

EM-HC2-KIT

HeatChoice to HeatChoice II Conversion Kit

Drawings included: **EH205**



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EM-HC2-KIT Installation Steps

WARNING

DISCONNECT ALL ELECTRICAL POWER BEFORE ELECTRICALLY CONNECTING OR SERVICING THE UNIT. FAILURE TO DISCONNECT THE ELECTRICAL POWER BEFORE WORKING ON THIS PRODUCT CAN CREATE A HAZARD LEADING TO PERSONAL INJURY OR DEATH.

Mechanical Installation

Step 1

Disconnect all wiring from the existing control board.

Step 2

Remove and discard the existing wire harness by disconnecting it from the contactors and off-peak load control wires.

Step 3

Remove the existing door that the control board is fastened to by removing three screws located on the right hand side of the cabinet.

Step 4

Install the new door and control board assembly.

Step 5

Fasten the (2) provided relays below the existing contactors located on Electro-Mate chassis using the provided self tapping screws.

Electrical Installation Overview

Note: All heat/cool functions for this dual heat system originate from a standard 4-wire (heat/cool) room thermostat. Do not install with a 2-stage heat/1-stage cool or a heat pump room thermostat. Also do not install using two individual thermostats.

Control Wiring – (reference figure 4) – this section assumes gas or oil furnace has an appropriate fan center or appropriate equivalent wiring terminals with 40VA or larger integral transformer and blower relay with “G” function. Use only a basic four wire heat/ cool type thermostat.

Blower Control – this is handled within the 4 (or 5) wire connection between the HeatChoice control board bottom and the gas furnace hookup. The HeatChoice control board allows the blower to turn off and operate under the control of the gas furnace during standby or utility interrupt. During cooling the control board logic keeps the blower running during utility air conditioning interrupt to circulate summer air.

- a. Delay on/off – within the control board logic, the blower turns on with an approximately 10 second delay. At the end of the thermostat heat cycle, the blower will continue to operate for 60 seconds to cool off the HeatChoice metal rod electric elements.
- b. LMC Purge cycles – there is a 60 second delay before allowing a gas furnace W input in order to allow the furnace blower to cool off the HeatChoice elements. There is also a 3 minute delay before allowing the electric elements to turn back on after the gas furnace has been on.
- c. Thermostat “G” function – do not connect the thermostat G wire directly to the gas furnace G screw. The thermostat G wire must pass through the HeatChoice control module from top point to the bottom point.

Electrical Installation

Reference hookup drawing EH205 in the back of this installation manual

Step 1

Route the new wire harness through the opening in the voltage barrier and connect the wires to the new relays as shown on EH205.

Step 2

Connect the remaining loose piece wires to the relays, contactors, and control board as shown on EH205.

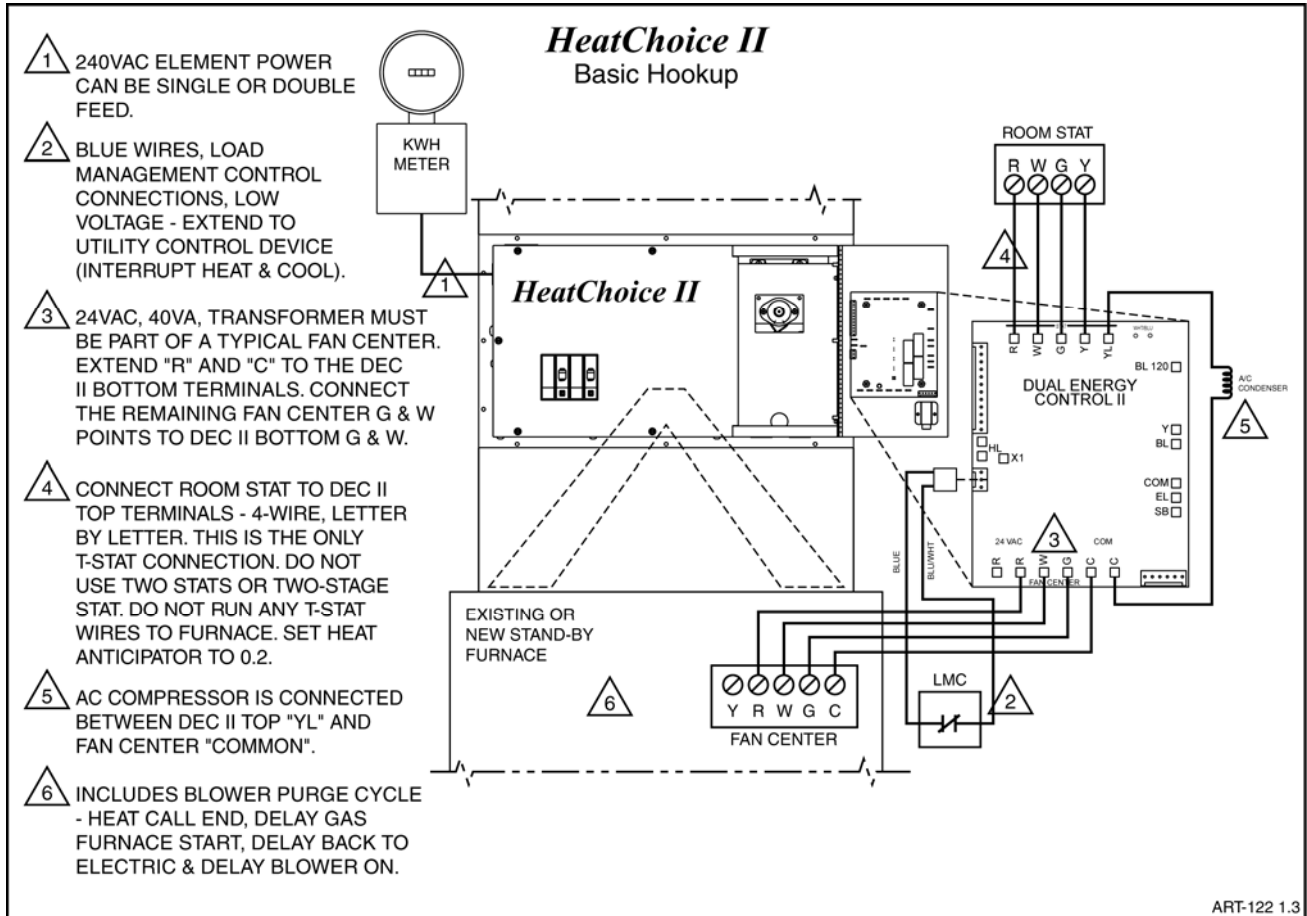


Figure 4

Step 3

Room thermostat – use only basic 4-wire, heat/cool type. Route the standard R, W, G, Y roomstat screw functions to the HeatChoice DECI control board top tab/screw terminal adapters. Use wire to wire same letter connection (Figure 5).

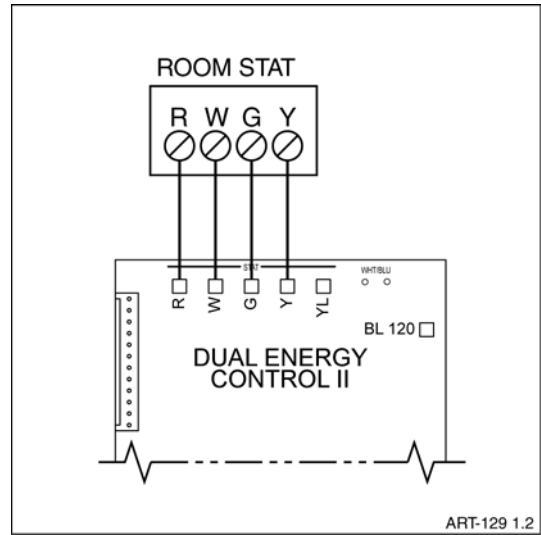


Figure 5

Step 4

Air conditioning, outdoor unit – this should be a 2-wire hookup, typically represents the contactor coil. Connect one wire to the top “YL” terminal and the second to a bottom “C” terminal. **Note: off-peak load control for the air conditioner will not work if the wiring is not connected through the HeatChoice control board** (Figure 6).

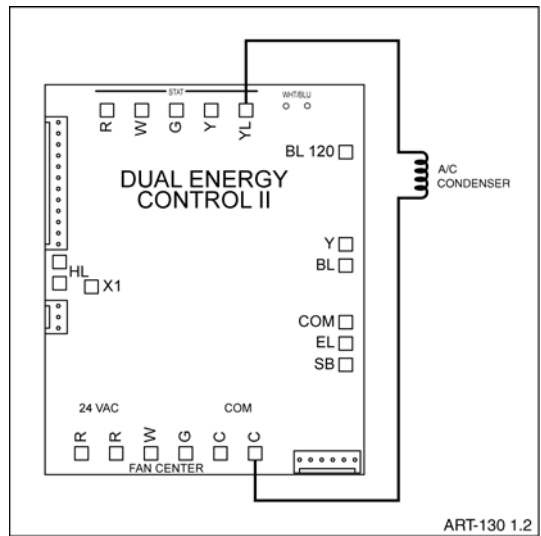


Figure 6

Step 5

Gas (or oil with fan center) furnace – the furnace should have a 4 or 5-wire terminal block and match the control board bottom four terminals – R, W, G, C (Figure 7).

- The furnace may also contain a “Y” screw, this is only needed if it is a variable speed (DC drive) furnace, see next section.
- Depending upon furnace manufacturer, the common may have various letter terminology – C, B, X. “C” is 24-volt common for this product.

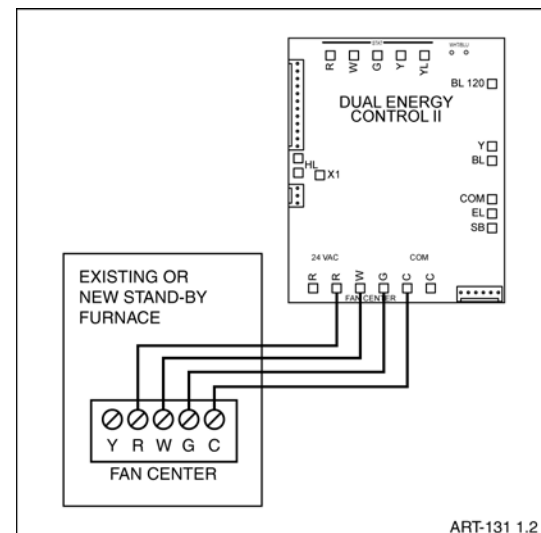


Figure 7

Step 6

Utility load control – extend the two blue wires to an appropriate set of wires or contact closure within the power company control receiver. For electric energy operation (off-peak) the two blue wires represent a contact closure as shipped. **Do not apply external voltage or external power to the blue wires, they are simply looking for a closed contact during off-peak** (Figure 8).

- Optional – where load management interrupt does not apply simply leave the two blue wires tied together and wire nutted.
- **LMC reverse logic** – Normal logic NC (normally closed) is simply the blue and blue/ white wires J3-2 and J3-3. NO (normally open) logic can be obtained by connecting the appropriate load control wires between the “X1” tab and “R” tab while the two blue wires remain wire nutted together.
- In areas where “peak” control is accomplished by interrupting the 240 line voltage, other methods must be used to open the blue/blue white wires. Contact factory for more information.

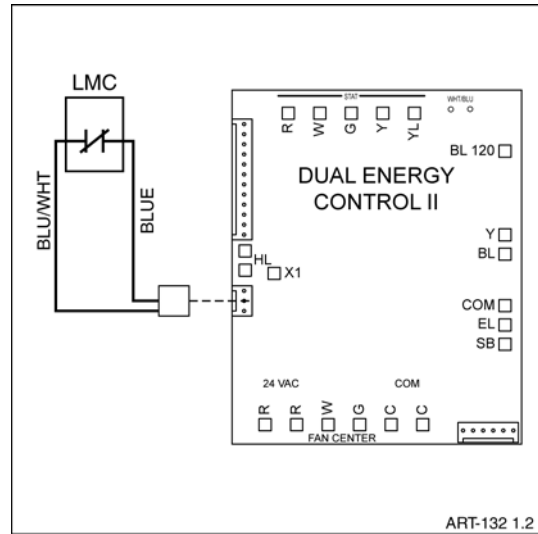


Figure 8

Step 7

Oil Furnace with “T and T” control information (Figure 9) – isolation is required between fan center “W” and the voltage which will be experienced on oil control “T and T”. Normally the standard fan center simply passes the “W” voltage on to the gas valve. **Warning:** When installing or wiring an oil furnace, this isolated contact is extremely important. Unexplainable and strange control reactions have been experienced when this isolation relay is not installed. The isolation relay shown on the following drawing can be a basic 24-volt coil, single contact cube relay or you can order from Electro Industries – EE-5053 prepackaged relay. If you use EE-5053 it has wire leads, the connection for the wire colors are as follows:

- Interface module, W – black/yellow
- Interface module, C – gray
- Oil control, T – yellow/green
- Oil control, T – blue/yellow
- Unused, cap off – orange/black

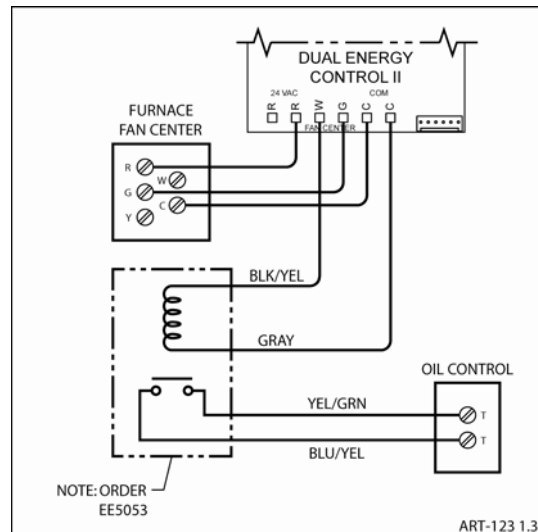


Figure 9

Operational Tips

DECII module indicators (Figure 10)

- Front panel top red LED (Hi-limit) – illuminates when high limit switch is open.
- Front panel green LED (Control Power) – indicates 24-volt source from furnace and non-blown fuse.
- Front panel red/green LED (Heat Source) – indicates which heat source is being used, red = gas, green = electric, flashing red/green = utility load control.
- Front panel bottom red LED (Heat Call) – Indicates room thermostat call for heat.
- Red LED (inside bottom) – gas furnace W is receiving 24V.

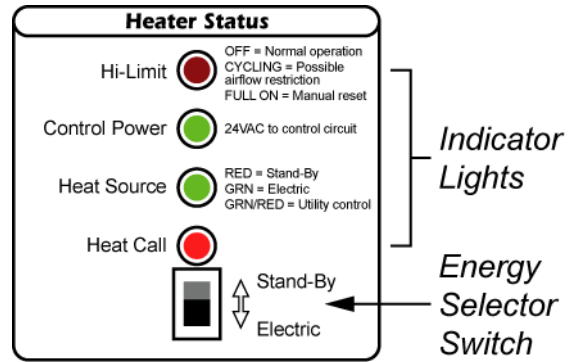


Figure 10

Front panel heat source LED – this is a multifunction LED the chart below shows the various conditions and functions of this LED.

Heat Source LED Status	Condition
Solid green	Normal operation, electric mode.
Solid red	Normal operation, Stand-by mode.
Flashing red	SOT timeout in electric mode, heating in stand-by.
Flashing green	SOT timeout in stand-by mode, heating in electric
Flashing red/ green	Utility load control heating in stand-by.

Stat Override Timer (SOT) – this is an internal timer which can be field set via the SOT jumper located on the upper right hand side of the control board. If this set run time (90 or 180 minutes) is exceeded before the thermostat is satisfied, the system automatically switches to either full electric elements or standby depending upon the position of the stand-by/ electric switch. This option will automatically switch to standby furnace if there is a system fault associated with inadvertent circuit breaker, manual reset hi-limit, etc. If the HeatChoice unit is undersized (intentionally or unknown) this option will automatically switch to standby heating if the HeatChoice electric unit cannot maintain temperature set point. Factory default is set at 90 minutes, to disable the SOT function, remove the jumper. **Note:** the control board must be powered down when making a change to the SOT jumper in order for the change to take affect.

Blower response – the blower has an approximate 10 second turn-on delay and will continue for 60 seconds after electric element power is turned off via the room thermostat. This is necessary to properly cool off the elements. Also note there is a 3 minute blower purge when switching from stand-by to electric.

Additional Applications

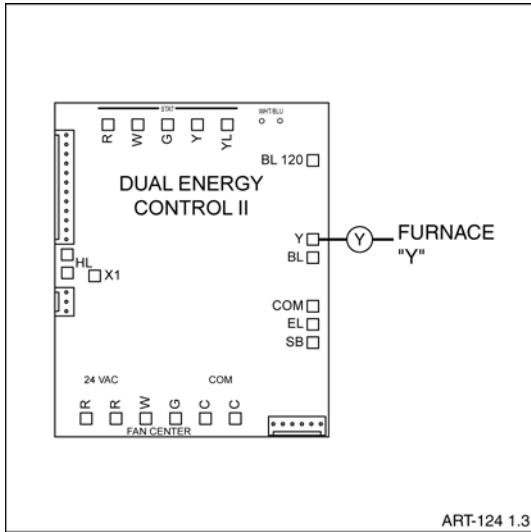


Figure 11

Furnace variable speed blower (Figure 11) – a fifth wire connection will be needed to speed up the gas furnace blower for air conditioning and HeatChoice electric heating operation. Add the fifth wire to the gas furnace “Y” terminal as shown on the diagram.

Note: Connection wires shown are in addition to 4-wire thermostat and 4 wires to furnace.

Note: In the latest version of the HeatChoice, external jumper wires are no longer needed to ramp up the blower for air conditioning and HeatChoice electric heating.

AUX Load Control, other Electro products – on HeatChoice control board, bottom right, connect blues (from other product) to COM and EL. (Note: this is a true function from the blue wires, it does not follow the override switch).

2-stage or variable burner gas – most furnaces ignore or do not take W2 (or Ruud “V”) action unless there is an input to W1. This means you can take a wire directly from 2-stage heat roomstat W2 to the furnace W2 and until the system is switched over to standby with the HeatChoice control board activating W1 there should be no furnace action.

2-speed or 2-stage air conditioning – load control action may be required with the outdoor unit Y2. This can be accomplished by routing the roomstat Y2 through a relay contact (onboard tabs) and the outdoor unit Y2.

- Roomstat Y2 – COM
- EL – outdoor unit Y2

Reduced HeatChoice output – (figure 14) the white/ blue jumper wire located on the upper right hand side of the control board (W1, W2) is designed to drop half of the HeatChoice heating elements when opened. When the jumper is opened stages 2, 4, and 5 are dropped, when applicable.

Application: This option can be useful for multiple zones, load shed, outdoor thermostat, or any other external contact closure when needed to cut the output in half.

Option: Purchase EB-5415A (hookup drawing EH020) for multiple zone applications, call factory for details.

Heat pump – this HeatChoice DECII control board has **no** provisions for heat pump operation or wiring. If there is a heat pump involved with this system, this is the wrong plenum heater product. Contact your local distributor for information on other models that include heat pump intelligent systems.

Troubleshooting

Fuse – the HeatChoice control board contains an integral 3A thermally resetting fuse. If tripped the control board will need to sit for a minimum of five minutes to allow the fuse to reset itself.

Operational Conditions, Forcing Standby – these conditions are also monitored by the front panel Heat Source LED being red.

1. Utility Load Control
2. SOT timeout
3. Front energy selector switch

Operational Conditions Which May Prevent Standby or Gas On

1. No call for heat – Heat Call LED is off
2. Heat Source LED green – utility is not controlling or front panel is not in override
3. Somehow stat terminal block Y is also energized or at 24 volts
4. Board K1 or K2 open/inoperative
5. Hang-up – power down, 10 seconds, power up

Operational Conditions Which May Prevent Electric Mode Stages On

1. No call for heat – Heat Call LED is off
2. In Stand-By mode, see previous section
3. Hang-up – power down, 10 seconds, power up

Conditions Which May Prevent Electric Elements On

1. Mechanical Hi-Limit, front panel top LED on
2. Board K1 or K2 open/inoperative
3. Inoperative element relays
4. HeatChoice circuit breakers off
5. Burnt 240 inside wires
6. Building power panel fusing or breakers open

EM-HC2-KIT HEAT CHOICE CONTROL BOARD CONVERSION KIT

