aSENSE™ VAV (Disp)

An advanced transmitter that measures CO_2 concentration and temperature.

aSENSE™ VAV is a stand-alone controller with built-in sensors for temperature and carbon dioxide. The unit measures both CO_2 concentration and temperature in ambient air and transforms the data into analogue and digital output signals, which are used for controlling air supply on demand. Additional a cooling compressor for dehumidification may also be controlled.

aSENSE™ VAV is for installation in the climate zone or in a ventilation duct. A common application for the aSENSE VAV is controlling the ventilation in rooms with varying load of people such as schools, nurseries, cinemas, theatres, sports centres etc. The product is a key component for energy efficiency and healthy climate control.

In museums and libraries etc, the ventilation control based on temperature and carbon dioxide measurements can be combined with control of humidity.

Standard specification

Measured gas	Carbon dioxide (CO_2)
Operating principle	Non-dispersive infrared (NDIR)
Measurement range	0–2000ppm
OUT1 VAV Output	0–10VDC, 0/4–20mA
CO_2	600–900ppm
Temperature	22–23°C
OUT2	0–10VDC, 0/4–20mA
CO_2	0–2000ppm
OUT3 Relay	Isolated N.O., 1mA/5V up to 1A/50VAC/24VDC
OUT4 Open Collector	In ON/OFF mode: max 0.5A/55VDC (halfwave rectifier for AC)
Accuracy (CO2)	±30ppm ±3% of reading
Dimensions	120 x 82 x 30mm
Life expectancy	>15 years
Operation temperature range	0–50°C
Power supply	24VAC/DC
Communication	UART

Key benefits

- Alternative control outputs
- Internal automatic self-diagnostics
- Housing options: Wall, duct and industry
- Cost-optimised for direct linear control of dampers and speed regulated fans
- Serial communication port for connection to a PC or a GSM module and local network
- Contributes to lower energy costs when applied in Demand Controlled Ventilation

Senseair

aSENSE™ VAV (Disp) Technical Specification

General Performance:

Storage Temperature Range	-20–50°C
Warm-up Time	1 min. (@ full specs 10 min.)
Sensor Life Expectancy	15 years
Maintenance Interval	No maintenance required[1]
Self-Diagnostics	Complete function check of the sensor
Status LED Indicators	Yellow = maintenance support, red = relay closed
Display	4 Digits, 7 segments LCD with ppm / °C / % indicator
Pushbuttons [2]	Offers a selection of installation support, calibration and operation functions

Electrical / Mechanical:

Power Input	24V AC/VDC ±20%, 50–60Hz <3W average
Wiring Connections	Max 1,5mm^2 wires
Main terminal block	Screw terminals
Digital/Analog inputs block	Spring load terminals
UART connector	5-pin, 2.54mm pitch, slide connector
Dimensions without housing	97 x 61 x 19 mm

CO_2 Measurement:

Operating Principle	Non-dispersive infrared (NDIR) with Automatic Baseline Correction (ABC) [6]
Gas Sampling Mode	Diffusion
Response Time (T1/e)	2 min. diffusion time (20 sec. with tube connection at 0.1 litre/minute gas flow)
Accuracy 7	± 30ppm, ± 3% of measured value
Pressure Dependence	+1.58% reading per kPa deviation from normal pressure, 100kPa
Annual Zero Drift 7	<±0.3% of measurement range
Measurement Ranges	0–3000 ppm

Temperature Measurement:

Operating Principle	Thermistor
Measurement Range	-20–60°C
Accuracy	±0.5°C; Digital Resolution 0.1°C (0.01°C via UART)

Outputs:

Analogue[3]

Protection	PTC resistor on signal return M
Output limits	MIN and MAX limits may be individually set to all outputs
Linear outputs OUT1 & OUT2 0/2-	0/2–10V optional 0/4–20mA R_{LOAD} <500Ω
Linear output OUT4	0–10VDC R_{OUT} <100Ω, R_{LOAD} >5kΩ
D/A Resolution	10 bits, 10mV / 0.01mA
D/A Conversion Accuracy Resolution	Voltage mode: ± 2% of reading ± 50mV, current loop: ±2% of reading ±0.3mA
Relay (OUT3)	Isolated N.O., 1mA/5V up to 1A/50VAC/24VDC.
Open collector OUT4	In ON/OFF mode: max 0.5A/55VDC (halfwave rectifier for AC)

UART Serial com port

Protocol	Modbus [4]
PC-interface	RS232 UART cable with sliding contact and driver (model A232 Cable)
PC User Interface Program	UIP5 [5]
RS485 network com	(Accessory -485) RS485 terminal slide-on port Option Modbus RTU

Inputs

Inputs	9, 10 DI1 switch input to delay timer and regulators

Note 1: In normal IAQ applications. Some industrial applications may require an annual zero gas purge, which automatically recalibrates the CO2 sensor.

Note 2: Different menus exists for different models. Push-buttons are available only in models having a LCD.

Note 3: The specifications are valid for the output load connected to ground G0 or com mon signal return.

Note 4: For more information, please contact Senseair AB.

Note 5: Free download from: https://senseair.com/download

Note 6: The ABC function is the key for maintenance free operation. It assumes normal IAQ environments or applications where some ventilation will occur (during some moment over an ABC period). For CO2 sensors this function automatically cor rects for any possible zero drift.

Note 7: In normal indoor air environment accuracy is defined at continuous operation (three (3) ABC periods are minimum after installation).