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# CD-W00-00-1 Wall Mount CO<sub>2</sub> Transmitter

## Product Bulletin

CD-W00-00-1

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Johnson Controls offers a Carbon Dioxide (CO<sub>2</sub>) transmitter for measuring and transmitting CO<sub>2</sub> levels, ranging from 0 to 2,000 parts per million (ppm), within Heating, Ventilating, and Air Conditioning (HVAC) CO<sub>2</sub> applications. Specific HVAC CO<sub>2</sub> 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 signals. It is designed to work:

- in stand-alone mode
- as part of any integrated Building Automation System (BAS)

This new CO<sub>2</sub> transmitter is easy to install, offers a full 3-year warranty, and requires no maintenance or field calibration.



**Figure 1: Wall Mount CO<sub>2</sub> Transmitter**

**Table 1: Features and Benefits**

Features	Benefits
<b>Energy Savings from DCV Strategies</b>	Offer potential for 10 to 70% energy savings.
<b>Vaisala CARBOCAP® Single-Beam, Dual-Wavelength Design</b>	Provides superior performance compared to other technologies.
<b>CARBOCAP Silicon, Micro-machined Construction</b>	Provides reliable CO <sub>2</sub> measurement in room environments.
<b>Calibration Reliability</b>	Offers 5 years of reliable calibration.
<b>Stable Infrared Reference</b>	Compensates for light-source drift.

## Product Overview

This CO<sub>2</sub> transmitter uses an advanced CO<sub>2</sub> sensing technology. The 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 both time and temperature.

The CO<sub>2</sub> transmitter is factory-set to measure CO<sub>2</sub> levels up to 2,000 ppm. It requires a Class 2, 24 VAC/VDC power source and generates an output signal proportional to the CO<sub>2</sub> 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

## Calibration

**IMPORTANT:** The CD-W00-00-1CO<sub>2</sub> Transmitter is 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 Johnson Controls® CD-W00-00-1 CO<sub>2</sub> Transmitter is calibrated using certified gases for the following:

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

## 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.

**Table 2: Product Code Number**

Product Code Number	Description
CD-W00-00-1	Wall Mount CO <sub>2</sub> Transmitter

**Table 3: 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

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

The wall mount CO<sub>2</sub> transmitter is designed for standard United States wallbox or surface mounting.

The Johnson Controls CO<sub>2</sub> 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-W00-00-1 Wall CO<sub>2</sub> Transmitter fails to operate within its specifications, replace the unit. For a replacement CO<sub>2</sub> 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-W00-00-1 Wall Mount CO<sub>2</sub> Transmitter Installation Instructions (Part No. 24-9601-94)* for additional information.

## Ordering Information

Contact the nearest Johnson Controls representative to order a CO<sub>2</sub> transmitter. See Table 3 for available accessories for the wall mount CO<sub>2</sub> transmitter.

## Technical Specifications

### CD-W00-00-1 Wall Mount CO<sub>2</sub> Transmitter

<b>Measuring Range</b>	0 to 2,000 ppm CO <sub>2</sub>	
<b>Accuracy at 77°F (25°C)</b>	±[50 ppm + 3.0% of reading] (includes calibration uncertainty, repeatability, and non-linearity). All accuracy specifications reflect the testing of the transmitter using high-grade certified gases. The transmitter is intended for an altitude range of 0 to 2,000 ft (0 to 600 m) above sea level without compensation.	
<b>Temperature Dependence of Output</b>	-0.35% of reading/°C, typical (may vary between individual units)	
<b>Long-Term Stability</b>	<5.0% of Full Scale/5 Years	
<b>Response Time (0 to 63%)</b>	1 Minute	
<b>Operating Temperature Range</b>	23 to 113°F (-5 to 45°C)	
<b>Storage Temperature Range</b>	-4 to 158°F (-20 to 70°C)	
<b>Humidity Range</b>	0 to 85% RH (noncondensing), 85°F (29°C) maximum dew point	
<b>Transmitter CO<sub>2</sub> Output Signal</b>	4 to 20 mA or 0 to 10 VDC Maximum Output Current: 25 mA; Maximum Output Voltage: 12.5 V	
<b>Resolution of Analog Outputs</b>	2.5 ppm CO <sub>2</sub>	
<b>Recommended External Load</b>	Current Output: Maximum 500 ohms Load Resistance Voltage Output: Minimum 1,000 ohms Load Resistance	
<b>Power Supply Range</b>	20 to 30 VAC (18 to 30 VDC), Class 2	
<b>Power Consumption</b>	<2.0 W Average, excluding current output consumption	
<b>Current Consumption</b>	150 mA peak (70 mA average)	
<b>Warm-Up Time</b>	<1 Minute <10 Minutes for Full Specification	
<b>Dimensions (H x W x D)</b>	4-23/32 x 3-5/32 x 1-7/32 in. (120 x 80 x 31 mm)	
<b>Shipping Weight</b>	0.26 lb (117 g)	
<b>Compliance</b>	<b>United States</b>	UL Listed, File E27734, CCN XAPX, UL 873, Temperature Indicating and Regulating Equipment, FCC Compliant to CFR 47, Part 15, Subpart B, Class A
	<b>Canada</b>	UL Listed, File E27734, CCN XAPX7, CAN/CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment. Industry Canada Compliant, ICES-003
	<b>Europe</b>	CE Mark, EMC Directive 89/336/EEC, in accordance with EN 61326-1:1997 + Am1:1998 + Am2:2001 + Am3:2003, Electrical equipment for measurement, control, and laboratory use – EMC requirements – Minimum requirements

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 is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her 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.



**Building Efficiency**  
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