Environmental dust monitor

The Grimm Aerosol Technik 164 Environmental Dust Monitor is a weatherproof housing which incorporates a Grimm 107 portable dust monitor. It quantifies the atmospheric aerosol content as a function of size as either a particle number concentration or PM value (1, 2.5 and 10). The housing has a 50 cm inlet through which air is drawn into the dust monitor by a volume-controlled pump. The air flows into a sampling chamber within the instrument. Here the scattering of a laser beam by the particles in the air is measured at an angle of approximately 90° to the laser beam path. The particle concentration is derived from the amount and angular distribution of the scattered light.

The instrument incorporates a Lufft WS500 weather station providing temperature, relative humidity, air pressure, wind speed and wind direction data.

The specification of the environmental dust monitor is as follows:

Instrument details	
Instrument type	164 Environmental Dust Monitor
Instrument manufacturer	Grimm Aerosol Technik
Dust monitor model	107
Height above ground level	8 m
Sampling period	60 seconds (can be varied)
Number of measured particle sizes	31
Minimum, maximum measured particle diameter	0.265, 34 μm
Particle size uncertainty	± 5% of measured diameter
Number of measured particle sizes	31
Measured PM values	1, 2.5, 10
Inlet length	0.5 m
Air flow rate	1.2 litres/minute
Operating temperature range	0 - 40°C
Laser wavelength	687 nm
Maximum laser power	50 mW
Uncertainty on a single particle concentration value	The greater of the square root of the number of counts or 20% (estimated from correspondence with manufacturer)
Air temperature uncertainty	± 0.2K
Relative humidity uncertainty	±2% RH
Air pressure uncertainty	±50 Pa
Wind speed uncertainty	±0.3 m/s

Instrument details	
Wind direction uncertainty	±3°
Particle concentration valid range	0 – 2 x 10^6 particles/litre
Air temperature valid range	-50 – +60 °C
Relative humidity valid range	0 – 100% RH
Air pressure valid range	30000 – 120000 Pa
Wind speed valid range	0 – 75 m/s
Wind direction valid range	0 – 360°

Data Archive	
Sampling rate	60 seconds time interval
Data storage	Continuous recording in daily files
Archive data format	netCDF
Archived to British Atmospheric Data Centre	http://badc.nerc.ac.uk/
BADC datafile	cfarr-grimm_chilbolton

For further information, please contact:

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