



MZHG-A04

WATER CONTAMINATION MONITORING SYSTEM

INTENDED USE

Determination of radionuclide composition and measurement of volumetric (specific) activity of radionuclides in the monitored liquid.

APPLICATION

The MZHG-A04 water contamination monitoring systems can be used for continuous automated radiation monitoring of liquid discharges, process media, unbalanced water and waste water at nuclear power plants and other enterprises using gamma-emitting radionuclides in their processes, as well as for monitoring of drinking water at water intakes and for environmental monitoring.

DESIGN

MZHG-A04 includes one UDS-GC gamma radiation detecting device based on a ($\varnothing 40 \times 40$) mm NaI(Tl) crystal installed in a measuring chamber, and a spectrometric processing unit (BOS-01).

The measuring chamber is designed to ensure continuous and uniform flow of the measured liquid around the gamma radiation detecting device in the required geometry.

Structurally, the measuring chamber is a stainless steel flow-through chamber with a well-shaped recess for the gamma radiation detecting device. Lead shielding blocks surrounding the chamber from all sides reduce the influence of external background during measurements.

The spectrometric processing unit includes a panel computer with specialised software installed, as well as power supply and communication units for the radiometer components.

KEY FEATURES

- Monitoring mode is flow-through, no sample preparation required
- Measured parameter is volumetric activity of radionuclides
- Monitoring of liquid media is spectrometric and radiometric
- Easy operation due to automation of the whole measurement cycle
- Decision support when thresholds are exceeded
- Remote management of settings and viewing of results
- Several MZHG-A systems can be combined to build a distributed site monitoring system
- Cross-platform system software, including for Linux OS





MZHG-A04

SPECIFICATIONS

Range of registered gamma-energies	0.05 to 3 MeV
Energy resolution, max	8 %
Identified radionuclides*	^{51}Cr , ^{54}Mn , ^{59}Fe , ^{58}Co , ^{60}Co , ^{65}Zn , ^{95}Zr , ^{103}Ru , ^{106}Ru , ^{131}I , ^{134}Cs , ^{137}Cs , ^{141}Ce , ^{144}Ce
Range of measured volumetric activity for the ^{137}Cs radionuclide in the operating geometry	2.5 to 5×10^6 Bq/l
Integral non-linearity	± 0.9 %
Limits of tolerable error of volumetric activity measurement for the operating geometry, max	± 30 %
Operating mode setting time, max	15 minutes
Continuous operation, min	24 hours
Power supply	~ 220 V, (50 $\pm$ 3) Hz, 500 V·A
Environmental:	
– Temperature	0 to +50 °C
– Humidity	up to 98 % at +35 °C and lower temperatures without moisture condensation up to 100 % at +25 °C and lower temperatures with moisture condensation for the detecting devices (excluding the BOS-01 unit)
– Sinusoidal vibrations	group 3 according to GOST 29075-91
– Electromagnetic compliance	group III with performance quality criteria A according to GOST 32137-2025
Safety class	3 or 4 according to NP-001-15, NP-016-05, NP-022-17, NP-033-11
Dimensions and weight:	
– UDS-GC-40×40-485-AS	(Ø66×306) mm; 1.1 kg
– Measuring chamber MZHG-A04	(670×280×740) mm; 60 kg
– Spectrometric processing unit BOS-01	(510×780×270) mm; 36 kg
Average overhaul life, min	15 years
Calibration period	18 months
Mean time between failures, min	28,000 hours

* Radionuclide library can be extended

CERTIFICATION

- Registered in the State Register of Measuring Instruments under No. 90851-23
- Complies with the requirements of the Technical Regulations of the Customs Union on safety of low voltage equipment (TR CU 004/2011), Technical Regulations of the Customs Union on electromagnetic compatibility of technical means (TR CU 020/2011)