CO₂ Sensors

**OPERATION**

The CX series carbon dioxide sensor is designed for use in HVAC control applications. By controlling fresh air to occupant need as determined by CO₂ requirements, energy can be saved and tenant comfort improved. Inside buildings, people are the major source of CO₂. Typical outdoor air levels of CO₂ range between 350 to 400 ppm. Ideal ventilation is typically around 1000 ppm.

The CX series ensures that adequate ventilation will be provided, while maximizing energy savings by ventilating at the optimum level.

The CX series is available with relative humidity and temperature sensors for lowest installed cost.

**Applications**

- Control HVAC in response to user needs – save up to 30% on energy by providing ventilation as required
- Improve tenant comfort
- Facilitate compliance with ASHRAE 62-1989 standard for air quality

**Microprocessor-based to reduce long-term drift and calibration requirements**

- Non-dispersive infrared technology (N.D.I.R.) repeatable to ±20 ppm. 0-2000 ppm range
- Innovative self calibration algorithm
- 5-year calibration interval (recommended)
- Low ambient sensitivity

**Versions for wall and duct applications**

- Field selectable 0-10, 0-5 VDC/4-20 mA output
- LCD display option
- Duct mount version available
- Optional relay output to trigger HVAC equipment at predetermined levels (e.g., one/two position damper)

**Save Up To 30% On Energy Costs**

**Demand Ventilation**

- Improve comfort and facilitate compliance with ASHRAE 62-1989 standard for air quality
- Optional relay with set point for direct ventilation control
- Output 4-20 mA or 0-10, 0-5V for control system interface
- Non-dispersive infrared technology (NDIR) for high accuracy and long term stability

**Ordering INFORMATION**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>CO₂</th>
<th>THERMISTOR or RTD</th>
<th>TEMP TRANSMITTER</th>
<th>RH TRANSMITTER</th>
<th>ALARM RELAY</th>
<th>LCD DISPLAY</th>
<th>DUCT MOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXL</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>CXL-RTD</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>CXL-T</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>CXL-RH</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>CXL-RH-RTD</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>CXL-RH-T</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>CXD</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>CXD/LCD</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Specify RTD or Thermistor type when ordering RTD versions
**Specifications**

- **Input Voltage**: 20 to 30 VAC/DC
- **Analog Output**: 0-5 VDC, 0-10 VDC or 4-20 mA (selectable)
- **Sensor Current Draw**: 100 mA maximum
- **Operating Temperature Range**: 0°C to 50°C
- **Material**: ABS high impact plastic, UL 94 V0

**CO2 Transmitter**

- **Sensor Type**: Non-dispersive infrared (NDIR), diffusion sampling
- **Measurement Range**: 0-2000 ppm or 0-5000 ppm user adjustable
- **Accuracy**: ±75 ppm
- **Repeatability**: ±20 ppm
- **Response Time**: <60 seconds for 90% step change

**RH Transmitter**

- **Sensor**: Digitally profiled thin-film capacitive (32 bit mathematics) U.S. Patent 5,844,138
- **Accuracy**: ±2% or ±3% (specify) @ 10 to 90% RH; Four-point calibration NIST standards
- **Stability**: ±1% @ 20°C (68°F) annually, for two years
- **Operating Humidity Range**: 0 to 100% RH
- **Temperature Coefficient**: ±0.03% RH/°C over 0 to 60°C (32° to 140°F)

**Temperature Transmitter**

- **Sensor Type**: Solid state, integrated circuit
- **Accuracy**: ±0.5°C typical
- **Resolution**: 0 to 50°C = 0.1°C; -50°C = 0.125°C
- **Ranges**: 10 to 35°C (50 to 95°F)

**Thermistor & RTD Options**

- **10k Type 2**: ±1.0°C, -50/150°C
- **10k Type 3**: ±0.2°C, 0/50°C
- **10k Type Dale**: ±0.2°C, -20/70°C
- **3k**: ±0.2°C, 0/70°C
- **100 Platinum RT D**: ±0.3°C, 385 curve
- **1000 Platinum RT D**: ±0.3°C, 385 curve

---

**Wiring Diagrams**

**CXL Wall Mount**

- Power Supply: 24 VAC/DC
- Control System: 0-10 V or 4-20 mA

**CXD Duct Mount**

- Power Supply: 24 VAC/DC
- Control System: 0-10 V or 4-20 mA

**Mounting Dimensions**

**CXL Wall Mount**

Dimensions: 4.250" (108 mm) x 3.50" (89 mm) x 4.75" (121 mm)

**CXD Duct Mount**

Dimensions: 4.250" (108 mm) x 1.162" (30 mm) x 1.530" (39 mm)

Optional built-in static pick up tube (CXD Models)