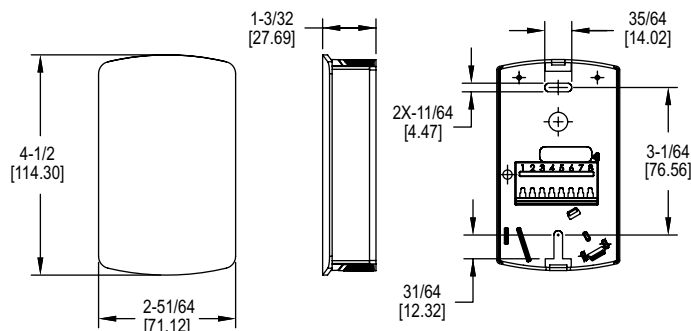




Model CDSN Carbon Dioxide Transmitter

Specifications - Installation and Operating Instructions



The **Model CDSN Carbon Dioxide Transmitter** accurately monitors the CO₂ concentration and temperature in schools, office buildings, and other indoor environments to help achieve LEED® certification and energy savings. In order to achieve a higher level of accuracy, the Model CDSN includes digital barometric pressure adjustment. The CO₂ universal output allows users to select the transmitter output to be 4-20 mA, 0-5 VDC, or 0-10 VDC to work with virtually any building management controller. In addition, the housing security feature reduces the likelihood of physical tampering.

BENEFITS/FEATURES

- Minimize inventory and save time by combining CO₂ and temperature measurement, as well as DIP switch selectable current/voltage outputs
- Integral passive temperature reduce number of devices mounted in the space
- Requires minimal maintenance with Automatic Baseline Correction (ABC) to account for sensor drift
- Reduce operation costs using a low energy, reliable, and repeatable CO₂ sensor
- Simplify installation with backplate electrical connections

APPLICATIONS

- Demand control ventilation in schools
- Indoor air quality monitoring in office buildings

INSTALLATION

CAUTION Disconnect power supply before installation to prevent electrical shock and equipment damage.

Make sure all connections are in accordance with the job wiring diagram and in accordance with national and local electrical codes. Use copper conductors only.

NOTICE Use electrostatic discharge precautions (e.g., use of wrist straps) during installation and wiring to prevent equipment damage.

NOTICE Avoid locations where severe shock or vibration, excessive moisture or corrosive fumes are present.

NOTICE Do not exceed ratings of this device. Exceeding the listed ratings may result in permanent damage not covered by warranty.

NOTICE Upon powering the transmitter, the firmware version will flash on the display. A warm-up period of 30 minutes is required for the transmitter to adjust to the current CO₂ concentration.

NOTICE Self-calibration feature requires exposure to normal, outdoor-equivalent carbon dioxide level once every 30 days.

SPECIFICATIONS

Sensor: NDIR, 15 year life expectancy.

Range: 0 to 2000 PPM.

Accuracy: ±40 PPM +3% of reading*.

Response Time: < 120 s (τ₉₀).

Warm Up Time: < 2 minutes operational; 10 minutes max accuracy.

Temperature Sensor Accuracy: ±1°C @ 25°C**.

Temperature Limits: Operating: 32 to 122°F (0 to 50°C); Storage: -22 to 158°F (-30 to 70°C).

Humidity Limits: 0 to 85%, non-condensing.

Power Requirements: 24 VAC/VDC ± 20%, 50/60 Hz.

Output Signal: Field selectable; Current: 4-20 mA or 0-20 mA; Voltage: 0-5 V, 1-5 V, 0-10 V, or 2-10 V.

Electrical Connection: Screw terminals.

Enclosure Material: ABS.

Enclosure Rating: NEMA 1 (IP30).

Agency Approvals: CE.

*The specified CO₂ accuracy is only guaranteed after three weeks of continuous operation in environments which are intermittently occupied.

**Included passive sensor: Sensor A - 10K Ω type 3 NTC thermistor; Sensor B - 10K Ω type 2 NTC thermistor; Sensor F - 20K Ω NTC thermistor.

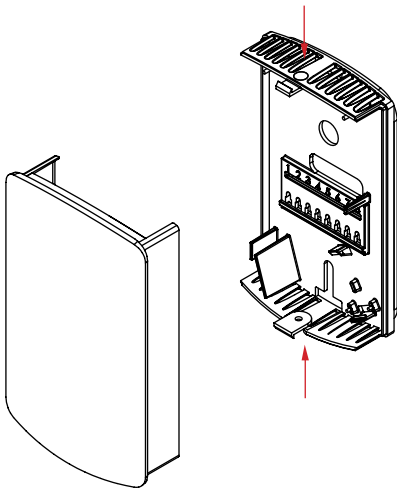


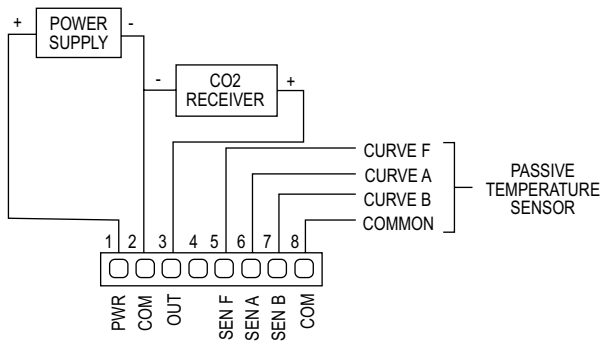
Figure 1: Removal of cover from backplate

MOUNTING

1. Select the mounting location, away from diffusers, lights, radiators, windows, or other external influences.
2. Push the tabs on the top and bottom of the backplate then pull the cover from the backplate (see Figure 1).
3. Mount transmitter on a vertical surface or a standard electrical box using the two #6 M2C type screws provided.
4. Pull wires through the oval hole in the backplate and make necessary connections. See Figure 2 for wiring diagram.
5. (Optional) If a temperature measurement is desired, connect wires to the appropriate terminal, see Figure 2. See Resistance Table on page 3.
6. Reinstall cover to backplate.
7. Take extreme caution not to touch the sensor when handling the device. This can cause the sensor's calibration to shift.

WIRING

Use maximum 18 AWG wire for wiring to terminals. Refer to Figure 2 for wiring information.



Included passive sensor:
 Sensor A - 10K Ω type 3 NTC thermistor
 Sensor B - 10K Ω type 2 NTC thermistor
 Sensor F - 20K Ω NTC thermistor

Figure 2: Active output wiring diagram

DIP SWITCH SETTINGS

To access the DIP switch panel, remove the cover of the unit as shown in Figure 1. The panel is located on the back of the circuit board as shown in Figure 3.

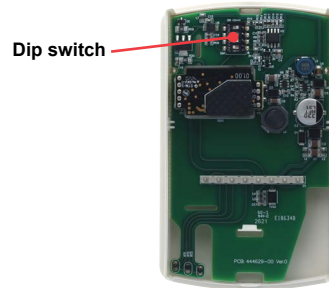


Figure 3: DIP switch location

The factory default output for the transmitter is 0-10 V. See the output range table to configure the desired output.

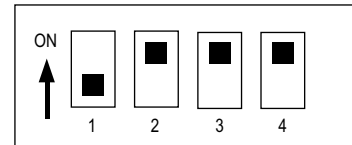


Figure 4: DIP switches

DIP Switch Positions: Output Range Selection

ON: Up position
 OFF: Down position

Current/Voltage Outputs

The CDSN can be configured to provide CO₂ readings via current or voltage output by adjusting the DIP switches.

OUTPUT RANGE TABLE				
Output Range	DIP Switch Positions			
	1	2	3	4
4-20 mA	ON	OFF	ON	OFF
0-20 mA	OFF	ON	ON	OFF
2-10 V	ON	OFF	ON	ON
0-10 V	OFF	ON	ON	ON
1-5 V	ON	OFF	OFF	ON
0-5 V	OFF	ON	OFF	ON

AUTOMATED CO₂ BASELINE CORRECTION (ABC)

The CDSN transmitter is a maintenance-free instrument that automatically adjusts its calibrated zero point in spaces that are intermittently occupied, such as office buildings. The Automated Baseline Correction (ABC) feature accounts for long-term sensor drift by making small adjustments to the zero calibration point based on the lowest captured CO₂ readings.

RESISTANCE VS TEMPERATURE TABLE

Temperature		Resistance Curves (in Ω)		
$^{\circ}\text{C}$	$^{\circ}\text{F}$	A	B	F
-55	-67.0	607800.00	963849.00	2394000.00
-50	-58.0	441200.00	670166.00	1646200.00
-45	-49.0	323600.00	471985.00	1145800.00
-40	-40.0	239700.00	336479.00	806800.00
-35	-31.0	179200.00	242681.00	574400.00
-30	-22.0	135200.00	176974.00	413400.00
-25	-13.0	102900.00	130421.00	300400.00
-20	-4.0	78910.00	97081.00	220600.00
-15	5.0	61020.00	72957.00	163500.00
-10	14.0	47540.00	55329.00	122280.00
-5	23.0	37310.00	42327.00	92240.00
0	32.0	29490.00	32650.00	70160.00
5	41.0	23460.00	25392.00	53780.00
10	50.0	18780.00	19901.00	41560.00
15	59.0	15130.00	15712.00	32340.00
20	68.0	12260.00	12493.00	25360.00
25	77.0	10000.00	10000.00	20000.00
30	86.0	8194.00	8057.00	15892.00
35	95.0	6752.00	6531.00	12704.00
40	104.0	5592.00	5326.00	10216.00
45	113.0	4655.00	4368.00	8264.00
50	122.0	3893.00	3602.00	6722.00
55	131.0	3271.00	2986.00	5498.00
60	140.0	2760.00	2488.00	4520.00
65	149.0	2339.00	2083.00	3734.00
70	158.0	1990.00	1752.00	3100.00
75	167.0	1700.00	1480.00	2586.00
80	176.0	1458.00	1255.00	2166.00
85	185.0	1255.00	1070.00	1822.60
90	194.0	1084.00	915.50	1540.00
95	203.0	939.30	786.60	1306.40
100	212.0	816.80	678.60	1112.60
105	221.0	712.60	587.60	951.00
110	230.0	623.60	510.60	815.80
115	239.0	547.30	445.30	702.20
120	248.0	481.80	389.60	606.40
125	257.0	425.30	341.90	525.60
130	266.0	376.40	301.00	N/A
135	275.0	334.00	265.80	N/A
140	284.0	297.20	235.30	N/A
145	293.0	265.10	208.90	N/A
150	302.0	237.00	186.10	N/A

MAINTENANCE/REPAIR

After the transmitter is installed, no routine maintenance is required. The Model CDSN is not field serviceable or field repairable. Field repair should not be attempted and may void warranty.

WARRANTY/RETURN

Refer to "Terms and Conditions of Sale" in our catalog and on our website. Contact customer service to receive a Return Materials Authorization (RMA) number before shipping the product back for repair. Be sure to include a brief description of the problem plus any additional application notes.

MODEL CHART	
Model	Description
CDSN	Carbon dioxide transmitter

