

Dekati[®] Mass Monitor DMM

- Real-time simultaneous particle mass and number concentration measurement
- Diesel and gasoline exhaust PM concentration
- Pre- and post after-treatment device measurements



Excellence in Particle Measurements

Dekati®

Mass Monitor DMM



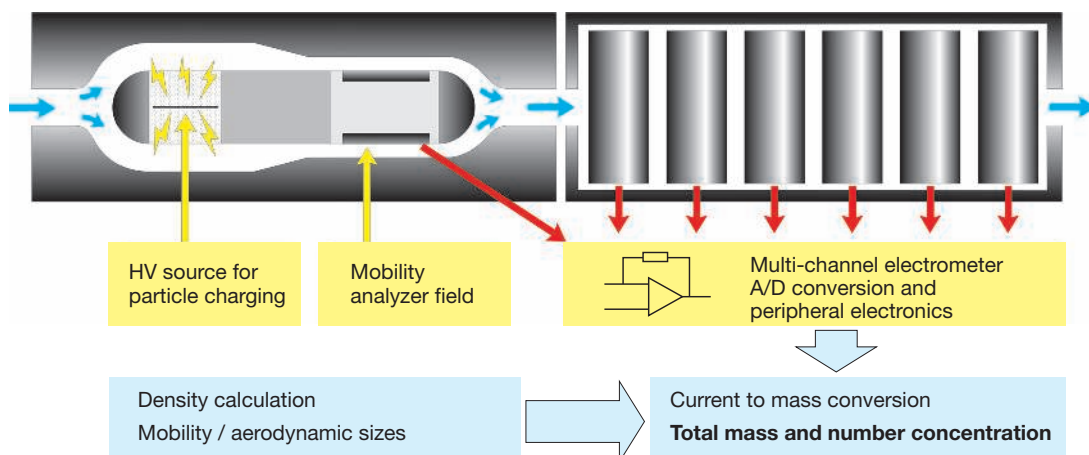
Dekati® Mass Monitor (DMM) measures PM emissions from diesel and gasoline vehicles in real-time. Connected either to a tailpipe sample conditioning system or a CVS tunnel, DMM provides second-by-second information on vehicle PM mass and number emissions. DMM is well suited for measuring emissions from all types of engines. The detection limit is as low as $1 \mu\text{g}/\text{m}^3$, time response 2-3 seconds and repeatability better than with gravimetric measurement. Since the operation of the DMM is based on electrical detection of the particles, DMM measures the concentration of both solid and volatile particles in the sample, not only black carbon.

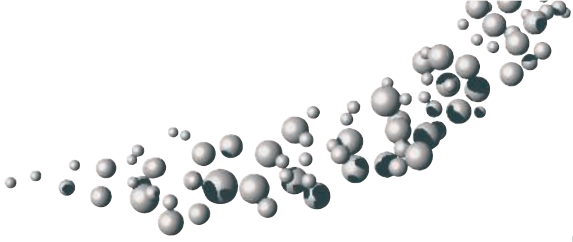
Operating principle

The operation of the Dekati® Mass Monitor is based on the well-known ELPI™ technology. The unit consists of a diffusion charger with an integrated particle mobility size measurement and an inertial 6-stage cascade impactor

with electrical detection. The particles first enter the charger where they gain a precisely determined charge level. After charging a static electrical field is used to deflect smallest particles to the charger mobility electrode; an electrometer is used to measure this current. This construction is a particle mobility size analyzer and it is used to estimate the particle density.

After the charger, particles enter a 6-stage inertial impactor where they are size classified based on their aerodynamic particle size. Each impactor stage is connected to a sensitive electrometer that measures the amount of charge brought to the stage by the charged particles. This amount of charge is directly proportional to the amount of particles in each particle size range. The information gained from the impactor is then combined together with the information from the particle mobility size analyzer to calculate the effective density of the particles. This enables accurate determination of particle mass concentration.





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Features

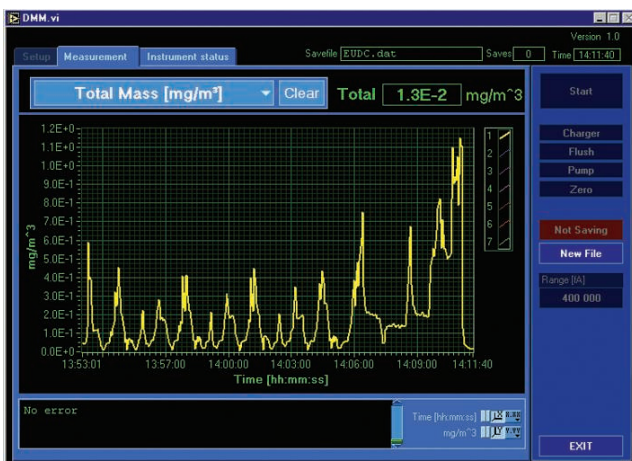
- Real-time particle mass and number concentration measurement
- Information on particle size distribution: MMD (Mass median diameter) and GSD (Geometric standard deviation)
- Measures all particles (PM), not only black carbon
- Excellent repeatability and correlation with gravimetric measurements
- Outstanding sensitivity down to $1 \mu\text{g}/\text{m}^3$
- Can be used in CVS and tailpipe measurements in both pre- and post-DPF conditions with a suitable sample conditioning system, e.g. the DEED or FPS.
- Robust system with low in-use costs
- Easy service and maintenance
- Provided with DMMVI software for instrument control and data storage
- Analogue inputs and outputs available for data integration into existing systems
- Possibility for full integration into existing test cell systems

Accessories

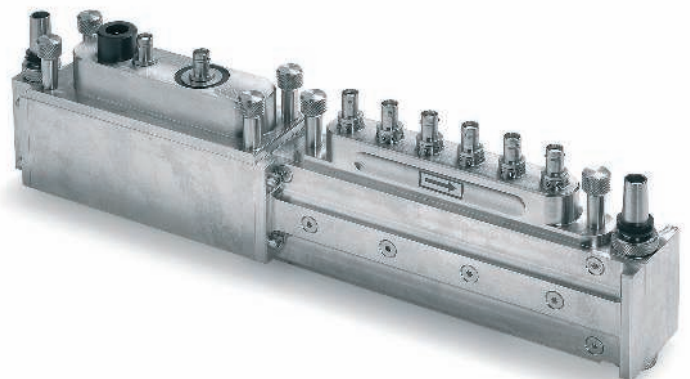
- Vacuum pumps for 230/100/110V
- Dekati® Diluter for CVS tunnel sampling
- Dekati® Fine Particle Sampler (FPS) for tailpipe sampling
- Dekati® Engine Exhaust Diluter (DEED) for sample conditioning according to EURO5b/6 legislation
- 19" mobile instrument rack

Applications

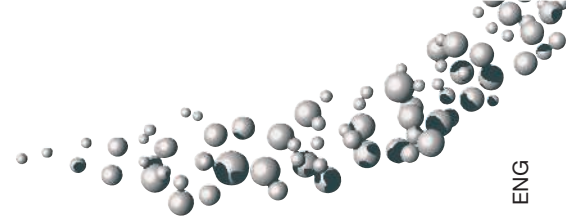
- Engine development and ECU tuning
- After-treatment device development; simultaneous tailpipe measurement upstream and downstream of catalyst or DPF for real-time efficiency measurements
- Raw exhaust or CVS tunnel measurements
- Steady state, transient and on-board testing



Total tailpipe mass concentration during EUDC cycle



Dekati® Mass Monitor impactor and charger unit



*Dekati® Mass Monitor
with impactor hatch
opened*

Specifications

Particle size range	0 – 1.2 µm
Number of stages	6 impactor stages + one mobility channel
Flow rate	10 lpm
Lowest stage pressure	100 mbars absolute pressure
Operation temperature	5-40 °C
Operation humidity	0-90 % R.H.
Sampling frequency	1 Hz
Concentration range	From 1 to 1000 µg/m ³ (up to 5000 µg/m ³ for short periods of time), or 100 – 10E+06 #/cm ³
DMM unit dimensions	Outer cabin: W x H x L 485 x 266 x 420 Installable to 19" rack, 6 U height: W x H x L 450 x 266 x 400 mm
Unit weight	40 kg
Inlet	G 3/8" female, sampling hose connection provided
Outlet	G 3/8" female, NW-16 connector provided
Input/output	RS-232 serial connector for computer interface, USB adapter provided 0-5 V analog mass concentration output 2 x 0-5 V analog inputs
Required accessories	Vacuum pump (e.g. IA-904) and a suitable vacuum hose (IA-203) Computer for instrument control Sample conditioning system
Computer requirements	MS-WINDOWS XP™, Vista™, 7™ or 8™
Pump requirements	7 m ³ /h at 100 mbar

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Dekati Ltd. is specialized in the design and manufacture of innovative fine particle measuring and sampling devices. Since its founding in 1994, Dekati has become the technological market leader in producing fine particle measurement instrumentation for various applications and thousands of customers. ●