Model *eSENSE*®

Carbon dioxide sensor / transmitter

PRODUCT DESCRIPTION

eSENSE® is a new simple, low cost, state-of-the-art, infrared carbon dioxide sensor / transmitter for installation in the incubator or equipment that requires CO2 measurement.

eSENSE® measures the carbon dioxide concentration in the sensor vicinity up to 2,000ppm and transforms the data into an analogue 0/2-10 V output signal.

eSENSE® controls the space CO2 level to the desire level and helps to save unnecessary CO2 gas wastage in maintaining the controlled environment.

eSENSE®
IP20 wall housing
without display

eSENSE®-D
IP20 wall housing
with display

FEATURES

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

- measurement range: 0 – 2,000ppm CO_2
- two analogue outputs (not model *–IP45*):

  OUT1: 0 - 10 V (= 0 - 2,000ppm CO_2)
  OUT2: 2 - 10 V (= 0 - 2,000ppm CO_2), or
  4 - 20mA (=0 - 2,000ppm CO_2)
- internal automatic self-diagnostics.
- most-optimised for connection to control equipment or
- three different housing options:

1) IP20 WALL housing (with / without display)
2) IP65 DUCT housing (with / without display)
3) IP45 INDUSTRIAL “all-round” housing (for both wall and duct applications)

APPLICATIONS

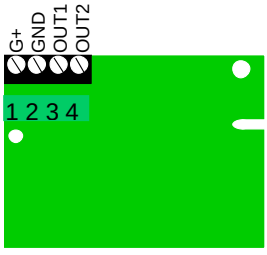
eSENSE® is an extremely cost-optimised sensor solution for incubator control and/or other processes where measured carbon dioxide values in voltage format are requested.

By controlling the CO2 level based on actual demand, it helps to reduce CO2 gas wastage while maintaining better environment control.

CONNECTIONS

Screw terminal

1	G+	24 V AC/DC (+)
2	GND	system ground (-)
3	OUT1	linear output (+) 0-10 V = 0 – 2,000ppm CO_2
4	OUT2	linear output (+) 2-10 V = 0 – 2,000ppm CO_2



Power supply has to be connected to G+ and GND. GND is considered as system ground. If the analogue output is connected to a controller *the same ground reference has to be used for the eSENSE unit and for the control system*

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eSENSE® technical specification *(rev nr: 070622)*

General Performance

Compliance with	EMC directive 89/336/EEC
Operating Temperature Range	0 - 50 °C
Storage Temperature Range	-40 to +70 °C (display model *-D*: -20 to +70 °C)
Operating Humidity Range	0 to 95% RH (non-condensing)
Operating Environment	residential, commercial and industrial spaces [1]
Warm-up Time	≤ 1 min. (@ full specs ≤ 15 minutes)
Sensor Life Expectancy	> 15 years
Maintenance Interval	12 months (typical)
Self Diagnostics	complete function-check, LCD error indication (display model *-D*)
Display (model *-D*)	4 Digits, 7 segments LCD with % indicator

Electrical

Power Input	24 VAC/VDC ±2,000ppm, 50 Hz (half-wave rectifier input)
Power Consumption	< 1 Watt average
Connection screw terminal A	4 x 1,5 mm^2 for power input (G+, G0) and voltage outputs (OUT1, OUT2) 80 cm 6-wire pigtail.

CO_2 Measurement

Sensing method	Infrared (NDIR) Absorption technology and passive gas diffusion
	(no moving parts)
Response Time ($T_{1/e}$)	< 10 sec. @ 30 cc/min. flow rate
	< 3 min. diffusion time
Repeatability	± 20ppm ± 1 % of reading
Accuracy [2]	± 30ppm ± 3 % of reading
Annual Zero Drift [2]	< ± 10ppm with ABC on
Pressure Dependence	+ 1.6 % reading per hPa
Installation support	Zero point Calibration by CO_2-free gas purge and background level calibration adjustment jumper trigger (bCAL).

Outputs

Voltage signal terminal CO2 [3]

OUT1 linear conversion range	0 -10 VDC for 0 – 2,000ppm.
OUT2 linear conversion range	2 -10 VDC (4 - 20mA) for 0 – 2,000ppm
	with 1 VDC used as FAULT status signal
D/A resolution	10 bits, 10 mV
D/A conversion accuracy	± 2 % of reading ± 50 mV
Electrical characteristics	R_{OUT} < 100 Ohm, R_{LOAD} > 5 kOhm

Housing options

WALL HOUSING (standard)

Dim.: 100 x 80 x 27 mm (H x W x D)
Protection class: IP20
60 mm hole separation for European standard J-boxes.

eSENSE

eSENSE-D

DUCT HOUSING (model *–KS*)

Dim.: 142 x 84 x 46 mm (H x W x D)
Duct probe length: 245 mm
(adjustable according to duct dimension)
Protection class: IP65

eSENSE-KS

eSENSE-DKS

ALL-ROUND HOUSING (model *–IP45*)

Dim.: 142 x 84 x 46 mm (H x W x D)
Protection class: IP45
Industrial wall housing.

eSENSE-IP45

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 incertainty.

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 mounteed by the user. Can be factory pre-mounted upon request.

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