JKDEC

Unitary Package Ducted Heating/Cooling Unit

INSTALLATION AND OPERATION MANUAL

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IMPORTANT:

READ AND SAVE THESE INSTRUCTIONS. INSTALLATION AND WIRING MUST BE IN ACCORDANCE WITH CEC, NEC AND LOCAL ELECTRICAL CODES.

802500R00

COMPONENTS

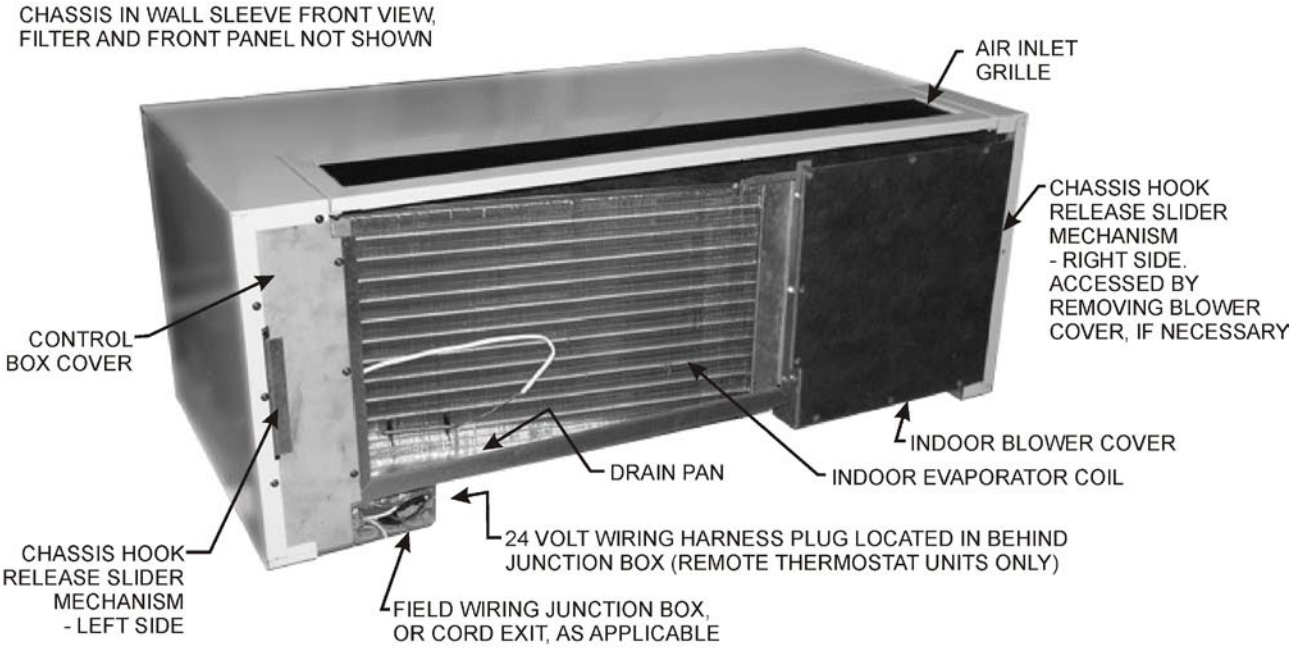


Fig. 1.

Fig. 2.

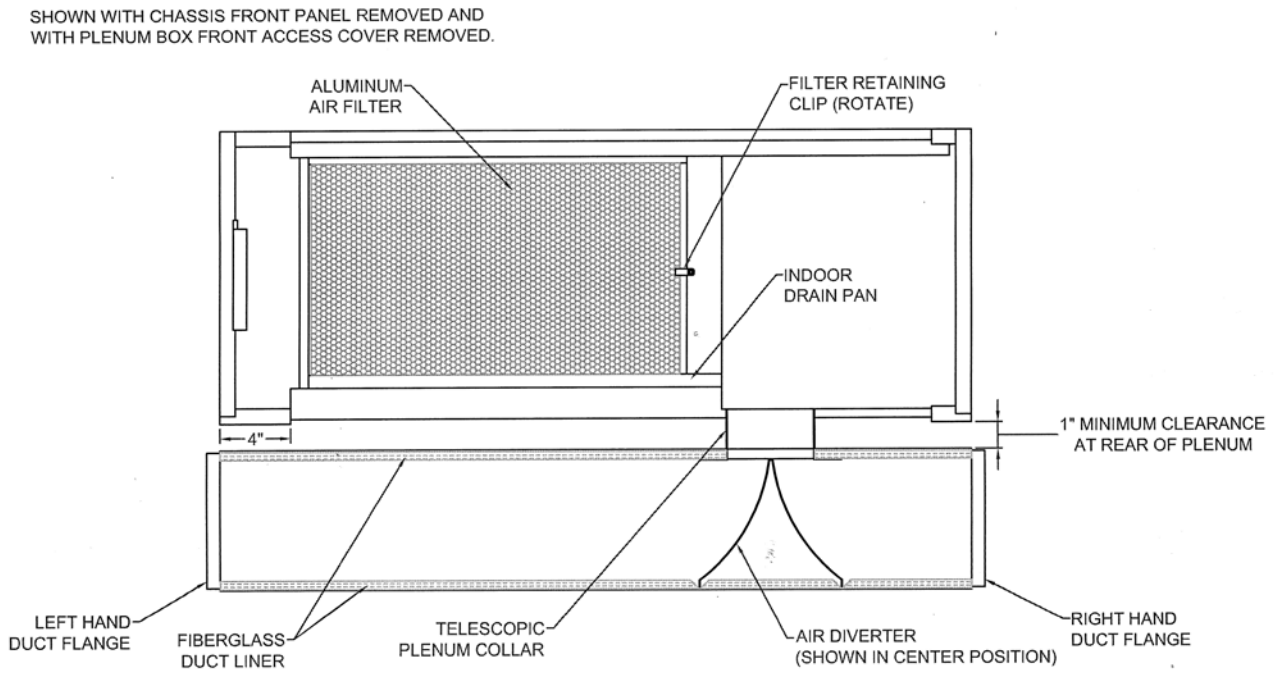

SHOWN WITH CHASSIS FRONT PANEL REMOVED AND
WITH PLENUM BOX FRONT ACCESS COVER REMOVED.
ALUMINUM
AIR FILTER
FILTER RETAINING
CLIP (ROTATE)
INDOOR
DRAIN PAN
4"
1" MINIMUM CLEARANCE
AT REAR OF PLENUM
LEFT HAND
DUCT FLANGE
FIBERGLASS
DUCT LINER
TELESCOPIC
PLENUM COLLAR
AIR DIVERTER
(SHOWN IN CENTER POSITION)
RIGHT HAND
DUCT FLANGE

Fig. 3.

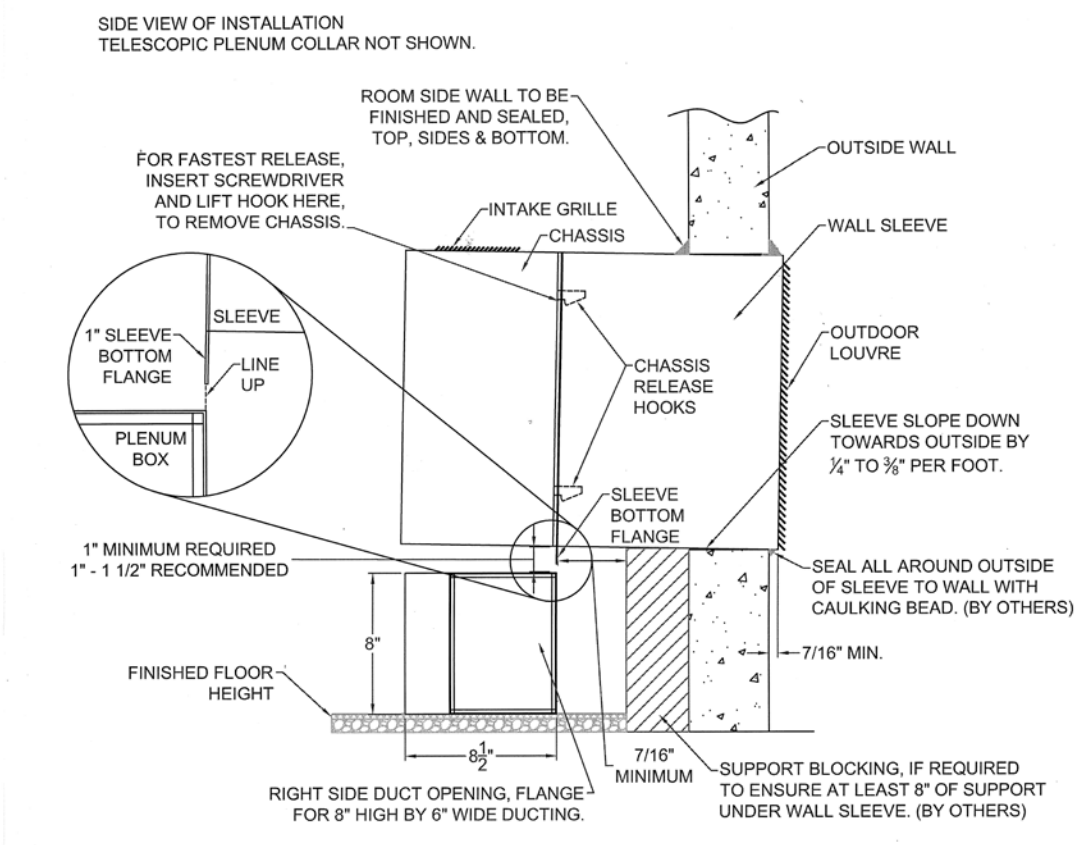

SIDE VIEW OF INSTALLATION
TELESCOPIC PLENUM COLLAR NOT SHOWN.
ROOM SIDE WALL TO BE
FINISHED AND SEALED,
TOP, SIDES & BOTTOM.
OUTSIDE WALL
FOR FASTEST RELEASE,
INSERT SCREWDRIVER
AND LIFT HOOK HERE,
TO REMOVE CHASSIS.
INTAKE GRILLE
CHASSIS
WALL SLEEVE
SLEEVE
1" SLEEVE
BOTTOM
FLANGE
LINE
UP
PLENUM
BOX
OUTDOOR
LOUVRE
CHASSIS
RELEASE
HOOKS
SLEEVE SLOPE DOWN
TOWARDS OUTSIDE BY
¼" TO ⅜" PER FOOT.
SLEEVE
BOTTOM
FLANGE
1" MINIMUM REQUIRED
1" - 1 1/2" RECOMMENDED
SEAL ALL AROUND OUTSIDE
OF SLEEVE TO WALL WITH
CAULKING BEAD. (BY OTHERS)
8"
7/16" MIN.
FINISHED FLOOR
HEIGHT
8½"
7/16"
MINIMUM
SUPPORT BLOCKING, IF REQUIRED
TO ENSURE AT LEAST 8" OF SUPPORT
UNDER WALL SLEEVE. (BY OTHERS)
RIGHT SIDE DUCT OPENING, FLANGE
FOR 8" HIGH BY 6" WIDE DUCTING.

Fig. 4.

1. Wall Sleeve & Plenum Box

The wall sleeve is 16- 1/2" high X 42-1/4" wide X 12 -7/16" deep, and is to be built into the wall during construction. The rough opening in the wall should be 16-7/8" high (to allow for slope on the sleeve) and 42-1/2" wide. At the inside wall, the distance from the bottom of the wall opening to the top surface of the finished floor (including any carpet) must be a minimum of 9" (see Fig. 4). A height of 9" to 9.5" is recommended to allow the plenum box to rest right on the finished floor, and will also permit the telescopic plenum collar to properly engage the indoor blower outlet, upon installation. The wall sleeve is used for all wall thicknesses from 2" through 11-13/16" maximum. The heating/cooling chassis slides into the wall sleeve and locks in place using self-acting spring-loaded hooks (see Fig. 2).

In operation, indoor unconditioned air enters the intake grill at the top of the unit, and the conditioned air is discharged down toward the floor into a plenum box. The plenum box has two purposes; one, to turn the air at right angles so that it can be discharged out one or both ends via the attached ductwork, and, two, so that the proportion of air diverted to each duct run can be adjusted using a diverter plate located within the plenum box (see Fig. 3). A telescopic plenum collar is situated directly above the air diverter plate which engages the indoor blower outlet mouth, and allows air to flow into the plenum box.

The wall sleeve and the plenum box must be in an exact spatial relationship so that the telescopic collar in the plenum box aligns with the blower mouth in the heat/cool chassis after the chassis is installed in the sleeve. In particular, the rear edge of the plenum box must line up with the bottom flange of the sleeve, and the plenum box must be centered from side-to-side relative to the sleeve (see Figs. 3 and 4).

The wall sleeve should penetrate into the room by at least 7/16" as measured at the bottom of the sleeve, as long as there is a minimum protrusion of the sleeve top rear edge past the outside wall of at least 7/16", which will create a fillet to receive the bead of caulking that must be applied around the entire perimeter in order to seal the sleeve to the outside wall (see Fig. 4).

After installation of the wall sleeve, the sleeve should be thoroughly cleaned. The room-side portion of the cabinet should be carefully protected during the construction period to prevent scratching of the paint.

IMPORTANT:
The heating/cooling unit must not be used for temporary heating or cooling during the building's construction stage, and may void the warranty if attempted.

2. Heating/Cooling Chassis

This chassis includes all cooling and heating (if intended) components, including air moving components and controls, except for the 24-volt room thermostat itself and associated thermostat wiring, if configured as a 24 Volt Remote Control Unit.

3. Power Supply

The chassis is normally provided as permanently-connected, with a field wiring junction box situated adjacent to the main control box, containing two current-carrying power leads and a ground lead. For units with electric heater capacities of 4.4 KW and less, the chassis can be ordered with a 5 foot power supply cord of the enhanced-safety LCDI type (Leakage Current Detection and Interruption), and correctly sized to the heater load. In such a case, the cord will exit the unit at the location where the junction box would have been placed, that is, adjacent to the main control box on the left hand side of the unit, as viewed from the inside (see Fig. 1).

4. Plenum Box

The plenum is a horizontal duct fully insulated with ½" fiberglass, and situated directly beneath the chassis on the room side (see Fig. 1).

A collar in the top of the plenum box rises up to engage with the downward discharge indoor blower mouth, after the chassis has been inserted fully into the sleeve. The plenum collects the air as it is discharged from the indoor blower, and turns the air in a right hand, left hand, or in both directions with the means of an adjustable diverter supplied within the plenum box. When the air reaches the end(s) of the plenum, it is directed into field-supplied interconnecting ductwork via duct collars suitable for 8" high X 6" wide duct. Transition up to a larger duct size to reduce downstream pressure is always possible, if desired.

The diverter within the plenum box can be adjusted to proportion the amount of air flowing out the left and right duct runs.

5. Ducting

The plenum box has duct collar flanges at each end to connect to 8" high X 6" wide standard ducting. As mentioned, the unit can be ducted out one side of the plenum box, or both. The field-supplied ductwork should be insulated with a recommended thickness of ½" fiberglass duct liner, suitable for the air velocities involved, to prevent condensation on the outside of the ductwork in air conditioning mode. Properly sized outlet vents should be located on the top or sides of the distribution ductwork to supply the desired amount of air to each room. Dampers on the outlet grilles and/or in the duct runs will help to properly balance the air delivered to each location.

6. Duct Sizing

If air will be ducted out only one end of the plenum box, the duct run, the damper (if any) and the discharge grilles must be sized for a maximum pressure drop of 0.15" of water column at 320 CFM. Designing to a lower pressure drop increases duct cost and outlet grille costs, but reduces noise, increases total air flow, and increases energy efficiency, thereby lowering operating costs.

If air will be ducted out both ends, the duct runs should be sized for a maximum pressure drop of 0.15" w.c., with regard for the fraction of 320 CFM that will be flowing through each duct run.

In other words, size the duct for the anticipated fraction of 320 CFM pertaining to that branch. In other words, if 40% airflow is desired out of the right side and 60% out the left, then size the duct as follows:

40/100 X 320 = 130 CFM at .15" w.c. maximum, out the right side.

60/100 X 400 = 190 CFM at .15" w.c. maximum, out the left side.

Or, design both ducts for 190 CFM at .15" w.c. and use a damper on the right side to throttle the flow down to 130 CFM in the right side branch, to obtain the desired air balance.

The .15" w.c. maximum pressure drop should also include the air resistance through the outlet vents calculated at the predicted CFM exiting out each vent. This will ensure that adequate airflow will result when the unit is operating at the factory-set indoor blower speeds for the particular heating and cooling capacity of the unit.

If the duct pressure will be checked using a manometer, it should be measured at a distance of about 1 to 1½ feet downstream of the plenum box in each direction.

7. Return Air

One must make suitable provision for returning air to the inlet grille of the heating/cooling unit from any adjacent rooms to which the supply duct feeds air, either using generous undercuts on the bottom of room entrance doors, or by installing return air grilles in adjacent walls, or both, according to established industry practices and procedures.

8. Room Thermostat

The heating/cooling unit can be supplied with unit-mounted user controls if necessary, but normally, the unit is supplied to operate with a 24 VAC remote wall thermostat in order to give superior operation and control of room temperature, fan cycling, and the ability to take advantage of energy management capabilities within modern thermostats.

Any standard or enhanced 24-volt heat/cool thermostat intended to control a gas-heating unit with cooling can be made to work with the unit.

In its simplest form, a remote room thermostat is basically a switch used to direct 24 volt power from the "R" terminal to its W, Y, and G terminals, according to the function being demanded by the user. Sometimes an electronic thermostat needs to be powered with 24 volts by connection to an additional "C" or "Common" terminal, typically if its display is backlit. The 24-Volt Thermostat configured chassis has provision to mesh with most advanced-function thermostats. Any limitations would likely be caused by an insufficient number of thermostat wires being run between the thermostat and the unit; not the unit itself.

INSTALLATION

WALL SLEEVE AND PLENUM BOX INSTALLATION

The cabinet/wall sleeve may be positioned in the wall to suit the application subject to the limitations that:

a) The wall sleeve should penetrate into the room by at least 7/16" as measured at the bottom of the sleeve (see Fig. 4). The room-side opening must be sealed to the wall sleeve and finished all around the top, sides and bottom, to complete the installation.

b) The outdoor louver must extend beyond the outside wall (no recess). Set a minimum protrusion of the sleeve top rear edge past the outside wall of at least 7/16", which will create the fillet necessary to receive a bead of caulking around the entire perimeter in order to water seal the sleeve to the outside wall (see Fig. 4).

c) The wall sleeve must be rigidly installed in the wall. Anchor the sleeve with fasteners appropriate for the type of construction, located in the top and/or sides of the wall sleeve (not through the bottom). Anchors installed through the sides of the sleeve should be no lower than 4" from bottom of sleeve.

d) The inside edge of the wall sleeve must be at least 9" above the finished floor. A distance of 9" to 9.5" is recommended. See Figure 1.

e) There should be at least 8" of the wall sleeve bottom supported. Add blocking if necessary to achieve this objective (see Fig. 4).

IMPORTANT: The cabinet/wall sleeve will not support the wall above it. Provide necessary lintels to prevent distortion of the cabinet.

The wall sleeve will be set in wet concrete or mortar and pressed firmly into place to get contact between the concrete and the sleeve bottom. Further details follow.

IMPORTANT: The wall sleeve must possess an overall 1/4" to 3/8" slope downward toward the outside to ensure proper water drainage. This slope also corresponds to 1/4 to 3/8 bubble on a carpenter's level. The wall sleeve must also be level from side-to-side.

All cracks or openings between the cabinet and the wall must be filled with mortar and/or caulked. Ensure there is no caulking or foreign material blocking the drain slots located along the outdoor bottom edge of the wall sleeve.

Failure to do so may cause property damage from water flowing into the conditioned space.

1. From the architect's drawings, determine the position of each unit and mark the centerline of the cabinet/wall sleeve. Also, mark the location of electrical junction box (see Fig.1), the plenum box, and plan the wire routing. The rear edge of the plenum box must line up with the bottom flange of the sleeve, and the plenum box must be centered from side-to-side relative to the sleeve (see Figs. 3 and 4).
2. Run wiring to location for each unit, as established in step 1.
3. Completely finish all concrete work associated with floor and wall.
4. Provide at least 8" of support under wall sleeve.
5. Route the high voltage wiring/conduit/receptacle, as applicable. If the unit will be hard-wired, leave at least 7" of free wire for inside the conduit box to facilitate connections. If the unit will be cord-connected, install the receptacle at a desired location, recognizing the power cord length is 5 feet and exits out the bottom of the chassis as noted in Fig. 1.
6. Ensure any low voltage thermostat wiring, if applicable, will reach into the vicinity of the high voltage field wiring junction box or cord attachment point of the chassis (see Fig. 1). This will ensure connections can be made to the low voltage harness as described
7. Set the cabinet/wall sleeve in 3/4" wet concrete – it must be level from side to side, and sloped 1/4" to 3/8"overall, toward the outside for proper drainage. Press into place.
8. Ensure cabinet/wall sleeve is not distorted during installation and is adequately protected during the construction period.
9. Build up wall around cabinet, making sure that the cracks are closed and that the cabinet remains square, especially on the top.

CONTROL WIRING

For remote thermostat models, a six-position low voltage connector plug with 24" leads is provided for 24 volt thermostat wiring connections. The connector plugs into a mating receptacle in the right side of the chassis control box that can be unplugged to facilitate removal of the chassis for servicing. The connector is located in behind the junction box, or power cord exit, as applicable.

Connections should be in accordance with the specific wiring diagram affixed to the chassis front panel. The thermostat circuit is 24 Volt AC, Class 2, so thermostat wire connections need not be made within an electrical enclosure.

CAUTION: One side of the unit's 24-volt control system is grounded. When wiring the thermostat, care must be taken not to ground the red wire, thereby potentially burning out the transformer.

CHASSIS INSTALLATION

1. After all construction is complete and the unit location is thoroughly cleaned, the heat/cool chassis is ready for installation in the cabinet/wall sleeve.
2. Unpack heat/cool chassis from shipping carton. Check for any shipping damage.
3. If the heating/cooling chassis is configured for 24 VAC remote wall thermostat, connect the low voltage wiring harness to the low voltage connector located in behind the junction box or cord exit, as applicable. Make the connections per the wiring diagram affixed to the front panel of the unit, specific to the desired function and number of available thermostat wires that may be pre-existing, if it is a replacement situation.

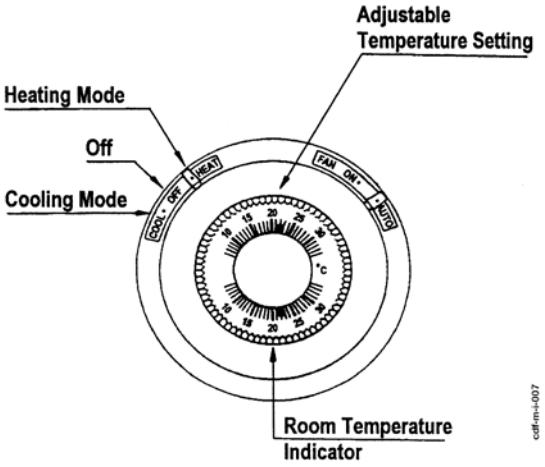
4. Position the plenum box so the rear edge of the plenum box lines up with the bottom flange of the sleeve. There should be a separation of 1" to 1-1/2" between the top surface of the plenum box, and the bottom edge of the sleeve (not to the bottom edge of the downturned sleeve flange).
5. Pry off the front cover of the plenum box, pull out the air diverter, and drop the air collar below the top surface of the plenum box, or remove it completely.
6. Slide the heating/cooling chassis fully into the sleeve, until the securing hooks drop completely into the receiving slots in the sleeve, by spring action.
7. Re-install the collar in the plenum box and push it upwards until it fully engages over the chassis blower mouth. Fix the collar in position with a sheet metal screw, most easily driven in from the left side of the collar. Sealing the blower mouth at the telescopic collar with aluminum tape is recommended.
8. Re-install the air diverter to distribute the air as desired. It will likely have to be re-adjusted after initial operation, in the case of air delivery out both sides of the plenum box.
9. Once the blower outlet-to-plenum collar relationship is known, the plenum box can be fixed into position permanently using fasteners appropriate to the situation. Re-install the cover on the plenum box.

IMPORTANT: When handling the chassis, care must be taken to ensure that no damage occurs to the blower wheels. Damaged or unbalanced fans will cause excessive noise and will impair unit performance.

10. Install the ducting to the plenum box flange(s) as described in the previous section entitled "Ducting".
11. Connect low voltage wiring harness to the heat/cool chassis, if applicable.
12. Install front panel.
13. Wipe unit cabinet/wall sleeve to remove dirt, etc.
14. The unit is now ready for operation, when supplied with power from the distribution panel and when wired to a thermostat.

CHASSIS REMOVAL
See section following entitled PREVENTIVE MAINTENANCE.

OPERATING INSTRUCTIONS



The Unitary Package Heating, Cooling Unit has been carefully designed and built to provide reliable operating performance when installed and maintained correctly.

CONTROL SYSTEM DESCRIPTION

Unit-Mounted Controls

Superior operation and energy management is always best attained with the 24 Volt Remote Wall Thermostat configured chassis.

For units that incorporate unit-mounted controls, there are two knobs – one knob controls indoor fan speed and selects whether the unit is to operate in heating mode or cooling mode, and the other knob sets and controls room temperature. The indoor blower runs all the time at the user-desired set fan speed, and the heating and cooling functions cycle on and off with heating or cooling demand, unless the indoor fan speed knob is set to OFF; if set to OFF, there will be no unit operation under any condition.

24-Volt Remote Wall Thermostat Operation

For remote thermostat operation, heating and cooling functions will always be cycled on and off as dictated by the setting of the wall thermostat. In this mode, the room-side fan will run at factory-predetermined speeds for heating and cooling.

However, depending on the specific thermostat wiring detail that was used during the installation of the equipment, the indoor fan will normally be off when neither heating nor cooling are required, if the fan switch on the thermostat is set to “AUTO”. If the fan switch is set to “ON”, the indoor fan will circulate air continuously until there is a call for heating or cooling.

However, in some cases, where there are not enough thermostat wires in the wall for instance, control over the fan cannot be established at the thermostat. The indoor fan will be off when neither heating nor cooling are required no matter what the position of the fan setting on the thermostat. If the fan switch is set to “ON”, the indoor fan will not circulate air without a call for heating or cooling. If this presents a problem, ask your installer for solutions. The unit has the capability of interacting with many thermostat options. It is typically the existing infrastructure that imposes any limitations. The unit wiring diagram located on the back side of the front panel shows multiple thermostat wiring options.

Here is an overview of the hook-up diagrams:

3-Wire Thermostat Hook-up (Limited Functionality)
Used when there are only 3 thermostat wires available in an existing installation.
No indoor fan response to “Fan On” selection at wall thermostat.
Indoor fan energizes normally upon a thermostat call for cooling or heating.

3-Wire Thermostat Hook-up with a 4th wire as “Common” (Limited Functionality)
Used when there are only 4 thermostat wires available in an existing installation and the thermostat requires the “Common” or “C” terminal to be used (for a powered backlit thermostat, for example).
No indoor fan response to “Fan On” selection at wall thermostat.
Indoor fan energizes normally upon a thermostat call for cooling or heating.

Standard 4-Wire Thermostat Hook-up (Enhanced Functionality)
Used when there are at least 4 thermostat wires available in an installation.
Indoor fan will response to "Fan On" selection at wall thermostat, providing air circulation without requiring a call for heating or cooling.
Indoor fan energizes normally upon a thermostat call for cooling or heating.

Standard 5-Wire Thermostat Hook-up incorporating "Common" (Enhanced Functionality)
Used when there are at least 5 thermostat wires available in an existing installation and the thermostat requires the "Common" or "C" terminal to be used (for a powered backlit thermostat, for example). Indoor fan will response to "Fan On" selection at wall thermostat, providing air circulation without requiring a call for heating or cooling.
Indoor fan energizes normally upon a thermostat call for cooling or heating.

IMPORTANT: The factory-set indoor fan speeds must not be changed by maintenance personnel or end-users. Maintain wiring in accordance with the original wiring diagram provided with the unit.

To get reasonable comfort and energy consumption, it is recommended that wall mounted thermostats be set at 21°C (70°F) for heating and 25°C (77°F) for cooling.

Over-adjusting the thermostat will not increase the rate at which a unit will heat or cool the space; it is merely an on-off switch that responds to temperature.

ATTENTION: Do not place the wall thermostat in locations where it cannot detect true room temperature, such as in direct sunlight or near air registers. Also beware of drafts flowing through the thermostat wiring hole from in behind the wall.

OPERATING PROCEDURES

SUGGESTED OPERATING PROCEDURES
To obtain the maximum comfort from your packaged heating and cooling unit, the following procedures are recommended.

1. Always draw drapes or blinds in the summer, to block out direct rays from the sun.
2. Keep windows and doors closed when operating unit on cooling.
3. Prior to operating unit on cooling, ensure filter is clean for maximum efficiency.
4. Check filters regularly. Filters have to be cleaned in accordance with the unit environment. Never operate unit with a dirty filter or without a filter.
5. Ensure that the air discharge and return air openings are not obstructed, causing a restricted air flow condition. **DO NOT PLACE ARTICLES ON AIR INLET GRILLE.**
6. When adjusting the thermostat, be careful not to over control. A change in temperature of plus or minus 2 degrees can make the difference between comfort and discomfort. Set the control at the desired comfort settings and allow the unit to operate at that setting. The unit will automatically maintain the comfort level by cycling on and off as required.

IF THE UNIT DOESN'T WORK

The unit has been carefully designed and tested and should provide trouble free operation when properly sized, correctly installed, intelligently operated and checked by a competent serviceman at least once a year. However, if you should experience difficulty, check the following before calling for services.

1. Ensure that controls are properly set.
2. Check to see if a fuse has blown or a circuit breaker has tripped.
3. Check to see that the power plug is properly engaged (if applicable).
4. If unit is calling for cooling, check to see if outside condenser blower is running.
5. Is cooling being demanded at a very low outdoor temperature? The unit is designed to discontinue cooling operation at low outdoor temperatures, when air conditioning is not typically required.

If, after checking the above, your unit is still not operating, call in competent service personnel.

ATTENTION: When in cooling mode, if the compressor is shut off by switching from cooling to heating with the heat/cool switch, then wait 3 minutes before re-starting. The same applies for a power interruption.

PREVENTIVE MAINTENANCE

WARNING:
DISCONNECT POWER SUPPLY TO UNIT BEFORE SERVICING
FAILURE TO DO SO COULD RESULT IN MECHANICAL OR ELECTRICAL INJURY, OR DEATH

Before each heating and cooling season:

FOR THE USER:

1. Remove front panel
2. Remove the permanent aluminum mesh filter and wash it in warm soapy water, and rinse.

FOR QUALIFIED SERVICE PERSONNEL:

1. Remove front panel
2. Remove the permanent aluminum mesh filter and wash it in warm soapy water, and rinse.
3. Pry off the front cover of the plenum box and note the location of the air diverter. Pull out the air diverter. Remove the retaining screw and drop the air collar below the top surface of the plenum box, or remove it completely.
4. Pull off (disconnect) the low voltage thermostat wiring connector, if applicable.

5. Disconnect the attachment plug if cord connected. AFTER THE ENTERING ELECTRICAL SUPPLY HAS BEEN DE-ENERGIZED, disconnect the power supply wiring for hard-wired units, if applicable.
6. Release the spring loaded hook mechanism that is locking the chassis in the sleeve. There are a few ways to do this. The quickest way is to slide a thin device in under the hook in the void space between the chassis and sleeve (see notation in Fig. 4) and pull up on the spring loaded hook, while at the same time pulling the chassis slightly out of the sleeve. Repeat for the other side. If the left side of the unit is inaccessible, locate and lift the hand-operated Chassis Hook Slider Mechanism on the left side of the Control Box Cover (see Fig. 1). If the right side of the unit is inaccessible, remove the Indoor Blower Cover (see Fig. 1) and then use a long screwdriver as a pry device to lift the Right Side Chassis Hook Slider Mechanism to release the right side hooks.
7. Pull the heat/cool chassis from the wall sleeve and set on a stable surface.
8. Remove the outdoor cover and clean the condenser using customary industry practices for the type and severity of debris fouling the condenser coil fins. Repeat for the portion of the indoor coil exposed for cleaning. If the coil is severely fouled, and a more thorough cleaning of the evaporator is desired, further disassembly of the unit will be required as necessary, to gain the desired cleaning access.
9. With the condenser cover removed, take the opportunity to ensure that the condensate drain tube is clear of debris or blockages.
10. Clean the indoor and outdoor blower wheels with a soft brush. The blower blade material is strong, but caution must still be used to avoid bending blades.
11. The motors are permanently lubricated and need no re-oiling. Inspect electrical wiring and repair or replace as necessary.
12. Check all sealing gaskets and repair if necessary.
13. Reassemble unit in reverse order.
14. Reinstall heating/cooling chassis. Reinstall control wiring, and power wiring or cord plug, as applicable.
15. Re-install the collar in the plenum box and push it upwards until it fully engages over the chassis blower mouth. Replace the collar retaining screw.
16. Re-install the air diverter in its original location noted, in order to restore correct air distribution out the right and left sides of the plenum box, if applicable.
17. Re-install the Plenum Box Cover.
18. Replace Front Panel.
19. Turn power on and test unit for proper heating and cooling function.