

INSTALLATION AND OPERATION INSTRUCTIONS ECON-3V, ECON-5V Economizers for V & H Series Vertical Wallmount Units

These Economizers make use of outside air for cooling when conditions permit. This reduces power consumption by reducing compressor operating time. When the outdoor air temperature and/or humidity are suitable for cooling, the Economizers damper is automatically proportioned providing cool fresh air to maintain the desired indoor temperature. During heating operation or when the outdoor air temperature and/or humidity is above the control setting, the Economizer is not operational.

NOTES TO INSTALLER

These instructions are for the use of qualified individuals specially trained and experienced in the installation of this type of equipment and related system components.

Installation and service personnel are required by some locales to be licensed. Persons not qualified shall not install this equipment nor interpret these instructions.

This installation manual is provided to ensure the proper installation and satisfactory performance of your equipment. The instructions contained herein shall not be deemed to extend, modify, alter, or expand any of the representations contained in the **LIMITED WARRANTY**.

DANGER: BEFORE PERFORMING ANY WORK ON THIS EQUIPMENT, THE ELECTRICAL SUPPLY MUST BE TURNED OFF AT THE ELECTRICAL SERVICE BOX TO AVOID THE POSSIBILITY OF SHOCK, INJURY, DEATH, OR DAMAGE EQUIPMENT. THERE MAY BE MORE THAN ONE POWER SUPPLY CIRCUIT.

CODES

The installer shall comply with all local, state, and federal codes, and/or regulations pertaining to this type of equipment and its installation. Such codes and/or regulations should take precedence over any recommendations contained herein, in lieu of local codes. Installation shall be made in accordance with National Electrical Code and recommendations made by the National Board of Fire Underwriters.

INSPECTION AND UNPACKING

A thorough inspection of the shipping container should be made immediately upon receiving the Economizer or Power Ventilator. Look for any punctures or openings, and if it appears damage has occurred, it should be noted on the freight bill before signing. The delivering carrier should be contacted immediately to inspect any damage, and no installation work should begin until this inspection is completed.

WARNING: IMPROPER INSTALLATION MAY DAMAGE EQUIPMENT, CAN CREATE A HAZARD, AND WILL VOID THE WARRANTY.

FIELD INSTALLATION

1. Power to the unit **MUST** be turned off at the main electrical service box.
2. Remove and discard the center front access panel.
3. In the return air compartment behind the electrical box, remove the six screws that hold down the relief opening blank off plate. Then remove and discard the plate.
4. Remove the blower from the unit. Remove the two screws that hold the blower discharge plate to the outlet of the blower and remove the plate. Remove the two blower mounting screws, one located on each side of the blower. Then remove the blower electrical plug from the electrical box and slide the blower out of the unit.
5. Remove the six screws from behind the blower that hold the electrical heat rack in place. Then drop the heat rack plate down and install the discharge air sensor using holes provided on left end of the plate.
6. Route the blue wires for the discharge air sensor up through the hole provided in the filter rack, then through the hole provided in the heat rack plate , and connect one on each of the spade terminals of the sensor.
7. Reinstall the heat rack plate using all six screws as removed in step 5.
8. Remove the screws that hold the filter rack in place, then slide the rack up high enough to make room for installing the Economizer.
9. Carefully lower the Economizer into place behind the electrical box.
10. Plug the six-pin Economizer plug into the receptacle located on the top of the left end of the electrical box. This plug is polarized and will only connect one way.
11. Replace the filter rack into its original position and replace all of the screws removed in step 8.
12. Replace the blower in the reverse as was done in step 4. Reconnect the blower electrical plug and replace the blower discharge plate. This plate **MUST** be in place for correct unit performance.
13. Install the front panel sent with the Economizer.
14. Install the rain hood onto the front panel by inserting the hood top flange into the top of the fresh air opening and hinge the hood downward. Attach the top and bottom of the hood to the door with the screws provided.

NOTE ON H SERIES MODEL UNITS: When field installing this Economizer in heat pump models, an orange jumper wire on the six-pin Economizer plug **MUST** be cut for proper operation. (See Economizer wire diagram for jumper location.)

FACTORY-INSTALLED UNITS

The rain hood is not installed at the factory. The hood is packaged and shipped in the space above the unit indoor blower for field installation. Follow the instructions in step 14 above to install the hood.

START UP (See Figure 1 for the following settings)

1. Adjust Economizer set point to A, B, C, or D (see Fig. 2 for these operating conditions). This allows the Economizer to operate if the outdoor enthalpy (temperature and humidity) is below the set point.
2. Adjust to minimum position.

SEQUENCE OF OPERATION

In V or H model units, the Econ-3V and Econ-5V is designed to deliver cooling without the use of the system compressor when outdoor conditions allow. The Economizer will not operate in the heating mode except to deliver fresh air ventilation with the use of a damper position setting. (For this feature see “Minimum Position Set Point”)

COOLING

A single stage room thermostat is recommended. On a call for cooling (R connected to Y and G), an enthalpy sensor, based on a field adjustable setting, will determine if the outdoor air is suitable for cooling.

If outdoor air is suitable for cooling, the Economizer will act on first-stage cooling. The indoor fan will be energized and the Economizer damper will slowly modulate open. The Economizer provides cooling by modulating the outdoor air damper to maintain a 53° to 57°F mixed air temperature (mixed air sensor located behind the evaporator coil). The damper is closed and the indoor fan is de-energized when the room thermostat is satisfied. When a call for cooling is again needed, the logic module will remember and move the damper directly to the position located during the previous cycle. If the outdoor air alone cannot satisfy the room thermostat within a 10-minute time period, the logic module will send a signal from the “CL1” terminal to energize the compressor as second-stage

cooling. Once the room thermostat is satisfied, the damper is modulated closed and the compressor contactor will be de-energized.

If the outdoor air is not suitable for cooling, the logic module will send a signal from the “CL1” terminal to energize the compressor contactor bringing on mechanical cooling.

NOTE: A two-minute minimum ON/minimum OFF is incorporated within the logic module.

HEATING

When the room thermostat calls for heat, the heating controls are energized and the damper will only modulate to its minimum position. The Economizer enthalpy controls are disabled.



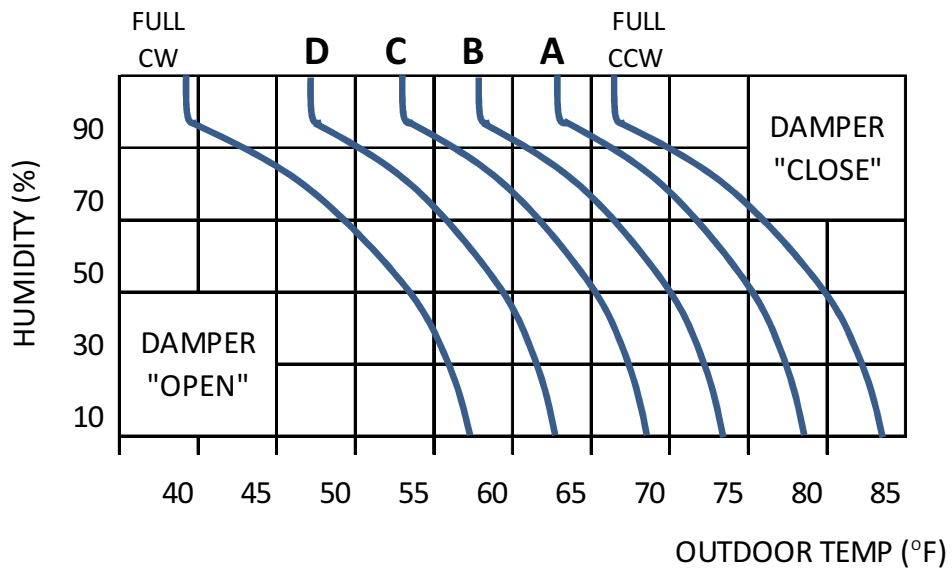
THE LOGIC MODULE FEATURES:

1. **ECONOMIZER CHANGEOVER SET POINT-** Adjustable between A, B, C, and D settings (see Fig. 1 and Fig. 2). This set point is used to determine the outdoor condition at which the control uses free cooling.
2. **MINIMUM POSITION SET POINT-** Adjustment is located on the Logic Module. (See Fig. 1). Provides for fresh air ventilation within the conditioned space. Adjustable between 0 and 100% fresh supply air. Adjusting the set point determines the minimum closed position the damper will

modulate to, while the indoor fan is energized. This feature is operational in both the cooling and the heating mode. (Two-minute delay when first energized.)

ENTHALPY SETTING

Air enthalpy (temperature and humidity) is measured by a sensor within the Economizer. The controller setting should be selected from the psychometric chart below. The area to the left of the selected set point indicates conditions at which the outdoor air is suitable for free cooling.



EXAMPLES

CHANGES IN RELATIVE HUMIDITY (wet bulb temperature) – TEMPERATURE (dry bulb temperature) CONSTANT

Assume the average humidity and temperature are 50% and 65°F (18°C) respectively. The enthalpy controller is set in range B. Within the existing conditions, the damper is in the open position. If the humidity increases to 70% with the temperature constant, the damper will close to its

CHANGES IN AIR TEMPERATURE (dry bulb temperature) – RELATIVE HUMIDITY (wet bulb temperature) CONSTANT

Assume the average humidity and temperature are 60% and 65°F (18°C), respectively. The Enthalpy Controller is set in range B, the damper is open to its maximum position. If the humidity and temperature change to 20% relative

humidity and 75°F (24°C), the damper will be closed to its minimum position as the new conditions lie to the right of the operating range.

SUPPLY AIR LOW LIMIT

The supply air low limit control strategy is used to protect the compressor. The supply air low limit overrides the minimum position set point, if the mixed air temperature drops below 45°F. The outdoor air damper will modulate completely closed if the mixed air temperature reaches 35°F. If the mechanical cooling is energized, it will remain energized.
