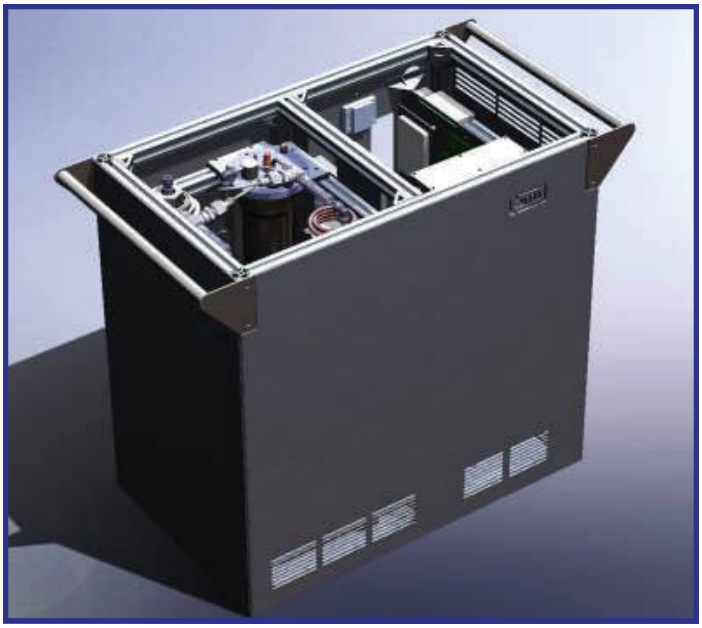
BMI: Humidified Tandem Differential Mobility Analyzer

Our HTDMA System is comprised of two SEMS systems and a novel diffusion-based humidifier. The first SEMS selects dry particles of known size while the second determines the size of the grown droplets.

The HTDMA measures the water uptake (growth factor) of monodisperse particles over a wide range of relative humidities.



Key Features:

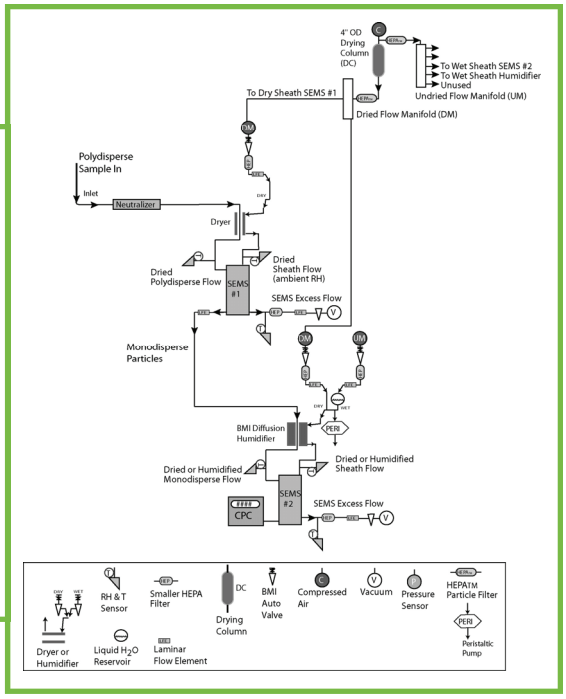
- Fully automated growth factor measurements in multiple sampling modes
- Integrated control hardware with easy access to sensor outputs
- Rapid diffusion-based humidification system operating over the 2-93% RH range
- Multiple particle detection options
- Aerosol flow rates of 0.2-1 lpm
- Sheath flow rates 2.5-10 lpm
- Use of ceramic materials as high voltage insulators
- Reduced arcing potential
- Easy-to-use software including multiple sampling modes, data inversion, calibration mode and residence time

HTDMA User Interface & Operation

The HTDMA allows size-resolved measurements to be made of the water uptake properties of aerosols. This information is critical for understanding how particles act as cloud condensation nuclei and how particles grow and deposit within the human respiratory system. HTDMA data have found important applications in research on the climate impacts of aerosols.

Fully automated and easy-to-use software allows the user to configure the HTDMA to step through a pre-selected series of monodisperse dry particle sizes with multiple RH's tested at each size. The cycle may be repeated automatically for as long as desired.

A built-in calibration system that introduces known chemical composition particles into the HTDMA may be purchased as an option to validate operation.



aerosol solutions

For more information about our HTDMA System, please visit our website at www.brechtel.com/Aerosol/Products/ or contact our sales department by email at bmi_info@brechtel.com or 510-732-9723

*Specifications subject to change without notice

Dated: 9/9/2009

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Technical Specifications

	Parameter	Value	Unit	Accuracy	Precision	Time Resolution
Air Flow Systems	Neutralizer Flow Rate	0.2-1.0	lpm	0.05	0.03	1 second
	SEMS Polydisperse Flow Rate	0.2-1.0	lpm	0.05	0.03	1 second
	SEMS Sheath Flow Rate	2.0-10.0	lpm	0.05	0.03	1 second
	SEMS Monodisperse Flow Rate	0.2-1.0	lpm	0.05	0.03	1 second
	SEMS Excess Flow Rate	2.0-10.0	lpm	0.05	0.03	1 second
	CPC Sample Flow Rate	0.2-0.7	lpm	0.015	0.03	1 second
	SEMS Humidifier Dry Flow Rate	2.0-10.0	lpm	0.05	0.03	1 second
	SEMS Humidifier Wet Flow Rate	2.0-10.0	lpm	0.05	0.03	1 second
	Impactor Flow Rate (if used)	1.0	lpm	0.05	0.03	1 second
	Pressurized Air Supply (10 psi min)	5.0-20.0	lpm	-	-	-
	Vacuum Air Supply (15" Hg min)	6.0-22.0	lpm	-	-	-
Sizing/Counting System	Impactor D50	0.3-1.0	µm	0.05	0.03	-
	SEMS Sizing (cylindrical geometry)	0.02-3.0	µm	0.01	0.01	1-6 seconds
	SEMS Sizing Resolution	1-10	%	-	-	-
	SEMS Center Rod Outside Diameter	0.06241	m	-	-	-
	SEMS Outer Rod Inside Diameter	0.07226	m	-	-	-
	SEMS Center Rod Length	0.339	m	-	-	-
	CPC Sizing	0.01-3.0	µm	-	-	0.1-5 seconds
	CPC Counting	$0.01\text{-}10^{5}$	cm^{-3}	10%	5%	0.1-5 seconds
Humidification System	Relative Humidity	2-93	%	-	0.8	15 seconds
	RH control stability at 80% RH	1.2	%	-	-	-
	Time to Reset RH set point by 10%	180	seconds	-	-	-
	Time to Reach 93% RH from 2%	600	seconds	-	-	-
	Time to Reach 80% RH from 2%	200	seconds	1.0	0.8	-
Other System	Pressure	100-1000	mb	10.0	5.0	30-180 seconds
	Temperature	-40-60	°C	1.0	0.5	1-6 seconds
Operating System	Pressure	200-1000	mb	-	-	-
	Temperature	15-35	°C	-	-	-
	Humidification Systems	2-93	%	-	-	-
Physical	HTDMA Length (depth)	38	cm	-	-	-
	HTDMA Width	94	cm	-	-	-
	HTDMA Height	64	cm	-	-	-
	HTDMA Weight (estimated)	35	kg	-	-	-
Electrical	SEMS #1	50	watts	-	-	-
	Humidification System	80	watts	-	-	-
	SEMS #2	50	watts	-	-	-
	CPC	30	watts	-	-	-
	HTDMA Total Power Requirements (estimated, no pumps)	210	watts	-	-	-
	Operating Voltage	100-220	VAC	-	-	-

bmi aerosol solutions

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