Air Quality
Monitoring Systems

Automatic and Real-time Suspended Particulate Monitor – MP101M

DTN partners with ENVEA to provide organizations worldwide with the best technologies and systems and help different authorities and institutions, both public and private, to monitor air quality and achieve their goals and objectives.

Applications

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

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 (ß 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
- 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

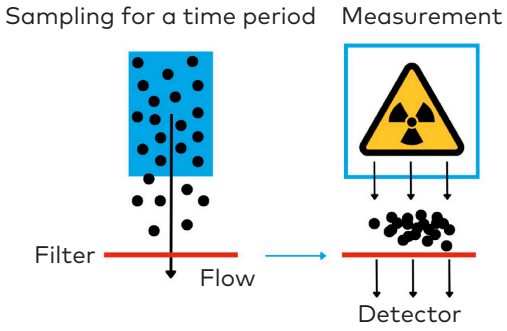
The MP101M, based on the beta attenuation measurement technique, determines the particles concentration by measuring the amount of radiation that a sample, collected on a fiber tape, absorbs when exposed to a radioactive source.

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.

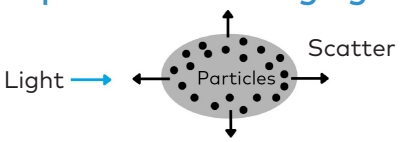
The OPM's (Optical Particulate Monitor) principle is based on the measurement of the light scattered by the particles. A powerful algorithm is applied to continuously convert the signal into mass concentration.

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



Options and accessories

- OPM module for optical real-time measurement
- U.S. 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

Tech specs

Measurement ranges	0-10 000 µg/m³ (user-selectable and programmable)
Lower detectable limit	0.5 µg/m³ (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
Sample flow-rate	1 m³/h
Standard filter	Fiberglass tape (width 35mm, 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 Tech specs

Technology	Light scattering (*)
Max. concentratiaon	0-1000 µg/m³
Range of size	0.3-10 µm
Lower detection limit	1 µg/m³
Memory capacity	6 months (1 minute average)
Temporal resolution	1 second
Dimensions	230 x 370 x 200 mm (W x D x H)
Flow	2.5L/min

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