



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 _____

WS0021513-DLSWARR-HP-Rev 3-8-13

Gree Electric Appliances, Inc ©2014 Cat No: DFS-MULTI-HP-11N



66129912795



MULTI DUCTLESS INVERTER HEAT PUMP INSTALLATION MANUAL

Models:

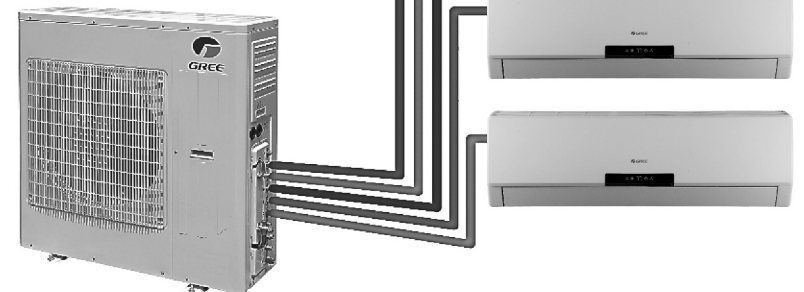
MULTI18HP230V1AO

MULTI24HP230V1AO

MULTI30HP230V1AO

MULTI36HP230V1AO

MULTI42HP230V1AO



Thank you for choosing a Gree Multi Ductless Heat Pump for your customer.

Please read this installation manual carefully before installing and starting up the Multi 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.

Contents


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1

SAFETY PRECAUTIONS

Please read the following before installation.

Recognize safety information.  This is the safety-alert symbol. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety-alert symbol.

DANGER identifies the most serious hazards which will result in severe personal injury or death.

WARNING signifies hazards which could result in personal injury or death.

CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage.

NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

NOTE: Your actual heat pump system and related devices may differ from the images shown in this manual.

This appliance is not intended for use by children without responsible adult supervision. Proper care should be taken to ensure safety.

WARNING

Heat pumps, air conditioners & heating equipment should be installed, started up, and serviced only by qualified installers and service technicians. Air conditioning, heat pumps and refrigeration systems are hazardous due to high voltage electrical components, high refrigerant pressures, and moving parts.

2

SAFETY PRECAUTIONS

CAUTION

- The unit should be installed and serviced only by trained, qualified installers and service mechanics. Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.
- Owner should be cautioned that children should not play with the appliance.

WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

- Before installing, servicing or modifying the system, the main electrical disconnect switch must be in the OFF position. There may be more than one disconnect switch. Lock out and tag all switches with a warning label.

General Safety Precautions

- A dedicated power supply circuit should be used in accordance with local electrical safety regulations and National Electrical Codes (NEC).
- Ensure that the entire system is reliably grounded.
- Use proper size circuit breaker to protect equipment against short circuit and overload conditions.
- Observe all local codes and regulations.

INSTALLATION SITE INSTRUCTIONS

Proper installation site is vital for correct and reliable operation of the system.

Avoid the following installation locations:

- Strong heat sources, vapors, flammable gas or volatile liquids.
- High-frequency electro-magnetic waves, generated by radio equipment, welders or medical equipment.

SYSTEM REQUIREMENTS

Piping Requirements

OUTDOOR UNITS in (mm)

Unit Size (BtuH)		Liquid Line in (mm)	Suction/Gas Line in (mm)
18,000	Port 1	1/4 (6)	3/8 (9.5)
	Port 2	1/4 (6)	3/8 (9.5)
24,000	Port 1	1/4 (6)	3/8 (9.5)
	Port 2	1/4 (6)	3/8 (9.5)
	Port 3	1/4 (6)	3/8 (9.5)
30,000	Port 1	1/4 (6)	3/8 (9.5)
	Port 2	1/4 (6)	3/8 (9.5)
	Port 3	1/4 (6)	3/8 (9.5)
	Port 4	1/4 (6)	3/8 (9.5)
36,000	Port 1	1/4 (6)	3/8 (9.5)
	Port 2	1/4 (6)	3/8 (9.5)
	Port 3	1/4 (6)	1/2 (12)
	Port 4	3/8 (9.5)	5/8 (16)
42,000	Port 1	1/4 (6)	3/8 (9.5)
	Port 2	1/4 (6)	3/8 (9.5)
	Port 3	1/4 (6)	1/2 (12)
	Port 4	1/4 (6)	1/2 (12)
	Port 5	3/8 (9.5)	5/8 (16)

INDOOR UNITS in (mm)

Unit Size (BtuH)	Liquid Line in (mm)	Suction/Gas Line in (mm)
9,000	1/4 (6)	3/8 (9.5)
12,000	1/4 (6)	3/8 (9.5)
18,000	1/4 (6)	1/2 (12)

REFRIGERANT PIPE LENGTHS

Unit Size (BtuH)	Min Pipe Length ft (m)	Max Total Pipe Length ft (m)	Max Equivalent Pipe Length ft (m)	Max Elev btwn IND Units ft	Max Elev btwn IND & OTD Units ft (m)
18,000	10 (3)	66 (20)	33 (10)	16	33 (10)
24,000	10 (3)	230 (70)	66 (20)	33	66 (20)
30,000	10 (3)	230 (70)	66 (20)	33	66 (20)
36,000	10 (3)	230 (70)	82 (25)	50	82 (25)
42,000	10 (3)	262 (80)	82 (25)	50	82 (25)

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	48 (1.4)	33 (10)	0.2 (20)
24,000	R-410A	78 (2.2)	98 (30)	0.2 (20)
30,000	R-410A	78 (2.2)	131 (40)	0.2 (20)
36,000	R-410A	102 (2.9)	131 (40)	0.2 (20)
42,000	R-410A	169 (4.8)	164 (50)	0.2 (20)

*Precharge amount for up to 25-ft of refrigerant pipe.

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	13	20	12
24,000	208/230v - 1ph 60hz	20	30	10
30,000	208/230v - 1ph 60hz	26	45	8
36,000	208/230v - 1ph 60hz	28	45	8
42,000	208/230v - 1ph 60hz	29	50	6

**Main power wire from electrical panel to outdoor unit.

- 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.

Condensate Drain Size: 5/8-in OD 7/16-in ID

Note: Insulate condensate drain hose to prevent sweating and possible water damage.



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

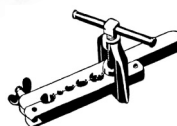
- Vacuum Pump

- Safety Glasses

- Work Gloves

- Refrigerant Scale

- Micron Gauge



INSTALLATION SITE INSTRUCTIONS

Step 1

Installation Site of Indoor Unit

Select a site that allows for the following:

- Ensure the installation complies with the installation minimum dimensions and meets the minimum and maximum connecting piping length and maximum change in elevation.
- Air inlet and outlet will be clear of obstructions, ensuring proper airflow throughout the room.
- Condensate can be easily and safely drained.
- All connections can be easily made to outdoor unit.
- Indoor unit is out of reach of children.
- A wall strong enough to withstand the full weight and vibration of the unit.
- Filter can be easily accessed for cleaning.
- Leave enough free space to allow access for routine maintenance.
- 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.
- Do not install in a laundry room or by a swimming pool.
- Determine if condensate pumps are required to properly drain condensate water from the indoor units.

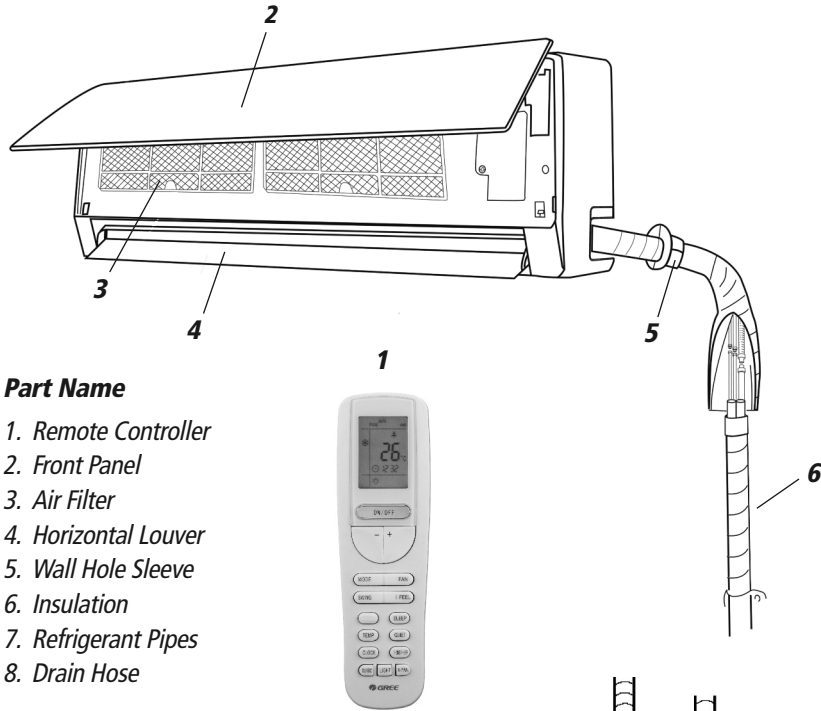
Installation Site of Outdoor Unit

Select a site that allows for the following:

- Outdoor location meets all minimum installation distances defined in the Installation Dimensions section.
- Sound from outdoor unit will not annoy neighbors.
- All connections can be easily made to indoor unit.
- Air inlet and outlet will be clear of obstructions to ensure proper airflow.
- Wall or roof is strong enough to withstand the full weight and vibration of the outdoor unit (for wall or roof installation only).
- Outdoor unit is out of reach of children and does not obstruct walkways.
- Outdoor unit is not exposed to direct sunlight or strong wind.
- Maintenance and repairs can be easily performed on the outdoor unit.
- Ensure the installation complies with the minimum and maximum connecting piping length and maximum change in elevation criteria.

INSTALLATION DIMENSIONS

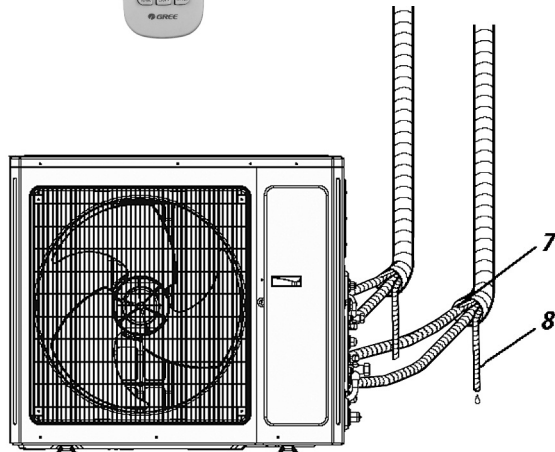
Indoor unit



Part Name

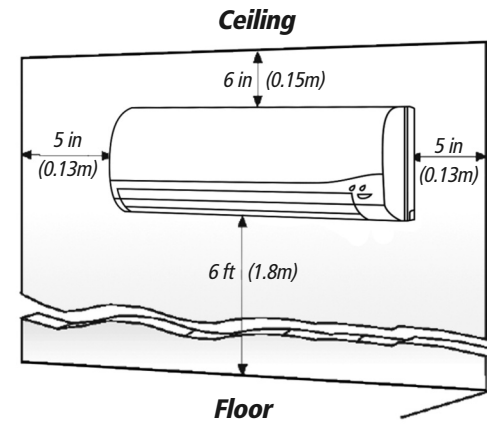
1. Remote Controller
2. Front Panel
3. Air Filter
4. Horizontal Louver
5. Wall Hole Sleeve
6. Insulation
7. Refrigerant Pipes
8. Drain Hose

Outdoor unit

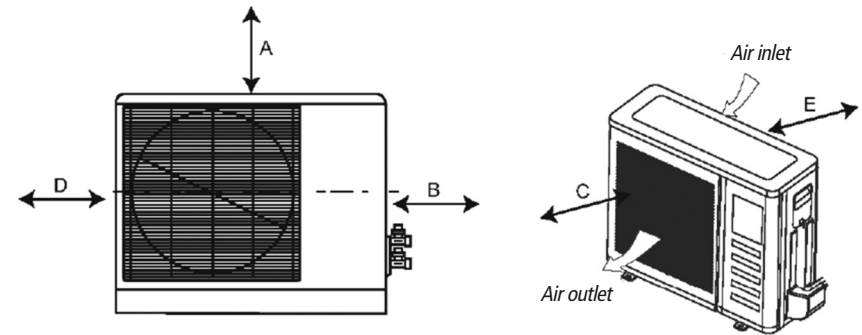


INSTALLATION DIMENSIONS

Minimum indoor clearances



Minimum outdoor clearances



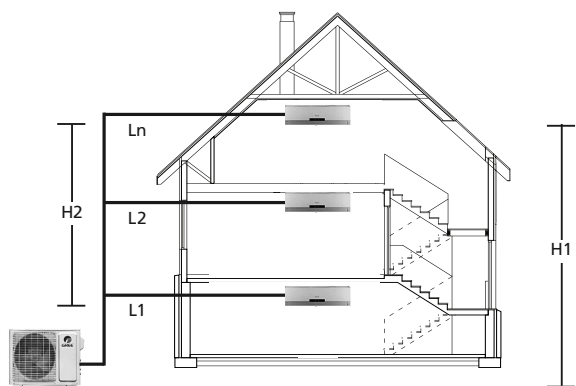
Outdoor Unit	Minimum Distances in (mm)
A	20 (500)
B	24 (610)
C	78 (2000)
D	12 (305)
E	20 (500)

INSTALLATION OF INDOOR UNIT

Step 2

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.



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=

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=

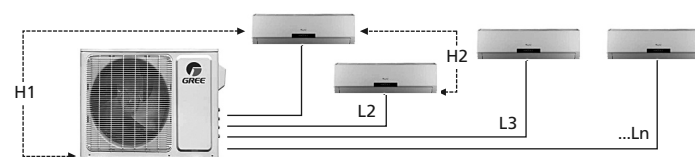
Find the two indoor units with the greatest vertical distance from each other. Measure the maximum vertical height (H2) between those two indoor units from bottom of one unit to bottom of the other unit.

H2=

INSTALLATION OF INDOOR UNIT

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:

Maximum Elevation between Outdoor to Indoor Unit (H1)

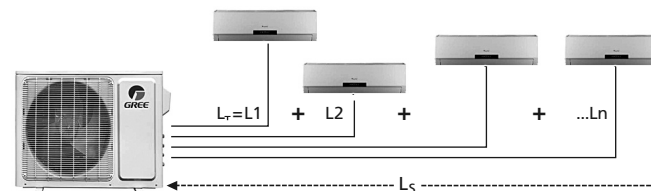
Capacity Size (BtuH)	Distance ft (m)
18,000	33 (10)
24,000	66 (20)
30,000	66 (20)
36,000	82 (25)
42,000	82 (25)

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

Maximum Elevation between Indoor Units (H2)

Capacity Size (BtuH)	Distance ft (m)
18,000	16 (5)
24,000	33 (10)
30,000	33 (10)
36,000	50 (15)
42,000	50 (15)

NOTE: If an indoor unit is below the outdoor unit, install oil traps in the suction/gas pipe every 20 vert. ft (6 m)



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

Maximum Equivalent Pipe Length Outdoor to Farthest Indoor Unit (Ls)

Capacity Size (BtuH)	Distance ft (m)
18,000	33 (10)
24,000	66 (20)
30,000	66 (20)
36,000	82 (25)
42,000	82 (25)

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

Maximum Total Pipe Length (Lt)

Capacity Size (BtuH)	Distance ft (m)
18,000	66 (20)
24,000	230 (70)
30,000	230 (70)
36,000	230 (70)
42,000	262 (80)

NOTE: The outdoor unit is shipped with a full charge of R-410A refrigerant. The factory charge is based on 25 ft (7.6 m) pipe runs. For pipe runs over this limit, add 0.2 oz/ft (20 g/m) of additional refrigerant.

INSTALLATION OF INDOOR UNIT

Step 3

Installation of 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.

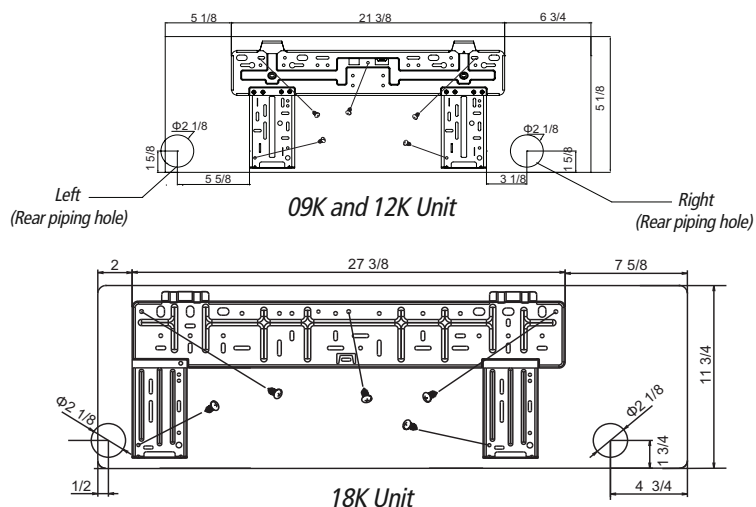
4. Remove the mounting brackets from the indoor unit and position the mounting bracket on the wall in desired location. Use centering mark on mounting bracket for centering the indoor unit on the wall.
5. Mounting bracket must be installed horizontally and level right to left.

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.

Mounting Bracket Diagrams and Dimensions



INSTALLATION OF INDOOR UNIT

Step 4

Drill Hole in Wall for Interconnecting Piping, Drain & Wiring

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.

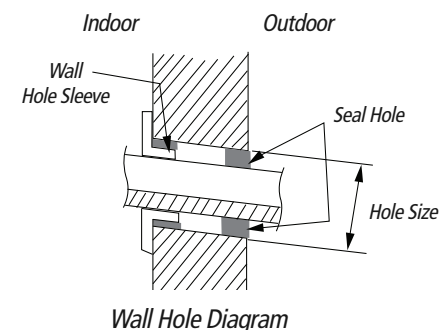
If refrigerant piping is going through the right or left side of front panel:

1. Use a small saw blade to carefully cut a U-shaped hole in the side of the front panel. The hole must be large enough for refrigerant pipes, condensate hose and wires.
2. Determine and mark proper location for wall hole.
3. Use table below to determine recommended wall hole size for your unit size.

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	66

4. Cut the wall hole with a 5° to 10° downward slant to the outdoors.
5. Insert a wall hole sleeve into hole to prevent damage to refrigerant pipes, insulation, condensate drain hose and wiring.
6. Seal around wall hole sleeve with caulk or foam to weatherproof.



GREE

OUTDOOR UNIT PREPARATION

Step 5

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.

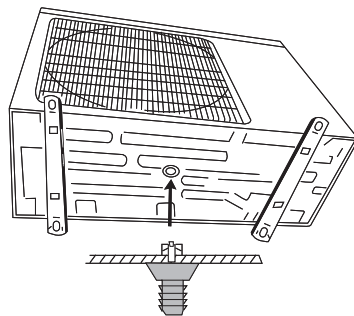
WARNING

Florida Wind Load Requirements state that outdoor unit must be anchored to concrete pad using four 3/8-in diameter Power Wedge Bolt Plus (or equivalent) with 1-in diameter fender washers. Anchor bolts must be embedded into 3,000 PSI minimum concrete at a distance of 4 1/2-in from any concrete edge. The concrete thickness must exceed 1.5 times the anchor depth.

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.



Drain Fitting Installation

INSTALLATION OF REFRIGERANT PIPING

Step 6

Piping Connections

CAUTION

Use refrigeration grade tubing **ONLY**. No other type of tubing may be used. Use of other types of tubing will void manufacturer's warranty. Make sure there is enough piping to cover the required length between the outdoor and indoor unit.

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 (16mm) drainage hose.
- Insulate each refrigerant pipe and condensate hose with minimum 3/8" (10 mm) wall thermal pipe insulation.

NOTE: Insulate 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.

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

INSTALLATION OF REFRIGERANT PIPING

Step 6 (Cont'd)

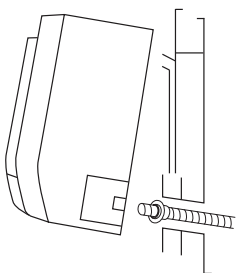
Piping and Drain Hose Connections to Indoor Unit

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

1. Feed refrigerant pipes, drain hose and interconnecting wires assembly through wall hole from outdoor to the indoor space.

2. Set the indoor unit on mounting bracket. Allow the indoor unit to hinge on the top of the mounting bracket. Do not lock down bottom of unit to mounting bracket.

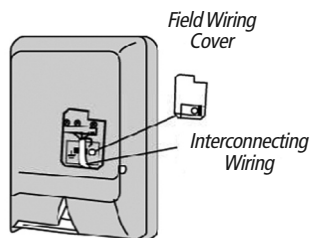
3. Adjust the length of the interconnecting wires so that it can easily reach the indoor unit electrical control box. Route and fit the interconnecting wires into back side of indoor unit.



4. Open front cover of indoor unit and remove field wiring terminal block cover. Route the interconnecting wires to terminal block in control box.

5. Allow interconnecting wires to hang free. Wire connections will be handled later in these instructions.

6. Adjust the length of condensate drain hose to easily meet the drain pipe of the indoor unit. Make connection and secure with a hose clamp. Insulate the drainage hose and connection to prevent sweating.

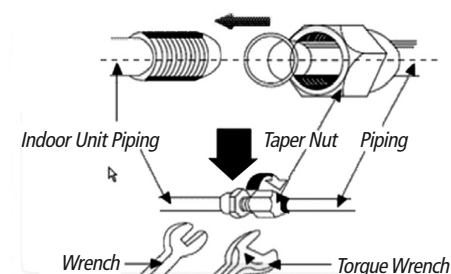


NOTE: Prevent condensate drain hose from sagging or kinking for proper drainage.

7. Adjust the length and carefully bend refrigerant pipes to meet indoor unit refrigerant pipe connections with proper tools to avoid kinks.

INSTALLATION OF REFRIGERANT PIPING

8. Apply a small amount of refrigerant oil to the flare connection on the refrigerant pipes.
9. Properly align piping and tighten flare nut using a standard wrench and a torque wrench as shown in figure below:



10. 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.

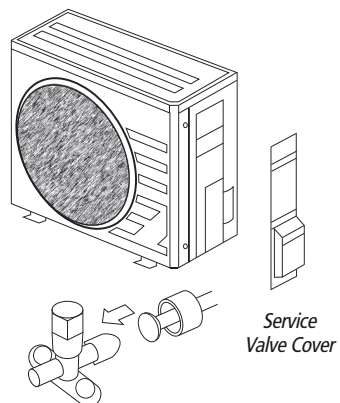
11. Apply insulation to refrigerant pipe joints to prevent sweating.
12. Gently and securely lock down bottom of indoor unit to wall mounting bracket.

INSTALLATION OF REFRIGERANT PIPING

Step 7

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 may vary. 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 1/2
36,000	1	1/4 to 3/8
	1	1/2 to 3/8
	1	1/2 to 5/8
	1	3/8 to 1/4
	1	5/8 to 3/8
	2	3/8 to 1/2
42,000	2	1/4 to 3/8
	2	1/2 to 3/8
	2	1/2 to 5/8
	1	3/8 to 1/4
	1	5/8 to 3/8
	1	3/8 to 1/2
	1	5/8 to 1/2

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

INSTALLATION OF REFRIGERANT PIPING

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.

INSTALLATION OF POWER AND WIRING

Step 8

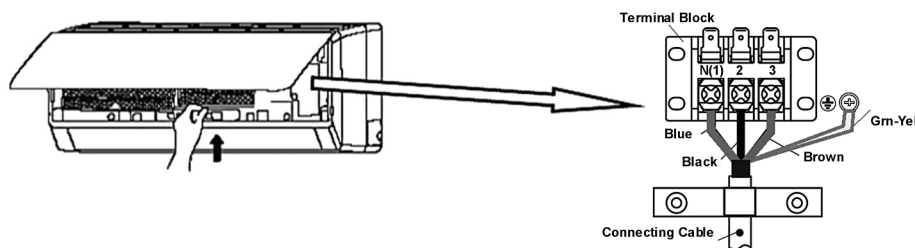
Indoor Unit Interconnecting Wire Connections

WARNING

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

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: 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.



3. Connect wiring to indoor unit per connection diagram.

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

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

INSTALLATION OF POWER AND WIRING

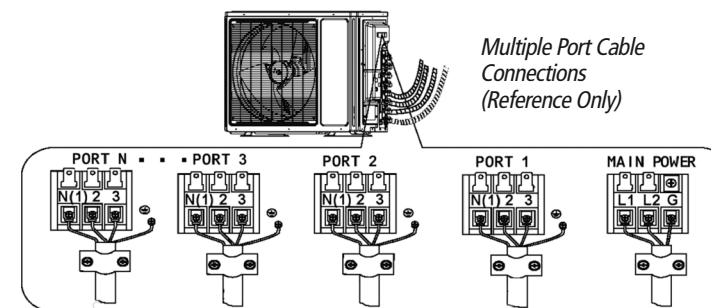
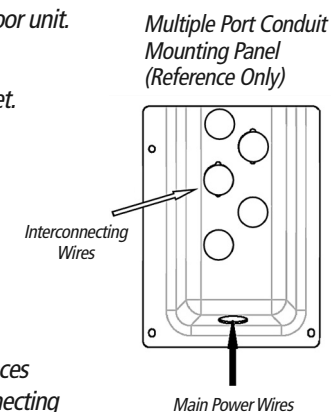
Step 9

Outdoor Unit Wire Connections

WARNING

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

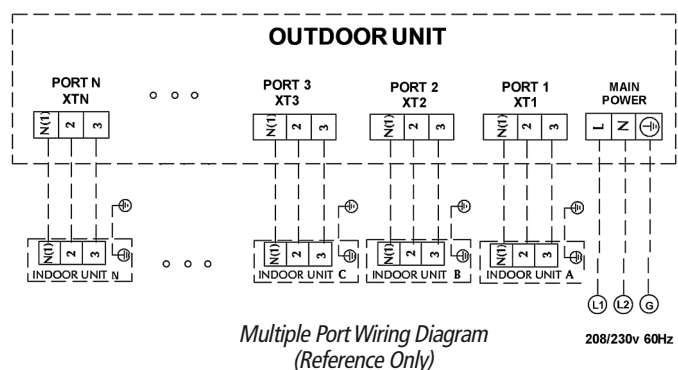
1. Remove the service panel on right side of the outdoor unit.
2. Insert interconnecting wires and main power wires through the wire holes on conduit mounting bracket.
3. Secure main power conduit (and interconnecting wire conduit, if required) with locking nuts to conduit mounting bracket
4. Open wire 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 diagram below.



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

INSTALLATION OF POWER AND WIRING

Step 9 (Cont'd)



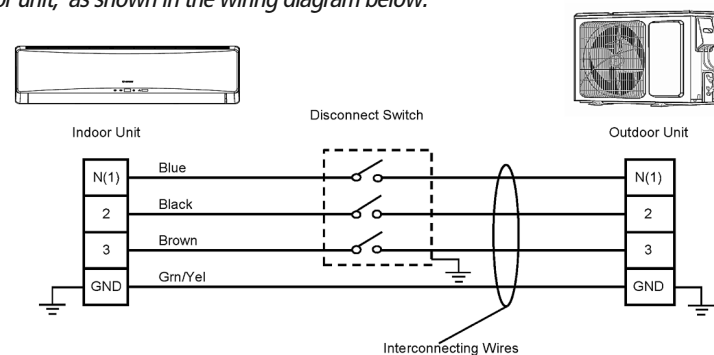
6. Tightly connect main power wires to outdoor unit terminal block per wiring diagram above.
7. Secure all wires inside wire clamp/strain reliefs. Verify wires are secure, not loose and no external force on wires affects the connections at the terminals.
8. Replace service panel on right side of the outdoor unit.
9. Connect main power wires and conduit to unit. Disconnect switch box per manufacturer's instructions, National Electrical Code (NEC) and local electrical codes.

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.**

INSTALLATION OF POWER AND WIRING

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:



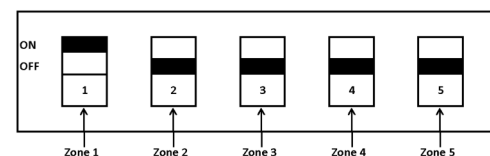
CAUTION

Never break or interrupt the ground wire with a switch or disconnect device.

Setting Master-Slave Indoor Units

Typically, the outdoor unit will respond to the indoor units on a first-come-first-served basis. 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, 4, 5 correspond to Indoor units (or Ports) 1, 2, 3, 4, 5. Select the master zone by setting the desired switch to the "On" position. The other switches need to be set in the "Off" for slaves. By turning the switch from number to ON, the IDU with ON is set to be the master unit.



NOTE: This function is not valid on the 18,000 BtuH 2-Zone model.

VACUUM TESTING

Step 10

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.

Step 11

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

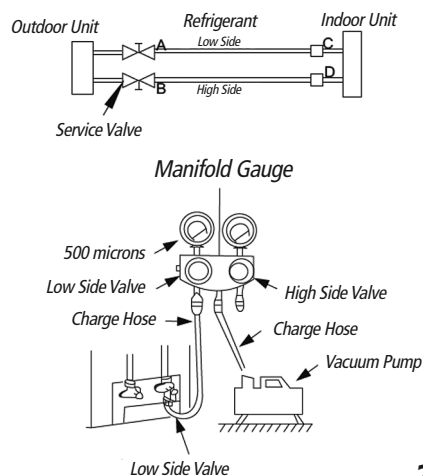
Never use the system compressor as a vacuum pump. It may result in equipment damage or improper system operation.

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.



VACUUM TESTING

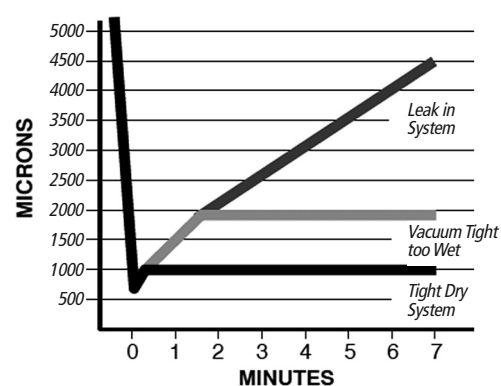
5. Evacuate using either deep vacuum or triple evacuation method.
6. After evacuation is complete, fully close the low side of manifold gauge and stop operation of vacuum pump.
7. The factory charge contained in the outdoor unit is good for up to 25 ft. (8 m) of line length.

NOTE: For refrigerant lines longer than 25 ft (8 m), add add'l refrigerant per foot of extra piping up to the maximum allowable length. See System Requirement section on page 4 for more info.

8. Disconnect charge hose from charge connection of the low side service valve.
9. Fully open service valves B and A.
10. Securely tighten caps of service valves.

Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gauge capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water.



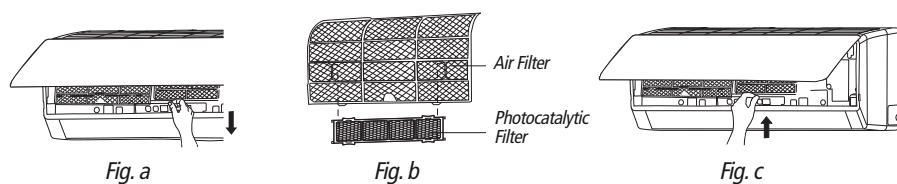
Deep Vacuum Graph

START-UP

Step 12

Installing Photocatalytic Filter (optional)

1. Lift front panel and remove air filter. (Fig. a).
2. Attach photocatalytic filter onto air filter. (Fig. b).
3. Install air filter as shown; close panel. (Fig. c).



Step 13

Start-up and Checkout

Test Operation

Perform test operation after completing gas leak and electrical safety check.

1. Turn on electrical disconnect to outdoor unit.
2. Push the "ON/OFF" button on Remote Control to begin testing.

NOTE: A protection feature prevents the system from being activated for approx. 3 minutes.

3. Push MODE button, select COOLING, HEATING, FAN mode to confirm all functions.

System Checks

1. Conceal refrigerant pipes where possible.
2. Make sure drain hose slopes downward along entire length.
3. Ensure all refrigerant pipes and connections are properly insulated.
4. Fasten pipes to outside wall, when possible.
5. Seal and weatherproof wall hole which the interconnecting wires and refrigerant pipes pass through.

START-UP

Indoor Unit

1. Do all Remote Control buttons function properly?
2. Do the display panel lights work properly?
3. Does the swing louver function properly?
4. Does the drain work?

Outdoor Unit

1. Push the mode button to COOL and adjust the room setting to 61° F deg. Wait up to 3 minutes from compressor time guard. Does compressor and outdoor fan turn on in cooling mode?
2. Push the mode button to HEAT and adjust the room setting to 85° F deg. Wait up to 3 minutes for compressor time guard. Does compressor and outdoor fan turn on in heat mode?

Explain Following Items To Customer With The Aid Of The Owner's Manual:

1. How to turn system on and off; selecting COOLING, HEATING and other operating modes; setting a desired temperature; setting the timer to automatically start and stop system operation; and all other features of the Remote Control and display panel.
2. How to remove and clean the air filter.
3. How to set air with the swing louvers.
4. Explain care and maintenance.
5. Present the Owner's Manual and installation instructions to customer.

TROUBLESHOOTING

Troubleshooting

This unit has onboard diagnostics. Informational and error codes will be displayed on the LED display on the front panel of the indoor unit in place of the temperature display. The unit will provide informational codes to alert the user of special system operations. Informational codes are not signs of system malfunctions or failures. The following is a list of system informational codes and descriptions:

Description	Info Code	Possible Causes
Mode Conflict	E7	Some Indoor Units are Requesting Heat and Some cooling.
Defrosting	H1	Defrosting Indoor Coil during Heating Mode

Error codes are an indicator of a system malfunction or failure. The following list of error codes and descriptions:

Equipment Fault	Error Codes	Possible Causes
Indoor Ambient Temp. Sensor	F1	Short/Open of the Indoor Ambient Temperature Sensor
Indoor Evaporator Temp Sensor	F2	Short/Open of the Indoor Evaporator Temperature Sensor
Outdoor Ambient Temp Sensor	F3	Short/Open of the Outdoor Ambient temp Sensor
Outdoor Coil Temp Sensor	F4	Short/Open of the condenser coil Temperature Sensor
Outdoor Discharge Air Temp Sensor	F5	Short/Open of the Outdoor Discharge Temperature Sensor
Liquid Valve Inlet Temp Sensor	b5	Short/Open of the liquid valve Temperature Sensor
Suction/Gas Valve Outlet Temp Sensor	b7	Short/Open of the gas valve Temperature Sensor
Indoor Configuration Jumper	C5	Missing Configuration Jumper on Indoor Control Board
High Discharge Temp Protection	E4	Compressor Discharge high Temperature Protection
High Current Protection	E5	Power Supply is not Stable and Voltage Range is too Large
Communication Error	E6	Mis-wired or Communication Failure between the Indoor and Outdoor units
Overload Protection	E8	Overload Protection
Compressor Overheat Protection	H3	Compressor Thermal Overload Protection
IPM Protection	H5	Module Current Protection(namely IPM Protection)
Indoor fan Malfunction	H6	Indoor Fan Stopped or Running too Slow
Motor Desynchronizing	H7	Compressor Desynchronizing
PFC Error	Hc	PFC Protection
Startup Failure	Lc	Compressor Startup Failure
Phase Loss	Ld	Compressor phase Failure/Reverse Protection
Indoor/Outdoor Mismatch	LP	Indoor and Outdoor Units Unmatched (Model or Capacity)
Compressor Current Protection	P5	Phase Over-Current Protection
Radiator Temp Sensor Error	P7	Short/Open Circuit of the Module Temperature Sensor
Radiator Overheat Protection	P8	Module Temperature Protection
4-Way Valve Malfunction	U7	Bad Connection, Solenoid Failure or Valve Malfunction
High Pressure Protection	E1	Too much refrigerant or High Ambient conditions or low airflow.

APPENDIX A

Authorized Indoor Unit Combinations

18,000 BtuH	Indoor Unit Size	30,000 BtuH	Indoor Unit Size
Dual Configuration 2 Zones	9K+9K 9K+12K	Dual Configuration 2 Zones	9+9 9+12 9+18 9+21 9+24 12+12 12+18 12+21 12+24 18+18 18+21 18+24 21+21 21+24 24+24
Dual Configuration 2 Zones	9K+9K 9K+12K 9K+9K 9K+12K 9K+18K 12K+12K 12K+18K 18K+18K		Tri-Configuration 3 Zones
Tri-Configuration 3 Zones	9K+9K+9K 9K+12K+12K 9K+9K+12K 9K+9K+18K 12K+12K+12K	Dual Configuration 2 Zones	
30,000 BtuH	Indoor Unit Size	Tri-Configuration 3 Zones	Quad-Configuration 4 Zones
Dual Configuration 2 Zones	9+9+9 9+9+12 9+12+12 9+9+18 12+12+12 9+12+18 12+12+18		
Tri-Configuration 3 Zones	9+9+9 9+9+12 9+12+12 9+9+18 12+12+12 9+12+18 12+12+18	Quad-Configuration 4 Zones	9+9+9+9 9+9+9+12 9+9+9+18 9+9+9+21 9+9+9+24 9+9+12+12 9+9+12+18 9+9+12+21 9+9+18+18 9+12+12+12 9+12+12+18 12+12+12+12
Quad-Configuration 4 Zones	9+9+9+9 9+9+9+12 9+9+12+12		

APPENDIX A

Authorized Indoor Unit Combinations (Cont'd)

42,000 BtuH	Indoor Unit Size	42,000 BtuH	Indoor Unit Size
Dual Configuration 2 Zones	9+12	Quad-Configuration 4 Zones	9+9+9+9
	9+18		9+9+9+12
	9+21		9+9+9+18
	9+24		9+9+9+21
	12+12		9+9+9+24
	12+18		9+9+12+12
	12+21		9+9+12+18
	12+24		9+9+12+21
	18+18		9+9+12+24
	18+21		9+9+18+18
	18+24		9+9+18+21
	21+21		9+9+18+24
	21+24		9+9+21+21
	24+24		9+12+12+12
	Tri-Configuration 3 Zones		9+9+9
9+9+12		9+12+12+21	
9+9+18		9+12+12+24	
9+9+21		9+12+18+18	
9+9+24		9+12+18+21	
9+12+12		9+12+21+21	
9+12+18		9+18+18+18	
9+12+21		12+12+12+12	
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12+24+24		9+9+12+12+18	
18+18+18		9+9+12+12+21	
18+18+21		9+12+12+12+12	
18+18+24	9+12+12+12+18		
18+21+21	12+12+12+12+12		
21+21+21			
		Penta Configuration 5 Zones	

NOMENCLATURE GUIDE

