



MULTI **21**

SLIM CONCEALED DUCT INSTALLATION MANUAL

Models:

Indoor Unit

DUCT09HP230V1AD

DUCT12HP230V1AD

DUCT18HP230V1AD

DUCT24HP230V1AD



Thank you for choosing a Gree Slim Concealed Duct unit for your customer.

Please read this installation manual carefully before installing and starting up the Slim Duct 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.*

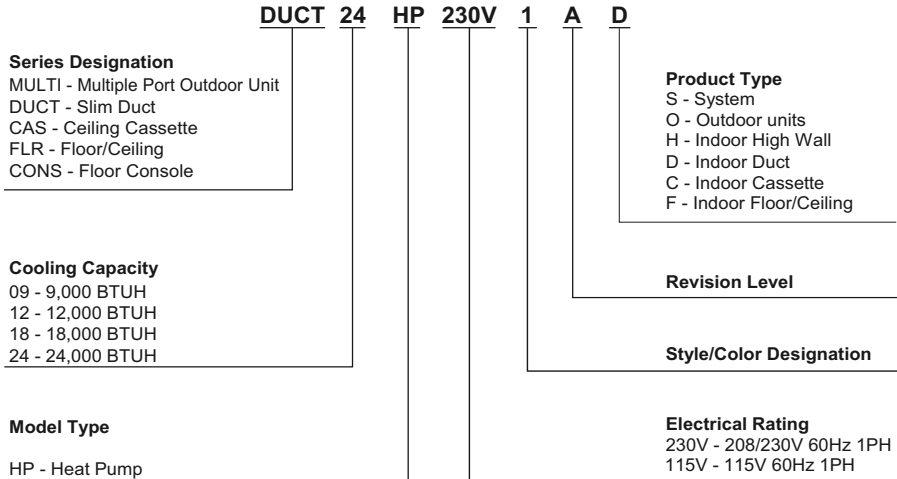
⚠ WARNING

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

Indoor unit

Example: DUCT24HP230V1 A D



SYSTEM REQUIREMENTS

PIPE SIZE in (mm)

Unit Size (BtuH)	Liquid Line	Suction/Gas Line	Net/Gross Weight
9,000	1/4 (6)	3/8 (9.5)	49/60 lbs.
12,000	1/4 (6)	3/8 (9.5)	51/64 lbs.
18,000	1/4 (6)	1/2 (12)	60/79 lbs.
24,000	3/8 (9.5)	5/8 (16)	68/90 lbs.

Interconnecting Cable

The ceiling duct unit is powered from the outdoor unit. Use recommended 14/4 AWG stranded copper conductors THHN 600V unshielded wire.

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

Condensate Drainage: The unit has two gravity drain ports and a factory installed condensate pump with an outlet port. Any condensate port not used must be plugged and insulated. The condensate pump operates when the unit is running; if a gravity drain port is desired, the pump must be disconnected from the control board and the condensate pump power plug must be electrically insulated to prevent an accidental short circuit. Use piping of the same diameter or larger as the unit connection. Local code should be referenced for approved condensate piping for your area.

NOTE: Insulate all condensate drain pipes to prevent sweating and possible water damage.

SUGGESTED TOOLS

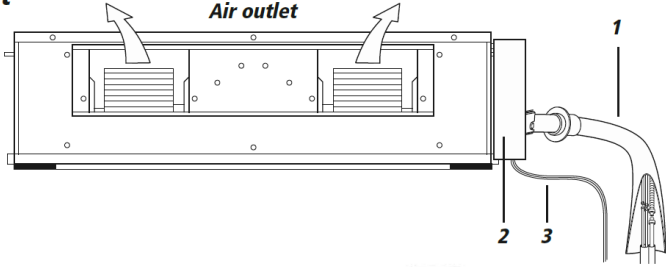


- *Standard Wrench*
- *Adjustable/Crescent Wrench*
- *Torque Wrench*
- *Hex Keys or Allen Wrenches*
- *Drill & Drill Bits*
- *Hole Saw*
- *Pipe Cutter*
- *Screw drivers (Phillips & Flat blade)*
- *Manifold and Gauges*
- *Level*
- *R410A Flaring Tool*
- *Clamp on Amp Meter*
- *Vacuum Pump*
- *Safety Glasses*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



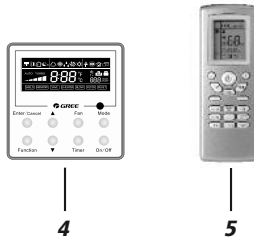
SYSTEM COMPONENTS

Indoor Unit

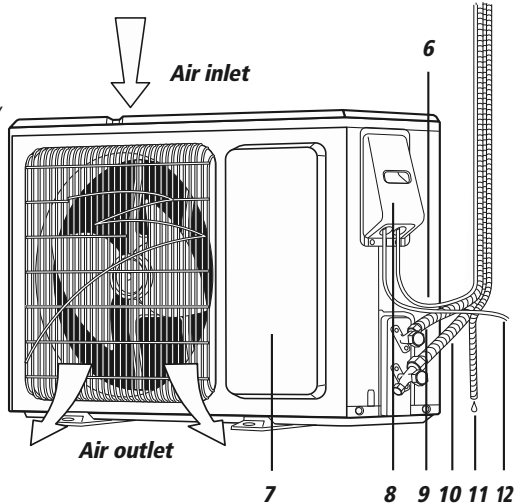


COMPONENT NAMES*

1. Gas & Liquid Pipes
 2. Electric Box
 3. Interconnection Cable
 4. XK19 Wired Controller
 5. Remote Controller
 6. Interconnection Cable
 7. Front Panel
 8. Service Cover
 9. Liquid Pipe
 10. Gas Pipe
 11. Drain Hose
 12. Outdoor Power Supply
- * Not all items included with equipment purchase



Outdoor Unit



CAUTION

The refrigerant pipe, drain pipe, electrical wiring, and duct for this unit should be installed by a qualified HVAC professional only.

INSTALLATION SITE INSTRUCTIONS

Indoor Unit

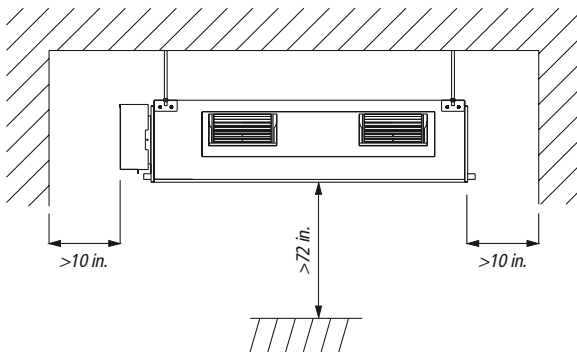
WARNING

The unit must be installed in a location which can withstand twice the weight of the unit. Inadequate building support at the installation location may result in serious property damage and injuries.

Review the installation location with the customer as follows:

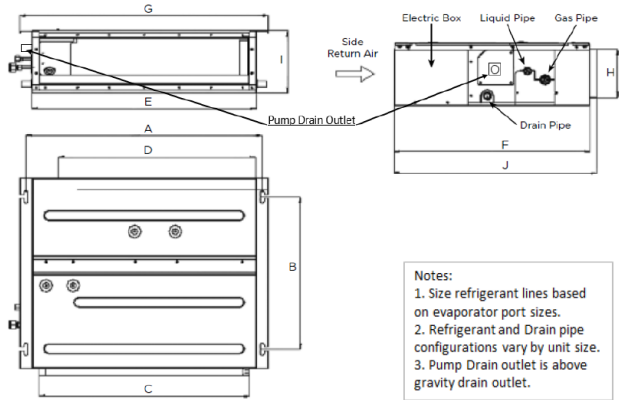
1. Ceiling is strong enough to support twice the weight of the unit.
2. Ductwork can easily be installed using the shortest amount of duct.
3. Location allows easy installation of drain pipe.
4. Space is left around the unit as required in Fig. 1.1 for future service and maintenance.
5. Air inlet and outlet registers of the unit should never be blocked, so airflow can reach every corner of the room.

Fig. 1.1



INDOOR UNIT INSTALLATION

For the units: 9-12K

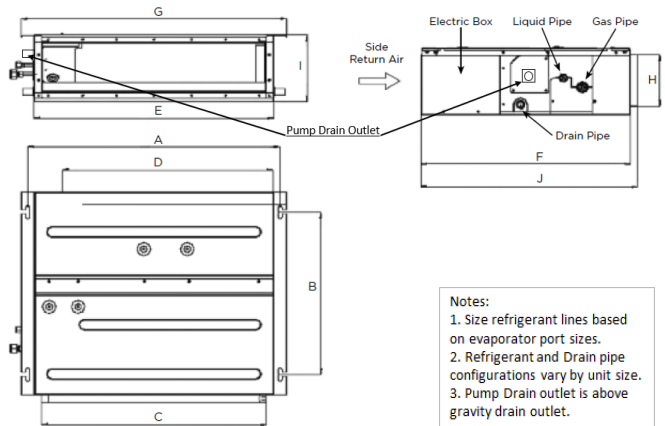


- Notes:
1. Size refrigerant lines based on evaporator port sizes.
 2. Refrigerant and Drain pipe configurations vary by unit size.
 3. Pump Drain outlet is above gravity drain outlet.

INDOOR UNIT DIMENSIONS in (mm)

Model	A	B	C	D	E	F	G	H	I	J
DUCT09HP230V1AD	29.2 (742)	19.3 (491)	26.1 (662)	24.4 (620)	27.6 (700)	24.2 (615)	30.8 (782)	6.1 (156)	7.9 (200)	25.0 (635)
DUCT12HP230V1AD	29.2 (742)	19.3 (491)	26.1 (662)	24.4 (620)	27.6 (700)	24.2 (615)	30.8 (782)	6.1 (156)	7.9 (200)	25.0 (635)

For the units: 18K



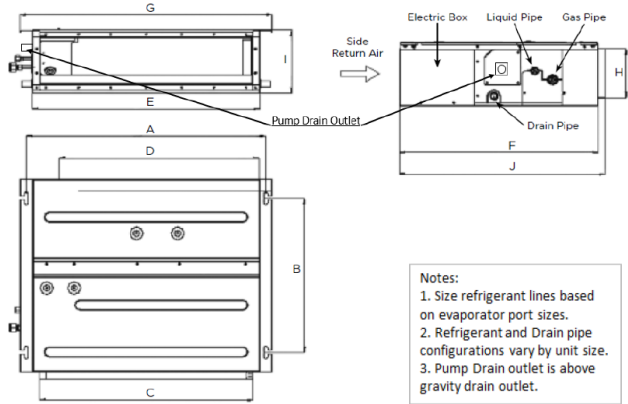
- Notes:
1. Size refrigerant lines based on evaporator port sizes.
 2. Refrigerant and Drain pipe configurations vary by unit size.
 3. Pump Drain outlet is above gravity drain outlet.

INDOOR UNIT DIMENSIONS in (mm)

Model	A	B	C	D	E	F	G	H	I	J
DUCT18HP230V1AD	37.1 (942)	19.3 (491)	33.9 (862)	32.3 (820)	35.4 (900)	24.2 (615)	38.7 (982)	6.1 (156)	7.9 (200)	25.0 (635)

INDOOR UNIT INSTALLATION

For the units: 24K



INDOOR UNIT DIMENSIONS in (mm)

Model	A	B	C	D	E	F	G	H	I	J
DUCT24HP230V1AD	44.3 (1124)	19.3 (491)	41.8 (1062)	40.2 (1020)	43.3 (1100)	24.2 (615)	46.5 (1182)	6.1 (156)	7.9 (200)	25.0 (635)

INDOOR UNIT INSTALLATION

Mounting Indoor Unit

It is critical to properly secure the indoor unit to a stable and rigid structure that can support twice its weight for safety and product reliability.

Select the proper size suspension bolts or anchoring devices (field supplied) to support twice the weight of the unit.

1. Locate a structure strong enough to support twice the weight of the unit.
2. Using the installation template supplied with the unit, mark the hole locations as shown in fig 2.1.
3. Drill 4 mounting holes for suspension bolts per the manufacturer's instructions.
4. Install 4 suspension bolts into pre-drilled holes.
5. Install the 4 hanger brackets to unit as shown in fig 2.2.
6. Add an upper nut to each suspension bolt.
7. Carefully lift unit and position the 4 hanger brackets on the suspension bolts.
8. Install a lower washer and nut to each suspension bolt to secure unit as shown in fig 2.3.
9. Adjust the unit height to desired position.

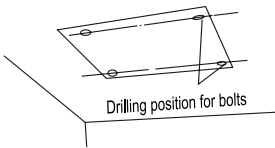


Fig. 2.1

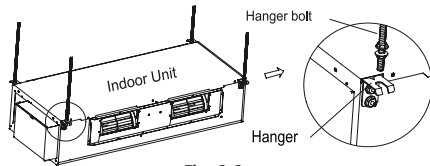


Fig. 2.2

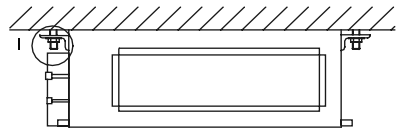
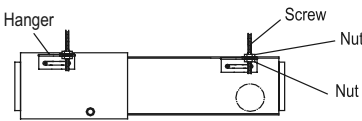
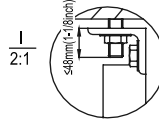


Fig. 2.3



Leveling

After the indoor unit is installed and adjusted to proper height, check the unit position to ensure that the unit is level as shown below.

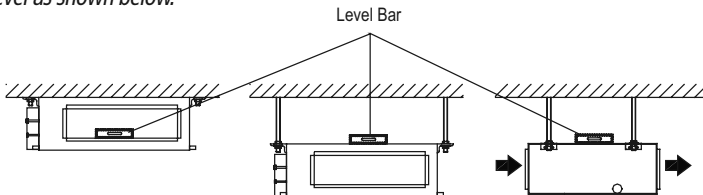


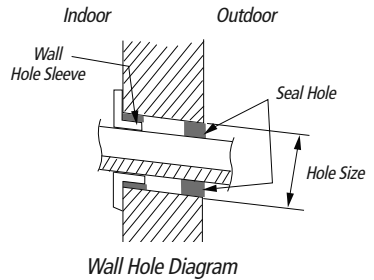
Fig. 2.4

PIPING INSTALLATION

Refrigerant Piping

Drill Hole in Wall

1. Locate and mark proper location for the wall hole.
2. Cut the 2 3/4" wall hole with a 5° to 10° downward slant to the outdoors.
3. Insert a wall sleeve (field supplied) into hole to prevent damage to refrigerant pipes, insulation, condensate drain hose and wiring.
4. 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.



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

Piping Preparation

1. Do not open service valves or remove protective caps on pipes until instructed by this manual.
2. Keep tubing free of dirt, sand, moisture and contaminants.
3. Insulate each refrigerant pipe and condensate hose with minimum 3/8" (10 mm) wall thermal pipe insulation.

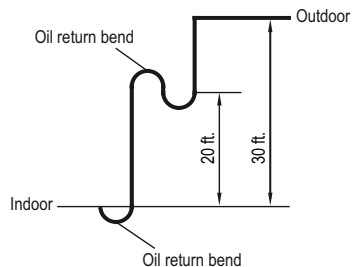
CAUTION

Insulate entire interior section of condensate hose to prevent sweating which may cause water stains or wall damage.

4. Bind refrigerant pipes and interconnecting cable together with cable ties at 12-inch intervals.
5. Include the condensate hose in bundle for exterior portion only.

Indoor Unit below Outdoor Unit Application

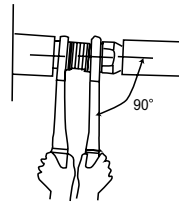
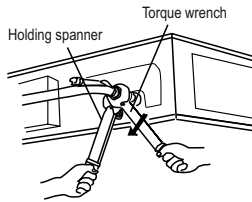
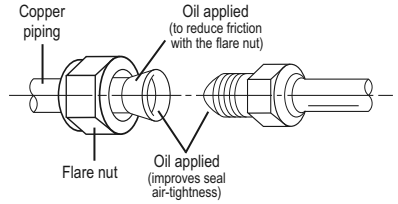
When height difference between indoor unit and outdoor unit is more than 30 feet, an oil return bend should be added for every 20 feet of connection pipe as shown.



PIPING INSTALLATION

Indoor Unit Pipe Connections

1. Feed refrigerant pipes, drain hose and interconnecting wires assembly through wall hole from outdoor to the indoor unit.
2. Pull the piping assembly to the indoor unit. Carefully bend refrigerant pipes to meet indoor unit connection ports. Use proper tools to avoid kinks.
3. Add a small amount of refrigerant oil to both ends of the flare fittings.
4. Starting with either refrigerant pipe, carefully center the pipe to the indoor unit connection port then hand tighten the flare nut.
5. Repeat procedure with remaining pipe.
6. Tighten both flare nuts using a standard wrench and a torque wrench as shown below.



7. Carefully tighten flare nuts to correct torque level referring to the Torque Table below.

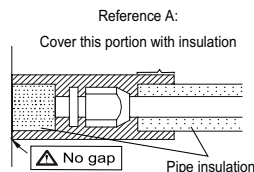
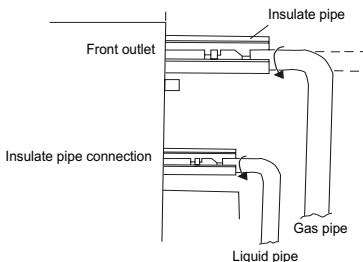
Pipe Diameter inch (mm)	Nut Size inch (mm)	Tightening Torque	
		ft-lbs	N-m
1/4 (6.35)	1/4 (17)	11 to 22	15 to 30
3/8 (9.5)	3/8 (22)	26 to 30	35 to 40
1/2 (12.0)	1/2 (25)	33 to 37	45 to 50
5/8 (15.9)	5/8 (29)	44 to 48	60 to 65



CAUTION

Over tightening may damage flare connections and cause leaks.

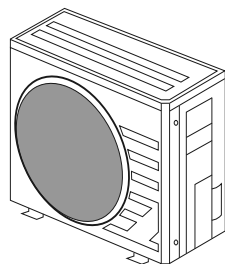
8. Individually insulate each bare refrigerant pipe and joint as shown below to prevent sweating.



PIPING INSTALLATION

Outdoor Unit Pipe Connections

Carefully bend and adjust length of refrigerant pipes to meet outdoor unit port connections. See installation instructions shipped with the outdoor unit for further instructions..



Indoor Condensate Drain Piping

WARNING

Observe all local sanitary codes when installing condensate drains.

It is recommended to install the condensate drain system with hard polyvinyl chloride (PVC) pipe and matching connectors. Use piping of the same diameter or larger as the unit connection.

The unit has two drain ports, one on the left side or electric box side (Factory Default) and one on the right side of the unit. To use the right side drain port, remove the drain plug from the port and re-install it on the left or electric box side drain port.

See Table below for Condensate Drainage port size.

Capacity Size (BtuH)	Drain Connection Size (OD)
9,000 - 24,000	Φ 1.0 (26)

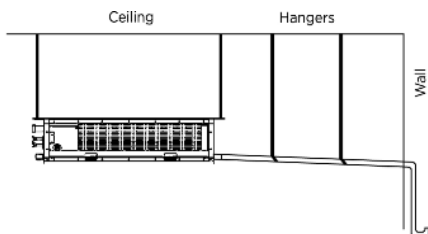
Pitch the condensate drain pipe at a gradual 2.5% pitch (Example: 1/4-in drop over a 10-in length) without obstructions. Use pipe hanger/brackets to support the condensate drain pipe from sagging or drooping.

NOTE: Insulate condensate hose and/or pipes to prevent sweating which may cause water stains or wall damage.

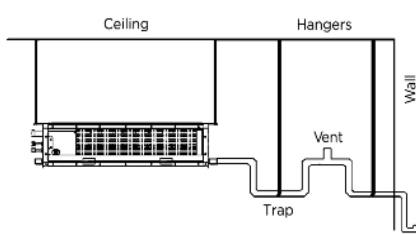
Gravity Drainage Systems

The following are recommended gravity drainage systems for the ceiling duct.

Typical Drainage System



System with P-Trap and Vent

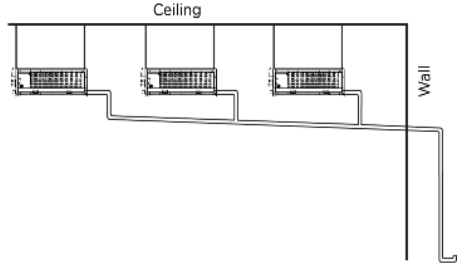


PIPING INSTALLATION

Multiple Units with Common Drain

The following is the recommended condensate drainage system for multiple units that share a common drain line. Connecting multiple units to one trap allows air to be pulled through one or more of the units, bypassing the trap. An alternate method is having individual drains and traps for each unit.

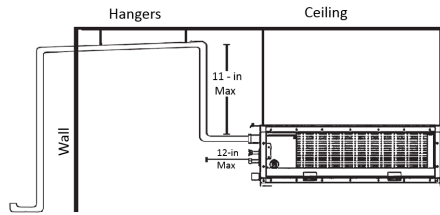
(Gravity Drain Configuration)



Vertical Lift Drainage System (Internal Condensate Pump)

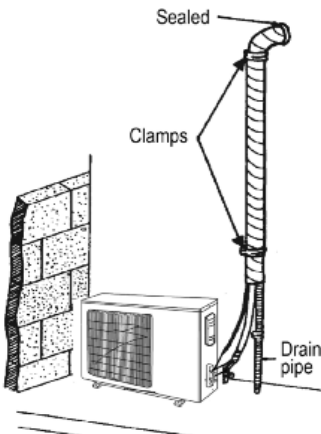
If a gradual 2.5% pitch is not obtainable, the indoor unit has a condensate drain pump with limited head or lift. An 11-in (max) riser pipe may be added within the first 12 inches to create a proper pitch for the drainage system.

Use an auxiliary condensate pump (field supplied) with float valve for vertical height greater than 11-in. above the unit drainage port. A float valve is recommended to shut off the system if the auxiliary pump fails.



The unit has two gravity drain ports and a factory installed condensate pump with an outlet port. The condensate pump port must be utilized for condensate removal or the pump may be disconnected from the control board if a gravity drain port is desired. If disconnected the condensate pump plug must be electrically insulated to prevent an accidental short circuit. Use piping of the same diameter or larger as the unit connection. Local code should be referenced for approved condensate piping for your area.

Completing Condensate Drainage Piping



- Include the condensate hose in the pipe/wire bundle for the exterior/outdoor section.
- Fasten the refrigerant and condensate pipe assembly to the exterior wall for support.
- The drain pipe should terminate 6 inches above grade.

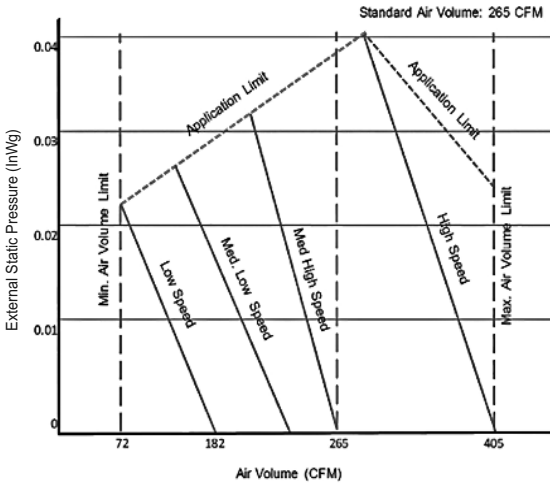
DUCTWORK INSTALLATION

Design and Layout of Ductwork

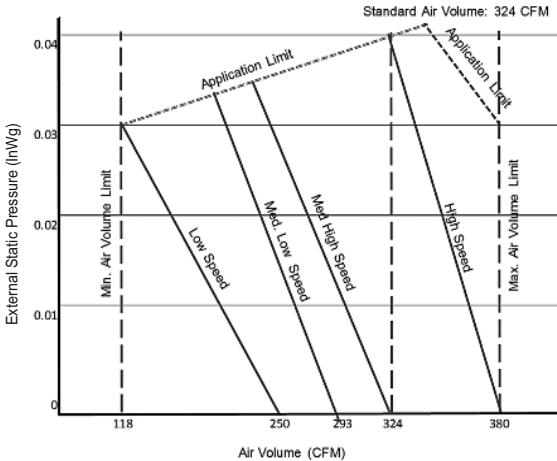
The ductwork configuration should be based on the conditions of the building and maintenance etc., as shown below.

Indoor Fan Performance and Air Volume

DUCT09H0230V1AD



DUCT12H0230V1AD



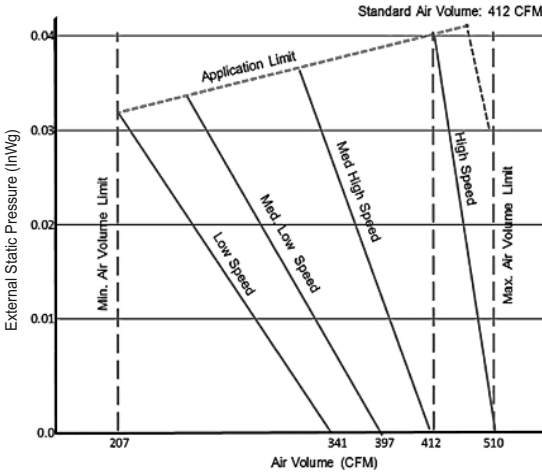
DUCTWORK INSTALLATION

Design and Layout of Ductwork

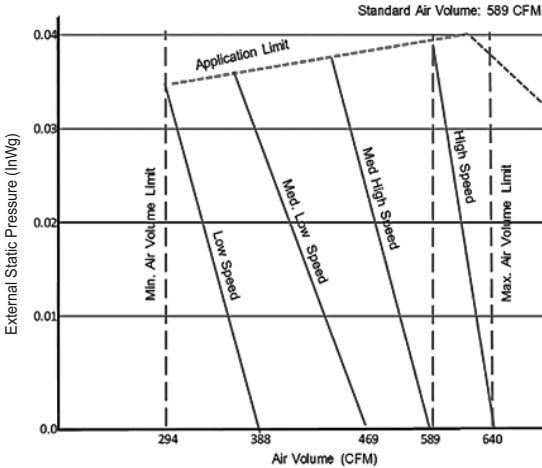
The ductwork configuration should be based on the conditions of the building and maintenance etc., as shown below.

Indoor Fan Performance and Air Volume

DUCT18H0230V1AD



DUCT24H0230V1AD



DUCTWORK INSTALLATION

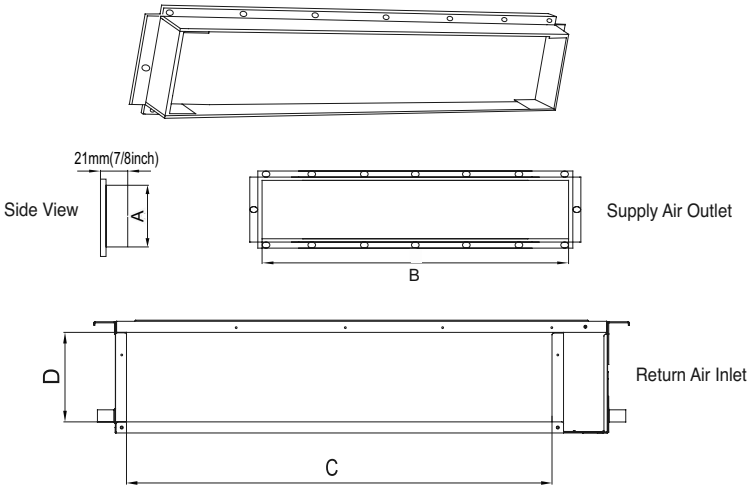
Duct Sizing Suggestions

Correct ductwork design is critical to insure proper system performance. The total length of the ductwork is the length from the return air duct register to the supply air register. It is recommended that the ductwork and register selection should follow ACCA manual D duct design to insure proper velocity and air flow.

MAX. EXT. STATIC PRESSURE

Capacity Size (BtuH)	9K	12K	18K	24K
Air Flow Rate (CFM)	265	324	412	589
Ext. Static Pressure (InWg)	0.04	0.04	0.04	0.04

Duct Connection Requirements



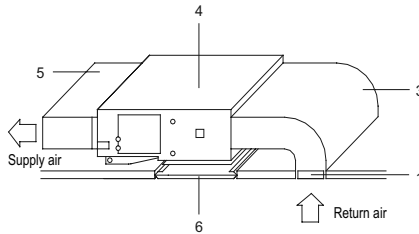
SUPPLY AIR OUTLET/RETURN AIR INLET DIMENSIONS in (mm)

Model	Supply Duct (in/mm)		Return Duct (in/mm)		Flange (in/mm)
	A	B	C	D	E
DUCT09HP230V1AD	6.1/156	26.1/662	22.8/580	6.4/162	0.8/21
DUCT12HP230V1AD	6.1/156	26.1/662	22.8/580	6.4/162	0.8/21
DUCT18HP230V1AD	6.1/156	33.9/862	30.7/780	6.4/162	0.8/21
DUCT24HP230V1AD	6.1/156	41.8/1062	38.6/980	6.4/162	0.8/21

DUCTWORK INSTALLATION

Attaching Ductwork to Indoor Unit

1. Connect return air duct (#3) to the return air inlet of the unit (#4) and the other end to a return air register. Ensure return ductwork is properly supported with hangers.
2. Connect supply air duct (#5) to the supply air outlet of the unit (#4) and the other end to a discharge air register. Ensure supply ductwork is properly supported with hangers.



Part Name

1. Return Air Inlet (with filter)
2. Canvas Duct
3. Return Air Duct
4. Indoor Unit
5. Supply Air Duct
6. Access Cover (18K Only)

POWER AND WIRING INSTALLATION

WARNING

- 1. Before obtaining access to electrical box and terminals, all electrical supply circuits must be disconnected.*
- 2. Use a circuit breaker with adequate capacity to meet the requirements of the total system.*
- 3. A circuit breaker or fuse should be installed per the National Electric Code (NEC) and local regulations.*
- 4. Electrical wiring must be completed in accordance with NEC, local laws, and regulations of the electric company so that the system will operate properly.*
- 5. Provide a GFI circuit breaker at the electrical panel in accordance with the NEC and the local electrical company standards.*
- 6. Connect the connection wires firmly to the terminal block. Improper installation may cause a fire.*

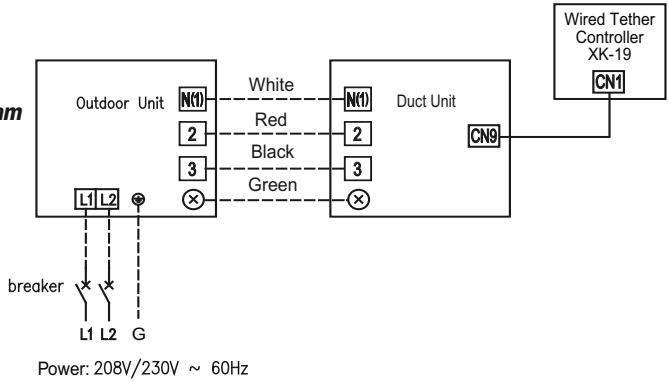
CAUTION

- 1. If the indoor unit communication wire (to the outdoor unit) and power wire are connected incorrectly, the air conditioner may be damaged.*
- 2. Ground both indoor unit and outdoor unit to earth ground in accordance with the applicable local and national codes.*

POWER AND WIRING INSTALLATION

Electric Wiring Between Indoor Unit and Outdoor Unit

Typical Wiring Diagram

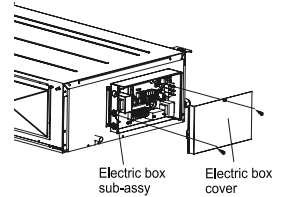


Outdoor Unit Electrical Wiring

For Outdoor Unit wire connections, see installation instructions shipped with the outdoor unit.

Indoor Unit Electrical Wiring

Locate and remove the electrical box cover to access wire terminals.



POWER AND WIRING INSTALLATION

Electrical Connections to Concealed Duct

WARNING

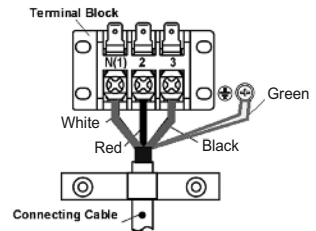
Disconnect all electrical power to indoor and outdoor units including disconnects, fuses and circuit breakers. Lockout and tag all disconnect switches.

1. Adjust the length of the interconnecting wires so that it can easily reach the indoor unit electrical control box.
2. Open electrical control box cover and route the interconnecting wires to field wiring terminal block.

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. Secure interconnecting wires to the terminal block as shown in the connection diagram at right:

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



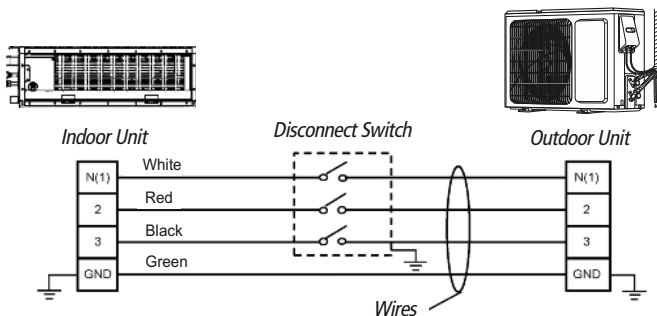
4. Secure all wires inside wire clamp/strain relief. Verify wires are secure, not loose and no external force on wires affects the connections at the terminals.

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

5. Replace electrical box cover on unit.

Indoor Disconnect Switch (Optional)

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 interconnecting wires going to the N(1), 2, 3, terminals on the indoor unit, as shown in the wiring diagram below:

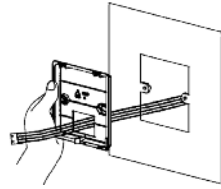


CONTROLLER INSTALLATION AND SETUP (Optional)

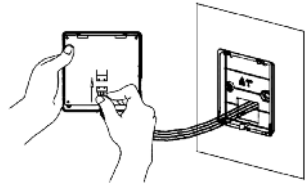
The following is a brief overview of the Wired Tether Controller installation. See Tether Controller Owner's Manual for more detailed instructions for setup and operation.

Preparation for Installation

Select a proper location on the wall for mounting the Tether Controller. Install switch box, if required by code. The maximum wire length between indoor unit and Tether Controller is 26 ft (8m). Route electrical cable (provided) between indoor unit and selected wall mounting location. See Indoor Unit wiring section for diagram to connect the Wired Tether Controller to the indoor unit.

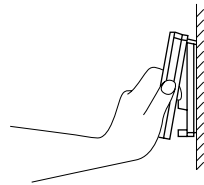


Route communication cable to main control board in electrical box. Location connector CN9 on main control board. Carefully connect cable to main control board connector.

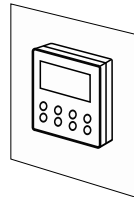


Wired Tether Controller Installation

Pull communication cable through switch box (if one is used) and Wired Tether Controller backplate. Securely fasten backplate to the switch box or wall.



Locate wire terminals connector on rear of Tether Controller panel. Carefully connect cable to controller connector. Verify connector is secure, not loose and no external force on wires affects the connections at the terminals. Push extra cable into wall and secure controller panel to backplate mounted on the wall.



NOTE: Do not cut or splice communication cable.

TESTING AND INSPECTION

Start-up Checklist

Turn on main power to indoor and outdoor units.

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

Press the ON button on the Tether Controller.

- Verify the Tether Controller display turns ON.

Press the Mode button to Cooling.

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.

Adjust the room setpoint to bring the system on in heating mode. The system should start heating mode within 3-5 minutes.

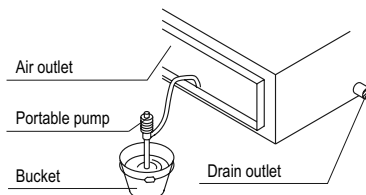
- Verify the outdoor fan and compressor are operating.
- Verify the indoor fan is operating.
- Verify the indoor discharge air is heating the room.

Press the OFF button on the Tether Controller.

- Verify Tether Controller display turns OFF and the system shuts OFF.

Test the Drain Piping.

- Verify condensate water drains smoothly. As shown in the figure, add approximately 1 quart of water slowly into the drain pan. The condensate pump should turn on and drain the water through the condensate drain pipe to a safe location. Verify there are no leaks in the condensate pipe and connections.



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 discharge register 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 Tether Controller is not turned on. • Tether 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.

TROUBLESHOOTING

PROBLEM	CAUSE/SOLUTION
<i>Water leakage from the outdoor unit.</i>	<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>
<i>Water leaking from the indoor unit into the room.</i>	<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.
<i>The unit will not deliver air.</i>	<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.

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 malfunction
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.

CARE AND CLEANING

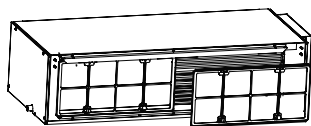
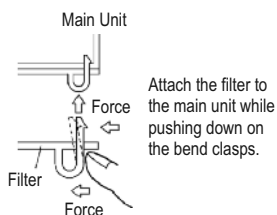
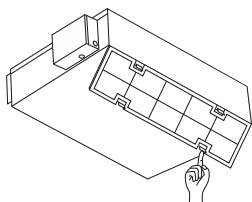
Routine Maintenance

NOTE: Filters should be installed before operating the air conditioner, otherwise dirt or dust could enter the unit. Do not remove the air filter except for cleaning.

Cleaning

The air filter should be cleaned every 90 days. Cleaning frequency should be increased if the unit is installed in a room where there is an abnormal amount of dirt and dust.

1. Remove the air filter from the duct.
2. Clean the air filter. Remove dust from the air filter using a vacuum cleaner and gently rinse in cool water with mild detergent. Don't use hot water to avoid filter shrinking or deformation. After cleaning the filter, dry filter before replacing.
3. Replace the air filter.



NOTE: The 24K size has two separate air filters.



GREE ELECTRIC APPLIANCES, INC.

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PRODUCT & INSTALLATION RECORD

For your convenience, please record the model and serial numbers of your new equipment in the spaces provided. This information, along with the installation data and dealer contact information, will be helpful should your system require maintenance or service.

UNIT INFORMATION

Outdoor Unit:

Model No. _____

Serial No. _____

Indoor Unit:

Model No. _____

Serial No. _____

INSTALLATION INFORMATION

Date Installed: _____

DEALERSHIP/INSTALLER INFORMATION

Company Name: _____

Address: _____

Phone Number: _____

Technician Name: _____

