

PM<sub>1</sub>  
PM<sub>2.5</sub>  
PM<sub>10</sub>

# Particulate Matter



K-CI-PM-A-01

## Where are they found?

Particles are emitted from a wide range of man-made sources. The most significant road transport, non-combustion processes, industrial combustion plants and processes, commercial and residential combustion and power plants. Natural sources are less important and include volcanoes and dust storms.

## Why are they harmful?

Particles may be seen as ones of the most critical of all pollutants. Particulate matter is the generic term to classify air pollutants comprising of suspended particles in the air. The size, surface, number and composition of particles play an important role in human health effects. The upper respiratory tract is affected by PM<sub>10</sub> while lung alveoli is affected by ultrafine particles (<0.1 µm diameter).

Particles can cause premature mortality in patients suffering from lung or heart disease, provoke heart attacks, aggravate asthma, reduced lung functionality, irritation in airways, coughing, difficult breathing, etc.

## PM sensor

K-CI-PM-A-01

The Particulate Matter sensor consists on an Optical Particle Counter (OPC) capable of counting particles in 24 bins from 0.3 µm up to 40 µm. Then, the PM<sub>1</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> are calculated assuming a particle density profile. The effect of humidity is corrected with the algorithm avoiding false high concentration alarms except under foggy days or condensation. Further calibrations can be applied at a specific site to match the mass concentrations. Also, the particle size distributions are available on Kunak Cloud.

## Technical characteristics

Parameter	Unit	Resolution <sup>(2)</sup>	Temperature range <sup>(3)</sup>	RH range <sup>(4)</sup>	Operating life <sup>(5)</sup>
Optical particle counter	µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	-10 to 50 °C	0 - 95 %RH	<24 months

## Proven performance

Parameter	Measurement range <sup>(1)</sup>	Accuracy <sup>(15)</sup>	90% confidence interval <sup>(16)</sup>	R <sup>2</sup> precision <sup>(17)</sup>
PM <sub>1</sub>	0-1,000 µg/m <sup>3</sup>	± 6 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>	> 0.9
PM <sub>2.5</sub>	0-1,500 µg/m <sup>3</sup>	± 10 µg/m <sup>3</sup>	18 µg/m <sup>3</sup>	> 0.8
PM <sub>10</sub>	0-2,000 µg/m <sup>3</sup>	± 18 µg/m <sup>3</sup>	30 µg/m <sup>3</sup>	> 0.7

\* See notes on page 25