



SETTING THE HEATED SAMPLE INLET

For outdoor environmental sampling you must use a heated sample inlet to achieve accurate results. Ambient aerosol particles are known to absorb or release water in response to changing atmospheric relative humidity (RH). As particles lose or absorb water their physical and chemical properties such as size and index of refraction will change. These changes can dramatically influence how the aerosol particles scatter light and hence the determined PM mass. Moreover, the size of the changes will depend on the material composition of the aerosol, so applying simple correction factor based on the measured RH is not accurate. It helps, as in Turnkey's iPM, if only the forward scatter component (diffraction) is measured since this is largely independent of refractive index. But the size change due to water absorption is still significant, as are the presence of water droplets themselves in mist or fog.

The Turnkey Heated Sample Inlet is designed to maintain constant relative humidity in the sample air stream before it enters the iPM light scattering photometer. The Turnkey iPM uses ambient Relative Humidity and Temperature sensors to measure the atmospheric conditions and the Sample Inlet is heated to control the air stream humidity at the selected RH set point

The Turnkey Heated Sample Inlet can be set to condition the sample air stream humidity to any value from ambient RH down to 20% RH

It can also be set to condition the sample air stream to a constant temperature from ambient T up to 60°C, regardless of RH

- In the UK and EU, EN12341 requires humidity control to 50% for PM10 particle sampling, and 30 to 40% for PM2.5 particle sampling.
- In the US, the EPA requires humidity control to 30 to 40% for PM10 particle sampling, and 35% for PM2.5 particle sampling.

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