



HANDHELD RADIATION MONITOR MKC-A03-1

INTENDED USE

- Nuclear and radioactive materials (NRM) search, detection and location
- Measurement of the quantitative characteristics of nuclear radiation on α , β , γ , n channels
- Identification of gamma emitting radionuclides

APPLICATION

- Monitoring of NRM trafficking at checkpoints
- In mobile radiological laboratories, radiation monitoring services at nuclear cycle enterprises and nuclear power plants
- At other facilities where highly sensitive and selective monitoring of radionuclides for α , β , γ , n radiation is required

KEY FEATURES

- Advanced software for identification of radionuclides
- Control of all instrument functions with five buttons
- Separate alarm thresholds can be set for γ - and n channels
- High environmental resistance
- Measured results are stored in the form of gamma spectra and can be transferred to a PC
- Automatic procedure of energy calibration and diagnostics of the main components during battery charging
- Service life is 10 years

By 2023, over 2200 MKC-A03 Handhel radiation monitors of various modifications have been produced and put into operation.

DESIGN

MKC-A03-1 is a compact portable instrument. Its front panel has a liquid crystal display, function buttons, LED indicators, sockets for connecting an AC adapter, a BDS-AB2 external alpha/beta detector and an interface cable.

MKC-A03-1 contains a built-in NaI(Tl)-based gamma scintillation detector, a Geiger-Muller counter, a neutron detector based on ^3He proportional counters and an external ZnS(Ag)-based alpha and beta detector.

MKC-A03-1 software is used to transfer calibration files from a PC, and to transfer and view accumulated gamma spectra on a PC.





MKC-A03-1

SPECIFICATIONS

Detection channels	alpha, beta, gamma, neutron
Gamma detectors	NaI(Tl), Geiger-Mueller counter
Alpha/beta detector	ZnS(Ag) scintillator
Neutron detector	³ He counters
Detection thresholds (detection with probability of 0.5 at a confidence level of 0.95 of NRM moving with the speed of 0.5 m/s at a distance of 0.2 m from the instrument)	55 kBq (¹³³ Ba) 100 kBq (¹³⁷ Cs) 50 kBq (⁶⁰ Co) 6000 neutron/s (²⁵² Cf) } – equivalent of 0.3 of WGPu / 10 g WGU – equivalent of 100 g of WGPu
False alarm rate	not more than 1: - for 1 minute (gamma channel) - for 10 minutes (neutron channel)
Registered energies	0.05 to 3 MeV (gamma channel) spectrum of ²³⁹ Pu-α-Be (neutron channel) 3 to 10 MeV (alpha channel) 0.3 to 3 MeV (beta channel)
ADER measurement range	0.1 to 10,000 μSv/h (gamma channel) 1 to 1000 μSv/h (neutron channel)
ADER measurement error	±20% (gamma channel, up to 100 μSv/h) ±30% (gamma channel, more than 100 μSv/h) ±40% (neutron channel)
Flux density measurement range	1 to 5000 cm ⁻² ·min ⁻¹ (alpha channel) 2 to 5000 cm ⁻² ·min ⁻¹ (beta channel)
Flux density measurement error	±40% (alpha channel, up to 10 cm ⁻² ·min ⁻¹) ±20% (alpha channel, more than 10 cm ⁻² ·min ⁻¹) ±40% (beta channel, up to 20 cm ⁻² ·min ⁻¹) ±20% (beta channel, more than 20 cm ⁻² ·min ⁻¹)
Identification of gamma emitting radionuclides (without further computer processing)	²³⁵ U (incl. HEU), ²³³ U, ²³⁸ U, ²³⁹ Pu, WGPu, ²³² Th, ²²⁶ Ra, ²³⁷ Np, ¹⁹² Ir, ⁶⁰ Co, ⁵⁷ Co, ¹³⁷ Cs, ¹³¹ I, ¹²³ I, ¹³³ Ba, ¹³³ Xe, ²⁰⁷ Pb, ¹¹¹ In, ²⁰¹ Tl, ¹⁰³ Pd, ⁷⁵ Se, ⁶⁷ Ga, ^{99m} Tc, ²⁴¹ Am, ¹⁵² Eu, ⁴⁰ K, ^{99m} Mo
Relative energy resolution for 662 keV gamma radiation line (¹³⁷ Cs), max	8 %
Number of ADC channels	1024
Number of stored spectra, min	100
Ingress protection	IP65 (MKC-A03 unit) IP22 (BDS-AB2 unit)
Environmental	-20 to +50 °C, 95 %
Dimensions, max	(280×130×181) mm (MKC-A03 unit) (350×160×89) mm (BDS-AB2 unit)
Weight, max	3 kg (MKC-A03 unit) 1 kg (BDS-AB2 unit)
Power supply	(176-253) V, (50±1) Hz
Run time on the built-in batteries, min	16 hours