



CDS-01

(Combined Detection System)

A DETECTION MACHINE FOR EXPLOSIVE, FISSIONABLE AND RADIOACTIVE MATERIALS FOR VISITOR AND PERSONNEL HAND LUGGAGE INSPECTION AT HIGH-SECURITY PREMISES

The CDS-01 machine serves for inspecting hand-carried luggage and belongings of visitors and personnel at high-security premises for detecting explosive, fissionable and radioactive materials. The machine enables to check briefcases, handbags, packages, bundles, compact radio-electronic devices and instruments, as well as any other objects fitting within 500x400x130 mm (length, width, height).

Essential characteristics:

⊕ Detection capabilities:

- 100 grams of explosives
- 1 gram of U^{235}
- 1 kBq-strong radioactivity

⊕ Detection capabilities are not affected by:

- camouflage
- capsulation
- weight distribution

⊕ Detection time:

- 5 to 100 seconds depending on the weight of the explosive
- 30 seconds when there are no explosives

⊕ Fully automatic operation:

The entire operation process is fully automated except loading the inspected objects into machine. The system estimates the weight of the detected explosive and its position inside the checked container without involving the operator in decision making.

The detection principle used for explosive materials is based on spotting any higher-than-normal nitrogen concentration, which is a telltale of practically all common kinds of explosives. The machine applies the neutron-radiation method i.e. irradiates the checked object with thermal neutrons and registers the resulting characteristic gamma radiation signature.

The chosen method enables the machine to detect explosive materials regardless of the attempted camouflage measures. This includes camouflaging fully encapsulated explosives as inconspicuous items, shaping explosives into thin plates or trying to shield them against the neutron flux of the detection machine.

Fissionable material detection (^{235}U , ^{239}Pu) is performed by logging the delayed gamma-radiation and the delayed neutrons, as well as by the natural gamma-radiation.

The machine is film-safe and does not affect any qualities of the checked products.

⊕ **Service features:**

- The machine operates in rooms at ambient temperatures of $+10^{\circ}\text{C}$ to $+35^{\circ}\text{C}$ and relative humidity of 95% at $+30^{\circ}\text{C}$
- In terms of its radiation safety, the machine complies with NRB-99 Radiation Safety Standards and OSPORB-99 Special Sanitary Rules for Radiation Safety Provisions
- Maximum dimensions of inspected objects: 500x400x130 mm (length, width, height)
- The operator may be any person qualified in handling ionising-radiation hardware and familiar with the operation manual
- There are no special requirements to the room for installing the machine, except it should be properly guarded and fitted with relevant alarms