

## Model **eSENSE™** Carbon dioxide transmitter

### PRODUCT DESCRIPTION

*eSENSE™ is a new simple, low cost, state-of-the-art, infrared and maintenance-free carbon dioxide transmitter for installation in the climate zone or in the ventilation duct.*

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

*eSENSE™ helps you save money by decreasing your energy consumption while creating a healthier indoor climate!*



### FEATURES

SenseAir's patented state-of-the-art infrared (NDIR) waveguide technology offers reliable measurements

- Measurement range: 0 - 2 000 ppm CO<sub>2</sub>
- Two analogue outputs (not model -IP50):
- Internal automatic self-diagnostics.
- Maintenance-free in normal applications
- Cost-optimized for connection to DDC:s
- Prepared for complementary passive temperature element (model -Tr).
- Different housing options

### APPLICATIONS

*eSENSE™ is an extremely cost-optimized sensor solution for climate control of buildings and other processes.*

By controlling the ventilation based on actual demand, it helps you decrease your energy consumption and yet have a healthy indoor climate!

The different housing options makes the *eSENSE™* available to almost any application or environment for example in greenhouses, residential and commercial buildings.

*eSENSE™ - Tr* is also prepared for quick mounting of a complementary passive temperature element, which can easily be done by the customer.

*eSENSE™ II* has a new housing that fits directly on top of EU and US electrical junction box standards



# eSENSE™ carbon dioxide transmitter Technical Specification\* (rev nr: 120912)

## General Performance

Compliance with .....	EMC directive 89/336/EEC. RoHS directive 2002/95/EG
Operating Temperature Range .....	0 to +40 °C
Storage Temperature Range .....	-20 to +50 °C <sup>1</sup>
Operating Humidity Range .....	0 to 85% RH (non-condensing and aerosol free)
Operating Environment .....	Indoor residential/commercial/industrial spaces <sup>2</sup>
Warm-up Time .....	≤ 1 min. (@ full specs ≤ 15 minutes)
Sensor Life Expectancy .....	> 15 years <sup>3</sup>
Maintenance Interval .....	no maintenance required <sup>3</sup>
Self Diagnostics .....	complete function-check, LCD error indication (display model -D)
Display (model -D) .....	4 Digits, 7 segments LCD with ppm indicator

## Electrical

Power Input .....	24 VAC/VDC ±20%, 50 Hz (half-wave rectifier input)
Power Consumption .....	< 1 Watt average
Connection screw terminal A .....	4 x 1,5 mm <sup>2</sup> for power input (G+, G0) and voltage outputs (OUT1, OUT2)
Connection screw terminal B .....	2 x 1,5 mm <sup>2</sup> for passive resistive output (Y, M) for option -Tr
Model IP50 .....	34 cm 3-wire pigtail. Please note that OUT2 is not made available.

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

Sensing method .....	Infrared (NDIR) waveguide technology with Automatic Baseline Correction (ABC) <sup>5</sup> and passive gas diffusion (no moving parts)
Response Time (T <sub>1/e</sub> ) .....	< 10 sec. @ 30 cc/min. flow rate, < 3 min. diffusion time
Repeatability .....	± 20 ppm ± 1 % of reading
Accuracy <sup>3,4</sup> .....	± 30 ppm ± 3 % of reading
Annual Zero Drift <sup>3,4</sup> .....	< ± 10 ppm
Pressure Dependence .....	+1.6% of reading per kPa deviation from normal pressure 101.3kPa <sup>6</sup>

## Outputs

### Output signal terminal CO<sub>2</sub><sup>7</sup>

OUT1 linear conversion range .....	0 - 10 VDC for 0 - 2 000 ppm.
OUT2 linear conversion range .....	2 - 10 VDC, or 4 - 20 mA for 0 - 2 000 ppm.
.....	D/A resolution 10 bits, 10 mV
D/A conversion accuracy .....	± 2 % of reading ± 50 mV
Electrical characteristics.....	R <sub>OUT</sub> < 100 Ohm, R <sub>LOAD</sub> > 5 kOhm

### Resistive terminals<sup>8</sup>

Thermistor outputs.....	temperature measurement resistor terminal output with signal return connected to ground terminal (option -Tr)
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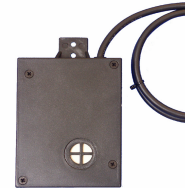
## Housing options

WALL HOUSING (standard) with or without display.  
eSENSE: Dim.: 100 x 80 x 28 mm (H x W x D)  
Protection class: IP30  
60 mm hole separation for European standard J-boxes.

eSENSE II: Dim.: 130 x 85 x 30 mm (H x W x D)  
Protection class: IP30  
Fits Us standard J-boxes.

INDUSTRIAL WALL HOUSING  
With or without display  
Dim.: 142 x 84 x 46 mm (H x W x D)  
Protection class: IP54  
DUCT HOUSING (model -K)  
Protection class: IP65  
Duct probe length: 245 mm (model -K)  
(adjustable according to duct dimension)

ALL-ROUND HOUSING (model -IP50)  
Dim.: 106 x 67 x 26 mm (H x W x D)  
Protection class: IP50  
Connection: 34 cm 3-wire pigtail (no OUT2)  
For both wall and duct applications.



eSENSE™ -Disp

eSENSE™ II -Disp

eSENSE™ Duct -Disp

eSENSE™ Ind

eSENSE™ -Slim

Note 1: After long term storage a zero calibration is needed.

Note 2: All corrosive environments are excluded.

Note 3: In normal Indoor Air Quality (IAQ) applications @ NTP (25C, 101.3 kPa).

Note 4: Accuracy is defined after zero calibration or after minimum 23 days of continuous operation. The tolerance of the span gas (2% unless otherwise requested) and test gas adds to the total uncertainty.

Note 5: Requires fresh air (400 ppm) at least once every week.

Note 6: For reference see TN-025 "on pressure sensitivity".

Note 7: The specifications are valid for the output load connected to Ground G0. Other outputs and measurement ranges are available per request.

Note 8: Resistive probe is to be mounted by the user. Can be factory pre-mounted upon request.