

AQS1

AQS – Urban Air Quality Monitor Continuous Outdoor PM / Ozone / NO₂ / VOC Monitor

The AQS 1 combines a robust light scattering particulate monitor, and Aeroqual's industry leading sensor-based gas analyser modules. The monitor performs to Near Reference levels yet costs much less than comparable analyzers; it is also lightweight and can be installed and moved with ease.

What does AQS measure?

The AQS can measure particulate matter (PM) and up to two gases at the same time. You can choose from the following parameters.

- Particulate matter (TSP, PM₁₀, PM_{2.5}, PM₁)
- Gases: Ozone, Nitrogen dioxide, VOCs
- Meteorological (temp, humidity, rain, pressure, wind speed / direction, solar radiation)
- Noise

At any time the AQS can be upgraded to measure additional parameters by adding new modules. New modules can be added in the field; there is no need to return the unit to the factory.

How is AQS different?

Collectively the key features of the AQS enable it to deliver near reference data quality over extended periods of time – several years with appropriate maintenance.

In head to head tests with traditional EPA-approved analyzers, the AQS has shown r² correlations as high as 0.98.

The AQS produces better data for longer periods because Aeroqual's ABC methodology eliminates diurnal and seasonal temperature and humidity effects which affect other sensor-based instruments. The computational method is patented and proprietary to Aeroqual.



PM and gas



Gas only

Key Features

- Pumped sampling
- Inlet filters
- Heated PM inlet
- Automatic Baseline Correction (ABC)
- Part-per-billion gas detection
- Traceable calibration
- Rugged protective enclosure
- Wireless data connectivity
- Quick set up and relocation in under 10 minutes
- Optional plug and play environmental sensors

Applications

- Construction dust and emissions
- Roadside traffic emissions
- Rail corridor and terminal emissions
- Mapping smog formation and distribution
- Validation of air quality models
- Community exposure studies
- Remediation site emissions
- Port and shipping emissions

AQS 1 Specifications

Particle Module	Sizes		Range	Accuracy		Flow Rate	Lower Detectable Limit (2 σ)
Nephelometer	PM ₁ , PM _{2.5} , PM ₁₀ OR TSP		0 to 2000 $\mu\text{g}/\text{m}^3$	$<\pm(2 \mu\text{g}/\text{m}^3 + 5\% \text{ of reading})$		2.0 LPM	$<1 \mu\text{g}/\text{m}^3$
Profiler (OPC)	PM ₁ , PM _{2.5} , PM ₁₀ AND TSP		PM1 200 $\mu\text{g}/\text{m}^3$ PM2.5 2000 $\mu\text{g}/\text{m}^3$ PM10 5000 $\mu\text{g}/\text{m}^3$ TSP 5000 $\mu\text{g}/\text{m}^3$	$<\pm(5 \mu\text{g}/\text{m}^3 + 15\% \text{ of reading})$		1.0 LPM	$<1 \mu\text{g}/\text{m}^3$
Gas Module	Range (ppb)	Resolution (ppb)	Noise	Lower detection limit / ppb	Precision	Linearity (% of FS)	Drift 24 hour
			Zero / ppb; Span % of reading				Zero / ppb; Span % of FS
Ozone O ₃	0-500	0.1	<1 $<1\%$	1	$<2\%$ of reading or 2 ppb	$<1.5\%$	1; 0.2%
Nitrogen Dioxide	0-500	0.1	<2 $<2\%$	2	$<2\%$ of reading or 3 ppb	$<2.0\%$	2; 1%
VOC	0-500	0.1	<0.5 $<1\%$	<1	$<2\%$ of reading or 1 ppb	$<1.0\%$	1; 1%

System Specifications

Control System	Embedded fanless PC, Intel Atom N2600, 1.6GHz, 2GB RAM, 32GB SSD, Ubuntu Linux Operating System
Communications	Standard: WIFI, Ethernet (LAN) Optional: Cellular IP HSPA 4G modem
Software	Connect: Runs on embedded PC, access via browser (IE, Firefox, Chrome, Safari) Cloud: Runs on secure 'cloud' servers, accessed via web browser Connect / Cloud Features: configuration, diagnostics, journal, calibration and data acquisition, plus SMS and email alerts (optional), auto data export via FTP and email (optional), and data export API (optional)
Data logging	32GB Hard Drive (>5 years data storage)
Averaging period	1 min, 5 min, 10 min, 15 min, 20 min, 30 min, 1 hr, 2 hr, 4 hr, 8 hr, 12 hr, 24 hr
Power requirements	100-260VAC (standard): 21W / 30W * Regulated 12VDC (if required): 21W / 30W *
Enclosure	Lockable IP65 GRP cabinet with integrated aluminium solar shield armour
PM Sampling System	Inlet: 36cm heated inlet Pump: 12V brushless DC diaphragm
Gas Sampling System	Inlet: Teflon, glass-coated stainless steel Pump: 12V brushless DC diaphragm
Dimensions	483H x 330W x 187D mm (including solar shield armour & mounting brackets)
Weight	$<12.5 \text{ kg}^*$
Environmental operating range	-10°C to $+45^\circ\text{C}$
Mounting	Pole, tripod and wall mounting brackets included
Factory Integrated & Tested Sensors (Optional)	Gill WindSonic (ultrasonic wind sensor), Vaisala WXT520 (weather transmitter), Met One MSO (weather transmitter), Cirrus MK427 Class 1 (noise sensor), Novalynx Pyranometer (solar radiation)

* Configuration used for power and weight calculations: base unit, nephelometer, PM10 sharp cut, O3 module, modem, heater off / heater on.