

Model *aSENSE*TM

Carbon dioxide & temperature transmitter for wall mounting

PRODUCT DESCRIPTION

*aSENSE*TM is an all - digital low - cost transmitter for installation in the climate zone. It measures both CO₂ concentration and temperature in the ambient air. The data is transmitted to a BMS system or controller.

*aSENSE*TM 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 CO₂
- 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
- 2 analogue outputs as standard (V/mA). Relay output as option
- Cost-efficient RS485 communication as option
- Internal 2-channel logger as option

APPLICATIONS

*aSENSE*TM 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 CO₂ concentration is 350 ppm, this airflow answers directly to an in-door CO₂ concentration of 1040 ppm. According to National Boards of Occupational Safety and Health, the CO₂ concentration can therefore be used as an indicator of the Indoor Air Quality (IAQ).

A CO₂ concentration below 1000 ppm should then always be the aim.

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

General Performance

| | |
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| 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 | ≤ 1 min. (@ full specs ≤ 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

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

Outputs

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|---------------------------------|---|
| 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. |
| UART Serial com port | |
| | |
| Protocol | SenseAir protocol (see <i>comprot 0700xx rev 3_04.pdf</i>) 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 RTU |

CO₂ Measurement

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|---|--|
| 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) |



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 occur (at least during some moment over a week period)
Note 7: In normal indoor environment. Accuracy is defined at continous operation (3 weeks minimum after installation)
Note 8: Valid only for units configured in voltage outputs mode



* Can be changed without notice

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