

Model *aSENSE*[®]

Carbon dioxide & Temperature Transmitter for wall mounting

Option models: *aSENSE*[®]- D, *aSENSE*[®]-Lon, *aSENSE*[®]-R

PRODUCT DESCRIPTION

aSENSE[®] is an all-digital low-cost transmitter for installation in the climate zone. It measures both CO₂ concentration and temperature in the ambient air, transforms the data into output signals and sends these values to a comprehensive system. The *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.



aSENSE[®]
(standard model)



aSENSE[®] - D
(display model)

FEATURES

- state-of-the-art Non-Dispersive InfraRed (NDIR) technology to measure CO₂
- 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 5 different carbon dioxide measurement ranges
- internal automatic self diagnostics
- maintenance interval > 5 years
- serial communication port for connection to a PC or a GSM module
- 2 analogue outputs as standard (V/mA). Relay output as option
- cost-efficient RS485 or LonWorks[™] local network communication as options
- internal 2-channel logger as option

APPLICATIONS

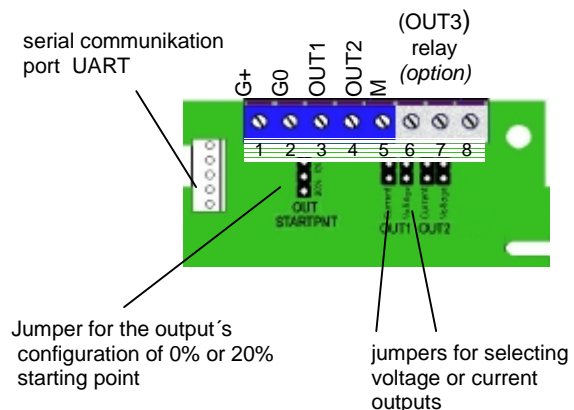
aSENSE[®] is designed to control ventilation by transmitting the measured carbon dioxide and temperature value to the system's Master or DDC. The transmitter is flexible and suits many different ventilation strategies.

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 CO₂ concentration is 350 ppm, this airflow answers directly to an indoor CO₂ concentration of 1 040 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 1 000 ppm should then always be the aim.

CONNECTIONS model *aSENSE*[®] (-R)

Screw terminal

1	G+	24 VAC/DC
2	G0	System ground
3	OUT1	Linear output (+) 0-2000 ppm
4	OUT2	Linear output (+) temperature 0-50 °C
5	M	Signal ground (-)
6,7	(OUT3)	(Optional) relay output ON: 1000 ppm CO ₂ OFF: 900 ppm CO ₂
8		Not connected



aSENSE[®] technical specification (rev nr 040317)

General Performance

Compliance with	EMC directive 89/336/EEC
Operating Temperature Range ¹	0 to +50 °C
Storage Temperature Range	-40 to +70 °C (<i>standard model</i>) (<i>models -D</i> : -20 to + 70 °C)
Operating Humidity Range	0 to 95% RH (non-condensing)
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 of the sensor
Display	4 Digits, 7 segments LCD with ppm / °C / % indicator (<i>models -D</i>)

Electrical/Mechanical

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
Dimensions.....	120 x 82 x 30 mm (H x W x D)
Protection class	IP30

Outputs

Analog ³	
Protection	PTC fuse (auto reset) on signal return <i>M</i> , 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 (<i>see comprot 0700xx rev 3_04.pdf</i>) ⁴
PC-interface	RS232 UART cable with sliding contact and driver (model <i>A232 Cable</i>)
PC User Interface Program	UIP version 4.0 (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 PCB

CO₂ 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	5 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[®]-IP54 aSENSE[®]-IP54-D aSENSE[®]-k aSENSE[®]-K-D

Housing Options

INDUSTRIAL WALL HOUSING
Dim.: 142 x 84 x 46 mm
Protection class: IP54 (to the left)

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 (to the right)

- 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 moment 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