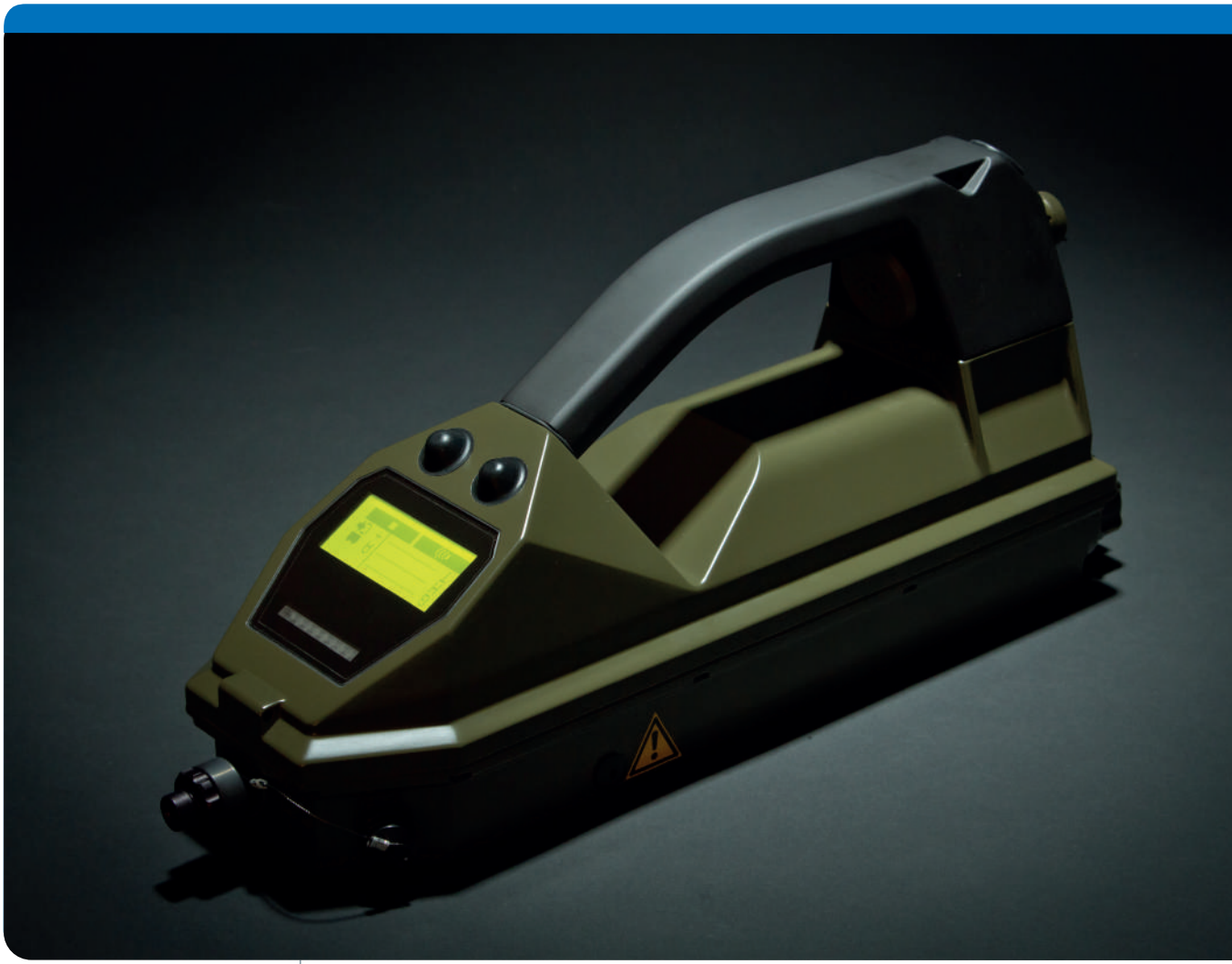


# Chemical Threat Detection

- Hand-held Chemical Agent Monitor: **RAID-M Series**

CBRNE

Innovation with Integrity

# Choose Innovation – Choose Bruker

Bruker is recognised as the leading authority on the use of detection and identification technologies to mitigate the threat from the accidental or deliberate release of toxic gases, explosives and radioactive materials that could kill or injure civilians and military personnel.

We offer the world's most comprehensive range of threat detection and identification solutions and can help you to assess how these can be best employed to protect people, property and military assets.

We develop, manufacture and supply technology worldwide for a range of customers and end users that need to protect people and property. These include, but are not limited to, national armies who need to protect their troops, as well as governments, commercial enterprises and multi-national corporations who need to protect their employees and clients from the ever-increasing threat from terrorism.

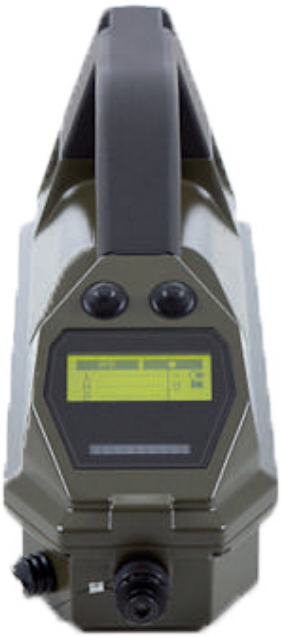
Bruker is strongly committed to meeting its customers' needs by continuing to revolutionise the design, manufacture and distribution of detection tools based on our core technologies; by providing solutions that are regarded as the 'Gold Standard' by threat mitigation experts.

# Chemical Detection: RAID-M Series

RAID-M Series hand-held Chemical Agent detectors are based on the well-established principle of Ion Mobility Spectrometry (IMS). They are designed to detect, search for and locate Chemical Warfare Agents (CWA) and Toxic Industrial Chemicals (TIC) on personnel, equipment, vehicles and on the ground. Two versions of RAID-M are offered. The RAID-M100 uses a low-level $^{63}$Ni source, whereas the RAID-$M_{NR}$ uses a non-radioactive high energy photoionisation (HEPI) source. Otherwise, both systems are externally identical, perform to the same detection limits and both use the same consumables for operation.

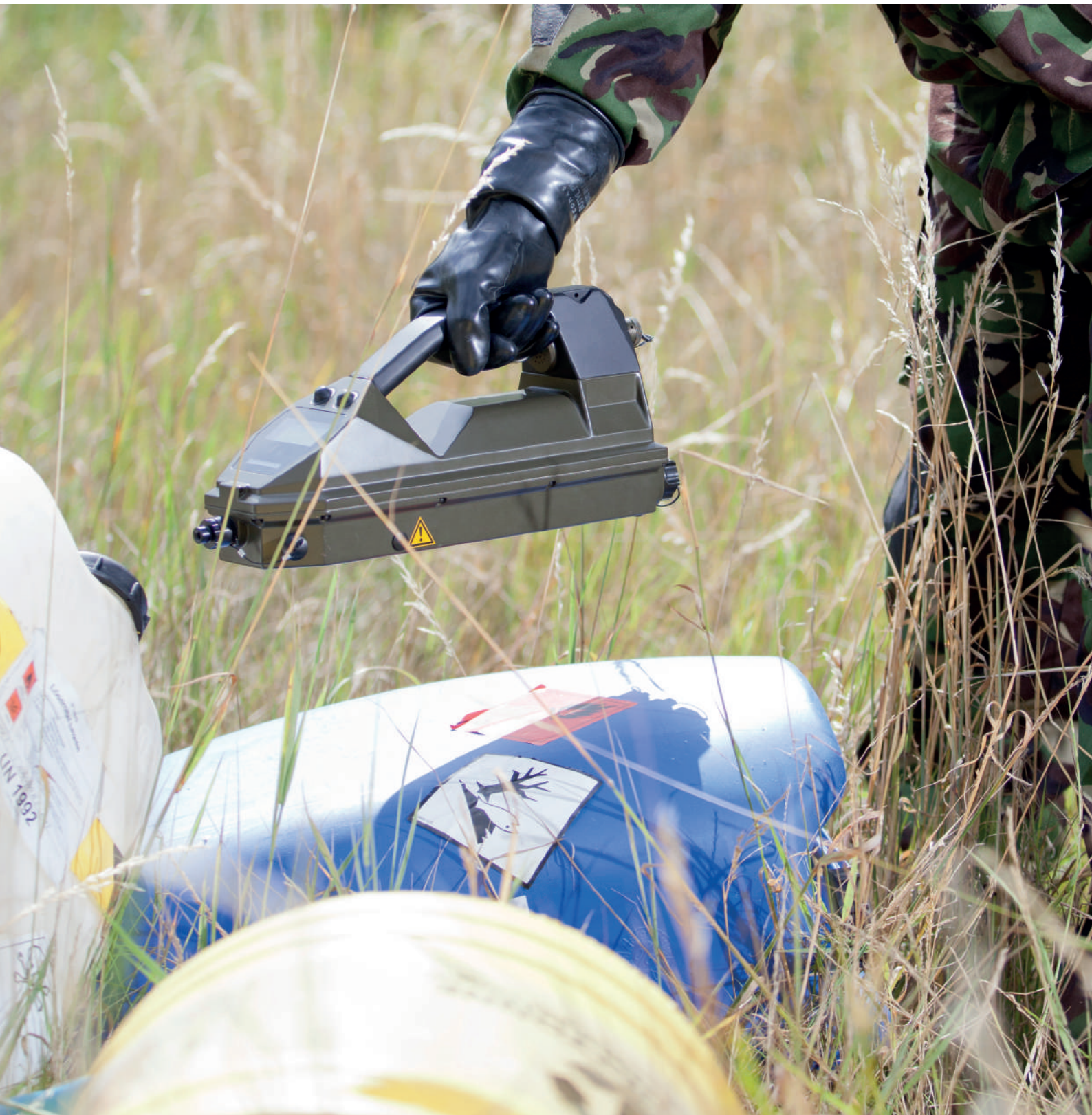
RAID-M Series are able to detect, identify, quantify and continuously monitor concentration levels of the specified CWA and TIC. The identity of detected substances is displayed by its standard code (GA, VX, etc.) or its appropriate abbreviation. For each class (G, H and T) a separate display section is provided, so that all the classes may be monitored independently. Hazard levels are indicated by an incremental bar display with eight segments that relate to concentration. RAID-M Series can be user-configured to give an audible and a visual alarm when a substance is detected, and includes the ability to silence the sounder. By providing very low detection limits and short response times, the state of the art measuring cell and highly sophisticated detection algorithms, highly toxic substances can be detected at lowest levels. In the event of an overload, a Bruker Detection exclusive feature realises short recovery times by means of an automatic clean air purge mode; termed 'backflush'.

Supporting post-mission analysis of detection events, all RAID-M Series detectors are equipped with a data logging system. This system is capable of continuous monitoring and uses two integrated data loggers that are able to record independently from each other. Separately, these record individual spectra as well as the results of a measurement campaign. The event logger stores almost 3000 events, and the spectrum logger keeps 30 full spectra for subsequent inspection.



## Why specify RAID M Series?

- Industry-Standard IMS detection technology
  Time proven technology - the de-facto standard
- Detects, identifies and quantifies the threat
  Bruker algorithms afford better threat detection
- No calibration - ever!
  Factory calibrated, no field calibration is required
- Consumables changed at the operator level
  No need to return to base for consumables
- Automatic backflush mode
  This overload protection aids detector recovery
- Non-radioactive HEPI source option
  With identical performance to the $^{63}$Ni version
- Operates from one rechargeable battery - two included
  Provides a seven hour runtime @ 20°C
- External power options
  12 to 32V DC, 100 to 240V AC, 50/60Hz
- Powered/unpowered vehicle mounting options
  For mobile platform integration
- Military Certified product range
  Designed to survive the toughest missions



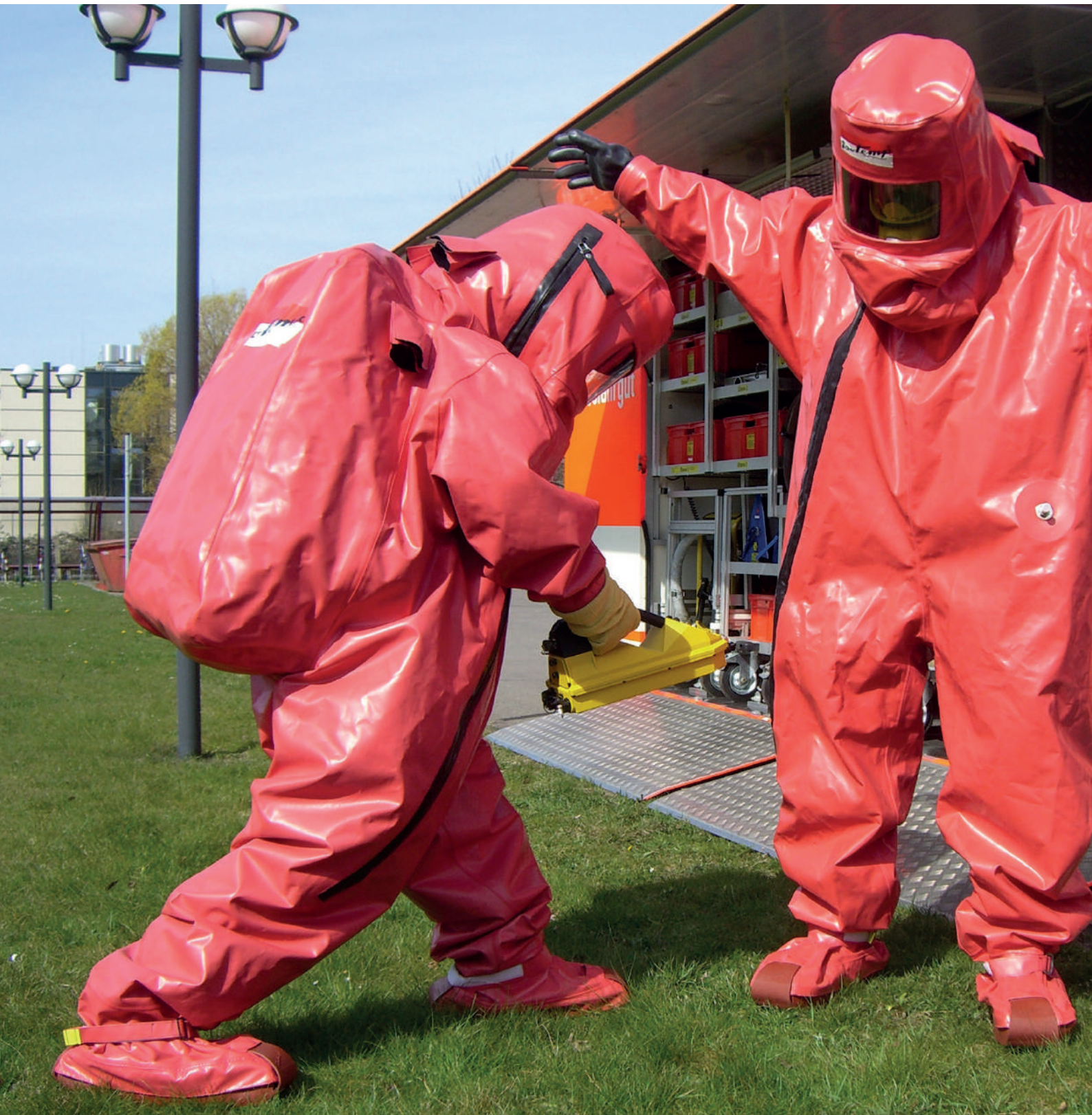
# Bruker RAID-M Series: Military Deployments

Regarded as the Gold Standard of CWA detectors, the RAID-M Series impresses with its overall capability in a single lightweight, hand-held, battery-operated package. RAID-M Series detect, identify, quantify and continuously monitor concentration levels of both CWA and TIC. The identity of detected substances is displayed and a separate section is provided on the display, permitting all the agent classes to be monitored independently. Hazard levels are shown using a display with segments that relate to concentration. RAID-M Series offers both an audible and visual detection alarms, and the sounder can be disabled for stealth operation.

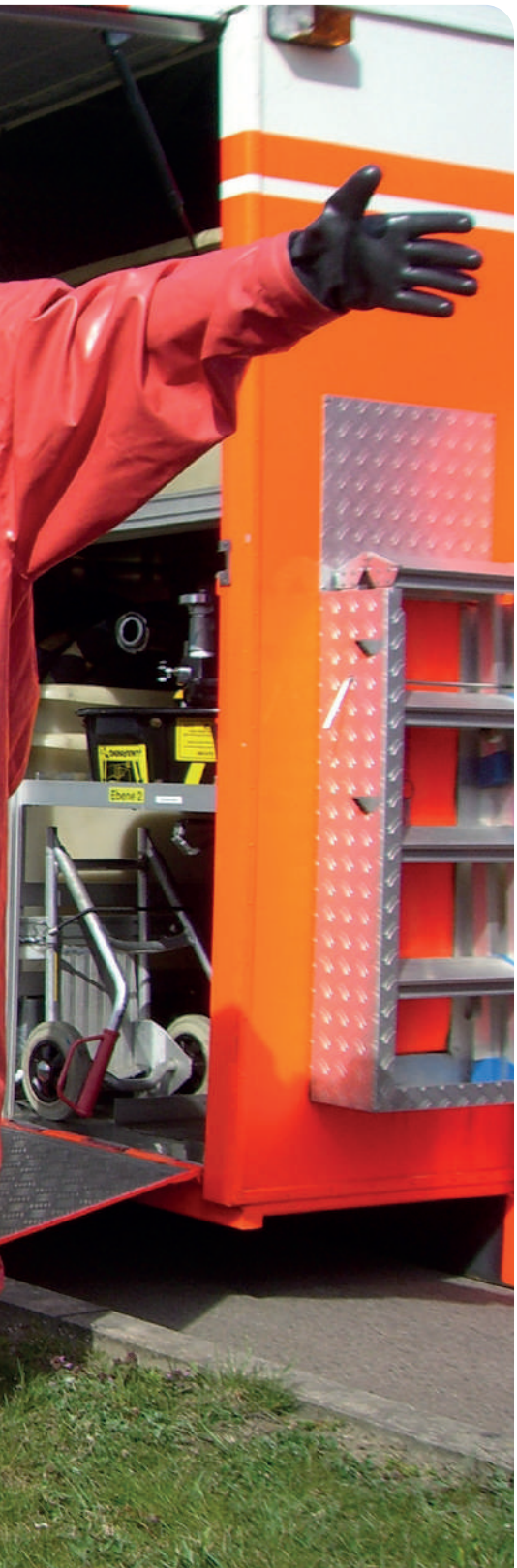
RAID-M Series benefit from a low maintenance burden. Consumables have a typical lifetime of 500 operational hours and can be changed by the operator. Additionally, RAID-M Series are factory calibrated for life; completely removing any requirement for field calibration.

Based on field-proven Bruker IMS technology, the RAID-M Series offers two variants. The RAID-M 100 uses a $^{63}Ni$ source and is the lower–cost option. The RAID-$M_{NR}$ uses a non-radioactive high-energy photoionisation (HEPI) source. The HEPI variant is the preferred option for bulk purchasing contracts that might require the equipment storing for extended periods, yet being ready for deployment at short notice.

For installation to mobile platforms, such as reconnaissance vehicles, RAID-M Series are offered with optional vehicle mounts; powered and unpowered. The powered mount, in conjunction with external sample probes, permits the detector to make CWA/TIC measurements whilst underway. Alternatively, the unpowered mount provides convenient safe storage for the instrument so it can be deployed at a moment's notice.



# Bruker RAID-M Series: Civilian Deployments

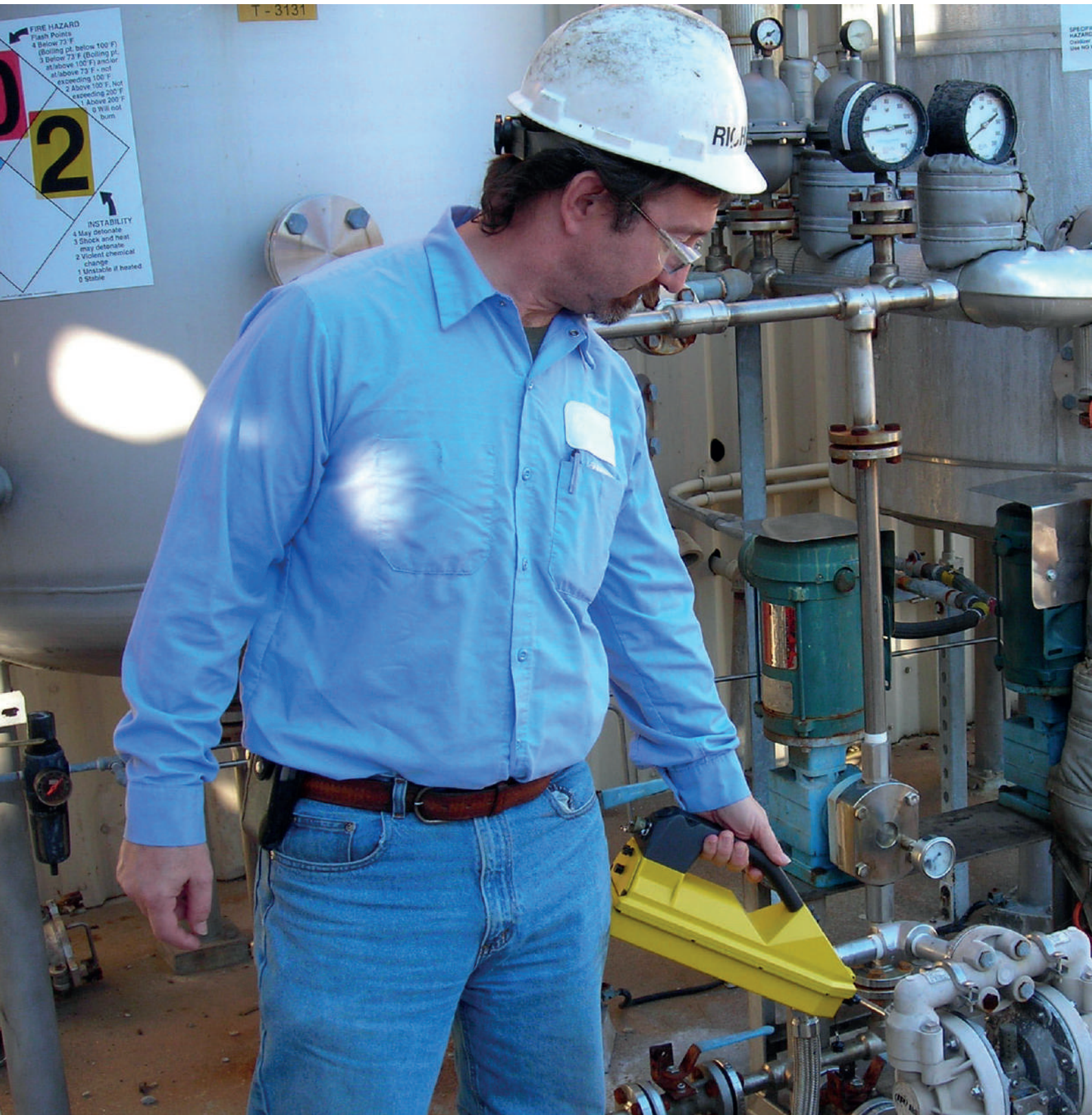


The RAID-M Series are the ideal choice of hand-held chemical detectors for deployment by civilian response services, including Police CBRN teams, First Responders, Firefighters and Chemical Disaster Management teams.

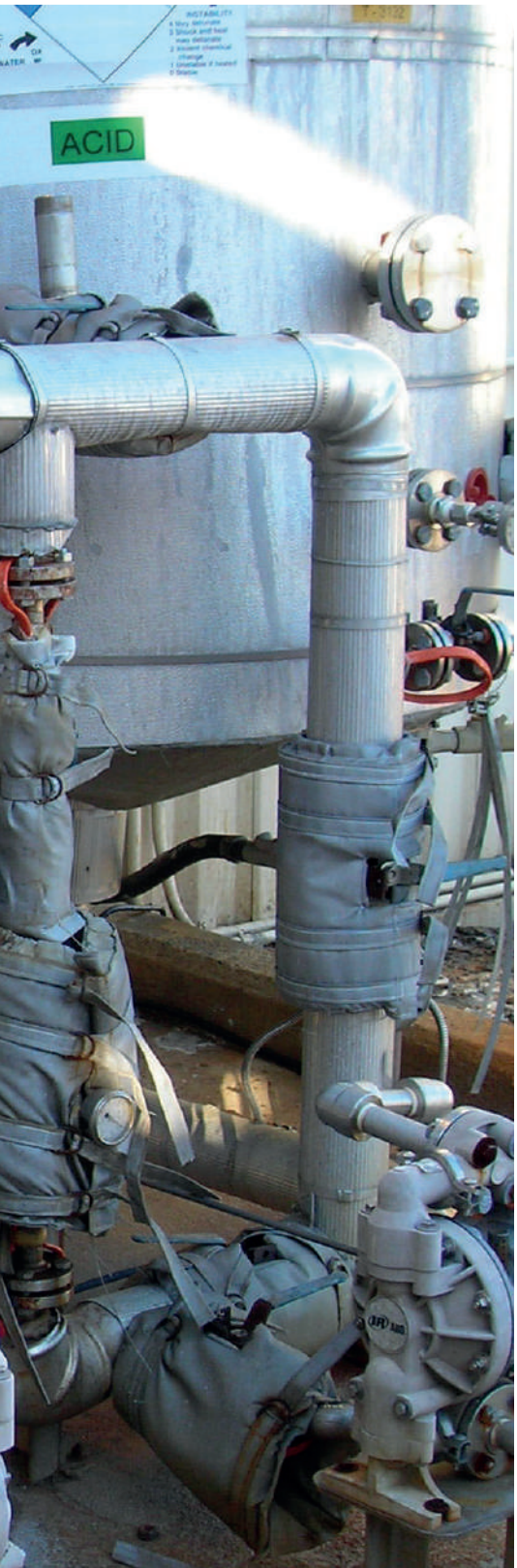
Unlike simple non-specific chemical detectors, RAID-M Series are configured explicitly to detect and identify Chemical Warfare Agents (CWA) and a number of Toxic Industrial Chemicals (TIC). In addition to detection and identification, the RAID-M Series also quantify the threat by means of a multi-segment bar display. Further, especially in non-military roles, the RAID-M Series excels in the rejection of interferences from other chemicals that may be present, which could otherwise produce false positive and/or false negative results. This interference rejection feature derives from extensive field tests, which has resulted in the development and implementation of unique Bruker algorithms that suppress interference from many common and not-so-common chemicals.

Two detectors are offered within the series; the RAID-M100 uses a $^{63}Ni$ source and is the lower-cost option. Alternatively, the new RAID-$M_{NR}$ uses a high-energy photoionisation (HEPI) source that is non-radioactive. Organisations that currently deploy the RAID-M100 can also use the RAID-$M_{NR}$ in the knowledge that not only are both instruments externally identical, they use exactly the same consumables, the same batteries and the same software. Furthermore have identical detection capabilities and operational features.

For installation to many types of civilian vehicles, including vans and trucks, powered mounts are available providing the facility to operate the instrument using the vehicle's power, whilst sampling the ambient air for threats. Alternatively, the unpowered mount provides safe stowage, keeping the RAID-M Series available for immediate deployment; perhaps by having it mounted adjacent to a convenient door.


T - 3131
FIRE HAZARD
Flash Points
4 Below 73° F
(Boiling pt. below 100° F)
3 Below 73° F (Boiling pt.
at/above 100° F) and/or
at/above 73° F - not
exceeding 100° F
2 Above 100° F, Not
exceeding 200° F
1 Above 200° F
0 Will not
burn
2
INSTABILITY
4 May detonate
3 Shock and heat
may detonate
2 Violent chemical
change
1 Unstable if heated
0 Stable

# Bruker RAID-M Series: Industrial Applications




IMS, Ion mobility spectrometry, is a fast and sensitive method of detection for a number of toxic industrial chemicals in gas and vapour form. The specific detection capabilities of the portable, hand-held, RAID-M Series make them uniquely suited to the detection of highly-hazardous Toxic Industrial Chemicals (TIC). This battery-powered device can be used to identify sources of leaks, to monitor transportation and to monitor filling processes, as well as providing information in case of disasters. The RAID-M Series can be configured at the time of purchase to measure substances such as toluene diisocyanate (TDI) and dimethyl sulphate (DMS) in air.

Two detectors are offered within the series; the RAID-M100 uses a $^{63}$Ni source and is the lower-cost option. Alternatively, the RAID-$M_{NR}$ uses a non-radioactive source in the form of a high-energy photoionisation (HEPI) source.

## TOLUENE DIISOCYANATE (TDI)

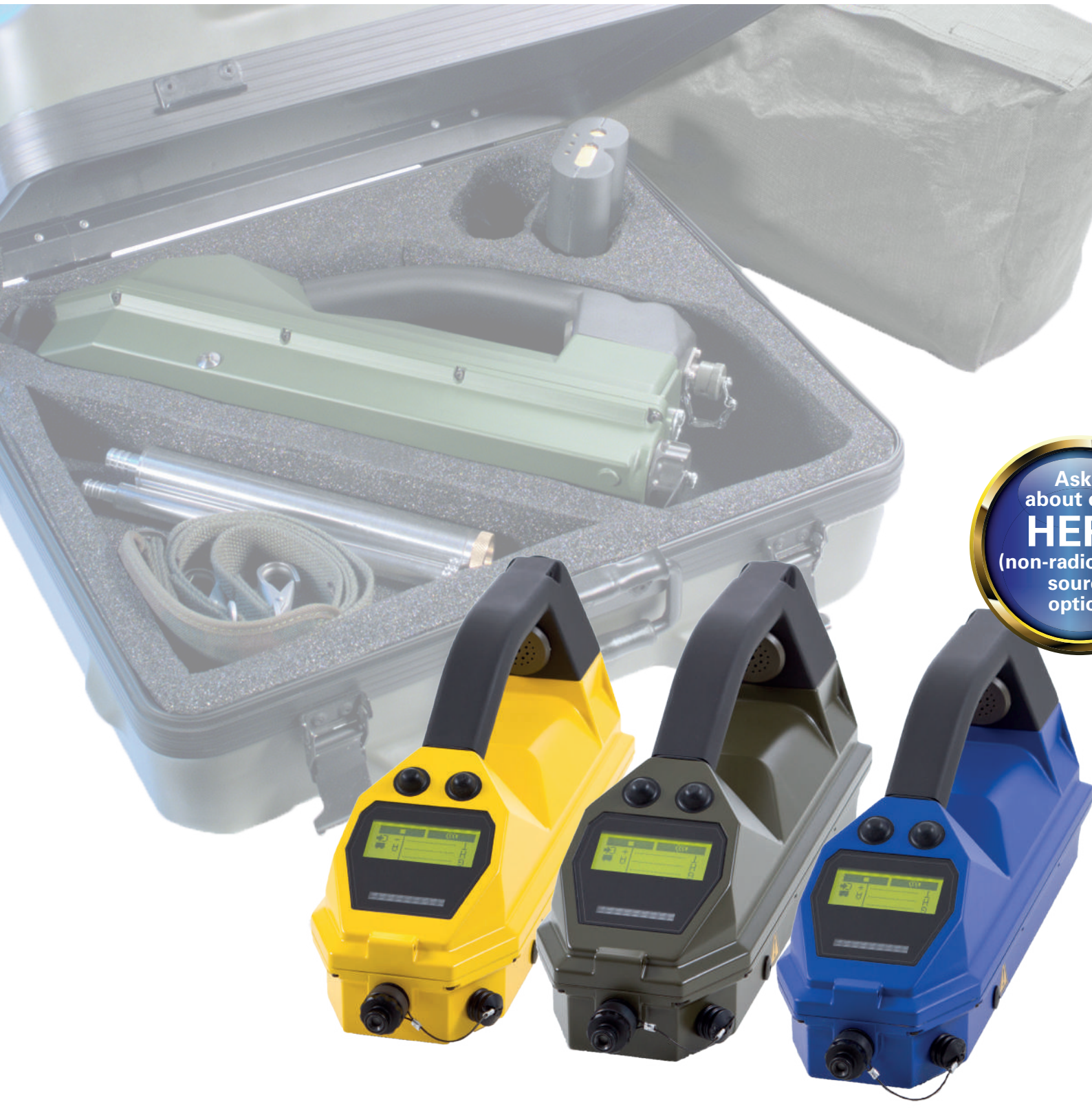
Isocyanates are increasingly being used for manufacturing polyurethane foam, elastomers, adhesives, paints, coatings, insecticides, and many other products. RAID-M series devices are capable of detecting TDI rapidly down to 1 ppb (0.007 mg m-3). This is below the lower limit of common workplace exposure limits.

Request our free Application Note:
CBRNE 1843545. Monitoring Toluene Diisocyanate Using a Bruker Ion Mobility Spectrometer

## DIMETHYL SULPHATE (DMS)

DMS is used in the synthesis of dyestuffs, perfumes, pesticides and pharmaceuticals, and is highly toxic. The RAID-M series are ideally suited for the ambient air monitoring of DMS concentrations, and this toxic substance can be detected at low ppb levels within a few seconds. Using a RAID-M series instrument, the minimum detectable DMS concentration is in the order of 4 ppb, and is lower than the required international occupational exposure limits.

Request our free Application Note:
CBRNE 1838036 - Using Bruker RAID instruments to monitor Occupational Exposure Limits to Dimethyl Sulphate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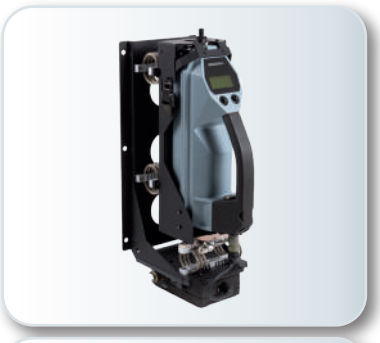
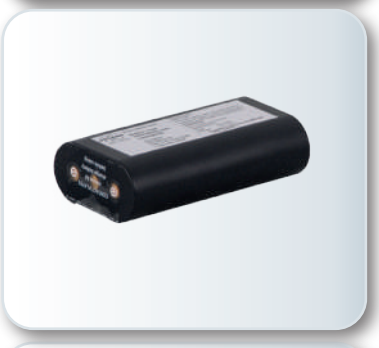
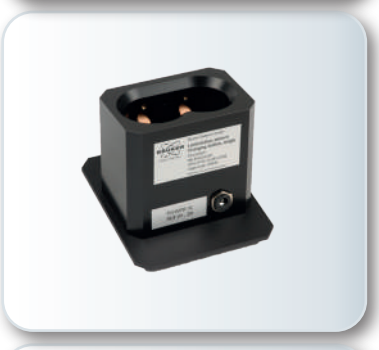
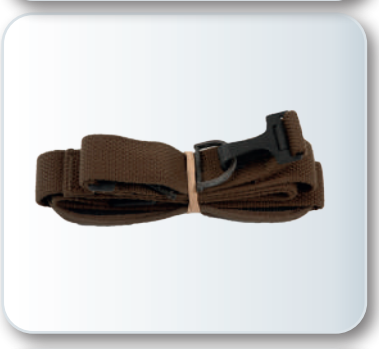
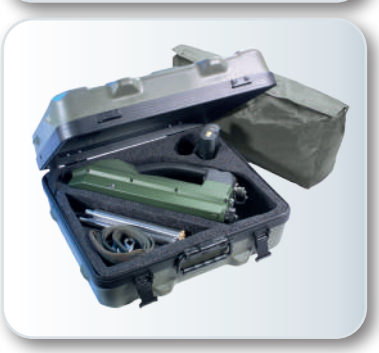
# RAID-M Series: Overview











Widely regarded as the Gold Standard in hand-held detector technology, the RAID-M Series impresses with its minimal logistic requirements and its superior availability. The operator can change consumables without returning the product to a repair centre. Not only are RAID-M Series highly sensitive, the same product detects, identifies and quantifies the level of threat all in a single device.

RAID-M Series detectors are available in a choice of colourways to meet the requirements of specific users:

**Key Features**

| | RAID-M 100 | RAID-M 100Plus | RAID-M NR |
|---|---|---|---|
| 5 on-board libraries | - | yes | yes |
| Factory default library configuration | Library 1: Standard CWA<br>Library 2: Standard ITOX | Library 1: Standard CWA<br>Library 2: Extended CWA<br>Library 1: ITF 25 agent list<br>Library 2: Conflagration gases | Library 1: Standard CWA<br>Library 2: Extended CWA<br>Library 1: ITF 25 agent list<br>Library 2: Conflagration gases |
| Graduated display of reactant ions | - | yes | yes |
| Substance toxicity with sequencing according to degree of risk | - | yes | yes |
| Concentration shown in bars or numeric to the identified substance | - | yes | yes |
| Ionisation source | Ni-63 | Ni-63 | Non-radioactive ionization source (Photo-ionization) |

detection@bruker.com

# Global Resources – Local Focus

Bruker has support centres of technical expertise in every major area of the world providing sales, applications and engineering support for our complete product range. With more than 6,000 employees at 90 locations worldwide you can be confident that the support team fronts a uniquely integrated global resource. Research and development specialists, applications professionals and highly trained engineers in every field are dedicated to your investment in our equipment.

### Superior Detector Performance
For highly sensitive detection, identification and quantification of chemical, biological, explosive and radiation threats. Superior performance and high reliability comes as standard.

### Applications Support
Systems are configured to meet your needs and result from our detailed evaluation of your requirements.

### Standards & Compliance
All our systems are manufactured in ISO9001 compliant factories; so you can be assured of superior quality and performance.

### Software & Data Systems
Designed to industry standards on the Microsoft® platform, our software can be integrated with your security management software.

### Training
User Training and User-Level Maintenance is part of our standard Scope of Supply. Our goal is simple; to minimise your cost of ownership.

### Low Maintenance
All our systems are designed for extended maintenance periods and reduce the through-life-costs of your investment.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