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 *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
.... 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 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

Resistive Terminals[4]
Thermistor Outputs .... temperature 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
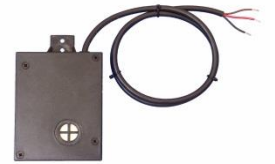
eSENSE™ Slim
Dim: 106 x 67 x 26 mm

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 – 5 V
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 – 5 V
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 SO_2 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.