

Sensor-Based Air Quality Monitoring Micro-Stations





DESCRIPTION:

Our **Cairsens**[®] sensor is an integrated system consisting of a compact measuring cell (amperometric, but also NDIR, PID...), a dynamic air sampler with a patented filter, and an electronic circuit allowing measurement of the smallest variations in concentration levels. Using a gas specific inlet filter combined with our dynamic air sampling system technology, a reliable measurement is achieved by limiting the effect of humidity variations. The high quality of our **Cairsens**[®] allows specific measurement, comparable to the reference methods (notably by the USEPA, the JRC, etc.).

The compact size of the **Cairsens**[®] along with its very low power consumption allows them to be easily positioned and set up outside for several days (**Cairtub**[®]), or integrated in our autonomous and wireless communicating stations for real-time data access (**Cairnet**[®]).

EXCLUSIVE FEATURES:

- Simple, reliable, cost effective
- Ppb levels detection
- No maintenance required, no need for re-calibration
- Autonomous version (solar panel)
- Immediate operation
- Useful life: 1 year

MAIN APPLICATIONS:

- Ambient air pollution study
- Dynamic pollution mapping
- Indoor air quality measurement
- Chronic exposure evaluation
- · Monitoring fugitive emissions like odor on WWT plants
- Individual health survey
- Epidemiologic study...



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Miniature Air Quality Monitoring Sensors Network

SPECIFICATIONS:

- LCD display with concentration levels of the measured pollutants
- Internal data storage: 11 days minimum for 1 min. data, up to 1.5 years for hourly acquisition
- Internal microprocessor for value and time calculation
- Low battery indication
- Operating time: 24 to 36 hours when fully charged for USB versions (daily recharge for optimal use)
- Power supply: 5VDC /500 mA rechargeable by USB via PC or 220V/110V with 5V adaptor (solar panel option)
- Output: USB or UART (Analog signal on demand)
- Dimensions: diameter 32 mm (1.26"), length 62 mm (2.44")
- Weight: 55 g (1.94 oz)
- IP 42 (according IEC60529)
- Storage condition: 5 to 20°C (41°F to 68°F), 10 to 90% RH, mbar 1013 ffl 200 (psi 14.69 ffl 2.90)
- Operating condition: depending of the sensor, in general -20°C to +45 °C (-4°F to 113°F), 10 to 90% RH, mbar 1013 ffl 200 (psi 14.69 ffl 2.90)
- Electric standards: CEI/UL/CSA N°61010-1: 2008 / EN 61010-1:2001
- * Detailed specification per sensor on request

MAIN OPTIONS:

Cairtub©: Protective housing for stand-alone outdoor application, 21 days power autonomy, easy to install or move. Up to 3 integrated sensors.

Cairnet: Protective housing - with wireless communication, autonomous using solar panel - for online data acquisition. Up to 4 integrated sensors.

Software: Real-time data management and display on a fixed PC (Cairmap suite) or via Internet access (Caircloud), with numerous optional features: Meteo data integration, alarms management, automated reports, modeling software exports, etc.)

	Ranges:	Detection limit:
O ₃ / NO ₂	0-250 ppb	20 ppb
NO ₂	0-250 ppb	20 ppb
СО	0-20 ppm	0.05 ppm
H_2S / CH_4S	0-1000 ppb / 0-20 ppm / 0-200 ppm	10 ppb / 30 ppb / 200 ppb
NH ₃	0-25 ppm	0.5 ppm
SO ₂	0-1000 ppb	50 ppb
$\rm CH_{2}O$ / Organic solvents	0-1000 ppb	10 ppb
nM VOC	0-16 ppm	10 ppb
CO ₂	0-5000 ppm	1 ppm



MEASUREMENT PRINCIPLE:

The amperometric sensor consists of three electrodes: the working electrode (anode), the counter electrode (cathode) and the reference electrode. The gas to be analyzed is diffused through a permeable membrane towards the sensitive electrode. Depending on the gas, oxydation takes place at the anode, or reduction at the cathode. The electrical signal generated between the two electrodes is proportional to the concentration.

CASE STUDY: H₂S MONITORING WITH CAIRSENS





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