

Integrating Nephelometer

Ecotech M9003 Nephelometer

The Ecotech M9003 Integrating Nephelometer is an innovative, low maintenance instrument designed for general environmental monitoring.



It measures the light scattering coefficient due to particles (σ_{sp}) using the geometry of a standard integrating nephelometer. The light source (*U.S. Patent Pending*) is a very reliable and stable light emitting diode (LED) array, emitting a Lambertian distribution of light at a fixed wavelength. The optical and electrical background noise is sufficiently low to allow measures of σ_{sp} (for particles) from less than 10 percent of air Rayleigh ($\sigma_{sp} < 0.25 \text{ Mm}^{-1}$) to greater than $\sigma_{sp} = 2000 \text{ Mm}^{-1}$. The electronics are microprocessor based, providing flexible menu driven programming of the instrument operation using the display and keypad or a serial port. Data averages can be stored internally and retrieved at any time using a PC.

The instrument has many unique features:

- Internal battery backed real time clock and data logger. Holds up to 49 days of 5 minute averaged data
- Reports on scattering coefficient, can be compensated for Pressure and Temperature (selectable 0, 20, 25 °C or none)
- Easy, automated instrument calibration using the selected span gas, with pressure and temperature compensation
- Automatic zero, span or zero & span check, or zero adjust, with operator selectable intervals of 1,3,6,12 or 24 hrs
- Manual zero and span checks
- Span gas selection table including calibration values for CO₂, SF₆, FM-200, R-12, R-22, R-134 or a user defined gas
- Automatic optical reference calibration (every 15 seconds)
- RS-232 serial communication provides remote terminal, polled and unpolled data output modes
- Internal self heating is minimal, $< 0.2 \text{ }^\circ\text{C}$ (when used without sample inlet heater), thus enabling measurements to be made at close to ambient conditions if desired
- Optional external sample inlet heater which can reduce Relative Humidity to a value set by the operator. (<40 to <90%)
- Internal cell heater is operator selectable to keep the cell temperature the same as the sample air temperature to eliminate condensation forming in the cell.
- Includes internal sample pump, zero pump, span gas valve, zero calibration filter and inlet heater controller.
- Data downloader and Firmware upgrading software supplied on CD
- Operation and Service manuals

Options

- Heated Sample Inlet, unheated inlet tube, rain cap, roof flange
- Wall mounting bracket
- Calibration Gas Flow Meter Kit
- 12VDC Power supply for 12V operation.

Specifications:

Parameter:	Light scattering coefficient σ_{sp} (due to particles)
Ranges:	0 to 2000 Mm^{-1}
Noise:	$< 0.2 \text{ Mm}^{-1}$, (Lower Detectable limit $< 0.4 \text{ Mm}^{-1}$) 60 second data.
Secondary Measurements:	Sample air temperature, cell temperature, relative humidity and cell pressure
Outputs:	4 analogue outputs (2 voltage & 2 current) and 2 RS 232 serial
Filtering:	Kalman (digital adaptive filter) or Moving average (30 seconds)
Optics:	No lenses. Reference brightness measurement
Wavelength:	520nm (green) standard. 470nm (blue) & 630nm (red) also available upon request
Operating Voltage:	110-240 VAC 50/60 Hz (50VA without inlet heater) or optional 12 VDC.

Internal Data Logging

Stored Parameters: Date & Time, σ_{sp} , Air temp, Cell temp, RH, Pressure, Status
Maximum of 49 days of 5 minute averages, or 10 days of 1 minute averaged data

For further information please contact our nearest office

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