

## Setback Thermostat With CO<sub>2</sub> And Economizer Control



TR9240-L



TR9240



### Setback Temperature, Ventilation Control & Economizer Control In A Single Unit!

The TR9240 integrates a setback thermostat, CO<sub>2</sub> control and economizer control into a single wall mounted device. It is ideal for single zone applications where the need for ventilation may vary including school classrooms, meeting rooms and retail spaces. Versions are available with two stages of cooling or one state each of heating and cooling. It is designed as a cost effective platform for new or retrofit thermostat applications that would like to increase energy savings by controlling temperature and ventilation based on occupancy.

- ✓ Programmable setback temperature can be initiated by external timer switch or by indication of unoccupied conditions with CO<sub>2</sub>.
- ✓ Push buttons allow occupant adjustment of temperature set point within programmable limits and allows for reset from setback conditions.
- ✓ Will take sensor input from an external temperature or enthalpy sensor to provide free cooling in economizer mode.
- ✓ Provides a signal to directly modulate an air intake damper for CO<sub>2</sub> based ventilation control and economizer control.
- ✓ Integrates automatic switchover between heating and cooling modes.
- ✓ Cover can be locked in place to prevent sensor adjustment if desired.
- ✓ Add-on options for Lonworks® or RS-485 network/central system communication.
- ✓ Purposefully built for quality - designed and built using Internationally Certified ISO 9001 processes.
- ✓ All settings can be easily adjusted with an easy to use, plug-in PC interface.

### Why Active Ventilation Control With CO<sub>2</sub>?

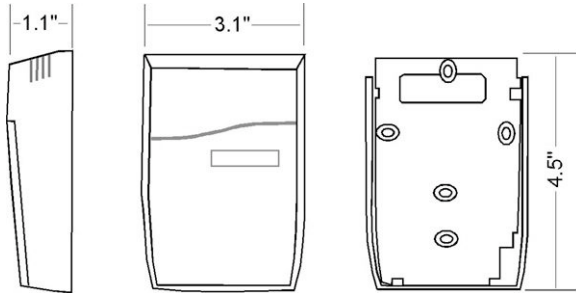
Zone ventilation control with CO<sub>2</sub> is a viable and energy efficient way of controlling ventilation to target cfm/person levels based on actual occupancy. It saves energy and effectively provides real time air balancing for outside air ventilation. This approach offers many advantages over the traditional approach of a one time set-up and adjustment of outside air to provide fixed ventilation based on assumed building maximum occupancy.

- ⇒ Reduce ventilation and energy costs in applications with variable occupancy.
- ⇒ In static occupancy applications, owner can continuously control ventilation rates to reflect current occupancy conditions.
- ⇒ Actively control ventilation to eliminate unintended over and under ventilation conditions resulting from arbitrary adjustment of outside air quantities.
- ⇒ Monitor and control zone ventilation efficiency and take advantage of using preconditioned transfer air from under occupied spaces for ventilation.
- ⇒ Documented CO<sub>2</sub> levels can provide ongoing verification that code-required ventilation rates are being maintained.

## Control Based On Real Time Occupancy

The TR9240 measures CO<sub>2</sub> concentrations in a space to determine both occupancy and the need for ventilation. The need to deal with complicated time-based programming is eliminated with the ability to sense actual occupancy using the CO<sub>2</sub> exhaled by people.

## TR9240 Dimensions



## Ordering Information

### 2 Stage Cooling (+ Economizer Control)

**TR9240-L** Display, Flip-Open Cover Provides Access To Adjustment Buttons

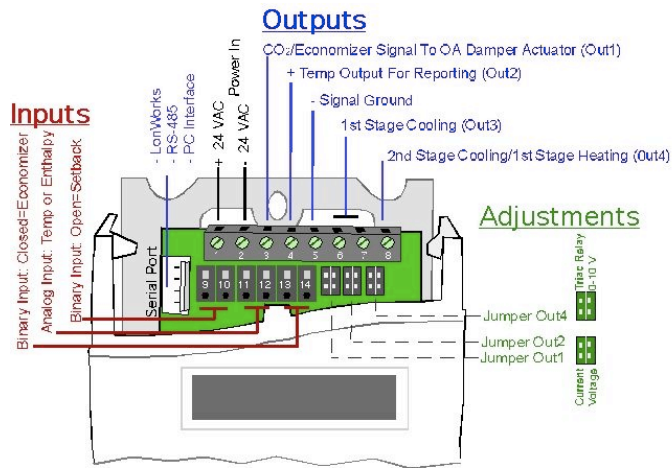
**TR9420-L-(Lock)** Display, Locking Screws On Cover

### 1 Stage Cooling, 1 Stage Heating (+ Economizer Control)

**TR9241-L** Display, Flip-Open Cover Provides Access To Adjustment Buttons

**TR9421-L-(Lock)** Display, Locking Screws On Cover  
For Lonworks® add "-LON" to suffix, For RS485 add "-485" to suffix.

## Wiring



## Other AirTest CO<sub>2</sub> Products

AirTest™ also offers other programmable CO<sub>2</sub> monitors that offer additional capabilities including:

- ➔ Measurement of humidity or dew point,
- ➔ Measurement up to 20% CO<sub>2</sub>,
- ➔ The ability to receive inputs from other sensors,
- ➔ Zone VAV box control of ventilation and temperature,
- ➔ A variety of enclosures for industrial and other uses.
- ➔ Hand held CO<sub>2</sub> monitors with data logging

### Distributed By:

**Global Controls, Inc.**  
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## Specifications

### General

**CO<sub>2</sub> Detection Method:** Gold Plated Non-Dispersive Infrared Optical Sensor with Automatic Baseline Correction for Self-Calibration. Diffusion Sampling.

**Certification:** CE, EMC89/336/EEC, CA Energy Commission

**Temperature Measurement:** Thermistor With Linear Output

**Transmitter Rated Life:** 15 years

**Operating Conditions:** 32 to 122° F (0 to 50°C), 0 to 95% RH

**Storage Conditions:** -40 to 158° F (-40 to 70° C)

### Performance

**CO<sub>2</sub> Measurement Range:** 0-2000 ppm (factory set), user adjustable to 6000 ppm

**CO<sub>2</sub> Accuracy:** +/- 1% of measurement range + 5% of measured value.

**Response Time:** T<sub>90</sub> = <2 minutes (diffusion)

**Temperature Measurement Accuracy:** +/- 0.9° F ( 0.5° C)

### Power

**Input:** 18-30 VAC, 50-60 hz (half-wave rectified)

**Average Power Consumption:** £ 3 Watts average

### Inputs:

**Switch Input1:** External timer input for setback (9,10)

**Switch input2:** Binary indicator of economizer mode (13,14)

**Analog Input:** From OA temp or enthalpy sensor (11,12)

**Push Buttons:** Temp adjustment/reset/program change

**Program Adjustment & Defaults:** All program variables adjustable via simple PC interface. (Bracketed values indicate factory setting)

- Cooling Temperature set point (74°F)
- Heating Temperature set point (69°F)
- Temperature setback set point (78°F)
- Temperature button adjustment limits (+/-2°F from sp)
- Operating time after reset (2 hours)
- Target outside air ventilation rate (15 cfm/person)

### Outputs

**Adjustment:** All outputs including display values shown, measurement range, analog output range and relay set point can be easily adjusted by the user or your distributor using a PC and the AirTest™ Interface(AI) program.

**Digital Display:** CO<sub>2</sub> Concentrations in ppm, Temperature in °F or °C, Setback or Normal Operation.

### Linear Analog Outputs:

- Out1\*: CO<sub>2</sub> Ventilation & Economizer Signal To Actuator
- Out2\*: Temperature for Reporting  
\*jumper selectable for VDC or mA  
0 to 10 VDC R<sub>OUT</sub> < 100 ohm, 0 to 5 VDC R<sub>LOAD</sub> >5k ohm,  
4 to 20 mA R<sub>LOAD</sub> < 500 ohm

### \*\*Relay

- Out3: 1<sup>st</sup> Stage Cooling Relay
  - Out4: 2<sup>nd</sup> Stage Cooling or 1<sup>st</sup> Stage Heating
- \*\*Relay: Isolated, NO, 1mA/5V up to 1A/50VAC/24VDC

**Lonworks® Option:** CO<sub>2</sub>, Temperature

**RS-485 Option:** Network capability for up to 30 units (Custom protocol: contact AirTest™ or Distributor for details).

Covered By US Patents: 6194735, 6016203, other patents pending

AirTest™ Technologies Inc. specializes in the application of cost effective, state-of-the-art gas monitoring technology to ensure the comfort, security, health and energy efficiency of buildings.

**airTest**  
Sensors That Make Buildings Smart!