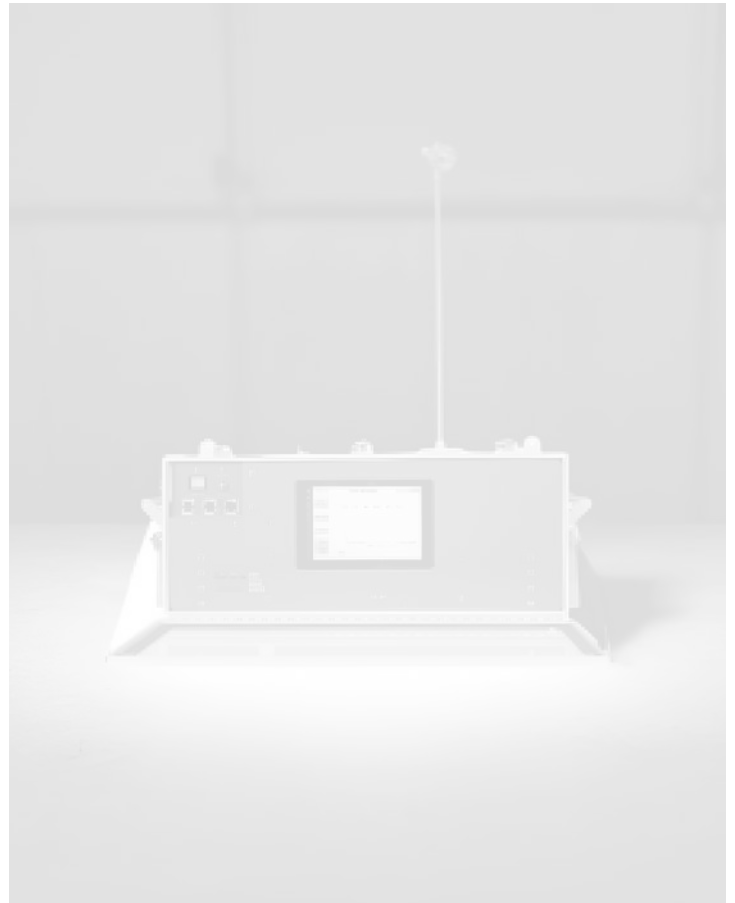
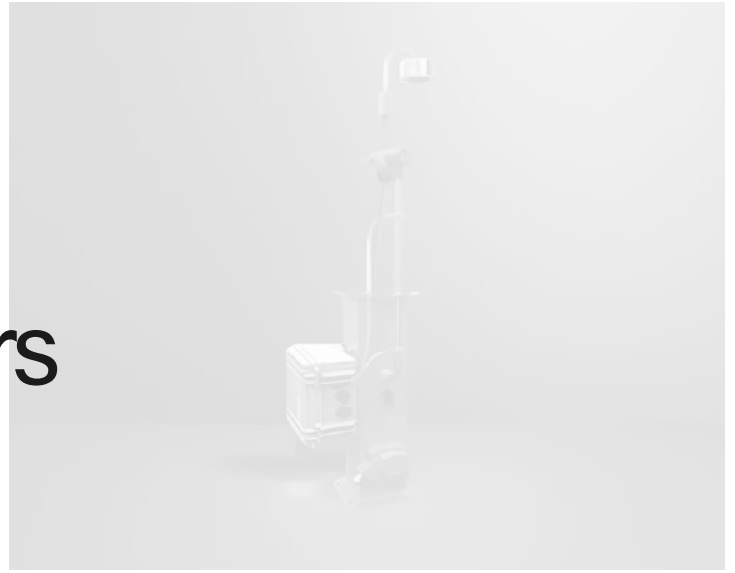


AirPhoton Nephelometers



AirPhoton Nephelometers

AirPhoton nephelometers provide real-time measurements of airborne particulates. Nephelometers use light scattering to measure bulk properties of aerosols including overall size and concentration. We achieve a high degree of sensitivity due to a large angular range and design features which minimize stray light.

All of our nephelometers are weather hardened for field deployment and can operate over a large range of heat and humidity. They are deployed globally by both the SPARTAN network and NASA's MAIA mission.

We produce several different models of nephelometers. Our more advanced models allow for data collection at multiple size cuts. When combined with the GRASP retrieval algorithm these instruments provide a wealth of information beyond what is possible with a standard nephelometer.

Our nephelometer models are described in the following pages. All models can be used with our communications module allowing for internet or cell network control and monitoring of the instrument.

Also note that our philosophy is to collect and measure particles under ambient conditions. We can, at additional cost and upon request, provide a nafion tube system to dry the aerosols



The AirPhoton IN10IT is our basic Integrating Nephelometer, designed for essential aerosol measurement tasks. It is generally used for simple operations, such as determining the bulk properties of aerosols, including the overall amount and size distribution of the particles. This instrument is highly valued for its accuracy and reliability, providing essential data for environmental monitoring and research (page 14).

A photograph of the AirPhoton IN10IT instrument, a compact, boxy device with a vertical tube on top and a base. The image is overlaid with a semi-transparent green filter.

IN10IT

A photograph of the AirPhoton IN102 instrument, which is taller and more complex than the IN10IT, featuring a prominent vertical tube and a cyclone inlet. The image is overlaid with a semi-transparent green filter.

IN102

The IN102 introduces a cyclone inlet to allow for sampling particles in a specific size range. We carefully monitor and adjust the instrument flow rate. In combination with the cyclone inlet, this allows us to measure particles separately at PM_{2.5} and PM₁₀, the sizes most critical for air quality studies. This capability significantly enhances our precision and effectiveness in environmental monitoring and research applications.

AirPhoton IN102Ex is the extended version of the IN102. It adds an additional capability to collect particles down to a PM₁ size bin. Combined with the GRASP data retrieval, this allows us to determine the particulate size distribution, making this model unique for scientific research. The enhanced capabilities of the IN102Ex provide researchers with more detailed and precise data, which is crucial for advanced environmental studies and air quality assessments.

A photograph of the AirPhoton IN102X instrument, showing a close-up of the front panel with various ports and a vertical tube. The image is overlaid with a semi-transparent green filter.

IN102X

IN101T | AirPhoton Basic Integrating Turbo Nephelometer



Our basic nephelometer designed for robust operation under a wide range of conditions. While its rugged design allows for field deployment, it is also a highly sensitive instrument which can be used in the laboratory or modified for use in aircraft. In this regard, the IN101T is highly versatile and can work in different environments and for different purposes.

Capabilities

- Forward and Back Scatter measurements
- Three wavelengths
- High Speed fan

Suggested use

Measurements of all particle sizes at normal ambient conditions as well as for situations where higher pressure intake is required - i.e. high altitudes, clean condition or long inlet tubes.

Specifications

- Dimensions: 9" x 10" x 24"
- Mass: 6.7 Kg
- Operating temperature: -30 to +45°C
- Wavelengths: 450, 532, and 632 nm
- Angular range: 7° to 90° ; 90° to 170°
- Full scattering = forward + back scattering
- Standard range: 0.0-3,000 Mm⁻¹
- Extended range: 20,000 Mm⁻¹ (upon request)
- Lower detectable limit:
 - <0.15 Mm⁻¹ (60 sec AVG)
 - < 0.06 Mm⁻¹ for Backscattering (60 sec AVG)
- Time resolution: 15 sec standard - 1 sec minimum
- Sensitivity: < 0.1 Mm⁻¹
- Clean air reference option provides automatic zero for span calibration
- Data Interfaces: 4GB SD card (possible up to 32GB), RS 485, and USB

IN102 | AirPhoton Size Scanning Nephelometer

The IN102 nephelometer is a highly accurate instrument built to rugged standards that allows for field deployment under a wide range of conditions. Using a cyclone inlet and our feedback flow control system, it can collect and analyze particles in multiple size ranges (PM2.5 and PM10) making this especially useful for air quality studies.



Capabilities

- Forward and Back Scatter measurements
- Three wavelengths
- High Speed fan
- Feedback Flow control system
- Multiple Size Cuts

Suggested use

High precision measurements for various size cut-offs under all conditions for air quality and health and climate applications.

Specifications

- Dimensions: 9" x 10" x 24"
- Mass: 6.8 Kg
- Operating temperature: -30 to +45°C
- Wavelengths: 450, 532, and 632 nm
- Angular range: 7° to 90° ; 90° to 170°
- Full scattering = forward + back scattering
- Standard range: 0.0-3,000 Mm⁻¹
- Extended range: 20,000 Mm⁻¹ (upon request)
- Lower detectable limit:
 - <0.15 Mm⁻¹ (at 60 sec AVG)
 - < 0.06 Mm⁻¹ for Backscattering (60 sec AVG)
- Time resolution: 15 sec standard - 1 sec minimum
- Sensitivity: < 0.1 Mm⁻¹
- Clean air reference option provides automatic zero for span calibration
- Data Interfaces: 4GB SD card (possible up to 32GB), RS 485, and USB

IN102X

AirPhoton Extended Range Size Scanning Nephelometer



Dual pressure taps in inlet to provide accurate flow monitoring

The IN102X extended range nephelometer is built to the same standards as our IN102 instrument. In addition, it has the capability to extend its measurement range down to a separate size bin for PM1. The additional data range allows us to derive a full optical particle size distribution in about 30 – 40 minutes.

Capabilities

- Forward and Back Scatter measurements
- Three wavelengths
- High Speed fan
- Feedback Flow control system
- Multiple Size Cuts
- Determines Size distribution

Suggested use

High precision measurements for various aerodynamic size cut-offs under all conditions for air quality & health and climate applications with ability to obtain size distribution.

Specifications

- Dimensions: 9" x 10" x 24"
- Mass: 6.8 Kg
- Operating temperature: -30 to +45°C
- Wavelengths: 450, 532, and 632 nm
- Angular range: 7 to 90° ; 90 to 170°
- Full scattering = forward + back scattering
- Standard range: 0.0-3,000 Mm⁻¹
- Extended range: 20,000 Mm⁻¹ (upon request)
- Lower detectable limit:
 - <0.15 Mm⁻¹ (at 60 sec AVG)
 - < 0.06 Mm⁻¹ for Backscattering (60 sec AVG)
- Time resolution: 15 sec standard – 1 sec minimum
- Sensitivity: < 0.1 Mm⁻¹
- Intensity: < 0.01 mM⁻¹

- Clean air reference option provides automatic zero for span calibration
- Data Interfaces: 4GB SD card (possible up to 32GB), RS 485, and USB

CR100

AirPhoton Clean Air Reference System CRM100 system



CR100
clean air
reference
module

The clean air reference module comes as a standard reference add-on for all of our nephelometers. This allows for on the fly zero calibration of the instrument. The user can determine how often to collect the reference data. We generally recommend once per day..

Summary of capabilities

		Forward & Back Scatter Measurement	Three Wavelengths	High Speed Fan	Feedback flow control system	Multiple Size Bins	Determine Size Distribution
INT01	Measurements of all particle sizes at normal ambient conditions as well as for situations where higher pressure intake is required.	●	●	●			
INT02	High precision measurements for various size cut-offs under all conditions for air quality & health and climate applications.	●	●	●	●		
INT02X	High precision measurements for various size cut-offs under all conditions for air quality & climate applications with ability to obtain size distribution.	●	●	●	●	●	●