Self Calibrating - CO₂ Transmitters

With BACnet® or LonMark® Certified Communicating Options

A No Calibration CO₂ Transmitter

The TR9290 family of sensors are quality-engineered CO₂ transmitter targeted at applications where a dependable CO₂ sensor is required that never needs calibration.

Key features of these CO₂ transmitters include:

- Internal self-calibration method based on background measurement that also eliminates need for outdoor CO₂ sensor.
- Choice of outputs: 0-10V, 0-5V or 4-20mA and LonWorks®.
- Built to ISO 9001 standards
- Mounting options include wall, duct and in-duct.
- Utilizes a proven infrared measurement technology with over 18 years of flawless operating history.
- Supported by a team of knowledgeable application specialists. We are just a phone call away if you have questions.
- LonMark® Certified output option.

AirTest also offers CO₂ sensors that feature self-calibrating dual beam technology, and that integrate CO₂ temperature and humidity in one device. We also have a wide variety of other sensors to measure combustible and toxic gases, humidity, dew point and air velocity. Contact us for more information.

Length Does Matter...

The AirTest CO₂ transmitter has proven itself to be the most trouble free CO₂ product available today. A important reason for this is the unique, patented, oval design of the sensor. All competitive sensors use a straight path of infrared energy shining through an air sample to measure CO₂. The amount of gas that can be sampled, called the “path length” is limited by the size constraints of their wall-mounted and duct-mounted cases.

The AirTest design, using a similar sized case, provides over double the path length of any other CO₂ sensor (4.8") by bouncing the light around the small oval sensor element. Longer path length means that a larger sample of air is measured. In technical terms this results in an increased signal-to-noise ratio. This means that the AirTest sensor performs better at long-term sensor stability and accuracy than other devices.

Greater dependability is the ultimate result.
# Dimensions TR9294 (New Wall Mount)

- **Front**: 3.25” x 3.25”
- **Back**: Designed for 2.5” X 4” J-box/mud ring mounting or direct fasten to wall
- **Side**: 5.0”
- **Display Option**:
- **Wiring Access**:

## Specifications

### General
- **CO₂ Detection Method**: Gold Plated Non-Dispersive Infrared Optical Sensor with Automatic Baseline Correction for Self-Calibration, 4.8” optical path length, diffusion sampling.
- **Certification**: CE, EMC89/336/EEC, CA Energy Commission, NYSERDA, LonMark® Certified (V3.4).
- **Transmitter Rated Life**: minimum 15 years
- **Operating Conditions**: 32 to 122º F (0 to 50ºC), 0 to 95% RH
- **Storage Conditions**: -40 to 158º F (-40 to 70ºC)

### Performance
- **CO₂ Measurement Range**: 0-2000 ppm (factory adjustable to 10,000 ppm upon request),
- **CO₂ Accuracy**: +/- 1% of measurement range +/- 3% of measured value.
- **Calibration**: Self Calibrating, Calibration Not Required
- **Response Time**: T90 = <2 minutes (diffusion), < 15 seconds for flow through.

### Power
- **Input**: 24 VAC/VDC ±20%, 50-60 hz (half-wave rectified)
- **Average Power Consumption**: ≤ <1 Watt average
- **Ground**: Analog output transmitters must share common ground with control system.

### Outputs
- **Linear Analog Output**: Two simultaneous dual output options available: A) 0-5V & 4-20mA, B) 0-10V & 4-20mA.
- **LonWorks®**: CO₂ ppm & % SNVT (See LonWorks® Specification on next page). LonMark® Certified.
- **BACnet® MS/TP**:
  - User Interface: Simple DIP Switch Selection
  - Output To Host Control: RS485 BACnet® MS/TP
  - Baud Rates: 9.6K, 19.2K, 38.4K, 57.6K, 76.8K
- **More Information**: [www.airtest.com/net/Lon.pdf](http://www.airtest.com/net/Lon.pdf)

### Dimesions: TR-9290 (Wall)

### Dimesions: TR-9291 (In-Duct)

### Dimesions: TR9292 (Aspiration Duct Probe)

### Distributed By:

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

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

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www.AirTestTechnologies.com 1/13/12
AirTest LonWorks® Specifications

Description: This LonWorks® output is only available for the AirTest Model TR9294 wall Mount CO₂ Transmitter. These sensors are all self-calibrating and will not require any maintenance for the life for the sensor (typically 15 years). These sensors provide a CO₂ ppm & % SNVT for 0-2000 ppm CO₂. Other ranges up to 0-10,000 can be factory set.

LonMark® Specification:

- **AirTest Models:** TR9294-L-Lon, TR9294-Lon,
- **Category:** Sensor
- **Measurement Range:** 0-2000 ppm (factory adjustable to 10,000 ppm)
- **Standard Program ID:** 80:00:E5:0A:46:06:04:01
- **LonMark® Version:** 3.4
- **Manufacturer ID:** 229
- **Device Class:** CO₂ Sensor (10.70)
- **Usage:** 06 – Residential/Commercial
- **XIF/DRF Download:** [www.airtest.ca/support/sw/AirTestLon.zip](http://www.airtest.ca/support/sw/AirTestLon.zip)
- **Transceiver:** 04-TPFT-10
- **Model:** 1
- **XIF Available:** True
- **DRF available:** True
- **LonMark Objects:** 0000 Node object (1), 1070 CO₂ Sensor (1)
- **Clock Rate:** 10 MHz
- **Power Requirement:** 18-30VAC/VDC (1/2 wave rectified) < 1 W average
- **Object Details:** See diagram
AirTest CO₂ BACnet® Specifications

Description: This BacNet® output is only available for the AirTest Model TR9294 wall Mount CO₂ Transmitter. These sensors are all self-calibrating and will not require any maintenance for the life for the sensor (typically 15 years). These sensors provide a CO₂ ppm output object for 0-2000 ppm CO₂. Evaluated by the BACnet® Interoperability Testing Service (BITS), BACnet® Testing Laboratory (BTL) Certification in progress.

TR9294-BAC Overview

The BACnet® objects associated with the TR9294 permits display of current values of the CO₂ transmitter. The BACnet® objects associated with the TR9294 are described below.

BACnet® Device Object

The device object allows the configuration of the TR9294. Object properties can be specified as follows.

<table>
<thead>
<tr>
<th>BACnet® Device Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR9294</td>
<td>This allows the operator to specify the following: Device name, Device location, Time and Date, Universal Time Coordinates Offset, APDU properties, MS/TP properties, Object Identifier</td>
</tr>
</tbody>
</table>

Other BACnet® Objects

<table>
<thead>
<tr>
<th>BACnet® Objects</th>
<th>Default Present-Value</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Input Objects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO2 Level (A1)</td>
<td>Display Only</td>
<td>NA</td>
<td>Displays present CO2 value</td>
</tr>
<tr>
<td>Temperature (A2)</td>
<td>Display Only</td>
<td>NA</td>
<td>Displays present temperature value</td>
</tr>
<tr>
<td>Analog Value Objects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binary Input Objects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pushbutton ID (B1)</td>
<td>Inactive</td>
<td>Active/Inactive</td>
<td>Pushbutton on sensor module to facilitate identifying and locating</td>
</tr>
<tr>
<td>Sensor Error (B2)</td>
<td></td>
<td>Active</td>
<td>Output from raw sensor indicating an error condition</td>
</tr>
<tr>
<td>Binary Output Objects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote Calibration Request (BO1)</td>
<td>Inactive</td>
<td>Active/Inactive</td>
<td>optional remote calibration request</td>
</tr>
<tr>
<td>ID LED (BO2)</td>
<td></td>
<td>Active/Inactive</td>
<td>LED for ID purpose</td>
</tr>
</tbody>
</table>