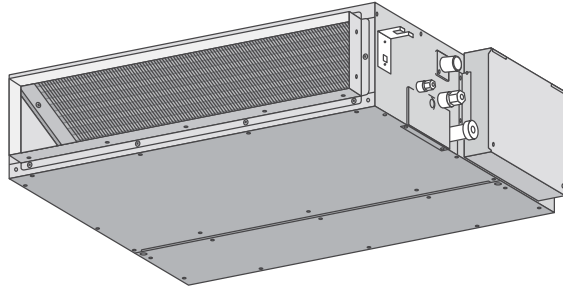


# Installation Manual

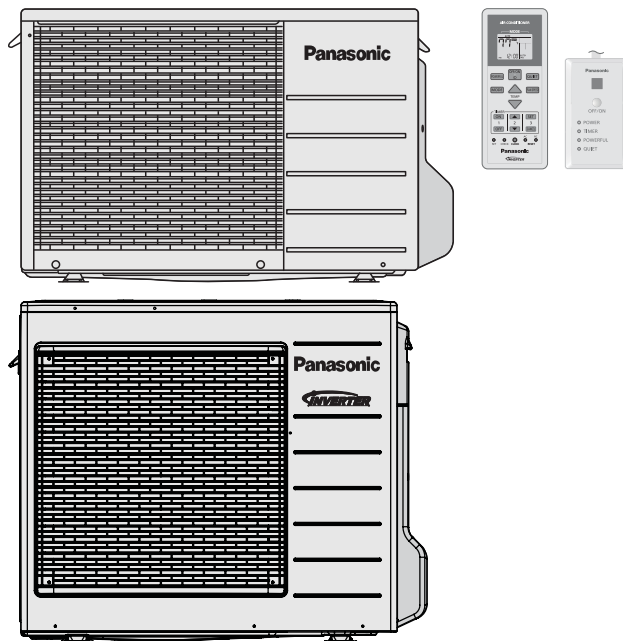
## Air Conditioner



**Indoor Unit**  
**CS-E9SD3UAW**  
**CS-E12SD3UAW**  
**CS-E18SD3UAW**

**Outdoor Unit**  
**CU-E9SD3UA**  
**CU-E12SD3UA**  
**CU-E18SD3UA**

**Destination**  
**USA**



### **⚠ 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<sup>®</sup>






# 11. Installation Instruction







- IMPORTANT (ONLY FOR E9SD3UAW AND E12SD3UAW)**

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

## Attached Accessories

No.	Accessory part	Qty.
1	Remote control 	1
2	Battery 	2
3	Remote control holder 	1
4	Remote control holder fixing screw 	2
5	Remote control receiver 	1

No.	Accessory part	Qty.
6	Receiver fixing screw (M4 x 39/64" (15.5 mm)) 	2
7	Clamper (band) (for receiver cable fixing) 	1
8	Receiver cable (6.56 ft (2 m)) 	1
9	Washer (for suspension fitting) 	8
10	Flare insulator (for gas pipe / liquid pipe connection) 	2

No.	Accessory part	Qty.
11	Clamper (band) (for flare & drain insulating connection) 	4
12	Drain hose (for unit & PVC pipe connection) L=131 	1
13	Hose band (for drain hose connection) 	1
14	Drain hose insulation (for drain pipe connection) 	2
15	Clamper (band) (for power supply cord) * Be sure to fix the power supply cord with clamper (band). 	1
16	Drain elbow 	1

## Required Materials

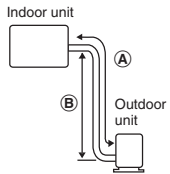
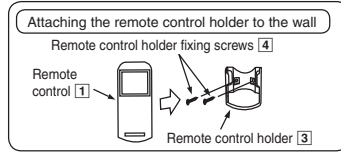
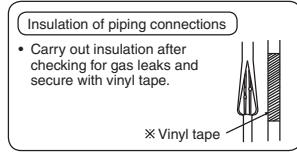
- Read the catalog and other technical materials and prepare the required materials.
- Applicable piping kit

Applicable piping kit	Piping size	
	Gas	Liquid
CZ-3F5, 7BP	3/8" (9.52 mm)	1/4" (6.35 mm)
CZ-4F5, 7, 10BP	1/2" (12.7 mm)	1/4" (6.35 mm)
CZ-52F5, 7, 10BP	5/8" (15.88 mm)	1/4" (6.35 mm)

- Pipe size reducer (CZ-MA1P) for outdoor Multi connection CS-E12SD3UAW, CS-E18SD3UAW

■ Other Items to be Prepared (Locally Purchased)

Product name	Remarks
Rigid PVC pipe	VP20 (outer diameter $\phi$ 1 1/32" ( $\phi$ 26)); also sockets, elbows and other parts as necessary
Adhesive	PVC adhesive
Insulation	For refrigerant piping insulation: foamed polyethylene with a thickness of 5/16" (8 mm) or more. For drain piping insulation: foamed polyethylene with a thickness of 13/32" (10 mm) or more.
Indoor/outdoor connecting cable	UL listed or CSA approved 4 conductor wires minimum AWG16
Hanging bolt related parts	Hanging bolts (M10) (4) and nuts (12), (when hanging the indoor unit)

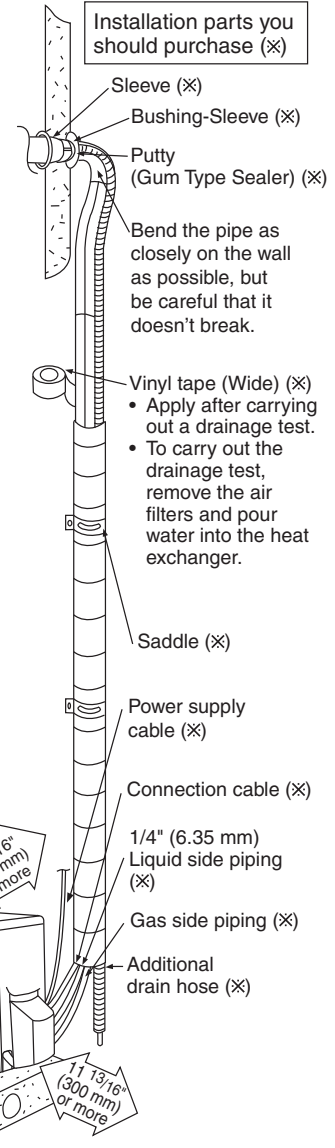


**IMPORTANT**  
Begin the installation job from the "Indoor Unit" installation.

Model	Capacity (Btu/h)	Piping size		Std. Length	Max Elevation	Min. Piping Length	Max. Piping Length	Additional Refrigerant	Piping Length for add. gas
		Gas	Liquid						
E9SD3UAW	9000	3/8" (9.52 mm)	1/4" (6.35 mm)	24.6 ft (7.5 m)	49.2 ft (15 m)	9.8 ft (3 m)	65.6 ft (20 m)	0.2 oz/ft (20 g/m)	24.6 ft (7.5 m)
E12SD3UAW	11500	1/2" (12.7 mm)							
E18SD3UAW	17200	1/2" (12.7 mm)					100.0 ft (30.5 m)	0.3 oz/ft (25 g/m)	32.8 ft (10 m)

Example: For E9SD3UAW

If the unit is installed at 32.8 ft (10 m) distance, the quantity of additional refrigerant should be 1.64 oz (50 g) .... (32.8 - 24.6) ft x 0.2 oz/ft = 1.64 oz.  
((10 - 7.5) m x 20 g/m = 50 g).



It is advisable to avoid more than 2 blockage directions. For better ventilation & multiple-outdoor installation, please consult authorized dealer/specialist.

Or

- This illustration is for explanation purposes only. The indoor unit will actually face a different way.

## 11.1 Indoor Unit

### 11.1.1 Selecting the Installation Location


Take into consideration the following contents when creating the blueprint.

#### ■ Indoor unit installation location

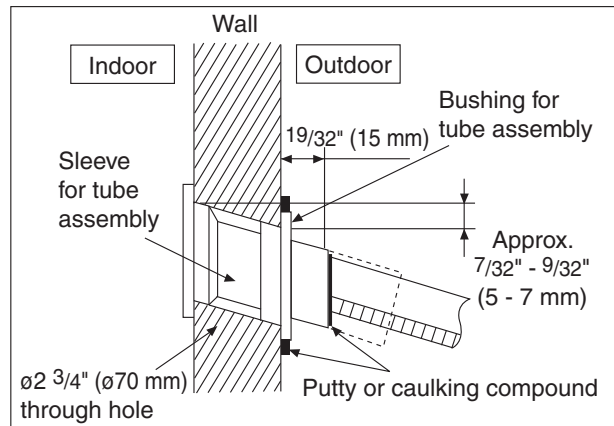
- Do not install the unit in excessive oil fume area such as kitchen, workshop and etc.
- The location should be strong enough to support the main unit without vibration.
- There should not be any heat or steam source nearby.
- Drainage should be easy. Avoid locating the drain port close to ditches (domestic wastewater).
- Avoid locations above entrances and exits.
- Do not block the air intake and discharge passages.
- Select the location that enables the cool and warm air to spread out to the entire room.
- Locate the indoor unit at least 3.28 ft (1 m) or more away from a TV, radio, wireless appliance, antenna cable and fluorescent light, and 6.56 ft (2 m) or more away from a telephone.
- Recommended installation height for indoor unit shall be at least 8.27 ft (2.5 m) from floor.

### 11.1.2 To Drill a Hole in the Wall and Install a Sleeve of Piping

- 1 Insert the piping sleeve to the hole.
- 2 Fix the bushing to the sleeve.
- 3 Cut the sleeve until it extrudes about  $19/32''$  (15 mm) from the wall.

 <b>CAUTION</b>
When the wall is hollow, be sure to use the sleeve for tube assembly to prevent pests from damaging the cables, e.g. mice biting the connection cable.


- 4 Finish by sealing the sleeve with putty or caulking compound at the final stage.



### 11.1.3 Installing the Indoor Unit (Installation Embedded in the Ceiling)

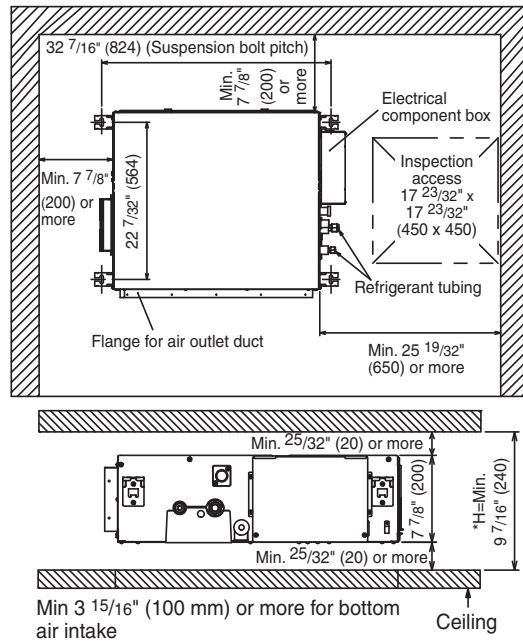
#### 11.1.3.1 Preparation Before Installation

- Always provide sufficient entry and exit space to allow installation work, inspection and unit replacement.
- Waterproof the rear surface of the ceiling below the unit in consideration of water droplets forming and dropping.

 <b>CAUTION</b>
When cooling operation is performed for an extended period under the following conditions, water droplets may form and drop. Attach locally purchased insulation (foamed polyethylene with a thickness of $7/32''$ (5 mm) or more) to the outside of the indoor unit before installing into the ceiling to improve heat insulation.
<ul style="list-style-type: none"><li>• Locations with a dew point inside the ceiling of <math>73.4^{\circ}\text{F}</math> (<math>23^{\circ}\text{C}</math>) or more</li><li>• Kitchens and other locations that produce large amounts of heat and steam</li><li>• Locations where the inside of the ceiling serves as an outside air intake passage</li></ul>

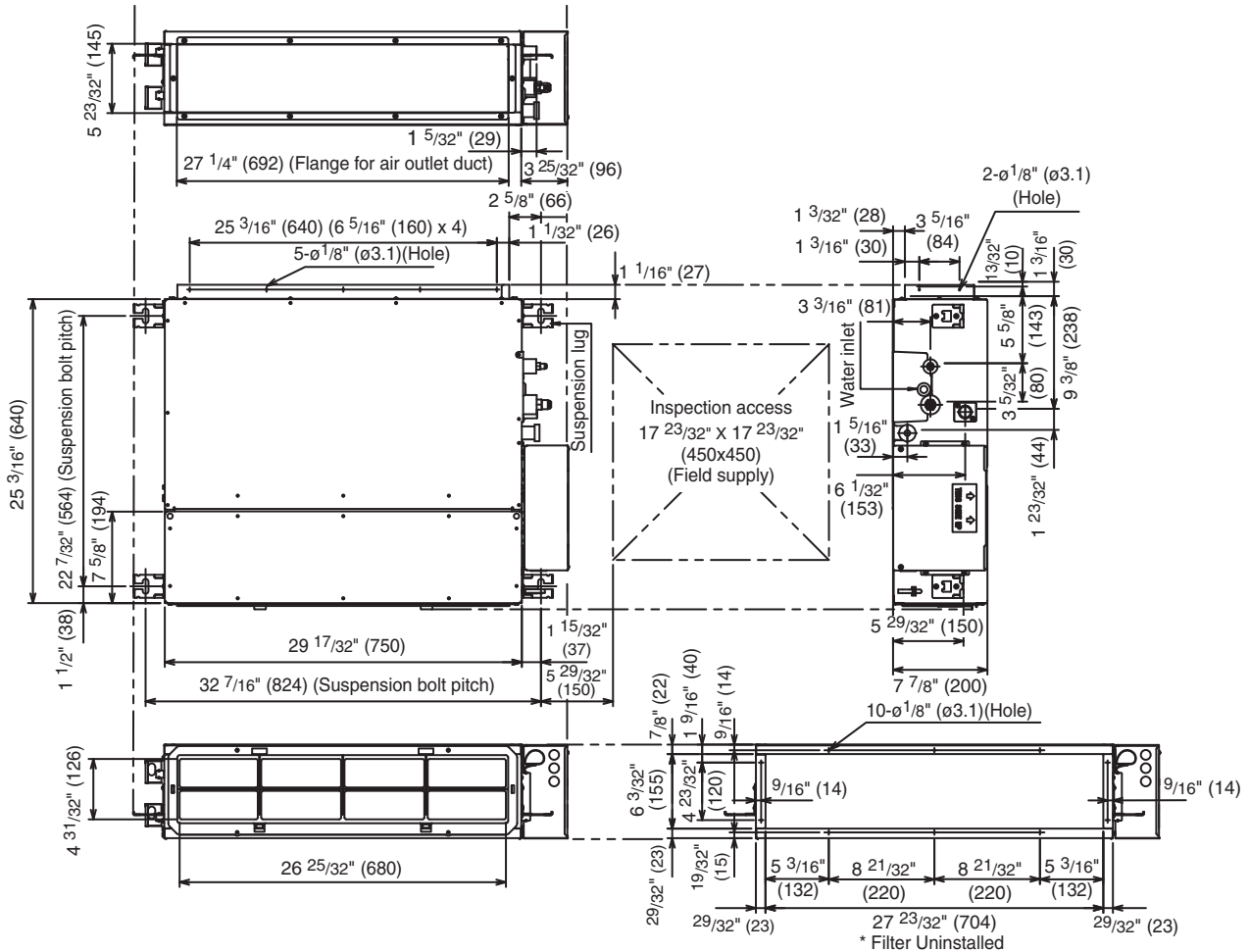
- **When installing into a ceiling, select the unit position and airflow direction that enable the cool and warm air to spread out to the whole room.**
- **Do not place objects that might obstruct the airflow within 3.28 ft (1 m) below the intake grill.**

**Required Minimum Space for Installation and Service**



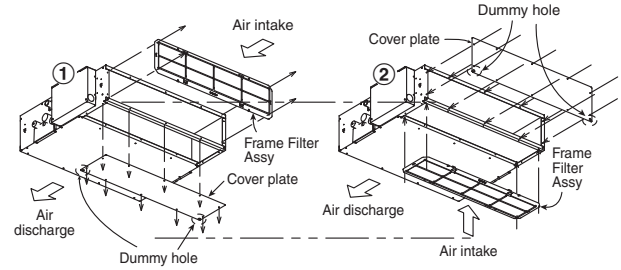
- H dimension means the minimum height of the unit installation space.
- Select H dimension such that a downward slope of at least 1/100 is ensured. Refer to 11.1.4 "Connecting the drain piping"

**Dimension of the Indoor Unit**

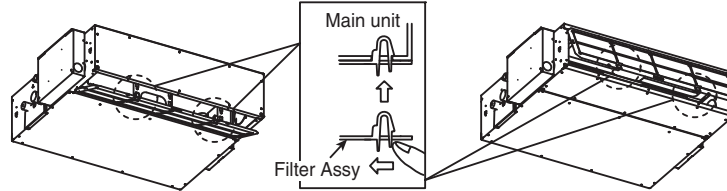


### In Case of Bottom Intake

- 1 Remove the frame filter assy as shown in diagram ①
- 2 Remove cover plate as shown in diagram ①
- 3 Fix frame filter assy as shown in diagram ②
- 4 Fix cover plate as shown in diagram ② with the dummy hole downward.



### Fixing Frame Filter Assy



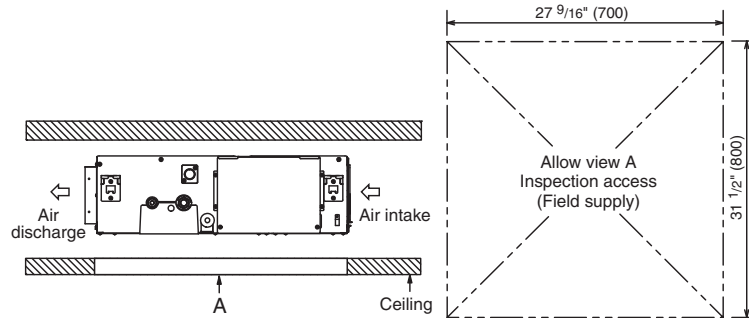
In case of bottom side

\* Attach the frame filter assy to the main unit while pushing the tip of the latches in the direction of the arrow.

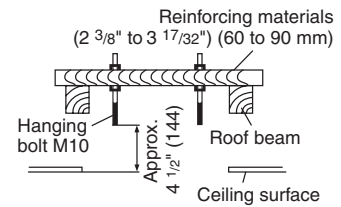
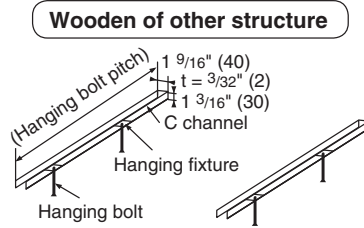
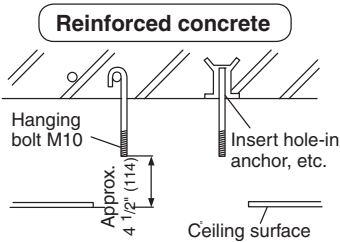
In case of back side

### Ceiling Opening

- Install inspection opening 17 23/32" x 17 23/32" (450 mm x 450 mm) on the control box side where maintenance and inspection of the control box and drain pump are easy. Install another inspection opening 31 1/2" x 27 9/16" (800 mm x 700 mm) also at the lower part of the unit.



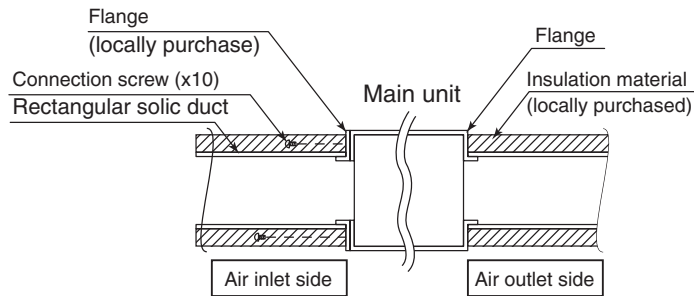
### Securing the Hanging Bolts



- Secure the hanging bolts (M10, locally purchased) firmly in a manner capable of supporting the unit weight.
- Consult your construction or interior contractor for details on finishing the ceiling opening.

### Installing an Intake and Discharge Duct Type

- Ensure the range of unit external static pressure is not exceeded. Refer technical manual for the range of external static pressure setting.
- Connect the duct as shown.
- When attaching duct to the intake side, remove the product filter frame assy and replace with locally purchase intake-side flange by using 10 -  $\text{Ø } 1/8''$  ( $\text{Ø } 3.1$ )(hole) screws.
- Wrap the flange and duct connection area with aluminium tape or similar to prevent air leak.

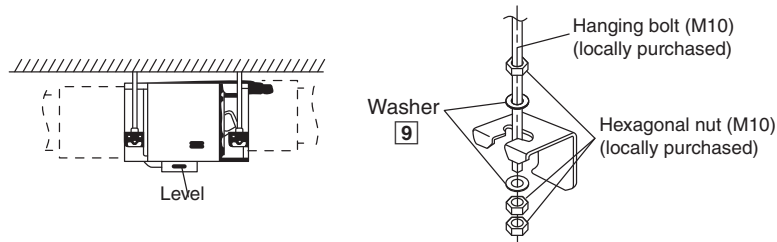


### CAUTION

When attaching a duct to the intake-side, be sure to attach an air filter inside the air passage on the intake-side. (Use an air filter with dust collecting efficiency at least 50% in a gravimetric technique.)

### Installation into the Ceiling

- Attach the nuts and washers to the hanging bolts, then lift up and hook the main unit onto the hanging fixtures.
- Check if the unit is leveled using a level or a vinyl hose filled partially with water.

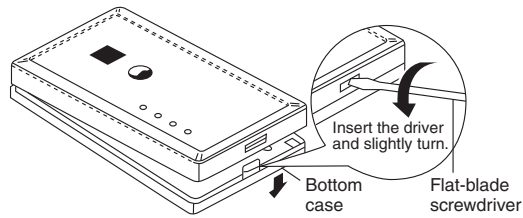


## Mounting Remote Controller Receiver

### CAUTION

Install the remote controller receiver cable at least 1 31/32" (50 mm) away from electric wires of other appliances to avoid miss-operation (electromagnetic noise).

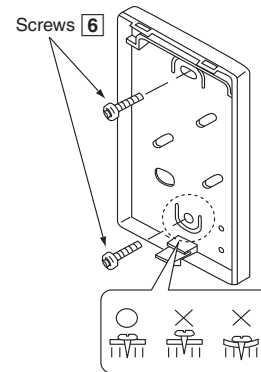
#### 1 Remove the bottom case.



#### Attention

##### Mounting the bottom case

- Tighten the screws securely until the screw heads touch the bottom case. (Otherwise, loose screw heads may hit the PCB and cause malfunction when mounting the top case.)
- Do not over-tighten the screws. (The bottom case may be deformed, resulting in fall of the unit.)



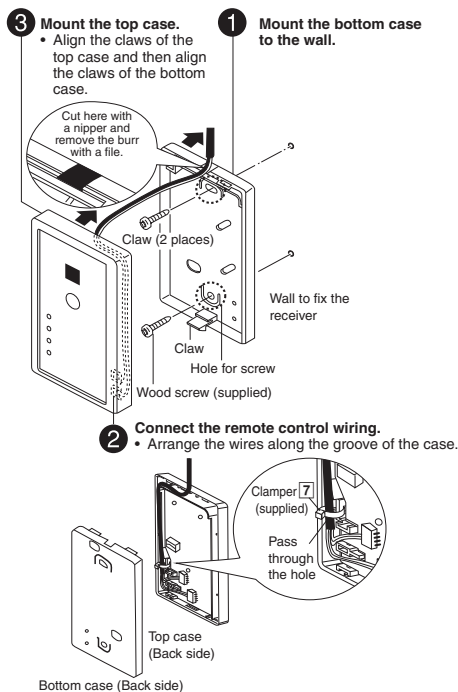
##### Connecting the remote control wiring

- Arrange the wires as shown in the illustration for ② as in diagram below, avoiding unnecessary wires being stored in the case. (Caught wires may destroy the PCB.)
- Avoid wires touching parts on the PCB. (Caught wires may destroy the PCB.)

#### 2 Mount to the wall.

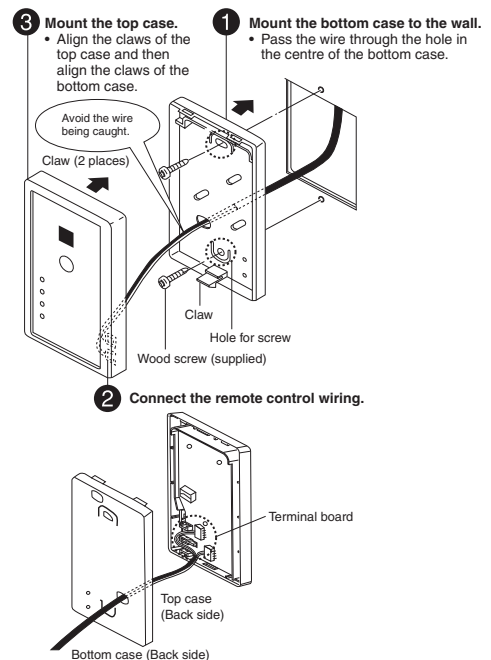
##### EXPOSED TYPE

**Preparation:** Make 2 holes for screws using a driver.



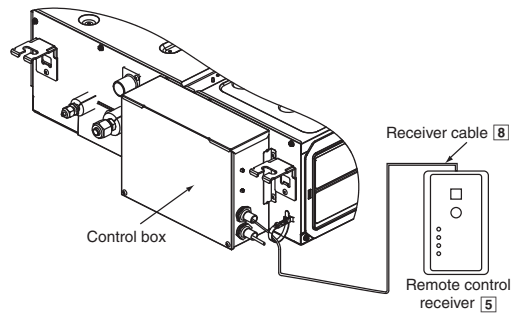
##### EMBEDDED TYPE

**Preparation:** Make 2 holes for screws using a driver.



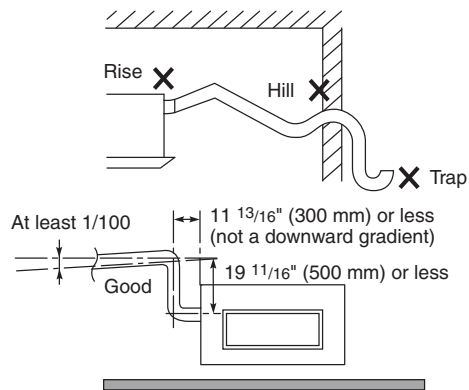
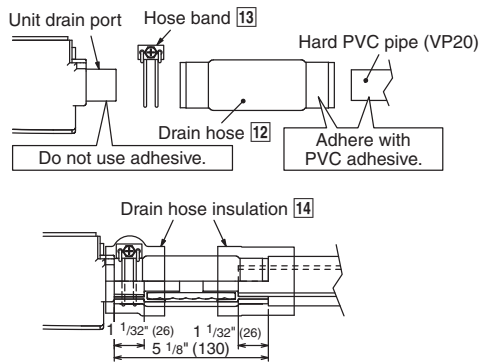


- Connect the indoor unit and the remote control receiver **5**. (Refer to the illustration.)
- Fix the green wire from receiver cable **8** to the grounding location provided inside control board.



### 11.1.4 Connecting the Drain Piping

- Lay the drain piping so as to ensure drainage.
- Use a locally purchased VP20 general rigid PVC pipe (outer diameter  $\phi 1 \frac{1}{32}$ " ( $\phi 26$ )) for the drain piping **and firmly connect the indoor unit and the drain piping using supplied hose band to ensure that no leakage occurs.**
- Drain piping located indoor should always be insulated by wrapping with locally purchased insulation (foamed polyethylene with a thickness of  $\frac{13}{32}$ " (10 mm) or more).
- The drain piping should have a downward gradient ( $\frac{1}{100}$  or more) and should be secured by using pipe hanging equipment to avoid creating hills or traps partway.
- Should there be any obstacle preventing the drain piping from being extended smoothly, the drain piping can be raised outside of the main unit as shown in the illustration below.

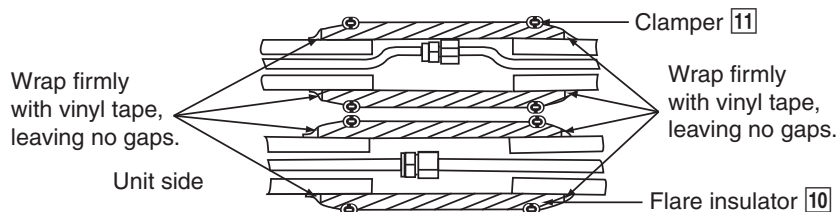


#### ⚠ CAUTION

- Strictly do not install and extend the drain piping from the main unit drain water outlet horizontally or upward or raised it 19 11/16" (500 mm) or more. Doing so may result in poor drainage or drain motor failure.
- Do not use drain hose bent at 90° angle. (The maximum permissible bend is 45°.)







### 11.1.5 Insulating the Refrigerant Piping

- After the piping is connected, insulate. (Refer to the illustration)

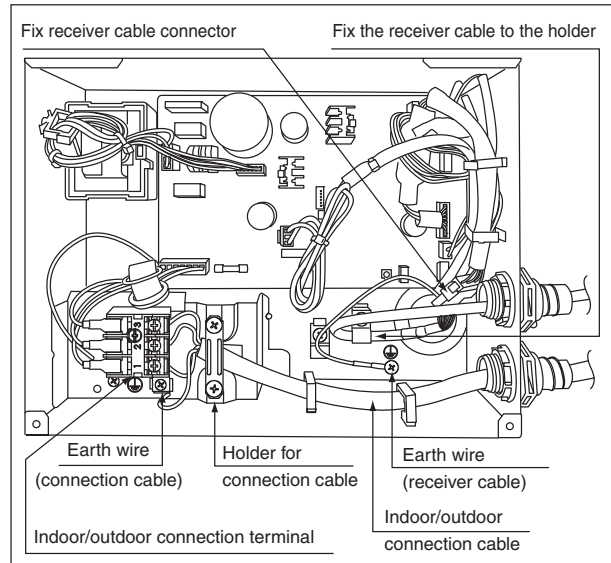
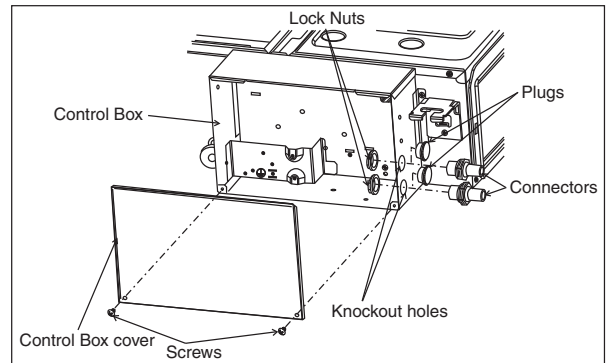


### 11.1.6 Connect the Cable to the Indoor Unit

- Remove control box cover.
- Remove the plugs.
- Fix the conduit connections to the knockout holes together with lock nuts, then secure them against the control box side panel.
- Receiver cable wires **8** must pass through the upper conduit hole. Make sure the receiver cable is inserted from inside of the control box. Connect receiver cable connector to control box wire connector and fix it to the power supply cord holder as shown in the diagram. Insert firmly the connector of receiver cable **8** to connector at control box of indoor unit.
- Connection cable between indoor unit and outdoor unit should be UL listed or CSA approved 4 conductor wires minimum AWG16 in accordance with local electric codes.
  - Ensure that the terminal numbers on the indoor unit are connected to the same terminal numbers on the outdoor unit by the right coloured wires as shown in the diagram.
  - Earth lead wire should be longer than the other lead wires as shown in the diagram for electrical safety purpose in case the cord slips out from the anchorage.
  - Secure the cable onto the control board with the holder (clamer).

Terminals on the indoor unit	1	2	3	
Colour of wires				
Terminals on the outdoor unit	1	2	3	

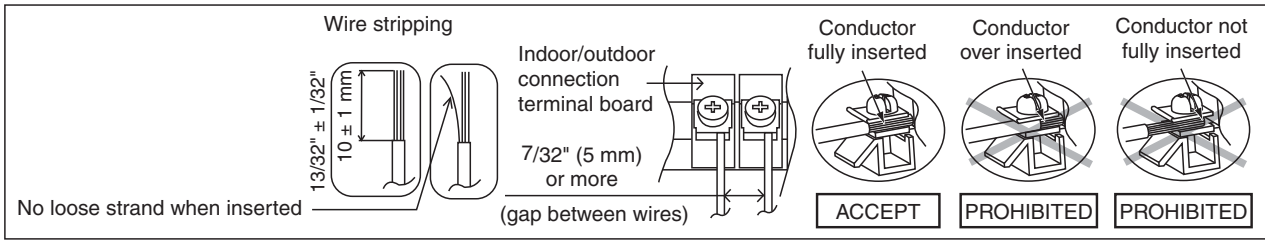
**CAUTION**  
When the wall is hollow, please be sure to use the sleeve for tube ass'y to prevent dangers caused by mice biting the connection cable.



**WARNING**  
 This equipment must be properly earthed.

- Ensure the colour of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reason.

### 11.1.6.1 Wire Stripping and Connecting Requirement

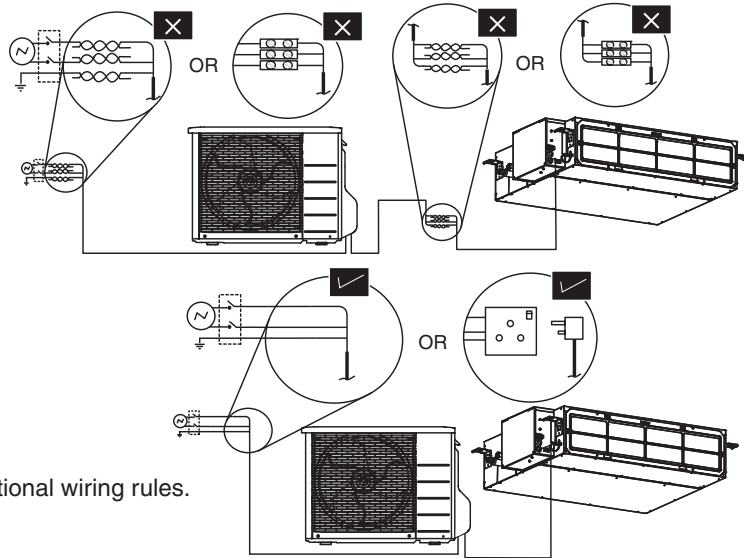


Do not joint wires

**WARNING**

**RISK OF FIRE**  
JOINING OF WIRES MAY CAUSE OVERHEATING AND FIRE.

- ! Use complete wire without joining.
- ! Use approved socket and plug with earth pin.
- ! Wire connection in this area must follow to national wiring rules.

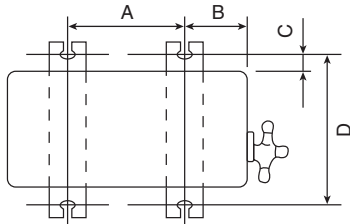


## 11.2 Outdoor Unit

### 11.2.1 Select the Best Location

### 11.2.2 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 a bolt nut ( $\varnothing$  13/32" ( $\varnothing$ 10 mm)).
  - When installing at roof, please consider strong wind and earthquake.  
Please fasten the installation stand firmly with bolt or nails.



Model	A	B	C	D
E9SD3UAW, E12SD3UAW	22 7/16" (570 mm)	4 1/8" (105 mm)	23/32" (18.5 mm)	12 19/32" (320 mm)
E18SD3UAW	24 1/8" (613 mm)	5 5/32" (131 mm)	5/8" (16 mm)	14 3/16" (360.5 mm)

### 11.2.3 Connect the Piping

#### 11.2.3.1 Connecting the Piping to Indoor

Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.

Do not over tighten, overtightening may cause gas leakage.

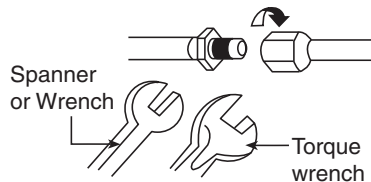
Piping size	Torque
1/4" (6.35 mm)	13.3 lbf•ft [18 N•m (1.8 kgf•m)]
3/8" (9.52 mm)	31.0 lbf•ft [42 N•m (4.3 kgf•m)]
1/2" (12.7 mm)	40.6 lbf•ft [55 N•m (5.6 kgf•m)]
5/8" (15.88 mm)	47.9 lbf•ft [65 N•m (6.6 kgf•m)]
3/4" (19.05 mm)	73.8 lbf•ft [100 N•m (10.2 kgf•m)]

#### 11.2.3.2 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.

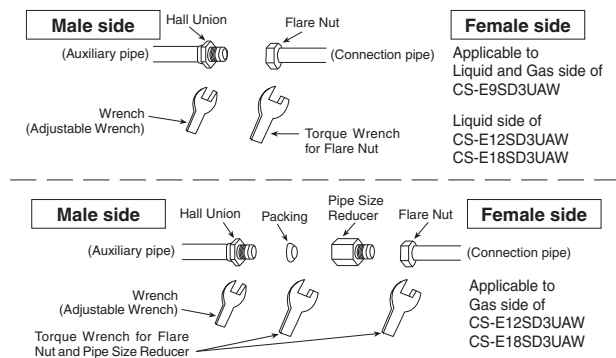


#### 11.2.3.3 Connecting the Piping to Outdoor Multi

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.

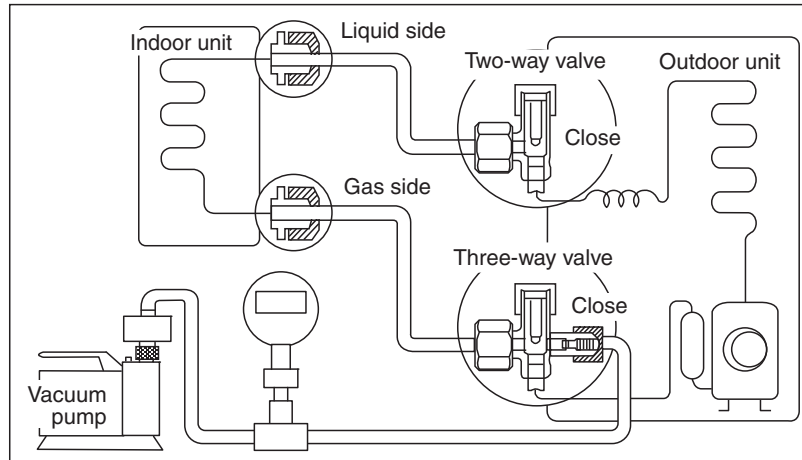


#### 11.2.3.4 Gas Leak Checking

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.

## 11.2.4 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.

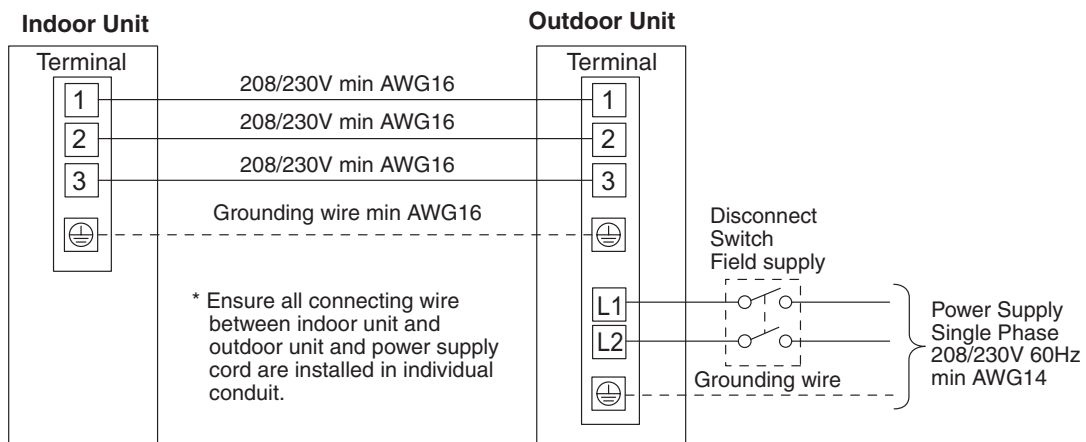
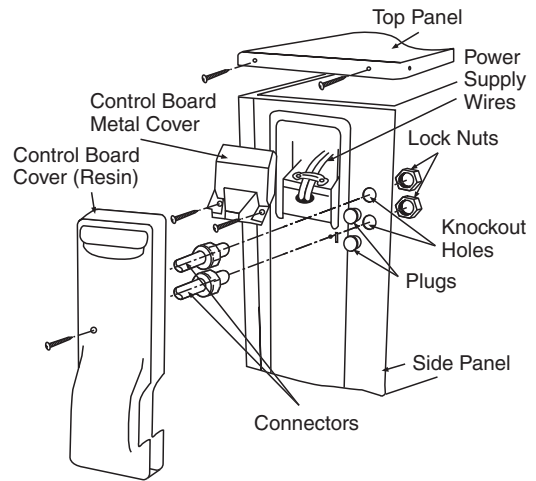


- 1 Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
- 2 Connect the micron gauge between vacuum pump and service port of outdoor units.
- 3 Turn on the power switch of the vacuum pump and make sure that connect digital micron gauge and 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 the 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 the 3-way valve.
  - o Be sure to check for gas leakage.

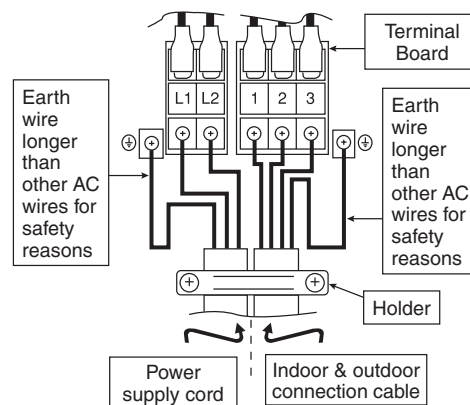
- If micron gauge value does not descend 500 microns, take the following measures:
  - If the leak stops when the piping connections are tightened further, continue working from step ③.
  - If the leak does not stop when the connections are retightened, repair location of leak.
  - Do not release refrigerant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

## 11.2.5 Connect the cable to the Outdoor Unit

- For model E9SD3UAW, E12SD3UAW
  - 1 Remove Top panel.
  - 2 Remove Control Board Cover (Resin and Metal).
  - 3 Remove Plugs.
  - 4 Fix the conduit connectors to the knockout holes with lock-nuts, then secure them against the side panel.
  - 5 All wires pass through conduits.
  - 6 Connection cable between indoor unit and outdoor unit should be UL listed or CSA approved 4 conductor wires minimum AWG16 in accordance with local electric codes.
  - 7 Wire connection to the power supply (208/230V 60Hz) through circuit breaker.
    - Connect the UL listed or CSA approved wires minimum AWG14 to the terminal board, and connect the other end of the wires to ELCB / GFCI.
  - 8 Connect the power supply cord and connection cable between indoor unit and outdoor unit according to the diagram below.



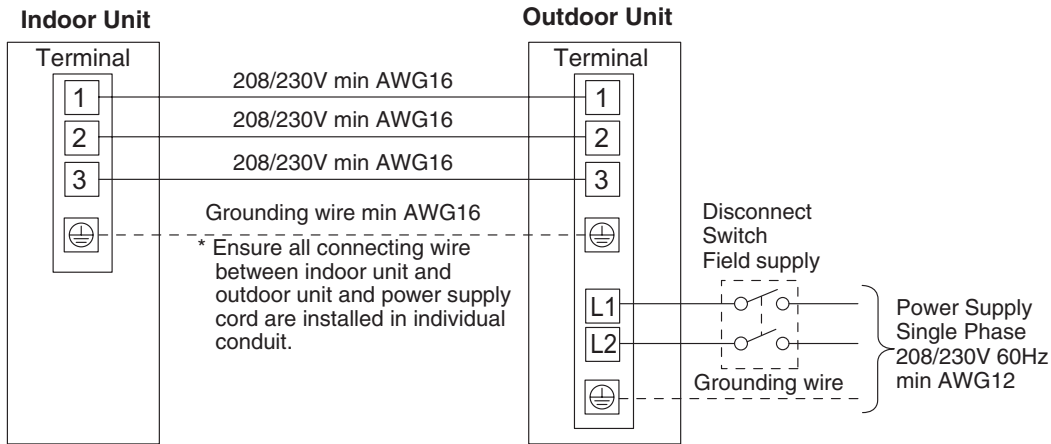
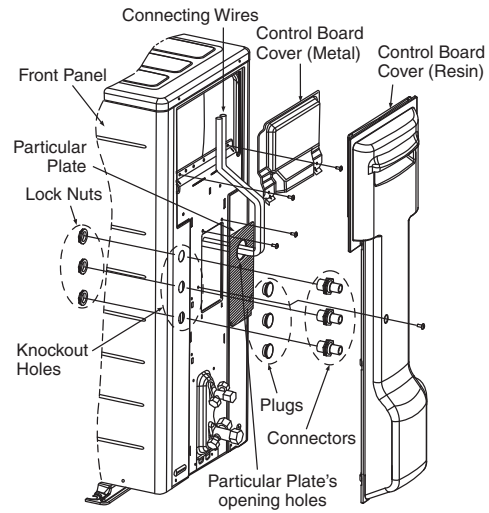
- 9 Secure the wire onto the control board with the holder (clammer).
- 10 After completing wiring connections, reattach the control board cover (Metal and Resin) and the top panel to the original position with the screws.
- 11 For wire stripping and connection requirement, refer to instruction 11.1.6 of indoor unit.



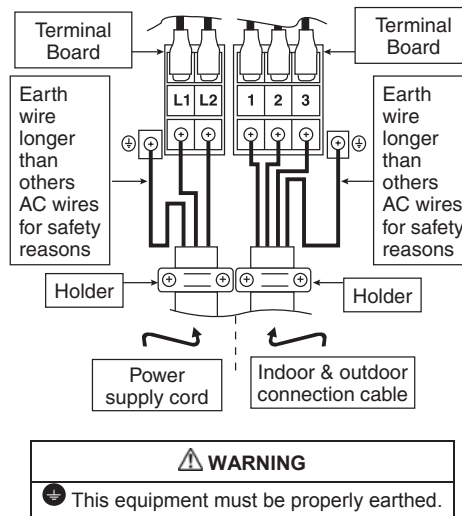
**⚠ WARNING**  
 ⚡ This equipment must be properly earthed.

- Earth lead wire shall be Yellow/Green (Y/G) in colour and should be longer than other lead wires as shown in the figure for electrical safety in case of slipping.

- For model E18SD3UAW
  - 1 Remove control board cover (Resin and Metal).
  - 2 Remove particular plate.
  - 3 Remove plugs.
  - 4 Fix the conduit connectors to the knockout holes with lock-nuts, then secure them against the side panel.
  - 5 All wires pass through conduits & particular plate's opening hole.
  - 6 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.
  - 7 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 the other end of the wires to ELCB / GFCI.
  - 8 Connect the power supply cord and connecting wire between indoor unit and outdoor unit according to the diagram below.



- 9 Secure the wire onto the control board with the holder (clammer).
- 10 After completing wiring connections, reattach the particular plate and control board cover (metal and resin) to the original position with the screws.
- 11 For wire stripping and connection requirement, refer to instruction 11.1.6 of indoor unit.



- Earth lead wire shall be Yellow/Green (Y/G) in colour and longer than other lead wires for electrical safety in case of the slipping.

## 11.2.6 Piping 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 1/4" (6 mm) or above.

### Switching the High State Switch (SW2)

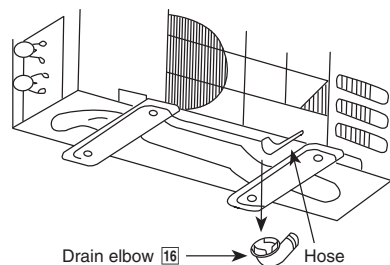
- To increase the air volume, open the control box and on the control board, switch the FAN switch (SW2) to "HI".
- See the diagram for "Connecting the Indoor/Outdoor Connection Cable".

### Note: Enabling Long-range Remote Control

- To maintain EMC emission limits, cabling interconnecting the HA terminal and subsequent opto-coupler, must be no more than 6.2 ft (1.9 m) length.
- Loop four turns of this cable through a suitable small EMC ferrite toroid, and protect with a short length of large diameter heat-shrink tube.
- There is no similar length limit for cable following on from the opto-coupler isolation.

### 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 3/16" (30 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.



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

### CHECK THE DRAINAGE

#### Check after connecting the power supply.

- Pour approximately 600 cc of water into the drain pan of the main unit using a squeeze bottle, etc.
- Press the drain test run switch on the control board in the control box to start the drain motor and check whether the water drains normally. (The drain motor operates for approximately 5 minutes and then stops automatically.) (See the diagram for "Connecting the Indoor/Outdoor Connection Cable".)

