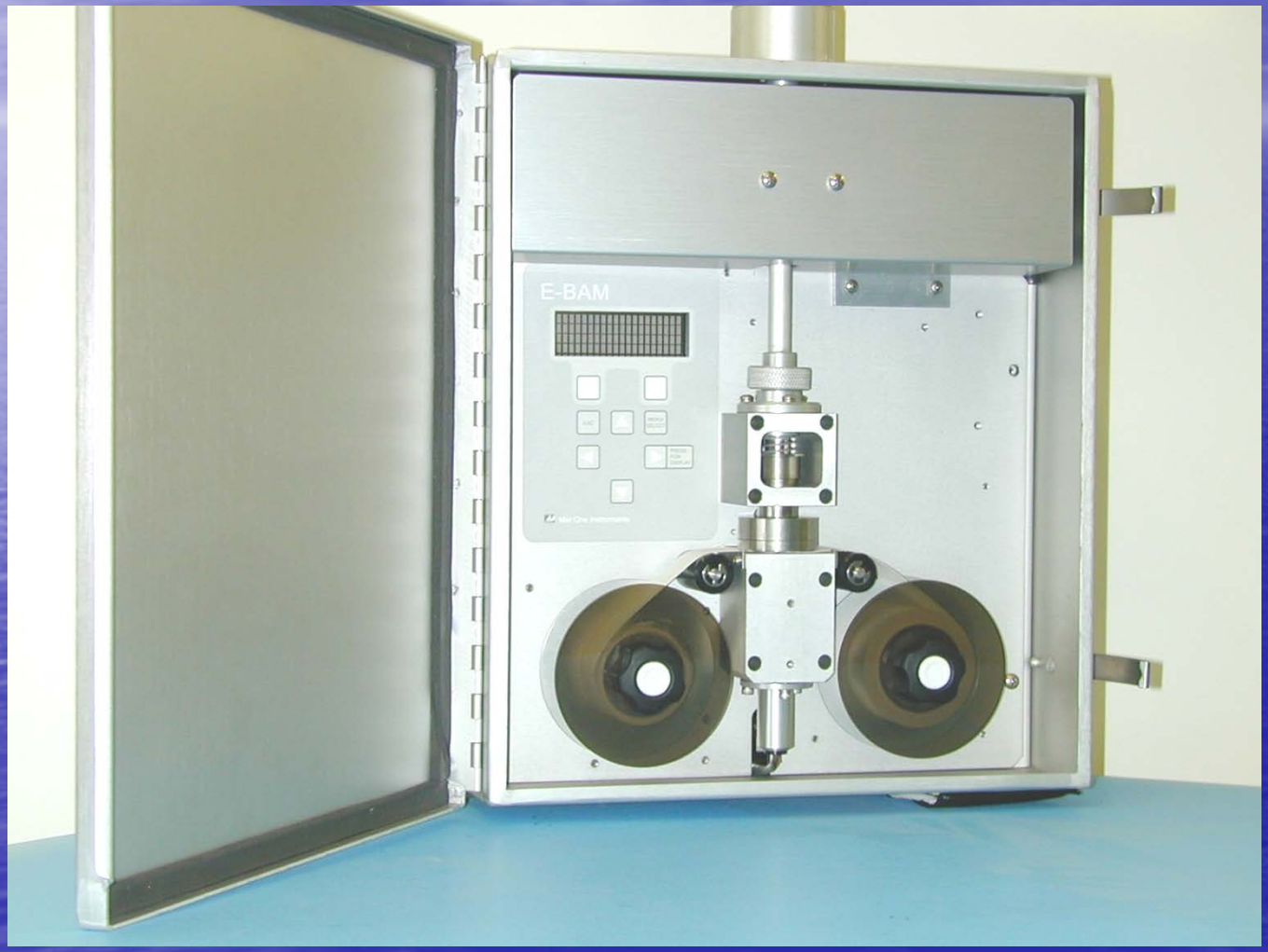
E-BAM Beta Attenuation Monitors

Implementation

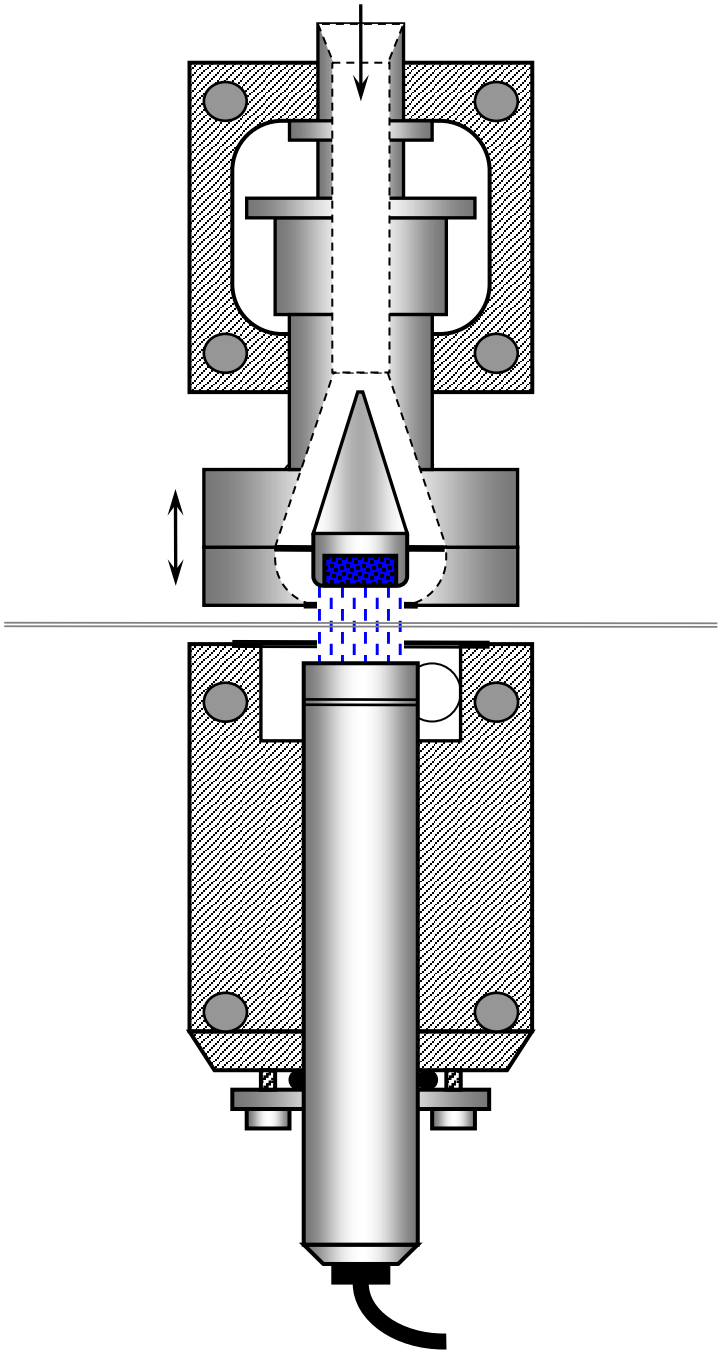
Met One Instruments, Inc.

E-BAM



Theory of Operation

- Air containing particulate flows around the beta source, through the filter tape spot, and past the beta detector. The particulate is deposited on the tape.
- Beta particles are simultaneously emitted through the same spot of tape.
- 4-minute beta counts at the beginning and end of each hour are used to determine the hourly concentration.
- A 60-second update of continuous overlapping 4-min beta counts is used to determine the real-time average.



Critical Checks

- The 16.7 LPM flow system should be calibrated or verified on a regular basis.
- A leak check should be performed with every flow calibration.
- The nozzle sealing surface and support vane may need to be cleaned more frequently in humid environments.

E-BAM Features

- Rapid deployment, portable unit.
- 12 volt, 4 amp DC operation is compatible with batteries or solar arrays.
- Weatherproof enclosure construction.
- Easy set up by a single person in less than 15 minutes with included tripod.
- Compatible with optional Met One wind sensors for smoke tracking. Ambient RH and BP sensors also available.
- Instrument operating temperature between -30° and +40° C. (50C with shield kit)

E-BAM Features

- “As needed” filter tape spot advance. One roll of tape may last up to a year depending on concentration levels.
- Real-time data capability due to simultaneous sampling and measurement.
- Real-time concentration can be calculated on a 1, 5, 10, 15, 30, or 60 minute average basis.
- Hourly concentration is always available regardless of real-time settings.
- Up to 180 days of data storage, depending on data storage rate.

E-BAM Features

- Lower cost and less parts than other units.
- Modem, cellular, radio and Airsis satellite communications are available for remote data retrieval.
- Replaceable integral DC air pump is standard. External long life AC pump options are available.
- AC power supply is included for non-remote sampling.

E-BAM Sensors

- 9250 AT sensor (standard)
- Barometric pressure sensor (above nozzle)
- Filter pressure (beneath tape)
- Filter RH (beneath tape)
- Filter Temperature (beneath tape)
- Wind speed/direction (optional EX-034)
- Ambient RH (optional EX-593)

E-BAM New Accessories

- EX-502/EX-503 Transport Cases
- EX-908 Solar Shield kit for high temp areas.

E-BAM Data Validation

- Zero Filter Tests for E-BAM
- Filter RH data and inlet heater control
- Span Checks

E-BAM Data

Comparing E-BAM to BAM-1020 and FRMs.

- Noise band and geometry.
- Calibration process at the factory.
- RH control vs power consumption.
- PM10 impacting in the nozzle
- Spot change and RH: Tests in Europe and Monterey.
- Inter-instrument variability.

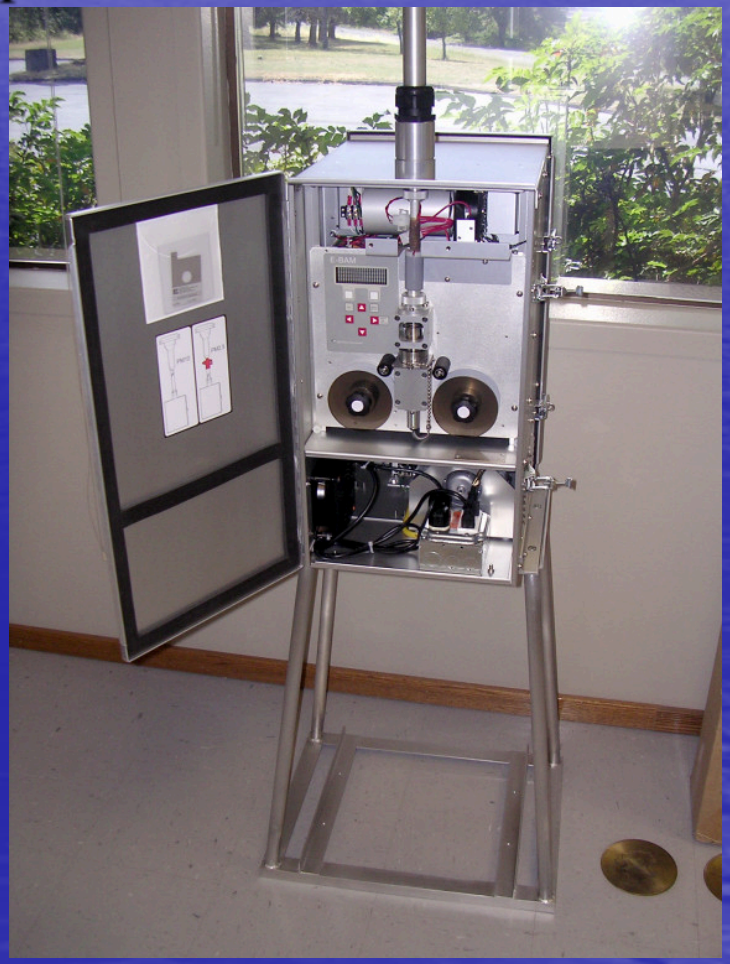
E-BAM – Emergency Response

- Lab-level calibrations.
- Smoke and ash monitoring with a wind sensor.
- EPA deployments: Hurricanes and oil spills.
- Airsis Satellite transmitters.
- Transport Cases.

E-BAM Upcoming Features

- Other packages: Rack and stand-alone AC units.
- PM10 designations – 1030 version at least
- Extra high concentration operation

E-BAM Versions

E-BAM ACE: Replaces external pump AC pump box

E-BAM-1030: Rack mount version