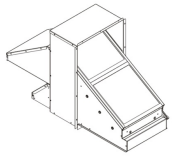
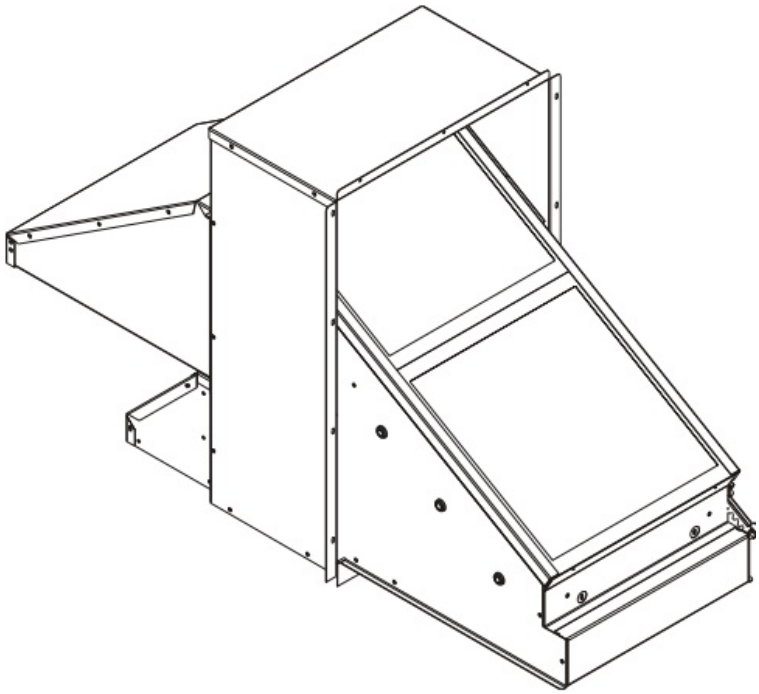


GIBSON 562533 Package Unit Modulating Economizer Instruction Manual

Contents

GIBSON 562533 Package Unit Modulating Economizer



Product Information

Package Unit Modulating Economizer

Specifications:

- Model: Downflow Economizer #562533 / 563209
- Package Equipment Models: 2-5T Convertible Package Units AC, HP or Gas Electric
- Form: #212E-0714 (NEW)
- Dimensions:
  - Unit# 562533: A – 47.59, B – 37.56, C – 18.73, D – 28.86, E – 10.79, F – 14.29, G – 8.18, H – 18.90, I – 18.00, J – 27.50, K – 28.25
  - Unit# 563209: A – 51.03, B – 41.06, C – 18.75, D – 32.29, E – 12.54, F – 17.34, G – 8.18, H – 18.90, I – 18.00, J – 31.08, K – 31.83
  - Shipping Information: Height – 35, Length – 109, Width – 112, Weight – 35

Installation Instructions

1. Shut down the unit and disconnect it from electrical power.
2. Remove the return access panel, saving the screws.
3. Align the holes and place the tab on the side panel on the return side of the divider wall. Secure it with the self-tapping screw provided, being careful not to puncture the coil tubing.
4. (Optional) Install the differential enthalpy control and DCV (CO_2) sensor according to the kit's instructions.
5. Install the economizer in the unit, attaching only the left and right side mounting screws. Ensure that the economizer rails sit flush on the return air-opening lip. Avoid tearing insulation on the unit's side wall or floor.

FAQ:

Q: What are the dimensions of the economizer?

The dimensions of the economizer vary depending on the unit number. For Unit# 562533, the dimensions are A – 47.59, B – 37.56, C – 18.73, D – 28.86, E – 10.79, F – 14.29, G – 8.18, H – 18.90, I 18.00, J – 27.50, K – 28.25. For Unit# 563209, the dimensions are A – 51.03, B – 41.06, C – 18.75, D – 32.29, E – 12.54, F – 17.34, G 8.18, H – 18.90, I – 18.00, J – 31.08, K – 31.83.

Q: How do I install the economizer?

To install the economizer:

1. Shut down the unit and disconnect it from electrical power.
2. Remove the return access panel, saving the screws.
3. Align the holes and place the tab on the side panel on the return side of the divider wall. Secure it with the self-tapping screw provided, being careful not to puncture the coil tubing.
4. (Optional) Install the differential enthalpy control and DCV (CO2) sensor according to the kit's instructions.
5. Install the economizer in the unit, attaching only the left and right side mounting screws. Ensure that the economizer rails sit flush on the return air-opening lip. Avoid tearing insulation on the unit's side wall or floor.

Downflow Unit

Warning:

- Recognize this symbol as an indication of Important Safety Information!
- Read all instructions before installation.
- Disconnect electrical power to the unit before servicing.
- Failure to do so can cause electrical shock resulting in personal injury or death.
- Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual.
- For assistance or additional information consult a qualified installer or service agency.
- DO NOT DESTROY. PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE

INSTALLATION INSTRUCTION

Note:
Reference Unit Technical Service Literature for application requirements.
Before You Begin:
Inspect the economizer for shipping damage and correct parts with the list below.

- 1 – Economizer Assembly w/ Filter installed
- Upper Adaptor Panels (See Table 1 on Page 2)
- 1 – Side Adaptor Panel
- 1 – Outdoor Air Hood (Attached to Economizer)
- 1 – Hardware Package
- 1 – Mixed Air Sensor (MAS)
- 1 – Mixed Air Sensor Wiring Harness 2 – 8″ Wire Tie
- 3 – #10 x 16 x ½" Self-Tapping Screws 13 – #10 x 16 x ½" Type A Screws

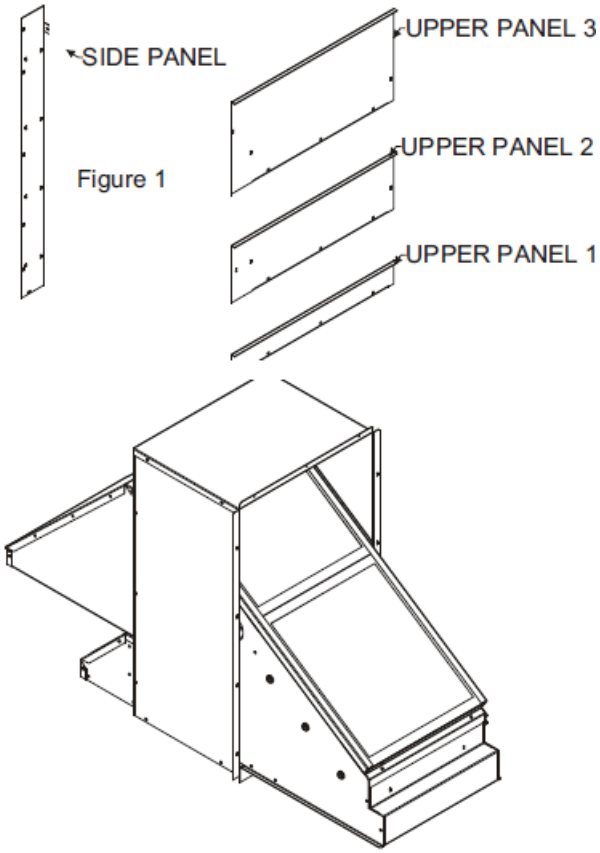
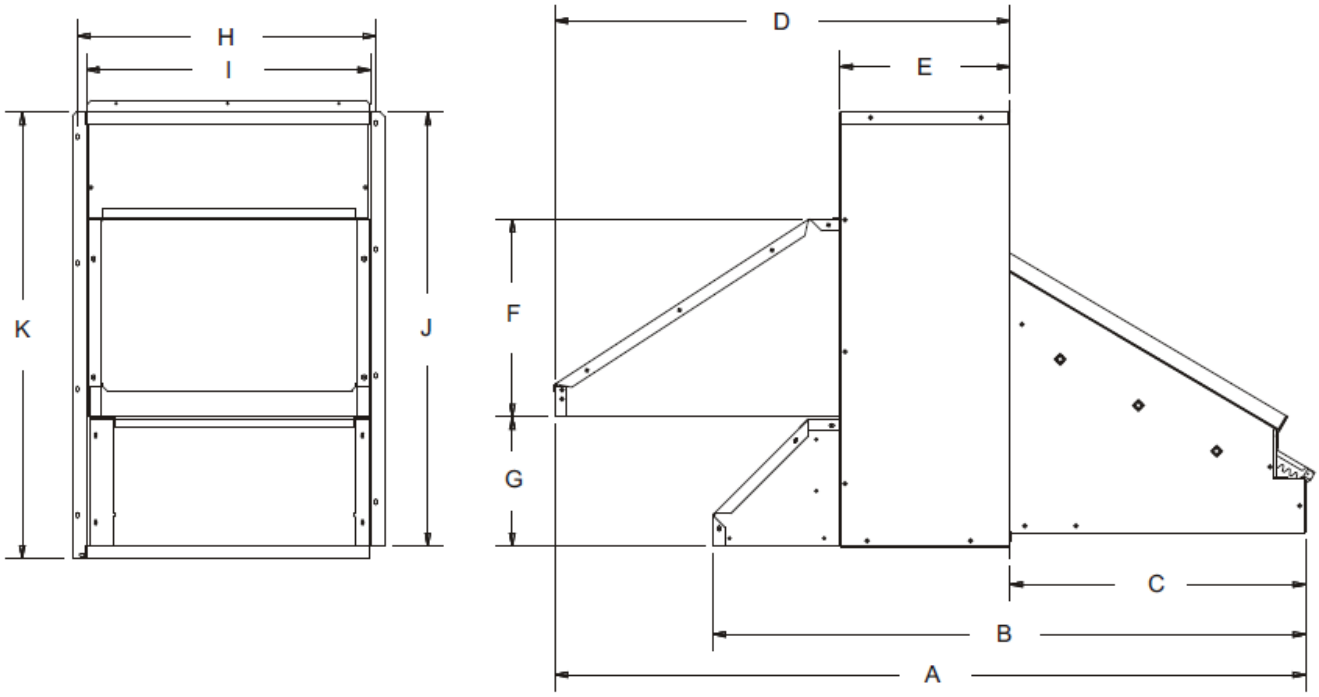


Figure 1

- **Note:** For rooftops or other installations requiring the economizer to be lifted or hoisted, always lift the economizer with the supplied packaging to prevent damage from lifting and rigging equipment.

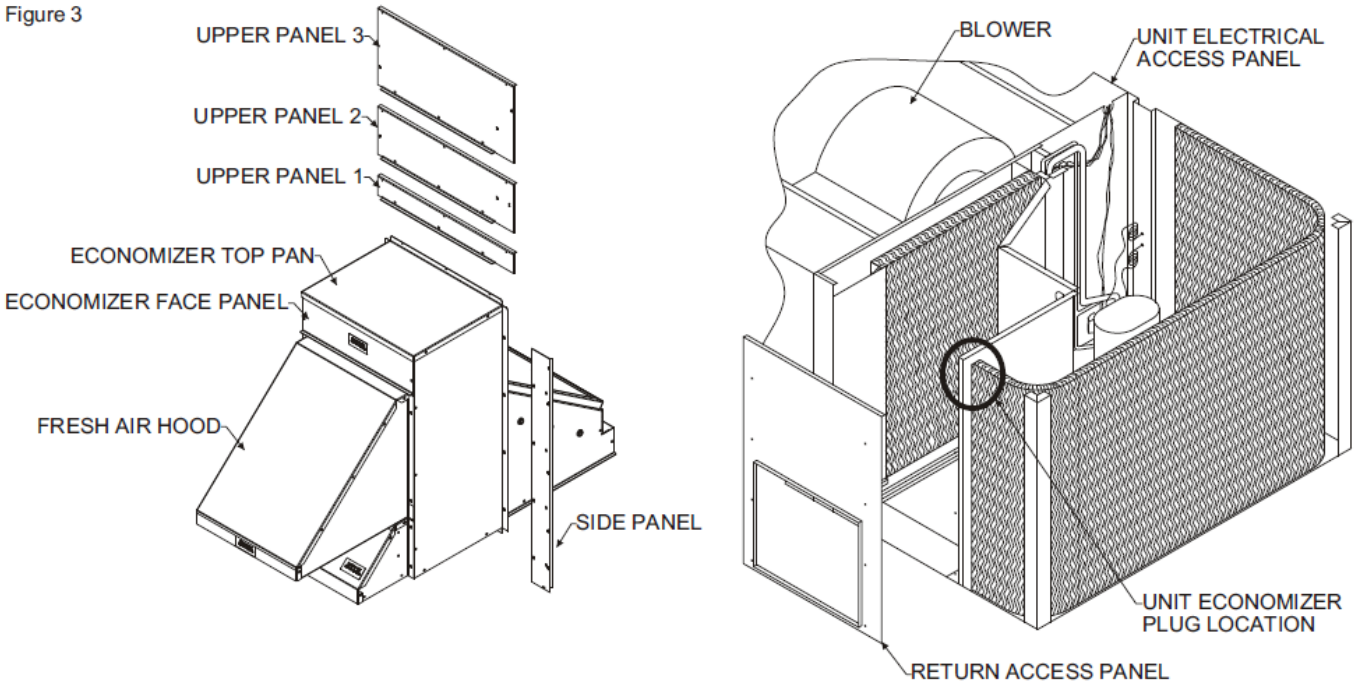
Optional Accessory Kits:

- CO2 Sensor Kit, Wall Mount (920317)
- CO2 Sensor Kit, Duct Mount (920318)
- Differential Enthalpy Kit (922431)
- HP isolation relay kit (older heat pump models) (922598) Power Exhaust Kit (547842, 555578)



Unit #	Unit Dimensions											Shipping Information			
	A	B	C	D	E	F	G	H	I	J	K	Height	Length	Width	Weight
562533	47.59	37.56	18.73	28.86	10.79	12.54	8.18	18.90	18.00	27.50	28.25	35	57 ½	20 ½	109
563209	51.03	41.06	18.75	32.29	14.29	17.34				31.08	31.83				112

Figure 3



UNIT HEIGHT (WITH BASE RAILS)*	UPPER PANEL CLOSE-OFF	USED w/ UNIT#
35″	PANEL 1 – 22″ x 3″	562533
39″	PANEL 1 – 22″ x 3″	563209
43″	PANEL 2 – 22″ x 7″	
47″	PANEL 3 – 22″ x 11″	

Step 1:

- Shutdown the unit and disconnect from electrical power.

Step 2:

- Remove the return access panel. (Save screws.)

Step 3:

- Using CAUTION not to puncture coil tubing, align holes and place the tab on the side panel on the return side of the divider wall and secure with the self-tapping screw provided.

Step 3a: (Optional)

- Install differential enthalpy control and DCV (CO2) sensor according to that kit's instructions. (See products technical service literature.)

Step 4:

- Install economizer in the unit, attaching only left and right side mounting screws. Ensure economizer rails sit flush on the return air-opening lip.
- Use CAUTION not to tear insulation on unit side wall or floor. (Use screws that were removed in Step 2.) (See wiring diagram attached.)

Step 5:

- Screw the side panel in place.

Step 6:

- Remove the economizer top pan and face panels. Locate the unit economizer plug (S1) in the return air compartment (top right corner). Remove the jumper wire and zip-tie it to the economizer wiring harness. Connect the economizer plug (P1) to the unit plug (S1). Inspect all wiring and linkage connections for security and proper operation. Secure all loose wires with a 6" wire tie. Ensure that wires are protected from all sharp edges, and inadvertent grounding, and will not become entangled with filter or moveable vanes.

Step 6a (Optional)

- If installed, make sure differential enthalpy control and DCV (CO2) sensor wiring connections are made per that kit's instructions.

Step 7:

- Remove unit blower access panel and install mixed air sensor in appropriate location (as shown in Figure 4) with two #10 Type A screws provided and then make electrical connection. Replace blower access panel.

Step 8:

- Return power to unit, Setup and configure economizer.(See Appendix A on page 5)

Step 9:

- Install appropriate upper close-off panel and replace face panel and top panel and secure with screws (See

Table 1). Ensure all mounting screws, panels, and doors are installed.

Note to Installer

- When this economizer is used in conjunction with heat pumps, unit WHITE wire from economizer plug pin #7 MUST be relocated from defrost control board “T1” to low voltage terminal board “A1”.
- When this economizer is used with any 2-5 ton package unit (Gas/Electric, A/C, or Heat Pump) WITHOUT A COMMERCIAL THERMOSTAT, the GREEN wire from economizer plug pin #1 MUST be relocated from low voltage terminal board “G” to low voltage terminal board “R” to force dampers to remain in minimum position 100 percent of the time, while in heating mode, to meet the minimum fresh air requirements. When used in conjunction with a commercial thermostat, see Note 2 on wiring diagram.
- Some older 2-5T package heat pumps may not be equipped with a reversing valve isolation relay, required for use with economizers that have a Jade control system. Nordyne kit #922598 is required for these applications.

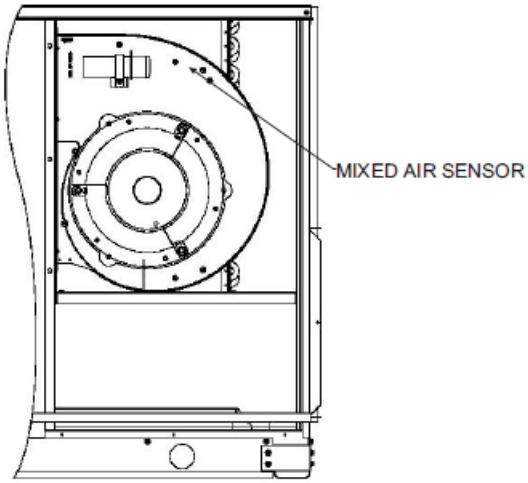


Figure 4a - Gas/Electric

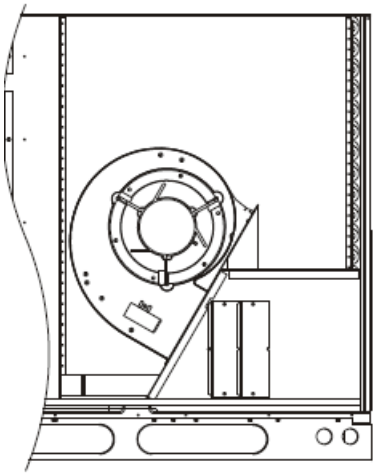


Figure 4b - Electric/Electric or Heat Pump

MAIN TE NANCE

- Return Air Filter Replacement is recommended every 30 days. (16 x 16 x 1)

Step 1:

- Remove the economizer face panel and side screws of the top pan.

Step 2:

- Slide filters out (2) and replace them with new filters.

Step 3:

- Replace the face panel and secure all screws.

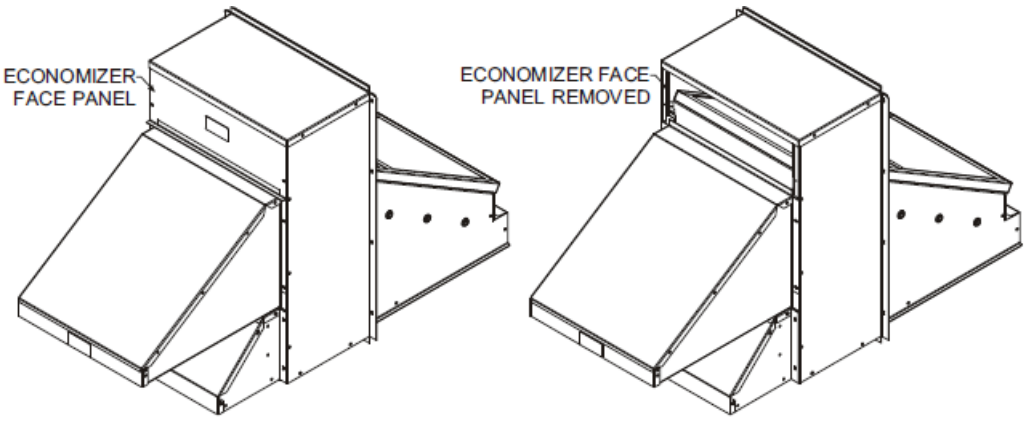


Figure 5

- Fresh air filter cleaning is recommended every 3 months.

Step 1:

- Remove the lower section of the fresh air hood to access washable filters. (4 screws)

Step 2:

- Remove filters (2) and clean with water and a mild detergent.

Step 3:

- Tak ing note of the “Air Flow Direction” marking on the filter frame, re-install the filters and fresh air filter access cover, se cur ing all screws.

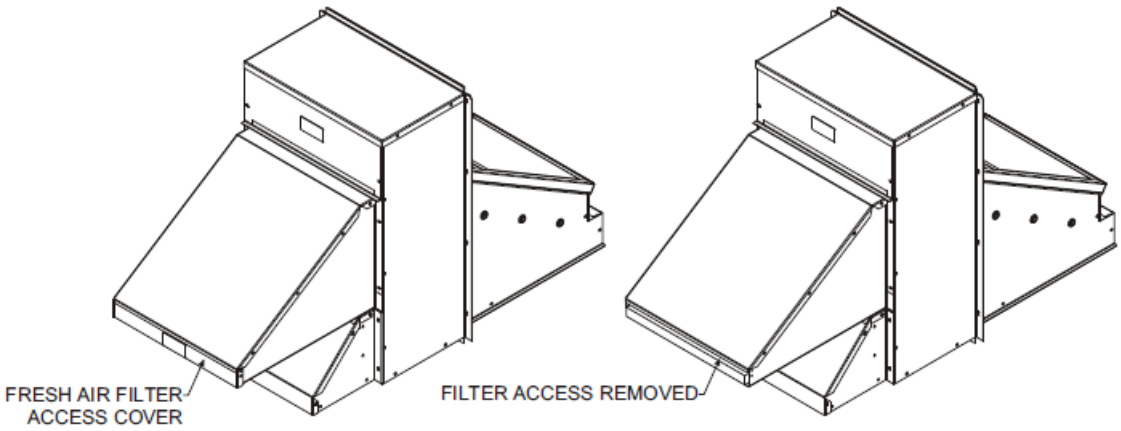


Figure 6

User Interface

- The user interface consists of an LCD and a 4-button keypad on the front of the Economizer module. The LCD is a 16-character by 2-line dot matrix display.

Power UpCycle

- All setpoints and advanced settings are restored after any power loss (a power loss is assumed if voltage falls below 18 Vac). Normal operation is restored when power returns above 18 Vac.

Initial Menu Display

- On initial startup, Honeywell displays on the first line and Economizer W7220 on the second line. After a brief pause, the revision of the software appears on the first line (the second line is blank).
- It then displays W7220 on the first line and STATUS on the second line.

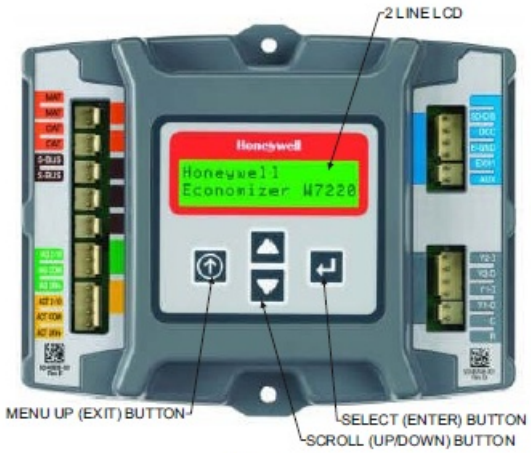


Figure 7

Keypad

- The four navigation buttons illustrated in Figure 7 are used to scroll through the menus and menu items, select menu items, and change parameter and configuration settings.

Us ing the Keypad with Menus

- To use the keypad when working with menus:
- Press the ▲ button to move to the previous menu.
- Press the ▼ button to move to the next menu.
- Press the ↵ button (Enter) to display the first item in the currently displayed menu.
- Press the ↑ button (Menu up) 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:
- Navigate to the desired menu.

- Press the ↵ button (Enter) to display the first item in the currently displayed menu.
- Use the ▲ and ▼ buttons to scroll to the desired parameter.
- Press the ▲ button (Enter) to display the value of the currently displayed item.
- Press the ▼ button to increase (change) the displayed parameter value.a
- Press the ↵ button to decrease (change) the displayed parameter value.a
- Press the button to accept the displayed value and store it in non-volatile RAM.
- When the value is accepted, CHANGE STORED is displayed on the LCD.
- Press the ↵ button (Enter) to return to the current menu parameter.
- Press the ↑ button (MenuUp/Exit) to return to the previous menu.
- When values are displayed, pressing and holding the ▲ or ▼ button causes the display to au to matically in cre ment.

Menu Structure

- The following tables illustrate the complete hierarchy of menus and parameters for the JADE™ Economizer system.

The Menus in display order are:

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

IMPORTANT

- 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 and only MIN POS will display. If you have a CO2 sensor, the DCV MIN and DCV MAX will appear AND if you have 2-speed fan DCV MIN (high and low speed) and
- DCV MAX (high and low speed will appear).

SETUP AND CONFIGURATION

- Before being placed into service, the JADE™ Economizer module must be set up and configured for the installed system. Use the System Setup menu, the Advanced Setup menu (if necessary), and the Setpoints menu to accomplish this.

Time-out and Screen saver

- When no buttons have been pressed for 10 minutes, the LCD is a screen saver, which cycles through the

Status items. Each Status item displays in turn and cycles to the next item after 5 seconds.

STATUS MENU

Parameter	Parameter Default Value	Parameter Range and Increment	Notes
ECON AVAIL	NO	YES/NO	YES = economizing available; the system can use Outdoor Air for free cooling when required.
ECONOMIZING	NO	YES/NO	YES = Outdoor Air being used for 1st 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	COOL	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 input for cooling stage 1 or heat pump heating 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 input for second stage cooling or heat pump heating stage 2. 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	_ _._ºF	-40 to 150ºF	Displays value of measured mixed air from MAT sensor. Displays -.- if not connected, short, or out-of-range.
DA TEMP	_ _._ºF	-40 to 150ºF	Displays when Discharge Air Sylk Bus sensor is connected and displays measured discharge air temperature. Displays -.-°F if sensor sends invalid value, if not connected, short or out-of-range.
OA TEMP	_ _._ ºF	-40 to 140ºF	Displays measured value of outdoor air temperature. Displays -°F if the sensor sends an invalid value if not connected, short or out-of-range.
OA HUM	_ _%	0 to 100%	Displays measured value of outdoor humidity from OA Sylkbus sensor. Displays -% if not connected, short, or out-of-range.
RA TEMP	_ _._ºF	0 to 140ºF	If the field-installed Dual Enthalpy sensor is connected, displays the measured value of return air temperature. Displays -°F if the sensor sends an invalid value if not connected, short or out-of-range.

RA HUM	_ _%	0 to 100%	If the field-installed Dual Enthalpy sensor is connected, displays the measured value of return air humidity. Displays -% if sensor sends invalid value if not connected, short or out-of-range.
IN CO2	_ _ _ ppm	“0 to 2000 (3500) ppm”	If the field-installed CO2 sensor is connected, displays the value of measured CO2. Invalid if not connected, short or out-of-range. May be adjusted in the Advanced menu by Zero offset and Span.
DCV STATUS	n/a	n/a	If the field installed CO2 sensor is connected, displays ON if above the setpoint and OFF if below the setpoint.
DAMPER OUT	_ _%	0 to 100%	Displays output position to the damper actuator. When used with Honeywell communicating actuator the damper out is in XX.X%
ACT POS.	n/a	0 to 100%	Displays the actual position of the actuator.
ACT COUNT	n/a	1 to 65,535	Displays the number of times the actuator has cycled. 1 Cycle equals 180° of movement in any direction.
ACTUATOR	n/a	OK/Alarm	Displays Error on ALARM MENU if voltage or torque is below actuator range.
EXH1 OUT	OFF	ON/OFF	Output of EXH1 terminal. Displays ON when damper position reaches programmed percentage setpoint. ON = 24 Vac Output; OFF = No Output.
EXH2 OUT	OFF	ON/OFF	The output of the AUX1 O terminal Displays ON when the damper position reaches the programmed percentage setpoint ON = 24 Vac Output, OFF = No Output; displays only if AUX1 O = EXH2
ERV	OFF	ON/OFF	Output of AUX1 O terminal, ON = 24 Vac Output, OFF = No Output; displays only if AUX1 O = ERV
MECH COOL ON	0	0, 1, or 2	Displays the number of mechanical cooling stages that are active.
FAN SPEED	n/a	LOW/HIGH	Displays the speed of the fan on a 2-speed fan unit
W (HEAT IN)	n/a	ON/OFF	Displays the status of heat on a 2-speed fan unit.

SETPOINTS MENU

Parameter	**Parameter Default Value**	**Parameter Range and a Increment**	**Notes**

MAT SET	53ºF	38 to 70ºF; increment by 1	The economizer will modulate the OA damper to maintain the mixed air temperature at the setpoint.
LOW T LOCK	32ºF	-45 to 80ºF; increment by 1	Setpoint determines outdoor temperature when the mechanical cooling cannot be turned on. Commonly referred to as the Compressor lockout. At or below the setpoint the Y1-O and Y2-O will not be energized on the controller.
DRYBLB SET	63ºF	48 to 80ºF; increment by 1	Setpoint determines where the economizer will assume outdoor air temperature is good for free cooling; e.g.; at 63 ºF setpoint unit will economise at 62 ºF and below and not economize at 64 ºF and above. There is a 2 ºF deadband.
ENTH CURVE	ES3	ES1, ES2, ES3, ES4, or ES5	Does not display if a field-installed Dual Enthalpy kit is connected. Enthalpy boundary “curves” for economizing using single enthalpy comparison between outdoor air enthalpy and setpoint.
DCV SET	1100 ppm	500 to 2000 ppm increment by 100	Displays ONLY if the field installed CO2 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	2.8 V	2 to 10 Vdc	Displays ONLY if a CO2 sensor is NOT connected.
			With 2-speed fan units MIN POS L (low speed fan) and MIN POS H (high speed fan) settings are required. The default for MIN POS L is 3.2V and MIN POS H is 2.8V
VENTMAX	2.8 V	2 to 10 Vdc	Displays only if a field-installed CO2 sensor is connected. Used for Vbz (ventilation max cfm) setpoint. VENTMAX is the same setting as MIN POS would be if you did not have the CO2 sensor.
		100 to 9990 cfm increment by 10	If OA, MA, RA and CO2 sensors are connected and DCV CAL ENABLE is set to AUTO mode, the OA dampers are controlled by CFM and display from 100 to 9990 cfm.
		2 to 10 Vdc	**With 2-speed fan units VENTMAX L (low speed fan) and VENTMAX H (high speed fan) settings are required. Default for VENTMAX L is 3.2V and VENTMAX H is 2.8V.**
VENTMIN	2.25 V	2 to 10 Vdc	Displays only if the field-installed CO2 sensor is connected. Used for Va (ventilation min cfm) setpoint. This is the ventilation requirement for less than maximum occupancy of the space.
		100 to 9990 cfm increment by 10	If OA, MA, RA and CO2 sensors are connected and DCV CAL ENABLE is set to AUTO mode, the OA dampers are controlled by CFM and display from 100 to 9990 cfm.

		2 to 10 Vdc	**With 2-speed fan units VENTMIN L (low speed fan) and VENTMIN H (high speed fan) settings are required. The default for VENTMIN L i s 2.5V and VENTMIN H is 2.25V.**
b ERV OAT SP	32ºF	0 to 50ºF; in crement by 1	Only when AUX1 O = ERV
EXH1 SET	50%	0 to 100%; i ncrement by 1	Setpoint for OA damper position when exhaust fan 1 is powered by the e conomizer. With 2-speed fan units Exh1 L (low-speed fan) and Exh1 H (high-speed fan) s ettings are required. The default for Exh1 L is 65% and Exh1 H is 50%.
EXH2 SET	75%	0 to 100%; i ncrement by 1	Setpoint for OA damper position when exhaust fan 2 is powered by the e conomizer. Only used when AUX1 O is set to EHX2. With 2-speed fan units Exh2 L (low speed fan) and Exh2 H (high speed f an) settings are required. The default for Exh2 L is 80% and Exh2 H is 7 5%.

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

SYSTEM SETUP MENU

Parameter	**Param eter De fault V alue**	**Parameter Range and an Increme nt**	**Notes**
INSTALL	01/01/2 011		Display order = MM/DD/YY. Setting order = DD, MM, then YY.
UNITS DEG	ºF	ºF or ºC	Sets economizer controller in degrees Fahrenheit or Celsius.
EQUIPMENT	CONV	CONV HP	CONV = conventional. HP O/B = Enables Heat Pump mode. Use AUX2 I for Heat Pump input from the thermostat or controller.

AUX2 I	N/A	Shutdown (SD) Heat (W1) HP(O) HP(B)	In CONV mode: SD = Enables configuration of shutdown (default); W = Informs controller that system is in heating mode. **NOTE: If using the 2-speed fan mode, you must program CONV mode for W. Shutdown is not available in the two-speed fan mode .** In HP O/B mode: HP(O) = energize heat pump on Cool (default); HP(B) = energize heat pump on Heat.
FAN TYPE	1 spee d	1 speed/ 2 speed	Sets economizer controller for operation of 1-speed or 2-speed supply fan. The controller does not control the fan but positions the OA and R A dampers to the heating or cooling mode. **NOTE: The 2-speed fan option also needs Heat (W1) programmed in AUX 2 In.**
FAN CFM	5000cf m	100 to 1500 0 cfm; incre ment by 100	This is the capacity of the RTU. The value is found on the label from t he RTU manufacturer. The cfm of the fan is only used with DCV CAL E NABLE AUO
AUX1 OUT	NONE	NONE ERV EXH2 SYS	Ÿ NONE = not configured (output is not used) Ÿ ERV= Energy Recovery Ventilator Ÿ EXH2 = second damper position relay closure for second exhaust fa n. Ÿ SYS = use output as an alarm signal
OCC	INPUT	INPUT or A LWAYS	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 the program to “ALWAYS” OR add a jumpe r from terminal R to the OCC terminal.
FACTORY DE FAULT	NO	NO or YES	Resets all set points to factory defaults when set to YES. LCD will briefl y flash YES and change to NO but all parameters will change to factory default values.

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

ADVANCE SETUP MENU

Parameter	**Param eter De fault V alue**	**Parameter Range and an Increm ent**	**Notes**

MA LO SET	45ºF	35 to 55ºF increment by 1º	Temp to activate Freeze Protection (close damper or modulate to MIN POS if temp falls below set value)
FREEZE POS	CLO	CLO MIN	Damper position when freeze protection is active (closed or MIN POS).
CO2 ZERO	0 ppm	0 to 500 ppm increment by 10	Displays only if the field-installed CO2 sensor is connected. CO2 ppm level to match CO2 sensor start level.
CO2 SPAN	2000 ppm	1000 to 3000 ppm; increment by 50	Displays only if the field-installed CO2 sensor is connected. CO2 ppm span to match CO2 sensor; e.g.; 500-1500 sensor output would be 500 CO2 zero and 1000 CO2 span. See note on page 6 for the C7632 CO2 sensor.
STG3 DAY	2.0h	0 min, 5 min, 15 min, then 15 min intervals. Up to 4 hours or OFF	Delay after stage 2 for cool has been active. Turns on the 2nd stage of mechanical cooling when the economizer is 1st stage call and mechanical cooling is the 2nd stage call. Allows three stages of cooling, 1 economizer and 2 mechanical. OFF = no Stage 3 cooling.
SD DMPR POS	CLO	CLO OPN	Indicates shutdown signal from space thermostat. When the controller receives 24 Vac input on the SD terminal in conventional mode, the OA damper will open if programmed for OPN and the OA damper will close if programmed for CLO. All other controls, e.g., Y1-O, Y2-O, EXH1, 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 sensors (RA, OA, MA and CO2). This operation is not operable with a 2-speed fan unit.
MAT T CAL	0.0 F°	+/-2.5F°	Allows for the operator to adjust for an out-of-calibration mixed air temperature sensor.
OAS T CAL	0.0F°	+/-2.5F°	Allows for the operator to adjust for an out-of-calibration outdoor air temperature sensor.
OAS H CAL	0% RH	+/-10% RH	Allows for the operator to adjust for an out of calibration outdoor air humidity sensor.
RA T CAL	0.0F°	+/-2.5F°	If field field-installed Dual Enthalpy sensor is connected, allows for the operator to adjust for an out of calibration temperature sensor.
RA H CAL	0% RH	+/-10% RH	If field field-installed Dual Enthalpy sensor is connected, allows for the operator to adjust for an out of calibration humidity sensor.

DA T CAL	0.0 F°	+/-2.5F°	Allows for the operator to adjust for an out of calibration Discharge Air Sylk Bus temperature sensor.
2SP FAN DE LAY	5 Minu tes	0 to 20 min utes in 1-mi nute increments.	When in economizing mode this is the delay for the high-speed fan to t ry to satisfy the call for second-stage cooling before the first-stage mec hanical cooling is enabled.

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

CHECKOUT MENU

Parameter	**Paramet er Defaul t Value**	**Parameter Range and an Increme nt**	**Notes**
DAMPER VMIN -HS	n/a	n/a	Positions damper to VMIN position
DAMPER VMA X-HS	n/a	n/a	Positions damper to VMAX position.
DAMPER VMA X-LS			**With 2-speed fan units, the damper will position to VMAX low -speed fan.**
DAMPER OPE NS	n/a	n/a	Positions damper to the full open position. Exhaust fan contacts a re enabled during the DAMPER OPEN test. Make sure you pause in this mode to allow for exhaust contacts to energize due to the d elay in the system.
DAMPER CLO SE	n/a	n/a	Positions outside air damper to the fully closed position.
CONNECT Y1- O	n/a	n/a	Closes the Y1-O relay (Y1-O). See CAUTION below
CONNECT Y2- O	n/a	n/a	Closes the Y2-O relay (Y2-O). See the CAUTION below
CONNECT AU X1-O	n/a	n/a	Energizes the AUX1-O output. If the AUX1-O setting is: Ÿ NONE – no action taken Ÿ ERV – 24 Vac out. Turns on or signals an ERV that the condition s are not good for economizing but are good for ERV operation.b Ÿ SYS – 24 Vac out. Issues a system alarm.
CONNECT EX H1	n/a	n/a	Closes the power exhaust fan 1 relay (EXH1)

- **b** When values are displayed, pressing and holding the p or q button causes the display to automatically increment.

- 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
- **c** ERV terminal will be energized when the OA is below the ERV OAT setpoint in the setpoint menu.
- After 10 minutes without a command or mode change, the controller will change to normal operation.

CHECK OUT

- Inspect all wiring connections at the Economizer module's terminals, and verify compliance with the installation wiring diagrams.
- For checkout, review the Status of each configured parameter and perform the Checkout tests.
- **Note:** See "Interface Overview" on page 5. for information about menu navigation and use of the keypad.

WARNING: Electrical Shock Hazard

- Can cause severe injury, death or property damage. Disconnect the power supply before beginning wiring or making wiring connections, to prevent electrical shock or equipment damage.
- If any wiring changes are required, first be sure to remove power from the Economizer module before starting work. Pay particular attention to verifying the power connection (24 Vac).

Power Up

- After the module is mounted and wired, apply power.

Power Up Delay

- Upon power-up (or after a power outage or brownout), the W7220 controller module begins a 5-minute power-up delay before enabling mechanical cooling.

Power Loss (Out age or Brown out)

- All setpoints and advanced settings are restored after any power loss or interruption.
- **Note:** If 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.
- All settings are stored in non-volatile flash memory.
- **Status**
- Use the Status Menu to check the parameter values for the various devices and sensors configured.

Check out Tests

- Use the Checkout Menu to test the damper operation and any configured outputs. Only items that are configured are shown in the Checkout menu.

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 on the display.
4. Press the ↵ button to start the test.
5. The unit pauses and then displays TEST RUNNING.
6. Press the button ↑ (Menu up) to end the test (e.g. turn off the relay). Test stops automatically after 10 minutes without a command or mode change, and will resume normal operation.

- The checkout tests can all be performed at the time of installation or any time during the operation of the system as a test that the system is operable.

CAUTION

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

ALARM MENU

Parameter	**Parameter Default Value**	**Parameter Range and a Increment**	**Notes**
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 AUX1 O is set to SYS and there is any alarm (e.g., failed sensors, etc.), the AUX1 O terminal has 24 Vac out.
ACT UNDER V	n/a	n/a	The voltage received by the Actuator is above the expected range
ACT OVER V	n/a	n/a	The voltage received by the Actuator is below the expected range
ACT STALLED	n/a	n/a	The actuator stopped before achieving the commanded position

- When values are displayed, pressing and holding the p or q button causes the display to automatically increment.

Alarms

- The Economizer module provides alarm messages that are displayed on the 2-line LCD.
- **NOTE:** Upon power up, the module waits 60 minutes before checking for alarms. This allows time for all the configured devices (e.g. sensors, actuator) to become operational. The exception is the MA sensor which will alarm immediately.
- 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 menu at any time.

Clearing Alarms

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

To clear an alarm, perform the following:

1. Navigate to the desired alarm.
2. Press the 8 button.
3. ERASE? displays.
4. Press the 8 button.
5. ALARM ERASED displays.
6. Press the button Ó (MenuUp/Exit) to complete the action and return to the previous menu.

NOTE: If an alarm still exists after you clear it, it redisplays within 5 seconds.

SEQUENCE OF OPERATION

Dry Bulb Operation No DCV (CO2 sensor) – 1 Speed Fan.								
DCV	**Is OA Good to economize?**	**Y1-I**	**Y2-I**	**FAN SPD**	**Y1-O**	**Y2-O**	**Occupied**	**Unoccupied**
None	No	Off	Off	High	0-v/Off	0-v/Off	MIN POS	Closed
		On	Off	High	24-v/On	0-v/Off	MIN POS	Closed
		On	On	High	24-v/On	24-v/On	MIN POS	Closed
None	Yes	Off	Off	High	0-v/Off	0-v/Off	MIN POS	Closed
		On	Off	High	0-v/Off	0-v/Off	MIN POS to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/Off a	MIN POS to Full-Open	Closed to Full-Open

With stage 3 delay (STG3 DLY) in Advanced setup, the menu can turn on the 2nd stage of mechanical cooling Y2

–O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Dry Bulb Operation With DCV (CO2 sensor) – 1 Speed Fan.								
DCV	**Is OA Good to economize?**	**Y1-I**	**Y2-I**	**FAN SPD**	**Y1-O**	**Y2-O**	**Occupied**	**Unoccupied**
Below CO2 set	No	Off	Off	High	0-v/Off	0-v/Off	VENTMIN	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	VENTMIN	Closed
		On	Off	High	0-v/Off	0-v/Off	VENTMIN to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/Off a	VENTMIN to Full-Open	Closed to Full-Open
Above CO2 set	No	Off	Off	High	0-v/Off	0-v/Off	VENTMIN to VENTMAX	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN to VENTMAX	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN to VENTMAX	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	VENTMIN to VENTMAX	Closed
		On	Off	High	0-v/Off	0-v/Off	VENTMIN to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/Off a	VENTMIN to Full-Open	Closed to Full-Open

With stage 3 delay (STG3 DLY) in Advanced setup, the menu can turn on the 2nd stage of mechanical cooling Y2 –O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Enthalpy Operation No DCV (CO2 sensor) – 1 Speed Fan.								
DCV	**Is OA Good to economize?**	**Y1-I**	**Y2-I**	**FAN SPD**	**Y1-O**	**Y2-O**	**Occupied**	**Unoccupied**
None	No	Off	Off	High	0-v/Off	0-v/Off	MIN POS	Closed
		On	Off	High	24-v/On	0-v/Off	MIN POS	Closed
		On	On	High	24-v/On	24-v/On	MIN POS	Closed
None	Yes	Off	Off	High	0-v/Off	0-v/Off	MIN POS	Closed
		On	Off	High	0-v/Off	0-v/Off	MIN POS to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	a 0-v/Off	MIN POS to Full-Open	Closed to Full-Open

With stage 3 delay (STG3 DLY) in Advanced setup, the menu can turn on the 2nd stage of mechanical cooling Y2 –O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Enthalpy Operation With DCV (CO2 sensor) – 1 Speed Fan.								
DCV	**Is OA Good to economize?**	**Y1-I**	**Y2-I**	**FAN SPD**	**Y1-O**	**Y2-O**	**Occupied**	**Unoccupied**
Below set	No	Off	Off	High	0-v/Off	0-v/Off	VENTMIN	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	VENTMIN	Closed
		On	Off	High	0-v/Off	0-v/Off	VENTMIN to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/Off a	VENTMIN to Full-Open	Closed to Full-Open
Above set	No	Off	Off	High	0-v/Off	0-v/Off	VENTMIN to VENTMAX	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN H to VENTMAX	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	Off	High	0-v/Off	0-v/Off	VENTMIN to Full-Open	Closed to Full-Open
		On	On	High	DELAY (b) 24-v/On	a 0-v/Off	VENTMIN to Full-Open	Closed to Full-Open

With stage 3 delay (STG3 DLY) in the Advanced setup menu can turn on the 2nd stage of mechanical cooling Y2 –O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Dry Bulb Operation No DCV (CO2 sensor) – 2 Speed Fan.								
DCV	**Is OA Good to economize?**	**Y1-I**	**Y2-I**	**FAN SPD**	**Y1-O**	**Y2-O**	**Occupied**	**Unoccupied**
None	No	Off	Off	Low	0-v/Off	0-v/Off	MIN POS L	Closed
		On	Off	Low	24-v/On	0-v/Off	MIN POS L	Closed
		On	On	High	24-v/On	24-v/On	MIN POS H	Closed
None	Yes	Off	Off	Low	0-v/Off	0-v/Off	MIN POS L	Closed
		On	Off	Low	0-v/Off	0-v/Off	MIN POS L to Full-Open	Closed to Full-Open
		On	On	High	b DELAY 24-v/On	a 0-v/Off	MIN POS H to Full-Open	Closed to Full-Open

- With stage 3 delay (STG3 DLY) in the Advanced setup menu can turn on the 2nd stage of mechanical cooling Y2 –O after the delay if the call for Y1-I and Y2-I have not been satisfied.
- With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high-speed fan to try to satisfy the call for second-stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.

Dry Bulb Operation With DCV (CO2 sensor) – 2 Speed Fan.								
DCV	**OA Good to economize?**	**Y1-I**	**Y2-I**	**FAN SPD**	**Y1-O**	**Y2-O**	**Occupied**	**Unoccupied**
Below set	No	Off	Off	Low	0-v/Off	0-v/Off	VENTMIN L	Closed
		On	Off	Low	24-v/On	0-v/Off	VENTMIN L	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN H	Closed
	Yes	Off	Off	Low	0-v/Off	0-v/Off	VENTMIN L	Closed
		On	Off	Low	0-v/Off	0-v/Off	VENTMIN L to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/Off a	VENTMIN H to Full-Open	Closed to Full-Open
Above set	No	Off	Off	Low	0-v/Off	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	Off	Low	24-v/On	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN H to VENTMAX	Closed
	Yes	Off	Off	Low	0-v/Off	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	Off	Low	0-v/Off	0-v/Off	VENTMIN L to Full-Open	Closed to Full-Open
		On	On	High	b DELAY 24-v/On	a 0-v/Off	VENTMIN H to Full-Open	Closed to Full-Open

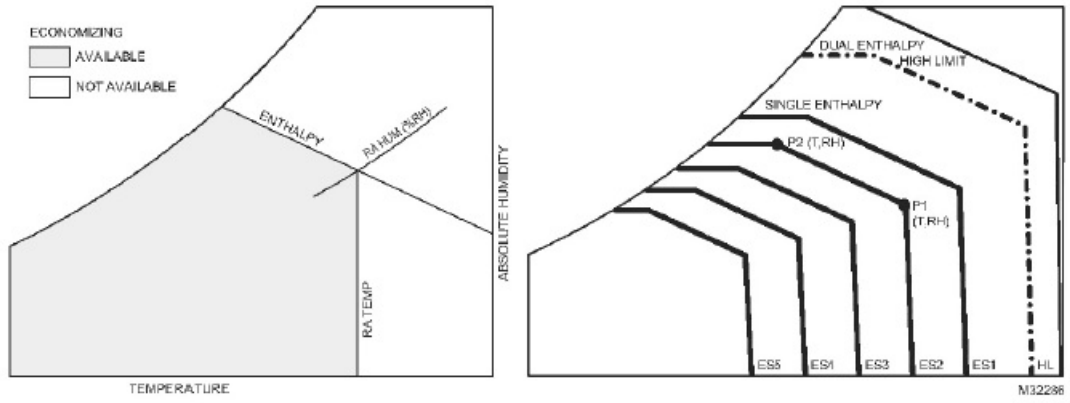
- **a** With stage 3 delay (STG3 DLY) in the Advanced setup menu can turn on the 2nd stage of mechanical cooling Y2 –O after the delay if the call for Y1-I and Y2-I have not been satisfied.
- **b** With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high-speed fan to try to satisfy the call for second-stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.

Enthalpy Operation No DCV (CO2 sensor) – 2 Speed Fan.								
DCV	**OA Good to econo mize?**	**Y1-I**	**Y2-I**	**FAN S PD**	**Y1-O**	**Y2-O**	**Occupied**	**Unoccupied**
NO C O2 SE NSOR	No	Off	Off	Low	0-v/Off	0-v/Off	MIN POS L	Closed
		On	Off	Low	24-v/O n	0-v/Off	MIN POS L	Closed
		On	On	High	24-v/O n	24-v/O n	MIN POS H	Closed
	Yes	Off	Off	Low	0-v/Off	0-v/Off	MIN POS L	Closed
		On	Off	Low	0-v/Off	0-v/Off	MIN POS L to Full-Open	Closed to Full-Open
		On	On	High	b DELAY 24-v/O n	a 0-v/Off	MIN POS H to Full-Open	Closed to Full-Open

- With stage 3 delay (STG3 DLY) in the Advanced setup menu can turn on the 2nd stage of mechanical cooling Y2 –O after the delay if the call for Y1-I and Y2-I have not been satisfied.
- **b** With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high-speed fan to try to satisfy the call for second-stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.

Dry Bulb Operation With DCV (CO2 sensor) – 2 Speed Fan.								
DCV	**OA Good to econo mize?**	**Y1-I**	**Y2-I**	**FAN S PD**	**Y1-O**	**Y2-O**	**Occupied**	**Unoccupied**
Below set	No	Off	Off	Low	0-v/Off	0-v/Off	VENTMIN L	Closed
		On	Off	Low	24-v/On	0-v/Off	VENTMIN L	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN H	Closed
	Yes	Off	Off	Low	0-v/Off	0-v/Off	VENTMIN L	Closed
		On	Off	Low	0-v/Off	0-v/Off	VENTMIN L to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/Off a	VENTMIN H to Full-Open	Closed to Full-Open
Above set	No	Off	Off	Low	0-v/Off	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	Off	Low	24-v/On	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN H to VENTMAX	Closed
	Yes	Off	Off	Low	0-v/Off	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	Off	Low	0-v/Off	0-v/Off	VENTMIN L to Full-Open	Closed to Full-Open
		On	On	High	b DELAY 24-v/On	a 0-v/Off	VENTMIN H to Full-Open	Closed to Full-Open

- With stage 3 delay (STG3 DLY) in the Advanced setup menu can turn on the 2nd stage of mechanical cooling Y2 –O after the delay if the call for Y1-I and Y2-I have not been satisfied.
- **b** With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high-speed fan to try to satisfy the call for second-stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.



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. 18 shows the new single enthalpy boundaries in the W7220. There are 5 boundaries (setpoints ES1 through ES5), which are defined by dry bulb temperature, enthalpy and dew point.
- Refer to the Table above for the ENTH CURVE setpoint values.
- To use enthalpy the W7220 must have a C7400S Sylkbus sensor for OA. The W7220 calculates the enthalpy and dew point 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 conditions are above the selected boundary, the conditions are not good to economize and the mode is set to NO.
- Figure ## 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 when a compressor stage is energized.
- The table above provides the values for each boundary limit.

Two-Speed Fan Option

- The later versions of the W7220 Jade controller can work with a system using a 2-speed supply fan.

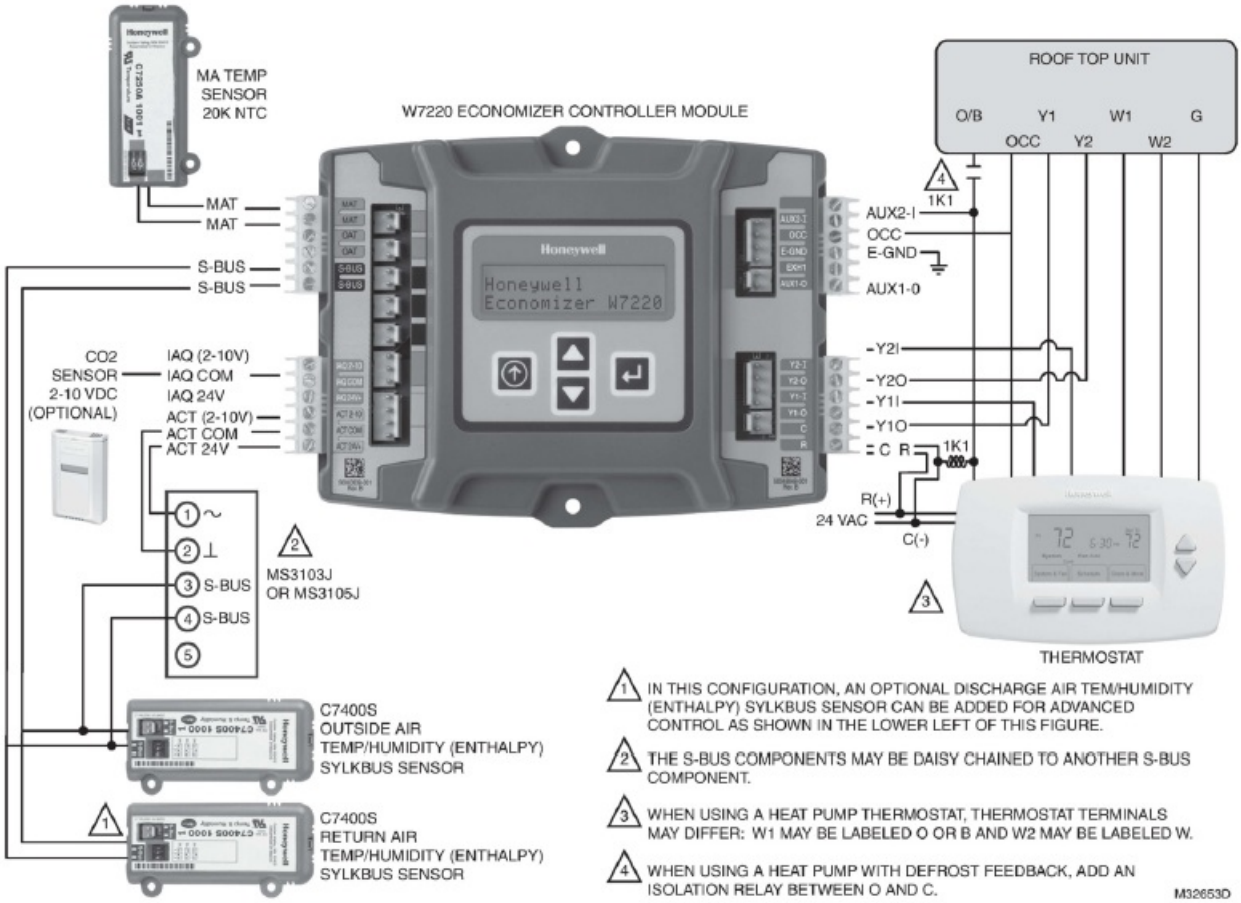
- The W7220 does not control the supply directly but uses the following input status to determine the speed of the supply fan and controls the OA damper to the required position.

State	**Fan Speed**
OCC	Low
Y1	Low
Y2	High
W	High

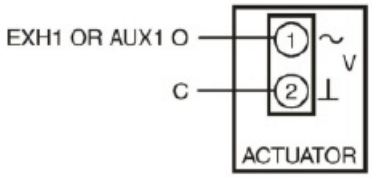
- The W (heating mode) is not controlled by the W7220 but it requires the status to know where to position the OA damper for a minimum position for the fan speed.
- The 2-speed fan delay is available when the system is programmed for the 2-speed fan (in the System Setup menu item). The 2-speed fan delay is defaulted to 5 minutes and can be changed in the Advanced Setup menu item.
- When the unit has a call for Y1 In and in the free cooling mode and there is a call for Y2 In, the 2-speed fan delay starts and the OA damper will modulate 100% open, the supply fan should be set to high speed by the unit controller.

After the delay one of two actions will happen:

- The Y2 In call will be satisfied with the damper 100% open and fan on high speed and the call will turn off OR.
- If the call for additional cooling in the space has not been satisfied then the first stage of chancal cooling will be enabled through Y1 Out or Y2 Out.



- **Figure 8** Economizer with Sylk Bus sensors for enthalpy configuration with a Honeywell MS3103J or MS3105J communicating actuators.



NOTE: ON/OFF ACTUATORS CAN BE USED ON THE EXH1 OR AUX1 O TERMINAL WITH GROUND TO THE C TERMINAL. WHEN PROGRAMMING THE EXH1 OR AUX1 O, THE % IS THE PERCENT OPEN POSITION OF THE OUTDOOR AIR DAMPER WHEN THE EXH1 OR AUX1 O TERMINAL IS ENERGIZED AND THE 2-POS DAMPER GOES OPEN. IF USING THE AUX1 O TERMINAL PROGRAM AUX1 O FOR EXH2.

M33409

Figure 9
2-position actuator

Wiring Diagram

HARNESS ENDS AT P1

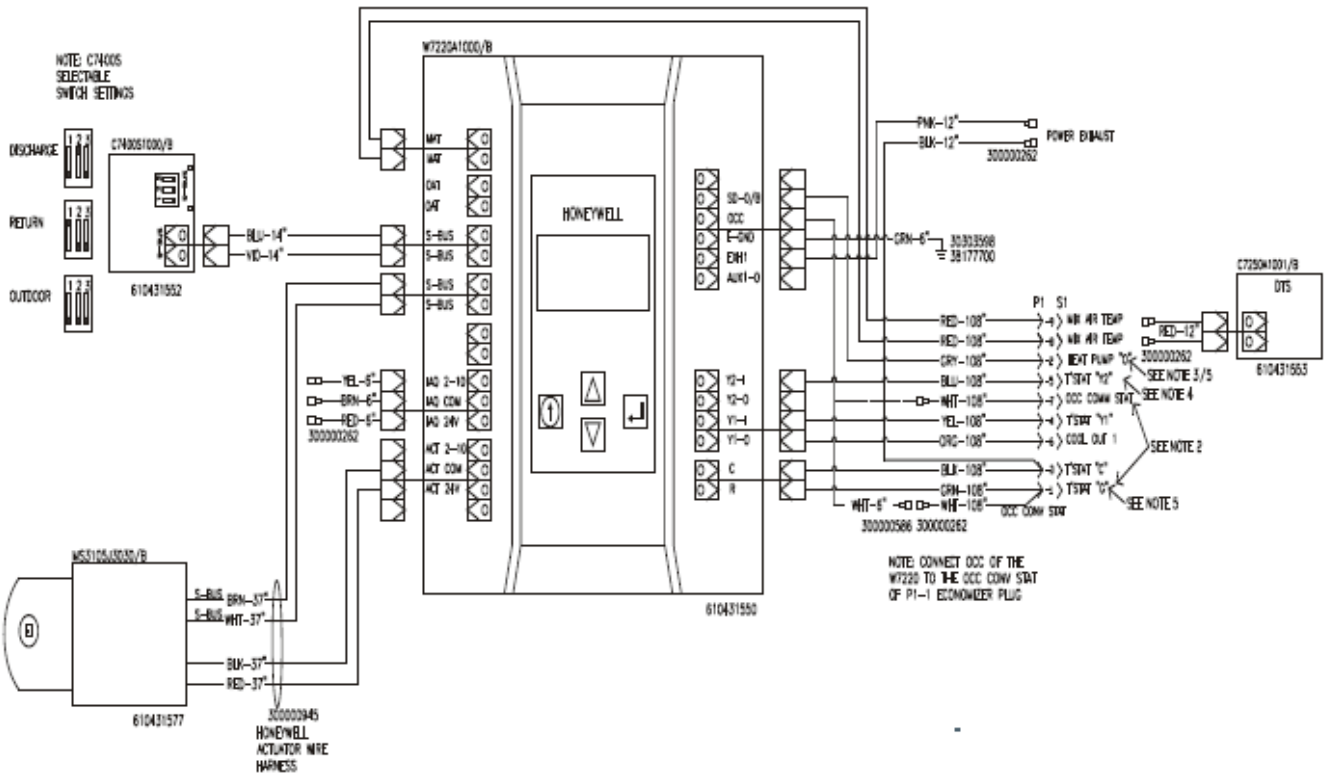
COMPONENT CODE

Nordyne#	Honeywell#	Description
622754	MS3105J3030	Damper Actuator 24v
626621	W7220A1000	Logic Module
626622	C7400S1000	Fresh Air Enthalpy Sensor
626623	C7250A1001	Mixed Air Temperature Sensor
-------	P1	Male Interface Unit Plug
-------	S1	Male Interface Unit Plug

WIRE COLOR CODE

BLK	Black	BLU	Blue
BRN	Brown	GRN	Green
GRY	Gray	ORG	Orange
PNK	Pink	RED	Red
TAN	Tan	VIO	Violet
WHT	White	YEL	Yellow

Revision	Change	Date



Notes:

1. Unit wiring shown as reference only. Check unit wiring for actual unit wiring.
2. Standard connection shown. When this economizer is used in conjunction with a commercial thermostat that has an OCC connection, unplug white wire with insulated terminal from pin # 1 and plug into white wire from pin # 7. Connect the thermostat OCC output to A 1 terminal on the unit low voltage terminal board. (On older models without A1 terminal connection a field supplied wire can be routed and connected to the unplugged white wire from Pin # 1 to JADE OCC)
3. Economizer pin location S1-2 connected to the following:
   - Package Gas/Electrics – "W1" or Gas valve
   - Package Air Conditioners – "W1"
   - Package Heat Pumps – "O" for Cooling mode of operation
4. For mechanical cooling (compressor) to energize during economizer cooling mode of operation, a thermostat "Y2" call must be present. A 2 stage cooling thermostat is required for this operation.
5. See unit low voltage wiring instruction changes required for economizers equipped with the Honeywell W220 JADE control module and Page 3 of these instructions.

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DOWNFLOW ECONOMIZER # 562533 / 563209
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Fax: (972) 243-0340

Date:	February 18, 2015
Supersedes:	
Drawn by:	MGL
Unit #:	47-366-06
Diagram#:	4736606W
Approved by:	

Documents / Resources

	**GIBSON 562533 Package Unit Modulating Economizer** [pdf] Instruction Manual 562533 Package Unit Modulating Economizer, 562533, Package Unit Modulating Economizer, Unit Modulating Economizer, Modulating Economizer, Economizer

References

- TCPDF
- User Manual