



ENVIRONICS OY

M90 - D1 - A  
Chemical Warfare Agent Detector

# User's Manual

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## 1 General Information

The M90 Chemical Warfare Agent (CWA) Detector is a multiapplication instrument. The M90 is capable of operating as a point detector to provide an early warning of approaching toxic chemical gas, or as a chemical agent monitor to identify and monitor personnel, vehicles, and equipment for contamination. The M90 is capable of detecting all known Chemical Warfare Agents.

M90 is generally manpacked, but it is capable of being installed on vehicles. It can also be installed as fixed detector, where it can operate without constant supervision. The alarm capability provides both local and distant alarms, can automatically close down ventilation systems and secure buildings and positions from further agent contamination.

**WARNING:** The M90 contains a radioactive source, 160 microcuries of Americium 241. Unauthorized repair or disassembly of the M90 may result in exposure to Alpha radiation.

The M90 contains two sensor units, an aspiration -type ion mobility spectrometric sensor (IMCell) and a semiconductor sensor (SCCell). The responses of these sensors is used for detecting CW- agents.

### 1.1 Detection Capability

The detection capability of M90 with standard gas library is as follows:

Agent Class and Types	Agent Concentration ( mg/m <sup>3</sup> )	Response Time (seconds)	Relative Humidity Range (%)	Temperature Range ( °C )	Alarm
VX	0.04 1.00	≤ 90 ≤ 10	5 to 95	-10 to +52	Nerve
Tabun GA	0.10 1.00	≤ 30 ≤ 10	5 to 95	-30 to +52	Nerve
Sarin GB	0.10 1.00	≤ 30 ≤ 10	5 to 95	-30 to +52	Nerve
Soman GD	0.10 1.00	≤ 30 ≤ 10	5 to 95	-30 to +52	Nerve
Mustard Gas HD	2.00 50.00	≤ 120 ≤ 10	5 to 95	+15 to +52	Blister
Lewisite L	2.00 50.00	≤ 120 ≤ 10	5 to 95	-18 to +52	Blister
Hydrogen-cyanide AC	30.00	≤ 10	5 to 95	-10 to +52	Blood

Table 1. Detector sensitivity with the standard gas library

The versatility of the M90 is such that it can detect also other agents either by teaching the compound or by modifying the gas library. Also the sensitivity can be adjusted by modifying the gas library parameters.

## 7 Maintenance Instructions

**Radiation Warning:** The M90 utilizes a small sealed radioactive source as a part of the detection system. The unauthorized disassembly or repair of the M90 CWA Detector may result in Alpha radiation contamination and exposure.

### 7.1 Cleaning

Before cleaning the detector, check that all air and electric protector caps are tightly closed, the power is turned off and the battery box is installed.

The exterior of the M90 CWA detector may be cleaned by the following ways:

- A gentle spray containing a mild dish soap and water solution, or
- A dampened cloth containing a soap and water solution.

### 7.2 Decontamination

Before outside decontaminating the detector, check that all air and electric protector caps are tightly closed, and the power is turned off.

The outside casing and top panel of the detector can be decontaminated by using a decontamination solution of mild soap water.

If the internal parts have been contaminated two options are possible.

1. Use the M90 chemical filter adapter with a charcoal filter fitted to the air inlet port, and operate until the alarm light is extinguished.
2. Use the UIP and run the decontamination option.

**CAUTION:** The sensor must not be continuously decontaminated for more than three hours.

### 7.3 Troubleshooting

- \*\* If during start-up the POWER light does not start to flash intermittently and no air pump sound can be heard after a couple of minutes from turning the power on, replace the battery with a charged one and retry the start up.
- \*\* If only the LOW BATT, or both the LOW BATT and FAILURE lights illuminate, replace the battery with a charged one and try again.
- \*\* If only the FAILURE light illuminates proceed as follows:

1. Check that the sample air flow is free, that there is no blockage in the airflow, and both inlet and outlet protective caps are removed. Check that the external pump connector cap is tightly closed.

2. If the checks in 1 do not cure the fault, replace the internal dust filter according to instructions given later of this manual.

3. If there is still a FAILURE alarm, return the detector for service.