RAD – CHEM- BIO- UNITECT-AIR

UNIVERSAL DETECTOR FOR AIRBORNE HAZARDS

Model UNITECT-AIR

A STATE OF THE ART
INTEGRATED CHEMICAL
BIOLOGICAL & RADIATION
AIR MONITORING SYSTEM

APPLICATIONS
• Room Air, Outdoor Air, Ducts or
  Exhaust Stacks, Airbourne Plumes
• High Profile Buildings:
  Convention Centers,
  Sports Arenas,
  Government Establishments
• Industrial Contaminates:
  Laboratory, Power Plant

FEATURES
- Combines Several Detection Goals
- Real-Time, On-Line
- Major Chemical Tests CWA +TIC’s
- pH, ORP, and Lead
- Detects Alpha, Beta, Gamma,
  Tritium, Radon, (Optional)
- Detects More Than 6 classes of Microbes

BENEFITS
- All-in-One Continuous Monitor
- Real-Time, On-Line
- Into One Monitor
- No Reagents Required
- Measurements Logged 24 Hr/Day 7 Day /Week
- Customer Controlled Alarm Threshold
- SCADA compatible
- Easy Installation
- Calibration Can be Customized for
  Specific Contaminants
- Remote Control & Communications

Real – Time
Air Monitors

TECHNICAL ASSOCIATES

Technical Associates and Data Rangers
# PHYSICAL PARAMETER SENSORS

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
<th>RANGE</th>
<th>SENSOR</th>
<th>MAINTENANCE</th>
<th>POWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW</td>
<td>0 to 3.0 CFM</td>
<td>Volumetric</td>
<td>None</td>
<td>10 – 36 VDC Input</td>
</tr>
<tr>
<td>TEMPERATURE</td>
<td>Ambient</td>
<td>RTD Ceramic</td>
<td>Periodic Calibration</td>
<td>10 – 36 VDC Input</td>
</tr>
<tr>
<td>PRESSURE</td>
<td>900 – 1400 hpa</td>
<td>Diaphragm</td>
<td>None</td>
<td>10 – 36 VDC Input</td>
</tr>
</tbody>
</table>

**FLOW RATE**

**STANDARD**  
0-3 cfm

**OPTIONAL**  
Wide range of flow rates available

**OPTIONS**  
Cooler model: Cool-33 for detector and samples is used in case of higher sample or ambient temperatures.

## SIZE AND WEIGHT

**DIMENSIONS**

**CABINET:**  
29” W x 31” D x 59” H (including wheels)

**CHEM PANELS:**  
36” W x 28” H (2 each)

**BIO PANELS:**  
28” W x 50” H

**WHEELS**  
5” diameter, high capacity, rugged wheels with lock and rubber tires

**WEIGHT**  
Standard unit 170kg
## CHEMICAL SENSORS

### TYPICAL

<table>
<thead>
<tr>
<th>TOXIN TYPES</th>
<th>Chemical Warfare Agents CWA’s DETECTED</th>
<th>Toxic Industrial Chemicals TIC’s DETECTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nerve and blister agents such as Tabun, Sarin, Soman, Cyclosarin, Agent VX, Agent VXR, Cyanogen chloride (CK), Mustard Nitrogen mustard</td>
<td>C12, HCl, HNO3, SO2, HCN, HB, HF, BC13, BF3, CS2, Phosgene Ammonia Ethylene Oxide Phosphorus, Trichloride (PC13) Diborane, plus others as requested</td>
<td></td>
</tr>
</tbody>
</table>
**RADIATION SENSORS**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>UNITECT-AIR (Standard)</th>
<th>UNITECT-AIR – R4</th>
<th>UNITECT-AIR-R6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>Three</td>
<td>Four</td>
<td>Six</td>
</tr>
<tr>
<td>Activity Detected</td>
<td>1. Beta-gamma particulate, Iodine and Radio-Chemicals</td>
<td>1,2,3 plus, 4 Alpha particulate</td>
<td>1-4 plus, 5.Tritium and 6. Carbon-14</td>
</tr>
<tr>
<td></td>
<td>2. Noble gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Activity Detected**

- **Filters**: 2” dia
- **Filter Type**: Glass Fiber Filter
- **Collection Efficiency**: 99% Efficiency at 0.3 micron particle size
- **Beta-Gamma Particulate**
- **Iodine**: 2.5” dia x 1” thick
- **Nobel Gas**: One Liter Chamber
- **Iodine**: 60 KeV to 3 MeV (7 MeV optional)
- **Nobel Gas**: 60 KeV to 3 MeV (7 MeV optional)

**Activity Detected**

- **Filters/Collector**: 2” dia
- **Filter Collector Type**: Glass Fiber Filter
- **Alpha Particulate**: 2.5” dia
- **Organic Carbon-14**: TEDA Activated Charcoal Disk
- **Tritium**: Dual Ion Chamber
- **Tritium**: Stainless Steel or Nickel Lined
**RAD – CHEM- BIO- UNITECT-AIR**

**RADIATION SENSORS**

<table>
<thead>
<tr>
<th>Type of Detector</th>
<th>1 Minute</th>
<th>1 Hour</th>
<th>10 Hours</th>
<th>1 Day</th>
<th>1 Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulate Beta-Gamma Cs-137, Co-58, etc</td>
<td>$6 \times 10^{-10}$ uCi/ml</td>
<td>$1 \times 10^{-11}$ uCi/ml $3.7 \times 10^{-7}$ Bq/ml</td>
<td>$1 \times 10^{-12}$ uCi/ml $3.7 \times 10^{-8}$ Bq/ml</td>
<td>$6 \times 10^{-13}$ uCi/ml</td>
<td>$1 \times 10^{-13}$ Bq/ml $4 \times 10^{-9}$ Bq/ml</td>
</tr>
<tr>
<td>Iodine I-131, etc.</td>
<td>$3 \times 10^{-9}$ uCi/ml</td>
<td>$1 \times 10^{-11}$ uCi/ml $3.7 \times 10^{-1}$ Bq/ml</td>
<td>$1 \times 10^{-12}$ uCi/ml $3.7 \times 10^{-8}$ Bq/ml</td>
<td>$6 \times 10^{-13}$ uCi/ml</td>
<td>$1 \times 10^{-13}$ Bq/ml $4 \times 10^{-9}$ Bq/ml</td>
</tr>
<tr>
<td>Gas-Standard Range Xe-133, etc</td>
<td>$6 \times 10^{-7}$ uCi/ml</td>
<td>$1 \times 10^{-7}$ uCi/ml $3.7 \times 10^{-3}$ Bq/ml</td>
<td>$2.7 \times 10^{-8}$ uCi/ml $1 \times 10^{-3}$ Bq/ml</td>
<td>$1 \times 10^{-8}$ Bq/ml $3.7 \times 10^{-4}$ Bq/ml</td>
<td>$2.7 \times 10^{-9}$ Bq/ml $1 \times 10^{-4}$ Bq/ml</td>
</tr>
</tbody>
</table>

**Measurement Ranges of Optional Detectors**

<table>
<thead>
<tr>
<th>Type of Detector</th>
<th>From</th>
<th>4 Decade Model</th>
<th>6 Decade Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tritium</td>
<td>$10^{-7}$</td>
<td>$10^{-3}$</td>
<td>$10^{-1}$ uCi/cc</td>
</tr>
<tr>
<td>Inorganic C-14</td>
<td>$10^{-8}$</td>
<td>$10^{-4}$</td>
<td>$10^{-2}$ uCi/cc</td>
</tr>
<tr>
<td>Organic C-14</td>
<td>$10^{-9}$</td>
<td>$10^{-5}$</td>
<td>$10^{-3}$ uCi/cc</td>
</tr>
<tr>
<td>Alpha particulate</td>
<td>$5 \times 10^{-9}$</td>
<td>$10^{-4}$</td>
<td>uCi/cc</td>
</tr>
</tbody>
</table>

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**Close program before changing filter/cartridge.**
Real-time detection of bioagents in air
Also detects genetically modified agents

The SmartBio Sensor (SBS) enables real-time detection of biological agents in ambient air, The system Classifies bacteria, bacterial spores, toxins and viruses while maintaining a low response to common biological and and chemical interferants in the environment.

The SBS continuously samples the air and traps bioagents onto an array of semi-selective optical biosensors.

The fluorescence from the array is processed by an on-board computer to produce signal patterns that are characteristic of bioagents. The bioagents are retained on the sensor substrates for confirmatory analysis or forensic archiving.

The current SBS system uses 8-sensor array and an integrated airborne particle counter to detect bioagent-containing clouds in real time. This detection suite affords more selectivity and greater immunity to previous based techniques. The SBS sensors will also respond to unanticipated or genetically modified organisms that could be missed by sensors designed for specific organism detection.

Specifications
Principal of Operation: Multichannel fluorescence and pattern recognition
Agents Classes Detected: Bacteria, bacterial spores, viruses, toxins
Detection Channels: 8 fluorescent chemical sensors, 2 particle counting channels
Operation Mode: Continuous Sampling
Response Time: Detect < 2 minutes, Classify < 5 minutes,
Initial startup time After < 10 minutes
BIOLOGICAL SENSORS

BIOLOGICAL DETECTION LIBRARY TYPICAL

<table>
<thead>
<tr>
<th>MICROBIAL TYPES</th>
<th>DETECTION LIBRARY MICROORGANISM</th>
<th>CURRENTLY CLASSIFIED AS ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACTERIA ROD SHAPED</td>
<td>Various</td>
<td>BACTERIA</td>
</tr>
<tr>
<td>BACTERIA COCCI</td>
<td>Bacillus - vegetative</td>
<td>BACTERIA</td>
</tr>
<tr>
<td>BACTERIA ENOSPORES</td>
<td>Various</td>
<td>SPORES</td>
</tr>
<tr>
<td>PROTOZOA</td>
<td>Various</td>
<td>PROTOZOA</td>
</tr>
<tr>
<td>RECENT ADDITIONS TO LIBRARY</td>
<td>Various</td>
<td>Yeast, Mold, Virus</td>
</tr>
</tbody>
</table>

BioSentry offers state-of-the-art based technology for continuous, on-line, real-time monitoring for airborne pathogens.
This screenshot allows the user to set all "Alarm Set Points" for all Detector Chambers.

This screenshot displays & finds both Background & Source Counts, and sets Parameters.
UNITECT FLOW CHART
For Radiation-Chemical-Biological Detection
This is “Test Screen” which allows the user to test Primary Detectors and Functions

**OPERATE SCREEN**

This screenshot displays & finds both Background & Source Counts, and sets Parameters
UNITECT-AIR combines several detection goals into a single monitor. The UNITECT-AIR continuously monitors Radio Nuclides using particulate filter and charcoal filter. Both Industrial and Warfare Chemicals, as well as Biological Threats including Bacteria, Yeasts, Virus and Molds are monitored with detectors integrated within the UNITECT system. Additional monitoring is available and will be tailored to specific needs upon request. Measurements are logged 24 hr/day - 7 day/week, with alarm capability and a universal read out adaptable to mainframe infrastructure computers.

All Chemical and Biological Technology is provided by Data Rangers LLC.