

CRECOMZR077A00
CRECOMZR079A00
CRECOMZR081A00

Small Rooftop Products
3 to 12 1/2 Tons
Horizontal EconoMi\$er X Accessory

Installation Instructions

Read these instructions completely before attempting to install the Horizontal EconoMi\$er X Accessory.

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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. 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.

WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury or death.

Before performing service or maintenance operations on the unit, always turn off main power switch(es) to unit and install lockout tag(s). Unit may have more than one power switch.

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, safety glasses and gloves when handling parts and servicing roof top units.

GENERAL

The EconoMi\$er X system utilizes the latest technology available for integrating the use of free cooling with mechanical cooling for packaged rooftop units. The solid-state control system optimizes energy consumption, zone comfort, and equipment cycling by operating the compressors when the outdoor-air temperature is too warm, integrating the compressor with outdoor air when free cooling is available, and locking out the compressor when outdoor-air temperature is too cold. Demand control ventilation is supported.

Units displaying 17th position of the model number to indicate that the unit is equipped with the factory-installed VFD (Variable Frequency Drive) option for 2-speed indoor fan control. The VFD option is required for units equipped with EconoMi\$er X. For detailed information on the VFD see the Variable Frequency Drive (VFD) Installation, Setup and Troubleshooting Supplement.

The EconoMi\$er X system utilizes gear-drive technology with a direct-mount spring return actuator that will close upon loss of power. The EconoMi\$er X system comes standard with an outdoor air temperature sensor, supply air temperature sensor, and low temperature compressor lockout switch. Outdoor enthalpy, indoor enthalpy, and CO2 sensors are available for field installation. See Table 3 for sensor usage.

Standard barometric relief dampers provide natural building pressurization control. An optional power exhaust system is available for applications requiring even greater exhaust capabilities. The power exhaust set point is adjustable at the EconoMi\$er X controller.

See Table 1 for package usage. See Table 2 for package contents. See Table 3 for sensor usage and table for accessories.

Table 1 - Package Usage

UNIT SIZE	PART NUMBER
Small Cabinet, Footprint Size: 46 3/4" x 74 3/8"	CRECOMZR077A00
Large Cabinet, Footprint Size: 58 1/2" x 88 1/8"	CRECOMZR079A00
Extra-large Cabinet, Footprint Size: 63 3/8" x 115 7/8"	CRECOMZR081A00

Table 2 - Package Contents

PACKAGE NO.	QTY	CONTENTS
CRECOMZR077A00	1	Hood Assembly
	1	Filter Access Door
	1	Aluminum Filter
	18	Screws
	1	EconoMi\$er X Assembly
	1	Front Blank Off Panel
CRECOMZR079A00	1	Supply Air Temperature Sensor
	1	Hood Assembly
	1	Filter Access Door
	1	Aluminum Filter
	18	Screws
	1	EconoMi\$er X Assembly
CRECOMZR081A00	1	Supply Air Temperature Sensor
	1	Supply Air Temperature Sensor
	1	Front Blank Off Panel
	1	Horizontal Blank Off Panel
	1	Hardware Bag
	1	EconoMi\$er X Assembly

Table 3 - EconoMi\$er X Sensor Usage

APPLICATION	ECONOMI\$ER X WITH OUTDOOR AIR DRY BULB SENSOR		
	Accessories Required		
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is factory installed		
Single Enthalpy	HH57AC081		
Differential Enthalpy	HH57AC081		
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 CGCDXASP00100**	RCO	CRCBDIOX005A00††

†33ZCSENCO2 and CGCDXSEN004A00 are accessory CO2 sensors.
 **33ZCASPCO2 and CGCDXASP00100 are accessory aspirator boxes required for duct-mounted applications.
 ††CRCBDIOX005A00 is an accessory that contains both 33ZCSENCO2 and 33ZCASPCO2 accessories.

ACCESSORIES LIST

The EconoMi\$er X has several field-installed accessories available to optimize performance. Refer to Table 4 for authorized parts and power exhaust descriptions

Table 4 - EconoMi\$er X Field-Installed Accessories

DESCRIPTION	PART NUMBER
Small & Large Cabinet Power Exhaust 208-230 v 1 Ph	CRPWREXH028A01
Small & Large Cabinet Power Exhaust 460 v 3Ph	CRPWREXH029A01
Extra Large Cabinet Power Exhaust 208-230 v 1Ph	CRPWREXH082A00
Extra Large Cabinet Power Exhaust 460 v 3Ph	CRPWREXH083A00
Enthalpy Sensor	HH57AC081
CO ₂ Sensor and Aspirator Box	CRCBDIOX005A00
Return Air CO ₂ Sensor (4 to 20 mA)	CRCBDIOX002A00
CO ₂ Room Sensor (4 to 20 mA)	33ZCSENCO2 or CGCDXSEN004A00
Aspirator Box for Duct Mount CO ₂ Sensor (4 to 20 mA)	33ZCASPCO2 or CGCDXASP001A00

INSTALLATION

⚠ WARNING

ELECTRICAL SHOCK HAZARD
 Failure to follow this warning could result in personal injury and/or death.
 Disconnect power supply and install lockout tag before attempting to install accessory.

- Turn off unit power supply(s) and install lockout tag.
- Remove the existing unit filter access panel. Raise the panel and swing the bottom outward. The panel is now disengaged from the track and can be removed and discarded. (See Fig. 2.)
 NOTE: Unit with hinged panels will require a hinged door seal angle kit. Use part no. CRHNGPNL001A00 for small cabinet units. Use part no. CRHNGPNL002A00 for large cabinet units. Refer to the separate accessory installation instructions for details on installing the seal angle kit.
- Remove the indoor coil access panel and discard. (See Fig. 2.)
- The EconoMi\$er X hood assembly is shipped assembled. Aluminum filter must be installed on some models. See step 13.
- Set the EconoMi\$er X upright. (See Fig. 4.)
- If EconoMi\$er X will be operating under enthalpy control, replace the factory installed outdoor dry bulb temperature sensor with accessory enthalpy sensor HH57AC081. (See Fig. 1.)
- Insert the EconoMi\$er X assembly into the rooftop unit, positioning the EconoMi\$er X to the far left side of the opening. (See Fig. 5.)
- Slide the EconoMi\$er X all the way back into the unit until it locks into the horizontal opening of the HVAC (heating, ventilation and air conditioning) unit.
- Secure the EconoMi\$er X mounting flanges to the HVAC unit with the screws provided. (See Fig. 6.)
- Install a screw through the pre-punched hole in the EconoMi\$er X into the flange on the horizontal duct opening. (See Fig. 7.)
- Remove the tape securing the relief dampers in place.
- Remove and save the 12-pin jumper plug from the unit wiring harness (located in the upper left corner of the unit). Insert the EconoMi\$er X plug into the unit wiring harness. Refer to Fig. 14 for wiring diagram.

NOTE: The 12-pin jumper plug should be saved for future use, in the event that the EconoMi\$er X is removed from the unit. The jumper plug is not needed as long as the EconoMi\$er X is installed.

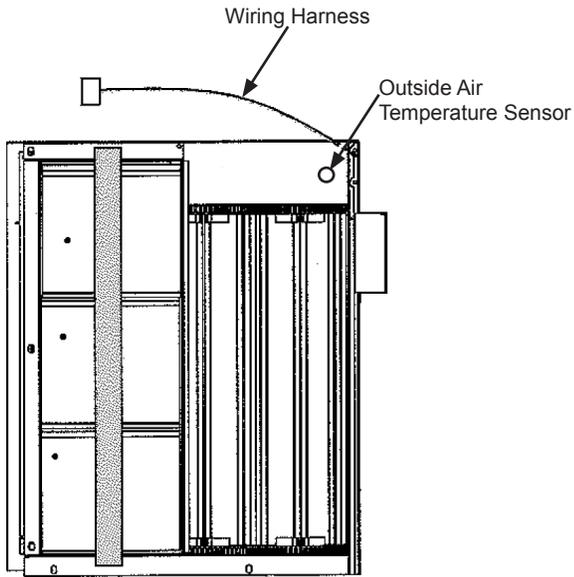


Fig. 1 - EconoMi\$er X Component Locations

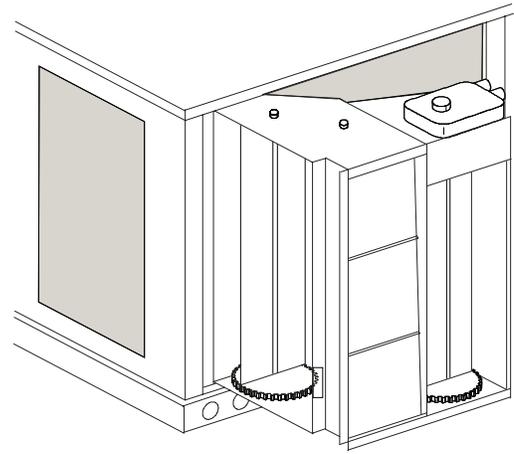


Fig. 4 - EconoMi\$er X Positioned for Installation in Unit

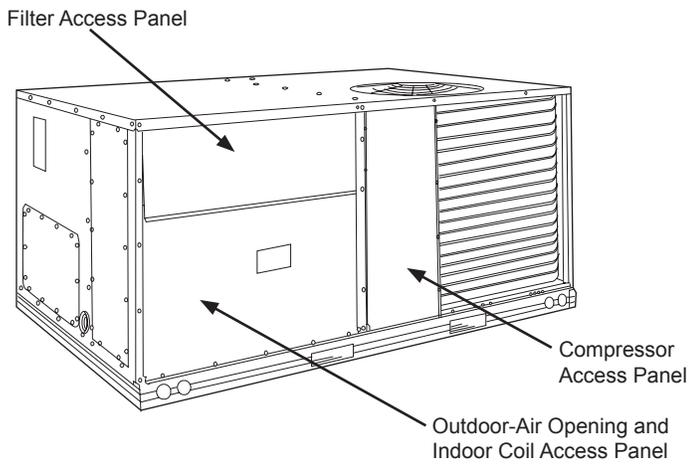


Fig. 2 - Typical Outdoor Air Section Access Panel Locations

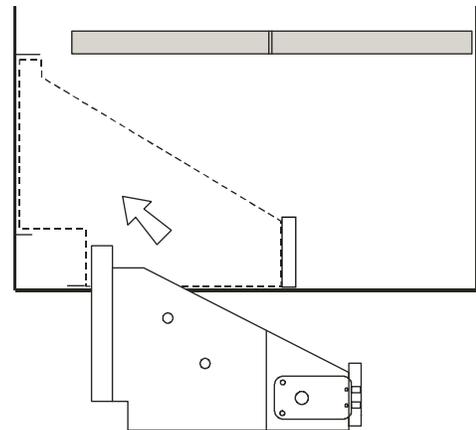
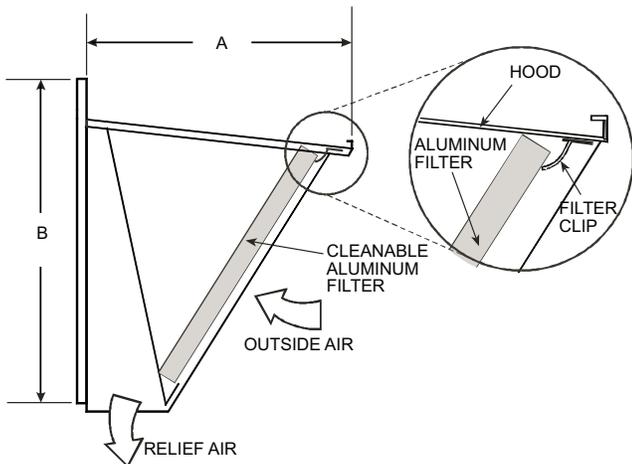


Fig. 5 - Top View of EconoMi\$er X Installation



ECONOMIZER P/N	A	B	SHIP WT.
CRECOMZR077A00	27.09"	29.19"	95 lb
CRECOMZR079A00	29.21"	37.25"	150 lb
CRECOMZR081A00	24.81"	53.36"	245lb

Fig. 3 - EconoMi\$er X Hood Detail

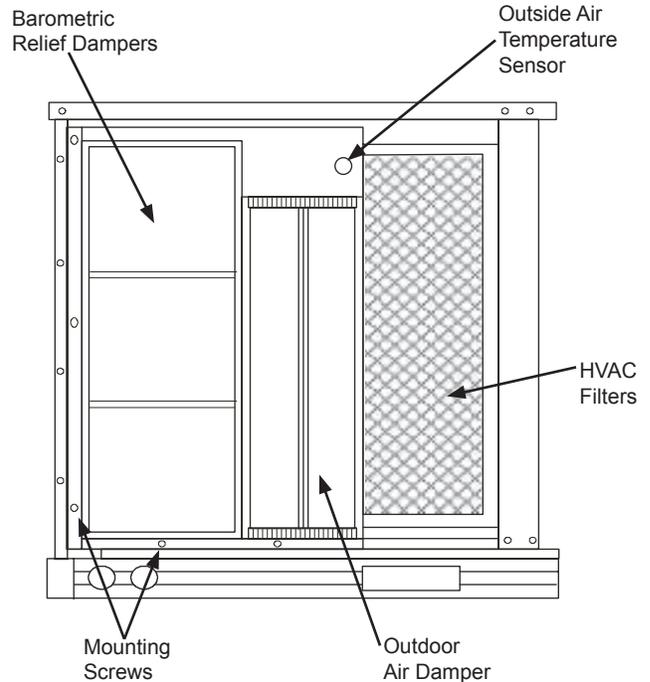


Fig. 6 - EconoMi\$er X Installed in Unit

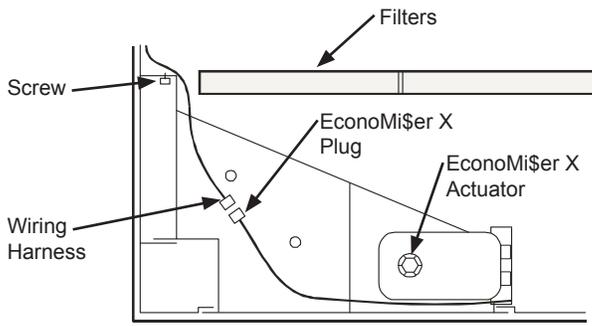


Fig. 7 - Top View of EconoMi\$er X Installed in Unit

13. Remove the indoor fan motor access panel. (See Fig. 9.)
14. The supply air temperature sensor looks like an eyelet terminal with wires running to it. The sensor is located on the “crimp end” and is sealed from moisture. Mount the supply air temperature sensor (provided) to the lower left section of the indoor fan blower housing. (See Fig. 10.) Use the screw provided and use existing hole. Connect the violet and pink wires to the corresponding connections on the supply air temperature sensor. (See Fig. 14.) Reinstall the indoor fan motor access panel.
15. While everything is open install and wire any other accessories and/or sensors as applicable and convenient, per their installation instructions and/or the Configuration section of this instruction. Some accessories require that unit ducting already be installed.
16. On some units the EconoMi\$er X and hood does not reach to the top of the unit. In this case a front blank-off panel must be installed. Install provided front blank-off panel above hood. Screw in place. (See Fig. 13.)

NOTE: The front blank-off panel must be installed before the hood because the top of the hood fits into a channel in the bottom of the panel.

17. Install the EconoMi\$er X hood over the EconoMi\$er X. Use screws provided. (See Fig. 11 and 13.) Insert screw through right side flange of hood into EconoMi\$er X flange.
18. On some units the return damper does not reach to the top of the horizontal return opening in the unit. In this case a horizontal blank-off must be installed. Install the horizontal blank-off at the top of the horizontal return opening. (See Fig. 12.) Screw in place thru pre-punched holes.
19. The W7220 EconoMi\$er X controller is shipped mounted to a bracket. Install the controller / bracket in the top left corner of the unit control box as shown in wiring diagram, Fig. 14. Screw in place through pre-punched holes.
20. Connect the plugs coming from the controller as shown in wiring diagram, Fig. 7, 8 and 14.
21. Adjust controller settings (minimum position, outside air, etc.) per instructions detailed later in this instruction.
22. Follow all local and other applicable codes.
23. Check all wiring for safety then reapply power to the unit. Verify correct operation and setting of the accessory(s) per the Configuration and Operations sections of the instruction.
24. Install access door next to hood. Screw bottom of door to HVAC unit. (See Fig. 11 and 13.) For the economizer for the extra large cabinet, install plastic inserts on right-hand vertical post and install long gasketed screws along the vertical edge. Use standard serrated screws along the bottom of the panel for all units.
25. Replace the indoor fan motor access panel.
26. Install the filter by opening the filter clips which are located underneath the hood top. Insert the aluminum filter into the bottom filter rack (hood divider). Push the filter into position past the open filter clips. Close the filter clips to lock the filter into place. (See Fig. 3.)

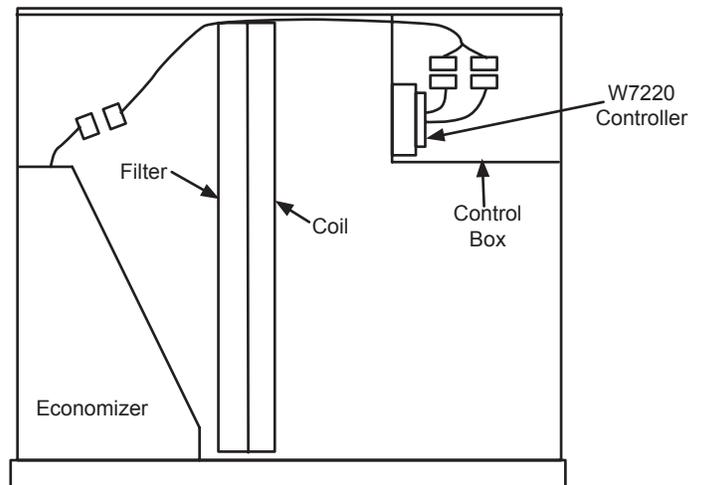


Fig. 8 - Harness Detail

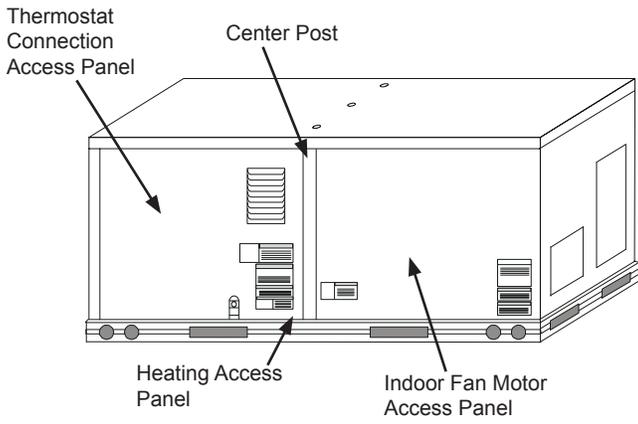


Fig. 9 - Typical Indoor Fan Motor Access Panel Locations

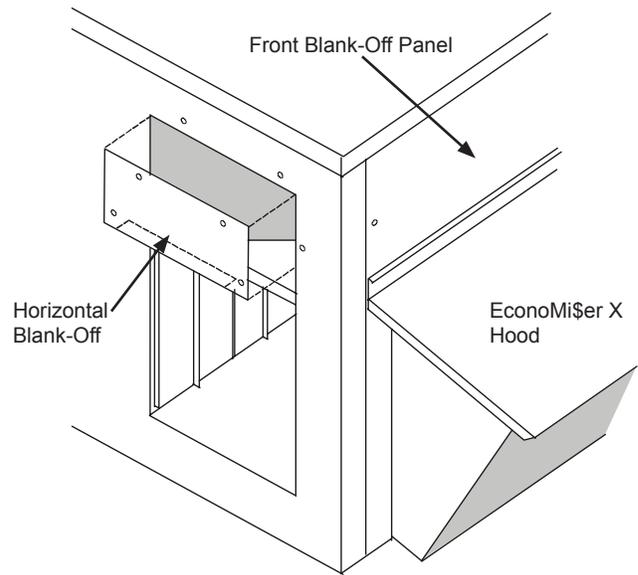


Fig. 12 - Horizontal Return Opening Blank-Off Panel

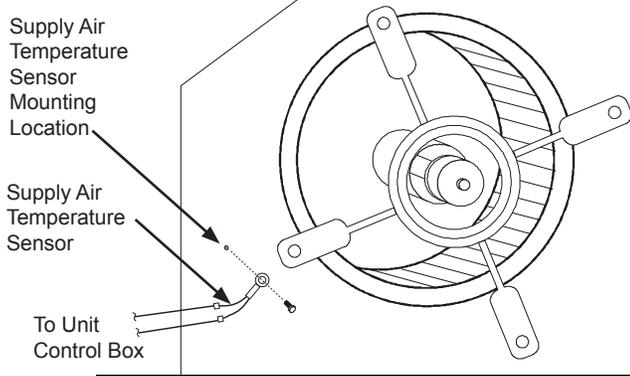


Fig. 10 - Mixed Air Sensor Placement

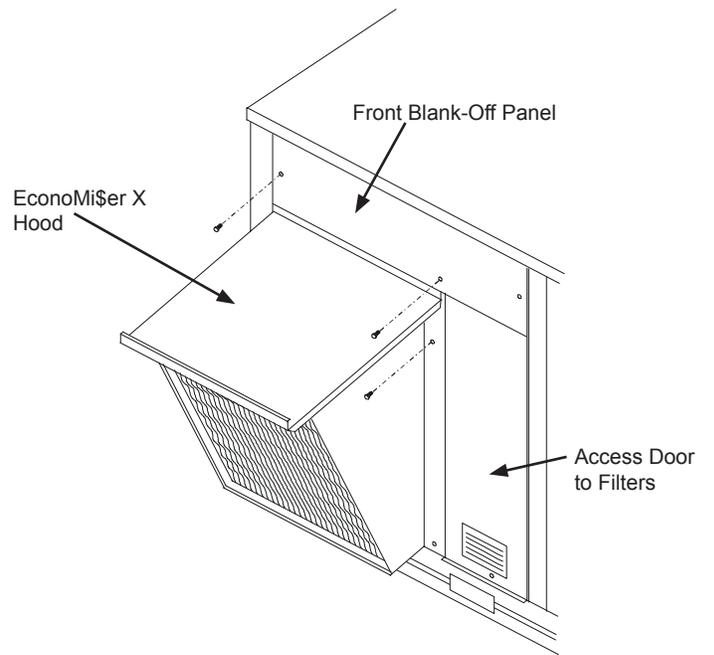


Fig. 13 - Front Blank-Off Panel Installation Panel

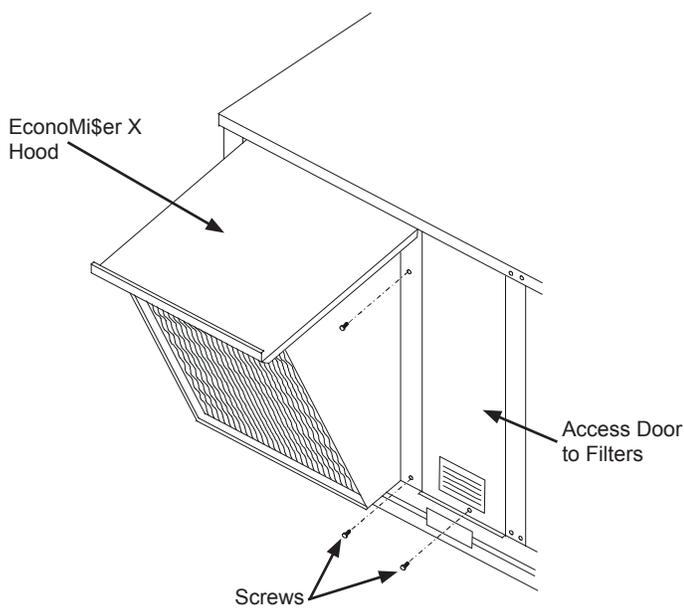


Fig. 11 - EconoMiSer2 Hood Installation

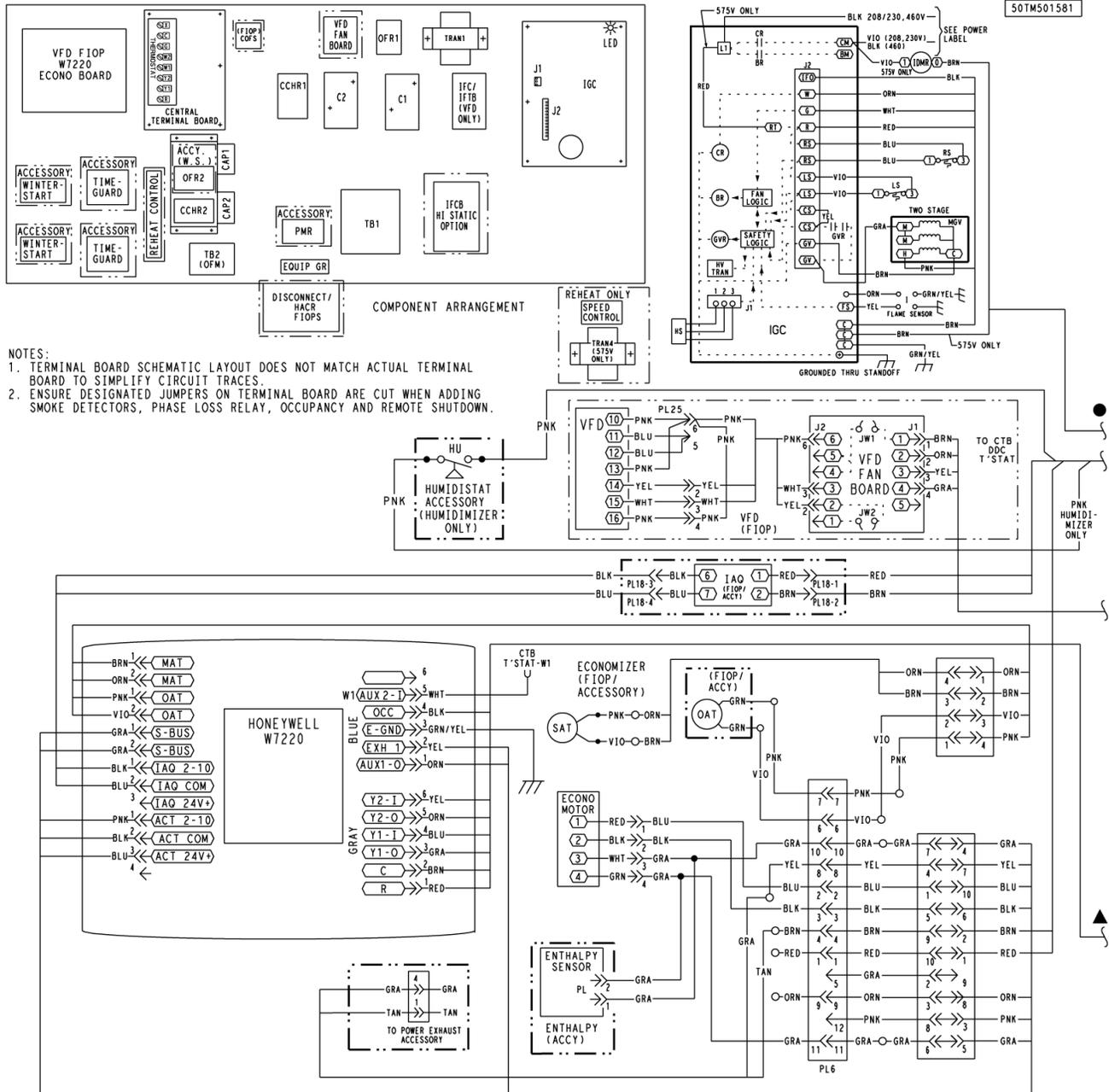


Fig. 14 - Typical EconoMiSer X Wiring Diagram

EconoMiSer X

EconoMiSer X is an economizer system which is available for 2-stage cooling units equipped with the 2-speed Variable Frequency Drive (VFD) system.

The field-installed accessory consist of the following:

- Economizer assembly
- W7220 economizer controller
- 20K dry bulb temperature control sensor

W7220 Economizer

The economizer controller used on electro mechanical units is a Honeywell W7220 which is to be located in the RTU base unit's Control Box. See the Installation Instruction for your base unit for the location of the Control Box access panel.

The W7220 controller provide the following:

- 2-line LCD interface screen for setup, configuration and troubleshooting.
- On-board fault detection and diagnostics
- Sensor failure loss of communications identification
- Automatic sensor detection
- Capabilities for use with multiple-speed indoor fan systems

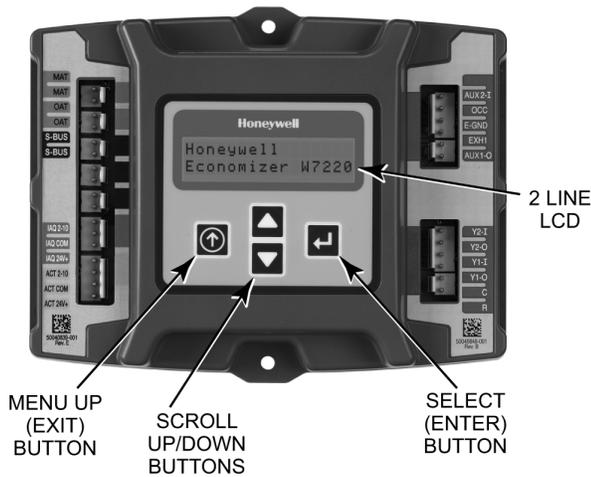


Fig. 15 - W7220 Controller

User Interface

The user interface consists of a LCD display and a 4-button keypad on the front of the economizer controller.

Keypad

The four navigation button (see Fig. 15) are used to scroll through the menus and menu items, select menu items, and to change parameter and configuration settings.

Using the Keypad with Menus

To use the keypad when working with menus:

- Press the ▲ (Up arrow) button to move to the previous menu.
- Press the ▼ (Down arrow) button to move to the next menu.
- Press the ↵ (Enter) button to display the first item in the currently displayed menu.
- Press the ⏪ (Menu Up/Exit) button to exit a menu's item and return to the list of menus.

Using the Keypad with Settings and Parameters

To use the keypad when working with Setpoints, System and Advanced Settings, Checkout tests and Alarms:

1. Navigate to the desire menu.
2. Press the ↵ (Enter) button to display the first item in the currently displayed menu.
3. Use the ▲ and ▼ buttons to scroll to the desired parameter.
4. Press the ↵ (Enter) button to display the value of the currently displayed item.
5. Press the ▲ button to increase (change) the displayed parameter value.
6. Press the ▼ button to decrease (change) the displayed parameter value.

- NOTE:** When values are displayed, pressing and holding the ▲ or ▼ button causes the display to automatically increment.
7. Press the ↵ (Enter) button to accept the displayed value and store it in nonvolatile RAM.
 8. "CHANGE STORED" displays.
 9. Press the ↵ (Enter) button to return to the current menu parameter.
 10. Press the ⏪ (Menu Up/Exit) button to return to the previous menu.

Menu Structure

Table 5 illustrates the complete hierarchy of menus and parameters for the EconoMiSer X system.

The Menus in display order are:

- STATUS
- SETPOINTS
- SYSTEM SETUP
- ADVANCED SETUP
- CHECKOUT
- ALARMS

IMPORTANT: Table 5 illustrates the complete hierarchy. Your menu parameters may be different depending on your configuration. For example if you do not have a DCV (CO₂) sensor, then none of the DCV parameters appear.

Table 5 – Menu Structure ^a

Menu	Parameter	Parameter Default Value	Parameter Range and Increment ^b	Notes
STATUS	ECON AVAIL	NO	YES/NO	YES = economizing available; the system can use outside air for free cooling when required
	ECONOMIZING	NO	YES/NO	YES = outside air being used for 1 st stage cooling
	OCCUPIED	NO	YES/NO	YES = OCC signal received from space thermostat or unitary controller YES = 24 Vac on terminal OCC. NO = 0 Vac on terminal OCC.
	HEAT PUMP	n/a ^c	COOL HEAT	Displays COOL or HEAT when system is set to heat pump (Non-conventional)
	COOL Y1–IN	OFF	ON/OFF	Y1–I signal from space thermostat or unitary controller for cooling stage 1. ON = 24 Vac on terminal Y1–I OFF = 0 Vac on terminal Y1–I
	COOL Y1–OUT	OFF	ON/OFF	Cool stage 1 Relay Output to stage 1 mechanical cooling (Y1–OUT terminal)
	COOL Y2–IN	OFF	ON/OFF	Y2–I signal from space thermostat our unitary controller for second stage cooling. ON = 24 Vac on terminal Y2–I OFF = 0 Vac on terminal Y2–I
	COOL Y2–OUT	OFF	ON/OFF	Cool Stage 2 Relay Output to mechanical cooling (Y2–OUT terminal)
	MA TEMP	__ . __ °F	0 to 140°F	Displays value of measured mixed air from MAT sensor. Displays __ . __ °F if not connected, short or out-of-range.
	DA TEMP	__ . __ °F	0 to 140°F	Displays when Discharge Air sensor is connected and displays measured discharge temperature. Displays __ . __ °F if sensor sends invalid value, if not connected, short or out-of-range.
	OA TEMP	__ . __ °F	-40 to 140°F	Displays measured value of outdoor air temperature. Displays __ . __ °F if sensor sends invalid value, short or out-of-range.
	OA HUM	__ %	0 to 100%	Displays measured value of outdoor humidity from OA sensor. Displays __ % if not connected short, or out-of-range.
	RA TEMP	__ . __ °F	0 to 140°F	Displays measured value of return air temperature from RAT sensor. Displays __ . __ °F if sensor sends invalid value, if not connected, short or out-of-range
	RA HUM	__ %	0 to 100%	Displays measured value of return air humidity from RA sensor. Displays __ % if sensor sends invalid value, if not connected, short or out-of-range
	IN CO2	__ __ ppm	0 to 2000 ppm	Displays value of measured CO ₂ from CO ₂ sensor. Invalid if not connected, short or out-of-range
	DCV STATUS	n/a	ON/OFF	Displays ON if above setpoint and OFF if below setpoint, and ONLY if a CO ₂ sensor is connected.
	DAMPER OUT	2.0V	2.0 to 10.0V	Displays voltage output to the damper actuator.
	EXH1 OUT	OFF	ON/OFF	Output of EXH1 terminal: ON = relay closed OFF = relay open
EXH2 OUT	OFF	ON/OFF	Output of AUX terminal; displays only if AUX = EXH2	
ERV	OFF	ON/OFF	Output of AUX terminal; displays only if AUX = ERV	
MECH COOL ON	0	0,1, or 2	Displays stage of mechanical cooling that is active.	

Table 5 – Menu Structure^a (cont)

Menu	Parameter	Parameter Default Value	Parameter Range and Increment ^b	Notes
SETPOINTS	MAT SET	53°F	38 to 65°F; increment by 1	Setpoint determines where the economizer will modulate the OA damper to maintain the mixed air temperature.
	LOW T LOCK	32°F	-45 to 80°F; increment by 1	Setpoint determines outdoor temperature when the mechanical cooling cannot be turned on. Commonly referred to as the Compressor lockout.
	DRYBLB SET	63°F	48 to 80°F; increment by 1	Setpoint determines where the economizer will assume outdoor air temperature is good for free cooling; e.g.; at 63°F unit will economize at 62°F and below and not economize at 64°F and above. There is a 2°F deadband.
	ENTH CURVE	ES3	ES1,ES2,ES3,ES4, or ES5	Enthalpy boundary “curves” for economizing using single enthalpy
	DCV SET	1100ppm	500 to 2000ppm; increment by 100	Displays only if CO ₂ sensor is connected. Setpoint for Demand Control Ventilation of space. Above the setpoint, the OA dampers will modulate open to bring in additional OA to maintain a space ppm level below the setpoint.
	MIN POS	4.4 V	2 to 10 Vdc	Displays ONLY if a CO ₂ sensor is NOT connected
	VENTMAX With 2-speed fan units VENTMAX L (low speed fan) and VENTMAX H (high speed fan) settings are required	4.4 V	2 to 10 Vdc or 100 to 9990 cfm increment by 10	Displays only if a CO ₂ sensor is connected. Used for Vbz (ventilation max cfm) setpoint. Displays 2 to 10 V if <3 sensors (RA, OA, and MA). In AUTO mode dampers controlled by CFM
	VENTMAX L	6 V		
	VENTMAX H	4.4 V		
	VENTMIN With 2-speed fan units VENTMIN L (low speed fan) and VENTMIN H (high speed fan) set	2.8 V	2 to 10 Vdc or 100 to 9990 cfm increment by 10	Displays only if a CO ₂ sensor is connected. Used for Ba (ventilation min cfm) setpoint. Displays 2 to 10 V if <3 sensors (RA, OA, and MA). Va is only set if DCV is used. This is the ventilation for less than maximum occupancy of the space. In AUTO mode dampers controlled by CFM.
	VENTMIN L	3.7 V		
	VENTMIN H	2.8 V		
	ERV OAT SP	32°F	0 to 50°F; increment by 1	Only when AUX1 O = ERV
	EXH1 SET With 2-speed fan units Exh1 L (low speed fan) and Exh1 H (high speed fan) settings are required	50%	0 to 100%; increment by 1	Setpoint for OA damper position when exhaust fan 1 is powered by the economizer.
	Exh1 L	65%		
	Exh1 H	50%		
	EXH2 SET With 2-speed fan units Exh2 L (low speed fan) and Exh2 H (high speed fan) settings are required	75%	0 to 100%; increment by 1	Setpoint for OA damper position when exhaust fan 2 is powered by the economizer. Only used when AUX is set to EHX2.
	Exh2 L	80%		
Exh2 H	75%			
SYSTEM SETUP	INSTALL	01/01/10		Display order = MM/DD/YY Setting order = DD, MM, then YY.
	UNITS DEG	°F	°F or °C	Sets economizer controller in degrees Fahrenheit or Celsius
	EQUIPMENT	CONV	Conventional or HP	CONV = conventional; HP O/B = Enable Heat Pump mode. Use AUX2 I for Heat Pump input from thermostat or controller.
	AUX2 I	W	SD/W or HP(O)/HP(B)	In CONV mode: SD + Enables configuration of shutdown (default); W = Informs controller that system is in heating mode. In HP O/B mode: HP(O) = energize heat pump on Cool (default); HP(B) = energize heat pump on heat.
	FAN TYPE	2 speed	1 speed/2 speed	Sets the economizer controller for operation of 1 speed or 2 speed supply fan.
	FAN CFM	5000cfm	100 to 15000 cfm; increment by 100	This is the capacity of the RTU. The value is found in the Project Submittal documents for the specific RTU.
	AUX OUT	NONE	NONE ERV EXH2 SYS	<ul style="list-style-type: none"> • NONE = not configured (output is not used) • ERV = Energy Recovery Ventilatioⁿ • EXH2 = second damper position relay closure for second exhaust fan • SYS = use output as an alarm signal
	OCC	INPUT	INPUT or ALWAYS	When using a setback thermostat with occupancy out (24 Vac), the 24 Vac is input “INPUT” to the OCC terminal. If no occupancy output from the thermostat then change program to “ALWAYS” OR add a jumper from terminal R to OCC terminal

Table 5 – Menu Structure^a (cont)

Menu	Parameter	Parameter Default Value	Parameter Range and Increment ^b	Notes
SYSTEM SETUP	FACTORY DEFAULT	NO	NO or YES	Resets all set points to factory defaults when set to YES. LCD will briefly flash YES and change to NO but all parameters will change to the factory default values.
ADVANCED SETUP	MA LO SET	45°F	35 to 55°F; Incremented by 1°	Temperature to achieve Freeze Protection (close damper and alarm if temperature falls below setup value).
	FREEZE POS	CLO	CLO or MIN	Damper position when freeze protection is active (closed or MIN POS).
	CO2 ZERO	0ppm	0 to 500 ppm; Increment by 10	CO ₂ ppm level to match CO ₂ sensor start level.
	CO2 SPAN	2000ppm	1000 to 3000 ppm; Increment by 10	CO ₂ ppm span to match CO ₂ sensor.
	STG3 DLY	2.0h	0 min, 5 min, 15 min, then 15 min intervals. Up to 4 h or OFF	Delay after stage 2 cool has been active. Turns on 2 nd stage of cooling when economizer is 1 st stage and mechanical cooling is 2 nd stage. Allows three stages of cooling, 1 economizer and 2 mechanical. OFF = no Stage 3 cooling
	SD DMPR POS	CLO	CLO or OPN	Indicates shutdown signal from space thermostat or unitary controller. When controller receives 24 Vac input on the SD terminal in conventional mode, the OA damper will open if programmed for OPN and OA damper will close if programmed for CLO. All other controls, e.g., fans, etc. will shut off.
	DCVCAL ENA	MAN	MAN (manual) AUTO	Turns on the DCV automatic control of the dampers. Resets ventilation based on the RA, OA, and MA sensor conditions. Requires all 3 RA, OA, and MA sensors.
	MAT T CAL	0.0°F	+/-2.5°F	Allows for the operator to adjust for an out of calibration temperature sensor.
	OA T CAL	0.0°F	+/-2.5°F	Allows for the operator to adjust for an out of calibration temperature sensor.
	OA H CAL	0% RH	+/-10% RH	Allows for operator to adjust for an out of calibration humidity sensor.
	RA T CAL	0.0°F	+/-2.5°F	Allows for the operator to adjust for an out of calibration temperature sensor.
	RA H CAL	0% RH	+/-10% RH	Allows for operator to adjust for an out of calibration humidity sensor.
	DA T CA;	0.0°F	+/-2.5°F	Allows for the operator to adjust for an out of calibration temperature sensor.
CHECKOUT	DAMPER VMIN—HS	n/a	n/a	Positions damper to VMIN position
	DAMPER VMAX—HS	n/a	n/a	Positions damper to VMAX position
	DAMPER OPEN	n/a	n/a	Position damper to the full open position. Exhaust fan contacts enable during the DAMPER OPEN test. Make sure you pause in the mode to allow exhaust contacts to energize due to the delay in the system.
	DAMPER CLOSE	n/a	n/a	Positions damper to the fully closed position
	CONNECT Y1—O	n/a	n/a	Closes the Y1—O relay (Y1—O)
	CONNECT Y2—O	n/a	n/a	Closes the Y2—O relay (Y2—O)
	CONNECT AUX	n/a	n/a	Energizes the AUX output. If Aux setting is: • NONE – not action taken • ERV – 24 Vac out. Turns on or signals an ERV that the conditions are not good for economizing but are for ERV operation. ^d • SYS – 24 Vac out. Issues a system alarm
ALARMS()	MA T SENS ERR	n/a	n/a	Alarms display only when they are active. The menu title “ALARMS()” includes the number of active alarms in parenthesis ().
	CO2 SENS ERR	n/a	n/a	
	OA T SENS ERR	n/a	n/a	
	DA ENTHL ERR	n/a	n/a	
	SYS ALARM	n/a	n/a	When AUX is set to SYS and there is any alarm (e.g., failed sensors, etc.), the AUX terminal has 24 Vac out.
	NOTE: The alarms listed are examples. Additional alarms display depending on the parameter settings and configuration. For example if you do not have a DCV (CO ₂) sensor, then none of the DCV parameters appear.			

^a Table 5 illustrates the complete hierarchy. Your menu parameters may be different depending on your configuration. For example if you do not have a DCV (CO₂) sensor, then none of the DCV parameters appear

^b When values are displayed, pressing and holding the ▲ or ▼ button causes the display to automatically increment.

^c n/a = not applicable

^d ERV Operation: When in Cooling mode AND the conditions are NOT OK for economizing - the ERV terminal will be energized. In the Heating mode the ERV terminal will be energized when the OA is below the ERV OAT setpoint in the setpoint menu.

Checkout Tests

Use the Checkout menu (see Table 5) to test the damper operation and any configured outputs. Only items that are configured are shown in the Checkout menu.

NOTE: See User Interface for information about menu navigation and use of the keypad.

To perform a Checkout test:

1. Scroll to the desired test in the Checkout menu using the ▲ and ▼ buttons.
2. Press the  button to select the item.
3. RUN? appears.
4. Press the  button to start the test.
5. The unit pauses and then displays IN PROGRESS.
6. When the test is complete, DONE appears.
7. When all desired parameters have been tested, press the ⏴ (Menu up) button to end the test.

Checkout test can be performed at any time during the operation of the system as a test that the system is operable.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in damage to equipment

Be sure to allow enough time for compressor startup and shutdown between checkout tests so that you do not short-cycle the compressors.

SETUP AND CONFIGURATION

W7220 Economizer Module Wiring

Use Fig. 16 and Tables 6 and 7 to locate the wiring terminals for the economizer module.

NOTE: The four terminal blocks are removable. You can slide out each terminal block, wire it, and then slide it back into place.

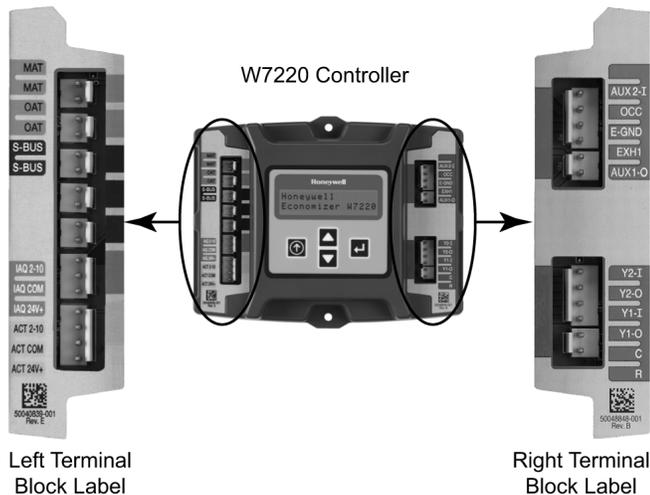


Fig. 16 - W7220 Economizer Module Terminal Connection Labels

Table 6 - Economizer Module - Left Hand Terminal Blocks

Label	Type	Description
Top Left Terminal Block		
MAT MAT	20k NTC and COM	Mixed Air Temperature Sensor (Polarity insensitive connections)
OAT OAT	20k NTC and COM	Outdoor Air Temperature Sensor (Polarity insensitive connection)
S-BUS S-BUS	S-BUS (Syk Bus)	Enthalpy Control Sensor (Polarity insensitive connection)
Bottom Left Terminal Block		
IAQ 2-10	2-10 Vdc	Air Quality Sensor Input (e.g. CO ₂ sensor)
IAQ COM	COM	Air Quality Sensor Common
IAQ 24V	24 Vac	Air Quality Sensor 24 Vac Source
ACT 2-10	2-10 Vdc	Damper Actuator Output (2-10 Vdc)
ACT COM	COM	Damper Actuator Output Common
ACT 24V	24 Vac	Damper Actuator 24 Vac Source

Table 7 - Economizer Module - Right Hand Terminal Blocks

Label	Type	Description
Top Right Terminal Block		
	n/a	The first terminal is not used
AUX2 I	24 Vac IN	Shut Down (SD) or Heat (W) Conventional only and Heat Pump Changeover (O?B) in Heat Pump mode.
OCC	24 Vac IN	Occupied / Unoccupied Input
E - GND	E-GND	Earth Ground - System Required
EXH1	24 Vac OUT	Exhaust Fan 1 Output
AUX1 O	24 Vac OUT	Programmable: Exhaust fan 2 output or ERV or System alarm output
Bottom Right Terminal Block		
Y2-1	24 Vac IN	Y2 in - Cooling Stage 2 Input from space thermostat
Y2-O	24 Vac OUT	Y2 out - Cooling Stage 2 Output to stage 2 mechanical cooling
Y1-I	24 Vac IN	Y1 in - Cooling Stage 2 Input from space thermostat
Y1-O	24 Vac OUT	Y1 out - Cooling Stage 2 Output to stage 2 mechanical cooling
C	COM	24 Vac Common
R	24 Vac	24 Vac Power (Hot)

Time-out and Screen Saver

When no buttons have been pressed for 10 minutes, the LCD displays a screen saver, which cycles through the Status items. Each Status item displays in turn and cycles to the next item after 5 seconds.

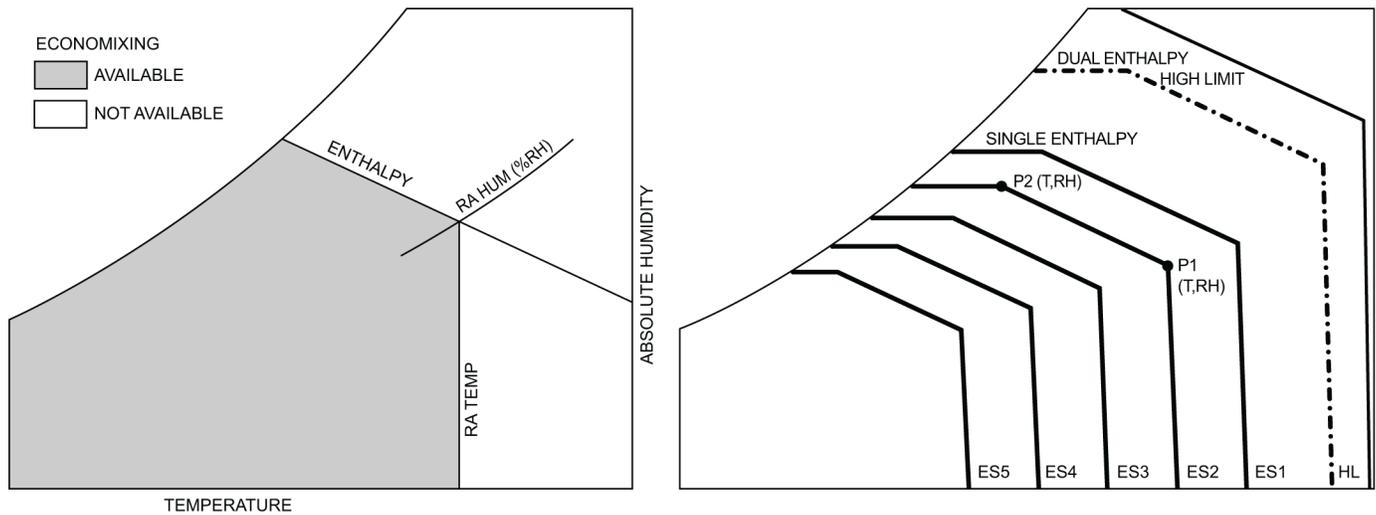


Fig. 17 - Single Enthalpy Curve boundaries

Table 8 - Single Enthalpy and Dual Enthalpy High Limit Curves

Enthalpy Curve	Temp. Dry Bulb (°F)	Temp. Dewpoint (°F)	Enthalpy (btu/lb/da)	Point P1		Point P2	
				Temp (°F)	Humidity %RH	Temp (°F)	Humidity %RH
ES1	80.0	60.0	28.0	80.0	36.8	66.3	80.1
ES2	75.0	57.0	26.0	75.0	39.6	63.3	80.0
ES3	70.0	54.0	24.0	70.0	42.3	59.7	81.4
ES4	65.0	51.0	22.0	65.0	44.8	55.7	84.2
ES5	60.0	48.0	20.0	60.0	46.9	51.3	88.5
HL	86.0	66.0	32.4	86.0	38.9	72.4	80.3

Enthalpy Settings

When the OA temperature, enthalpy and dew point are below the respective setpoints, the Outdoor Air can be used for economizing. Fig. 13 shows the new single enthalpy boundaries in the W7220. There are 5 boundaries (setpoints ES1 thru ES5), which are defined by dry bulb temperature, enthalpy and dew point.

Refer to Table 8 for ENTH CURVE setpoint values.

To use enthalpy the W7220 must have a HH57AC081 enthalpy control sensor for OA. The W7220 calculates the enthalpy and dewpoint using the OA temperature and humidity input from the OA sensor. When the OA temperature, OA humidity and OA dew point are all below the selected boundary, the economizer sets the economizing mode to YES, economizing is available.

When all of the OA conditions are above the selected boundary, the conditions are not good to economize and the mode is set to NO.

Fig. 17 shows the 5 current boundaries. There is also a high limit boundary for differential enthalpy. The high limit boundary is ES1 when there are no stages of mechanical cooling energized and HL (high limit) when a compressor stage is energized.

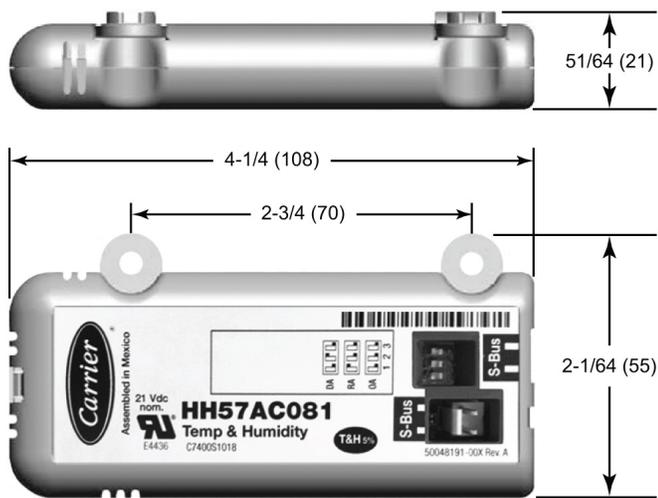
Table 8 provides the values for each boundary limit.

Enthalpy control Sensor Configuration

The Enthalpy Control sensor (Part Number: HH57AC081) communicates with the W7220 Economizer controller on the two-wire communications bus and can either be wired using a two pin header or using a side connector. This sensor is used for all OAT (Outdoor Air Temperature), RAT (Return Air Temperature), and DAT (discharge Air Temperature), depending on how its three position DIP switch is set.

Use Fig. 14 and 16 and Table 9 to locate the wiring terminals for each Enthalpy Control sensor.

Use Fig. 18 and Table 10 to set the DIP switches for the desired use of the sensor.



NOTE: Dimensions in () are in mm

Fig. 18 - Enthalpy Control Sensor, Dimensions and DIP Switch Location

Table 9 - Enthalpy Control Sensor Wiring Terminations^a

Terminal		Type	Description
Nbr	Label		
1	S-BUS	S-BUS	S-Bus Communications (Enthalpy Control Sensor Bus)
2	S-BUS	S-BUS	S-Bus Communications (Enthalpy Control Sensor Bus)

Table 10 - Enthalpy Control Sensor DIP Switch

Use	DIP Switch Positions for Switches 1, 2, & 3		
	1	2	3
DA ^a	OFF	ON	OFF
RA ^b	ON	OFF	OFF
OA ^c	OFF	OFF	OFF

- a DA = Discharge Air or Supply Sensor
- b RA = Return Air
- c OA = Outside Air

OPERATION

Cooling, Unit with EconoMiSer X

For Occupied mode operation of EconoMiSer X, there must be a 24-v signal at terminals R and OCC (provided through PL6-3 from the unit's IFC coil). Removing the signal at OCC places the EconoMiSer X control in Unoccupied mode.

During Occupied mode operation, indoor fan operation will be accompanied by economizer dampers moving to Minimum Position setpoint for ventilation. If indoor fan is off, dampers will close. During Unoccupied mode operation, dampers will remain closed unless a Cooling (by free cooling) or DCV demand is received.

When free cooling using outside air is not available, the unit cooling sequence will be controlled directly by the space thermostat. Outside air damper position will be closed or Minimum Position as determined by Occupancy mode and fan signal.

When free cooling is available as determined by the appropriate changeover command (dry bulb, outdoor enthalpy, differential dry bulb or differential enthalpy), a call for cooling (Y1 closes at the thermostat) will cause the economizer control to modulate the dampers open and closed to maintain the unit supply air temperature at 50 to 55°F. Compressor will not run.

During free cooling operation, a supply air temperature (SAT) above 50°F will cause the dampers to modulate between Minimum Position setpoint and 100% open. With SAT from 50°F to 45°F, the dampers will maintain at the Minimum Position setting. With SAT below 45°F, the outside air dampers will be closed. When SAT rises to 48°F, the dampers will re-open to Minimum Position setting.

Should 100% outside air not be capable of satisfying the space temperature, space temperature will rise until Y2 is closed. The economizer control will call for compressor operation. Dampers will modulate to maintain SAT at 50 to 55°F concurrent with Compressor 1 operation. The Low Ambient Lockout Thermostat will block compressor operation with economizer operation below 42°F outside air temperature.

When space temperature demand is satisfied (thermostat Y1 opens), the dampers will return to Minimum Damper position if indoor fan is running or fully closed if fan is off.

If accessory power exhaust is installed, the power exhaust fan motors will be energized by the economizer control as the dampers open above the EXH1 SET setpoint and will be energized as the dampers close below the EXH1 SET setpoint.

Damper movement from full closed to full open (or vice versa) will take between 1-1/2 and 2-1/2 minutes.

Heating with EconoMiSer X

During Occupied mode operation, indoor fan operation will be accompanied by economizer dampers moving to Minimum Position setpoint for ventilation. If indoor fan is off, dampers will close. During Unoccupied mode operation, dampers will remain closed unless a DCV demand is received.

When the room temperature calls for heat (W1 closes), the heating controls are energized.

Demand Controlled Ventilation

If a field-installed CO₂ sensor is connected to the EconoMiSer X control, a Demand controlled Ventilation strategy will operate automatically. As the CO₂ level in the space increases above the setpoint (on the EconoMiSer X controller), the minimum position of the dampers will be increased proportionally, until the Maximum Ventilation setting is reached. As the space CO₂ level decreases because of the increase in fresh air, the outdoor damper will follow the higher demand condition from the DCV mode or from the free cooling mode.

DCV operation is available in Occupied and Unoccupied periods with EconoMiSer X. However, a control modification will be required on the HVAC units to implement the Unoccupied period function.

Table 11 - Damper Position Control, 2-Speed Fan Motor, Economizer Cooling Not Available

INPUT					
OCC	0 - V	24 - V	24 - V	24 - V	24 - V
Y1	0 - V	0 - V	24 - V	24 - V	0 - V
Y2	0 - V	0 - V	0 - V	24 - V	0 - V
W1	0 - V	0 - V	0 - V	0 - V	24 - V
SUPPLY FAN MOTOR SPEED	OFF	LOW	LOW	HIGH	HIGH
DAMPER POSITION					
NO CI2 SENSOR	CLOSED	MIN POS	MIN POS	MIN POS	MIN POS
W/ CO2 SENSOR	CLOSED	FROM VENTMIN L TO VENTMAX L	FROM VENTMIN L TO VENTMAX L	FROM VENTMIN H TO VENTMAX H	FROM VENTMIN H TO VENTMAX H

TROUBLESHOOTING

Power Loss (Outage or Brownout)

All setpoints and advanced settings are restored after any power loss or interruption, as all settings are stored in the Economizer controller's non-volatile flash memory.

NOTE If the power goes below 18 Vac, the W7220 controller module assumes a power loss and the 5 minute power up delay will become functional when power returns above 18 Vac.

Alarms

The Economizer module provides alarm messages that display on the 2-line LCD

NOTE: Upon power up, the module waits several seconds before checking for alarms. This allows time for all the configured devices (e.g. sensors, actuator) to become operational.

If one or more alarms are present and there has been no keypad activity for at least 5 minutes, the Alarms menu displays and cycles through the active alarms.

You can also navigate to the Alarms menus at any time.

See Table 5 for the Alarms menu.

Clearing Alarms

Once the alarm has been identified and the cause has been removed (e.g. replaced faulty sensor). The can be cleared from the display.

To clear an alarm, perform the following:

1. Navigate to the desired alarm.
2. Press the \downarrow button.
3. ERASE? displays.
4. Press the \downarrow button.
5. ALARM ERASED displays.
6. Press the \uparrow (Menu up/Exit) button to complete the action and return to the previous menu.

NOTE: If the alarm still exists after you clear it, it is redisplayed within 5 seconds.

Table 12 - Operating Issues and Concerns

Issue or Concern	Possible Cause and Remedy
My outdoor temperature reading on the STATUS menu is not accurate	Check the sensor wiring: <ul style="list-style-type: none"> • Enthalpy sensors are to be wired to the S-Bus terminals. • Temperature sensors are to be wired to the OAT and MAT terminals.
If my enthalpy sensor drifts in accuracy over time, can I re-calibrate it?	The sensor is not able to be re-calibrated in the field. However there is a menu item under the ADVANCED menu where you are able to input a limited off set in temperature and humidity for each sensor you have connected to the economizer.
Can I go back to factory defaults and start over?	Under the SYSTEM SETUP menu you can change the setpoints to the factory defaults.
Will I be able to see the LCD screen when it is in the unit?	The LCD screen has a backlight that is always illuminated.
What is a good setpoint for the Mixed Air Temperature (MAT)?	The mixed air temperature is the temperature of air that you want to supply to the space. In a commercial building, this is between 50 to 55°F (10 to 13°C). The mixed air is the mixing of the return air and the outdoor air.
I am using enthalpy sensors. Why did the control ask me to input a dry bulb changeover temperature?	In the even the humidity sensor in the enthalpy sensors fails, the backup algorithm in the control is to default to the temperature sensor in the enthalpy sensor.
In checkout, the outdoor damper closes when I command it to open.	Check the actuator linkage or rotation. In the CHECKOUT mode, the outdoor damper should drive open or closed with the return air damper having the opposite effect.
How do I set my minimum position?	The minimum position is set using the VENTMIN and VENTMAX setup in the SETPOINTS menu. VENTMIN is the minimum ventilation required when using an occupancy sensor and VENTMAX is the minimum ventilation when not using an occupancy sensor for Demand Control Ventilation. The VENTMAX position is set the same as with the potentiometer on the analog economizers and is the output voltage to the damper actuator. The range is 2 Vdc closed OA damper and 10 Vdc open OA damper.
What if my damper does not go completely closed in the checkout operation?	Check the damper linkage or hub to make sure the damper is able to close completely.
How do I set the OCC?	There are two setting for the OCC setting, INPUT and ALWAYS, INPUT is from the space thermostat, if it has an occupancy output. ALWAYS is the unit in the occupied mode, if the economizer is powered (fan on).
Does the economizer save my program values if the unit loses power?	Yes, once the changes are stored in the controller they will be stored until they are changed by the operator.
If the unit is left in checkout, how long will the unit stay in checkout mode without input?	The unit will remain in checkout for 10 minutes, then return to normal operation.

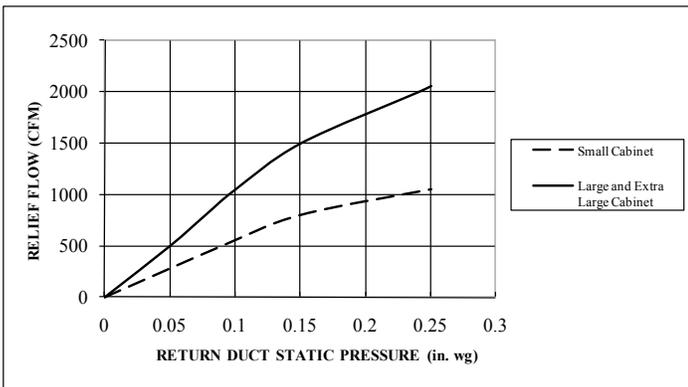


Fig. 19 - Barometric Flow Capacity

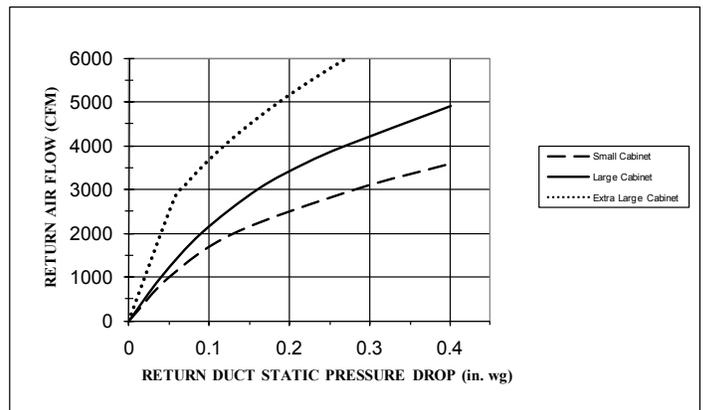


Fig. 20 - Return Air Pressure Drop

