

Sensors

Sensor: SEN-22395

Company: Sparkfun

Price: \$55

Measures: CO2, Temp, Hum



Parameters	
Accuracy	$\pm 50 \text{ ppm} + 5\%$
Power	0.0594 - 0.12 W
Sensitivity	High for indoor CO2
Drift	Minimal with auto-calibration; estimated at <1% per year
Range	0 - 40,000 ppm
Durability	>10 years
Resolution	High
Temp	-10°C - 50°C

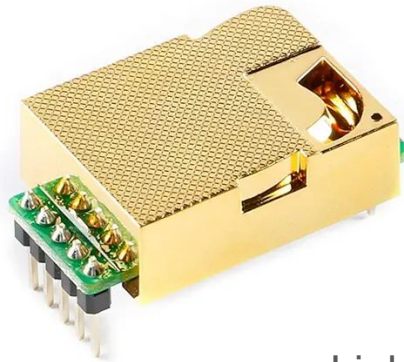
Link: <https://www.sparkfun.com/products/22395>

Sensor: MH-Z19C

Company: Winsen

Price: ~ \$11

Measures: CO2



Parameters	
Accuracy	$\pm 50 \text{ ppm} + 5\%$
Power	0.2W
Sensitivity	"high" (no detail given)
Drift	1% per year with minimal environmental change
Range	40 - 10,000 ppm
Durability	>5yrs
Resolution	analog PWM output
Temp	Min: -10°C

Link: <https://www.neumueller.com/datenblatt/neumueller/MH-Z19C.pdf>

Sensor: MQ-4

Company: Sparkfun

Price: ~ \$42

Measures: CO2



Parameters	
Accuracy	± 30 ppm + 3%
Power	0.1W
Sensitivity	
Drift	Requires regular calibration; sensitive to humidity
Range	40-10,000 ppm
Durability	
Resolution	
Temp	Min: 0°C

Link: <https://sensirion.com/products/catalog/SCD30>

Sensor: SCD30

Company: SENSIRION

Price: ~\$6

Measures: CH₄



Parameters	
Accuracy	± 30 ppm + 3%
Power	< 0.95W
Sensitivity	Less after 2000 ppm
Drift	<1% of reading per year, ± 50 ppm over lifetime,
Range	300-10,000 ppm
Durability	
Resolution	
Temp	

Link: <https://www.sparkfun.com/products/9404>

Sensor: SGX NGM_1

Company: SGX Sensortech

Price: ~ \$25

Measures: CH4



Parameters	
Accuracy	5% v/v.
Power	0.002W
Sensitivity	>10 mV/% CH4
Drift	<0.1%v/v /month. Low, MEMS-based, with periodic calibration recommended
Range	
Durability	With 2AA: 6 months
Resolution	
Temp	

Link: <https://www.farnell.com/datasheets/2700567.pdf>

Sensor: INIR2-ME100

Company: SGX Sensortech

Price: \$245.00

Measures: CH₄



Parameters	
Accuracy	Upto 10 ppm \pm 0.15 %
Power	<100 mW
Sensitivity	
Drift	Stable; <1% per year in stable conditions
Range	AutoSwitch over - LOW (0.0%vol. - 4.0%vol.), MID(4.0%vol.–40%vol.), High(40%vol. & above).
Durability	
Resolution	\pm 0.002% vol (0-5%) \pm 0.1% vol (5-100%)
Temp	-40°C to 75°C, Calibrated to 5% Methane

Link: <https://sgx.cdistore.com/datasheets/sgx/>

Sensor: TGS2611

Company: Figaro

Price: ~\$13

Measures: CH4



Parameters	
Accuracy	
Power	0.3 W
Sensitivity	0.60 ± 0.06
Drift	Variable; regular calibration required for accuracy
Range	500 -10,000 ppm
Durability	
Resolution	
Temp	

Link: [https://www.figarosensor.com/product/docs/TGS%202611C00\(1013\).pdf](https://www.figarosensor.com/product/docs/TGS%202611C00(1013).pdf)

Sensors - Currently Used

Sensor: SHT 45-AD1B-R2

Company: Sensirion AG

Price: €5.69 = ~\$7

Measures: Temp/Hum



Parameters	
Accuracy	+/-1.0% Hum; +/-0.1 C
Power	0.001 W
Sensitivity	
Drift	<0.1% RH per year, ±0.03° C per year
Range	Hum: 0-100% Temp: -40-125 C
Durability	JEDEC JESD47 qualified
Resolution	0.01 (Hum and Temp)
Temp	-40°C to 125°C

Link: [SHT45-AD1B-R2 Sensirion | Mouser](#)

Sensor: K33-ELG

Company: Senseair

Price: €70 = ~\$75

Measures: CO2



Parameters	
Accuracy	± 30 ppm ± 3 % of reading
Power	250mA
Sensitivity	
Drift	1–2% of reading per year
Range	0–5000ppm
Durability	>10 years
Resolution	
Temp	-30 - 50 °C

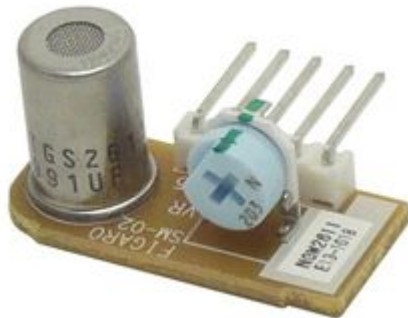
Link: <https://senseair.com/product/k33-elg/>

Sensor: NGM2611-E13

Company: Figaro

Price: €25 = ~\$27

Measures: Methane



Parameters	
Accuracy	
Power	280 mW
Sensitivity	
Drift	Typically low; periodic recalibration advised
Range	300 - 10,000 ppm
Durability	
Resolution	
Temp	Min: -15°C

Link: <https://www.figarosensor.com/product/entry/ngm2611.html>

Comparison Data

Parameters	SEN-22395 Sensirion	MH-Z19C Winsen	MQ-4 ?Winsen	K33-ELG Senseair
Accuracy	± 50 ppm + 5%	± 50 ppm + 5%	±30 ppm + 3%	±30 ppm ±3 % of reading
Power	0.0594 - 0.12 W	0.2W	0.1W	250mA
Sensitivity	High for indoor CO2	"high" (no detail given)		
Drift	Minimal with auto-calibration; estimated at <1% per year	1% per year with minimal environmental change	Requires regular calibration; sensitive to humidity	1–2% of reading per year
Range	0 - 40,000 ppm	40 - 10,000 ppm	40-10,000 ppm	0–5000ppm
Durability	>10 years	>5yrs		>10 years
Resolution	High	analog PWM output		
Temp	-10°C - 50°C	Min: -10°C	Min: 0°C	-30 - 50 °C
Price	\$55	\$11	\$42	\$75

Parameters	SCD30 SENSIRION	SGX NGM_1	INIR2-ME100	NGM2611-E13
Accuracy	±30 ppm + 3%	5% v/v.	Upto 10 ppm ± 0.15 %	
Power	< 0.95W	0.002W	<100 mW	280 mW
Sensitivity	Less after 2000 ppm	>10 mV/% CH4		
Drift	<1% of reading per year, ±50 ppm over lifetime,	<0.1%v/v /month. Low,	Stable; <1% per year in stable conditions	Typically low;
Range	300-10,000 ppm		Auto Switch over LOW (0.0%vol. - 4.0%vol.), MID(4.0%vol.–40%vol.), High(40%vol. & above).	300 - 10,000 ppm
Durability		With 2AA: 6 months		
Resolution			± 0.002% vol (0-5%) ± 0.1% vol (5-100%)	
Temp			-40°C to 75°C, Calibrated to 5% Methane	Min: -15°C
Price	\$6	\$25	\$242	\$27

Appendix

Measurement Criteria

- **Accuracy:** How close sensor measurements are to the true value.
- **Power:** Energy consumption, often measured in W or A, indicating sensor efficiency.
- **Sensitivity:** Ability to detect small changes or low levels of the measured quantity.
- **Drift:** Change in sensor output over time, impacting long-term reliability.
- **Range:** The span of values the sensor can measure effectively.
- **Durability:** Sensor's resilience and longevity under environmental conditions.
- **Resolution:** The smallest detectable increment in measurement.
- **Operating Temperature:** Temperature range where the sensor operates accurately.