

# eSENSE II (Disp)



## Cost-optimised CO<sub>2</sub> sensor solution for residential and commercial buildings.

eSENSE II is a CO<sub>2</sub> sensor for climate control and fits directly on top of US electrical junction box standards. The unit is available both with and without display for fixed installation in the climate zone and helps you to save money by decreasing your energy consumption while creating a healthier indoor air climate.

The product measures the carbon dioxide concentration in the ambient air up to 2000 ppm and transforms the data into an analogue output.

eSENSE II is an extremely cost-optimised sensor solution. By controlling the ventilation based on actual demand, it helps you decreasing the energy consumption and having a healthy indoor climate in both residential and commercial buildings. eSENSE II is also available to other normal applications or environments.

## Standard specification

Measured gas	Carbon dioxide (CO <sub>2</sub> )
Operating principle	Non-dispersive infrared (NDIR)
Measurement range	0–2000ppm
OUT1 (CO <sub>2</sub> )	0–10VDC
OUT2 (CO <sub>2</sub> )	2–10VDC, 4–20mA
OUT3	-
Accuracy (CO <sub>2</sub> ) <sup>1</sup>	±30ppm ±3% of reading
Dimensions	100 x 80 x 28mm
Life expectancy	> 15 years
Operation temperature range	0–50 °C
Power supply	24VAC/VDC
Communication	UART

Note 1: Accuracy is specified over operating temperature range at normal pressure 101.3 kPa. Specification is referenced to certified calibration mixtures. Uncertainty of calibration gas mixtures (±1%) is added to the specified accuracy for absolute measurements.

## Key benefits

- Maintenance-free
- Compliant with ANSI/ASHRAE Standard 62.1-2022
- Compliant with RESET grad B
- Compliant with WELL Building Standard® (WELL v2™)
- Internal automatic self-diagnostics
- Cost-optimised for connection to DDC



# eSENSE II (Disp) Technical Specification

## General performance:

Operating temperature range	0–50 °C
Storage temperature range	-40–70 °C (display model Disp: -20–50 °C)
Operating humidity range	0–95% RH (non-condensing)
Operating environment	Residential, commercial and industrial spaces
Warm-up time	1 min. (@ full specs 15 min.)
Sensor life expectancy	> 15 years
Maintenance interval	No maintenance required <sup>1</sup>
Self-diagnostics	Complete function-check, LCD error indication (display model Disp) Display (Disp) 4 digits, 7 segments LCD with ppm indicator

## Electrical / mechanical:

Power input	24VAC/VDC ±20%, 50Hz (half-wave rectifier input)
Power consumption	< 1W average
Connection screw terminal A	4 x 1.5mm <sup>2</sup> for power input (G+, G0) and voltage outputs (OUT1, OUT2)

## CO<sub>2</sub> Measurement:

Operating principle	Non-dispersive infrared (NDIR) with Automatic Baseline Correction (ABC) <sup>1</sup>
Diffusion time (T1/e)	3 min.
Accuracy	±30ppm ±3% of reading <sup>1</sup>
Annual zero drift	±10ppm <sup>1</sup>
Pressure dependence	+1.6% reading per kPa
Measurement range	0–2000ppm

## Outputs:

### Output signal <sup>2</sup> terminal CO<sub>2</sub>

OUT1 Linear conversion range	0–10VDC for 0–2000ppm
OUT2 Linear conversion range	2–10VDC, or 4–20mA for 0–2000ppm
D/A Resolution	10 bits, 10mV

### Voltage outputs:

D/A conversion accuracy	±2% of reading ±20mV
D/A resolution	10mV
Electrical characteristics	R <sub>OUT</sub> < 100Ω, R <sub>LOAD</sub> > 5kΩ

### Current loop output:

D/A conversion accuracy	±2% of reading ±0.3mA D/A
D/A resolution	0.02mA
Electrical characteristics	R <sub>LOAD</sub> < 500Ω

Note 1: In normal IAQ applications (@ NTP) accuracy is defined after minimum 3 ABC periods of continuous operation. Accuracy is specified over operating temperature range at normal pressure 101.3kPa. Specification is referenced to certified calibration mixtures. Uncertainty of calibration gas mixtures (±1%) is to be added to the specified accuracy for absolute measurements.

Note 2: The specifications are valid for the output load connected to ground G0. Other outputs and measurement ranges are available per request.