

RETROAIRE™

The Right Fit for Comfort

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An ISO 9001-2000 Certified Company



CM / CW / WM

R-410A High Efficiency Water Source Heat Pump

MODEL CM - Heat pump nominal capacities

8,000	12,000	15,000	Btuh
2.6	3.5	4.4	kW

MODEL CW - Straight cooling / heat pump nominal capacities

8,000	10,000	13,000	17,000	Btuh
2.6	3.5	4.4	5.3	kW

MODEL WM - Heat pump nominal capacities

9,000	12,000	15,000	Btuh
2.6	3.5	4.4	kW

Installation, Operation, & Maintenance Manual

CM

Replacement for:
Freidrich and Climate Master "801"
Series Water Source

CW

New Construction
Replacement for:
Freidrich and Climate Master CW and
"800" Series Water Source

WM

Replacement for:
McQuay, Singer, or Climate Control WM
Series Water Source

Read This First

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To the installer

Retain this manual and warranty for future reference.

Before leaving the premises, review this manual to be sure the unit has been installed correctly and run the unit for one complete cycle to make sure it functions properly.

To obtain technical service or warranty assistance during or after the installation of this unit, contact your local representative. Visit our web site www.retroaire.com for a local representative listing. For further assistance call 1-800-228-9364.

When calling for assistance, please have the following information ready:

Model Number _____

Serial Number _____

Date of installation _____

NOTICE

RetroAire™ Water Source Console Units are backed by EMI and ECR International and are tested and rated in accordance with:

AHRI/ ISO 13256-1

UL-484

Due to ongoing product development, product designs and specifications may change without notice.

Please contact the factory for more information.

Read This First *(continued)*



Recognize this symbol as an indication of important safety information.

Inspection

- Carefully check the shipment against the bill of lading.
- Make sure correct chassis has been received (*as well as any options*).
- Verify your equipment by using "model nomenclature" on page 7.

Verify unit:

- Unit size and type correct per submittal sheet and job requirements?
- Voltage correct?

Verify options (if any):

- Capacity, electric heat, if used?
- Hydronic coil included, if required? Piping located as required?
- All other factory installed options installed, if any?
- All field installed options included, if any?

Shipping damage **MUST** be reported to the carrier **IMMEDIATELY**.

- **Examine the exterior.**
- **Remove cover and examine compressor and piping for signs of damage.**
- Inspect each component for damage.
- Concealed damage must be reported to the carrier within **15 days** of the receipt of the shipment.
- The carrier must make proper notation on the delivery receipt of all damage identified and complete a carrier inspection report.
- The purchaser must notify ECR International's Customer Service department of all damage and is responsible for filing any necessary claims with the carrier.

Customer Service : (800) 228-9364

General precautions

DANGER

Electrical Supply

Carefully read the rating plate located on the front panel. The RetroAire replacement Water Source Console Units must:

- **Be properly connected** to electrical supply with the proper voltage as stated on the rating plate.
- **Be properly grounded.**
- **Use the properly-sized over-current protection device** as stated on the rating plate. (*time-delay fuse/HACR Breaker*)

Do not modify the RetroAire replacement Water Source Console Units

Do not attempt to modify or change this unit in any way. Tampering with RetroAire replacement Water Source Console Units is dangerous and may result in serious injury or death. Tampering voids all warranties.

Power Cord-Optional

The **power cord** supplied with the RetroAire replacement Water Source Console Units should be checked before every use. Follow the instructions in the order listed on the device. Do not use the product if the cord fails the test. A damaged power supply cord must be replaced with a new cord from the manufacturer and not repaired. The use of extension cords is prohibited.

Failure to follow these instructions can result in a fire, explosion or electrical shock causing property damage, personal injury or death.

WARNING — Safety instructions

Save these instructions — this manual is intended as an aid to **qualified service personnel** for proper installation, operation, and maintenance of RetroAire replacement Water Source Console Units.

Read all instructions thoroughly and carefully before attempting installation or operation. Install or locate this unit only in accordance with these instructions. Use this unit only for its intended use as described in this manual.

Turn off the electrical supply before servicing the unit.

Water Source Console Units chassis are heavy. To avoid injury, use assistance when lifting.

Do not use the unit if it has damaged wiring, is not working properly, or has been damaged or dropped.

Failure to follow these instructions may result in improper installation, operation, service, or maintenance, possibly resulting in fire, electrical shock, property damage, personal injury, or death.

General Product Information

Product description

All RetroAire Water Source Console Units units are available as heat pump systems. Model CW is available as a straight cool unit.

The Retroaire Water Source Console Units:

- Use R-410A refrigerant.
- Include high-efficiency rotary compressors, protected by a 5-year warranty.
- Include enhanced, high-efficiency heat exchangers.
- Offer two fan speeds.
- RetroAire Water Source Console Units ratings:
- Water Source Console Units units are available in nominal sizes of 8,000 Btuh (2.3kW), 9,000 Btuh (2.6kW), 10,000 Btuh (2.9kW), 12,000 Btuh (3.5kW), 13,000 Btuh (3.8kW), 15,000 Btuh (4.4kW) or 17,000 Btuh (4.9kW).
- Energy Efficiency Rating(EER) in excess of 13.
- Coefficient of performance(COP) in excess of 4 for (heat pump models only)

Standard controls and components

Construction

- 20-gauge galvanized steel Water Source Console Units construction of chassis.
- Powder-coated evaporator drain pan.
- Foam strip seal for supply air duct.

Air systems

- Indoor fan motor is are thermally-protected PSC type.
- Air-stream surfaces are insulated with 1/4" fiber-glass or 1/8" (3.2 mm) Volara™.
- The indoor fan is a foward-curved type, directly mounted to the motor shaft.

Controls

- Unit-mounted operating controls include thermostat, fan speed control and heat/cool switch.
- Remote mount controls include fan speed control.
- High pressure switch.
- Low Temperature/Low water flow cut out switch compressor lock out relay
- 4-Way reversing valve with solenoid activated by line voltage. Solenoid is energized for cooling mode. (Heat pump models only)

Factory-installed options (see model nomenclature p.7)

- Voltage
- Electric Heat/Hydronic Heat
- Piping
- Cabinet options
- Pipe connection
- Control

Field-installed accessories

- Remote thermostat
- Hydronic heat valves
- Cabinets

NOTICE

RetroAire units can be equipped with either unit-mounted or remote controlled thermostats. Specify when ordering.

Figure 1 CM Chassis

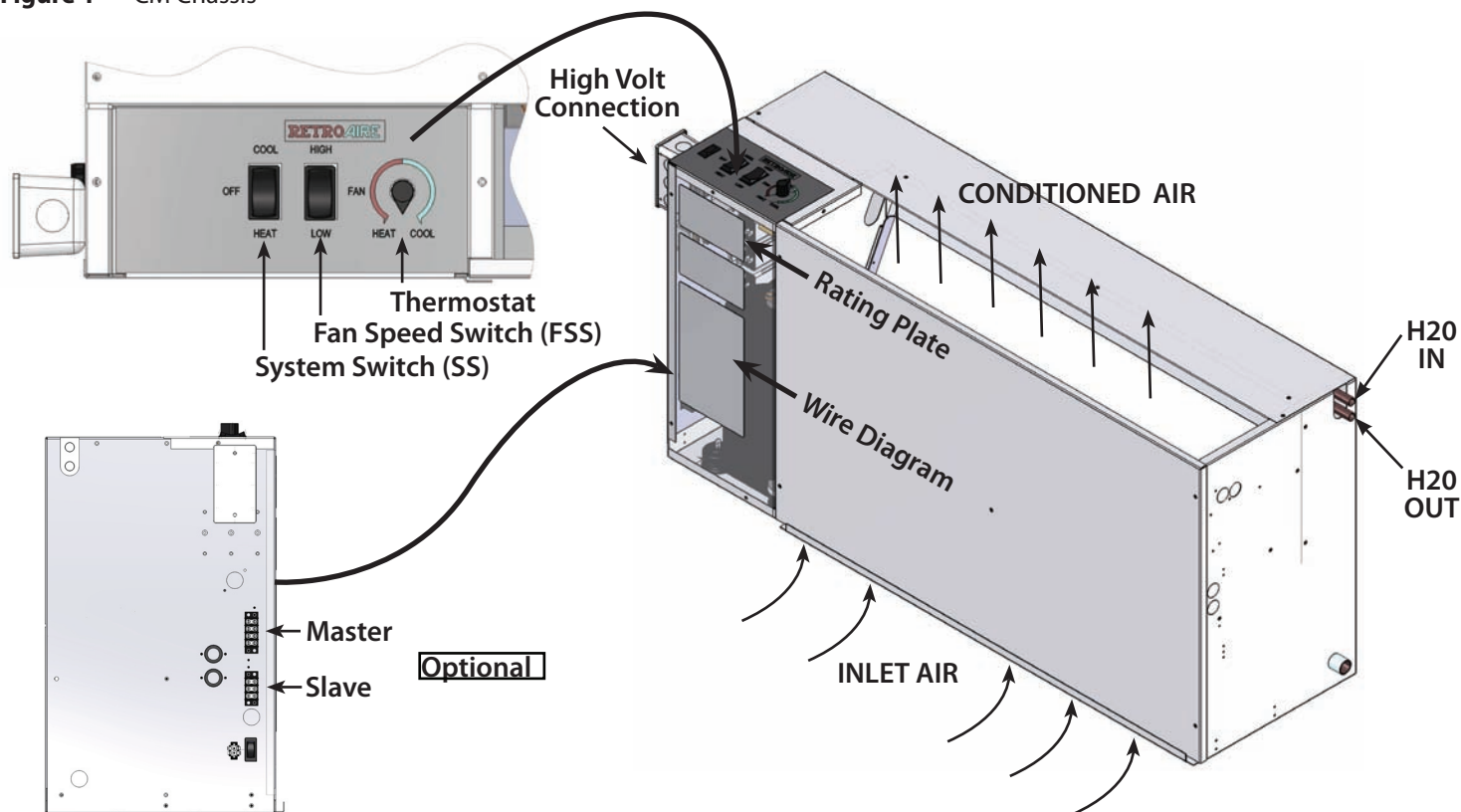


Figure 2 CW Chassis

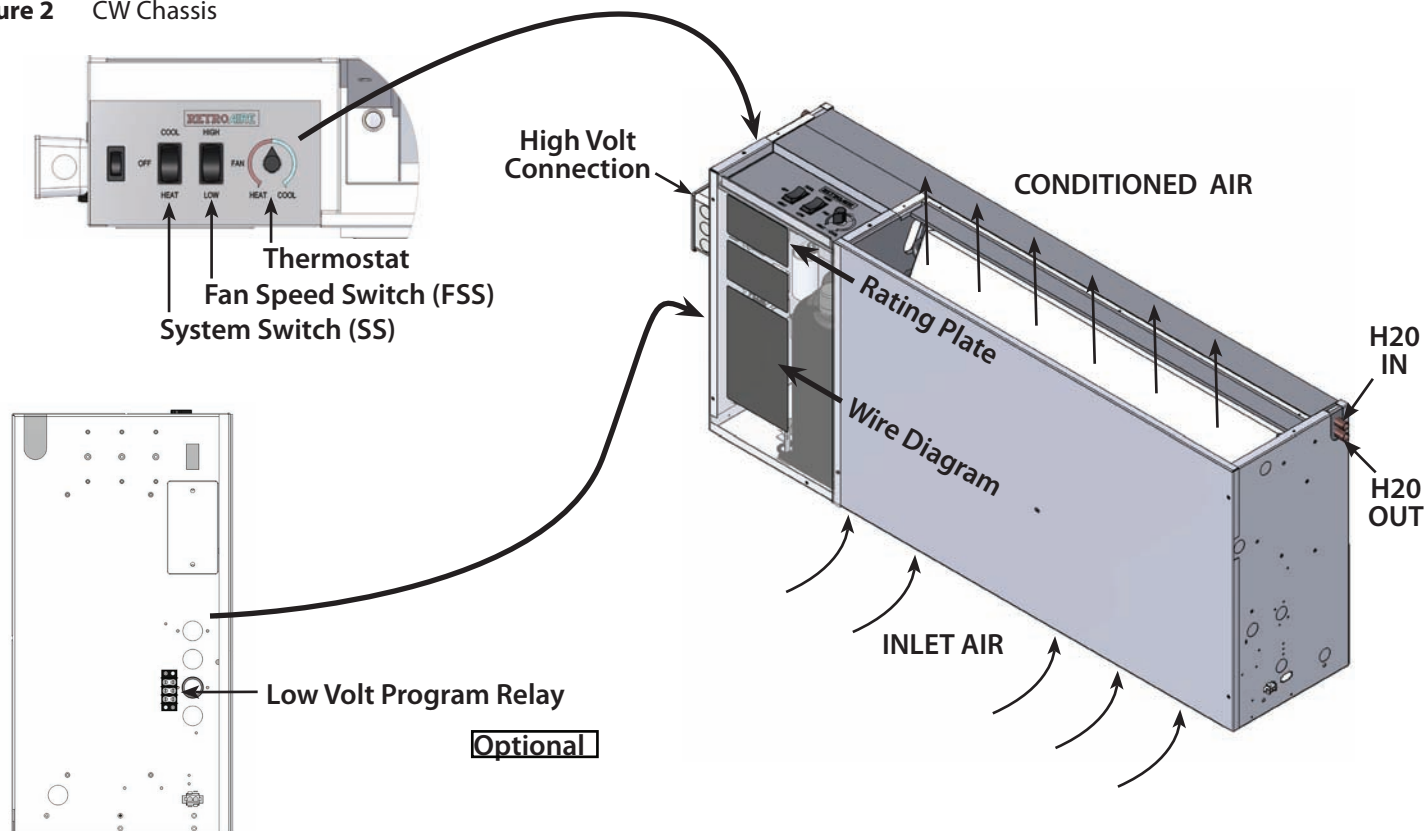


Figure 3 WM Chassis (Left)

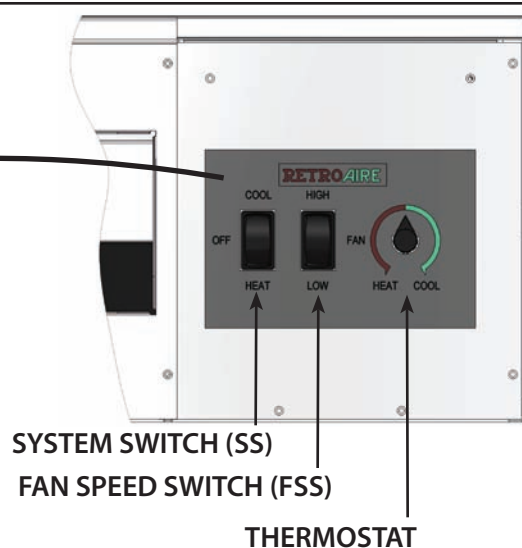
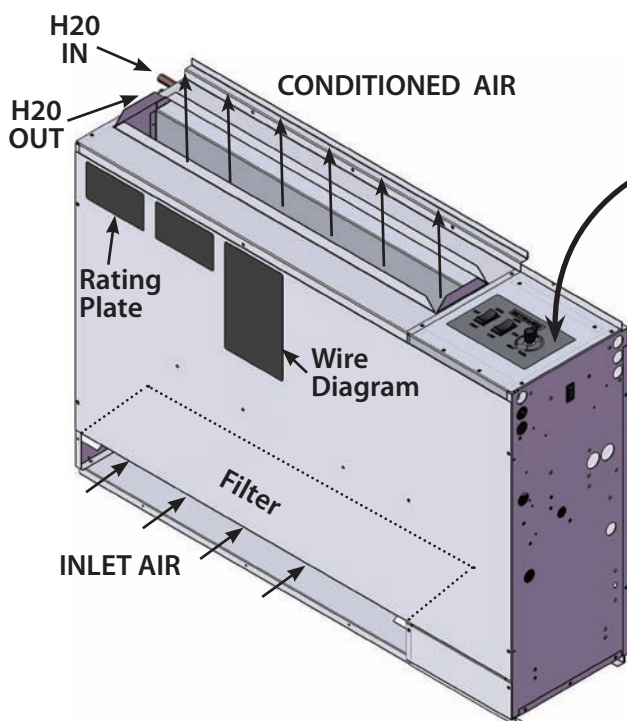
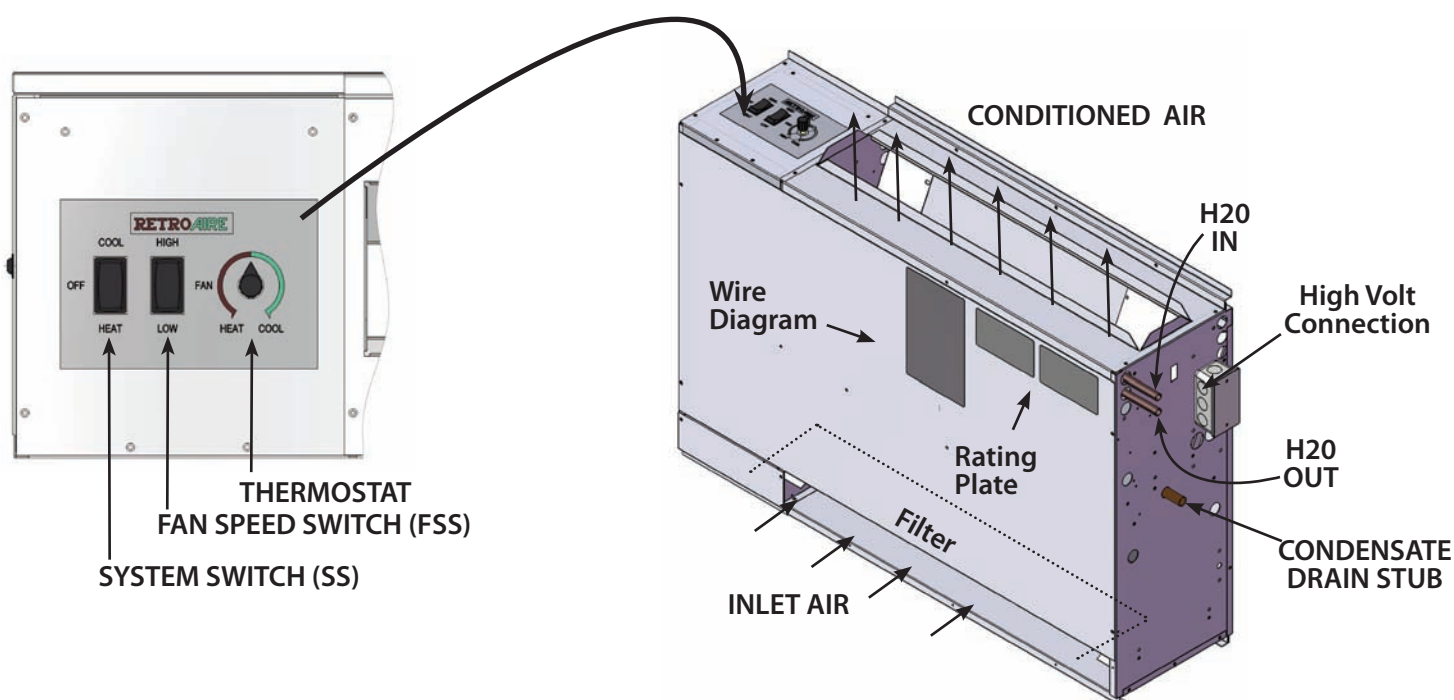


Figure 4 WM Chassis (Right)



CM, CW, WM Model Nomenclature

Figure 5 Model coding

Position number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Chassis coding [verify with rating plate]															
Product Series	[CM series]			[CW series]			[WM series]						Design Revision [A = Rev Level]		
Straight cool or Heat Pump	[C = straight cooling (CW Series Only)]			[H = heat pump unit]									Standard/Special [0 = standard] [A-Z = special option]		
Refrigerant G = 410A													Compressor Code [A = Tech] [L = LG] [T = Toshiba]		
Cooling Capacity (Btuh)	[08 = 08,000 Btuh (CM and CW Series Only)]			[09 = 09,000 Btuh (WM Series Only)]			[10 = 10,000 Btuh (CW Series Only)]			[12 = 12,000 Btuh (CM and WM Series Only)]			[13 = 13,000 Btuh (CW Series Only)]		
	[15 = 15,000 Btuh (CM and WM Series Only)]			[17 = 17,000 Btuh (CW Series Only)]									Pipe Connections [0 = Sweat Connection] [1 = Female Pipe Thread] [2 = Male Pipe Thread] [3 = Ball Valve & Union] [4 = Sweat Connection with Cupronickel Water Coil] [5 = Female Pipe thread with Cupronickel Water Coil] [6 = Male Pipe thread with Cupronickel Water Coil] [7 = Ball Valve & Union with Cupronickel Water Coil]		
Voltage	[A = 115 V / 1 / 60] (CW Series Only)			[D = 208/230 V / 1 / 60]			[E = 265/277 V / 1 / 60]						Cabinet Options [A = No Cabinet] [B = With Cabinet (CW Series Only)] [C = Cabinet with Locking Door (CW Series Only)] [D = Front Air Intake (CW Series Only)]		
Heat Options (230 Volts)	[0 = No electric heat]			[2 = 2 kW electric heat]			[3 = 3 kW electric heat]			[4 = 4 kW electric heat]			[5 = 5 kW electric heat]		
	[6 = 1 Row Hydronic Coil N/C Valve (CWC Right Hand Pipe Only)]			[7 = 1 Row Hydronic Coil N/O Valve (CWC Right Hand Pipe Only)]									Piping Options [L = Left Hand Piping] [R = Right Hand Piping] [M = Left Mono Flow Piping] [N = Right Mono Flow Piping]		
Control Options	[0 = Unit Mount MCO]			[1 = Unit Mount MCO Boiler less (Heat pump with Electric Heat Only)]			[2 = Unit Mount MCO with Disconnect Switch]			[3 = Unit Mount MCO Boilerless (Heatpump with Elect Heat Only)]			[4 = Unit Mount ACO]		
	[5 = Unit Mount ACO Boilerless (Heat Pump with Elect Heat Only)]			[6 = Unit Mount ACO with Disconnect Sw.]			[7 = Unit Mount ACO Boilerless (Heat Pump with Elect Heat Only and Disconnect Sw.)]						Control Options (Con't) [A = Remote] [B = Remote Master / Slave] [C = Remote with Disconnect Sw.] [D = Remote Master / Slave with Disconnect Sw.] [E = Remote Boilerless (Heat Pump with Elect Heat Only)] [F = Remote Master / Slave Boilerless (Heat Pump with Elect Heat Only)] [G = Remote with Boilerless (Heat Pump with Elect Heat Only) and Disconnect Sw.] [H = Remote Master / Slave with Boilerless (Heat Pump with Elect Heat Only) and Disconnect SW.]		

Features

Indoor coil freeze protection *(standard)*

This feature will prevent the indoor coil from freeze up in the cooling mode.

- Indoor coil freeze up can occur due to a dirty air filter, restricted or poor air flow, low refrigerant charge or low room or coil water temperatures.
- Low temperature water flow cut-out switch.
- High pressure control.
- Should a freeze condition be detected, the compressor will be switched off until the freeze condition is satisfied.
- During this time the indoor fan will continue to run to aid in the defrost process.

Power cord with integral safety protection *(optional)*

Water Source Console Units have the option of a power cord with internal safety protection.

- Provides personal shock protection as well as arcing and fire prevention. The device is designed to sense any damage in the line cord and disconnect power before a fire can occur.
- Tested in accordance with Underwriters Laboratories, the cord set also offers a unique “passive” operation, meaning the unit does not require resetting if main power is interrupted.

Heat pump *(optional)*

Heat pumps are designed to operate when entering water temperature is between 60°F (16°C) to 90°F (33°C) and with a maximum indoor air temperature of 80°F (27°C). The unit is equipped with a reversing valve that is energized for cooling and de-energized in heating mode.

Hydronic heating *(optional)*

An optional hydronic heat package may be selected in lieu of electric heat. Heating operation is essentially the same as that of units with electric heat.

Optional wall-mounted thermostats

Thermostats available from EMI

EMI offers a thermostat that is compatible with your Water Source Console Unit.

- Select EMI part number 240008208 for the latest RetroAire price list for this option. This is a single stage, cool/heat, thermostat that can be used in all RetroAire cooling, heating or heat pump applications.
- The thermostat has an adjustable setpoint range of between 45°F (7°C) and 90°F (32°C).
- For heat pumps another option is EMI part number 240008209. This is a 2 stage heat/cool thermostat which allows for emergency heat.

Selecting a thermostat *(by others)*

When selecting a thermostat other than one offered by EMI, choose a single stage heat/cool, 24v thermostat.

Straight cooling with electric heat or hydronic heat

Select a thermostat that is compatible with a cooling/electric heat system. The thermostat should have “R”, “Y”, “W” and “G” terminals.

Heat pump

Select a thermostat that is compatible with a cooling/single-stage heat/heat pump system. The thermostat should have “R”, “Y”, “O” and “G” terminals. RetroAire units are single stage heating only.

Preparing for the Installation of the Water Source Console Units

WARNING

Moving parts can cause personal injury. Avoid contact with moving parts when testing or servicing the unit.

The existing front panels must be secured by screws that prevent contact with all parts.

Minor dimensions of openings must not exceed ½ inch (12.5mm).

The indoor air discharge grill must have dimensions not less than 26" x 4". The grill must separate the top surface of the chassis from the top surface of the discharge grill by a minimum of 1 in (25.4mm).

Electrical supply

Each unit must have a separate branch circuit protected by a fuse or breaker. Refer to the unit rating plate for the proper wire and breaker or fuse size. Use of extension cords is prohibited.

DO NOT connect the RetroAire unit to a circuit with an incorrectly-sized overcurrent-protection device.

All cord-connected 265-volt units must be plugged into receptacles within the unit subbase or chassis.

Electrical shock hazard — Before opening the existing unit:

Open the power supply disconnect switch. Secure it in an open position during installation. Attach a sign stating, "**DO NOT TURN ON.**"

On a plug and receptacle connection, unplug the existing unit at the wall outlet. DO NOT plug in the new unit until installation is complete and the start-up checklist has been completed.

Failure to comply with the above could result in severe personal injury, death or substantial property damage.

NOTICE

All wiring should be in accordance with both the National Electric Code (NEC) and the local building codes.

Electrical power connection

1. Check the RetroAire unit rating plate for circuit ampacity and required breaker or fuse size.
2. Verify that the existing breaker or fuse is the correct size.
 - a. Replace the breaker or fuse if incorrectly-sized.
 - b. **Breakers must be type HACR only.**
3. Cord-connected units — verify that the wall outlet is the correct rating. The outlet's blade configuration must match that of the cord supplied with the RetroAire unit.
4. Hard-wired units — verify that the power wiring is correctly sized. Inspect the existing wiring for any deficiencies, such as cuts or frayed wires. Replace such wiring if found. Refer to the units wire diagram for wire connections.

Remove the old chassis

1. Disconnect power or unplug cord before proceeding. See **WARNING** at left.
2. Remove the cabinet from the old chassis.
3. Disconnect water supply to coil.
4. Disconnect condensate drain piping
5. Remove any fasteners holding the old chassis to the sub base or wall and remove the chassis.

NOTICE

Dispose of the old chassis following existing state and federal regulations.

1. See the instructions for the specific RetroAire unit on the following pages.
2. **DO NOT** connect power to the unit or plug in the cord until all instructions in this manual have been followed.

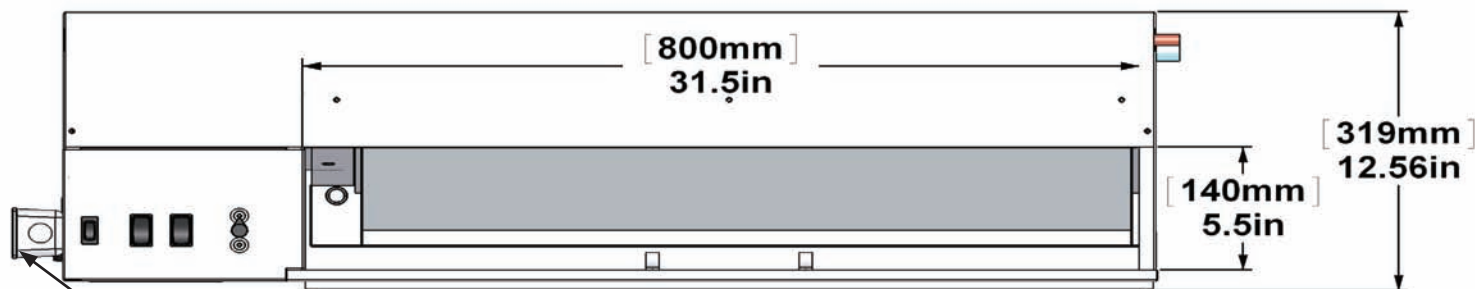
INSTALLATION

1. Put the new chassis in the same place where the old chassis stood, and secure it to the subbase or wall as the older unit was secured.
2. Pipe the new chassis with the same hoses (check the hose for cracks and/or brittleness, replace with new hoses if any damage is found). If the unit is to be hard piped, there should be union between the unit and the hand shut off valve for service or removal of the unit. Connect condensate tube, and route to an adequate drain.
3. Plug the line cord into the receptacle. If hard wired; connect power wiring to unit wires in the J-box. (See wiring diagram on unit). Wiring must be made in accordance with NEC and local codes. Follow the instructions on page 9 to verify existing wiring and overcurrent protection. Remove the line cord wires from the Water Source Console Units power entrance terminals. Route the power supply wiring through a strain-relief bushing and connect leads to the power entrance terminals. Secure the strain-relief clamp. (If wiring is through conduit, insert the conduit through the control box knockout and secure in place.) **DO NOT** turn on power until completing instructions in "Final Inspection and Startup" on page 14.
4. Open water valves. Bleed air from the water lines with the air vent (if used) or by uncoupling the return water line allow any air to escape. If the water appears dirty the entire water system should be flushed with the proper cleaners to obtain a PH value of 7 or 8. Exercise caution if any sort of glycol (antifreeze) is being used when cleaning the system. Be careful not to let this fluid get on any carpeting ect. It is best to use trained personnel to do this type of work.
5. **DO NOT PLUG IN the line cord, if in used condition.** Follow instructions in "Final Inspection and Startup" on page 14.

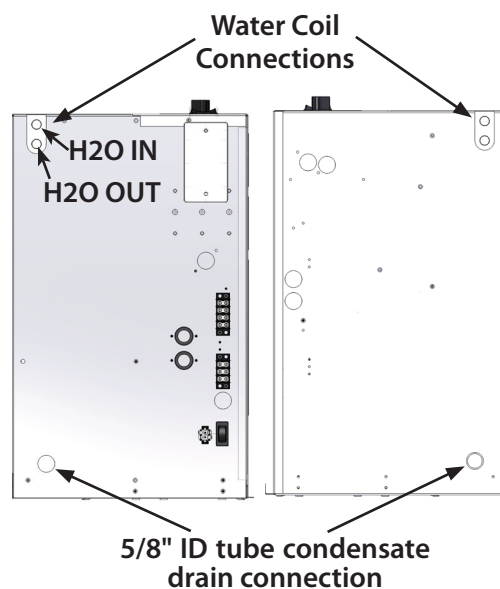
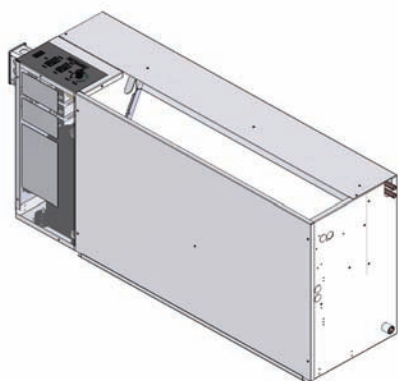
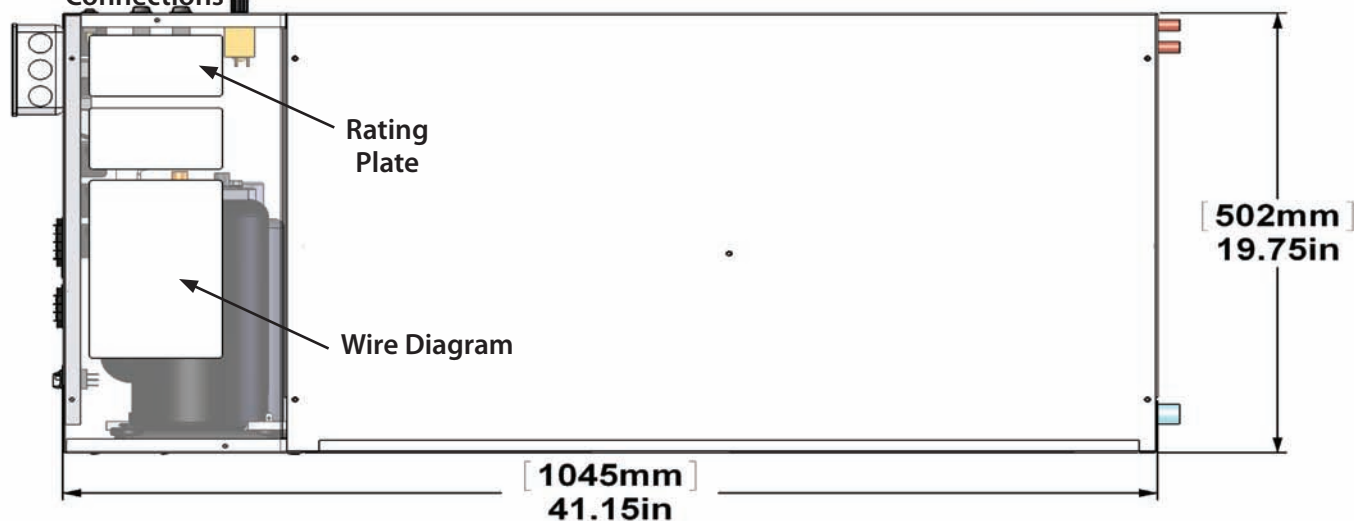
Installation Instructions — CM Chassis

Figure 6 CM chassis

TOP

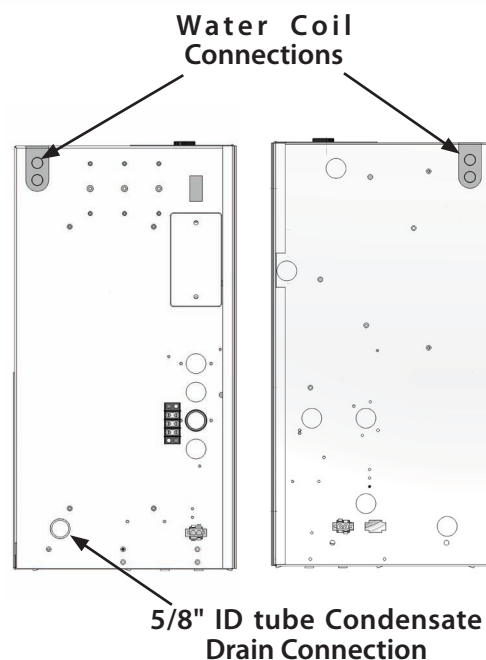
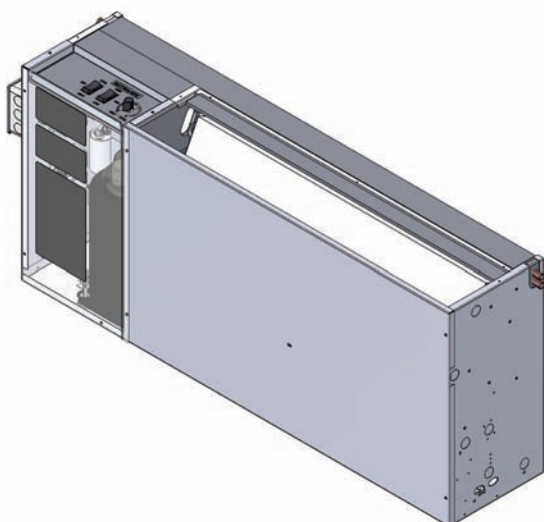
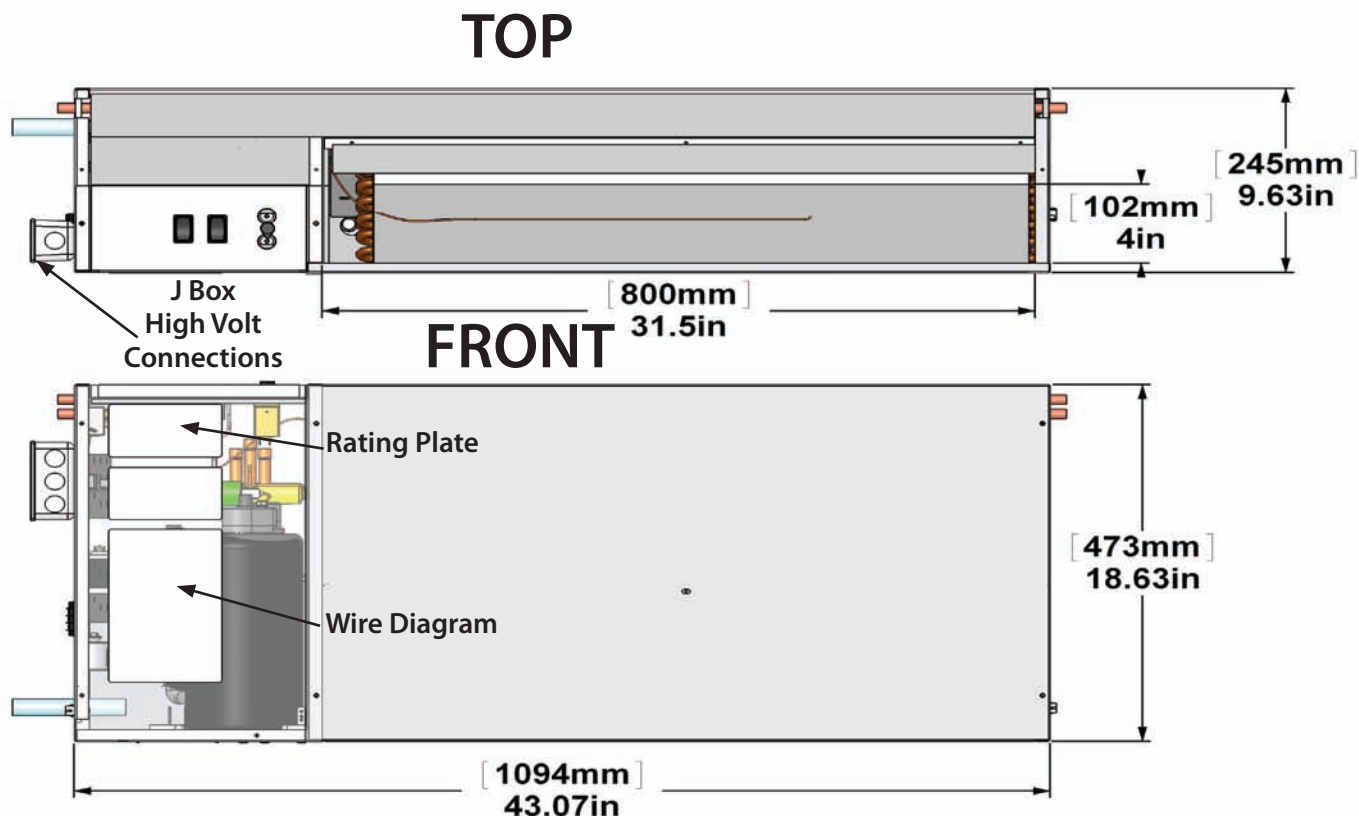


FRONT



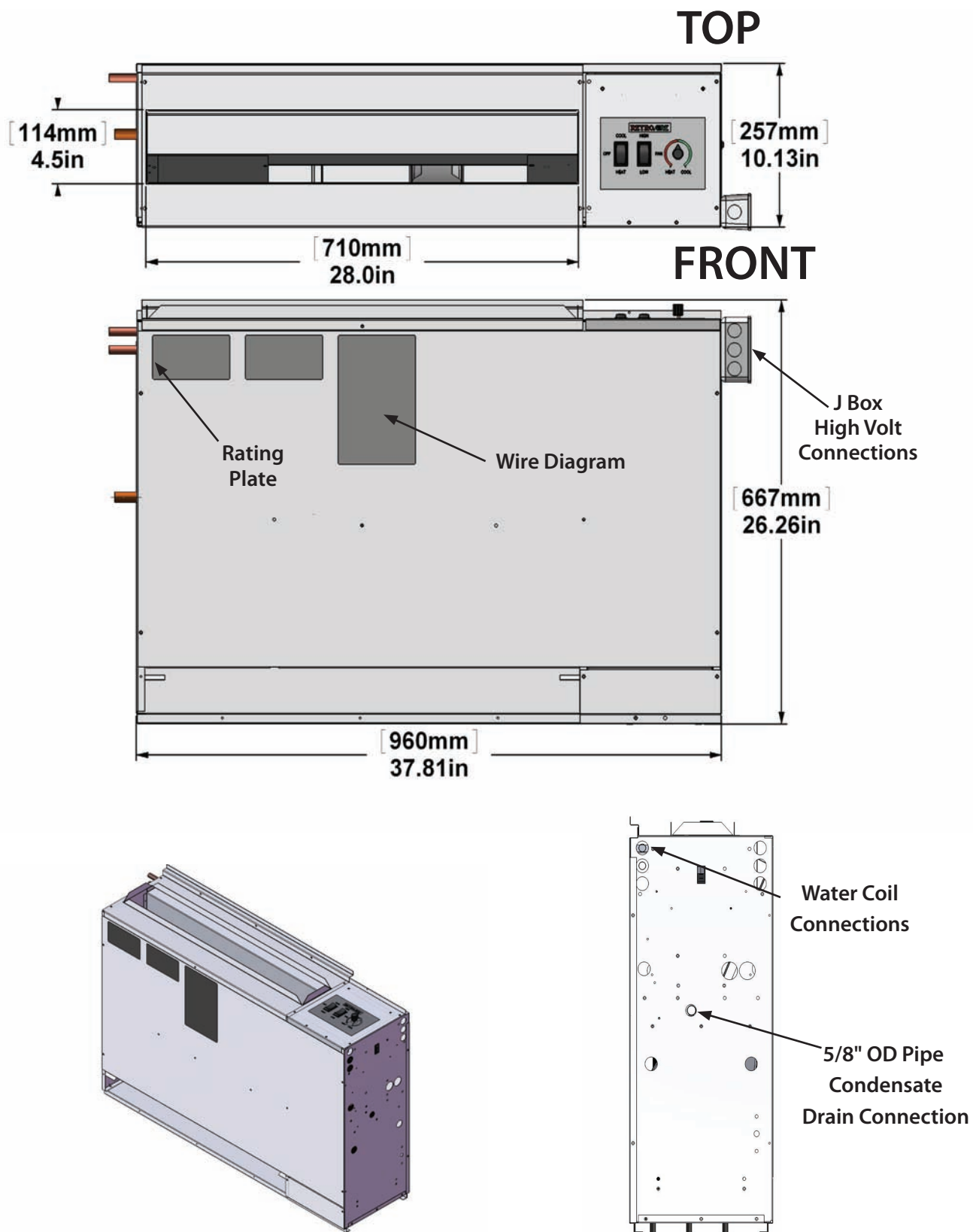
Installation Instructions — CW

Figure 7 CW chassis



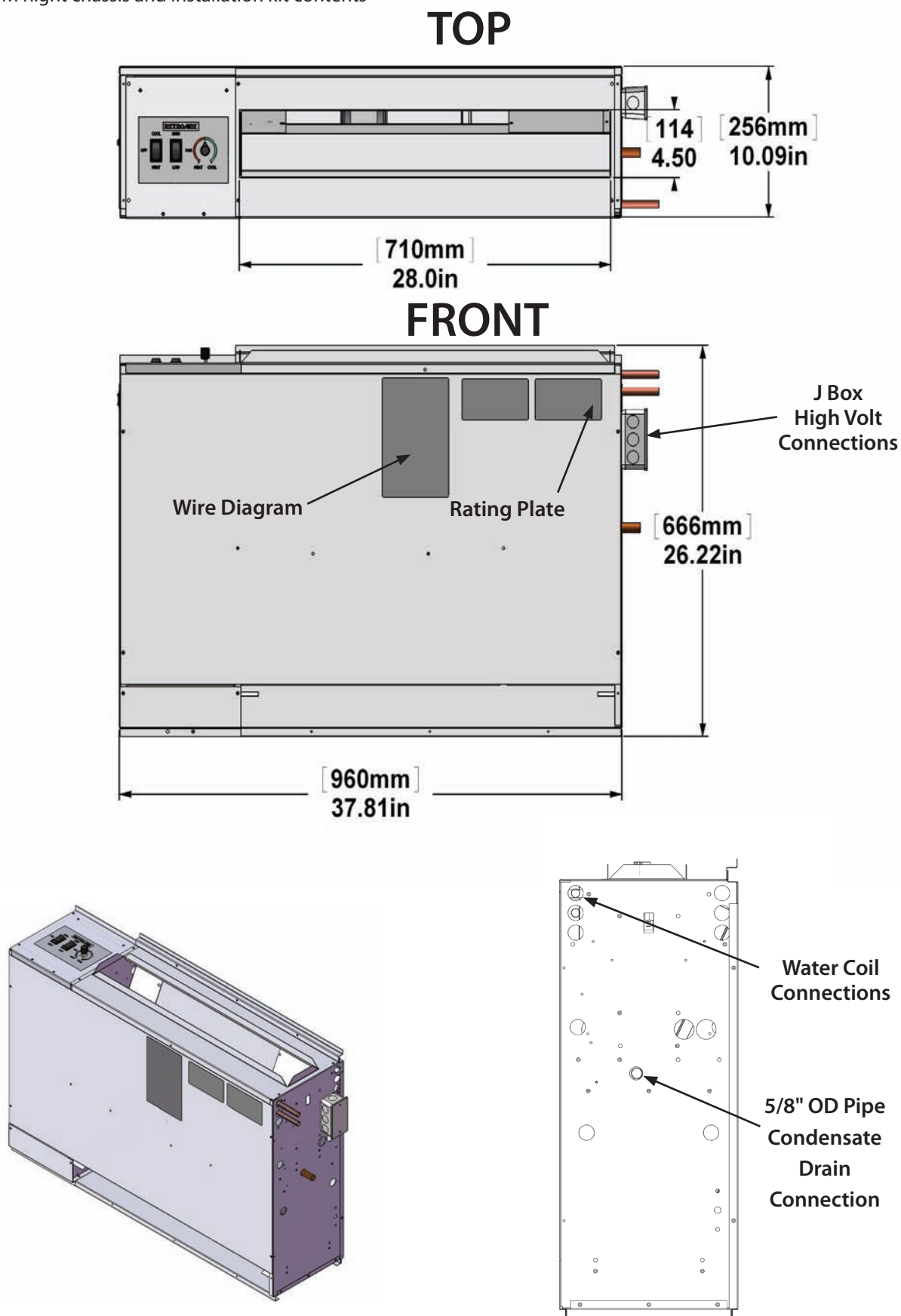
Installation Instructions — WM Left

Figure 8 WM chassis



Installation Instructions — WM Right

Figure 9 WM Right chassis and installation kit contents



Final Inspection & Start-up

Before operating the unit

- ☐ Read and understand the contents of this manual.
- ☐ Install the unit per the instructions outlined in this manual and all applicable local and national codes.
- ☐ Ensure the electrical supply matches the electrical requirements of the unit, and that the unit is properly grounded.
- ☐ Examine control box. Ensure all wire connections are secure.
- ☐ Verify that the chassis is properly fitted to the cabinet and securely mounted to the sub base or floor.
- ☐ Make sure the chassis is level:
- ☐ Pour water into the drain pan and make certain it flows from the drain pan to the condensate drain
- ☐ Verify that indoor blower wheels are secured to the motor shaft, and rotate freely.
- ☐ Ensure all sheet metal panels are in place and secure.
- ☐ Attach the front panel to the existing cabinet enclosure.
- ☐ Verify that nothing will interfere with the room discharge air or the return air of the units. Examples:
 - Check for curtains or drapes that obstruct the air flow.
 - See Figure 10 and Figure 11.
 - Check for plush carpeting that can obstruct the return air.
 - Items like these can cause serious damage to the chassis.

CAUTION

Any obstruction of supply air, including the use of deflector baffles, may cause condensate to form on the louver or cabinet (see Figure 10).

Figure 10 Proper air flow diagram



To ensure optimum performance of your Water Source Console Unit, avoid restricting the air flow. The position of curtains or drapes over supply air grille may cause air to recirculate without cooling the room. The unit will short cycle and may cause premature compressor failure (see Figure 11).

Figure 11 Restricted air flow diagram



Final Inspection & Start-up (continued)

Start Up

Use the procedure outlined below to initiate proper unit start up.

1. Adjust all hand water valves to the full open position, and turn on the power to the units. (If when taking the old unit out you marked the position of the hand water valve handle put it back to that position rather than full open.)
2. Operate each unit in the cooling cycle first. Set thermostat temperature lower than the room temperature and depress the "Cool" button. The entering water temperature (EWT) should be at least 60°F (16°C). for start up. The unit will start discharging cool air almost instantly. After the unit has been running about 5 minutes check the temperature of the EWT and the leaving water temperature (LWT). The difference should show a higher LWT by about 10-12°F (6-7°C). If you find you have this difference you also have the correct water flow. If the difference is less then 10-12°F (6-7°C) you have too much water flowing through the unit and if the difference is higher then you don't have enough water flowing through the unit. You will have to adjust the hand water valve to get the temperature difference needed.
3. Check the heating operation of the unit, turn the thermostat to slightly above room temperature and depress the "Heat" button. The compressor and fan will operate. After about 5 minutes of operation check the water temperature of the EWT & LWT. For correct water flow adjust the hand valves until the LWT is 6°F (3°C) less than the EWT.
4. Unit Mount ACO (Automatic change-over) with Fan Cycle Switch (Optional): This option allows the operator of the CWC/CWH/CMH to have the evaporator fan cycle or run continuously. With the switch in the cycling position the evaporator fan will only run when the unit is calling for heat or cooling. When the switch is in the "constant" position, the evaporator fan will run continuously unless the unit is physically turned off.

NOTE: Three factors determine the operating limits of RetroAire heat pump units:

1. Return air temperature
2. Water temperature
3. Ambient temperature

Whenever any one of these factors is at a minimum or maximum level, the other two factors must be at normal levels to ensure proper unit operation.

Operating Limits

WMH Operating Limits		
Air & Water Limits	Cooling°F(°C)	Heating°F(°C)
Min. Ambient Air	50(10)	50(10)
Rated Ambient Air	80(27)	70(21)
Max. Ambient Air	100(38)	85(30)
Min. EAT	50(10)	70(21)
Rated EAT DB/WB	80/67(27/20)	60(16)
Max. EAT DB/WB	100/83(38/29)	80(27)
Water Limits	Cooling°F(°C)	Heating°F(°C)
Min. EWT	60(16)	60(16)
Normal EWT	85(30)	70(21)
Max. EWT	95(35)	90(33)

CM/CW Operating Limits		
Air & Water Limits	Cooling°F(°C)	Heating°F(°C)
Rated *EAT DB/WB °F	80/67(27/20)	70/60(21/16)
Rated**EWT °F	85(30)	70(21)
Rated***LWT °F	95(35)	N/A
Max.EWT°F	95/71(35/22)	80/67(27/20)
Max.EWT °F	95(35)	90(33)
Min.*EAT DB/WB °F	67/57(20/14)	N/A
Min.*EWT °F	65(19)	N/A
Water Limits	Cooling°F(°C)	Heating°F(°C)
Min. EWT °F	60(16)	60(16)
Normal EWT °F	85(30)	70(21)
Max. EWT °F	95(35)	90(33)

(*EAT' and Ambient Temp. Surrounding the unit are the same value)

STARTING CONDITIONS

Unit will start and operate with entering air temperature(EAT) of 50°F(10°C) and entering water temperature(EWT) of 60°F(16°C) with both the air and water at the flow rates used in the ARI Standard 320/86 rating test, for initial start up in winter. This is for start up only not long time running.

If the unit fails to operate, check the following:

- a. Check the voltage and current. it should be in accordance with the electrical specifications on the unit rating plate.
- b. Look for wiring errors. check for loose terminals or wire nuts where wire connections have been made on both the line and low-voltage terminal boards.
- c. Check for water leaks around hose swivel joints, If hard piped check all joints. After the unit is running check for leaks around the condensate drain hose and connection.
- d. Ensure the High Pressure Switch (HPS) did not trip. Cycle the system switch off to reset the lockout relay.

Final Inspection & Start-up *(continued)*

Determine whether the fan operates during heating and cooling modes. If these checks fail to reveal a problem and the unit will not operate, contact a trained service technician for proper diagnosis or call the factory service department for assistance.

Unit-mounted thermostat

1. Use the system switch to place the Water Source Console Units in either the "COOL", "HEAT", or "OFF" position (see Figure 12). Test operation in all positions.
2. Use the fan speed switch places the fan in either LOW or HIGH speed (see Figure 12). Test operation in both positions for heating and cooling.
3. Test operation of the optional Fan Cycle switch (this is a toggle switch on side of control box), with switch set at ON (continuous fan operation) or AUTO (cycling with thermostat) for both heating and cooling. Set the switch in the desired position.
4. Rotate the thermostat knob counter clockwise to increase setpoint temperature, or clockwise to decrease (see Figure 12). Turning the unit-mounted thermostat knob counter clockwise until it stops will produce the warmest room temperature, while turning it clockwise until it stops will produce the coolest. The setting can be adjusted for personal comfort.

Boilerless control operation-Optional

- For Heat pump units with an optional Boilerless control and electric heat, the heat pump and electric heat do not operate simultaneously.
- The Boilerless control will monitor incoming water temperature to the heat exchanger and when it drops below approximately 50°F the control will change from heat pump operation to electric heat.

CAUTION

DO NOT rotate the thermostat knob back and forth from heating to cooling. This causes the compressor to cycle on and off rapidly and will cause damage to the compressor. Allow the compressor to remain off for at least three minutes prior to restarting the unit.

Figure 12 Typical Representation of a Unit Mount Control



Remote-mounted thermostat

1. Use the thermostat to place the Water Source Console Unit in either the "COOL", "HEAT", or "OFF" position. Test operation in all positions.
2. If the thermostat is fitted with a fan switch, set as desired places the fan in either "ON", "OFF", or "AUTO". Test operation in all positions.
3. Check thermostat calibration for both heating and cooling operation.

Straight cooling Water Source Console Units

Cooling cycle

1. Place the thermostat or system switch in the COOL position.
2. Adjust the thermostat to a cooler temperature until the indoor fan starts running. The compressor should then turn on and cold air will begin to flow from the unit. Let the unit continue operating to cool the room and remove humidity.
3. After the unit starts running and the space gets cooler, adjust the thermostat to a warmer temperature until the compressor cycles off.
4. If a colder room temperature is desired, adjust the thermostat to a cooler temperature setting, turning the compressor and fan back on.
5. If a warmer room temperature is desired, adjust the thermostat to a warmer temperature setting, the compressor will stop.
6. Place the thermostat or system switch in the OFF position. All operation should stop.

Final Inspection & Start-up *(continued)*

NOTICE

The room temperature must be above 65°F (18°C) for the compressor to operate in cooling mode on Water Source Console Units with unit-mounted controllers.



CAUTION

When the unit is first powered up, high humidity conditions can cause condensation to form on the discharge grill. Keep doors and windows closed to reduce humidity and condensation will evaporate.

Heating cycle — electric option

1. Place the thermostat or system switch in the **HEAT** position.
2. Adjust the thermostat for a warmer temperature until the indoor fan starts running and the electric heater coil starts emitting heat.
3. After the unit starts running and the space gets warmer, adjust the thermostat to a cooler temperature until the electric heater turns off.
4. If a warmer room temperature is desired, adjust the thermostat to a warmer temperature setting, which will turn the electric heater back on.
5. If a cooler room temperature is desired, adjust the thermostat to a cooler temperature setting until the electric heater turns off. The fan will stop.
6. Place the thermostat or system switch in the **OFF** position. All operation should stop.

NOTICE

Room temperature must be below 85°F (29.4°C) to energize the heater on Water Source Console Units with unit-mounted controllers.

Heating cycle — hydronic option

NOTICE

Make sure the motorized valve is rated for the correct voltage. Most RetroAire units with unit mount controls will power a hydronic valve that is the same voltage as the unit (ex: a unit rated 208/230V will power a 208/230V). Be sure to check the wiring diagram (located on the unit) and voltage application for the specific unit. Other valve configurations and voltage options are available. Consult Technical Service if the unit voltage does not match your valve application.

1. Place the thermostat or system switch in the **HEAT** position.
2. Adjust the thermostat to a warmer temperature. The following should then occur:
 - The motorized valve should open and allow hot water to run through the coil.

- The indoor fan will run, blowing air through the hydronic coil.
- The signal to the water valve will continue until the room temperature rises above the setpoint by 3°F (2°C).

3. After the unit starts running and the area gets warmer, adjust the thermostat to a cooler temperature, the hydronic valve will close and indoor fan will switch off.
4. If a warmer room temperature is desired, adjust the thermostat to a warmer temperature setting, which will open the hydronic valve and turn on the indoor fan.
5. If a cooler room temperature is desired, adjust the thermostat to a cooler temperature setting. The hydronic valve will again close and fan will stop.
6. Place the thermostat or system switch in the **OFF** position. All operation should stop.

NOTICE

Room temperature must be below 85°F (29°C) for the hydronic heater to operate.

Heat Pump Water Source Console Units

NOTICE

The unit is equipped with a reversing valve that is energized for cooling and de-energized in heating mode.

Cooling cycle — heat pump units

1. Place the thermostat or system switch in the **COOL** position.
2. Adjust the thermostat to a cooler temperature until the indoor fan starts running. The compressor will then turn on and cold air will begin to flow from the unit. Allow the unit continue operating to cool the room and remove humidity.
3. After the unit starts running and the space gets cooler, adjust the thermostat to a warmer temperature until the compressor cycles off.
4. If a colder room temperature is desired, adjust the thermostat to a cooler temperature setting, turning the compressor and fan back on.
5. If a warmer room temperature setting is desired, adjust the thermostat to a warmer temperature. The cooling mode will cease and the compressor and fan will stop.
6. Place the thermostat or system switch in the **OFF** position. All operation should stop.

NOTICE

The room temperature must be above 65°F (19°C) for the compressor to operate in cooling mode on Water Source Console Units with unit-mounted controllers.

7. Place system switch in the **OFF** position. All operation should stop.

Final Inspection & Start-up *(continued)*

Heating operation — heat pump units — Entering Water temperature above 60°F (16°C)

1. Place the thermostat or system switch in the "HEAT" position.
2. Adjust the thermostat to a warmer temperature setting until the Compressor and fan start running. Warm air will begin to flow from the unit.
3. After the unit starts running and the space gets warmer, adjust the thermostat to a cooler temperature until the fan and compressor turn off.
4. For a warmer room temperature, adjust the thermostat to a warmer temperature setting turning the fan, and compressor back on.
5. If a cooler room temperature is desired, adjust the thermostat to a cooler temperature setting. The heating mode will cease and the compressor and fan will stop.

NOTICE

Room temperature must be below 85°F (29°C) for the compressor to operate in heating mode on Water Source Console Units with unit-mounted controllers. .

6. Place the thermostat or system switch in the **OFF** position.
All operation should stop.

Auxiliary heating operation — electric option

1. Place the thermostat or system switch in the "HEAT" position.
2. Adjust the thermostat to a warmer temperature until the fan starts running and the electric coil starts emitting heat.
3. After the unit starts running and the space gets warmer, adjust the thermostat to a cooler temperature until the electric heater and fan turn off.
4. If a warmer room temperature is desired, adjust the thermostat to a warmer temperature setting, which will turn the electric heater and fan back on.
5. If a cooler room temperature is desired, adjust the thermostat to a cooler temperature setting until the electric heater and fan turn off.
6. Place the thermostat or system switch in the **OFF** position.
All operation should stop.

NOTICE

Room temperature must be below 85°F(29°C) to energize the heater on Water Source Console Units with unit-mounted controllers.

Auxiliary heating operation— hydronic option

1. Place the thermostat or system switch in the "HEAT" position.
2. Adjust the thermostat to a warmer temperature.
The following should then occur:
 - The motorized valve should open and allow hot water to run through the coil.
 - The indoor fan will run, blowing air through the hydronic coil
 - The signal to the water valve will continue until the room temperature rises above the setpoint by 3°F (2°C).
 - After the unit starts running and the space gets warmer, the hydronic valve will close and the fan will turn off.
3. After the unit starts running and the space gets warmer, adjust the thermostat to a cooler temperature setting, the hydronic valve will close and fan will turn off.
4. If a warmer room temperature is desired, adjust the thermostat to a warmer temperature setting, which will open the hydronic valve and turn on the fan.
5. If a cooler room temperature is desired, adjust the thermostat to a cooler temperature setting. The hydronic valve will close and fan will turn off.
6. Place the thermostat or system switch in the **OFF** position.
All operation should stop.

NOTICE

Room temperature must be below 85°F (29°C) for the hydronic heater to operate on Water Source Console Units with unit-mounted controllers. The hydronic valve is a 24Vac normally open valve. Should power be lost to the unit, the valve will default to the open position.

Maintenance & Troubleshooting

Monthly inspection and maintenance

DANGER

Electrical shock hazard — disconnect power to the RetroAire replacement Water Source Console Units before servicing or accessing the control compartment. Failure to do so could result in severe personal injury or death.

WARNING

It is illegal to discharge refrigerant into the atmosphere. Use proper reclaiming methods and equipment when servicing a RetroAire replacement Water Source Console Unit.

For optimum performance and reliability of your RetroAire replacement Water Source Console Unit, ECR International recommends performing the following inspections and maintenance on a monthly basis. Units that are installed in harsh or dirty environments will require more frequent inspections and maintenance.

Disconnect power to unit and remove necessary access panels.

- ☐ Clean or replace the return air filter.

WARNING

Clean or replace the return air filter as needed. Allowing dust to collect on the filter will cause the unit to lose efficiency and eventually malfunction. Check the filter at least once a month. Some environments may require more frequent replacement, depending on particulate in the air stream.

NOTICE

If a new air filter is needed for your RetroAire replacement Water Source Console Unit, consult factory for availability and/or proper sizing.

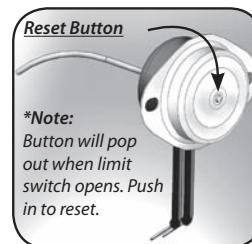
- ☐ Vacuum return air grille surface.
- ☐ Inspect & clean the chassis interior for rodent or insect infestation.
- ☐ Clean & flush condensate drain pan.
- ☐ Ensure the condensate drain is functioning properly.
- ☐ Inspect refrigeration tubing, especially braze joints, for signs of refrigerant leaks (*oil residue*). Repair if necessary.
- ☐ Inspect coil. Ensure dirt or debris have not collected on the fins. Clean if necessary. Be careful not to damage coil fins when cleaning. Use a fin comb to straighten any bent fins.
- ☐ Examine control box. Ensure all wire connections are secure.
- ☐ Ensure blower wheels are secured to their motor shafts.
- ☐ Ensure dirt or debris have not collected on the blower wheels. Use a vacuum and soft brush to clean if necessary.
- ☐ If the unit has a hydronic option installed, inspect piping, especially braze joints, for signs of water leaks. Repair if necessary.
- ☐ Clean the exterior of the cabinet as desired with a mild soap or household cleaner.

- ☐ In the event the limit switch opens and de-energizes the electric heat, the limit switch will need to be manually reset.

To reset switch:

- Remove the control box cover.
- Locate the limit switch.
- Push in the reset button on the face of the switch (see Figure 13).

Figure 13 Manual Reset Limit Switch



Seasonal start-up and maintenance

At the beginning of the cooling and heating seasons, a complete mechanical check should be performed and maintenance/inspections performed as described below.

Disconnect power to unit and remove necessary access panels.

1. Perform the inspections and maintenance defined in "Monthly start-up and maintenance."
2. Do a visual check of the equipment. Look for obvious changes in the unit such as damaged coils or evidence of extended wear on any moving parts.
3. Check for unusual odors, oil leaks, or stains on or around the coil and refrigerant lines. The presence of oil here may indicate a potentially serious problem such as a refrigerant leak (*example — burned motor windings, water, or refrigerant*).
4. Make sure the base pan is clean.
5. Inspect all electrical connections. Look for frayed wires and poor connections. Terminal ends that are loose will eventually fail, causing a loss of performance or possible damage to equipment.
6. Check fan motor and blower assemblies. Some units may require a drop of light oil to motors and/or bearing assemblies (*look for oil cups*). Ensure setscrews and motor mounting hardware are tight.
7. Brush and/or vacuum the centrifugal fan blades and blower cage assemblies, as they must be clean to operate efficiently.
8. If the unit has a hydronic option installed, inspect piping, especially braze joints, for signs of water leaks. Repair if necessary.
9. Clean or replace the return air filter.
10. Vacuum return air grille surface.
11. Inspect & clean the chassis interior for rodent or insect infestation.
12. Inspect coils. Use a fin comb to straighten out any damaged fins. These coils must be clean for proper operation.

Maintenance & Troubleshooting *(continued)*

WARNING

Do not use a solvent-based cleaner to clean coils, as some solvents will produce a noxious odor when the unit is in operation.

13. Inspect and clean the drain pan and drain line(s). The use of an anti-fungicide tablet to keep the condensate system free from bacterial contaminants is recommended.

14. Ensure the unit is level. Over time the building and equipment may settle, causing a shift in the direction of the condensate flow.
15. Replace the access panels and reconnect the electrical power.
16. Test the unit operation.

Troubleshooting

WARNING

The troubleshooting procedures below should only be conducted by a qualified technician.

Symptom	Suggestion
No heat or cooling	<ul style="list-style-type: none"> Check to see if the unit has power and if the thermostat is satisfied. If the thermostat is not satisfied, call your installing contractor or service contractor.
The thermostat calls for cooling, but cool air is not coming out of the unit.	<ul style="list-style-type: none"> Check for continuity between the thermostat and the unit. Also make sure 24 Vac is present across terminals C and R. Ensure the water is flowing through the water coil. Locate the high pressure switch reset button and push button. Some units are equipped with an LCDI (Leakage Current Detection Interrupt) line cord. Make sure this line cord is reset by pressing the reset button at the line cord plug. Note: If the indoor fan is operational and all of the above suggested procedures have been followed, and there is still no cooling being supplied by the unit, then contact a trained heating and cooling professional.
The thermostat calls for heat, but no heat comes out of the unit.	<ul style="list-style-type: none"> Check to see if the unit has power or if the thermostat has been satisfied. If the unit has power and the thermostat is satisfied, set the thermostat a above room temperature. Units equipped with electric heaters have a temperature limit switch to prevent the electric heater from reaching unsafe temperatures. If after calling for heating the heater is not energized, check for continuity across the limit. If the limit is open, replace with an equivalent limit switch. Auto reset / Manual reset Switch.
The thermostat calls for heat while in heat pump mode, but heated air is not coming out of the unit.	<ul style="list-style-type: none"> If the unit is equipped with a LCDI Line Cord, Ensure it is not tripped. (See Page 8 for information.) While in heat pump mode, make sure the thermostat is not energizing the O terminal. RetroAire units are designed to work in heat pump mode when 24Vac is present across Y and C. Check to see if the unit has power or if the thermostat has been satisfied. If the unit has power and the thermostat is satisfied, set the thermostat a above room temperature.

Table 1 Performance Data

PERFORMANCE DATA CM / CW / WM **							
Voltage	Model	Cooling		Heat Pump		Indoor Airflow CFM (L/S)	Shipping Weight Lbs (Kg)
		Btuh (kW)	EER	Btuh (kW)	COP		
115V	CMHG08	9,400 (2.7)	13.2	10,200 (3.0)	4.2	350 (165)	140 (64)
	CMHG12	12,900 (3.8)	12.9	13,100 (3.8)	4.2	450 (212)	140 (64)
	CWHG08	9,400 (2.7)	13.2	10,200 (3.0)	4.2	350 (165)	150 (68)
	CWCG08	9,400 (2.7)	13.2	N/A	N/A	350 (165)	150 (68)
	CWHG10	13,000 (3.8)	12.9	13,100 (3.8)	4.2	400 (189)	160 (73)
	CWCG10	13,000 (3.8)	12.9	N/A	N/A	400 (189)	160 (73)
	CWHG13	17,500 (5.1)	12.0	19,500 (5.7)	4.2	450 (212)	165 (75)
	CWCG13	17,500 (5.1)	12.0	N/A	N/A	450 (212)	165 (75)
	WMHG09	9,200 (2.7)	12.9	10,000 (3.0)	4.2	350 (165)	150 (68)
	WMHG12	12,400 (3.6)	13.1	13,600 (4.0)	4.2	450 (212)	160 (73)
208/230V	CMHG08	9,400 (2.7)	13.2	10,200 (3.0)	4.2	350 (165)	140 (64)
	CMHG12	12,900 (3.8)	12.9	13,100 (3.8)	4.2	450 (212)	140 (64)
	CMHG15	18,200 (5.3)	12.9	18,300 (5.4)	4.2	500 (236)	150 (68)
	CWHG08	9,400 (2.7)	13.2	10,200 (3.0)	4.2	350 (165)	150 (68)
	CWCG08	9,400 (2.7)	13.2	N/A	N/A	350 (165)	150 (68)
	CWHG10	13,000 (3.8)	12.9	13,100 (3.8)	4.2	400 (189)	160 (73)
	CWHG10	13,000 (3.8)	12.9	N/A	N/A	400 (189)	160 (73)
	CWHG13	17,500 (5.1)	12.0	19,500 (5.7)	4.2	450 (212)	165 (75)
	CWCG13	17,500 (5.1)	12.0	N/A	N/A	450 (212)	165 (75)
	CWHG17	19,300 (5.6)	13.6	19,400 (5.7)	4.2	500 (236)	170 (77)
	CWCG17	19,300 (5.6)	13.6	N/A	N/A	500 (236)	170 (77)
	WMHG09	9,200 (2.7)	12.9	10,000 (3.0)	4.2	350 (165)	150 (68)
	WMHG12	12,400 (3.6)	13.1	13,600 (4.0)	4.2	450 (212)	160 (73)
	WMHG15	17,500 (5.1)	12.0	19,500 (5.7)	4.2	550 (260)	170 (77)
265V	CMHG08	N/A	N/A	N/A	N/A	N/A	N/A
	CMHG12	12,900 (3.8)	12.9	13,100 (3.8)	4.2	450 (212)	140 (64)
	CMHG15	18,200 (5.3)	12.9	18,300 (5.4)	4.2	500 (236)	150 (68)
	CWHG08	N/A	N/A	N/A	N/A	N/A	N/A
	CWCG08	N/A	N/A	N/A	N/A	N/A	N/A
	CWHG10	13,000 (3.8)	12.9	13,100 (3.8)	4.2	400 (189)	160 (73)
	CWCG10	13,000 (3.8)	12.9	N/A	N/A	400 (189)	160 (73)
	CWHG13	17,500 (5.1)	12.0	19,500 (5.7)	4.2	450 (212)	165 (75)
	CWCG13	17,500 (5.1)	12.0	N/A	N/A	450 (212)	165 (75)
	CWHG17	N/A	N/A	N/A	N/A	N/A	N/A
	CWCG17	N/A	N/A	N/A	N/A	N/A	N/A
	WMHG09	N/A	N/A	N/A	N/A	N/A	N/A
	WMHG12	12,400 (3.6)	13.1	13,600 (4.0)	4.2	450 (212)	160 (73)
	WMHG15	17,500 (5.1)	12.0	19,500 (5.7)	4.2	550 (260)	170 (77)

****Cooling – E.A.T. D.B. 80.6°F (27°C)
E.A.T. W.B. 66.2°F (19°C)
E.W.T. 86°F (30°C)**

****Heating - E.A.T. D.B. 68°F (20°C)
E.A.T. W.B. 59°F (15°C)
E.W.T. 68°F (20°C)**

Electrical Specifications

IMPORTANT

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

Table 2 CW / CM - 8,000 BTU electrical specifications

Power Supply Volt — 1-60		Compressor		Indoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	Htr#	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
115V	104	7.5	47	1.4	0.09	N/A	N/A	N/A	N/A	8.9	N/A	10.8	15	5-15P
208/ 230V	197	3.9	20	0.6	0.08	0	N/A	N/A	N/A	4.5	N/A	5.5	15	6-15P
						2	208	1636	7.9		8.5	10.6	15	6-15P
							230	2000	8.7		9.3	11.6		
						3	208	2454	11.8		12.4	15.5	20	6-20P
							230	3000	13.0		13.6	17.1		
						4	208	3271	15.7		16.3	20.4	25	6-30P
							230	4000	17.4		18.0	22.5		
						5	208	4089	19.7		20.3	25.3	30	6-30P
							230	5000	21.7		22.3	27.9		
265V	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3 WM - 9,000 BTU electrical specifications

Power Supply Volt — 1-60		Compressor		Indoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	Htr#	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
115V	104	7.5	47	1.4	0.09	N/A	N/A	N/A	N/A	8.9	N/A	10.8	15	5-15P
208/ 230V	197	3.9	20	0.6	0.08	0	N/A	N/A	N/A	4.5	N/A	5.5	15	6-15P
						2	208	1636	7.9		8.5	10.6	15	6-15P
							230	2000	8.7		9.3	11.6		
						3	208	2454	11.8		12.4	15.5	20	6-20P
							230	3000	13.0		13.6	17.1		
						0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Electrical Specifications

IMPORTANT

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

Table 4 CW - 10,000 BTU electrical specifications

Power Supply Volt — 1-60		Compressor		Indoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	Htr#	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
115V	104	9.9	53	1.4	0.09	N/A	N/A	N/A	N/A	11.3	N/A	13.8	15	5-15P
208/ 230V	197	5.2	27	0.6	0.08	0	N/A	N/A	N/A	5.8	N/A	7.1	15	6-15P
						2	208	1636	7.9		8.5	10.6	15	6-15P
							230	2000	8.7		9.3	11.6		
						3	208	2454	11.8		12.4	15.5	20	6-20P
							230	3000	13.0		13.6	17.1		
						4	208	3271	15.7		16.3	20.4	25	6-30P
							230	4000	17.4		18.0	22.5		
						5	208	4089	19.7		20.3	25.3	30	6-30P
							230	5000	21.7		22.3	27.9		
265V	240	4.6	20	0.67	0.08	0	N/A	N/A	N/A	5.3	N/A	6.4	15	7-20P

Table 5 CM / WM - 12,000 BTU electrical specifications

Power Supply Volt — 1-60		Compressor		Indoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	Htr#	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
115V	104	9.9	53	1.4	0.09	N/A	N/A	N/A	N/A	11.3	N/A	13.8	20	5-15P
208/ 230V Models CM & WM Model CM only	197	5.2	27	0.6	0.08	0	N/A	N/A	N/A	5.8	N/A	7.1	15	6-15P
						2	208	1636	7.9		8.5	10.6	15	6-15P
							230	2000	8.7		9.3	11.6		
						3	208	2454	11.8		12.4	15.5	20	6-20P
							230	3000	13.0		13.6	17.1		
						4	208	3271	15.7		16.3	20.4	25	6-30P
							230	4000	17.4		18.0	22.5		
						5	208	4089	19.7		20.3	25.3	30	6-30P
							230	5000	21.7		22.3	27.9		
265V	240	4.6	20	0.67	0.08	0	N/A	N/A	N/A	5.3	N/A	6.4	15	7-20P

Electrical Specifications

IMPORTANT

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

Table 6 CW - 13,000 BTU electrical specifications

Power Supply Volt — 1-60		Compressor		Indoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	Htr#	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
115V	104	10.8	53	1.4	0.09	N/A	N/A	N/A	N/A	13.8	N/A	16.5	25	5-20P
208/ 230V	197	7.4	33	0.6	0.08	0	N/A	N/A	N/A	8.0	N/A	9.9	15	6-15P
						2	208	1636	7.9		8.5	10.6	15	6-15P
							230	2000	8.7		9.3	11.6		
						3	208	2454	11.8		12.4	15.5	20	6-20P
							230	3000	13.0		13.6	17.1		
						4	208	3271	15.7		16.3	20.4	25	6-30P
							230	4000	17.4		18.0	22.5		
						5	208	4089	19.7		20.3	25.3	30	6-30P
							230	5000	21.7		22.3	27.9		
265V	240	6.0	28	0.67	0.08	0	N/A	N/A	N/A	6.7	N/A	8.2	15	7-20P

Table 7 CM / WM - 15,000 BTU electrical specifications

Power Supply Volt — 1-60		Compressor		Indoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	Htr#	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
208/ 230V Models CM & WM	197	7.4	33	0.6	0.08	0	N/A	N/A	N/A	8.0	N/A	9.9	15	6-15P
						2	208	1636	7.9		8.5	10.6	15	6-15P
							230	2000	8.7		9.3	11.6		
						3	208	2454	11.8		12.4	15.5	20	6-20P
							230	3000	13.0		13.6	17.1		
						208/ 230V Model CM only	197	7.4	33		0.6	0.08	4	208
230	4000	17.4	18.0	22.5										
5	208	4089	19.7	20.3	25.3								30	6-30P
	230	5000	21.7	22.3	27.9									
265V	240	6.0	28	0.67	0.08	0	N/A	N/A	N/A	6.7	N/A	8.2	15	7-20P

Electrical Specifications

IMPORTANT

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

Table 8 CW - 17,000 BTU electrical specifications

Power Supply Volt — 1-60		Compressor		Indoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	Htr#	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
208/ 230V	197	8.3	44	0.6	0.08	0	N/A	N/A	N/A	8.9	N/A	11.0	15	6-15P
						2	208	1636	7.9		8.5	10.6	15	6-15P
							230	2000	8.7		9.3	11.6		
						3	208	2454	11.8		12.4	15.5	20	6-20P
							230	3000	13.0		13.6	17.1		
						4	208	3271	15.7		16.3	20.4	25	6-30P
							230	4000	17.4		18.0	22.5		
						5	208	4089	19.7		20.3	25.3	30	6-30P
							230	5000	21.7		22.3	27.9		
265V	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



Figure 14 NEMA Specifications Non / Locking / Receptacles

VOLTAGE	125V		250V			265V		
	15(A)	20(A)	15(A)	20(A)	30(A)	15(A)	20(A)	30(A)
PLUG								
	5-15 P	5-20 P	6-15 P	6-20 P	6-30 P	7-15 P	7-20 P	7-30 P
RECEPTACLE								
	5-15 R	5-20 R	6-15 R	6-20 R	6-30 R	7-15 R	7-20 R	7-30 R

Notes

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form a uniform pattern of small squares across the entire surface. There are no margins, text, or other markings on the paper.

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