

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 ±20mV
OUT2	2–10V (or 4–20mA) for 0–2000ppm ±2% of reading ±20mV
Accuracy ¹	±30ppm ±3% of reading
Dimensions:	(H x W x D)
<i>Disp</i>	100 x 80 x 28mm
<i>Slim</i>	106 x 67 x 26mm
<i>II Disp</i>	130 x 85 x 30mm
<i>Duct Disp, Ind Disp</i>	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
Power consumption	<1W average
Communication	UART

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

¹Accuracy 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 added to the specified accuracy for absolute measurements.

APPLICATIONS

eSENSE™ 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™ family is also available to other normal applications or environments.

KEY BENEFITS

- Maintenance-free
- Available in different carbon dioxide measurement ranges and different housings
- Internal automatic self-diagnostics
- Cost-optimised for connection to DDC

eSENSE™ carbon dioxide transmitter Technical Specification

General Performance:

Operating Temperature Range.....0–50°C
 Storage Temperature Range.....-40–70°C (display model *Disp*: -20–50°C)
 Operating Humidity Range0–95%RH (non-condensing)
 Operating Environmentresidential, commercial and industrial spaces¹
 Warm-up Time1min. (@ full specs 15 min.)
 Sensor Life Expectancy.....>15years
 Maintenance Interval.....no maintenance required²
 Self-Diagnosticscomplete function-check, LCD error indication (display model *Disp*)
 Display (*Disp*).....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 1.5mm² for power input (G+, G0) and voltage outputs (OUT1, OUT2)
 Connection screw terminal B.....2 x 1.5mm² 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 MethodEQC (Eternal Quality Coating) technology with Automatic Baseline Correction (ABC) and passive gas diffusion (no moving parts)
 Diffusion Time (T_{1/e}).....<3min.
 Accuracy²EQC ±30ppm ±3% of reading
 Annual Zero Drift²<±10ppm
 Pressure Dependence.....+1.6% reading per kPa
 Measurement Range.....0–2000ppm

Outputs:

Output Signal Terminal CO₂³

OUT1 Linear Conversion Range0–10VDC for 0–2000ppm
 OUT2 Linear Conversion Range2–10VDC, or 4–20mA for 0–2000ppm
 D/A Resolution10 bits, 10mV

Voltage Outputs:

D/A Conversion Accuracy±2% of reading ±20mV
 D/A Resolution10mV
 Electrical CharacteristicsR_{OUT} <100Ω, R_{LOAD} >5kΩ

Current Loop Output:

D/A Conversion Accuracy±2% of reading ±0.3mA
 D/A Resolution0.02mA
 Electrical CharacteristicsR_{LOAD} <500Ω

Resistive Terminals⁴

Thermistor Outputstemperature measurement resistor terminal output with signal return connected to ground terminal (option *TR*)



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

eSENSE™ Family

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

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 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 3: The specifications are valid for the output load connected to ground G0. Other outputs and measurement ranges are available per request.
 Note 4: Resistive probe is to be mounted by the user. Can be factory pre-mounted upon request.