Immediately set the gas side valve to close position and then press the PUMP DOWN switch (SW1) to stop the pump down operation.

Note: Pump down operation will stop automatically after 15 minutes if PUMP DOWN switch (SW1) is not pressed again.

Pump down operation cannot be restarted until 3 minutes after compressor is stopped.

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

O: Flashing

## COOLING ONLY OPERATION

- Setting of Cooling only operation.

The equipment can be set to cooling only operation by setting the JP line on the outdoor unit display circuit board.

[Setting method]

Switch off power supply to the outdoor unit, cut JP1N1 (COOL ONLY), as shown in Figure 1.

After cutting off the wire, switch ON the equipment power.

When setting the cooling only operation, Heating operation is disabled.

ODOUR WASH operation is disabled. (Odour cut operation is still enabled.)

To revert the setting back to heat pump operation, switch OFF the equipment power, reconnect JP1 (COOL ONLY) back to short circuit condition and switch ON the equipment power.

## WIRING ERROR CHECK

This product is capable of correcting wiring errors automatically by following these procedures.

- Confirm the valve on the liquid side and gas side is open.
- Press WIRING CHECK switch (SW3) on the display printed circuit board for more than 10 seconds to start wiring check operation.
- Wiring check process will complete in approximately 10 minutes. However, wiring check operation will not start within 3 minutes after compressor is stopped. When outdoor air temperature is less than 41°F or unit is malfunctioning, wiring check will not start. (See NOTE 2)

The LED 2 to 6 in display printed circuit board inside the outdoor unit indicate whether correction is possible or not and the status of the correction, as shown in the table below.

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

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

## NOTE

- For two rooms, LED-4 and 5 are not illuminated after wiring operation is complete.
- If the outdoor air temperature is less than 41°F or unit has abnormally, wiring operation will not start.
- After wiring check operation is complete, LED indication will be illuminated until normal operation starts.
- Follow the product diagnosis procedure. (Check the diagnostic label at the control board cover.)
- When LED 1 only is illuminated, this indicates that outdoor unit is operating normally.

## CHECK ITEMS

- Short circuit of the blow-out air
- Smooth flow of the drain
- Reliable thermal insulation
- Leakage of refrigerant
- Mistake in wiring
- Reliable connection of the grand wire
- Looseness in terminal screw
- Grounding/Earth connection