

# Accessory Solid-State Enthalpy Control and Differential Enthalpy Control

Cancels: IIK 548B,C-36-1

IIK 548-36-31  
9/15/97

## Installation Instructions

Part Numbers — HH57AC077  
HH57AC078

### GENERAL

Solid-state enthalpy control (HH57AC077) maximizes the use of free outdoor air for efficient economizer operation with small rooftop units. It replaces the economizer outdoor-air thermostat.

For even greater efficiency, a differential enthalpy control system (HH57AC077 with HH57AC078) can be installed. This system compares the temperature and humidity of return air to that of outside air and adjusts the economizer position to ensure the lowest enthalpy air is used for cooling.

### INSTALLATION

#### ⚠ CAUTION

Turn off all power to the unit before installing enthalpy control package.

#### Solid-State Enthalpy Control (HH57AC077)

1. Remove economizer air hood filter by loosening filter cap and sliding out the filters. (Fig. 1).
2. Disconnect gray and red wires from outdoor-air thermostat (OAT).
3. Remove OAT and discard. Save screws.
4. Install solid-state enthalpy control (HH57AC077) to the hood side by using the enthalpy control mounting bracket and the screws from the outdoor-air thermostat. Refer to Fig. 2 for correct positioning.
5. Connect gray wire to solid-state enthalpy control terminal 3 and red wire to terminal 2. See Fig. 3.
6. Install 2 wires from the red and brown terminals of the economizer board to the power terminals TR and TR1 of the solid-state enthalpy control, respectively. See Fig. 3.
7. Set the enthalpy control to the 'A' setting for maximum use of outdoor air, or adjust to the setting which will maintain correct control set point for the application. See Fig. 4 for the correct enthalpy changeover set point.

NOTE: The factory-installed 620-ohm jumper must be in place across the terminals + and SR if differential enthalpy control is *not* being used.

If **differential enthalpy control** is desired, skip Step 8 and continue with Differential Enthalpy Control (HH57AC078) section, this page.

8. Replace outdoor-air filters and tighten screws on filter cap.

#### Differential Enthalpy Control (HH57AC078)

1. Follow Steps 1-7 in Solid-State Enthalpy Control (HH57AC077) section, this page.
2. Remove evaporator coil access panel with the hood attached. Remove economizer from unit.
3. Install the solid-state enthalpy sensor (HH57AC078) to the inside of the economizer using the mounting hole provided. (See Fig. 2.)
4. Connect two 36-in. wires to the S and + terminals on the sensor. Route the wires through the hole in the economizer side plate.
5. Install the economizer in the unit and replace the screws.
6. Connect the 2 wires from the enthalpy sensor (HH57AC078) to the enthalpy controller (HH57AC077). Remove jumper across terminals + and SR on the controller. The wire from terminal S on the sensor connects to terminal SR on the controller. The wire from terminal + on the sensor connects to terminal + on the controller. See Fig. 5. Turn the enthalpy set point potentiometer clockwise past the 'D' setting on the controller.
7. Install evaporator coil access panel with hood attached and replace mounting screws.
8. Replace outdoor-air filters and tighten screws on filter cap.

NOTE: Use wiring suitable for a NEC (National Electrical Code) Class II circuit with a temperature rating of 90 C.

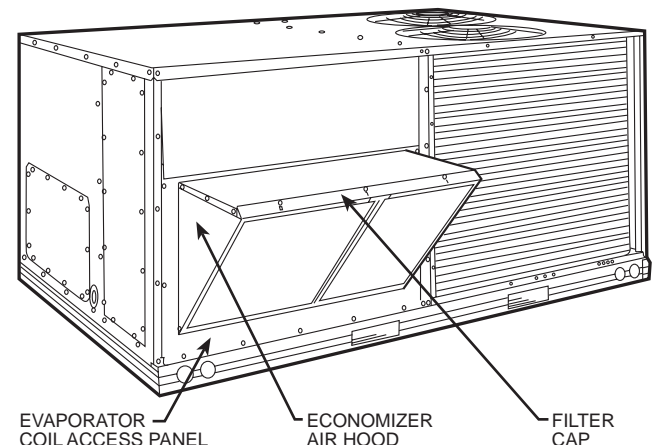
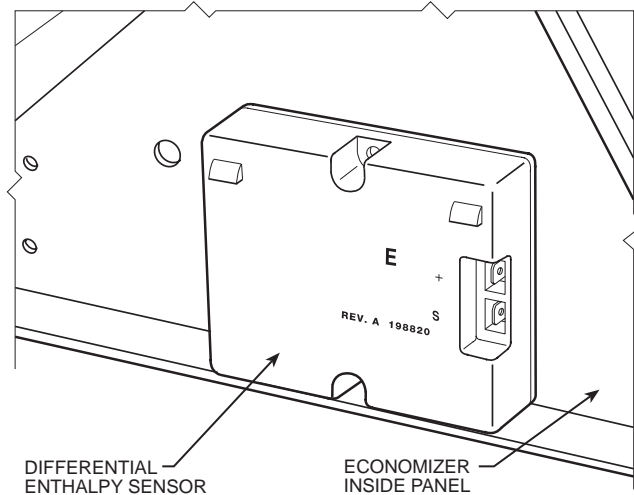
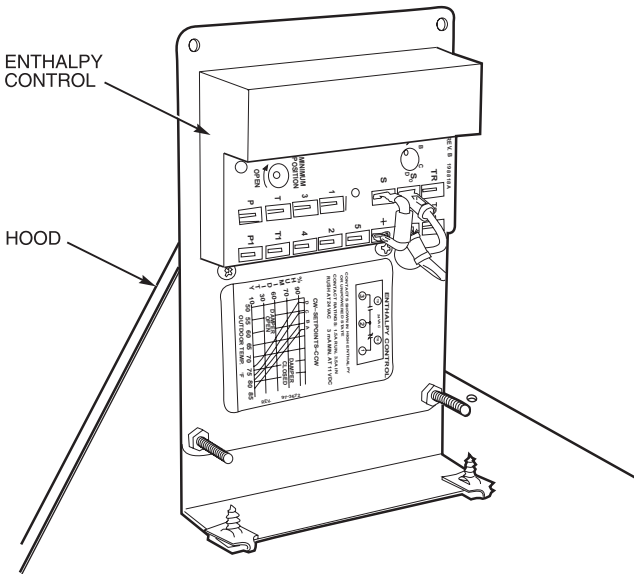
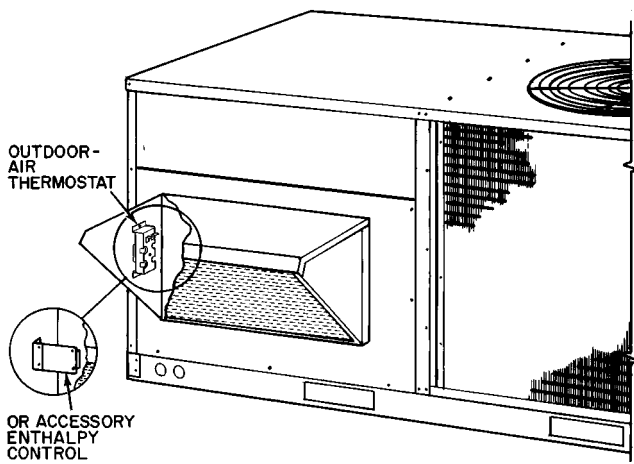
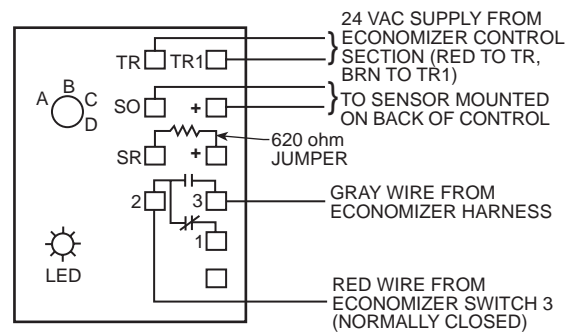


Fig. 1 — Economizer Assembled to Typical Unit

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

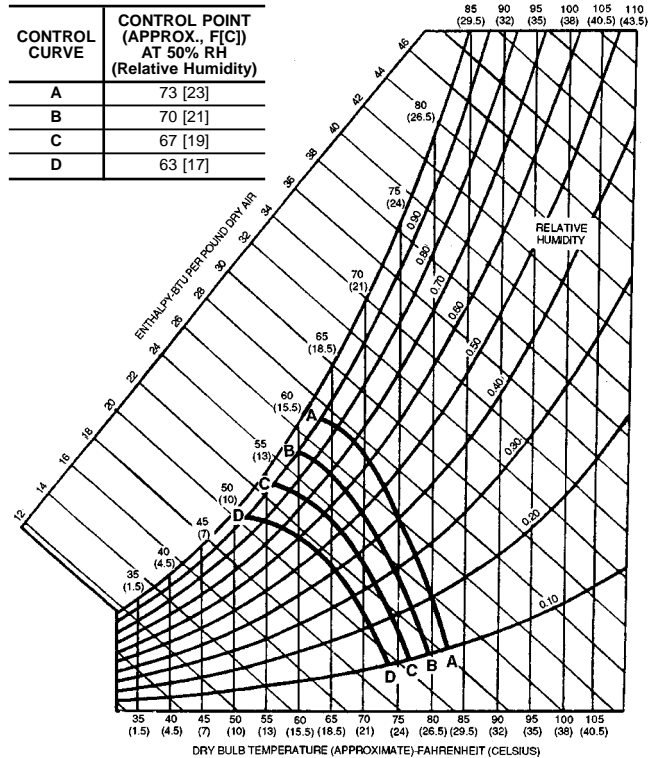


**Fig. 2 — Outdoor-Air Thermostat/Enthalpy Control and Differential Enthalpy Sensor Installation**

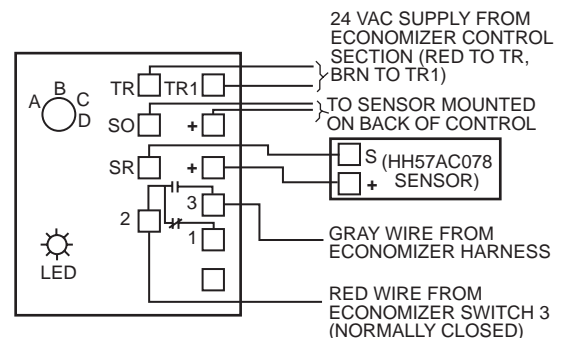


NOTE: Switches shown in high enthalpy state. Terminals 2 and 3 close on enthalpy decrease.

**Fig. 3 — Wiring Connections for Solid-State Enthalpy Control (HH57AC077)**



**Fig. 4 — Setting "A" Operating Conditions**



NOTES:

1. Remove factory-installed jumper across SR and + before connecting wires from HH57AC078 sensor.
2. Switches shown in high outdoor air enthalpy state. Terminals 2 and 3 close on low outdoor air enthalpy relative to indoor air enthalpy.

**Fig. 5 — Wiring Connections for Differential Enthalpy Control (HH57AC077 and HH57AC078)**

## CHECKOUT AND TROUBLESHOOTING

Refer to Table 1 and Fig. 3 for checkout procedures to be used after accessory installation, and when accessory troubleshooting. Perform each checkout procedure, in order, to verify proper accessory operation.

**Table 1 — Checkout and Troubleshooting Procedures**

<b>Checkout Procedure 1</b>	<b>Result</b>
A. With 620-ohm resistor connected across terminals SR and + and outdoor air sensor disconnected (terminals SO and + open), apply power (24 vac) to terminals TR and TR1.	Light-emitting diode (LED) should be off. Control terminals 2 and 3 open. Terminals 1 and 2 close.
B. Disconnect 620-ohm resistor from terminals SR and + .	LED should be on. Control terminals 2 and 3 close. Terminals 1 and 2 open.
C. Reconnect 620-ohm resistor across terminals SR and +. Connect 1.2K-ohm Checkout Resistor across terminals SO and +. Turn enthalpy set point to A.	LED should be on. (This result indicates low enthalpy.)
D. With resistors in place from previous step, turn enthalpy set point to D.	LED should be off. (This result indicates high enthalpy.)
E. Connect a DC milliammeter between terminal SO of the solid-state enthalpy controller and terminal S of the outdoor air sensor. If using differential enthalpy, the return-air sensor may be checked by connecting a DC milliammeter between terminal SR of the solid-state enthalpy controller and terminal S of the return-air sensor.	Milliammeter should indicate between 3 mA and 25 mA. (If milliammeter indicates zero, the sensor may be wired incorrectly.)
<b>Checkout Procedure 2</b>	<b>Result</b>
A. Verify enthalpy sensor is connected across terminals SO and +. Connect a 620-ohm resistor across terminals SR and +. Turn enthalpy set point to A. With power connected, spray coolant into upper left vent of enthalpy sensor to simulate low outdoor air enthalpy.	LED turns on. Control terminals 2 and 3 close. Terminals 1 and 2 open.
B. Disconnect power at TR and TR1.	Control terminals 2 and 3 open. Terminals 1 and 2 close.
C. If using differential enthalpy, verify the outdoor sensor is connected to terminals SO and + and the return-air sensor is connected to terminals SR and +. Turn enthalpy set point fully clockwise to D. With power connected, spray coolant in upper left vent of Enthalpy Sensor to simulate low return-air enthalpy.	LED turns on (one minute delay). Control terminals 2 and 3 close. Terminals 1 and 3 open.
D. Spray small amount of coolant in upper left vent of the return-air enthalpy sensor connected to SR and + to simulate low return-air enthalpy.	LED turns off. Control terminals 2 and 3 open. Terminals 1 and 2 close.

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