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# Installation Instructions

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## ECW™ Series Air Handler

Very low profile  
External pump  
Hot water coil  
DX cooling coil  
Build in filter rack  
ECM high efficiency motor

### **ECOLOGIX HEATING TECHNOLOGIES INC.**

90 Monarch Road.  
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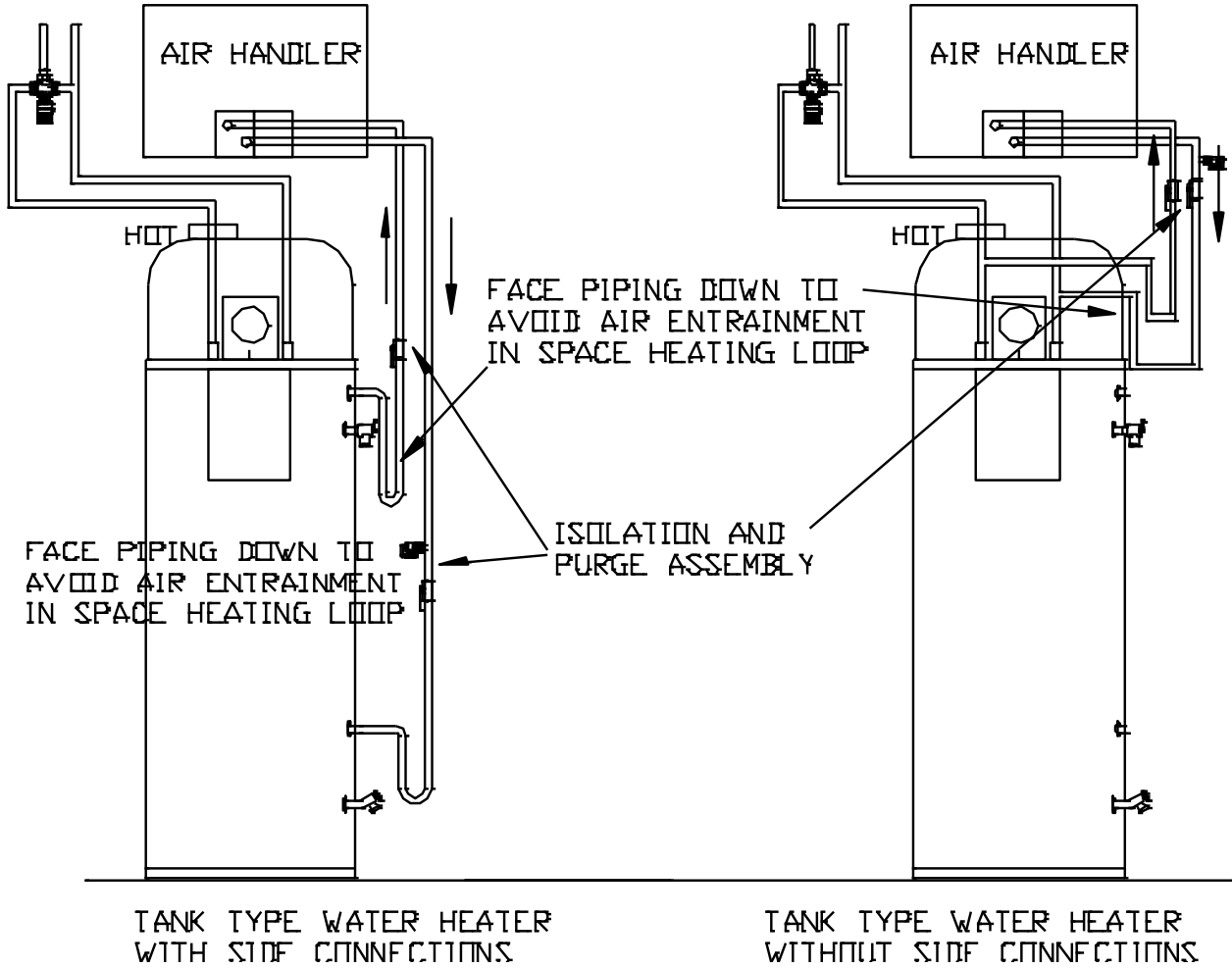
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**CHECKLIST FOR THE INSTALLER**

<input checked="" type="checkbox"/>	<b>A Quick Check List</b>
<input type="checkbox"/>	Are the water connections to the water heater 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 outdoor cooling unit contactor wired according to the wiring diagram?
<input type="checkbox"/>	Are Thermostat connections correct, including cooling and continuous run connections? Do they operate their intended zone?
<input type="checkbox"/>	Have the packing materials been removed from the blower and the pump ?
<input type="checkbox"/>	Is there an installation 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?
<input type="checkbox"/>	Have the fan speeds been set up properly for heating, cooling, and continuous fan for the specific install?

### TYPICAL PLUMBING CONNECTIONS





## EQUIPMENT SPECIFICATIONS

### x Physical Properties

MODEL:	ECW33	ECW40
Dimensions (W x D x H) inches	26"x24"x16.25"	26"x24"x16.25"
Supply Air Opening (WxD) inches	Adjustable	Adjustable
Return Air Opening (WxD) inches	20"x8"	20"x8"
Filter Rack Size (WxD) inches	16"x24"	16"x24"
Water inlet and outlet	½"	½"
Water Coil (length x width x rows)	13 x 20 x 2 row	13 x 20 x 3 row
AC Coil (length x width x rows)	16x20x2	16x20x3
Shipping weight – pounds	60	65
Power (V/Ph/Hz)	230/1/60	230/1/60
Total Unit FLA	6.3	6.3
Minimum Ampacity	7.7	7.7
Max over current (max fuse size) Amps	15	15

### PERFORMANCE Specifications

MODEL:	ECW33	ECW40
Heating Capacity (Btu/h) 100F water	14,000	17,000
Heating Capacity (Btu/h) 110F water	18,600	22,700
Heating Capacity (Btu/h) 120F water	23,200	28,400
Heating Capacity (Btu/h) 130F water	27,900	34,100
Heating Capacity (Btu/h) 140F water	33,000	39,800
Cooling Capacity – (Tons)	1.5	2.0
Continuous run speeds	Low ML-Med-MH High	Low ML-Med-MH High
Heating Air flow speeds - cfm	240 320 480-650-800	240 320 480-650-800
Cooling air flow speeds – cfm	240 320 480-650-800	240 320 480-650-800
Circulator Pump Flow(GPM)	4.0	4.0
Maximum Heating Airflow (CFM)	800	800
Max. Ext. Static Pressure (in.wc)	0.6	0.6

Heating capacities are based on 70F return air, high fan speed. For medium speed de-rate capacity by 20%. For low speed de-rate capacity by 40%. Air handler can deliver the programmed airflow at any static pressure below the maximum external static pressure.

## INTRODUCTION

The ECW™ series air handler is designed for use in combination space and water heating systems (Combo Systems). Combo heating systems use the home's

water heater to provide both the space heating and domestic hot water, eliminating the need for a furnace. The ECW has a low profile which makes it ideally suited for air handler replacements above the newer taller high efficiency water heaters where space is at a premium.

## Features

The ECW air handler offers many unique features that set them apart:

### **ROTARY SPEED SELECTOR KNOBS**

The control has a selector knob for each speed: heating, cooling, continuous run. The knobs are colour coded and labelled for easy identification. Each mode speed is independently selectable directly from the control board.

### **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 ECW series air handlers 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 for the heating contractor to operate a boiler or external pumps and devices with any heating call. Refer to the wiring diagram in the controls user manual for details.

### **PUMP EXERCISER**

The air handler is equipped with a pump exerciser that brings on the pump for 90 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

### **BUILT IN COOLING COIL**

Integral coil sized for maximum two tons of cooling.

### **STAINLESS STEEL FLOAT SWITCH**

Float switch shuts off air conditioning in case of drain plug to avoid flooding.

## PRODUCT DESCRIPTION

### **CABINET**

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

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.

### **HEATING COILS**

All heating coils are potable water grade copper suitable for use in plumbing systems. No lead solder is

## **EC VARIABLE SPEED MOTORIZED BLOWER**

All blowers are backward inclined EC variable speed motors that can be mounted in any position.

## **CIRCULATING PUMP**

The circulating pump is matched for maximum performance. Air handlers come with a pump to be externally mounted.

## **CHECK VALVE**

The pumps come with a spring-loaded check valve to be installed with the external pump

Check valves protect against back-flow of water to avoid short circuiting around the water heater during domestic water use.

## **THERMOSTAT**

ECW air handlers are compatible with most heat / cool thermostats. Note that the thermostat must be supplied separately.

## **EQUIPMENT SIZING AND SELECTION**

### **PROCEDURE**

1. Conduct a complete heat loss / heat gain calculation.
2. Determine inlet water temperature
3. Select Air Handler
4. Determine zones within the space
5. Select # outlets per room
6. Determine Duct Layout

The selected air handler must be sized according to the following rules:

- a) Heating capacity should be between 100% and 140% of the heat loss.

*(110% to 140% for combo systems @ 130 °F water temp)*

- b) Cooling capacity should be between 75-100% of the heat gain. Do not oversize

### **HEAT LOSS / HEAT GAIN**

Room by room calculations need to be completed using HRAI, ASHRAE, or another approved sizing methods.

When using a boiler system, select a boiler with an output that meets or exceeds the heat loss of the space being heated. If the boiler is serving additional loads, size the boiler to meet the total combined load.

For combo heating systems, use an approved sizing method such as the Unified Combo Guidelines published by HRAI.

### **AIR HANDLER SELECTION**

## **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.

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.

### **AIR HANDLER MOUNTING**

The ECW air handler is designed to be installed above a water heater near the ceiling with the supply duct coming off the top. The return air can be connected to either the top or side of the unit opposite to the supply duct.

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 (eg. basement, main, upstairs).

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 installed in unheated spaces such as attics must be installed between the insulation and the heated space. Provide at least R-12 of insulation above 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.**

### HRV and Fresh air connections

If a fresh air duct is required, make connection to return air plenum at least 18 inches from the air handler. Insulate all fresh air ducts.

Fresh air and HRV connections to ductwork can pose a risk of dumping cold air into ductwork during periods of stand-by or continuous run. Calculate

mixed air stream temperatures and provide interlock controls to prevent freezing conditions.

If an HRV is to be attached to the return ductwork, the HRV must be interlocked to the air handler controls to ensure the air handler fan is forced to run if the HRV is in operation. This interlock is required for both summer and winter operation.

## **AIR CONDITIONING**

The ECW series air handler is equipped with an integral coil for cooling. The unit is shipped with a flow rater piston sized for 1.5 Tons of cooling using R410a refrigerant. Other piston sizes are available. For applications where a TX valve is desired, the piston can be removed and the TX valve piped external to the unit. To install the TX valve inside the unit, a TX valve kit using Chatteff connections is available for threading directly into the flow rater body. 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 ECW 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 protect the hot water coil from freezing. An optional Freeze protection remote bulb thermostat wired in parallel to the room thermostat can be used to cycle on the pump and blower when conditions get close to freezing. The Freeze Protection thermostat cannot protect piping that passes through unconditioned spaces

## **ELECTRICAL**

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

All ECW air handlers operate on 230VAC/1ph/60hz line voltage. All control circuits are low voltage, either 24VAC or 0-10VDC.

### **FIELD CONNECTION:**

- 1) 230 VAC Main Power Connection to screw terminal (REQUIRED)
- 2) External Pump connections. Note that the 230 VAC power for the pump is supplied

at the screw terminal and 'L1' and 'L2' are switched using the relay installed in order to bring the pump on when required. (REQUIRED)

- 3) Thermostat Connections – Connect thermostat connections at “Thermostat Inputs” on the board. Be sure to match the wires with the “Conventional” silk screen. (REQUIRED)
- 4) ‘TT’ Connection – This is a dry contact that is closed on a heating call. Generally

- used as a switch to bring on a boiler if applicable. (OPTIONAL)
- 5) 'AC' Connections – This is to be connected directly to the 24 VAC coil of the AC contactor. This connection sends a 24 VAC signal to bring the compressor on whenever there is a cooling call. (REQUIRED if connected to an air conditioner)
  - 6) 'HUM' Connection – This is a dry contact that is closed on a heating call. It can be used to turn on a humidifier whenever the unit is running in heating mode. (OPTIONAL)

## **THERMOSTAT**

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

The ECW series air handler is compatible with both heat/cool and heat pump thermostats. A switch is provided on the control board to toggle between thermostat types

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 space-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. Set the room thermostat for heat to energize the fan and pump. If a gurgling sound is present, it should subside within one minute. If noise is still present after one minute, repeat step 3 to purge air as necessary.
7. Check pipes for heating to make sure there is flow and feel the pump motor to see if it is running hot.

## SERVICE AND MAINTENANCE

### **FILTER**

All **Ecologix** air handlers are provided with a pleated filter media. 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

### **MOTORIZED BLOWER**

Check blower 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.

## TROUBLESHOOTING

### **THERMOSTAT CALL ERROR**

If the air handler does not run when thermostat is calling, 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. Thermostat error occurs when a heating and cooling call are simultaneously being received by the control. 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.

### **WATER HEATER T&P IS WEEPING**

A check valve or back-flow preventer may have been installed in the system. Some form of pressure relief may be required. Options are:

- Install expansion tank
- Install pressure relief valve; locate outlet over laundry tub or floor drain.
- Install combination toilet tank/pressure relief valve

## **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.
- 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.

## **WATER HEATER SUPPLY TEMP IS UNSTABLE**

Check water heater setting and temperature sensors for good contact on coil headers.

## **COLD WATER AT HOT FAUCET**

When heat source is a water heater, the most probable cause is reverse flow through the heating loop from a stuck check valve; repair or replace valve.

## **FAN RUNS FOR COOLING BUT NOT HEATING**

Room thermostat may be connected improperly. Refer to *Electrical* section or wiring schematic on air handler for proper installation.

## **HEATING DURING STANDBY MODE**

Probable cause is thermal siphoning. Make sure piping elevation instructions shown in piping drawings have been followed. Repair or replace check valve. Check elevation of air handler above water heater to see if motorized valve required for positive shut-off.

## 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.