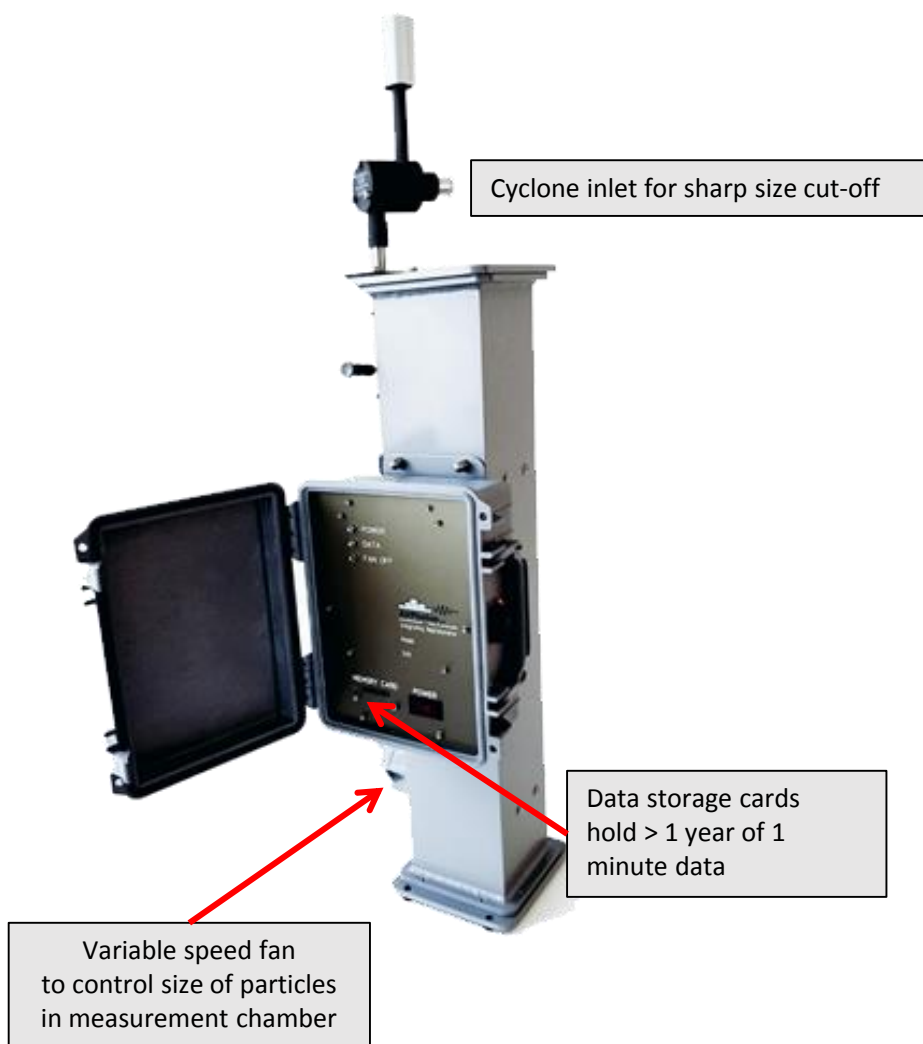


AeroExplorer Size Scanning Nephelometer (IN102) Specification Sheet



Size Scanning Nephelometer Specifications (IN102)

- Dimensions: 9" x 10" x 24"
- Mass: 6.8 Kg
- Power requirements: 15W @120VAC
- Light source: LED
- Operating temperature: -30 to +45°C
- Optional external pump
- Wavelengths: 450, 532, and 632 nm
- Angular range: 7 to 90° ; 90 to170°
- Full scattering = forward + back scattering
- Standard range: 0.0-3,000Mm⁻¹
- Extended range: 20,000Mm⁻¹ (upon request)
- Lower detectable limit: <0.15 Mm⁻¹ (at 60 sec AVG)
< 0.06 Mm⁻¹ for Backscattering (60 sec AVG)
- Clean air reference option provides automatic zero for span calibration
- Data Interfaces: 4GB SD card, RS485 (optional)
- Syncs to AeroExplorer filter sampling station.
- Environmentally rugged. No need for full enclosure.

Unique size scanning capability

- User sets flow rate protocols that run autonomously
- Internal flow measurement recorded
- 1.5 to 20 lpm feedback stabilized
- Cycling through up to 4 flow rates controls size of particles entering measurement chamber
- Automatic scan of light scattering for up to 4 distinct particle size ranges
- Particle Size Range: PM 1 to PM 10

AeroExplorer Size Scanning Nephelometer (IN102) Unique Data Collection Capability

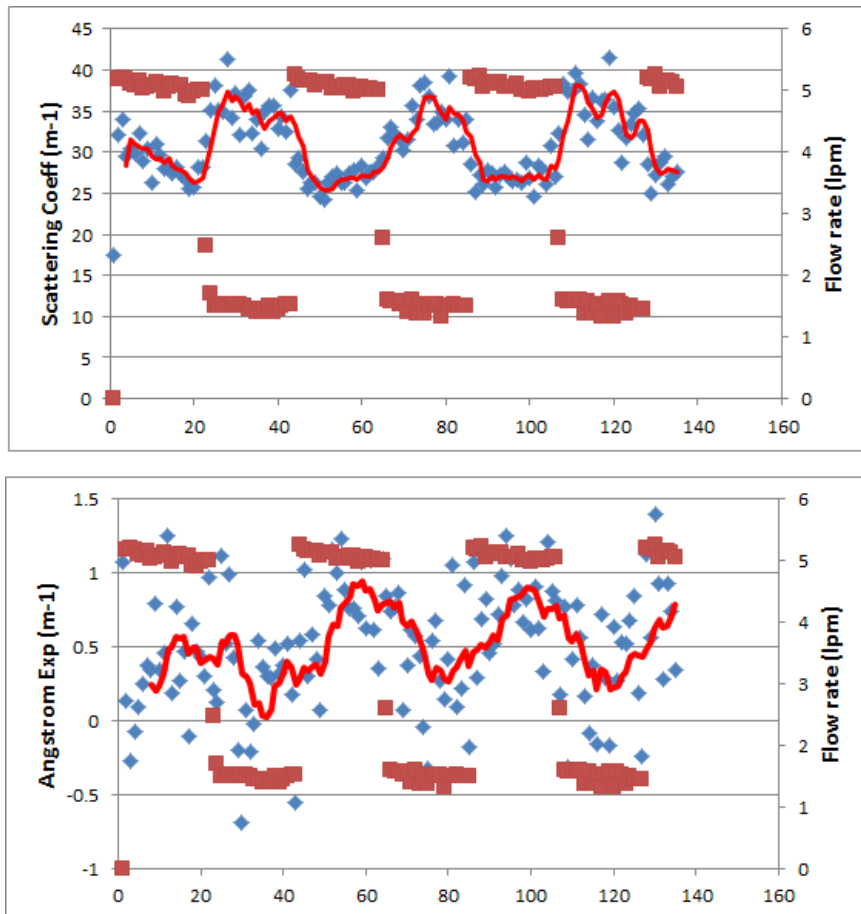


Figure shows time series of total scattering of 532 nm (top) and Angstrom Exponent (bottom) denoted by blue dots, with an 8-point running average through the blue dots denoted by the continuous red curve. The red squares denote the time series of the measured flow rate, with values shown on the right hand y-axis. As the flow toggles between 5 and 1 lpm, allowing smaller and larger particles, respectively, the total scattering jumps between 25 and 35 m⁻¹, and Angstrom Exponents of 0.8 and 0.25, respectively. Confirming that the particles with the smaller cutoff size are scattering less and with a higher Angstrom Exponent than the particles with the larger cutoff size (that also include the smaller particles).

The AirPhoton AeroExplorer size scanning 3-wavelength Integrating Nephelometer (IN102) measures the light scattered by particulate matter, over the angular range 7 to 170°. Using exclusive programmable flow rates with stabilization feedback and proven cyclone inlets, the IN102 toggles between up to 4 particle sizes at selectable time periods. Employing an innovative design, the forward and backward scattering measurements are made completely independently. LED technology allows the nephelometer to make these measurements at 450 nm, 532 nm and 632 nm, and to a sensitivity <math><10^{-7}\text{m}^{-1}</math>. Internal sensors measure and record temperature, relative humidity and pressure.

Small and compact, the 3-wavelength Integrating Nephelometer is enclosed in an environmentally protected case, ready for outdoor deployment in rugged conditions. Power requirements are 25W @ 120 VAC and input power options include: 110/220 VAC, 50/60Hz with provided power supply, and regulated 12VDC from sampling station with provided power connector. Other powering options can be made available upon request such as operating from batteries or solar power. Optional heaters are available at the expense of additional power consumption. Data from the AirPhoton IN102 Integrating Nephelometer is saved in a removable SD memory card and can be linked to an external computer via RS485 using AirPhoton optional accessories. The AeroExplorer nephelometer can be linked to the AeroExplorer filter sampling station to sync data time series.

