

## Spirant BAM Particulate Monitor

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The Spirant BAM automatically measures and records airborne particulate concentrations using the beta ray attenuation method. It is designated by the U.S. EPA as Federal Equivalent Method for  $PM_{10}$  and  $PM_{2.5}$  monitoring.

### DESIGNATIONS

#### Spirant BAM 1000:

$PM_{10}$ : FEM (EQPM-0798-122) AS/NZS 3580.9.11:2008

#### Spirant BAM 1100:

$PM_{2.5}$ : Class III FEM, (EQPM-0308-170)  
AS/NZS 3580.9.12:2013

### FEATURES

- Long term unattended remote operation of up to 60 days between site visits.
- Automatic hourly span checks.
- Fast and easy field audits using common audit tools.
- Rugged anodised aluminum, stainless steel, and baked enamel construction.
- Highly accurate, reliable, and mechanically simple flow system.
- Hourly filter advances minimise effects on volatile compounds.
- Real-time particulate monitoring option.
- Advanced Smart Heater technology precisely controls sample relative humidity.
- Integrated datalogger allows the connection of up to six additional meteorological sensors with 182 days of data storage.



### OPERATION

The Spirant BAM uses the beta ray attenuation method to measure particulate concentration.

Every hour, a small  $^{14}C$  (carbon-14) element emits a constant source of high-energy electrons (known as beta rays) through a spot of clean filter tape. These beta rays are detected and counted by a sensitive scintillation detector to determine a zero reading.

The instrument automatically advances this spot of tape to the sample nozzle, where a vacuum pump then pulls a measured and controlled amount of dust-laden air through the filter tape, loading it with ambient dust.

At the end of the hour, the dust laden spot is placed back between the beta source and the detector, thereby causing an attenuation of the beta ray signal. This is then used to determine the mass of particulate matter on the filter tape and volumetric concentration of particulate matter in ambient air.

Measurement data, configuration files, error logs, and flow statistics are stored in its internal data logger and are available via RS-232 using common terminal programs and Ecotech's Airodis software.

Digital dataloggers may obtain data from the unit using serial port commands or by recording the automatic hourly serial output.

The Spirant BAM performs continuous user selected evaluation of a variety of criteria for data validation including flow statistics and a comprehensive set of error codes including power, flow, hardware, tape, nozzle, beta count and span check errors.

### Maintenance

Designed to run continuously with only monthly or bi-monthly scheduled maintenance—a single roll of filter tape will last for up to 90 days.

The instrument also contains a comprehensive self-test function which allows the unit to test itself for any mechanical failures in the tape control system.

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## SPECIFICATIONS

### Performance

Accuracy:	Exceeds US-EPA Class III PM <sub>2.5</sub> FEM standards for additive and multiplicative bias.
Measurement resolution:	0.1 µg/m <sup>3</sup>
Display resolution:	1 µg/m <sup>3</sup>
Lower detection limit (1 hr):	< 4.8 µg/m <sup>3</sup> (less than 4.0 µg/m <sup>3</sup> typical).
Lower detection limit (24 hr):	< 1.0 µg/m <sup>3</sup>
Standard range:	0 - 1,000 mg/m <sup>3</sup> (0 - 1000 µg/m <sup>3</sup> ).
Optional ranges:	Available on request.
Measurement cycle time:	One hour or one minute with RTPM option.
Flow rate:	16.7 litres/minute adjustable 0-20 LPM range actual or standardised flow.
Filter tape:	Continuous glass fiber filter tape.
Span check:	Automatic 0.800 mg (typical) span foil, verified hourly.
Beta source:	14C (carbon -14), 60 µCi ±15 µCi (< 2.22 x 10 <sup>6</sup> Beq), half-life 5730 years.
Beta detector type:	Photomultiplier tube with organic plastic scintillator.

### Environmental

Operating temperature:	0 to +50 °C.
Ambient humidity:	0 - 95% RH, noncondensing.
Sample humidity control:	Active Smart Heater module, 10 - 99% RH setpoint.

### Interface

User interface:	Menu-driven interface with 8 line 40 character LCD display and keypad.
Analog output:	Isolated 0 -1 VDC output standard. 0 -10 V, 4-20 mA, 0-16 mA switch-selectable.
Serial interface:	RS - 232 two-way serial port for PC or modem communications.
Telemetry inputs:	Clock reset (voltage or contact closure).
Alarm contact closures:	Data error, tape fault, flow error, power failure, maintenance.
Error reporting:	User-configurable available through serial port, display, and relay outputs.
Memory:	4369 records (182 days at 1 record/hr).

### Electrical

Power supply:	100 -230 VAC, 50/60 Hz. Factory configured. Less than 0.4 kw, 3.4 A.
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### Physical

Weight & dimensions:	24.5 kg without external accessories/310 x 430x 400 mm HxWxD.
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### Options

RTPM:	Real-time particulate monitor provides one minute measurements.
Aurora Interface:	Enables interfacing of Spirant with Aurora 2000 Nephelometer for one minute. measurements (requires Aurora 2000 Integrating Nephelometer).
Sample inlets:	PM <sub>10</sub> , PM <sub>2.5</sub> & TSP available.

### For your local certified distributor visit:

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