

INSTALLATION

HEAT RECOVERY PACKAGE

ISO 9001:2000 Certified

MANUAL

TABLE OF CONTENTS

Model Nomenclature 1

Inspection.....2

Application2

Field Mounting HR.....2

Water Tank Preparation2

HR Water Piping.....3

Water Tank Refill.....3

Typical Installation.....3

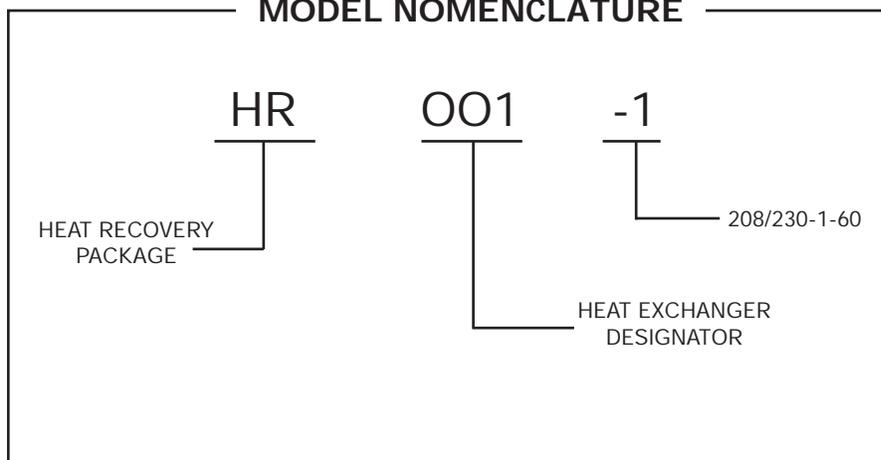
Installation Start-Up.....3

Trouble Shooting4

Electrical Diagram.....4

Capacity Data.....4

MODEL NOMENCLATURE



FORWARD:

The complete instruction manual should be read carefully before beginning installation. Follow the instructions precisely to insure proper operation of the system. The instructions are to be left with the homeowner for future reference if needed. All local, state and national codes supercede these instructions and must be strictly adhered to.

UNCRATING AND INSPECTION:

Check for shipping damage, both visible and concealed if there exists any indication of damage immediately file a claim with the shipping company. You are the only one to file a claim regardless of why the damage was incurred or by whom. Remove the access cover and check all of the components parts to make sure they are properly secured before installing the unit. Parts broken loose from their secured position with resultant damage is considered damage during shipment.

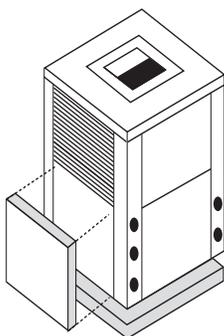
APPLICATION:

The Heat Recovery unit is a forced pumped unit that employs a circulating pump to move water through a double wall/vented heat exchanger and returns the heated water to the water tank. The water is heated by superheated refrigerant discharge gas from the compressor. This waste heat of the cooling mode captured by the heat recovery increases the capacity and efficiency of the heat pump unit. If the air temperature is uncomfortable coming from the air vents in the heating mode the heat recovery may need to be turned off. In the heating mode the heat recovery captures heat that would normally be used for space heating.

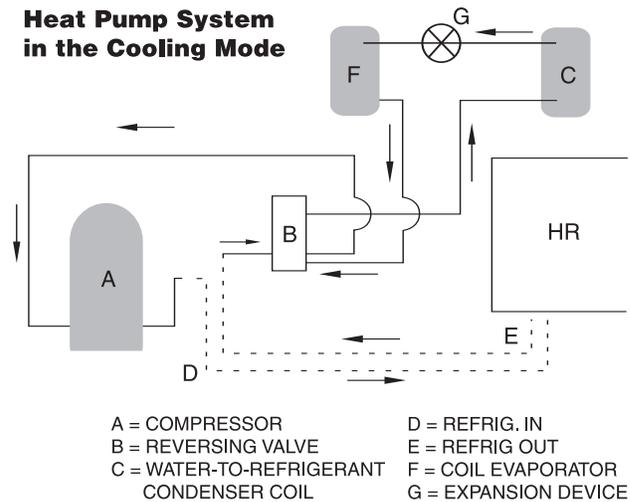
FIELD MOUNTING HR KIT:

It is recommended that the heat recovery package be factory mounted at the time the heat pump is purchased. This eliminates field intrusion into the refrigeration circuit of the heat pump and the associated problems that may arise. If the heat recovery package is to be field installed the following steps must occur:

1. Disconnect all power supplies to the unit before servicing.
More than one power supply may be present.
2. Remove the lower left side heat pump access panel. This is where the heat recovery kit will be attached. (Figure #1)
3. Mark and drill holes in panel where heat recovery package hot gas in and out lines will enter and exit. Allow enough space for lines not to touch panels.



(Figure #1)

Heat Pump System in the Cooling Mode

(Figure #2)

4. Mount heat recovery package to panel using sheet metal screws.

CAUTION: Do not mount heat recovery unit to panel while on unit. Refrigerant containing components are present and may be damaged.

5. Remove refrigerant from heat pump utilizing standard refrigerant recovery techniques.

WARNING: Recovery of this substance is mandatory and State/ Federally regulated. Failure to recover this refrigerant properly can/will result in serious penalties including substantial fines and/or prison sentences.

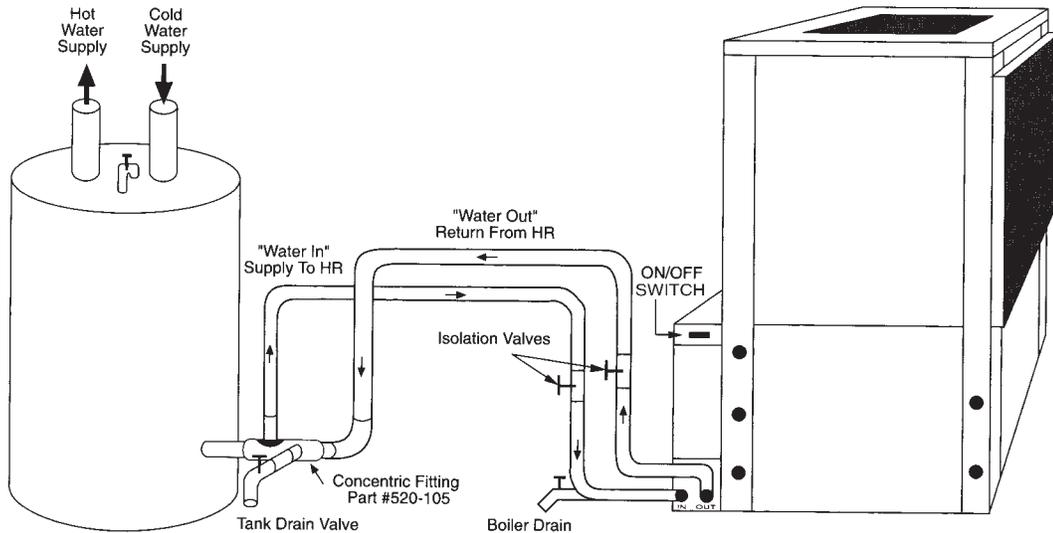
6. Cut the hot gas discharge line between the compressor discharge port and the reversing valve inlet. Connect the discharge line from the compressor to the line marked "Refrigerant in" on the heat recovery coil. Connect the line marked "Refrigerant out" of the heat recovery coil to the reversing valve inlet line. (Figure #2)
7. Make the wiring connections from the heat recovery package to the compressor contactor as shown. (Figure #4)
8. It is imperative that the refrigerant system remain clean and dry during the above operations. If there is doubt of this a bi-flow liquid line dryer must be installed.
9. Evacuate the unit and recharge according to unit nameplate.

WARNING: If heat recovery unit is installed in an area where freezing may occur the unit must be drained during winter months to prevent heat exchanger damage. Heat exchanger ruptures that occur due to freezing will void the heat recovery package warranty along with the heat pump warranty.

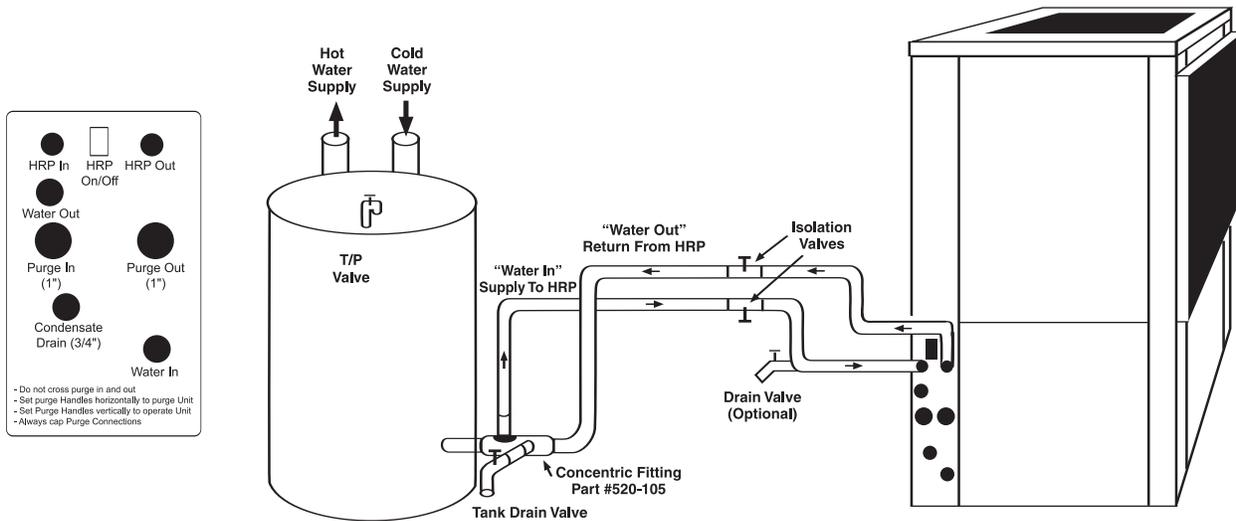
WATER TANK PREPARATION:

1. Turn off electrical or fuel supply to the water heater.
2. Attach garden hose to water tank drain connection and run other end of hose out doors or to an open drain.
3. Close cold water inlet valve to water heater tank.

TYPICAL CONNECTION DIAGRAM FOR EXTERNAL MOUNTING



TYPICAL CONNECTION DIAGRAM FOR AP, ES SERIES WITH INTERNAL HRP



(Figure #3)

4. Drain tank by opening drain valve on the bottom of the tank, then open pressure relief valve or hot water faucet.
5. Once drained the tank should be flushed with cold water until the water leaving the drain hose is clear and free of sediment.
6. Close all valves and remove the drain hose.
7. Install HR water piping.

HR WATER PIPING:

All hot water piping should be a minimum of 3/8" O.D. copper tube to a maximum distance of fifteen (15) feet. For distances beyond fifteen feet but not exceeding sixty (60) feet use 1/2" copper tube. Separately insulate all exposed surface of both connecting water lines with 3/8" wall closed cell insulation. Install isolation valves on supply and return to the heat recovery. (Figure #3)

WATER TANK REFILL:

1. Open the cold water supply to the tank.
2. Open a hot water faucet to vent air from the system until water flows from the faucet, then close.
3. Depress the hot water tank pressure relief valve

4. to ensure there is no air remaining in the tank.
4. Carefully inspect all plumbing for water leaks . Correct as required.
5. Purge all air from HR by depressing the schrader valve on the HR Unit. Allow all air to bleed out until water appears at the valve.
6. Before restoring the power or fuel supply to the water heater, adjust the temperature setting on the tank thermostat(s) to ensure maximum utilization of the heat available from the refrigeration system and conserve the most energy. On tanks with both upper and lower elements and thermostats, the lower element should be turned down to 100° F, while the upper element should be adjusted to 120° F. Depending upon the specific needs of the customer, you may need to adjust the upper element differently. On tanks with a single thermostat lower the thermostat setting to 120° F or the "LOW" position.
7. After thermostat adjustments are completed, replace access cover and restore electrical or fuel supply to water heater.

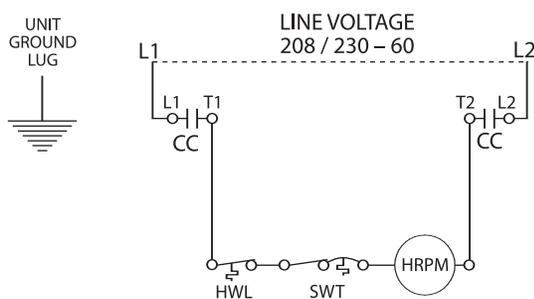
INITIAL START-UP:

1. Make sure all valves in heat recovery water piping system are open. NEVER OPERATE HR PUMP DRY.
2. Turn on the heat pump. The HR pump should not run if the compressor is not running.
3. Turn HR switch to the "ON" position. The pump will operate if entering water temperature to HR is below 120° F.
4. The temperature difference between the water entering and leaving the heat recovery should be 5° to 15° F.
5. Allow the unit to operate for 20 to 30 minutes to ensure it is functioning properly. The pump should shut off when the water temperature entering the heat recovery reaches 120°F.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CHECKS AND CORRECTIONS
No Flow Low Flow	No Power On/Off Switch Position Compressor Contactor Broken or loose wires Air Lock Stuck pump shaft/impeller Defective pump Kinked or under sized water piping	Check power supply Set switch to "ON" position Engage heat pump contactor Repair or tighten wires Purge air from piping system Remove pump cartridge and clean Replace pump Repair kink and check for proper line size
High Water Temperature	Water temp limit closed	Stuck limit switch Sensor not attached securely to line
Low Heat Output	Scaled or fouled heat exchanger	Clean heat exchanger

LINE VOLTAGE CONTROL DIAGRAM



NOTES:

1. SEE UNIT NAME PLATE FOR ELECTRICAL RATING
2. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH N.E.C. — N.F.P.A. #70. COPPER CONDUCTORS ONLY
3. HEAT RECOVERY PACKAGE MUST BE WIRED ON LOAD (T) SIDE OF CONTACTOR

CC — COMPRESSOR CONTACTOR (LOCATED IN HEAT PUMP ELECTRICAL BOX)
 HRPM — HEAT RECOVERY PUMP MOTOR
 HWL — HOT WATER LIMIT (120 DEG)
 SWT — ON / OFF SWITCH AND OVERLOAD PROTECTION

CAPACITY DATA

MODEL	NOMINAL UNIT TONS	HR CAPACITY (BTU/HR.)	GHR GPM FLOW RATE	POTENTIAL SAVINGS PER HOUR EQUIV. - Kwh
HR000	1.0	1,430	.50	.4
	1.5	2,140	.75	.7
HR001	1.0	2,858	.50	.8
	1.5	4,287	.75	1.3
HR002	2.0	5,716	1.00	1.7
	2.5	7,146	1.25	2.1
	3.0	8,575	1.50	2.5
HR003	3.5	10,004	1.75	2.9
	4.0	11,433	2.00	3.4
	4.5	12,862	2.25	3.8
	5.0	14,292	2.50	4.2

* Capacity based on entering domestic water temperature of 80° F, entering superheated discharge gas temperature 180° F, and leaving saturated vapor temperature 105° F.