eSENSE™ FAI
(Fresh Air Indicator)

CO₂ Alarm Transmitters

eSENSE™ FAI is a new simple, low-cost, state-of-the-art infrared and maintenance-free carbon dioxide alarm for installation in areas where the carbon dioxide levels need to be monitored, such as class-rooms and offices.

eSENSE™ FAI measures the carbon dioxide concentration in the ambient air and alarms with sound and light when the levels are exceeding the defined levels.

STANDARD SPECIFICATION*

Measured gas	Carbon dioxide (CO₂)
Operating Principle	Non-dispersive infrared (NDIR)
Measurement range	0-3000 ppm*
OUT1 linear output	0-10 VDC, 0-2000 ppm
OUT2 linear output	2-10V (or 4-20mA), 0-2000 ppm
Accuracy	± 30 ppm ± 3 %xof reading
Dimensions	100 x 80 x 28 mm
Life Expectancy	> 15 years
Operation temperature range	0 to +50 °C
Operation humidity range	0 to 85% RH (non-condensing)
Power supply	24 V AC/DC
Power consumption	< 1 Watt average
Communication	UART (Modbus protocol)

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

APPLICATIONS

eSENSE™ FAI is a cost-optimized sensor solution for climate monitor. By measuring CO₂ users get a good indicator to when adequate "fresh" outside air must be supplied for an acceptable indoor air quality. The ventilation will then be based on actual demand. It helps users decrease your energy consumption and yet have a healthy indoor climate.

eSENSE™ FAI has solutions fit both US standard Jbox and European standard Jbox.

Warranty: five (5) years.

KEY BENEFITS

- Audible alarm
- Mute button
- One analogue output
- Internal automatic self-diagnostics.
- Maintenance-free
- Three Leds: Red, yellow, green
  Alarm configuration:3
  Green: 0 - 800 ppm
  Yellow: 800 -1400 ppm
  Red: >1400 ppm

eSENSE™ FAI carbon dioxide alarm 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 to +50 °C
Storage Temperature Range .... ……….	-40 to +70 °C (display model -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 .... ……….	no maintenance required **2**
Self Diagnostics .... ……….	complete function-check, LCD error indication (display model)
Display.. ……….	4 Digits, 7 segments LCD with ppm indicator

Electrical / Mechanical:

Power Input .... ……….	24 VAC/VDC ±20%, 50 Hz (half-wave rectifier input)
Power Consumption .... ……….	< 1 Watt average
Connection screw terminal A ……………....	1,5 mm^2

CO_2 Measurement:

Sensing method	Gold-plated infrared (NDIR) waveguide technology with Automatic Background Calibration (ABC) and passive gas diffusion (no moving parts)
Response Time ($T_{1/e}$)	< 10 sec. @ 30 cc/min. flow rate, < 3 min. diffusion time
Repeatability...	± 20 ppm ± 1 % of reading
Accuracy [2]	± 30 ppm ± 3 % of reading
Annual Zero Drift [2]	< ± 10 ppm
Pressure Dependence	+ 1.6 % reading per kPa
Measurement range..	0 to 3 000 ppm

Output signal terminal CO2:

OUT1 linear conversion range	0 to 10 VDC for 0 to 2 000 ppm
Audible alarm...	Typ 94 Db Mute button
....	D/A resolution 10 bits, 10mV
D/A conversion accuracy	± 2 % of reading ± 50 mV
Electrical characteristics.................................	R_{OUT} < 100 Ohm, R_{LOAD} > 5 kOhm

eSENSE™ FAI

Available in different carbon dioxide measurement ranges and different housings

Art.no	Product	Additional features
050-8-0061	eSENSE™ FAI	Fits European standard J-boxes (mute button on the side)
050-8-0057	eSENSE™ FAI II	Fits US standard J-boxes (visible red mute button on the front)

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:   Can be ordered with special settings.
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eSENSE FAI (standard)
Dim.: 100 x 80 x 28

eSENSE **II** FAI
Dim.: 130 x 85 x 30