Leading in Environmental Radiation Protection

SARA – SPECTROSCOPIC GAMMA DETECTOR

This self-contained spectroscopic in-situ gamma detector is designed to measure and analyze online and continuously the gamma spectra under environmental conditions. SARA is able to detect even minor changes of the composition of the nuclear spectra in the environment. This improves significantly the recognition of artificial isotopes, which is very important for the radiation early warning system, for example. It does not only support the fast detection of artificial radiation but it can also identify the nuclear isotopes. It is designed for outdoor use even in harsh environments and for continuous operation without any maintenance. Hermetically sealed detector unit guarantees optimal protection for the detector and the electronics against environmental conditions. The NaI(Tl), $CeBr_3$ or $LaBr_3$(Ce)-based scintillation detector together with the MCA (multi-channel analyzer) provide high energy resolution under ambient temperature operation conditions. The integrated embedded Linux-PC enables online isotope identification and versatile data exchange through several interfaces. The standardized ANSI N42.42 protocol enables the use of many spectra evaluation software programs. An integrated web server facilitates data access using a web browser. SARA measures the total and nuclide specific gamma dose rate in units of the ambient dose equivalent rate H*(10). For an extended gamma dose rate range an additional Geiger-Müller-detector (GM) or a high dose rate spectrometer can be integrated as option.

FEATURES

- Fast detection of very low artificial radiation
- Online spectrum analysis
- In-situ isotope identification
- Standardized data protocol ANSI N42.42-2012 (XML-based)
- Embedded PC with LINUX provides ultimate flexibility
- Operation under harsh environmental conditions
- Absolute unattended operation
- Easy to maintain - neither consumables nor wear parts
- Rugged design (IP 68)
- Easy and quick set up
- Detector verification supported automatically with optional test set
- **Optimized glass fiber housing for low gamma energy**
- **Integrated LTE und GPS antenna**

FUNCTIONS

- **Nonvolatile memory for 3 years of data or more**
- **Three user configurable aggregation intervals**
- Dose rate evaluation for each aggregation interval
- Nuclide specific evaluation: H*(10), Bq/m² and Bq/m³
- Nuclide identification
- **Extended dose rate range with additional GM detector or high dose rate spectrometer* as option**
- Freely configurable nuclide library
- Isotope based alarm management
- Integrated detector accuracy test
- Data access and parameter setting with web browser
- Characteristic limits of peak/nuclide analysis according ISO11929
- **Integrated WiFi for wireless service**

*patent DE 10 2016 117 356

ORDERING INFORMATION

SARA can be selected as follows (examples):

	LTE	GPS
SARA-1xx-L4	X	
SARA-1xx-L4-G	X	X
SARA-1xx-L		
SARA-1xx-Lx-xT comes with additional GM detector.		
SARA-1xx-Lx-xH with an additional high dose rate spectrometer.		

	Unit	SARA-121	SARA-122	SARA-120	SARA-101	SARA-103	SARA-111	SARA-112	SARA-110
Spectroscopic detector									
Material		$CeBr_3$	$CeBr_3$	$CeBr_3$	NaI(Tl)	NaI(Tl)	$LaBr_3$(Ce)	$LaBr_3$(Ce)	$LaBr_3$(Ce)
Size	Inch	1.5x1.5	2.0x2.0	1.0x1.0	1.5x1.5	3.0x3.0	1.5x1.5	2.0x2.0	1.0x1.0
Dose rate range[1]	µSv/h	0.001…1000	0.001…600	0.001…2000	0.001…400	0.001…100	0.001…1000	0.001…600	0.001…2000
Accuracy	%	+/-10	+/-10	+/-10	+/-10	+/-10	+/-10	+/-10	+/-10
Energy resolution[1]	FWHM (guaranteed)	typ. 4.0 % (<4.5 %)	typ. 4.0 % (<4.5 %)	typ. 4.0 % (<4.5 %)	typ. 6.5 % (<7.8 %)	typ. 6.6 % (<7.8 %)	typ. 2.8 % (<3.3 %)	typ. 3.5 % (<3.9 %)	typ. 3.5 % (<3.9 %)
Energy range	keV	30 keV...3.0 MeV							
Total efficiency[1]	cpm / µSv/h	62500	119000	20400	61200	260000	62500	112000	20400
Photopeak efficiency[1]	cpm / µSv/h	11300	31000	3200	9900	70600	11300	29200	3200
Intrinsic background	nSv/h	<5	<10	<5	<5	<5	100	130	100
MCA									
Number of channels		8192 (2048 used)							
ADC	Bit	14							
ADC Sampling Rate	MSPS	40							
Filtering		Digital							
Option additional integrated Geiger Mueller tube (GM) model SARA-500-T or SARA-500-X									
		SARA-500-T				SARA-500-X			
Range	mSv/h	0.04...1000				0.2...10000			
Accuracy	%	+/-15				+15/-15			
Sensitivity	cpm / µSv/h	7.15				1.03			
Intrinsic background	nSv/h	<270				--			
Energy range	keV	50..1250				70 .. 1300			
Option additional integrated high dose rate spectrometer model SARA-500-H (patent DE 10 2016 117 356)									
Detector		$CeBr_3$							
Range	mSv/h	0.05...100							
Accuracy	%	+/-15%							
Energy resolution[1]	FWHM	Typ. 7%							
Energy range	keV	30 keV...3.0 MeV							
Total efficiency[1]	cpm / µSv/h	1650							
Photopeak efficiency[1]	cpm / µSv/h	125							
Environmental specification									
Operation temperature	°C °F	-40…+60 -40…+140							
LTE transmission	°C °F	-30…+60 -22…+140							
Protection class		IP68							
Humidity	%	0…100							
Electrical specification									
Power	W	2.2 (average)							
Supply voltage	V	7…30							
EMC-proofed		EN55022:2006+A1:2007+A2:2010 Class B EN55024:1998+A1:2001+A2:2003							
Size and weight specification									
Diameter	mm (in)	94/134 (3.70/5.28)							
Height	mm (in)	502 (19.76)							
Weight	kg (lb)	1.95 (4.30)	2.26 (4.97)	3.90 (8.59)	1.89 (4.17)	3.40 (7.5)	1.95 (4.30)	2.25 (4.96)	1.80 (3.96)
Communication interfaces		Ethernet 100 Mbit/s RS232 (Service) WiFi (for wireless service) Optional: LTE (SARA-400-4)							
Protocols		HTTP, FTP, MODBUS, OpenVPN, SSH							
Optional extensions		GPS (SARA-500-G)							
Optional Accessory		Test Set (SARA-800-0100)							

[1] Cs-137

RELATED PRODUCTS: SARA–SPECTROSCOPIC MONITORING STATION

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