

eSENSE™ Family

Carbon dioxide transmitter



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

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

STANDARD SPECIFICATION*

Measured gas	Carbon dioxide (CO ₂)
Operating Principle	Non-dispersive infrared (NDIR)
Measurement range	0 - 2000ppm*
OUT1	0 - 10V for 0 - 2000ppm ±2% of reading ±50mV
OUT2	2 - 10V (or 4 - 20mA) for 0 - 2000ppm ±2% of reading ±50mV
Accuracy	±30ppm ±3% of reading
Dimensions:	(H x W x D)
Disp	100 x 80 x 28mm
Slim	106 x 67 x 26mm
II Disp	130 x 85 x 30mm
Duct Disp, Ind Disp	142 x 84 x 46mm
Life Expectancy	>15years
Operation temperature range	0 - 50°C
Operation humidity range	0 - 95%RH (non-condensing)
Power supply	24VAC/DC

* Available in different carbon dioxide measurement ranges and different housings.

APPLICATIONS

eSENSE™ is an extremely cost-optimized 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™ family is also available to other normal applications or environments for example in greenhouse.

KEY BENEFITS

- Maintenance-free
- Available in different carbon dioxide measurement ranges and different housings
- Internal automatic self-diagnostics
- Cost-optimized for connection to DDC:s
- Five year warranty



eSENSE™ carbon dioxide transmitter Technical Specification

General Performance:

Conformance with standards.....	EMC 2004/108/EC directive
.....	EN 61326-1:2006, Class B equipment, Table 1 – Basic immunity test requirements
.....	RoHS directive 2011/65/EU
Operating Temperature Range.....	0 - 50°C
Storage Temperature Range.....	-40 - 70°C (display model <i>Disp</i> : -20 - 50°C)
Operating Humidity Range.....	0 - 95%RH (non-condensing)
Operating Environment.....	residential, commercial and industrial spaces ¹
Warm-up Time.....	1min. (@ full specs 15 min.)
Sensor Life Expectancy.....	>15years
Maintenance Interval.....	no maintenance required ²
Self-Diagnostics.....	complete function-check, LCD error indication (display model <i>Disp</i>)
Display (<i>Disp</i>).....	4 Digits, 7 segments LCD with ppm indicator

Electrical:

Power Input.....	24VAC/VDC ±20%, 50Hz (half-wave rectifier input)
Power Consumption.....	<1W average
Connection screw terminal A.....	4 x 1.5mm ² for power input (G+, G0) and voltage outputs (OUT1, OUT2)
Connection screw terminal B.....	2 x 1.5mm ² for passive resistive output (Y, M) for option -TR
Model IP50.....	34cm 3-wire pigtail. Please note that OUT2 is not made available.

CO₂ Measurement:

Sensing Method.....	EQC (Eternal Quality Coating) technology with Automatic Background Calibration (ABC) and passive gas diffusion (no moving parts)
Diffusion Time (T _{1/e}).....	<3min.
Accuracy ²	EQC ±30ppm ±3% of reading
Annual Zero Drift ²	<±10ppm
Pressure Dependence.....	+1.6% reading per kPa
Measurement Range.....	0 - 2000ppm

Outputs:

Output Signal Terminal CO₂³

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 _{OUT} <100Ω, R _{LOAD} >5kΩ

Current Loop Output:

D/A Conversion Accuracy.....	±2% of reading ±0.3mA
D/A Resolution.....	0.02mA
Electrical Characteristics.....	R _{LOAD} >500Ω

Resistive Terminals⁴

Thermistor Outputs.....	temperature measurement
.....	resistor terminal output with signal return
.....	connected to ground terminal(option <i>TR</i>)

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Art.no.	Product	Additional features
050-8-0002	eSENSE™	No display
050-8-0005	eSENSE™ <i>Disp</i>	Display
050-8-0026	eSENSE™ - <i>TR</i>	No display, terminal for resistive temperature probe
050-8-0004	eSENSE™ <i>Duct</i>	No display
050-8-0009	eSENSE™ <i>Duct Disp</i>	Display
050-8-0047	eSENSE™ <i>Duct</i>	No display, OUT1= 0 – 5 V
050-8-0032	eSENSE™ <i>Ind</i>	No display
050-8-0033	eSENSE™ <i>Ind Disp</i>	Display
050-8-0003	eSENSE™ <i>Slim</i>	No Display, protection class IP50
050-8-0045	eSENSE™ <i>Slim</i>	OUT1 = 0 – 5 V
050-8-0014	eSENSE™ <i>II</i>	No display
050-8-0012	eSENSE™ <i>II Disp</i>	Display



eSENSE™ *Duct Disp* eSENSE™ *Ind Disp*
Dim: 142 x 84 x 46 mm



eSENSE™ *Disp* eSENSE™
Dim: 100 x 80 x 28 mm



eSENSE™ *Slim*
Dim: 106 x 67 x 26 mm



eSENSE™ *II Disp* eSENSE™ *II*
Dim: 130 x 85 x 30 mm

Available in different carbon dioxide measurement ranges and different housings

Note 1: The SO₂ enriched environments are excluded.

Note 2: In normal IAQ applications (@ NTP) accuracy is defined after minimum 3 weeks of continuous operation. The tolerance of the span calibration gas (2% unless otherwise requested) and test gas adds to the total uncertainty.

Note 3: The specifications are valid for the output load connected to ground G0. Other outputs and measurement ranges are available per request.