GENUINE COMFORT

VERTICAL TERMINAL
AIR CONDITIONER/HEAT PUMP
INSTALLATION INSTRUCTIONS & OWNER'S MANUAL

ATTENTION INSTALLATION PROFESSIONAL

As a professional installer you have an obligation to know the product better than the customer. This includes all safety precautions and related items.

Prior to actual installation, thoroughly familiarize yourself with this instruction manual. Pay special attention to all safety warnings.

Often during installation or repair it is possible to place yourself in a position which is more hazardous than when the unit is in operation.

Remember it is your responsibility to install the product safely and to know it well enough to be able to instruct a customer in its safe use.

Safety is a matter of common sense, a matter of thinking before acting. Most dealers have a list of specific good safety practices, follow them.

The precautions listed in this Installation Manual are intended as supplemental to existing practices. However, if there a direct conflict between existing practices and the content of this manual, the precautions listed here take precedence.

CONTENTS

The following warnings are very important for safety. Please read them carefully before installation!

1.This unit must be properly installed in accordance with the Installation Instructions before it is used.
See the Installation Instructions in the back of this manual.
2.Replace immediately all electric service cords that have become frayed or otherwise damaged. A damaged power supply cord must be replaced with a new power supply cord obtained from the manufacturer and not repaired. Do not use a cord that shows cracks or abrasion damage along its length or at either the plug or connector end.
3.Product must be operated with the electrical plug supplied with the product. Do not replace the electrical plug supplied with the product.
4.If the receptacle does not match the plug, the receptacle must be changed out by a qualified electrician.
5.Unplug or disconnect the unit at the fuse box or circuit breaker before making any repairs.
NOTE: We strongly recommend that any servicing be performed by a qualified individual.
6.All air conditioners contain refrigerants which under federal law must be removed prior to product disposal. If you are getting rid of an old product with refrigerants, check with the company handling disposal about what to do.
7.These R410A Air Conditioner Systems require contractors and technicians to use tools, equipment and safety standards approved for use with this refrigerant. Do not use equipment certified for R22 refrigerant only.

RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION

⚠ WARNING

The manufacturer will not be responsible for any injury or property, damage arising from improper service or service procedures. If you install or perform service on this unit, you assume responsibility for any personal injury or property damage which may result, many jurisdictions require a license to install or service heating and air conditioning equipment.

⚠ WARNING

HIGH VOLTAGE
Disconnect all power before servicing or installing this unit. Multiple power sources may be present, failure to do so may cause property damage, personal injury or death.

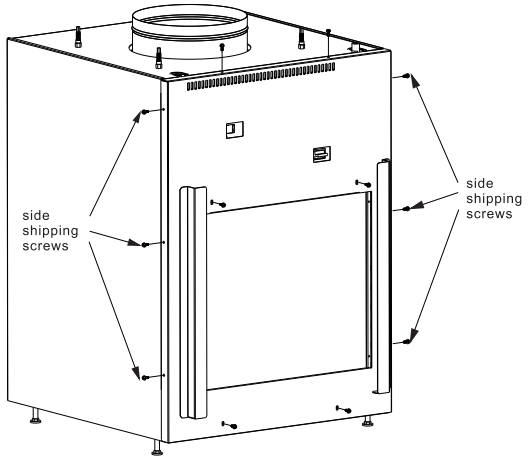
⚠ WARNING

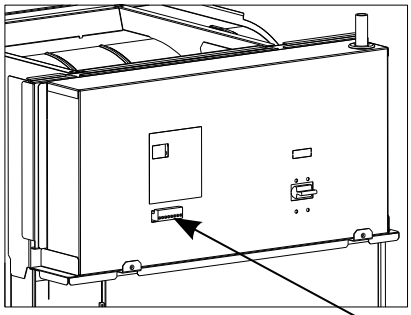
Risk of electric shock can cause injury or death. For your safety, the information in this manual must be followed to minimize the risk of fire, electric shock or personal injury.

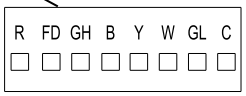
OPERATION INSTRUCTION

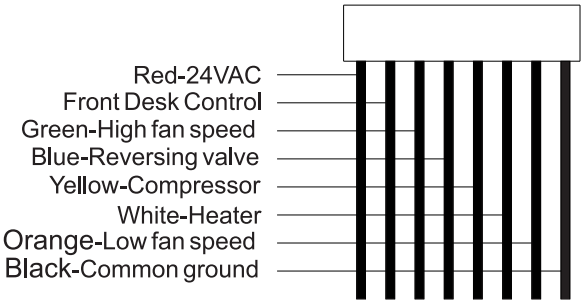
Controls-terminal connections

To access the control- terminal connections, remove the front case panel by removing the filter, taking out the four front screws, the upper two screws from the top of the panel and the shipping screws on each side, if present. (Discard the six side shipping screws, if present).



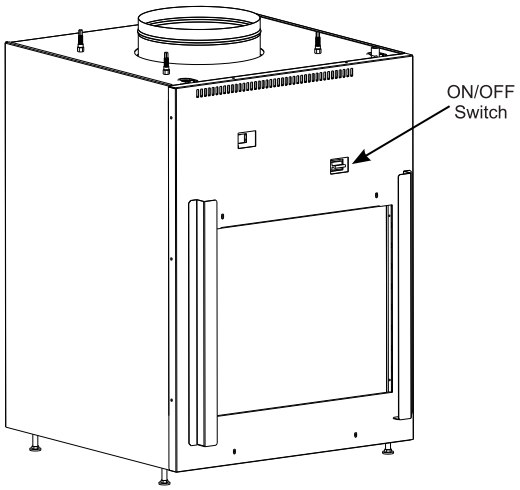






• **Front Desk Control –** The unit can be turned ON/OFF from a remote location. Front desk control can reduce energy consumption by allowing front desk personnel to turn the unit off when the room is vacant.
Control logic is as below:
1.Turn ON unit: short circuit R and LS for one full second then release for one time within 5 seconds
2.Turn OFF unit: short circuit R and LS for one full second then release for twice within 5 seconds

ON/OFF switches



The unit on/off switch is located on the front of the unit.
To turn on the unit, push the on/off switch up.
To turn off the unit, push the on/off switch down.

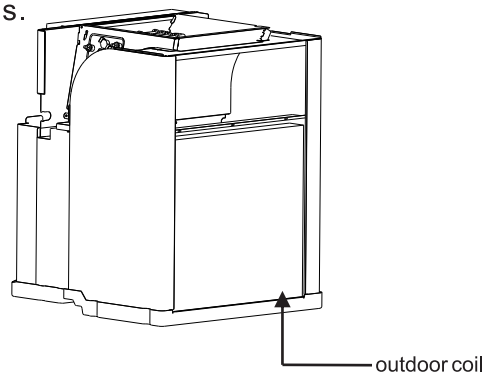
WARNING: The on/off switch will remove power from the unit. But the power cord terminals are still HOT and must not be touched.You **MUST DISCONNECT POWER** before repairing or servicing.

CARE AND CLEANING

Turn off the Unit and disconnect the power supply before cleaning

Indoor/Outdoor Coils

The coils on the unit should be checked regularly. If they are clogged with dirt or soot, they may be professionally cleaned.You will need to remove the unit from the case to inspect the coils because the dirt build-up occurs on the coil face that first contacts the debris.



Have the coils been cleaned regularly?

Drain

Clean the drain system regularly to prevent clogging.

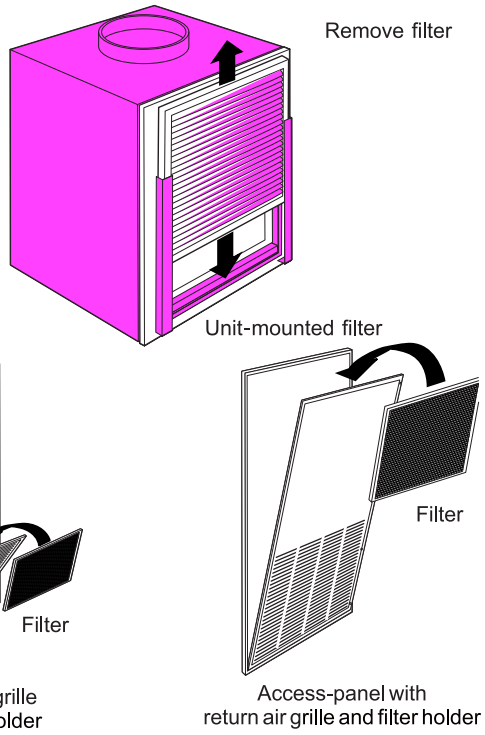
Base Pan

In some installations, dirt or other debris may be blown into the unit from the outside and settle in the base pan the bottom of the unit.
In some areas of the North America , a "gel-like" substance may be present in the base pan.
Check it periodically and clean, if necessary.

Air Filters

To maintain optimum performance, change the filter at least every 30 days. The most important thing you can do to maintain the unit is to change the filter at least every 30 days. Dirty filters reduce cooling, heating and air flow.
Changing the filter will:
Decrease cost of operation, save energy, prevent clogged heat exchanger coils and reduce the risk of premature component failure.

To remove and replace the filter:



Operating without the filter in place or with a damaged filter will allow dirt and dust to reach the indoor coil and reduce the cooling, heating airflow and efficiency of the unit.
Replacement filters should be purchased from your local retailer where air conditioner and furnace accessories are sold.
Filter size required is 20″x 20″x1″, except for Access-panel with return air grille and filter holder which requires a 24″×30″×1″ size.

NOTICE:

Do not operate the unit without the filter in place. If a filter becomes torn or damaged, it should be replaced immediately.

INSTALLATION INSTRUCTION

BEFORE YOU BEGIN

Read these instructions completely and carefully.

IMPORTANT - Save these instructions for local inspector's use.

IMPORTANT - Observe all governing codes and ordinances.

Note to Installer - Be sure to leave these instructions with the owner.

Note to Owner - Keep these instructions for future reference.

Proper installation is the responsibility of the installer.

Product failure due to improper installation is not covered under the Warranty.

You **MUST** use all supplied parts and use proper installation procedures as described in these instructions when installing this air conditioner.

⚠ WARNING

RISK OF ELECTRIC SHOCK.

Can cause injury or death. This appliance must be properly grounded. Where a 2-prong wall outlet is encountered, it is your responsibility and obligation to have it replaced with a properly grounded 3-prong outlet.

⚠ WARNING

This air conditioner is not meant to provide unattended cooling or life support for persons or animals who are unable reacting to the failure of the product.

The failure or an unattended air conditioner may result in extreme heat in the conditioned space causing overheating or death of persons or animals.

IMPORTANT ELECTRICAL SAFETY-READ CAREFULLY

⚠ WARNING

RISK OF ELECTRIC SHOCK.

All electrical connections and wiring MUST be installed by a qualified electrician.

Follow the National Electrical Code (NEC) and/or local codes and ordinances.

For personal safety, this unit and case must be properly grounded.

Protective devices (fuses or circuit breakers) acceptable for unit installations are specified on the nameplate of each unit.

Do not use an extension cord with this unit.

Aluminum building wiring may present special problems - consult a qualified electrician.

When the unit is not running there is still voltage to the electrical controls.

Disconnect the power to the unit before servicing by:

1. Removing the power cord (if it has one) from the wall receptacle.

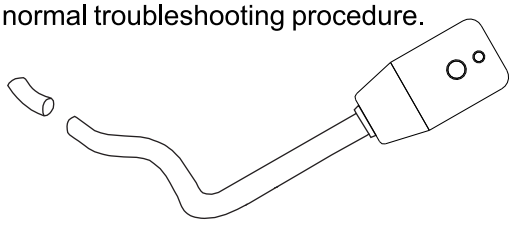
OR

2. Removing the branch circuit fuses or turning the circuit breakers off at the panel.

INSTALLATION INSTRUCTION

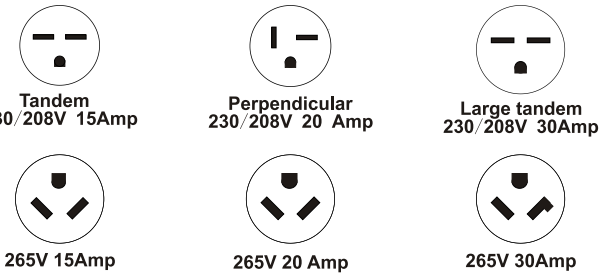
Electrical Requirement

• **LCDI Cords (230/208V models only)** –
Underwriters Laboratories and the National Electric Code (NEC) now require power cords that sense current leakage and can open the electrical circuit to the unit on units rated at 250 volts or less. In the event that unit does not operate, check the reset button located on or near the head of the power cord as part of the normal troubleshooting procedure.



LCDI power Cord

All wiring , including installation of the receptacle, must be in accordance with the NEC and local codes ordinances and regulations.



VOLTAGE MEASUREMENTS

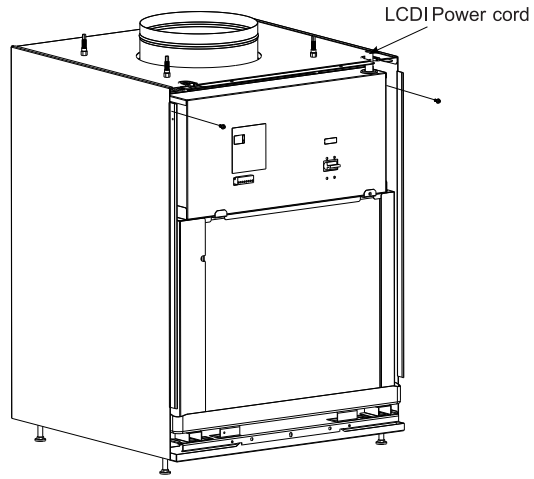
Once the unit is properly wired, measure the unit supply voltage. Voltage must fall within the voltage utilization range.

Operating Voltage		
Unit Voltage	Voltage Utilization Range	
Rating	Minimum	Maximum
230/208	187	253
265	238	292

⚠ WARNING

To avoid the risk of property damage, personal injury or death due to fire, ensure that the Case, Unit, and Front Case Panel are replaced as a complete assembly in a retrofit/ replacement situation. Do not under any circumstances insert this Unit into an existing competitor case. For example, some existing cases may contain plastics that are incompatible with this unit from a safety standpoint.

The power cord is located inside the electrical control box cover for insert mounting.



⚠ WARNING

HIGH VOLTAGE
Disconnect all power before servicing or installing this unit multiple power sources be present , failure to do so may cause property damage , personal injury or death. Do not service this unit without first shutting off the power to the unit form the circuit breaker and/or removing the unit cord set plug from the wall outlet.

⚠ WARNING

To avoid the risk of property damage, personal injury or fire, use only copper conductors.

⚠ WARNING

To avoid property damage, personal injury or death due to electrical shock, do not use an extension cord with this unit.

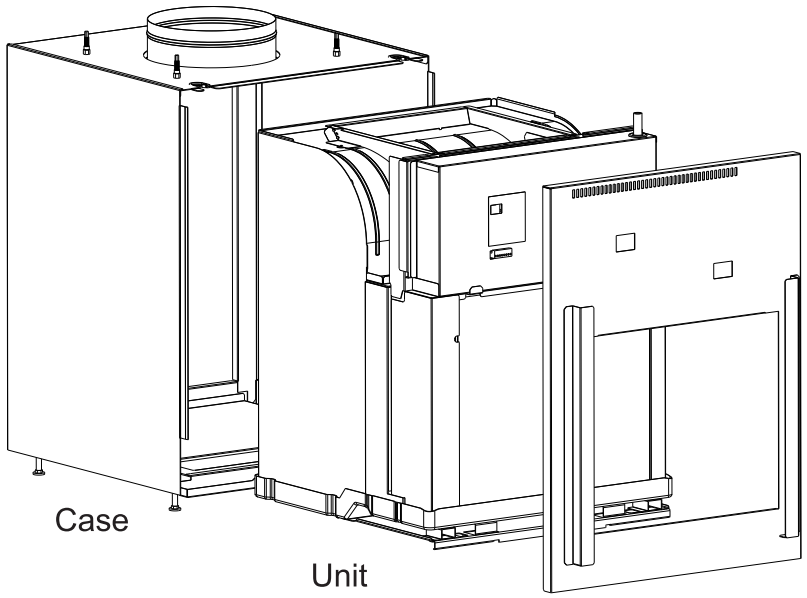
⚠ WARNING

To avoid the risk of property damage, personal injury or fire do not install with power cord stretched or under a strain as this may create loose plug/receptacle connection.

⚠ WARNING

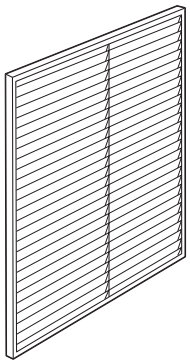
To avoid the risk of personal injury, wiring to the unit must be properly polarized and grounded.

Unit Component

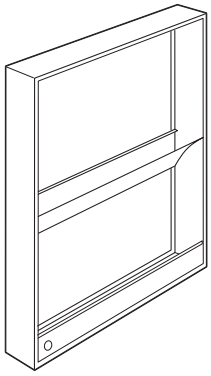


Required Accessories

(Check the"Essential Elements"label on the unit.)

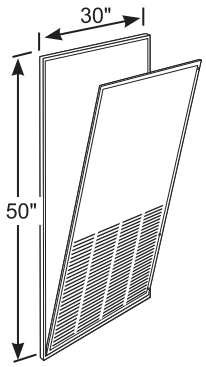


Architectural Louver



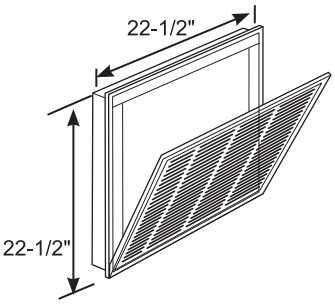
Cutout
Dimensions:
20-5/16" W x 32-5/16"H

Wall Plenum
6"D x 20"W x 32"H
8"D x 20"W x 32"H
12"D x 20"W x 32"H
15"D x 20"W x 32"H



Cutout
Dimensions:
28"Wx 48"H

Access Panel with
Return Air Grille
with filter holder

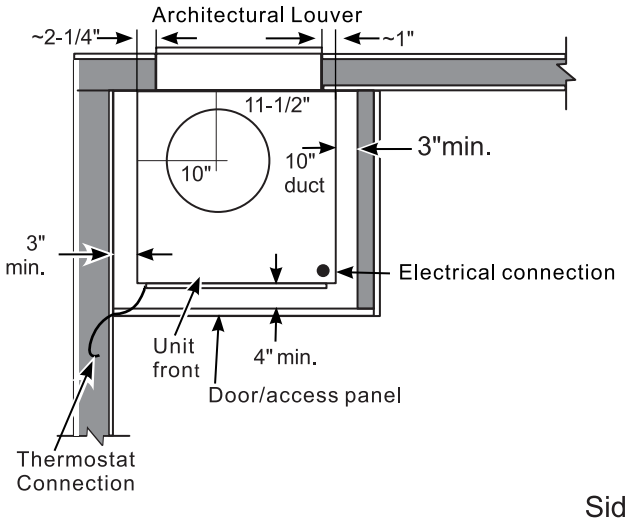


Cutout
Dimensions:
20-3/8"W x 20-3/8"H

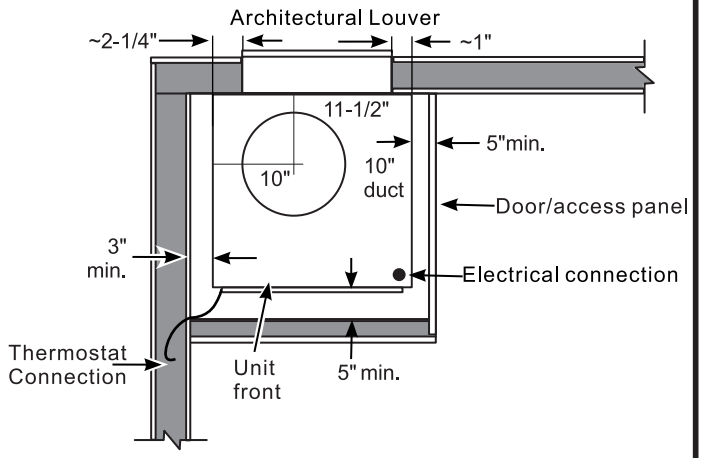
Return Air Grille
with filter holder

Typical Utility Closet And Dimensions
(FOR REFERENCE ONLY)

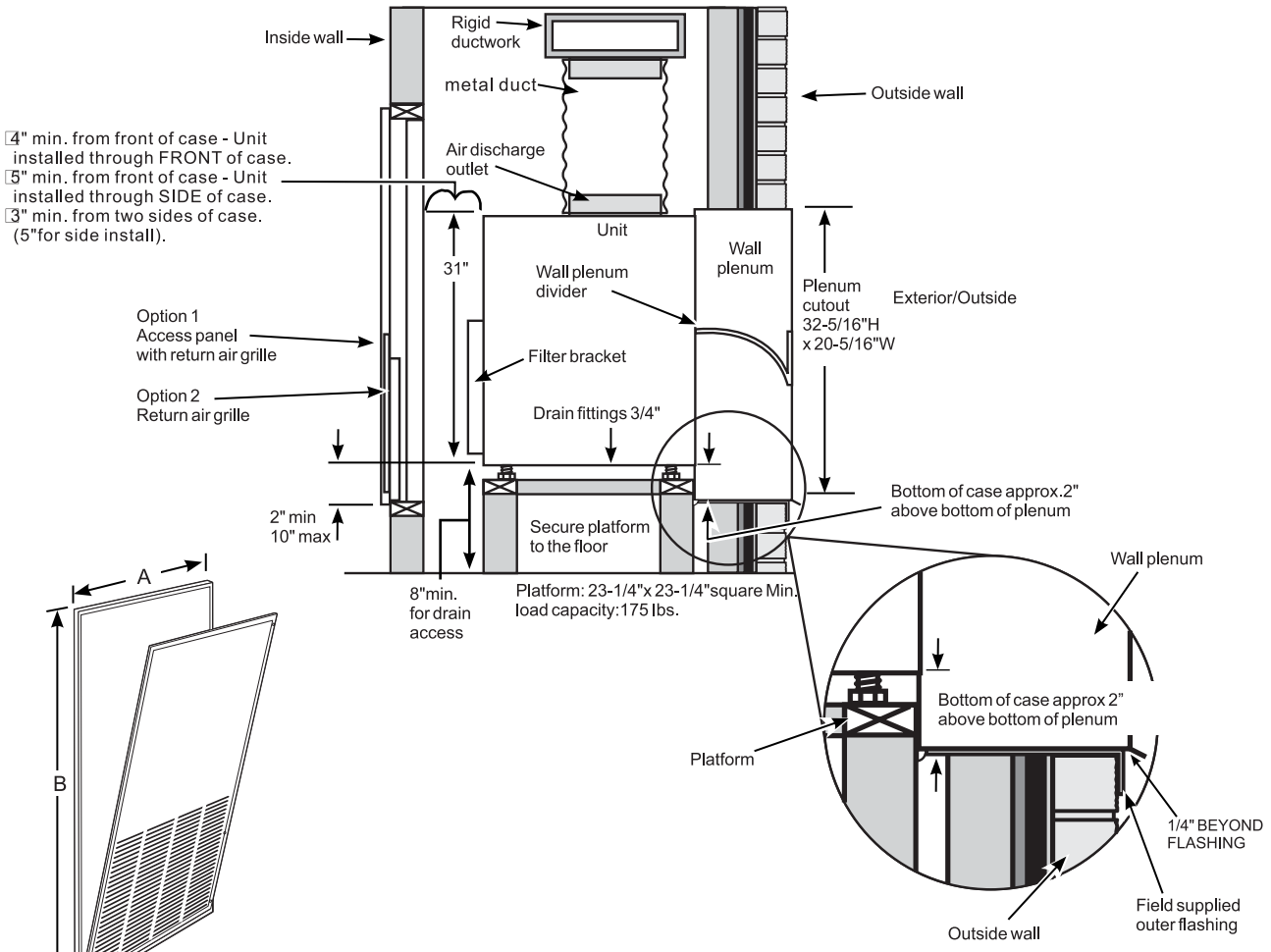
UNIT INSTALLED THROUGH FRONT OF CASE
Top View



UNIT INSTALLED THROUGH SIDE OF CASE
Top View



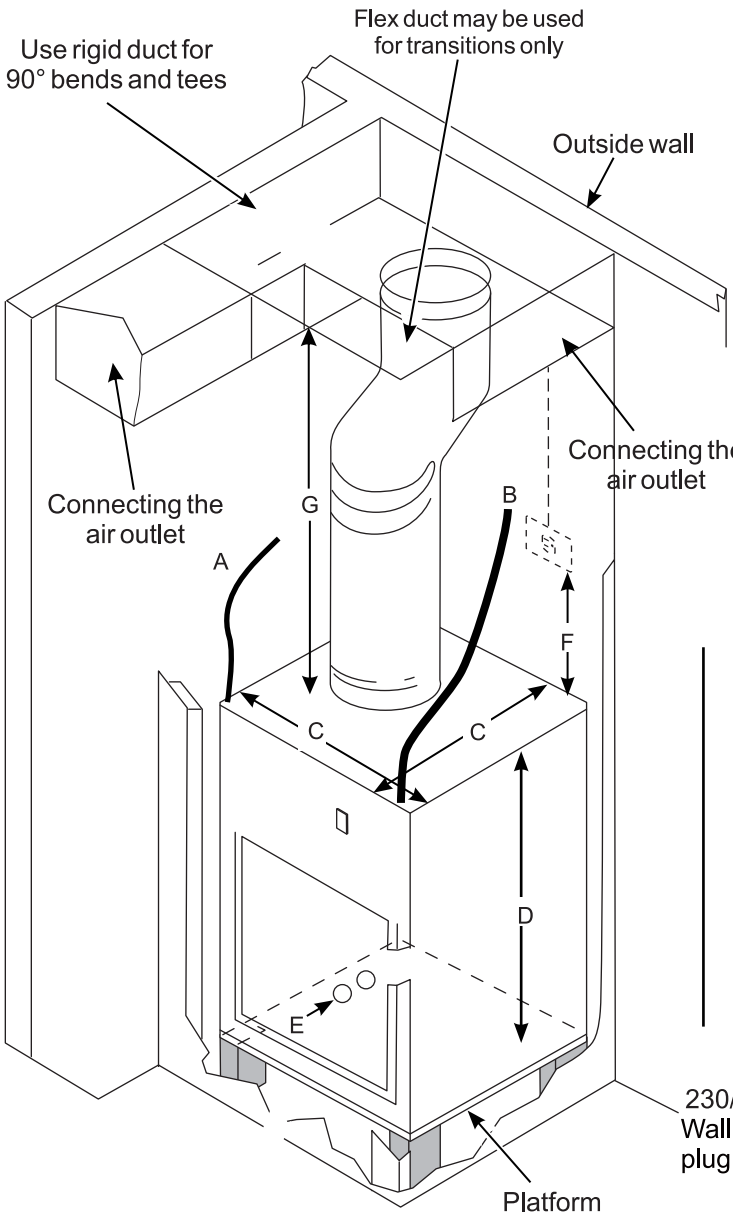
Side View



A Minimum recommended access door width: 30"
B Minimum recommended access door height : 50"

Utility Closet Connection Locations

IMPORTANT: Plan and locate plenum, wall plug, drains and thermostat carefully to avoid interference. Hard-to-reach locations will make installation and service difficult!



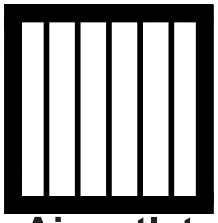
⚠ WARNING

Supply duct is intended to distribute conditioned air throughout a single unit on one floor only. Unit space may be partitioned into rooms within the same unit, but supply air is not to be delivered to any other unit.
Provide adequate return air paths for rooms by established means. Do not attach a return air duct to the chassis or outer case.

Reference Dimensions

A Thermostat cable
B Power cord: 60" long if 230VAC or conduit entrance if 265VAC.
C Case width and depth: 23-1/8"
D Case height: 31"
E Condensate drains: 3/4"connector
- Primary Drain - Centerline of cutout is approximately 5-1/4" from left case wall and 8-1/2" from back case wall.
- Secondary Drain-centerline of cutout is approximately 6-1/2" from left case wall and 5-1/4" from back case wall.

F Typical wall plug: 6"-12" above case
G 40" min.



Air outlet

⚠ WARNING

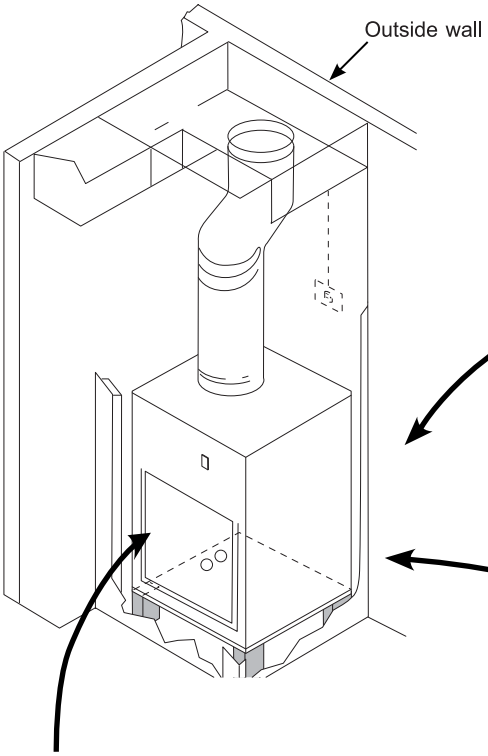
To avoid the risk of property damage, personal injury, or death due to fire, use metal duct material only.

Return Air Grille Installation Options

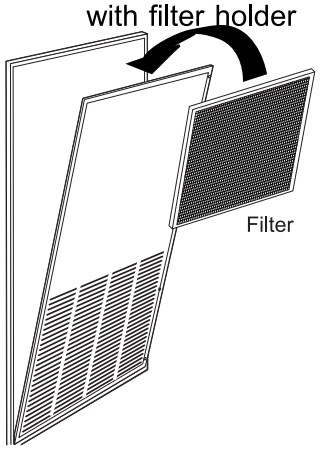
The room return air grille may be installed toward the front or either side of the unit. Improper return air arrangements will cause performance problems.

There are three indoor return air grille installation options. Choose the option that best suits your installation requirements. Follow the Installation Instructions provided with the return air grille accessory for installation details.

NOTE: **Use only one filter in the installation**. **The filter may be installed on the unit or in** the access panel/door.

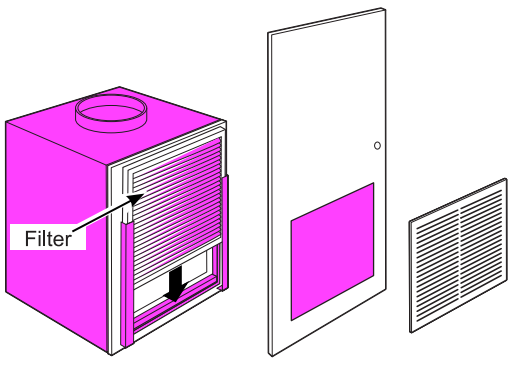


Access panel with return air grille with filter holder



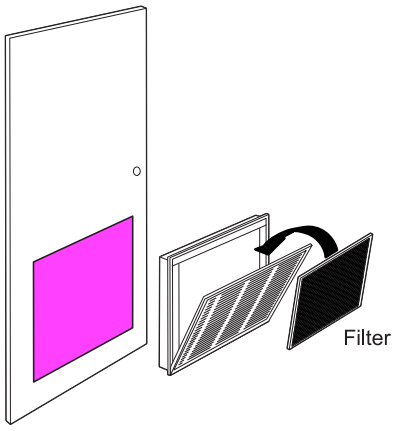
Option 1

Unit-mounted filter with a field-supplied return air grille and access door/panel



Option 3

Return air grille with filter holder

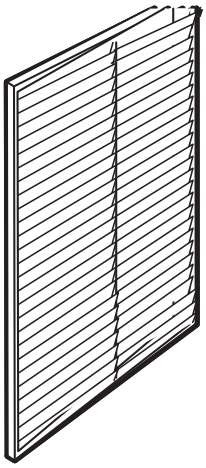


Option 2

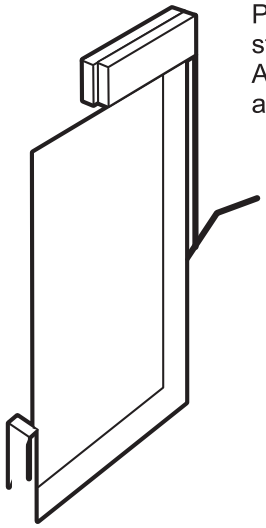
Wall Plenum And Architectural Louver Installation

Install the appropriate wall plenum through the exterior wall in accordance with the Installation Instructions provided with the plenum.

IMPORTANT: The wall plenum is not designed to carry structural loads. Proper wall header construction is required. The plenum requires proper flashing, shim and caulk for a weather resistant installation.

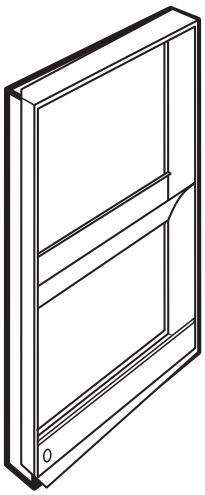


Architectural



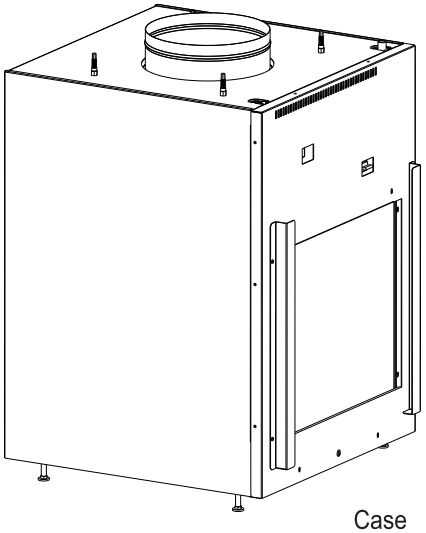
Exterior/Outside Wall

Proper header for structural support
Apply proper caulking and flashing



Wall Plenum
6"D x 20"W x 32"H
8"D x 20"W x 32"H
12"D x 20"W x 32"H
15"D x 20"W x 32"H

Properly square and level plenum.

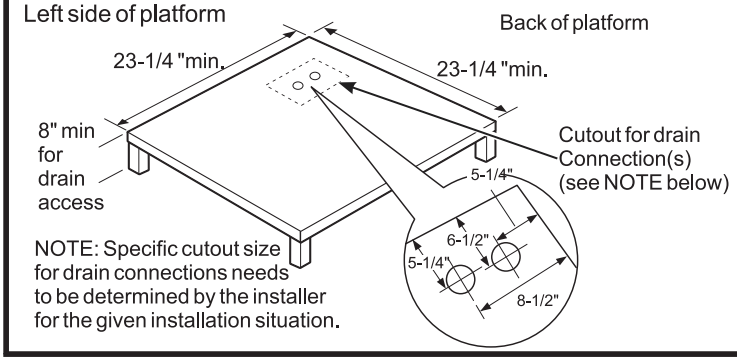


Case

(1)Build And Install The Unit

Base Platform

1. Construct a 23-1/4 "min. x 23-1/4 "min. square platform with legs to raise the platform a minimum of 8".
   NOTE: The platform must have a load-bearing capacity of 175 lbs. minimum.
2. Make drain hole cutout(s):
   Primary Drain-centerline of drain is approximately 5-1/4 "from left platform edge and 8-1/2 "from back platform edge.



•Secondary Drain-center line of drain is approximately 6-1/4"from left platform edge and 5-1/4"from back platform edge.

3. Place the platform in the utility closet with the following clearance between it and the interior surface of the walls/door/ panel:
   •4"min. from front of the case
   Unit to be installed through **FRONT** of case
   •5"min. from front of the case
   Unit to be installed through **SIDE** of case
   •3"min. from two sides of the case(5"for side installation)
4. Align the platform with the opening of the wall plenum and secure to the floor using appropriate brackets and bolts.

(2)Install The Drain(s)

An external or an internal drain must be attached to the primary drain connector. A secondary drain is supplied if required by state and local codes. Refer to the local codes for proper installation of the drains. If the secondary drain is not used, seal its drain port with a 3/4"MNPT plug.

External Drain

Attach a 90° PVC elbow to the units female 3/4"NPT drain connector. Use the other end of the elbow to run a 3/4 " Sch. 40 PVC pipe through the knockout holes of both the wall plenum and the architectural louver to the outside Seal the gap between the plenum hole and PVC tube. See the installation instructions in the figure 1.

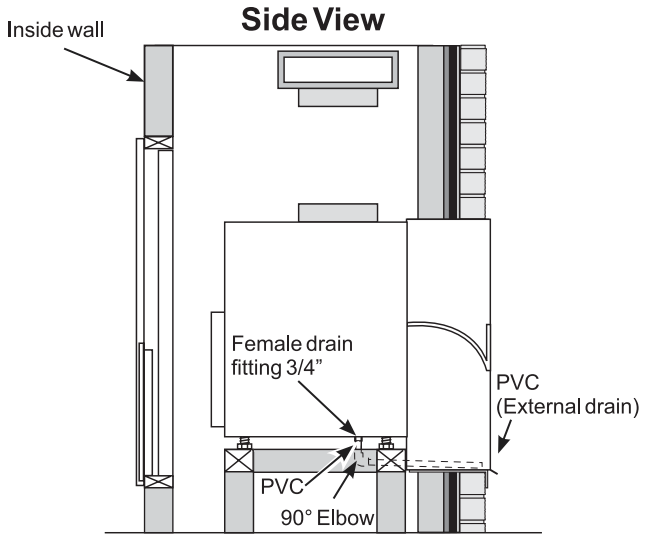


figure 1

Internal Drain

Attach PVC to the units female 3/4"NPT drain connector. See the Installation Instructions in the figure 2 Local codes may apply.

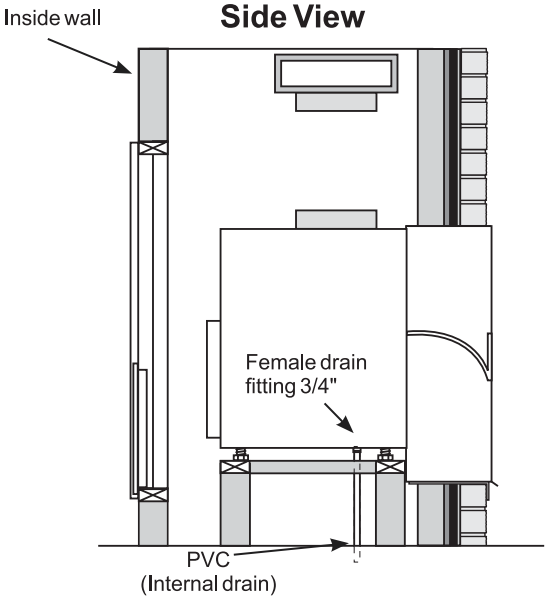


figure 2

(3)Ductwork

Prepare the closet ductwork for later connection to the case.

The total flow rate(CFM) and external static pressure (ESP) available can be estimated from the chart below.

The collar on top of the case accepts standard 10"duct.Pull all duct tight. Extra duct slack can greatly increase Static pressure.

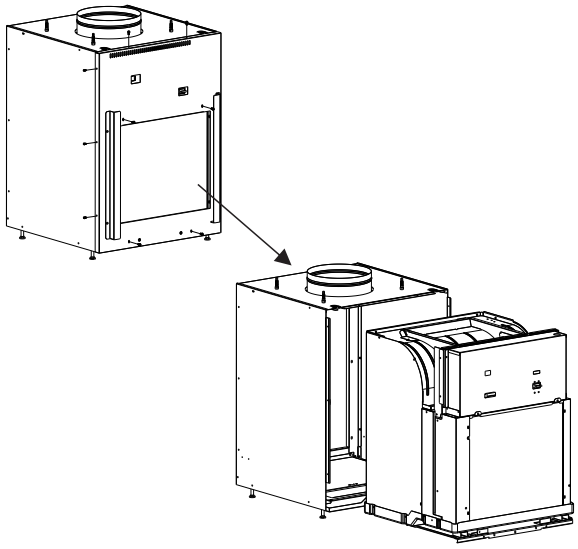
NOTICE: Flex duct can collapse and cause airflow restrictions. Do not use flex duct for 90° bends or unsupported runs of 5 ft. or more.

Airflow -CFM					
ESP (in.water)		Indoor Fan CFM			
		Duct Select Switch			
		OFF		ON	
		High CFM	Medium CFM	Medium CFM	Low CFM
09K	0.00	550	450	425	410
	0.04	515	410	395	375
	0.10	465	360	350	320
	0.15	440	310	300	270
	0.20	405	245	240	205
	0.25	365	225	180	120
	0.30	310	-	110	-
12K	0.00	585	520	520	450
	0.04	550	485	485	410
	0.10	505	435	435	360
	0.15	470	385	385	310
	0.20	430	345	345	245
	0.25	390	285	285	225
	0.30	340	230	230	-
18K	0.00	585	525	525	510
	0.04	550	490	490	475
	0.10	530	440	440	420
	0.15	505	390	390	375
	0.20	470	350	350	320
	0.25	430	290	290	250
	0.30	390	235	235	180

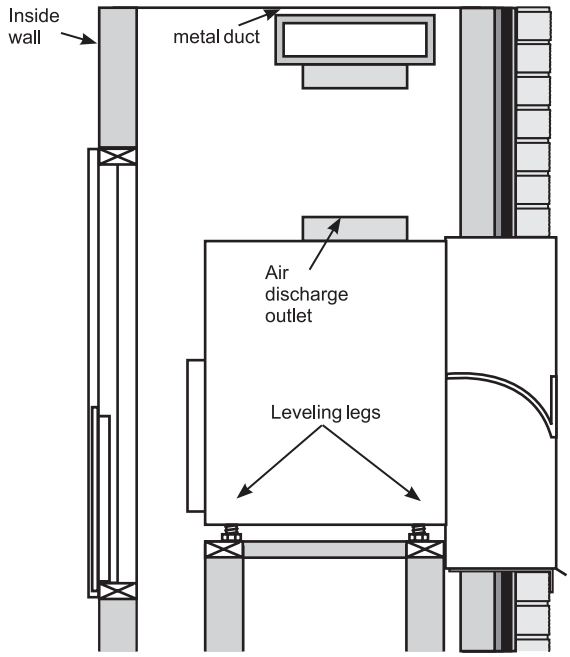
Your airflow should be balanced based on many factors such as available ESP room CFM. and ductwork. Consult an HVAC engineer for proper applications. External static pressure (ESP) can be measured with a manometer or pitot tube. Once this ESP is established you can calculate the CFM use above chart.

(4)Install And Connect The Case

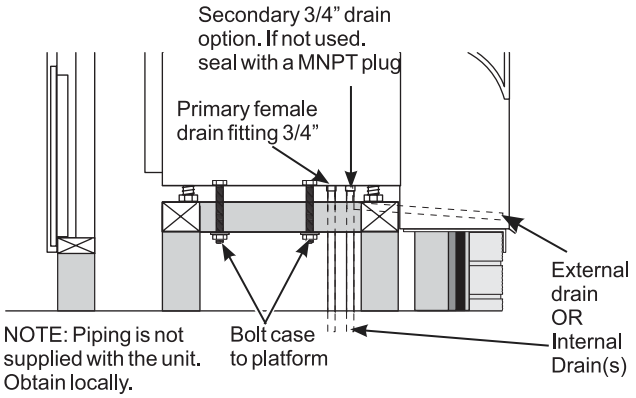
1. Remove the front case panel and pull the unit out of the case. Place the empty case onto the platform in the closet with the outdoor side facing the wall plenum opening. Align the case with plenum opening and attach.



2. Adjust the leveling legs so the case is level from side to side and from level to 1/4" bubble tilt to the outdoors.



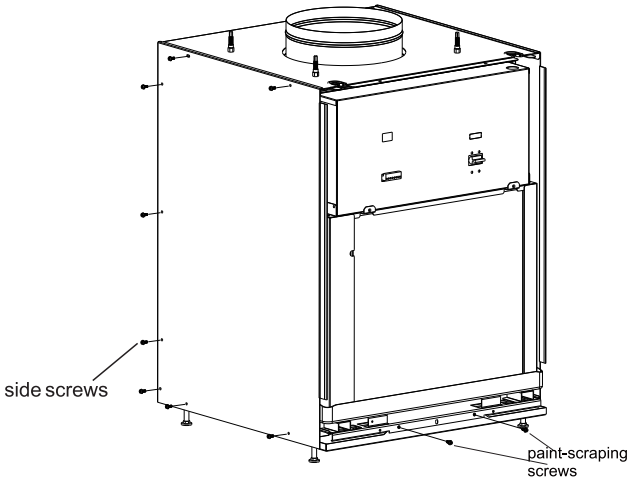
3. Using field-supplied screws, bolt the case to the platform.



4. Connect the internal or external drain(s) as necessary.

(5a)Install And Ground The Unit To The Case Unit Installed Through Front Of Case

1. Slide the back of the unit into the case. Push the unit all of the way into the case until it stops.
   NOTE: Either of the case sides may be removed to enable the unit to be slid into the case.
2. Ground the unit to the case by installing the front case-to-unit hex-bolt.

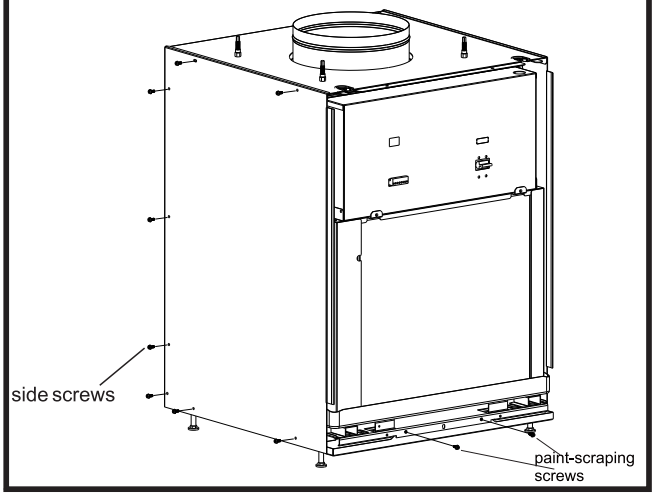


(5b) Install And Ground The Unit To The Case Unit Installed Through Side Of Case

1. Slide the side of the unit into the case. Push the unit all of the way into the case until it stops.

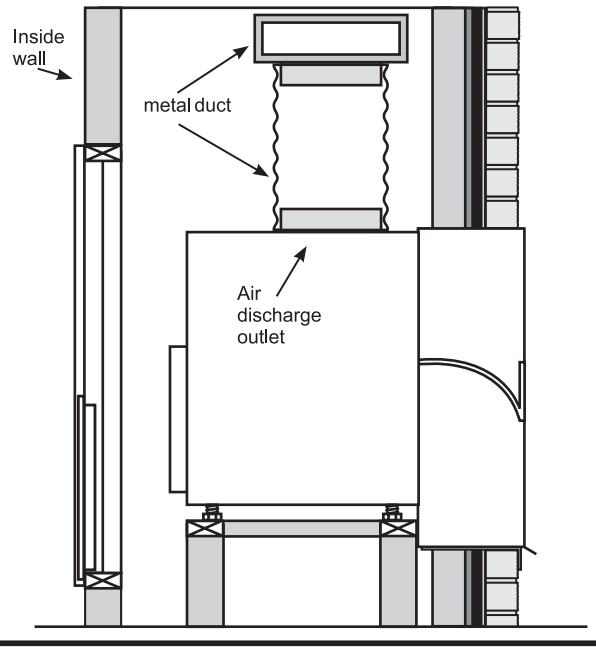
NOTE: Either of the case sides may be removed to enable the unit to be slid into the case.

2. Attach the case side panel to the main case
3. Ground the unit to the case by installing the front unit-to-case hex-bolt.

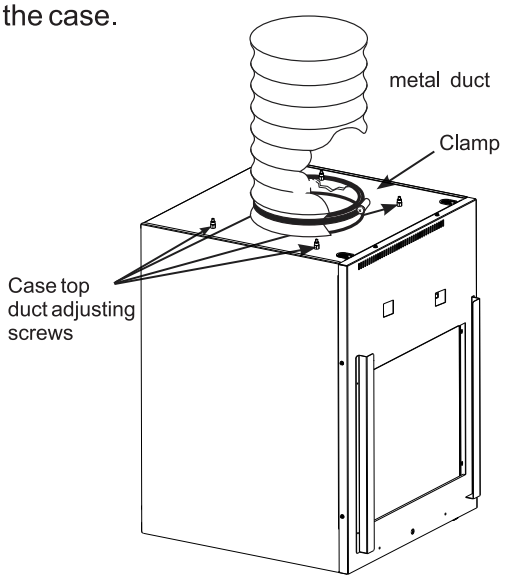


(6)Connect The Top Duct

1. Install the duct onto the air discharge outlet.



2. Secure the top duct to the unit by turning the four case top duct adjusting screws until they are tight. Use a field supplied clamp to lock the top duct to the case.



(7)Final Check

Review this Checklist before restoring power.

- Correct line voltage?
- Single circuit only?
- Ductwork connected?
- Case and unit level?
- Wall plenum caulked? Level? Flashing?
- Drain connected?
- Unit wired correctly?
- Hydronic plumbing connections (if applicable)
- Hydronic wiring connections (if applicable)

(8)Connect Power

1. If all the above items are correct, turn the power on at the main service panel.
2. Turn the unit power switch, on the front of the unit.

SERVICING

⚠ WARNING

HIGH VOLTAGE

Disconnect all power before servicing or installing this unit, multiple power sources may be present, failure to do so may cause property damage, personal injury or death.

Before servicing, switch power off at the service panel and lock the area to prevent power from being switched on accidentally. When the area cannot be locked securely fasten a prominent warning device, such as a tag to the service panel.

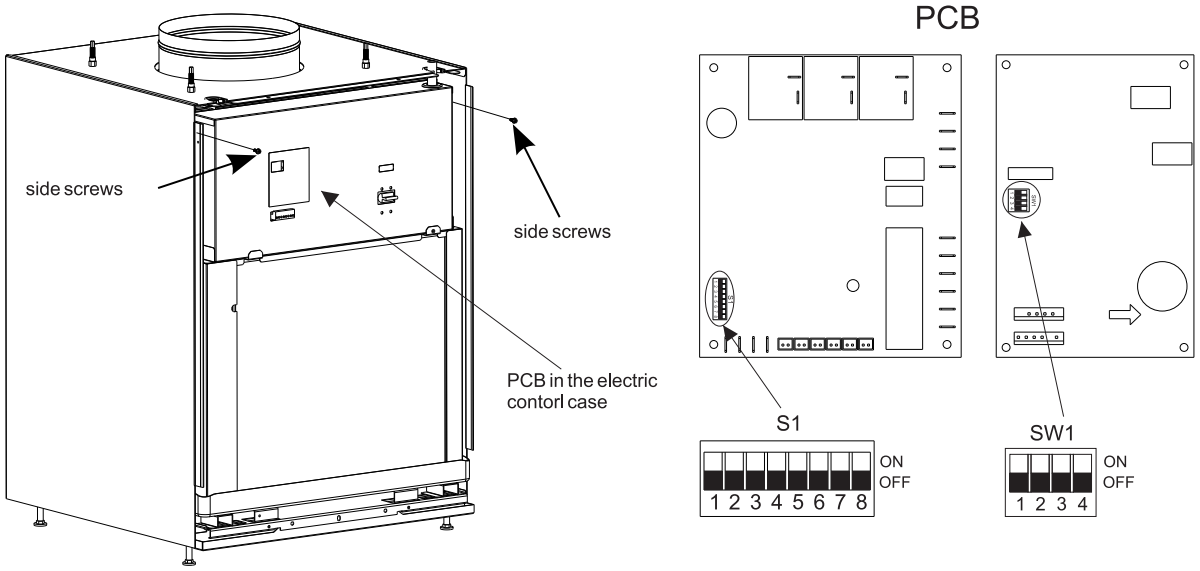
NOTE: We strongly recommend that any servicing be performed by a qualified individual.

For ease of service. the unit can be removed from the case:

1. Remove the front case panel.
2. Unplug the power cord.
3. Raise the top duct by turning all four case top duct adjusting screws counterclockwise.
4. Remove the case-to unit grounding screws.
5. Slide the unit out of the case.

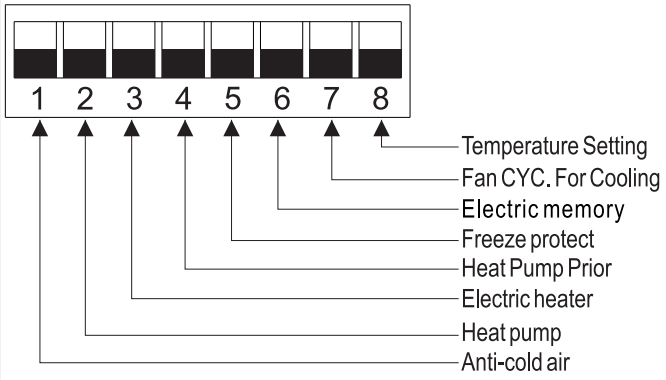
Control Configuration-For use by qualified service personnel only

The adjustable control switches are located at the PCB.The inputs are only visible and accessible with the electric control box removed from the unit.



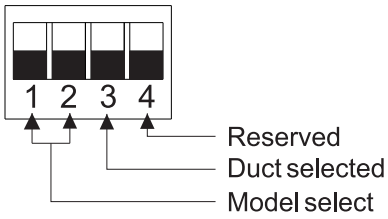
Switch Setting

1□S1



Switch	Description	Function	Factory Setting
1#	Anti-cold air	ON-Enable ; OFF-Disable;	ON
2#	Heat pump	ON-Enable; OFF-Disable;	ON
3#	Electric heater	ON-Enable; OFF-Disable;	ON
4#	Heat Pump Prior	ON-Heat Pump Prior; OFF-Electric Heat Prior; (Only available for panel control)	ON
5#	Freeze protect	ON-Allow the unit to ensure the indoor room temperature does not fall below 40?F even when turned off; OFF-disable freeze protection.	ON
6#	Electric memory	ON-Enable ; OFF-Disable;	ON
7#	Fan CYC. For Cooling	ON-Enable ; OFF-Disable;	OFF
8#	Temperature Setting	ON-Set temp.step for two degree ; OFF-Set temp.step for one degree	OFF

2□SW1



SW1.1□ SW1.2—Model select

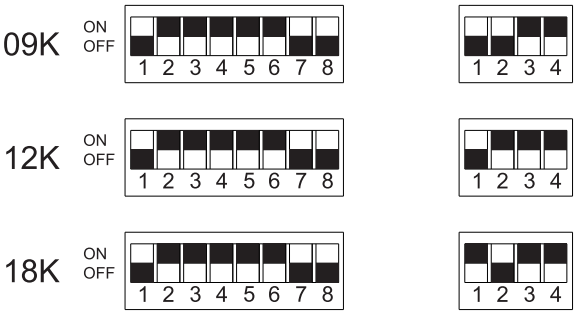
SW1.3□Duct select

The duct select function allows the indoor fan to be operated at two variable fan speeds.

When set in the down position(OFF), the unit automatically selects either high or middle fan speed (for longer ductwork applications).

When set in the up position(ON), the unit automatically selects either middle or low fan speed (for shorter ductwork applications).

Factory default setting



Error code and solutions

Failure code	Nature of defect
E2	Indoor temperature sensor failure
E3	Indoor coil temperature sensor failure
E5	Outdoor coil temperature sensor failure
E8	Overheating protection/defrosting
E9	Refrigerant high pressure protection

NORMAL OPERATING SOUNDS AND CONDITIONS

Water trickling sounds

Water is picked up and distributed over the outdoor coil. This improves the efficiency and helps with water removal.

Water dripping

Water will collect in the base pan during high humidity days . This can cause overflow and drip from the outside of the unit if the external instead of internal drain connection method is used.

Air sounds

The fan cycle switch sets the operational mode of the fan . In the ON position the fan will run continuously whenever power is applied in this mode . In the AUTO position, the fan will cycle on and off with the compressor or electric heater.

Starting delay

You may notice a few minutes delay in the starting if you try to restart the unit too soon after turning it off or if you adjust the thermostat right after the compressor has shut off .This is due to a built– in delay to protect the compressor.

Buzzer Response

The buzzer will chime Di"(0.1 sec)as response when receiving the effective order from key pad control.

DIAGNOSTIC CODES

The Diagnostic Maintenance provides detailed information on VTAC control operation and operational status including present modes, failures , airflow restriction ,warnings , operating temperatures, and past failures. To enter Diagnostic Status Report mode, press and hold the down arrows and, while holding press the FAN SPEED key for a period of five (5) seconds.The meaning of figure on display pad is as below: X .X ---- (0~4: times of protection)
□ □ is protection mode(1:anti-frost; 2:overheat; 3:high pressure; 4:anti-freezing)
For example, 3.3 means high pressure occurred 3 times.

TROUBLESHOOTING

POSSIBLE CAUSES	SOLUTIONS
UNIT DOES NOT START ● Unit may have become unplugged ● Fuse may have blown ● Circuit breaker may have been tripped ● Unit may be off or in wall thermostat mode. Check section on dipswitch settings to verify dipswitches are set properly. □ Unit may be in a protection or diagnostic failure mode. See section on diagnostic codes.	□ Check that plug is plugged securely in wall receptacle. **Note** :Plug has a test/reset button on it. Make sure that the plug has not tripped. □ Replace the fuse. □ Reset circuit breaker. □ Turn unit on (bottom right button on keypad).
DISPLAY HAS STRANGE NUMBERS/CHARACTERS ON IT	□ The unit may be in a diagnostic condition. Check diagnostic codes --- checking Control section to determine if unit has had a failure. □ The unit may be set for ° C (instead of ° F), see the keypad configuration section
UNIT MAKING NOISES	□ Clicking, gurgling and whooshing noises are normal during operation of unit.
UNIT NOT COOLING / HEATING ROOM □ Unit air discharge section is blocked □ Temperature setting is not high or low enough Note: Setpoint limits may not allow the unit to heat or cool the room to the temperature desired. Check section on dipswitch settings. □ Unit air filters are dirty. □ Room is excessively hot or cold when unit is started □ Vent door left open □ Unit may be in a protection or diagnostic failure mode. Check section on Intelligent Self --- checking Control. □ Compressor is in time delay. There is a protective time delay (approx . 3 minutes) on starting the compressor after a power outage(or restarting after it has been turned off), to prevent tripping of the compressor overload.	□ Make sure that curtains, blinds or furniture are not restricting or blocking unit airflow. □ Reset to a lower or higher temperature setting. □ Remove and clean filters. □ Allow sufficient amount of time for unit to heat or cool the room. Start heating or cooling early before outdoor temperature, cooking heat or gatherings of people make room uncomfortable. □ Close vent door. □ Check dipswitch settings for desired comfort. □ Wait approximately 3 minutes for compressor to start
WATER DRIPPING OUTSIDE	□ If a drain kit has not been installed, condensation runoff during very hot and humid weather is normal. See Note 2. If a drain kit has been installed and is connected to a drain system, check gaskets and fittings around drain for leaks and plugs.
WATER DRIPPING INSIDE □ Wall sleeve is not installed level	□ Wall sleeve must be installed level for proper drainage of condensation. Check that installation is level and make any necessary adjustments.
ICE OR FROST FORMS ON INDOOR COIL □ Low outdoor temperature □ Dirty filters	□ When outdoor temperature is approximately 55°F (12.8°C) or below, frost may form on the indoor coil when unit is in Cooling mode. Switch unit to FAN operation until ice or frost melts. □ Remove and clean filters.
COMPRESSOR PROTECTION □ Power may have cycled, so compressor is in a restart protection.	□ **Random Compressor restart—Whenever** the unit is plugged in, or power has been restarted, a random compressor restart will occur. After a power outage, the compressor will restart after approximately 3 minutes. □ **Compressor Protection —** To prevent short cycling of the compressor, there is a random startup delay of 3 minutes and a minimum compressor run time of 3 minutes

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