12. Installation Instruction (CU-3Z52/68/4Z68CBE)

12.1 Select The Best Location

12.1.1 Outdoor Unit

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

Table A

Model	Maximum Total Piping Length to Add Gas (m)	Additional Refrigerant (g/m)	Max. Refrigerant Charge (kg)	Wall Mounted Indoor Amin (m^2)	Mini Cassette Indoor Amin (m^2)	Ducted Indoor Amin (m^2)
CU-3Z52***	30	20	2.32	5.60	4.58	4.58
CU-3Z68***	30	20	2.85	7.68	5.63	5.63
CU-4Z68***	30	20	2.85	7.68	5.63	5.63

(*) Systems with total refrigerant charge, m_c, lower than 1.84 kg are not subjected to any room area requirements.

- If total piping length of all indoor units exceed the maximum total length listed above, additionally charge with 20 g of refrigerant (R32) for each additional meter of piping.

$$Amin = (m_c / (2.5 \times (LFL)^{(5/4)} \times h_0))^2$$

** not less than concentration factor margin

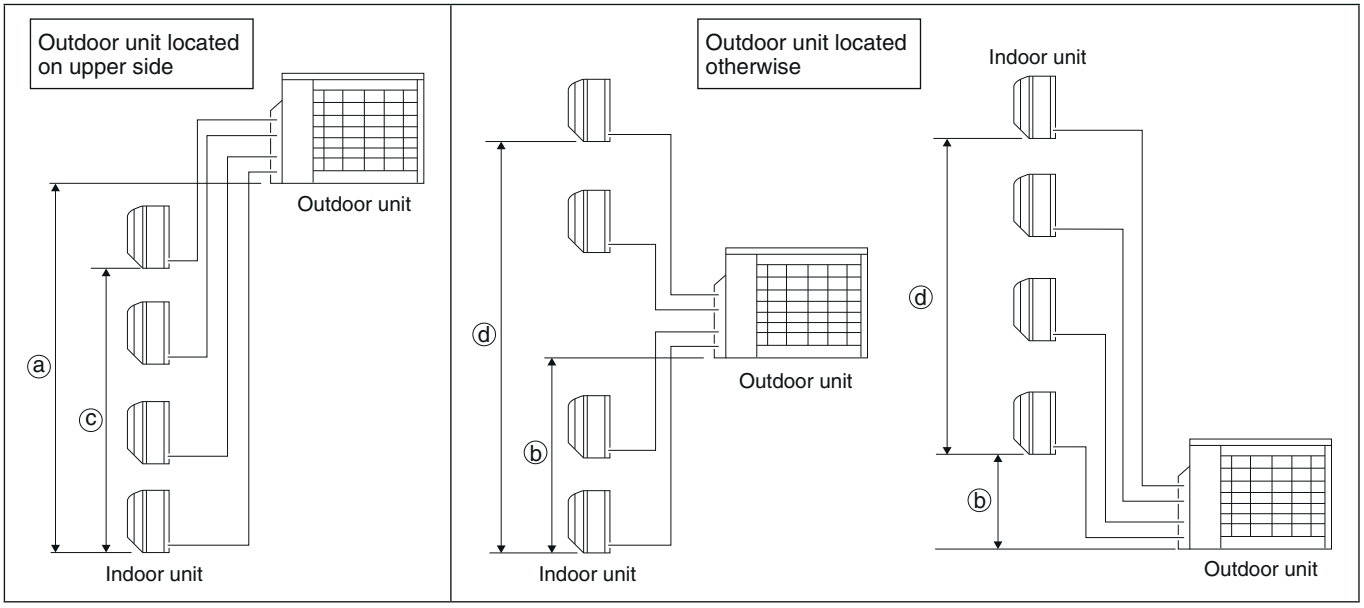
A_{min} = Required minimum room area, in m^2
m_c = Refrigerant charge in appliance, in kg
LFL = Lower flammability limit (0.307 kg/m^3)
h_0 = Installation height of the appliance (1.8 m for wall mounted)
(2.2 m for mini cassette and ducted)
CF = Concentration factor with a value of 0.75

** The required minimum room area, Amin, shall also be governed by the concentration factor margin formula below :

$$Amin = m_c / (CF \times LFL \times h_0)$$

The higher value shall be taken when determining the room area.

Allowable piping length				
Outdoor Unit			CU-3Z52***	CU-3Z68***, CU-4Z68***
Allowable piping length of each indoor unit (min. ~ max.)			3 m ~ 25 m	3 m ~ 25 m
Allowable total piping length of all indoor unit			50 m or less	60 m or less
Height difference between indoor and outdoor unit	Outdoor unit located on upper side	ⓐ	15 m or less	15 m or less
	Outdoor unit located otherwise	ⓑ	7.5 m or less	7.5 m or less
Height difference between indoor unit	Outdoor unit located on upper side	ⓒ	7.5 m or less	7.5 m or less
	Outdoor unit located otherwise	ⓓ	15 m or less	15 m or less



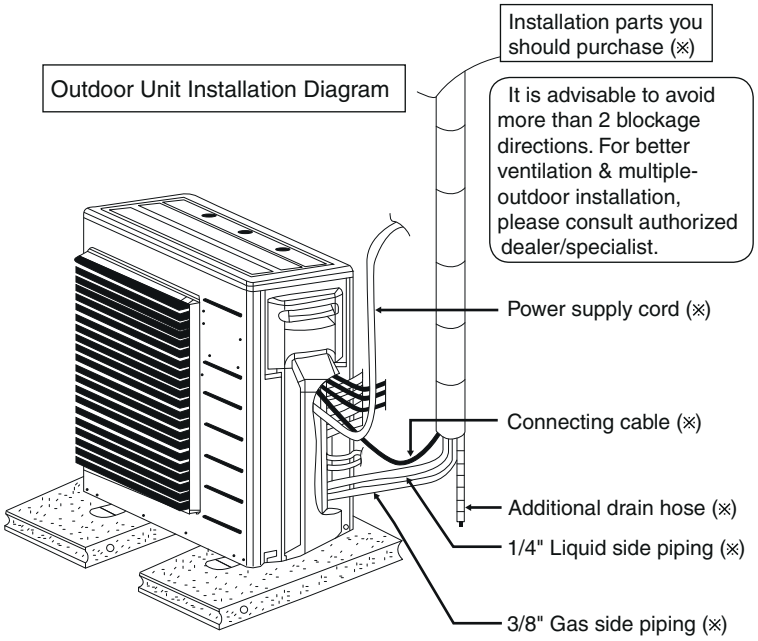
12.1.2 Outdoor Unit Installation Diagram

Refrigerant piping size		
Outdoor Unit	CU-3Z52***	CU-3Z68***, CU-4Z68***
Liquid - side	ø 6.35 t0.8	ø 6.35 t0.8
Gas - side	ø 9.52 t0.8	ø 9.52 t0.8 *(ø 12.7 t0.8)

* In case of indoor is CS-Z60***, CS-TZ60***, S-60***, then ø 12.7 t0.8 gas-pipe size must be used together with CZ-MA2PA (pipe size expander)

Attention:
Water droplet will be formed outside the base pan due to the temperature difference.
We would recommend installer to apply **insulators onto the refrigerant pipes'** and 2,3-way valve in order to minimize the amount of condensate accumulated inside the base pan which cause the temperature difference.

Outdoor Unit Installation Diagram

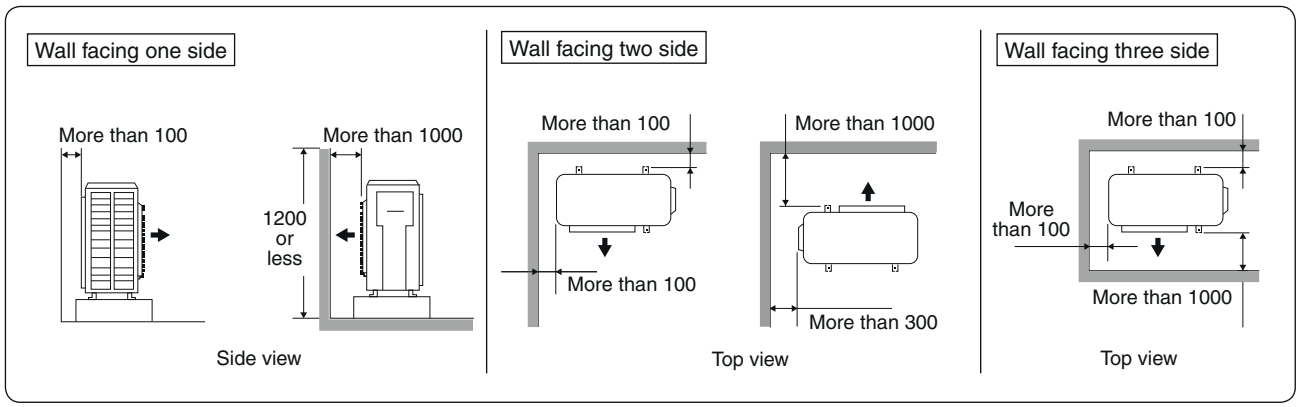


- This illustration is for explanation purposes only.

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

Outdoor Unit Installation Guidelines

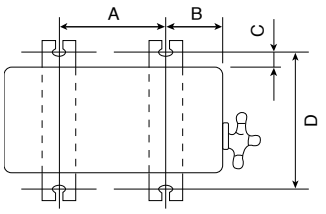
- Where a wall or other obstacle is in the path of outdoor unit's intake or exhaust airflow, follow the installation guidelines below.
- For any of the below installation patterns, the wall height on the exhaust side should be 1200 mm or less.



Unit : mm

12.2 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 (ø10 mm).
  2. When installing at roof, please consider strong wind and earthquake.
     Please fasten the installation stand firmly with bolt, screws or nails.



Model	A	B	C	D
CU-3Z52***, CU-3Z68***, CU-4Z68***	613 mm	131 mm	24 mm	360.5 mm

12.3 Connect The Piping

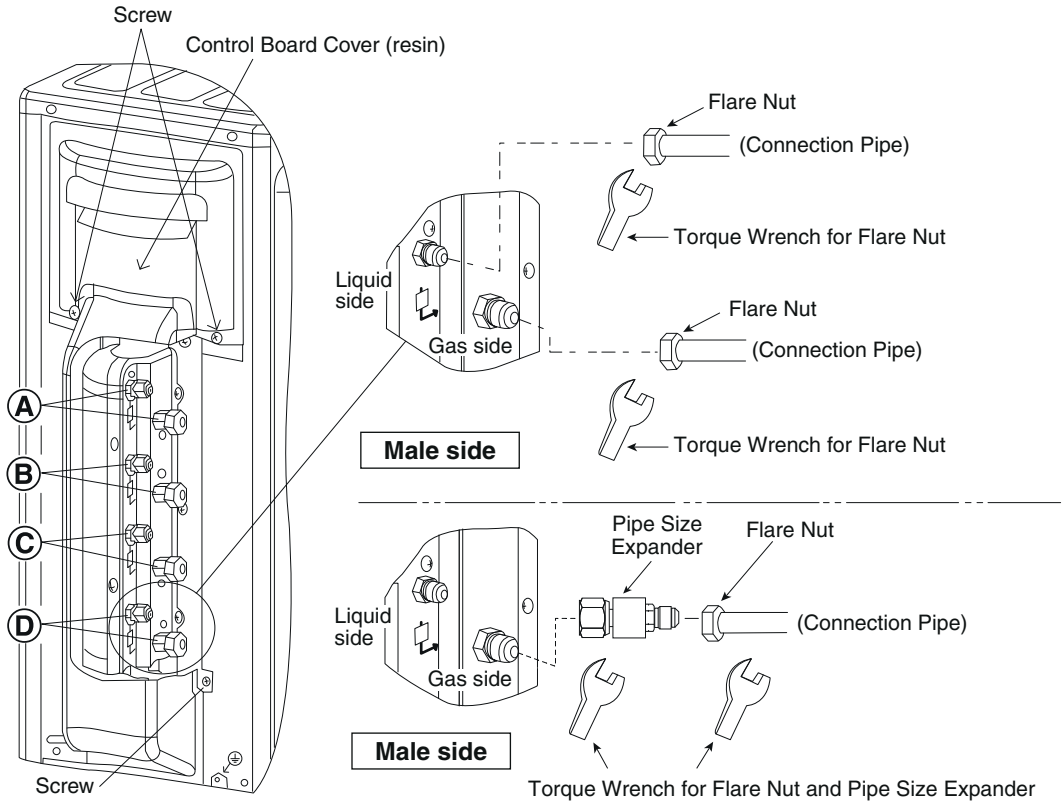
- Remove the control board cover (resin) from the unit by loosening three screws.

Connecting The Piping To Outdoor

Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge.

Make flare after inserting the flare nut (locate at valve) onto the copper pipe. Align center of piping to valve and then tighten with torque wrench to the specified torque as stated in the table.

⚠ CAUTION	
⃠ Do not over tighten, overtightening may cause gas leakage	
Piping size	Torque
1/4" (6.35 mm)	[18N•m (1.8 kgf.m)]
3/8" (9.52 mm)	[42 N•m (4.3 kgf.m)]
1/2" (12.7 mm)	[55 N•m (5.6 kgf.m)]
5/8" (15.88 mm)	[65 N•m (6.6 kgf.m)]
3/4" (19.05 mm)	[100N•m (10.2 kgf.m)]



Female side

Applicable to
Liquid and Gas side of
CS-MZ16***, CS-MZ20***,
CS-MTZ16***, CS-Z20***,
CS-Z25***, CS-Z35***,
CS-Z42***, CS-Z50***,
CS-XZ20***, CS-XZ25***,
CS-XZ35***, CS-XZ42***,
CS-XZ50***, CS-TZ20***,
CS-TZ25***, CS-TZ35***,
CS-TZ42***, CS-TZ50***,
CS-RZ25***, CS-RZ35***,
CS-RZ50***, S-M20***,
S-25***, S-36***, S-50***

Liquid side of
CS-Z60***, CS-TZ60***,
S-60***

Female side

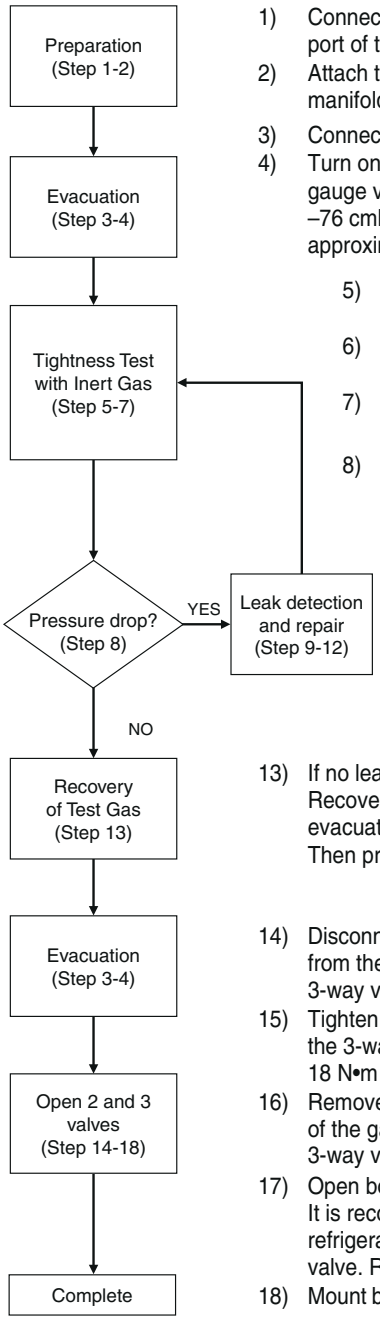
Applicable to
Gas side of CS-Z60***,
CS-TZ60***, S-60***

12.4 Air Tightness Test on the Refrigerating System

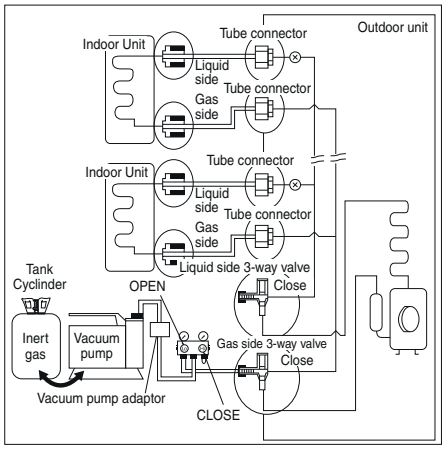
⃠ Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.
❗ There is no extra refrigerant in the outdoor unit for air purging.

- Before system is charged with refrigerant and before the refrigerating system is put into operation, below site test procedure and acceptance criteria shall be verified by the certified technicians, and/or the installer.
- Be sure to check whole system for gas leakage.

- Before system is charged with refrigerant and before the refrigerating system is put into operation, below site test procedure and acceptance criteria shall be verified by the certified technicians, and/or the installer.
- Be sure to check whole system for gas leakage.



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) Attach the gauge manifold set correctly and tightly. Make sure that both valves of the manifold gauge (low pressure and high pressure) is in close position.
3) Connect the center hose of the manifold gauge to a vacuum pump.
4) Turn on the power switch of the vacuum pump, then turn open the low side manifold gauge valve and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to –76 cmHg (–0.1 MPa) or vacuum until 500 microns is achieved. This process continues for approximately ten minutes. Then close the low side manifold gauge valve.
5) Remove the vacuum pump from the centre hose and connect the center hose to cylinder of any applicable inert gas as test gas.
6) Charge test gas into the system and wait until the pressure within the system to reach min. 1.04 MPa (10.4 barg).
7) Wait and monitor the pressure reading on the gauges. Check if there is any pressure drop. Waiting time depends on the size of the system.
8) If there is any pressure drop, perform step 9-12. If there is no pressure drop, perform step 13.
9) Use Gas Leak Detector to check for leaks. Must use the detection equipment with a sensitivity of 5 grams per year of test gas or better.
10) Move the probe along the air conditioning system to check for leaks, and mark for repair.
11) Any leak detected and marked shall be repaired.
12) After repair, repeat evacuation steps 3-4 and tightness test steps 5-7. Check the pressure drop as in step 8.
13) If no leak,
Recover the test gas. Perform evacuation of steps 3-4.
Then proceed to step 14.

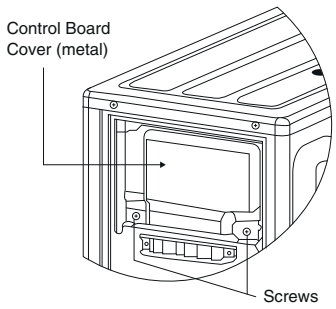


14) Disconnect the charging hose from the service port of the 3-way valve.
15) Tighten the service port caps of the 3-way valve at a torque of 18 N•m with a torque wrench.
16) Remove the valve caps of both of the gas side and liquid side 3-way valve.
17) Open both of the valves, using a hexagonal wrench (4 mm).
It is recommended to allow refrigerant slowly flow into the refrigerant system to prevent refrigerant freezing. Slightly open the liquid side 3-way valve for 5 seconds then close the valve. Repeat this action for 3 cycles then fully open the valve.
18) Mount back the valve caps onto both the 3-way valve to complete this process.

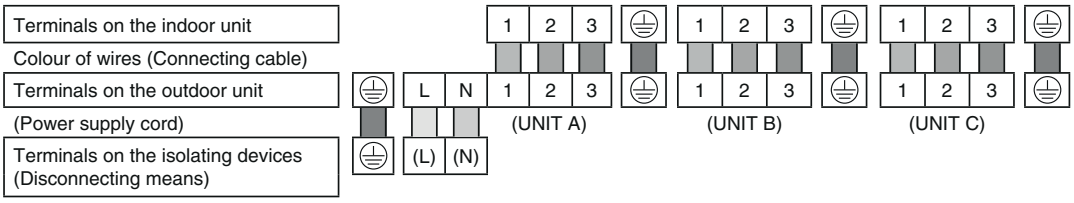
Notes:
Recommended use of any of the following leak detector,
I) Universal Sniffer leak detector
II) Electronic halogen leak detector
III) Ultrasonic Leak Detector

12.5 Connect The Cable To The Outdoor Unit

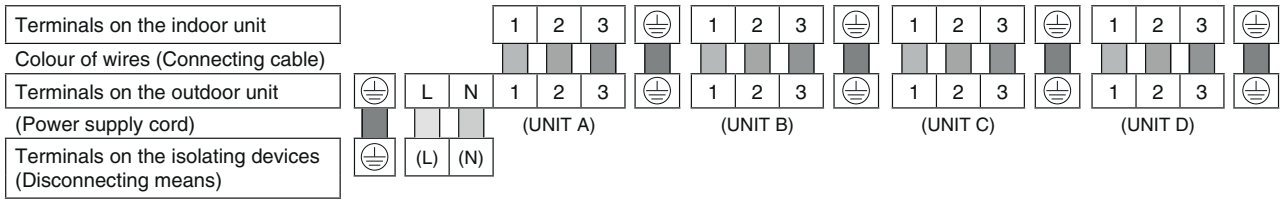
1. Remove the control board cover metal from the unit by loosening two screws.
2. Cable connection to the power supply through Isolating Devices (Disconnecting means).
   - Connect approved type polychloropene sheathed **power supply cord** 3 x 2.5 mm^2 60245 IEC 57 type designation or heavier cord to the terminal board, and connect the others end of the cord to Isolating Devices (Disconnecting means)
3. **Connection cable** between indoor unit and outdoor unit shall be approved polychloroprene sheathed 4 x 1.5 mm^2 flexible cord, type designation 60245 IEC 57 or heavier cord. Allowable connection cable length of each indoor unit shall be 30 m or less.
4. Connect the power supply cord and connecting cable between indoor unit and outdoor unit according to the diagram as shown.



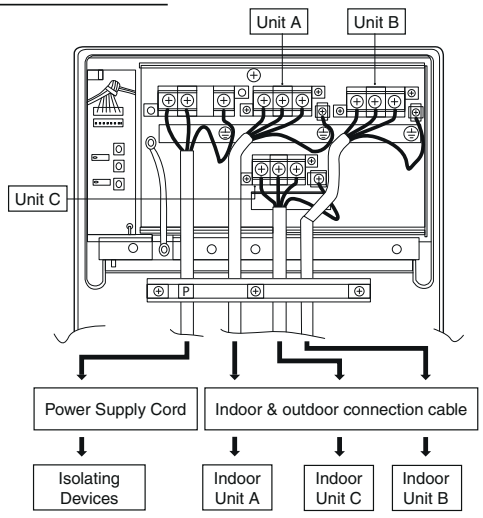
CU-3Z52*, CU-3Z68*****



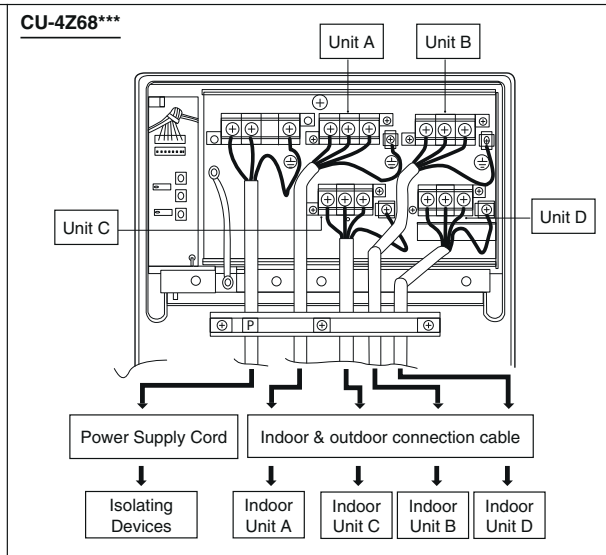
CU-4Z68***



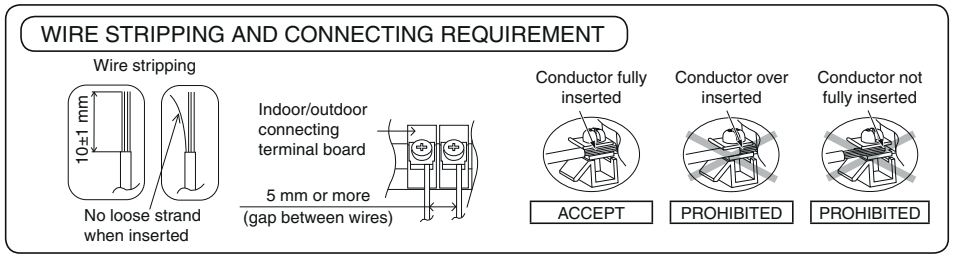
CU-3Z52*, CU-3Z68*****



CU-4Z68***



5. For wire stripping and connection requirement, refer to the diagram below.
6. Secure the power supply cord and connecting cables onto the control board with the holder.
7. Attach the control board cover back to the original position with screw.

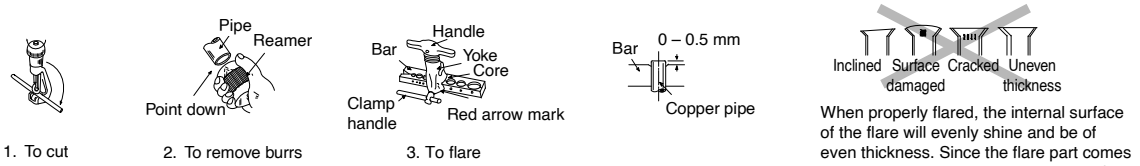


This equipment must be properly earthed.

- Note: Isolating Devices (Disconnecting means) should have minimum 3.0 mm contact gap.
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reason.

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.



1. To cut
2. To remove burrs
3. To flare

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

12.6 Heat Insulation

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

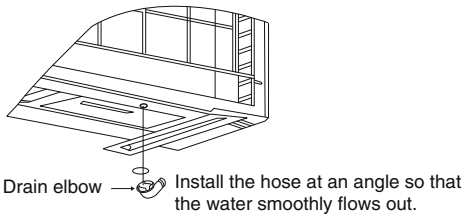
❗	Refrigerant tubing shall be protected against mechanical damage.

⚠ 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.

Liquid-side pipes	Material shall withstand 120°C or higher
Gas-side pipes	

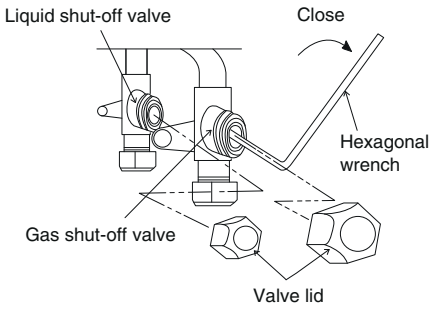
12.7 Disposal Of Outdoor Unit Drain Water

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



12.8 Pump Down Operation

- Operate the pump down according to the following procedures.
  1. Confirm the valve on the liquid side and gas side is open.
  2. 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.
  3. Set the liquid side 3 way valve to close position and wait until the pressure gauge indicates 0.01 MPa (0.1 kg/cm^{2}G).
  4. Immediate 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 is not started within 3 minutes after compressor is stopped.



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

O: Flashing

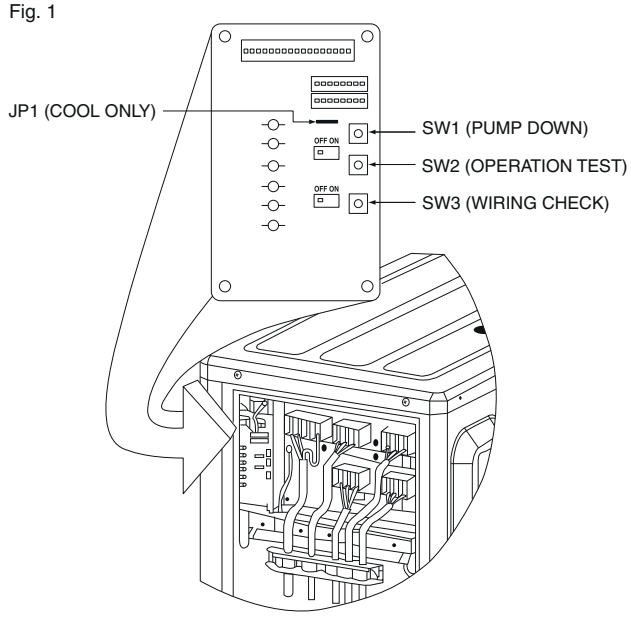
12.9 Cooling Only Operation

- 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 JPN1 (COOL ONLY) as shown in Figure 1.
After cut off the wire, switch ON the equipment power.
When setting the cooling only operation, Heating operation is disable.
ODOUR WASH operation is disabled. (Odour cut operation is still enabled.)
To revert back the setting to heat pump operation, switch OFF the equipment power, reconnect JP1 (COOL ONLY) back to short circuit condition and switch ON the equipment power.

Fig. 1

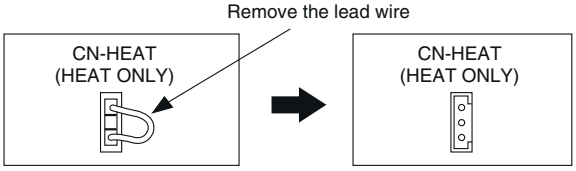


12.10 Heating Only Operation

- Setting of Heating only operation.

The equipment can be set to heating only operation by some setting on the Outdoor unit main circuit board

[Setting method]
Switch off power supply to the outdoor unit, unplug and remove the lead wire on CN-HEAT



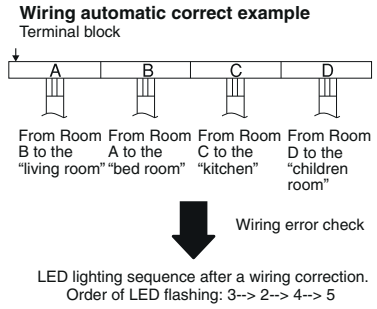
12.11 Wiring Error Check

This product capable to correct the wiring error automatically by following procedures.

1. Confirm the valve on the liquid side and gas side is open.
2. Press WIRING CHECK switch (SW3) on the display printed circuit board for more than 10 seconds to start wiring check operation.
3. Wiring check process will complete in approximately 20-25 minutes. However, wiring check operation will not start within 3 minutes after compressor is stopped. When outdoor air temperature is less than 5 °C or unit has abnormality, 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	2	3	4	5	6	Message
ROOM	A	B	C	D	–	
Status	All flashing					Automatic correction impossible
	LED 2, 4, 6 and LED 3, 5 alternatively flashing					Wiring check in progress
	Flashing one after another					Automatic correction completed
	Other than above					Unit has abnormally (Note 4)



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

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

12.12 In Case of Reusing Existing Refrigerant Piping

Observe the followings to decide reusing the existing refrigerant piping.
Poor refrigerant piping could result in product failure.

- In the circumstances listed below, do not reuse any refrigerant piping. Instead, make sure to install a new piping.
  - Heat insulation is not provided for either liquid-side or gas-side piping or both.
  - The existing refrigerant pipe has been left in an open condition.
  - The diameter and thickness of the existing refrigerant piping does not meet the requirement.
  - The piping length and elevation does not meet the requirement.

  Perform proper pump down before reuse piping.
- In the circumstances listed below, clean it thoroughly before reuse.
  - Pump down operation cannot be performed for the existing air-conditioner.
  - The compressor has a failure history.
  - Oil color is darken. (ASTM 4.0 and above).
  - The existing air-conditioner is gas/oil heat pump type.
- Do not reuse the flare to prevent gas leak. Make sure to install a new flare.
- If there is a welded part on the existing refrigerant piping, conduct a gas leak check on the welded part.
- Replace deteriorated heat insulating material with a new one.
  Heat insulating material is required for both liquid-side and gas-side piping.