MKS Instruments, Inc. - AIRGARD and AIRGARD Plus (w/EC sensor)

GENERAL DESCRIPTION:

AIRGARD is an FTIR based chemical point sensor for simultaneous detection and alarming on 50+ CWAs and TICs at the ppb level within 10 seconds. It is designed to be for fixed installations, such as HVAC and ambient air monitoring. AIRGARD Plus is a version which also contains ancillary electrochemical sensors for detection of halogen and hydrogen sulfide vapors which have either little or no infrared signature. The AIRGARD has a near 0% false alarm rate as proven in significant government testing.

TECHNICAL DESCRIPTION:

AIRGARD uses a cryogenically cooled infrared quantum detector (MCT) to sensitively detect very small infrared absorptions from vapors enclosed in our patented 10.18 meter path length (400 mL volume) multipass cell. The classical least squares algorithm then processes any absorptions against our library of 370+ vaporous compounds and will alarm if any threat agent is detected with high certainty. The sample is introduced into the cell with a 10 L/min diprhagm pump, resulting in a T90 of approx. 4.5 seconds.

CONTACT INFORMATION

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COST

- $72,500/system
- ~$0/analysis

Tier Selection

Final tier assignment is based on overall product score.

● Top Tier   ◓ Second Tier   ○ Third Tier
◖ Fourth Tier   ● Bottom Tier

RANKINGS

	Biological	Chemical	Radiological
FIELD USE System	N/A	Fourth Tier	N/A
MOBILE Laboratory	N/A	Fourth Tier	N/A
DIAGNOSTIC Laboratory	N/A	Fourth Tier	N/A
ANALYTICAL Laboratory	N/A	Third Tier	N/A

Survey Source

Vendor Supplied Information

Scoring Analysis

System scores are compared across the four scenarios and ranked from highest to lowest.
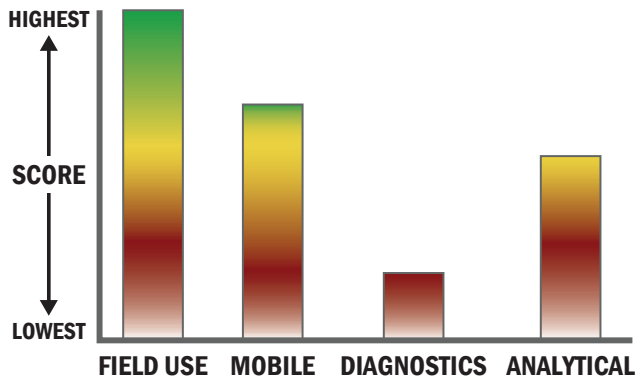
Impact Chart

The Impact Chart is a spider graph representing specific categories and designed to give the reader a visual depiction of how a particular system is expected to operate across the four different scenarios. The score for each of the seven categories is presented as the percentage of the total possible score. Higher category scores extend the spokes of a graphic toward the outer edge of the chart. The area graphed for each of the four scenarios relates to how well the system performed in that scenario. Graphics for each of the four scenarios are super-imposed for ease of comparison.
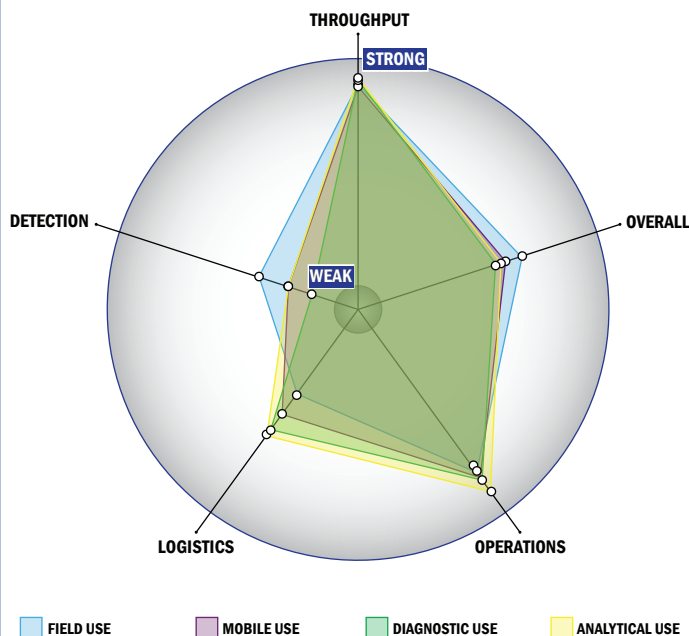

Evaluation Criteria

Throughput:
- Detection is instantaneous
- Continuous operation with no defined runs
- Greater than 750 samples every 2 hours
- The system or device is currently fully automated
- Device or system is intended for multiple detection assays
- 0-1 solutions, buffer, eluents, and/or reagents
- 0 components
- 10-20 minutes is required is required for setup
- Almost instantaneous detection

Logistics:
- An afternoon of training and some technical skills required
- Approximately the size of a carry-on luggage suitcase
- Between 25 and 50 kg
- Wired connections are available
- System or device has 110V electrical requirement

MOST MATURE ← → LEAST MATURE
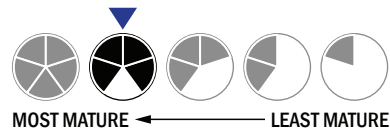
Operations:
- Can be used from 4°C to 41°C
- Components must be stored at room temperature (27°C)
- Device or system has peak performance at normal relative humidity conditions
- 5-10 years expected life
- Results can be viewed in real-time
- The system or device is currently fully autonomous
- The system software is closed and not available for modification
- The system hardware is closed and not available for modification

Detection:
- Not possible for the system to achieve 510K clearance
- Not possible for the system to achieve FDA approval
- This system does not test liquids
- Superior specificity. System has a false alarm rate approaching zero (~0%)
- > 1×10^{-3} mg/m³
- System currently can identify aerosolized chemical agent
- System could be adapted to identify liquid chemical agent