Small Rooftop Units
Mid-Range Rooftop Units
3 to 25 Tons
Accessory Enthalpy Sensor
and Differential Enthalpy Sensor for EconoMi$erIV

Cancels: New IIK 548-36-77
1/15/06

Installation Instructions

Part Numbers: HH57AC078, CRENTDIF004A00

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IMPORTANT: Read these instructions completely before attempting to install the accessory temperature sensor.

The HH57AC078 and CRENTDIF004A00 enthalpy sensors are used with the EconoMi$erIV (part numbers CRECOMZR008C00, 020A02, 021A02, 024A02, 025A02, 038A00, 039A00, 040A00, 041A00, 042A00, 046A00, 047A00) and are used on the following units:

UNIT	SIZE
48HJ	004-028
50HJ	004-028
50HJQ	004-016
48PG	03-28
50PG	03-28
48TF	004-014
50TFF	004-014
50TFQ	004-012
48TJ	016-028
50TJ	016-028
48TM	004-028
50TM	004-028

UNIT	SIZE
542J	150,180
548F	036-120
549B	036-120
551A	155-300
551B	036-150
558F	036-300
559F	180-300
579F	180-300
580F	036-300
581A	155-300
581B	036-150

The accessory temperature sensor can be used on all rooftop units with a factory-installed or accessory EconoMi$erIV.

PACKAGE CONTENTS — HH57AC078

QTY	CONTENTS
1	Enthalpy Sensor

PACKAGE CONTENTS — CRENTDIF004A00

QTY	CONTENTS
1	Enthalpy Sensor
2	6-20, 3/4-in. Sheet Metal Screw
1	Grommet
1	Black Wire
1	Red Wire

SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform the basic maintenance functions of replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

⚠ WARNING

Electrical shock can cause injury or death. Disconnect power supply and install lockout tag before attempting to install accessory.

GENERAL

An outdoor air temperature sensor (HH57AC074) is standard and is provided with the accessory EconoMi$erIV package. The 48/50PG03-28 units have a choice of dry-bulb or enthalpy sensor with the factory-installed EconoMi$erIV. All other units come with the dry-bulb sensor as standard with the factory-installed EconoMi$erIV. For units equipped with dry-bulb temperature sensors, accessory HH57AC078 can be used to reconfigure the EconoMi$erIV for outdoor enthalpy changeover control. Accessories HH57AC078 and CRENTDIF004A00 can both be added for differential enthalpy control. The sensor is used for outdoor temperature control. See Table 1.

Outdoor Enthalpy Changeover Control — For enthalpy control, accessory enthalpy sensor (part number HH57AC078) is required. When the outdoor air enthalpy rises above the outdoor enthalpy changeover set point, the outdoor-air damper moves to its minimum position.

Differential Enthalpy Control — For differential enthalpy control, the EconoMi$erIV controller uses two enthalpy sensors (HH57AC078 and CRENTDIF004A00), one in the outside air and one in the return airstream. The EconoMi$erIV controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi$erIV use. The controller selects the lower enthalpy air (return or outdoor) for cooling. For example, when the outdoor air has a lower enthalpy than the return air and is below the set point, the EconoMi$erIV opens to bring in outdoor air for free cooling.

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

Table 1 — EconoMi$erIV Sensor Usage

APPLICATION	ECONOMI$ERIV WITH OUTDOOR AIR DRY BULB SENSOR		
	Accessories Required		
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is factory installed.		
Differential Dry Bulb	CRTEMPSN002A00*		
Single Enthalpy	HH57AC078		
Differential Enthalpy	HH57AC078 and CRENTDIF004A00*		
CO_2 for DCV Control using a Wall-Mounted CO_2 Sensor	33ZCSENCO2 or CGCDXSEN004A00		
CO_2 for DCV Control using a Duct-Mounted CO_2 Sensor	33ZCSENCO2 or CGCDXSEN004A00† and 33ZCASPCO2 or CGCDXASP001A00**	OR	CRCBDIOX005A00††

*CRENTDIF004A00 and CRTEMPSN002A00 accessories are used on many different base units. As such, these kits may contain parts that will not be needed for installation.
†33ZCSENCO2 and CGCDXSEN004A00 are accessory CO_2 sensors.
**33ZCASPCO2 and CGCDXASP001A00 are accessory aspirator boxes required for duct-mounted applications.
††CRCBDIOX005A00 is an accessory that contains both 33ZCSENCO2 and 33ZCASPCO2 accessories.
NOTE: Some 48/50PG03-16 units may have factory-installed enthalpy sensor.

INSTALLATION

NOTE: The 48/50PG03-28 units have a choice of dry-bulb or enthalpy sensor with the factory-installed EconoMi$erIV. All other units come with the dry-bulb sensor as standard with the factory-installed EconoMi$erIV.

Single Outdoor Air Enthalpy Sensor

48/50PG03-16 UNITS — If installing the temperature sensor on an accessory EconoMi$erIV, it is easier to install the temperature sensor before installing the EconoMi$erIV. If installing the sensor on a factory-installed EconoMi$erIV, it is easier to install the temperature sensor before installing the EconoMi$erIV hoods.

NOTE: For horizontal applications, it is easiest to install the temperature sensor before making duct connections.

1. Remove the screws securing the EconoMi$erIV hood to the unit. Save the screws for use in Step 6. On units with a factory-installed EconoMi$erIV, the panel will be hinged and should not be removed from the unit. Open the hinged panel and secure it.
2. Remove the pre-existing outdoor temperature sensor. Disconnect the pink and yellow wires from the temperature sensor and let them hang. The wires will be used to connect to the enthalpy sensor. Remove the temperature sensor and save the screws for use in Step 3.
3. Mount the enthalpy sensor to the top (outdoor air side) of the EconoMi$erIV frame as shown in Fig. 1 and 2, using the two sheet metal screws (no. 8) from Step 2. There are two screw holes in the EconoMi$erIV frame for ease of installation.
4. Locate the pink and yellow wires coming from the EconoMi$erIV controller terminals "SO+" (pink) and "SO" (yellow). Connect the wires to the enthalpy sensor. See Fig. 3. Connect the yellow wire to the "S" terminal and the pink wire to the "+" terminal on the enthalpy sensor. See Fig. 4.
5. If the accessory differential enthalpy sensor is also being installed, skip to the Differential Enthalpy Sensor section on page 4.
6. Replace (or close if hinged panel) the EconoMi$erIV panel. Secure the panel using the screws saved from Step 1.
7. Restore power to the unit and configure the EconoMi$erIV controller. See the Configuration section on page 6.

48/50PG20-28, 48/50HJ020-028 AND 551A/581A210-300 UNITS

1. Remove the damper motor access panel at the return end of the unit. Save the screws for use in Step 6.
2. Remove the pre-existing outdoor air temperature sensor. Disconnect the pink and yellow wires from the temperature sensor and let them hang. The wires will be used to connect to the enthalpy sensor. Remove the temperature sensor and save the screws for use in Step 3.
3. Mount the enthalpy sensor in the predrilled holes on the economizer frame (where the temperature sensor was removed in Step 2). See Fig. 5. Use the screws removed in Step 2.
4. Locate the pink and yellow wires coming from the EconoMi$erIV controller terminals "SO+" (pink) and "SO" (yellow). See Fig. 3. Connect the wires to the enthalpy sensor. Connect the yellow wire to the "S" terminal and the pink wire to the "+" terminal on the enthalpy sensor. See Fig. 4.
5. If the accessory differential enthalpy sensor is also being installed, skip to the Differential Enthalpy Sensor section on page 4.
6. Replace the EconoMi$erIV panel. Secure the panel using the screws saved from Step 1.
7. Restore power to the unit and configure the EconoMi$erIV controller. See the Configuration section on page 6.

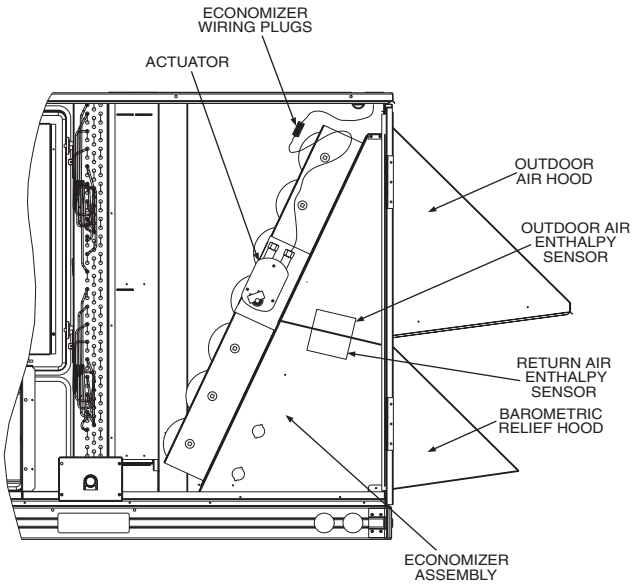


Fig. 1 — Side View of Vertical Economizer — 48/50PG03-16 Units

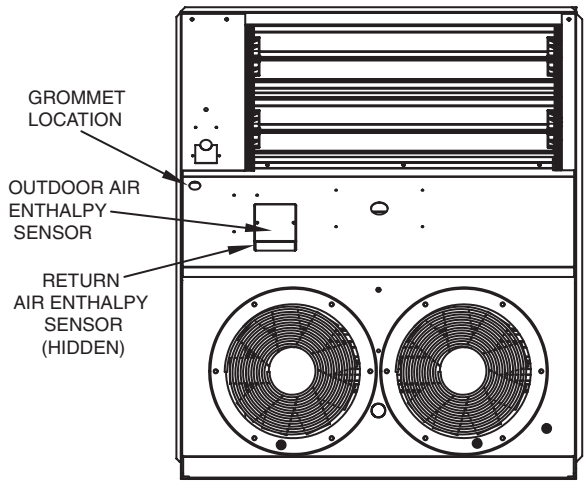


Fig. 2 — Sensor Locations — 48/50PG03-16 Units

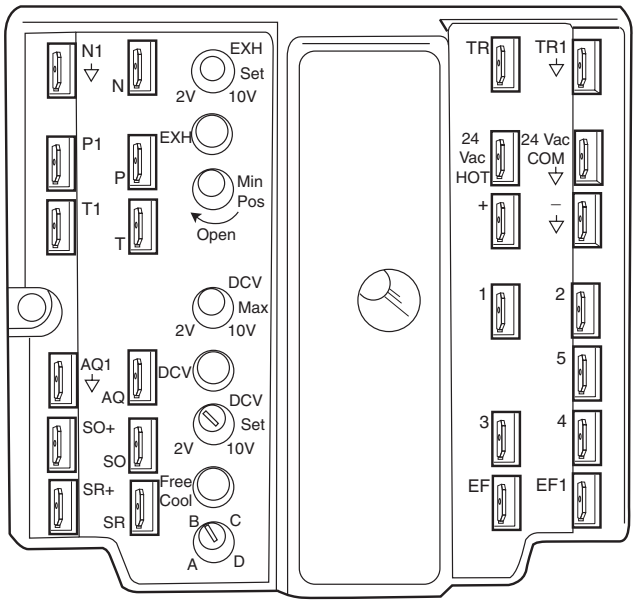
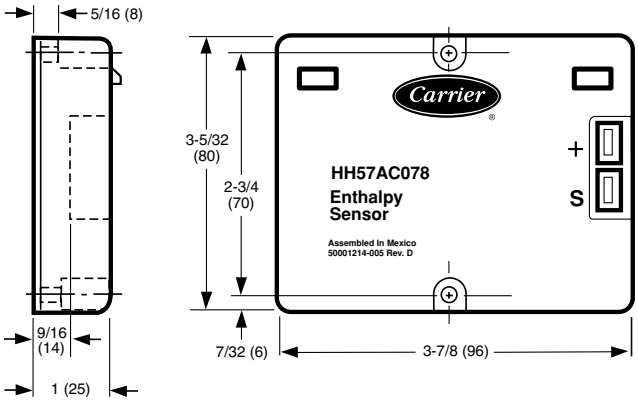


Fig. 3 — EconoMi$erIV Controller



NOTE: Dimensions are in inches. Dimensions in ( ) are in millimeters.

Fig. 4 — Enthalpy Sensor Specifications

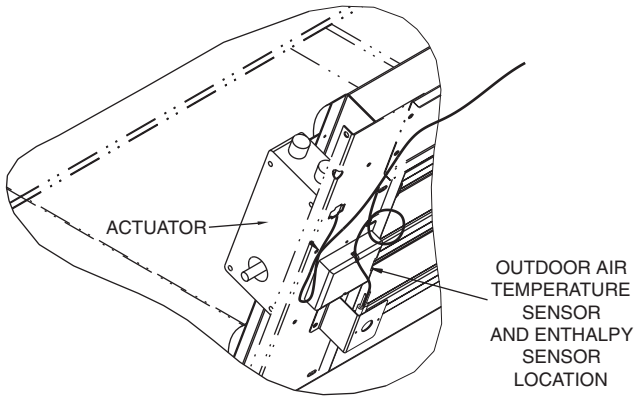


Fig. 5 — Outdoor Air Sensor Location — 48/50PG20-28, 48/50HJ020-028, and 551A/581A210-300 Units

48/50HJ,TF,TM004-014, 50HJQ,TFQ004-012, 548F/549B036-120, 551B/558F/580F/581B036-150 UNITS

1. Remove the economizer hood from the base unit and save the screws for Step 6. On units with factory-installed hinged panels, the panel is hinged and should not be removed from the unit. Open the hinged panel and secure it.
2. Remove the pre-existing outdoor air temperature sensor. Disconnect the black and red wires from the temperature sensor and let them hang. The wires will be used to connect to the enthalpy sensor. Remove the temperature sensor and save the screws for use in Step 3.
3. Mount the enthalpy sensor on the front left of the EconoMi$erIV frame as shown in Fig. 6, using the two sheet metal screws (no. 8) from Step 2. There are two screw holes in the EconoMi$erIV frame for ease of installation.
4. Connect the black and red wires (provided) to the EconoMi$erIV controller terminals "SO+" (black) and "SO" (red). Route the wires to the enthalpy sensor. See Fig. 3. Connect the red wire to the "S" terminal and the black wire to the "+" terminal on the enthalpy sensor. See Fig. 4.
5. If the accessory differential enthalpy sensor is also being installed, skip to the Differential Enthalpy Sensor section on page 4.
6. Reinstall the economizer hood removed in Step 1.
7. Restore power to the unit and configure the EconoMi$erIV controller. See the Configuration section on page 6.

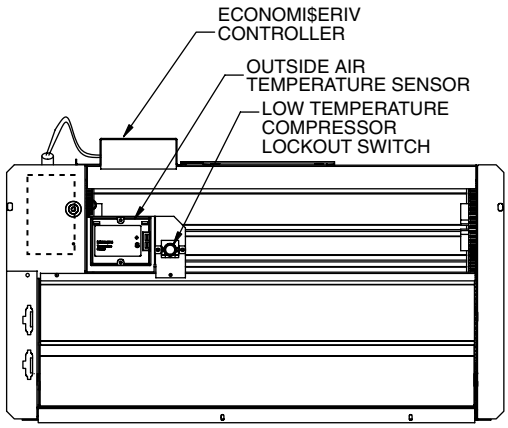


Fig. 6 — EconoMi$erIV Component Locations — 48/50HJ,TF,TM004-014, 50HJQ,TFQ004-012, 548F/549B036-120, 551B/558B/580F/581B036-150 Units

48/50HJ015-017, 50HJQ014-016, 48/50TJ,TM016-028, 542J150-180, 551A/581A155-180, 558F/559F/579F/580F180-300 UNITS

1. Remove the economizer hood from the base unit and save the screws for Step 6. On units with factory-installed hinged panels, the panel is hinged and should not be removed from the unit. Open the hinged panel and secure it.
2. Remove the pre-existing outdoor air temperature sensor. Disconnect the black and red wires from the temperature sensor and let them hang. The wires will be used to connect to the enthalpy sensor. Remove the temperature sensor and save the screws for use in Step 3.
3. Mount the enthalpy sensor to the top left on the EconoMi$erIV frame as shown in Fig. 7, using the two sheet metal screws (no. 8) from Step 2. There are two screw holes in the EconoMi$erIV frame for ease of installation.
4. Connect the black and red wires (provided) to the EconoMi$erIV controller terminals "SO+" (black) and "SO" (red). Route the wires to the enthalpy sensor. See Fig. 3. Connect the red wire to the "S" terminal and the black wire to the "+" terminal on the enthalpy sensor. See Fig. 4.
5. If the accessory differential enthalpy sensor is also being installed, skip to the Differential Enthalpy Sensor section below.
6. Reinstall the economizer hood removed in Step 1.
7. Restore power to the unit and configure the EconoMi$erIV controller. See the Configuration section on page 6.

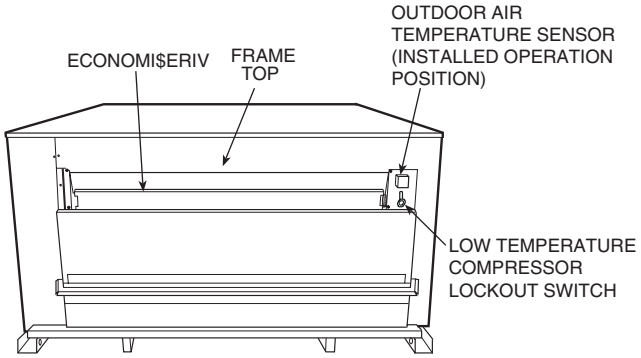


Fig. 7 — EconoMi$erIV Component Locations — 48/50HJ015-017, 50HJQ014-016, 48/50TJ, TM016-028, 542J150-180, 551A/581A155-180, 558F/559F/579F/580F180-300 Units

Differential Enthalpy Sensor — If installing the differential enthalpy sensor on an accessory economizer, it is easier to install the differential enthalpy sensor before installing the economizer. If installing the sensor on a factory-installed economizer, it is easier to install the differential enthalpy sensor before installing the economizer hoods.

A single enthalpy sensor (HH57AC078) must be installed in addition to the differential enthalpy sensor (CRENTDIF004A00) to achieve differential enthalpy economizer control.

For horizontal applications, it is easiest to install the differential enthalpy sensor before making duct connections.

48/50PG03-16 UNITS

NOTE: All wiring for the sensors on 48/50PG units is factory-provided. The red and black wires provided with the accessory are not used.

1. Remove the economizer hood from the base unit and save the screws for use in Step 8. On units with factory-installed economizers, the panel is hinged and should not be removed from the unit. Open the hinged panel and secure it.
2. Remove the plug button in the economizer deck and install the grommet supplied with the kit into the hole. See Fig. 2.
3. If there is a pre-existing differential temperature sensor, remove the sensor. To remove the sensor, disconnect the blue and orange wires from the differential temperature sensor and let them hang. They are used later to connect the differential enthalpy sensor. Remove the differential temperature sensor and save the screws for use in Step 4.
4. Locate screw holes in the economizer deck partition. Mount the differential enthalpy sensor onto the backside of the deck, directly behind the outdoor air enthalpy sensor (already installed) as shown in Fig. 1 and 2. Use the screws provided.
5. Remove the 620-ohm resistor that connects SR+ and SR on the economizer controller.
6. Route the control wires from the EconoMi$erIV controller to the differential enthalpy sensor. Connect the blue and orange wires to the economizer control board terminals labeled "SR+" (blue) and "SR" (orange). See Fig. 3. Route the wires through the grommet installed in Step 3. The grommet seals this hole airtight while allowing the wires to pass through.
7. Connect the blue and orange wires to the differential enthalpy sensor. Connect the blue wire to the "+" terminal and the orange wire to the "S" terminal on the enthalpy sensor. See Fig. 4.
8. Reinstall the economizer hood and inlet screens removed in Step 1.
9. Restore power to the unit and configure the EconoMi$erIV controller. See the Configuration section on page 6.

48/50PG20-28, 48/50HJ020-028, AND 551A/581A210-300 UNITS

NOTE: All wiring for the sensors on 48/50PG units is factory-provided. The red and black wires provided with the accessory are not used.

1. Remove the damper motor access panel at the return end of the unit. Save the screws for later use.
2. Drill a $^{7}/_{8}$-in hole in the economizer block-off panel (economizer deck), as shown in Fig. 8. Install the supplied grommet into the hole.
3. If there is a pre-existing differential temperature sensor, remove the sensor. To remove the sensor, disconnect the blue and orange wires from the differential temperature sensor and let them hang. They are used later to connect the differential enthalpy sensor. Remove the differential enthalpy sensor and save the screws for use in Step 4.
4. Locate holes on the back (return air) side of the economizer frame and mount the differential enthalpy sensor on the frame. Use the screws provided.
5. Remove the 620-ohm resistor that connects SR+ and SR on the economizer controller.

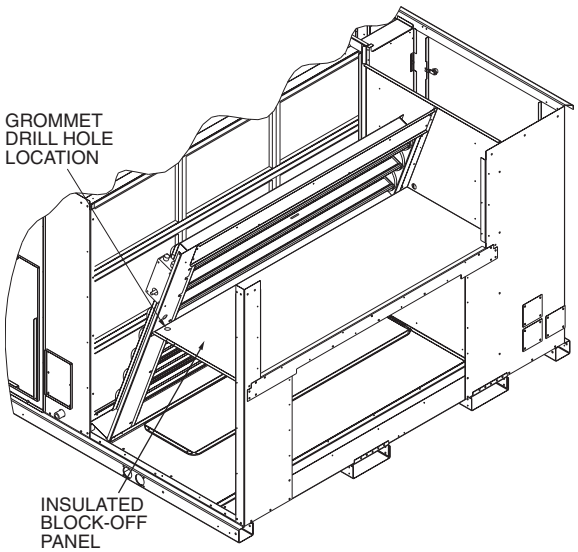


Fig. 8 — Economizer Block-Off Panel Location — 48/50PG20-28, 48/50HJ020-028, and 551A/581A210-300 Units

6. Route the control wires from the EconoMi$erIV controller to the differential enthalpy sensor. Connect the blue and orange wires to the economizer control board terminals labeled "SR+" (blue) and "SR" (orange). See Fig. 3. Route the wires through the grommet installed in Step 3. The grommet seals this hole airtight while allowing the wires to pass through.
7. Connect the blue and orange wires to the differential enthalpy sensor. Connect the blue wire to the "+" terminal and the orange wire to the "S" terminal on the enthalpy sensor. See Fig. 4.
8. Replace the damper motor access panel. Secure panel with the screws saved from Step 1.
9. Restore power to the unit and configure the EconoMi$erIV controller. See the Configuration section on page 6.

48/50HJ,TF,TM004-014, 50HJQ,TFQ004-012, 548F/549B036-120, 551B/558F/580F/581B036-150 UNITS

1. Remove the economizer hood from the base unit and save the screws for Step 6. On units with factory-installed hinged panels, the panel is hinged and should not be removed from the unit. Open the hinged panel and secure it.
2. Mount the differential enthalpy sensor in the return air duct as shown in Fig. 9. Use the screws provided.
3. Remove the 620-ohm resistor that connects SR+ and SR on the economizer controller.
4. Route the control wires from the EconoMi$erIV controller to the differential enthalpy sensor. Connect the red and black wires provided to the economizer controller terminals labeled "SR+" (black) and "SR" (red). See Fig. 3.
5. Connect the black and red wires to the differential enthalpy sensor. Connect the black wire to the "+" terminal and the red wire to the "S" terminal on the enthalpy sensor. See Fig. 4.
6. Reinstall the economizer hood removed in Step 1.
7. Restore power to the unit and configure the EconoMi$erIV controller. See the Configuration section on page 6.

48/50HJ015-017, 50HJQ014-016, 48/50TJ,TM016-028, 542J150-180, 551A/581A155-180, 558F/559F/579F/580F180-300 UNITS

1. Remove the economizer hood from the base unit and save the screws for Step 6. On units with factory-installed hinged panels, the panel is hinged and should not be removed from the unit. Open the hinged panel and secure it.
2. Mount the differential enthalpy sensor onto the EconoMi$erIV frame in the return air section as shown in Fig. 10. Use the screws provided.
3. Remove the 620-ohm resistor that connects SR+ and SR on the economizer controller.

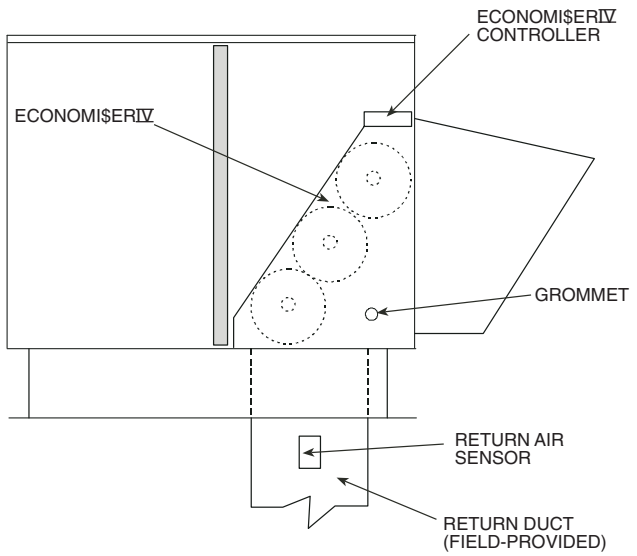


Fig. 9 — Return Air Enthalpy Sensor Mounting Location — 48/50HJ,TF,TM004-014, 50HJQ,TFQ004-012, 548F/549B036-120, 551B/558B/580F/581B036-150 Units

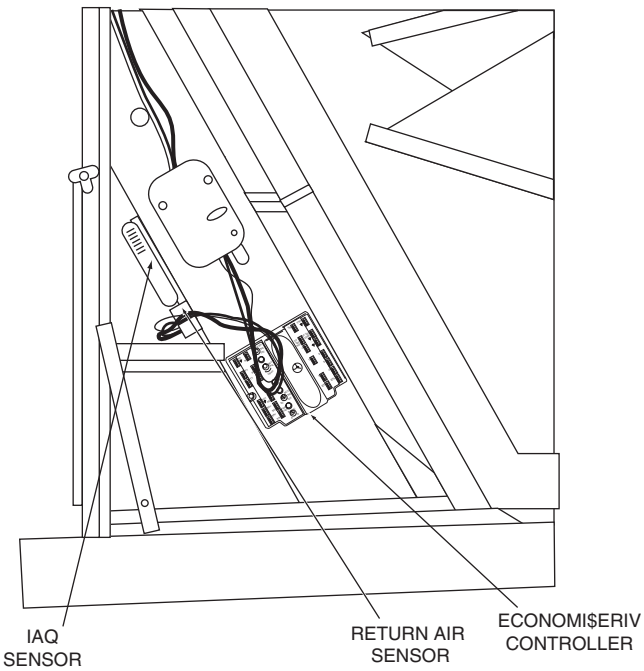


Fig. 10 — Return Air Enthalpy Sensor Mounting Location — 48/50HJ015-017, 50HJQ014-016, 48/50TJ,TM016-028, 542J150-180, 551A/581A155-180, 558F/559F/579F/580F180-300 Units

4. Route the control wires from the EconoMi$erIV controller to the differential enthalpy sensor. Connect the red and black wires provided to the economizer controller terminals labeled “SR+” (black) and “SR” (red). See Fig. 3.
5. Connect the black and red wires to the differential enthalpy sensor. Connect the black wire to the “+” terminal and the red wire to the “S” terminal on the enthalpy sensor. See Fig. 4.
6. Reinstall the economizer hood removed in Step 1.
7. Restore power to the unit and configure the EconoMi$erIV controller. See the Configuration section below.

CONFIGURATION

Outdoor Enthalpy Changeover Control — When the outdoor air enthalpy rises above the outdoor enthalpy changeover set point, the outdoor-air damper moves to its minimum position. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$erIV controller. The set points are A, B, C, and D. See Fig. 11 and 12. The factory-installed 620-ohm jumper must be in place across terminals SR and SR+ on the EconoMi$er IV controller. See Fig. 3.

Differential Enthalpy Control — The EconoMi$erIV controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi$erIV use. The controller selects the lower enthalpy air (return or outdoor) for cooling. For example, when the outdoor air has a lower enthalpy than the return air and is below the set point, the EconoMi$erIV opens to bring in outdoor air for free cooling.

When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting.

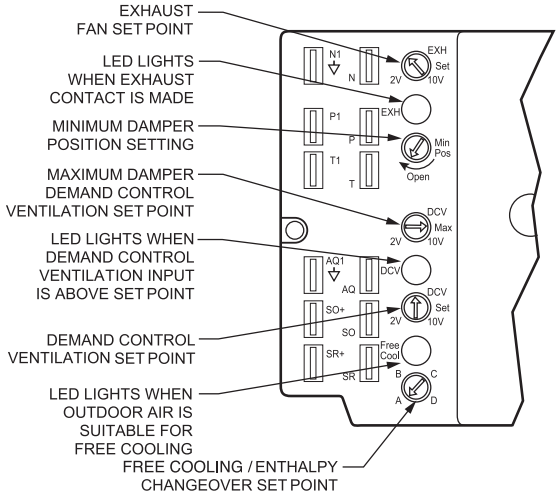


Fig. 11 — EconoMi$erIV Controller Potentiometer and LED Locations

CONTROL CURVE	CONTROL POINT APPROX. °F (°C) AT 50% RH
A	73 (23)
B	70 (21)
C	67 (19)
D	63 (17)

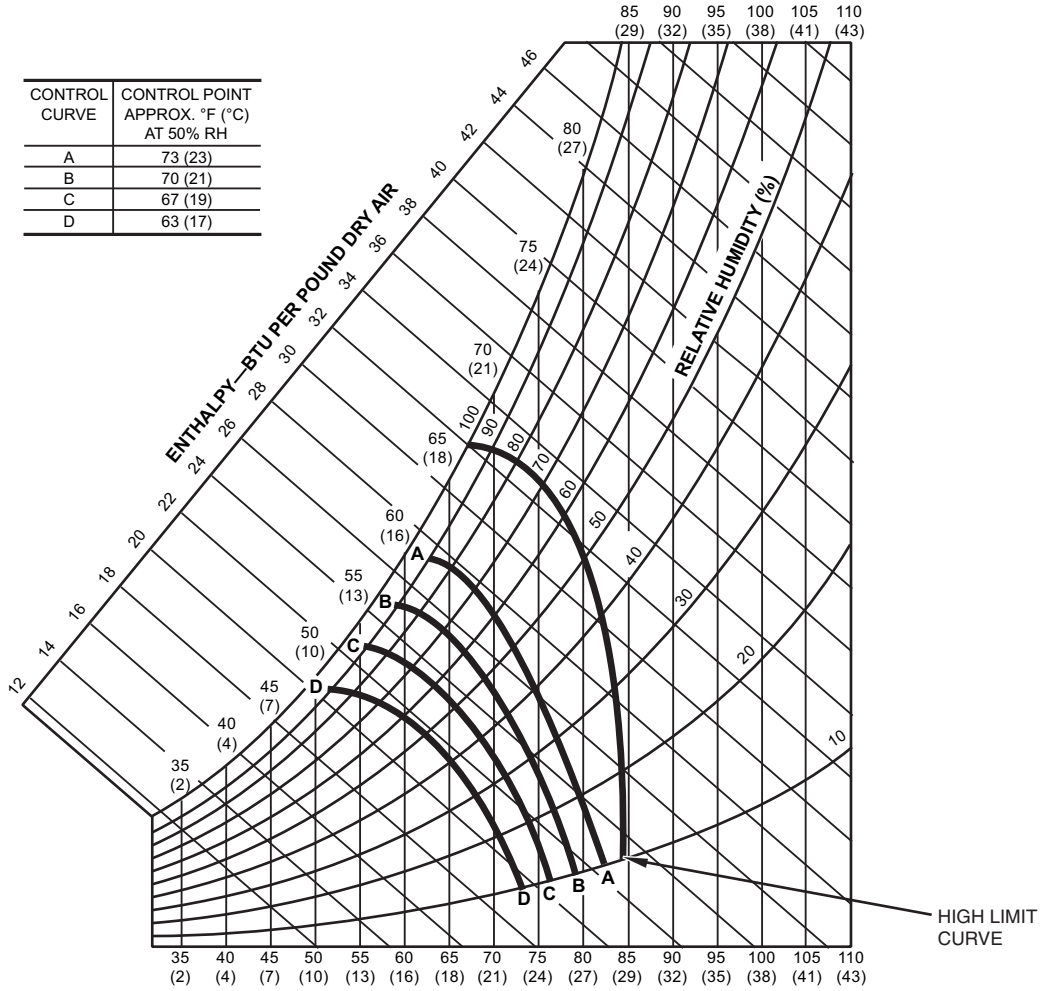


Fig. 12 — Enthalpy Changeover Set Points

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