Carbon Dioxide CO_2 Transmitters

CDR 100

Nov.08

CDR

FEATURES / BENEFITS

- **Attractive low profile case suits your building décor**
- **CO_2 gas sensor provides high accuracy in a compact low cost package**
- **15 years of experience and reliability built in**
- **Gold-plated optical CO_2 sensor increases sensor life and durability**
- **Gas permeable, water resistant diffusion filter prevents particulate and water contamination of the sensor**
- **Analogue outputs 0-10Vdc, 2-10Vdc & 0-5Vdc jumper selectable**
- **No recalibration required**
- **Lifetime warranty of calibration**

Technical Data

Method:	Single Beam Absorption Infrared Diffusuion sample method
Measurement range:	0-2000 ppm
Accuracy:	± 40 ppm @ 25C
Stability:	<2% of FS over life of sensor (15 years typical)
Non-lineraty:	<1% of FS
Response Time:	0-90% <2 minutes
Signal Update:	Every 2 seconds
Warm-Up Time@25°C:	<2 minutes (operational) 10 minutes (maximum accuracy)
Operation Conditions:	+0...+50°C 0-95% RH non-condensing
Power Supply:	24Vac/dc
Analogue output:	0-10Vdc, 2-10Vdc, 0-5Vdc Jumper selectable for CDR 100V 4-20mA (3-wire) for CDR 100A
Wiring:	0,75-1 mm^2 stranded copper wire only.
Weight:	150g
Calibration:	Life-time Guarantee
Dimensions:	102 x 90 x 40mm
Application Standards:	EN 55014:2000 EN 61000-4-2 EN 61000-4-3
Applic. EC directives:	89/336/EEC

Usage

CDR is a carbon dioxide transmitter to be used in commercial environments.

Typical applications:

- **office buildings**
- **conference rooms**
- **schools**
- **retail stores**
- **restaurants**
- **gymnasiums**
- **theaters**
- **movie**

CO_2 based Demand Controlled Ventilation (DCV) allows for ventilation based on occupancy while still maintaining ASHRAE recommended per-person ventilation rates.

Over-ventilation of buildings can be reduced, energy can be saved and air quality can be optimized.

Ordering

CDR 100V	CO2 Detector for 0-10V, 2-10V or 0-5Vdc
CDR 100A	CO2 Detector 4-20mA

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CDR provides Automatic Calibration

The CDR uses ABC Logic (Automatic Background Calibration) CO_2 self-calibration system that virtually eliminates the need for manual calibration in applications where the indoor CO_2 levels drops to outside levels during unoccupied periods (e.g. during evening hours).

ABC Logic is a special software routine in the sensor that remembers the CO_2 background readings 14 consecutive evenings and calculates if there is sensor drift and corrects for it.

The CDW sensor accuracy staying well within the +/- 40 ppm accuracy specifications of the sensor.

ABC Logic will not work properly in applications where the space is unoccupied for less than four hours a day or where there ar other internal sources of CO_2 in the building such as breweries, wineries, greenhouses or occupational health settings.

How the CDR CO_2 Transmitter works

The CO_2 sensor can detect gases based on the fact that gases will absorb light at very specific wavelenghts in the infrared spectrum.

In the CDR sensor, gas diffuses through a gas permeable membrane allows gas molecules to pass freely but prevents the entry of particules.

A light source at one end of the chamber generates a broad band of infrared energy that is directed through the sample chamber.

Because much of the light bounces off the gold plated walls of the sensor, alonger effective sample path can be achieved in a small disance.

At the other end of the sensor is a special optical filter installed on the top of a light detector.

The optical filter is designed to only admit light at the wavelength where CO_2 is known to absorb light.

The small change in light intensity caused by a change in the CO_2 concentrations is then measured by the detector and converted into a CO_2 measurement by a microprocessor.

The microprocessor also automatically calibrates and corrects the sensor for long term drift using ABC Logic self calibartion software.

Installation

The sensor must be placed in an area that is representative of the conditioned space of zone.

A mounting height between 1 and 1,5m is recommended.

The sensor is comprised of two separate pieces: sensor pre-mounted on the sensor bottom and the sensor case top.

Remove the cover.

Please note, use your nails or other unship tools to depress the clips.

Step 1. Sensor Location

The sensor should be mounted:

- On an internal wall near a return air grille or duct.
- At least 1m from a corner, 0,5m from an open doorway and 1m to 1,5m from the floor.
- Proximal to the wiring egress on the wall.
- Where temperature operating limits are 0...50°C

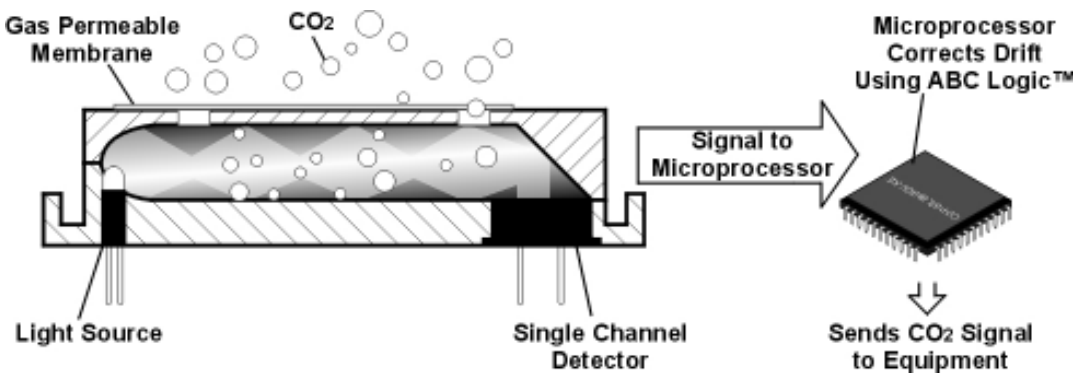
The sensor should not be mounted:

- Close to a window, on an outside wall, or next to a door leading to the outside.
- Close to or indirect airflow of areas such as open windows, drafts or overheat sources.
- In areas with poor air circulation, such as behind a door or in a alcove in areas where there are dramatic temperature fluctuations or moisture accumulation.
- Where it may be exposed to direct occupant breathing such as near water coolers or coffee machines.

WARNING

Before performing service or maintenance operations on the system, turn off main power switches to the unit.

Electric shock can cause personal injury.



Step 2. Wiring Requirements

The sensor wiring has the following requirements:

1.Power requirements: 24Vac/dc.

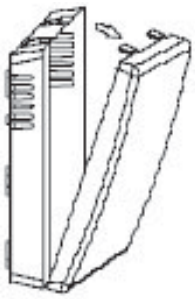
2. All system wiring must be in compliance with all applicable local and national codes.
3. A dedicated power supply is required for this sensor.
4. All sensor wiring should be colour coded for ease of maintenance and service.
5. Wiring should be 0,75-1mm^2 stranded wire. 1mm^2 is recommended.

Step 3. Mounting the Sensor

The sensor can be mounted on a surface, wall or in a junction box.

Surface or wall mounting

1. Place the mounting bracket on the wall.
   Mark the desired location of the two mounting holes on the wall through the holes in the mounting plate.
2. Pull the wires through the wire hole in the middle of the mounting plate.
3. Drill the mounting holes in the wall in the location market in Step1.
4. Mount the sensor mounting plate with wood screws and anchors.



Step 4 . Sensor Start Up

Perform the following procedure to start up the sensor:

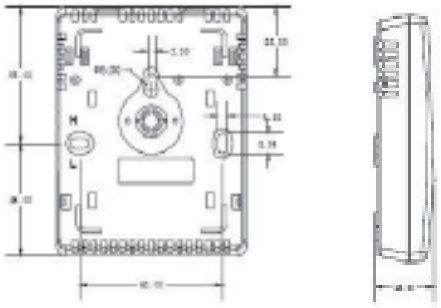
Once the installation is complete, apply power to the sensor. A two minute warm up will take place.

After two minutes, the LED indicator light will be solid.

Measure and read the temperature and CO_2 sensor levels by using a meter or checking the readings at the attached controller.

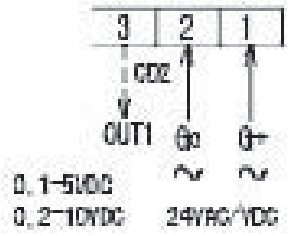
Be sure the CO_2 levels are above the minimum, up to the maximum acceptable level in the range. Replace the sensor cover once the test is complete.

Dimensions



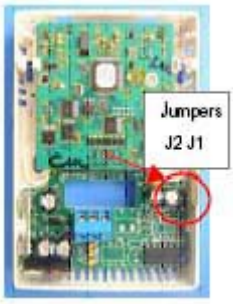
Wiring

CDR 100V with selectable jumper 2-10Vdc, 0-5Vdc or 0-10Vdc output.



Selection of voltage output via jumpers J1 and J2

J2	J1	output
connection	connection	1-5VDC
disconnection	connection	2-10VDC
connection	disconnection	0-5VDC
disconnection	disconnection	0-10VDC



CDR 100A with 4-20mA output (3-wire)

For 4-20mA you do not need any selection by jumpers.