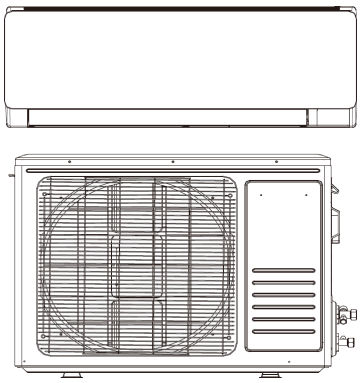
Installation, Operation, and Maintenance

19-23 Seer 2 Single Zone Ductless Mini-Split Heat Pump

Outdoor Model	Indoor Model Pairing
M5THS2309A11NA	M5MHWUN09B1N0A
M5THS2312A11NA	M5MHWUN12B1N0A
M5THS2318A11NA	M5MHWUN18B1N0A
M5THS2324A11NA	M5MHWUN24B1N0A
M5THS1909A11NA	M5MHWUN09B1N0A
M5THS1912A11NA	M5MHWUN12B1N0A
M5THS1918A11NA	M5MHWUN18B1N0A
M5THS1924A11NA	M5MHWUN24B1N0A
M5THS1936A11NA	M5MHW1936B1N0A



Note: *Graphics in this document are for representation only. Actual model may differ in appearance.*

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

December 2025 **DLR-SVX026A-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

This document is customer property and is to remain with this unit. Return to the service information pack upon completion of work.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/ sleeves, butyl gloves, safety glasses, hard hat/ bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

⚠ WARNING

Cancer and Reproductive Harm!

This product can expose you to chemicals, including lead, which are 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

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

This unit is not to be used 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 the use of the appliance by a person responsible for their safety.

Do not allow children to play or climb on the unit or to clean or maintain the unit without supervision.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

Connect the air handler to an outdoor unit suitable for use with R-454B refrigerant only.

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

⚠ WARNING

Grounding Required!

Failure to follow instructions below could result in death or serious injury, or property damage.

- **Reconnect all grounding devices.**
- **All parts of this product that are capable of conducting electrical current are grounded.**
- **If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.**

⚠ WARNING

Risk of Fire — Flammable Refrigerant!

Failure to follow instructions below could result in death or serious injury, and equipment damage.

- **To be repaired only by trained service personnel.**
- **Do not puncture refrigerant tubing.**
- **Dispose of properly in accordance with federal or local regulations.**

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

⚠ WARNING

Refrigerant under High Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.

System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury and equipment or property damage.

- **Do not use any items other than those approved by the manufacturer for defrosting or cleaning process.**
- **Store the appliance 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 cautious that refrigerants may be odorless.**

⚠ WARNING

Risk of Fire!

Failure to follow the safety precautions could result in serious injury, death, or property damage.

Only approved auxiliary devices listed in this manual and declared suitable with the refrigerant must be installed in the connecting ductwork. Devices that may be potential ignition sources, such as hot surfaces or electric switching devices, must not be installed unless approved by the manufacturer or declared suitable with the refrigerant used.

⚠ CAUTION

Sharp Edges!

Failure to follow instructions below could result in minor to moderate injury.

The service procedure described in this document involves working around sharp edges. To avoid being cut, technicians MUST put on all necessary Personal Protective Equipment (PPE), including gloves and arm guards.

⚠ CAUTION

Corrosion Hazard!

Failure to follow instructions below could result in personal injury or equipment damage.

To prevent shortening its service life, do not use air handler during the finishing phases of construction or remodeling. The low return air temperatures can lead to the formation of condensate. Condensate in the presence of chlorides and fluorides from paint and other components creates a corrosive condition which may cause rapid deterioration of the cabinet and internal components.

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Table of Contents

General Information

Components

Figure 1. 9–24K indoor and outdoor unit

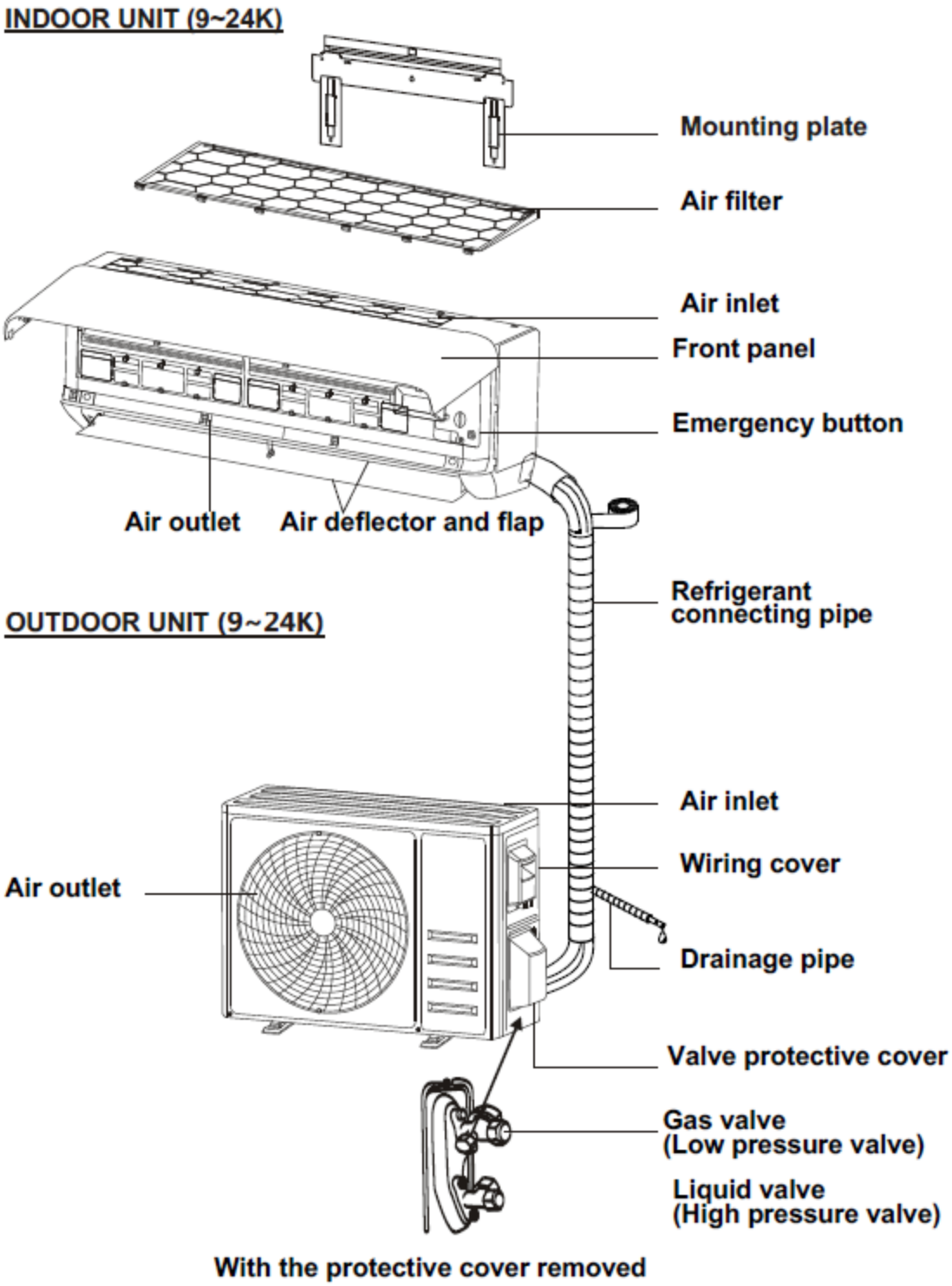


Figure 2. 36K indoor and outdoor unit

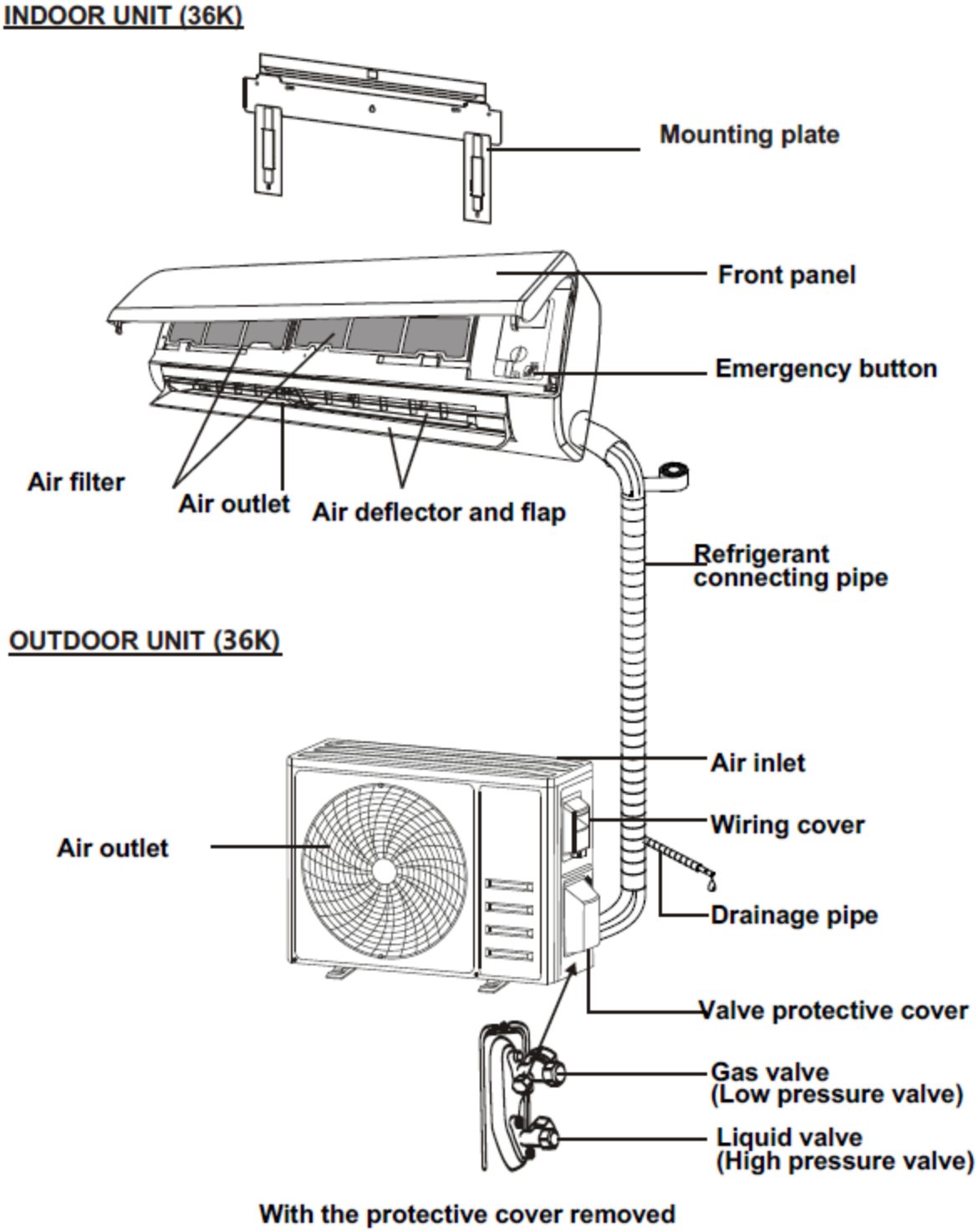


Figure 3. 9–24K indoor display

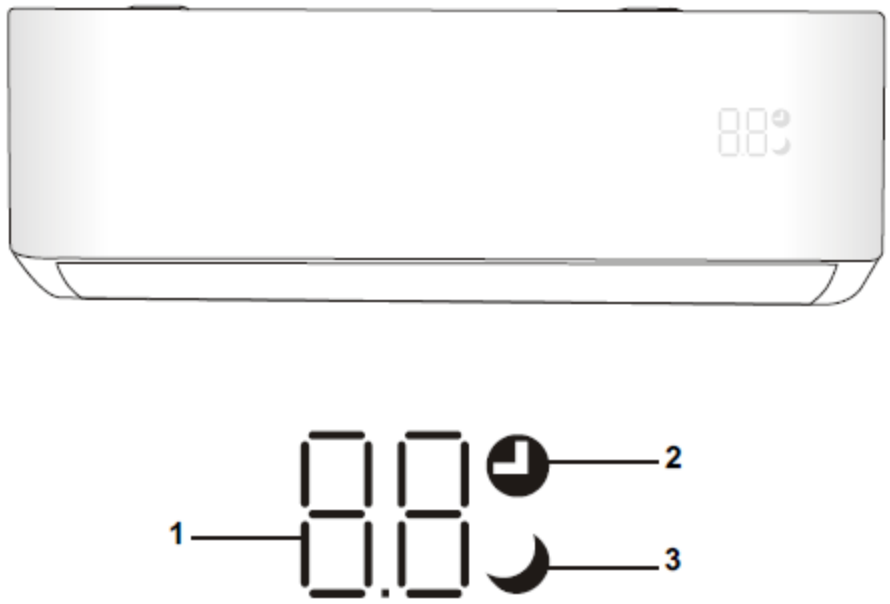


Table 1. 9–24K indoor display functions

No.	Function
1	Indicator for timer, temperature, and error codes
2	Lights up for timer operation
3	Sleep mode

Figure 4. 36K indoor display

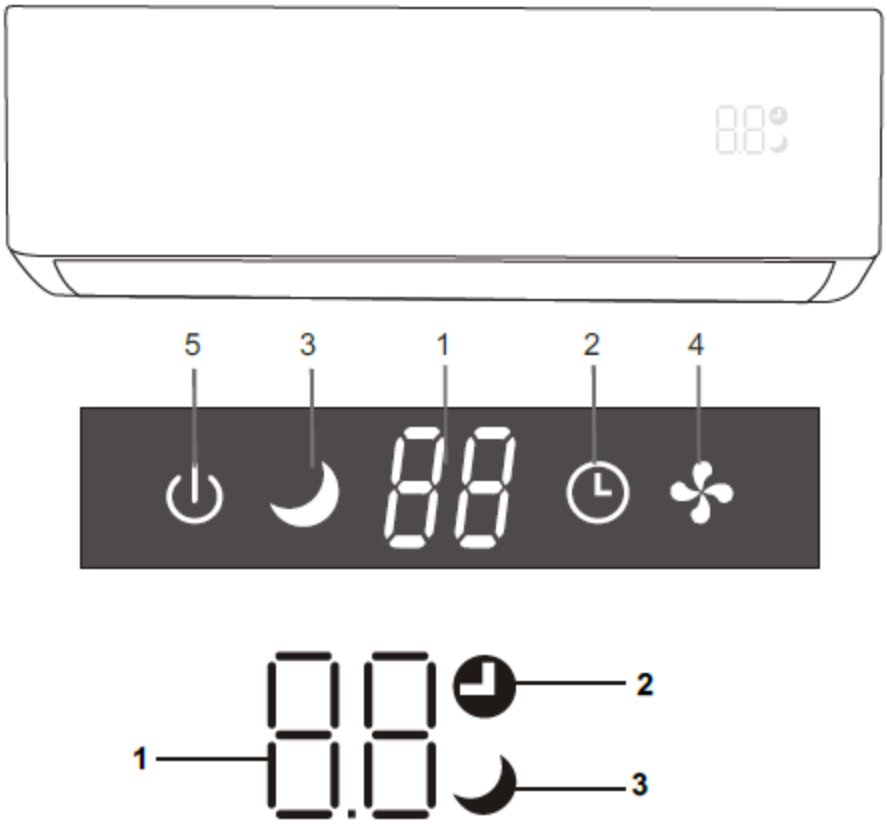


Table 2. 36K indoor display functions

No.	Function
1	Indicator for timer, temperature, and error codes
2	Lights up for timer operation
3	Sleep mode
4	This symbol displays when the unit is turned on and disappears when the unit is turned off
5	This symbol displays when the power is on

Operating Conditions

Operating the air conditioner outside the specified temperature range may activate its protection device, potentially causing a malfunction. Confirm the air conditioner is used within the recommended temperature conditions.

Table 3. Inverter heat pump

Temperature Mode	Heating	Cooling
Room temperature	32 – 80°F (0 – 27°C)	63 – 90°F (17 – 32°C)
Outdoor temperature	5° – 75°F (-15 – 24° C) **Low temperature heating**: 9–24K: 13 – 75°F (-25 – 24°C) 36K□-4 – 75°F (-20 – 24°C))	**T1 Climate** 59 – 122°F (15 – 50° C **Low temperature cooling**: 5 – 75°F (-15 – 24C)
		T3 Climate: 59 – 131°F (15 – 55° C)

With the power supply connected, restart the air conditioner after shutdown or switch it to other mode during operation, and the air conditioner protection device will start. The compressor will resume operation after three minutes.

Heating Operation

Preheating

When the heating function is enabled, the indoor unit will take two to five minutes for preheating, then the air conditioner will start heating and produce warm air.

Defrosting

When the outdoor unit is frosted during heating, the air conditioner enables the automatic defrosting function to improve the heating effect. During defrosting, the indoor and outdoor fans stop running. The air conditioner will resume heating automatically after defrosting finishes.

Emergency Button

To access the emergency button, open the indoor unit panel and locate the button on the electronic control box when the remote controller fails.

Figure 5. Emergency button

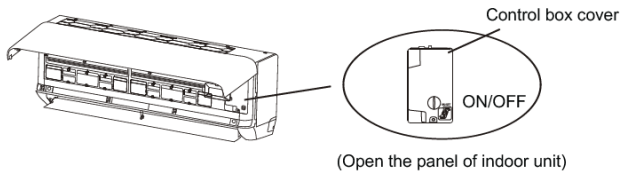


Table 4. Emergency operations

Current Status	Operation	Response	Enter Mode
Standby	Press the emergency button once	Beeps briefly once	Cooling mode
Standby (only for heat pump models)	Press the emergency button twice in three seconds	Beeps briefly twice	Heating mode
Running	Press the emergency button once	Continues beeping	Off mode

Installation Considerations

Installation considerations:

- **Professional installation**: The air conditioner must be installed by certified and professional personnel. The installation manual is intended solely for use by these professionals. Installation specifications must comply with after-sales service regulations.
- **Leak test**: A leak test must be conducted upon completion of the installation.
- **Safety inspection**: Prior to any maintenance or repair involving combustible refrigerants, a safety inspection is required to minimize fire risks.
- **Controlled operation**: The machine must be operated under controlled procedures to minimize risks associated with combustible gases or vapors during operation.
- **Space verification**: The installer must confirm that the total conditioned space is sufficient to safely dilute any leaked refrigerant in the event of a leak within the indoor system.
- **Minimum space requirements**: The minimum conditioned space must comply with the specifications outlined in Table 5, p. 11 and Table 6, p. 11. This includes considerations of installation height and the altitude above sea level at the installation site.

Table 5. Maximum charge (lbs)

Category	LFL (kg/m^3)	h_0 (ft)	Floor area (sq. ft)						
			43.1	75.3	107.6	161.5	215.3	322.9	538.2
R–454B	0.296	3.3	0.7	1.1	1.8	2.4	3.3	5.1	8.4
		5.9	1.2	2.1	3.1	4.4	6.0	9.0	15.0
		7.2	1.5	2.6	3.7	5.5	7.3	11.0	18.3

Table 6. Minimum room area (square feet)

Category	LFL (kg/m^3)	h_0 (ft)	Charge amount (M) (lbs) Minimum room area (sq. ft)						
			2.2 lbs	2.61 lbs	3.11 lbs	3.51 lbs	4.01 lbs	4.41 lbs	4.91 lbs
R–454B	0.296	3.3	143.1	171.7	200.2	228.8	257.5	286.1	314.7
		5.9	79.4	95.4	111.3	127.1	143.1	159.0	174.8
		7.2	65.0	78.0	91.1	104.0	117.0	130.0	143.1

Table 7. Minimum space conditioned by the appliance (square feet)

	Altitude(ft)								
	Sea level-2000	2001- 4000	4001- 6000	6001-8000	8001- 10000	10001-12000	12001-14000	14001-15000	above 15000
Charge (lb)	Minimum Conditioned Space (sq. ft)								
4	63	66	70	74	79	85	91	94	98
5	79	83	88	93	99	106	113	119	131
6	95	100	105	112	119	130	156	171	188
7	110	116	123	130	150	177	212	232	256
8	126	133	146	168	196	232	276	304	334
9	142	160	184	213	249	293	350	384	423
10	174	198	227	263	307	362	432	474	522
11	210	240	275	318	372	438	523	574	632
12	250	285	327	379	442	521	622	683	752
13	294	335	384	444	519	612	730	801	883

Table 7. Minimum space conditioned by the appliance (square feet) (continued)

	Altitude(ft)								
	Sea level-2000	2001- 4000	4001- 6000	6001-8000	8001- 10000	10001-12000	12001-14000	14001-15000	above 15000
Charge (lb)	Minimum Conditioned Space (sq. ft)								
14	341	388	446	515	602	710	847	930	1024
15	391	446	512	592	691	815	972	1067	1176
16	445	507	582	673	786	927	1106	1214	1337
17	502	573	657	760	887	1046	1249	1371	1510
18	563	642	737	852	995	1173	1400	1537	1693
19	628	715	821	949	1108	1307	1560	1712	1886
20	695	792	909	1052	1228	1448	1728	1897	2090
21	767	874	1003	1160	1354	1597	1905	2091	2304
22	842	959	1100	1273	1486	1753	2091	2295	2529

Installation Safety

- **Ventilation**: Confirm the installation site is well-ventilated.
- **Heat source restrictions**: The installation and maintenance sites must be free from open flames, welding activities, smoking, drying ovens, or any other heat sources exceeding 1018°F (548°C).
- **Anti-static measures**: Appropriate anti-static measures, such as wearing anti-static clothing and gloves, must be taken during installation.
- **Site selection**: Choose a site that facilitates easy installation and maintenance. Ensure that the air inlets and outlets of both indoor and outdoor units are not obstructed and are away from heat sources, combustible materials, and explosive environments.
- **Refrigerant leak protocol**: In the event of a refrigerant leak during installation, immediately turn off the outdoor unit valve and evacuate all personnel for at least 15 minutes to allow the refrigerant to dissipate. If the product is damaged, it must be returned to the maintenance station. Welding the refrigerant pipe or conducting other operations on-site is prohibited.
- **Airflow considerations**: Select a location where the inlet and outlet air of the indoor unit can flow evenly.
- **Avoid electrical hazards**: Avoid installing the unit near other electrical products, power switches, plugs, sockets, kitchen cabinets, beds, sofas, or other valuables directly beneath the indoor unit.

Table 8. Single zone charge

ODU Capacity (BTUH)	9K	12K	18K	24K	36K
Pre-charged Refrigerant Amount (oz)	25.04	35.27	45.44	55.03	55.73
Length of pre-charge pipe (ft)	25	25	25	25	25
Maximum Line Length (ft)	50	50	65	65	65
Additional Refrigerant Charge (oz/ft)	0.11	0.11	0.11	0.11	0.32
Maximum Height Difference Between Indoor and Outdoor Unit (ft)	33	33	49	49	65

Figure 6. Additional refrigerant

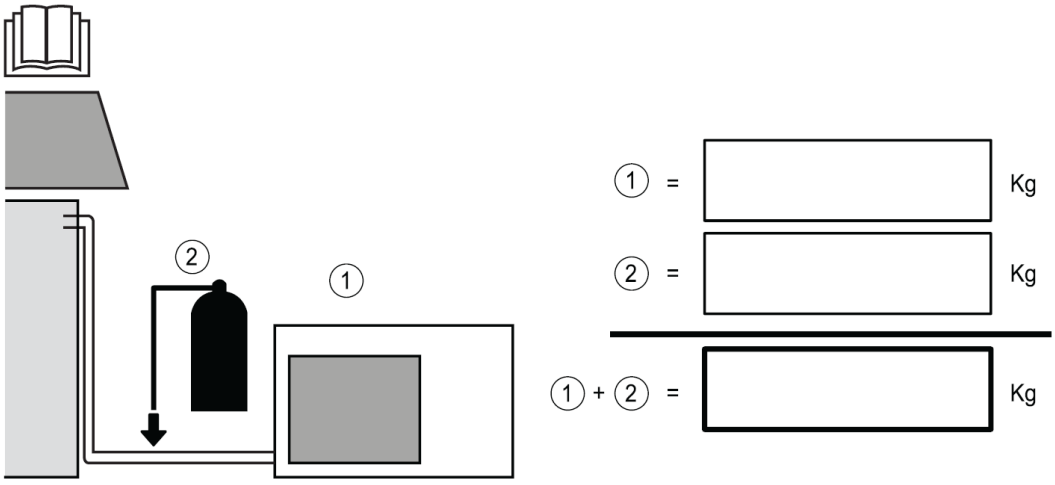


Table 9. Torque parameters

Pipe Size	Newton Meter [N x m]	Pound-force foot (lbf-ft)	Kilogram-force meter (kgf-m)
1/4 inch (φ6.35)	15 - 20	11.1 - 14.8	1.5 - 2.0
3/8 inch (φ9.52)	31 - 35	22.9 - 25.8	3.2 - 3.6
1/2 inch (φ12)	45 - 50	33.2 - 36.9	4.6 - 5.1
5/8 inch (φ15.88)	60 - 65	44.3 - 48.0	6.1 - 6.6

Table 10. Connecting pipe and wire specifications

Model	Liquid Pipe		Gas Pipe		Connecting Cable Size
9K 230V 12K 230V	1/4 inch	φ6.35mm	3/8 inch	Φ9.52mm	16AWG
18K 230V	1/4 inch	φ6.35mm	1/2 inch	Φ12.7mm	16AWG
24K 230V	1/4 inch	φ6.35mm	5/8 inch	Φ15.88mm	16AWG
36K 230V	1/4 inch	φ6.35mm	5/8 inch	Φ15.88mm	16AWG

Indoor Unit Installation

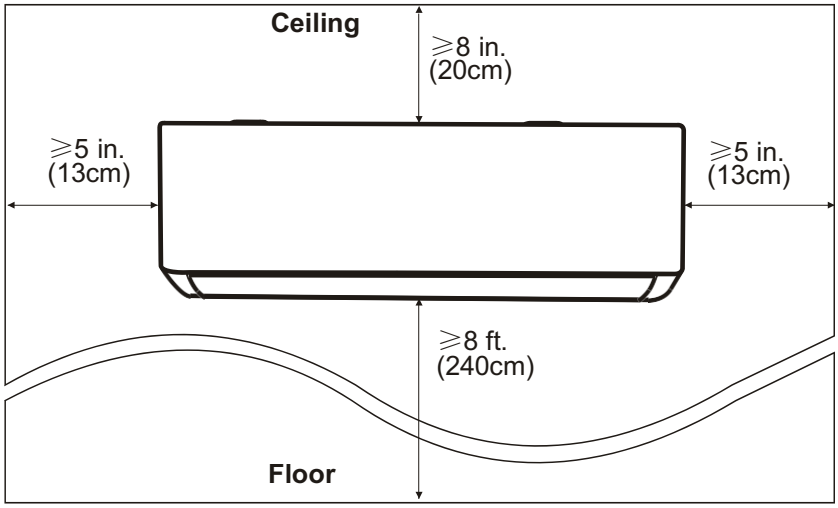
Installation Location

Confirm that:

- The installation complies with the installation minimum dimensions (defined below) and meets the minimum and maximum connecting piping length and maximum change in elevation as defined in the System Requirements section.
- Air inlet and outlet are clear of obstructions, ensuring proper airflow throughout the room.
- Condensate is easily and safely drained.
- All connections can be easily made to outdoor unit.
- Indoor unit is out of reach of children.
- The mounting wall is strong enough to withstand four times the full weight and vibration of the unit.
- The filter can be easily accessed for cleaning.
- There is enough clearance to allow access for routine maintenance.
- Installation is at least 10 feet (3 m) away from the antenna of TV set or radio. Operation of the air conditioner may interfere with radio or TV reception in areas where reception is weak. An amplifier may be required for the device.
- Do not install in a laundry room or by a swimming pool due to the corrosive environment.

Minimum Indoor Clearances

Figure 7. Minimum indoor clearance

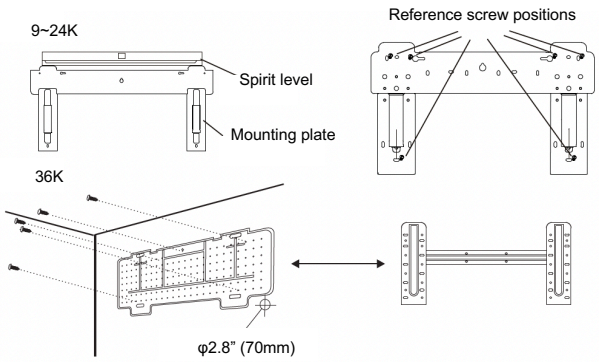


Note: *Minimum installation height must be at least 8 feet (2.4 m) above floor or grade.*

Install Mounting Plate

1. Remove the mounting plate from the back of indoor unit.
2. Confirm the installation meets the minimum installation dimensions. according to the size of mounting plate.
3. Determine the position and stick the mounting plate close to the wall.
4. Adjust the mounting plate to a horizontal state with a level, then mark out the screw hole positions on the wall.
5. Put down the mounting plate and drill holes in the marked positions with drill.
6. Insert expansion rubber plugs into the holes, then hang the mounting plate and fix it with screws.

Figure 8. Install mounting plate



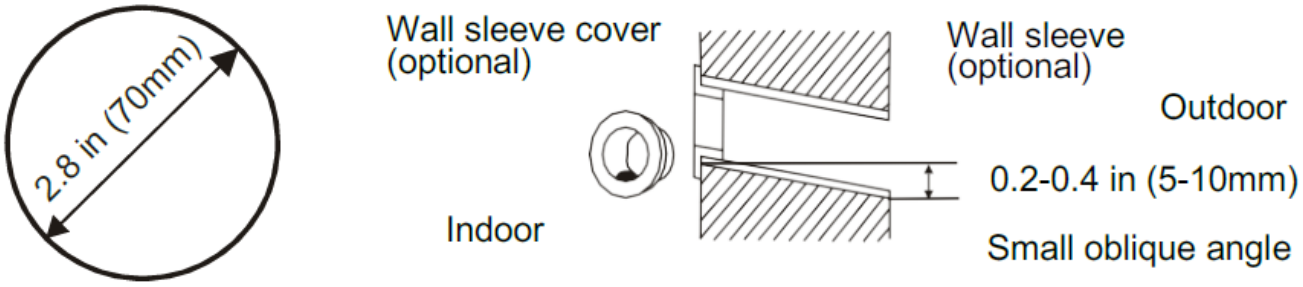
Drill Wall Access

Drill a hole in the wall for refrigerant piping, the drainage pipe, and connecting cables.

Important: *Avoid wires and plumbing when drilling the wall hole.*

1. Determine the location of wall hole base on the position of mounting plate.
2. The hole should be have at least a 2.8 inch (70 mm) diameter and a small oblique angle to facilitate drainage.
3. Drill the wall hole with 2.8 inch (70 mm) core drill and with small oblique angle lower than the indoor end about 0.2 inch (5mm) to 0.4 inch (10mm).
4. Place the wall sleeve and wall sleeve cover (both are optional parts) to protect the connection parts.

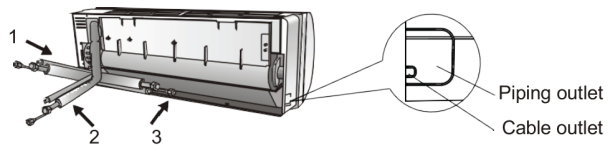
Figure 9. Wall access



Connecting the Refrigerant Pipe

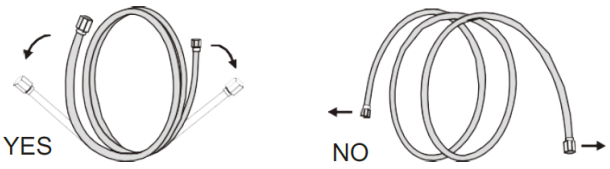
1. Select one of the three options for connecting the refrigerant pipe (see .
   - Option 2 is the recommended method.
   - If using option 1 or option 3, use scissors to cut a notch in the plastic sheet of the piping outlet and the cable outlet on the corresponding side of the indoor unit. Confirm the cut is smooth.

Figure 10. Refrigerant pipe options



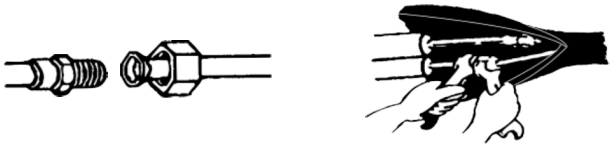
2. Bend the connecting pipes with the port facing up, as shown below.

Figure 11. Bend connecting pipes



3. Remove the plastic covering from the pipe ports and the end of the piping connectors.
4. Confirm the port of the connecting pipe is clean and free of debris.
5. Align the center, and rotate the nut of the connecting pipe to hand tighten the nut.
6. Use a torque wrench to tighten in accordance to the torque values in the Torque Parameters table.
7. Wrap the joint with the insulation pipe.

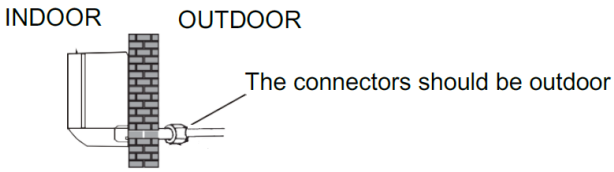
Figure 12. Insulation pipe



Note: *When flared joints are reused indoors, the flare will need to be re-fabricated.*

8. Confirm the connectors are outdoors.

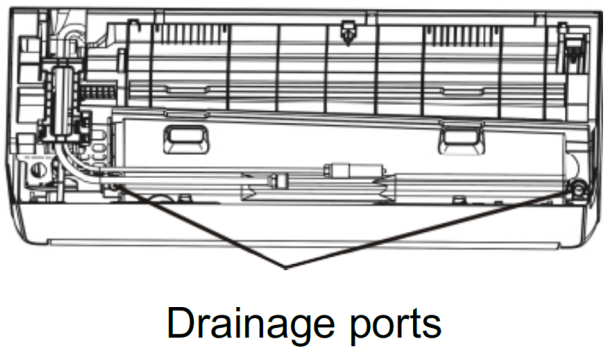
Figure 13. Outdoor connectors



Connect Drainage Hose

1. Adjust the drainage hose (if applicable). Some models have a drainage port on both sides of the indoor unit. Select which side to attach the drainage hose and plug the unused drain port with the attached rubber plug.

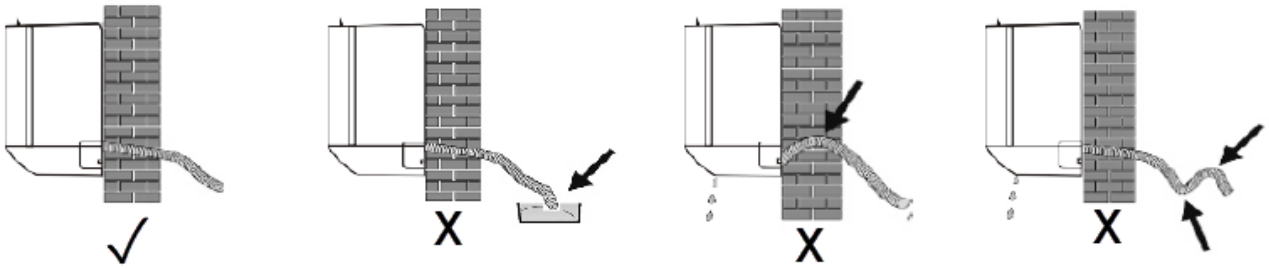
Figure 14. Drainage ports



2. Connect the drainage host to the drainage port and confirm the joint is properly sealed.
3. Wrap the joint with teflon tape to prevent leaks.

Note: *Confirm there are no twists on dents in the hose. The hose should be placed at a downward angle for proper drainage and to avoid blockage.*

Figure 15. Correct hose placement



Connect Wiring

1. Choose the correct cable sizes determined by the maximum operating current on the nameplate.
2. Open the front panel of indoor unit.
3. Use a screwdriver to open the electric control box cover to the terminal block.
4. Unscrew the cable clamp.
5. Insert one end of the cable into the position of control box from the back of the right end of the indoor unit.
6. Connect the wires to corresponding terminal according to the wiring diagram on the electric control box cover. Confirm the wires are securely connected.
7. Screw the cable clamp to fasten the cables.
8. Reinstall the electric control box cover and front panel.

Figure 16. Wiring

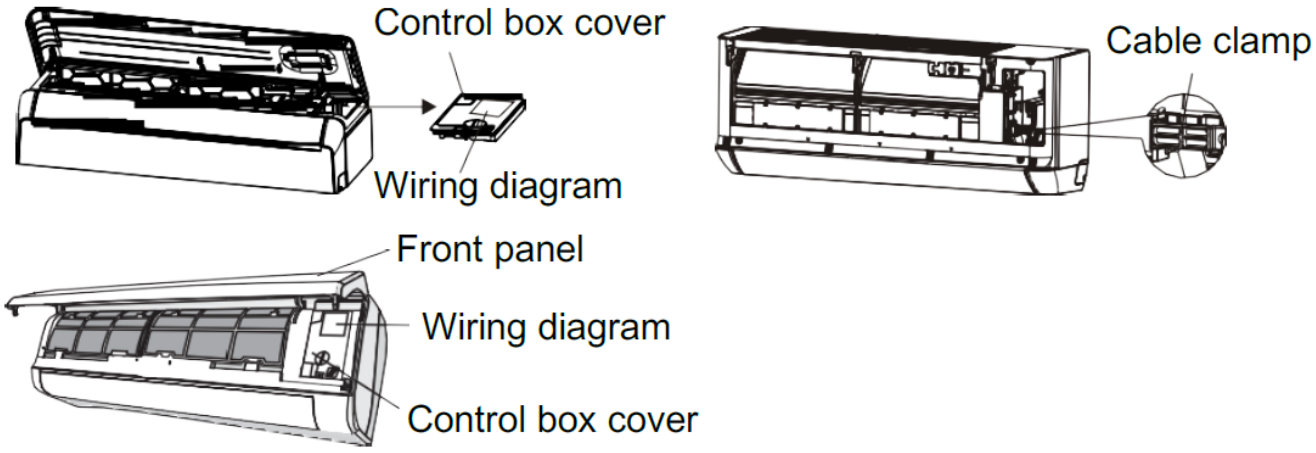
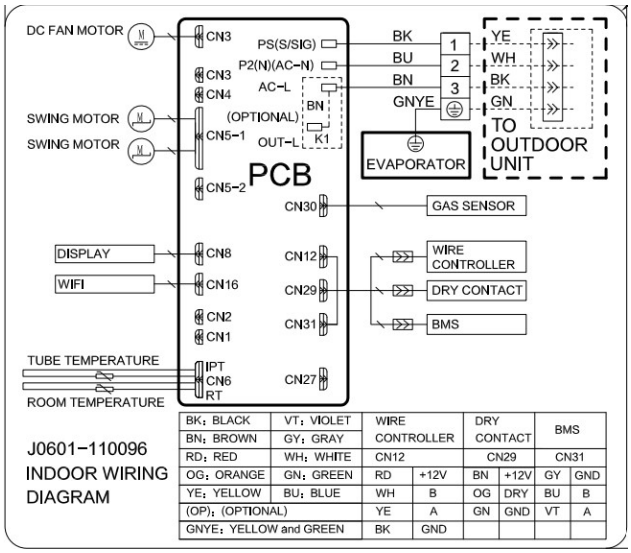


Figure 17. Indoor wiring diagram



BK: BLACK	VT: VIOLET	WIRE CONTROLLER		DRY CONTACT		BMS	
BN: BROWN	GY: GRAY	CN12		CN29		CN31	
RD: RED	WH: WHITE	RD	+12V	BN	+12V	GY	GND
OG: ORANGE	GN: GREEN	WH	B	OG	DRY	BU	B
YE: YELLOW	BU: BLUE	YE	A	GN	GND	VT	A
(OP): (OPTIONAL)		BK	GND				
GNYE: YELLOW and GREEN							

Wrap Piping and Cable

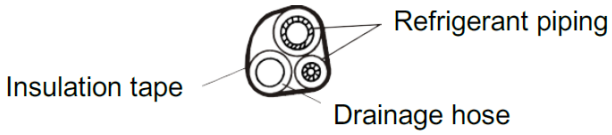
After installing the refrigerant pipes, connecting wires, and drainage hose bundle with insulating tape to save space, protect, and insulate them before passing them through the wall hole.

1. Arrange the pipes, cables, and drainage hose per the following figure.

Notes:

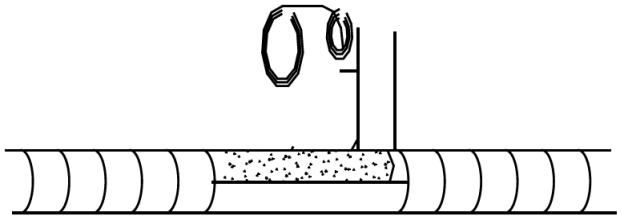
- *Confirm the drainage hose is at the bottom.*
- *Avoid the crossing or bending of parts.*

Figure 18. Arrange pipes, wires, and drainage hose



2. Using the insulating tape wrap the refrigerant pipes, connecting wires and drainage hose tightly together.

Figure 19. Wrap tightly



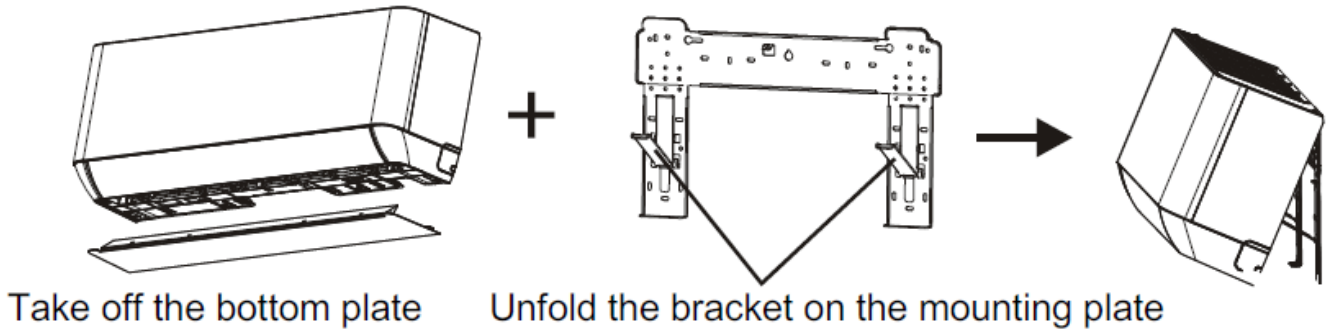
Mount Indoor Unit

1. Slowly pass the refrigerant pipes, connecting wires, and drainage hose wrapped bundle through the wall access.
2. Hook the top of indoor unit on the mounting plate.
3. Apply slight pressure to the left and right sides of the indoor unit, confirm the indoor unit is firmly hooked.
4. Push down the bottom of indoor unit to snap into hooks of the mounting plate. Confirm it is secure.

In cases where the refrigerant pipes are installed within the wall, or to connect the pipes and wires on the wall:

- Grab both ends of the bottom plate, apply outward force to take off the bottom plate.
- Hook the top of the indoor unit on the mounting plate without piping and wiring.
- Lift the indoor unit opposite the wall, unfold the bracket on the mounting plate, and use this bracket to prop up the indoor unit. There will be a gap for operation.
- Wrap the refrigerant piping and connect the drainage hose.
- Replace the bracket of mounting plate.
- Push down the bottom of indoor unit to snap into hooks of the mounting plate. Confirm it is secure.
- Replace the bottom plate of the indoor unit.

Figure 20. Mount indoor unit



Refrigerant Sensor

⚠ WARNING

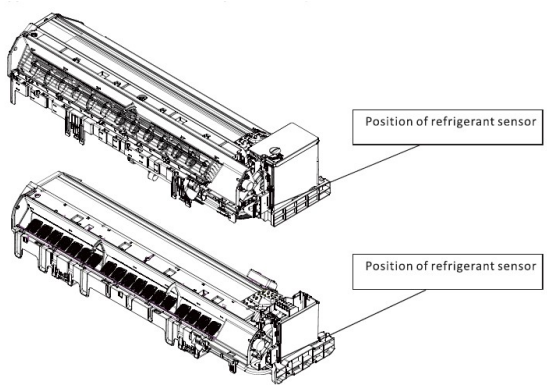
Leak Detection System Installed!

Failure to follow instructions below could result in death or serious injury or equipment damage.

The unit is equipped with electrically powered safety measures and must be powered at all times after installation, except during servicing, to detect any leak.

- The design life of the refrigerant sensor is 15 years. Replace the sensor within the range of the service life.
- The refrigerant sensor automatically detects the condition of the machine while in operation and will automatically start the circulating air flow and stop the compressor when the refrigerant concentration reaches the alarm range.
- A refrigerant leaked detector is installed for safety due to the use of A2L refrigerant.
- The refrigerant sensor shall only be replaced with manufacturer approved sensor.
- The installation position of the refrigerant sensor is shown in the figure below.

Figure 21. Refrigerant sensor



Outdoor Unit Installation

Installation Location

- Do not install the outdoor unit near sources of heat, steam, or flammable gas.
- Do not install the unit in windy or dusty locations.
- Do not install the unit in high-traffic areas.
- Select a location where the air discharge and operating sound will not disturb the neighbors.
- Avoid installing the unit where it will be exposed to direct sunlight (or use a sun protector, if necessary, that should not interfere with the air flow).
- Reserve the spaces as shown in the figure below for the air to circulate freely.
- Install the outdoor unit in a safe and solid place.
- If the outdoor unit is subject to vibration, place rubber mats under the feet of the unit.

Note: *Confirm the outdoor unit is positioned at least three feet away from TVs and radios to prevent interference. Additionally, install the unit at an appropriate height to avoid issues with snow and flooding.*

Figure 22. Installation location

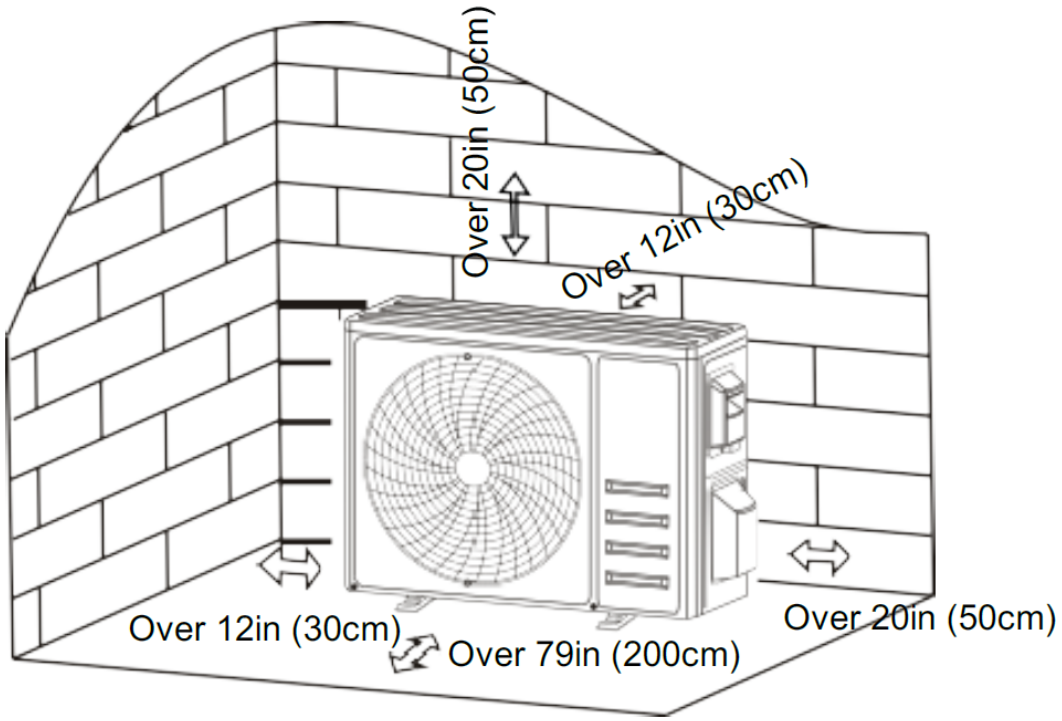


Figure 23. Maximum installation height indoor unit (all tonnages)

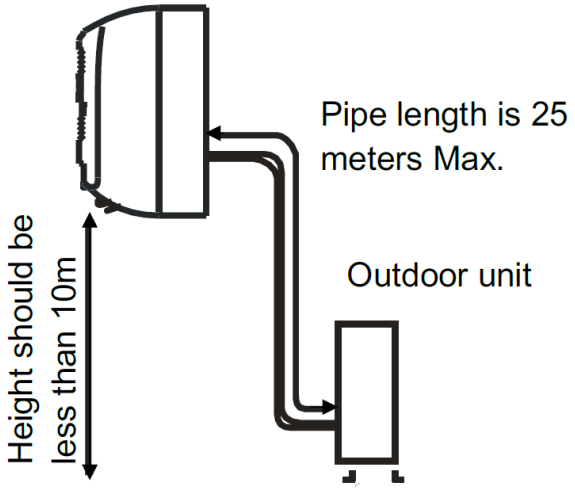
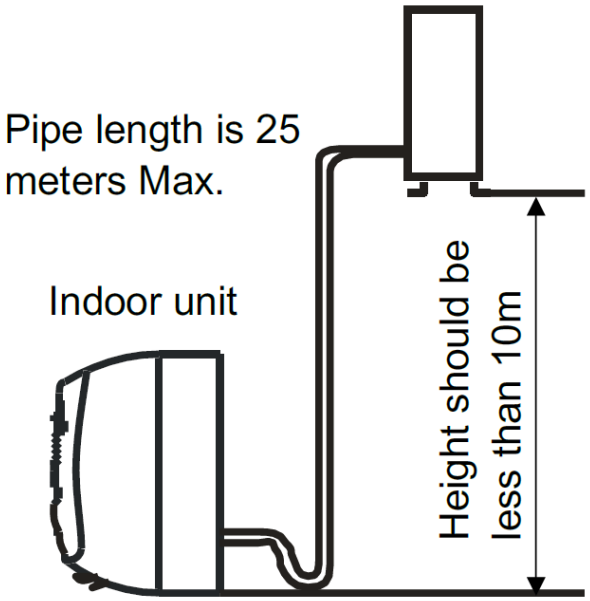


Figure 24. Maximum installation height outdoor unit (all tonnages)



Installing Multiple Units

To guarantee the proper functioning of the unit, confirm that the installation space for the outdoor unit adheres to the specified installation dimensions.

Figure 25. Installing multiple units

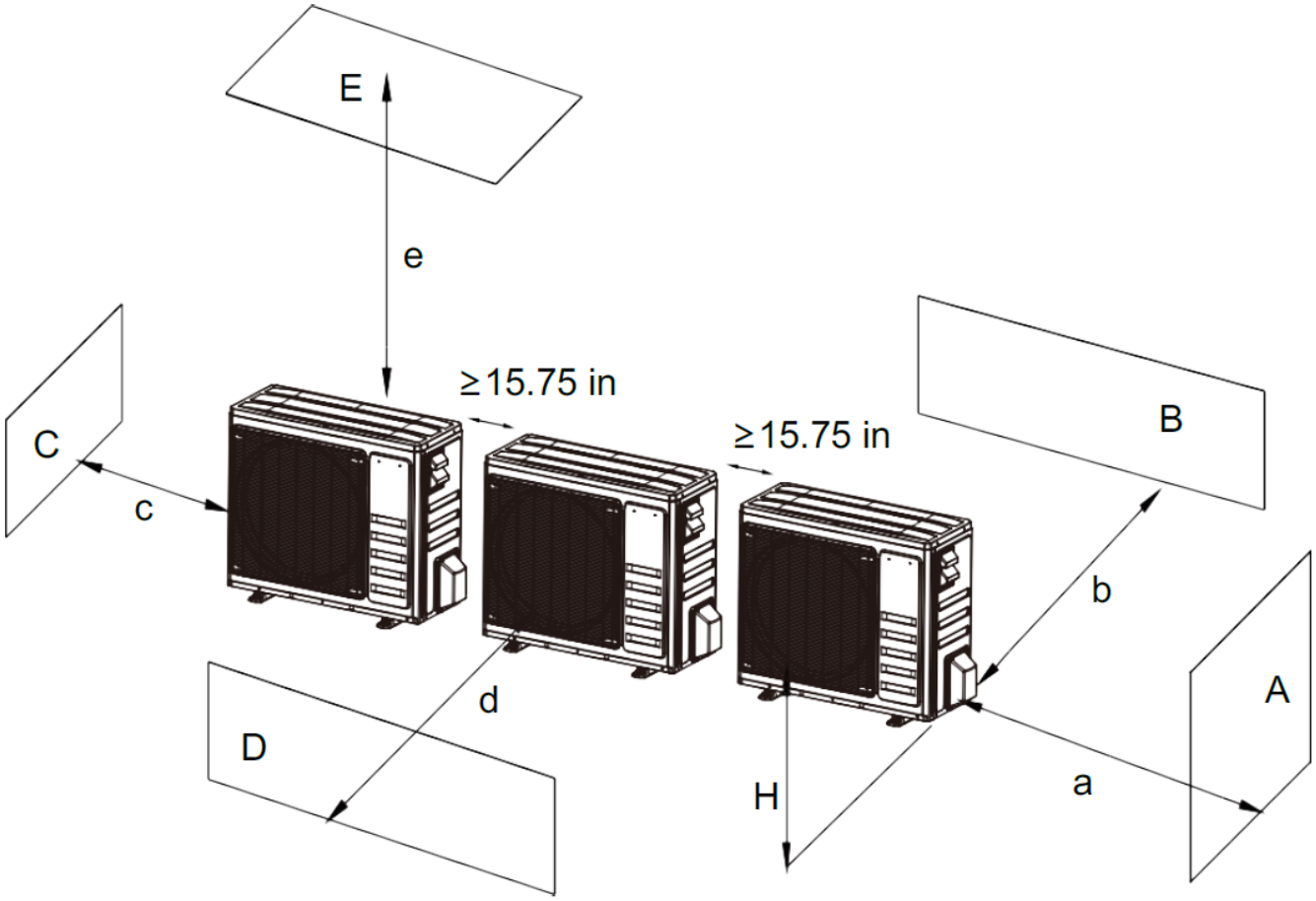


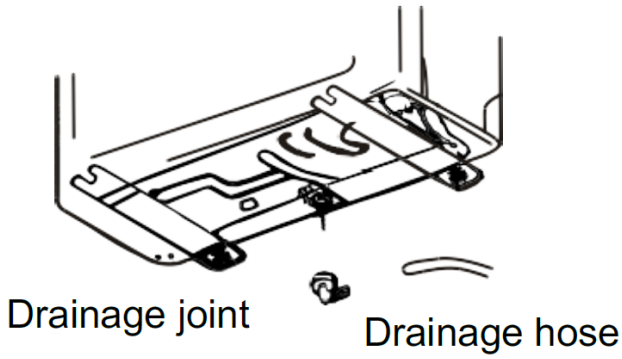
Table 11. Multiple outdoor units installation clearance requirements

A-E	Inches (in)				
	a	b	c	d	e
A, B, C	≥11.81 in	≥11.81 in	≥39.37 in		
A, B, C, E	≥11.81 in	≥11.81 in	≥39.37 in		≥39.37 in
D				≥78.74 in	
D, E				≥78.74 in	≥39.37 in
B, D		≥11.81 in		≥98.43 in	

Install Drainage Hose

1. Insert the drainage joint to the hole at the bottom of the outdoor unit.
2. Connect the drainage hose to the joint and connect.

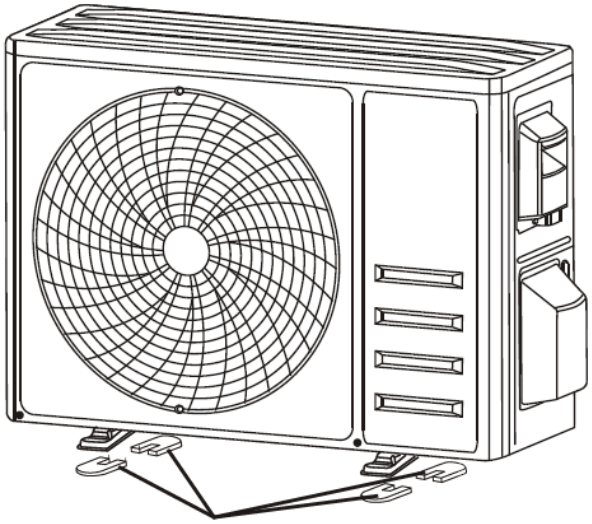
Figure 26. Drainage hose



Install Outdoor Unit

1. Mark the installation position for expansion bolts.
2. Drill holes, clean the concrete dust, and place the bolts.
3. If applicable, install four rubber mats on the feet. This will reduce vibrations and noise.

Figure 27. Install rubber mats



4. Place the outdoor unit base on the bolts and pre-drilled holes.
5. Use a wrench to secure the outdoor unit firmly with bolts.

The outdoor unit can also be installed on a wall mounting bracket:

1. Follow the bracket instructs to secure the bracket to the wall.
2. Fasten the outdoor unit to the bracket, keeping the unit level.

Note: *The wall mounting bracket must be able to support at least four times the weight of the outdoor unit.*

Install Wiring

1. Use a Phillips screwdriver to unscrew wiring cover.
2. Grasp the cover and press it down gently to remove.
3. Unscrew the cable clamp and remove.
4. According to the wiring diagram pasted inside the wiring cover, connect the connecting wires to the corresponding terminals and confirm all connections are
5. secure.
6. Reinstall the cable clamp and wiring cover.

Important: *When connecting the wires of indoor and outdoor units, the power should be off.*

Figure 28. Wiring

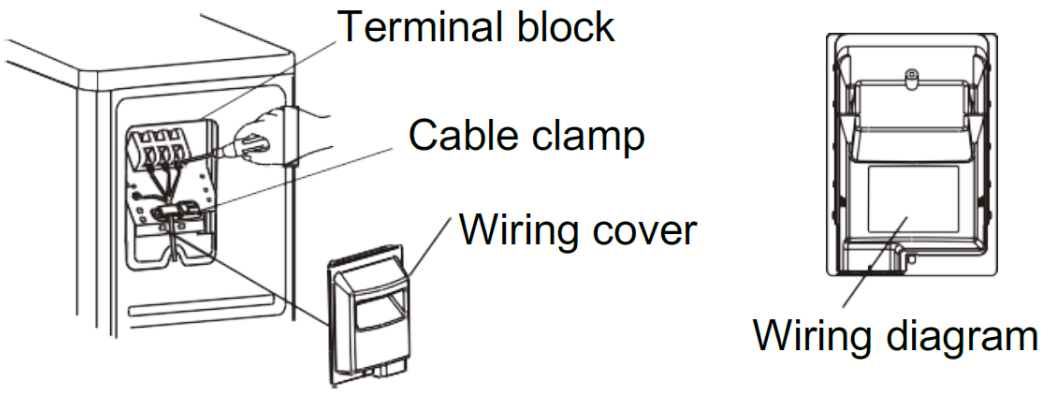


Figure 29. Wall wiring

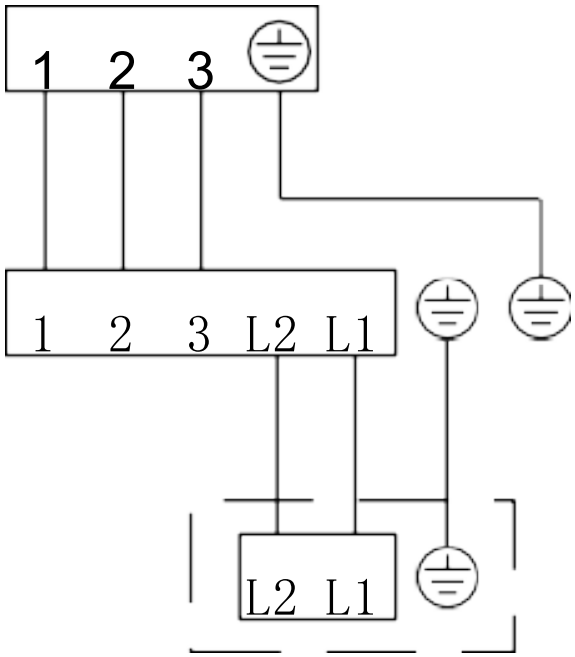


Figure 30. 9–24 K outdoor wiring diagram

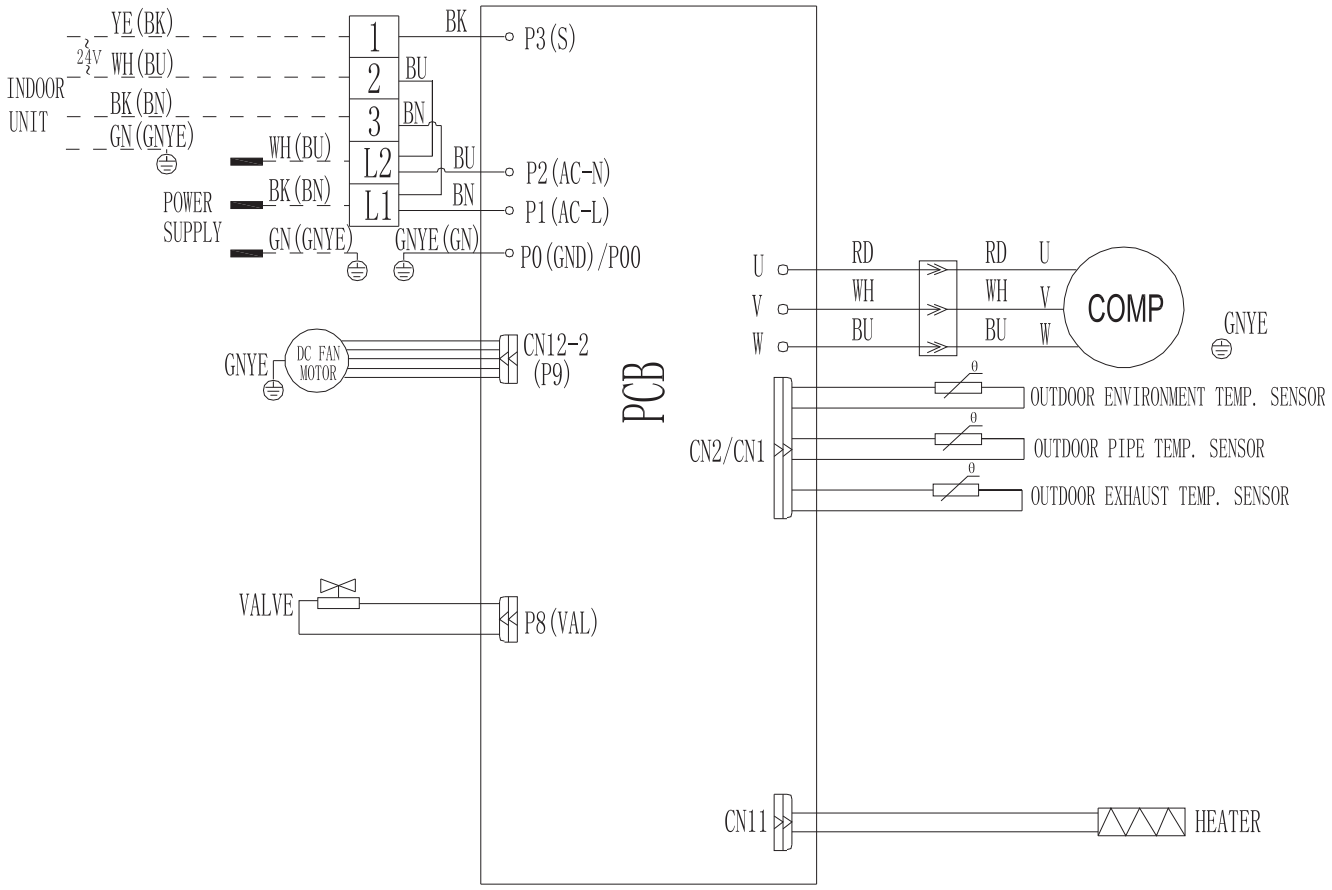


Figure 31. 36 K outdoor wiring diagram

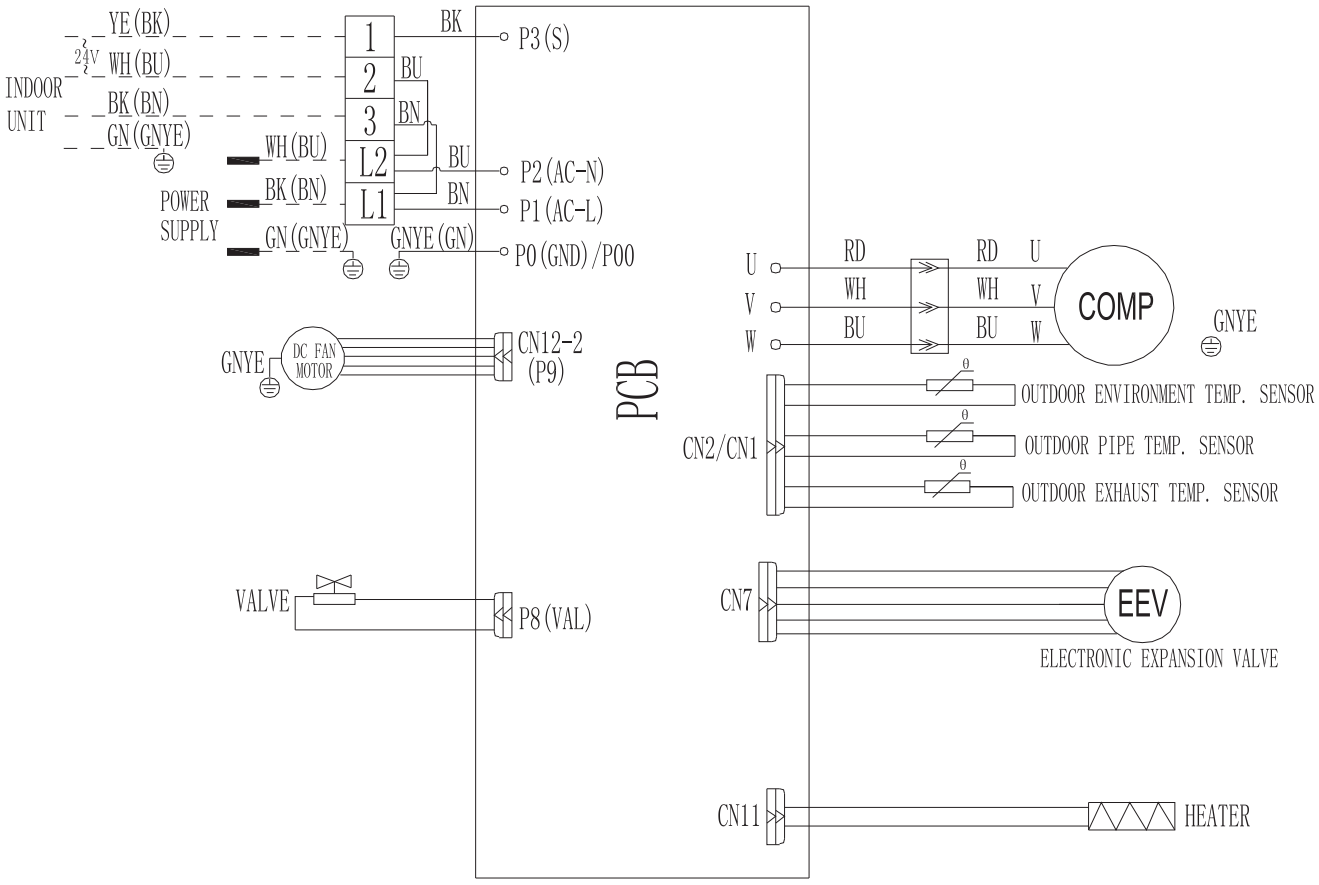


Table 12. Fuses

Unit	Fuse type and rating
9K 230V	15A
12K 230V	15A
18K 230V	20A
24K 230V	25A
36K 230V	30A

Refrigerant Piping Connections

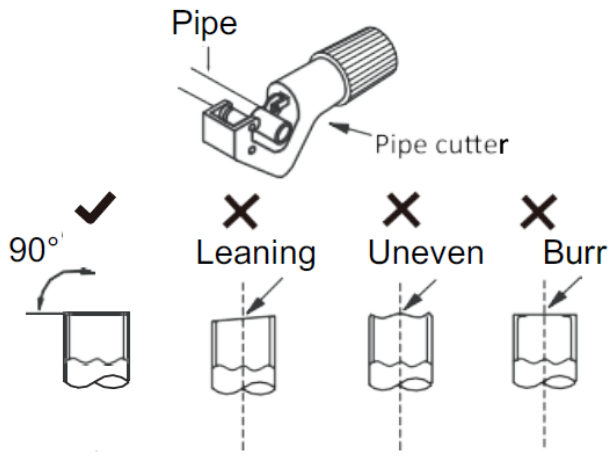
- Do not install the connecting pipe until both indoor and outdoor units have been installed.
- Insulate both the gas and liquid piping to prevent water leakage.
- Avoid damaging the pipe while cutting, as this can significantly reduce the unit's heating efficiency.

Cut Pipes

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will promote efficient operation and minimize the need for future maintenance.

1. Use the piping kit accessory or the pipes purchased locally.
2. Measure the distance between the indoor and the outdoor unit.
3. Cut the pipes a little longer than the measured distance.

Figure 32. Cut pipes

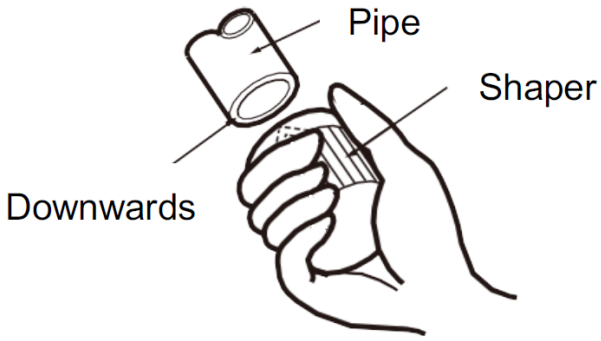


Remove Burrs

Burrs can affect the air-tight seal of refrigerant piping connection.

1. Completely remove all burrs from the cut cross section of pipe/tube.
2. Put the end of the copper tube/pipe in a down ward direction during burr removal to avoid dropping burrs into the tubing.

Figure 33. Remove burrs



Flaring Work

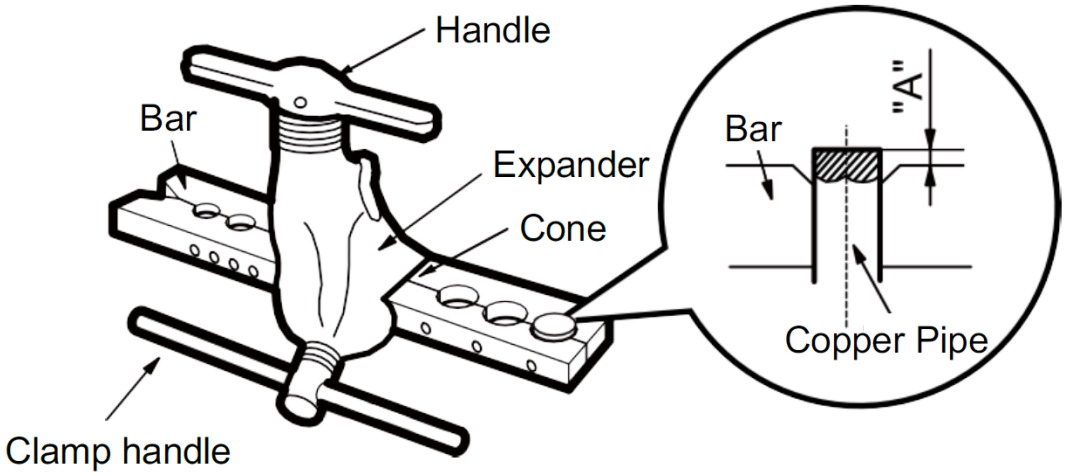
Carry out flaring work as shown below.

Table 13. Flaring work dimension

Outside diameter	A
3/8 inch	0.03 – 0.04 inch
3/4 inch	0.02 – 0.03 inch
7/8 inch	0.02 – 0.03 inch

Firmly hold copper pipe in a die in the dimension shown in the table above.

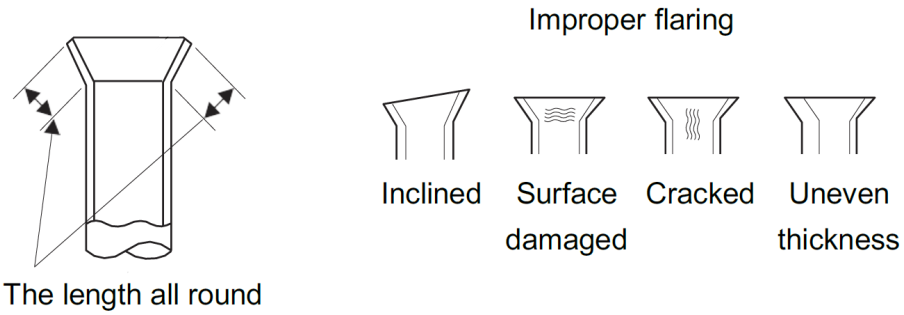
Figure 34. Flaring work



Confirm that:

- The flared work matches the figure below. The flare should be smooth all around and the inside shiny without scratches.
- If the flare is defective, cut off the flared section and do the flaring work again.

Figure 35. Confirm flare work

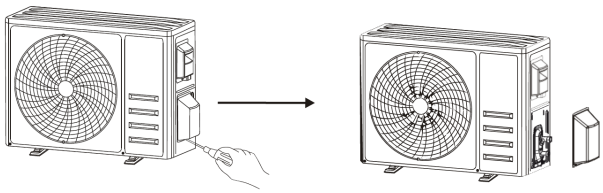


Connect the copper pipes to the indoor unit first, then connect it to the outdoor unit.

Connect Refrigerant Pipe

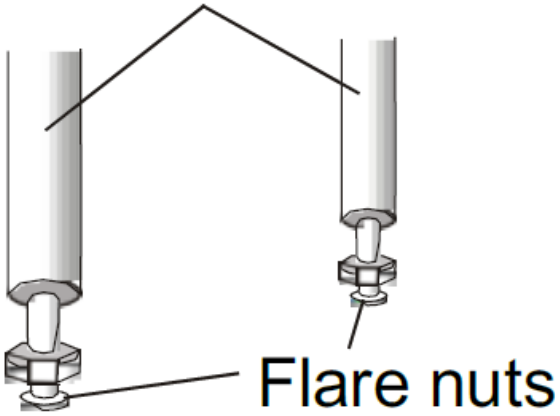
1. Unscrews the valve cover, grasp, and press it down gently to remove (if the valve cover is used).

Figure 36. Remove valve cover



2. Remove the protective caps from the end of the valves.
3. Remove the plastic cover in the pipe ports and confirm the connecting pipe and ports are clear of debris.
4. After aligning the center, rotate the flare nut of the connecting pipe to tighten the nut as tightly as possible by hand.

Figure 37. Connection pipes

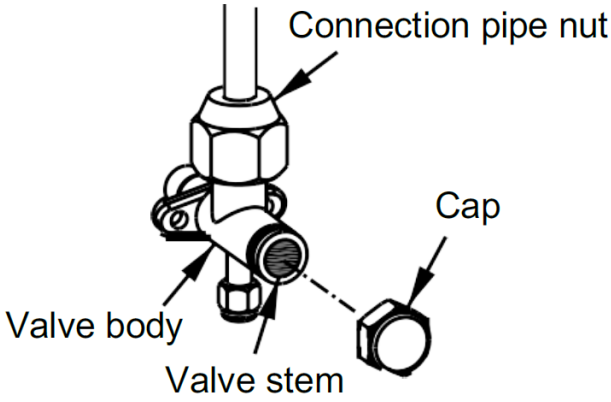


5. Use a spanner to hold the body of the valve and use a torque wrench to tighten the flare nut according to the torque values in the torque requirements table.

Important: *First connect the low-pressure pipe, then the high-pressure pipe.*

6. Align the center of the two pipes to connect.
7. Tighten the flare nut as tightly as possible by hand.

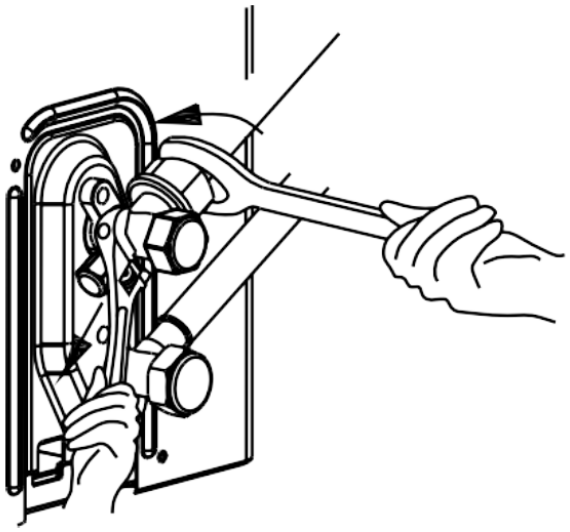
Figure 38. High-pressure valve structure



8. Using a wrench, grip the nut on the unit tubing.

Note: *Use two wrenches to connect the pipe to avoid damaging the copper pipe.*

Figure 39. Use two wrenches



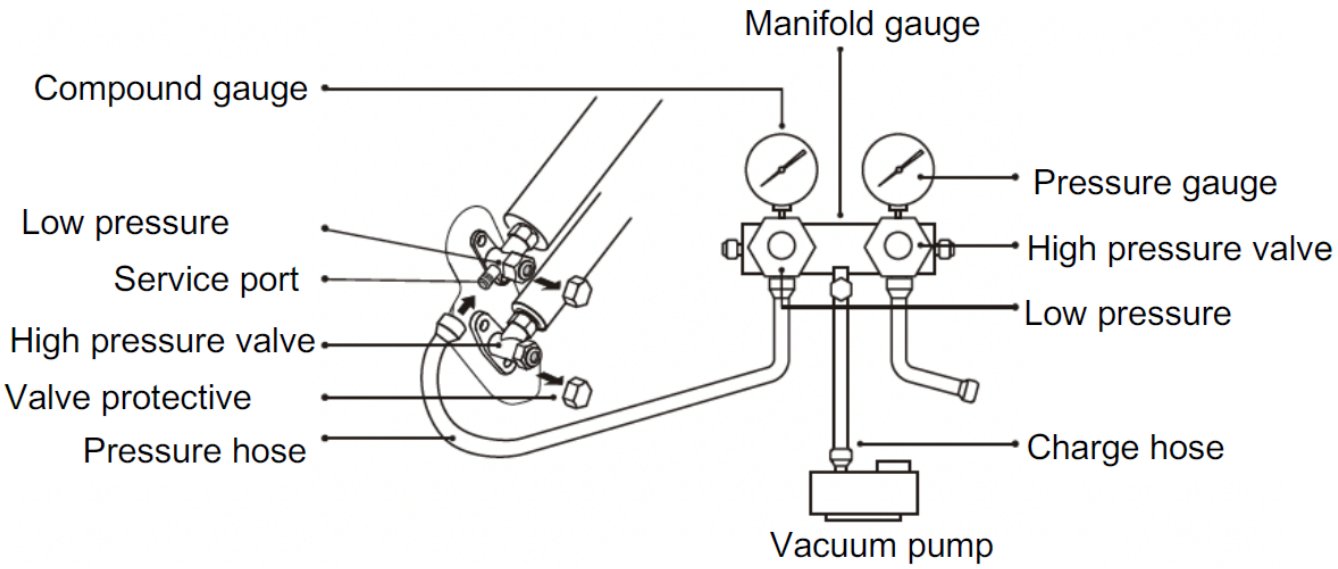
Pressure Testing

1. Using dry nitrogen, pressurize the field piping and indoor coil to the lower of the maximum operating pressures listed on the nameplates of the indoor and outdoor units (725.1 psi).
2. Maintain the test pressure after removal of the pressure source for at least one hour with no decrease of pressure indicated by the test gauge, with
3. Check for leaks by using a soapy solution at each field-made joint.

Vacuum Pumping

1. Use a spanner to remove the protective caps from the service port, low-pressure valve, and high-pressure valve of the outdoor unit.
2. Connect the pressure hose of the manifold gauge to the service port on the outdoor unit low-pressure valve.
3. Connect the charge hose from the manifold gauge to the vacuum pump.
   a. Open the piezometer and operate for 10-15 minutes to evacuate to 4,000 microns, then break with nitrogen to dry the pipe.
   b. Evacuate to 1,500 microns for 20 minutes and break with dry nitrogen.
   c. Evacuate to 500 microns or below.
4. Open the low-pressure valve of the manifold gauge and close the high-pressure valve.
5. Turn on the vacuum pump to vacuum the system.
6. Vacuum for at least 15 minutes and confirm that the compound gauge indicates -0.1 MPa (-76 cmHg).
7. Close the low pressure valve of the manifold gauge and turn off the vacuum.
8. Hold the pressure for five minutes and confirm that the rebound of the compound gauge pointer does not exceed 0.005 MPa.
9. Open the low-pressure valve counterclockwise for 1/4 turn with a hexagonal wrench to allow a small amount of refrigerant to fill the system.
10. Close the low-pressure valve after five seconds and quickly remove the pressure hose.
11. Check all indoor and outdoor joints for leakage using soapy water or a leak detector.
12. Fully open the low-pressure valve and high-pressure valve of the outdoor unit using a hexagonal wrench.
13. Reinstall the protective caps on the service port, low-pressure valve, and high-pressure valve of the outdoor unit.
14. Reinstall the valve cover.

Figure 40. Schematic diagram



Testing

Before testing the system, perform electrical and installation safety inspections and a refrigerant leak test.

Electrical Safety Inspection

Confirm that:

- The power supply voltage complies with specifications.
- Connections between the power lines, signal lines, and earth wires are correct.
- The earth resistance and insulation resistance complies with requirements.

Installation Safety Inspection

Confirm that:

- The drainage pipe is configured correctly.
- The refrigerant pipe joint is installed completely.
- The safety of outdoor unit, mounting plate, and indoor unit installation.
- The valves are fully open.
- There are no foreign objects or tools left inside the unit.
- Installation of indoor unit air inlet grill and panel is complete.

Refrigerant Leak Detection

Confirm the piping joint, the connector of the two valves of the outdoor unit, the valve spool, and the welding port, where leakage may occur, are sealed:

- **Foam detection method:** Apply soapy water or foam evenly on the parts where leakage may occur, and observe if bubbles appear. If no bubbles appear, the leakage detection result is safe.
- **Leak detector method:** Use a professional leak detector. Follow the instructions to detect at the position where leakage may occur. The duration of leak detection for each position should last for at least three minutes.

If the test result shows that there is leakage, the nut should be tightened and tested again until there is no leakage.

After the leak detection is completed, wrap the exposed pipe connector of indoor unit with thermal insulation material and wrap with insulation tape.

Test the System

1. Turn on the power supply.
2. Press **ON/OFF** on the remote controller to turn on the air conditioner.
3. Press **Mode** to switch the mode COOLING and HEATING.

- COOLING: Set the lowest temperature.
- HEATING: Set the highest temperature.

4. Run the system for about eight minutes in each mode and check all functions are properly run respond:
   -
   - If the outlet air temperature responds to the cooling and heating modes.
   - If the water drains properly from the drainage hose.
   - If the louver and deflectors(optional) rotate properly.
5. Observe the test run state of the air conditioner at least 30 minutes.
6. After the successful test run, return the normal setting and press ON/OFF button on the remote controller to turn off the unit.

Note: *If the ambient temperature exceeds the ranges in the Operating Instructions section and it can not run COOLING or HEATING mode, lift the front panel and refer to the emergency button operation to run the COOLING and HEATING mode.*

Maintenance

- Before cleaning, confirm the machine is shut down and the power supply is disconnected for at least five minutes.
- Never flush the air conditioner with water.
- Regularly clean the filter screen to prevent dust accumulation, which can impair its effectiveness. Increase the cleaning frequency if the operating environment is particularly dusty.
- When removing the filter screen, be careful not to touch the fins of the indoor unit to avoid injury.

Cleaning the Unit

Use a soft dry cloth or a damp cloth dipped in mild detergent for cleaning.

Filter

Disassemble and Re-assemble the Filter

To disassemble the filter:

1. Grasp the raised handle on the filter by hand and pull it away from the unit.
2. Separate the upper edge of the filter from the unit.
3. Remove the filter by lifting it upwards.

To reassemble the filter:

1. Insert the lower end of the filter screen into its designated position on the unit.
2. Press the upper end of the filter into the corresponding locking position on the unit body.

Figure 41. 9–24 K filter

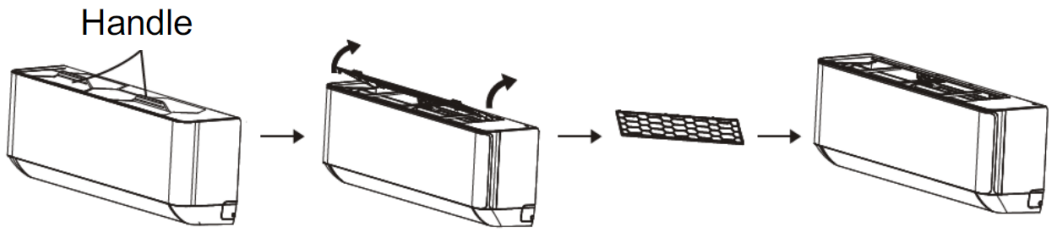
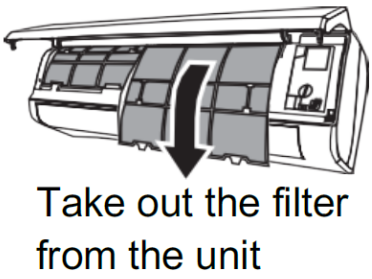
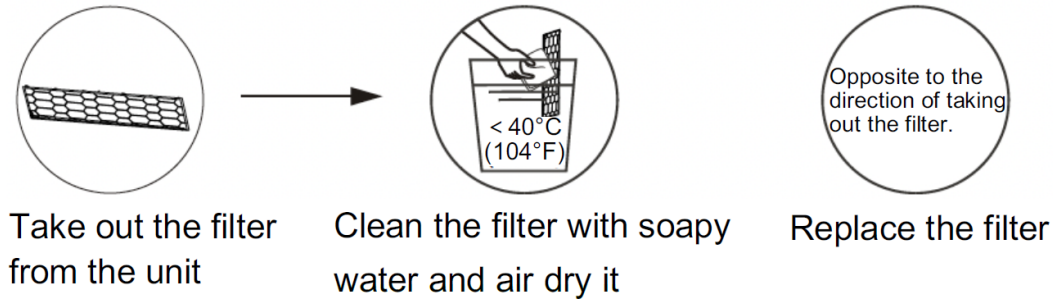


Figure 42. 36 K filter



Cleaning the Filter

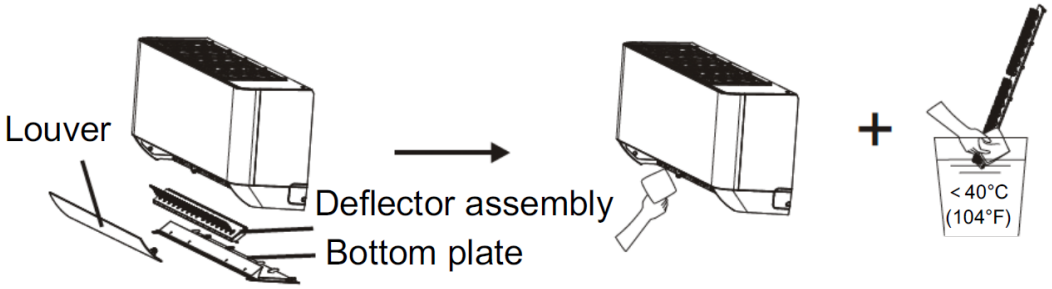
Figure 43. Cleaning the filter



Cleaning the Air Duct

1. Loosen the knob on the middle of louver and bend the louver outwards to remove it.
2. Grasp both sides of bottom plate and push down to remove the bottom plate.
3. Loosen the buckle of deflector assembly and remove.
4. Wipe the air duct and fan assembly with a clean, damp cloth.
5. Clean the removed parts with soapy water and air dry them.
6. After cleaning, restore the removed parts.

Figure 44. Air duct



Service and Maintenance

When the air conditioner is not in use for an extended period, follow these steps:

1. Remove the remote controller batteries.
2. Disconnect the power supply.

Before using the air conditioner after a long shutdown:

1. Clean the unit and filter screen.
2. Confirm there are no obstacles at the air inlet and outlet of both indoor and outdoor units.
3. Check that the drain pipe is clear.
4. Reinstall the remote controller batteries and verify the power is on.

Troubleshooting

Table 14. Troubleshooting

Issue	Possible Causes
The appliance does not operate	Power failure/plug disconnected.
	Damaged indoor/outdoor unit fan motor.
	Faulty compressor thermomagnetic circuit breaker.
	Faulty protective device or fuses.
	Loose connections or plug disconnected.
	It sometimes stops operating to protect the appliance.
	Voltage higher or lower than the voltage range.
	Active TIMER-ON function.
	Damaged electronic control board.
Strange odor	Dirty air filter.
Noise of running water	Back flow of liquid in the refrigerant circulation.
A fine mist comes from the air outlet	This occurs when the air in the room becomes very cold, for example in the COOLING or DEHUMIDIFYING/DRY modes.
A strange noise can be heard	This noise is made by the expansion or contraction of the front panel due to variations in temperature and does not indicate a problem.
Insufficient airflow, either hot or cold	Unsuitable temperature setting.
	Obstructed air conditioner intakes and outlets.
	Dirty air filter.
	Fan speed set at minimum.
	Other sources of heat in the room.
	No refrigerant.
The appliance does not respond to commands	Remote control is not close enough to indoor unit.
	The batteries of remote control need to be replaced.
	Obstacles between remote control and signal receiver in indoor unit.
The display is off	Active DISPLAY function.

Switch off the air conditioner immediately and cut off the power supply in the event of:

- Power failure
- Strange noises during operation
- Faulty electronic control board
- Faulty fuses or switches
- Water inside the appliance
- Overheated cables or plugs
- Very strong smells coming from the appliance

Error Codes

When an error occurs, the indoor unit displays an error code.

Table 15. Error codes

Error Code	Description
E1	Indoor room temperature sensor fault
E2	Indoor pipe temperature sensor fault
E3	Outdoor pipe temperature sensor fault
E4	Refrigerant system leakage or fault
E6	Malfunction of indoor fan motor
E7	Outdoor ambient temperature sensor fault
E0	Indoor and outdoor communication fault
E8	Outdoor discharge temperature sensor fault
E9	Outdoor IPM module fault
EA	Outdoor current detect fault
EE	Outdoor PCB EEPROM fault
EF	Outdoor fan motor fault
EH	Outdoor suction temperature sensor fault
P0	IPM module protection
P1	Over/under voltage protection
P2	Over current protection
P4	ODU Discharge pipe Over temperature protection

Servicing

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to minimize ignition risk. For repair to the refrigerating system, complete the following before beginning work:

- **Work procedure** — Use a controlled environment to minimize the risk of flammable gas or vapor being present during servicing.
- **General work area** — Inform all maintenance staff and others working in the local area of the nature of work being carried out. Avoid work in confined spaces.
- **Check for refrigerant** — Use an appropriate refrigerant detector prior to and during work to ensure the technician is aware of potentially toxic or flammable atmospheres. Confirm that the leak detection equipment used is suitable for all applicable refrigerants (non-sparking, adequately sealed, or intrinsically safe).
- **Fire extinguisher** — If any hot work is to be conducted on the refrigerating equipment or any associated parts, confirm appropriate fire extinguishing equipment is. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.
- **No ignition sources** — Do not use any source of ignition that may lead to fire or explosion. Keep all possible ignition sources, including cigarettes, far away from the site of installation, repair, removal and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the confirm there are no flammable hazards or ignition risks in the area around the equipment. “No Smoking” signs shall be displayed.
- **Ventilation** — Confirm that the area is adequately ventilated before beginning work or conducting any hot work. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Refrigerant Equipment

Confirm the following when 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.
- Refrigeration 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.

Electrical Devices

Perform initial and ongoing safety checks of electrical components. If an issue exists that could compromise safety, do not connect any electrical supply o the circuit until it is resolved. If the error cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution can be used. Report all issues o the owner of the equipment.

Initial safety checks include:

- 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 grounding.

Repairs to Sealed Components

Sealed electrical components must be replaced.

Repair to Intrinsically Safe Components

Do not apply any permanent inductive or capacitance loads to the circuit without confirming that it 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. Confirm the testing devices is 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.

Cabling

Check that cabling is not showing signs of wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. Take into account the effects of ageing or continual vibration from sources such as compressors or fans.

Detection of Flammable Refrigerants

Under no circumstances should 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) can not be used.

The following leak detection methods are 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.) Confirm 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.

Examples of leak detection fluids are:

- Bubble method
- Fluorescent method agents

If a leak is suspected, all open 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.

Removal and Evacuation

When opening the refrigerant circuit to make repair, or for any other purpose, conventional procedures shall be used. Recover the refrigerant charge into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times:

1. Safely remove refrigerant following local and national regulations.
2. Evacuate.
3. Purge the circuit with inert gas (optional for A2L).
4. Evacuate (optional for A2L).
5. Continuously flush or purge with inert gas when using flame to open circuit.
6. Open the circuit.

Do no use compressed air or oxygen for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging is 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 (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Decommissioning

A technician familiar with the equipment should perform this procedure. Before decommissioning, take an oil and refrigerant sample in case analysis is required prior to reuse of reclaimed refrigerant. It is essential that the unit is powered before beginning decommissioning.

1. Become familiar with the equipment and its operation.
2. Isolate the system electrically.
3. Before attempting the procedure confirm 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.

4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Confirm that cylinder is situated on the scales before recovery takes place.
7. Start the recovery machine and operate in accordance with manufacturer's instructions.
8. Do not overfill cylinders. (No more than 80% volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, confirm that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
11. Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

Labeling

Label equipment that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, all refrigerants must be removed safely.

When transferring refrigerant into cylinders, confirm that only appropriate refrigerant recovery cylinders are used. Confirm that the correct number of cylinders for holding the

total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (special cylinders for the recovery of refrigerant).

Cylinders need to have a pressure relief valve and associated shut-off valves in good working order.

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 and has been properly maintained. Consult the manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Notice arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, confirm that they have been evacuated to an acceptable level and that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers.

Any quality or other issues encountered in the purchased air conditioner, please contact the local after-sales service department.

Notes

About Trane and American Standard Heating and Air Conditioning

Trane and American Standard create comfortable, energy efficient indoor environments for residential applications. For more information, please visit www.trane.com or www.americanstandardair.com.

The AHRI Certified mark indicates company participation in the AHRI Certification program. For verification of individual certified products, go to ahridirectory.org.

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