Knowledge Beyond Measure.

NanoScan SMPS™ Nanoparticle Sizer

Models 3910

Expanding nanoparticle measurement capabilities.

The TSI NanoScan SMPS™ Nanoparticle Sizer 3910 opens the door to routine nanoparticle size measurements. This revolutionary sizer uses scanning mobility particle sizing technology in a portable, easy to use, lightweight and battery-powered instrument. NanoScan SMPS™ enables investigators to collect valuable nanoparticle size data from more sites. Derived from core TSI® technologies, the NanoScan SMPS™ is an innovative, cost effective solution for real-time nanoparticle size measurements.

Applications

The NanoScan SMPS™ is suitable for a variety of applications, including:

- General applied research
- Occupational hygiene/workplace exposure monitoring
- Indoor/outdoor air quality investigations
- Nanotechnology/nanoparticle applications
- Combustion/emission research
- Mobile studies
- Health effects/inhalation toxicology
- Point source identification

Features and Benefits

Size distributions down to 10 nm

- Two measurement modes:
  - SCAN: real-time size distributions
  - SINGLE: single size concentration monitoring
- One-minute size distributions; 1 second single size data
- Simple, stand-alone operation
- Built-in data logging
- Small and portable
- ~Six hour battery life, with hot swappable rechargeable batteries
- Concentrations up to 1,000,000 particles/cm^3
- NanoScan Manager software package
- No radioactive materials

Advanced Nanoparticle Sizing Technology

Nanoparticle Size Distributions
Nanotechnology is an active area of scientific research due to the wide variety of potential applications. However, nanoparticle emissions, generated from a wide variety of common sources, are considered a potential indoor/outdoor air quality hazard. To date, the cost and size of nanoparticle sizing instruments have prohibited many users from investigating nanoparticles and nanoparticle exposure. TSI's NanoScan SMPS™ provides investigators the opportunity to move into the field of nanoparticle exposure measurement and nanotechnology.

Portability
Move your measurements out of the lab. Small, lightweight and battery powered, the NanoScan SMPS™ is ideal for applications that demand portability like on-road measurements, work place surveys, field studies, and point source identification. This cost effective instrument also opens up the possibility of simultaneous temporal and spatial measurements with multiple units. Expand the number of places that you make nano-measurements.

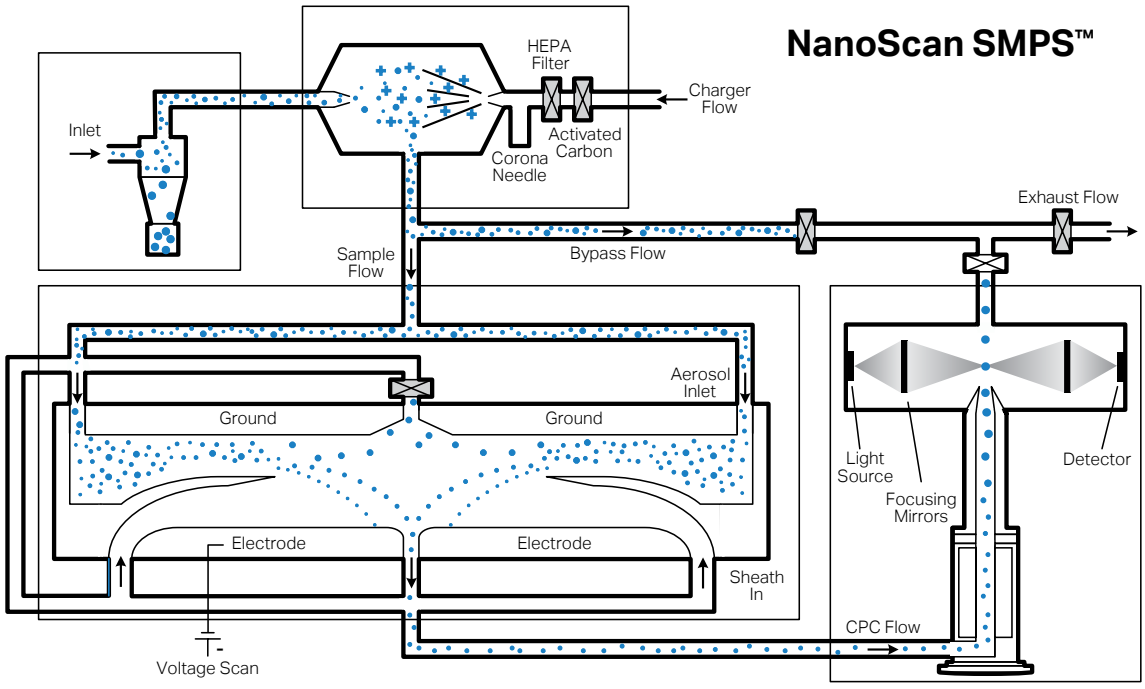
A Sophisticated Instrument in a Simple Package
The NanoScan SMPS™ combines sophisticated technology and ease of use into a practical measurement tool. Four key design components:

1. Pre-conditioner: A cyclone is used to remove larger particles

2. Particle Charger: A patented unipolar charger charges more nanoparticles than bipolar chargers, and eliminates the need for radioactive material.

3. Size Selector: A Radial Differential Mobility Analyzer (RDMA) is used for size resolution and accuracy and helps keep the instrument compact and lightweight.

4. Particle Counter: An isopropanol-based Condensation Particle Counter (CPC) provides accurate measurements at high and low concentrations using a working fluid acceptable in workplace environments. The instrument can be operated off of a rechargeable wick with a ~six hour life, or for longer measurements, an external liquid reservoir can be used.



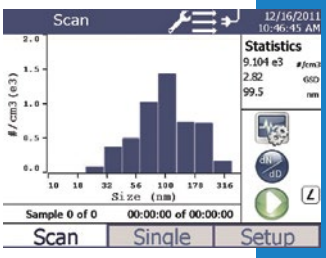
NanoScan SMPS operating principal

Streamlined Data Collection and Analysis

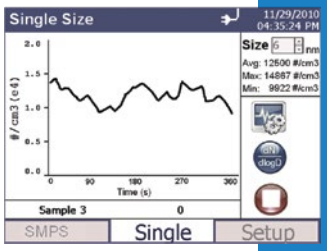
Easy Acquisition of Valuable Data
Data collection begins at the touch of the instrument display. No need for a dedicated computer to setup the instrument or save data. The user interface is intuitive and easy for new users to operate. NanoScan SMPS™ displays real-time number, surface area or mass weighted size distributions, concentrations and statistics. From the front panel users can program start time, number of samples and other parameters. A full suite of instrument diagnostics data can be viewed from the Setup Screen.

Single-Size Monitoring
In addition to nanoparticle size distributions, the NanoScan SMPS™ can be used to collect second-by-second concentration data at a single mobility diameter. If the nanoparticle source of concern generates 50 nm particles, you can easily monitor 50 nm mobility diameter with 1-second time resolution to keep a real-time record of concentration levels.

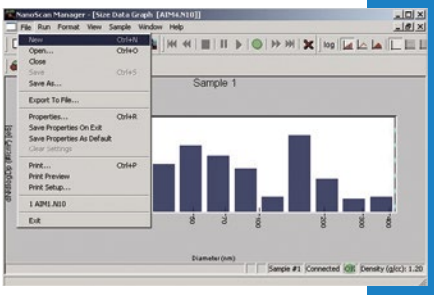
Streamline Data Analysis with NanoScan Manager Software
Generate presentation-ready graphs and tables in minutes with this easy to use, menu-driven software package. Data can be quickly weighted by number, surface area and mass. Full statistical suites are calculated on every data set. A handy playback feature allows visual review of collected data. Users can focus the display window on the area of interest to provide greater detail. Peak size and concentration can easily be pinpointed by selecting a data hot spot on the graph. TSI's NanoScan Manager Software is Microsoft® Windows® 7 64-bit compatible and can be used to control instrument operation and for data collection.



Screen shot of NanoScan SMPS during nanoparticle size distribution measurement

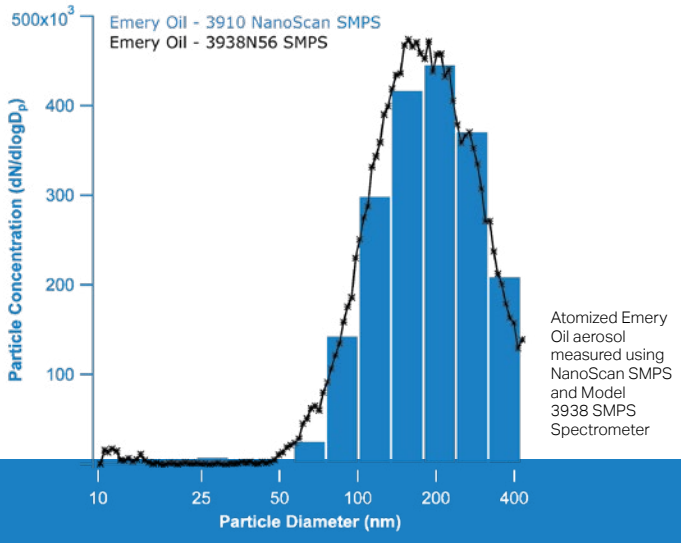


Screenshot of NanoScan SMPS during single size monitoring

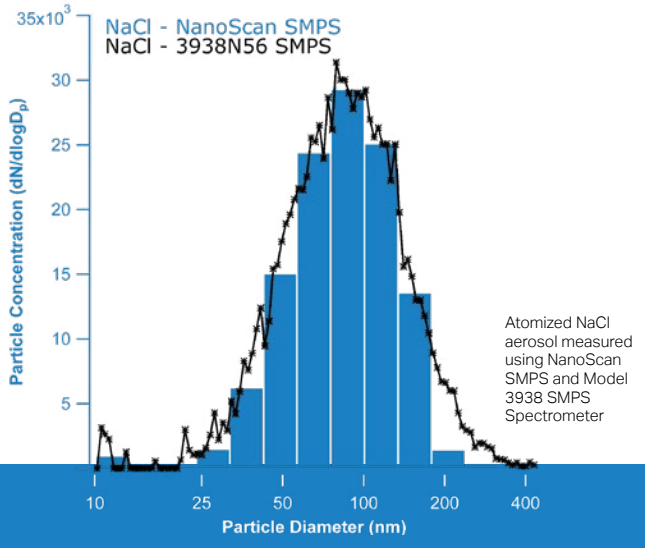


NanoScan Manager software

Comparison to a TSI Scanning Mobility Particle Sizer™ (SMPS™) Spectrometer



Atomized Emery Oil aerosol measured using NanoScan SMPS and Model 3938 SMPS Spectrometer



Atomized NaCl aerosol measured using NanoScan SMPS and Model 3938 SMPS Spectrometer

Specifications

NanoScan SMPS™ Nanoparticle Sizer

Model 3910

Operating Features

Measurement Modes	SCAN – size distributions SINGLE – single size concentration monitoring
Size Range	10 to 420 nm
Size Channels	13
Measurement Time	Size distributions: 60 s (45 s upscan, 15 s downscan) Single size mode: 1 s
Particle Concentration	100-1,000,000 particles/cm^3
Flow Rate	0.75lpm ± 20% inlet; 0.25lpm ±10% sample
Condensing Liquid	Reagent grade (99.5% or better); isopropyl alcohol
Fill System	Wick only [~8 hrs operation @ 21°C (70°F)]; Optional external bottle
Zero Count	≤0.1 particles/cm^3
Data Storage Option	3-8 days on-board memory; USB storage drive option
Display	Color touchscreen
Communications	USB
Warm-up Time	<15 minutes
Vacuum Source	Internal
Dimensions (H x W x D)	11.9 in x 11.2 in x 11 in (30.2 cm x 28.4 cm x 28 cm)
Weight	<8kg (<17.5 lbs); without batteries; <9kg (<19.5 lbs); with 2 batteries
Power	100 to 240 VAC, 50/60 Hz; AC Adaptor or battery power
Env. Operating Conditions	10-30°C: 0-40% RH or greater depending on dew point; up to 80% with optional diffusion drier
Software	NanoScan Manager Software
Battery Performance	2 batteries ~6 hrs; hot swappable, rechargeable
Compliance	CE, CSA and ROHS
Calibration	Recommended annually

Specifications are subject to change without notice.

TSI® Quality and Support

TSI® strives to meet or exceed our customers' needs and expectations through continual improvement of our processes, products and services. Our Quality System is registered to ISO 9001:2008 and TSI uses NIST traceable analytical tools and NIST traceable standard reference materials to check out and calibrate instruments. Each instrument that leaves the factory is built for longevity, backed by TSI's commitment to quality, and supported by our worldwide network of committed TSI® professionals.

Measure Size Over Three Orders of Magnitude

For a portable, affordable option to measure real-time particle size distributions from 10 nm to 10 microns, the NanoScan SMPS™ 3910 can be paired with the Optical Particle Sizer 3330.

NanoScan SMPS™ 3910

+

Optical Particle Sizer 3330

To Order

NanoScan SMPS™

Specify	Description
3910	NanoScan SMPS Nanoparticle Sizer with NanoScan Manager Software

Accessories

Specify	Description
80168	Battery
801685	Battery Charger
3062	Diffusion Drier
801622	Sampling Probe
3910-Accy	NanoScan SMPS Maintenance Kit (includes stylus, wick, zero count filter, tyson tubing)
8016	Isopropyl Alcohol 16 30ml Bottles

Knowledge Beyond Measure.

TSI Incorporated - Visit our website **www.tsi.com** for more information.

USA	Tel: +1 800 874 2811	**India**	Tel: +91 80 67877200
UK	Tel: +44 149 4 459200	**China**	Tel: +86 10 8219 7688
France	Tel: +33 1 41 19 21 99	**Singapore**	Tel: +65 6595 6388
Germany	Tel: +49 241 523030		

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