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# Installation Instructions

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Ecologix EM™ Series Air Handler  
Make Up Air Unit  
Internal pump  
ECM High Efficiency Motor

**ECOLOGIX HEATING TECHNOLOGIES INC.**  
90 Monarch Road.  
Guelph, Ontario  
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ISSUE DATE: 11/23/2023

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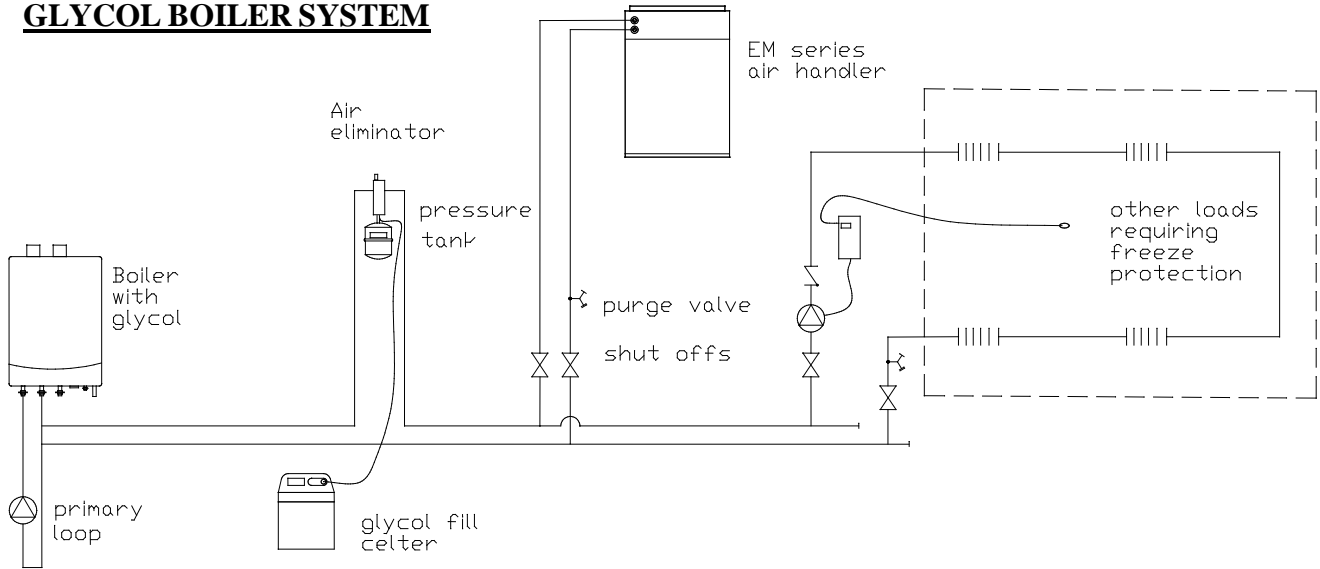


**CHECKLIST FOR THE INSTALLER**

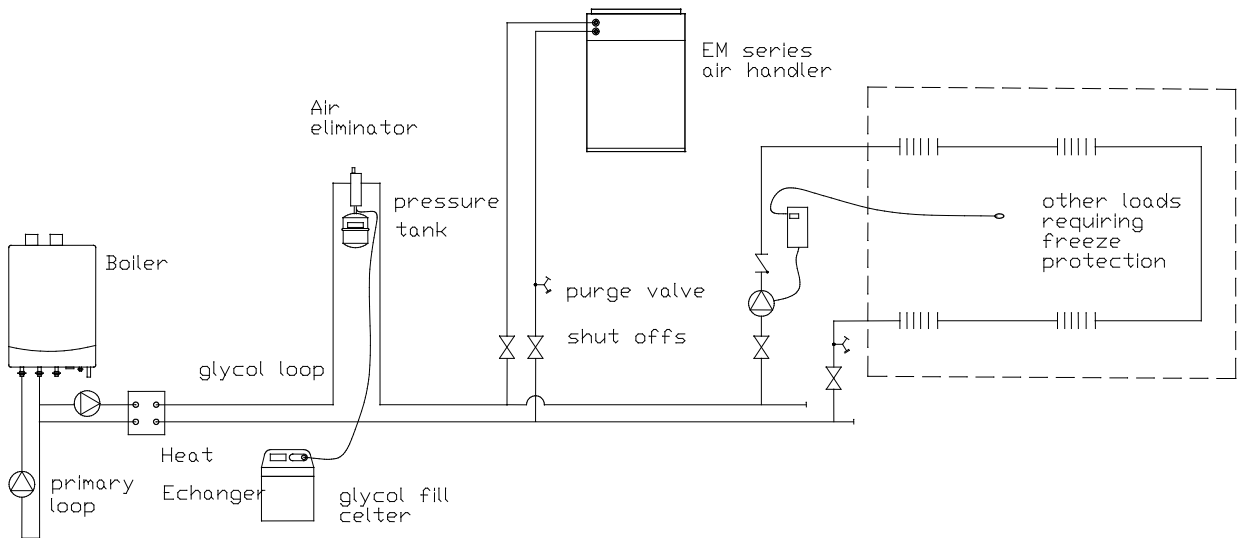
<input checked="" type="checkbox"/>	<b>A Quick Check List</b>
<input type="checkbox"/>	Are the water connections to the boiler oriented in a way to avoid trapping air in the heating circuit?
<input type="checkbox"/>	Is the purge valve installed on the return line from the air handler upstream from the isolation valve?
<input type="checkbox"/>	Is the air handler hung and isolated to avoid transmitting vibration through framing and duct work?
<input type="checkbox"/>	Are the isolation valves full-port? Restrictive valves will limit performance.
<input type="checkbox"/>	Is the glycol loop concentration adequate for the location design conditions?
<input type="checkbox"/>	Are Thermostat connections correct, including cooling and continuous run/heat connections? Do they operate their intended zone (if second zone is used)?
<input type="checkbox"/>	Have the packing materials been removed from the blower and the pump (if applicable) ?
<input type="checkbox"/>	Is there an installation manual and controls user manual for the home owner ?
<input type="checkbox"/>	Is the unit accessible? Are there clearances for service and component replacement?
<input type="checkbox"/>	Is the return duct/drop acoustically lined ? (at least 6 ft. of the return duct/drop must be lined)
<input type="checkbox"/>	Is the filter cover in place? Is a clean filter in place? Is the filter rack installed?
<input type="checkbox"/>	Has the control board been properly configured for required fan speeds?

## TYPICAL PLUMBING CONNECTIONS

### GLYCOL BOILER SYSTEM



### SYSTEM WITH HEAT EXCHANGER



## INTRODUCTION

The **EM™ series air handler** is designed for use in hydronic (boiler) systems, Hydronic Heat Pump systems or combination space and water heating systems (Combo Systems). The EM series make up

air handler will control the supply air temperature of a fresh air stream to deliver conditioned air to the space. The optional cooling mode allows the connection of a cooling system for summer conditioning if desired.

## Features

Ecologix air handlers offer many unique features that set them apart:

### SOFT START

This feature starts the fan slowly and quietly rather than a large “thump” common in some furnaces and air handlers.

### EVAPORATOR COIL FREEZE PROTECTION

If the evaporator coil air temperature drops outside of the expected operating range this indicates a potential evaporator coil freeze condition. Coil freezing can lead to slugging (liquid refrigerant going back to the

compressor) which will damage the compressor. All EM series come equipped with a sensor which will respond by shutting off the outdoor cooling unit to allow the system to warm up. Note that this freeze condition is not normal and may indicate blocked ducts, dirty filter or an over-sized cooling unit.

### TT CONNECTIONS

TT connections are provided on the control board for the heating contractor to operate a boiler or external pumps and devices with any heating call. Refer to the wiring diagram for details.

## PRODUCT DESCRIPTION

### CABINET

All cabinets are constructed from a durable low maintenance galvanized sheet metal.

Cabinet dimensions are designed to provide maximum installation flexibility. Refer to installation requirements for more details.

### HEATING COILS

All heating coils are potable water grade copper suitable for use in plumbing systems. No lead solder is used in any component construction. All coils and internal piping conform to ASTM B68 or ASTM B88 standards.

High-density aluminum fins provide maximum heat transfer for small coil surface.

### FAN AND MOTOR

All fans are wide body dynamically balanced for extra quiet operation. Multi-directional sleeve bearing motors allow mounting in any direction for maximum installation flexibility.

### CIRCULATING PUMP

The circulating pump is matched for maximum performance. Air handlers come with internally mounted pumps for ease of installation. Air handlers can be special ordered with external, field installed pumps, when it is desirable to locate the circulator below the air handler, such as in attic installations.

### CHECK VALVE

Air handlers come with built in spring loaded check valves located in the outlet of the internal pump. Check valves protect against back-flow of water to avoid short circuiting around the water heater during domestic water use.

### PUMP EXERCISER

The air handler is equipped with a pump exerciser that brings on the pump for 60 seconds every 24 hours to flush any water through the system at least once a day. A test button on the control allows for easy verification that the pump exerciser is operating correctly.



## EQUIPMENT SIZING AND SELECTION

### PROCEDURE

1. Determine air needs for makeup.

2. Determine inlet water temperature
3. Select Air Handler from specifications sheet

## INSTALLATION

The installer must adhere strictly to all local and national code requirements pertaining to the installation of this equipment. Detailed instructions are shipped with all accessory items and should be followed closely.

### AIR HANDLER MOUNTING

The air handler can be installed in any direction. Some precautions must be observed for some of the possible mounting positions. For installations where the access door faces up or down, select an air handler with an external pump to avoid the pump being mounted with its shaft vertical. The pump shaft must be mounted horizontally to avoid premature failure.

The air handler can be hung by securing straps through any of the existing screw holes in the cabinet. When the existing screw is too short for securing a mounting strap, a longer screw can be used provided care is taken not to damage any internal components. When fastening straps using screws other than those supplied with the cabinet, special care should be taken in the vicinity of the coil to avoid tube puncture.

The cabinet is designed so that the return air can be located on either side of the cabinet, through the bottom of the cabinet, or from the back. Position the filter rack so that the filter is readily accessible.

Install the air handler with the door firmly screwed in place to make sure the cabinet remains square.

Provide at least 2 feet (0.75 metres) of service clearance in front of the access panel of the air handler. Zero clearance is acceptable on all other faces.

### DUCTWORK

Duct connections at the air handler should be labeled for future reference.

Supply trunks may be square or round. SEAL all joints and seams with metal tape or sealing compound. Locate outlets at least 6 inches from outside walls or window coverings.

Ductwork for conditioned supply air from the EM unit installed in unheated spaces or fresh air ducts in conditioned spaces connecting to the EM unit must be insulated. Provide at least R-12 of insulation around ducts. If cooling is required, the branch and trunk lines must be insulated and sealed with a vapour barrier prior to applying house insulation.

### RISK OF FREEZING

**Steps must be taken to prevent the hot water coil from freezing. Coils that have failed due to freezing and damage caused by frozen coils are not covered under warranty. GLYCOL freeze protection must be used and the concentration must be adequate to avoid damage to the system.**

### EVAPORATOR COILS

The EM series air handler is designed to provide acceptable airflow for cooling. Make sure the fan speed is correctly selected for the cooling load installed. Abnormal conditions such as plugged filter can pose the risk of freezing. All EM series air handlers include a temperature sensor in the air stream that will detect a near freezing condition and will interrupt the air conditioner until it warms up. (Refer to wiring diagram mounted inside air handler.)

### ATTIC AND CRAWL SPACES

Air handlers may be located in areas subject to freezing conditions. It is necessary to use glycol to protect the hot water coil from freezing.

## ELECTRICAL

**Warning!** - Make sure unit is properly grounded. Locate air handler on a separate electric circuit.

All air handlers operate on either 115VAC/1ph/60hz OR 230VAC/1ph/60hz line voltage, refer to the unit's rating plate. All control circuits are low voltage, either 24VAC or 0-10VDC.

### THERMOSTAT

The EM™ air handlers are compatible with all thermostats. Some electronic thermostats (primarily “power robbing” types) require the addition of a resistor between the W & C terminals and the Y & C terminals. This is usually covered in the thermostat instruction manual. A path is provided to bleed off this residual power under most operating conditions. If you encounter older style thermostats that require significant power to be dissipated, there are large

resistors that can be switched into the circuit to accommodate these thermostats. See the board wiring diagram for location of the dip switches. DO NOT turn on these resistors unless they are required to avoid wasting electrical power unnecessarily.

The EM™ air handler is compatible with all standard setback thermostats. Setback thermostats can be used to achieve greater energy savings.

Thermostat wires are connected to the control using push button terminal strip inside the air handler electric box.

### HUMIDISTAT

Humidistat connection is provided on the control board for switching the humidistat on and off with the heating cycle. Do not connect to the Y terminal to drive the humidistat 24 volt circuit. See wiring diagram inside unit for details.

## START-UP PROCEDURE

**Do not start the air handler or water heater until ALL air has been purged!**

1. Fill the boiler loop or water heater with water, but do not start it.
2. Purge all air from the boiler heating or domestic water system.
3. Purge all air from the glycol-heating loop by closing the isolation valve on the return leg of the loop and open the drain to purge air. Open the return leg isolation valve and then close the drain valve.
4. Start the boiler or water heater according to the manufacturer's instructions. Set the design water temperature and wait for the system to shut off. You can check that the water heater is set properly during the warm up by running a small amount of

- water into a glass in a sink while the water heater is warming up. Using a thermometer measure the temperature of the water as soon as the water heater burner shuts off. If the set-point temperature is too low or is above 140F/60C, reset the tank control, run water until the burner starts again and repeat the measurement.
5. Turn on the power to the air handler and set up the air flow desired for heating, cooling and continuous run speeds. This is important to ensure that the correct airflows are used for the equipment as installed.
6. Provide a W thermostat call and check pipes for heating to make sure there is flow and feel the pump motor to see if it is running hot.
7. Test cooling operation if applicable.

## SERVICE AND MAINTENANCE

### FILTER

All Ecologix air handlers must be installed with an air filter. This filter should be inspected monthly and

replaced as required. Replacement filters are available from Ecologix.



## DUCT CLEANING

If proper filter maintenance is adhered to, duct cleaning will not be required for the life of the equipment.

## COILS

Air conditioning and heating coils should not require cleaning if the filter maintenance schedule is adhered to. If a filter is damaged or collapses from plugging, dust may foul the coils. If this happens, replace the filter and carefully vacuum the heating coil. The fan may need to be removed to gain access to the face of the heating coil.

## AIR CONDITIONING COIL

At the start of each cooling season, check the drain connection to the cooling coil to ensure it is free of debris. If a plugged air conditioning coil is suspected, call a service technician for testing and cleaning

## FAN AND MOTOR

Check fan for dust once a year. If dirty, vacuum to remove dust. Keeping the fan blades clean will reduce noise and improve the capacity and efficiency of the heating system

## PUMP

The circulating pump is water lubricated and should require no regular maintenance. A cycle timer function is included in the software to exercise the pump even during prolonged periods of no heat to avoid seizing from long idle periods.

## TROUBLESHOOTING

### THERMOSTAT CALL ERROR

If the air handler does not run when W is energized, check the status lights to see if the call is being seen by the control and check the error lights to see if there is a thermostat error. When the W call is made the Y call will bring on cooling. Heating cycle for fresh air is automatic but cooling requires a room thermostat to be connected. Note that some thermostats have a delay (typically five minutes) before they will start the air handler in cooling the first time.

### PUMP DOES NOT RUN

In areas where hard water is present the pump may “stick” and fail to run. Often, closing the isolation valve on the return leg and opening the drain port so that water flows through the pump can free this. If this fails to free the pump, removal for cleaning or replacement is necessary. The daily pump exerciser will help prevent pump sticking

### PUMP IS NOISY AT START-UP

Air is present in heating loop. If sound has not diminished within 1 minute, purge air in accordance with the *Start-Up* procedures. If heat source is a water heater, check to make sure branch connections for heating loop are horizontal to prevent the collecting of

air in the heating loop. See the drawing: Typical Plumbing Connections at the front of this manual.

### INSUFFICIENT OR NO HEAT

- Plugged air filter or coil. Refer to *Maintenance* section for filter care and coil cleaning.
- Air in heating loop; purge system.
- Inlet and outlet connections to air handler backwards; reverse connections.
- Water heater supply tube (dip tube) is restricted or damaged; check and/or replace.
- Boiler supply water temperature set too low or not calibrated properly; check water temperature.
- Restrictions in heating loop; remove restrictions, check if valve is stuck, isolation valves could be too restrictive or left partially closed after purging, or closed valve.

### FAN RUNS FOR COOLING BUT NOT HEATING

Thermostat is connected for cooling but there is no call on W to start the make-up air. Room thermostat may be connected improperly. Refer to *Electrical* section or wiring schematic on air handler for proper installation.



## Warranty

This product is warranted by Ecologix Heating Technologies Inc to be free from defects in materials and workmanship that affect product performance under normal use and maintenance within the applicable periods specified below. Replacements furnished will carry only the un-expired portion of the original warranty.

### Two-Year Parts

Ecologix Heating Technologies Inc will provide replacement parts for **ANY part** that fail within two years of purchase, subject to the **terms** below.

### Five-Year Parts

Ecologix Heating Technologies Inc will provide replacement parts for any **heating coils, cooling coils, cabinetry and piping** that fail within five years of purchase, subject to the **terms** below.

### Terms

- ❖ Reasonable proof of original purchase date must be provided in order to establish the effective date of the warranty, failing which, the effective date will be based on the date of manufacture plus thirty days.  
The warranty does not cover failure or damages caused by:
  - improper installation or operation
  - accident, abuse or alteration
  - operation of device at temperatures or pressures outside of the rated capacities
  - lime or scale deposits
  - corrosive operating environment
  - equipment moved from original installation location
- ❖ Replacements furnished under this warranty will be F.O.B. Ecologix Heating Technologies Inc product distribution points in the United States and Canada. They will be invoiced at regular prices. The account will be credited the full amount when the defective part is received by Ecologix, examined and approved as a valid warranty.
- ❖ Warranty applies to the original purchaser, but may be transferred to another owner provided the equipment is not moved from the original installation site.
- ❖ This warranty does not apply to labour, freight or any other cost associated with the service repair or operation of the product.
- ❖ Ecologix shall not be liable for any direct, special, incidental or consequential damages caused by the use, misuse, or inability to use this product.
- ❖ Ecologix is under no legal obligations to rectify, including but not limited to, lost profits, downtime, good will, damages to, or replacement of equipment and property
- ❖ Purchaser assumes all risk and liability of loss, damage or injury to purchaser and purchaser's property and to others and their property arising out of the use, misuse or inability to use this product.