

Zephyr® Air Quality Sensor

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 Temperatures	-20°C to +45°C
Construction	Extruded aluminium body, hard anodised with ASA-PC end mouldings. Stainless steel mounting brackets for 80-140mm diameter poles.
IP Rating	IP65 - without cartridges IP63 - with cartridges

Electrical

Power Inputs	12-32V DC via IP68 connector for automotive applications (~13.8V for cars and LCV, ~27.6V for HGV) or solar powered applications (~18-20V)	
Internal Battery	Li-Ion ~55 Whr. Charged by MPPT battery charging controller to maximise solar panel output. Increase battery capacity option available	
Power Draw	Max: 19W at 19V Nominal: ~ 0.2W at 19V	
Battery Run Time	Normal mode: 4 days	Low Power/Winter Mode: 2-4 days dependant on configuration options
IP Rated Power Supply Unit	IP67	
Solar Panel (Optional)	50WP output Bracket, mount and straps included Dimensions: 530mm (h) x 670mm (w) x 250mm (d) Mass: 5.5kg	

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

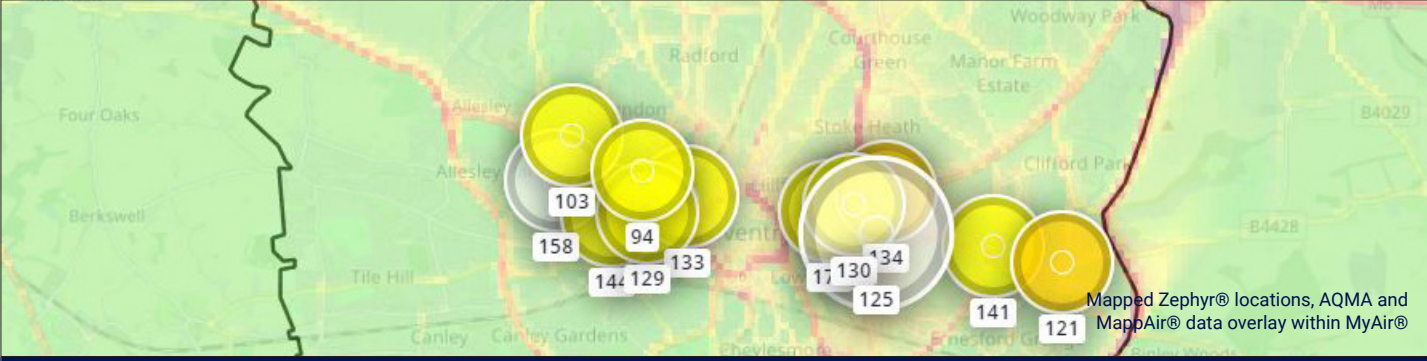
Measure	Standard Cartridge	Enhanced Cartridge	Estimated Accuracy		Range		Limits of Detection	
			µg/m³ mg/m³	ppb ppm	µg/m³ mg/m³	ppb ppm	µg/m³ mg/m³	ppb ppm
NO ₂	•	•	10 µg/m³	5.2 ppbV	0 - 20,000 µg/m³ ^c	0 - 10,000 ppbV ^c	8 µg/m³	4 ppbV
NO	•	•	10 µg/m³	8 ppbV	0 - 6,000 µg/m³ ^c	0 - 5,000 ppbV ^c	10 µg/m³	8 ppbV
O ₃	•	•	15 µg/m³	7.5 ppbV	0 - 15,000 µg/m³ ^c	0 - 7,500 ppbV ^c	10 µg/m³	8 ppbV
PM ₁	•	•	5 µg/m³		0 - 20,000 µg/m³ ^c		2 µg/m³	
PM _{2.5}	•	•	5 µg/m³		0 - 20,000 µg/m³ ^c		5 µg/m³	
PM ₁₀	•	•	5 µg/m³		0 - 20,000 µg/m³ ^c		5 µg/m³	
CO		•	0.3 mg/m³	0.3 ppmV	0 - 40 mg/m³ ^c	0 - 35 ppmV ^c	0.23 mg/m³	0.2 ppmV
SO ₂		•	20 µg/m³	7.6 ppbV	0 - 6,500 µg/m³ ^c	0 - 2,500 ppbV ^c	8 µg/m³	3 ppbV
H ₂ S		•	5 µg/m³	3.6 ppbV	0 - 1,500 µg/m³ ^c	0 - 1,000 ppbV ^c	25 µg/m³	18 ppbV
CO ₂ (optional)		•	30 ppmV		0 - 5,000 ppm		405 ppmV ^b	
TVOCs (optional)		•	-		0 - 15,000 ppbV ^c		-	
Pressure	•	•	1.2 hPa		300 - 1,100 hPa		-	
Temperature	•	•	5°C ^a		-20°C - 45°C		-	
Relative Humidity	•	•	5% ^a		0 - 100%		-	

Location Sensing

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

8GB SD Card	Sufficient for 16 million measurements
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Data Handling		
GSM module with internal antenna	During the sensing programme, data is collected inside the unit is uploaded to the database at configurable intervals	
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 5G technologies (NB-IoT and LTE Cat-M1)* RS232*, RS485* *Optional	
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 - Additional data overlays including global MappAir and 3 rd 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 subscription.	
Zephyr® API	Data can be integrated into existing systems such as traffic management, environmental reports and GIS.	
		
Default Sensing Programme		
	Standard Cartridge	Enhanced Cartridge
Sample Rate:	10 seconds	60 seconds
Upload Rate:	15 minutes	60 minutes
Custom modes can be configured		
Data Integrations		
Stratos	Compatible with Siemens Mobility Stratos traffic management system	
Third Party Device Integrations		
RS232 / RS485	Zephyr input power can be passed through to the connector (9-30V) to supply the auxiliary 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.	
Subscription Includes		
Cartridge Calibration	All calibration and testing carried out at the EarthSense manufacturing facility to near-reference site standard with no in-field calibration required.	
Data Hosting & SIM	All costs included	
Continous Monitoring	In-house data scientist carry out remote monitoring of sensor performance to ensure no loss of data quality	
Replacement Cartridges	Throughout the duration of your subscription	
Power Supply	Internal rechargeable battery with option of solar panel	
Data Access	Via API or MyAir	
In-house Technical Support	Comprehensive service levels and technical assistance	
Warranty	Full warranty on manufacturer faults	
Support Levels		
Supported Hours	09:00 - 17:00 (UK Official Time)	
Supported Calls	All support calls will be answered on average within 30 seconds. EarthSense will use reasonable endeavours to provide a plan of action for all support calls within 7.5 Supported Hours of the call being logged.	