



GDA-X

Gas Detector Array - Explosives



For hazardous chemicals and traces of explosives

The standard GDA commonly used to detect and identify hazardous gaseous compounds has been improved to allow the detection of explosives. The hybrid Gas Detector Array (GDA) is a gas detection device with multiple sensors which allows detecting a broad range of hazardous gases with high specificity.

All the sensors (IMS, PID, EC, 2xMOS) from the array deliver complementary information about the detected compounds. The sensor signals are evaluated and compared with the library. In case that there is a match, the name of the compound and its concentration is displayed.

Extending this technology for the detection of explosives requires evaporation of some explosive materials with very low volatility and some modification on the detector.

This has been achieved with a special tool using high temperatures to vaporize those materials and enabling therefore a response from the sensors. With added explosive detection capabilities, the **GDA-X** offers an added value to the public safety regarding explosive material and hazardous chemicals in a portable design. For the detection of chemical gas hazards the GDA is simply turned on and ready to be used as a broad range detector for TICs and CWAs. At normal temperatures high volatility explosives such as TATP are already detectable.



To detect further explosives with low volatility, it is required to perform three steps:

- Assemble the desorption tool to the GDA
- Choose the explosive application from the menu
- Wait for the system to heat up

After some minutes the system and the tool are ready to initiate the analysis.

Using a special fiber tape, the user wipes the sampling area and inserts the tape in the tool tray.

An analytically closed system ensures that no chemicals are lost and the whole procedure is carried with optimized sensitivity and without the danger of overloading and contaminating the system for a longer period.

Once reaching the adequate measuring temperature, the tape is placed in the desorber tool for about 20 seconds. The result is shown immediately on the display.



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Name	Molecular weight	Density (g/cm ³)	Vapor Pressure	Form	Detection limit
RDX (Hexogen)	222	1.83	6 ppt [25°C]	Particle	10 ng [100°C]
PETN (Pentrite)	316	1.78	18 ppt [25°C]	Particle	20 ng [100°C]
TNT (2,4,6 Trinitoluene)	227	1.65	7.7 ppb [25°C]	Particle, Vapor	1 ng [100°C]
NG (Nitroglycerin)	227	1.59	0.4 ppm [25°C]	Vapor	1 ng [100°C]
EGDN (Ethylene Glycol dinitrate)	152	1.49	93 ppm [25°C]	Vapor	20 ng [40°C]
HMTD (Hexamethylene triperoxide diamine)	208	0.88	1.7 ppb [22°C]	Particle Vapor	10 ng [100°C]
TATP (Triacetone Triperoxide)	222	1.2	>100 ppm [25°C]	Vapor	100 ng

Instrument Specifications

GDA with X-Desorption Tool

- Hybrid Sensor Array GDA with following sensors: Ion Mobility Spectrometer, Photo Ionization Detector, Electrochemical Cell, 2 Metal Oxide Sensors
- Chemical Detection Mode for TICs / CWAs gases
- Explosive Detection Mode
- Dedicated libraries
- Analysis software
- Self-test diagnosis tool
- **Standard sampling:** internal pumping and dilution system with self-protection
- For explosives an initial sampling kit is delivered with the instrument.

Operation Mode:

- GDA Mode for detection of TICs, CWAs and explosives with high vapor pressure
- GDA-X Mode + tool for detection of explosives with low vapor pressure
- **GDA dimension:** ~395 x 112 x 210 mm
- **Tool dimension:** ~110 x 64 x 113 mm
- **GDA weight:** 4.2 kg
- **Tool weight:** 0.920 kg
- **Power consumption:** standard ~50 W with tool ~100 W (power supply required)
- Example detection limits (see table above)