



BioHawk[®] Plus

High-Volume Concentrator + 8-channel Collector/Bioidentifier

Multi-Functional CBRN Solutions



*BioHawk Plus: Concentrator PLUS
8-Channel Bioidentification System.*

BioHawk[®] Plus combines a high-volume aerosol concentrator (SASS 4000) with an 8-channel collector/bioidentifier (BioHawk). The system concentrates particulates from ambient air then passes them on to a wetted-wall air sampler that extracts the particulates from the air stream and transfers them into a liquid phase. The liquid sample is then automatically analyzed by fluoro-immunoassay.

The system continuously samples over 3500 liters/minute of ambient air. Particulates in this air stream are transferred to a much smaller secondary air stream using centrifugal and virtual impaction principles. Particles are then routed into the secondary flow where centrifugal force and particle momentum isolate and concentrate the particles. The

secondary flow can reach aerosol concentrations that are 4X to 15X higher than present in the incoming air.

Secondary airflow is then routed via a hose connection into the integrated wetted-wall aerosol collector of the BioHawk system, where particulates are captured and concentrated in the collector operating fluid. Then the concentrated sample is automatically transferred to the bioidentifier portion. Assay results are typically available in 20 minutes. Bioassays are performed within a small disposable credit card-sized plastic assay coupon which may be used for up to 10 assay procedures before being discarded. Since a single assay coupon can handle up to eight different analytes simultaneously, up to 80 individual assays may be performed before discarding or removing the coupon. This capability simplifies field use and substantially reduces life cycle costs.

FEATURES

- Maintenance is minimal.
- Wide operating temperature range.
- Sampled air volume is maximized, improving collection statistics.
- Man portable.
- Air collection at 325 LPM, nominal.
- Disposable wet assay coupon reusable up to 15 times.
- Eight simultaneous assays.
- Fast assays: 10 - 15 minutes typical.
- Identifies: toxins, bacteria, spores, fungi, multi-cellular pathogens.
- Sensitivity: analyte dependent, 1 to 10 ppb typical for toxins, 100 to 100,000 CFU/ml for bacteria.
- Designed to MILSPEC 810F.

APPLICATION AREAS

- Counter-terrorism
- Epidemiology
- Agriculture
- Food processing air quality
- Medical facility air quality
- Military
- Power plants

BioHawk Plus Dry/Wet Air Sampling and Bioidentification System Specifications	
8-Channel Collector/Bioidentifier (BioHawk)	
Characteristic	Description
Use profile	Indoor/outdoor sample collection, transfer, and assay; storage of 255 assay recipes; user in full MOPP gear either walking or in moving vehicle.
Sample introduction	4ml liquid or liquefied solid sample inserted into sample port, or automated aerosol sample collection and transfer protocol based on built-in wetted-wall cyclone.
Assay method	Disposable wet assay coupon-reusable more than 10 times. Eight simultaneous software-based assays. Antibody or nucleic acid. Coupon reseals on removal for archival storage.
Fluid Handling	Fluids manipulated under microprocessor control using peristaltic and syringe pumps; sample may be oscillated to lower assay time; reagent is recovered for reuse.
Fluids storage	Snap on 3-section fluid pack. Clean water: 1 liter; Buffer: 250 ml. Waste: 500ml. Assay samples may be optionally stored in a detachable 8cc vial for later analysis.
Human interface	Day/night Touchscreen LCD display. Usable in MOPP gear.
Digital communication	RS-232 bi-directional serial link
Physical size	35.6 cm W x 36.5 cm H x 17.1 cm D
Weight	21.7 lbs. dry; 26.7 lbs. with battery and fluids (9.8/12.1 kg).
Operating/storage	1 to 66°C and -29 to 66°C. Reagent deterioration can reduce upper limit significantly
Humidity	10% and above. May be operated in rain.
Survivability	MILSPEC 810F; MTBF of about 30,000 hours is determined by air sampler fan
Data storage	Flash memory retains raw/processed data for over 6000 assays.
Power Consumption	6.2 W at idle; 17.8W with fan operating and one assay performed each 30 minutes
Power sources	<ul style="list-style-type: none"> • Primary battery BA-5590/U (1.05 kg /2.3 lb; lifetime 14 to 45 hours), OR • Rechargeable battery UBI-2590, OR • Universal lump-in-cord power supply, 82-265 Volt (47-63 Hz)
Alarm	Visual LED and 103 dB @0.6m waterproof horn; adjustable. RS-232 data link.
Decontamination	Auto-flush protocols using onboard water, or manual flush with detergent and/or disinfectant. High-performance pull-through fan easily remove if contaminated.
Sound level	60 dB (A).
Ancillary equipment	Heavy-duty hard-shell transport case with wheels.
Analyte range	Toxins, viruses, bacteria, spores, fungi, multicellular pathogens
Sensitivity	Analyte dependent, 1 to 10 ppb typical for toxins, 100 to 100,000 CFU/ml for bacteria.
Assay time	Dependent on assay; 10 to 20 minutes typical.
Reagent storage	Reagent stored onboard assay coupon; may be reused up to 15 times depending on assay protocol.
Confirmatory sample	Confirmatory sample may be stored in assay coupon or 8cc sample vial.

BioHawk Plus Dry/Wet Air Sampling and Bioidentification System Specifications	
8-Channel Collector/Bioidentifier (BioHawk) - continued	
Characteristic	Description
Air collection rate	325 LPM, nominal.
Particulates collection range	1-10 µm
Concentration ratio	65,000/min., nominal
Liquid inventory	4 to 5cc. Factory set but adjustable under computer control. Patented control process maintains a constant liquid volume in the sampler, independent of collection time, temperature, or humidity; useful for concentrating trace airborne analytes.
Air inlet	Screened rectangular opening. Hose adapters available.
Concentrator (SASS 4000)	
Characteristic	Description
Primary airflow	4000 liters/min is sampled uniformly from around the concentrator's circumference.
Secondary airflow	30-325 LPM at +0.4 cm of water static head maximum; aerosol concentrate typically delivered to a wet or dry sampler such as the SASS 2300 or SASS 3100, respectively.
Aerosol range	Particles greater than 0.5 microns in diameter with a density of 1.0 g/cc
Secondary airflow connection	Hose barb fitting on base surface for nominal 3.8 cm ID hose.
Concentration enhancement	4 - 15 times typical for aerosols greater than 0.5 microns in size. Performance also influenced by secondary airflow- request specific data for your application.
Overall size	38 cm high x 25.4 cm diameter max.
Weight	6.32 kg (13.9 lbs.)
Operating temperature range	-40°C to 60°C
Power consumption	<ul style="list-style-type: none"> • 160 watts at 24VDC; Brushless drive motor with 70,000 hour life at 40°C. • 100 to 230 VAC lump-in cord AD/DC converter supplied.
Sound level	72 dBA @ 1 meter radius on inlet equatorial plane.
Mounting	Quick-detach tripod legs; 0.53m to 1.46m adjustable height.
Accessories	<ul style="list-style-type: none"> • Hard shell carrying case. • Electret sample filter assembly (for stand-alone operation).
<i>Research International reserves the right to change specifications without prior notice</i>	

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