tSENSE (Disp)

CO_2-, Temperature- and RH Transmitter with colour touch display

tSENSE is an advanced and versatile 3-in-1 transmitter designed for installation in the air-conditioned zone. It measures CO_2 concentration, temperature and humidity in the ambient air accurately without need for additional compensation – true read. The data transmits to a BMS system or stand-alone controller using industry standard output signals and communication protocols.

tSENSE combines all the necessary elements for effective climate control in commercial office buildings, hospitals, hotels, schools and other facilities. Using CO_2-monitoring for demand control ventilation (DCV) allows healthy, comfortable and cost-effective environment for the occupants. It is flexible in design with temperature control and combination of humidity control optional. Though suitable for use in many different energy-efficient ventilation strategies, **SenseAir®** welcomes any discussions for specific needs.

Complies with ASHRAE standard 189.1
(±50ppm @ 1000ppm of measured CO_2 value)

STANDARD SPECIFICATION

Art.no	070-8-0001/070-8-0002 (*Disp*)
Measured gas	Carbon dioxide (CO_2)
Operating principle	Non-dispersive infrared (NDIR)
Measurement range	0 - 2000ppm
OUT1 CO_2	0 - 10VDC, 0 - 2000ppm
OUT2 Temperature	0 - 10VDC, 0 - 50°C
OUT3 Relative Humidity	0 - 10VDC, 0 - 100%RH
Accuracy (CO_2)	±30ppm ±3% of reading
Dimensions	125mm x 85mm x 22mm
Dimensions display	49mm x 37mm
Life expectancy	>15 years
Operation temperature range	0 - 50°C
Power supply	12VDC, 24VAC/DC
Communication	Modbus (MB) or BACnet (BAC) protocol over RS485

KEY BENEFITS

Maintenance free

3 sensors in one housing

Colour touch display with possibility of customizable GUI

Flexibility - Temperature and/or Humidity optional

Improved housing design for effective measurement

Five year warranty

SenseAir® AB
Box 96 I SE-82060 Delsbo I Sweden
Phone: +46-(0)653 - 71 77 70
info@senseair.com I *www.senseair.com*

tSENSE™ (Disp) Technical Specification

General Performance:

Storage Temperature Range ..... -30 - 70°C
Sensor Life Expectancy [1] ..... >15 years
Maintenance Interval [2] ..... Maintenance free
Self-Diagnostics ..... Complete function-check of the sensor module
Display (Disp) ..... Configurable colour LCD with CO_2 (ppm), Temperature (°C) and Humidity (%RH)
Buttons ..... Touch display (Disp)
Complies With Standards ..... EMC directive 2004/108/EC, RoHS directive 2011/65/EU
Warm-up Time ..... ≤1min.(@ full specs 15min)
Operating Temperature Range ..... 0 - 50°C
Operating Humidity Range ..... 0 - 95%RH, non condensing humidity environment
Operating Environment ..... Residential, commercial

Electrical / Mechanical:

Power Input ..... 12VDC, 24VDC or 24VAC (50 - 60Hz) ±20%
Power Consumption ..... <0.35W average non-display version, <0.6W display version
Peak Power Consumption ..... <2W
Wiring Connections ..... Screw terminal, max 1.5mm^2, Containing: Power, GND, Out1, Out2, Out3, RS485. Option: passive temperature or relay

CO_2 Measurement:

Sensing Method ..... Non-dispersive infrared (NDIR) waveguide technology
Sampling Method ..... Diffusion
Response Time ($T_{1/e}$) ..... <3min
Measurement Range ..... 0 - 2000ppm$_{vol}$
Accuracy [3] ..... ±50ppm (@1000ppm$_{vol}$, 17 - 28°C and 30 - 60%RH)
Typical full range: ±30ppm +3% of measured value [4, 5]
Pressure Dependence ..... +1.58% reading per kPa deviation from normal pressure, 101.3kPa
Measurement Interval 15s

Temperature Measurement:

Measurement Range (T) ..... 0 - 50°C
Accuracy [6] ..... ±0.5°C (@ 17 - 28°C), ±1.0°C (@ 0 - 50°C)
Repeatability ..... ±0.25°C (@ 17 - 28°C)
Response Time ..... <6min (Air velocity of 0.15m/s)
Measurement Interval 15s

Relative Humidity Measurement:

Measurement Range ..... 0 - 100%RH
Accuracy [6] ..... ±5%RH (@ 20 - 80%RH)
Hysteresis ..... ±1%RH (@ 20 - 80%RH)
Annual Drift ..... <±0.5%RH
Repeatability ..... ±0.25%RH (@ 17 - 28°C)
Response Time ..... <6min (Air velocity of 0.15m/s)
Measurement Interval 15s

Outputs:

Linear Analog Outputs:

Protection ..... PTC-fuses (auto reset), short-circuit safe
Output Signal ..... Voltage output 0 - 10V, R_{out} <100Ω, Load: >5kΩ
Output Resolution ..... 10-bits, 10mV steps, 0.1% steps of full ppm/°C/%RH range
Out1: CO_2 [7] ..... 0 - 10V, corresponds to 0 - 2000ppm$_{vol}$, at screw terminal
Out2: Temperature (T) [7] ..... 0 - 10V, corresponds to 0 - 50°C, at screw terminal
Out3: Relative Humidity (RH) [7] ..... 0 - 10V, corresponds to 0 - 100%RH, at screw terminal

Digital Output:

Relay (RL) [7] ..... On ≥1000ppm$_{vol}$ CO_2, Off ≤900ppm$_{vol}$, CO_2, at screw terminal
..... Form C / DPDT, I_{max}: 1A/50VAC/24VDC
Input Source ..... CO_2/T/RH (configurable via touch display)

tSENSE™

Art.no.	Product	Additional features
070-8-0001	*tSENSE™ Disp T RH RL MB BAC*	Colour touch display
070-8-0002	*tSENSE™ T RH RL MB BAC*	No display
070-8-0003	*tSENSE™ VAV Disp T RH RL MB BAC*	Colour touch display

[1] SO_2 enriched environments are excluded.
[2] No maintenance required in normal indoor air as ABC (Automatic Baseline Correction) is used.
[3] In normal IAQ applications, accuracy is defined after minimum three (3) weeks of continuous operation with ABC.
[4] Accuracy is specified over operating temperature range. Specification is referenced to certified calibration mixtures. Uncertainty of calibration gas mixtures (±1% currently) is to be added to the specified accuracy for absolute measurements.
[5] Repeatability is included. Uncertainty of calibration gases (±1%) is added to the specified accuracy.
[6] Depending on display brightness setting.
[7] Can be configured with PC software UIP (version 5 or later). See information at www.senseair.com