aSENSE™ (Disp)

CO$_2$- and Temperature Transmitters

aSENSE™ is an advanced 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 and can be configured with UIP Software.

aSENSE™ is a key component for climate control of buildings and other processes. The transmitter is flexible and suits many different ventilation strategies. It is also a cost-efficient gas alarm sensor for spaces where carbon dioxide gas is a potential danger.

STANDARD SPECIFICATION

Measured gas	Carbon dioxide (CO$_2$)
Operating Principle	Non-dispersive infrared (NDIR)
Measurement range	0—2000ppm
OUT1 linear output	0/2—10VDC, 0—2000ppm CO$_2$
	0/4—20mA, 0—2000ppm CO$_2$
OUT2 linear output	0/2—10VDC, 0—50°C
	0/4—20mA, 0—50°C
Accuracy	±30ppm ±3% of reading
Dimensions	120 x 82 x 30mm
Life Expectancy	>15years
Operation temperature range	0—50°C
Operation humidity range	0 to 95% RH (non-condensing)
Power supply	24V AC/DC
Power consumption	<1W average
Communication	UART (Modbus protocol)

APPLICATIONS

aSENSE™ is designed to control ventilation by transmitting the measured carbon dioxide and temperature value to the Master or DDC of the system. A common application is controlling ventilation in rooms with varying numbers of people such as offices, classrooms, and cinemas. The ventilation control is based on temperature and CO$_2$ measurements and helps to save energy and create a healthy indoor environment.

KEY BENEFITS

- Maintenance-free
- Contributes to lower energy costs
- RS485 communication as option

aSENSE™ *(Disp)* carbon dioxide transmitter Technical Specification

General Performance:

Storage Temperature Range	-40—70°C (display model *Disp*: -20—50°C)
Sensor Life Expectancy	>15years[1]
Maintenance Interval	no maintenance required[1]
Self-Diagnostics	complete function check, yellow LED and LCD error indication (display model *Disp*)
Display (model *Disp*)	4 Digits, 7 segments LCD with ppm indicator
Warm-up Time	>1min. (@ full specs >5min.)
Operating Temperature Range[2]	0—50°C
Operating Environment	Residential, commercial spaces.[3]

Electrical / Mechanical:

Power Input	24VAC ±20%, 50/60Hz (half-wave rectifier input)
Power Consumption	<1W average
Electrical Connections[4]	$1.5mm^2$ screw terminals for power input (G+, G0) and outputs (OUT1, OUT2)

CO_2 Measurement:[4]

Sensing Method	non-dispersive infrared (NDIR) waveguide technology with ABC automatic background calibration algorithm
Sampling Method	diffusion
Response Time ($T_{1/e}$)	<3min. diffusion time
Measurement Range	0—2000ppm$_{vol.}$
Accuracy[1,5]	±30ppm ±3% of measured value
Pressure Dependence	+1.6% reading per kPa deviation from normal pressure, 100kPa

Temperature Measurement:[4]

Operating principle	Negative Temperature Coefficient (NTC) resistor
Measurement range	-20—60°C
Accuracy[6]/ Digital resolution	±1°C / 0.1°C on display, 0.01°C by UART

Linear Signal Outputs:[4,7]

OUT1	Voltage or mA current loop output, selectable by jumper
Linear Conversion Range, voltage	0/2—10VDC for 0—2000ppm$_{vol.}$
Linear Conversion Range, mA current	0/4—20mA for 0—2000ppm$_{vol.}$
OUT2	Voltage or mA current loop output, selectable by jumper
Linear Conversion Range, voltage	0/2—10VDC for 0—50°C
Linear Conversion Range, mA current	0/4—20mA for 0—50°C

Voltage outputs:

D/A Conversion Accuracy	±2% of reading ±20mV
D/A Resolution	10mV
Electrical Characteristics	R_{OUT} <100Ω R_{LOAD} >5kΩ,

Current loop output:

D/A Conversion Accuracy	±2% of reading ±0.3mA
D/A Resolution	0.02mA
Electrical Characteristics	R_{LOAD} <500Ω

Note 1: In normal IAQ applications, accuracy is defined after minimum three (3) ABC periods of continuous operation. Some industrial applications do require maintenance.
Note 2: Lower operation temperature range can be reached by adding a box heater assembly
Note 3: SO_2 enriched environments are excluded.
Note 4: Different options exist and can be customized depending on the application. Please, contact Senseair for further information!
Note 5: Repeatability is included. Uncertainty of calibration gases (±1% currently) is added to the specified accuracy.
Note 6: Valid only for units configured in voltage output mode.
Note 7: During power up, OUT1 and OUT2 are defined to be low. Exact value depends on many factors including temperature.