



Installation Instructions

Part No. 50DJ902321

PACKAGE CONTENTS

ITEM	QUANTITY
Enthalpy Sensor (Part No. HH57AC078)	1
No. 6B, 3/4-in. long Sheet Metal Screw	2
Blue Wire Assembly (256-in. long with 1/4-in. quick-connect fitting)*	1
Violet Wire Assembly (256-in. long with 1/4-in. quick-connect fitting)	1
1/4-in. Quick-Connect Terminal†	1
Wire Tie	10

*The blue wire assembly is not used for enthalpy single-sensor installation into the TJ units.

†The quick-connect terminal is only used for enthalpy sensor installation into the TJ units.

GENERAL

There are 2 types of enthalpy control: single-sensor and differential. Both are accomplished using the enthalpy sensor part no. 50DJ902321. All units except the 48/50TJ016-028 units come with one outdoor-air enthalpy sensor as standard (on units with factory-installed economizers), and therefore have the single-sensor enthalpy control function as standard. For the 48/50TJ units, enthalpy control is not available as standard from the factory (on units with the factory-installed economizer), but an outdoor dry-bulb control is available. If single, outdoor-air enthalpy control is desired, a single enthalpy sensor must be installed in these units.

NOTE: All accessory field-installed economizers have single-sensor enthalpy control as standard in the package (including TJ units).

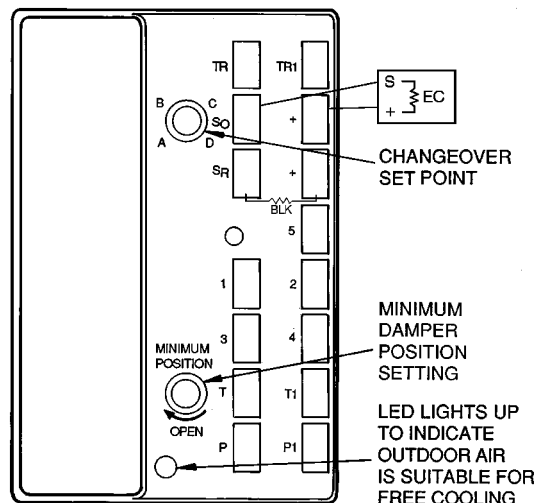
Differential enthalpy control is used to increase the operating efficiency of the rooftop system. The system compares the temperature and humidity of the return air to that of the outdoor air to determine whether outdoor air or mechanical cooling is more economical and efficient. On all units with a factory-installed economizer (except the 48/50TJ016-028), a single return-air enthalpy sensor is required to complement the factory-installed outdoor-air enthalpy controller to provide the differential enthalpy control function. The 48/50TJ016-028 units require 2 accessory enthalpy sensors to accomplish differential enthalpy control.

NOTE: Differential enthalpy control can be accomplished with 1 accessory enthalpy sensor on TJ units with accessory field-installed economizer.

SINGLE-SENSOR, OUTDOOR-AIR ENTHALPY CONTROL INSTALLATION — 48/50TJ016-028 ONLY

NOTE: The outdoor-air enthalpy sensor must be installed BEFORE the economizer hoods are installed on the unit or hoods will have to be removed.

1. Remove and discard the factory-installed jumper assembly containing the 800-ohm resistor on the economizer control module (between terminals S_R and +). See Fig. 1.
2. Remove black wire assembly containing the 620-ohm resistor from between economizer control module terminal S_O and the outdoor-air thermostat (OAT). Place this wire assembly (containing the 620-ohm resistor) between economizer control module terminals S_R and +, replacing the jumper removed in Step 1. See Fig. 1.
3. Disconnect the blue wire from the OAT.
4. Remove OAT from the outside of the economizer (see Fig. 2).
5. Mount the enthalpy sensor (Fig. 3) to the economizer on the outside of the unit (in the same location from which the OAT was removed) using the 2 screws provided. See Fig. 2.
6. Reconnect the blue wire removed in Step 3 to the enthalpy sensor terminal +.
7. Cut the violet wire provided to desired length and terminate with quick-connect terminal provided. Route the violet wire from the enthalpy sensor terminal S, through the snap bushing, and to the economizer control module terminal S_O. See Fig. 1.



EC — Enthalpy Control Sensor
 LED — Light-Emitting Diode

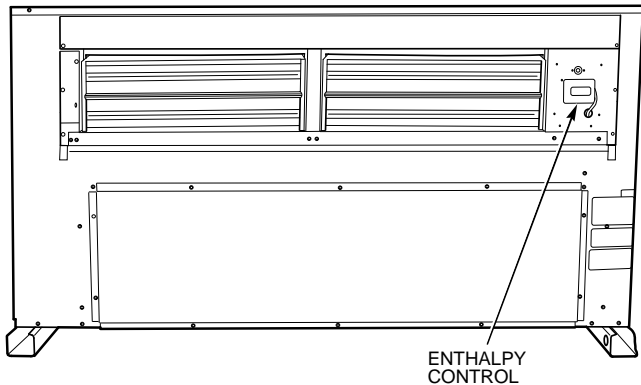
Fig. 1 — Economizer Control Module

- Set changeover set point to the desired location. See Fig. 4.

NOTE: For maximum benefit of outdoor air, set the enthalpy control to the "A" setting. At this setting, when the relative humidity is 50% and the outdoor air is below 74 F, the relay contacts on the sensor will be closed.

- Reinstall economizer hoods if removed.

IMPORTANT: Be sure all seal strips and RTV sealant are intact. A watertight seal to inside of unit must be maintained.



OAT — Outdoor-Air Thermostat

Fig. 2 — Enthalpy Sensor Installed

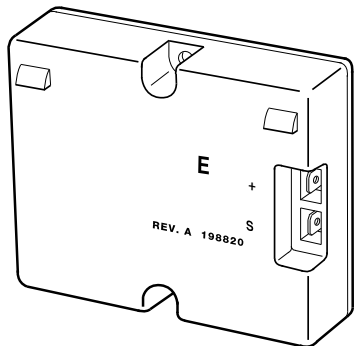
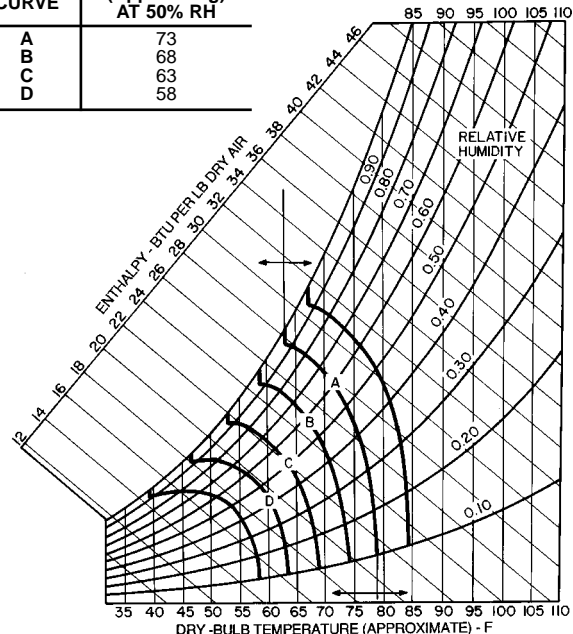


Fig. 3 — Outdoor-Air and Return-Air Enthalpy Sensor

CONTROL CURVE	CONTROL POINT (Approx Deg) AT 50% RH
A	73
B	68
C	63
D	58



RH — Relative Humidity

Fig. 4 — Psychrometric Chart for Solid-State Enthalpy Control

DIFFERENTIAL ENTHALPY CONTROL INSTALLATION — ALL UNITS

Size 016-028 Constant Volume Units (48/50TJ Units)

NOTE: The outdoor-air enthalpy sensor must be installed BEFORE the economizer hoods are installed on the unit or hoods will have to be removed.

- Remove and discard the factory-installed jumper assembly containing the 800-ohm resistor on the economizer control module (between terminals S_R and +. See Fig. 1.
- Disconnect black wire from economizer control module terminal S_O and blue wire from the OAT (outdoor-air thermostat).
- Remove OAT and black wire assembly containing the 620-ohm resistor from the outside of the economizer (see Fig. 2).
- Mount the outdoor-air enthalpy sensor (first sensor) to the economizer on the outside of the unit (in the same location from which the OAT was removed) using the 2 screws provided. See Fig. 2.
- Reconnect the blue wire removed in Step 2 to the enthalpy sensor terminal +.
- Cut the violet wire provided to desired length and terminate with quick-connect terminal provided. Route the violet wire from the enthalpy sensor terminal S, through the snap bushing, and to the economizer control module terminal S_O .
- Mount the second enthalpy sensor in the return-air duct (return-air sensor).
- Route the blue wire (provided) from terminal + on the return-air enthalpy sensor to the economizer control module terminal +.

9. Route the violet wire (provided) from terminal S on the return-air enthalpy sensor to the economizer control module terminal S_R.
10. Turn changeover set point dial clockwise past the "D" setting, or the control will not operate on a differential. See Fig. 1.
11. Reinstall economizer hood if removed.

IMPORTANT: Be sure all seal strips and RTV sealant are intact. A watertight seal to inside of unit must be maintained.

Size 024-030 Constant Volume Units (48DJ,LJ/50DJ,DW,LJ,LW and 64RT)

NOTE: Return-air sensor must be installed before economizer hoods are installed on the unit or hoods will have to be removed.

1. Remove access cover from top of economizer motor. See Fig. 5 and 6.
2. Remove factory-installed, 620-ohm jumper between terminals + and S_R on inside top of economizer motor access cover. See Fig. 7.
3. Route blue and violet wires supplied with differential enthalpy control sensor accessory through connector on the side of the economizer motor into the economizer motor wiring compartment. See Fig. 6. Connect the violet wire to + terminal and the blue wire to S_R terminal.
4. Remove return-air enthalpy sensor from accessory package. Using screws provided, attach sensor to factory-installed bracket on filter track. See Fig. 5.
5. Connect violet wire to + terminal and blue wire to S terminal on return-air enthalpy sensor. Dress wires with wire ties supplied with accessory.
6. Replace economizer motor access cover. Turn the enthalpy set point potentiometer located on top of economizer motor clockwise past the "D" setting, or control will not operate on a differential.

7. Replace economizer hoods if removed.

IMPORTANT: Be sure all seal strips and RTV sealant are intact. A watertight seal to inside of unit must be maintained.

Size 024-030 Variable-Air Volume Units (48DJ,NK/50DJ,DK,NK,NY, 48NP/50NB,NP, and 64RT Units)

NOTE: Return-air sensor must be installed before the economizer hoods are installed on the unit or hoods will have to be removed.

1. Remove economizer hood (if hoods are already installed) to gain access to enthalpy control and outdoor-air section of unit. See Fig. 8 and 9.
2. Remove factory-installed, 620-ohm jumper between terminals S_R and + on enthalpy control in unit. See Fig. 7.
3. Connect violet wire to + terminal and blue wire to S_R terminal on enthalpy control. (Wires are supplied with the differential enthalpy accessory.)
4. Turn the enthalpy control set point potentiometer clockwise past the "D" setting on the enthalpy control, or control will not operate on a differential.
5. Route wires to filter section as shown in Fig. 5, using wire ties to attach to existing wires.
6. Remove return-air enthalpy sensor from accessory package. Using screws provided, attach sensor to factory-installed bracket on filter track. See Fig. 5.
7. Connect violet wire to + terminal and blue wire to S terminal on return-air enthalpy sensor.
8. Reinstall economizer hood on side of unit.

IMPORTANT: Be sure all seal strips and RTV sealant are intact. A watertight seal to inside of unit must be maintained.

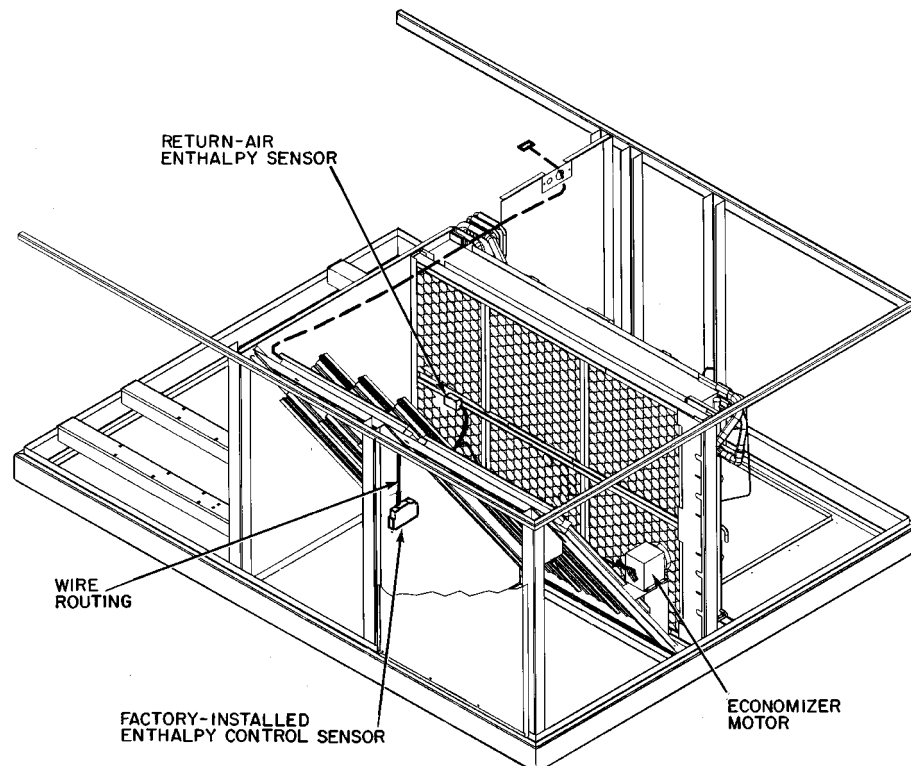


Fig. 5 — Return-Air Enthalpy Sensor Installation and Wire Routing, 024-030 Units

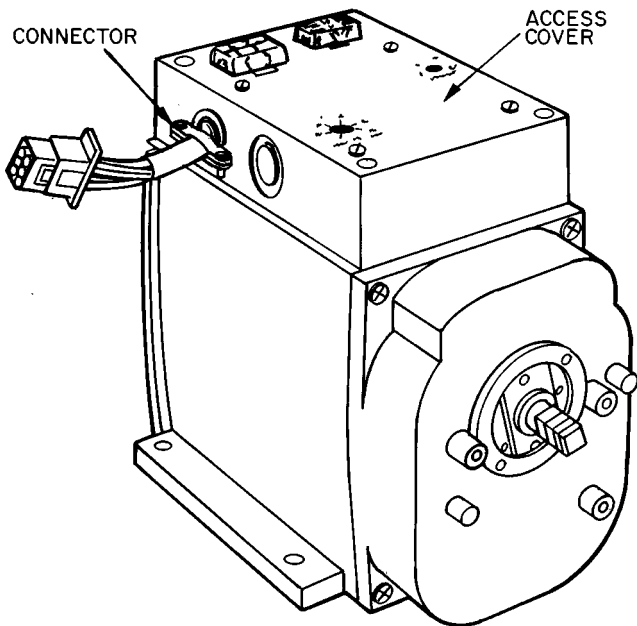


Fig. 6 — Economizer Motor

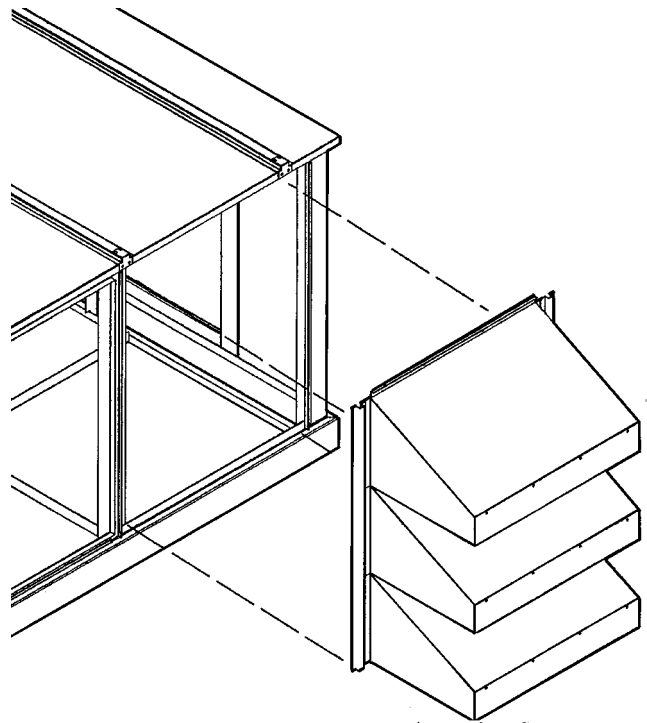
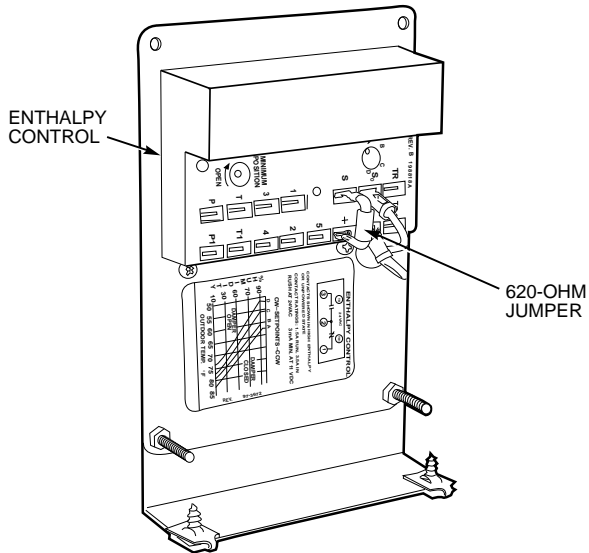


Fig. 8 — Economizer Hood Removal



NOTE: Sensor is on the back of the enthalpy control and is hidden in this photo.

Fig. 7 — Factory-Installed Enthalpy Control and Sensor

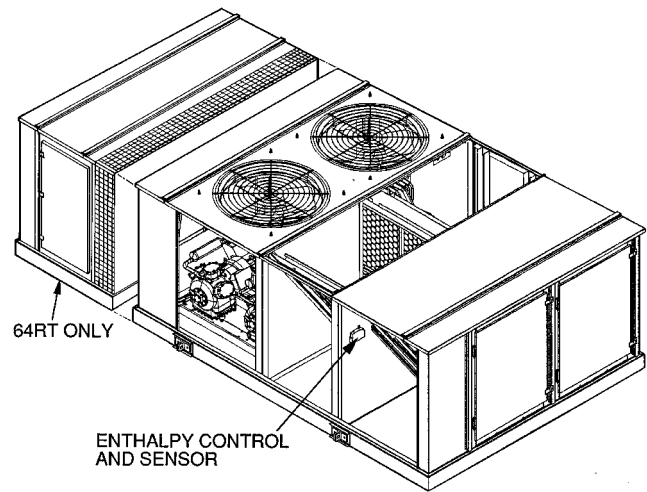


Fig. 9 — Typical Enthalpy Control and Sensor Location

**Size 034-074 Constant Volume Units
Manufactured After 12/1/92
(48DJ/50DJ,DW Units)**

NOTE: Return-air sensor must be installed before economizer hoods are installed on the unit or hoods will have to be removed.

1. Remove access cover from top of economizer motor. See Fig. 6 and 10.
2. Remove factory-installed, 620-ohm jumper between terminals + and S_R on inside top of economizer motor access cover.
3. Route blue and violet wire supplied with differential enthalpy control accessory through connector on the side of the economizer motor into the economizer motor wiring compartment. See Fig. 6. Connect the violet wire to + terminal and the blue wire to S_R terminal.
4. Remove return-air enthalpy sensor from accessory package. Using screws provided, attach sensor to factory-installed bracket on filter track. See Fig. 10.
5. Connect violet wire to + terminal and blue wire to S terminal on return-air enthalpy sensor. Dress wires with wire ties supplied with accessory.
6. Replace economizer motor access cover. Turn the enthalpy set point potentiometer clockwise past the "D" setting, or control will not operate on a differential.
7. Reinstall hoods if removed.

IMPORTANT: Be sure all seal strips and RTV sealant are intact. A watertight seal to inside of unit must be maintained.

**Size 034-074 Variable-Air Volume Units
Manufactured After 12/1/92 (48DK,NK/
50DK,DY,NK,NY, 48NP/50NB,NP Units)**

NOTE: Return-air sensor must be installed before the economizer hoods are installed on the unit or hoods will have to be removed.

1. Remove economizer hood (if hoods are already installed) from one side of unit to gain access to enthalpy control and outdoor-air section of unit. See Fig. 10.
2. Remove factory-installed, 620-ohm jumper between terminals S_R and + on enthalpy control in unit. See Fig. 7.
3. Connect violet wire to + terminal and blue wire to S_R terminal on enthalpy control. (Wires are supplied with the enthalpy sensor accessory.)
4. Turn the enthalpy set point potentiometer clockwise past the "D" setting on the enthalpy control, or control will not operate on a differential.
5. Route wires to filter section as shown in Fig. 10, using wire ties to attach to existing wires.
6. Remove return-air enthalpy sensor from accessory package. Using screws provided, attach sensor to factory-installed bracket on filter track. See Fig. 3 and 10.
7. Connect violet wire to + terminal and blue wire to S terminal on return-air enthalpy sensor.
8. Reinstall economizer hood on side of unit.

IMPORTANT: Be sure all seal strips and RTV sealant are intact. A watertight seal to inside of unit must be maintained.

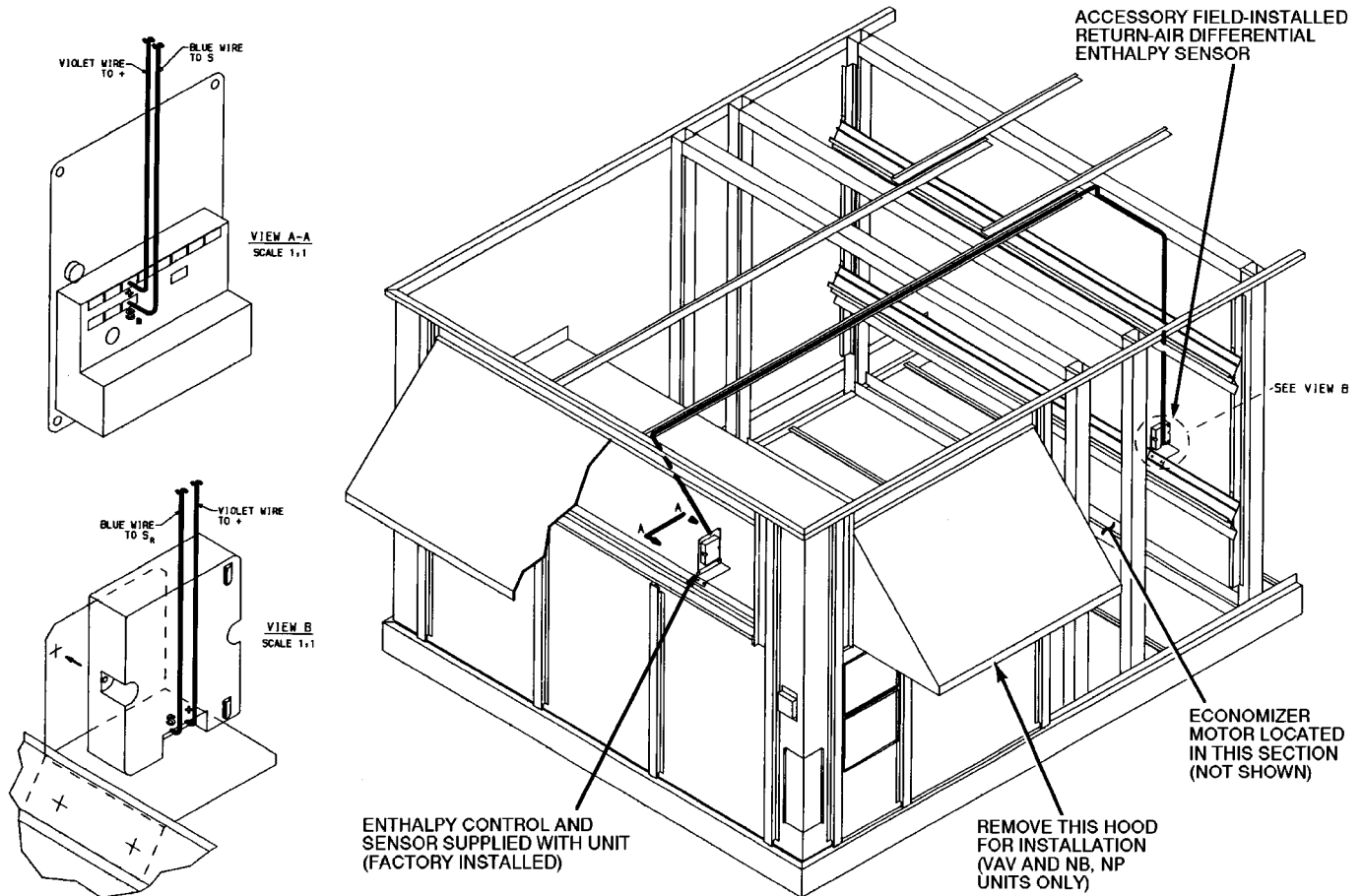


Fig. 10 — Differential Enthalpy Control Wiring Detail

All Size 034-074 Units Manufactured Prior to 12/1/92 (48DJ,DK,NK/50DJ,DK,DW,DY,NK, NY Units)

NOTE: Return-air sensor must be installed before the economizer hoods are installed on the unit or hoods will have to be removed.

1. Remove economizer hood (if hoods are already installed) from one side of unit to gain access to enthalpy control and outdoor-air section of unit. See Fig. 10.
2. Remove factory-installed, 620-ohm jumper between terminals S_R and + on enthalpy control in unit. See Fig. 7.
3. Connect violet wire to + terminal and blue wire to S_R terminal on enthalpy control. (Wires are supplied with the differential enthalpy accessory.)
4. Turn the enthalpy set point potentiometer clockwise past the "D" setting on the enthalpy control, or control will not operate on a differential.
5. Route wires as shown in Fig. 10, using wire ties to attach to existing wires.
6. Remove return-air enthalpy sensor from accessory package. Using screws provided, attach sensor to factory-installed bracket on filter track. See Fig. 3 and 10.
7. Connect violet wire to + terminal and blue wire to S terminal on return-air enthalpy sensor.
8. Reinstall economizer hood on side of unit.

IMPORTANT: Be sure all seal strips and RTV sealant are intact. A watertight seal to inside of unit must be maintained.

ENTHALPY SENSOR CHECKOUT

After installing the sensor(s), check them out to ensure proper installation and working condition. Refer to appropriate base unit Installation Instructions for complete troubleshooting information on the economizer controls.

Outdoor-Air Sensor

TEST — The enthalpy sensor terminal + should be connected to terminal + on the economizer control module. Connect the positive (+) terminal of a DC milliammeter to the S terminal of the sensor and the negative (–) terminal of the meter to terminal S_O of the economizer control module.

RESULTS — The milliammeter reading should be between 3 and 24 mA if the sensor is operating correctly. If the reading is 0 mA, the sensor is either wired backwards or is defective.

Return-Air Sensor

TEST — The enthalpy sensor terminal + should be connected to terminal + on the economizer control module. Connect the positive (+) terminal of a DC milliammeter to the S terminal of the sensor and the negative (–) terminal of the meter to terminal S_R of the economizer control module.

RESULTS — The milliammeter reading should be between 3 and 24 mA if the sensor is operating correctly. If the reading is 0 mA, the sensor is either wired backwards or is defective.

Economizer Checkout Procedures (48/50TJ Units Only)

TEST PROCEDURE	RESULTS
<ol style="list-style-type: none"> Disconnect power at TR and TR1. Disconnect jumper between P and P1. See Fig. 1. Jumper TR to 1. Jumper T1 to T. Disconnect outdoor-air thermostat connections from S_O and +. Factory-installed 800 ohm resistor should remain connected to S_R and +. Reconnect power to terminals TR and TR1. 	<ol style="list-style-type: none"> LED (light-emitting diode) should be off. Motor is in closed position.

TEST PROCEDURE	RESULTS
<ol style="list-style-type: none"> Disconnect factory-installed resistor from terminals S_R and +. 	<ol style="list-style-type: none"> LED (light-emitting diode) should be on. Motor drives toward open.

High and Low Enthalpy Simulation

TEST PROCEDURE	RESULTS
<ol style="list-style-type: none"> Reconnect factory-installed 800 ohm resistor between terminals S_R and +. Connect 1200 ohm checkout resistor between terminals S_O and +. Turn set point potentiometer to position A. 	<p>Low enthalpy test results:</p> <ol style="list-style-type: none"> LED (light-emitting diode) should be on. Motor drives toward open.
<ol style="list-style-type: none"> Turn set point potentiometer to position D. Disconnect 1200 ohm checkout resistor. 	<p>High enthalpy test results:</p> <ol style="list-style-type: none"> LED should be off. Motor drives toward closed.

