AQ Guard Ambient

Compact ambient air quality monitor. Featuring Palas® aerosol spectrometer technology for precise measurement of air pollution by particulates.

Description

Fig. 1: AQ Guard Ambient AQ Guard Ambient, currently the most advanced compact analyzer for determining ambient air quality, continuously and reliably analyses airborne fine dust particles in the range 175 nm – 20 µm. A newly developed mass conversion algorithm calculates PM values based on single particle optical light scattering, taking signal duration and shape into account. Sensor system and algorithms were developed based on the technology of the EN 16450 certified Fidas® 200. The heated aerosol inlet ensures that results are not affected by relative humidity or by presence of fog droplets. Under any weather conditions AQ Guard Ambient achieves precision comparable to type approved analyzers, which makes it stand out compared to similar devices.

AQ Guard Ambient

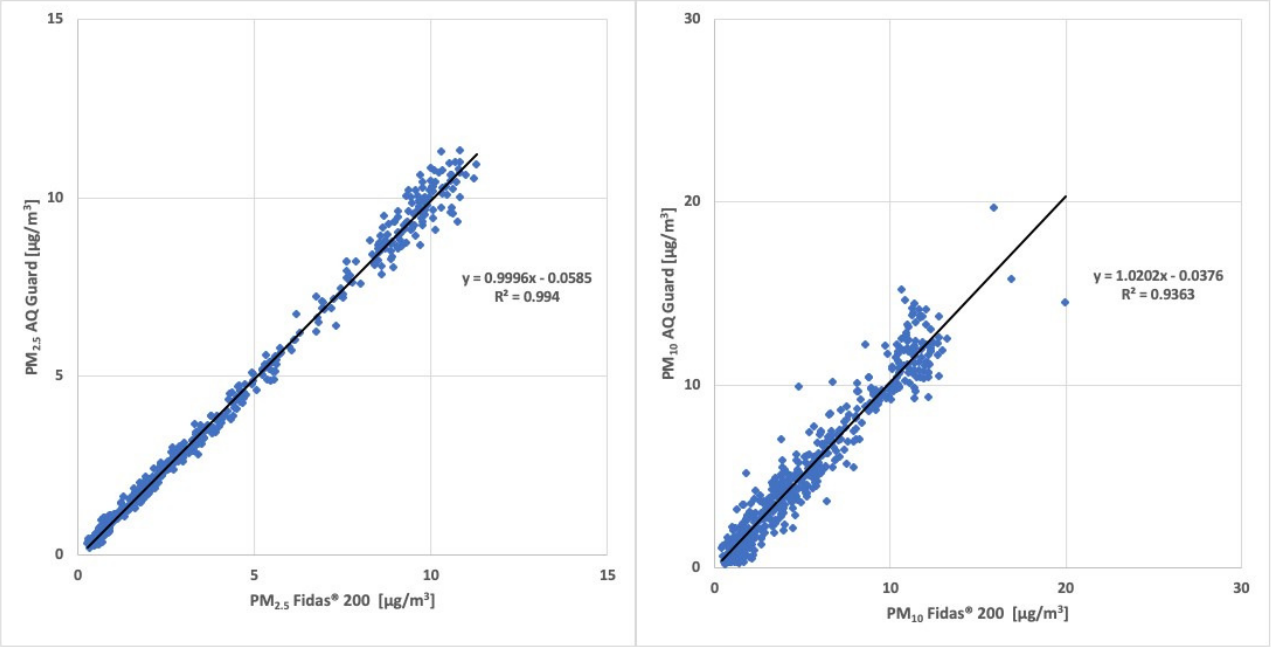

Fig. 2: Comparison of data recorded by AQ Guard Ambient and Fidas® 200 S Besides the PM_{10} und $PM_{2.5}$ fine dust fractions, relevant for regulatory immission control, AQ Guard simultaneously calculates and records PM_1, PM_4, the total dust load, the particle number concentration C_n as well as the particle size distribution. AQ Guard thus provides precise and comprehensive informationen about particulates as only a single particle counting and sizing device can. AQ Guard is designed for unattended, continuous operation and features an extraordinarily durable sampling gas blower. Aerosol sampling, aerosol conditioning as well as optical sensor system resist staining but can be cleaned, if necessary, by the user. Exceptional long term stability of the measuring system is achieved by automatic calibration tracking, which allows up to two years of operation without recalibration. Calibration status can be checked, using a test powder calibrated by Palas®. This makes Palas® aerosol spectrometers the only optical fine dust monitors which can be user calibrated with a traceable standard on site.

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Abb. 3: AQ Guard Ambient mounting AQ Guard Ambient features a robust, attractive weather shield and can be combined with a multitude of mounting systems by a VESA compatible bracket. Special ruggedized versions for hazardous environments are available on demand. AQ Guard Ambient records air temperature, pressure and relative humidity with integrated sensors. Additional sensors for gaseous pollutants are in development.

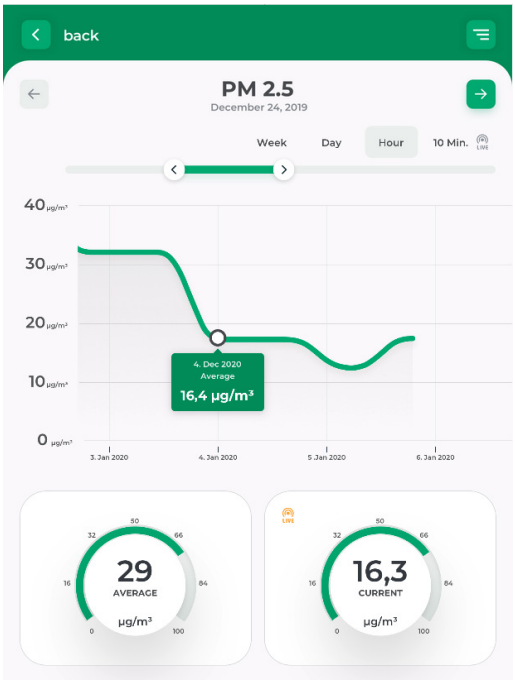

Abb. 4: Web interface AQ Guard Ambient features fast data interfaces and allows real time access over Ethernet, WiFi or cellular network. Since all results are calculated and recorded within the analyzer it requires no external data processing by,

e.g., cloud computing. Users retain full control over their data and decide over information access. AQ Guard can provide numerical data, using various communication protocols, as well as visualize information on any type of device using a modern web interface. Compact design and optional power supply on the Ethernet port (PoE) simplify installation and integration in an existing infrastructure.

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Benefits

- Technology based on the type approved Fidas® 200 series (EN16450 and MCERTS); simultaneous measurement of Cn, PM1, PM2.5, PM4, PM10
- Computation of air quality index based on measurements of particulates, CO2, and VOC
- High accuracy due to advanced algorithms
- Long term stable due to self calibration for measurement of flow rate, particulates, and gaseous pollutants
- 2 years operation without calibration; re-calibration with NIST traced test powder possible on site
- Operates on AC, DC, or power-over-Ethernet

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Datasheet

Parameter	*Description*
Interfaces	USB, Ethernet, Wi-Fi, optional: UMTS
Measurement range (size)	0.175 – 20 µm
Size channels	128 (64/decade)
Measuring principle	Single particle optical light scattering with evaluation of signal duration and shape,advanced mass conversion algorithm
Measurement range (number C_N)	0 – 20,000 particles/cm³
Volume flow	1.0 l/min ≙ 0.06 m³/h
Data acquisition	Digital, 22 MHz processor, 256 raw data channels
Light source	Long term stable LED
Power consumption	< 60 W
User interface	Touchscreen 800 • 480 pixels, 5" (12,7cm)
Dimensions	240 • 320 • 190 • mm (H • W • D)
Weight	3.9 kg
Operating system	Windows 10 IoT Enterprise
Data logger storage	10 GB
Software	PDAnalyze
Response time	1 s
Aerosol conditioning	Thermal with compact IADS
Measurement range (mass)	0 – 20,000 µg/m³
Reported data	PM_1, $PM_{2.5}$, PM_4, PM_{10}, TSP, C_N, particle size distribution, pressure, temperature, relative humidity, CO_2, TVOC, Air Quality Index
Installation conditions	-20 – +50 °C, weatherproof
Linearity	0.95 – 1.05 (measured against EN16450 certified Fidas® 200)
Accuracy	R2 > 0,98 for PM2.5 and R2> 0,94 for PM10 versus EN16450-certified Fidas® 200 (15 min average, each)

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Applications

- Industry:
  - Production processes
  - Bulk material handling (mixing, discharge, storage, packaging etc.)
  - Fenceline Monitoring
- Construction sites: Roads, railroads, demolition sites
- Buildings: Schools, kindergartens, hospitals, hotels, offices, public service buildings
- Residential buildings near construction sites or other polluted areas
- Public transportation: Airports, train stations, tramway underground stations, cruise ships, passenger cabin, e.g. in tram, train

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