

# FAMCO IAQ ECONOMIZER™

Patent Pending

## BREATHERS' MANUAL



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BREATHE SMARTER

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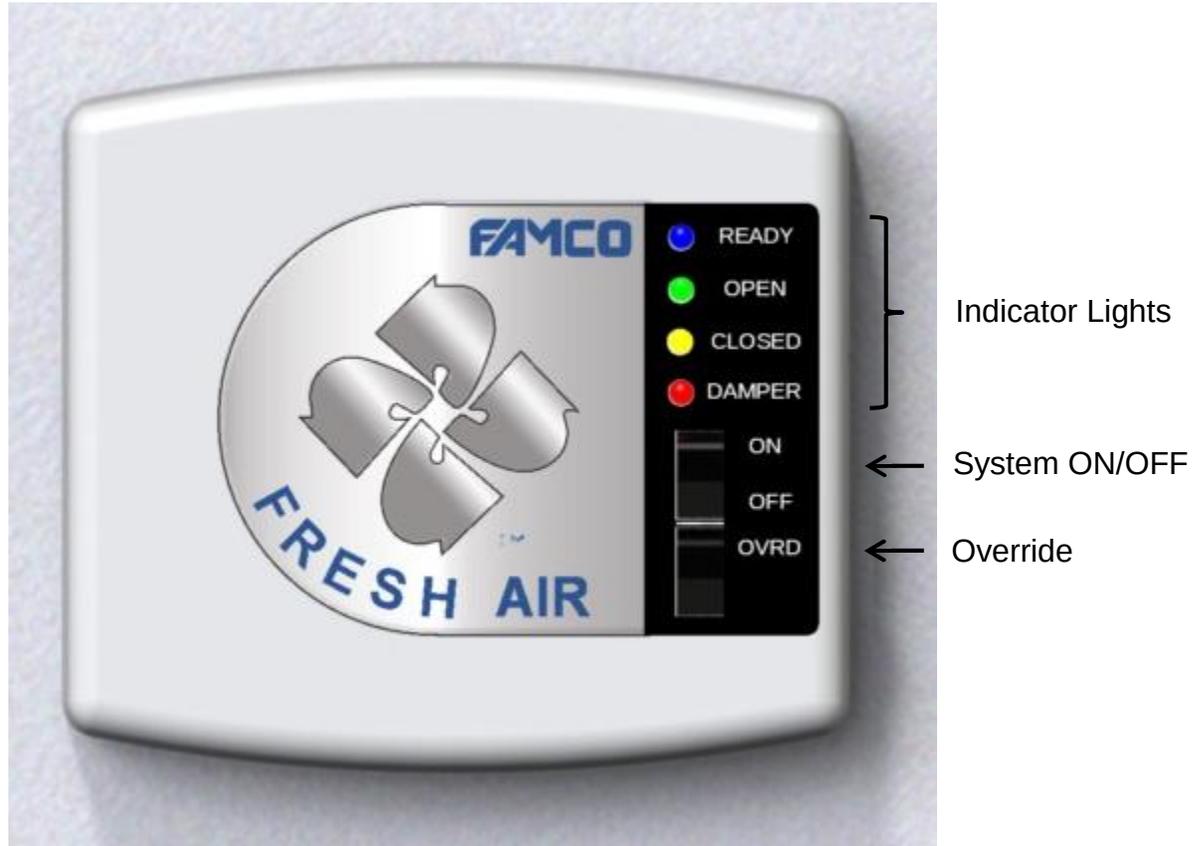
Thank you for purchasing a FAMCO IAQ Economizer. We are confident that your purchase will allow you to Breathe Better and Smarter than ever before. The unit you have purchased has a variety of options that may or may not have been included with your installation. Please review the Installation Manual and our website [famcoiaq.com](http://famcoiaq.com) to see if there are other features that you would like to enable. (Unlike other manufacturers' products our options are not part of how FAMCO generates additional revenue. They were not included to keep initial install cost low and to allow users to determine what options they actually want.)

We sincerely hope you enjoy our product, and invite you to contact us if you have questions or to let us know about your air quality experience.

**UPGRADE OFFER:** We would like to invite customers to communicate with us their ideas on how to improve The IAQ Economizer.

If you are the first one to suggest an idea, and we incorporate your idea into a future version of the product; we will upgrade your IAQ Economizer to the new version using the breakthrough that you suggested for free.

# IAQ Economizer



## UNIT OPERATION

### INDICATOR LEDs

There are four LED lights located on the Logic Box: Yellow, Red, Green and Blue.

Blue indicates that outside air temperature and (optional control devices such as humidistat or low limit thermostat) have been satisfied and the system is Ready to provide free cooling.

Yellow indicates that the dampers have been verified in the proper non-economizing position.

Green indicates that the dampers have been verified in the proper economizing position.

Red indicates two things: 1) Dampers are moving. This occurs for about 90 seconds while dampers are being driven to their economizing position, and for about 10 seconds when they are returning to their non-economizing position. And 2) Dampers are not in the proper position for the current mode of operation. If the Red indicator remains lit for more than two minutes the dampers are not operating normally and may require service. See the "Troubleshooting" section of this manual.

### SWITCHES

There are two switches on the front of the Logic Box. The top switch is the system On/Off switch.

The bottom switch is the Manual Override switch. This switch is used to manually run the economizer. The system ON/OFF switch must be ON to perform the manual override function. Manual override is typically used when the occupant would prefer to use ventilation cooling instead of the air conditioning compressor even though the outside thermostat has not yet reached a point to provide free cooling automatically, or to temporarily run the system to clear out household odors, to improve IAQ (Indoor Air Quality,) or to test damper function. **(FAMCO recommends that outdoor air introduction not be initiated below 45 degrees Fahrenheit. Too cold of air introduced into a hot furnace may damage the furnace.)** Air introduction should also be limited when the system is air conditioning during the hottest part of the day as this will cause increased energy consumption. Air introduction should also not be initiated on days when outdoor air quality may be a health concern. **(All outdoor air introductions are at the discretion of, and are the responsibility of the system owner.)**

### OUTDOOR AIR TEMPERATURE THERMOSTAT

Mounted on the outside of your house is a thermostat which enables "Ventilation Cooling" whenever the system ON/OFF switch is switched to "ON" and the outside air temperature is below the setting on this thermostat. IT is recommended that this be set to 72 degrees F, but it is adjustable to meet the occupant's preference. The sensor MUST be installed in a location where the sun cannot hit it directly, and is generally considered to be the coolest part of the yard surrounding the house. This is generally the North side of the house. It is also supposed to be accessible to the homeowner with a reasonable amount of effort to allow for adjustment if needed. It is generally located under the eave on the first story of the home, on the North side.

The outdoor thermostat is not meant to be frequently adjusted. It should be set to the temperature where the homeowner would like to start automatic operation, and then left at that temperature. Most people set the outdoor thermostat to between 70 and 76 degrees. If you wish to stop automatic operation on occasion, turn the system ON/OFF switch to OFF. If you wish to override the system 'ON' on occasion, use the Override switch located on the Logic Box.

### **USING WITH AN AIR CONDITIONER**

The system requires only seasonal intervention. That is you need to turn it off in the late fall and back on in the spring. Optional devices can automatically perform this function for you.

When you are done with the heating season, turn the system ON/OFF switch to ON to enable the IAQ Economizer.

The outdoor air temperature thermostat is set to a temperature in which you feel outdoor ventilation would provide adequate indoor cooling. (72 deg F. recommended.)

With the system ON, when the outdoor air temp is at or below 72 deg F, a call from the thermostat for cooling will instead lockout the air conditioning compressor, open the system dampers, and bring fresh outdoor air into the conditioned space.

At any time the occupant prefers outdoor air over recycled air conditioned air, or would just like to introduce outdoor air into the space push the OVRRD switch to the ON position. This will open the system dampers and start the system fan introducing fresh outdoor air into the conditioned space. (With the override (OVRRD) activated the system will not allow the air conditioning compressor to run.)

When you are done with the cooling season for the year, turn the system ON/OFF switch to OFF to disable the IAQ Economizer. (Failure to do so may cause the IAQ Economizer to introduce cold outside air while the furnace is trying to keep interior spaces warm. This could cause a large increase in energy used for heating.) If you are planning to use year-round IAQ functions make sure an outdoor low limit is installed.

The system requires only seasonal intervention. That is you need to turn it off in the late fall and back on in the spring. Optional devices can perform this function for you. For help with this please visit [famcoiaq.com](http://famcoiaq.com).

When you are done with the heating season, turn the system ON/OFF switch to ON to enable the IAQ Economizer.

**IMPORTANT!** If the system is to be used year-round for IAQ functions, an outdoor Low Limit thermostat should be installed. Failing to do so may cause damage to heating and air condition equipment.

## **USE WITHOUT AN AIR CONDITIONER**

The IAQ Economizer can function in homes that don't have air conditioning installed, but have forced air for heating. Functioning in this manner a separate thermostat or other control device will have to be installed to provide a call for interior cooling. (See Auxiliary device installation instructions.) This function can also be used in air conditioned home is to allow a Low Limit that the system attempts to achieve when "Ventilation Cooling" can be achieved at a lower cost than mechanical cooling.

## **EXPANDED FUNCTIONALITY (OPTIONAL CONTROL DEVICES)**

**(Please see additional information and diagrams at [famcoiaq.com](http://famcoiaq.com))**

There are a number of other devices that the FAMCO IAQ Economizer is ready to support to optimize energy savings, and to extend the functionality of the system to improve Indoor Air Quality.

Optimize energy savings:

**Indoor Low Limit** – An indoor low limit, (secondary indoor thermostat,) can be installed to provide a Low Limit or (stopping point). This allows the system to seek a cooler indoor temperature without a more expensive mechanical cooling call. The optional Indoor Low Limit also allows any forced air system to provide ventilation cooling even if it does not have an air conditioner.

### **Outdoor Operational Limits**

**Low Temperature** – Allows the system to automatically shut down for the winter/start up in spring, and prevents system use at lower than recommended outdoor temps. Recommended for use in conjunction with remote manual override switches. Prevents undesirable manual overrides when outdoor temps are too low.

**High Humidity/Enthalpy/Dew Point** – Limits air introduction at high humidity levels. May be desirable or considered essential in more humid climates.

**High Temperature** – Limits air introduction at high outdoor temperatures. Recommended for use in conjunction with remote manual override switches. Prevents undesirable manual overrides when outdoor temps are too high.

Ways to initiate air introductions to improve IAQ (indoor air quality):

**Interval Timer** – Frequency and duration determined by the occupant.

**Wall Timer** – Any timer capable such as a mechanical wall timer, or electronic timer can be used to provide time limited air introductions.

**Occupancy Sensor** – Can be used alone or in conjunction with other control device to initiate introductions when occupied, or to limit introductions to times when the space is occupied.

**CO2 Controller** – Initiates air introductions when indoor CO2 reaches a preset limit.

**CO Alarm** – Initiates air introductions when a CO Alarm devices in in alarm, (CO Alarm must have an alarm switch contact properly wired to the system.)

**Radon Alarm** – Initiates air introductions when a Radon Alarm devices in in alarm, (CO Alarm must have an alarm switch contact properly wired to the system.)

IMPORTANT: Alarm devices must be located within the space served by the IAQ Economizer.

**EXTREMELY IMPORTANT: Systems configured to start with a signal from an external Alarm device should be tested regularly by initiating an alarm condition using the device manufacturer’s recommended testing procedure.**

**Ventilation Fan** – External equipment designed to provide air introductions to maintain acceptable air quality. The IAQ Economizer can be configured to coordinate economizer/Ventilation fan introductions, limiting ventilation fan use to times when economizing is unavailable due to outdoor operational limits.

**Heat Recovery Ventilators (HRV)** – External equipment designed to provide air introductions to maintain acceptable air quality, using less energy than a ventilation fan. The IAQ Economizer can be configured to coordinate Economizer/HRV introductions, limiting HRV use to times when economizing is unavailable due to outdoor operational limits.

### **Override Functionality**

Like the Logic Box OVRRD switch, caution should be taken to only perform override or automatic start under appropriate conditions: The outside air temperature should not be so cold as to cause damage to the furnace heat exchanger or items contained in the interior space. **(FAMCO recommends that outdoor air introduction not be initiated below 45 degrees Fahrenheit.)** Air introduction should also be limited when the system is air conditioning during the hottest part of the day as this will cause increased energy consumption. Air introduction should also not be initiated on days when outdoor air quality may be a health concern. **(All outdoor air introductions are at the discretion of, and are the responsibility of the system owner.)**

**Type 1 (EXT START 1)** Type 1 override inputs initiate an override function regardless of the status of all other system functions. This causes the unit to open dampers and with the detection of proper damper status begin introducing outdoor air into the interior space under all outdoor air conditions.

Any number override devices may be connected to the system type 1 override input. This means that system can be started by as many external devices as desired.

Type 1 override inputs should be reserved for devices that you would like to have initiate an air introduction under all circumstances. A CO Alarm or interior space radon Alarm are good examples of Type 1 input devices.

**Type 2 (EXT START 2)** Type 2 override inputs have all the same features as Type 1, except initiation of an air introduction using the Type 2 input requires that the System ON/OFF Switch be on, and that any other control device connected to the LIMIT be in the proper operating position.

Type 2 override inputs basically limit the use of overrides to times when the system is ON and LIMITS are satisfied. Manual remote start switches should be type 2 overrides.

Like a type 1 input, any number override switches or other devices may be connected to the system type 2 override input. This means that system can be started from as many locations or devices as desired. Multiple remote start switches would be wired in parallel to the Type 2 input.