

Miniature solution for real-time continuous pollution monitoring

AIR QUALITY MONITORING SYSTEMS

“40 years of experience in the field of environmental monitoring to the benefit of our micro-sensors”

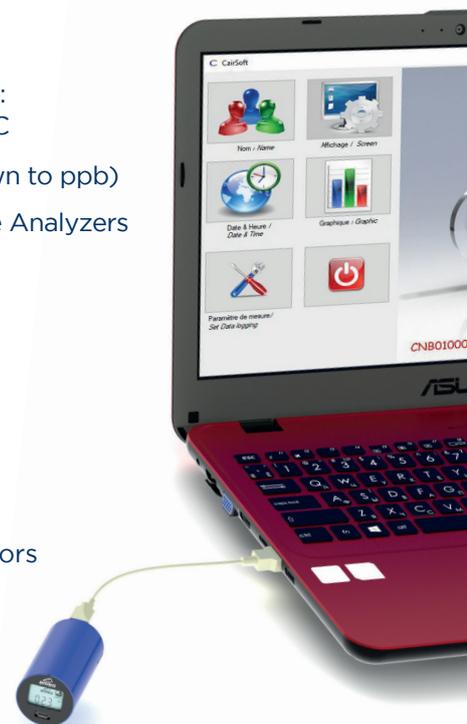


The Cairsens® sensor allows specific pollutant measurement comparable to reference methods. The high quality sensors are renowned worldwide by our customers looking for the newest technologies in air quality monitoring.

Excellent measurement accuracy is achieved by limiting the effect of humidity interference by using a specific and patented inlet filter combined with dynamic sampling.

MAIN BENEFITS:

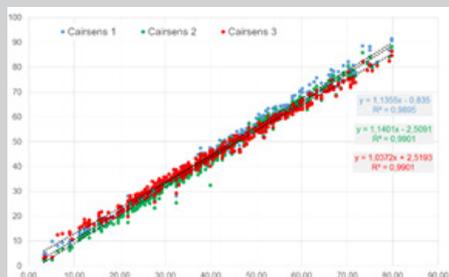
- Real-time monitoring of the most common types of pollutants: NO₂, O₃ + NO₂, CO, SO₂, PM10 & PM2.5, H₂S/CH₄S, NH₃, nmVOC
- Very high sensitivity to capture low level gas concentrations (down to ppb)
- Accurate measurement data at a fraction of the cost of Reference Analyzers
- No maintenance required during the Cairsens®'s lifetime
- No need for re-calibration during 12 months
- Embedded USB and UART / ModBus communication ports
- Up to 20 days of 1-minute data storage capacity
- Ultra-small, with close to zero power consumption
- Ready to use and easy to integrate
- Measurements meet **European directive 2008/50/EC** for indicators



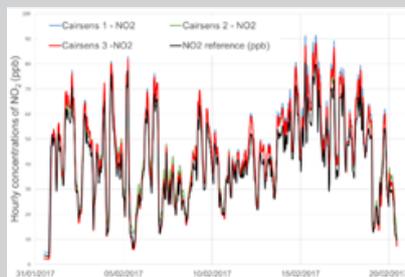
Data download
via computer

RELIABILITY AND ACCURACY

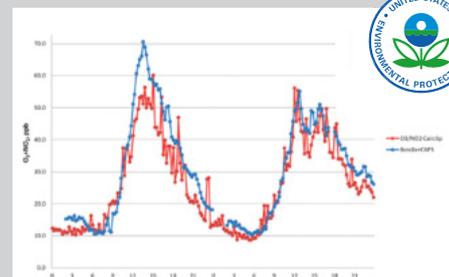
Independent reviewers, including the European **JRC** (Joint Research Council), the **LCSQA** and the **US-EPA**, have determined the accuracy, linearity, limits of detection and precision of Cairsens® as very good when compared with reference methods. Further studies with **NASA** have shown **very good correlation with reference measurements**.



Correlation of measurements:
Reference station vs Cairsens NO₂ (ppb)



NO₂ measurement comparison:
Traffic reference-station vs 3 Cairsens



O₃ monitoring, comparative test:
Cairsens vs Reference method

“ Great correlation between measurements of Cairsens and Reference Analyzer at all range, particularly at low concentration ”

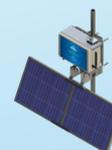


*Cairsens® are manufactured in France and calibrated in our metrological laboratory using Standard Reference AQMS monitors. Every sensor shipped includes a **calibration certificate**.

MAIN APPLICATIONS

- Indoor and outdoor air quality monitoring: smart cities, road-side & tunnels, schools, airports, ship terminals...
- Odor monitoring: WWTP, recycling, pulp and paper manufacturing, sewage treatment facilities, refineries
- Leak detection and monitoring of fugitive emissions: quarries, storage facilities, mines, manufacturing plants
- Providing data for air dispersion modelling
- Health and safety: mines, industrial sites, construction
- Forecasting of industrial fence line emissions

Cairnet® is a real-time air quality monitoring mini-station containing up to 6 Cairsens® micro-sensors plus cellular communication within a waterproof enclosure. Compact, easily deployable and autonomous thanks to its solar panels, Cairnet® enables you to cost-effectively monitor dust and gases, with centralized data management in the cloud, through ENVEA's Caircloud® application.



A SMART MICRO-SENSOR WITH FULL TURNKEY CAPABILITIES

ENVEA micro-sensors are extremely versatile. They can be customized and utilized as part of a larger network for monitoring multiple pollutant measurements (Cairnet®). The micro-sensors can also be used as a standalone system, for single-spot measurements, or to be integrated by the users.

CAIRSENS Microsensors



The intelligent and user-friendly Caircloud® web-based interface allows easy, continuous and real-time data acquisition, processing and the management of unlimited sensors' or Cairnet® mini-stations.



Caircloud® recorded data is fully compatible with the XR® Air Quality Data Acquisition and Handling solution from ENVEA.

METROLOGICAL PERFORMANCES

Measured Parameter	Criteria pollutants (Air Quality)				Odorous Compounds					
	NO ₂	O ₃ * + NO ₂	SO ₂	CO	H ₂ S / CH ₄ S			NH ₃	nmVOC	
Article code	A40-405	A40-0406	A40-0407	A40-0404	A40-0401	A40-0402	A40-0403	A40-0408	A40-0409	A40-0410
Measuring Range (ppm)	0 - 0.25	0 - 0.25	0 - 1	0 - 20	0 - 1	0 - 20	0 - 200	0 - 25	0 - 2	0 - 16
Certified* Detection Limit (ppm)	0.02	0.02	0.05	0.05	0.01	0.03	0.2	0.5	0.2	0.5
Resolution (ppm)	0.001				0.001					
Operating Temperature (°C)	-20 to +40	-20 to +40	-20 to +50	-20 to +50	-20 to +40	-20 to +40	-20 to +40	-20 to +40	-20 to +50	-20 to +50
Operating Relative Humidity (% HR)	10 to 90 (non-condensing)				10 to 90 (non-condensing)					
Sensor Type	Electrochemical							PID		

Metrological performances according to the European Directive 2008/50/EC are guaranteed for 12 months

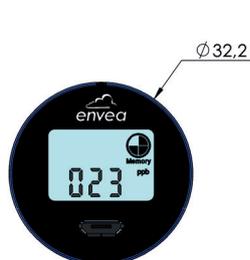
*This Cairsens® measures the combination of {O₃ + NO₂}. To obtain O₃ alone, it is necessary to use two Cairsens® sensors: Cairsens® O₃ + NO₂ and Cairsens® NO₂. For the measurement of particulates PM₁₀ / PM_{2.5} / PM₁, please refer to the specific brochure PM Cairsens®

STORAGE CONDITIONS

Temperature (°C)	+5 to +20
Relative Humidity (% HR)	> 15 (non-condensing)
Max. Storage Duration	3 months for gas sensors, 6 months for VOCs

COMPLIANCE TO ENVIRONMENTAL REGULATIONS

Electrical Safety	NF EN 61010-1: 2010
Electromagnetic Compatibility	NF EN 61326-1: 2013
Protection Index	IP 42 (according to IEC 60529)
European Directive	2008/50/EC



TOP



SIDE



BOTTOM

TECHNICAL SPECIFICATIONS

Sampling method	Dynamic air sampling, with a controlled micro-fan
Power supply	5VDC / 500mA, USB port of a PC or Power bank type «Always on» (not provided)
Power consumption	20 mA max under 5 VDC
I/O communications	USB, UART, Modbus RTU-TTL. Modbus RS445 on request (article code A40-0219)
Lifetime duration	24 months
LCD Display	Concentration in ppb or ppm, operating status, memory available...
Control & data treatment	Internal microprocessor for data acquisition and treatment, embedded timer
Data Storage (internal)	20 days for 1 min data, 303 days for 15 min data or 1212 days for 60 min data
Download data mode	- Cairsoft (free download on our website) - e-SAM DAHS system or Customized integration - Cairnet® Mini-stations with data exported in the Caircloud®
Weight	55 g



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More information & downloads:
envea.global/cairnet/faq-downloads

