

# ERS VOC

## Description

ERS VOC is a sensor for measuring the indoor environment. It is enclosed in a room sensor box and is designed to be wall mounted. ERS VOC is completely wireless and powered by two 3.6V AA lithium batteries. Inside you will find internal sensors for measuring VOC levels, temperature, humidity, light, and motion.



## Applications

- Indoor environment measuring
- Smart buildings
- Workplace management
- Room occupancy

## Product features

- VOC sensor
- Temperature sensor
- Humidity sensor
- Light sensor
- Motion detection sensor (PIR)
- NFC for configuration
- Configuration over the air
- Discrete and minimalistic design

## Device Specifications

### Mechanical specifications

Weight	60 g excluding batteries / 100 g including batteries
Dimensions	86 x 86 x 27 mm
Enclosure	Plastic, PC/ABS

### Operating conditions

Temperature	0 to 50 °C
Humidity	0 to 85 % RH (non-condensing)

### Device Power Supply

Battery Type	2 x 3.6V AA Lithium Batteries
Expected Battery Life	<5 years (Depending on configurations and environment)

### Device Logging Function

Sampling Interval	Configurable via NFC and downlink configuration
Data Upload Interval	Configurable via NFC and downlink configuration

# ERS VOC

Radio / Wireless	
Wireless Technology	LoRaWAN® 1.0.3
Wireless Security	LoRaWAN® End-to-End encryption (AES-CTR), Data Integrity Protection (AES-CMAC)
LoRaWAN Device Type	Class A/C (configurable) End-device
Supported LoRaWAN® features	OTAA, ABP, ADR, Adaptive Channel Setup
Supported LoRaWAN® regions	US902 – 928, EU863 – 870, AS923, AU915 – 928, KR920 – 923, RU864, IN865
Link Budget	137 dB (SF7) to 151 dB (SF12)
RF Transmit Power	14 dB / 20 dB (Region specific)

Data types				
Type value	Type	Data size	Comment	
0x01	Temperature	2	-3276.5 °C → 3276.5 °C (Value of: 100 → 10.0 °C)	
0x02	Humidity	1	0 – 100 %	
0x04	Light	2	0 – 65535 Lux	
0x05	Motion (PIR)	1	0 – 255 (Number of motion counts)	
0x07	VDD (Battery voltage)	2	0 – 65535 mV	
0x1C	VOC	2	0 – 60000 ppb	
0x3D	Debug information	4	Data depends on debug information	
0x3E	Sensor settings	n	Sensor setting sent to server at startup (first package). Sent on Port+1.	

## Sensors

### VOC

Resolution:

0 ppb – 2008 ppb	1 ppb
2008 ppb – 11110 ppb	6 ppb
11110 ppb – 60000 ppb	32 ppb

Accuracy: 15 % of measured value (See figure 1)

Measurement Range: 0 – 60000 ppb TVOC, 0 – 1000 ppm Ethanol

Specified Range: 0.3 – 30 ppm Ethanol

The specified measurement range covers the gas concentrations expected in indoor air quality applications.

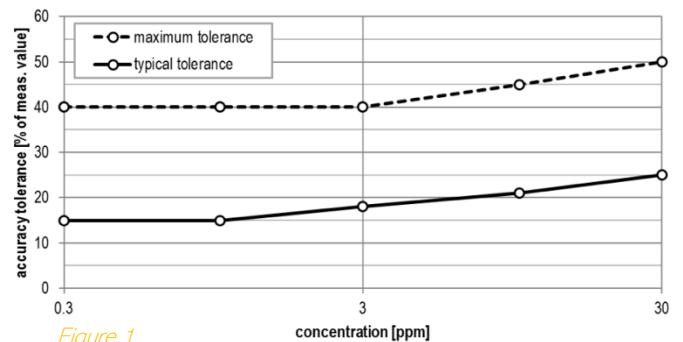


Figure 1

# ERS VOC

## Temperature

Resolution: 0.1 °C

Accuracy:  $\pm 0.2$  °C (See figure 2)

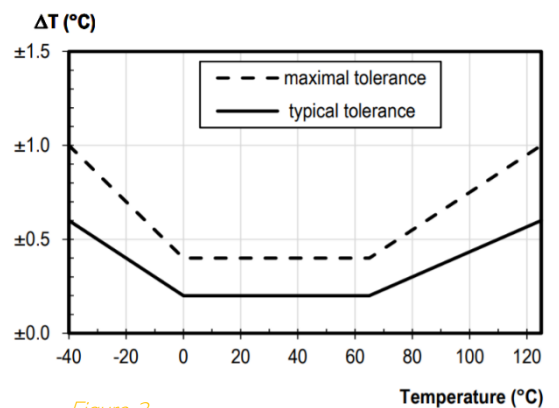


Figure 2

## Humidity

Resolution: 0.1 % RH

Accuracy at 25 °C:  $\pm 2$  % RH (See figure 3)

Accuracy of humidity over temperature: See figure 4

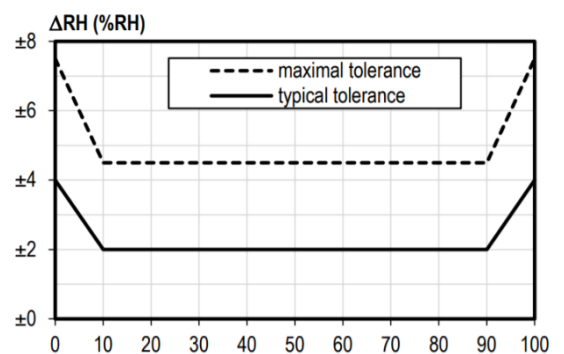


Figure 3

## Light

Range: 4 – 2000 LUX

Resolution: 1 LUX

Accuracy:  $\pm 10$  LUX

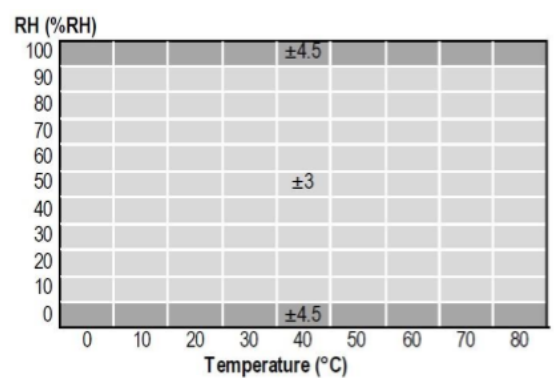
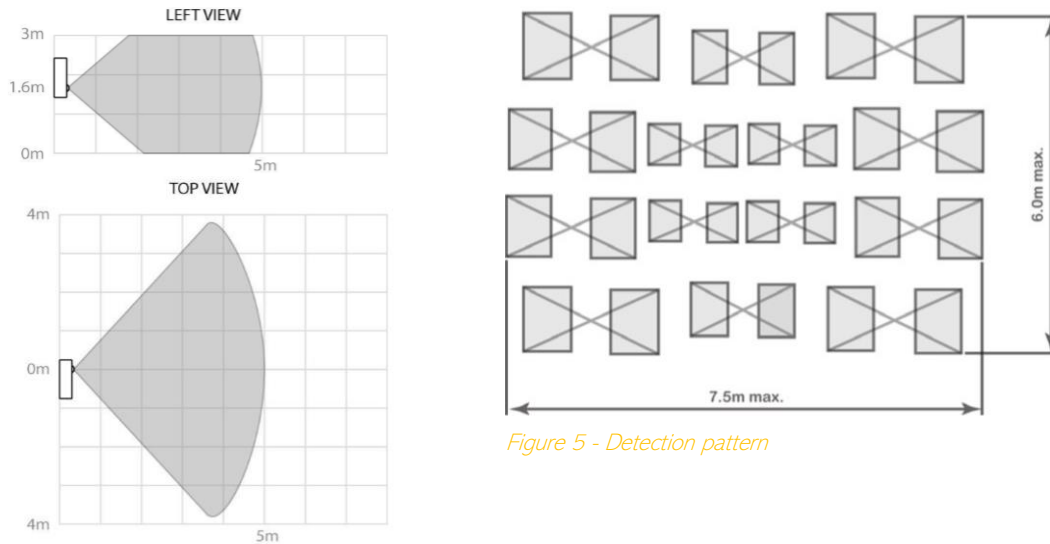


Figure 4

# ERS VOC

## Motion (PIR)



Note: There is a blanking time of 30 seconds of the PIR triggering after each PIR trig and after each transmission. This is to reduce the risk of self-triggering from internal events that could disturb the high sensitivity PIR circuits.