

aSENSE MIII



CO and CO₂ sensor ventilation controller

aSENSE MIII is a controller with built-in sensors to monitor at the same time carbon dioxide and carbon monoxide. With these parameters, the programmable unit can control, e.g. ventilation rates, and generate alarm signals for personal safety devices.

aSENSE MIII is designed for stand-alone operation, as well as being connected to larger building automation systems.

The aSENSE MIII is applicable in most large spaces where combustion is the source of the potential toxic danger, such as in public garages, truck terminals, tunnels and mines. It offers the possibility to combine CO and CO₂ measurements which not just guarantees public safety, but also saves energy when applied to Demand Controlled Ventilation.

The aSENSE MIII offers the possibility to regulate ventilation systems stand-alone, as well as being just a sensor in a larger system. To cover larger spaces, e.g. several sensors could be joined in a simple relay loop and together control an intermittent two-speed exhaust fan.

Standard specification

Measured gas	Carbon dioxide (CO ₂) Carbon monoxide (CO)
Operating principle	Non-dispersive infrared (NDIR)
Measurement range CO ₂	0–3000ppm
Measurement range CO	0–100ppm
OUT1 CO	0–10VDC, 0-100ppm
OUT2 CO ₂	0–10VDC, 0–2000ppm
OUT3 Relay	Closed: (CO < 30ppm) AND (CO ₂ < 1400ppm) Open: (CO > 35ppm) OR (CO ₂ > 1500ppm)
OUT4 Open collector	Error detection
Accuracy (CO ₂)	±30ppm ±3% of reading
Accuracy (CO)	±10ppm
Dimensions	150 x 85 x 46mm
Life expectancy	>5 years
Operation temperature range	0–50°C
Power supply	24VAC/DC (±20%), 3W
Communication	UART (Modbus)
Display	Optional

Key benefits

- Maintenance-free
- Two sensors in one housing
- Flexible control outputs for connection to DDC, or direct control of dampers and speed regulated fans
- Contributes to lower energy costs when applied in Demand Controlled Ventilation
- Internal data recorder for environmental trend logging
- Serial com port for connection to PC, GSM-module or local network



Senseair
AsahiKASEI

aSENSE MIII (Duct) (Disp) Technical Specification

General Performance:

Storage Temperature Range	-20–70°C (Display -20–50°C)
Sensor Life Expectancy	>5years ¹
Self-Diagnostics	Complete function-check of the sensor
Status LED Indicators	yellow = maintenance support green = relay closed red = active open collector output
Step Response (T _{1/e})	8min
Warm-up Time	≤15min (more when un-powered for a long time)
Operating Temperature Range	0–50°C ²
Operating Humidity Range	5–85%RH, (non-condensing)
Display (Disp)	4 Digits, 7 segments LCD with ppm indicator
Push Buttons	Offers a selection of set point adjusts and calibration operation functions
Data logger	Internal data logger of CO- and CO ₂ readings, 2 X 960 samples, corresponding to just under two weeks data sampling of CO- and CO ₂ values in 20 minutes intervals

Electrical / Mechanical:

Power Input	24VAC ±20%, 50/60Hz
Power Consumption	≤3W average
Electrical Connections	max 1.5mm ² wires for screw terminal (main terminal) and spring loaded terminal
UART connector	5-pin, 2.54mm pitch, slide connector (Senseair standard)
Dimension of housing	150 x 85 (+ cable throughput 25mm) x 46mm (L x W x D) For duct mounted, sampling probe 245 x 40mm (L x diameter of hole)

CO₂ Measurement:

Operating Principle	Non-dispersive infrared (NDIR) with Automatic Baseline Correction (ABC) ³
Accuracy	±30ppm ±3% of measured value ⁴
Pressure Dependence	+1.6% reading per kPa deviation from normal pressure, 11kPa
Measurement Range	0–3000ppm _{vol} (ranges up to ±20% vol. offered on request)

CO Measurement:

Operating Principle	Electrochemical gas sensor with compensation for temperature variations
Accuracy	±10ppm ⁴
Measurement Range	0–100ppm (standard)
Extended Measurement Range	101–500ppm
Accuracy in extended Range	±20% of reading ⁴

Outputs/Terminals:

Analogue Outputs⁵:

Protection	PTC-fuses (auto reset), on signal return M, short-circuit safe
Output Limits	MIN- and MAX limits may be individually set to all outputs
Linear Outputs OUT1 and OUT2	0/2–10VDC, R _{OUT} <100Ω, R _{LOAD} >5kΩ 0/4–20mA, R _{LOAD} : <500Ω
Linear Output OUT4	0–10VDC, R _{OUT} <100Ω, R _{LOAD} >5kΩ
D/A Resolution	10 bits, 10mV / 0.016mA
D/A Conversion Accuracy	Voltage mode: ±2% of reading ±50mV Current loop: ±2% of reading ±30mA
Digital Output:	
Relay (OUT3)	Isolated NC, 1mA/5V to 1A/50VAC/24VDC
Open Collector OUT4	In ON/OFF mode: max 0.5A/55VDC (half-wave rectifier for AC), closed to ground

¹Is limited by the CO sensor.

²Lower temperature operation range can be reached by adding a box heater assembly.

³The ABC-function is the key to maintenance free operation. It assumes normal operation applications, where ventilation to some degree will occur (at least during some moment over an ABC period). This function automatically corrects for any possible zero drifts for the CO₂ sensor.

⁴In normal ventilated environments. Accuracy is defined at continuous operation (minimum three ABC periods after installation). Accuracy is specified over operating temperature range at normal pressure 101.3 kPa. Specification is referenced to certified calibration mixtures.

⁵The specifications are valid for outputs connected to power ground G0 or the common signal ground M

Note! The CO probe also responds to some other chemicals than CO, i.e. silicone. Some non-common operation environments therefore may not be applicable for this product!