AQSync Air Quality Monitoring Station: Detailed Specifications

Instrument/Sensor Specifications
(per manufacturer)

Ozone (O_3)

Measurement Method: UV Absorbance at 254 nm
Instrument: 2B Technologies Model 108-L (FEM)
Linear Range: 0-100,000 ppb
Precision: 1.5 ppb or 2% of reading for 10-s avg
Accuracy: 1.5 ppb or 2% of reading
Response Time: 4 s for 2-s avg, 20 s for 10-s avg

Nitrogen Dioxide (NO_2)

Measurement Method: Direct Absorbance at 405 nm
Instrument: Based on 2B Tech Model 405 nm NO_2/NO/NO_x Monitor (FEM for NO_2)
Linear Range: 0-10,000 ppb
Precision: 0.5 ppb
Accuracy: 2 ppb or 2% or reading
Response Time 20 s

Nitric Oxide (NO)

Measurement Method: Oxidation to NO_2 with O_3 followed by Absorbance of NO_2 at 405 nm
Instrument: 2B Tech Model 405 nm NO_2/NO/NO_x Monitor
Linear Range: 0-2,000 ppb
Precision: 0.5 ppb
Accuracy: 2 ppb or 2% of reading
Response Time: 20 s

Particulate Matter (PM_1, $PM_{2.5}$, PM_{10})

Measurement Method: Optical Particle Counter, right angle light scatter detection with sheath flow and heated inlet
Instrument: Met One Instruments Model 83214
Range: 0-320,000 particles per liter
Minimum Particle Size: 0.3 µm
Accuracy: 10%
Response Time: minimum 1 s

Carbon Dioxide (CO_2)

Measurement Method: Non Dispersive Infrared (NDIR) Absorbance with Auto-Zeroing
Instrument: PP Systems CO_2 Gas Analyzer, Model SBA-5
Linear Range: 0-1,000 ppm
Precision: 1 ppm
Accuracy: 5 ppm
Response Time: 10 s

Carbon Monoxide (CO)

Measurement Method: Amperometry
Linear Range: 0-50 ppm
Sensor: Alphasense CO-A4
Precision: 0.02 ppm
Accuracy: 0.1 ppm
Response Time: 20 s

Total VOCs

Measurement Method: Photoionization Detector
Sensor: ION Science Mini-PID2 HS
Measurement Range: 0 to 3 ppm
Sensitivity: > 600 mV per ppm
Minimum Detection Limit: 0.5 ppb
Response Time: < 12 s

Methane

Measurement Method: Tunable-Diode Laser
Sensor: Axetris LGD Compact-A CH4
Measurement Range: 0 to 100 ppm
Precision: up to 100 ppm, < 0.8 ppm
Resolution: 0.01 ppm
Sampling Rate: 2 Hz

Speciated BTEX

Measurement method: microGC
Sensor: PyxisGC BTEX
Carrier gas: Ambient Air, <10 sccm
Sampling: Sample Flow Rate 250 - 450 sccm

Detector: High-sensitivity PID - Photo Ionization Detector (10.6 eV) **Analytical performance:** [0.5 – 80] µg/m³, benzene with 10 min analysis cycles "Smart City" configuration [1 – 160] µg/m³, benzene with 10 min analysis cycles "Fence Line" configuration **Lower detection limit:** <0.2 µg/m³ (0.05ppb) benzene	

Weather Station Specifications

(per manufacturer)

Gill Instruments MaxiMet 500GMX	Range	Accuracy
Temperature	-40 to +70 °C	±0.3 °C (at 20 °C)
Pressure	300 – 1100 hPa	±0.5 hPa (at 25 °C)
Relative Humidity	0 – 100% RH	±2 %RH (10 to 90 %RH)
Wind Speed (2-D Sonic Anemometry)	0.01-60 m/s (134 MPH)	±2% (0-30 m/s) ±3% (>30 m/s)
Wind Direction (2-D Sonic Anemometry)	0-360 degrees azimuth	±3 degrees (to 40 m/s) ±5 degrees (40-60 m/s)

System Specifications

Weight	54.7 lb, 24.9 kg (varies with modules chosen)
Size	25.5 H x 25.5 W x 10.3 D in (65 x 65 x 26.2 cm); height with weather station is 49 in (124.5 cm)
Power	35-60 watt (53-78 watt max during warmup) (varies with modules chosen)
Data Transmission	Cellular or WiFi to the Cloud; Ethernet option
Sample Flow Rate	~4 L/min (varies with modules chosen)
Certification	CE