

# SIZE DISTRIBUTIONS WITH HIGH SENSITIVITY AND RESOLUTION FOR NANO- TO MICROMETER PARTICLES

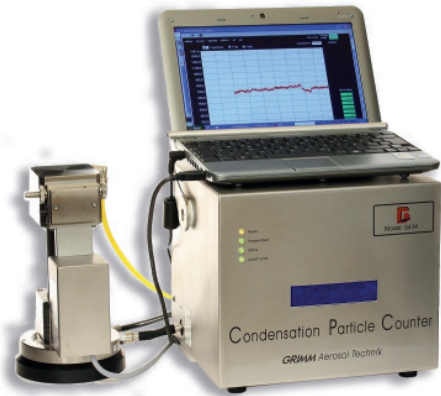


## SCANNING MOBILITY PARTICLE SIZER (SMPS+C)

The GRIMM SMPS+C systems are designed to measure size distributions in the size range 5 – 1094 nm. The SMPS+C system includes a

- Condensation Particle Counter (CPC) and a
- Differential Mobility Analyser (DMA).

Both components are carefully manufactured and calibrated, and thoroughly tested within our ISO 9001 quality management system.



GRIMM DMAs feature the Vienna-Type design (Reischl et al. 1997, Winkelmayr et al. 1990), well known for highest resolution and lowest diffusional losses even for small particles. GRIMM offers a flexible design of the Vienna-type DMA with two electrodes of different length to accommodate a variety of experimental needs.

For the detection we offer two assorted product lines of CPCs, optimized either for stationary or mobile use and described in detail on separate data sheets.

### YOUR BENEFITS

- Size distributions from 5 to 1094 nm
- Concentrations of up to  $10^8/\text{cm}^3$
- Two Vienna type DMAs
- Rugged and reliable
- Butanol safety features (anti-spill, odor removal)
- Fully automated use with our software
- Analog inputs for climatic sensors
- Self-test upon start-up assures highest reliability

### APPLICATIONS

- Fundamental aerosol research
- Inhalation & exposure studies
- Environmental & climatic studies
- Studies on NP growth, coagulation & transport
- Filter testing
- Engine exhaust studies
- Mobile aerosol studies
- Workplace monitoring



SMPS+C

M-DMA  
5 - 350 nm

L-DMA  
10 - 1094 nm

Ni-63, ADBD  
Am-241

REAL-TIME

# TECHNICAL DATA

## SPECIFICATIONS

Size Range	5 – 350 nm (M-DMA), 10 – 1094 nm (L-DMA)
Concentration Range	See data sheet of connected CPC
Size Resolution	Stepping mode: 45 channels, as standard. Optionally up to 255 channels. Scanning mode: 64 channels per decade, Logarithmic spacing.

### Air Flow System

Flow Rates of Sample Air	0.3 l/min
Flow Rate of Sheath Air	3.0 l/min
Flow Control	Through differential pressure sensors across a heated orifice. Insensitive against variations in ambient temperature and pressure
Aerosol Carrier Gas	Air and inert gases

### Liquid Flow System

Working Fluid	1-butanol (Reagent-grade p.A.) for activation of hydrophobic and hydrophilic particles
Condensate Removal	Continuous drain with a micro-pump into drain bottle

## FUNCTION

CPC / SMPS Control	USB or serial, 9-pin D connector, ASCII based command set
Data Recording	Directly on PC (GRIMM universal software 5477), optionally on USB stick (for mobile systems only: PCMCIA SRAM 4MB memory card)
Analog Inputs	Port for 3 optional analog climatic or gas sensors, plug and play

## HANDLING

Ambient Temperature	10 to 35°C (50 to 95°F)
Ambient Humidity	0 to 95% RH, noncondensing
Pressure	± 50 mbar to ambient pressure
Power Requirements	85 - 264 VAC wide range power supply, 47 - 440 Hz, or 120 - 370 VDC

## GRIMM U-DMA VIENNA TYPE DIFFERENTIAL MOBILITY ANALYZER

Dimensions	Inner Diameter of Outer Electrode 40 mm Outer Diameter of Inner Electrode 26 mm
Output of HV Module	5 – 10 000 V, positive inner electrode (negative available on request)
Input of HV Module	0 – 10 V, from CPC or DMA controller
Safety Shutdown of HV	Automatic when opening the DMA
Sensors (internal)	Temperature, absolute pressure, and pressure difference across impactor nozzle

This technical data might be changed without notice.