

SARA ENVINET



FOR DESALINATION PLANTS

SARA - Radiation Monitoring

SARA helps to make water production at desalination plants safer with regard to radiation contamination. It monitors the gamma radiation in water continuously and provides around-the-clock information on the quality of the raw material sea water. SARA is designed for permanent use in sea water where it measures and analyses the water on a long-term basis.

SPECTROSCOPIC DETECTION OF GAMMA RADIATION AT DESALINATION PLANTS

SARA MARKS THE BEGINNING OF A NEW ERA IN RADIATION MONITORING

With its completely innovative product series, ENVINET provides solutions for the spectroscopic online monitoring of the ambient gamma radiation in water that, for the first time, meet all the requirements for unrestricted automatic remote monitoring under the harsh operating conditions of continual use in sea water or fresh water.

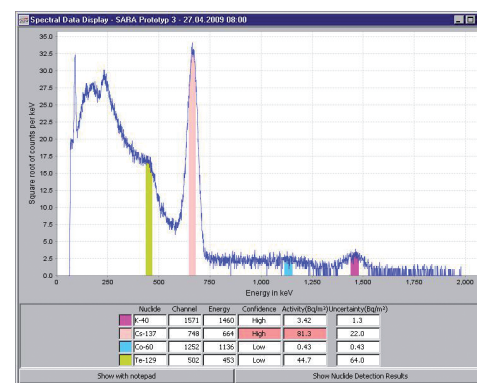
DESALINATION – A MAJOR SOURCE OF DRINKING WATER

Desalination is defined as the extraction of fresh water from sea or brackish waters. The interest in and importance of water desalination all over the world is immense. Especially in the Gulf Region, in some countries up to 90% – or even more – of all drinking water is produced from sea water by desalination. For countries that extract their drinking water from the sea via desalination, contamination with radioactivity is a serious hazard.

HOW CAN DESALINATION PLANTS BE PROTECTED FROM RADIOACTIVE CONTAMINATION?

For risk prevention and protection, it is essential to monitor continuously and efficiently the quality of the water by which the desalination plants are fed. This is the precondition for effective measures to prevent contamination of drinking water.

Fast and reliable monitoring requires automated online measuring systems. ENVINET GmbH specializes in the continuous and automatic monitoring of radioactivity in the environment in general and water in particular.



Data analysis in NMC



ENVINET offers complete turnkey solutions for online monitoring of water in desalination plants:

- Water probes and water analysis stations
- Wired and wireless data communication technology (radio, GPRS, satellite, etc.)
- Central monitoring and control systems.

The water measurement probe series SARA are specifically designed for permanent use in sea water and approved for extreme environmental operating conditions. They are type tested for a water depth of 500 m.

SARA records the entire energy spectrum of gamma radiation continuously, analyzes it online and thus permits the monitoring of individual radionuclides that exceed alarm thresholds. This allows rapid detection of minor radioactive contamination.

The probes are either installed offshore at buoys or in water-feeding channels at the desalination plants. To increase reliability, each detection channel can be designed redundant and equipped with two or three detection probes.

FEATURES

SARA's most important feature is its ability to detect extremely low levels of artificial radiation in the environment and in water rapidly and automatically. For further details, please request the data sheet.

NMC – UNIVERSAL SOLUTION FOR ONLINE MONITORING

The control and technical supervision of the entire system is carried out centrally by the software NMC. Other key features include the analysis and interpretation of data.

NMC generates alerts to provide information immediately in the event high levels of radioactivity are detected. Reports can be automatically generated and distributed. All data and information is archived in a database, which allows long-term analysis of the measurements.

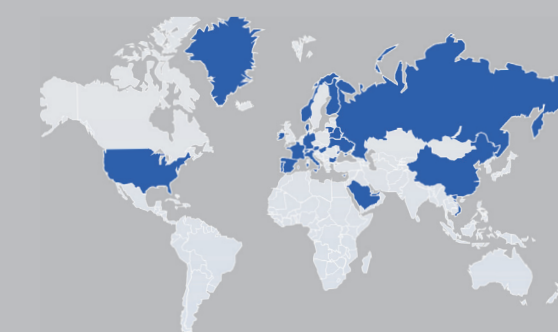
To exchange information or for data forwarding to a higher level control center, NMC has a variety of selectable data interfaces and formats.

BENEFITS

- Constant information on water quality
- Early detection of extremely low levels of artificial radiation
- Designed for use in extreme weather conditions and sea water
- Low set-up costs
- Low operating costs
- Easy installation
- High level of automation
- Low level of maintenance required
- Remote configuration and monitoring

ABOUT ENVINET

ENVINET GmbH is a German company based in Munich. For more than 30 years, our customers have been relying on our solutions when monitoring environmental parameters. With over 4,500 online detectors in operation, we are the leading manufacturer of networks to monitor environmental radiation. ENVINET's products and solutions reflect the experience and innovative capability of our team, thus guaranteeing top quality, extremely reliable yet, at the same time, highly functional solutions.



Countries where ENVINET products are installed



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SARA–SPECTROSCOPIC WATER STATION

The SARA Spectroscopic Water Station consists of a submersible Spectroscopic Water Gamma Detector and the Supply- & Communication Unit. It supports 110V / 230 V power supply with battery backup and solar power supply as option. Data communication between the station and Network Monitoring Center (NMC) uses LAN, DSL and/or LTE/GPRS in each case through a secure VPN. The base SARA-80W unit of the station is designed for installation on a wall or pole. 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. Not only does it support the fast detection of artificial radiation but it can also identify the nuclear isotopes. The detector is designed for submersible operation even in depth up to 500 m and for continuous operation with small maintenance. The hermetically sealed detector unit housing guarantees optimal protection for the detector and the electronics against harsh marine conditions. The NaI(Tl)-based scintillation detector together with the MCA (multi-channel analyzer) provide good energy resolution under ambient temperature operation conditions. If a higher resolution is required compared to NaI(Tl) different sizes of CeBr₃-based scintillation detectors are offered. The embedded PC of the detector unit 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. The integrated web server facilitates easy data access using a web browser. SARA also measures the gamma dose rate. Total gamma dose rate measurement of SARA is calibrated according to Ambient Dose Equivalent Rate H*(10).



BASE UNIT SARA-80W + DETECTOR SARA-WXX WITH MOORING BRACKET (SARA-80W-2000)

PERFORMANCE SPECIFICATION

	Unit	SARA-80W
Features		Pole or wall installation
Compatible detector		All SARA detectors SARA-WXX (data sheet SARA – SPECTROSCOPIC WATER GAMMA DETECTOR)
Operation temperature	°C °F	-40...+60 -40...+140
Protection class base unit		IP66
Humidity	%	0...100
Power	W	2.5 (average)
Supply voltage		110 V / 230 V AC
Battery voltage	V	12
Battery capacity	Ah	26
Battery operation time with SARA detector	days	5
EMC-proofed		EN55022 Class B, EN55024 61000-3-2, 61000-3-3
Depth (base unit)	mm	300
Width (base unit)	mm	500
Height (base unit)	mm	500
Weight	kg	~25
Displacement volume (water 20°C)	l	8.7 (including frame)
Communication interfaces additional to SARA detector		LTE/GPRS (optional) DSL (optional) Other communication interfaces on request
Optional accessory base unit		Mounting pole Solar power supply

ORDERING INFORMATION

The Spectroscopic Monitoring Station consists of a Spectroscopic Water Gamma Detector SARA-WXX and the base unit SARA-80W. The station can be selected as follows:

	SOLAR	DSL	LTE/GPRS
SARA-80W-LA-S	X	X	
SARA-80W-L-S	X		
SARA-80W-LA		X	
SARA-80W-L			
SARA-80W-L4A-S	X	X	X
SARA-80W-L4		X	X
SARA-80W-L4-S	X	X	X

Solar units may need adjusted battery size, depending on location

Additionally the SARA detector can be selected as follows:

SARA-Wxx-L

SARA-Wxx-Lx-xT comes with additional GM detector.

SARA-Wxx-Lx-xH with an additional high dose rate spectrometer.

RELATED PRODUCTS: SARA – SPECTROSCOPIC WATER GAMMA DETECTOR

SARA – SPECTROSCOPIC WATER GAMMA DETECTOR

This self-contained spectroscopic in-situ detector is designed to measure and analyze online and continuously the gamma spectrum in fresh water, sea water or potable water. It calculates the activity of each identified nuclear isotope, the total gamma activity as well as the total gamma dose rate. It provides fast detection of artificial nuclear radiation and an automatic identification of the nuclear isotopes in water. Thus, the detector is able to detect minor changes of the composition of the nuclear spectrum in aquatic environments and to alarm on single nuclear nuclides. The nuclide library and their individual alarm levels are configurable. It is designed for fixed installation and for continuous operation under harsh environmental conditions. The detector unit is enclosed by a waterproof housing and can be submerged directly into the water. The hermetically sealed housing protects the detector system and the electronics. The NaI(Tl)-based scintillation detector together with the MCA (multi-channel analyzer) provide good energy resolution under ambient temperature operation conditions. If a higher resolution is required compared to NaI(Tl) different sizes of CeBr₃-based scintillation detector are offered. The integrated embedded Linux-PC enables online data exchange through a data network (LAN). The standardized ANSI N42.42 protocol allows the use of many spectra evaluation software programs. An integrated web server facilitates data access and allows full remote control and remote configuration capabilities, using a web browser (e.g. Firefox). 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 (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, max. depth 500 m / IP 69K)
- Easy and quick set up
- Detector verification supported automatically (TW810)

FUNCTIONS

- **Nonvolatile memory for 3 years of data or more**
- **Three user configurable aggregation intervals**
- Dose rate evaluation for each aggregation interval
- Nuclide specific dose rate evaluation
- Nuclide identification
- **Extended dose rate range with additional GM detector or high dose rate spectrometer* as option**
- Free configurable isotope library
- Isotope based alarm management
- Integrated detector accuracy test
- Temperature stabilization of energy spectra based on K40
- Supervision of detectors and electronic devices
- Overload protection of detector
- Data access and parameter setting with web browser
- Characteristic limits of peak/nuclide analysis according ISO11929
- **Integrated WiFi for wireless service**



ORDERING INFORMATION

SARA Water can be selected as follows:

	LAN
SARA-Wxx-L	X
SARA-Wxx-Lx-xT comes with additional GM detector. SARA-Wxx-Lx-xH with an additional high dose rate spectrometer. The standard length of the optional sea water cable is 5 m. On request customer specified lengths are possible.	

*patent DE 10 2016 117 356

	Unit	SARA-W03	SARA-W21	SARA-W22	SARA-W23
Spectroscopic detector					
Material		NaI(Tl)	CeBr ₃	CeBr ₃	CeBr ₃
Size	Inch	3.0x3.0	1.5x1.5	2.0x2.0	3.0x3.0
Dose rate range ¹	μSv/h	Up to 100	Up to 1000	Up to 600	Up to 250
Activity range ¹ (10 min interval)	Bq/Liter	0.55...200 000	0.8...2 000 000	0.6...1 200 000	0.5...500 000
Energy resolution ¹	FWHM (guaranteed)	typ. 6.6 % (<7.8 %)	typ. 4 % (< 4.5 %)	typ. 4 % (<4.5 %)	typ. 4 % (4.5 %)
Energy range	keV	30...3000			
Total efficiency ¹	cpm / μSv/h	260 000	56 000	113 000	270 000
Photopeak efficiency ¹	cpm / μSv/h	70 600	10 300	29 400	71 800
Intrinsic background	nSv/h	<5	<5	<5	<5
MCA					
Number of channels		8192 (2048 used)			
ADC	Bit	14			
Clock speed	MHz	40			
Peaking time	μs	0.1			
Filtering		Digital			
Option additional integrated Geiger Mueller tube (GM) model SARA-500-T					
Detector		GM detector ZP1314			
Range	mSv/h	0.04..1000			
Accuracy	%	+/-15			
Sensitivity	cpm / μSv/h	7.5			
Intrinsic background	nSv/h	<270			
Energy range	keV	50..1250			
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. 5%			
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	-40...+60			
	°F	-40...+140			
Water depth	m	0...500			
Protection class		IP68 / IP69K			
Humidity	%	0...100			
Electrical specification					
Power	W	1.8 (average)			
Supply voltage	V	8...17			
EMC-proofed		EN55022:2006 + A1:2007 + A2:2010 Class B EN55024:1998 + A1:2001 + A2:2003			
Size and weight specification					
Diameter	mm (in)	150 (5.91)			
Height	mm (in)	570 (22.05)			
Weight	kg (lb)	8.7 (19.2)	7.7 (17)	8.0 (17.6)	9.1 (20.1)
Communication interfaces		Ethernet 100 Mbit/s RS232 (Service) WiFi (for wireless service on shore)			
Optional Accessory		Test Set for detectors verification and testing TW810 (SARA-800-W-G) Mooring bracket (SARA-800-W-2000) Sea water cable (please specify length)			

¹ Cs-137

RELATED PRODUCTS: SPECTROSCOPIC WATER STATION (SUBMERSIBLE TYPE)

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Technical contents are subject to change without notice!