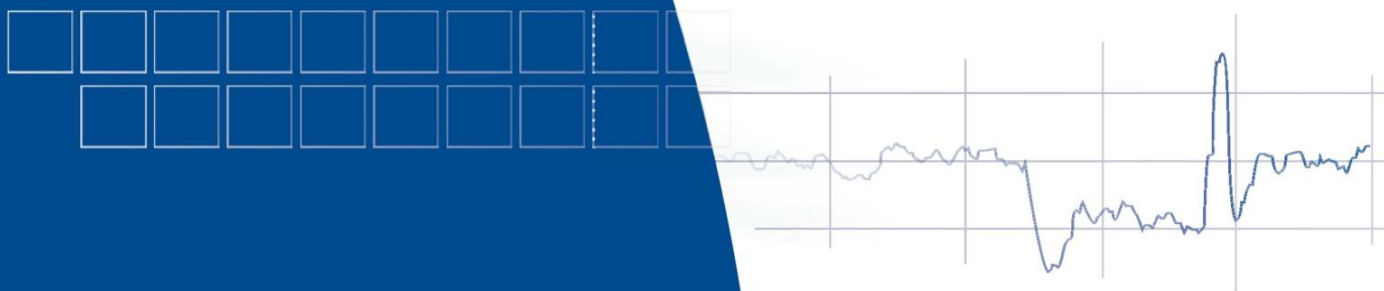




YANTAR

RADIATION MONITORS



- Pedestrian and post-luggage monitors
- Vehicle monitors
- Mobile monitors
- Integrated monitoring system



General Information

Yantar systems for monitoring for the presence of fissile and radioactive materials are designed to detect radioactive and nuclear materials during continuous automatic monitoring of vehicles, trains, pedestrians, and luggage at various checkpoints.

APPLICATION

- Customs check points
- Nuclear power plants
- Nuclear material mining and processing facilities
- Military nuclear plants and storages
- Customs warehouses
- Metallurgical and waste processing plants
- Banks and offices

BASIC SET

The basic unit consists of:

- Pillars with detectors and electronic units
- Control panel (an IBM PC can be used instead).
- A video monitoring system, network devices, additional alarm devices, traffic lights, and drop bars are optional.

SPECIFICATIONS

- Operation - continuous, automatic
- Uninterrupted operation after disconnection of 220 V power supply - no less than 10 hours
- Service life - 12 years
- Bus with interface RS-485
- Protocol - MODBUS

FEATURES

- Light and audible alarm indication
- Automatic adaptation to the varying natural background
- Archival storage of the alarm event data: date, time, detector count rate, type of channel (gamma or neutron).
- Gamma detector: based on organic plastic scintillators
- Neutron detector: based on proportional He-3 counters
- Operating temperature: from -50° to +50°C
- Compliance with EMC requirements for nuclear instruments
- Lightning protection of power and signal lines
- Possible remote access
- Developed self-diagnostics system
- Program access to detector parameters, self-diagnostics

More than 6000 Yantar radiation monitors of different modifications have been manufactured and delivered to customers.

Quality and reliability of supplied equipment are confirmed by the manufacturer's ISO 9001-2000 certified quality management system and fully comply with international requirements, which is confirmed by licenses, patents, certificates and successful performance of the supplied equipment.

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Pedestrian monitors

YANTAR-1P



YANTAR-2P



YANTAR-1P3
with identification module



Vehicle monitors

YANTAR-U



YANTAR-A



Vehicle monitors

YANTAR-2L



YANTAR-SN/S



Vehicle monitors

YANTAR-ZH



Mobile monitors

YANTAR-MA

- is used as part of radiation survey vehicles (vehicle, helicopter, launch)
- can be mounted on port cranes, structure elements of conveyors, etc.



Parameters of Radiation Monitors Basic Modifications. Summary table

Types of monitors Parameters		PEDESTRIAN AND POST - BAGGAGE			VEHICLE					MOBILE
		Yantar-1P3 ^{1,4}	Yantar-2P ^{1,2,4}	Yantar-PB ⁴	Yantar-1A ^{3,4}	Yantar-2U ^{3,4}	Yantar-2L ⁵	Yantar-2SN ^{3,4}	Yantar-1ZH ^{3,4}	Yantar-MA ⁴
Detection thresholds, no more than	Cs-137	80 kBq	44 kBq (11kBq)	25 kBq	300 kBq	390 kBq	170 kBq	390 kBq	890 kBq	490 kBq
	Co- 60	40 kBq	23 kBq (7 kBq)	13 kBq	150 kBq	190 kBq	85 kBq	190 kBq	445 kBq	245 kBq
	Ba-133	65 kBq	35 kBq (11 kBq)	20 kBq	240 kBq	315 kBq	145 kBq	315 kBq	710 kBq	390 kBq
	Pu	0.3 g	0.3 g	0.15 g	3 g	5 g	2.5 g	5 g	10 g	5 g
	U	10 g	10 g	6 g	315 g	480 g	250 g	480 g	1450 g	312 g
	Pu shielded	52 g	52 g	35 g	80 g	95 g	—	350 g	290 g	80 g
Detection channels		gamma neutron	gamma neutron	gamma neutron	gamma neutron	gamma neutron	gamma neutron	gamma neutron	gamma neutron	gamma neutron
Gamma detector		1 plastic 4.6 L	4 plastics 4.6 L each	1 plastic 4.6 L	4 plastics 4.6 L each	2 plastics 4.6 L each	4 plastics 11.5 L each	2 plastics 4.6 L each	4 plastics 13.8 L each	1 plastic 20.4 L
Neutron detector		2 counters 0.6 L each	8 counters 0.3 L each	3 counters 0.6 L each	12 counters 0.6 L each	6 counters 0.6 L each	—	4 counters 0.1 L each	12 counters 0.6 L each	9 counters 0.6 L each
Parameters of the search area	Width	1.5 m	3 m	1.5 m	6 m	6 m	6 m	6 m	6.2 m	3 m
	Height	2 m	2 m	0.7 m	4 m	3 m	4 m	3 m	4 m	3 m
Speed of the target object		5 km/h	5 km/h	5 km/h	15 km/h	15 km/h	15 km/h	15 km/h	25 km/h	15 km/h
Power consumption		45 W	60 W	45 W	80 W	60 W	40 W	60 W	150 W	80 W
Operating temperature		From -50°C to +50°C	From -50°C to +50°C	From -50°C to +50°C	From -50°C to +50°C	From -50°C to +50°C	From -50°C to +50°C	From -50°C to +50°C	From -50°C to +50°C	From +5°C to +50°C
Appearance										
Overall dimensions of a pillar		542x1853x201 mm	680x2080x255 mm	2750x1898x572 mm	795x3057x370 mm	651x2073x300 mm	860x2660x300 mm	350x2018x274 mm	1130x2740x400 mm	450x1260x240 mm
Weight		145 kg	500 kg	170 kg	700 kg	390 kg	500 kg	154 kg	1000 kg	135 kg

Pu – sample of highly-enriched Pu-239

U – sample of highly-enriched U-235

Detection probability of the given masses of nuclear materials is 0.5 at level of confidence 95%, maximum background intensity 20 µR/h and maximum false alarm rate 1/1000.

■ Sensitivity of gamma channel can be increased with replacement of gamma detector:

Modification of Yantar-2P: 4 plastics, 7.1 L each (this modification does not have a neutron channel)

Modification of Yantar-1A: 4 plastics, 7.1 L each

¹ Can be supplied with an identification module

² Detection thresholds at the 0.7 m search area are shown in brackets

³ Can be supplied in a single-pillar modification

⁴ Can be supplied without neutron channel

⁵ Can be supplied with neutron channel

Integrated nuclear and radioactive materials monitoring system

PURPOSE

Integration of the Yantar radiation monitors, video monitoring systems, data acquisition, processing and display systems in a single information and measurement system.

FUNCTIONS

- Monitoring of the current status at checkpoints
- Automatic registration and storage of alarms and video frames of the target object
- Alarm response software support for the workstation operator
- Generation of reports
- Transmission of data to the upper level of the system

COMPOSITION

Composition of the Integrated System is variable and depends on the site where it is installed.

Basic equipment of the Integrated System includes:

- Yantar radiation monitors
- Video monitoring systems
- Data acquisition, processing and display system(data acquisition server, workstations)
- Telecommunication equipment

The Integrated System can also include additional physical protection devices which help to:

- protect the equipment from damage
- regulate the traffic through the search area of Yantar system

FEATURES

Automatic registration and video recording of alarms:

Alarms are registered by the Yantar radiation monitors, which can be equipped with one or several video cameras. Video monitoring frames can be recorded with Axis video servers and/ or with video capture boards built into the data acquisition server.

High level of protection against unauthorized access:

An MS SQL Server 2000 is used as a database to store and process measurement results. Since the server and customer's parts are implemented on the same platform, the inherent authorization and data protection mechanism of the Windows NT/2000 system is utilized.

Accessibility of data through Internet:

The software allows an easy access to both current data and statistical information through a standard Web browser using a fetch-protection protocol.

Automatic generation of reports:

The server software allows access to the powerful built-in system for analysis of statistical information and preparation of reports in the form of MS Office documents that can be automatically forwarded via e-mail to senior officials.

Easy to maintain:

The server part of the Integrated System is intended for long-term operation and does not require daily professional administration.



- ▶ Integrated System Structure
- ▶ Alarm description: video recording and measurements
- ▶ Operator's response
- ▶ Alarm response support
- ▶ Documents

SITE

Certificates and patents

The Yantar radiation monitors have been developed on the order of the Russian Federation Federal Customs Service and listed in the Russian State Register of Measuring Devices. It is awarded the following certificates and is covered with the following patents:

- Certificate of the Federal Agency on Technical Regulation and Metrology
- Hygiene Certificates issued by the Federal Service on Protection of Consumer Rights and Welfare
- Certificate of approval of a type of measuring instrument issued by the Ukraine State Committee on Technical Regulations and Customer Policies
- Certificate of the IAEA, Interpol, and World Customs Organization
- Certificate of the Los Alamos National Laboratory (USA)
- Patent of invention No 2129289 of 20.03.1999
- Patent of invention No 2150127 of 27.05.2000
- Patent of invention No 2207592 of 27.06.2003



The Yantar monitors have passed tests at the test centers in:

- Federal Nuclear Center (VNIITF, Snezhinsk, Russia)
- Los Alamos National Laboratory (LANL, USA)
- Austrian Research Center (IAEA, Seibersdorf, Austria)

Custom Configurations/Installation

Upon request, the Yantar radiation monitors can be supplied with different numbers and types of detection channels.

Installation of the equipment, start-up and adjustment and post warranty service are available.

Contact Information

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