



INSTALLATION, OPERATION, AND MAINTENANCE – WATER COOLED CONSOLE



Climate Master • 2007 Beechgrove Place • Utica, New York 13501

A DIVISION OF INTERNATIONAL HEATING & AIR CONDITIONING CORP.



F-10003

UNPACKING AND INSPECTION

Each Climate Master Heating/Cooling Console has been inspected, operated and tested at the factory by quality control. It was carefully packed to arrive in good condition, however, rough handling by a carrier can cause damage. All equipment is shipped F.O.B. factory; therefore, claims for damage must be initiated by the receiver against the carrier.

VISIBLE DAMAGE

Report any evidence of visible damage to the carrier's agent at once. Request an inspection and a report. If the unit has been damaged to the extent that it must be returned to the factory, return it via the same carrier and file the necessary claims against that carrier.

PIPING AND ELECTRIC

All water and electrical connections must be installed in accordance with applicable codes, regulations and piping, wiring, and installation instructions supplied by Climate Master. Where local codes are at variance with these installation instructions, the codes should be followed.

WATER PIPING

Water piping may be run either above or below the floor. Where above-the-floor piping is used (either single or dual pipe) it may be concealed within a prefabricated piping enclosure. Each one-pipe unit for above-the-floor piping is shipped complete including shut-off valves, union, air vent and 2" pipe extensions beyond each end of the cabinet. Where piping is run below the floor and stubbed up to the unit, field connections are necessary to connect the supply and return to the factory-piped extensions inside the cabinet. Brass fittings must be used for all connections since the factory piping is copper. To reduce the possibility of system contamination when making a pipe thread connection a commercial brand of Teflon ribbon pipe thread sealer must be used.

A balancing valve must be installed at either the beginning or end of each piping loop. For more accurate system balancing, a flow indicator and a thermometer should also be installed in each loop. In the case of a one-pipe system, each loop should have hand shut-off valves at both the supply and return ends, with the drain connection such that each loop may be isolated and drained without disrupting the flow of the entire system.

CAUTION: The water inlet and outlet pipes to the condenser are clearly tagged and marked. Be sure that the system supply and return piping is connected accordingly. Each one-pipe unit is marked either right hand or left hand. The hand is determined by facing the unit. If the loop supply water enters the unit from the right, it is Right Hand; the opposite is a Left Hand Unit.

CONDENSATE PIPING

For above-the-floor units, caution must be used in connecting the drain pan connector to the condensate line. Pitch becomes limited in above-the-floor applications and a vertical drain line should be installed after every 8 units in order to properly remove condensate. For below-the-floor piping, condensate lines must be run and pitched at least 1/4" per foot. If a flexible hose is used to connect the unit condensate drain to the drain line, the hose must be clamped properly to the lines and the installer must ensure that the line is not kinked. All condensate lines must be installed in accordance with local codes.

WIRING

Line voltage wiring should be provided to each unit in accordance with specifications and applicable electrical codes. The supply voltage must be within plus or minus 10% of the nameplate rating of the single voltage units, and within plus 10% minus 5% of the nameplate rating of the dual voltage units. Before connecting the line cord to the receptacle, (supplied by others), be sure that the OFF button on the switch is depressed. Units are normally shipped with the OFF button depressed.

INSTALLATION

Open the carton at the point of installation exercising care not to scratch the surface of the cabinet with the tools used.

The carton should be used to cover and protect the unit against damage after installation is complete and while construction activity continues.

Remove the front panel by grasping the upper edge of the panel and lifting upwards. The combination cabinet and chassis should then be set level on the floor and shimmed where necessary. Check all electrical supply cables to make sure access will be available for wiring.

When the above steps are complete, the unit should then be fixed permanently to the wall with the use of screws, molly bolts, lag screws, etc., through the holes provided in the cabinet frame.

NOTE: The compressors are internally spring mounted and externally isolated. There are no hold downs to be removed. The unit receives its return air from beneath the front panel kick plate. If additional flooring or carpeting of more than 3/4" is put down on the rough grade, the unit must be raised an appropriate amount so that the proper return air area is maintained. Note: Failure to provide the designed return air can cause coil frosting, compressor failure and voiding of the warranty. After installation, caution should be exercised in seeing that drapes, desks, files, cabinets, etc., are not placed in front of the unit to obstruct air flow. When water, drain and electrical connections are finished, ensure that neither piping nor electrical cables touch or rattle. Check that all fittings are tight and that all connections are made properly. Check drain lines to see that they are installed, pitched, and connected from the unit drain pan to the drain line in the manner acceptable by local codes. Finally, check to see that the air filter is in place. After piping connections have been completed, the two hand valves inside the unit should be closed for flushing the system. Flush all water system lines, making certain that the water is clean. The units will not operate properly if the heat exchangers become fouled with dirt, pipe dope, shavings, or any other foreign matter. Damage will occur if water is supplied that is corrosive or impure, or if the water flow through the condenser is restricted with foreign matter. Such conditions will void the warranty.

CLEANING THE SYSTEM

For best cleaning results after the initial flushing, the valves to the individual units should be opened and the system should be filled in the usual manner. After filling the system, the water should be brought up to a 90°F temperature and allowed to circulate for several hours. The

system should be drained completely and refilled with fresh water.

If water conditions are known to be bad, it is advisable to consult a water treatment organization before filling the system. Caution should be exercised in cleaning the system. Special "stop-leak" compounds and Anti-Freeze solutions should not be added to the system.

AIR REMOVAL

After installation is complete and the system has been filled, leak-tested, drained, flushed clean and refilled, air must be removed before starting the units. Air that is not removed can cause pockets in the condenser coils restricting the flow of water and thereby resulting in damage to the unit. The procedure for venting is as follows:

1. Each unit must be vented beginning with the unit closest to the pump. When venting the first time, make sure all OFF buttons are depressed and that power plug is in place. At this point the electric power to each unit should have been verified.
2. The main supply lines and loops should be vented first through a manual or automatic vent installed at the highest point in the system.
3. Open each hand valve at the unit and using a screw driver and a cup, open the vent and collect at least one cup of water or keep open until a steady flow comes through the vent. Close the vent and repeat procedure throughout each unit in the system.
4. After each unit has been vented in this manner, recheck the system pressure and add additional water as necessary.
5. Vent the main supply lines again.

STARTUP PROCEDURE

WCC UNITS AUTO CHANGEOVER

1 SPEED FAN MOTOR

1. Establish system flow.
 2. Flush clean and fill system.
 3. Open all unit and system valves.
 4. Vent each unit and main.
 5. Check flow rate and balance the system with the balancing valves and flow indicators to provide design flow conditions to each loop system. The proper flow rate to the system is very important since too little flow can cause improper operation and may result in damage to the unit.
 6. Raise water temperature to approximately 110°F. CAUTION — THE UNIT MUST NOT BE USED FOR TEMPORARY HEAT UNDER ANY CIRCUMSTANCES. IT MUST NOT BE OPERATED ON ANY OPEN PIPING.
 7. Check and test flow and temperature alarm system.
 8. Verify and check all necessary electrical protection circuits and verify proper voltage to each unit as established.
 9. Return to the first unit as outlined in the first venting procedure and proceed throughout each unit as follows:
 - A. Plug in unit with OFF button depressed.
 - B. Turn thermostat counterclockwise to maximum "Heat" position.
 - C. Depress "Vent" Button which will allow only the room blowers and vent to operate. If fan(s) do not operate recheck the power and refer to the trouble shooting chart in the appendix.
 - D. Now depress the "ON" button. The discharge air should grow warmer indicating proper operation of the three-way valve.
 - E. In this position re-vent the unit for elimination of any additional air.
 - F. Turn the thermostat clockwise toward the "cooler" position until a clicking sound is heard. The fans will continue to run and the compressor will come on. Let the unit run in this position until cooling is verified.
- NOTE: If the compressor is turned off for any reason, wait approximately two minutes before restarting.
- G. If water noise is still heard, it indicates air is still in the system. Vent the unit until this noise disappears.
 - H. By hand, feel the water inlet and outlet pipes to the condenser. A temperature differential should be felt indicating proper operation.
 - I. If in any of the above procedures the unit malfunctions, refer to the Trouble Shooting Chart in the Appendix.
 - J. Check the unit for any vibrations, unusual noises or water leaks.
 - K. After being satisfied the unit operates in all positions, it should be turned off. Repeat the above procedures on the next unit and continue until all units have been checked and started.
10. When the system has been checked and is ready for operation, the units should be turned on and the thermostats should be set for the temperature range desired.
 11. With the system in operation, check the water system temperature controls and ensure they are operating properly. Such controls are:
 - A. Controls that energize the boiler.
 - B. Controls that energize the cooling tower.
 - C. Controls that de-energize the boiler and tower.

STARTUP PROCEDURE

WCC UNITS MANUAL CHANGEOVER

1 SPEED FAN MOTOR

1. Establish system flow.
 2. Flush clean and fill system.
 3. Open all unit and system valves.
 4. Vent each unit and main.
 5. Check flow rate and balance the system with the balancing valves and flow indicators to provide design flow conditions to each loop system. The proper flow rate to the system is very important since too little flow can cause improper operation and may result in damage to the unit.
 6. Raise water temperature to approximately 110°F. CAUTION — THE UNIT MUST NOT BE USED FOR TEMPORARY HEAT UNDER ANY CIRCUMSTANCES. IT MUST NOT BE OPERATED ON ANY OPEN PIPING.
 7. Check and test flow and temperature alarm system.
 8. Verify and check all necessary electrical protection circuits and verify proper voltage to each unit as established.
 9. Return to the first unit as outlined in the first venting procedure and proceed throughout each unit as follows:
 - A. Plug in unit with OFF button depressed.
 - B. Turn the thermostat clockwise to the maximum cool position.
 - C. Depress the heat button. (This will allow only the room blowers to operate.) If fans do not operate, recheck the power. If power is verified, refer to the Trouble Shooting Chart in the Appendix.
 - D. Now turn the thermostat counter-clockwise toward "Warmer" until a clicking sound is heard. The discharge air should grow warmer indicating correct operation of the three-way valve.
 - E. In this position, re-vent the unit for the elimination of additional air.
 - F. Depress the "Cool" button. Turn the thermostat clockwise toward the cool position until a clicking sound is heard. The compressor will come on and the fans will run.
- NOTE: If the compressor is turned off for any reason, wait approximately two minutes before restarting.
- G. If water noise is still heard, it indicates air is still in the system. Vent the unit until this noise disappears.
 - H. By hand, feel the water inlet and outlet pipes to the condenser. A temperature differential should be felt indicating proper operation.
 - I. If in any of the above procedures the unit malfunctions, refer to the Trouble Shooting Chart in the Appendix.
 - J. Check the unit for any vibrations, unusual noises or water leaks.
 - K. After being satisfied the unit operates in all positions, it should be turned off. Repeat the above procedures on the next unit and continue until all units have been checked and started.
10. When the system has been checked and is ready for operation, the units should be turned on and the thermostats should be set for the temperature range desired.
11. With the system in operation, check the water system temperature controls and ensure they are operating properly. Such controls are:
 - A. Controls that energize the boiler.
 - B. Controls that energize the cooling tower.
 - C. Controls that de-energize the boiler and tower.

STARTUP PROCEDURE

WCC UNITS AUTO CHANGEOVER

2 SPEED FAN MOTOR

1. Establish system flow.
2. Flush clean and fill system.
3. Open all unit and system valves.
4. Vent each unit and main.
5. Check flow rate and balance the system with the balancing valves and flow indicators to provide design flow conditions to each loop system. The proper flow rate to the system is very important since too little flow can cause improper operation and may result in damage to the unit.
6. Raise water temperature to approximately 110°F. CAUTION — THE UNIT MUST NOT BE USED FOR TEMPORARY HEAT UNDER ANY CIRCUMSTANCES. IT MUST NOT BE OPERATED ON ANY OPEN PIPING.
7. Check and test flow and temperature alarm system.
8. Verify and check all necessary electrical protection circuits and verify proper voltage to each unit as established.
9. Return to the first unit as outlined in the first venting procedure and proceed through-out each unit as follows:
 - A. Plug in unit with "OFF" button depressed.
 - B. Turn thermostat counterclockwise to maximum "Heat" position.
 - C. Depress "Vent" Button which will allow only the room blowers and vent to operate. If fan(s) do not operate recheck the power and refer to the trouble shooting chart in the appendix.
 - D. Now depress the "ON" button. The discharge air should grow warmer indicating proper operation of the three-way valve.
 - E. In this position re-vent the unit for elimination of any additional air.

F. Turn the thermostat clockwise toward the "cooler" position until a clicking sound is heard. The fans will continue to run and the compressor will come on. Let the unit run in this position until cooling is verified.

NOTE: If the compressor is turned off for any reason, wait approximately two minutes before restarting.

- G. If water noise is still heard, it indicates air is still in the system. Vent the unit until this noise disappears.
 - H. By hand, feel the water inlet and outlet pipes to the condenser. A temperature differential should be felt indicating proper operation.
 - I. If in any of the above procedures the unit malfunctions, refer to the Trouble Shooting Chart in the Appendix.
 - J. Check the unit for any vibrations, unusual noises or water leaks.
 - K. After being satisfied the unit operates in all positions, it should be turned off. Repeat the above procedures on the next unit and continue until all units have been checked and started.
10. When the system has been checked and is ready for operation, the units should be turned on and the thermostats should be set for the temperature range desired.
 11. With the system in operation, check the water system temperature controls and ensure they are operating properly. Such controls are:
 - A. Controls that energize the boiler.
 - B. Controls that energize the cooling tower.
 - C. Controls that de-energize the boiler and tower.

STARTUP PROCEDURE

WCC UNITS MANUAL CHANGEOVER

2 SPEED FAN MOTOR

1. Establish system flow.
 2. Flush clean and fill system.
 3. Open all unit and system valves.
 4. Vent each unit and main.
 5. Check flow rate and balance the system with the balancing valves and flow indicators to provide design flow conditions to each loop system. The proper flow rate to the system is very important since too little flow can cause improper operation and may result in damage to the unit.
 6. Raise water temperature to approximately 110°F. CAUTION — THE UNIT MUST NOT BE USED FOR TEMPORARY HEAT UNDER ANY CIRCUMSTANCES. IT MUST NOT BE OPERATED ON ANY OPEN PIPING.
 7. Check and test flow and temperature alarm system.
 8. Verify and check all necessary electrical protection circuits and verify proper voltage to each unit as established.
 9. Return to the first unit as outlined in the first venting procedure and proceed through-out each unit as follows:
 - A. Plug in unit with OFF button depressed.
 - B. Turn the thermostat clockwise to the maximum cool position.
 - C. Depress the heat button. (This will allow only the room blowers to operate.) If fans do not operate, recheck the power. If power is verified, refer to the Trouble Shooting Chart in the Appendix.
 - D. Now turn the thermostat counter-clockwise toward "Warmer" until a clicking sound is heard. The discharge air should grow warmer indicating correct operation of the three-way valve.
 - E. In this position, re-vent the unit for the elimination of additional air.
 - F. Depress the "Lo-Cool" button. Turn the thermostat clockwise toward the cool position until a clicking sound is heard. The compressor will come on and the fans will run (at low speed).
 - G. Next, depress the Hi-Cool button. The compressor will continue to run and the fans will switch to Hi speed. Let the unit run in this position until cooling is verified.
- NOTE: If the compressor is turned off for any reason, wait approximately two minutes before restarting.
- H. If water noise is still heard, it indicates air is still in the system. Vent the unit until this water noise disappears.
 - I. By hand, feel the water inlet and outlet pipes to the condenser. A temperature differential should be felt indicating proper operation.
 - J. If in any of the above procedures the unit malfunctions, refer to the Trouble Shooting Chart in the Appendix.
 - K. Check the unit for any vibrations, unusual noises or water leaks.
 - L. After being satisfied the unit operates in all positions, it should be turned off. Repeat the above procedures on the next unit and continue until all units have been checked and started.
10. When the system has been checked and is ready for operation, the units should be turned on and the thermostats should be set for the temperature range desired.
 11. With the system in operation, check the water system temperature controls and ensure they are operating properly. Such controls are:
 - A. Controls that energize the boiler.
 - B. Controls that energize the cooling tower.
 - C. Controls that de-energize the boiler and tower.

MAINTENANCE AND OPERATION FILTER

The units come equipped with a permanent washable filter. During the construction period this filter may become clogged with construction dust. It should be checked and cleaned before the units are put into operation. The filter can be cleaned with tap water and shaken free of moisture and installed. During the first six months of operation these filters should be checked and cleaned every three months. However, after the first six months the filter cleaning period may be extended to six months if the building is clean enough. **CAUTION: A clogged filter can restrict air flow to the coil and, therefore, cause damage to the unit and result in voiding the warranty. THE UNITS SHOULD NEVER BE OPERATED WITHOUT THE FILTER IN PLACE.**

LUBRICATION

The units are equipped with lubricated fan motors. Do not oil initially. The motors do have oil cups and it is recommended that the motor be oiled with non-detergent SAE #10 oil every year. This can be done by removing the fan cover plate and oiling with a hand pressure oiler. Use only three or four drops of oil per cup. The hermetic

compressors are sealed and require no lubrication. All other controls - high and low temperature or pressure cut outs, freeze stats, thermostats, switches and valves - are sealed items requiring no maintenance. In the case of a failure they should be replaced.

DRAIN LINES

The condensate drain line can become plugged from time to time and this should be inspected once a year to prevent leakage.

SAFETY CONTROLS

Each unit is equipped with factory installed safety controls designed to protect the units from abnormal operating conditions. System controls mentioned herein are additional controls to protect the system.

AUXILIARY EQUIPMENT

The Climate Master Water Cooled System also incorporates other components important to proper system operation such as circulating pumps, a heat rejector and a heater, such as an electric oil or gas fired boiler. These items must also be properly maintained and periodically checked because failure or malfunction of any one of these components can cause system difficulty or shut-down.

TROUBLE-SHOOTING CHART

Complaint	Possible Cause	Checks & Corrections
UNIT DOES NOT RUN.	Blown fuse	Check for blown fuses or tripped circuit breaker. Replace fuse or reset circuit breaker.
	Broken or loose wires	Check power connection to the unit and check wall outlet.
	Low voltage	Check voltage. Does it match name plate rated voltage?
	Defective switch	Check if there is power into switch but no continuity through it. Replace switch.
UNIT BLOWS FUSE.	Undersized fuse	Check fuse size. Replace with proper size fuse.
	Shorted or incorrect unit wiring.	Check and correct unit wiring.
	Shorted capacitor	Check capacitor, if found defective, replace.
	Shorted or stuck compressor	Check compressor.
	Compressor short cycling	Check compressor.
	Compressor starting difficulty	Check voltage.
	Dirty or blocked condenser coil	Check and blow out with air if necessary.
BLOWERS RUN BUT COMPRESSOR DOES NOT.	Thermostat improperly set	Check thermostat setting.
	Defective thermostat	Check thermostat operation. Replace, if found defective.
	Loose or broken wires	Check unit wiring and wiring connections at switch, thermostat, compressor and capacitor. Replace or repair as necessary.
	Running capacitor defective	Check capacitor. Replace if found defective.
	Overload open or defective	Check for overheated compressor or defective overload. Replace overload if found defective.
	Compressor motor defective	Replace compressor.
	Low voltage	Check voltage.
COMPRESSOR CYCLES OFF AND ON, BLOWERS RUNNING.	Low voltage	Check voltage.
	Water flow through condensor restricted or stopped	Check condensor coil for restriction or dirt. Clean if required.
	Thermostat feeler bulb not in proper position	Check bulb for proper location in return air stream. Adjust or relocate if necessary. Bulb should be pitched down towards the capillary.
	Defective or incorrect overload	Check if overload has tripped. Check compressor temperature. If compressor is not overheated and if amperage is normal and overload trips, change overload.

TROUBLE SHOOTING CHART

Complaint	Possible Cause	Checks & Corrections
UNIT VIBRATES OR RATTLES.	Discharge or suction tube hitting metal surface	Bend and adjust for clearance where hitting.
	Loose or bent blower	Tighten or replace blower.
WATER DRIPS FROM UNIT.	Blower motor out of alignment, bent shaft or loose on mounting	Check alignment and tighten mounting. Replace motor if shaft is bent.
	Unit not level or pitched correctly	Level unit.
NOISY BLOWER OPERATION.	Condensate drain line kinked or plugged	Clean condensate drain.
	Blower hitting	Check blower, adjust for clearance.
UNIT OPERATES, NOT COOLING PROPERLY.	Bent blower	Check and replace blower.
	Loose blower on shaft	Check and tighten.
	Clogged air filter	Check filter. Clean or replace if found too dirty.
EVAPORATOR ICES OVER.	Water flow through condensor restricted or stopped	Check condensor flow.
	Defective compressor or refrigerant leak	If compressor runs but the evaporator does not cool, it would indicate either a defective compressor or loss of refrigerant charge.
	Clogged air filter	Check filter. Clean or replace if found too dirty.
	Evaporator blower motor tripping off on overload	Check for overheated evaporator blower motor and tripped overload. Replace motor if necessary.
UNIT WILL NOT WORK ON "HEATING".	Unit operating at too low room temperature	If room temperature drops below 65 F. the evaporator may ice over.
	Unit operates at too low water temperature	When unit operates when water too cold it may ice over.
	Defective thermostat	If motor works in other positions and thermostat, klixon, etc. are OK, check switch. Replace if found defective.
	Clogged or dirty filter	Check filter. Clean or replace if found too dirty.
	Thermostat improperly set	Is it below room temperature? Check thermostat setting.
	Defective thermostat	Check thermostat operation. Replace if found defective.
	Incorrect wiring	Check for broken, loose or incorrect wires.
3-Way Valve Inoperative	Evaporator motor defective	Check evaporator motor in one of the other switch positions. If it does not work check for open overload. If motor is not overheated replace it.
		Check wiring & thermostat. If voltage is supplied to valve motor and valve does not throw, replace valve.