

Aerosol Generators and Dispersers

Collectively, our generators and dispersers produce particles in the range of 0.001 to 200 μm from liquids, suspensions or powders.

Visit <http://www.tsi.com/aerosol-generators-and-dispersers/> for the full overview.

Monodisperse Generators

This type of generators is useful anywhere a precise, monodisperse aerosol is needed. Specific applications include calibrating particle counters, testing various filters, and studying size-dependent particle properties.

Model	3480	3482	3940A and 3082	3475	1520/1530
Particle Size Range (μm)	<0.002 to >0.15		0.001 to 1.0	0.1 to 8.0	0.8 to 12 (dry particles) / 15 to 90 (droplets)
Particle Concentration (particles/ cm^3)	$\sim 10^7$	Up to 10^7	$< 10^5$	$> 10^6$	$\sim 10^3$ (at 1 μm) to $\sim 10^4$ (at 10 μm)
Nominal Flow Rate (L/min)	0.2 to 2.5		0.2 to 3.5	3.5 to 4	5 to 25

Electrospray Aerosol Generator

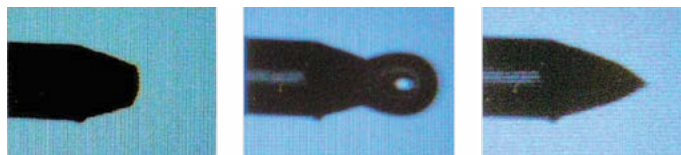
Models 3480, 3482

Produces monodisperse particles as small as 2 nm.

The Electrospray Aerosol Generator (EAG) uses a patented technique to produce high concentrations of monodisperse, submicrometer particles in the range from 2 to >150 nm in diameter. The EAG produces such small, uniform particles by pushing a charged liquid solution or suspension through a capillary tube and exerting an electrical field on the liquid at the capillary tip. The electrical field pulls the liquid from the capillary, forming individual droplets. Air and CO_2 mixed with the droplets evaporate the liquid, and the remaining particles are neutralized by an ionizer. The result is a neutralized, monodisperse aerosol. Applications for the EAG include instrument calibration, analysis of nanomaterial suspensions, macromolecular analysis, and nano-aerosol studies.

The classic model 3480 uses a pressure capsule fluid delivery system and radioactive Po-210 neutralizer.

The next generation model 3482 features a built-in touch screen, soft x-ray neutralizer, and syringe pump liquid delivery system.



The 3482 produces particles down to 2 nm. The camera (3482) or viewing window (3480) allows you to easily see the capillary tip during operation: (1) no liquid flow; (2) with liquid flow but no electric field; (3) with liquid flow and electric field (showing the formation of the Taylor cone).

Accessories (available separately)

Specify	Description
3482-SPUMP	Syringe Pump
3482-SPUMP-ACC	1 mL Syringe with Connectors
3482-SPUMP-ACC KIT	Syringe Pump and Accessory Kit
3482050	Model 3482 Accessory Kit
348002	Replacement Po-210 Aerosol Neutralizer for Model 3480
1031535	3480 Maintenance Kit
1036008	3480 Accessory Kit

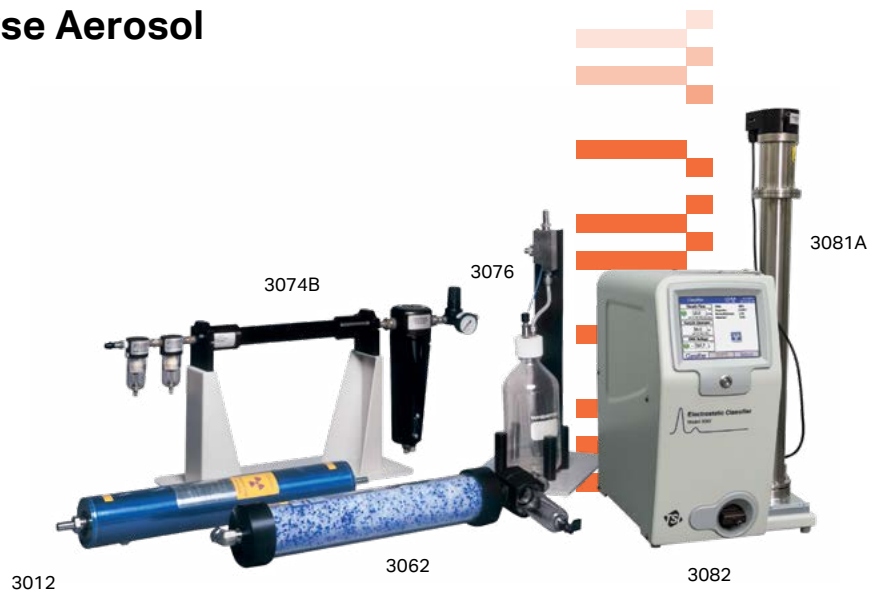
Submicrometer Monodisperse Aerosol Generation System

Model 3940A

A complete system for generating monodisperse, submicrometer particles.

The Submicrometer Monodisperse Aerosol Generation System gives you the ability to produce monodisperse particles from 0.01 to 1.0 μm in diameter. The system includes:

- Electrostatic Classifier 3082
- Long DMA 3081A
- Aerosol Neutralizer 3077A
- Aerosol Neutralizer 3012
- Filtered Air Supply 3074B
- Constant Output Atomizer 3076
- Diffusion Dryer 3062
- Dilution Bridge 1035575



Electrostatic Classifiers

Model 3082

Primary-standard instruments that produce highly monodisperse, submicrometer aerosols.

The 3082 Electrostatic Classifiers are primary standard aerosol instruments that give you highly monodisperse, submicrometer aerosol from a polydisperse source. Our classifiers are first-principles instruments (i.e., they are not calibrated against other particle instruments), and have been used in a variety of aerosol generation and particle sizing applications with highly repeatable results.

The Electrostatic Classifier uses a Differential Mobility Analyzer (DMA) to classify and select out a narrow, predictable size band. TSI® provides a choice of four DMA columns. You can purchase any column and interchange them on the same platform, giving you unprecedented versatility. The platform is available separately for use with your own DMA, just connect the tubing and enter the DMA dimensions on the touch screen.

Particles classified with our Electrostatic Classifiers range in size from 0.001 to 1.0 μm . For monodisperse aerosol generation, simply set the touch screen for the desired particle size.



Electrostatic Classifiers are included in our SMPS™ systems. Models 3082 and 3081A are part of the 3940A Submicrometer Monodisperse Aerosol Generation System. DMA columns are interchangeable. For restrictions, consult local authorities on the use of Aerosol Neutralizers. The Nano DMA was developed in cooperation with the University of Minnesota Particle Technology Laboratory and Gerhard Mercator University. Refer to United States Patent Number 6,230,572.

Electrostatic Classifiers and DMAs

Specify	Description
3082	Electrostatic Classifier
3081A	Long DMA (10 nm to 1 μm)
3085A	Nano DMA (2 to 150 nm)
3083	Wide-Range Vienna DMA (10 to 800 nm in a single scan)
3086	1 nm DMA (1 to 50 nm)

Accessories (available separately):

Specify	Description
3077	Aerosol Neutralizer
3077A	Aerosol Neutralizer (for High Concentrations/Charges)
3088	Advanced Aerosol Neutralizer (Soft X-Ray)
6005931	Lead Shielding Column

Condensation Monodisperse Aerosol Generator

Model 3475

Generates high-concentration, monodisperse aerosols quickly and accurately.

The Condensation Monodisperse Aerosol Generator (CMAG) is a Sinclair-LaMer-type instrument that produces high-concentration, monodisperse aerosol particles. It is well-suited for challenging HEPA and ULPA filters, seeding wind tunnels, conducting inhalation studies, or other applications requiring monodisperse particles in high concentrations.

The CMAG generates liquid or solid particles from a variety of oils, waxes, and other materials. It generally produces concentrations greater than 10^6 particles/cm³, and operates at a flow rate of 3.5 - 4 L/min. Particles can be fluorescently or radioactively labeled. Monodisperse particles can be generated by condensing volatilized oil or wax onto solid seed particles; in this case, the final monodisperse size is within the range of 0.1 - 8 μ m, and is user-adjustable. The CMAG can also generate particles via homogenous nucleation, resulting in a polydisperse aerosol. The CMAG can operate for long periods without interruption. Aerosol may be monitored for concentration using the optional Process Aerosol Monitor 3375.

Please specify voltage requirements at time of order.



CMAG Accessories (available separately):

Specify	Description
3375	Process Aerosol Monitor

