

BRECHTEL

**Solutions for your
research challenges**

SEMS Scanning Electrical Mobility Spectrometer

Model 2100



Fast particle number size distribution measurements up to 2 microns

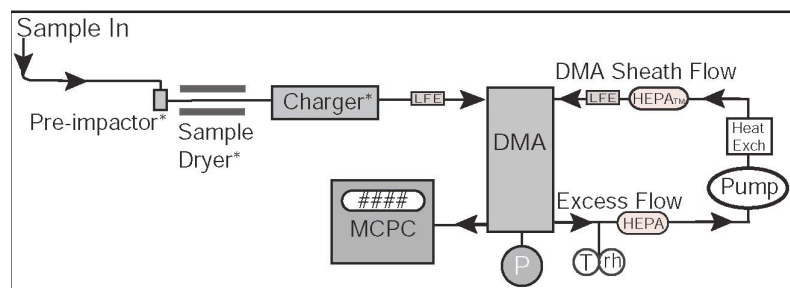
Features:

- Broadest available particle size range - select up to 2 micron diameter
- Recirculating DMA sheath flow eliminates external pumps
- Fast CPC response and DMA scan times down to a few seconds
- Precise volumetric airflow measurement with laminar flow elements
- Easy to use software displays Number, Area & Volume size distributions
- Fully automated, long-term unattended operation
- Dry sizing package for low relative humidity operation
- High voltage design practically eliminates arcing problems
- Monodisperse particle selection and scanning software with inversion
- Real-time temperature, relative humidity and pressure measurements

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Providing Aerosol Measurement Solutions

Schematic of SEMS



*denotes optional equipment

Specifications

Parameter	Value
Selectable particle diameter size range	0.005-0.3; 0.005-1.0; 0.01-2.0 μm ^{NOTE 1}
Size resolution (set by $Q_{\text{aer}}/Q_{\text{sheath}}$)	Variable (28:1 typical)
Scan time range	5 secs to > 1 hour
Sheath flow range	2.5-12 lpm
Aerosol sample flow range	0.1 to 2.0 lpm
Particle concentration range	$1\text{-}10^8 / \text{cm}^3$
Range of high voltage	0-6,000 Volts
Pre-impactor cut size diameter	0.5, 1.0 or 2.0 μm
Communications	Ethernet and RS-232
CPC working fluid	1-Butanol
Operating temperature	15-35 °C
Operating pressure	200-1,000 mb ^{NOTE 2}
Physical size	19 x 13 x 22 in/48 x 33 x 56 cm
Weight	35 lbs/16 kg
Power usage	80 watts (85 to 230 VAC)

Notes:

1. 2 micron sizing with SEMS-DMA-UG option.
2. Only with SEMS-Exp options.

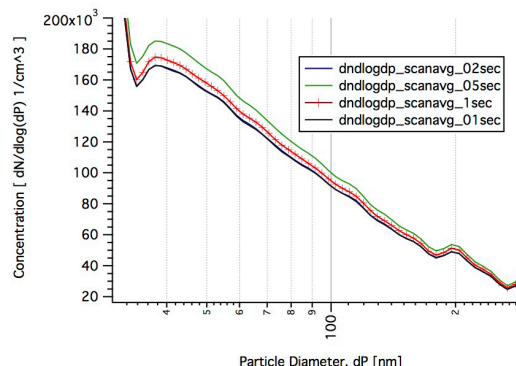
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*Some products may be shown with optional accessories, which are sold separately. Items shown may not be to scale.

Publications:

Xerxes F. Lopez-Yglesias, Ming Chee Yeung, Stephen E. Dey, Fred J. Brechtel and Chak K. Chan (2014), Performance evaluation of the Brechtel Mfg. Humidified Tandem Differential Mobility Analyzer (BMI HTDMA) for studying hygroscopic properties of aerosol particles, Aerosol Science and Technology, July 2014; DOI: 10.1080/02786826.2014.952366

Ambient size distribution measurements with 60 size bins for total scan times between 6 and 60 seconds



Applications

- Continuous monitoring of ambient number size distributions
- Laboratory flow-tube reactor studies
- Cloud condensation nucleus studies
- Visibility reduction studies
- Aerosol health impacts
- Long-term climate and air quality monitoring
- Sampling conditions with highly transient aerosol concentrations
- Vertical profiles of number distributions from aircraft

How to Order

Part No.	Description
2100	Scanning Electrical Mobility Sizing (SEMS) System
SEMS-DMA-UG	Upgrade DMA for 0.01 to 2 μm diameter size selection range
DMA-0.3um	Miniature Differential Mobility Analyzer (DMA) column for 0.005-0.3 micron diameter size selection in SEMS (available only with SEMS purchase)
8008	Particle Round Jet Impactor (0.5 micrometer cut size, 0.6 lpm flow)
8009	Particle Round Jet Impactor (1.0 micrometer cut size, 0.6 lpm flow)
8010	Particle Round Jet Impactor (1.0 μm cut size, 2.0 lpm flow)
9000	Aerosol charge neutralizer (Requires Polonium-210 sources)
9001	Non-radioactive charger (available 2021)
9002	Soft X-ray charger
9200	Aerosol Generation System
9202	Automated Aerosol Generation System: includes Model 9200 AGS plus Auto-3 way Valve Chassis
ACC-Dryer	Sample flow dryer
SEMS-Exp115	External pump package, 115V
SEMS-Exp230	External pump package, 230V
SEMS-PPSoft	Post-processing software to allow off-line inversion
RackS	Rackmount kit for 2100 SEMS
SEMS-Kit	Maintenance kit for 2100 SEMS