

Particulate Monitor, DataRAM 4™

Portable continuous particle sizing monitor/Dual Wavelength Nephelometer



Expandable to a complete particle characterization system

- Aerodynamic particle size separators allow measurement of specific particulate fractions such as the thoracic, respirable, PM10, PM2.5, and PM1.0 fractions.
- An omnidirectional sampling inlet and an in-line mist and fog elimination heater are available for ambient air monitoring.
- An isokinetic sampling probe / nozzle kit enables duct / stack monitoring.
- Self calibration extends unattended operation
- A unique programmable automatic zeroing feature permits long-term unattended field operation
- Has both RS232 and RS485 data ports for bidirectional digital communications.

The Thermo Scientific DataRAM 4™ continuously monitors and logs the real-time concentration and median particle size of airborne dust, smoke, mist and fumes. In addition, air temperature and humidity are displayed and recorded. With appropriate particle discriminators, it provides measurements correlated with PM10, PM2.5, PM1.0, and respirable fractions. Its patented two-wavelength particle detection system provides the volume median particle diameter of the sampled aerosol, over a concentration range up to 400 mg/m³. Unlike typical particle counting devices, the Thermo Scientific DataRAM 4™ is totally immune to particle coincidence errors, even at the highest concentrations.

Volume median particle sizes down to 0.05 µm can be measured by this unique spectral nephelometric technique. The Thermo Scientific DataRAM 4™ monitors the concentrations of fine particulates in ambient air by a combination of aerodynamic size preselection, two wavelength nephelometry, and concurrent sensing / correction for relative humidity. This patented technique provides a continuous measurement of PM2.5, independent of particle size and moisture - without heating, diffusion drying, or denuding the sample stream.

Particulate Monitor, DataRam4™

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product lifecycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific air quality products.

Product Specifications

Concentration measurement range	0.0001 to 400 mg/m ³ (Auto ranging) Referenced to gravimetric calibration (NIST traceable) with SAE Fine test dust (mmd = 2 to 3 µm, $\sigma_g = 2.5$, as aerosolized)
Precision / repeatability (2-sigma)	±1% of reading or ±0.001 mg/m ³ , whichever is greater (1 second averaging) ±0.3% of reading or ±0.0001 mg/m ³ , whichever is greater (10 second averaging) For single-wavelength concentration sensing at 25°C
Accuracy	±2% of reading ± precision Referenced to gravimetric calibration (NIST traceable) with SAE Fine test dust (mmd = 2 to 3 µm, $\sigma_g = 2.5$, as aerosolized)
Resolution	0.1% of reading or 0.1 µg/m ³ , whichever is greater
Scattering coefficient range	10 ⁻⁷ to 0.4 m ⁻¹ (resolution: 3 significant digits, maximum)
Minimum Detection Limit	1.0 µg/m ³ (0.001 mg/m ³) (1 second averaging) 0.3 µg/m ³ (0.003 mg/m ³) (10 second averaging) 0.10 µg/m ³ (0.0001 mg/m ³) (60 second averaging)
Visual range (@ $\sigma = 550$ nm)	0.001 to 337 km (resolution: 3 significant digits, maximum)
Angström coefficient measurement range	0.0 to 4.0
Particle sizing range	(log-normal, $\sigma_g = 2.0$, $m = 1.50$) 0.05 to 4 µm
Particle size range for concentration measurements	0.08 to 10 µm
Temperature measurement range	5°F to 140°F (-15°C to 60°C); accuracy: 0.05°C
Relative humidity measurement range (@ 25°F)	0 to 100% non condensing (accuracy: 2%)
Sampling flow rate range (user selectable)	1.0 to 3.0 liters/min. (accuracy: 0.05 liters/min., adjustability: 0.1 liters/min.)
Measurement/display integration time range	(user selectable) 1 to 60 sec. (selectable in 1-sec. steps)
Measurement/display update frequency	1 per sec.
HEPA filter cartridge replacement frequency	(typical) less than 1 per 5 yrs (@ < 1 mg/m ³)
Alarm level range	(user selectable) selectable over entire measurement range 0.001-400mg/m ³
Data logging averaging periods	(user selectable) 1 sec. to 24 hrs. (selectable in 1-sec. increments)
Data logging memory capacity	50,000 data points in up to 99 tags (data sets)
Programmable zeroing periods	(user selectable) 1 to 168 hrs. (selectable in 1-hr increments; if enabled, logging period must be more than 10 min.)
Elapsed time readout range	1 sec. to 100,000 hrs. (over 11 yrs.), in sec., min., and hrs.
Digital communications	RS232/RS485; full duplex, 9600 baud, software-controlled, filtered
Computer requirements	IBM-compatible PC, Windows™ 95 or higher; 8 MB memory or more
Analog outputs	(user selectable) 0 to 5 V and 4 to 20 mA Selectable full scale ranges between 0.1 and 400 mg/m ³
Power	Internal battery; rechargeable, sealed lead-acid, 6.5 Ahr, 6 V, 20-hr run time between charges (typical) AC line: universal voltage charger / power supply (included) 100-250 V, 50-60 Hz (CE marked) Optional solar power system (Model DR-SOL)
Alarm Outputs	Alarm switch: 30 V (off, open), 2.5 A (on, closed) Alarm signal: 0 V (off), 5 V (on) (1 mA maximum load current) Audio alarm (back panel): More than 65 dB @ 1 m
Operating environment	14°F to 122°F (-10°C to 50°C); 10 to 95% RH, non condensing
Storage environment	-4°F to 158°F (-20°C to 70°C)
Dimensions	5.28 in. (134 mm) H x 7.25 in. (184mm) W x 13.63 in. (346 mm) D
Weight	11.7 lbs (5.3kg)
Safety approvals and certificates	The DataRAM 4™ complies with US FCC rules (Part 15) and has received CE certification.
Standard accessories included	Universal voltage battery charger / power supply, Standard HEPA filter cartridge, Analytical filter holder, PC communications software disk, Digital output cable, Carrying case and instruction manual

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