MicroMetl

Since 1965

OA3-MRT69SA-D20S 3-POSITION OUTDOOR AIR ULTRA LOW LEAK DAMPER FOR ONE OR TWO SPEED UNITS

Installation Instructions

Part No: OA3-MRT69CB-D20S

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SAFETY CONSIDERATIONS

Installation of this accessory can be hazardous due to system pressures, electrical components and equipment, and equipment locations (such as a roof or elevated surface). Only trained qualified installers and service technicians should install, start-up, and service this equipment.

When installing this accessory, observe precautions in the literature and on any labels attached to the equipment and all other safety precautions may apply.

- Follow all safety codes.
- Wear safety glasses and work gloves.
- Use care in handling and installing the accessory.

It is important to 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, CAUTION, and NOTE. 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 hazards 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 to unit and install lock(s) and lockout tag(s). Unit may have more than one power switch. Ensure electrical service to rooftop unit agrees with voltage and amperage listed on the unit rating plate.

⚠ 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.

⚠ CAUTION

Failure to follow this caution may result in personal injury and damage to the unit. Cover the duct opening as a precaution so objects cannot fall into the return duct opening. Be sure to remove the cover when installation is complete.

Table 1. Blank-off Usage

RTU	*Cabinet Height	Damper Part Number	Blank Off Used
Short Cabinet	49-3/8"	OA3-MRT69CB-D20S	No
Tall Cabinet	57-3/8"		Yes

GENERAL

The 3-position outdoor air package can be used in either a vertical or horizontal airflow configuration. The damper actuator is controlled by the Honeywell W7220 economizer logic. The minimum positions are set via the economizer controller from 2-10 Vdc. The 3-position damper can be used on 49 3/8" tall units and 57 3/8" tall units. A blank-off panel is provided for use on the 57 3/8" tall unit only.

Table 2. Packaging List

Quantity	Description
1	Damper, Assembled, includes W7220 Controller, including harness, and O/A Panel
1	O/A Hood Top
1	O/A Hood Base
2	O/A Hood Sides
3	Hood Filter Dividers
4	Hood Aluminum Filters
1	*Outside Air Blank-off Panel (8" Tall)
1	Hardware Bag

*Used on 57 3/8" tall units only.

INSTALLATION

1. Turn off unit power supply and install lockout tag. For gas units, also turn off the gas supply.

2. Determine the quantity of ventilation air required for the served space. Record the percent of outside air required for use in ***CONTROLLER SETUP*** (See page 5.)

3. Remove the upper panel (provided with the HVAC unit) on the end of the unit to expose part of the return section.(See Fig. 1.) Save the screws for use later when replacing the panel. The panel can be discarded.

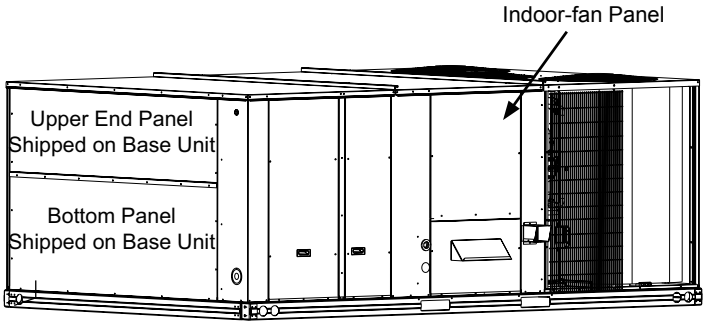

Fig. 1 Upper and Bottom Panel on End of Unit

4. Remove the unit left side panel (See Fig 2.)

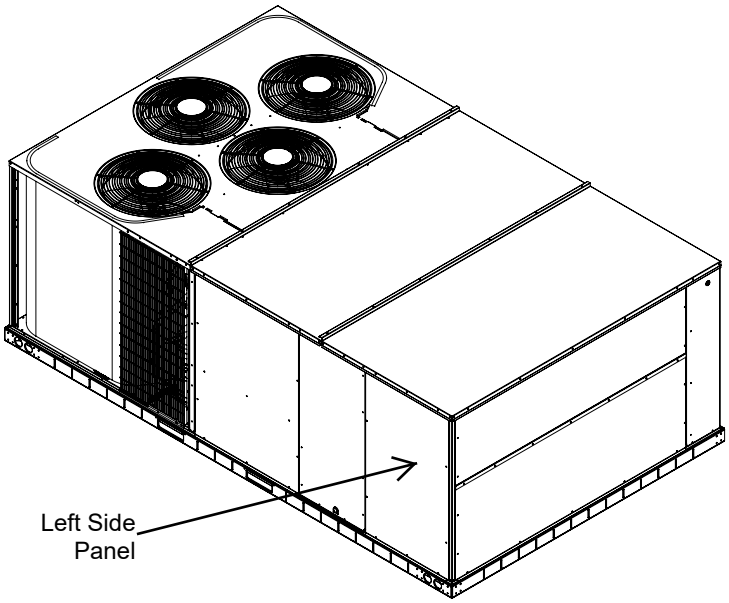

Fig. 2 Remove Left Side Panel

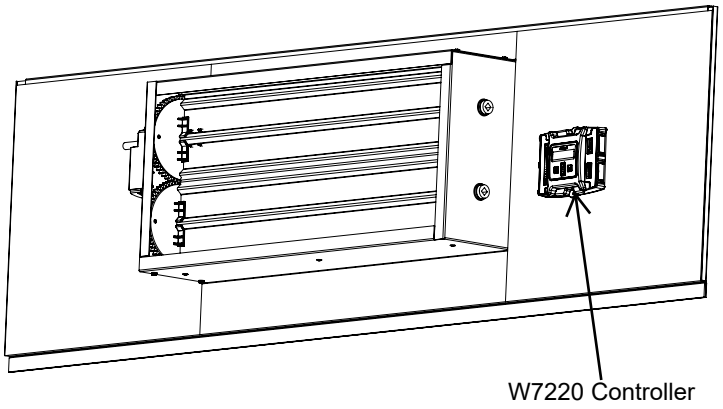

Fig. 3 Damper with W7220 Controller Assembly

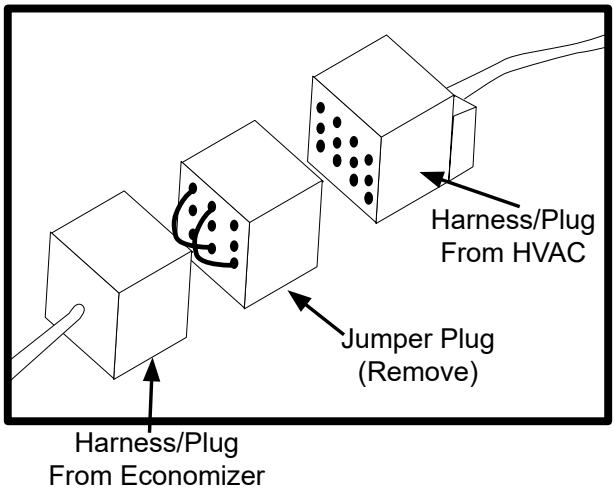

Fig. 4 Harness and Jumper Plug

5. Locate the damper assembly mounted on panel (See Fig. 3)

6. Remove jumper plug connected to the RTU 12-pin plug, (See Fig. 4) save in the RTU control box for possible future need. The plug will be located in the R/A opening near the unit's control box (opposite of the left side panel.)

7. Locate the white W1 wire connected to the W7220 controller. Route this wire into the control box.

8. Connect this white W1 wire to the W1 screw terminal on the unit's central terminal board. (See Fig. 5) Enough wire has been provided to route this wire with the panel resting next to the unit on the roof (ensure to protect the roof from panel rough edges.)

9. Connect the 12-pin plug connected to the W7220 to the RTU 12-pin plug. (See Fig. 4)

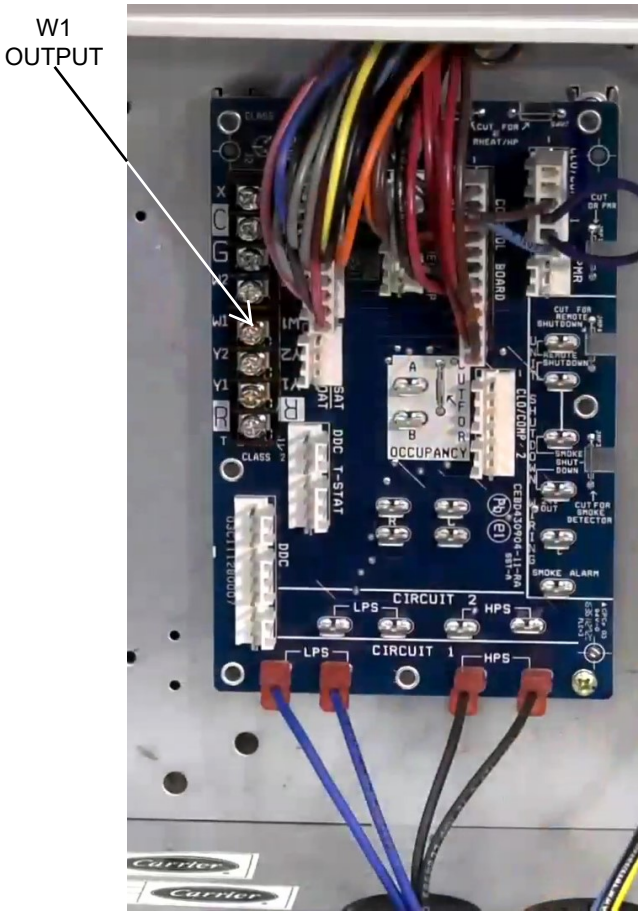

Fig. 5 Land white W1 wire on W1 screw terminal

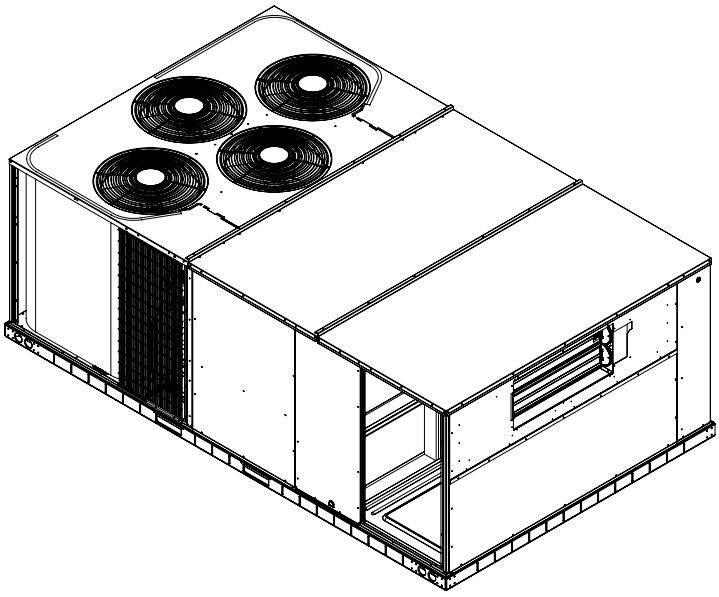

Fig. 7 Installed Damper

10. Install the damper over the Unit Upper End Panel opening (See Fig. 6 & 7.) Attach with the screws provided in the parts bag. **Note**: If using damper on 57 3/8" tall unit, install 8" outside air blank off panel above damper panel. (See Fig. 8)

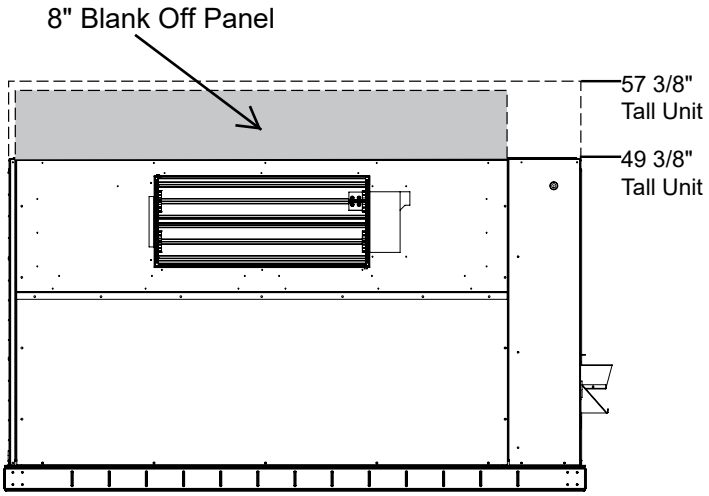

Fig. 8 57 3/8" Tall Unit Blank Off Panel

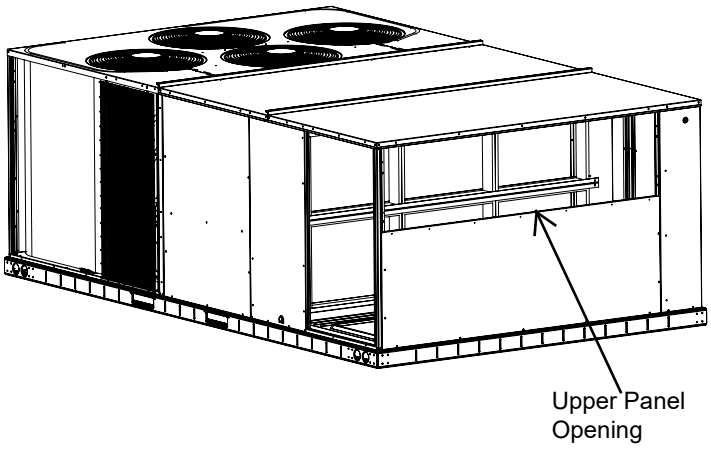

Fig. 6 End Panel

11. Assemble the outside air hood per Fig. 9 and 10.

11a. Attach the left hood side and right hood side to the hood top. Ensure that the hood top flange overlaps the side panels. Verify that the mounting flanges are on the exterior of the assembly.

11b. Attach the hood base with the flat side on the exterior of the assembly.

11c. Apply gasketing to the mounting flanges.

11d. Attach the bottom filter support to the hood base.

11e. Attach the filter dividers.

11f. The top filter support ships assembled to the hood top and has a spring hinge. Lift up the top filter support, then slide in the filters and flip the top filter support over the filters to secure them in place.

12. Attach the assembled hood over the outside air damper panel. If installing on a 57 3/8" tall unit, also install the 8" blank-off panel.

13. Caulk the hood corners, if necessary.

14. Re-attach the left side panel. (See Fig. 2) Leave panel off for ***CONTROLLER SETUP*** (page5) and replace when finished.

15. Remove the lockout tag and restore RTU operation

16. Follow ***CONTROLLER SETUP*** (page 5) and ***MINIMUM DAMPER POSITION SETUP*** (page 6) to modify the W7220 default settings and ensure proper minimum ventilation.

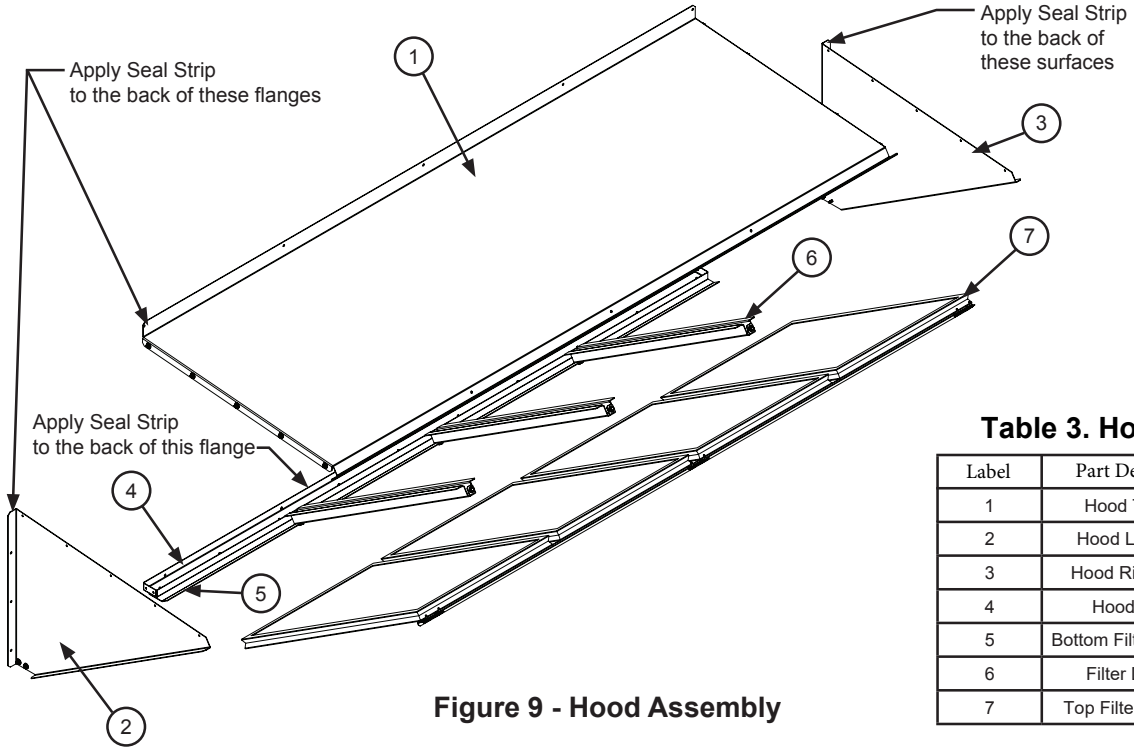

Figure 9 - Hood Assembly

Table 3. Hood Parts

Label	Part Description	Qty
1	Hood Top	1
2	Hood Left Side	1
3	Hood Right Side	1
4	Hood Base	1
5	Bottom Filter Support	1
6	Filter Divider	3
7	Top Filter Support	1

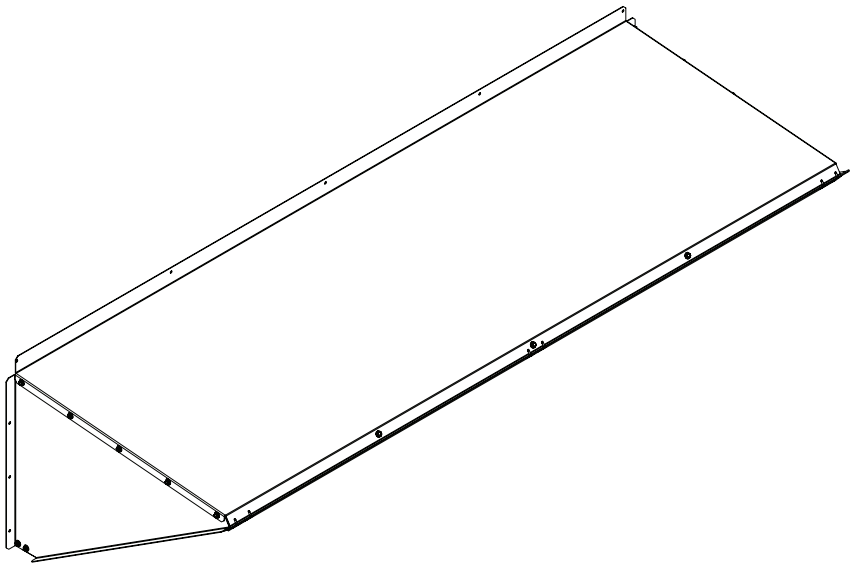

Figure 10 - Hood Assembly - Completed

CONTROLLER SETUP
for OA3-MRT69SA-D20S

The Honeywell W7220 is pre-mounted to the outside air damper assembly, see Fig. 3. Your RTU will need to have power in order to operate the controller. Ensure no high voltage wiring is around the damper or controller when beginning this process.

This product doesn't include temperature sensors. The temperature inputs provided are 10k ohm resistors to prevent the controller from returning sensor faults. This will produce a constant value of approximately 105° F for the Outside Air and Mixed Air. The controller will show a sensor fault if one of these resistors becomes defective. If actual readings are preferred, you may replace with 20k ohm NTC sensors.

Before beginning the setup, familiarize yourself with the Honeywell W7220 ***INTERFACE OVERVIEW*** on the following pages (See Page 8.)

Setup Sequence
It is important to establish the operating parameters the system will be operating at prior to making any changes.
MENU – i.e. Number of RTU/AHU fan speeds, with/without CO_2 (DCV), etc. and have all sensors installed and operational before attempting the setup sequence.

Single Speed Fan and No DCV (CO_2)

1. After power up scroll down ▼ to SYSTEM SETUP
2. Enter the SYSTEM SETUP MENU and enter the install date, if desired.
3. Scroll down ▼ to AUX2 IN – Change Shutdown (SD) to Heat (W1)
4. Scroll down ▼ to OCC- occupancy, always set to INPUT.
5. Press ⓵ (MENU UP/EXIT)
6. Scroll up ▲ to SETPOINTS and press ENTER
7. Scroll down ▼ MIN POS for minimum position setting. (see ***MINIMUM DAMPER POSITION SETUP*** on the next page)
8. Press ⓵ (MENU UP/EXIT) – Setup is complete.

2-Speed Fan

1. After power up, scroll down ▼ to SYSTEM SETUP
2. Enter the SYSTEM SETUP MENU and enter the install date.
3. Scroll down ▼ to AUX2 IN – Change Shutdown (SD) to Heat (W1)
4. Scroll down ▼ to Fan Speed – Change from 1 Speed to 2 Speed.
5. Scroll down ▼ to OCC- occupancy, always sent to INPUT.
6. Press ⓵ (MENU UP/EXIT)
7. Scroll down ▼ to ADVANCED SETUP if DCV option is being used (See DCV (CO_2) below).

If not:

8. Scroll up ▲ to and enter SETPOINTS
9. Scroll down ▼ to MIN POS H (high speed) and MIN POS L (low speed) for minimum position settings.(see ***MINIMUM DAMPER POSITION SETUP*** on the next page)
10. Press ⓵ (MENU UP/EXIT) – Setup is complete.

DCV (CO_2)

1. After power up, scroll down ▼ to SYSTEM SETUP for install date. If previously in SYSTEM SETUP for Fan Speed Setup, scroll down ▼ to ADVANCED SETUP.
2. Enter ADVANCED SETUP and scroll down ▼ to CO_2 ZERO. Set the Zero Value (2Vdc) to match the CO_2 Sensor. See CO_2 Setup on Page 5 for example.
3. Scroll down ▼ to CO_2 SPAN. Set the Span to match the CO_2 Senor. See CO_2 Setup for example.
4. Press ⓵ (MENU UP/EXIT)
5. Scroll up ▲to SETPOINTS and press ↵ ENTER
6. Scroll down ▼ to DCV SET to set the CO2 setpoint.
7. Scroll down ▼ to VENT MAX H (high speed) and VENT MAX L (low speed), and VENT MIN H (high speed) and VENT MIN L (low speed) for minimum position settings.
8. Press ⓵ (MENU UP/EXIT) – Setup is complete.

Table 4. MicroMetl Jade W7220 Controller Configuration

		FOR SINGLE SPEED UNIT		FOR 2 SPEED UNITS		
	Controller Menu Item	**Default**	**Set To:**	**Default**	**Set To:**	**Note**
SETPOINTS	MAT SET	53°F	NA	53°F	NA	Setting not used for 3-position damper
	LOW T LOCK	32°F	NA	32°F	NA	Setting not used for 3-position damper
	DRYBLB SET	63°F	NA	63°F	NA	Setting not used for 3-position damper
	MIN POS	2.8 Vdc	2 to 10 Vdc	NA	NA	Only displayed if set up for single speed unit
	MIN POS H	NA	NA	2.8 Vdc	2 to 10 Vdc	Only displayed if set up for 2 speed unit
	MIN POS L	NA	NA	3.2 Vdc	2 to 10 Vdc	Only displayed if set up for 2 speed unit
SYSTEM SETUP	INSTALL	1/1/2010	Current date	1/1/2010	Current date	
	EQUIPMENT	CONV	CONV	CONV	CONV	Always set to CONV, even on HP units
	AUX2 I	SD	W1	SD	W1	Always set to W1
	FAN TYPE	1 speed	1 speed	1 speed	2 speed	
	OCC	INPUT	INPUT	INPUT	INPUT	Always set to INPUT

Note 1: For 2 speed unit, under SYSTEM SETUP: EQUIPMENT= CONV, AUX2 I = Wl, and FAN TYPE = 2 SPEED

NA = Not applicable

Minimum Damper Position Setup

The following details how to adjust the MIN POS set point (Single Speed unit) or MIN POS L and MIN POS H (Two Speed unit) to allow the proper amount of outdoor air, as required by local codes, to enter the building if an airflow measuring hood is not available. Make minimum position adjustments with at least 10°F temperature difference between the outdoor-air and return-air temperatures. The minimum damper position maintains the minimum airflow for the building space during the occupied period when demand control ventilation is not being used.

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

1. Calculate the appropriate mixed air temperature using the following formula:
(TO x OA/100) + (TR x RA/100) = TM
TO = Outdoor-Air Temperature
OA = Percent of Outdoor Air
TR = Return-Air Temperature
RA = Percent of Return Air
TM = Mixed-Air Temperature
As an example, if DCV is not being used and local codes require 10% outdoor air during occupied conditions, outdoor-air temperature is 60°F, and return-air temperature is 75°F. (60 x 0.10) + (75 x 0.90) = 73.5°F

2. Take temperature readings of the Return air and the Outdoor temperature. Use the formula above to determine what your target mixed air temperature reading should be. This procedure should be performed with all the hoods and panels assembled and fastened to the unit to simulate unit operation conditions.

3. Put a temperature probe in the indoor fan section of the unit (a probe that you can remotely read, with the unit panel attached, is ideal.)

4. Make note of what the current MIN POS (default is 2.8V) for Single Speed unit or for a Two Speed unit make note of what the current MIN POS L (default is 3.2V) and MIN POS H (default is 2.8V) voltages are currently set at on the W7220 controller.

5. Turn the unit on and run the indoor fan. Cut the signal to the compressor(s) to ensure the coil will not affect the mixed air temperature. Also, ensure an occupied signal is being sent to the W7220 controller, so the damper will move to minimum position . For Two Speed units this procedure will need to be done with the unit fan in Low speed (requires an input to Y1-I) and High speed (requires an input to Y1-I and Y2-I.)

6. Take your reading of the Mixed Air and see whether you need to open (increase voltage) or close (decrease voltage) the damper to achieve the desired mixed air temperature.

7. You can remove the filter access panel from the unit, make the adjustment on the controller to MIN POS (Single Speed unit), MIN POS L (Two Speed unit low speed), or MIN POS H (Two Speed unit high speed), replace the filter access panel and take temperature reading again. Continue this process until you reach the target temperature. For Two Speed units ensure you adjust both set points: MIN POS L when indoor fan is running at low speed and MIN POS H when indoor fan is running at high speed.

HONEYWELL CO_2 SETUP EXAMPLE

When using any CO_2 sensor be sure the sensor scale and the JADE W7220 scale are the same. For example, as shipped, the MicroMetl 8002-WMDM (Honeywell C7232) scale is 500 – 1500 ppm with an output range of 2-10Vdc. The W7220 control default is 0-2000 ppm and 2-10Vdc input. When using the C7232 with the W7220 you will need to set the sensor span to match the W7220 or vice versa. See Fig. 11 and Tables 5 & 6 for the sensor jumper confirgurations.

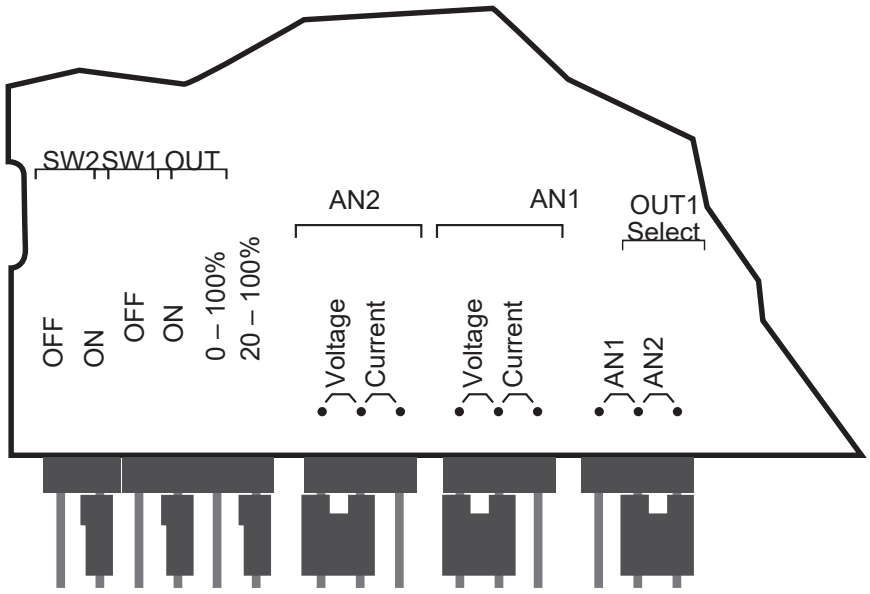

Fig. 11. Honeywell C7232 Jumper Configuration

SW1	SW2	AN (ppm)	Relay [a] (ppm)
ON	ON	0 to 1000	1000
ON	Off	0 to 2000	1200
Off	On	500 to 1500	800
Off	Off	500 to 2000	1200

[a] When the level reaches this value, the contacts close; when the level drops 100ppm below this value, the contacts open.

Table 5. Honeywell C7232 Switch ppm Output Configuration

AN	OUT	
	0-100%	20-100%
Voltage	0-10Vdc	2-10Vdc
Current	0-20 mA	4-20 mA

Table 6. Honeywell C7232 Voltage/Current Output Configuration

INTERFACE OVERVIEW

This section describes how to use the W7220 user interface for:

- Keypad and menu navigation
- Settings and parameter changes
- Menu structure and selection

User Interface

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

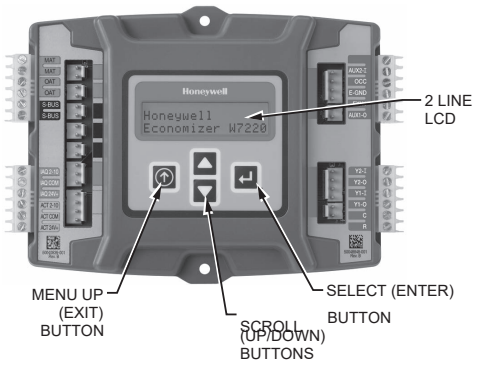

Fig. 12 Economizer LCD and Keypad Layout.

Keypad

The four navigation buttons illustrated in Fig. 12 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 ▲ 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.
- CHANGE STORED displays.
- Press the ⏎ button (MenuUp/Exit) to return to the previous menu.

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

Menu Structure

Tables 7-10 on pages 9-12 illustrates the complete hierarchy of menus and parameters for the W7220 control system.

The Menus in display order are:

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

IMPORTANT

Your menu parameters will be different depending on your configuration.

For example if you do not have a DCV (CO_2) 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™ W7220 controller must be setup and configured for the installed system.

IMPORTANT

During setup, the Economizer module is live at all times.

The setup process uses a hierarchical menu structure that is easy to use. You press the ▲ and ▼ arrow buttons to move forward and backward through the menus and press the ↵ button to select and confirm setup item changes.

Time-out and Screensaver

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.

Table 7. Menu Structure[a]

Menu	Parameter	Parameter Default Value	Parameter Range and Increment[b]	Notes
STATUS	ECON AVAIL	NO	YES/NO	The 3-postion damper will never enter economizer mode.
	ECONOMIZING	NO	YES/NO	The 3-postion damper will never enter economizer mode.
	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	COOL HEAT	Do not use. Always set controller to CONVENTIONAL.
	COOL Y1-IN	OFF	ON/OFF	Y1-I signal from space thermostat or unitary controller for cooling stage 1. ON = 24 Vac on term Y1-I OFF = 0 Vac on term Y1-I
	COOL Y1-OUT	OFF	ON/OFF	Signal not sent by controller. Signal is routed back to the RTU within the wiring harness.
	COOL Y2-IN	OFF	ON/OFF	Y2-I signal from space thermostat or unitary controller for second stage cooling. ON = 24 Vac on term Y2-I OFF = 0 Vac on term Y2-I
	COOL Y2-OUT	OFF	ON/OFF	Signal not sent by controller. Signal is routed back to the RTU within the wiring harness.
	MA TEMP	_ _._ ºF	-40 to 150 ºF	The 3-position damper will always display an approximate temperature of 105º F, unless sensors are installed.
	DA TEMP	_ _._ ºF	-40 to 150 ºF	The 3-position damper doesn't use a DA sensor.
	OA TEMP	_ _._ ºF	-40 to 140 ºF	The 3-position damper will always display an approximate temperature of 105º F, unless sensors are installed.
	OA HUM	_ _ %	0 to 100%	This will not be displayed on the 3-position damper, unless sensors are installed.
	RA TEMP	_ _._ ºF	0 to 140 ºF	This will not be displayed on the 3-position damper, unless sensors are installed.
	RA HUM	_ _ %	0 to 100%	This will not be displayed on the 3-position damper, unless sensors are installed.
	IN CO2	_ _ _ ppm	0 to 2000 ppm	Displays value of measured CO2 from CO2 sensor (if connected.) Not shown if CO2 not connected, short or out-of-range. See note on page 8 concerning MicroMetl 8002-WMDM (Honeywell C7632 sensor.)
	DCV STATUS	n/a	ON/OFF	Displays ON if above setpoint and OFF if below setpoint, ONLY if a CO2 sensor is connected.
	DAMPER OUT	2.0V	2.0 to 10.0 V	Displays output voltage to the damper actuator.
	EXH1 OUT	OFF	ON/OFF	The wiring is not provided with the 3-postion damper to utilize this output.

Table 8. Menu Structure [a] (cont)

Menu	Parameter	Parameter Default Value	Parameter Range and Increment[b]	Notes
STATUS (cont)	EXH2 OUT	OFF	ON/OFF	EXHAUST STAGE 2 RELAY OUTPUT Output of AUX terminal; displays only if AUX = EXH2 ON = relay closed OFF = relay open
	ERV	OFF	ON/OFF	ENERGY RECOVERY UNIT RELAY OUTPUT Output of AUX terminal; displays only if AUX = ERV ON = relay closed OFF = relay open
	MECH COOL ON	0	0, 1, or 2	Displays stage of mechanical cooling that is active.
	FAN SPEED	n/a	LOW or HIGH	SUPPLY FAN SPEED Displays speed setting of fan on a 2–speed fan unit.
	W (HEAT ON)	n/a	ON/OFF	HEAT DEMAND STATUS Displays status of heat demand on a 2–speed fan unit.
SETPOINTS	MAT SET	53°F (12°C)	38° to 70°F; (3° to 18°C) increment by 1	MIXED AIR SETPOINT The 3-position damper will not use this setting.
	LOW T LOCK	32°F (0°C)	-45° to 80°F; (-43° to 27°C) increment by 1	COMPRESSOR LOW TEMPERATURE LOCKOUT The 3-position damper will not use this setting.
	DRYBLB SET	63°F (17°C)	48° to 80°F (9° to 27°C) increment by 1	OA DRY BULB TEMPERATURE CHANGEOVER SETPOINT The 3-position damper will not use this setting.
	ENTH CURVE	ES3	ES1, ES2, ES3, ES4, or ES5	ENTHALPY CHANGEOVER CURVE (Requires enthalpy sensor option) The 3-position damper will not use this setting.
	DCV SET	1100ppm	500 to 2000 ppm; increment by 100	DEMAND CONTROL VENTILATION SETPOINT Displays only if 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	VENTILATION MINIMUM POSITION. Only displayed if controller is set for single speed unit under FAN TYPE, and if DCV is NOT used.
	MIN POS L	3.2 V	2 to 10 Vdc	VENTILATION MINIMUM POSITION AT LOW SPEED Displays ONLY if used on 2 speed units and CO2 sensor is NOT connected.
	MIN POS H	2.8 V	2 to 10 Vdc	VENTILATION MINIMUM POSITION AT HIGH SPEED Displays ONLY if used on 2 speed units and CO2 sensor is NOT connected.
	VENTMAX L	3.2 V	2 to 10 Vdc	DCV MAXIMUM DAMPER POSITION AT LOW SPEED (Requires CO2 sensor connected)
	VENTMAX H	2.8 V	2 to 10 Vdc	DCV MAXIMUM DAMPER POSITION AT HIGH SPEED (Requires CO2 sensor connected)
	VENTMIN L	2.5 V	2 to 10 Vdc	DCV MINIMUM DAMPER POSITION AT LOW SPEED (Requires CO2 sensor connected)
	VENTMIN H	2.25 V	2 to 10 Vdc	DCV MINIMUM DAMPER POSITION AT HIGH SPEED (Requires CO2 sensor connected)
	VENTMAX	2.8 V	2 to 10 Vdc	Displays only if a 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 displays 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 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 displays 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. Default for VENTMIN L is 2.5V and VENTMIN H is 2.25V.

Table 9. Menu Structure[a] (cont)

Menu	Parameter	Parameter Default Value	Parameter Range and Increment[b]	Notes
SYSTEM SETUP	INSTALL	01/01/14		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	Always set to CONV even for heat pump unit.
	AUX2 IN	SHUTDOWN (SD)	HEAT (W1) required for 2–speed mode	Always set to HEAT (W1)
	FAN TYPE	1 speed	1 speed / 2 speed	Sets the economizer controller for operation of 1 speed or 2 speed indoor fan system.
	FAN CFM	5000cfm	100 to 15000 cfm; increment by 100	UNIT DESIGN AIRFLOW (CFM) Enter ONLY if using DCVCAL ENA = AUTO
	AUX OUT	NONE	NONE ERV EXH2 SYS	Select OUTPUT for AUX1 O relay NONE = not configured (output is not used) ERV = Energy Recovery Ventilator[d] EXH2 = second damper position relay closure for second exhaust fan SYS = use output as an FDD remote alarm signal
	OCC	INPUT	INPUT or ALWAYS	Always set to INPUT.
ADVANCED SETUP	MA LO SET	45°F (7°C)	35° to 55°F; (2° to 12°C) Incremented by 1°	MIXED AIR TEMPERATURE LOW LIMIT The 3-position damper will not use this setting.
	FREEZE POS	CLO	CLO or MIN	FREEZE PROTECTION DAMPER POSITION This option is not available for the 3-position damper.
	CO2 ZERO	0ppm	0 to 500 ppm: Increment by 10	CO2 ppm level to match CO2 sensor start level.
	CO2 SPAN	2000ppm	1000 to 3000 ppm; Increment by 50	CO2 ppm span to match CO2 sensor.
	STG3 DLY	2.0h	0 min, 5 min, 15 min, then 15 min intervals. Up to 4 h or OFF	COOLING STAGE 3 DELAY The 3-position damper will not use this setting.
	SD DMPR POS	CLO	CLO or OPEN	Function NOT AVAILABLE with 2–speed mode
	DCVCAL ENA	MAN	manual or auto	Turns on the DCV automatic control of the dampers. (Single speed only.)
	MATTCAL	0.0°F (or C)	+/ ---2.5°F (+/ ---1.4°C)	MIXED AIR TEMPERATURE CALIBRATION Allows for the operator to adjust for an out of calibration mixed air temperature (MAT) sensor
	OA T CAL	1.0°F (or C)	+/ ---2.5°F (+/ ---1.4°C)	OUTSIDE AIR TEMPERATURE CALIBRATION Allows for the operator to adjust for an out of calibration outside air temperature (OAT) sensor
	OA H CAL	0% RH	+/ ---10% RH	OUTSIDE AIR HUMIDITY CALIBRATION Allows for the operator to adjust for an out of calibration outside air enthalpy sensor
	RA T CAL	2.0°F (or C)	+/ ---2.5°F (+/ ---1.4°C)	RETURN AIR TEMPERATURE CALIBRATION Allows for the operator to adjust for an out of calibration return air temperature (RA) sensor
	RA H CAL	0% RH	+/ ---10% RH	RETURN AIR HUMIDITY CALIBRATION Allows for the operator to adjust for an out of calibration return air enthalpy sensor
	DA T CAL	0.0°F (or C)	+/ ---2.5°F (+/ ---1.4°C)	DISCHARGE AIR TEMPERATURE CALIBRATION Allows for the operator to adjust for an out of calibration discharge air temperature (DAT) sensor
	2SP FAN DELAY	5 Minutes	0 to 20 minutes in 1 minute increments	TIME DELAY ON 2nd STAGE ECONOMIZING The 3-position damper will not use this setting.

Table 10. Menu Structure[a] (cont)

Menu	Parameter	Parameter Default Value	Parameter Range and Increment	Notes
CHECKOUT	DAMPER VMIN .HS	n/a	n/a	Positions OA damper to VMIN High Speed position
	DAMPER VMAX .HS	n/a	n/a	Positions OA damper to VMAX High Speed position
	DAMPER OPEN	n/a	n/a	Positions OA damper to the full open position.
	DAMPER CLOSE	n/a	n/a	Positions damper to the fully closed position
	CONNECT Y1---O	n/a	n/a	This checkout cannot be performed with the 3-postion damper.
	CONNECT Y2---O	n/a	n/a	This checkout cannot be performed with the 3-postion damper.
	CONNECT AUX1O	n/a	n/a	This checkout cannot be performed with the 3-postion damper.
ALARMS(_)	Alarms display only when they are active. The menu title “ALARMS(_)” includes the number of active alarms in parenthesis ( ).			
	MA T SENS ERR	n/a	n/a	MIXED AIR TEMPERATURE SENSOR ERROR
	CO2 SENS ERR	n/a	n/a	CO2 SENSOR ERROR
	OA T SENS ERR	n/a	n/a	OUTSIDE AIR TEMPERATURE SENSOR ERROR OAT sensor connected at input terminals OAT
	OA SYLK SENS ERR	n/a	n/a	OUTSIDE AIR ENTHALPY SENSOR ERROR OAT sensor connected on S– bus
	DA T SENS ERR	n/a	n/a	DISCHARGE AIR TEMPERATURE SENSOR ERROR
	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.
	ACT UNDER V	n/a	n/a	ACTUATOR VOLTAGE LOW Voltage received at actuator is below expected range
	ACT OVER V	n/a	n/a	ACTUATOR VOLTAGE HIGH Voltage received at actuator is above expected range
	ACT STALLED	n/a	n/a	ACTUATOR STALLED Actuator stopped before reaching commanded position

[a] Table 7-10 illustrates the control hierarchy pertinent for the 3-postion damper. Additional information may be found within Honeywell document, "63-2700-10."

Checkout Tests

Use the Checkout Menu (See Table 10) to test the damper operation.

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
3. RUN? appears.
4. Press the ↵ button to start
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.

TROUBLESHOOTING

Alarms

The Economizer module provides alarm messages that display 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 corrected (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 ↵ button.
3. ERASE? displays.
4. Press the ↵ button.
5. ALARM ERASED displays.
6. Press the ⓘ button (MenuUp/Exit) to complete the action and return to the previous menu.

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

SEQUENCE OF OPERATION

Table 11. Dry Bulb Operation No DCV (CO2 sensor) - 1 Speed Fan.

DCV	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

Table 12. Dry Bulb Operation With DCV (CO2 sensor) - 1 Speed Fan.

DCV	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
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

Table 13. Dry Bulb Operation No DCV (CO2 sensor) - 2 Speed Fan.

DCV	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 L	Closed
		On	Off	High	24-v/On	0-v/Off	MIN POS L	Closed
		On	On	High	24-v/On	24-v/On	MIN POS H	Closed

Table 14. 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	High	0-v/Off	0-v/Off	VENTMIN L	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN L	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN H	Closed
Above set	No	Off	Off	High	0-v/Off	0-v/Off	VENTMIN L 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

Two-Speed Fan Operation

The W7220 Jade controller has the capability to work with a system using a 2-speed supply fan. The W7220 does not control the supply directly but uses the input status (See Table. 15) 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

Table 15. Fan speed input.

The W1 (heating mode) is not controlled by the W7220 but it requires the status to know where to position the OA damper for minimum position for the fan speed.

CHECKOUT

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 8 for information about menu navigation and use of the keypad.

⚠ WARNING

Electrical Shock Hazard.
Can cause severe injury, death or property damage.
Disconnect 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.

Initial Menu Display

On initial start up, **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 and the second line will be blank.

Power Loss (Outage or Brownout)

All setpoints and advanced settings are restored[b] after any power loss or interruption.

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

[b] All settings are stored in non-volatile flash memory

W7220 ECONOMIZER MODULE WIRING

Use tables 16 and 17 to locate the wiring terminals for the economizer module.

Table 16. 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 (Sylk 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 17. 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)

WIRING DIAGRAM

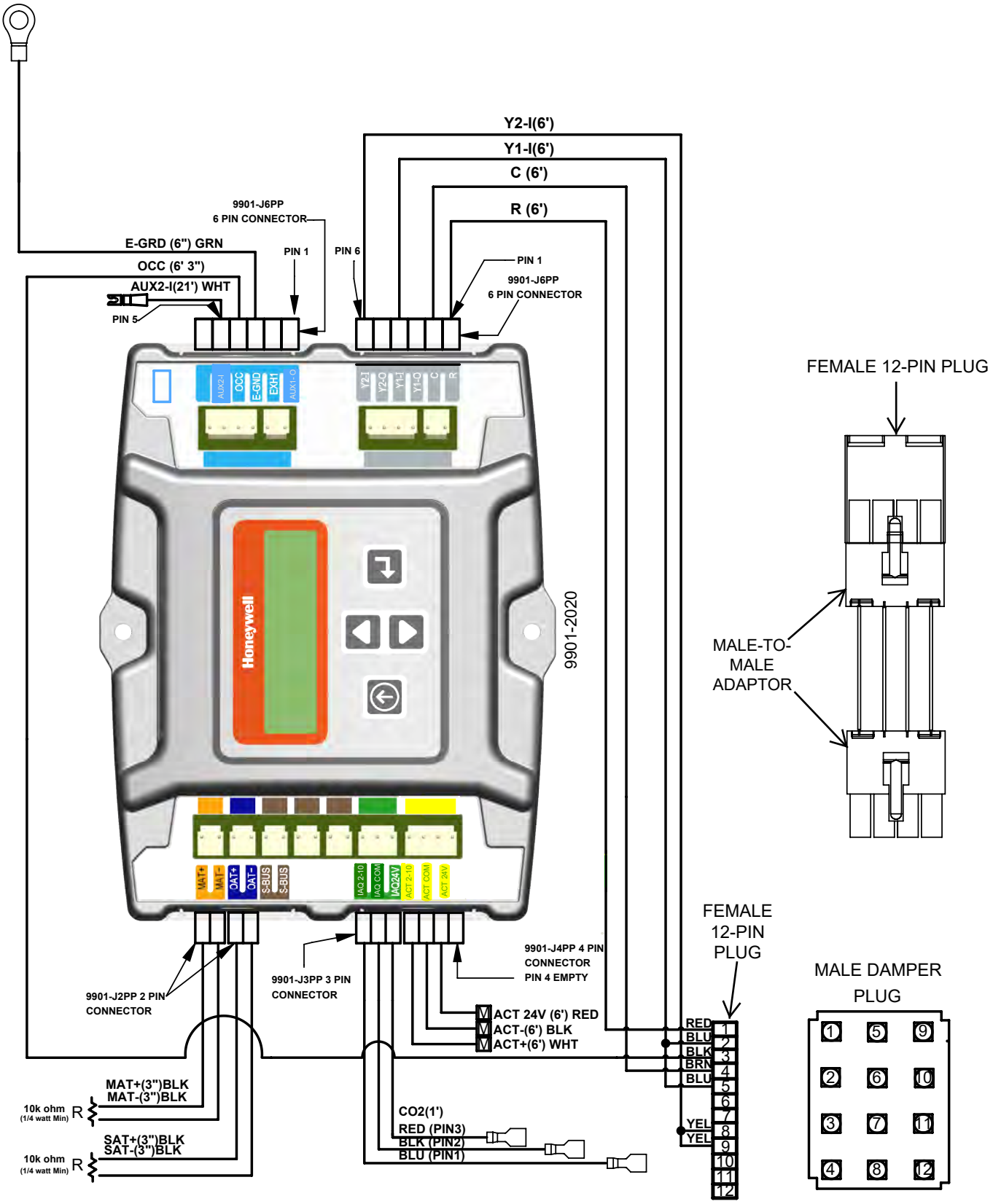

Fig 13. Wlring diagram

MicroMetl Indianapolis
3035 N. Shadeland Ave., Suite 300
Indianapolis, IN 46226
1.800.MMC.HVAC (EST)
indycustomerservice@micrometl.com

MicroMetl Longview
201 Kodak Blvd.
Longview, TX 75602
1.903.248.4800 (CST)
longviewcustomerservice@micrometl.com

MicroMetl Sparks
905 Southern Way
Sparks, NV 89431
1.800.884.4662 (PST)
sparkscustomerservice@micrometl.com

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