# $CO_2$ duct sensor

# SDC

## Description

The SDC CO2 sensor measures air quality through the presence of carbon dioxide in air ducts in the range between 0...2000 ppm / 0...5000 ppm. The measurement of CO2 concentration happens through a NDIR sensor that operates on an infrared basis and which compensates the presence of any impurity. The product can be provided with humidity or humidity/temperature sensor.
Output 0 ... 10 Vdc or 4 ... 20 mA outputs.

## Technical specifications

| | |
|---|---|
| **CO2 measuring range** | 0 ... 2000 ppm / 0 ... 5000 ppm |
| **Accuracy** | ± 60 ppm (0 ... 2000 ppm) ± 2% FS / ± 150 ppm (0 ... 5000 ppm) ± 2% FS |
| **Measuring range ° C (optional)** | See configuration |
| **Accuracy ° C** | ± 0.3 ° C (5 ... 60 ° C) + 1% FS |
| **Measurement range RH (optional)** | See configuration |
| **RH accuracy** | 25°C ±2% RH (20...80% RH) + 2% FS |
| **Supply voltage** | 12 ... 34 V AC / DC |
| **Power consumption** | 40 ... 100 mA |
| **Resistive load at 0 ... 10 V DC** | 10 ... 100 kOhm |
| **Resistive load at 4 ... 20 mA** | 50 ... 500 Ohm |
| **CO2 sensitive element** | Self-calibrating NDIR |
| **Electrical connections** | Screw terminals for cables max. 1.5 $mm^2$ |
| **Sensor setting up time** | 60 min. |
| **Cable gland** | M16 x 1.5 for cables ø 4 ... 10 mm |
| **Protection** | IP65 |
| **Material** | PA6 |
| **Working range RH** | 0 ... 98% RH in clean, non-condensed air |
| **Working range ° C** | 0 ... + 50 ° C |
| **Installation** | PVC mounting flange (included) |
| **Standards** | CE, RoHs compliance |

| Models | Temperature | Humidity | Output |
|---|---|---|---|
| **SDCV** | - | - | 0...10 V DC |
| **SDCT(x)V*** | • | - | 0...10 V DC |
| **SDCTH(x)V*** | • | • | 0...10 V DC |
| **SDCC** | - | - | 4...20 mA |
| **SDCTC** | • | - | 4...20 mA |
| **SDCHC** | - | • | 4...20 mA |

Optional: Suffix D version with display

(*) Replace "**X**" with the number of selected passive sensor:

| "X" | Type of passive sensor |
|---|---|
| **1** | Pt100 (DIN EN 60751 Cl. B) |
| **3** | Ni1000 (TK6180) |
| **5** | NTC20k (±1%) |
| **6** | NTC10k (±1%) BETA 3435K |

The sensor must comply with the ventilation slots against the flow direction the measured medium are attached. An external indication of the location of ventilation slits offers inappropriate gland, which always towards the vents shows.
Generally the sensor should be supplied at least once per day with fresh air, as he regularly calibrates itself to this. This procedure prevents a long-term drift whereby the sensor is very stable.
The sensor requires 15 days of calibration time, during which time it adapts to the real values.

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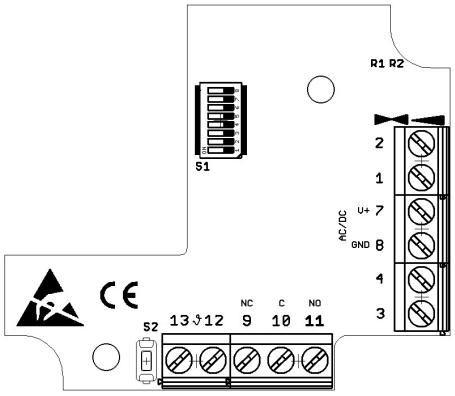
## Electrical wirings




| | Output 0...10 Vdc | | | Output 4...20 mA | | | |
|---|---|---|---|---|---|---|---|
| PIN | $CO_2$ | $CO_2$/T | $CO_2$/T/H | PIN | $CO_2$ | $CO_2$/T | $CO_2$/H |
| 1 | ppm | temp | temp | 1 | - | - | - |
| 2 | - | ppm | humidity | 2 | - | - | - |
| 3 | - | - | ppm | 3 | ppm | temp | humidity |
| 4 | - | - | - | 4 | | ppm | ppm |
| 7 | V+ | | | | | | |
| 8 | GND | | | | | | |
| 12 | passive sensor | | | | | | |
| 13 | passive sensor | | | | | | |
| S2 | $CO_2$ Manual adjustment to 400 ppm | | | | | | |

## Dip-switch setting

Temperature range selection

| Range | 1 | 2 |
|---|---|---|
| -30...+70°C | OFF | OFF |
| -20...+80°C | ON | OFF |
| 0...+50°C | ON | ON |
| 0...+100°C | OFF | ON |

Humidity range selection

| Range | 3 | 4 | 5 | 6 |
|---|---|---|---|---|
| Relative humidity | | | | |
| 0...100% | OFF | OFF | OFF | OFF |
| Absolute humidity | | | | |
| 0 g/m³...30g/m³ | ON | OFF | OFF | OFF |
| 0 g/m³...50g/m³ | ON | ON | OFF | OFF |
| 0 g/m³...80g/m³ | ON | ON | ON | OFF |
| Mix ratio | | | | |
| 0 g/kg...30g/kg | OFF | OFF | OFF | ON |
| 0 g/kg...50g/kg | OFF | OFF | ON | ON |
| 0 g/kg...80g/kg | OFF | ON | ON | ON |
| Dew point | | | | |
| 0...+50°C | OFF | ON | ON | OFF |
| -50...+100°C | ON | OFF | OFF | ON |
| -20...+80°C | OFF | ON | OFF | ON |
| Enthalpy | | | | |
| 0 kj/kg...85kj/kg | ON | ON | ON | ON |

$CO_2$ range settings

| Range | 7 | 8 |
|---|---|---|
| $CO_2$ ranges | | |
| 0...2000 ppm | OFF | |
| 0...5000 ppm | ON | |
| Auto-calibration | | |
| Not activated | | ON |
| Activated | | OFF |

The automatic self-calibration (ASC) algorithm independently generates a reference value by analyzing the measured $CO_2$ concentration over a certain period of time (approx. 7 days). This reference value is used to update the calibration curve.
For correct use, it is necessary that the $CO_2$ sensor is regulary exposed to fresh air = 400 ppm at least 1 time per day for at least 30 minutes. The $Co_2$ sensor must be operated in continuous measurement mode during (ASC), switching it off will delay (ASC).
To exclude gross calibration errors, the reference value is only accepted when the values are found to be plausible by the internal plausibility check of the sensor.

## Dimensions (mm) and installation