



Installation Instructions

Part Numbers: CRECOMZR038A00, CRECOMZR039A00, CRECOMZR040A00,
 CRECOMZR041A00, CRECOMZR042A00, CRECOMZR043A00

TABLE OF CONTENTS


	Page
SAFETY CONSIDERATIONS	1
GENERAL	1
PACKAGE USAGE	1
PACKAGE CONTENTS	2
ACCESSORIES	2
INSTALLATION	2
Verical EconoMi\$er IV (CRECOMZR038A00, CRECOMZR039A00, and CRECOMZR040A00)	2
Horizontal EconoMi\$er IV (CRECOMZR041A00, CRECOMZR042A00 and CRECOMZR043A00)	6
CONFIGURATION	12
EconoMi\$er IV Standard Sensors	12
EconoMi\$er IV Controller Wiring and Operational Modes	13
TROUBLESHOOTING	16

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 basic maintenance functions of cleaning coils and filters and 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.

Follow all safety codes. Wear safety glasses and work gloves.

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies a hazard which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

IMPORTANT: Do not adjust the damper assembly. The motor and damper have been pre-set and adjusted for proper operation.

GENERAL

IMPORTANT: Read these instructions completely before attempting to install the accessory EconoMi\$er IV.

The accessory EconoMi\$er IV package uses solid-state controls to sequence mechanical cooling with cool outdoor air (free cooling) to satisfy the cooling load and minimize energy consumption. Free cooling can be used alone or in conjunction with mechanical cooling.

The accessory EconoMi\$er IV uses an outdoor-air temperature (OAT) sensor to sense outdoor-air temperature. The EconoMi\$er IV will provide cooling when the outdoor temperature is suitable and a thermostat has signaled a cooling demand. If an outdoor enthalpy sensor accessory has been installed, then the enthalpy reading must also be “low” before EconoMi\$er IV cooling can occur.

When free cooling is available, the EconoMi\$er IV sequences free cooling with mechanical cooling to maintain comfort in the space. When free cooling is not available, the EconoMi\$er IV remains at an adjustable minimum position to maintain a supply of fresh air entering the building.

A barometric relief damper provides building pressurization control. An optional power exhaust system is available for applications that require greater relief capabilities.

If the EconoMi\$er IV hood is oriented in the direction of a prevailing wind or if 100% outdoor air operation is expected during steady rain, outdoor mist screens are recommended.

PACKAGE USAGE

UNIT 48/50PG	PART NUMBER	TYPE
03-07	CRECOMZR038A00	Vertical
	CRECOMZR041A00	Horizontal
08-14	CRECOMZR039A00	Vertical
	CRECOMZR042A00	Horizontal
16	CRECOMZR040A00	Vertical
16	CRECOMZR043A00	Horizontal

PACKAGE CONTENTS

PACKAGE NO.	QTY	CONTENTS
CRECOMZR038A00, CRECOMZR039A00, CRECOMZR040A00	1	EconoMiSer IV Assembly
	2	Pivot Brackets
	1	Front Panel/Hood Assembly
	1	Hardware Bag
	1	EconoMiSer IV Controller
	2	Wiring Harness
	1	Mixed Air Sensor
CRECOMZR041A00, CRECOMZR042A00, CRECOMZR043A00	1	EconoMiSer IV Assembly
	1	Front Panel/Hood Assembly
	1	Hardware Bag
	1	EconoMiSer IV Controller
	2	Wiring Harness
	1	Mixed Air Sensor

ACCESSORIES

The EconoMiSer IV has several field-installed accessories available to optimize performance. Refer to Table 1 for authorized parts. See Table 2 for sensor usage.

Table 1—EconoMiSer IV Field-Installed Accessories

DESCRIPTION	PART NUMBER
2 to 6 Ton Power Exhaust, Prop Fan, 208-230 v (Single Ph and 3 Ph)	CRPWREXH032A00
3 to 6 Ton Power Exhaust, Prop Fan, 460 v	CRPWREXH037A00
3 to 6 Ton Power Exhaust, Prop Fan, 575 v	CRPWREXH048A00
7 ¹ / ₂ to 12 ¹ / ₂ Ton Power Exhaust, Prop Fan, 208-230 v	CRPWREXH038A00
7 ¹ / ₂ to 12 ¹ / ₂ Ton Power Exhaust Prop Fan, 460 v	CRPWREXH039A00
7 ¹ / ₂ to 12 ¹ / ₂ Ton Power Exhaust, Prop Fan, 575 v	CRPWREXH049A00
15 Ton Power Exhaust, Prop Fan, 208-230 v	CRPWREXH046A00
15 Ton Power Exhaust, Prop Fan, 460 v	CRPWREXH047A00
15 Ton Power Exhaust, Prop Fan, 575 v	CRPWREXH050A00
Outdoor or Return Dry Bulb Temperature Sensor	CRTEMPSN002A00
Outdoor Air Enthalpy Sensor	HH57AC078
Return Air Enthalpy Sensor (used for Differential Enthalpy Control)	CRENDIF004A00
Return Air CO ₂ Sensor	CRCBDIOX005A00
CO ₂ Room Sensor	33ZCSENC02
Aspiration Box for Duct Mount CO ₂ Sensor	33ZCASPC02
Outdoor Air Mist Screens (03-07)	CRODAFLT001A00
Outdoor Air Mist Screens (08-14)	CRODAFLT002A00
Outdoor Air Mist Screens (16)	CRODAFLT003A00

INSTALLATION

⚠ WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing or servicing unit, always turn off all power to unit. There may be more than 1 disconnect switch.

Vertical EconoMiSer IV (CRECOMZR038A00, CRECOMZR039A00, and CRECOMZR040A00)

To install the vertical EconoMiSer IV, perform the following:

1. Turn off power supply and install lockout tag.
2. Unscrew and remove the front cover panel on the return end of the unit to expose the return section of the unit. (See Fig. 1.) Retain screws and discard panel.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

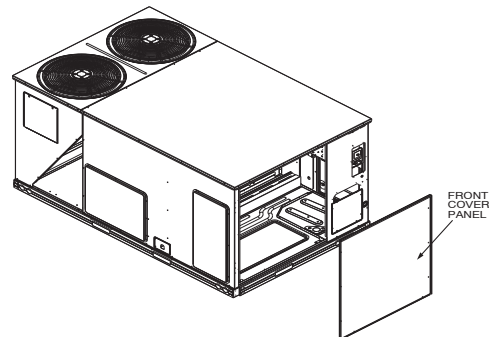
Cover the duct opening as a precaution so objects cannot fall into the return duct opening.

⚠ CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.



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Fig. 1 – Remove Unit Front Cover Panel
(Sizes 08-14 Shown)

3. Locate the 2 EconoMiSer IV pivot brackets provided. Screw the brackets down to the base of the rooftop unit with the no. 10 screws provided. (See Fig. 2 and 3.)
4. Set the EconoMiSer IV in front of the return air opening. Connect the plug coming from the EconoMiSer IV actuator to the EconoMiSer IV plug PL4 in the rooftop unit. (See Fig. 2.) Be sure that wires will not interfere with moving parts. Secure with wire ties if needed. See Fig. 4 for wiring details.
5. If an accessory power exhaust has been purchased, install it at this time. Refer to the accessory power exhaust installation instructions for installation information.
6. Slide the EconoMiSer IV assembly into the return air section of the rooftop unit as shown in Fig. 5. When installed, the front flanges of the EconoMiSer IV will be flush with the rooftop unit.

7. Attach the EconoMiSer IV to the pivot brackets installed in Step 3. Use no. 10 screws provided. This will allow the EconoMiSer IV to pivot out for service, repair, or cleaning.
8. Locate the tether cable hanging from the right side of the EconoMiSer IV. The hanging end of the cable must be attached to the unit to prevent the EconoMiSer IV from falling out of the rooftop unit when it is pivoted out. Screw the tether cable in place. (See Fig. 2.)

IMPORTANT: If the return duct opening was covered prior to installation, remember to remove the covering so as not to block off the return air to the unit.

9. The outside air hoods and barometric relief hoods are factory installed on the EconoMiSer IV front panel/hood assembly. Lift the panel in place over the front of the EconoMiSer IV. (See Fig. 5.) Attach the panel to the unit with the screws saved from Step 2. Use self-drilling screws (provided) to secure hinges on panel to unit. (See Fig. 6 and 7.)
10. Make sure panel and hoods are properly sealed to prevent water and air leakage.

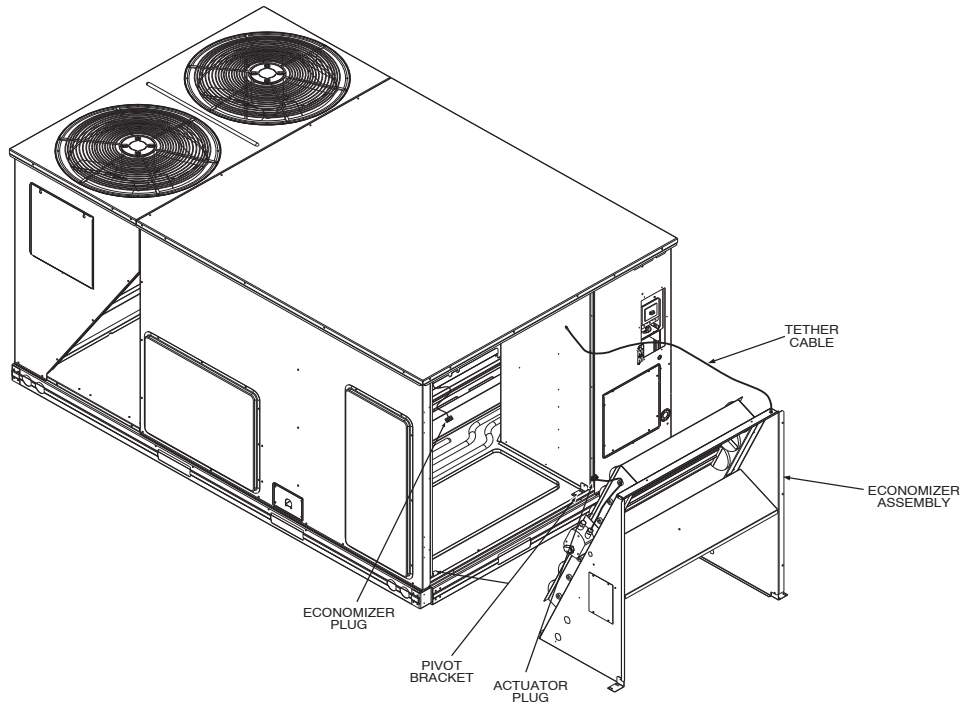


Fig. 2 – Installing Vertical Economizer Assembly (Sizes 08-14 Shown)

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Table 2—EconoMiSer IV Sensor Usage

APPLICATION	ECONOMISER IV ACCESSORIES REQUIRED		
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is provided with the accessory.		
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		
CO ₂ for DCV Control Using a Duct-Mounted CO ₂ Sensor	33ZCSENCO2† and 33ZCASPCO2**	OR	CRCBDIOX005A00††

LEGEND

DCV – Demand Control Ventilation

*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 is an accessory CO₂ sensor.

**33ZCASPCO2 is an accessory aspirator box required for duct-mounted applications.

††CRCBDIOX005A00 is an accessory that contains both 33ZCSENCO2 and 33ZCASPCO2 accessories.

- The barometric relief damper is screwed in place for shipping purposes. Remove shipping screw to allow for blade movement. The 16 size has 2 dampers. (See Fig. 6.) DO NOT REMOVE THIS PANEL.

NOTE: If using the centrifugal power exhaust, the relief hood and relief blade will not be used. Refer to the accessory centrifugal power exhaust instructions for more information.

- The OAT sensor and outdoor air temperature lockout switch are factory installed on the EconoMi\$er IV. (See Fig. 8.)
- Open the hinged control box compartment on the unit and open the control box cover.
- Install the EconoMi\$er IV controller into the control box. Secure the board using two screws provided in the pre-drilled holes. (See Fig. 9 and 10.)

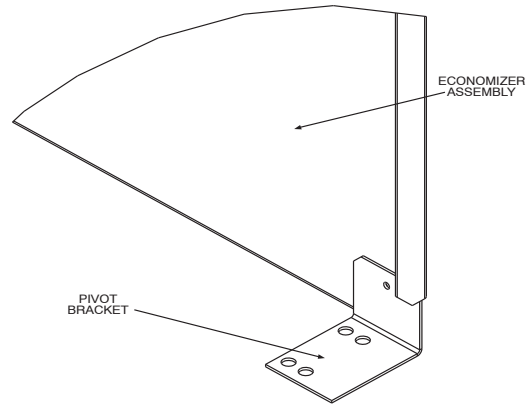


Fig. 3 – Economizer Pivot Bracket

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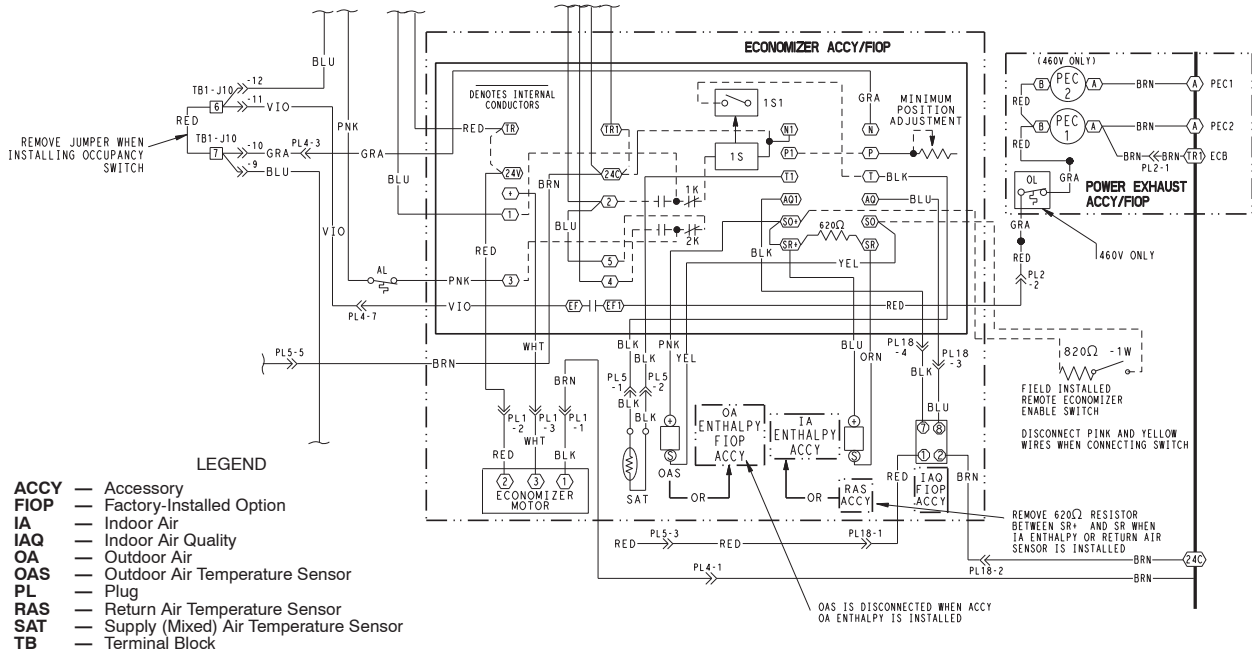


Fig. 4 – EconoMi\$er IV Wiring

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- Remove D shaped grommet from partition located between compressor and return air section. Route lead (1/4-in. quick connect) end through U-shaped slot from indoor section side of partition into compressor section. (See Fig. 11.) From the control box access door route harness into hole located in the bottom of control box. Ensure that the wires do not come into contact with discharge refrigerant lines. Each wire is labeled with the termination point. Use labels and unit schematic located on the compressor access door to complete wiring. Reinstall grommet into slot to prevent outdoor air infiltration. From economizer side of unit route plug end of harness toward duct panel. Secure wire in the two clips located toward the top cover. (See Fig. 11.)
- Close the control box cover.

- Install mixed air temperature sensor (MAT) into blower slide plate. Open blower access door. Locate 1/4-in. hole in blower side plate. (See Fig. 12.) On size 03-14 units, the hole is located opposite the drive end. On size 16 units, the hole is in the drive end of the closest blower to the access panel. Insert MAT into hole until the spring clips catch. The MAT is self secured by the spring clips. Locate black leads with insulated 1/4-in. quick connects in wire harness located on the left hand side of blower compartment. These two wires are labeled SAT. Connect the two wires to the 1/4-in. insulated quick connects on the sensor. These are non-polar connections. Dress wires to ensure that loose wires do not get drawn into the blower. Close blower access panel.
- Power can now safely be restored to the unit.
- The control can now be configured to operate the EconoMi\$er IV. See Configuration section for more information.

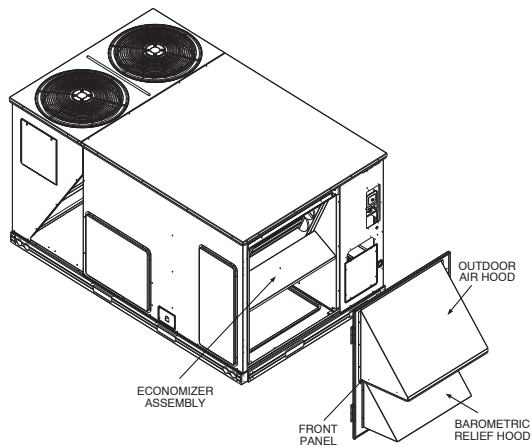


Fig. 5 – Install Economizer Front Panel

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20. Install the accessory mist eliminating filters (if purchased) into the outdoor air inlet hood.
21. Inspect the unit to make sure all panels are properly replaced and secured to the unit.
22. The unit is now ready for normal operation using the EconoMi\$er IV.

CO₂ Sensor Configuration

The CO₂ sensor has preset standard voltage settings. These settings can be adjusted anytime after the sensor is powered up. (See Table 3.)

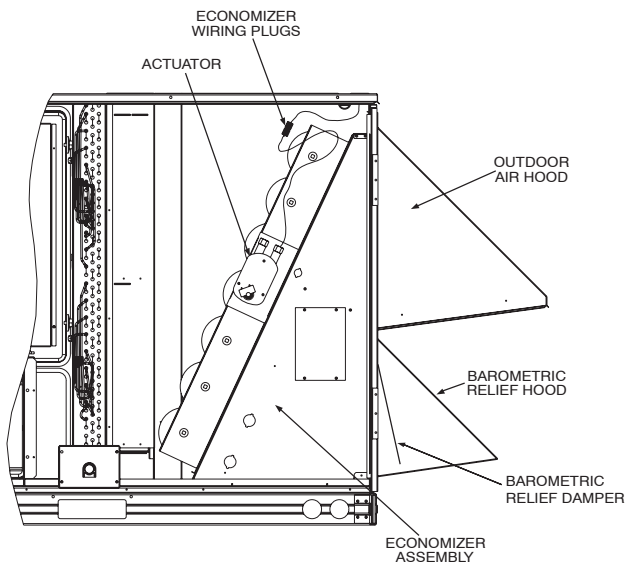


Fig. 6 – Side View of Vertical Economizer Installation

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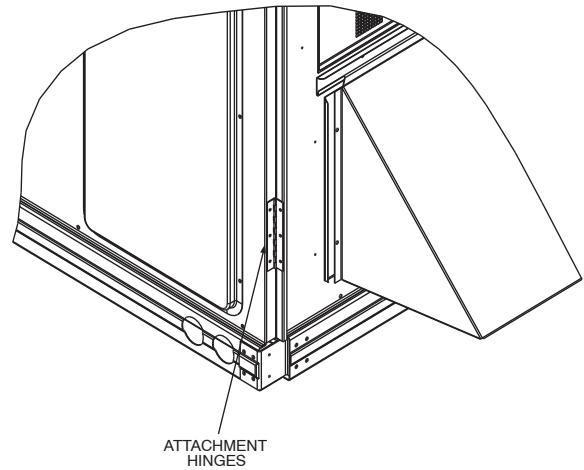


Fig. 7 – Economizer Front Panel Attachment Hinges

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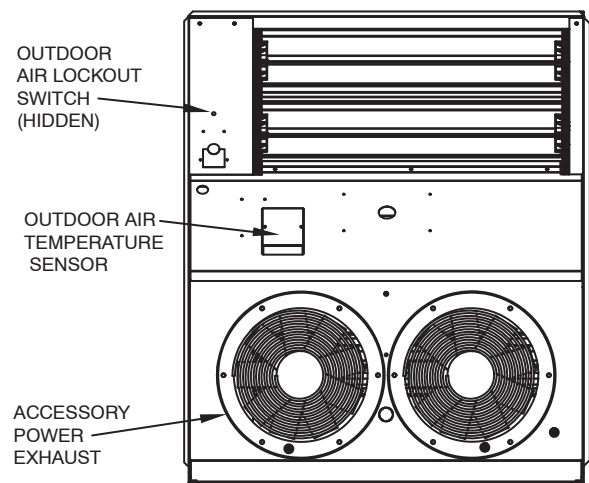


Fig. 8 – Sensor Locations

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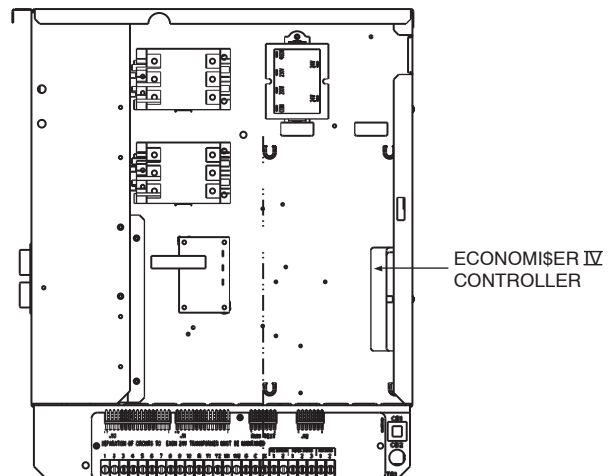


Fig. 9 – EconoMi\$er IV Controller Location

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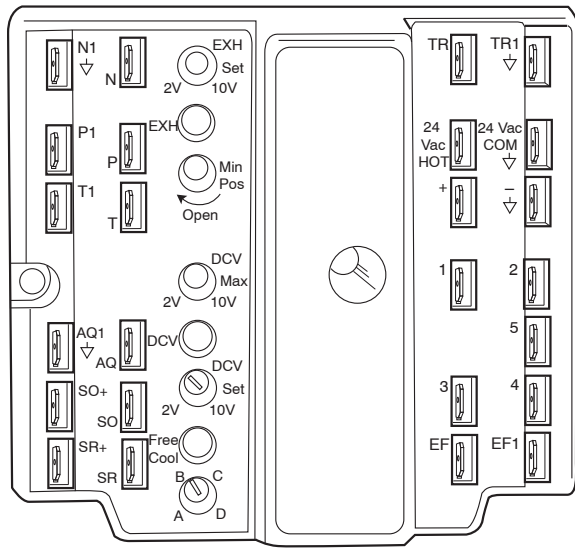


Fig. 10 – EconoMiSer IV Control

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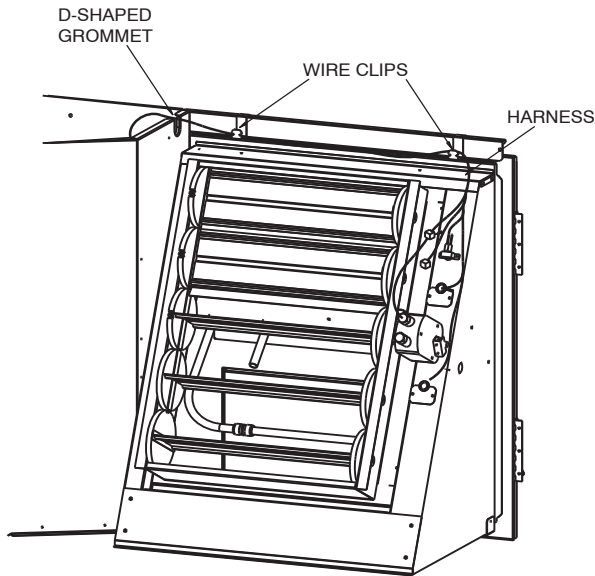


Fig. 11 – Harness Routing
(Vertical EconoMiSer IV Shown)

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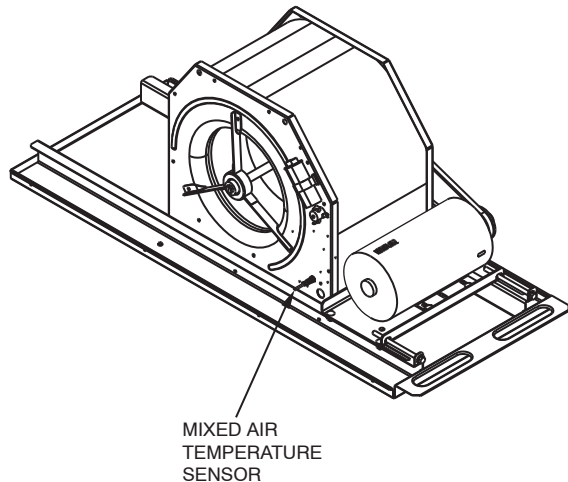


Fig. 12 – MAT Location (Sizes 03-14 Shown)

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Horizontal EconoMiSer IV (CRECOMZR041A00, CRECOMZR042A00 and CRECOMZR043A00)

To install the horizontal EconoMiSer IV, perform the following:

1. Turn off power supply and install lockout tag.
 2. Unscrew and remove the front cover panel on the return end of the unit to expose the return section of the unit. (See Fig. 13.) Save the screws for later use. Retain screws and discard panel.
 3. Unscrew and remove the cover panel shipped over the rooftop unit horizontal return air opening. (See Fig. 13.) Reinstall the panel over the vertical air opening in the base of the rooftop unit. Repeat the process for the supply air cover if using the EconoMiSer IV on a horizontal supply application. This step changes the unit configuration from vertical supply and return to horizontal supply and return. Refer to the 48/50PG installation instructions for more information on converting the unit supply/return configuration.
 4. Set the EconoMiSer IV in front of the return air opening. Connect the plug coming from the EconoMiSer IV actuator to the EconoMiSer IV plug PL4 in the rooftop unit. (See Fig. 14.) Be sure that wires will not interfere with moving parts. Secure with wire ties if needed. See Fig. 4 for wiring details.
 5. If an accessory propeller power exhaust has been purchased, install it at this time. Refer to the accessory propeller power exhaust installation instructions for installation information.
 6. Slide the EconoMiSer IV assembly into the return air section of the rooftop unit as shown in Fig. 15. When installed, the front flanges of the EconoMiSer IV will be flush with the rooftop unit. Angle the return side of the EconoMiSer IV into the unit first. Slide the EconoMiSer IV in until the return damper covers the horizontal return air opening.
 7. The outside air hoods and barometric relief hoods are factory installed on the EconoMiSer IV front panel/hood assembly. Lift the panel in place over the front of the EconoMiSer IV. (See Fig. 16 and 17.) Attach the panel to the unit with the screws saved from Step 2. Use self-drilling screws (provided) to secure hinges on panel to unit. (See Fig. 7.)
 8. Make sure panel and hoods are properly sealed to prevent water and air leakage.
 9. The barometric relief damper is screwed in place for shipping purposes. Remove shipping screw to allow for blade movement. The 16 size has 2 dampers. **DO NOT REMOVE THIS PANEL.**
- NOTE:** If using the centrifugal power exhaust, the relief hood and relief blade will not be used. Refer to the accessory centrifugal power exhaust instructions for more information.
10. The OAT and outdoor air lockout sensors are factory installed on the EconoMiSer IV.
 11. Attach the horizontal return air duct to the horizontal return air opening. Attach the horizontal supply air duct to the horizontal supply air opening. Refer to unit installation instructions for information on attaching ductwork to the unit.
 12. Open the hinged control box compartment on the unit and open the control box cover.
 13. Install the EconoMiSer IV controller into the control box. Secure the board using two screws provided in the pre-drilled holes. (See Fig. 9 and 10.)

14. Remove D shaped grommet from partition located between compressor and return air section. Route lead (1/4-in. quick connect) end through U-shaped slot from indoor section side of partition into compressor section. From the control box access door route harness into hole located in the bottom of control box. Ensure that the wires do not come into contact with discharge refrigerant lines. Each wire is labeled with the termination point. Use labels and unit schematic to complete wiring. Reinstall grommet into slot to prevent outdoor air infiltration. From economizer side of unit route plug end of harness toward duct panel. Secure wire in the two clips located toward the top cover.
15. Close the control box cover.

16. Install mixed air temperature sensor (MAT) into blower slide plate. Open blower access door. Locate 1/4-in. hole in blower side plate. (See Fig. 12.) On size 03-14 units, the hole is located opposite the drive end. On size 16 units, the hole is in the drive end of the closest blower to the access panel. Insert MAT into hole until the spring clips catch. The MAT is self secured by the spring clips. Locate black leads with insulated 1/4-in. quick connects in wire harness located on the left hand side of blower compartment. These two wires are labeled SAT. Connect the two wires to the 1/4-in. insulated quick connects on the sensor. These are non-polar connections. Dress wires to ensure that loose wires do not get drawn into the blower. Close blower access panel.

Table 3—CO₂ Sensor Standard Settings

SETTING	EQUIPMENT	OUTPUT	VENTILATION RATE (cfm/Person)	ANALOG OUTPUT	CO ₂ CONTROL RANGE (ppm)	OPTIONAL RELAY SETPOINT (ppm)	RELAY HYSTERESIS (ppm)
1	Interface with Standard Building Control System	Proportional	Any	4-20 mA	0-2000	1000	50
2		Proportional	Any	7-20 mA	0-2000	1000	50
3		Exponential	Any	4-20 mA	0-2000	1100	50
4	EconoMiSer IV	Proportional	15	4-20 mA	0-1100	1100	50
5		Proportional	20	4-20 mA	0- 900	900	50
6		Exponential	15	4-20 mA	0-1100	1100	50
7		Exponential	20	4-20 mA	0- 900	900	50
8	Health & Safety	Proportional	—	4-20 mA	0-9999	5000	500
9	Parking/Air Intakes/ Loading Docks	Proportional	—	4-20 mA	0-2000	700	50

LEGEND

ppm – Parts Per Million

NOTE: Check that the transformer(s) are sized properly. If a common transformer is used, make sure that polarity is observed on the secondary. This means connect all No. 1 wires to one leg of the transformer and all No. 2 wires to the other leg of the transformer.

NOTE: If multiple transformers are used with one control signal, make sure all No. 1 wires are tied together and tied to control signal negative (-).

NOTE: Controllers and actuators must have separate 24 vac/vdc power sources.

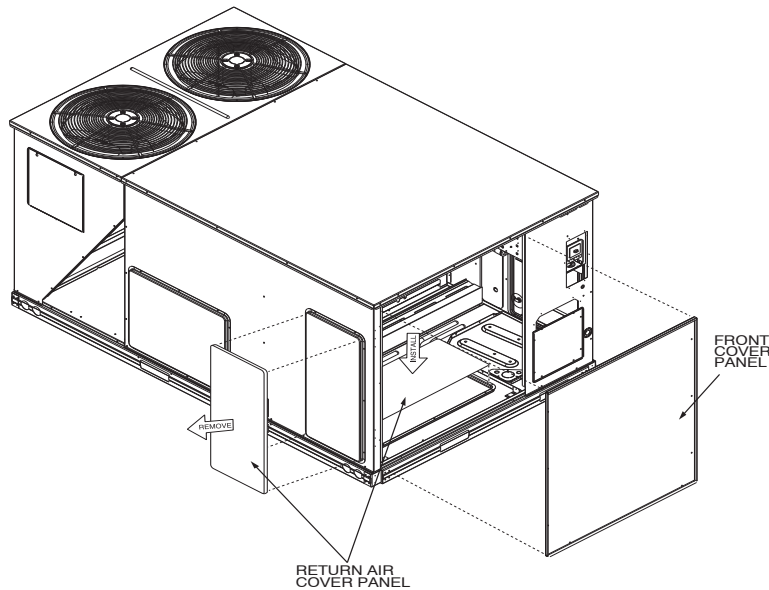


Fig. 13 – Horizontal Return Conversion

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48/50PG03-16

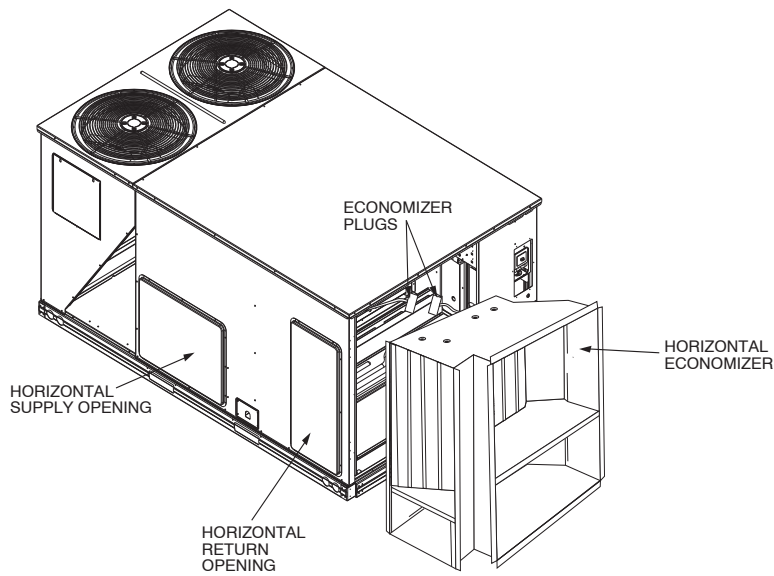


Fig. 14 – Horizontal Economizer Assembly

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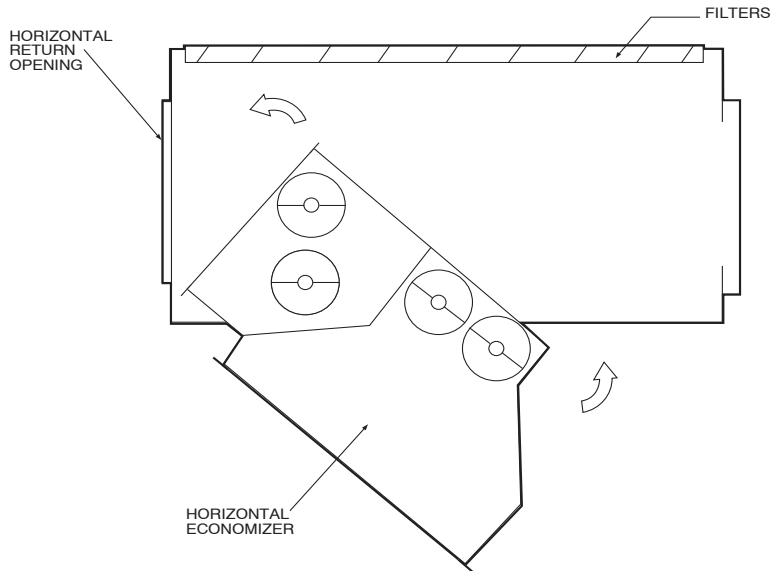


Fig. 15 – Horizontal Economizer Installation (Top View)

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17. Power can now safely be restored to the unit.
18. The control can now be configured to operate the EconoMiSer IV. See Configuration section for more information.
19. Install the accessory mist eliminating filters (if purchased) into the outdoor air inlet hood.
20. Inspect the unit to make sure all panels are properly replaced and secured to the unit.

21. The unit is now ready for normal operation using the EconoMiSer IV.

CO₂ Sensor Configuration

The CO₂ sensor has preset standard voltage settings that can be selected anytime after the sensor is powered up. (See Table 3.)

EconoMiSer IV Performance

The EconoMiSer IV pressure drops are shown in Fig. 18-23.

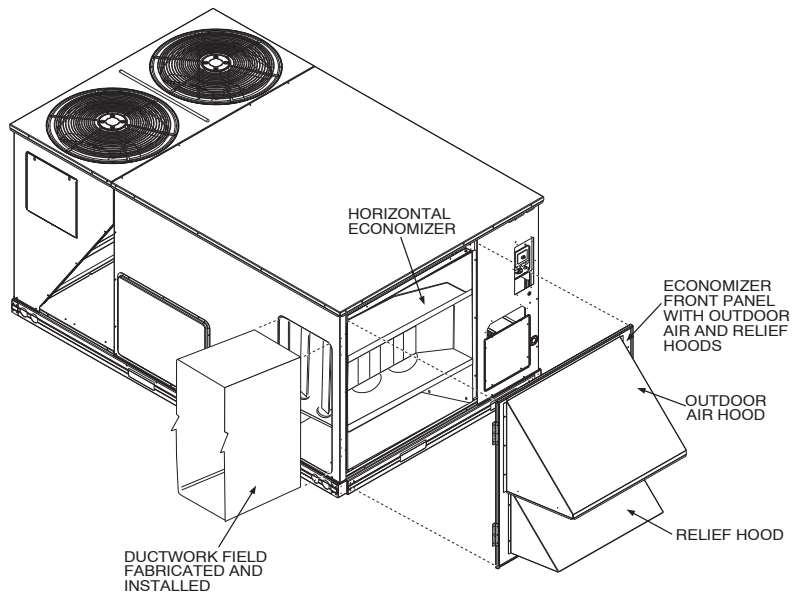


Fig. 16 – Installing Front Panel on Horizontal Economizer (08-14 Shown)

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48/50PG03-16

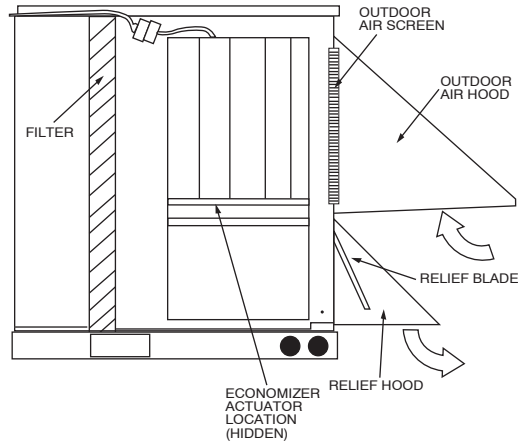
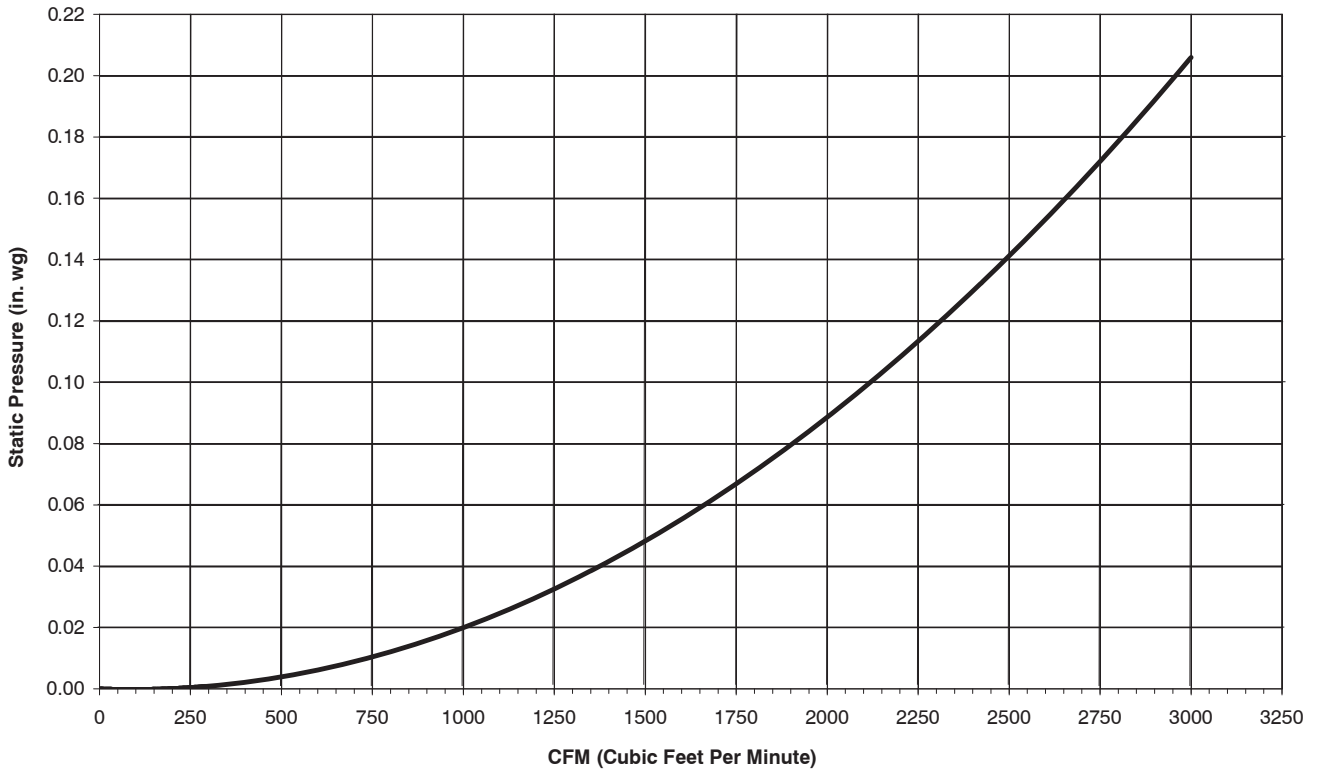


Fig. 17 – Horizontal Economizer Installed in Unit

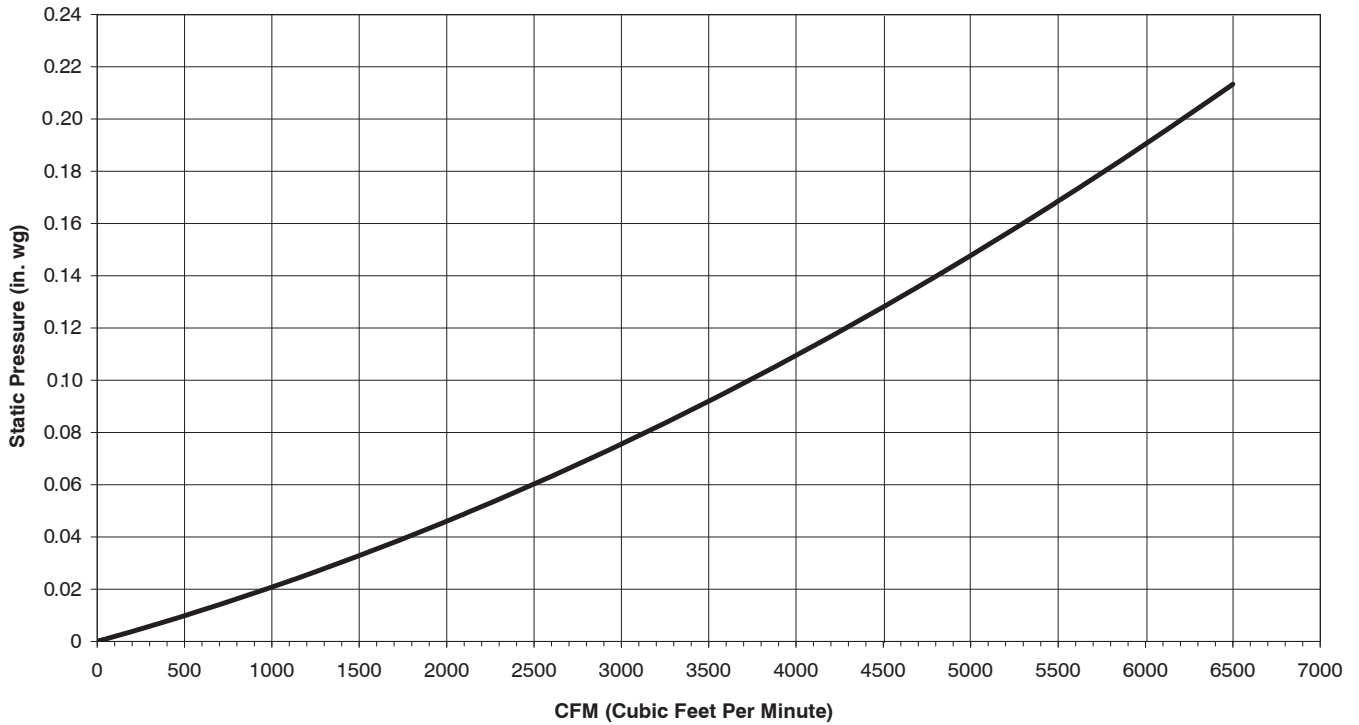
C06175



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

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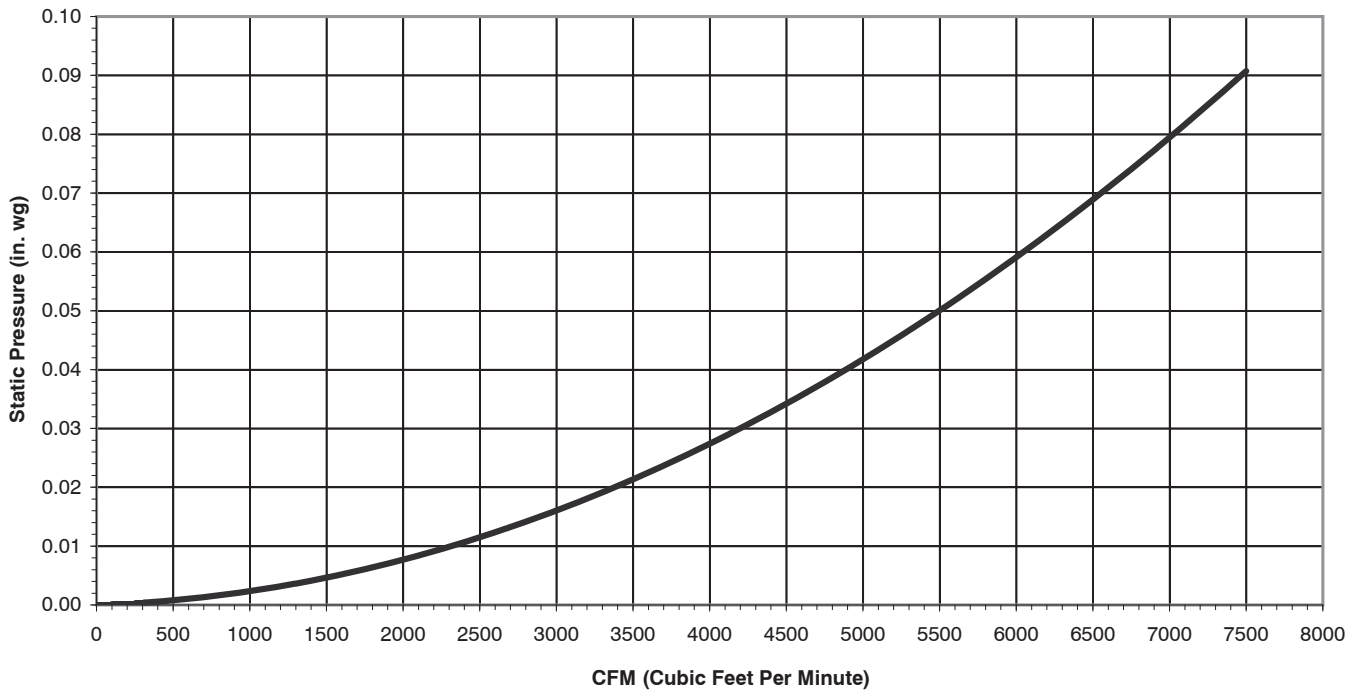
Fig. 18 – Pressure Drop for Vertical Economizer (48/50PG03-07)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

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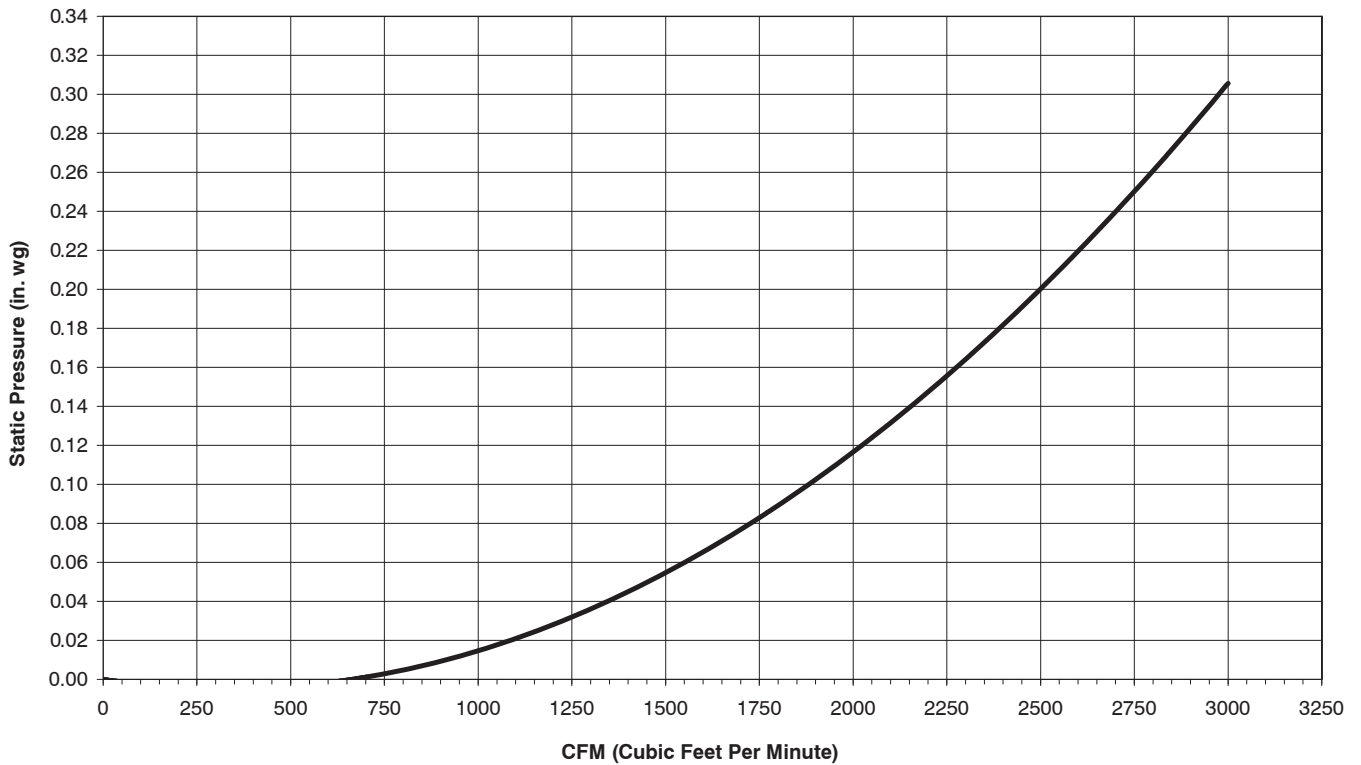
Fig. 19 – Pressure Drop for Vertical Economizer (48/50PG08-14)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

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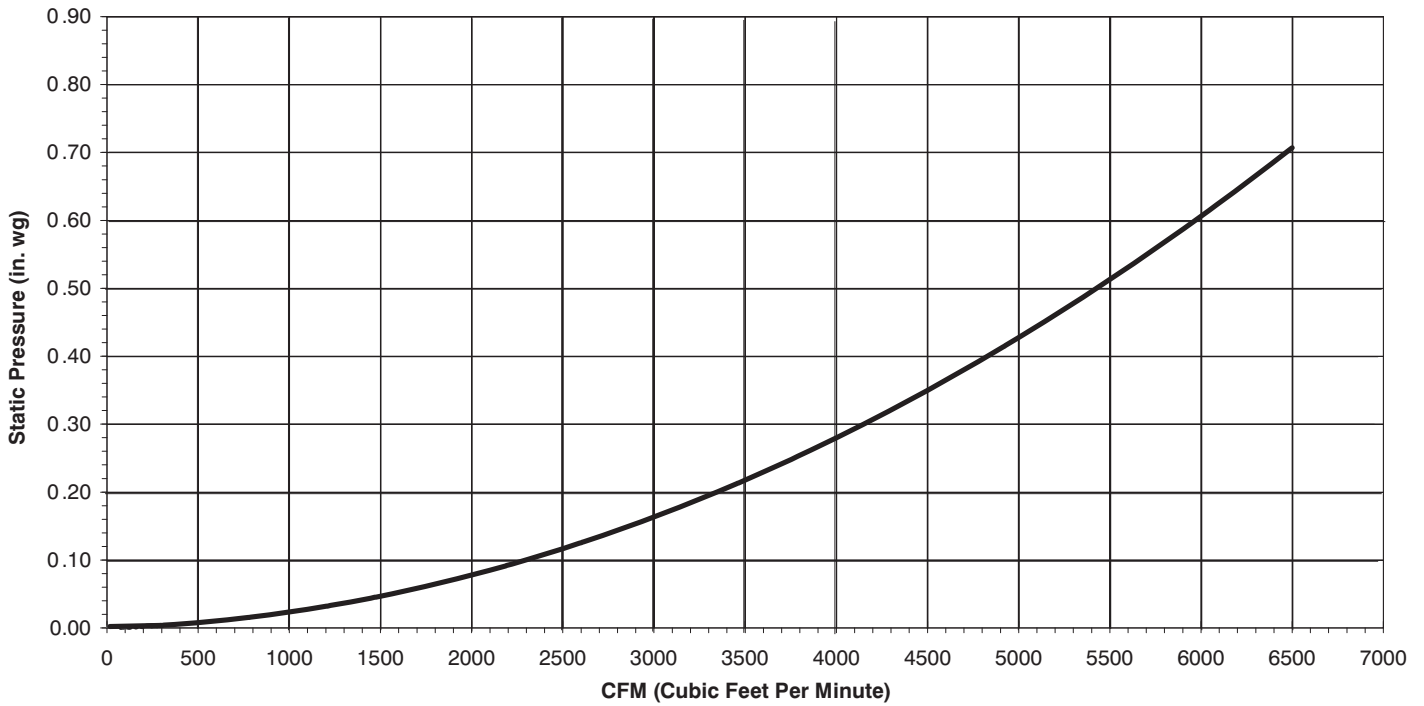
Fig. 20 – Pressure Drop for Vertical Economizer (48/50PG16)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

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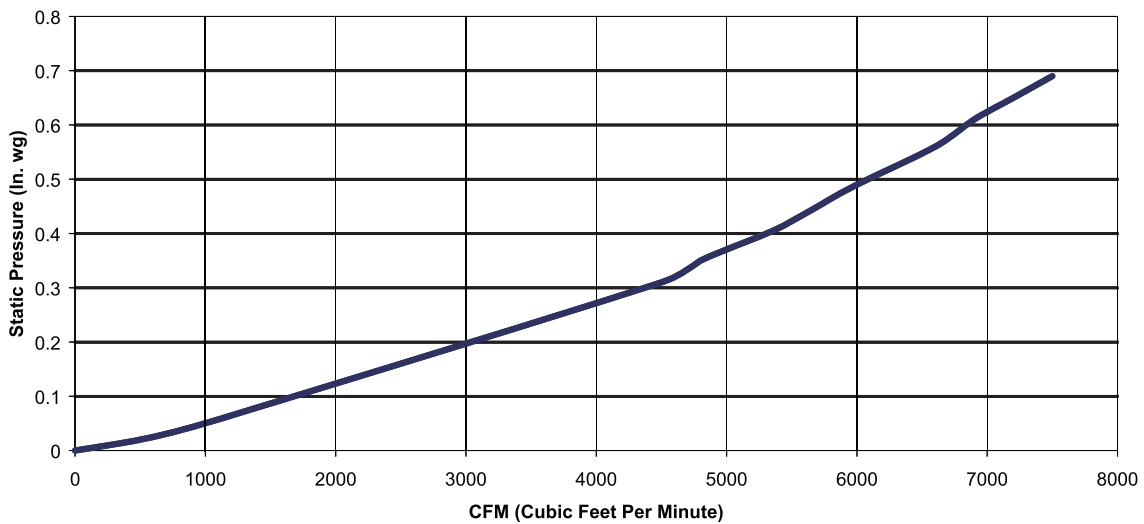
Fig. 21 – Pressure Drop for Horizontal Economizer (48/50PG03-07)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

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Fig. 22 – Pressure Drop for Horizontal Economizer (48/50PG08-14)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

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Fig. 23 – Pressure Drop for Horizontal Economizer (48/50PG16)

CONFIGURATION

EconoMiSer IV Standard Sensors

Outdoor-Air Temperature (OAT) Sensor

The outdoor-air temperature sensor is a 10 to 20 mA device used to measure the outdoor-air temperature. The outdoor-air temperature is used to determine when the EconoMiSer IV can be used for free cooling. The sensor is factory-installed on the EconoMiSer IV in the outdoor airstream. The operating range of temperature measurement is 40° to 100°F.

Mixed-Air Temperature (MAT) Sensor

The mixed-air temperature sensor is a 3 K thermistor located at the discharge of the indoor fan. The sensor is mounted through the side plate of the blower. The sensor is a probe and has blue leads. The sensor is field-installed. The operating range of temperature measurement is 0° to 158°F.

Outdoor Air Temperature Lockout Switch

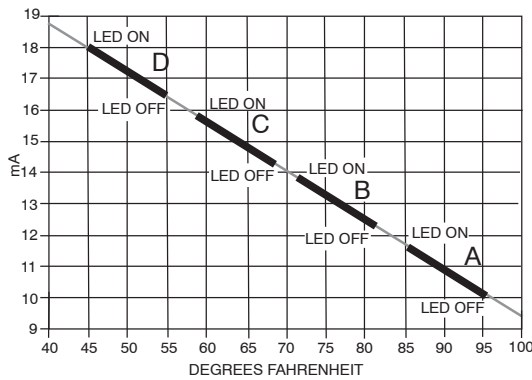
The EconoMiSer IV is equipped with a temperature limit switch located in the outdoor airstream which is used to lock out the compressors below a 50°F ambient temperature.

EconoMi\$er IV Controller Wiring and Operational Modes

Determine the EconoMi\$er IV control mode before installing sensors and accessories. Different sensors are required for different control modes, and a number of accessories are available. Refer to Table 2. The EconoMi\$er IV is supplied from the factory with a mixed air temperature sensor and an outdoor air temperature sensor. This allows for operation of the EconoMi\$er IV with outdoor air dry bulb changeover control. Additional accessories can be added to allow for different types of changeover control and operation of the EconoMi\$er IV and unit. See Fig. 4 for wiring.

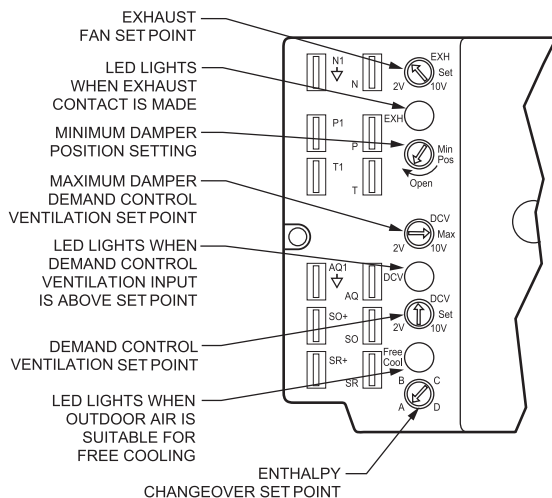
Outdoor Dry Bulb Changeover

The standard controller is shipped from the factory configured for outdoor dry bulb changeover control. The outdoor-air and mixed-air temperature sensors are included as standard. For this control mode, the outdoor temperature is compared to an adjustable set point selected on the control. If the outdoor-air temperature is above the set point, the EconoMi\$er IV will adjust the outdoor-air dampers to minimum position. If the outdoor-air temperature is below the set point, the position of the outdoor-air dampers will be controlled to provide free cooling using outdoor air. When in this mode, the LED next to the free cooling set point potentiometer will be on. The changeover temperature set point is controlled by the free cooling set point potentiometer located on the control. The scale on the potentiometer is A, B, C, and D. See Fig. 24 for the corresponding temperature changeover values.



C06035

Fig. 24 – Temperature Changeover Set Points



C06034

Fig. 25 – EconoMi\$er IV Controller Potentiometer and LED Locations

Differential Dry Bulb Changeover

For differential dry bulb control the standard outdoor dry bulb sensor is used in conjunction with an additional accessory dry bulb sensor (part number CRTEMPN002A00). The accessory sensor must be mounted in the return airstream. Connect the return air temperature sensor to the S_R terminal (after removing the 620-ohm resistor) and to the + terminal on the controller. (See Fig. 4.)

In this mode of operation, the outdoor-air temperature is compared to the return-air temperature and the lower temperature airstream is used for cooling. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting. (See Fig. 25.)

Outdoor Enthalpy Changeover

For enthalpy control, accessory enthalpy sensor (part number HH57AC078) is required. Replace the standard outdoor dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. 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\$er IV controller. The set points are A, B, C, and D. (See Fig. 26.) The factory-installed 620-ohm jumper must be in place across terminals S_R and + on the EconoMi\$er IV controller. (See Fig. 4.)

Differential Enthalpy Control

For differential enthalpy control, the EconoMi\$er IV controller uses two enthalpy sensors: HH57AC078 in the outdoor air and accessory return air CRENTDIF004A00 in the return air duct. The EconoMi\$er IV controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi\$er IV 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, the EconoMi\$er IV opens to bring in outdoor air for free cooling.

Replace the standard outside air dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. Mount the return air enthalpy sensor in the return air duct. The return air enthalpy sensor is wired to terminals S_R and + on the EconoMi\$er IV controller. (See Fig. 4.) The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi\$er IV controller. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting.

Indoor Air Quality (IAQ) Sensor Input

The IAQ input can be used for demand control ventilation control based on the level of CO_2 measured in the space or return air duct. Mount the accessory IAQ sensor according to manufacturer specifications. The IAQ sensor is wired to the AQ and AQ1 terminals of the controller. Adjust the DCV (demand controlled ventilation) potentiometers to correspond to the DCV voltage output of the indoor air quality sensor at the user-determined set point. (See Fig. 25.)

If a separate field-supplied transformer is used to power the IAQ sensor, the sensor must not be grounded or the EconoMi\$er IV control board will be damaged.

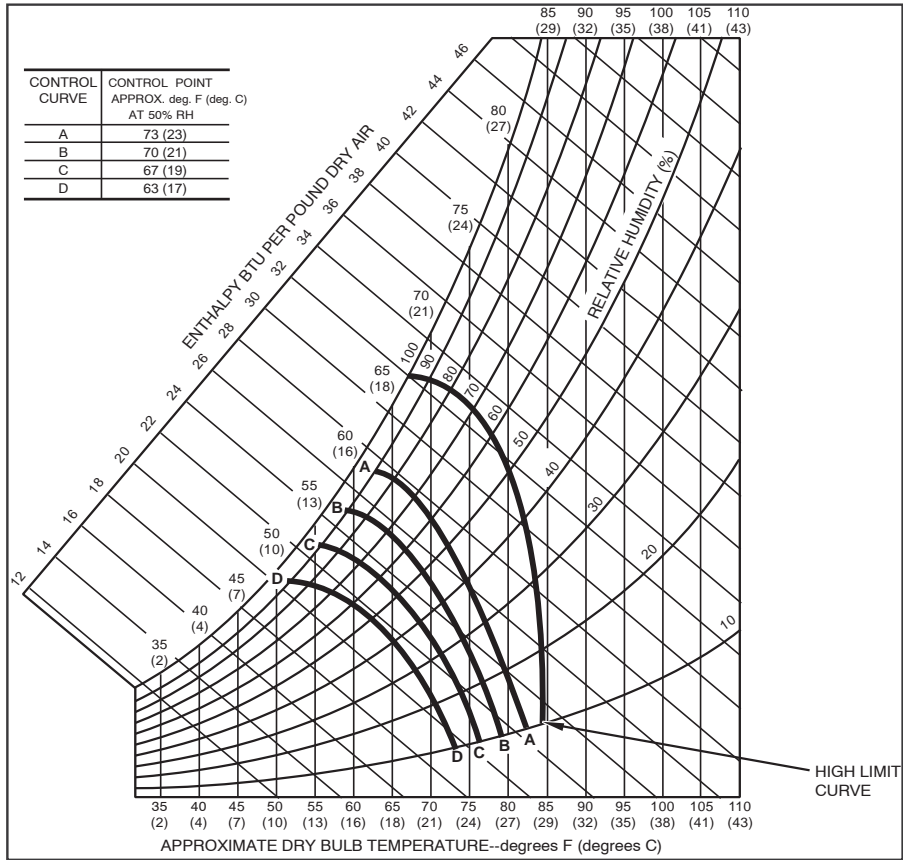


Fig. 26 – Enthalpy Changeover Set Points

C06037

Power Exhaust

If an accessory power exhaust is to be installed, see the accessory power exhaust installation instructions included with the power exhaust for installation and wiring. The wiring plug on the power exhaust is connected to wiring harness plug PL2.

Exhaust Set Point Adjustment

The exhaust set point will determine when the exhaust fan runs based on damper position (if accessory power exhaust is installed). The set point is modified with the Exhaust Fan Set Point (EXH SET) potentiometer. The set point represents the damper position above which the exhaust fans will be turned on. When there is a call for exhaust, the EconoMi\$er IV controller provides a 45 ± 15 second delay before exhaust fan activation to allow the dampers to open. This delay allows the damper to reach the appropriate position to avoid unnecessary fan overload.

Minimum Position Control

There is a minimum damper position potentiometer on the EconoMi\$er IV controller. (See Fig. 25.) The minimum damper position maintains the minimum airflow into the building during the occupied period.

When using demand controlled ventilation, the minimum damper position represents the minimum ventilation position for VOC (volatile organic compounds) ventilation requirements. The maximum demand ventilation position is used for fully occupied ventilation.

When demand controlled ventilation is not being used, the minimum position potentiometer should be used to set the occupied ventilation position. The maximum demand ventilation position should be turned fully clockwise.

Adjust the minimum position potentiometer to allow the minimum amount of outdoor air, as required by local codes, to enter the building. Make minimum position adjustments with at least 10°F temperature difference between the outdoor and return-air temperatures.

To determine the minimum position setting, perform the following procedure:

1. Calculate the appropriate mixed-air temperature using the following formula:

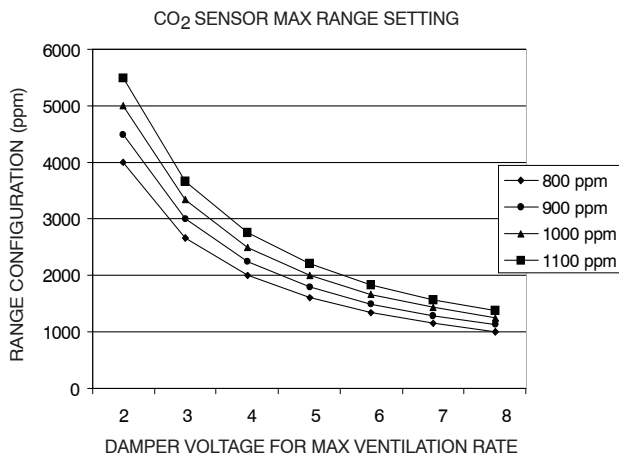
$$(T_O \times \frac{OA}{100}) + (T_R \times \frac{RA}{100}) = T_M$$

- T_O = Outdoor-Air Temperature
- OA = Percent of Outdoor Air
- T_R = Return-Air Temperature
- RA = Percent of Return Air
- T_M = Mixed-Air Temperature

As an example, if local codes require 10% outdoor air during occupied conditions, outdoor-air temperature is 60°F, and return-air temperature is 75°F.

$$(60 \times .10) + (75 \times .90) = 73.5 \text{ F}$$

2. Disconnect the mixed-air sensor from terminals T and T1.



C06039

Fig. 27 – CO₂ Sensor Maximum Range Setting

3. Ensure that the factory-installed jumper is in place across terminals P and P1. If remote damper positioning is being used, make sure that the terminals are wired according to Fig. 4 and that the minimum position potentiometer is turned fully clockwise.
4. Connect 24 vac across terminals TR and TR1.
5. Carefully adjust the minimum position potentiometer until the measured mixed-air temperature matches the calculated value.
6. Reconnect the mixed-air sensor to terminals T and T1.

Remote control of the EconoMi\$er IV damper is desirable when requiring additional temporary ventilation. If a field-supplied remote potentiometer (Honeywell part number S963B1128) is wired to the EconoMi\$er IV controller, the minimum position of the damper can be controlled from a remote location.

To control the minimum damper position remotely, remove the factory-installed jumper on the P and P1 terminals on the EconoMi\$er IV controller. Wire the field-supplied potentiometer to the P and P1 terminals on the EconoMi\$er IV controller. (See Fig. 4.)

Damper Movement

When the EconoMi\$er IV board receives initial power, it can take the damper up to 2¹/₂ minutes before it begins to position itself. After the initial positioning, subsequent changes to damper position will take up to 30 seconds to initiate. Damper movement from full open to full closed (or vice versa) takes 2¹/₂ minutes.

Thermostats

The EconoMi\$er IV control works with conventional thermostats that have a Y1 (cool stage 1), Y2 (cool stage 2), W1 (heat stage 1), W2 (heat stage 2), and G (fan). The EconoMi\$er IV control does not support space temperature sensors. Connections are made at the thermostat terminal connection board located in the main control box.

Occupancy Control

EconoMi\$er IV control has an Occupied mode and an Unoccupied mode. (See Table 4.) The operating mode is dictated by the presence (or absence) or a 24-v signal at terminal N on the controller module. For units built before date code 1407, the factory default condition was Unoccupied. To place the control in Occupied mode, install the factory-provided RED jumper (taped to the control box front cover) to TB1 terminals 6 and 7, or connect a timeclock or external switch that provides a CLOSED contact set for Occupied mode operation to TB1 terminals 6 and 7.

On units built after date code 1407, the factory default condition is Occupied. A RED jumper is installed on the rear side of terminal block TB1 at terminals 6 and 7. To convert this unit to remote occupancy control, reach behind TB1 and remove the RED jumper. Connect a timeclock or external switch that provides a CLOSED contact set for Occupied mode operation to TB1 terminals 6 and 7.

Demand Controlled Ventilation (DCV)

When using the EconoMi\$er IV for demand control ventilation, there are some equipment selection criteria which should be considered. When selecting the heat capacity and cool capacity of the equipment, the maximum ventilation rate must be evaluated for design conditions. The maximum damper position must be calculated to provide the desired fresh air.

Typically the maximum ventilation rate will be about 5 to 10% more than the typical cfm required per person, using normal outside air design criteria.

A proportional anticipatory strategy should be taken with the following conditions: a zone with a large area, varied occupancy, and equipment that cannot exceed the required ventilation rate at design conditions. Exceeding the required ventilation rate means the equipment can condition air at a maximum ventilation rate that is greater than the required ventilation rate for maximum occupancy. A proportional-anticipatory strategy will cause the fresh air supplied to increase as the room CO₂ level increases even though the CO₂ set point has not been reached. By the time the CO₂ level reaches the set point, the damper will be at maximum ventilation and should maintain the set point.

In order to have the CO₂ sensor control the economizer damper in this manner, first determine the damper voltage output for minimum or base ventilation. Base ventilation is the ventilation required to remove contaminants during unoccupied periods. The following equation may be used to determine the percent of outside air entering the building for a given damper position. For best results there should be at least a 10 degree difference in outside and return-air temperatures.

$$(T_{Ox} \frac{OA}{100}) + (T_{Rx} \frac{RA}{100}) = T_M$$

T_O = Outdoor-Air Temperature

OA = Percent of Outdoor Air

T_R = Return-Air Temperature

RA = Percent of Return Air

T_M = Mixed-Air Temperature

Once base ventilation has been determined, set the minimum damper position potentiometer to the correct position.

The same equation can be used to determine the occupied or maximum ventilation rate to the building. For example, an output of 3.6 volts to the actuator provides a base ventilation rate of 5% and an output of 6.7 volts provides the maximum ventilation rate of 20% (or base plus 15 cfm per person). Use Fig. 26 to determine the maximum setting of the CO₂ sensor. For example, a 1100 ppm set point relates to a 15 cfm per person design. Use the 1100 ppm curve on Fig. 26 to find the point when the CO₂ sensor output will be 6.7 volts. Line up the point on the graph with the left side of the chart to determine that the range configuration for the CO₂ sensor should be 1800 ppm. The EconoMi\$er IV controller will output the 6.7 volts from the CO₂ sensor to the actuator when the CO₂ concentration in the space is at 1100 ppm. The DCV set point may be left at 2 volts since the CO₂ sensor voltage will be ignored by the EconoMi\$er IV controller until it rises above the 3.6 volt setting of the minimum position potentiometer.

Once the fully occupied damper position has been determined, set the maximum damper demand control ventilation potentiometer to this position. Do not set to the maximum position as this can result in over-ventilation to the space and potential high humidity levels.

CO₂ Sensor Configuration

The CO₂ sensor has preset standard voltage settings that can be selected anytime after the sensor is powered up. (See Table 3.)

Use setting 1 or 2 for Carrier equipment.

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.
3. Use the Up/Down button to select the preset number. (See Table 3.)
4. Press Enter to lock in the selection.
5. Press Mode to exit and resume normal operation.

The custom settings of the CO₂ sensor can be changed anytime after the sensor is energized. Follow the steps below to change the non-standard settings:

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.
3. Use the Up/Down button to toggle to the NONSTD menu and press Enter.
4. Use the Up/Down button to toggle through each of the nine variables, starting with Altitude, until the desired setting is reached.
5. Press Mode to move through the variables.
6. Press Enter to lock in the selection, then press Mode to continue to the next variable.

Dehumidification of Fresh Air With DCV (Demand Controlled Ventilation) Control

Information from ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) indicates that the largest humidity load on any zone is the fresh air introduced. For some applications, a device such as a 62AQ energy recovery unit is added to reduce the moisture content of the fresh air being brought into the building when the enthalpy is high. In most cases, the normal heating and cooling processes are more than adequate to remove the humidity loads for most commercial applications.

This makes the control of the dehumidification device simple when using the enthalpy or differential enthalpy sensor. The enthalpy sensor or differential enthalpy sensor is installed on the equipment to determine economizer operation. The high enthalpy signal from the enthalpy sensor or differential enthalpy sensor can be used to turn on the outdoor air moisture removal device any time fresh air is required for the space.

The energy recovery device should be sized for maximum latent and sensible conditioning at maximum ventilation on a design day. A calculation for leaving-air temperature on a low ambient, low ventilation day should also be done to determine the mixed-air temperature of the return and pre-conditioned outside air. The design should produce an air temperature somewhat near room conditions to prevent reheat of the air mixture. The energy recovery device should be interlocked with the heat to turn off the device when in the heat mode.

TROUBLESHOOTING

See Table 4 for EconoMi\$er IV logic.

EconoMi\$er IV Preparation

This procedure is used to prepare the EconoMi\$er IV for troubleshooting. No troubleshooting or testing is done by performing the following procedure.

NOTE: This procedure requires a 9-v battery, 1.2 kilo-ohm resistor, and a 5.6 kilo-ohm resistor which are not supplied with the EconoMi\$er IV.

IMPORTANT: Be sure to record the positions of all potentiometers before starting troubleshooting.

1. Disconnect power at TR and TR1. All LEDs should be off. Exhaust fan contacts should be open.
2. Disconnect device at P and P1.
3. Jumper P to P1.
4. Disconnect wires at T and T1. Place 5.6 kilo-ohm resistor across T and T1.
5. Jumper TR to 1.
6. Jumper TR to N.
7. If connected, remove sensor from terminals S_O and +. Connect 1.2 kilo-ohm 4074EJM checkout resistor across terminals S_O and +.
8. Put 620-ohm resistor across terminals S_R and +.
9. Set minimum position, DCV set point, and exhaust potentiometers fully CCW (counterclockwise).
10. Set DCV maximum position potentiometer fully CW (clockwise).
11. Set enthalpy potentiometer to D.
12. Apply power (24 vac) to terminals TR and TR1.

Differential Enthalpy

To check differential enthalpy:

1. Make sure EconoMi\$er IV preparation procedure has been performed.
2. Place 620-ohm resistor across S_O and +.
3. Place 1.2 kilo-ohm resistor across S_R and +. The Free Cool LED should be lit.
4. Remove 620-ohm resistor across S_O and +. The Free Cool LED should turn off.
5. Return EconoMi\$er IV settings and wiring to normal after completing troubleshooting.

Single Enthalpy

To check single enthalpy:

1. Make sure EconoMi\$er IV preparation procedure has been performed.
2. Set the enthalpy potentiometer to A (fully CCW). The Free Cool LED should be lit.
3. Set the enthalpy potentiometer to D (fully CW). The Free Cool LED should turn off.
4. Return EconoMi\$er IV settings and wiring to normal after completing troubleshooting.

DCV (Demand Controlled Ventilation) and Power Exhaust

To check DCV and Power Exhaust:

1. Make sure EconoMi\$er IV preparation procedure has been performed.
2. Ensure terminals AQ and AQ1 are open. The LED for both DCV and Exhaust should be off. The actuator should be fully closed.
3. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The LED for both DCV and Exhaust should turn on. The actuator should drive to between 90 and 95% open.
4. Turn the Exhaust potentiometer CW until the Exhaust LED turns off. The LED should turn off when the potentiometer is approximately 90%. The actuator should remain in position.

Table 4—EconoMi\$er IV Input/Output Logic

INPUTS					OUTPUTS				
Demand Control Ventilation (DCV)	Enthalpy*		Y1	Y2	Compressor		N Terminal†		
	Outdoor	Return			Stage 1	Stage 2	Occupied	Unoccupied	
			Damper						
Below set (DCV LED Off)	High (Free Cooling LED Off)	Low	On	On	On	On	Minimum position	Closed	
			On	Off	On	Off			
			Off	Off	Off	Off			
	Low (Free Cooling LED On)	High	On	On	On	Off	Modulating** (between min. position and full-open)	Modulating** (between closed and full-open)	
			On	Off	Off	Off			
			Off	Off	Off	Off	Minimum position	Closed	
Above set (DCV LED On)	High (Free Cooling LED Off)	Low	On	On	On	On	Modulating†† (between min. position and DCV maximum)	Modulating†† (between closed and DCV maximum)	
			On	Off	On	Off			
			Off	Off	Off	Off			
	Low (Free Cooling LED On)	High	On	On	On	Off	Modulating***	Modulating†††	
			On	Off	Off	Off			
			Off	Off	Off	Off			

*For single enthalpy control, the module compares outdoor enthalpy to the ABCD set point.

†Power at N terminal determines Occupied/Unoccupied setting: 24 vac (Occupied), no power (Unoccupied).

**Modulation is based on the supply-air sensor signal.

††Modulation is based on the DCV signal.

***Modulation is based on the greater of DCV and supply-air sensor signals, between minimum position and either maximum position (DCV) or fully open (supply-air signal).

†††Modulation is based on the greater of DCV and supply-air sensor signals, between closed and either maximum position (DCV) or fully open (supply-air signal).

- Turn the DCV set point potentiometer CW until the DCV LED turns off. The DCV LED should turn off when the potentiometer is approximately 9 v. The actuator should drive fully closed.
- Turn the DCV and Exhaust potentiometers CCW until the Exhaust LED turns on. The exhaust contacts will close 30 to 120 seconds after the Exhaust LED turns on.
- Return EconoMi\$er IV settings and wiring to normal after completing troubleshooting.

DCV Minimum and Maximum Position

To check the DCV minimum and maximum position:

- Make sure EconoMi\$er IV preparation procedure has been performed.
- Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The DCV LED should turn on. The actuator should drive to between 90 and 95% open.
- Turn the DCV Maximum Position potentiometer to midpoint. The actuator should drive to between 20 and 80% open.
- Turn the DCV Maximum Position potentiometer to fully CCW. The actuator should drive fully closed.
- Turn the Minimum Position potentiometer to midpoint. The actuator should drive to between 20 and 80% open.
- Turn the Minimum Position Potentiometer fully CW. The actuator should drive fully open.
- Remove the jumper from TR and N. The actuator should drive fully closed.
- Return EconoMi\$er IV settings and wiring to normal after completing troubleshooting.

Mixed Air Input

To check mixed air input:

- Make sure EconoMi\$er IV preparation procedure has been performed.
- Set the Enthalpy potentiometer to A. The Free Cool LED turns on. The actuator should drive to between 20 and 80% open.
- Remove the 5.6 kilo-ohm resistor and jumper T to T1. The actuator should drive fully open.
- Remove the jumper across T and T1. The actuator should drive fully closed.
- Return EconoMi\$er IV settings and wiring to normal after completing troubleshooting.

EconoMi\$er IV Troubleshooting Completion

This procedure is used to return the EconoMi\$er IV to operation. No troubleshooting or testing is done by performing the following procedure.

- Disconnect power at TR and TR1.
- Set enthalpy potentiometer to previous setting.
- Set DCV maximum position potentiometer to previous setting.
- Set minimum position, DCV set point, and exhaust potentiometers to previous settings.
- Remove 620-ohm resistor from terminals S_R and +.
- Remove 1.2 kilo-ohm checkout resistor from terminals S_O and +. If used, reconnect sensor from terminals S_O and +.
- Remove jumper from TR to N.
- Remove jumper from TR to 1.
- Remove 5.6 kilo-ohm resistor from T and T1. Reconnect wires at T and T1.
- Remove jumper from P to P1. Reconnect device at P and P1.
- Apply power (24 vac) to terminals TR and TR1.

