

## Automatic & Real-Time Suspended Particulate Monitor

AIR QUALITY MONITORING SYSTEMS

The standard Beta gauge measurement Method **ISO 10473** of the MP101M analyzer allows, when used with the optical technology of the OPM module, the continuous and simultaneous measurement of fine dust.

The beta attenuation instrument is compliant with **EN 16450 for PM10 and PM2.5** European Standards. **QAL1** certified by the **TÜV**, the MP101M is also approved as Federal Equivalent Method (FEM) by **US EPA for PM10 and PM2.5** continuous suspended particulate monitoring.

- Precise beta attenuation monitoring of PM10, PM2.5, PM1
- Real time optical indication about PM10, PM2.5, PM1 mass concentration ( $\mu\text{g}/\text{m}^3$ ) using an independent inlet



MP101M Beta gauge monitor with its optional OPM (Optical Particulate Monitor)

### SPECIFIC FEATURES:

- True volumetric air flow control with 3 atmospheric pressure and temperature sensors
- Sampling flow-rate continuously regulated to the atmospheric temperature and pressure: reduces evaporation artefacts of volatile compounds (mandatory for PM2.5 according to EU regulations)
- Automatic calibration of the real time optical module (OPM) to the reference measurement ( $\beta$  gauge)
- Flow calibration possible during the measurement
- Built-in reference gauge for calibration: no need for factory re-calibration
- Calibration screen for atmospheric pressure sensors
- Regulated Sampling Tube (RST) compliant with CEN PM10 and US-EPA standard: sample not affected by seasonal or geographical factors and avoids evaporative losses of semi-volatile particles
- Fibreglass tape with 3 years of autonomy of continuous sampling with daily cycles (1200 cycles)
- Low activity C14 sealed flat source with analyzer lifetime duration
- Rugged instrument, not sensitive to vibration, humidity, temperature...
- New: On board web server compatible with any internet browser. ENVEA Connect™ user interface with on-line help for the display, configuration, maintenance, diagnostics or software updating of the analyser, remotely, from any PC, tablet or smartphone.



Sliding drawer on the rear panel for easy access and maintenance



Simultaneous multi-screen remote access via Wifi or Lan

### MAIN APPLICATIONS:

- Ambient air quality monitoring
- Indoor dust monitoring
- Working places



# Suspended Particulate Monitor **MP101M** with **OPM** option

## PRINCIPLE OF OPERATION:

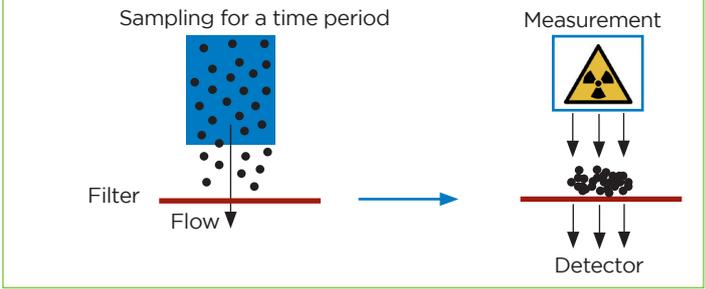
The **MP101M**, based on the beta attenuation measurement technique, determines the particles concentration by measuring the amount of radiation that a sample, collected on a fiber tape, absorbs when exposed to a radioactive source.

Low energy beta rays are absorbed by collision of dust, whose number is proportional to density. Absorption is thus a function of the mass of the irradiated material, independently of its physico-chemical nature.

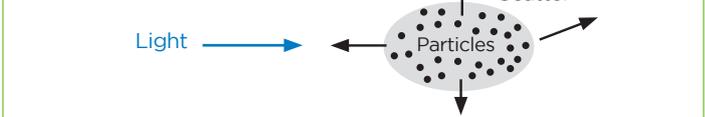
The **OPM's** (Optical Particulate Monitor) principle is based on the measurement of the light scattered by the particles. A powerful algorithm is applied to continuously convert the signal into mass concentration.

Combination of both technologies provides simultaneously approved particulate measurement PLUS real-time indication of PM10, PM2.5 and PM1 .

### Principle of Beta gauge



### Principle of scattering light



## MP101M TECHNICAL SPECIFICATIONS

Measuring ranges	0-10 000 µg/m <sup>3</sup> (user-selectable & programmable)
Lower detectable limit	0.5 µg/m <sup>3</sup> (24h average)
Measurement cycles	1/2h, 1h, 2h, 3h, 6h, 12h, 24h, user-selectable (up to 96 hours)
Measuring period	10 min, 15 min, 30 min, 1h, 2h, ..., 48h (user-selectable)
Beta Source	Sealed Carbon 14 (1.6MBq±15%)
Detector	High performance Geiger-Müller counter
Sampling flow rate	1 m <sup>3</sup> /h
Standard filter	Fibreglass tape (width 35 mm, length 30 m) Autonomy for 1,200 samples (>3 years of daily measurements)
Power supply	230V/50Hz (115V/60 Hz)
Housing	19" rack / 6U
Dimensions	483 x 324 x 266 mm (W x D x H)
Weight	15 kg (without pump)
Operating temperature	+5°C to +40°C
Serial link	RS 232
Ethernet (RJ45) and USB port	
On-board web-server with remote ENVEA Connect™ interface	

## OPM TECHNICAL SPECIFICATIONS

Technology	Light scattering (*)
Max. concentration	0-1000 µg/m <sup>3</sup>
Range of size	0.3-10 µm
Lower detection limit	1 µg/m <sup>3</sup>
Memory Capacity	6 months (1 minute average)
Temporal resolution	1 second
Dimensions (WxDxH)	230 x 370 x 200 mm
Flow	2.5L/min

(\*) Light scattering technologies applied to particle mass concentration measure can be affected by aerosols chemical composition and atmospheric conditions & should be subject to operator interpretation.

## OPTIONS & ACCESSORIES:

- **OPM module** for optical real-time measurement
- US EPA and EU-CEN compliant sampling inlets
- **Temperature-regulated sampling tube (RST):**  
1 m, 1.5 m, 2 m, 2.75 m, compliant with **CEN PM10 Directive**
- Max 2 ESTEL electronic boards with:
  - 4 independent analog inputs / outputs
  - 4 remote control inputs
  - 6 dry contacts outputs
- External pump assembly: diaphragm (9.5kg), rotary vane (4.7kg)
- Easy to install span calibration module for automatic and programmable calibrations
- Field connection kit for leak and zero test (on RST tube)
- Laboratory connection kit for leak and zero test (on MP101M)
- Bead flowmeter for flow calibration
- HEPA filter for zero test

## SAMPLING INLETS



PM 10 - EN 12341  
PM 2.5 - EN 14907



PM10  
US-EPA



Adapter  
PM 2.5 VSCC  
US-EPA



TSP  
US-EPA

Other sampling inlets for research or specific applications are available upon request, such as PM1 for Europe and US-EPA



Automatic and programmable  
Span Calibration Module

