

Aurora™ 1000

INTEGRATING NEPHELOMETER



Easy to use and maintain, the Aurora™ 1000 lowers the cost of ownership for aerosol light scattering, visibility and particulate monitoring instrumentation.

The Aurora™ 1000 Integrating Nephelometer uses a single wavelength for scattering coefficient visibility measurements at one of three user specified wavelengths.

ECOTECH, through collaboration with globally renowned atmospheric research institutes, now provides the scientific community with the most advanced commercially available nephelometers.

Using a single wavelength LED light source, the Aurora™ 1000 can be equipped with any of the following light sources:

- 450 nm (blue) for fine and ultra fine particulates (wood fires, automobiles)
- 525 nm (green) for visibility
- 635 nm (red) for large particulates (e.g. pollen, sea salt).

BENEFITS

- Simplified automatic calibration using internal valves, ideal for remote locations. Fully automatic zero check or adjust, automatic span check or automatic zero and span check available in intervals of 1, 3, 6, 12, 24 hrs or weekly
- Fully integrated package including: internal sample pump, sample heater, internal calibration valves, zero air pump and data logger
- Internal sample heater with temperature or RH control, which can be enabled by the user to eliminate the effects of humidity (RH: < 30 to < 90 %)
- 12 VDC operation (60 watts max, 13 watts nominal)
- Holds up to 61 days of 5 minute data averages or 2 days of 1 min data
- Data downloading and firmware upgrading software supplied on USB or internet.

Increased accuracy

- Automatic calibration
- Easy maintenance/cleaning of the measurement cell
- Long lasting LED light source
- Intuitive software and maintenance
- Automatic optical reference calibration
- Facilitates a wide measurement range (0 to 20,000 Mm⁻¹).

LED vs flash lamp

- Our LED light source is guaranteed not to fail and often exceeds 5 years, compared to a flash lamp that is recommended to be changed every 4 - 6 months
- Heat generated by the LED light source is a fraction of that generated by a flash lamp, minimising changes in sample RH
- LEDs emit light at a specific wavelength eliminating the need for band pass filters.

Lower cost of ownership

- Fully automatic zero and span calibrations
- Low power internal 12 V heater eliminates the need for external inlet heater
- Long lasting low power LED light source
- No bandpass filters to be replaced
- Unique in its simplicity and practicality.

SPECIFICATIONS

Measured parameters:	Light scattering coefficient (σ_{sp}) at (450, 525 or 635 nm)
Ranges:	0 to >20,000 Mm^{-1}
Lower detectable limit:	<0.3 Mm^{-1} (60 second averaged data)
Secondary measurements:	Sample air temperature, relative humidity (RH), barometric pressure and enclosure temperature
Flow rate:	\approx 5 l/min with default blower. Higher flow can be obtained using the external pump option (e.g. in case of common inlet)
Operating temperature:	-20 to 45 °C
Operating RH:	10 to 95 %
Calibration:	Span gas available for CO ₂ , SF ₆ , FM-200, R-12, R-22, R-134 or a user defined gas
Optics:	Reference light source measurement
Light source:	Stable LED light source (US patent 7,671,988)
Wavelength:	525 nm (green), 450 nm (blue), 635 nm (red)
Operating voltage:	12 VDC (incl 110-240 VAC 50/60 Hz power supply converter)
Power consumption:	13 watts nominal, 45 watts with heater active
Dimensions:	170 x 700 x 215 mm
Weight:	11.2 kg

COMMUNICATIONS & DATA LOGGING

Outputs:	25 pin external I/O analog outputs (2 voltage & 2 current) 2 x RS232 serial ports (multi-drop, service)
Filtering:	Kalman (digital adaptive filter), moving average (30 seconds) or no filter
Data averaging:	1 min or 5 min
Stored parameters:	Date & time, σ_{sp} (635, 525 or 450 nm), sample air temperature, enclosure temperature, RH, barometric pressure and instrument status
Capacity:	Maximum of 61 days of 5 minute averages, or 12 days of 1 minute averaged data

OPTIONS

- Internal flow control and PM_{2.5} sampling 3 slpm
- Solar power option
- Sample bypass
- Roof flange kit and rain cap with insect screen
- Gas Calibration kit
- Wall mount bracket.

APPLICATIONS

- Visibility measurements (airports, city pollution, AAQMS)
- Dust/sand storm monitoring and early detection networks
- Bushfire pollution monitoring and early detection networks
- PM_{2.5} mass measurement correlation studies.

