ClimateMaster

A COMBINATION OF CHP CORP. AND FRIEDRICH™ CLIMATE MASTER, INC.

INSTALLATION INSTRUCTIONS
816 SERIES

INSTALLATION INSTRUCTIONS

The **Climate Master 816 Series** Heat Pump consist of two principal components which are shipped separately:

1. A cabinet assembly which contains the electrical power connections, controls or thermostat connections, a blower-motor assembly, a condensate drain pan, and normally riser pipes for connection to the water circulating system and condensate disposal sewer.

2. A chassis assembly designed to fit into the cabinet, consisting of a compressor, water to refrigerant heat exchanger, finned tube refrigerant to air heat exchanger, reversing valve, capillary tubes, a complete refrigerant charge, a primary condensate pan, and required electrical components.

Shipping Damage:

Immediately upon receipt of the units, check for signs of damage. If the cartons show signs of rough handling, ask the driver to sign a statement describing the condition of the cartons so a claim can be entered if concealed damage is found after the cartons are removed.

The chassis cartons are marked so they will shipped right side up. If the units are received, or show signs of having been in another position, ask the driver to sign a statement to this effect. File a claim with the freight hauler for any damage that is found later.

Handling:

Since the cabinets may have different size riser pipes, or special arrangements of air supply grilles, each cabinet may be individually tagged for a specific location in the building. Be sure the cabinet is installed in the proper location.

Always keep the unit chassis in an upright position both while in the carton and when out of it. Note the markings on the carton to determine its model number so it can be matched with a cabinet having the same model number.

Installation:

Move the cabinet into place with riser pipes raised clear of the floor. Lift cabinet upright and lower into place, making sure the riser pipes fit into the connections of the unit below.

Each riser is supplied with a 3"swaged portion on the top and sufficient extension at the bottom to insert approximately 2" into the swaged portion of the riser below. This unit-to-unit joint is not intended for full bottoming into the joint. This allows for variations in floor-to-floor dimensions and for correct riser positioning.

NOTE: Some jobs require that the unit risers be supplemented with "between the floors" extensions. These pieces should be assembled into position at this time.

Between the floor extensions may be field or factory supplied.

Once the units are positioned with the risers centered in the pipe chase, each unit should be positioned perfectly vertical (plumb) in two planes and anchored to the building structure. This may be done using sheet metal angles on at least two sides, attached to both the cabinet and the floor, using shims as needed. Braces installed at the top of the cabinet both anchor the cabinet and assist later when drywall is furred around the unit.

It is imperative that the unit be properly leveled to assure condensate drainage and proper operation. Once all units on a riser are anchored, unit-to-unit riser joints may be made as follows:

Each horizontal branch runout for supply and return water connections to the chassis must be centered top to bottom in the expansion slot in the back panel prior to joining risers. To insure proper vertical position, be certain that the top of the riser pipes are 3" above the cabinet top. Each riser joint must be in vertical alignment with a minimum of 1" penetration into each swaged joint. This condition will be met if floor-to-floor dimensions are as specified and if that branch runout is properly centered. The branch runout **must also be positioned perpendicular** to the riser back panel before the riser joints are brazed.

Riser joints must be made with a phos-copper, silfos, or other high temperature alloys. Soft solders,(50-50, 60-40, 85-15) or other low temperature lead alloys are not suitable for this application.

Wide variations in floor-to-floor dimensions may necessitate cutting off or extending individual risers. Such modifications are the full responsibility of the installing contractor.

The risers must not be rigidly fastened within each unit, but must be free to move within the pipe chase with normal vertical expansion and contraction movements.

The built-in risers must be anchored at some point to the building structure by the installing contractor. The unit design will accomadate up to 1½" expansion and contraction (3" total movement) of the riser assemblies. If the total calculated riser expansion exceeds 3" (min. to max.), the installing contractor must provide for and install additional expansion devices in each riser to compensate.

Leave the individual unit shutoff valves closed until after the system has been flushed and the chassis connected. A valve loop may be connected between the risers at their farthest end away from the pump. The valve is opened while fresh water is pumped throughout the system, and closed after the system is clean.

The system must be kept free of air. Install vents in the pipe loop where required for this purpose.

When making power wiring connections, check the unit data plate against the available power supply to be certain they are compatible. Electrical power may enter through the factory installed conduit which allows field wiring to be pulled by the installer from the top of the cabinet down to the control panel where wiring connections are to be made.

Follow applicable codes in the installation of all wiring. Size wiring to handle circuit ampacity marked on unit. Refer to data plate for maximum fuse or HACR type circuit breaker sizing for unit protection.

Follow the unit wiring diagram in connecting any external thermostat, and for power connections and grounding.

The wallboard should be attached by normal methods, although adhesive bonding alone is **not** recommended.

Use sheet metal low profile pan head screws to secure drywall to framework. Be sure to keep drywall dust out of the unit. Drywall dust can damage motors, and if drywall dust is allowed to collect on the coil fins, coil effeciency is reduced and compressor damage can occur. The manufacturer will not be resposible for components damaged due to drywall dust.

Do not apply sheet metal screws or nails where they are subject to penetrating the chassis, riser pipes, electrical junction boxes, raceways, nor where they interfere with removal of the chassis.

NOTE: Extreme care is necessary when driving screws in the vicinity of the control box and drain pan to prevent electrical shorts and condensate pan leaks. The drywall material need not be screwed to either the drain pan edges nor to the control box enclosure.

When cutting out supply and return holes for grilles, be sure to vacuum sweep clean all drywall dust from coils, drain pans, and the blower discharge plenum.

After the wallboard is in place, and rooms are prepared for final wall treatment, the supply and return air openings and the control compartment opening should be securely covered (as with cardboard cut from the protective shipping cartons) to prevent introduction of foreign material. If the wall texture and/or color is to be spray applied, it is imperative that none of the overspray contact the coil, fan or other unit parts. Unit warranties are voided if paint or foreign material are present on the coil, fan, piping, wiring or other internal components.

If return air enters the unit through openings in a stud wall, a duct must be furnished and installed by others to seal against the return air grille. Add a sheet metal block-off above and below the chassis so that all air entering the unit must properly pass through the filter and aircoil, without bypassing the coil.

NOTE: The units should not be operated at any time without complete enclosure, supply grille, return air grille and filter in place. Operation in any other condition will likely result in component failures, and clogging of coil surface motor ventilation openings, fan blades or all of the above.

Chassis:

Slide the chassis into the cabinet until the front chassis flange mates with the cabinet flange to form an air tight seal. To minimize noise, be certain the chassis is centered from left to right and is not twisted askew on the rails of the cabinet.

Connect the water pipe unions (or hose kits if furnished), being careful not to over tighten, since the threads could be damaged by excessive force.

After making these connections and after the pipe loop has been flushed clean, open the water valves and check for leaks.

Make the electrical connections. Three plug-together connectors, one black, one red and one yellow will be found at the end of the flexible cable attached to the chassis. Matching plugs will be found at the ends of the wires terminating just to the left side of the cabinet control box.

The upper end of the flexible cable is to be anchored in the knockout hole, and the plugs pushed together...red to red, black to black and yellow to yellow.

Install the air filter in the chassis by inserting it into the top bracket, pushing up until the bottom of the filter can be pushed into place, then let the filter down into the lower bracket.

Prior to installation of the return air/access panel, the following checks should be made:

1. Rotate the fan wheel by hand to insure that it is free and does not rub the housing. Rough handling during shipment may have caused the wheel to shift. Adjust if necessary.

2. Check to see that pipe connections are completed to the chassis and the service valves are opened after flushing the pipe loop, but before operating the unit.

3. Check that power conections from the chassis have been properly made in the upper control panel using mated color coded plugs and receptacles for each wire.

4. Check the drain line to see that it is not clogged and that it is properly positioned and secured.

5. Check to see that the nuts securing the motor blower assembly to the fan deck are tight.

If the unit is equipped with a combination stop and balance valve (ball valve) in the supply and/or return line, the proper flow through the coil should be set. See "Balancing Water Flow" below.

The return air sensing bulb (if factory supplied) is now inserted through the plastic bushings in the bottom panel of the control box and the chassis top panel and the attached capillary tube is routed just outside the filter frame to place the bulb in approximately the center of the filter. The bulb may be inserted into the filter media to hold it in proper position. Take care during the operation not to kink the capillary tube connecting the sensing bulb to the thermostat control. Allow sufficient length to make all bends gradual and coil any excess tubing below the control box. Be certain the capillary tube does not contact any live electrical terminal within the control box.

Install the cabinet Return Air/Access Panel. If the panel includes a return air louver, insert the bottom of the panel first, then push in at the top. Fasten the panel by turning the cam lock fasteners. It may be necessary to adjust these fasteners depending on the thickness of wall board used.

If "solid" Return Air/Access panels are furnished, the upper and lower block off plates, which include the brackets for supporting each panel, must be attached to the cabinet after the chassis is properly installed.

The upper block off plate tucks inside a flange at the top of the chassis and attaches to the cabinet by removing four (4) sheet metal screws that fasten the drywall stop around the perimeter of the opening through which the chassis is removed or replaced. These four(4) sheet metal screws are then reused in the same holes to fastened the upper air block off plate. The lower air block off plate is similarly attached by loosening a sheet metal screw on the chassis which holds the bottom center panel of the chassis control panel. The lower block off plate then tucks up underneath that control panel cover. The lower edge of this air block off panel is then held at each side by removing a screw from the drywall stop and then replacing each in the same hole in order to also fasten the lower edge of the block off plate. Then retighten the screw at the top center of the block off plate.

Initial Startup:

The water circulation system must be in operation, circulating water within the required temperature range of 60 to 90 degrees F.

1. Supply and return hand valves must both be open at each unit.

2. Return Air/Access Panel must be in place any time the unit is in operation.

3. Set the system switch to "OFF".

4. Turn on the power supply to the unit.

5. Set the thermostat to its lowest setting.

6. Set the system switch to "COOL". The unit should operate in the cooling mode. (Unit will not cool if room ambient is below about 65° F.)

7. Set the system switch to "OFF".

8. Set the thermostat to its highest setting.

9. Set the system switch to "HEAT". The unit should be operating in the heating mode. (Unit will not heat if room ambient is above about 85° F.)

24 Volt Wall Thermostats:

The manufacturer's installation instructions, packed with the thermostat, should be followed. Wiring to the thermostat is indicated in the wiring diagram on the unit.

With manual changeover thermostats, set the heat anticipator at 0.4. With automatic changeover thermostats, set the first stage heat anticipator at 1.0, with the second stage set at 0.4.

If the "plug-in" option was specified, thermostat wiring has been factory connected to the control panel, with a plug at the opposite end. A mating plug is installed at the end of the matching wires factory installed to the thermostat subbase. When the thermostat is field mounted on the drywall that conceals the heat pump, the mating plugs may be connected to complete the thermostat wiring.

Balanced Flow:

If flow measurement connections were provided, use these per the directions with the devices. If no provisions have been made for flow measurement, use a dual temperature test instrument, fastening one sensor to the inlet (supply) water pipe inside the unit, and the other sensor to the return pipe. Replace the door panel,being careful not to damage the sensor leads leading out to the temperature indicator.

Start the unit in the cooling mode and note the temperature rise of the water going through the unit. Close down on the water flow balancing valve until the temperature rise is as specified, generally about 15°F. The same rate of water flow during heating operation will result in a water temperature drop of about 7° or 8°F.

Fan Speed

Remove the front panel and open the control panel. The wires coming from the fan motor will be found inside. Two of the wires will be fitted with yellow plug connectors. The unit is shipped with the black wire from the fan motor connected. By pulling this connector apart, and plugging the red wire's connector in, the fan will run at low speed. Use the high fan speed if there is a top duct connection for supply air.

Maintenance

Once each year, put six (6) drops of 20 weight non-detergent motor oil in each oiler on the fan motor. Check the air filter periodically and clean or change it whenever it is covered with solids. The time between cleaning or changing will vary with each location. It is very important that the filter be kept clean. Never operate the unit without a filter in place!

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OPERATION AND MAINTENANCE INSTRUCTIONS WITH UNIT MOUNTED THERMOSTAT

816 SERIES

OPERATION

Operate the heat pump from the unit mounted switch and thermostat located behind the unit control door.

Automatic Change Over Control

Turn control switch to "*On*" position and turn thermostat knob in "*Warmer*" direction to warm the room up *or* in "*Cooler*" direction to cool the room down. Once the desired comfort setting has been determined, leave control switch in the "*On*" position and thermostat will automatically select heating or cooling mode to maintain desired comfort level.

Turn control switch to "*Off*" position when air conditioning is not required.

Manual Change Over Control

Select "*Heat*" or "*Cool*" position on control switch.

Turn thermostat in "*Warmer*" direction to warm room up *or* in "*Cooler*" direction to cool room down. Once the desired comfort setting has been determined, simply select "*Heating*" or "*Cooling*" on control switch as needed.

Select "*Off*" position on control switch when air conditioning in not required.

MAINTENANCE

1. Air filters should be changed or cleaned whenever they become dirty enough to restrict air flow. Check at least once every three months. DO NOT operate without having the filter in place.

   To remove lift filter *up* and pull out on bottom.
   Replace by sliding top edge of new filter *up* into rack, pushing bottom in, and filter will drop into place.

2. Once every year, remove the service panel and add 10 drops of SAE 20 *non-detergent* oil to each of the two oil holes on the fan motor. At the same time, check the condensate pan and drain, and wipe clean if necessary. Also check the supply and return water hoses, and replace if there is any indication of leaks or cracks in the hose.