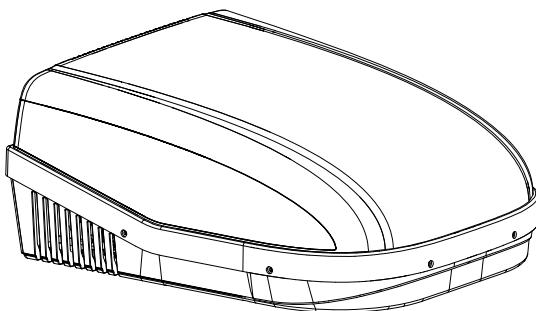




Rooftop Air Conditioner

Installation and Operation Manual



WARNING

This manual must be carefully read and understood before installation, adjustment, repair or maintenance. The equipment must be installed by qualified technicians. Transformation of this product is an extremely dangerous operation, which may lead to personal injury or property loss.
Important: please keep this manual with the product.

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1 Safety Information

1.1 Safety Definitions

This manual has safety information and instructions to help you eliminate or reduce the risk of accidents and injuries.



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION

Indicates a hazardous situation which, if not avoided, could result in property damage and minor or moderate injury.



NOTICE

This symbol indicates important information where there is no risk to people or property.

1.2 Information introduction

This air conditioner (hereinafter referred to as "unit" or "product") is designed and intended for installation on the roof of a Recreational Vehicle (hereinafter referred to as RV Air conditioner) during or after the time it is manufactured.

This unit can be installed by one person with brief help from additional personnel. Use these instructions to ensure a properly installed, and properly functioning product.

We reserves the right to modify appearances and specifications without notice.

This manual has safety information and instructions to help you eliminate or reduce the risk of accidents and injuries.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

- That the appliance shall be installed in accordance with national wiring regulations.

1.3 Supplemental Directives



A2L Appliance filled with flammable gas R32.



Before install and use the appliance, read the owner's manual first.



Before install the appliance, read the installation manual first.



Before repair the appliance, read the service manual first.



A2L

1.4 General Safety Messages

Failure to obey the following warnings could result in death or serious injury:

- This product **MUST** be [installed / serviced] by a qualified service technician.
- Do **NOT** modify this product in any way. Modification can be extremely hazardous.
- Do **NOT** add any devices or accessories to this product except those specifically authorized in writing by We.



WARNING

If the power cuts off suddenly during the operation of the device, please do not turn it on immediately. The device must stop running for 1 minute before turning it on; otherwise, excessive current may cause the damage of the device.



WARNING

This product can expose you to lead, which is known to the state of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65warnings.ca.gov.



WARNING

During the use of this product, due to the great change of air temperature in the vehicle, when the temperature drops rapidly, part of condensate will adhere to the surface of objects near the air outlet, which is a normal phenomenon. After the air conditioner works normally for a certain period, it will be automatically dried and detached from the surface of objects. Therefore, when the air conditioner works, please close the doors and windows as much as possible to reduce the coagulation of water vapor on the surface of objects inside the vehicle.

2 General Information

2.1 Power Connection

- * Minimum Wire Size 12 AWG Copper/JP to 24', For wire length over 24 ft., consult the National Electric Code for proper sizing.
- ** When powering the unit with a generator, we recommend using a 3.5 kW generator. These guidelines come from experiences people have had in actual applications. When sizing the generator, the total power usage of your RV must be considered. Keep in mind generators lose power at high altitudes and from a lack of maintenance.
- *** CIRCUIT PROTECTION: Time Delay Fuse or Circuit Breaker Required.

2.2 Roof Requirements

- A 14-1/4" x 14-1/4" ($\pm 1/8$ ") square opening (hereinafter referred to as "roof opening") is required for installing this unit. This opening is part of the return air system of the unit and MUST be finished in accordance with NFPA1192.
- Roof construction with rafters/joists support frames on a minimum of 16 inch centers.
- Minimum of 1.5 inches and maximum of 6 inches distance between roof to ceiling of RV air conditioner.

2.3 Introduction of Air Conditioner

The design and installation of this machine is suitable for RV to improve its internal temperature and provide a comfortable environment.

If the ductwork is used on the roof of a motorhome, the ductwork should meet the following requirements:

Air Distribution Duct Sizing and Design

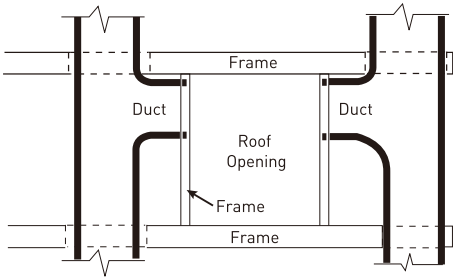
The installer of this system must design the air distribution system for their particular application.

NOTE: Make sure ductwork will NOT bend or collapse during and after installation, and that it is correctly insulated and sealed. Otherwise, damage to roof structure and ceiling could occur.

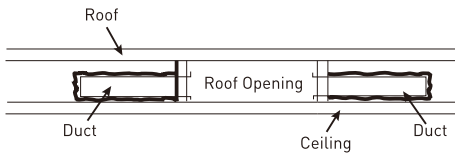
The following requirements must be met for properly operate the unit:

Roof cavity depth		3"-6" (75mm-152mm)
Duct cross sectional area		21 Sq. In. Min.
Duct size	Depth	1½" Min. - 2½" Max. (38mm Min. - 63.5mm Max.)
	Width	7" Min. - 10" Max. (178mm Min. - 254mm Max.)
	Total duct length	15Ft. Min. - 40Ft. Max. (4.5m - 13m)
	Duct length (short run)	1/3 Total Duct Length
Register requirements per A/C unit	Number required	3 Min. - 8 Max.
	Supply register free air area	7" Min. - 10" Max. (178mm Min. - 254mm Max.)
	Total duct length	14 Sq. In. (90 sq. cm)
	Return register free air area	40 Sq. In. (258 sq. cm)
	Distance from duct end	5" Min. - 8" Max. (127mm Min. - 203mm Max.)
	Distance from elbow	15" (381mm)
Total System Static Air Pressure	Blower at high speed, filter & grille in place	0.55 - 1.10 In. W.C.

- Properly insulate and seal all discharge air ducts to prevent condensation from forming on their surfaces or adjacent surfaces during operation of the unit. This insulation must be R-7 minimum.



SIDE VIEW
(TOWARD BACK OF RV)



- Return air openings must have 40 square inches minimum free area including the filter.
- Return air to the unit must be filtered to prevent dirt accumulation on the unit cooling surface.

2.4 User Guide

The performance of air conditioner is related to the heating condition of insulation box of RV itself. Users can take some preventive measures to reduce heat entry, so as to improve the refrigeration performance of air conditioning equipment.

When outdoor temperature is high, the following methods can be adopted to reduce the heat entry of RV and improve work efficiency:

- Park the RV in a cool place.
- Strengthen thermal insulation of the compartment, remove or block the opening in the vehicle.
- Block the window with shade curtains (shutters or hanging curtains).
- Close doors and windows or avoid frequent opening and closing of them.
- Avoid using heating devices inside the vehicle.

Turn on the air conditioner in advance to achieve better effect. When indoor or outdoor temperature is high, set the air conditioner in cooling mode and turn on high wind speed will bring the performance of air conditioner into full play.



WARNING

The manufacturer will not be responsible for any damage arising from condensation on the ceiling or the surface of other objects caused by the condensate of this product.

2.5 Tools and Materials

Included Parts	Quantity
Duct divide	1
Ceiling template	1
Rooftop air conditioner installation and operation manual	1
Air distribution box	1
Mounting bolt (6*205 mm)	4
Screw (4*12 mm)	12
Junction box	1
Wireless remote controller	1
Stick sponge	1
Sealing strip (Inside the host)	1

Recommended Tools	
Angle Grinder	Impact Gun
Cutting Disc for Meta	Screwdriver Bit Set
Extension Cord	Hole Saw Set
Drill	Self Tapping Screws
Phillips Screwdriver	Flat Head Screwdriver
Side Cutters	Pliers
Automotive Staple Remover	

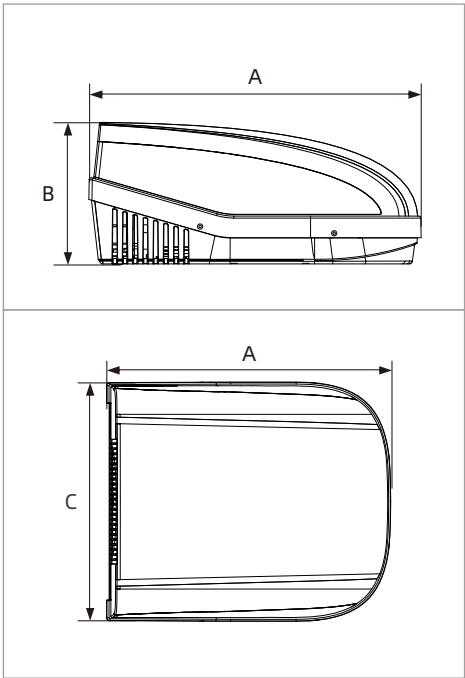
2.6 Dimensions



NOTICE

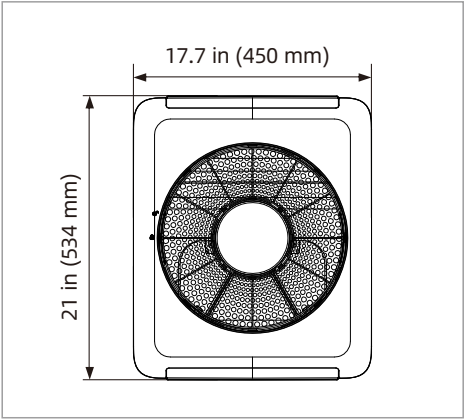
The images used in this document are for reference purposes only. Measurements may vary ± 0.38 in. (10 mm).

Rooftop Air Conditioner



A	B	C
33.3 in (845 mm)	14.2 in (360 mm)	27.9 in (710 mm)

Air Distribution Box



NOTICE

The ADB images in the manual are for reference only, and ADBs with different configurations may vary. Here they are just used for the convenience of description and as a reference guide.

2.7 Main Parameters

MODEL	RA160	RA180	RA180-H	RA180-R
Nominal capacity	16,000 BTU/h	18,000 BTU/h	18,000 BTU/h	18,000 BTU/h
Electrical rating (Volts/Frequency/Phase)	115VAC / 60Hz / 1PH			
PTC electric heater	/	/	13.5	/
Motor compressor RLA/LRA	9.2 A / 49.5 A	10.9 A / 57.9 A	10.9 A / 57.9 A	10.9 A / 57.9 A
Indoor fan motor FLA/HP	0.4 A / 0.091 HP			
Outdoor fan motor FLA/HP	0.6 A / 0.137 HP			
Minimum circuit ampacity (MCA)	23 A			
Maximum rating of overcurrent protective device (MOP)	35 A			
Maximum allowable pressure high/Low side	3.9 MPa / 1.6 MPa			
Degree of protection againse ingress of water	IPX4			
Refrigerant charged	R32 (GWP: 675)			
Charge volume (oz)	310 g (10.93 oz)	550 g (19.4 oz)		
Operating temperature range (Cooling)	63 ~ 115 °F (17 ~ 46 °C)			
Operating temperature range (Heating)	/	/	-4 ~ 81 °F (-20~27°C)	28 ~ 81 °F (-2~27°C)
Minimum Wire Size	12AWG copper wire			



WARNING

Please use the connecting wires complying with the national regulations.
During sizing of the generator, the total power usage of RV must be considered.



NOTICE

Tip: the generator will lose power due to high altitude and lack of maintenance.
Circuit protection: please use Time Delay Fuse or Circuit Breaker.

3 Installation

3.1 Choosing Proper Location for Unit

This unit is specifically designed for installation on the roof of an RV air conditioner. When determining your cooling requirements, the following should be considered:

- Size of RV air conditioner;
- Window area (increases heat gain);
- Amount of insulation in walls and roof;
- Geographical location where the RV air conditioner will be used;
- Personal comfort level required.

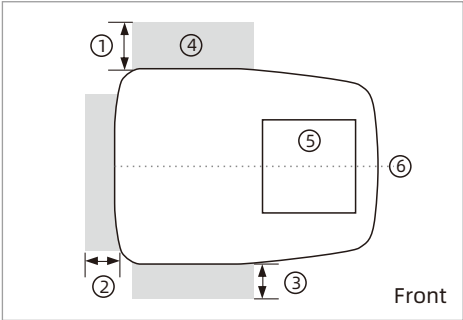
Normal locations

The unit is designed to fit over an existing roof vent opening.

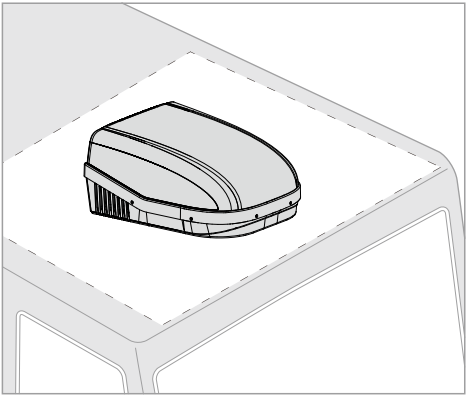
Other locations

When no roof vent is available or another location is desired, the following is recommended:

1. For one unit installation: The unit should be mounted slightly forward of center (front to back) and centered from side to side.
2. For two unit installations: Install one unit 1/3 and one unit 2/3's from front of RV air conditioner and centered from side to side. It is preferred that the unit be installed on a relatively flat and level roof section measured with the RV air conditioner parked on a level surface. The maximum inclination angle is 8°.
3. Products equipped with an auxiliary heater (PTC) must be installed to ensure a minimum distance of 13 inches between flammable materials and the machine.

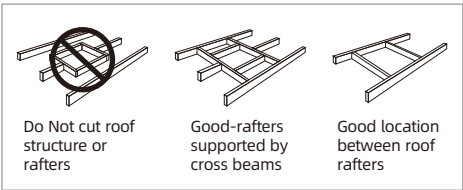


- | | |
|--|-----------------------|
| ① 12 in. (305 mm) | ⑤ Roof opening |
| ② 4 in. (102 mm) | ⑥ Center line of unit |
| ③ 4 in. (102 mm) | |
| ④ Keep these air flow areas free of obstructions | |

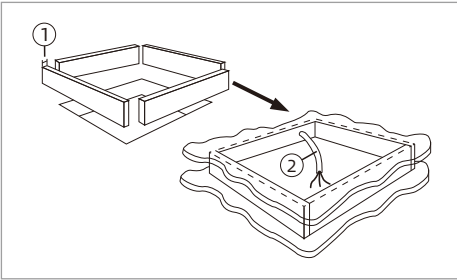


4. Maintain structural integrity. Otherwise damage to product and/or RV air conditioner could occur.

The roof must be designed to support 130 pounds when RV air conditioner is in motion. Normally a 200 lb. static load design will meet this requirement.



5. Check inside the RV air conditioner for air distribution box (hereinafter referred to as "ADB") obstructions (i.e. door openings, room dividers, curtains, ceiling fixtures, etc.).



- ① 3/4" Min.
② 15" Min at front of opening

Lumber 3/4" or more in thickness must be used. Remember to provide an entrance hole for power supplies (AC120V and DC12V) , wall thermostat and furnace wiring for connections. Leave 15" (381mm) minimum at the front of the opening.

3.2 Roof Preparation



WARNING

FIRE OR ELECTRICAL SHOCK HAZARD.

Make sure there are no obstacles (wires, pipes, etc.) inside RV air conditioner's [roof/floor/walls]. Shut OFF gas supply, disconnect 120 VAC power from RV air conditioner, and disconnect positive (+) 12 VDC terminal from supply battery BEFORE drilling or cutting into RV air conditioner.

Failure to obey these warnings could result in death or serious injury.

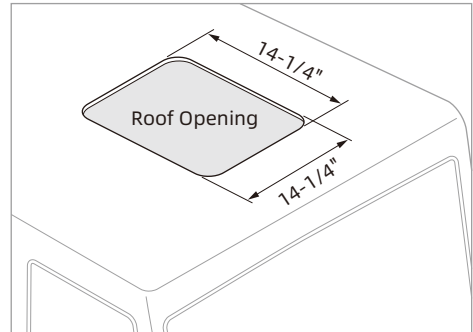
Opening Requirements

Before preparing the ceiling opening, read all of the following instructions before beginning the installation.

3.2.1 Creating a New Roof Opening

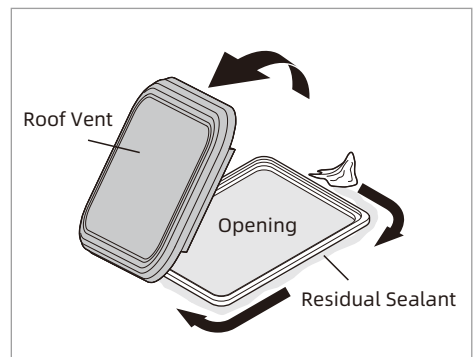
If an existing roof vent opening will NOT be used a roof opening MUST be cut through the roof and ceiling of the RV air conditioner.

This opening MUST be located between the roof reinforcing members. See "2.2 Roof Requirements"



3.2.2 Using an Existing Roof Opening

1. Unscrew and remove the roof vent.
2. Remove all caulking compound around opening.
3. Seal all screw holes and seams where the roof gasket will be located. Use a good grade of all weather sealant.



If the opening is less than 14-1/4" x 14-1/4", it must be enlarged. See "2.2 Roof Requirements".

1. Carefully mark and cut the required roof opening. See "2.2 Roof Requirements" .
2. Maintain structural integrity. Otherwise damage to product and/or RV Air conditioner could occur.



CAUTION

NEVER create a low spot on RV Air conditioner roof. Otherwise, water will pool and could cause a leak.

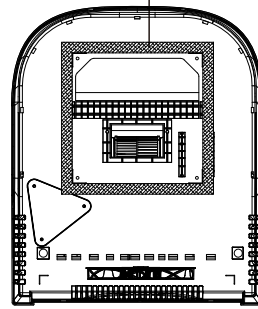
Using the roof opening as a guide, cut the matching hole in the ceiling.

The opening created must be framed to provide adequate support and prevent air from being drawn from the roof cavity. Framing stock 3/4" or more in thickness must be used. Remember to provide an entrance hole for power supplies at the front of the opening.

3.3 Stick Sponge (Sealing Strip) on The Outdoor Unit

1. Before sticking, clean up the sundries at the sticking position of the chassis of the outdoor unit to ensure that the sticking position is clean.
2. Take out one piece of sponge (sealing strip) of sponge from the accessories, and tear off the paper on the glue surface and align at the edge of the position as shown in Figure 1 to stick the sponge. If the sponge (sealing strip) is damaged or not stuck on the proper position, you must replace it with a new one and stick it properly.

Sticking position of sponge (sealing strip)



3. Check whether the sponge (sealing strip) are tightly adhered, and ensure that they will not fall off.

3.4 Wiring Requirements

Route a copper, with ground, 120 Vac supply wire from the time delay fuse or circuit breaker box to the roof opening. Use a listed/certified non metallic - sheathed single strand cable.

If vent fan was removed, the existing wire may be used provided it is of proper type, size, location, and correctly fused.

1. This supply wire must be located in the front portion of the roof opening.
2. The power **MUST** be on an appropriately sized separate time delay fuse or circuit breaker. See "2.1"
3. Make sure that at least 15" of supply wire extends into the roof opening. This ensures an easy connection at the junction box.
4. Protect the wire where it passes into the opening with approved method.

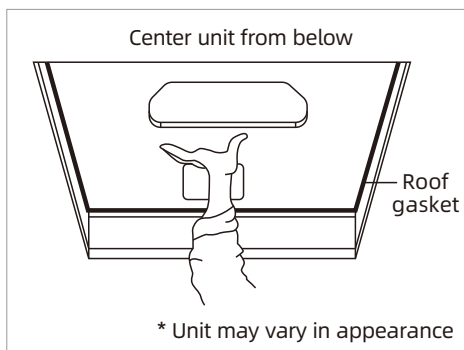
3.5 Placing Unit on Roof

1. Remove the unit from the carton and discard carton.
2. **LIFTING HAZARD.** Use proper lifting technique and control when lifting product. Failure to obey this caution could result in injury. Place unit on the roof.
3. Do NOT slide unit. Otherwise, damage to gasket (on bottom of unit) may occur and could cause a leak. Lift and place the unit over the prepared opening using the gasket on the unit as a guide.
4. Place the ADB kit inside the RV air conditioner. This box contains mounting hardware for the unit and will be used inside the RV air conditioner.

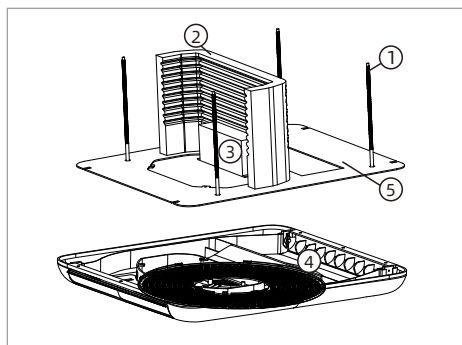
This completes the outside work. Minor adjustments can be done from inside the RV air conditioner if required.

3.6 Installation Preparation

Check gasket alignment of the unit over the roof opening and adjust if necessary. Unit may be moved from below by slightly lifting.

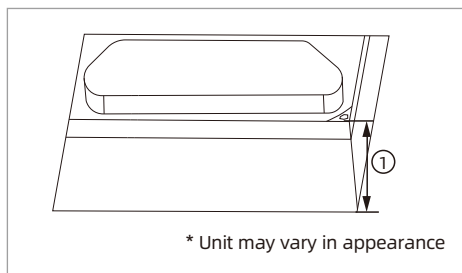


3.7 Install Air Distribution Box

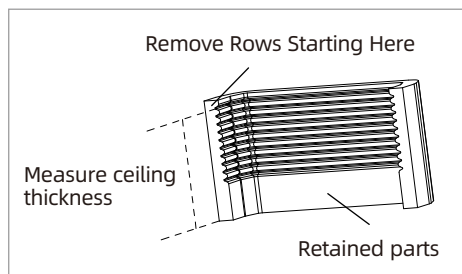


- ① Mounting Bolt *4
- ② Duct Divide
- ③ Junction Box
- ④ Air Distribution Box
- ⑤ Ceiling Template

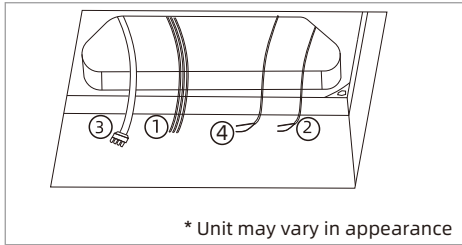
1. Measure the ceiling to AC bottom thickness.



- ① Measure ceiling thickness
2. Based on the measured thickness from the ceiling to the bottom of the air conditioner minus the excess height on the duct divide.



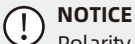
3.8 Routing Wiring



- ① AC 115V Power Supply for the Whole Machine.
3 wires: Hot, Neutral and Ground.
- ② DC 12V Controller Power Supply.
2 Wires: Red and Black Colors.
- ③ Wired controller 4 wires
- ④ Furnace connection wires.
two separate blue wires .

3.8.1 Routing 12V DC Wiring

1. Connect the controller's power supply wires (red and black) to 12V DC Power Supply Use 12 Volts DC. You may connect to the RV Battery. Please pay attention to the positive and neutral lines.
Red Color = Hot,
Black color = Neutral.
2. If applicable, locate the furnace wires from the ceiling controller, which are two separate blue wires tagged with "FURNACE". Connect them with the 12V+ wire from the furnace, and the return wire to the furnace.

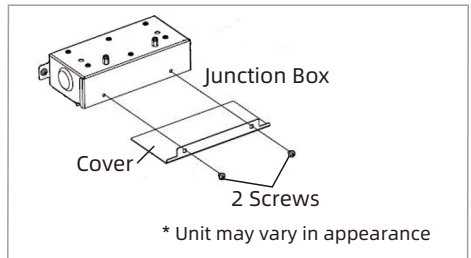


NOTICE

Polarity does not matter, connection can be freely made to either wire.
Do not connect the two blue "FURNACE" wires together.

3.8.2 Routing 115V AC Wiring

1. power cord (AC 115V high current) one should be directly connected to the terminal box while.
2. Route a copper, with ground, supply wiring with minimum #12 AWG, the wiring from its power source to the junction box. Do not attach them at this time.
3. Take the rooftop air conditioner power cord to connect to the side of the junction box.
4. Remove the junction box cover (2 screws). Take the power cord and make it get into the box through the strain relief that is provided.



5. Connect the power cord to the black, white and ground wires found in the junction box with a terminal board.



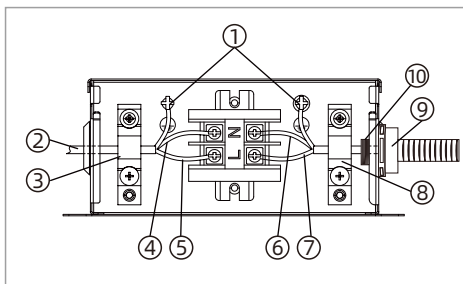
CAUTION

Connect black wire to black wire (brown wire), white wire to white wire (blue wire) and the ground wire to earth.



NOTICE

When connecting the power cord, please use the pipe for preventing cutting power wire.

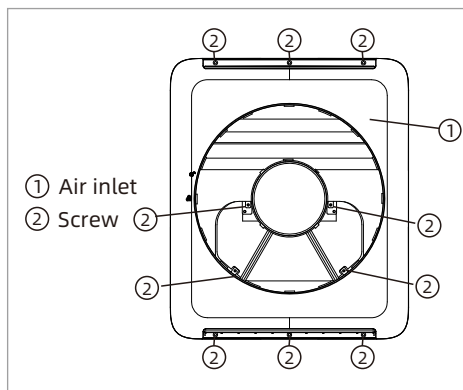


- ① Ground Wire (Yellow-Green Wire)
- ② Power Cord Come From Roof Top Air Conditioner
- ③ Strain Relief (Clamp)
- ④ White Wire
- ⑤ Black Wire
- ⑥ White Wire (Blue Wire)
- ⑦ Black Wire (Brown Wire)
- ⑧ Strain Relief (Clamp)
- ⑨ Pipe
- ⑩ Power Supply Cord

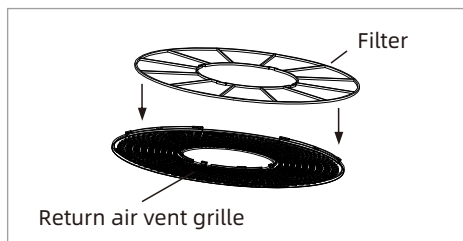
6. Tighten the strain relief clamp to secure the supply power cord. **DO NOT OVERTIGHTEN.** Reinstall the junction box cover.

3.9 Install Air Distribution Box (CONT)

1. Fix the electric control box on the top template and align it with the return air end of the host. Fix the top template on the ceiling with the fixing screws.
2. Rotate the filter clockwise, following the arrow indicator on the Air Distribution Box, to remove it from the Air Distribution Box.
3. Install Air Distribution Box panel. Cover the top template with Air Distribution Box, align the air inlet with the host air return port, and fix the screws in sequence.



4. Connect the four-wire signal cable between the outdoor unit and the ADB.
5. Place filter in return air vent grille. It may already be installed on some units.



6. Rotate the filter counterclockwise, following the arrow indicator on the Air Distribution Box, to install it onto the Air Distribution Box.

4 Operation



WARNING

If the power cuts off suddenly during the operation of the device, please do not turn it on immediately. The device must stop running for 1 minute before turning it on; otherwise, excessive current may cause the damage of the device.

4.1 Operation Of ADB

Cooling-Only Control Panel:



① Power / Wi-Fi Button

Power Function: Press to turn the unit on or off.

Wi-Fi Function: When the unit is powered off, press and hold this button to enter Wi-Fi pairing mode.

② Fan Speed Button

Press to adjust the fan speed. The available settings cycle as follows:

Low → Medium → High → Turbo → Off.

Note: The Off setting is only available when the furnace function is activated. If the furnace is not enabled, the fan cannot be set to Off.

③ Increase Button (+)

Press to increase the temperature setting.

Temperature setting range: 16-31 °C (61-88 °F).

④ Decrease Button (-)

Press to decrease the temperature setting.

Temperature setting range: 16-31 °C (61-88 °F).

⑤ Mode Button

Press to cycle through the operating modes:

Cooling → Dehumidification → Fan.

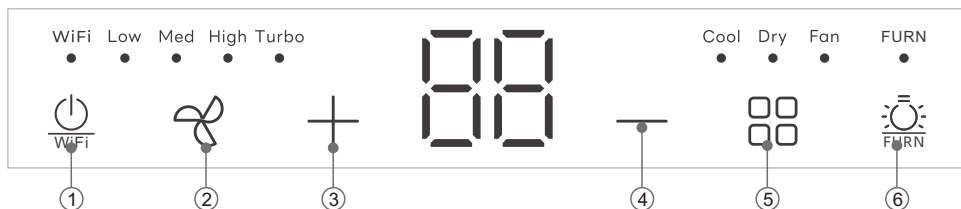
⑥ Furnace Button

Press to turn the externally connected furnace on or off.

°F / °C Unit Switching

When the unit is powered off, press and hold the Fan Speed button for 3 seconds to switch between Fahrenheit and Celsius. The factory default setting is Fahrenheit (°F).

Cooling-Only Control Panel with Lighting Function:



① Power / Wi-Fi Button

Power Function: Press to turn the unit on or off.

Wi-Fi Function: When the unit is powered off, press and hold this button to enter Wi-Fi pairing mode.

② Fan Speed Button

Press to adjust the fan speed. The available settings cycle as follows:

Low → Medium → High → Turbo → Off.

Note: The Off setting is only available when the furnace function is activated. If the furnace is not enabled, the fan cannot be set to Off.

③ Increase Button (+)

Press to increase the temperature setting.

Temperature setting range: 16–31 °C (61–88 °F).

④ Decrease Button (–)

Press to decrease the temperature setting.

Temperature setting range: 16–31 °C (61–88 °F).

⑤ Mode Button

Press to cycle through the operating modes:

Cooling → Dehumidification → Fan.

⑥ Lighting / Furnace Button

Lighting Function: Press to turn the light on or off.

Furnace Function: Press and hold for 3 seconds to turn the externally connected furnace on or off.

°F / °C Unit Switching

When the unit is powered off, press and hold the Fan Speed button for 3 seconds to switch between Fahrenheit and Celsius. The factory default setting is Fahrenheit (°F).

Cooling & Heating Control Panel with Lighting Function:



① Power / Wi-Fi Button

Power Function: Press to turn the unit on or off.

Wi-Fi Function: When the unit is powered off, press and hold this button to enter Wi-Fi pairing mode.

② Fan Speed Button

Press to adjust the fan speed. The available settings cycle as follows:

Low → Medium → High → Turbo → Off.

Note: The Off setting is only available when the furnace function is activated. If the furnace is not enabled, the fan cannot be set to Off.

③ Increase Button (+)

Press to increase the temperature setting.

Temperature setting range: 16-31 °C (61-88 °F).

④ Decrease Button (-)

Press to decrease the temperature setting.

Temperature setting range: 16-31 °C (61-88 °F).

⑤ Mode Button

Press to cycle through the operating modes:

Cooling → Dehumidification → Fan → Heating.

⑥ Lighting / Furnace Button

Lighting Function: Press to turn the light on or off.

Furnace Function: Press and hold for 3 seconds to turn the externally connected furnace on or off.

°F / °C Unit Switching

When the unit is powered off, press and hold the Fan Speed button for 3 seconds to switch between Fahrenheit and Celsius. The factory default setting is Fahrenheit (°F).

Furnace Function

This unit can only control furnace that support external control connectivity. To use this feature, a compatible externally controlled furnace must be purchased separately.

When the furnace is activated, the "Furn" indicator light turns on. The furnace will operate according to the set temperature, automatically turning the heating function on or off.

1. When the unit is powered off and the external furnace function is turned on, the system defaults to Fan Mode. The air conditioner fan is off by default. Press the Mode button to switch between Fan Mode and Heating Mode. In this state, the Fan Speed button can be used to adjust the fan speed. (In Fan Mode, the fan speed can be set to Off.)
2. In Fan Mode, if the external furnace function is turned off and the fan speed is set to Off, the unit will shut down directly. If the fan speed is set to any level other than Off, the unit will continue operating in Fan Mode.
3. In Heating Mode, if the external furnace function is turned off, the unit will continue operating in Heating Mode.

Dehumidification Mode

When Dehumidification Mode is activated, the fan operates at the lowest speed, and the fan speed cannot be adjusted.

Screen Saver Function

If there is no button operation for 15 seconds, the display will enter screen saver mode. Press any button to exit the screen saver.

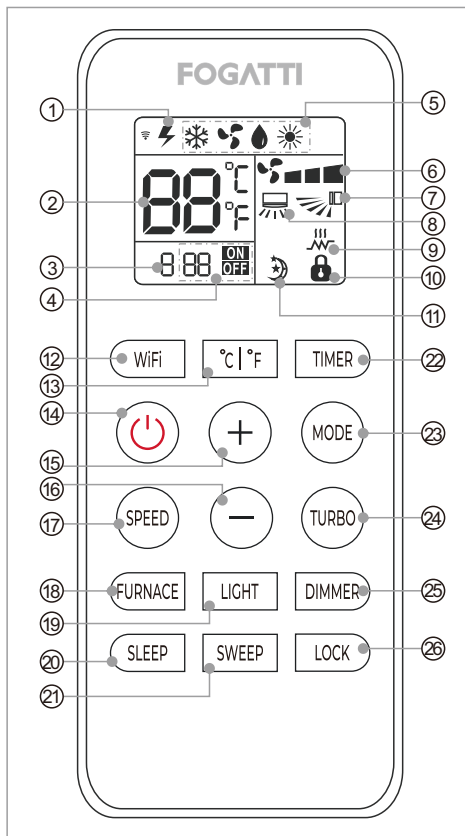
Wi-Fi Pairing Function

When the unit is powered off, press and hold the Power / Wi-Fi button for 3 seconds until the Wi-Fi icon flashes, indicating that the unit has entered Wi-Fi reset and pairing mode.

During pairing, the Wi-Fi icon flashes. Once the connection is successful, the icon remains steadily lit. If the connection fails, the Wi-Fi icon turns off.

When the unit is powered on, it automatically enters pairing mode by default, and the Wi-Fi indicator flashes. If the connection is not established within 3 minutes, the Wi-Fi indicator will turn off.

4.2 Operation Of Wireless Remote Controller



- ① **TURBO Display**
- ② **Temperature Display °C/°F**
- ③ **DIMMER Display**
- ④ **Timer Display Timer ON/OFF**
- ⑤ **Mode Display COOL/FAN/DRY/HEAT**
- ⑥ **Fan Speed Display Low/Medium/High**
- ⑦ **SWEEP Display**
- ⑧ **LIGHT Display**
- ⑨ **Furnace Display**
- ⑩ **Lock Function Display**
- ⑪ **Sleep Function Display**
- ⑫ **Wi-Fi Button**
Press and hold for 3 seconds to reset the Wi-Fi connection and enter pairing mode.

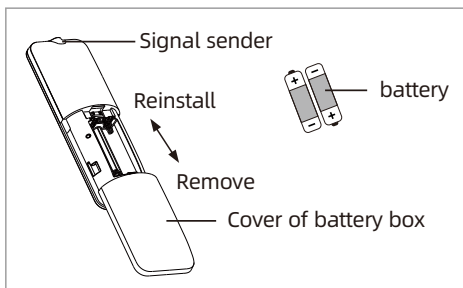
- ⑬ **°C/°F Button**
Switch between Fahrenheit and Celsius temperature units.
- ⑭ **Power Button**
Turns the device on or off.
- ⑮ **Increase Button (+)**
Used to increase the temperature or timer setting. Press and hold to increase rapidly.
Temperature setting range: 16-31 °C (61-88 °F).
Timer setting range: 00-24 hours.
- ⑯ **Decrease Button (-)**
Used to decrease the temperature or timer setting. Press and hold to decrease rapidly.
Temperature setting range: 16-31 °C (61-88 °F).
Timer setting range: 00-24 hours.
- ⑰ **SPEED Button**
Adjusts the fan speed with three selectable levels.
- ⑱ **FURNACE Button**
Turns the furnace function on or off. When activated, only Fan Mode and Heating Mode are available using the MODE button. Other modes cannot be selected.
- ⑲ **LIGHT Button**
Press to turn the lighting function on or off.
(Not available on some models.)
- ⑳ **SLEEP Button**
Press to enable or disable Sleep Mode. Sleep Mode is only available in Cooling and Heating modes.
- ㉑ **SWEEP Button**
Press to enable or disable the swing function.
(Not available on some models.)
- ㉒ **TIMER Button**
Set the timer to automatically turn the device on or off.
- ㉓ **MODE Button**
Press to cycle through operating modes: Cooling, Fan, Dehumidification, and Heating.
(Heating is not available on some models.)
- ㉔ **TURBO Button**
Activates turbo fan mode. The fan icon flashes and the lightning icon illuminates.
- ㉕ **DIMMER Button**
Adjusts the lighting level. Five brightness levels are available.
(Not available on some models.)
- ㉖ **LOCK Button**
Press and hold for 5 seconds to lock or unlock the remote control buttons.

■ Replacement of batteries in remote controller



NOTICE

Remote requires 2 AAA batteries. Some models come with included batteries.



1. Press the back side of remote controller marked with "PUSH", as shown in the fig, and then push out the cover of battery box along the arrow direction.
2. Replace two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar are correct.
3. Reinstall the cover of battery box.



NOTICE

- During operation, point the remote control signal sender at the receiving window on indoor unit.
- The distance between signal sender and receiving window should be no more than 8m, and there should be no obstacles between them.
- Signal may be interfered easily in the room where there is fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.
- Replace new batteries of the same model when replacement is required.
- When you don't use remote controller for a long time, please take out the batteries.
- If the display on remote controller is fuzzy or there's no display, please replace batteries.
- Battery Disposal: Do not dispose of batteries as unsorted municipal waste. Refer to local laws for proper disposal of batteries.

5 Maintenance

5.1 Cleaning of Air filter

Remove the filter screen behind the interior panel (Rotate the filter clockwise, following the arrow indicator on the Air Distribution Box, to remove it from the Air Distribution Box.), clean with water, and then re install after drying.



WARNING

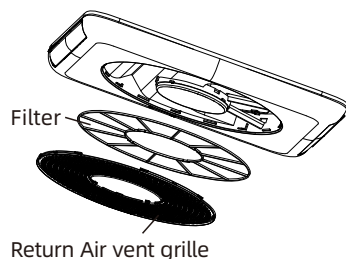
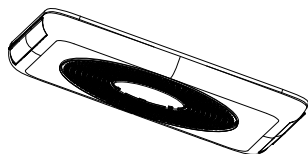
It is forbidden to operate the air conditioner without the air filter, otherwise, the evaporator coil will be defiled and the service life of air conditioner will be affected.

5.2 Panel Surface Cleaning

Clean the outer surface of the panel with soft cloth dipped in neutral detergent. Do not use polishing or cleaning powder.

5.3 Fan Motor

The fan motor has been lubricated during production procedure and does not need special maintenance.



6 Troubleshooting

If the air conditioning equipment cannot work normally, please carry out inspection as follows to remove the faults:

- Check whether the fuse of air conditioning equipment or leakage circuit breaker of the RV is turned on.
- If the air conditioner is powered by a generator, please first confirm whether the generator power matches the air conditioner, whether the generator runs normally and generates electricity, and whether voltage output of the generator is stable.
- If the RV is connected to the main supply, please make sure that the specification of power line matches the operating load of this product and that there is power supply. Check whether the mains voltage meets related requirements (the operating voltage of air conditioner is 115V).
- Check whether the connecting wires of air conditioner are inserted in place and connected in good condition. If the air conditioner still cannot work normally after the above inspection, please contact the factory for further help.

Code	Name	Fault Condition	Recovery Condition
E1	Communication Fault	Communication interrupted for 30 seconds	Communication restored
E2	Evaporator Fan Fault	Fan malfunction detected	Fault cleared
E3	Condenser Fan Fault	Fan malfunction detected	Fault cleared
E4	Wired Controller Temperature Sensor Fault	Open circuit or short circuit	Sensor reconnected
E5	Evaporator Sensor Fault	Open circuit or short circuit	Sensor reconnected
E6	Condenser Sensor Fault	Open circuit or short circuit	Sensor reconnected
E7	DC Power Low Voltage Protection	Voltage < 10.5 V	Voltage > 11.5 V
E8	DC Power Overvoltage Protection	Voltage ≥ 36 V	Voltage < 35 V

Fault Indication:

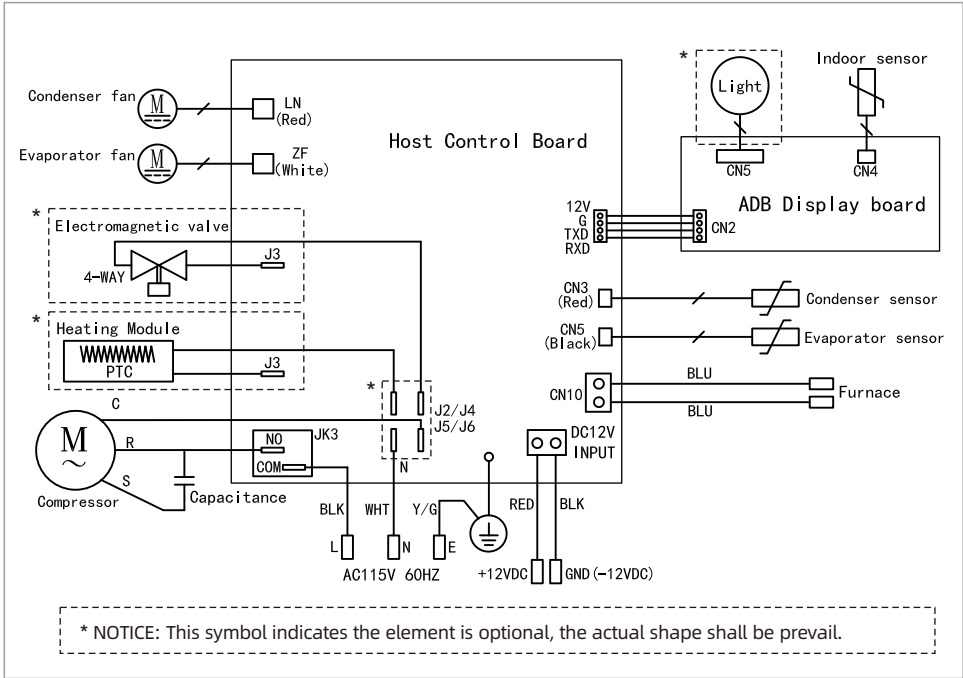
When a fault occurs, the buzzer will beep once every 2 seconds and stop after 15 seconds. The fault code will remain displayed on the screen. If the fault condition changes, the buzzer will sound again for another 15 seconds.



CAUTION

The equipment must be repaired by professional personnel.

7 Circuit Diagram



Transportation, marking and storage for units that employ flammable refrigerants

1. Transport of equipment containing flammable refrigerants

Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations.

2. Marking of equipment using signs

Signs for similar appliances used in a work area are generally addressed by local regulations and give the minimum requirements for the provision of safety and/or health signs for a work location.

All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs.

The effectiveness of signs should not be diminished by too many signs being placed together.

Any pictograms used should be as simple as possible and contain only essential details.

3. Disposal of equipment using flammable refrigerants

See national regulations.

4. Storage of equipment/appliances

The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent.

5. Storage of packed (unsold) equipment

Storage package protection should be constructed in such a way that mechanical damage to the equipment inside the package will not cause a leak of the REFRIGERANT CHARGE.

The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

Requirements for operation, service and installation manuals of appliances using flammable refrigerants

1. Warning

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.

Do not pierce or burn.

Be aware that refrigerants may not contain an odour.

2. General

- a warning to keep any required ventilation openings clear of obstruction;
- a notice that servicing shall be performed only as recommended by the manufacturer;
- a warning that ducts connected to an appliance shall not contain a POTENTIAL IGNITION SOURCE;

3. Qualification of workers

The manual shall contain specific information about the required qualification of the working personnel for maintenance, service and repair operations. Every working procedure that affects safety means shall only be carried out by competent persons according.

Examples for such working procedures are:

- Breaking into the refrigerating circuit;
- Opening of sealed components;
- Opening of ventilated enclosures.

4. Information on servicing

4.1 General

The manual shall contain specific information for service personnel according to 4.2 to 4.10.

4.2 Checks to the area

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the REFRIGERATING SYSTEM, 4.3 to 4.7 shall be completed prior to conducting work on the system.

4.3 Work procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

4.4 General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

4.5 Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

4.6 Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

4.7 No ignition sources

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

4.8 Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

4.9 Checks to the refrigerating equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

- The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

4.10 Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- That no live electrical components and wiring are exposed while charging, recovering or purging the system;
- That there is continuity of earth bonding.

5. Repairs to sealed components

5.1 During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

5.2 Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that the apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

6. Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

NOTE: The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

7. Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

8. Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area. Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. NOTE Examples of leak detection fluids are

- bubble method,
- fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

9. Removal and evacuation

When breaking into the refrigerant circuit to make repairs - or for any other purpose - conventional procedures shall be used. However, for FLAMMABLE REFRIGERANTS it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- remove refrigerant;
- purge the circuit with inert gas (optional for A2L);
- evacuate (optional for A2L);
- purge with inert gas (optional for A2L);
- open the circuit by cutting or brazing.

The REFRIGERANT CHARGE shall be recovered into the correct recovery cylinders. For appliances containing FLAMMABLE REFRIGERANTS other than A2L REFRIGERANTS, the system shall be purged with oxygen-free nitrogen to render the appliance safe for FLAMMABLE REFRIGERANTS. This process may need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing FLAMMABLE REFRIGERANTS, other than A2L REFRIGERANTS, REFRIGERANTS purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

Ensure that the outlet for the vacuum pump is not close to any POTENTIAL IGNITION SOURCES and that ventilation is available.

10. Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

11. Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

c) Before attempting the procedure, ensure that:

- Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- All personal protective equipment is available and being used correctly;
- The recovery process is supervised at all times by a competent person;
- Recovery equipment and cylinders conform to the appropriate standards.

-
- d) Pump down refrigerant system, if possible.
 - e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
 - f) Make sure that cylinder is situated on the scales before recovery takes place. g) Start the recovery machine and operate in accordance with instructions. h) Do not overfill cylinders (no more than 80 volume liquid charge).
 - i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
 - j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
 - k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

12. Labelling

Equipment shall be labeled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

13. Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, FLAMMABLE REFRIGERANTS. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.



WARNING: Risk of electric shock can cause injury or death: disconnect all remote electric power suppliers before servicing.

Made in China





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