

CD-Px0xx-00-00 Series Duct Mount CO₂ Transmitters

The Johnson Controls® CD-Px0xx-00-00 Series duct mount transmitters are designed for the measurement of CO₂ and temperature in HVAC applications where demand control ventilation (DCV), fresh air and indoor Air Quality (IAQ), and rooftop air handling economizer control systems are often required.

The CD-P Series sensors incorporate a dual wavelength non-dispersive infrared (NDIR) CO₂ sensor, which compensates for aging effects, is highly insensitive to pollution, and offers outstanding long-term stability.

The CD-P1000-00-00 transmitter is available with CO₂ output only, 0 to 10 V or 4 to 20 mA while the CD-P2000 Series offers CO₂ and temperature measurement with active or passive outputs.

A multiple point CO₂ factory adjustment procedure leads to excellent CO₂ measurement accuracy over the entire temperature working range.

Figure 1: Duct Mount CO₂ Transmitter (Shown with Mounting Flange and Cable Gland)



Features and benefits

Adjustable duct probe depth

Permits optimal placement of sensing tip in a duct.

Support for DCV

Offers potential for 10 to 70% energy savings.

Single-beam dual-wavelength NDIR CO₂ sensor

Is highly insensitive to pollution with outstanding long-term stability.

Models include CO₂ and CO₂ + temperature outputs

Reduces installation time and cost.

0 to 10 V or passive temperature output

Is suitable for a wider range of applications.

Factory calibration certificate

Includes test report according to DIN EN10204 - 2.2.

Product overview

This transmitter uses NDIR CO₂ sensing technology and operates in accordance with the single-beam dual-wavelength method. The sensor offers excellent stability over both time and temperature.

The transmitter is factory set to measure CO₂ levels up to 2,000 (ppm). It requires a 24 VAC or 15 to 30 VDC power source and generates an output signal proportional to the CO₂ level detected.

The duct-mounted CO₂ transmitter Series offers:

- CO₂ transmitter with 0 to 10 V or 4 to 20 mA output, field-selectable.
- CO₂ transmitter with 0 to 10 V or 4 to 20 mA output field-selectable and temperature output 0 to 10 V.
- CO₂ transmitter with 0 to 10 V or 4 to 20 mA output and passive temperature output Pt1000 or NTC10K.

► **Important:** The CD-Px0xx-00-00 Series Duct Mount CO₂ 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.

► **Important:** Le CD-Px0xx-00-00 Series Duct Mount CO₂ Transmitter est destiné à transmettre des données entrantes à un équipement dans des conditions normales de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du transmitter risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du transmitter.

- in stand-alone mode
- as part of any integrated building automation system (BAS)
- in HVAC applications where DCV or fresh air or IAQ control strategies are required

Johnson Controls CO₂ transmitters are calibrated using certified reference gases.

CD-Px0xx-00-00 can operate in support of DCV, with fresh air and IAQ systems, with rooftop air handling economizer controls systems, in stand-alone applications, or as part of any integrated building automation strategy.

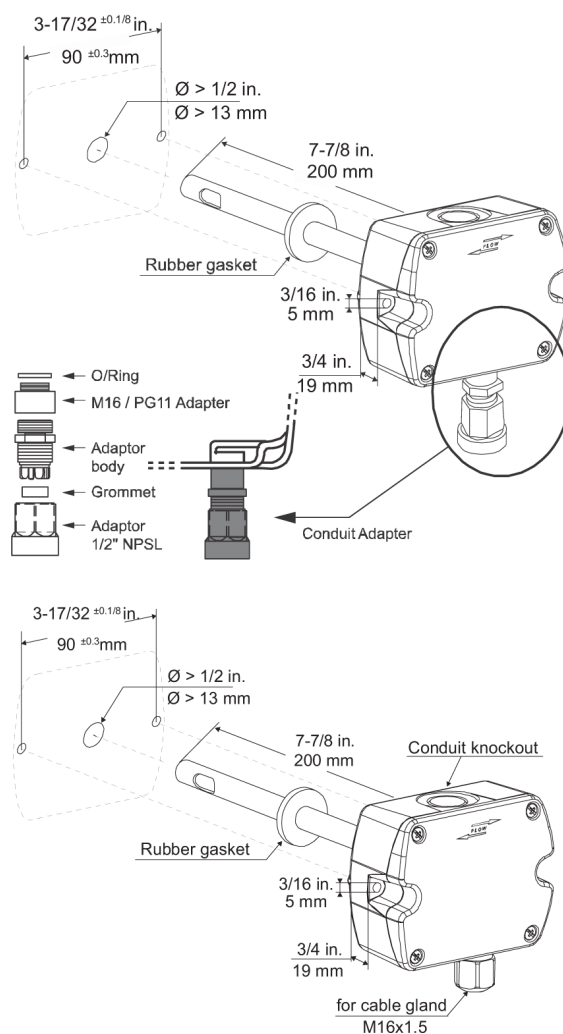
- 20 to 40% in office buildings
- 20 to 60% in restaurants/light retail facilities
- 10 to 70% in educational/business settings

See Figure 3 and Figure 2 for dimensions of the mounting flange and the CO₂ transmitter.

2-3/8 $\pm 0.1/8$ in.
60 ± 0.3 mm

$\varnothing > 5/8$ in.
($\varnothing > 16$ mm)

1/4 in.
6 mm



Altitude compensation

These devices are calibrated to be within accuracy specifications at sea level. To compensate for significantly higher altitudes, refer to the *CD-Px0xx-00-00 Series Duct Mount CO₂ Transmitter Installation Instructions (Part No. 24-11046-00007)* for additional information.

Repair information

If the CD-Px0xx-00-00 Series Duct Mount CO₂ Transmitter fails to operate within its specifications, replace the unit. For a replacement transmitter, contact the nearest Johnson Controls representative.

Ordering information

Contact the nearest Johnson Controls representative to order a CO₂ transmitter, and specify the desired product code number from Table 1. See Table 2 for the accessory available for the duct mount CO₂ transmitter.

Selection Charts

Table 1: CD-Px0xx-00-00 Series Duct Mount CO₂ Transmitters

Product Code Number	Description
CD-P1000-00-00	Duct CO ₂ 0/2000 PPM, output 0 to 10 V or 4 to 20 mA, selectable
CD-P2010-00-00	Duct CO ₂ 0/2000 PPM, output 0 to 10 V or 4 to 20 mA, selectable + temperature 0 to 10 V @ 32 to 131°F (0 to 50°C)
CD-P2016-00-00	Duct CO ₂ 0/2000 PPM, output 0 to 10 V or 4 to 20 mA, selectable + passive Pt1000
CD-P2017-00-00	Duct CO ₂ 0/2000 PPM, output 0 to 10 V or 4 to 20 mA, selectable + passive NTC10K

Table 2: Accessory for Duct Mount CO₂ Transmitters

Product Code Number	Description
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. (101.6 x 101.6 mm) Plate

Technical specifications

Table 3: CD-Px0xx-00-00 Series Duct Mount CO₂ Transmitter technical specifications

Specification		Description
Measuring Range		0 to 2,000 ppm CO ₂
Accuracy at 77°F (25°C)		< ± (50 ppm CO ₂ + 2.0% of reading) at 73.4°F (23°C) and 1013 mBar (14.7 psi)
Measuring Temperature (Pt1000 Accuracy)		EN60751 Class A, ±(0.15 + 0.002 * T °C)
Measuring Temperature (NTC10K Accuracy)		NTC 10k 1% B3950
Temperature Dependence of CO ₂ Output		± [1 + CO ₂ Concentration (ppm)/1000 (ppm)]/°C (-10 to 45°C), or ± (5/9) × [1 + CO ₂ Concentration (ppm)/1000 (ppm)]/°F (-4 to 113 °F)
Response Time (0 to 63%)		< 100 s at 590 ft/min (3 m/s) air speed in duct
Operating and Storage Temperature Range		-4 to 140°F (-20 to 60°C)
Humidity Range		0 to 95% RH non-condensing
CO ₂ Sensing Technology		Single-beam dual-wavelength NDIR
Transmitter Output Signal CO ₂		Switch Selectable: 4 to 20 mA or 0 to 10 VDC (Default)
Transmitter Output Temperature Signal		CD-P2010-00-00: 0 to 10 VDC, 32 to 122°F (0 to 50°C) CD-P2016-00-00: PT1000, Class A CD-P2017-00-00: NTC 10k, BETA=3950
Recommended External Load		Current Output: Maximum 500 ohms Load Resistance Voltage Output: Minimum 1,0000 ohms Load Resistance
Power Supply Requirements		Refer to <i>CD-Px000 CO₂ Duct Sensor Installation Instructions</i> (Part No. 14-88421-0)
Airflow Range		195 ft/min (1 m/s) recommended
Duct Probe Material		Duct probe meets plenum rating requirements of UL 1995, Heating and Cooling Equipment
Housing Material		ABS Plastic
Protection Class		Enclosure IP65/NEMA 4; Probe IP20
Dimensions (H x W x D)		Refer to <i>CD-Px000 CO₂ Duct Sensor Installation Instructions</i> (Part No. 14-88421-0)
Shipping Weight		0.3 lb (140 g)
Compliance	United States	cULus Listed; UL File E226431 CCN:PAZX, Under UL 916, Energy Management Equipment FCC compliant to CFR47, Part 15, Subpart B, Class A
	Canada	cULus Listed; UL File E226431 CCN:PAZX7, Under CAN/CSA C22.2 No. 205, Signal Equipment Industry Canada Compliant, ICES-003
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.

North American emissions compliance

United States

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.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canada

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.

Industry Canada Statement(s)

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Software terms

Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable end-user license, open-source software information, and other terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

Patents

Patents: <https://jciapat.com>

Single point of contact

APAC	Europe	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIJIANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS WESTENDHOF 3 45143 ESSEN GERMANY	JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA

Contact information

Contact your local branch office: www.johnsoncontrols.com/locations

Contact Johnson Controls: www.johnsoncontrols.com/contact-us

