



Knowledge Beyond Measure.

Scanning Mobility Particle Sizer (SMPS™) for Ambient Air Monitoring

Model 3938W50-CEN



Ultrafine particle monitoring you can count on for years

This particle sizer enables air quality monitoring of ultrafine particles (UFPs) following the harmonized measurement of particle size distribution in the atmosphere according to CEN/TS 17434:2020. The data provided by the Scanning Mobility Particle Sizer SMPS™ can be easily integrated into monitoring networks. Together with the sampling system and optional Condensation Particle Counter (CPC), monitoring stations have access to a complete solution to monitor ultrafine particles.

Applications

Designed for continuous air quality monitoring. Thanks to its exchangeable components it can also be adapted to support other measurement campaigns.

- Air quality monitoring of ultrafine particles
- Environmental chamber studies
- Indoor air quality studies
- Health effect studies
- Basic aerosol research

Features and Benefits

- Extended particle size range from 10 to 800 nm in a single scan
- New Wide-Range Differential Mobility Analyzer 3083 is based on TROPOS Vienna-type DMA
- Compliant with CEN/TS 17434:2020 when combined with appropriate sampling system, aerosol humidity and temperature sensor, and software
- Model 3938W50-CEN automatically includes a calibration performed by a facility of the European Center for Aerosol Calibration and Characterization (ECAC), as an independent reference. If desired, the same instrument can be purchased without this calibration included (model 3938W50), and the calibration obtained separately
- Scan time down to 1 minute: capture dynamic aerosol distributions (for example, near airports)
- Capable of providing a common log of particle data, relative humidity and temperature when used with the Aerosol Humidity and Temperature Sensor RHT3000



Specifications

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SMPS™ Settings and Requirements

Aerosol Flow Rate	1 L/min
Sheath Flow Rate	2 to 15 L/min, user-selectable
Recommended Setting, Sheath: Aerosol	5 : 1 (L/min)
Particle Size Range	10 to 800 nm
Measurement Time	1 to 10 minutes, user-selectable
Working Fluid for CPC	n-butyl alcohol (butanol)

Particle concentration range: up to 10^7 particles/cm³.
The recommended upper limit for the total particle number concentration entering the spectrometer is 10^5 particles/cm³ according to CEN/TS 17434.

Particle resolution: Measured at 128 channels/decade. Ability to adjust resolution to 64, 32, 16, 8 or 4 channels per decade for display and data export. Number of total size channels varies by configuration and settings.

At standard settings (64 channels/decade, 10 to 800 nm scan range, 5 : 1 sheath : aerosol ratio), scan includes 122 channels.

DMA voltage: Standard configuration is negative high voltage on DMA center electrode. An Electrostatic Classifier 308200 is optionally available for dual polarity.

Ambient Operating Conditions

Temperature	10 to 35°C
Pressure	75 to 105 kPa
Humidity	0 to 90%, non-condensing Temperature and pressure affect the available particle size range.

Data Acquisition

Continuous with PC-based software. The optional monitoring module allows automatic export of multiple data sets (raw and final concentrations), auto-recovery after power outage, and correction of data for particle losses occurring within the sampling system.

Aerosol Neutralizer Options - Ordered Separately

3077A	370 MBq (10 mCi), Kr-85, Half-life of 10.8-year
3088	Soft X-ray <9.5 keV ~8,760 operating hours
6005931	Lead shielding column for 3077/3077A placed inside 3082 classifier

Accessories

3750200	Sampling System for Atmospheric Aerosol
RHT3000	Aerosol Humidity & Temperature Sensor
3032-EC	Vacuum source
AIM11SMPSMONTRIAL	SMPS™ Monitoring Software Trial: permits current TSI® customers already using AIM 11 to temporarily access Monitoring-specific software features
AIMSMPSMONITOR	SMPS Monitoring Software

Communication & User Interfaces

Ethernet to communicate with monitoring software: 8-wire RJ-45 jack, 10/100 BASE-T, TCP/IP). Configurable for automated (DHCP) or manual network settings.

RS-232 connecting CPC to Classifier
Embedded touch display for local diagnostics

Power Requirements

3750 CPC	200 W
3082	200 W

Dimensions (H x W x D/Weight)

3082	40 × 28 × 40 cm / 14.2 kg
3083	47 × 13.2 × 15.9 cm / 8.5 kg
3750	27.5 × 18.3 × 29.9 cm / 6.6 kg
Assembled 3938W50-CEN SMPS system	67.5 × 40.5 × 40 cm / 29.3 kg*

* Neutralizer weight is additional. There are two suitable neutralizers:
the soft x-ray 3088 (1.6 kg), or the Kr85 source 3077A (0.4 kg).
The 3077A may be used with a lead shield (6 kg).

Refer to separate product sheets for descriptions and specifications of individual components.

To Order

Specify	Description
3938W50-CEN7	SMPS compliant to CEN/TS 17434 (7 nm CPC)
3938W50-CEN10	SMPS compliant to CEN/TS 17434 (10 nm CPC)
3077A	370 MBq (10 mCi), Kr-85, Half-life of 10.8-year
3088	Soft X-ray <9.5 keV~8,760 operating hours
6005931	Lead shielding column for 3077/3077A; placed inside 3082 classifier
3032-EC	Vacuum pump 230 V (EU)
3032	Vacuum pump 110V
3750200	Sampling System for Atmospheric Particles
RHT3000	Aerosol Humidity and Temperature Sensor
AIM11SMPSMONITOR	Aerosol Instrument Manager SMPS software, monitoring version
3750-MKIT	Maintenance kit for CPC
3750-WKIT	Wick replacement kit for CPC

Specifications are subject to change without notice.

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