

Comprehensive Comparison of Solafact 800 and Solafact 810 Chemical and Harmful Substance Detectors

When selecting a chemical and harmful substance detector, understanding the nuances between models is crucial. Below is a detailed comparison of the **Solafact 800** and **Solafact 810**, highlighting their features, technologies, applications, and ideal use cases.

Side by Side Breakdown

Feature/Aspect	Solafact 800	Solafact 810
Detection Technology	Time-of-flight ion mobility spectrometry, array multi-sensing fusion, scintillator detection.	Ion mobility spectrum, Raman spectroscopy, and array electrochemical sensing, with intelligent recognition algorithms.
Detection Scope	Detects chemical toxins, industrial toxic gases, and optional radioactive substances.	Detects chemical warfare agents, industrial gases, toxic chemicals, and flammable/explosive substances in solid, liquid, and gas forms.
Detection Sensitivity	Sarin: 0.1 mg/m ³ ; Ammonia: 10 mg/m ³ .	Sarin: 0.1 mg/m ³ ; Ammonia: 10 mg/m ³ . Solid-liquid sensitivity: 1% (DMMP in water); Gas sensitivity: ppb~ppm.
Response Time	2-15 seconds.	Most solids/liquids: ≤ 5 seconds; Gases: ≤ 10 seconds.
Weight	≤ 1.5 kg.	≤ 5.5 kg.
Dimensions	≤ 215mm × 102mm × 66mm.	≤ 280mm × 190mm × 135mm.
Power Source	Two 18650 Lithium batteries.	24V DC or 220V AC.
Operational Environment	-20°C to 50°C (working); -40°C to 70°C (storage).	-20°C to 50°C for chemical monitoring; -40°C to +55°C overall operation.
Additional Features	Compact and lightweight. Optional nuclear radiation module. Anti-interference with nitrate smoke, grass smoke, and engine exhaust.	Modular design for secondary development. Anti-vibration, salt fog resistance, and high-altitude adaptability (up to 5000m). Supports vehicle, boat, or emergency vehicle installation.
Radiation Monitoring	Optional module: 0.01 μSv/h to 10 mSv/h range, ±10% accuracy.	Gamma radiation dose rate: 0.1 μGy/h to 10 Gy/h. Includes cumulative dose tracking.
Applications	Military anti-terrorism, environmental monitoring, emergency security, industrial production.	Broader applications including field operations, mobile platforms, and high-altitude use.
Portability	Highly portable, handheld.	Portable but larger and heavier, suitable for mobile installations.

Detection Technology

- Solafact 800:**
 Utilizes **time-of-flight ion mobility spectrometry**, **array multi-sensing fusion technology**, and **scintillator detection technology**. These cutting-edge technologies enable rapid and accurate identification of chemical toxins and industrial toxic gases. The optional nuclear radiation detection module enhances its versatility for detecting radioactive substances.
- Solafact 810:**
 Incorporates a blend of **ion mobility spectrum**, **Raman spectroscopy**, and **array electrochemical sensing technologies**. Combined with an **intelligent recognition algorithm**, the Solafact 810 achieves precise identification of toxic and harmful substances across solid, liquid, and gaseous phases. This comprehensive technological approach makes it uniquely capable of detecting a wider range of substances compared to the Solafact 800.

Detection Scope

- **Solafact 800:**
Specializes in identifying chemical warfare agents, industrial toxic and harmful gases, and radioactive substances (with an optional module). This makes it suitable for scenarios where chemical and limited radiation monitoring are the primary concerns.
- **Solafact 810:**
Offers an unparalleled detection scope, capable of identifying:
 - Chemical warfare agents (CWAs).
 - Industrial toxic and harmful gases (TICs).
 - Highly toxic chemicals.
 - Flammable and explosive materials.
 - Substances in **solid, liquid, and gas** phases.

The ability to detect substances across all three states of matter provides significant flexibility in handling diverse and complex environmental conditions.

Detection Sensitivity and Response Time

- **Sensitivity:**
 - **Solafact 800:** Demonstrates high sensitivity with the capability to detect sarin at **0.1 mg/m³** and ammonia at **10 mg/m³**.
 - **Solafact 810:** Matches the gas detection sensitivity of the Solafact 800 while surpassing it with a solid-liquid phase sensitivity of **1%** (e.g., DMMP in water) and gas-phase sensitivity reaching the **ppb~ppm range**.
- **Response Time:**
 - **Solafact 800:** Responds within **2 to 15 seconds**, depending on the substance and environmental conditions.
 - **Solafact 810:** Provides faster response times for most solids and liquids (**≤ 5 seconds**) and gases (**≤ 10 seconds**).

The Solafact 810's faster response across a broader range of substances ensures more immediate alerts in critical scenarios.

Design and Portability

- **Solafact 800:**
 - Compact and lightweight at **≤ 1.5 kg**.
 - Small dimensions (**215mm × 102mm × 66mm**).
 - Powered by two **18650 Lithium batteries**, providing up to **6 hours** of operation in moderate conditions.
 - Highly portable and ideal for handheld use, enabling field operators to carry it effortlessly.
- **Solafact 810:**
 - Larger and heavier, weighing **≤ 5.5 kg**, with dimensions of **280mm × 190mm × 135mm**.
 - Offers dual power options: **24V DC or 220V AC**, ensuring adaptability for prolonged and fixed operations.

- Suitable for installation on vehicles, boats, and shelters or portable use in demanding field conditions.

The Solafact 800 emphasizes ease of mobility for individual operators, while the Solafact 810 caters to teams requiring advanced capabilities in static or mobile deployments.

Environmental Adaptability

- **Solafact 800:**
 - Operates effectively between **-20°C to 50°C**.
 - Can be stored in extreme temperatures ranging from **-40°C to 70°C**.
 - Designed with anti-interference capabilities to prevent false alarms caused by nitrate smoke, grass smoke, or engine exhaust gases.
- **Solafact 810:**
 - Features an extended operating range for chemical detection (**-20°C to 50°C**) and general operations (**-40°C to +55°C**).
 - Withstands harsh environments due to compliance with military-grade standards for **anti-vibration (GJB150.18A-2009)** and **salt fog resistance (GJB150.11A-2009)**.
 - Adaptable to high-altitude conditions, functioning at elevations up to **5000 meters**.

The Solafact 810 demonstrates superior resilience and versatility, making it more suited for extreme conditions compared to the Solafact 800.

Radiation Monitoring

- **Solafact 800:**

Optional module for radiation detection with a range of **0.01 µSv/h to 10 mSv/h**, $\pm 10\%$ accuracy, and a nucleus response range of **35 keV to 1.5 MeV**.
- **Solafact 810:**

Enhanced radiation monitoring capabilities, including:

 - Gamma-ray dose rate detection (**0.1 µGy/h to 10 Gy/h**) with automatic range conversion.
 - Cumulative dose tracking (**0.1 µGy to 10 Gy**).
 - Integrated reporting functions for radiation exposure.

The Solafact 810 offers more advanced and integrated radiation monitoring features compared to the optional module available with the Solafact 800.

Applications

- **Solafact 800:**
 - Military anti-terrorism operations.
 - Emergency response and environmental monitoring.
 - Industrial production and chemical site inspections.
 - Security checks in public places and border patrols.
- **Solafact 810:**
 - Includes all the applications of the Solafact 800.

- Adds suitability for high-altitude operations, installation on mobile platforms, and advanced field detection of flammable and explosive materials.
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Conclusion

Both the Solafact 800 and Solafact 810 offer state-of-the-art detection technologies tailored for security, environmental, and industrial needs. However, their strengths cater to different priorities:

- **Solafact 800:** A lightweight, handheld solution ideal for rapid deployment, personal use, and moderate operational needs. Its compact design and optional radiation module make it a practical choice for individual operators.
- **Solafact 810:** A versatile and robust detector designed for comprehensive substance identification across all phases, with enhanced adaptability for harsh and complex environments. Its modular design, advanced radiation monitoring, and compatibility with mobile platforms make it indispensable for large-scale or specialized missions.

Choosing the right detector depends on your operational requirements, portability needs, and environmental conditions. The Solafact 800 is optimal for straightforward, handheld applications, while the Solafact 810 excels in more demanding and varied scenarios.