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DATASHEET

AQT560

Vaisala · Authorized Partner

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VAISALA

Air Quality Transmitter AQT560



Vaisala Air Quality Transmitter AQT560 measures gases and particles to determine the pollution content of ambient air.

Features

- Outstanding particle measurement accuracy of PM_{10} and $PM_{2.5}$, and PM_1 as validated by 3rd-party organizations
- Excellent indicative class measurement of NO_2, NO, O_3, and CO
- Robust HMP110 probe with Vaisala HUMICAP® technology, ensuring reliable and consistent measurements in various conditions
- Proven laser particle counter (LPC) technology with improved detection limit and single-particle detection
- Intelligent humidity management of electrochemical gas sensors for consistent and accurate measurements in high-humidity environments
- Compact design with plug-and-play setup
- Industry-leading factory calibration process ensuring verified performance
- Advanced algorithms based on performance testing around the world, including long-term multi-site and multi-continent field tests

Applications

- Air quality networks supplementing existing regulatory stations
- Air quality modeling
- Building automation
- Fenceline monitoring around dust-emitting industrial facilities
- Near-source monitoring projects, including construction sites
- Road dust monitoring and mitigation
- Traffic management
- Wildfire smoke monitoring

Revolutionary particle measurements

AQT560 measures particles with a state-of-the-art proprietary laser particle counter (LPC). Single particles scatter light and based on the scattered intensity and number of pulses detected, the particle sizes and mass concentrations are calculated. AQT560 measures small and big particles down to 0.3 µm with great accuracy and reliability. This is possible also in extreme conditions due to the controlled air flow inside the device.

High-quality gas measurement

For gas measurements AQT560 uses industry standard electrochemical gas sensor technology. By using proprietary advanced algorithms, individual factory calibration, and improved humidity robustness, parts per billion (ppb) concentrations at different environmental conditions can be measured reliably in one compact package. Algorithms compensate for the impact of ambient conditions and aging of the sensor elements, removing the need for costly gas sampling and equipment.

Easy to deploy in networks

Thanks to its small weight, compact size, and good precision, AQT560 is ideal for supplementing existing air quality networks, for traffic management and road dust monitoring and mitigation, and for monitoring dust-emitting industrial facilities. Wildfire smoke monitoring is another area where AQT560 can be used effectively.

The versatile installation options make fitting to existing infrastructure easy, whether that is streetlight poles, traffic signal masts, or overhead bridges.

AQT560 operates as a standalone instrument because the measurement data is calculated in the sensor. To provide a professional-grade complete network solution with best-in-class accuracy and reliability, you can pair AQT560 with Vaisala Beam Weather Station BWS500. From BWS500, the data can be transferred to your backend system or to Vaisala Xweather Observe, part of the Vaisala Xweather Insight cloud platform.

Product model	NO_2	NO	O_3	CO	PM
Gases	✔	✔	✔	✔	
Particles					✔
Gas and particles	✔				✔
Gases and particles	✔	✔	✔	✔	✔

Technical data

Measurement performance – gases

Property	NO_2	NO	O_3	CO
Concentration range	2000 ppb	2000 ppb	2000 ppb	10 000 ppb
Detection limit	5 ppb	5 ppb	5 ppb	10 ppb

Field performance – gases

Property [1]	NO_2 [2]	NO	O_3 [2]	CO
Correlation with reference [3]	R^2: 0.90	R^2: 0.95	R^2: 0.90	R^2: 0.85
Accuracy [4]	5 ppb	8 ppb	6 ppb	183 ppb
Unit-to-unit correlation [5]	R^2: 0.98	R^2: 0.96	R^2: 0.95	R^2: 0.97
Precision [5]	3 ppb	3 ppb	4 ppb	25 ppb

1) *All values are based on 1-hour averages with factory calibration, no linear correction applied. Values are obtained from global field testing in major climate zones against reference instruments. The values represent typical values and may be different based on the location.*
2) *At 10 V/m RF field test, the presence of electromagnetic interference in the range of 800–900 MHz may cause additional deviation for NO_2 and O_3.*
3) *Typical R^2 against a reference grade instrument derived from field tests globally.*
4) *Mean absolute error against reference.*
5) *Mean absolute difference of AQT560 reading from average reading of AQT560 transmitters.*

Measurement performance – environmental parameters

Humidity	
Accuracy for sensor element	0–90 %RH: ±3 %RH 90–100 %RH: ±5 %RH
Resolution	0.1 %RH
Temperature	
Accuracy for sensor element	0.3 °C (0.17 °F) at +20 °C (+68 °F)
Resolution	0.1 °C
Pressure (indicative)	
Accuracy	15 hPa
Resolution	1 hPa

Operating environment

Operating temperature, product model with gas measurement	−30 … +46 °C (−22 … +115 °F) [1]
Operating temperature, product model with particle measurement only	−30 … +60 °C (−22 … +140 °F)
Storage temperature	+20 … +25 °C (+68 … +77 °F)
Operating humidity	15–100 %RH, non-condensing [2]
Storage humidity	20–75 %RH [3]
Operating pressure	800–1150 hPa
IP rating	IP65 [4]

1) *Optimal performance at −10 … +30 °C (−14 … +86 °F).*
2) *Optimal performance at 25–100 %RH. Operation in low-humidity environments may weaken the gas measurement performance.*
3) *If AQT560 is stored for long periods of time in relative humidity < 60 %RH, the stabilization period of the gas measurements is longer.*
4) *Specified for gas measurement device only.*

Mechanical specifications

Dimensions (H × Ø)	335 × 133 mm (13.19 × 5.24 in)
Weight, with mounting kit	2.4 kg (5.29 lb)
Color, radiation shield	White (RAL9003)
Material, base module	Anodized aluminum
Material, radiation shield	Polycarbonate (PC)
Power and data connector	Standard 8-pin M12 male

Measurement performance - regulated particles

Property [1]	PM_1	$PM_{2.5}$	PM_{10}
Concentration range [2]	0–1000 µg/m³	0–1000 µg/m³	0–2500 µg/m³
Detection limit	0.1 µg/m³	0.1 µg/m³	0.1 µg/m³

1) *Spherical equivalent size of DEHS particles. Lower size detection limit of 0.3 µm defined as 50 % detection efficiency for DEHS particles.*
2) *Specified with ISO 12103-1, A1 ultrafine test dust.*

Field performance – particles

Property [1]	PM_1	$PM_{2.5}$	PM_{10}
Correlation with reference [2]	R^2: 0.95	R^2: 0.85	R^2: 0.85
Accuracy [3]	2 µg/m³	3 µg/m³	4 µg/m³
Unit-to-unit correlation [4]	R^2: 0.99	R^2: 0.97	R^2: 0.97
Precision [4]	1 µg/m³	2 µg/m³	3 µg/m³

1) *All values are based on 1-hour averages with factory calibration, no linear correction applied. Values are obtained from global field testing in major climate zones with different pollution characteristics against different reference equivalent methods. The values represent typical values and may be different based on the location and reference instrument. Majority of particle mass within size range.*
2) *Typical R^2 against a reference grade instrument derived from field tests globally.*
3) *Mean absolute error against reference.*
4) *Mean absolute difference of AQT560 reading from average reading of AQT560 transmitters.*

Powering

Operating voltage	10–25 V DC, max. 1 A at 10 V DC	
Power consumption	**Typical** [1]	**Maximum**
Gas measurement	1.8 W	2.8 W [2]
Particle measurement	2.0 W [3]	2.7 W [4]
Gas and particle measurement	2.1 W [3]	3.7 W [5]

1) *Typical consumption in optimal conditions.*
2) *Maximum consumption when humidity is > 85 %RH and temperature < 0 °C (32 °F).*
3) *Typical consumption with default particle measurement cycle.*
4) *Maximum consumption during particle measurement.*
5) *Maximum consumption when humidity is > 85 %RH and temperature < 0 °C (32 °F) during particle measurement.*

Data connection specifications

Data output	Modbus® ASCII, Modbus® RTU, ASCII CSV
Serial data interface	RS-485
Maintenance interface [1]	RS-232

1) *Recommended Vaisala USB maintenance cable kit (253163SET).*

Compliance

EU directives and regulations	EMC Directive (2014/30/EU) REACH Regulation (EC 1907/2006) RoHS Directive (2011/65/EU) as amended by 2015/863
EMC immunity [1]	EN 61326-1, industrial environment
EMC emissions	CISPR 32 / EN 55032, Class B
Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Damp heat	IEC 60068-2-78
Eye safety	IEC 60825-1:2014 (Edition 3.0) and EN 60825-1:2014 + A11:2021 FDA 21 CFR 1040.10
Compliance marks	CE, China RoHS, FCC, RCM, UKCA

1) *At 10 V/m RF field test, the presence of electromagnetic interference in the range of 800–900 MHz may cause additional deviation for NO_2 and O_3.*

CLASS 1
LASER PRODUCT

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