

# BAM 1020

## Beta Attenuation Mass Monitor

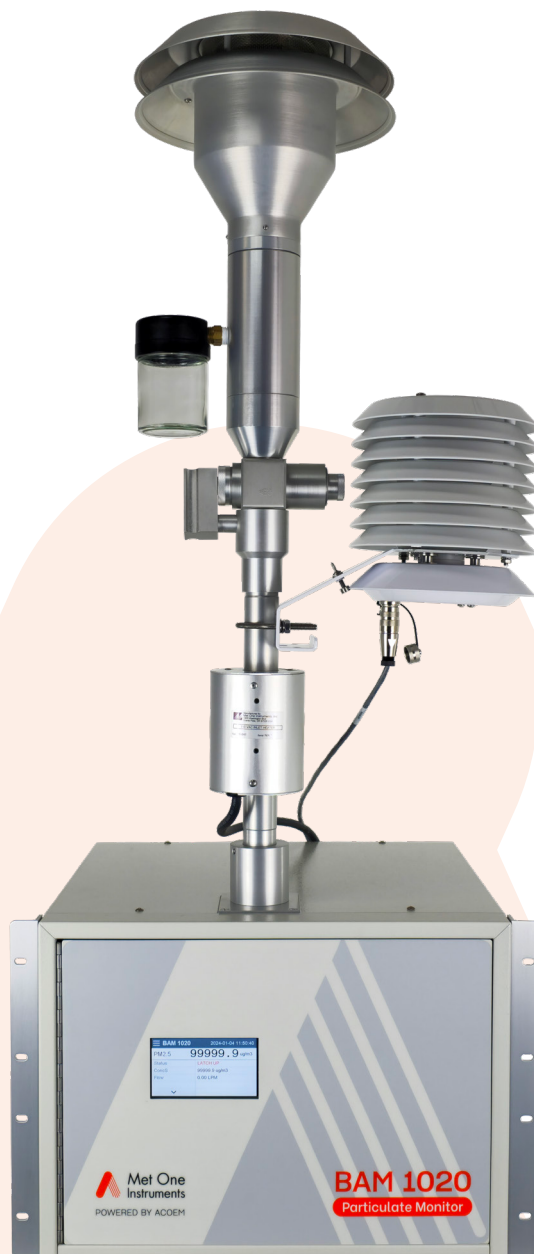
The **BAM 1020** is a continuous particulate monitor which automatically measures and records airborne particulate concentration levels (in milligrams or micrograms per cubic meter) using the industry-proven principle of beta ray attenuation. Thousands of **BAM 1020** units are currently deployed worldwide, making the unit one of the most prolific air monitoring platforms in the world.

### Designations

The **BAM 1020** was the first instrument to obtain U.S. EPA Federal Equivalent Method (FEM) designation for continuous  $PM_{2.5}$  monitoring, in addition to its longstanding EPA designation for  $PM_{10}$  monitoring. The **BAM 1020** has also obtained the corresponding  $PM_{2.5}$  and  $PM_{10}$  certifications in the European Union. Two **BAM 1020** units can also be operated together as an EPA designated  $PM_{10-2.5}$  coarse method. We supply complete sampling accessory kits for compliance with each designation.

### Features

- US-EPA Equivalent Method for  $PM_{10}$ ,  $PM_{2.5}$ , and  $PM_{10-2.5}$  monitoring
- Long term unattended remote operation
- Full remote Desk Top Control
- Expanded optional meteorological sensor interface
- Very low operating costs
- Fast and easy field audits
- Bench-top or rack-mount operation in mobile or stationary shelters
- Rugged, durable construction
- Highly accurate, reliable, and mechanically simple flow system
- Hourly filter advances minimize effects of semi-volatile compounds
- Advanced Smart Heater technology precisely controls sample relative humidity
- Integrated data logger
- Data retrieval through RS-232 or RS-485 serial ports
- Non-designated monitoring for  $PM_1$ ,  $PM_4$  or TSP



# Advantages

## Benchmark Technology

Beta attenuation mass monitors are indifferent to the chemical composition of the particulate matter whose mass density is being measured. As the name implies, beta attenuation mass monitors measure only mass. No assumptions concerning the physical or optical properties of the sampled particulate matter are necessary. Its sensitivity to diesel exhaust is no different than it is to road dust or salt spray. This translates into reliable mass measurement at any time, any place.

## Solid Reliability

The **BAM 1020** has a field-proven record of reliability even in the most challenging environments and particulate concentrations.

## Low Maintenance

The **BAM 1020** is designed to run continuously for 60+ days between site visits and maintenance. The **BAM 1020** also contains a comprehensive self-test function which allows the unit to routinely test itself for any mechanical failures in the tape control system.

## Continuous Improvement

The Met One Instruments **BAM 1020** has benefited from continuous improvement. Over time, functionality, performance, and reliability have advanced. The latest generation of **BAM 1020** incorporates a new generation of microprocessor and advanced electronics allowing remote operation, enhanced communications, and unsurpassed flexibility.

The **BAM 1020** is directly compatible with our COMET™ Cloud data service.



**BAM 1020** now has full remote desktop in addition to standard touch screen display.

# BAM 1020 Accessories and Configurations

The **BAM 1020** must be configured with certain accessories in order to operate as a regulatory-grade measurement device.

## US-EPA PM<sub>10</sub> Equivalent Method (EQPM-0798-122)

**BX-801** Sample Inlet System w/ Support Braces

**BX-802** PM<sub>10</sub> Inlet

**BX-598** Digital Temperature Sensor or **BX-597A** Digital T, BP, RH Sensor

**BX-302** Valve plus HEPA filter or **BX-305** Valve Only

**BX-827** (120 V) or **BX-830** (230 V) “Smart” Inlet Heater System

## US-EPA PM<sub>2.5</sub> Equivalent Method (EQPM-0308-170)

**BX-801** Sample Inlet System w/ Support Braces

**BX-802** PM<sub>10</sub> Inlet

**BX-808** “VSCC” PM<sub>2.5</sub> Cyclone

**BX-597A** Digital T, BP, RH Sensor

**BX-302** Valve plus HEPA filter

**BX-827** (120 V) or **BX-830** (230 V) “Smart” Inlet Heater System

## US-EPA PM<sub>2.5</sub> Equivalent Method (EQPM-0715-266)

**BX-801** Sample Inlet System w/ Support Braces

**BX-802** PM<sub>10</sub> Inlet

**BX-809** URG PM<sub>2.5</sub> Cyclone

**BX-597A** Digital T, BP, RH Sensor

**BX-302** Valve plus HEPA filter

**BX-827** (120 V) or **BX-830** (230 V) “Smart” Inlet Heater System

## US-EPA PM<sub>10-2.5</sub> Equivalent Method (EQPM-0709-185) (Requires 2 BAM 1020 Units)

**BX-801** Sample Inlet System w/ Support Braces (2 Needed)

**BX-802** PM<sub>10</sub> Inlet (2 Needed)

**BX-808** “VSCC” PM<sub>2.5</sub> Cyclone

**BX-597A** Digital T, BP, RH Combination Sensor (2 Needed)

**BX-302** Valve plus HEPA filter

**BX-827** (120 V) or **BX-830** (230 V) “Smart” Inlet Heater System (2 Needed)



# Specifications

- Measurement principle:** Beta Attenuation
- US EPA designations:** US-EPA PM<sub>10</sub> Equivalent Method: EQPM-0798-122  
US-EPA Class III PM<sub>2.5</sub> Equivalent Method: EQPM-0308-170 & EQPM-0715-266  
US-EPA PM<sub>10-2.5</sub> Equivalent Method: EQPM-0709-185
- Range:** 0 – 10 mg/m<sup>3</sup> (0 – 10,000 µg/m<sup>3</sup>)
- Analog Ranges:** 0 – 0.1, 0.2, 0.5, 1, 2, 5, 10 mg/m<sup>3</sup> (others available)
- Accuracy:** Exceeds all US-EPA designation requirements for PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>10-2.5</sub>
- Measurement resolution:** 0.1 µg/m<sup>3</sup>
- Lower detection limit (1 hour):** < 4.8 µg/m<sup>3</sup> (< 4.0 µg/m<sup>3</sup> typical)
- Lower detection limit (24 hour):** < 1 µg/m<sup>3</sup>
- Measurement cycle time:** 1 Hour (others available)
- Flow rate:** 16.67 liters/minute, actual flow
- Filter tape:** Continuous glass fiber filter, 30mm x 25m roll, 70+ day operation/roll (P/N 460180)
- Span check:** Manual (Automatic optional)
- Beta source:** <sup>14</sup>C (carbon-14), 60 µCi ±15 µCi (< 2.22 X 10<sup>6</sup> Beq), Half-Life 5730 years
- Beta detector type:** Photomultiplier tube with scintillator
- Operating temp. range:** 0° to +50° C
- Operating humidity range:** 0 to 90% RH, non-condensing
- Humidity control:** Actively controlled inlet heater module, 10% – 99% RH setpoint
- Approvals:** US-EPA, MCERTS, CE, NRC, TUV, CNEMC, Korea
- User interface:** Graphic color touch screen display
- Analog output:** 2 channels, voltage range 0-1 VDC, 0-2.5 VDC, 0-5 VDC
- Serial interface:** RS-232 2-way serial ports for PC or modem communications, Ethernet, USB
- Contact closure specification:** 1 channel, dry, Normally Open contact 12 VDC 0.5 A
- Alarm contact closures:** Data Error, Tape Fault, Flow Error, Power Failure, Maintenance
- Compatible software:** Air Plus™, COMET™, HyperTerminal®
- Error reporting:** User-configurable; available through serial port, display, and relay outputs 14,000
- Memory:** records (1.5 years at 1 record per hour)
- Power supply:** 100-240 VAC 50/60 Hz universal input
- Weight:** 19 kg (42 lbs) without external accessories
- Unit dimensions:** 43.2 cm wide x 46.7 cm deep x 36.2 cm high (17" W x 18" D x 14.25" H)

## Supplied Accessories

- Operation Manual and Quick Setup Guide
- Span Membrane
- Internal Flow Sensor and Flow Controller
- Internal Filter Temperature, Pressure, and Relative Humidity Sensors
- Serial Data Cable and Modular Power Cable
- Pump Control Cable and Air Tubing
- Rack Mounting Brackets and Hardware
- COMET™ Data Collection Software
- One Roll of 460180 Glass Fiber Filter Tape



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