



Aerosol Particle Mass Analyzer

Model APM-3600

This unique analyzer classifies aerosol particles by mass using a true “first-principle” measurement technique.



APM-3600 Analyzer and Control Unit

Methodology

This new and innovative measurement method classifies single aerosol particles based on their mass-to-charge ratio.

The APM utilizes two cylindrical electrodes rotating about a common axis at the same angular speed. Charged particles enter the annular gap rotating at the same speed as the electrodes. As a voltage is applied to the inner electrode, the particles experience directly opposing centrifugal and electrostatic forces. These forces are in balance for particles of a specific mass, allowing the particles to traverse through the APM.

Because the APM classifies particles based on their intrinsic mass, the technique is not dependent on particle size, shape factor, orientation, or properties of the surrounding gas.

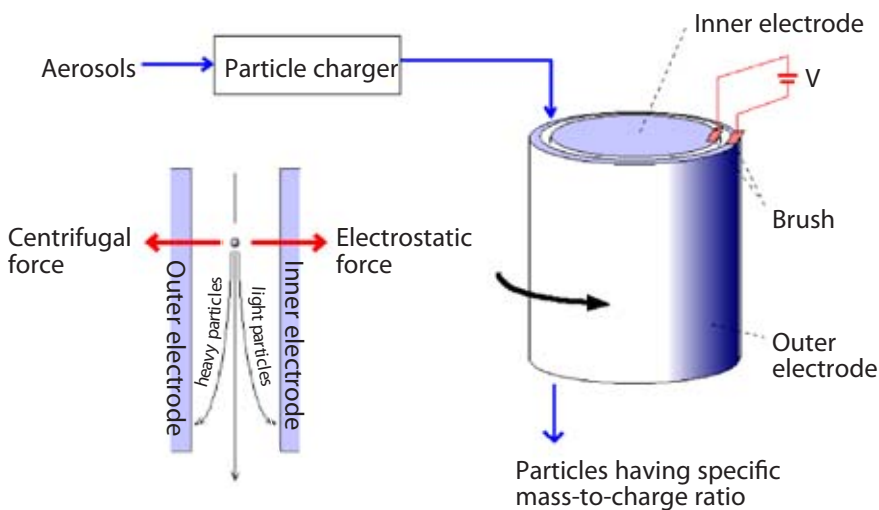
Applications

- Mass distribution measurements
- Particle density research
- Monodisperse aerosol generation

Specifications

Product Name	Aerosol Particle Mass Analyzer
Model	APM-3600
Classification Method	Based on the balance between centrifugal force and electrostatic force
Particle Mass Range	0.01~100 femtogram (Equivalent to approx. 30nm~580nm for particle density of 1g/cm ³)
Classification Accuracy	Within ±10% of the center mass
Maximum Rotation Speed	Up to 9,500 rpm (with dry air)
Maximum Voltage	Up to -2,000V (with dry air)
Rotating Cylinder Dimensions	Inner cylinder diameter: 100mm, Outer cylinder diameter: 104mm Cylinder length: 250mm (Gap between cylinders: 2mm)
Sampling Flow Rate	1 L/min.
Control Method	Panel or PC Control (Manual/Remote Switch)
Control Function	Number of rotations and applied voltage
Panel Display Function	Applied voltage / Number of rotations / Differential pressure between inlet and outlet (panel display)
Input / Output Function	Input: Settings of applied voltage and number of rotations Output: Applied voltage, number of rotations, and differential pressure between inlet and outlet
Dimensions / Weight	Main Unit: 550(W)×400(L)×900(H) mm / 125Kg Control Unit: 430(W)×350(L)×180(H) mm / 10Kg
Power Supply	AC115V/50/60Hz 15A

Operating Principle of APM-3600 (excludes particle charge equipment)



APM Force Balance Equation

$$mr \omega^2 = q \frac{V}{r \ln(r_2/r_1)}$$

m = particle mass

ω = APM angular speed

r = particle location relative to axis of rotation

q = particle charge

r_1, r_2 = radii of inner & outer electrodes

V = applied voltage

CAUTION For safe and trouble-free operations, please read Operation Manual carefully before using the instrument.



ETA Associates

119 Foster Street, Bldg #6 • Peabody, MA 01960

Tel: (978) 532-1330 • Fax: (978) 532 7325 • www.ETAassociates.com • eta@ETAAssociates.com