

kunak air PRO

Datasheet



Optical particle counter



Specifications

Dimensions	257 x 270 x 225 mm	Gas sensors	CO, CO ₂ , NO, NO ₂ , O ₃ , SO ₂ , H ₂ S, NH ₃ & VOCs
Weight	<3.5 kg	PM sensor	PM ₁ , PM _{2.5} & PM ₁₀
Enclosure	PMMA & Polycarbonate & Stainless steel	Internal status	Temp./Battery/Charging voltage & current/Signal
Operating temp	-20 °C to 60 °C	Built-in sensors	Temp./Humidity/Atmospheric pressure/Dew point
Operating RH	0 to 99 %RH	Additional probes & actuators	#3: Noise meter & Digital output (Relay) #4: Modbus RS485 RTU & 4-20mA & Configurable power supply output #5: Anemometer & Rain gauge inputs
IP rating	IP65	Sampling freq.	3Hz gases, 1Hz particles
Battery	Lithium 2.9Ah or 26Ah	Avg. periods	From 10 seconds to a maximum of 24 hours
External supply	7 – 12 Vdc. Charger or Solar panel	Sending periods	From 5 minutes to a maximum of 24 hours
Autonomy	24/7 with solar panel or charger	Remote management	Bidirectional communications Remote configuration and calibration
Power consumption	0.08-1.2W (depending on configuration)	SIM	Embedded eSIM and SIM holder
Communications	Multi-Band 2G/3G/4G (LTE-FDD/LTE-TDD/UMTS/HS-DPA/HSUPA/HSPA+/GSM/GPRS/EDGE) or Ethernet		
GNSS	GPS, GLONASS, GALILEO and BEIDOU		

Communications

GSM[📶] GPRS[📶] 2G[📶] 3G[📶] 4G[📶] Lte[📶] Ethernet ↔

Gas, PM & Environmental sensor specs

Parameter	Type	Unit of measurement	Measurement range ⁽¹⁾	Resolution ⁽²⁾	Operating Temp. range ⁽³⁾	Operating RH range ⁽⁴⁾	Operating life ⁽⁵⁾
CO	Electrochemical	µg/m ³ , ppb	0-12,000 ppb ^(A) 0-500 ppm ^(B)	1 ppb ^(A) 0.1 ppm ^(B)	-30 to +50 °C	15 to 90 %RH	> 24 months
CO ₂	Non-dispersive Infrared	µg/m ³ , ppm	0-5,000 ppm	1 ppm	0 to +50 °C	0 to 95 %RH	> 7 years
NO	Electrochemical	µg/m ³ , ppb	0-5,000 ppb	1 ppb	-30 to +40 °C	15 to 85 %RH	> 24 months
NO ₂	Electrochemical	µg/m ³ , ppb	0-5,000 ppb	1 ppb	-30 to +40 °C	15 to 85 %RH	> 24 months ⁽¹⁸⁾
O ₃	Electrochemical	µg/m ³ , ppb	0-2,000 ppb	1 ppb	-30 to +40 °C	15 to 85 %RH	> 24 months ⁽¹⁸⁾
H ₂ S	Electrochemical	µg/m ³ , ppb	0-2,000 ppb	1 ppb	-30 to +50 °C	15 to 90 %RH	> 24 months
SO ₂	Electrochemical	µg/m ³ , ppb	0-10,000 ppb	1 ppb	-30 to +40 °C	15 to 90 %RH	> 24 months
NH ₃	Electrochemical	mg/m ³ , ppm	0 - 50 ppm	0.1 ppm	-10 to +50 °C	15 to 90 %RH	> 24 months
VOCs	Photoionization	µg/m ³ , ppb	1-10,000 ppb	1 ppb	-20 to +60 °C	0 to 99 %RH	10,000 hours
PM ₁	Optical particle counter	µg/m ³	0 - 1,000 µg/m ³	1 µg/m ³	-10 to +50 °C	0 to 95 %RH	> 24 months
PM _{2.5}	Optical particle counter	µg/m ³	0 - 1,500 µg/m ³	1 µg/m ³	-10 to +50 °C	0 to 95 %RH	> 24 months
PM ₁₀	Optical particle counter	µg/m ³	0 - 2,000 µg/m ³	1 µg/m ³	-10 to +50 °C	0 to 95 %RH	> 24 months
Noise L _{Aeq}	Omnidirectional mic	dB(A)	35 - 130 dB(A)	0.1 dB(A)	-10 to +50 °C	1 to 95 %RH	> 24 months
Temperature	Solid state	°C	-40 - +150 °C	0.01 °C	-40 to +150°C	0 to 100 %RH	> 5 years
Relative humidity	Solid state	%RH	0 - 100 %RH	0.04 %	-40 to +150°C	0 to 100 %RH	> 5 years
Pressure	Solid state	hPa	300 - 1,100 hPa	0.18 Pa	-90 to +85°C	0 to 100 %RH	> 5 years

Parameter	Guarantee range ⁽⁶⁾	Limit of detection ⁽¹¹⁾	Performance limit level ⁽¹⁴⁾	Typical Accuracy ⁽¹⁵⁾	Typical 90% confidence interval ⁽¹⁶⁾	R ² typical precision ⁽¹⁷⁾
CO	1,000 ppm	10 ppb	< 50 ppb	± 0.08 ppm	0.125 ppm	> 0.85
CO ₂	-	-	-	± 30 ppm	-	-
NO	20 ppm	2 ppb	< 5 ppb	± 4 ppb	10 ppb	> 0.9
NO ₂	20 ppm	2 ppb	< 10 ppb	± 5 ppb	10 ppb	> 0.85
O ₃	20 ppm	2 ppb	< 10 ppb	± 8 ppb	14 ppb	> 0.9
H ₂ S	100 ppm	4 ppb	< 10 ppb	± 10 ppb	20 ppb	> 0.75
SO ₂	100 ppm	5 ppb	< 20 ppb	± 15 ppb	25 ppb	> 0.7
NH ₃	100 ppm	< 0.1 ppm	< 0.5 ppm	± 0.3 ppm	-	-
VOCs	20,000 ppb	1 ppb	-	-	-	-
PM ₁	-	-	-	± 6 µg/m ³	12 µg/m ³	> 0.9
PM _{2.5}	-	-	-	± 10 µg/m ³	18 µg/m ³	> 0.8
PM ₁₀	-	-	-	± 18 µg/m ³	30 µg/m ³	> 0.7
Noise L _{Aeq}	-	-	Frequency range 20 - 12,500 Hz	± 1 dB(A)	3 dB(A)	> 0.9
Temperature	-	-	-	± 0.9 °C	1.5 °C	> 0.95
Relative humidity	-	-	-	± 3 %RH	6 %RH	> 0.95
Pressure	-	-	-	± 2 hPa	3 hPa	> 0.95

(1) Measurement range: Concentration range measured by the sensor.

(2) Resolution: Smallest unit of measurement that can be indicated by the sensor.

(3) Temperature range: Interval of temperatures that the sensor could be exposed to.

(4) RH range: Interval of humidities that the sensor could be exposed to.

(5) Operating life: Lifetime of the sensor in normal conditions. Long exposures to humidity above 85% can damp the sensor and affect the measurements.

(6) Guarantee range: Limit covered by the guarantee.

(11) LOD (Limit of detection): Measured quantity value giving the probability of falsely claiming the absence or presence of a component.

(14) Performance limit level: Readings below this level can have lower performance than specified. Measured against reference instrument.

(15) Typical accuracy: Is obtained as the mean absolute error (MAE) between KUNAK AIR hourly measurements and reference instruments in 1 to 8 months field test between -10 to +30°C in different countries.

(16) Typical 90% confidence interval: 90% of the hourly measurements obtained in 1 to 8 months field tests between -10 to +30°C in different countries are below this absolute error comparing to reference instruments.

(17) Typical precision R²: The average R² between KUNAKAIR hourly measurements and reference instruments in 1 to 8 months field tests between -10 to +30°C in different countries.

(18) NO₂ - O₃: Operating life if applying correct calibrations with a small decrease in performance. 12 month recommended operating life for best performance.

(19) NDIR: Non-dispersive Infrared

Large data is the goal,
but accurate data is the key



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