Model *aSENSE*™

Carbon dioxide & temperature transmitter for wall mounting

PRODUCT DESCRIPTION

aSENSE™ *is an all - digital low - cost transmitter for installation in the climate zone. It measures both CO_2 concentration and temperature in the ambient air. The data is transmitted to a BMS system or controller.*

aSENSE™ *is a key component for climate control of buildings and other processes. It is also a cost-efficient gas alarm sensor for spaces where carbon dioxide gas is a potential danger.*

FEATURES

- State-of-the-art Non-Dispersive Infrared (NDIR) technology to measure CO_2

- Maintenance free in normal applications

- Cost optimized for connection to DDC:s

- Contributes to lower energy costs when it is applied in a *Demand Control Ventilation (DCV)* strategy

- Available in different carbon dioxide measurement ranges and different housings

- Internal automatic self-diagnostics

- Serial communication port and optional network connection

- 2 analogue outputs as standard (V/mA). Relay output as option

- Cost-efficient RS485 communication as option

- Internal 2-channel logger as option

- Open relay, closes at ≥1000ppm, opens at <900ppm

APPLICATIONS

aSENSE™ is designed to control ventilation by transmitting the measured carbon dioxide and temperature value to the system´s Master or DDC. The transmitter is flexible and suits many different ventilation strategies.

According to most building regulations, the fresh air flow should, in rooms where people stay more than occasionally, be at least 7 litres/sec and person.

If the room occupants are adults with a light work-load and the outdoor CO_2 concentration is 350 ppm, this airflow answers directly to an in-door CO_2 concentration of 1040 ppm. According to National Boards of Occupational Safety and Health, the CO_2 concentration can therefore be used as an indicator of the Indoor Air Quality (IAQ).
A CO_2 concentration below 1000 ppm should then always be the aim.

CERTIFIED
ISO 9001
SEMKO CERTIFICATION

aSENSE™ carbon dioxide transmitter Technical Specification* (rev nr 040317)

General Performance

Compliance with .... EMC directive 89/336/EEC, RoHS directive 2002/95/EG
Operating Temperature Range[1] .... 0 to +50 °C
Storage Temperature Range .... - 40 to +70 °C (*standard model*) (*models -D*: -20 to + 70 °C)
Operating Humidity Range .... 0 to 95% RH (non-condensing)
Warm-up Time .... $\leq$ 1 min. (@ full specs $\leq$ 10 minutes)
Sensor Life Expectancy .... >15 years
Maintenance Interval .... no maintenance required [2]
Self-Diagnostics .... complete function check of the sensor
Display .... 4 Digits, 7 segments LCD with ppm / °C / % indicator *(models –D)*

Electrical/Mechanical

Power Input .... 24 VAC/VDC±20%, 50-60 Hz (half-wave rectifier input)
Power Consumption .... $\leq$ 3 Watts average
Wiring Connections .... screw terminals, max 1,5 mm^2 wires/ European and US standard J-boxes

Outputs

Analogue [3]

  Protection .... PTC fuse (auto reset) on signal return *M*, short-circuit safe
  Linear outputs OUT1 & OUT2................... 0/2-10 VDC R_{OUT} < 100 OHM, R_{load} > 5k OHM (0/1-5 VDC optional) 0/4-20 mA R_{load} < 500 OHM
  Default ranges.. 0 – 2000 ppm CO_2, 0 - 50°C
  D/A Resolution .... 10 bits, 10 mV / 0.016 mA
  D/A Conversion Accuracy .... voltage mode: ± 2% of reading ± 50 mV
                                      current loop :   ± 2% of reading ± 0.3 mA

ON/OFF

  Relay (OUT3) **......................................** (accessory *-R*) isolated N.O., 1mA/5V up to 1A/50VAC/24VDC. Closes at ≥ 1000ppm, opens at < 900ppm

UART Serial com port

  Protocol .... SenseAir protocol *(see comprot 0700xx rev 3_04.pdf)* Modbus as option [4]
  PC-interface .... RS232 UART cable with sliding contact and driver (model *A232 Cable*)
  PC User Interface Program .... UIP4 (or higher) [5]
  RS485 network com .... (accessory *-485*) RS485 terminal slide-on port, network capabilities up to 30 units
  LonWorks™ network com. .... (accessory *-LON)* LonWorks™ add-on option MODBUS

CO_2 Measurement

Operating Principle .... Non-dispersive infrared (NDIR) with Automatic Baseline Correction (ABC) [6]
Response Time ($T_{1/e}$) .... 2 min. diffusion time
Accuracy [7] .... ± 1% of measurement range ± 5 % of measured value
Pressure Dependence .... + 1.58 % reading per kPa deviation from normal pressure, 100 kPa
Annual Zero Drift [7] .... < ±0.3 % of measurement range
Measurement ranges .... different sensor models from 0 - 3 000 ppm (standard) to 0 - 10 %vol.

Temperature Measurement

Operating Principle .... Thermistor
Measurement Range .... -20 to +60 °C
Accuracy [8] / Digital Resolution .... ± 0.5 °C / 0.1 °C (0.01 °C via UART)

aSENSE™   *aSENSE™ – D,*   *aSENSE™ IP54- D,*   *aSENSE™k - D*

Housing Options
The housings are available *with and without display (-D)* From the left:

WALL HOUSING
Dim.: 120 x 82 x 30 mm
Protection class: **IP30**

INDUSTRIAL WALL HOUSING
Dim.: 142 x 84 x 46 mm
Protection class: **IP54**

DUCT HOUSING (model –*K*)
Dim.: 142 x 84 x 46 mm
Duct probe length: 245 mm
(adjustable according to duct dimension). *Protection class*: **IP65**

Note 1**:**   Lower temperature operation range can be reached by adding a box heater assembly
Note 2:   In normal IAQ applications. Some industrial applications may require an annual zero gas purge, which automatically recalibrates the CO2 sensor.
Note 3:   The specifications are valid for the output load connected to ground G0 or common signal return M
Note 4:   For more information, please contact SenseAir AB.
Note 5**:**   Free download from SenseAir's web site www.senseair.com
Note 6:   The ABC function is the key for maintenance free operation. It assumes normal IAQ environments or applications, where some ventilation occurs (at least during some time over a week period)
Note 7:   In normal indoor environment. Accuracy is defined at continuous operation (3 weeks minimum after installation)
Note 8**:**   Valid only for units configured in voltage outputs mode

* ***Can be changed without notice***

CO2Meter.com, 131 Business Center Drive, Ormond Beach, FL 32174
Phone: (386) 872-7665 · Sales@CO2Meter.com
www.CO2Meter.com