



MULTI21

DUCTLESS INVERTER HEAT PUMP INSTALLATION MANUAL

Models:

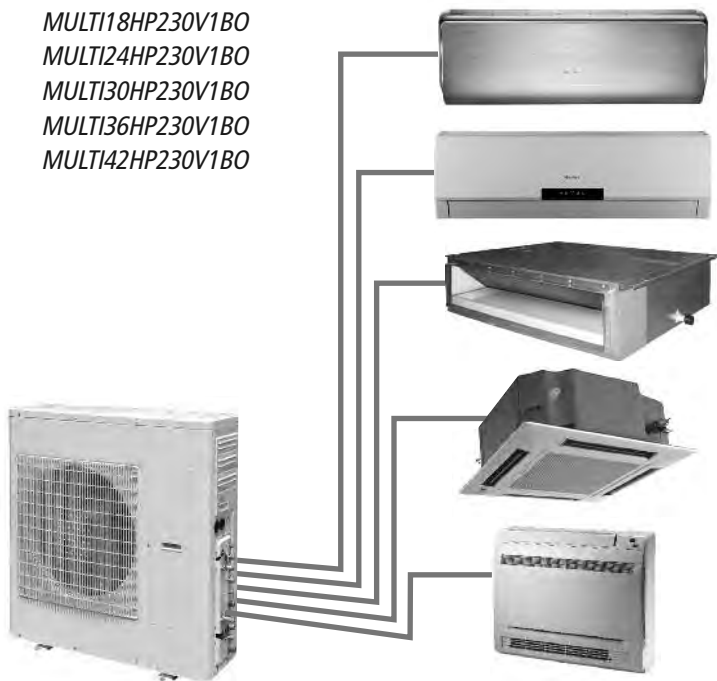
MULTI18HP230V1BO

MULTI24HP230V1BO

MULTI30HP230V1BO

MULTI36HP230V1BO

MULTI42HP230V1BO



Thank you for choosing a MULTI21 Ductless Heat Pump for your customer.

Please read this installation manual carefully before installing and starting up the Multi21 System. Take a moment to fill out the product and installation form on the back cover. Retain both the manual and installation record for future reference.

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SAFETY PRECAUTIONS

Please read the following before installation.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ WARNING

This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.

⚠ CAUTION

This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

NOTICE

Notice is used to address practices not related to personal injury.

General Safety Precautions

1. *Instructions for installation and use of this product are provided by the manufacturer. For proper operation, the system must be installed in accordance with this installation manual.*
2. *Installation must be performed in accordance with local laws, regulations and National Electrical Codes (NEC).*
3. *If refrigerant leaks while work is being carried out, ventilate the area. Do not allow refrigerant to come in contact with a flame as it produces toxic gas.*
4. *Disconnect all electrical power to the indoor and outdoor units until the system is ready for start-up and checkout.*
5. *When installing or repairing the system, use only R410A refrigerant. Do not mix refrigerant with other gases. If air or other gas enter the refrigeration system, the pressure inside the system may rise to an abnormally high value and cause damage or injury.*

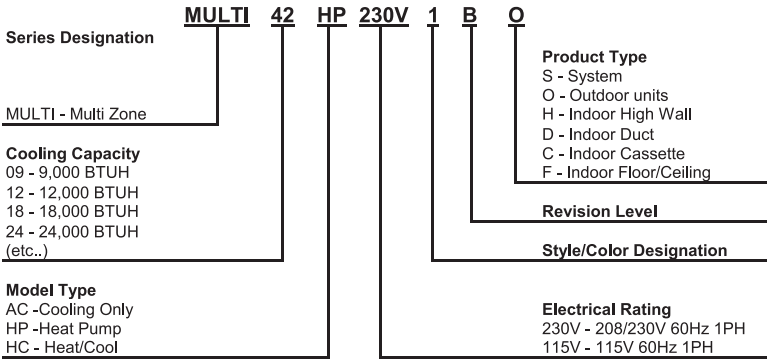
⚠ WARNING

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.

NOMENCLATURE

Outdoor Unit

Example: MULTI42HP230V1B O



SYSTEM REQUIREMENTS

Unit Size (BtuH)		Liquid Line in (mm)	Suction/Gas Line in (mm)
18,000	Port A	1/4 (6)	3/8 (9.5)
	Port B	1/4 (6)	3/8 (9.5)
24,000	Port A	1/4 (6)	3/8 (9.5)
	Port B	1/4 (6)	3/8 (9.5)
	Port C	1/4 (6)	3/8 (9.5)
30,000	Port A	1/4 (6)	3/8 (9.5)
	Port B	1/4 (6)	3/8 (9.5)
	Port C	1/4 (6)	3/8 (9.5)
	Port D	1/4 (6)	3/8 (9.5)
36,000	Port A	1/4 (6)	3/8 (9.5)
	Port B	1/4 (6)	3/8 (9.5)
	Port C	1/4 (6)	3/8 (9.5)
	Port D	1/4 (6)	3/8 (9.5)
	Port E	1/4 (6)	3/8 (9.5)
42,000	Port A	1/4 (6)	3/8 (9.5)
	Port B	1/4 (6)	3/8 (9.5)
	Port C	1/4 (6)	3/8 (9.5)
	Port D	1/4 (6)	3/8 (9.5)
	Port E	1/4 (6)	3/8 (9.5)

REFRIGERANT PIPE LENGTHS

Unit Size (BtuH)	Max Total Pipe Length ft(m)	Min Equivalent Pipe Length ft(m)	Max Equivalent Pipe Length ft(m)	Max Elev btwn IND Units ft(m)	Max Elev btwn IND & OTD Units ft(m)
18,000	65 (20)	10 (3)	33 (10)	33 (10)	33 (10)
24,000	197 (60)	10 (3)	65 (20)	33 (10)	33 (10)
30,000	230 (70)	10 (3)	82 (25)	25 (7.5)	49 (15)
36,000	246 (75)	10 (3)	82 (25)	25 (7.5)	49 (15)
42,000	246 (75)	10 (3)	82 (25)	25 (7.5)	49 (15)

REFRIGERANT CHARGE

Unit Size (BtuH)	Refrigerant Type	Factory System Charge oz (kg)	Max Pipe Length w/out adding Refrig ft(m)	Additional Charge oz/ft (g/m)
18,000	R-410A	56.5 (1.6)	33 (10)	0.2 (20)
24,000	R-410A	77.6 (2.2)	98 (30)	0.2 (20)
30,000	R-410A	98.7 (2.8)	131 (40)	0.2 (20)
36,000	R-410A	128.8 (3.65)	131 (40)	0.2 (20)
42,000	R-410A	128.8 (3.65)	131 (40)	0.2 (20)

ELECTRICAL REQUIREMENTS

Unit Size (BtuH)	Voltage	Min Circuit Amps (MCA)	Max Overcurrent Protection (MOP)	Main Power Wire Size (AWG)**
18,000	208/230v - 1ph 60hz	15	25	12
24,000	208/230v - 1ph 60hz	21	35	8
30,000	208/230v - 1ph 60hz	19	30	10
36,000	208/230v - 1ph 60hz	21	35	8
42,000	208/230v - 1ph 60hz	24	40	8

**Main power wire from electrical panel to outdoor unit. AWG based on 240VAC Single Phase, 100 ft. distance 1-way, max. 5% allowable voltage drop.

- Notes:
- 1) System must be on a single dedicated circuit.
 - 2) Main power is supplied to the outdoor unit.
 - 3) Use table above to size over current protection.
 - 4) Follow all local building codes and NEC (National Electrical Code) regulations.

Interconnecting Cable: Recommended cable - 14/4 AWG stranded bare copper conductors THHN 600V unshielded wire

Note: Use shield cable if installation is in close proximity of RF and EMI transmitting devices.

SUGGESTED TOOLS



- *Standard Wrench*
- *Adjustable/Crescent Wrench*
- *Torque Wrench*
- *Hex Keys or Allen Wrenches*
- *Drill & Drill Bits*
- *Hole Saw*
- *Pipe Cutter*
- *Screw drivers (Phillips & Flat blade)*
- *Manifold and Gauges*
- *Level*
- *R410A Flaring Tool*
- *Clamp on Amp Meter*
- *Vacuum Pump*
- *Safety Glasses*
- *Work Gloves*
- *Refrigerant Scale*
- *Micron Gauge*



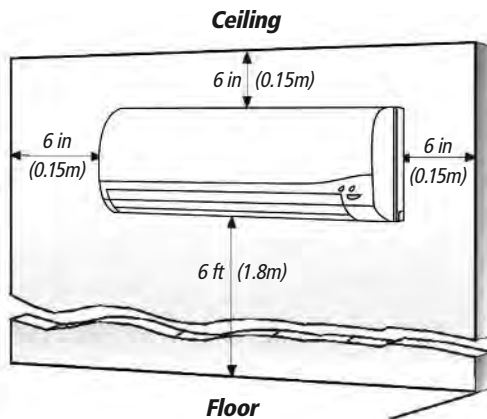
INSTALLATION SITE INSTRUCTIONS

Indoor Unit

Select a site that allows for the following:

1. Ensure 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.
2. Air inlet and outlet will be clear of obstructions, ensuring proper airflow throughout the room.
3. Condensate can be easily and safely drained.
4. All connections can be easily made to outdoor unit.
5. Indoor unit is out of reach of children.
6. A mounting structure (i.e. wall, ceiling, floor,...) strong enough to withstand four times the full weight and vibration of the unit.
7. Filter can be easily accessed for cleaning.
8. Leave enough free space to allow access for routine maintenance.
9. Install at least 10 ft. (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 affected device.
10. Do not install in a laundry room or by a swimming pool due to the corrosive environment.

Minimum Indoor Clearances - High Wall Units



NOTE: For minimum clearances of other indoor unit types, refer to the Installation Instructions enclosed with those indoor units.

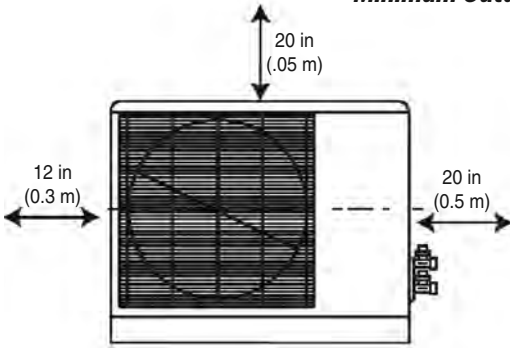
INSTALLATION SITE INSTRUCTIONS

Outdoor Unit

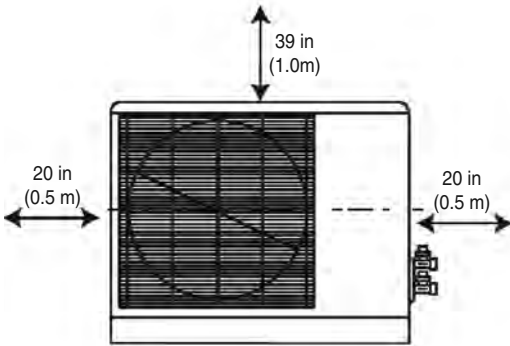
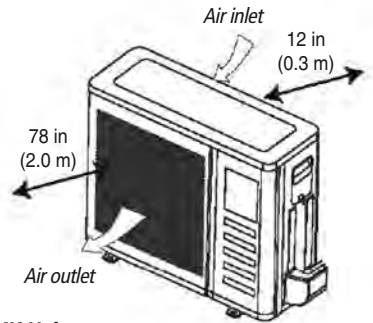
Select a site that allows the following:

1. Install the outdoor unit at a location that is capable of withstanding twice the weight of the unit.
2. Install the outdoor unit where it is convenient to connect refrigerant lines to the indoor units.
3. Install the outdoor unit where the condensate water can be drained unobstructed during the heating mode to a safe location.
4. Do not locate the unit where the noise may be objectionable to neighbors.
5. Provide the space shown below, so that the air flow is not blocked and future service and maintenance can be performed.

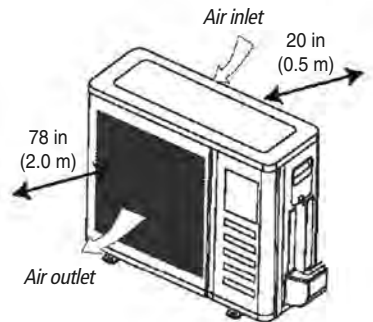
Minimum Outdoor Clearances



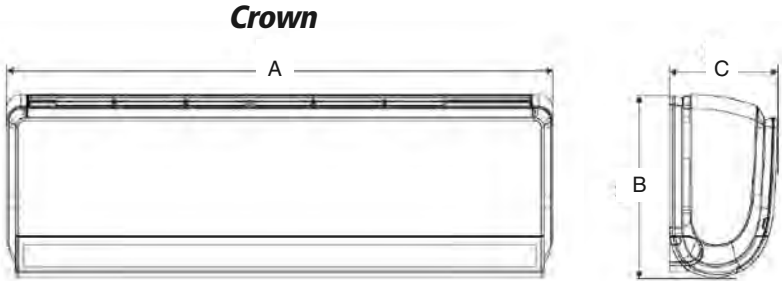
18K and 24K Unit



30K, 36K and 42K Unit



CROWN INDOOR UNIT INSTALLATION



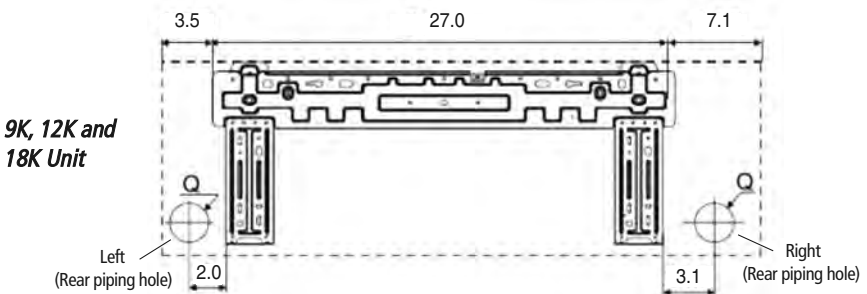
INDOOR UNIT DIMENSIONS – in (mm)

Model	A	B	C
CROWN09HP230V1A	37.8 (960)	12.6 (320)	8.1 (205)
CROWN12HP230V1A	37.8 (960)	12.6 (320)	8.1 (205)
CROWN18HP230V1A	37.8 (960)	12.6 (320)	8.1 (205)

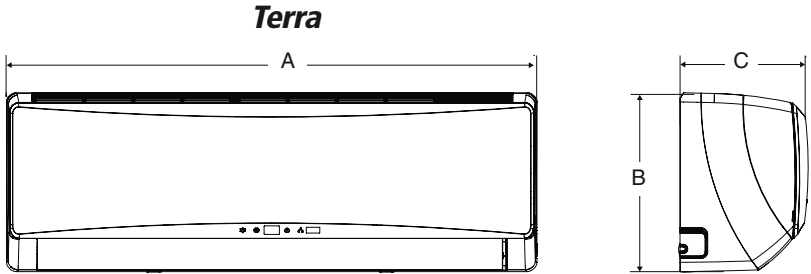
PIPE SIZE – in (mm)

Unit Size (BtuH)	Liquid Line	Suction/Gas Line
9,000	1/4 (6)	1/2 (12)
12,000	1/4 (6)	1/2 (12)
18,000	1/4 (6)	5/8 (16)

Crown Unit Mounting Bracket Diagram (inches)



TERRA INDOOR UNIT INSTALLATION



INDOOR UNIT DIMENSIONS – in (mm)

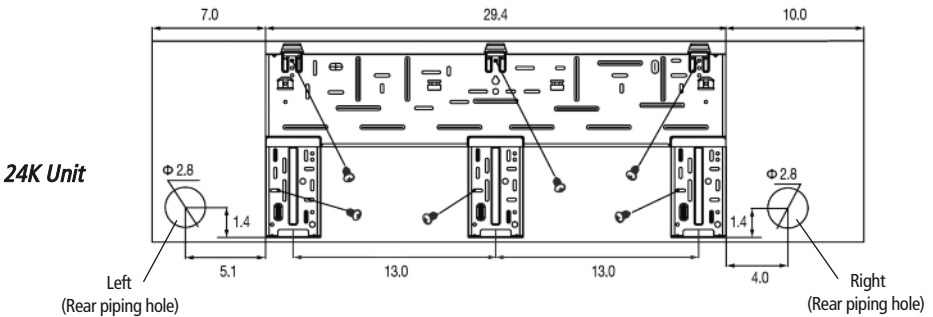
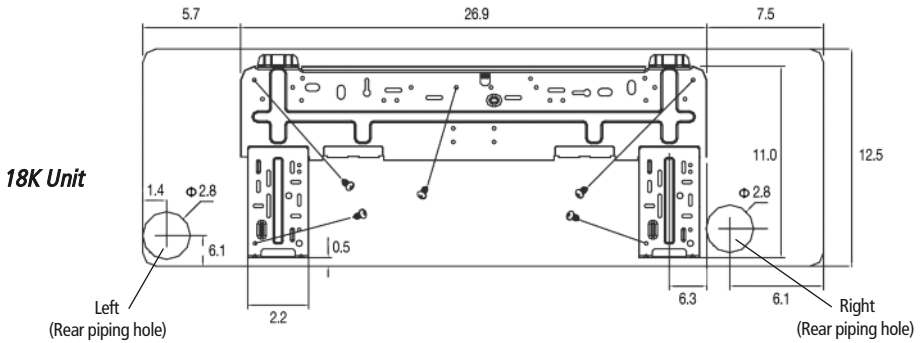
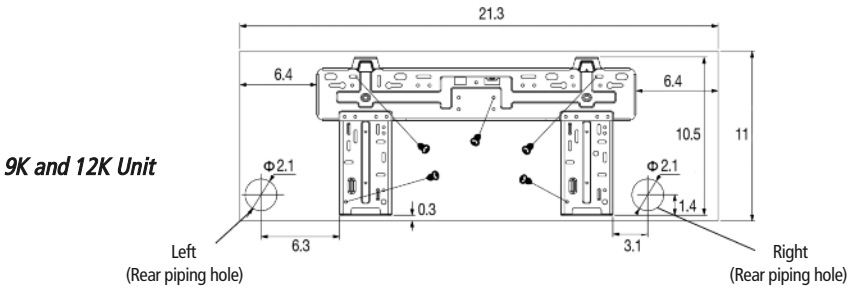
Model	A	B	C
TERRA09HP230V1AH	34.1 (866)	11.5 (292)	8.2 (208)
TERRA12HP230V1AH	34.1 (866)	11.5 (292)	8.2 (208)
TERRA18HP230V1BH	40.1 (1018)	12.6 (319)	9.1 (231)
TERRA24HP230V1BH	46.4 (1178)	12.8 (325)	10.4 (264)

PIPE SIZE – in (mm)

Unit Size (BtuH)	Liquid Line	Suction/Gas Line
9,000	1/4 (6)	1/2 (12)
12,000	1/4 (6)	1/2 (12)
18,000	1/4 (6)	5/8 (16)
24,000	1/4 (6)	5/8 (16)

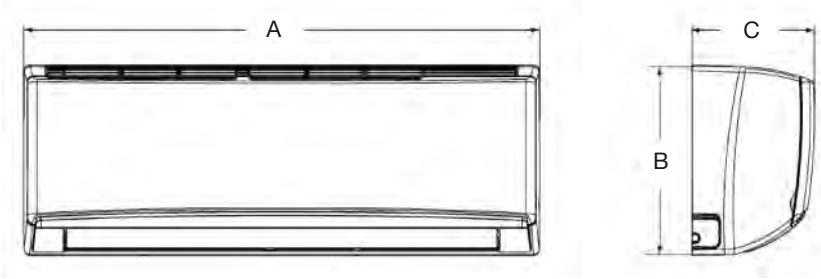
TERRA INDOOR UNIT INSTALLATION

Terra Unit Mounting Bracket Diagrams (inches)



VIREO INDOOR UNIT INSTALLATION

Vireo



INDOOR UNIT DIMENSIONS – in (mm)

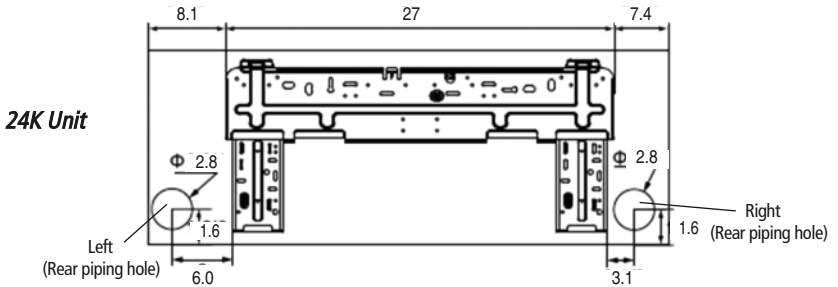
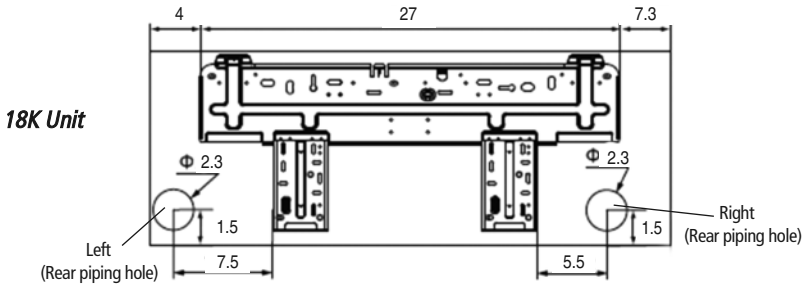
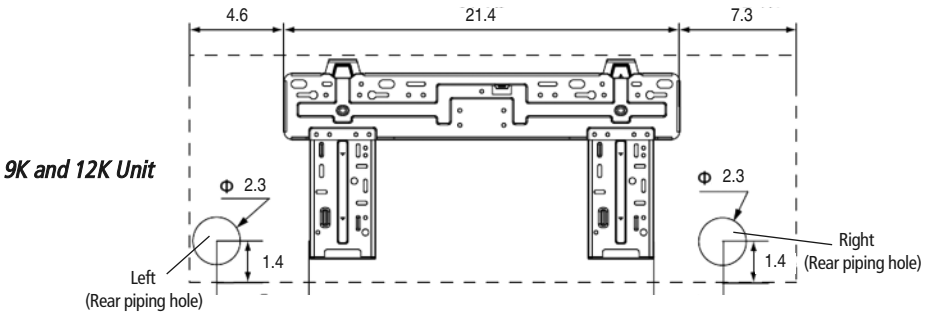
Model	A	B	C
VIR09HP230V1A	33.4 (848)	11.4 (290)	8.2 (208)
VIR12HP230V1A	33.4 (848)	11.4 (290)	8.2 (208)
VIR18HP230V1A	38.2 (970)	11.8 (300)	8.8 (224)
VIR24HP230V1A	42.4 (1077)	12.8 (325)	9.7 (246)

PIPE SIZE – in (mm)

Unit Size (BtuH)	Liquid Line	Suction/Gas Line
9,000	1/4 (6)	3/8 (9)
12,000	1/4 (6)	1/2 (12)
18,000	1/4 (6)	1/2 (12)
24,000	1/4 (6)	5/8 (16)

VIREO INDOOR UNIT INSTALLATION

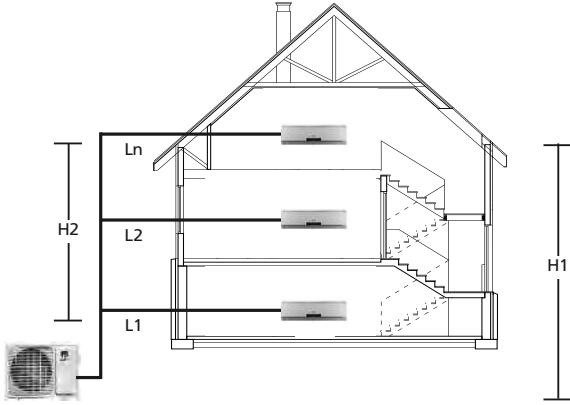
Vireo Unit Mounting Bracket Diagrams (inches)



INDOOR UNIT INSTALLATION

Piping Design and Layout

The piping design and layout are critical factors for the overall performance and reliability of the system. Find the desired locations for each indoor unit and the outdoor unit. Then measure and record the piping lengths and heights as directed below to qualify the piping design and layout.



First, measure and record the piping length (L1,L2, L3...Ln) from the outdoor unit to each indoor unit.

NOTE: Min. refrigerant line length between the indoor and outdoor units is 10 ft. (3 m).

L1=

L2=

L3=

L4=

L5=

Second, find the indoor units with the greatest vertical distance from the outdoor unit. Measure the maximum vertical height (H1) from the bottom of the outdoor unit to the bottom of the highest mounted indoor units.

H1=

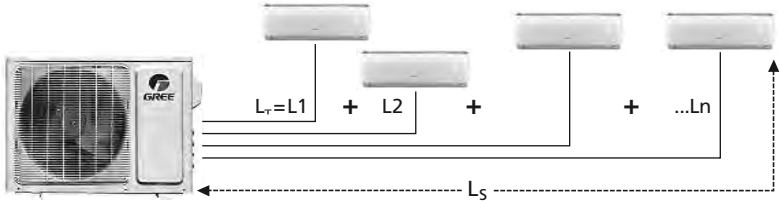
Third, find the two indoor units with the greatest vertical distance from each other. Measure the maximum vertical height (H2) between those two indoor units from bottom of one unit to bottom of the other unit.

H2=

INDOOR UNIT INSTALLATION

Piping Length Requirements

The system piping layout must take in the constraints of horizontal length on system performance. The outdoor unit has a length limit in which it can properly circulate refrigerant in the system.



The maximum equivalent pipe length from the outdoor to the farthest indoor units (L_S) must be less than:

The maximum total pipe length making up the system (L_T) must be less than:

Capacity Size (BtuH)	Distance ft (m)
18,000	33 (10)
24,000	65 (20)
30,000	82 (25)
36,000	82 (25)
42,000	82 (25)

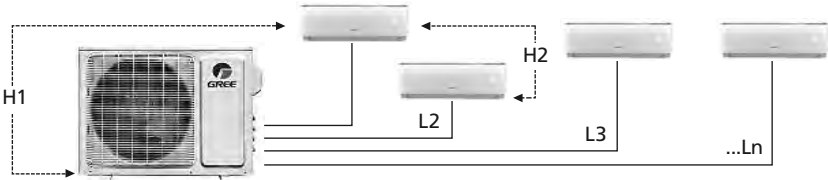
Capacity Size (BtuH)	Distance ft (m)
18,000	65 (20)
24,000	197 (60)
30,000	230 (70)
36,000	246 (75)
42,000	246 (75)

Verify your L_S and L_T maximum piping length measurements are less than the system limits.

INDOOR UNIT INSTALLATION

Piping Height Requirements

The system piping layout must take in the constraints of vertical height on system performance. The outdoor unit has a vertical height limit in which it can properly circulate refrigerant in the system.



The maximum elevation (H1) from the bottom of the outdoor unit to the bottom of the highest mounted indoor units must be less than:

The maximum elevation (H2) between those two indoor units from bottom of one unit to bottom of the other unit must be less than:

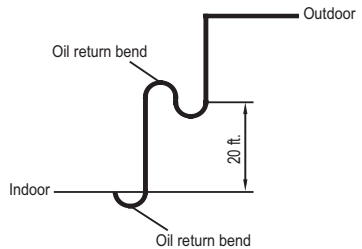
Capacity Size (BtuH)	Distance ft (m)
18,000	33 (10)
24,000	33 (10)
30,000	49 (15)
36,000	49 (15)
42,000	49 (15)

Capacity Size (BtuH)	Distance ft (m)
18,000	33 (10)
24,000	33 (10)
30,000	25 (7.5)
36,000	25 (7.5)
42,000	25 (7.5)

Verify your H1 and H2 maximum elevation measurements are less than the system limits.

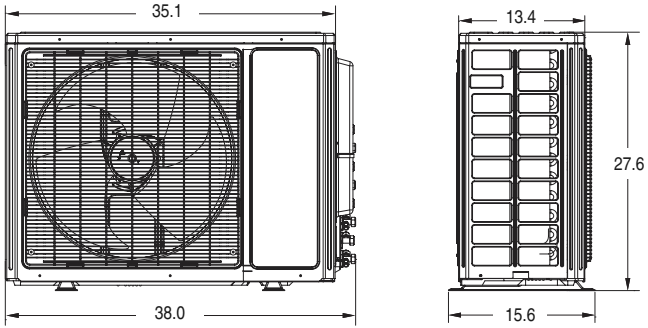
Oil Return Bend

When the outdoor unit is more than 30 feet above the indoor unit, an oil return bend must be added for every 20 feet of connection pipe.

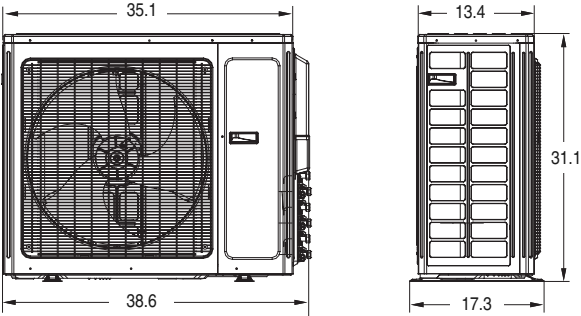
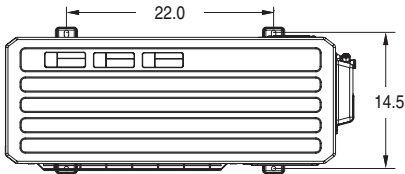


OUTDOOR UNIT INSTALLATION

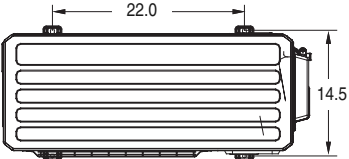
Outdoor Unit Dimensions



18K Unit

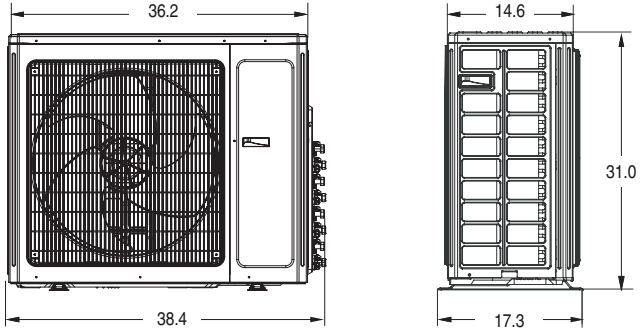


24K Unit

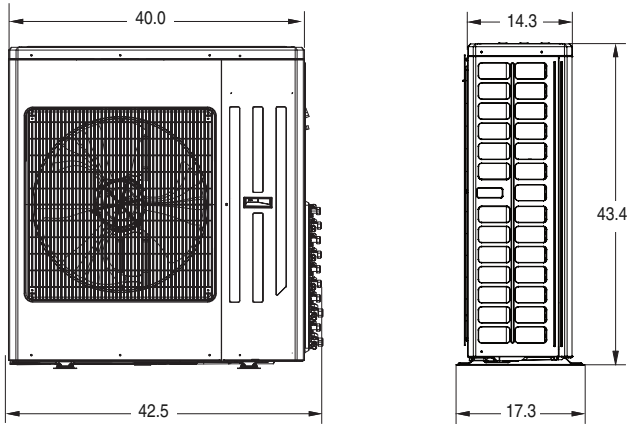
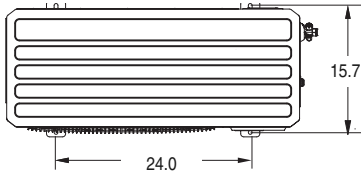


OUTDOOR UNIT INSTALLATION

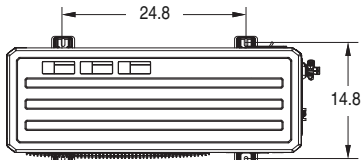
Outdoor Unit Dimensions



30K Unit



36K and 42K Unit



OUTDOOR UNIT INSTALLATION

Install Ground Pad or Wall Hangers

1. Determine proper location for outdoor unit.
2. Follow all instructions provided by manufacturer for installing wall hangers or ground pad.
3. Verify the wall hangers or ground pad can safely support the weight of the outdoor unit.
4. Verify the wall hangers or ground pad is level and meets all outdoor dimensional clearances.

Install Outdoor Unit Risers

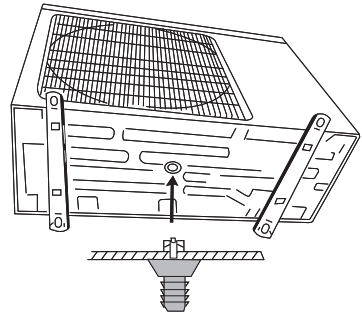
If the outdoor unit requires added elevation above the ground, installing riser legs will provide a sturdy and stable solution. Follow all instructions provided by manufacturer for installing riser legs to outdoor unit.

NOTE: Riser legs will also help absorb vibrations and noise while facilitating proper drainage.

Install Condensate Drain for Outdoor Unit

During normal heating and defrost operation, the outdoor unit will generate condensate water. The condensate water should be routed to a safe location through the drain hose.

1. Locate drain hole on bottom of outdoor unit.
2. Install the outdoor drain fitting into hole on the bottom of outdoor unit as shown.
3. Connect the drain hose to drain fitting.
4. Route drain hose to safe location for proper drainage of excess condensate water.
5. Plug the remaining drain holes in basepan with plugs provided from factory.



Drain Fitting Installation

INDOOR UNIT INSTALLATION

High Wall Indoor Installation

Install Mounting Bracket

1. Attach the mounting bracket to the indoor unit.
2. Find the horizontal center of the indoor unit.
3. Mark the center of the indoor unit on mounting bracket for future reference.

NOTE: The center of the mounting bracket is not the center of the indoor unit.

4. Remove the mounting brackets from the indoor unit and position the mounting bracket on the wall in desired location. Use centering mark on mounting bracket for centering the indoor unit on the wall.
5. Mounting bracket must be installed horizontally and level right to left.

NOTE: Condensate drain pan has built-in pitch for proper drainage.

6. Secure mounting bracket to wall with a minimum of five screws, evenly spaced to properly support indoor unit weight.

NOTE: It is recommended to install screw anchors for sheet rock, concrete block, brick and such type of walls.

NOTE: For mounting and installation of other indoor unit types, refer to the Installation Instructions enclosed with those indoor units.

INDOOR UNIT INSTALLATION

Refrigerant Piping

Drill Hole in Wall

If indoor unit refrigerant piping is going to exit from the rear:

1. It is recommended that the refrigerant pipe flare connectors extend through the wall to the outside. In some situations field-fabricated piping extensions will be required to extend the indoor unit refrigerant flare connections to the outside of the wall.
2. Use mounting bracket diagrams and dimensions to find and mark the proper location for the wall hole.

If refrigerant piping is going through the right or left side of front panel (not allowed on Crown models):

Carefully cut hole in the side of the front panel for piping to enter indoor unit as shown below. Find and mark the proper location for the wall hole. Use table below to determine recommended wall hole size for your unit size.

3. Cut the wall hole with a 5° to 10° downward slant to the outdoors.
4. Insert a wall sleeve into hole to prevent damage to refrigerant pipes, insulation, condensate drain hose and wiring.
5. Proper weather proofing of the wall surface and wall sleeve is essential to assure a trouble-free installation. Apply sealant, caulking or equivalent weather proofing material around the perimeter of the wall sleeve (interior & exterior) to eliminate outdoor air and water leaks into the living space.

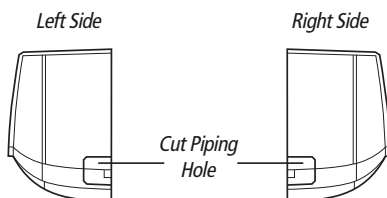
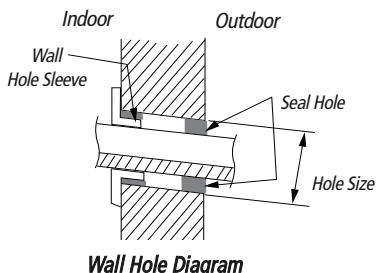


Table of Wall Hole Size per Unit Size

Unit Size (BtuH)	Wall Hole Size (Diameter)	
	in	mm
9,000	2 1/4	55
12,000	2 1/4	55
18,000	2 3/4	70
24,000	2 3/4	70



NOTE: Expandable foam insulation may be added to fill large wall gaps. Apply per manufacturer's instructions.

PIPING INSTALLATION

Refrigerant Piping



CAUTION

Use refrigeration grade piping **ONLY**. Uses of other piping will void the Manufacturer's Warranty.

Piping Preparation

- Do not open service valves or remove protective caps from tubing ends until all connections are made.
- Keep tubing free of dirt, sand, moisture and contaminants.
- Use a flexible condensate drain hose to fit over the factory 5/8-inch (15mm) drainage hose.
- Insulate each refrigerant pipe and condensate hose with minimum 3/8" (10 mm) wall thermal pipe insulation.

NOTE: Insulate the interior portion of the condensate hose to prevent sweating which may cause water stains or wall damage.

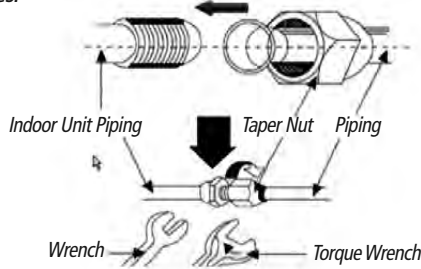
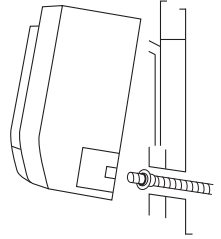
- Bind refrigerant pipes, condensate hose and interconnecting wire together with cable ties at 12 inch intervals on the exterior portion.

PIPING INSTALLATION

Refrigerant Piping Connections to Indoor Unit

NOTE: For maximum serviceability, it is recommended to have refrigerant piping and drain connections on the outside.

1. Feed refrigerant pipes, drain hose and interconnecting wires assembly through wall hole from outdoor to the indoor unit.
2. Adjust the length and carefully bend refrigerant pipes to meet indoor unit refrigerant pipe connections with proper tools to avoid kinks.
3. Apply a small amount of refrigerant oil to the flare connection on the refrigerant pipes.



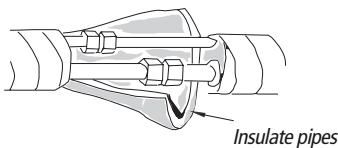
Torque Table

Pipe Diameter inch (mm)	Nut Size inch (mm)	Tightening Torque	
		ft-lbs	N-m
1/4 (6.35)	1/4 (17)	10 to 13	14 to 18
3/8 (9.5)	3/8 (22)	25 to 30	34 to 42
1/2 (12.7)	1/2 (25)	36 to 45	49 to 61
5/8 (15.9)	5/8 (29)	50 to 60	68 to 82

4. Properly align piping and tighten flare nut using a standard wrench and a torque wrench as shown in figure to the below. Carefully tighten flare nuts to correct torque level referring to the Torque Table above.

NOTE: Over tightening may damage flare connections and cause leaks.

5. Individually insulate each refrigerant line to prevent sweating.

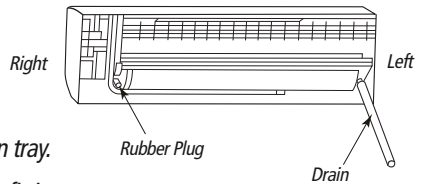


PIPING INSTALLATION

Indoor Drain Piping

How to Relocate Drain Hose from Left to Right Side (if required)

1. Locate drain plug on right side of the drain tray.
Firmly grab it and remove from drain tray.
2. Locate drain tube on the left side of drain tray.
Remove hose clamp and twist drain tube counter-clockwise and gently pull to remove from the drain tray.
3. Position drain tube on the right side over the drain fitting.
Push drain tube onto fitting and rotate clockwise to lock.
Verify drain tube is secure to prevent leaks.
4. Insert drain plug into left side of drain tray fitting.
Verify plug is fully seated to prevent leaks.

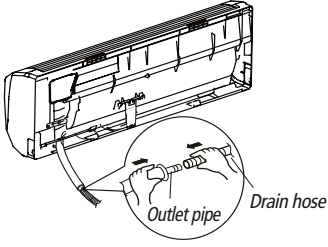


PIPING INSTALLATION

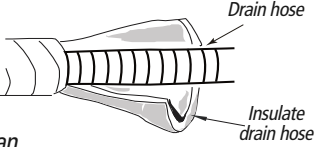
Indoor Drain Piping

The indoor wall unit uses a gravity drain system. There is no internal condensate pump. The drain hose must slope downward with no kinks, raises or fluctuations.

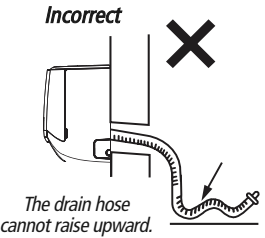
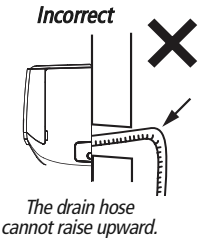
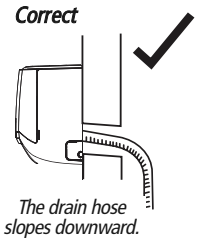
1. Connect the field supplied drain hose to the outlet pipe of indoor wall unit. A field supplied transition or adapter may be required. Secure connection with a field supplied hose clamp.



2. On the interior portion, apply pipe insulation to the entire drain line and joints to prevent sweating.



3. The through-wall hole for the drain hose must be lower than the indoor wall unit drain outlet for a functional gravity drain system.
4. Install field supplied drain hose with a downward slope from the Indoor wall unit drain outlet to the drain hose outlet.



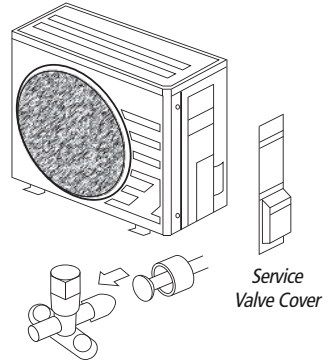
5. Route the condensate drain hose in the safety location to dispose of the condensate water.

NOTE: A condensate pump accessory (sold separately) is recommended for the indoor unit when adequate line pitch cannot be provided for gravity drainage.

PIPING INSTALLATION

Piping Connections to Outdoor Unit

1. Remove service valve cover (if provided) to access the service valves and refrigerant ports. The outdoor unit refrigerant port sizes vary with unit size. See System Requirement Section for refrigerant port sizes.
2. Carefully bend and adjust length of refrigerant pipes to meet outdoor unit service valves connections with proper tools to avoid kinks.



NOTE: Use proper techniques to cut and re-flare refrigerant pipes, if required. An R410A Flaring Tool is required for re-flaring refrigerant pipes.

An adapter pipe may be required to transition from the indoor unit to the outdoor unit refrigerant port. Piping adapters are provided with some models. See table below for factory provided piping adapter quantity and size:

Capacity Size (BTUH)	Quantity of Adapters Provided	Tube Size (Inch)
18,000	0	None
24,000	2	3/8 to 1/2
30,000	2	3/8 to 5/8
	4	3/8 to 1/2
	2	1/4 to 3/8
36,000	2	3/8 to 5/8
	4	3/8 to 1/2
	2	1/4 to 3/8
42,000	3	3/8 to 5/8
	4	3/8 to 1/2
	2	1/4 to 3/8

NOTE: In some situations, field fabricated piping adapters may be required.

PIPING INSTALLATION

Piping Connections to Outdoor Unit (con't)

3. Apply a small amount of refrigerant oil to the flare connection on the refrigerant pipe.
4. Properly align piping and tighten flare nut using a standard wrench and a torque wrench as shown in the indoor piping section.
5. Carefully tighten flare nuts to correct torque level referring to the following Torque Table:

Torque Table

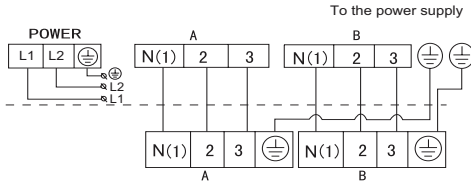
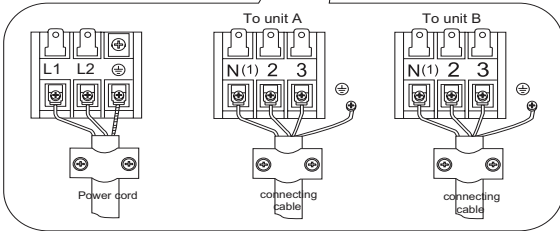
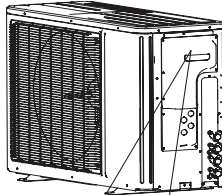
Pipe Diameter inch (mm)	Nut Size inch (mm)	Tightening Torque	
		ft-lbs	N-m
1/4 (6.35)	1/4 (17)	10 to 13	14 to 18
3/8 (9.5)	3/8 (22)	25 to 30	34 to 42
1/2 (12.7)	1/2 (25)	36 to 45	49 to 61
5/8 (15.9)	5/8 (29)	50 to 60	68 to 82

NOTE: Over tightening may damage flare connections and cause leaks.

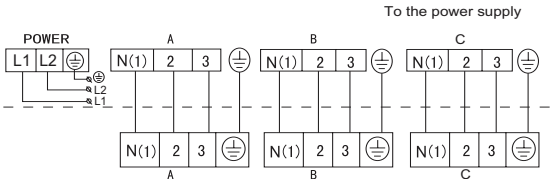
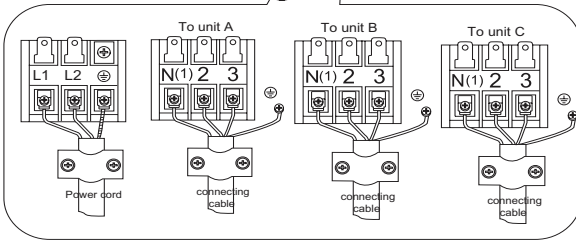
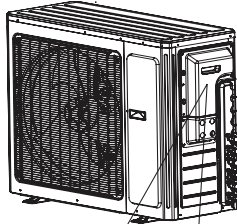
POWER AND WIRING INSTALLATION

Outdoor Unit Electrical Diagrams

18K Unit



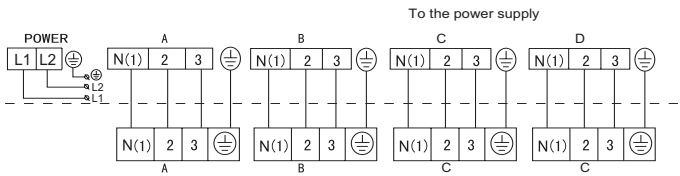
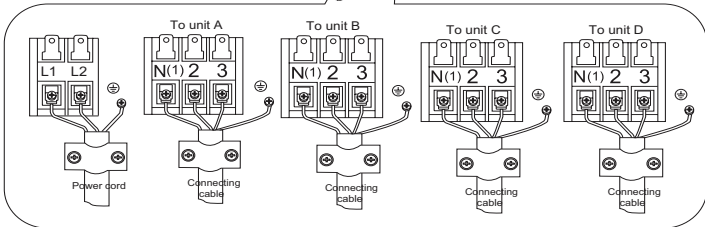
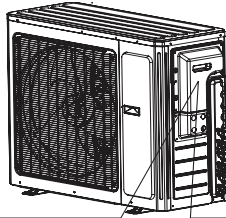
24K Unit



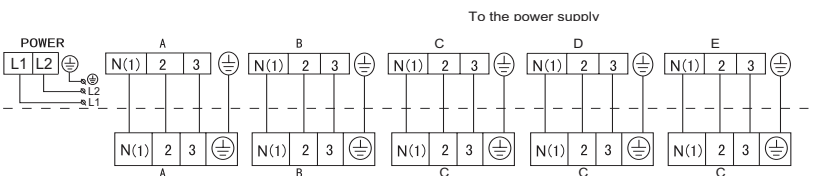
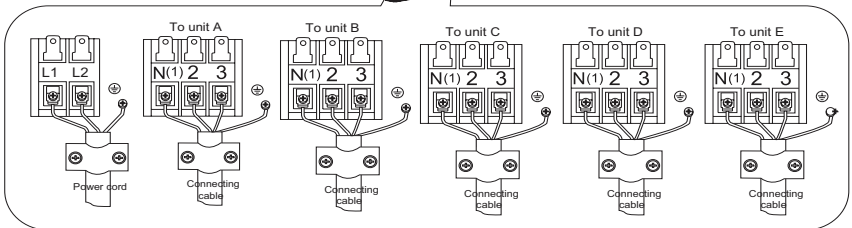
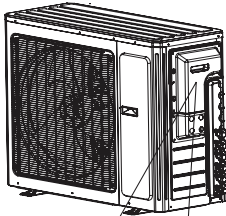
POWER AND WIRING INSTALLATION

Outdoor Unit Electrical Diagrams

30K Unit



36K and 42K Unit



POWER AND WIRING INSTALLATION

High Wall Indoor Wire Connection

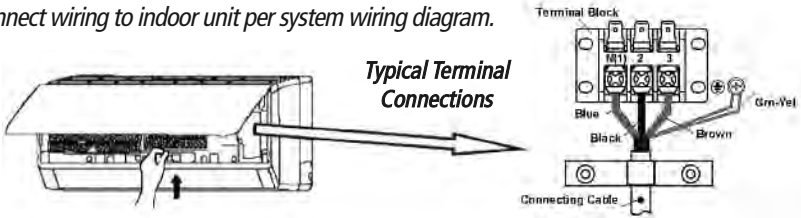
WARNING

Disconnect all electrical power to indoor and outdoor units including disconnects, fuses and circuit breakers. Lockout and tag all disconnect switches.

1. Open front cover of indoor unit and remove field wiring terminal block cover.
2. Pull interconnecting wires up from back of indoor unit and position in close to the terminal block on indoor unit.

NOTE: Record wire colors and terminal references for uses with Outdoor Unit wire connections.

3. Connect wiring to indoor unit per system wiring diagram.



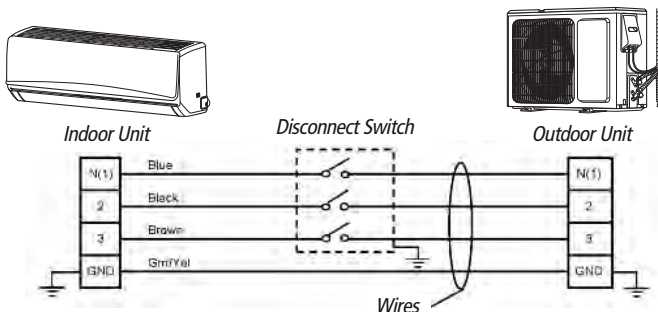
NOTE: The indoor unit is powered from the outdoor unit, depending on local code, a disconnect switch may need to be installed to a power supply circuit.

4. Replace field wiring cover and close front cover of indoor unit.

NOTE: For wire connection instructions for other indoor unit types, refer to the Installation Instructions enclosed with those units.

Indoor Disconnect Switch (If required)

Local codes may require a disconnect switch within sight of the indoor unit. Use a DFS Disconnect Switch Accessory Kit (Part No: DFS-SWITCH-A) to break wires going to the N(1), 2, 3, terminals on the indoor unit, as shown in the wiring diagram below:



POWER AND WIRING INSTALLATION

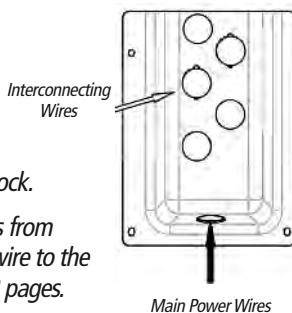
Outdoor Unit Wire Connections

WARNING

Disconnect all electrical power to unit including disconnects, fuses and breakers.

1. Remove the service panel on right side of the outdoor unit.
2. Insert interconnecting wires and main power wires through the wire holes on conduit mounting bracket.
3. Secure main power conduit (and interconnecting wire conduit, if required) with locking nuts to conduit mounting bracket
4. Open wire clamp/strain relief and adjust wire lengths for proper connections to the outdoor unit terminal block.
5. Following the same wire color and terminal references from the indoor unit, tightly connect each interconnecting wire to the terminal block per wiring diagrams on the following 2 pages.
6. Tightly connect main power wires to outdoor unit terminal block per wiring diagram above.
7. Secure all wires inside wire clamp/strain reliefs. Verify wires are secure, not loose and no external force on wires affects the connections at the terminals.
8. Replace service panel on right side of the outdoor unit.
9. Install Disconnect Switch Box per manufacturer's instructions, National Electrical Code (NEC) and local electrical codes.
10. Connect main power wires and conduit to unit.

Multiple Port Conduit Mounting Panel
(Reference Only)



NOTE: Crossing interconnecting wires will cause system malfunction and possible damage.

CAUTION

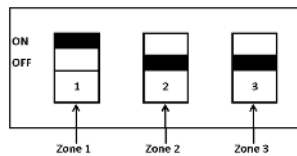
- Electrical disconnecting means must be provided and shall be located within sight and readily accessible from the unit.
- Failure to follow this caution may result in equipment damage or improper operation.
- All wires running from the indoor to outdoor unit must comply with National Electrical Code (NEC) and local codes.
- No wire should be allowed to touch refrigerant tubing, compressor or any moving parts.
- All wires must be connected firmly to terminal block to avoid unit malfunction, overheating and possible fire hazard.

POWER AND WIRING INSTALLATION

Setting Master-Slave Indoor Units (24K Size Only)

Typically, the outdoor unit will select a master indoor unit upon power up. A single indoor unit may be programmed at the master zone. The master zone will always have priority over the other indoor units. Setting an indoor unit as the master zone is not required for system operation.

To set an indoor unit as a master zone, locate master/slave configuration switches on the outdoor main control board. The switch locations 1, 2, 3 correspond to Indoor units (or Ports) 1, 2, 3. Select the master zone by setting the desired switch to the "On" position. The other switches need to be set in the "Off" position. By turning the switch from number to ON, the IDU with ON is set to be the master unit.



TESTING AND INSPECTION

Leaking Test

Leak test each indoor unit, one unit at a time. Repeat the leak test sequence for each indoor unit.

1. Connect the charging hose of the manifold valve to charge the end of the low-pressure valve.
2. Add dry nitrogen to a pressure of 200 lbs. Tightly close both high- and low-pressure valves.
3. Leak-test flare fittings with soap bubbles. If no leak is detected, release nitrogen.

System Vacuum and Charge

Evacuate each indoor unit, one unit at a time. Repeat the evacuation sequence for each indoor unit.

CAUTION

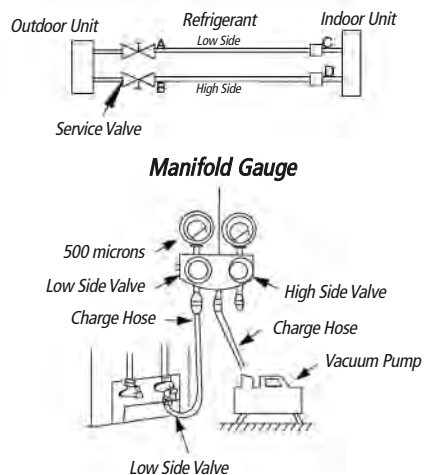
UNIT DAMAGE HAZARD – Never use the system compressor as a vacuum pump. It may result in equipment damage or improper system operation.

Refrigerant pipes and indoor coil should be evacuated using the recommended deep vacuum method of 500 microns. The alternate triple evacuation method may be used if the procedure outlined below is followed.

NOTE: Always break a vacuum with dry nitrogen.

Using Vacuum Pump

1. Completely tighten flare nuts A, B, C, D, connect manifold gauge charge hose to a charge port of the low side service valve.
2. Connect charge hose to vacuum pump.
3. Fully open the low side of manifold gauge. See figure at right.
4. Start vacuum pump.



TESTING AND INSPECTION

Using Vacuum Pump (con't):

5. Evacuate using either deep vacuum or triple evacuation method.
6. After evacuation is complete, fully close the low side of manifold gauge and stop operation of vacuum pump.
7. Disconnect charge hose from charge connection of the low side service valve.
8. Fully open service valves B and A.
9. Securely tighten caps of service valves.

Additional Charge

The outdoor unit is shipped with a full charge of R-410A refrigerant for the following total piping lengths:

Unit Size	Total Piping Length ft (m)
18,000	33 (10)
24,000	98 (30)
30,000	131 (40)
36,000	131 (40)
42,000	131 (40)



For pipe runs over this limit, add 0.2 oz/ft (20 g/m) of additional refrigerant.

START-UP

Start-up Checklist

Turn on main power to all indoor and outdoor units.

- Verify the system is not displaying an error code on the indoor unit display.

Add batteries and press the ON button on the remote controller.

- Verify the remote controller display turns ON and the indoor unit display is ON.

NOTE: The Crown indoor units must first be synced to the remote controller. See Crown Owner's Manual for instructions.

Press the Mode button to Cooling.

For each indoor unit, adjust the room setpoint to bring the system on in cooling mode. The system should start cooling mode within 3-5 minutes.

- Verify the outdoor fan and compressor are operating.
- Verify the indoor fan is operating.
- Verify the indoor discharge air is cooling the room.

Press the Mode button to Heating.

For each indoor unit, adjust the room setpoint to bring the system on in heating mode. The system should start heating mode within 3-5 minutes.

- Verify the outdoor fan and compressor are operating.
- Verify the indoor fan is operating.
- Verify the indoor discharge air is heating the room.

Press the OFF button on the remote controller.

- For each indoor unit, verify remote controller display turns OFF and the system shuts OFF.

TROUBLESHOOTING

PROBLEM	CAUSE/SOLUTION
System does not restart.	<p>Cause: The system has a built-in three-minute delay to prevent short and/or rapid cycling of the compressor.</p> <p>Solution: Wait three minutes for the protection delay to expire.</p>
Indoor unit emits unpleasant odor when started	<p>Cause: Typically unpleasant odors are the result of mold or mildew forming on the coil surfaces or the air filter.</p> <p>Solution: Wash indoor air filter in warm water with mild cleaner. If odors persist, contact a qualified service professional to clean the coil surfaces.</p>
You hear a “water flowing” sound.	<p>Cause: It is normal for the system to make “water flowing” or “gurgling” sounds from refrigerant pressures equalizing when the compressor starts and stops</p> <p>Solution: The noises should discontinue as the refrigerant system equalizes after two or three minutes.</p>
A thin fog or vapor coming out of the indoor unit when system is running.	<p>Cause: It is normal for the system to emit a slight fog or water vapor when cooling extremely humid warm air.</p> <p>Solution: The fog or water vapor will disappear as the system cools and dehumidifies the room space.</p>
You hear a slight cracking sound when the system stops or starts.	<p>Cause: It is normal for the system to make “slight cracking” sounds from parts expanding and contracting during system starts and stops.</p> <p>Solution: The noises will discontinue as temperature equalizes after 2 or 3 minutes.</p>
The system will not run.	<p>Cause: There are a number of situations that will prevent the system from running.</p> <p>Solution: Check for the following:</p> <ul style="list-style-type: none"> • Circuit breaker is “tripped” or “turned off.” • Power button of remote is not turned on. • Batteries in the remote controller are low. • Remote controller is in sleep mode or timer mode. • Otherwise, contact a qualified service professional for assistance.
The unit is not heating or cooling adequately.	<p>Cause: There are a number of reasons for inadequate cooling or heating.</p> <p>Solution: Check the following:</p> <ul style="list-style-type: none"> • Remove obstructions blocking airflow into the room. • Clean dirty or blocked air filter that is restricting airflow into the system. • Seal around door or windows to prevent air infiltration into the room. • Relocate or remove heat sources from the room.
Water leakage from the outdoor unit.	<p>Cause: It is normal for the outdoor unit to generate condensate water in the reverse cycle heating and defrost mode.</p> <p>Solution: This is normal. No action is required.</p>

TROUBLESHOOTING

PROBLEM	CAUSE/SOLUTION
<p>Water leaking from the indoor unit into the room.</p>	<p>Cause: While it is normal for the system to generate condensate water in cooling mode, it is designed to drain this water via a condensate drain system to a safe location.</p> <p>Solution: If water is leaking into the room, it may indicate one of the following.</p> <ul style="list-style-type: none"> • The indoor unit is not level right to left. Level indoor unit. • The condensate drain pipe is restricted or plugged. All restrictions must be removed to allow continuous drainage by gravity. • If problem persists, contact a qualified service professional for assistance.
<p>Wireless remote controller does not work.</p>	<p>Cause: There are a number of possible reasons</p> <p>Solution: Check the following:</p> <ul style="list-style-type: none"> • The remote controller was not matched to the indoor unit. See matching instructions. • The batteries might be low. Change the batteries. • The remote controller must be within 25 ft. (7.5 m) with no obstructions of the indoor unit. If remote controller needs to be replaced, contact a qualified service professional for assistance. In the meantime, use the Aux button to operate the system.
<p>The unit will not deliver air.</p>	<p>Cause: There are a number of system functions that will prevent air flow.</p> <p>Solution: Check for the following:</p> <ul style="list-style-type: none"> • In heating mode, the indoor fan may not start for three minutes if the room temperature is very low. This is to prevent blowing cold air. • In heat mode, if the outdoor temperature is low and humidity is high, the system may need to defrost for up to 10 minutes before beginning a heating cycle. • In dry mode, the indoor fan may stop for up to three minutes during the compressor off delay. • Otherwise, you should contact a qualified service professional for assistance.
<p>Moisture or condensation on the discharge air louvers or outlet vents.</p>	<p>Cause: It is normal for the system to develop condensation or moisture on the discharge air louvers when cooling warm humid air for a long period of time.</p> <p>Solution: The condensation or moisture will disappear as the system cools and dehumidifies the room space.</p>
<p>Mode Conflict (E7) is displayed.</p>	<p>Cause: When indoor units have different mode settings (for example, some set to Cool, others set to Heat, Fan Only or Dry) it creates a Mode Conflict.</p> <p>Solution: Be sure that all indoor units are set to the same mode (i.e., Cool, Heat, Fan Only or Dry). Once this is done, the Mode Conflict status will disappear.</p>

DIAGNOSTIC CODES

Troubleshooting

The unit has onboard diagnostics. The outdoor unit will provide status indicators. The indoor wall unit and remote controller will display error codes. The following is a summary of the codes with explanation:

Malfunction Name	Indoor Unit & Remote Display	Outdoor Unit Indicators		Possible Causes
		Yellow	Red	
X-fan Mode	AL			Operation status
Indoor Evap Coil Temperature Sensor Malfunction	b5			1) Loose or bad connection between sensor and control board 2) Indoor Evap Coil temperature sensor damaged 3) Control board malfunction
Gas valve temperature sensor is open/short circuited	b7			Hardware malfunction
System Configuration Malfunction	C5			1) No jumper cap inserted on the control board 2) Incorrect or damaged jumper cap on control board 3) Indoor and outdoor units are not compatible
Communication wire error or electronic expansion valve malfunction	dd			Operation status
Wrong connection of communication wire or malfunction of electronic expansion valve	dn			Hardware malfunction
System High Pressure	E1			1) Over charged with refrigerant 2) Blocked or dirty outdoor coil 3) Extreme outdoor ambient conditions
Indoor Anti-Freeze Protection	E2	3 flashes and 1 sec Off		1) Low return airflow 2) Indoor fan speed is too low 3) Indoor coil is blocked or dirty
Low Pressure Protection	E3		9 flashes and 1 sec Off	1) Low on refrigerant 2) Pressure sensor is damaged
Compressor High Discharge Temperature Protection	E4	7 flashes and 1 sec Off		Please refer to the malfunction analysis (discharge temperature, overload) in service manual
Overcurrent Protection	E5	5 flashes and 1 sec Off		1) Supply voltage is unstable 2) Supply voltage is too low and system load is too high 3) Indoor coil is blocked or dirty
Communication Malfunction	E6	Continuous On		1) Communication cable is mis-wired between indoor and outdoor units 2) Indoor or Outdoor control board malfunction
Mode conflict (Indoor units calling for simultaneously Heating and Cooling)	E7			Operation status

DIAGNOSTIC CODES

Malfunction Name	Indoor Unit Display	Outdoor Unit Indicators		Possible Causes
		Yellow	Red	
High Temperature Resistant Protection	E8	6 flashes and 1 sec Off		1) Incorrect refrigerant charge level 2) Refrigerant metering device malfunction 3) Compressor malfunction
Cold Air Protection	E9			1) Indoor coil has not reach minimum heating temperature 2) Indoor ambient is abnormally cold 3) Indoor control board malfunction
EEPROM Memory Malfunction	EE	11 flashes and 1 sec Off		Control board malfunction
Module Phase Current Protection - Frequency Decrease/Limit Mode	En			Outdoor control board malfunction
Module Temperature Protection - Frequency Decrease/Limit Mode	EU		11 flashes and 1 sec Off	1) IPM module over heating or malfunctioning 2) Improper voltage at IPM Module
Refrigerant Leakage Protection	F0		9 flashes and 1 sec Off	1) refrigerant leak(s) 2) Indoor coil temperature sensor no calibrated 3) Refrigerant flow is restricted (ex. valve, exv, debris)
Indoor Ambient Temperature Sensor Malfunction	F1			1) Loose or bad connection between sensor and control board 2) Indoor ambient temperature sensor damaged 3) Control board malfunction
Indoor Coil Temperature Sensor Malfunction	F2			1) Loose or bad connection between sensor and control board 2) Indoor coil temperature sensor damaged 3) Control board malfunction
Outdoor Ambient Temperature Sensor Malfunction	F3		6 flashes and 1 sec Off	1) Loose or bad connection between sensor and control board 2) Outdoor ambient temperature sensor damaged 3) Control board malfunction
Outdoor Coil Temperature Sensor Malfunction	F4		5 flashes and 1 sec Off	1) Loose or bad connection between sensor and control board 2) Outdoor coil temperature sensor damaged 3) Control board malfunction
Outdoor Discharge Temperature Sensor Malfunction	F5		7 flashes and 1 sec Off	1) Loose or bad connection between sensor and control board 2) Discharge temperature sensor damaged 3) Control board malfunction
Compressor Overload Protection - Frequency Decrease/Limit Mode	F6		3 flashes and 1 sec Off	1) Incorrect refrigerant charge 2) Metering device malfunction 3) Compressor malfunction
Oil Return Protection - Frequency Decrease/Limit Mode	F7			Normal function status code only
System Current Overload Protection - Frequency Decrease/Limit Mode	F8		1 flashes and 1 sec Off	1) Input voltage too low 2) System pressure too low
High Compressor Discharge Temperature - Frequency Decrease/Limit Mode	F9		2 flashes and 1 sec Off	1) Cooling load is too great 2) Outdoor ambient temperature too high 3) Refrigerant charge too low 4) Metering device malfunction

DIAGNOSTIC CODES

Malfunction Name	Indoor Unit Display	Outdoor Unit Indicators		Possible Causes
		Yellow	Red	
Indoor Coil Freeze Protection - Frequency Decrease/Limit Mode	FH		4 flashes and 1 sec Off	1) Indoor coil has not reach minimum heating temperature 2) Indoor ambient is abnormally cold 3) Indoor control board malfunction
Pump Down or Gathering Refrigerant Status	Fo	17 flashes and 1 sec Off		Optional Service Mode
High Indoor Coil Temperature in Heating- Frequency Decrease/Limit Mode	H0			1) Incorrect refrigerant charge 2) Metering device malfunction 3) Compressor malfunction
Defrost Mode in Heating	H1			Operation status
Compressor Overload Protection	H3	8 flashes and 1 sec Off		1) Wiring terminal OVC-COMP is loose 2) Refer to the malfunction analysis in Service Manual
Compressor Overload Protection	H4	6 flashes and 1 sec Off		1) Incorrect refrigerant charge 2) Metering device malfunction 3) Compressor malfunction
IPM Module Protection	H5	4 flashes and 1 sec Off		1) IPM module over heating 2) Improper or Low voltage at the IPM module 3) IPM module malfunction
Indoor DC Fan Motor Malfunction	H6			1) Loose connections between fan motor and control board 2) Fan motor or blower wheel bearings malfunction 3) Control board malfunction
Compressor De-Synchronized Malfunction	H7			1) Compressor voltage is not balance 2) Control board malfunction 3) Compressor malfunction
Power Factor Correction (PFC) Protection	HC	14 flashes and 1 sec Off		1) Mis-wiring of the reactor filter and PFC capacitor 2) Reactor filter or PFC capacitor malfunction 3) Control board malfunction
Compressor Demagnetization Protection	HE			Compressor malfunction
Outdoor Fan Motor Malfunction	L3		14 flashes and 1 sec Off	1) Loose connections between fan motor and control board 2) Fan motor malfunction 3) Control board malfunction
High Input Power Protection	L9	9 flashes and 1 sec Off		1) Compressor malfunction 2) Power circuit malfunction
Start-Up Malfunction	LC			1) Over charged with refrigerant 2) Control board malfunction 3) Compressor malefaction
Compressor phase-lacking/ phase-inverse protection	Ld			Hardware malfunction

DIAGNOSTIC CODES

Malfunction Name	Indoor Unit Display	Outdoor Unit Indicators		Possible Causes
		Yellow	Red	
Incompatible Indoor and Outdoor Units	LP	16 flashes and 1 sec Off		Indoor and outdoor units are not compatible
Defrosting Status	note 1	16 flashes and 1 sec Off		
Compressor Phase Current Protection	P5			1) IPM module malfunction 2) Outdoor control board malfunction 3) Compressor malfunction
Module Temperature Sensor Malfunction	P7			Outdoor control board malfunction
Module Temperature Protection	P8			1) Lack of thermal grease on IPM module 2) Heat sink (radiator) not tightly mounted 3) Control board malfunction
High DC Bus Voltage Protection	PH	13 flashes and 1 sec Off		1) Supply voltage on L1 and N is above 265Vac 2) Capacitor on control board malfunction 3) Outdoor control board malfunction
Low DC Bus Voltage Protection	PL	12 flashes and 1 sec Off		1) Supply voltage on L1 and N is below 150Vac 2) Capacitor on control board malfunction 3) Outdoor control board malfunction
Capacitor Charging Malfunction	PU			Capacitor malfunction
Compressor Phase-Current Detection Malfunction	U1			Outdoor control board malfunction
DC Bus Voltage Level Dropping Malfunction	U2			Unstable supply voltage
Current Detection Malfunction	U3			Outdoor control board malfunction
Reversing Valve Malfunction	U4			1) Voltage to reversing valve is less than 175V 2) Loose connections between reversing valve and control board 3) Reversing valve solenoid malfunction
Input Current Detection Malfunction	U5			Outdoor control board malfunction
The four-way valve is abnormal	U7			Hardware malfunction
Zero cross detection circuit malfunction(for indoor unit)	U8			Hardware malfunction
Zero cross detection malfunction	U9			Outdoor control board malfunction

Notes: 1) During defrosting process, the heating indicator is on for 10s and off for 0.5s.
2) Refer to Service Manual for additional information.

APPENDIX A

Authorized Indoor Unit Combinations

Outdoor Model Size	2-Zone	3-Zone	4-Zone	5-Zone
18	9+9 9+12			
24	9+9 9+12 9+18 12+12 12+18 18+18	9+9+9 9+9+12 9+9+18 9+12+12 12+12+12		
30	9+9 9+12 9+18 9+24 12+12 12+18 12+24 18+18 18+24	9+9+9 9+9+12 9+9+18 9+9+24 9+12+12 9+12+18 12+12+12 12+12+18	9+9+9+9 9+9+9+12 9+9+9+18 9+9+12+12	
36	9+9 9+12 9+18 9+24 12+12 12+18 12+24 18+18 18+24 24+24	9+9+9 9+9+12 9+9+18 9+9+24 9+12+12 9+12+18 9+12+24 9+18+18 12+12+12 12+12+18 12+12+24 12+18+18	9+9+9+9 9+9+9+12 9+9+9+18 9+9+12+12 9+9+12+18 9+12+12+12 12+12+12+12	9+9+9+9+9 9+9+9+9+12
42	9+9 9+12 9+18 9+24 12+12 12+18 12+24 18+18 18+24 24+24	9+9+9 9+9+12 9+9+18 9+9+24 9+12+12 9+12+18 9+12+24 9+18+18 12+12+12 12+12+18 12+12+24 12+18+18	9+9+9+9 9+9+9+12 9+9+9+18 9+9+12+12 9+9+12+18 9+12+12+12 9+12+12+18 12+12+12+12	9+9+9+9+9 9+9+9+9+12



GREE ELECTRIC APPLIANCES, INC.

www.greecomfort.com



LIMITED WARRANTY

GREE distributor (hereinafter "Company") warrants this product against failure due to defect in materials or workmanship under normal use and maintenance as follows. All warranty periods begin on the date of original installation. If the date cannot be verified, the warranty period begins one hundred twenty (120) days from date of manufacture. If a part fails due to defect during the applicable warranty period Company will provide a new or remanufactured part, at Company's option, to replace the failed defective part at no charge for the part. This limited warranty is subject to all provisions, conditions, limitations and exclusions listed below.

- Seven (7) years on compressor and Five (5) years on all parts to the original registered end-user.
- One (1) year warranty on remote controller unit.
- Proper installation – Limited warranty applies only to systems that are installed by a state certified or licensed HVAC contractor, under applicable local and state law in accordance with all applicable building codes and permits; GREE installation and operation instructions and good trade practices.
- Warranty applies only to products remaining in their original installation location.
- Defective parts must be returned to the distributor through a registered servicing dealer for credit.

LIMITATIONS OF WARRANTIES: ALL IMPLIED WARRANTIES AND/OR CONDITIONS (INCLUDING IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE OR PURPOSE) ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY, SOME STATES OR PROVINCES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY OR CONDITION LASTS, SO THE ABOVE MAY NOT APPLY TO YOU. THE EXPRESS WARRANTIES MADE IN THIS WARRANTY ARE EXCLUSIVE AND MAY NOT BE ALTERED, ENLARGED, OR CHANGED BY ANY DISTRIBUTOR, DEALER, OR OTHER PERSON, WHATSOEVER.

THIS WARRANTY DOES NOT COVER:

1. Labor or other costs incurred for diagnosing, repairing, removing, installing, shipping, servicing or handling of either defective parts, or replacement parts, or new units.
2. Normal maintenance as outlined in the installation and servicing instructions or Owner's Manual, including filter cleaning and/or replacement and lubrication.
3. Failure, damage or repairs due to faulty installation, misapplication, abuse, improper servicing, unauthorized alteration or improper operation.
4. Failure to start due to voltage conditions, blown fuses, open circuit breakers, or damages due to the inadequacy or interruption of electrical service.
5. Failure or damage due to floods, winds, fires, lightning, accidents, corrosive environments (rust, etc.) or other conditions beyond the control of the Company.
6. Parts not supplied or designated by Company, or damages resulting from their use.
7. Products installed outside USA and Canada.
8. Electricity or fuel costs, or increases in electricity or fuel costs from any reason whatsoever, including additional or unusual use of supplemental electric heat.
9. Any cost to replace, refill or dispose of refrigerant, including the cost of refrigerant.
10. Any special, indirect or consequential property or commercial damage of any nature whatsoever. Some states or provinces do not allow the exclusion of incidental or consequential damages, so the above limitation may not apply to you.

For additional warranty exclusions, visit www.GreeComfort.com.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or province to province.

For warranty service or repair, contact your installing contractor. You may find the installer's name on the equipment or in your Owner's packet.

Complete product registration below and send back by e-mail at service@twclimate.com

PRODUCT INFORMATION

Model No. _____

Serial No. _____ Date of Installation _____

Owner Name _____

Address of Installation _____

Installing Contractor _____

Address _____

Phone No. / E-mail _____