

INSTALLATION INSTRUCTIONS

FOR

ECU Heat Recovery Unit

GENERAL INFORMATION

1. The ECU Heat Recovery Unit is offered in several optional configurations. Check the Model number and the wiring diagram configuration to determine which configuration you are about to install. Some parts of this Installation Instructions may not apply.
2. The ECU Heat Recovery Unit consists of an all-copper, heat exchanger and a water-cooled water circulating pump. The pump is controlled by the use of one or more limit switches. Power for the pump is derived either from the hot side of the compressor contactor of the outdoor section of the Air Conditioner or Heat Pump, or it may be derived from a remote power source.

CAUTIONS / DISCLAIMERS

The ECU Heat Recovery Unit is an appliance that operates in conjunction with the Air Conditioning or Heat Pump System, the Hot Water System and the Electrical System. Installation should only be performed by skilled technicians with appropriate training and experience.

The installation must be in compliance with local codes and ordinances. Local Plumbing and Electrical Building Codes take precedence over instructions contained herein.

The Manufacturer accepts no liability for equipment damaged and/or personal injury arising from improper installation of the Heat Recovery Unit.

SPECIAL NOTE:

All our products are manufactured with a Freezestat. Consequently power must be available to the unit 24/7. If the temperature of the ECU approaches 32 degrees the freezestat will start and stop the pump to circulate water into the ECU preventing freeze up. In applications with extended periods of time below 32 degrees, cut the power to the pump, shut off the water supply and drain the unit with the bleed shut off valves. In the spring be sure and purge all the air from the pump on startup. Remember this type of freeze protection is inoperable in the event of a power outage. The safest method of freeze protection is to provide for draining the heat exchanger and water lines.

I. LOCATION / MOUNTING THE UNIT

The ECU Heat Recovery Unit should be mounted as close to the Air Conditioner or Heat Pump outdoor section as possible, in order to minimize the length of refrigerant run. Indoor mounting is preferred, where practical, to reduce the likelihood of freezing ambient temperature. It is recommended that the Heat Recovery Unit be mounted above the system compressor in order to promote proper oil movement and drain-down. This means that the Heat Recovery Unit can be wall mounted in any orientation except for stubs up.

SPECIAL NOTE: *The selected mounting location and orientation must allow the circulator pump to be positioned with the motor shaft horizontal DO NOT install the Heat Recovery Unit flat on its back.*

Mounting should be accomplished by fastening the HRU cabinet to the wall or other selected vertical member. A flange is provided at the top rear of the Unit. Any fastener suitable for supporting a 12 LB vertical load is acceptable.

II. REFRIGERANT LINE INSTALLATION

Before starting the installation into the refrigerant circuit, inspect and note the condition and performance of the Air Conditioner or Heat Pump. Any system deficiencies must be corrected prior to installing the Heat Recovery Unit. Addition of the unit will not correct system problems. Record the suction and discharge pressures and compressor amperage draw. These will be used for comparison with system operation after the refrigerant line installation is complete and before the water line installation is performed.

INSTALLATION

1. Disconnect power to the Air Conditioner or Heat Pump Outdoor Unit.
2. Reclaim the refrigerant from the system...
3. Cut the refrigerant line between compressor and condenser, or reversing valve if a Heat Pump System. Connect new refrigerant lines between the Heat Recovery Unit and the cut refrigerant lines. The recommended line size is dependent on the one way distance between the Heat Recovery Unit and the compressor; and the size of the system. Use the following table as a guideline.

	1/2" OD	5/8" OD	3/4" OD
2 Ton	Up to 16ft	Up to 30 ft.	N/A
3 Ton	Up to 9 ft.	Up to 25 ft.	Up to 30 ft.
4 Ton	Up to 5 ft.	Up to 13 ft.	Up to 30 ft.

5 Ton N/A Up to 9 ft. Up to 25 ft.

4. Make the connections with high temperature silver solder.

NOTE: *Make sure the Compressor discharge cut end is connected to the "Hot Gas In" stub on the Heat Recovery Unit.*

5. Insulate both refrigerant lines from the HRU with closed cell foam pipe insulation leaving no exposed surfaces. Do not put both lines in one jacket. This will reduce the heat output of the Heat Recovery Unit.

NOTE: *Locate Refrigerant lines to avoid accidental damage by lawnmowers of children.*

6. Evacuate and recharge the system using your standard practice. As a guide line add 1.0 oz. of refrigerant for the heat exchanger plus 1.0 oz. for each 10 ft of 1/2" OD refrigerant line, if the weighed charge method is used.

7. Carefully check for leaks; if none are found, then check system pressures and amperage draw, and compare to the readings taken before Heat Recovery Unit installation. Adjust charge, as required, to achieve normal system operation.

Electrical Installation

1. Disconnect power to the air conditioner or heat pump outdoor unit.
2. Run three (3) conductor #14 insulated wire in a grounded liquid tight conduit, or as required by local building and electrical codes.
3. In all applications the Heat Recovery Unit is intended to run only when the compressor runs. This is accomplished by a 125 degree close on rise thermostat in the ECU. In all cases power for the Heat Recovery Unit is pulled from the power or L1 and L2 side of the compressor contactor or a remote source.
4. The ECU may be connected to a remote power source, independent of the air conditioner power.
5. Connect the power lines to the wiring pigtails in the Heat Recovery Unit using

wire nuts (not provided). Secure the ground connections. The power lines can enter the Heat Recovery Unit cabinet from the left or right side by simply exchanging the vent cap and strain relief bushing installed in the cabinet.

NOTE: *The Heat Recovery Unit is designated to operate on 230VAC, single phase power. Under normal operating conditions it should draw approximately 90 watts (0.4 amps). The Heat Recovery Unit may be fused with either 0.6a or 0.75a 250V rated fuses; they are not required by code.*

III. WATER LINE INSTALLATION

Before starting installation of the water connections, inspect the water heater for leaks, corrosion or other problems. If the water heater needs to be changed out, now is the right time. If the existing water heater is acceptable, proceed with the following installation.

INSTALLATION

1. Shut off power to the water heater, if electric, at the fuse or circuit breaker panel. If it's a gas-fired water heater, close off the gas valve found ahead of the water heater burner and controls.
2. Shut off the cold water supply to the water heater.
3. Empty the water heater by attaching a hose to the drain valve and opening the pressure relief valve. If the draining water appears dirty or cloudy, you may have to refill the water heater and drain it again, until the draining water appears clear and free of sediment.
4. Cut the cold water supply line between the shut-off valve and the top of the water heater. Insert a Tee between the two cut ends. This will become the coldwater supply to the Heat Recovery Unit.

NOTE: *Some water heaters are already plumbed with stubs extending from the cold water line and the hot water delivery line. Use the cold water stub instead of performing step 4. Do not use the hot water stub.*

5. Determine where the hot water from the Heat Recovery Unit will return to the water heater. We recommend three places for the returning hot water. Most common is the bottom of the tank, remove the drain valve, inserting a pipe nipple and Tee, and then reinstalling the drain valve and the Heat Recovery water line on the Tee. Normally ½ " AC or ½" plumbing piping is used to the ECU unit. Option number 2 is to remove the sacrificial anode from the tank and replace it with a new anode rod that has a ¾" mpt fitting on top with a hole for incoming or outgoing water "see picture on file". This method works well as long as you can

remove the old rod. The third method is to use the optional side pop-off plug that is available on newer tank.

Note:

- *Do not return the Heat Recovery Unit's hot water by placing a Tee in the hot water delivery pipe above the water heater. This approach will allow water to pass directly from the Heat Recovery Unit into the Home; and that is likely to create bursts of cold water in the shower when the Heat Recovery Unit cycles on while the shower is running.*
- *Do not return the Heat Recovery Unit hot water by modifying the water heater's pressure relief valve opening.*

6. Connect the water lines between the water heater and the Heat Recovery Unit. The recommended pipe size is dependent on the one-way distance from the HRU to the water heater; the number of bends in the run; and the capacity of the cooling system. Use the following table as a guideline. (Assumes 3-90 degree bends)

	1/2" OD (3/8" Norn)	5/8" OP (1/2" Norn)	OP (5/8" Norn)
2 Ton	150ft	N/A	N/A
3 Ton	80ft.	150ft.	N/A
4 Ton	40ft	100 ft.	150ft.
5 Ton	25ft.	50ft.	150ft.

Larger runs & Larger pipes are not recommended

7. Your Heat Recovery Unit may have factory installed hand valves. If not we strongly recommend the installation of hand valves and a pressure relief valve at the Heat Recovery Unit end of the water lines. Drainable valves, also known as "Stop and Waste" valves should be used, as they will allow draining of the heat exchanger and will also perform as air-bleeds when filling the system.

NOTES:

- *Make sure that the water lines are connected to the "cold water in" and "hot water out" stubs of the Heat Recovery Unit. Connecting the water lines to the refrigerant lines will cause serious damage to your compressor.*
- *Make sure that the water line from the water heater's cold water supply tee is connected to the "cold water in" stub on the Heat Recovery Unit. Performance is significantly impaired if the water line connections are reversed.*

8. Insulate the entire length of both water lines between the water heater and the

Heat Recovery Unit, using closed cell foam pipe insulation.

9. Turn on the cold water supply to the water heater and allow the water heater and the Heat Recovery Unit to fill with water. Bleed air from the water heater and the lines by opening a hot water faucet in the house; opening the pressure relief valve at the water heater; opening the drain fittings on the hand valves at the Heat Recovery Unit; and venting the circulator pump. Shut the vents, pressure relief valve and faucet once the air has been expelled from the lines. Once the system is full of water, check for leaks at each of the new connections.

10. Turn the power (or gas) back on the water heater and check for normal operation.

NOTE: *The Heat Recovery Unit is capable of generating very hot water. Precautions should be taken to avoid the possibility of scalding. Make sure that the "hot water out" line is well insulated and protected from accidental handling or damage by children, lawnmowers, etc...*

V. SYSTEM START UP

At this point the Heat Recovery Unit is ready to operate in conjunction with the air conditioner or Heat Pump and the water heater.

1. Reconnect power to the air conditioner or heat pump.
2. Leave the cover off the Heat Recovery Unit during initial start-up, to facilitate final inspection.
3. Set the indoor thermostat on the air conditioner or heat pump to cause operation in the cooling mode.
4. The Heat Recovery Unit's circulator pump will start-up after the compressor starts up. Heat pump equipped and freeze protected models will be delayed in start-up until the hot gas control sensor is satisfied (125 Degrees F).
5. Inspect the interior of the Heat Recovery Unit for signs of leaks, exposed wire or loose connections. Make sure the controls are mounted securely on the internal piping.
6. After a few moments of operating carefully pull back the insulation around the "cold water in" and "hot water out" lines right outside the Heat Recovery Unit cabinet. Using a thermometer adjust the water flow so that the incoming water temperature and the outgoing water temperature have about a 15 degree TD. "Example incoming water 80 degrees outgoing water 115, add more flow to get

80 in and 95 out.” This will give you the optimum heat exchange rate and optimum seer increase to your AC/Heat Pump unit.

7. If you can feel that heat is being transferred into the water lines, you can replace the cover on the Heat Recovery Unit and start cleaning up. If not, move on to the next section of instructions. The section you need is: TROUBLESHOOTING.
8. You may want to reset the thermostats on the water heater to optimize operating of the Heat Recovery Unit. We recommend setting the upper thermostat to 125 degrees F and the lower thermostat to 100 degrees F. In southern climates, it may be possible to shut off the power to the water heater during the cooling season, and have the Heat Recovery Unit provide 100% of the water heating.
9. Another popular option is to add a water heater timer. Normal settings are to set the water heater for 130 degrees top and bottom and set the clock for 1 hour at 6 am and 1.5 hour at 8 pm. What you are doing is allowing the AC unit to “heat up your water” during the day and night, but checking twice a day to be sure it is up to snuff for morning and evening showers and baths. This is great for rainy summer days when the AC unit doesn’t turn on.

VI. TROUBLESHOOTING

The first steps in diagnosing a suspected Heat Recovery Unit malfunction are to determine (1) Is heat being transferred; and (2) should the Heat Recovery Unit be running now.

1. Check, by touch, the relative temperatures of the four stubs and connecting lines coming from the Heat Recovery Unit. Is the “hot gas in” line truly hot? Is the “cool gas out” line cooler than the “hot gas in” line? Is the “cold water in” line cool, warm or hot. Is the “hot water out” line warmer than the “cold water in” line?
2. Check the other system components to determine if the Heat Recovery Unit should be on or off. Is the water heater power on or off? Are the water heater thermostats set up to 140 degrees or more? Is the Compressor running?
3. If heat is not being transferred and the Heat Recovery Unit should be running, open the front cover and inspect the following items: Are the controls still firmly clamped to their respective pipes? Does the wiring agree with the wiring diagram? Is the pump running? Are the hand valves open? If there are fuses, are the fuses blown?

Note: *Pump operating can be checked by listening, by feeling vibrations, or amp draw (.4 amps).*

4. If the pump is not running and the fuses aren't blown, check the controls by removing them from the circuit and rewiring the circuit. If the pump still isn't running, replace the pump motor. Do not cut the plumbing connections from the pump, just replace the pump head.

5. If the pump is running and no heat is transferring, the most common fault is shut off water or an air lock. In the latter case you can purge the air by using the bleed valves or by carefully purging air by using the mounting screws for the pump assembly.

LIMITED WARRANTY FOR RESIDENTIAL APPLICATIONS

Doucette Industries, Inc. warrants each to be free of defects in materials and workmanship according to the following terms, conditions and time periods:

PART A - COVERAGE:

1. First Year Warranty Includes: Repair or replacement for a period of one year after original installation of all parts found to be defectively manufactured.
2. Second Through Tenth year Warranty includes: Repair or replacement for the second through tenth year after original installation of unit heat exchanger coil.
- 2a. Additional warranty coverage, up to 3 years is provided by the manufacturer of the pump.
3. In the absence of suitable proof of date of installation (Bill of Sale), the specified warranty period will commence 30 days after the date of manufacture.
4. This warranty extends only to units in residential applications which have been properly installed, operated and maintained. This warranty is nontransferable and applies to the original owner at the original installed location. Doucette Industries, Inc. makes no express warranties other than the warranties contained herein.

PART B - EXCLUSIONS:

1. First Year Warranty Excludes:
 - a. All labor charges incurred by any person in connection with the examination, replacement and/or repair of parts claimed to be defective.
 - b. Malfunction of parts due to improper installation or operation.
 - c. Failures resulting from abuse, accident, negligence, freezing or acts of God.
 - d. Damage caused by hard water, scale buildup, excessive oxygenation or external leakage.
2. Second Through Tenth Year Excludes: All of above "Part B" plus: Sheet metal jacket, insulation, electrical and mechanical components furnished to Doucette

Industries, Inc. by other manufacturers and Doucette Industries, Inc. has requested its dealers to assist consumers in obtaining performance of any warranties which may cover such components.

3. Doucette Industries, Inc. requires all alleged defective part(s) be returned through trade channels and replacement part(s) will, if warranty conditions are met, be provided by Doucette Industries, Inc. through the wholesaler, In this case, the cost of shipment to Doucette Industries, Inc. is borne by the consumer.

PART C - PROCEDURE FOR WARRANTY SERVICE:

For warranty service, contact your installing contractor with the following information: Unit model number, serial number (located on the rating plate on the side or base of the unit) - and the date of installation., The installing contractor will notify the wholesaler from whom the unit was purchased. Alleged defective part(s) must be returned through trade channels and replacement parts will, if warranty conditions are met, be provided by Doucette Industries, Inc. through the wholesaler, if there are any questions about the coverage of this warranty, please contact Doucette Industries, Inc. at the address shown below.

PART D - LEGAL RIGHTS:

No one else is authorized to make any other warranties on Doucette Industries, Inc.'s behalf. No other warranty expressed or implied, including warranty of merchantability or fitness for a particular purpose is made. This warranty does not extend to liability for incidental, special or consequential damages. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state-to-state

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