

Ambient Air Suspended Particulate Monitor Model MP101M-LCD



**Air quality
monitoring**



Certified equivalent to
PM10 measurement Reference
Method according to:

- US EPA (n°EQPM-0404-151)
- EN 12341 (CNR 087/2004)

Standard method
according to ISO 10473 : 2000



MP101M-LCD-EX
Outdoor Version

Major fields of application:

- Ambient air quality monitoring
- Indoor dust monitoring
- Working places
- Industrial areas
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Main features:

- **True particulate concentration measurement**, not influenced by the physicochemical nature, color or shape of particulates
- True volumetric air flow control with atmospheric temperature and pressure sensors to avoid artefacts in the size fractionating inlet
- Exclusive temperature-regulated sampling tube to avoid artefacts on the filter (evaporative losses of semi-volatile particulate matter during sampling...)
- Built-in reference gauge for calibration
- Selectable enhanced TSP, PM10, PM2.5, PM1 sampling inlets
- Low activity ¹⁴C sealed flat source usable in most
- Flow regulation by high precision differential pressure measurement
- Graphic Liquid Crystal Display (LCD)
- Interactive menu-driven software, with enhanced speed display
- Enhanced time resolution for daily floating average and continuous dust temporal trend evaluation
- Ethernet and USB connectivity for data retrieval and softwares upgrade by direct Flash EPROM application
- Low maintenance



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Specifications:

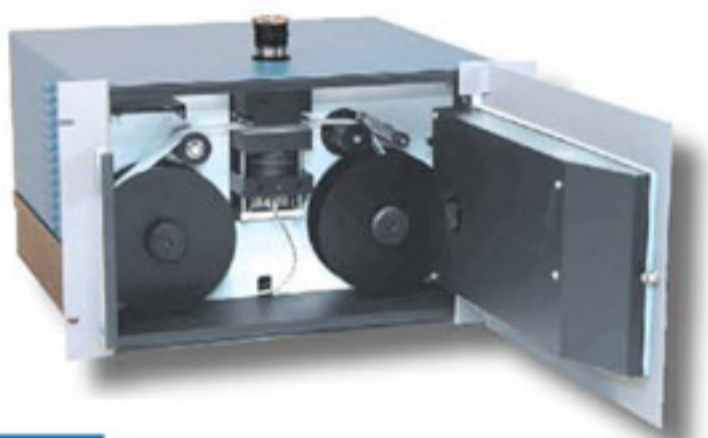
- Ranges: 0-100 / 0-200 / 0-500 / 0-1000 / 0-2000 / 0-5000 / 0-10000 $\mu\text{g}/\text{m}^3$
- Lower detectable limit (according to cycle and flow): 0.5 $\mu\text{g}/\text{m}^3$ with PM10 inlet (24h average)
- Cycle time: 1/2, 1, 2, 3, 6, 12, 24 h, user-selectable
- Sample collection period: 1/4, 1/2, 1, 2, 3 h, user-selectable
- Counting time: 10 to 300 s, user-selectable
- Source: sealed Carbon 14
- Half lifetime: 5000 years
- Activity: < 3.33 MBq (90 μCi)
- Detector : high performance Geiger-Müller counter tube
- Sampling flow rate: 1.0 to 1.5 m^3/h , user-selectable
- Sampling spot area: 2.0 cm^2
- Standard filter: fiberglass tape (width 35 mm, length 30 m)
- Autonomy: up to 1,200 measurements (more than 3 years on a daily sampling rate)
- Sampling tube: straight vertical tube
- Power supply: 230V/50Hz (115V/60 Hz)
- Consumption: 330 VA (pump included)
- Operating conditions:
 - temperature: + 10 to + 40°C
 - relative humidity: 90% without condensation
- Housing: 19" rack / 6U
- Dimensions: 440 x 483 x 266 mm (L x W x H)
- Weight: monitor 21.5 kg / pump 10.9 kg

Communication

- Analog outputs: 2 outputs (0-1 V, 0-10 V, 0-20 mA or 4-20 mA)
- Serial output: 1 RS 232/RS422
- Ethernet

Options & Accessories

- US EPA and EU-CEN compliant sampling inlets: TSP, PM10, PM2.5 (SCC, WINS, ...), PM1
- True volumetric air flow control according to atmospheric temperature and pressure at the sampling inlet (as per CEN PM2.5 standard)
- Heated sampling tube: 1 m, 2 m or 2.75 m
- Temperature-regulated sampling tube (1 m, 2 m, 2.75 m), compliant with CEN PM2.5 standard
- External pump assembly
- All-weather cabinet for outdoor use



Principle of operation:

Model MP101M-LCD determines the particulate concentration by measuring the amount of radiation a sample absorbs when exposed to a radioactive source. Low energy beta rays are absorbed by collision with electrons, whose number is proportional to density. Absorption is thus a function of the mass of the irradiated material, independently of its physicochemical nature.

At the beginning of each measurement cycle, model MP101M measures the amount of radiation absorbed by an unloaded filter tape (reference). Once the reference performed, the air sample is pulled through the filter tape at a regulated flow rate of 1 m^3/h during a user-selected period of time. At the end of the sampling period, the sample is exposed to the GM counter for a pre-defined time period (the longer the period, the greater the sensitivity). The difference between the original reading on the unloaded filter and the final reading is directly proportional to the mass collected on the tape. Cycles can be divided into different periods during which cumulative sample collection and measurement is performed. Measurement can be expressed over a whole cycle or on a period basis. The periodic measurement is used to monitor a rapidly evolving pollution event.

Main components:

Increased configuration flexibility with 4 independent modules:

- A sampling inlet: Different types can be fitted on the sampling tube: TSP, PM10, PM2.5, PM1 (impactor, cyclonic or combined).
- A sampling tube: weather conditions, temperature and humidity are essential factors that must be taken into account in order to maintain precise and reliable measurement. This is why the analyzer has built-in ambient temperature and pressure sensors to ensure a constant flow rate regardless of filter loading and ambient conditions: the True Volumetric Air Flow Control. The sampling line is heated and optionally temperature-regulated to avoid any artifact on the filter tape during sampling.
- A pump assembly: long-life external vacuum pump.
- The analyzer unit: the stability of the detector makes calibration unnecessary. A "calibrated foil gauge" delivered with the unit is used for a yearly gauge adjustment. The differential measurement technique overcomes problems of filter heterogeneity in the calculation of the mass of collected particulates. In addition, the instrument compensates for temperature changes located in the layer of air between the source and the detector.

