

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 (formerly known as the Ecotech Aurora 1000) uses a single wavelength for scattering coefficient visibility measurements at one of three user specified wavelengths.

Acoem, 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 & 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 & 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 & 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 W max, 13 W nominal)
- Stores up to 61 days of 5 minute data or 12 days of 1 min data.
- Free Airodis™ demo version & firmware upgrade software supplied on USB or via Internet
- Remote control through serial interface
- Our LED light source is guaranteed not to fail within 3 years & often exceeds 5 years life time
- 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

Increased accuracy

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

Lower cost of ownership

- Fully automatic zero & span calibrations
- Low power internal 12 V heater eliminates the need for external inlet heater
- No bandpass filters to be replaced
- Unique in its simplicity & 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 & enclosure temperature
Flow rate:	≈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:	450 nm (blue), 525 nm (green), 635 nm (red)
Operating voltage:	12 VDC (incl 110–240 VAC 50/60 Hz power supply converter)
Power consumption:	13 W nominal, 45 W with heater active
Dimensions:	170 x 700 x 215 mm
Weight:	11.2 kg
Altitude:	2000 m (15,000 m with 12 V operation).

COMMUNICATIONS & DATA STORAGE

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} (450, 525 or 635 nm), sample air temperature, enclosure temperature, RH, barometric pressure & instrument status
Capacity:	Maximum of 61 days of 5 minute averages, or 12 days of 1 minute averaged data
Data Collection:	Airodis™ demo analysis software provided free.

OPTIONS

- Automated ball valve (sample bypass)
- Exhaust tubing kit
- External pump controller kit & pump
- Roof flange kit & rain cap with insect screen
- Gas calibration kit
- Wall mount bracket.

APPLICATIONS

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



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