

# Volatile Organic Compounds



## Where is it found?

Most volatile organic compounds (VOCs) are produced by anthropogenic sources such as combustion of materials like wood, coal or petrol, transport or industrial activities.

They also enter the atmosphere from the evaporation of gasoline, paints and solvents in above-ground storage tanks. To a lesser extent, VOCs are emitted by biogenic sources such as vegetation or the decomposition of organic matter.

## Why is it harmful?

Many VOCs are toxic and can cause cancer, mutations, and/or other serious health problems. One of the most harmful compounds is the benzene, which can cause leukaemia.

Some of them contribute to ozone formation with associated health effects, environmental and climate effects. They also contribute to the formation of secondary organic aerosols that can warm and cool the atmosphere, respectively.

## VOCs cartridge

The VOC cartridge has a built-in photoionization detector (PID) sensor equipped with a 10.6 eV light energy source to measure accurately hundreds of VOCs commonly found in indoor and outdoor environments. Its cutting-edge design avoids any undesirable humidity effect, giving 10,000 hours of continuous operation.

To cover different applications, there are 2 measurement ranges:

- **Type A:** detects low ppb concentrations found in outdoor environments. Kunak algorithm corrects the temperature, humidity and pressure variations allowing accurate measurements from very low concentrations (< 5 ppb) up to > 3,000 ppb, with very low variability between sensors.
- **Type B:** higher range version that can measure up to 40 ppm. It is not recommended to use this cartridge to detect levels below 1 ppm, since the accuracy of this Type B sensor at low concentrations decreases.

Type	Photoionization detector	Limit of Detection (LOD) <sup>(7)</sup>	1 ppb <sup>(A)</sup> 0.01 ppm <sup>(B)</sup>
Unit of measurement	$\mu\text{g}/\text{m}^3$ , ppb <sup>(A)</sup> $\text{mg}/\text{m}^3$ , ppm <sup>(B)</sup>	Repeatability <sup>(8)</sup>	5 ppb <sup>(A)</sup> < 0.02 ppm <sup>(B)</sup>
Measurement range <sup>(1)</sup>	0 - 3,000 ppb <sup>(A)</sup> 0 - 40 ppm <sup>(B)</sup>	Response time <sup>(9)</sup>	< 12 sec <sup>(A)</sup> < 10 sec <sup>(B)</sup>
Resolution <sup>(2)</sup>	1 ppb <sup>(A)</sup> 0.01 ppm <sup>(B)</sup>	Typical accuracy <sup>(11) (12)</sup>	-
Operating temp. range <sup>(3)</sup>	-40 to 60°C	Typical precision R <sup>2</sup> <sup>(10)</sup>	-
Operating RH range <sup>(4)</sup>	0 to 99 %RH	Typical slope <sup>(10)</sup>	-
Recommended RH range <sup>(4)</sup>	0 to 99 %RH	Typical intercept (a) <sup>(10)</sup>	-
Operating life <sup>(5)</sup>	10,000 hours	DQO - Typical U(exp) <sup>(13)</sup>	-
Guarantee range <sup>(6)</sup>	50 ppm <sup>(A)</sup> 60 ppm <sup>(B)</sup>	Typical Intra-model variability <sup>(14)</sup>	< 3 ppb <sup>(A)</sup> < 0.1 ppm <sup>(B)</sup>