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. An 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)**

**Dimensions: TR-9290 (Wall)**

**Dimensions: TR-9291 (In-Duct)**

**Dimensions: TR9292 (Aspiration Duct Probe)**

**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 70º C)

**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). **Note:** TR9292-Lon is 24VDC only.

**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.

**More Information:** [www.airtest.com/net/Lon.pdf](http://www.airtest.com/net/Lon.pdf)

**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


<table>
<thead>
<tr>
<th>Model Number</th>
<th>Output</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR9290</td>
<td>- Wall (EU-3.5” x 3”)</td>
<td>A - 0-5V, 4-20mA</td>
</tr>
<tr>
<td>TR9291</td>
<td>- In Duct</td>
<td>B - 0-10V, 4-20mA</td>
</tr>
<tr>
<td>TR9292</td>
<td>- Duct Probe</td>
<td>Lon - LonWorks®¹</td>
</tr>
<tr>
<td>TR9293</td>
<td>- Splash Resistant</td>
<td>BAC - BACnet MS/TP¹</td>
</tr>
<tr>
<td>TR9294</td>
<td>- Wall (US-3.25 x 5”)</td>
<td>- No Display</td>
</tr>
</tbody>
</table>

**Notes:** 1 - Only available on TR9294
2 - Not Available On TR9291

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

TR9294-Lon TR9294-L-Lon

LonMark® Specification:

AirTest Models: TR9294-L-Lon, TR9294-Lon, TR9292-Lon
(Note: TR9292-Lon is 24VDC only)
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
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/NDC (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.

**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>

**BACnet Analog (AI) Objects**

The analog inout objects permit display of present values of the following values.