

# Aurora 4000

## Polar nephelometer

The Aurora 4000 is the only commercially available polar nephelometer in the world. The Aurora 4000 uses the same technology as Ecotech's successful Aurora 3000 Integrating three wavelength nephelometer but provides the additional benefit of being able to automatically measure scattering in different angular sectors by varying its backscatter shutter's position.

The Aurora 4000 polar nephelometer uses a programmable backscatter shutter which automatically changes its angle from 0° (total scatter) to 30°, 60°, 90° (backscatter) providing precise measurements of scattering across sectors with angles greater than these (custom sectors available on request).

This unique feature allows the analysis of parameters involved in climate studies such as the particle phase function used in global radiation balance measurements.

Furthermore it is relevant for general air quality studies such as pollution sources comparison, providing real-time indicators of changes in particle composition.



### Increased accuracy

- Automatic optical reference calibration
- Enhanced high powered LED light-source increases measurement accuracy
- Facilitates a wide measuring range ( $\sigma_{sp} < 0.0$  to  $> 20\,000\text{ Mm}^{-1}$ )

### Ease of use

- Compact and portable
- Span calibration with FM-200
- Internal sample heater enabled the elimination of humidity effects (RH:  $< 40\%$  to  $< 90\%$ )
- Automatic zero check or adjust, automatic span check or automatic zero & span check available in intervals of 1, 3, 6, 12, 24 hrs or weekly.
- Data downloader and firmware upgrade software supplied on CD

### Low cost of ownership

- Internal 12V heater eliminates the need for expensive external inlet heater
- Long lasting LED light source

## Specifications

|                              |  |
|------------------------------|--|
| Parameter:                   | Light scattering coefficient ( $\sigma_{sp}$ )<br>at (450, 525 or 635nm)                 |
| Ranges:                      | <0.0 to >20 000 $Mm^{-1}$  |
| Lower Detectable limit:      | <0.3 $Mm^{-1}$ (60 second averaged data)   |
| Secondary Measurements:      | Sample air temperature, chassis temperature,<br>relative humidity and sample pressure    |
| Intensity Function:          | 9-170°   |
| Programmable Shutter Angles: | 30°, 60°, 90° (customizable)   |
| Flow rate:                   | ≈5 l/min   |
| Operating Temperature:       | -20 to 45°C  |
| Operating RH:                | 10 to 95%  |
| Optics:                      | Reference brightness measurement   |
| Light source:                | Stable LED light source (U.S. patent 7, 671, 988)  |
| Wavelength:                  | 525nm, 450nm & 635nm   |
| Operating Voltage:           | 12 VDC (including 100-240 VAC 50/60 Hz power converter)<br>(60 watts with heater active) |
| Dimensions:                  | 6.7in x 27.5in x 8.5in(L x W x H) (170 x 700 x 215mm)                                    |
| Weight:                      | 25lbs (11.4kg)   |

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## Communications/Data logging

|                    |   |
|--------------------|---|
| Outputs:           | 4 analogue outputs (2 voltage & 2 current)<br>and RS 232 multidrop serial port                  |
| Filtering:         | Kalman (digital adaptive filter),<br>Moving average (30 seconds) or no filter                   |
| Stored Parameters: | Date & Time, $\sigma_{sp}$ (635, 525 or 450), Air temp,<br>Enclosure temp, RH, Pressure, Status |

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## Options

- Sample bypass
- Additional sample tube
- Roof flange kit
- Rain cap with insect screen
- Gas Calibration kit
- Wall mount bracket

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## Applications

- Studies on Backscatter and forward scatter
- Global radiation balance studies
- Particulate monitoring studies including extra data on particulate characterization