

Environmental Measurements

- Real-time monitoring of particle size distribution and concentration
- PM10, PM2.5, PM1.0 measurements
- Detailed gravimetric size distribution and chemical analysis
- Particle research



Excellence in Particle Measurements





Air Quality Monitoring and Atmospheric Aerosol Studies

Interest in air quality monitoring and atmospheric aerosol research has been continually increasing over recent decades when correlations between adverse health effects and particle concentration, size and composition have been discovered. Particles have also been found to have an effect on climate and in spite of extensive research they still remain an uncertainty in climate change modeling. Regulated environmental particle concentration values vary slightly depending on the region and local legislation but typically focus on PM10 and PM2.5 values. Since particle size, concentration and composition vary with measurement location, a more detailed analysis of the particles may be needed to determine the source and characteristics of the particles in the air.



Dekati® Solutions

Dekati Ltd. has provided high quality instrumentation for fine particle measurements successfully for over 20 years. Our measurement solutions for ambient aerosol measurements include both air quality monitoring and atmospheric aerosol research instruments. All our instruments are designed and manufactured in Finland according to strict quality requirements and provided with a standard two year warranty.

Dekati® particle measurement solutions for air quality monitoring and atmospheric aerosol research include:

- Real-time monitoring of particle size distribution and concentration
- PM10, PM2.5 and PM1.0 measurements
- Detailed gravimetric size distribution analysis

Each and every Dekati® Instrument is thoroughly tested with traceably calibrated flow, pressure, temperature, voltage, current and particle measurements. Additionally, all Dekati® Instruments go through rigorous type-approval tests, including instrument response tests for changes in temperature, pressure and humidity. The robustness of our instruments is guaranteed through misuse tests making sure that the instruments are ready for any environment. These procedures ensure that every instrument shipped operates according to their specifications and the measurement data is reliable and reproducible.

Dekati® Instruments

- All units original Dekati® design
- Over 20 years of experience in aerosol instrumentation
- All units manufactured and calibrated in Finland
- All units individually calibrated
- Provided with two year warranty
- Robust structure designed for use in field conditions
- Software and data processing spread sheet always included

Dekati® Calibration Services

Dekati provides detailed and accurate calibration and maintenance services for all Dekati® Products. Our instrument calibration services include:

- Arrival inspection of the instrument in its arrival condition
- Cleaning and overhauling of the instrument
- Change of seals, filters and other aging parts
- Adjustment of electronics (if any)
- Calibration of the instrument
- Final operation and/or reference test
- Detailed report on the service
- New calibration data sheets





Dekati® PM10 Impactor



PM10 Inlet

PM10, PM2.5 and PM1.0

Dekati® PM10 Impactor is an ideal tool to measure PM10, PM2.5 and PM1 mass concentrations both in outdoor and indoor air. The Dekati® PM10 Impactor size classifies and collects different sized particles on filters analyzed after the measurement for gravimetric mass size distribution and/or chemical composition. The unit is manufactured from stainless steel to ensure reliable operation in long term use even in harsh environments. Either aluminium or polycarbonate substrates can be used on the impactor stages as a particle collection surface depending on the preferred particle analysis method. The required sample collection times depend on PM levels in the air and also on the sensitivity of the chosen particle analysis method. Typical sampling times range from 1 to 7 days.

Dekati® PM10 Impactor Features

- PM10, PM2.5 and PM1.0 detection
- Gravimetric, chemical, SEM/TEM analysis of size classified particles
- 10 and 30 lpm flow rate versions available
- Robust stainless steel construction
- Can be heated up to 200 °C
- Complete sampling setups available
- Calibrated with aluminium and quartz fiber filters
- Tested for EN12341

Dekati® PM10 Impactor Setup

- Dekati® PM10 Impactor
- Pump with flow control
- PM10 inlet



Particle Mass Size Distribution

DLPI+ (Dekati® Low Pressure Impactor) is a widely used and well characterized cascade impactor for detailed particle size distribution analysis. This impactor gives information on particle size distribution in 14 size fractions 16 nm – 10 µm. The size classified particles can be collected on different material substrates, such as aluminium or polycarbonate, for either gravimetric or chemical analysis. The DLPI+'s robust construction makes it a reliable choice even for long term monitoring in different environments.

Each individual DLPI+ impactor unit is calibrated for exact flow rate and impactor stage cut points to ensure accuracy of the measured data. The DLPI+ design is the same as in the impactor used in the ELPI®+ (Electrical Low Pressure Impactor) enabling an easy upgrade from DLPI+ into a full ELPI®+ system for real-time particle size distribution measurements.

DLPI+ Features

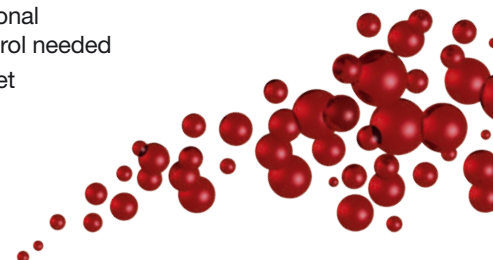
- Wide particle size range; 16 nm – 10 µm
- Particle size distribution in 14 size fractions
- 10 lpm sample flow rate, Classic DLPI available for 30 lpm
- Integrated impactor low pressure measurement and adjustment
- Gravimetric, chemical, SEM/TEM analysis of size classified particles
- Stainless steel stages for operation even in harsh environments
- Sampling from up to 180 °C with High Temperature DLPI+
- Excellent calibration data
- Can be upgraded into a full ELPI®+ system for real-time data
- Complete measurement solutions for different types of measurement applications available from Dekati Ltd.



*Dekati®
Low Pressure
Impactor
DLPI+*

DLPI+ Setup

- DLPI+ Impactor
- Vacuum pump, no additional flow control needed
- PM10 inlet





ELPI®+ Features

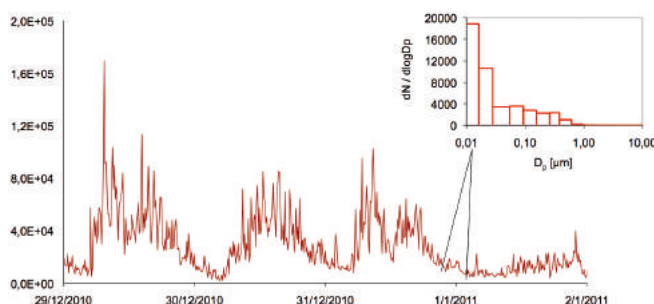
- Real-time particle size distribution and concentration measurement 6 nm – 10 µm
- Wide operational concentration range allows ambient air measurements in remote areas and direct measurements from a local particle source
- 10 Hz sampling rate for immediate and detailed detection of both short and long time-scale changes in the particle concentration and size distribution
- Possibility for chemical characterization of size classified particles to determine particle source and detailed characteristics of particles e.g. toxicity of the airborne particles
- High Resolution ELPI®+ for detailed particle size resolution, up to 500 size channels available
- Fully functional standalone operation suitable also for long term monitoring
- ELPI®+ data integration into external data logging systems
- Measurements according to VDI guideline 3867, Blatt 6

ELPI®+ Setup for Air Quality Measurements

- ELPI®+ unit
- Vacuum pump
- PM10 inlet
- Dekati® Dryer for removing water from aerosol sample (optional)

Real-time Size Distribution and Concentration

The Dekati® ELPI®+'s wide particle size and concentration range makes it an ideal instrument for measuring air quality both in high and low polluted areas. Since the ELPI®+ utilizes impactor technology for real-time measurements it also allows post-measurement chemical analysis of the size classified and collected particles. This unique feature enables e.g. determination of the source of different sized particles in addition to gaining detailed information on real-time particle number size distribution. The standalone operation of the ELPI®+ allows both long term environmental monitoring and short term air quality analysis.



Particle number concentration in Tampere city center

ELPI®+ with Dekati® Dryer

The Dekati® Dryer DD-600 is a Nafion® dryer used to remove water from the aerosol before it enters the ELPI®+. This dryer is specifically designed and calibrated for particle measurements. The use of the Nafion® technique eliminates the need to change or dry silica enabling long term continuous measurements. The Dekati® Dryer Setup, DD-603, includes the Dekati® Dryer, a PM10 inlet and all necessary connectors for a complete air quality measurements setup. Drying air for the Dekati® Dryer can be drawn with the same vacuum pump that is used to operate the ELPI®+ unit eliminating the need for an additional source for drying media.



*Dekati® Dryer
for removing water*

Air quality measurement station for gases and ultra-fine and fine particles in the city of Talca, Chile



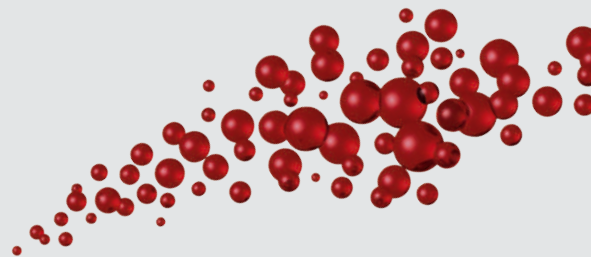
Atmospheric Aerosol Research

The Dekati® ELPI®+ is currently used in the following research areas:

- Long term monitoring or particle concentration and size distribution
- Road side measurements
- Source apportionment by studying the chemical composition or TEM/SEM pictures of the size classified particles after the real-time measurement
- Particle phase state studies
- Condensation/Ion sink calculations
- Hygroscopicity studies using the Dekati® Dryer
- Particle density and shape studies
- Flux measurements
- And many more



	Dekati® ELPI®+	Dekati® High Resolution ELPI®+	Dekati® DLPI	Dekati® DLPI+	Dekati® PM10
Size Range	6 nm - 10 µm	6 nm - 10 µm	30 nm - 10 µm	16 nm - 10 µm	< 10 µm
Number of Size Fractions	14	100 or 500	12	14	3
Analysis	Real-time, 10 Hz (also option for gravimetric)	Real-time, 1 Hz (also option for gravimetric)	Gravimetric	Gravimetric	Gravimetric
Option for Chemical Analysis	Yes	Yes	Yes	Yes	Yes
Sample flow rate	10 lpm	10 lpm	30 lpm	10 lpm	10 or 30 lpm



Dekati Ltd. is specialized in the design and manufacture of innovative fine particle measuring and sampling devices. Since its founding in 1993, Dekati has become the technological market leader in producing high-class fine particle measurement instrumentation for various applications and thousands of customers.

For more information, please contact: sales@dekati.fi

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