Zephyr® Air Quality Monitor

Specification Sheet





Key

[a] - accuracy may be diminished where Zephyrs are exposed to direct sunlight

[b] - lowest tested concentrations are background

[c] - estimates of range are based on the theoretical limits of the electronics

Mechanical	
Size	235mm (h) x 160mm (w) x 114mm (d)
Weight	1750g - 2000g (dependent on cartridge)
Operating Parameters	Operating Range: -20°C to +45°C ambient. Relative Humidity range: 15 - 85% continuous* *prolonged exposure outside of this range may irreparably damage the gas sensors.
Construction	Extruded aluminium body, hard anodised with ASA-PC end mouldings. Stainless steel mounting brackets for 80-140mm diameter poles.
Electrical	
Power Inputs	12-32V DC (~13.8V for cars and LCV, ~27.6V for HGV) or solar powered applications (~18-20V)
IP Rated Zephyr® Monitor	IP64
IP Rated Power Supply Unit (Optional)	IP67
IP Rated Power Supply Unit (Indoor use only)	IP2X
Solar Panel (Optional)	50WP output Bracket, mount and straps included Dimensions: 581mm (h) x 509mm (w) x 30mm (d) (22.9 x 20 x 1.18in) Weight: 3.5kg / 7.72lbs Weight including bracket: 4.75kg / 10.472lbs
External Battery Connector (Optional)	Connect to an IP rated external 12V battery with 120Ah capacity (recommended). Based on a normal sample* rate of 10s, this should enable operation for up to 50 days and on low power mode 100 days. *operational duration will be affected with changes to sample rate and cartridge configuration.
Power Draw	Max: 19W at 19V Nominal: ~ 0.2W at 19V Elexon charge code: 8300003002100* *Standard cartridge configuration only
Internal Battery	Li-Ion ~55 Whr. Charged by MPPT battery charging controller to maximise solar panel output. Increase battery capacity option available
Battery Run Time	Normal mode: 3 days, 17 hours* *with 1 standard cartridge Low Power/Winter Mode: 7 days, 18 hours* *with a standard cartridge

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Cartridge Options - *all Zephyrs come with a cartridge based system that uses active sampling*

Measure	Standard Cartridge	Standard + Cartridge	Enhanced Cartridge	Enhanced + Cartridge	Enhanced ++ Cartridge
Nitrogen dioxide (NO_2)	•		•	•	•
Nitric oxide (NO)	•		•	•	•
Ozone (O_3)	•		•	•	•
Particulate Matter (PM_1)	•		•	•	•
Particulate Matter ($PM_{2.5}$)	•		•	•	•
Particulate Matter (PM_{10})	•		•	•	•
Carbon monoxide (CO)			•	•	•
Sulphur dioxide (SO_2)			•	•	•
Hydrogen sulphide (H_2S)			•	•	•
Carbon dioxide (CO_2) (optional)		•		•	•
Total Organic Volatile Compounds (TVOCs) (optional)		•			•
Pressure	•		•	•	•
Temperature	•		•	•	•
Relative Humidity	•		•	•	•

Estimated Accuracy, Range and Limits of Detection

Measure	Estimated Accuracy		Range		Limits of Detection	
	µg/m³ | mg/m³	ppb | ppm	µg/m³ | mg/m³	ppb | ppm	µg/m³ | mg/m³	ppb | ppm
Nitrogen dioxide (NO_2)	10 µg/m³	5.2 ppbV	0 - 20,000 µg/m³ [c]	0 - 10,000 ppbV [c]	1.5 µg/m³	0.78 ppbV
Nitric oxide (NO)	10 µg/m³	8 ppbV	0 - 6,000 µg/m³ [c]	0 - 5,000 ppbV [c]	1.5 µg/m³	1.20 ppbV
Ozone (O_3)	15 µg/m³	7.5 ppbV	0 - 15,000 µg/m³ [c]	0 - 7,500 ppbV [c]	1.5 µg/m³	0.75 ppbV
Particulate Matter (PM_1)	5 µg/m³		0 - 20,000 µg/m³ [c]		0.2 µg/m³	
Particulate Matter ($PM_{2.5}$)	5 µg/m³		0 - 20,000 µg/m³ [c]		1.3 µg/m³	
Particulate Matter (PM_{10})	5 µg/m³		0 - 20,000 µg/m³ [c]		1.4 µg/m³	
Carbon monoxide (CO)	0.3 mg/m³	0.3 ppmV	0 - 40 mg/m³ [c]	0 - 35 ppmV [c]	0.03 mg/m³	0.02 ppmV
Sulphur dioxide (SO_2)	20 µg/m³	7.6 ppbV	0 - 6,500 µg/m³ [c]	0 - 2,500 ppbV [c]	1.5 µg/m³	0.57 ppbV
Hydrogen sulphide (H_2S)	5 µg/m³	3.6 ppbV	0 - 1,500 µg/m³ [c]	0 - 1,000 ppbV [c]	1.5 µg/m³	1.08 ppbV
Carbon dioxide (CO_2) (optional)	30 ppmV		0 - 5,000 ppm		-	
Total Organic Volatile Compounds (TVOCs) (optional)	-		0 - 15,000 ppbV [c]		1 ppbV	
Pressure	1.2 hPa		300 - 1,100 hPa		-	
Temperature	5°C [a]		-20°C - 45°C ambient		-	
Relative Humidity	5% [a]		15 - 85% continuous* *prolonged exposure outside of this range may irreparably damage the gas sensors.		-	

Location Sensing

High Sensitivity GNSS	GPS, GLONASS, Galileo and Beidou module with internal active antenna.

Internal Storage

16GB SD Card	Sufficient for 32 million measurement sets.

Data Handling

Web Services Infrastructure	Data infrastructure is hosted in the cloud to give high service availability, resilience, and regional selection
Communication Technologies	Wi-Fi (802.11 b/g/n 2.4GHz) Bluetooth (2.4GHz v4.2 BR/EDR + BLE compliant) GSM 2G 4G (NB-IoT and LTE Cat-M1)* RS232*, RS485* *Optional

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Data Access	
MyAir® Web App	View and download data via a URL link to the MyAir web app. MyAir® functionality includes: - Mapped Zephyr® locations - Data charting and download via KML or CSV - Additonal data overlays including global MappAir and 3rd party data - Satellite, AURN and Air Quality Management Area map overlays - Source apportionment - Historic and forecast data Our server via the customer username & password will hold collected Zephyr® data until the of the subscription.
Zephyr® API	Data can be integrated into existing systems such as traffic management, environmental reports and GIS.



MyAir® web app showing mapped Zephyr® locations with MappAir® modelling.

Default Sensing Programme		
	Normal Mode	Low Power/Winter Mode
Sample Rate:*	10 seconds	1 minute
Upload Rate:*	15 minutes	60 minutes

*for standard cartridge. Custom modes can be configured

Data Integrations	
Stratos Traffic Management System	Compatible with Yunex Traffic (formerly Siemens Mobility) traffic management system
MindSphere	Integrated with Siemens MindSphere Industrial IoT Solution

Third Party Device Integrations	
RS232 / RS485	Zephyr® input power can be passed through to the connector (9-30V) to supply the auxilliary hardware with up to 1A. We are able to configure data connections for a wide range of additional hardware, please contact us if your proposed device is not listed below.
Other Sensor Providers that Work with the Zephyr®	Gill MaxiMet range - GMX100, 101, 200, 240, 300, 301, 400, 500, 501, 531, 541, 550, 551 and 600. Any other integrations are available upon application.

Warranty	
Warranty	Full warranty on manufacturer faults

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