

kunak **air** PRO
LITE
DATASHEET



The air quality monitoring station for professionals

SENSOR BASED | BEST AVAILABLE ACCURACY

After 7 years designing and deploying small air quality stations all over the world, we have created the new Kunak AIR Pro, a huge evolution of our previous sensor based air quality monitoring station, designed to solve all the lifecycle challenges of a sensor-based air quality product, its operation and maintenance, as well as the need of every environmental project.

Its multipollutant cutting-edge design includes environmental sensors as well as connectors for external weather sensors or probes which, together with its solar panel operation and real-time wireless data transmission, makes the Kunak AIR Pro the most advanced air quality monitoring station on the market.



Easy & Fast installation

Set up in less than 10 minutes with visual diagnosis in a built-in display.



Cartridges system

Replace and combine pollutant sensors with a plug & play system.



Proven accuracy

Proven as the best-in-class system by independent organizations.



Easy calibration

Adjust the baseline and span remotely.



Air quality platform

Visualize, analyse and manage your data in the cloud.



Multi pollutant

Measure up to 5 gases and particulate matter at once.



Fully autonomous

Autonomous operation with its built-in battery and solar panel.



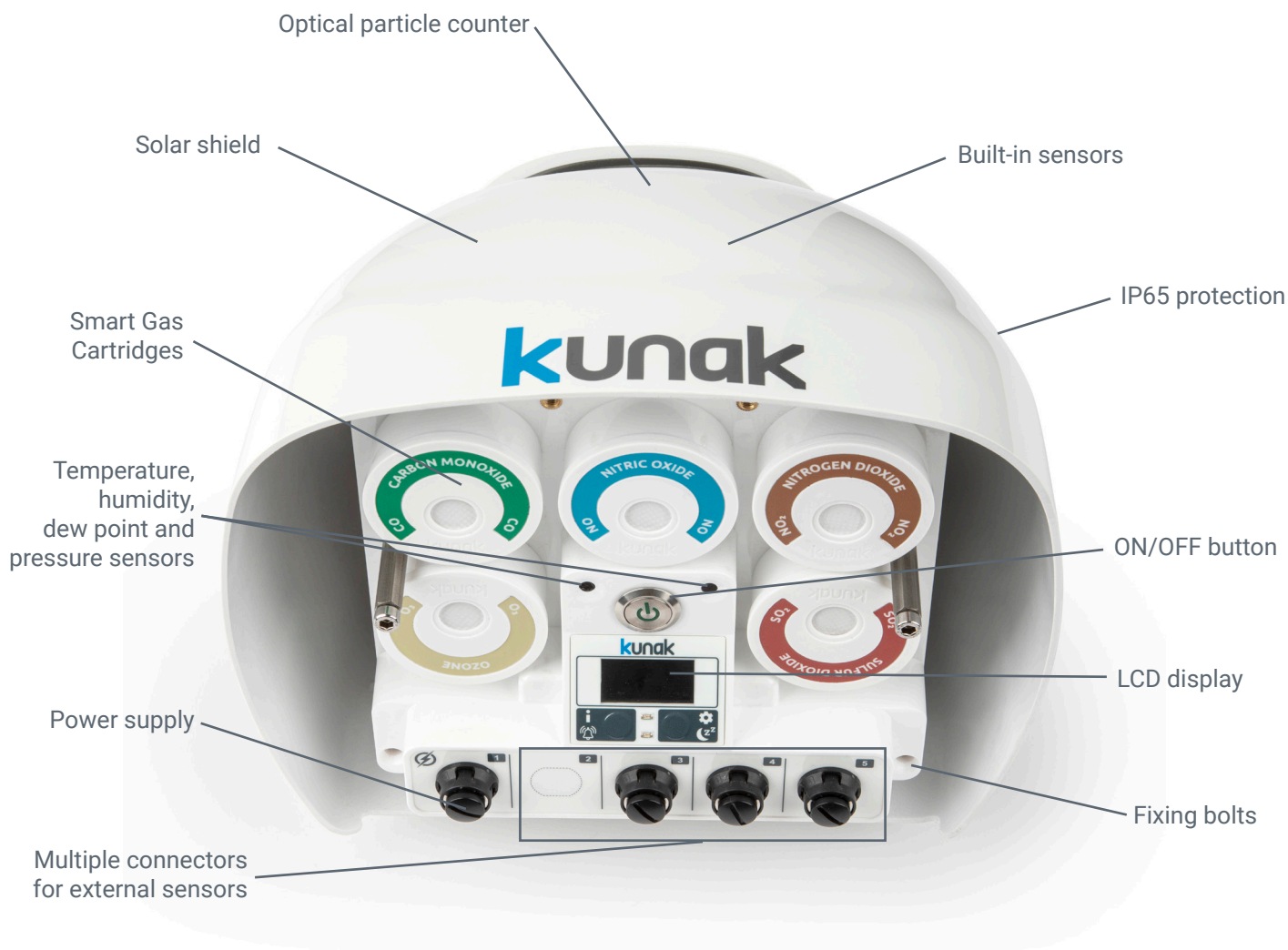
Real-time data

Access to your data and alarms in real-time.



Add environmental sensors

Connect wind, rain, noise, and other sensors.



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 2.9Ah or 26 Ah
External supply	7 - 12 Vdc. charger or solar panel
Autonomy	24/7 with charger or solar panel
Power consumption	0.08 - 1.2W (depending on configuration)
Communications	Multi-Band 2G/3G/4G Ethernet Modbus RTU Slave
GNSS	GPS and GLONASS

Gas sensors	CO, CO ₂ , NO, NO ₂ , O ₃ , SO ₂ , H ₂ S, NH ₃ & VOCs
PM sensor	PM ₁ , PM _{2.5} , PM ₄ , PM ₁₀ TSP and TPC
Internal status	Temperature Battery Charging voltage & current Signal
Built-in sensors	Temperature Humidity Atmospheric pressure 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 holder

Communications



GSM GPRS 2G 3G 4G Lte Ethernet Modbus RTU SLAVE

The compact air quality station for hyperlocal monitoring

INDUSTRY GRADE DESIGN | HIGH ACCURACY

An increasing demand of a compact and cost-effective air quality solution was perceived for industrial applications and massive deployments in cities. Thus, based on the same principles as Kunak AIR Pro solution and making use of the same Smart Gas sensor technology, the Kunak AIR Lite is designed to complete Kunak AIR solutions, targeting a maximum of 2 gases and particles. In addition, probes for wind, rain, noise... can be connected to the device to meet all the necessities of your air quality project.

This industrial air quality solution is designed for harsh environments with an easy integration of real-time data into wired industrial systems and maintaining wireless data transmission to the Kunak Cloud software.



Main applications:

- Industrial fenceline monitoring
- Massive city deployments
- Leakage detection
- Wastewater management
- Landfill monitoring
- Environmental Health & Safety (EHS)
- Building Automation



Application based design

Select your targeted pollutants for industrial monitoring or massive deployments in cities.



Built-in display

Easy installation and on field diagnosis thanks to its embedded display.



Best accuracy

Get the most reliable and accurate data without the need of additional external instruments.



Cost effective

Get the most accurate technology at a fair cost.



Cartridges system

Replace and combine gas cartridges and PM sensor with a plug & play system.



Easy data integration

Local wired integration through slave MODBUS RTU or via API through the cloud.



Rugged & Compact design

The smallest air quality solution designed for harsh environments (IP65 & IK08)



Targeted pollutants

Measure up to 2 gases and particulate matter at once.



Fully autonomous

Autonomous operation with its built-in battery and solar panel.



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 2.9Ah or 20 Ah
External supply	7 - 12 Vdc. charger or 6 Vdc. solar panel
Autonomy	24/7 with charger or solar panel
Power consumption	0.08 - 0.55W (depending on configuration)
Communications	Multi-Band 2G/3G/4G Ethernet Modbus RTU Slave
GNSS	GPS and GLONASS

Gas sensors	CO, CO ₂ , NO, NO ₂ , O ₃ , SO ₂ , H ₂ S, NH ₃ & VOCs
PM sensor	PM ₁ , PM _{2.5} & PM ₁₀ *
Internal status	Temperature Battery Charging voltage & current Signal
Built-in sensors	Temperature Humidity Atmospheric pressure 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 holder

Communications

GSM GPRS 2G 3G 4G LTE Ethernet Modbus RTU SLAVE

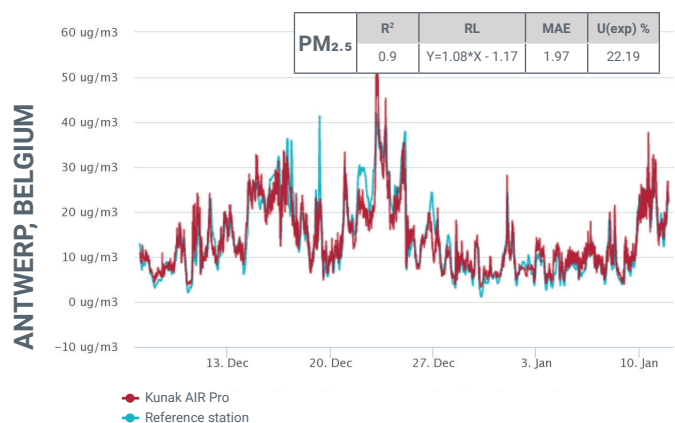
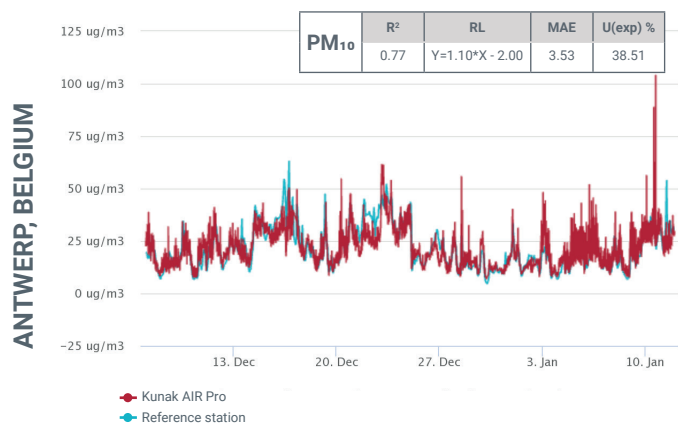
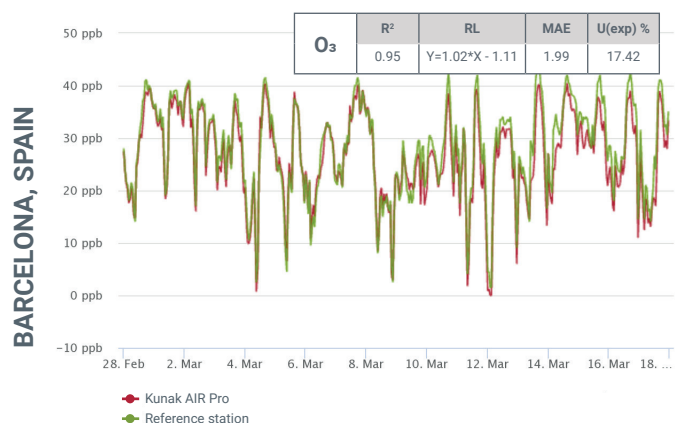
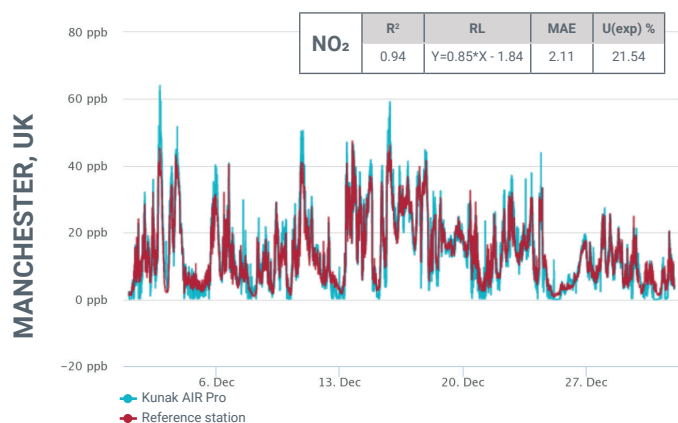
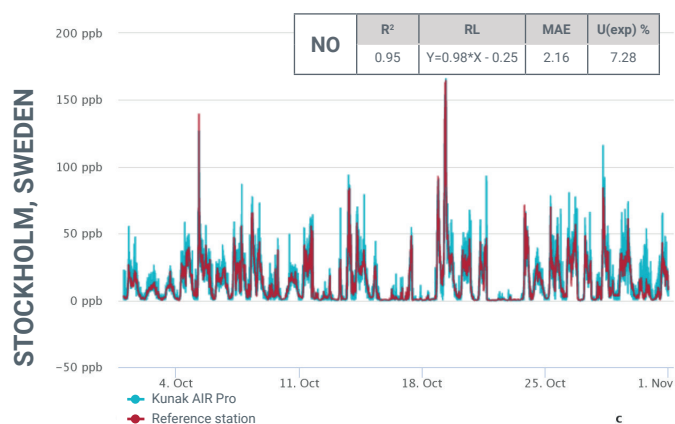
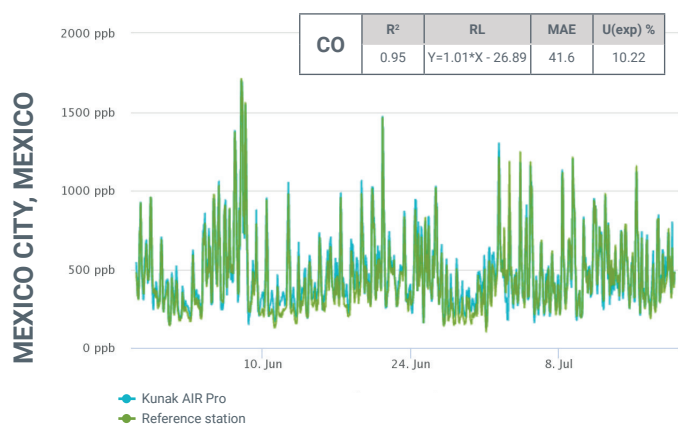


* Go to pages 24 and 25 for more information.

Evidence

OF ACCURACY

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



**THE MOST ACCURATE
MULTI-POLLUTANT SENSOR**

AIRLAB
The International
Microsensors Challenge



United States
Environmental Protection
Agency

"It provides excellent quality for PM₁, very good quality for PM_{2.5}, PM₁₀, and O₃, and good quality for NO₂ and NO, being the best performing sensor for this latter pollutant."

"Sensor nodes have very small form factor and weight that are practical for response field deployments."

AQ-SPEC
Air Quality Sensor Performance Evaluation Center

"The three sensors showed an absolute intra-model variability of 0.32 ppb, 0.33 ppb and 0.002 ppm for O₃, NO₂ and CO measurements, respectively."

Smart gas cartridges

Description

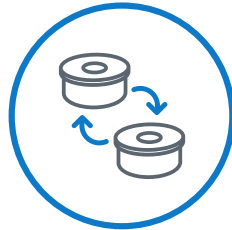
Kunak AIR stations are sensor-based devices equipped with slots to insert Smart gas cartridges. Kunak Smart Cartridges solve many of the known issues of sensor technology: sensor variability, factory and field calibration, automatic data invalidation, sensor replacement, network operation and maintenance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

Kunak's Smart Gas Cartridges ensure measurement control throughout the life cycle of each sensor, making the Kunak AIR stations more sustainable and our customers' lives easier.



Traceable QC & QA

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



Endless combinations

Combine the parameters freely. Reuse and scale your basestations at your own pace.



Plug & Play

Simply take the old one out and replace easily with the new one, on field. Be back online in 2'.



More sustainable

The electronic and mechanical parts can be reused, making it the most sustainable AQ sensor-based station in the market.

GasPlug™ technology (patented)

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




Technical specs

	CO	CO ₂	NO	NO ₂	O ₃	H ₂ S	SO ₂	NH ₃	VOCs
Type	Electro-chemical	Non-dispersive infrared (NDIR)	Electro-chemical	Electro-chemical	Electro-chemical	Electro-chemical	Electro-chemical	Electro-chemical	Photo-ionization detector
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)
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	0 - 3,000 ppb ^(A) 0 - 40 ppm ^(B)
Resolution ⁽²⁾	1 ppb ^(A) 0.01 ppm ^(B)	1 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)
Operating temp. range ⁽³⁾	-30 to 50 °C	-20 to 50 °C	-30 to 40 °C	-30 to 40 °C	-30 to 40 °C	-30 to 50 °C	-30 to 40 °C	-10 to 50 °C	-40 to 60 °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
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
Operating life ⁽⁵⁾	> 24 months	> 7 years	> 24 months	> 24 months	> 24 months	> 24 months	> 24 months	> 24 months	10,000 hours
Guarantee range ⁽⁶⁾	1,000 ppm	-	20 ppm	20 ppm	20 ppm	100 ppm	100 ppm	100 ppm	50 ppm ^(A) 60 ppm ^(B)
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	1 ppb ^(A) 0.01 ppm ^(B)
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	5 ppb ^(A) 0.02 ppm ^(B)
Response Time ⁽⁹⁾	< 30 sec ^(A) < 180 sec ^(B)	< 30 sec	< 30 sec	< 60 sec	< 70 sec	< 60 sec	< 60 sec	< 45 sec	< 12 sec ^(A) < 10 sec ^(B)
Typical Accuracy - MAE ⁽¹⁰⁾	± 80 ppb ^(A) ± 0.1 ppm ^(B)	±30 ppm	±4 ppb	±5 ppb	±8 ppb	± 10 ppb ^(A) ± 0.05 ppm ^(B)	±15 ppb	±0.3 ppm	± 10 ppb ^(A) ± 0.1 ppm ^(B)
Typical precision - R ² ⁽¹⁰⁾	> 0.85	-	> 0.9	> 0.85	> 0.9	> 0.8	> 0.7	-	> 0.99
Typical Slope ⁽¹⁰⁾	0.78 - 1.29	-	0.9 - 1.12	0.78 - 1.29	0.85 - 1.18	0.78 - 1.29	0.78 - 1.29	-	0.99 - 1.002
Typical Intercept (a) ⁽¹⁰⁾	-50 ppb ≤ a ≤ +50 ppb ^(A) -0.1 ppm ≤ a ≤ +0.1 ppm ^(B)	-	-2 ppb ≤ a ≤ +2 ppb	-4 ppb ≤ a ≤ +4 ppb	-3 ppb ≤ a ≤ +3 ppb	-2 ppb ≤ a ≤ +2 ppb ^(A) -0.02 ppm ≤ a ≤ +0.02 ppm ^(B)	-5 ppb ≤ a ≤ +5 ppb	-	-9 ppb ≤ a ≤ +9 ppb ^(A) -0.08 ppm ≤ a ≤ +0.08 ppm ^(B)
DQO - Typical U(exp) ⁽¹¹⁾	< 20%	-	< 20%	< 25%	< 20%	NA	< 25%	NA	NA
Typical intra-model variability ⁽¹²⁾	< 3 ppb ^(A) < 0.05 ppm ^(B)	-	< 1 ppb	< 1 ppb	< 1 ppb	< 2 ppb ^(A) < 0.02 ppm ^(B)	< 3 ppb	< 0.1 ppm	< 3 ppb ^(A) < 0.1 ppm ^(B)

1. Measurement range: concentration range measured by the sensor.
2. Resolution: smallest unit of measurement that can be indicated by the sensor.
3. Operating temperature range: temperature interval at which the sensor is rated to operate safely and provide measurements.
4. Operating RH range (Recommended RH range): humidity interval at which the sensor is rated to operate safely and provide measurements.
5. Operating life: lifetime of the sensor at normal conditions.
6. Guarantee range: limit covered by the guarantee.
7. 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 at zero gas concentration, based on the metric from the Technical Specification CEN/TS 17660-1:2022.
8. 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.
9. Response time: time needed by the sensor to reach 90% of the final stable value.
10. Statistical metric: statistics 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. (*) The expected error for PM10 is higher in presence of coarse particles.
11. 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.
12. 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.

	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/m³	µg/m³	µg/m³ ^(A)	µg/m³ ^(A)	µg/m³ ^(A)	counts/cm³ ^(A)
Measurement range ⁽¹⁾	0 - 1,000 µg/m³	0 - 2,000 µg/m³ ^(A) 0 - 1,000 µg/m³ ^(B)	0 - 2,000 µg/m³ ^(A)	0 - 10,000 µg/m³ ^(A) 0 - 1,000 µg/m³ ^(B)	0 - 15,000 µg/m³ ^(A)	0 - 8,000 counts/cm³ ^(A)
Resolution ⁽²⁾	1 µg/m³	1 µg/m³	1 µg/m³ ^(A)	1 µg/m³	1 µg/m³ ^(A)	1 counts /cm³ ^(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/m³ ^(A) 0.5 µg/m³ ^(B)	0.5 µg/m³ ^(A) 0.5 µg/m³ ^(B)	0.5 µg/m³ ^(A)	0.5 µg/m³ ^(A) 0.5 µg/m³ ^(B)	1 µg/m³ ^(A)	-
Repeatability ⁽⁸⁾	2 µg/m³ ^(A) 3 µg/m³ ^(B)	3 µg/m³	3 µg/m³ ^(A)	5 µg/m³ ^(A) 6 µg/m³ ^(B)	6 µg/m³ ^(A)	-
Response Time ⁽⁹⁾	< 10 sec	< 10 sec	< 10 sec ^(A)	< 10 sec	< 10 sec ^(A)	< 10 sec ^(A)
Typical Accuracy - MAE ⁽¹⁰⁾	±2 µg/m³ ^(A) ±3 µg/m³ ^(B)	±3 µg/m³	±3 µg/m³ ^(A)	±4 µg/m³ ^(A) ±6 µg/m³ ^(B) *	±6 µg/m³ ^(A)	-
Typical precision - R² ⁽¹⁰⁾	> 0.9 ^(A) > 0.7 ^(B)	> 0.8 ^(A) > 0.75 ^(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/m³ ≤ a ≤ +1.8 µg/m³ ^(A) -2 µg/m³ ≤ a ≤ +2 µg/m³ ^(B)	-2 µg/m³ ≤ a ≤ +2 µg/m³ ^(A) -3 µg/m³ ≤ a ≤ +3 µg/m³ ^(B)	-2 µg/m³ ≤ a ≤ +2 µg/m³ ^(A)	-3 µg/m³ ≤ a ≤ +3 µg/m³ ^(A) -9 µg/m³ ≤ a ≤ +9 µg/m³ ^(B) *	-4 µg/m³ ≤ a ≤ +4 µg/m³ ^(A)	-
DQO - Typical U(exp) ⁽¹¹⁾	< 50%	< 50%	< 50% ^(A)	< 50% ^(A) < 75% ^(B) *	< 50% ^(A)	-
Typical intra-model variability ⁽¹²⁾	< 2 µg/m³ ^(A)	< 2 µg/m³ ^(A)	< 2 µg/m³ ^(A)	< 2 µg/m³ ^(A)	< 2 µg/m³ ^(A)	-



***Large data is the goal
but accurate data is the key***

kunak[®]
SENSING ANYWHERE

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