

RADIATION MONITOR FOR LAUNDRY AND SMALL OBJECTS

BOX COUNTER

MAIN FEATURES

- Detectors: up to 5 large plastic scintillators
- Lead shielding on the external sides of the detectors
- Decontaminable internal and external surfaces
- Measuring chamber: 700 x 835 x 700 mm³
- 4 side doors: 700 x 835 mm²
- External dimensions: 1059 x 1391 x 971 mm³
- 4 pivoting and lockable wheels
- Visual and acoustic alarm indication
- Power supply: 220 VAC – 50 Hz
- Control console with touch-screen PC
- Ethernet connection available

DESCRIPTION

The **BOX COUNTER** system is designed to perform a fast gamma radiation monitoring of laundry, waste bags, tools and other small objects. The system measures the radioactive contamination of the items placed inside the measuring chamber, and compares the result with the release limits. System statuses such as alarm events and malfunctions are displayed on the PC of the control console and signaled by the visual/acoustic alarm unit installed on the top of the monitor.

The **BOX COUNTER** system can be easily moved and positioned by the operator thanks to 4 pivoting and lockable wheels. The enclosure is entirely made of stainless steel, all internal and external surfaces are specifically designed to be easily cleaned and decontaminated.



The core of the system is the measuring chamber, which is designed to provide a large active volume as well as a high sensitivity.

The (WxDxH) 700x700x835 mm³ chamber is accessible through 4 side doors. Five detectors are installed, 4 in the doors and 1 in the top side, facing the chamber through a thin stainless steel panel.

The detectors are based on large plastic scintillators, properly dimensioned to achieve an excellent sensitivity throughout a wide gamma energy range.

The associated PMT base provides HV supply and analogical signal processing.

The external sides of the detectors are shielded with lead sheets, in order to minimize the environmental radiation background and improve the system sensitivity. Each detectors of the **BOX COUNTER** can detect a 4 kBq ¹³⁷Cs source in 10 seconds (MDA, 95% confidence, for a point source at 50 cm).

The control console, consisting in the touch-screen PC and the graphic management software, is installed on the top of the monitor in an easily accessible position.

The software allows to operate and manage the system, i.e. activate the measurements; analyze, display and save the data coming from the counting electronics; set the operational parameters, such as alarm thresholds, detector enabling and calibration factors; activate, mute and reset the alarm and malfunction statuses through relay switches. A quality check can be performed before the measurement starts, to verify the proper functioning of the system.

TECHNICAL SPECIFICATIONS

Measurement features

- Energy range: 35 keV ÷ 2 MeV
- Minimum detectable dose (1 detector): 1 nGy/h (95% confidence, 10 s integration)
- Maximum dose: 1 mGy/h
- Environmental conditions:
environmental background < 0.2 µSv/h
functioning temperature between -20 and 50 °C
air humidity < 80%

Detectors

- Type: PVT plastic scintillators
- Number of units: From 2 up to 5
- Surface: 2500 cm²
- Thickness: 50 mm
- Photomultiplier: 2" diameter
- Shielding: Pb 10 mm
- PMT base connection: 14 pin M

PMT base

- PMT connection: 14 pin F
- Built-in modules: HV, pre-amplification, discriminator

- Available settings: HV 0÷ 1000 V, low level discriminator 'THR' 0÷4500 mV, high level 'WIN' 0÷4.5 V
- Counting electronics connection: DB-9 –power supply IN 24 VDC, digital counts output (TTL/optoisolated)
- Dimensions: Diameter 58 mm, height 86 mm

Housing

- Maximum dimensions:
(W x H x D) = 1059 x 1391 x 971 mm³
- Measurement compartment dimensions:
(W x H x D) = 700 x 835 x 700 mm³
- Side doors dimensions: (W x H) = 700 x 835 mm²
- Material: Stainless steel AISI 304
- Protection: IP55
- Handling: 4 pivoting and lockable wheels

Counting and signaling electronics

- Low noise power supply: IN 220 VAC – 50 Hz / OUT 24 VDC
- Signals acquisition: From 2 to 6 inputs counter/frequencymeter 32 bit
- Status management: 4 relays NO/NC
- PC interface: RS485/232

Control console

- Industrial touch-screen panel Pc
- Display: LCD TFT 8.4"

Management software

- Graphic software for data analysis, visualization and storage
- Alarm and malfunctioning statuses management

Acoustic-luminous alarm beacon

- Type: LED and sirena
- Height: 230 mm
- Diameter: 40 mm
- Green light: Not contaminated
- Yellow light: Ongoing measurement
- Red light/siren: Contaminated (alarm)
- Acoustic level: 85 dB at 1 m



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