

**Model eSENSE™**

Carbon dioxide transmitter

**PRODUCT DESCRIPTION**

*eSENSE™ is a new 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™ measures the carbon dioxide concentration in the ambient air up to 2000 ppm and transforms the data into an analogue 0/2-10 V output signal.*

*eSENSE™ helps you save money by de-creasing your energy consumption while creating a healthier indoor climate!*

*eSENSE™**eSENSE™-D***FEATURES**

SenseAir's patented state-of-the-art gold-plated infrared (NDIR) waveguide technology offers reliable measurements

- measurement range: 0 - 2 000 ppm CO<sub>2</sub>
- two analogue outputs (not model -I):
- OUT1: 0 - 10 V (= 0 - 2 000 ppm CO<sub>2</sub>)
- OUT2: 2 - 10 V (= 0 - 2 000 ppm CO<sub>2</sub>)
- internal automatic self-diagnostics.
- maintenance-free in normal applications
- cost-optimized for connection to DDC:s
- prepared for complementary passive temperature element (model -Tr).
- RS485 / ModBus net work communication as option
- three different housing options
- RoHS compliant

**APPLICATIONS**

*eSENSE™ is an extremely cost-optimized sensor solution for climate control of buildings and other processes where measured carbon dioxide values in voltage format are requested.*

By controlling the ventilation based on actual demand, it helps you decrease your energy consumption and yet have a healthy indoor climate!

The three different housing options makes the *eSENSE™* available to almost any application or environment.

*eSENSE™ -Tr* is also prepared for quick mounting of a complementary passive temperature element, which can easily be done by the customer.

*eSENSE™ -485* and *eSENSE™ -MB* offers RS485 communication with ModBus protocol as option (see separate data sheet).

# AQ Controls Limited

## eSENSE™ carbon dioxide transmitter Technical Specification

### General Performance

Compliance with .....	EMC directive 89/336/EEC RoHS directive 2002/95/EG
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 <sup>1</sup>
Warm-up Time .....	≤ 1 min. (@ full specs ≤ 15 minutes)
Sensor Life Expectancy .....	> 15 years
Maintenance Interval .....	no maintenance required <sup>2</sup>
Self Diagnostics .....	complete function-check, LCD error indication (display model -D)
Display (model -D) .....	4 Digits, 7 segments LCD with ppm indicator

### Electrical

Power Input .....	24 VAC/VDC ±20%, 50 Hz (half-wave rectifier input)
Power Consumption .....	< 1 Watt average
Connection screw terminal A .....	4 x 1,5 mm <sup>2</sup> for power input (G+, G0) and voltage outputs (OUT1, OUT2) 34 cm 3-wire pigtail. Please note that OUT2 is not made available (model IP50).
Connection screw terminal B .....	2 x 1,5 mm <sup>2</sup> for passive resistive output (Y, M) for option -Tr

### CO<sub>2</sub> Measurement

Sensing method .....	Gold-plated infrared (NDIR) waveguide technology with Automatic Background Calibration (ABC) and passive gas diffusion (no moving parts)
Response Time (T <sub>1/e</sub> ) .....	< 10 sec. @ 30 cc/min. flow rate < 3 min. diffusion time
Repeatability .....	± 20 ppm ± 1 % of reading
Accuracy <sup>2</sup> .....	± 30 ppm ± 2 % of reading
Annual Zero Drift <sup>2</sup> .....	< ± 10 ppm
Pressure Dependence .....	+ 1.6 % reading per kPa

### Outputs

#### Voltage signal terminal CO<sub>2</sub> <sup>3</sup>

OUT1 linear conversion range .....	0 -10 VDC for 0 - 2 000 ppmvol.
OUT2 linear conversion range .....	2 -10 VDC for 0 - 2 000 ppmvol. with 1 VDC used as FAULT status signal (Please note that OUT2 is not made available on model eSENSE-IP50)
(On request:	
OUT1 linear conversion range.....	0 - 5 VDC for 0 - 2 000 ppmvol.
OUT2 linear conversion range.....	2 -10 VDC for 0 - 2 000 ppmvol.)
D/A resolution.....	10 bits, 10 mV
D/A conversion accuracy .....	± 2 % of reading ± 50 mV
Electrical characteristics.....	R <sub>OUT</sub> < 100 Ohm, R <sub>LOAD</sub> > 5 kOhm

#### Resistive terminals <sup>4</sup>

Thermistor outputs .....	temperature measurement resistor terminal output with signal return connected to ground terminal (option -Tr)
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### Housing options

#### WALL HOUSING (standard)

Dim.: 100 x 80 x 28 mm (H x W x D)  
Protection class: IP30  
60 mm hole separation for European standard J-boxes.  
With or without display.

#### DUCT HOUSING (model -K)

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.  
With or without display

#### ALL-ROUND HOUSING (model -IP50)

Dim.: 106 x 67 x 26 mm (H x W x D)  
Protection class: IP50  
Connection: 34 cm 3-wire pigtail (no OUT2)  
For both wall and duct applications.



eSENSE™

eSENSE™-D

eSENSE™-K

eSENSE™-K-D

eSENSE™-IP50

**Note 1:** The SO<sub>2</sub> 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.

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