Tac-7®

Tactical Bio-Aerosol Detector

The Tac-7 UV-based biodetector

THE TAC-7® biological aerosol detector measures the biofluorescence and diffractive scattering produced by aerosol particles as they pass through an intense ultraviolet beam. It is used to monitor environmental particulates and classify them as being of either biological or non-biological origin, and to alarm if there is a sudden increase in the bio-aerosol level within a particular particle size range. It was developed by Research International for homeland security, public health, and military applications.

Very stable operation is assured. Sampled air is first subjected to a two-stage filtering process to eliminate large aerosols such as pollen and insects. Photon counting methods are used to minimize the effects of temperature and electro-optic component aging. A rugged solid state UV source with a maximum use temperature of 85° C provides a lifetime exceeding 20,000 hours. An RS-232 serial data connection is provided and the Tac-7 can be linked to a Research International air sampler for triggered sample collection. Signals may also be transmitted wirelessly between the Tac-7 and a monitoring PC or other equipment using BioLink™ Bluetooth transmitters and receivers.

FEATURES

- True UV-based "biological trigger"
- Photon counting: no analog drift
- Automated trigger/sampler protocols
- 24+ hours operation on swappable battery
- Wide operating temperature range
- Light weight/small size
- Long operating life
- RS-232 or wireless communications capable

APPLICATION AREAS

- Indoor or outdoor use
- Sports stadiums and arenas
- Subways
- Military bases
- Airports

Electric power consumption is less than 6 watts, allowing operation from either a small solar panel or for more than 24 hours on its swappable rechargeable battery. Multiple units may be monitored remotely using Windows-based software provided at no charge. The software can also be used to modify operating characteristics or alarm levels as needed or desired. All data is also automatically stored onboard on a removable solid state memory chip with a five-year capacity.

U.S. Patent Nos.: 10267723, 10274410, 10444137, 10794815, 11340153.

Specifications	
Operating principle	Monitoring of 365nm UV-stimulated particle scattering and biofluorescence using photon counting electro-optics. Alarm decisions are based on algorithms that consider bioaerosol statistical behavior, bio-fluorescence intensity and particle size.
Particle size and type	0.5 to 15 microns in four size ranges. Respirable aerosolized bacteria, spores, viruses, and toxins. Biofluorescence intensity in each size range is monitored and reported.
Interferents	Interferent resistant to diesel smoke, pollen, silica dust.
Detection limit	100 ACPLA in most natural environments, 20-30 ACPLA under laboratory test conditions.
Sampling rate	1.2 liter per min of ambient air nominal.
Consumables	None.
Time to alarm	15 second average, 30 seconds maximum. 15-minute trailing history is used in alarm protocols.
Alarms	Red LED and >100dB piezoacoustic alarm, plus serial link digital alarm output.
Communication	RS-232 or wireless BioLink; pre-programmed for use with sampler.
Serial data output	Alarm, particles per liter of air in each size bin; percentage of particles that are biological; relative biofluorescence compared to scattering intensity for each size bin.
Operating time	Essentially unlimited if powered externally, or 24+ hours on UBI 2590 rechargeable battery.
Operating life	Air pump: 30,000 - 40,000 hours. UV light source: greater than 20,000 hours.
Operating temperature	-40° C to 50° C. Operation to 60° C is permitted up to a total time of 1,000 hours.
Humidity	0 to 95% non-condensing.
Power	Less than 6 watts at 18 VDC to 36 VDC. Uses BA-5590 primary battery or UBI 2590 rechargeable battery. AC mains or vehicle power can be used with proper converter.
Start-up time	1 minute.
Data storage	Onboard removable SD-type data card. Stores more than 5 years of aerosol data.
Size	16 x 18 x 28 cm with no inlet air stack. 16 x 18 x 40 cm with inlet stack attached. 16 x 15 x 40 cm without side handle.
Weight	3.5 kg without battery / 4.5 kg with battery.
Package	EMI-resistant aluminum shell construction.

Research International reserves the right to change specifications without prior notice.

Research International, Inc.

U.S. Headquarters Office

17161 Beaton Road SE, Monroe, WA 98272-1034
Phone: 360-805-4930 • Fax: 360-863-0439
Toll Free: 1-800-927-7831
Email: info@resrchintl.com • Web: www.resrchintl.com

U.S. East Coast Office

Jon Tobelmann
Phone: 703-625-8381
Email: jontobelmann@resrchintl.com

To locate an international distributor, please contact our headquarters office.