

CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitters

Product Bulletin

CD-W00-00-2, CD-W00-N0-2

Code No. LIT-12012118
Issued February 2016

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Johnson Controls offers carbon dioxide (CO₂) and temperature transmitters for measuring and transmitting CO₂ levels, ranging from 0 to 2,000 parts per million (ppm) and temperatures, ranging from 32 to 122°F (0 to 50°C) within HVAC CO₂ and temperature applications.

Specific HVAC CO₂ applications include Demand Control Ventilation (DCV), fresh air and Indoor Air Quality (IAQ), and rooftop air handling Economizer controls systems.

This compact wall-mounted device produces 0 to 10 V and 4 to 20 mA signal for CO₂ output and provides connections to a platinum temperature sensor (Pt1000 RTD). It is designed to work as part of any integrated Building Automation System (BAS).

The CO₂ and temperature transmitter is easy to install and requires no maintenance or field calibration.



Figure 1: Wall Mount CO₂ and Temperature Transmitter

Table 1: Features and Benefits

Features	Benefits
Energy Savings from DCV Strategies	Offer potential for 10 to 70% energy savings.
Second-Generation CARBOCAP® Single-Beam, Dual-Wavelength Design	Provides superior performance compared to other technologies.
Second-Generation CARBOCAP Silicon, Micro-Machined Construction	Provides reliable CO ₂ measurement in room environments.
Platinum Temperature Sensor	Provides multiple functions in a single device, eliminating the need to install multiple devices
Calibration Reliability	Offers 5 years of reliable calibration.
Stable Infrared Reference	Compensates for light-source drift.

Product Overview

This multifunctional CO₂ and temperature transmitter uses an advanced CO₂ sensing technology. The second-generation, silicon-based CARBOCAP® sensor provides stability and reliability.

The CARBOCAP sensor operates in accordance with the single-beam, dual-wavelength method. This patented sensor has unique reference measurement capabilities, offering excellent stability over five years in typical HVAC applications.

The CO₂ transmitter is factory-set to measure CO₂ levels up to 2,000 ppm. It requires a Class 2, 24 VAC/VDC power source and generates an output signal proportional to the CO₂ level detected. One simple wire to a screw terminal on the Printed Circuit Board (PCB) selects the analog output signal from the following options:

- 0 to 10 V
- 4 to 20 mA

The multifunctional device also features a connection to an internal platinum temperature sensor (Pt1000 RTD). This temperature sensor has a range of 32 to 122°F, which allows for accurate temperature measurement in many common HVAC applications.

Calibration

IMPORTANT: The CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitters are intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the transmitter could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the transmitter.

The CD-W00-x0-2 CO₂ and Temperature Transmitter is calibrated using certified gases for the following:

- output signal (0 to 10 V) proportional to CO₂ concentration (0 to 2,000 ppm)
- altitude range of 0 to 2,000 ft (0 to 600 m) above sea level without compensation

Second-Generation CARBOCAP Technology

Johnson Controls is licensed to integrate the silicon-based CARBOCAP® sensor into HVAC or Building Automation Systems. Integrating this sensor delivers several advantages: high accuracy, excellent stability, negligible temperature dependence, and ease of installation. Due to the long-term stability, maintenance costs are reduced.

The structure of the diffusion-aspirated, single-beam dual-wavelength sensor is remarkably simple. It consists of an Infrared (IR) source, a sample cell, a tunable-interference filter, and an IR detector. The tunable-interference filter enables measurements at two wavelengths. As a result, references are measured accurately, without the typically broad tolerances inherent in dual-beam sensors.

Dust, water vapor, and most chemicals do not affect the measurement accuracy of the sensor. No special software compensation patches are necessary, and the device requires no maintenance.

Versatile Transmitter

Designed for mounting directly to a wallboard surface, the CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitter generates considerable savings in installation, operation, and maintenance with no recalibration costs.

Energy Efficiency

The CO₂ and temperature transmitter, when used with BAS/Economizer controllers (featuring DCV strategies), can generate energy savings up to:

- 20 to 40% in office buildings
- 20 to 60% in restaurants/light retail facilities
- 10 to 70% in educational/business settings

Repair Information

If the CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitters fail to operate within their specifications, replace the units. For a replacement CO₂ and temperature transmitter, contact the nearest Johnson Controls representative.

Altitude Compensation

This device is intended for an altitude range of 0 to 2,000 ft (0 to 600 m) without compensation. To compensate for higher altitudes, refer to the *CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitters Installation Instructions (Part No. 24-10864-11)* for additional information.

Ordering Information

Contact the nearest Johnson Controls representative to order CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitters. See Table 3 replacement parts and accessories available for the wall mount CO₂ and temperature transmitter.

Table 2: CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitters

Product Code Number	Description
CD-W00-00-2	Wall Mount CO ₂ and Temperature Transmitter with Logo
CD-W00-N0-2	Wall Mount CO ₂ and Temperature Transmitter without Logo

Table 3: Repair Parts and Accessories

Product Code Number	Description
ACC-DWCLIP-0	Drywall Spring-Clip Mounting Kit
Y65T31-0	Multiple Primary Transformer, 40 VA, 120/208/240 V Primary, 24 V Class 2 Secondary with Screw Terminals: Foot Mounting or 4 x 4 in. (100 x 100 mm) Plate

Technical Specifications

CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitters (Part 1 of 2)

CO₂ Measuring Range	0 to 2,000 ppm CO ₂
CO₂ Accuracy Across Temperature Range	68 to 86°F (20 to 30°C): ±(30 ppm +3% of reading) 50 to 68°F (10 to 20°C), 86 to 104°F (30 to 40°C): ±(35 ppm +3.7% of reading) 32 to 50°F (0 to 10°C), 104 to 122°F (40 to 50°C): ±(40 ppm +4.8% of reading)
Long-Term Stability	±(15 ppm +2% of reading) over 5 years
Response Time (0 to 63%)	1 minute
Temperature Measurement Range	32 to 122°F (0 to 50°C)
Platinum Temperature Sensor	Temperature Sensor: 1,000 ohms, Class F0.15 IEC 60751 (Class A), thin-film platinum Temperature Coefficient: Approximately 2 ohms per F° (3.9 ohms per C°) Reference Resistance: 1,000 ohms at 32°F (0°C) Accuracy: ±0.34F° at 70°F (±0.18C° at 21°C)
Operating Temperature Range	32 to 122°F (0 to 50°C)
Storage Temperature Range	-40 to 158°F (-40 to 70°C)
Operating Humidity Range	0 to 95% RH (noncondensing), 86°F (30°C) maximum dew point
Transmitter CO₂ Output Signal	4 to 20 mA and 0 to 10 VDC Maximum Output Current: 21 mA; Maximum Output Voltage: 11 V
Resolution of Analog Outputs	0.3 ppm CO ₂
Recommended External Load	Minimum 1,000 ohms load resistance for 0 to 10 V Maximum 600 ohms load resistance for 4 to 20 mA
Power Supply Range	24 VAC ±20%, 50/60 Hz (18 to 30 VDC), Class 2
Power Consumption	<1.0W Average, excluding current output consumption
Current Consumption	100 mA Peak on AC power; 45 mA Peak on DC power
Warm-Up Time	<1 minute <10 minutes for full specification
Dimensions (H x W x D)	5 x 3-3/16 x 1-1/32 in. (127 x 81 x 26 mm)
Shipping Weight	0.25 lb (114 g)

CD-W00-x0-2 Series Wall Mount CO₂ and Temperature Transmitters (Part 2 of 2)

	United States	UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment, FCC Compliant to CFR 47, Part 15, Subpart B, Class A
	Europe	CE Mark - Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC directive.
	Canada	UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205-12, Energy Management Equipment, Industry Canada Compliant, ICES-003
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant.

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

United States Emissions Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the users will be required to correct the interference at their own expense.

Canadian Emissions Compliance

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.
 Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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