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)
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
Power consumption	<1W average
Communication	UART

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

[1]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 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 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 *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 1.5mm^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.

CO_2 Measurement:

Sensing Method ..... EQC (Ethernal Quality Coating) technology with Automatic Baseline Correction (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

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

Outputs:

Output Signal Terminal CO_2[3]

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

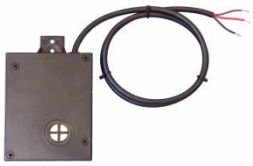
Current Loop Output:

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

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

Resistive Terminals[4]

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



eSENSE™ Slim
Dim: 106 x 67 x 26 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

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

Note 1: The SO_2 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.