



DATASHEET

kunak air

The most advanced and reliable solution for air quality monitoring



MOST ACCURATE MULTI-POLLUTANT SENSOR



CSA MC230418/00



Kunak AIR Pro

Air quality monitor



Measure air pollution with accurate and reliable data.

SENSOR BASED | NEAR REFERENCE DATA

Monitor up to 5 gas pollutants and particles simultaneously and get continuous and real-time data on the ambient air. Kunak AIR Pro allows you to measure various air pollutants in different environments, obtaining near-reference data.

All collected data can be visualised and analysed anywhere and anytime via Kunak AIR Cloud web platform.

Get the most versatile solution. The patented smart gas cartridge technology allows you to choose different pollutants depending on the project needs. Switch them whenever you need to.

Data quality is guaranteed. All of our sensors are factory calibrated and tested according to Class 1 of the European CEN/TS 17660.

Data traceability to reference standards: European Directive 2008/50/EC and USEPA 40 CFR Part 53.



Patented cartridge system



Multiple pollutants



MCERTS certified
CSA MC230418/00



Traceable back to reference standards



Remote calibration



Additional probes

Simplify your daily operations. Make better decisions.



Kunak AIR Pro air quality station was awarded **The Most Accurate Multi Pollutant Sensor** in 2021 and 2023 AIRLAB Microsensors Challenge editions organised by Airparif.

Our solution has been tested by the world's leading air quality experts:





Optical particle counter
Certified Product for Indicative
Ambient Particulate Monitors



Kunak AIR stations offer performance levels close to reference standards, providing reliable, accurate data according to [Class 1 of the European CEN/TS17660](#) and traceable data to international recognised standards ([European Directive 2008/50/EC](#) and [USEPA 40 CFR Part 53](#)).

Specifications

Dimensions	257 x 270 x 225 mm
Weight	< 3.5 kg
Enclosure	PMMA & Polycarbonate & Stainless steel
Operating temp.	-20 °C to 60°C
Operating RH	0 to 99 %RH
IP rating	IP65
Battery	Lithium 26 Ah
External supply	7 - 12 Vdc. charger or solar panel
Autonomy	24/7 with charger or solar panel 9-30 days operation on battery (depending on configuration)
Power consumption	0.08 - 1.2W (depending on configuration)
Communications	Multi-Band 2G/3G/4G, Ethernet and Modbus RTU Slave
GNSS	GPS and GLONASS

Gas sensors	CO, CO ₂ , NO, NO ₂ , O ₃ , SO ₂ , H ₂ S, NH ₃ , CH ₄ , VOC, HCl
PM sensor	PM ₁ , PM _{2.5} , PM ₄ , PM ₁₀ TSP and TPC
Internal status	Temperature, battery, charging voltage and current, and signal
Built-in sensors	Temperature, humidity, atmospheric pressure and dew point
Connectors	#1: Power 7V to 12V or Ethernet #2: Modbus RTU Slave #3: Sound meter, UV #4: WBGT, Pyranometer, Modbus RTU Master #5: Anemometer & Rain Gauge
Sampling freq.	3Hz gases, 0.25Hz particles
Avg. periods	From 10 seconds to a maximum of 24 hours
Sending periods	From 5 minutes to a maximum of 24 hours
Remote management	Bidirectional communications Remote configuration and calibration
SIM	Embedded eSIM and SIM extra holder



Kunak AIR Lite

Air quality station



Take quick and effective actions based on accurate and reliable data.

INDUSTRY GRADE DESIGN | NEAR REFERENCE DATA

Monitor pollution levels and make quick and effective decisions to protect human health and the environment. With the Kunak AIR Lite air quality monitoring station, you get accurate data on different pollutants easily, quickly, and cost-effectively.

Designed for industrial applications and massive deployments in cities.

Thanks to the patented smart cartridge technology, you can measure particulate matter (PM₁, PM_{2.5} and PM₁₀) and 2 gases simultaneously. Replace the cartridges as your project changes without the need of sending the device back to the factory.

Designed for projects where no more than 2 gases and particles need to be measured.

Data quality is guaranteed. All of our sensors are factory calibrated and tested according to Class 1 of the European CEN/TS 17660.

Data traceability to reference standards: European Directive 2008/50/EC and USEPA 40 CFR Part 53.



Patented cartridge system



2 gases and particles



Proven accuracy



Traceable to reference standards



Autonomous operation



Additional probes

All collected data can be visualised and analysed anywhere and anytime via the Kunak AIR Cloud web platform.



Kunak AIR Lite air quality station was awarded **The Most Accurate Multi Pollutant Sensor** in the latest AIRLAB Microsensors Challenge edition organised by Airparif.

Our solution has been tested by the world's leading air quality experts:





Kunak AIR stations offer performance levels close to reference standards, providing reliable, accurate data according to [Class 1 of the European CEN/TS17660](#) and traceable data to international recognised standards ([European Directive 2008/50/EC](#) and [USEPA 40 CFR Part 53](#)).

Specifications

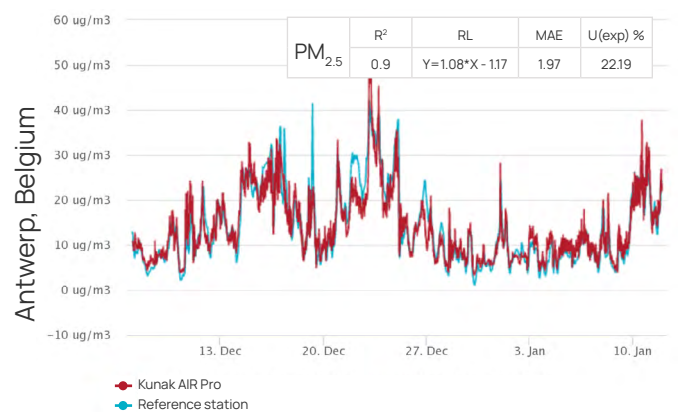
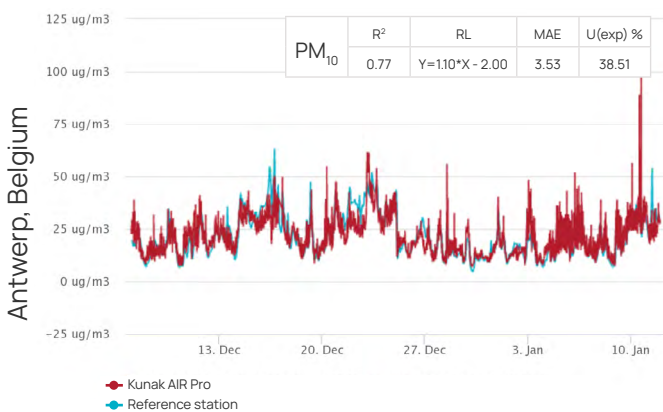
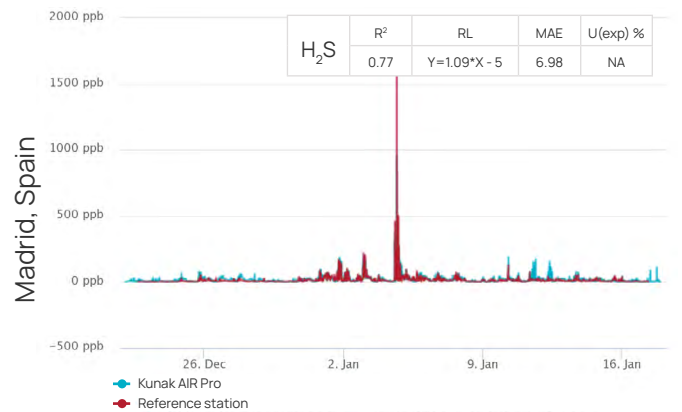
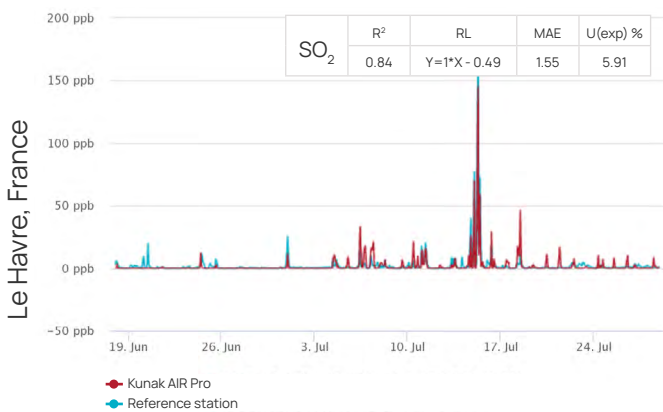
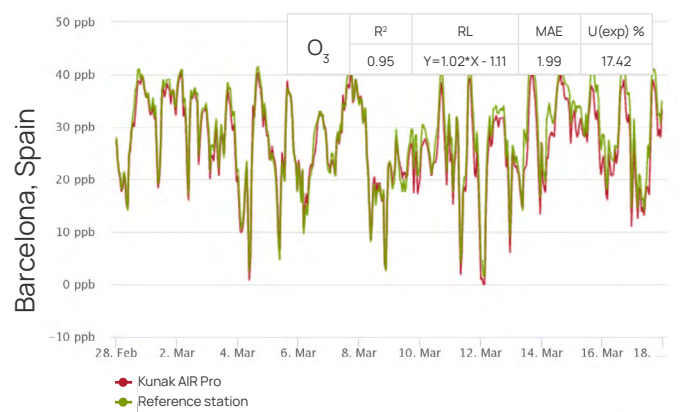
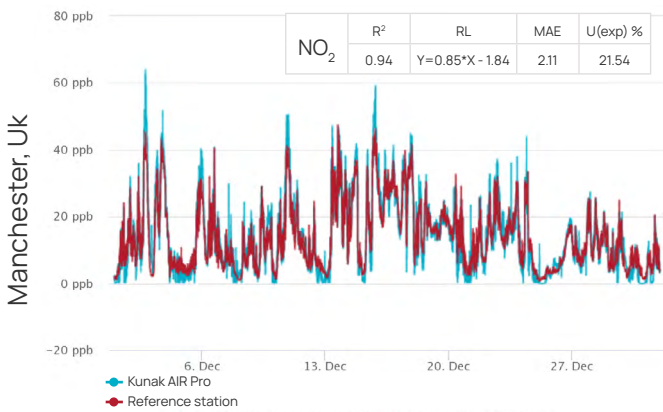
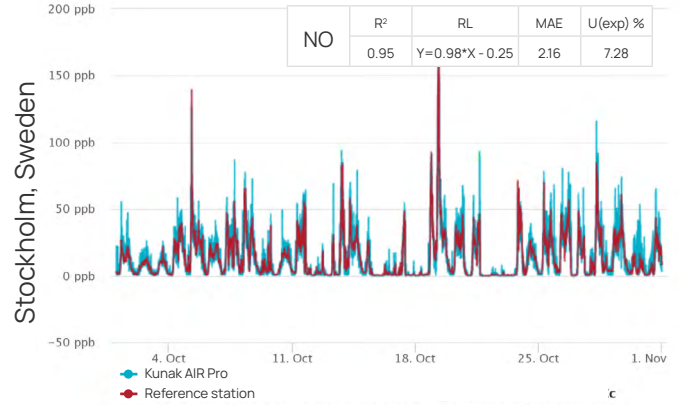
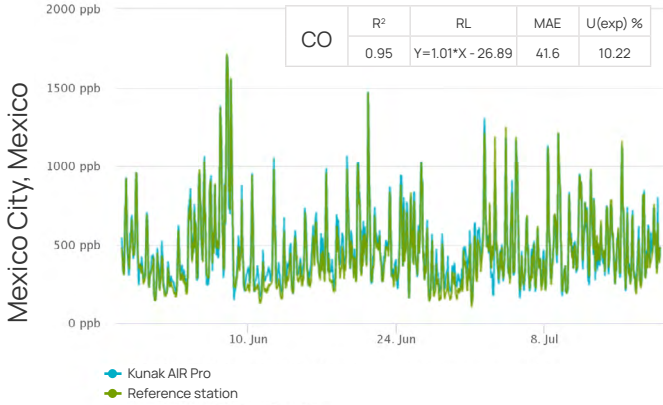
Dimensions	200 x 153 x 185 mm
Weight	< 2.3 kg
Enclosure	PMMA & Polycarbonate & Stainless steel
Operating temp.	-20 °C to 60°C
Operating RH	0 to 99 %RH
IP rating	IP65
Battery	Lithium 20 Ah
External supply	7 - 12 Vdc. charger or solar panel
Autonomy	24/7 with charger or solar panel 9-20 days operation on battery (depending on configuration)
Power consumption	0.08 - 0.55W (depending on configuration)
Communications	Multi-Band 2G/3G/4G, Ethernet and Modbus RTU Slave
GNSS	GPS and GLONASS

Gas sensors	CO, CO ₂ , NO, NO ₂ , O ₃ , SO ₂ , H ₂ S, NH ₃ , CH ₄ , VOC, HCl
PM sensor	PM ₁ , PM _{2.5} and PM ₁₀
Internal status	Temperature, battery, charging voltage and current, and signal
Built-in sensors	Temperature, humidity, atmospheric pressure and dew point
Connectors	#1: Power 7V to 12V #2: Several options to choose from: • Option 1: Anemometer & Rain Gauge • Option 2: Modbus RTU Master • Option 3: Sound meter • Option 4: Modbus RTU Slave • Option 5: Ethernet
Sampling freq.	3Hz gases, 1Hz particles
Avg. periods	From 10 seconds to a maximum of 24 hours
Sending periods	From 5 minutes to a maximum of 24 hours
Remote management	Bidirectional communications Remote configuration and calibration
SIM	Embedded eSIM and SIM extra holder



Evidence of accuracy

We continuously conduct intercomparative studies with reference stations in different locations and laboratories to guarantee the highest quality results.





Smart gas cartridges

Description

Kunak AIR stations are sensor-based devices equipped with slots to insert the smart gas cartridges. These cartridges solve many of the known issues of sensor technology as sensor variability, factory and field calibration, automatic data invalidation, sensor replacement, network operation and maintenance work.

The Smart gas cartridges ensure measurement control throughout the life cycle of each sensor.

Kunak AIR stations are the most sustainable solution on the market as most of the electronic and mechanical parts can be reused and recycled, making them the most sustainable air quality solution on the market.



Near reference data

Accurate real-time pollutant value without the need for external instruments or reference data



Traceable QC & QA

Each cartridge is calibrated and validated individually in lab against traceable reference standards.



Low intra-variability

Consistent readings across all equipment and locations, correcting implicit sensor variability.



Endless combinations

Combine your cartridges according to your needs in just 2 minutes.

Patented GasPlug™ technology

All cartridges are the same size and fit into any of the available slots. Inside the cartridge, we install the sensor into a PCB that stores all the information regarding type, age, and factory calibration. When you plug the cartridge, the basestation just reads the information, configures itself and starts working.

Select the pollutants you need to measure.
Replace them anytime.



Say hello to a revolutionary air quality sensor that fits in the palm of your hand.



Technical specs

	CO	CO ₂	NO	NO ₂	O ₃	H ₂ S	SO ₂	NH ₃	VOCs	CH ₄	HCl	
Type	Electrochemical	Non-dispersive infrared (NDIR)	Electrochemical	Electrochemical	Electrochemical	Electrochemical	Electrochemical	Electrochemical	Photo-ionization detector	NDIR ^(A) Non-dispersive Infrared MEMS ^(B) Micro-Electro-Mechanical Systems	Electrochemical	
Unit of measurement	µg/m ³ , ppb ^(A) mg/m ³ , ppm ^(B)	mg/m ³ , ppm	µg/m ³ , ppb	µg/m ³ , ppb	µg/m ³ , ppb	µg/m ³ , ppb ^(A) mg/m ³ , ppm ^(B)	µg/m ³ , ppb	mg/m ³ , ppm	µg/m ³ , ppb ^(A) mg/m ³ , ppm ^(B)	mg/m ³ , ppm	mg/m ³ , ppm	
Measurement range⁽¹⁾	0 - 12,000 ppb ^(A) 0 - 500 ppm ^(B)	0-5,000 ppm	0-5,000 ppb	0-5,000 ppb	0-2,000 ppb	0 - 2,000 ppb ^(A) 0 - 20 ppm ^(B)	0-10,000 ppb	0-50 ppm ^(A-C) 0 - 1,500 ppm ^(B)	0 - 3,000 ppb ^(A) 0 - 40 ppm ^(B)	1,000-50,000 ppm ^{(5% vol)^(A)} 60-300,000 ppm ^{(30% vol)^(B)}	0-20 ppm	
Resolution⁽²⁾	1 ppb ^(A) 0.01 ppm ^(B)	0,01 ppm	1 ppb	1 ppb	1 ppb	1 ppb ^(A) 0.01 ppm ^(B)	1 ppb	0.01 ppm	1 ppb ^(A) 0.01 ppm ^(B)	100 ppm ^(A) 1 ppm ^(B)	0.01 ppm	
Operating temp. range⁽³⁾	-30 to 50 °C	-20 to 50 °C	-30 to 45 °C	-30 to 45 °C	-30 to 45 °C	-30 to 50 °C	-30 to 40 °C	-10 to 50 °C ^(A) -20 to 43 °C ^(B) -20 to 40 °C ^(C)	-40 to 60 °C	-20 to 50 °C ^(A) -35 to 70 °C ^(B)	-20 to 50 °C	
Operating RH range⁽⁴⁾	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99% RH	0 to 99 %RH	0 to 99 %RH	
Recommended RH range⁽⁴⁾	15 to 90 %RH	15 to 95 %RH	15 to 85 %RH	15 to 85 %RH	15 to 85 %RH	15 to 90 %RH	15 to 90 %RH	15 to 90 %RH	0 to 99% RH	15 to 90 %RH ^(A) 0 to 99 %RH ^(B)	15 to 90 %RH	
Operating life⁽⁵⁾	> 24 months	> 4 years	> 24 months	> 24 months	> 24 months	> 24 months	> 24 months	> 24 months	> 24 months	10,000 hours	> 4 years	> 24 months
Guarantee range⁽⁶⁾	1,000 ppm	-	20 ppm	20 ppm	20 ppm	100 ppm	100 ppm	100 ppm ^(A) 5,000 ppm ^(B) 200 ppm ^(C)	50 ppm ^(A) 60 ppm ^(B)	100% vol	200 ppm	
LOD - Limit of detection⁽⁷⁾	10 ppb ^(A) 0.02 ppm ^(B)	-	2 ppb	2 ppb	3 ppb	2 ppb ^(A) 0.01 ppm ^(B)	3 ppb	0.02 ppm ^(A-C) 0.15 ppm ^(B)	1 ppb ^(A) 0.01 ppm ^(B)	1,000 ppm ^(A) 60 ppm ^(B)	0.01 ppm	
Repeatability⁽⁸⁾	20 ppb ^(A) 0.05 ppm ^(B)	-	4 ppb	4 ppb	4 ppb	4 ppb ^(A) 0.01 ppm ^(B)	5 ppb	0.03 ppm ^(A) 0.5 ppm ^(B) 0.1 ppm ^(C)	5 ppb ^(A) 0.02 ppm ^(B)	500 ppm ^(A)	0.02 ppm	
Response time⁽⁹⁾	< 30 sec ^(A) < 180 sec ^(B)	< 30 sec	< 30 sec	< 60 sec	< 70 sec	< 60 sec	< 60 sec	< 45 sec ^(A) < 90 sec ^(B-C)	< 12 sec ^(A) < 10 sec ^(B)	< 90 sec ^(A) < 10 sec ^(B)	< 45 sec	
Typical accuracy^{(11) (12)}	± 80 ppb ^(A) ± 0.1 ppm ^(B)	±20 ppm	±4 ppb	±5 ppb	±8 ppb	± 10 ppb ^(A) ± 0.05 ppm ^(B)	±15 ppb	±0.3 ppm ^(A) ±1.5 ppm ^(B) ±0.5 ppm ^(C)	-	±3% of F.S. ^(A) ±30 ppm + 10% of reading ^(B)	±0.1 ppm	
Typical precision - R²⁽¹⁰⁾	> 0.85	> 0,8	> 0.9	> 0.85	> 0.9	> 0.75	> 0.7	-	-	-	-	
Typical slope⁽¹⁰⁾	0.78 - 1.29	0.6 - 1.66	0.9 - 1.12	0.78 - 1.29	0.85 - 1.18	0.78 - 1.29	0.78 - 1.29	-	-	-	-	
Typical intercept (a)⁽¹⁰⁾	-50 ppb ≤ a ≤ +50 ppb ^(A) -0.1 ppm ≤ a ≤ +0.1 ppm ^(B)	-170 ppm ≤ a ≤ 170 ppm	-2 ppb ≤ a ≤ +2 ppb	-4 ppb ≤ a ≤ +4 ppb	-3 ppb ≤ a ≤ +3 ppb	-5 ppb ≤ a ≤ +5 ppb ^(A) -0.05 ppm ≤ a ≤ +0.05 ppm ^(B)	-5 ppb ≤ a ≤ +5 ppb	-	-	-	-	
DQO - Typical U_(exp)⁽¹³⁾	< 20%	-	< 20%	< 25%	< 20%	-	< 25%	-	-	-	-	
Typical intra-model variability⁽¹⁴⁾	< 3 ppb ^(A) < 0.05 ppm ^(B)	< 0,5 ppm	< 1 ppb	< 1 ppb	< 1 ppb	< 2 ppb ^(A) < 0.02 ppm ^(B)	< 3 ppb	< 0.1 ppm ^(A-C) < 0.2 ppm ^(B)	< 3 ppb ^(A) < 0.1 ppm ^(B)	< 500 ppm ^(A)	< 0.1 ppm	

Technical specs

	PM ₁	PM _{2.5}	PM ₄	PM ₁₀	TSP	TPC
Type	Optical particle counter	Optical particle counter	Optical particle counter	Optical particle counter	Optical particle counter	Optical particle counter
Unit of measurement	µg/m ³	µg/m ³	µg/m ³ (A)	µg/m ³ (A)	µg/m ³ (A)	counts/cm ³ (A)
Measurement range (1)	0 - 1,000 µg/m ³	0 - 2,000 µg/m ³ (A) 0 - 1,000 µg/m ³ (B)	0 - 2,000 µg/m ³ (A)	0 - 10,000 µg/m ³ (A) 0 - 1,000 µg/m ³ (B)	0 - 15,000 µg/m ³ (A)	0 - 8,000 counts/cm ³ (A)
Resolution (2)	1 µg/m ³	1 µg/m ³	1 µg/m ³ (A)	1 µg/m ³	1 µg/m ³ (A)	1 counts /cm ³ (A)
Operating temp. range (3)	-10 to 50 °C (A) -10 to 60 °C (B)	-10 to 50 °C (A) -10 to 60 °C (B)	-10 to 50 °C (A)	-10 to 50 °C (A) -10 to 60 °C (B)	-10 to 50 °C (A)	-10 to 50 °C (A)
Operating RH range (4)	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH (A)	0 to 99 %RH	0 to 99 %RH (A)	0 to 99 %RH (A)
Recommended RH range (4)	0 to 95 %RH (A)	0 to 95 %RH (A)	0 to 95 %RH (A)	0 to 95 %RH	0 to 95 %RH (A)	0 to 95 %RH (A)
Operating life (5)	> 24 months	> 24 months	> 24 months (A)	> 24 months	> 24 months (A)	> 24 months (A)
LOD - Limit of Detection (7)	0.5 µg/m ³ (A) 0.5 µg/m ³ (B)	0.5 µg/m ³ (A) 0.5 µg/m ³ (B)	0.5 µg/m ³ (A)	0.5 µg/m ³ (A) 0.5 µg/m ³ (B)	1 µg/m ³ (A)	-
Repeatability (8)	2 µg/m ³ (A) 3 µg/m ³ (B)	3 µg/m ³	3 µg/m ³ (A)	5 µg/m ³ (A) 6 µg/m ³ (B)	6 µg/m ³ (A)	-
Response Time (9)	< 10 sec	< 10 sec	< 10 sec (A)	< 10 sec	< 10 sec (A)	< 10 sec (A)
Typical accuracy (11) (12)	±2 µg/m ³ (A) ±3 µg/m ³ (B)	±3 µg/m ³	±3 µg/m ³ (A)	±4 µg/m ³ (A) ±6 µg/m ³ (B) *	±6 µg/m ³ (A)	-
Typical precision - R² (10)	> 0.9 (A) > 0.85 (B)	> 0.8 (A) > 0.8 (B)	> 0.8 (A)	> 0.7 (A) > 0.5 (B) *	> 0.7 (A)	> 0.8 (A)
Typical slope (10)	0.85 - 1.18 (A) 0.80 - 1.25 (B)	0.85 - 1.18 (A) 0.83 - 1.20 (B)	0.85 - 1.18 (A)	0.85 - 1.18 (A) 0.75 - 1.35 (B) *	0.85 - 1.18 (A)	-
Typical intercept (a) (10)	-1.8 µg/m ³ ≤ a ≤ +1.8 µg/m ³ (A) -2 µg/m ³ ≤ a ≤ +2 µg/m ³ (B)	-2 µg/m ³ ≤ a ≤ +2 µg/m ³ (A) -3 µg/m ³ ≤ a ≤ +3 µg/m ³ (B)	-2 µg/m ³ ≤ a ≤ +2 µg/m ³ (A)	-3 µg/m ³ ≤ a ≤ +3 µg/m ³ (A) -9 µg/m ³ ≤ a ≤ +9 µg/m ³ (B) *	-4 µg/m ³ ≤ a ≤ +4 µg/m ³ (A)	-
DQO - Typical U (exp) (13)	< 50%	< 50%	< 50% (A)	< 50% (A) < 75% (B) *	< 50% (A)	-
Typical intra-model variability (14)	< 2 µg/m ³ (A)	< 2 µg/m ³ (A)	< 2 µg/m ³ (A)	< 2 µg/m ³ (A)	< 2 µg/m ³ (A)	-

Table notes for gases and particulate matter:

- Measurement range: concentration range measured by the sensor.
- Resolution: smallest unit of measurement that can be indicated by the sensor.
- Operating temperature range: temperature interval at which the sensor is rated to operate safely and provide measurements.
- Operating RH range (Recommended RH range): humidity interval at which the sensor is rated to operate safely and provide measurements.
- Operating life: time period during which the sensor can operate effectively and accurately under normal conditions.
- Guarantee range: concentration range covered by Kunak's guarantee.
- LOD (Limit Of Detection): measured at laboratory conditions at 20°C and 50% RH. The limit of detection is the minimum concentration that can be detected as significantly different from zero gas concentration, based on the metric from the Technical Specification CEN/TS 17660-1:2022.
- Repeatability (measured at laboratory conditions at 20°C and 50% RH): closeness of the agreement between the results of successive measurements of the same measure carried out under the same conditions of measurement, based on the metric from the Technical Specification CEN/TS 17660-1:2022.
- Response time: time needed by the sensor to reach 90% of the final stable value.
- Statistical metric: statistics obtained between the device hourly measurements and reference instruments for 1 to 8 months field test between -10 to +30°C in different countries. (*) The expected error for PM₁₀ is higher in presence of coarse particles.
- Mean Absolute Error: it is the average mean absolute error (MAE) obtained between the device hourly measurements and reference instruments for 1 to 8 months field test between -10 to +30°C in different countries.
- Error: it is the error of the sensor at reading measurement or full scale.
- DQO-Typical U (exp): Data Quality Objective expressed as the Expanded Uncertainty in the Limit Value obtained between hourly measurements of the device and the reference instruments for 1 to 8 months field test between -10 to +30°C in different countries, based on the metric from the European Air Quality Directive 2008/50/EC and from the Technical Specification CEN/TS 17660-1:2022. (*) The expected error for PM₁₀ is higher in presence of coarse particles.
- Typical intra-model variability: calculated as the standard deviation of the three sensor means in 1 to 8 months field test between -10 to +30°C in different countries.

A, B, C superindex: the super indexes refer to different types of cartridges related to the same target pollutant but with different technical specifications.



Kunak AIR Cloud

Air quality software

Simplify data analysis and get actionable insights for decision-making

REAL-TIME DATA | ALWAYS UPDATED

Our web-based air quality monitoring software helps environmental professionals to use and understand air quality data and delivers operational environmental intelligence to make better decisions.

Thanks to our bidirectional software, Kunak Cloud offers professionals a new way to handle remote settings configuration, alarms management, calibration and field operations, as well as a complete suite for air quality data analysis.

Kunak Cloud is a flexible modular software designed for user-friendly account management, simple network operation, intuitive data validation, and simple analysis and reporting.

The Kunak Cloud web platform is the powerful air quality software that completes the comprehensive Kunak AIR solution.



www.kunakcloud.com

Secure & Confidential

HTTPS/SSL protocols. Confidentiality and ownership of data guaranteed by EULA.

Free continuous updates

Be always updated. Enjoy any new tool or functionality immediately without additional cost.

Air Quality reports

Create customized reports to show AQ data in required formats to share with your clients or external agencies.

Automatic supervision

Monitor the health of your stations & sensors remotely and troubleshoot with automatic tips.

Reliable data guaranteed

Advanced algorithms for automatic data flagging. High quality and validated data.

Pollution sources & Hot spots

Powerful air quality tools and advanced data visualization over the map.

Remote troubleshooting

Service, diagnose and troubleshoot your stations remotely. Get remote support from our team.

Data sharing & Integration

Share the collected data via API or export in different formats. Insert data from third party devices.

Public Air Quality Data

Create public web portals and widgets to share air quality data with stakeholders.



Complete suite of tools

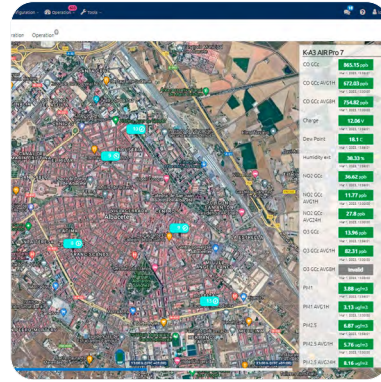
Our air quality monitoring software is the perfect complement to unleash the full potential of Kunak AIR stations and air pollution monitoring networks.

These are some of the main tools included:



Control panel

Check the status of your devices and easily view reliable data in real-time thanks to automatic data tagging.



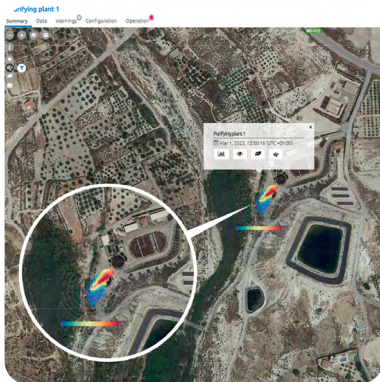
Dashboard

View your devices on a map, their status and the latest measurements.



Advanced analytics

Advanced analytics from the OpenAir suite: calculation of basic statistics, pollutant time plots, temporal variation, wind plots and many more.



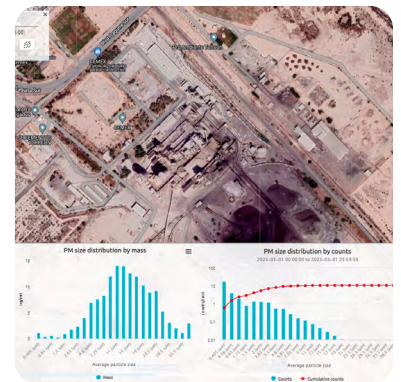
Contamination sources

Detection of pollution sources through pollution roses and polar graphs directly on the map.



Heat mapping

Identify hotspots in an area and variable heat maps to see how they evolve over time.



Particle counting

Particle size analysis tool including size distribution graphs by mass and by counts.

□ □ □ + Now you can choose the tools you need for your project.

Protect your health.
Protect the environment.

kunak[®]
SENSING ANYWHERE

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