FEATURES

- Very high sensitivity thanks to large detector, Marinelli geometry and algorithm capability
- Very robust processing against false positive detection regardless of the tested material
- Simple procedure
- Preset and user definable protocols
- Auto energy calibration
- Field transportable

SPIR-QUANTA

Liquid or Solid Sample Contamination Measurement

SPIR-Quanta is a system based on the SPIR-Ident product line technology, which provides reliable and sensitive identification, and quantification of gamma nuclides.

Low detection limits are achieved through Marinelli geometry, large 3x3” NaI scintillator and lead shielding.

Measurement protocols are predefined or user customized. Predefined protocols include nuclear accident contamination with Cs137, Cs134, I131 concentration measurement.

Customized protocols are possible over a wide library covering applications for nuclear installations, dismantling/decommisioning and medical isotope release check.

The PC software allows easy and step by step measurement process. The measurement sheet lists identified isotopes, related quantification in activity unit.

Transportable size and weight make it convenient to use on the field. Only a laptop with a USB or Ethernet port is necessary.

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Featuring:

DESCRIPTION

SPIR-Quanta uses a 3 by 3 inches NaI(Tl) detector, coupled to a spectrometric base to generate spectra from the samples contained in a Marinelli beaker placed in a 20mm thick lead container.

The spectrometer is controlled via USB or Ethernet by the SPIR-Quanta software that runs on a standard PC.

SPIR-Quanta accomodates standard Marinelli beakers:

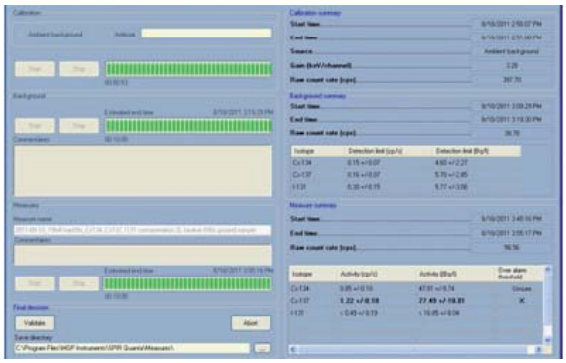
- 1l beaker: 133N-E + L-5 cover
- 2l beaker: 233N-E + L-6 cover

PRINCIPLE OF OPERATION

The SIA/Identpro algorithm provides a multiple ROIs analysis plus an iterative process that progressively eliminates low confidence level candidates. The quantification is then based on the net area estimation of the main peak of the intended isotopes. The two step process avoids false positive by first checking the presence of the intended isotope and so makes the device very robust in particular to variation of the natural isotopes concentration within the sampled material.
Issues like interferences between high radium daughter and Cesium are solved.

OPERATION MODE

The operation is interactive and guided by the user interface. User definable pop-ups are generated at each step to instruct the user. Basically, the operation is simple, no writing nor calculation is needed.
Preset protocols are provided and may be user customized.
The successive steps are: energy auto-calibration, background acquisition and samples acquisition.

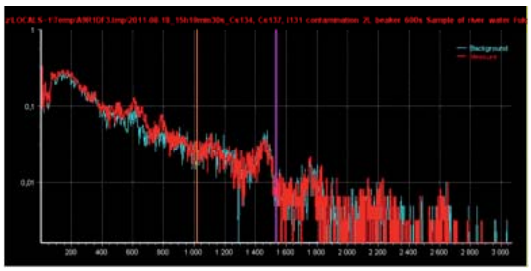


Step by step guidance *Step by step results*

EXAMPLE OF PERFORMANCES

Performances has been widely evaluated using actual and MCNP generated spectra for various intended isotopes and various material.

Typical limits of detection in water of Cs137, Cs134, Co60 for a 10 minutes measurement is 10Bq/l. Limits of detection depend on sample material, on sample natural radio-nuclides content and on ambient background.



Example of Cs134 and Cs137 contaminated sample and background spectra close to the limit of detection

SPECIFICATIONS

Detector :	3x3" NaI(Tl)
Resolution:	7.5% typical (Cs-137)
Spectrometer:	digital high throughput 1024 channels 25 keV to 3MeV USB or Ethernet link
Energy stabilization:	within 1%
Range of measurement:	3 to 1000000 Bq/l or Bq/kg
Temperature range:	0 to 45°C
External dimensions (base included):	
	43 cm x 28 cm x 60 cm (w x d x h)
	weight: <45kg

SIA Identification and related quantification

	Detection	Quantification
Medical	18F, 51Cr, 67Ga, 99Mo, 103Pd, 111In, 123I, 125I, 131I, 133Xe, 153Sm, 201Tl	18F, 51Cr, 67Ga, 111In, 123I, 131I, 153Sm, 201Tl
NORM	40K, 226Ra + daughters, 232Th + daughters,	40K, 226Ra + daughters, 232Th + daughters,
Industrial	22Na, 57Co, 54Mn, 60Co, 75Se, 133Ba, 137Cs, 152Eu, 154Eu, 166Ho, 192Ir, 207Bi, 228Th (232U), 241Am	22Na, 54Mn, 57Co, 60Co,133Ba, 137Cs, 241Am
SNM	U, LEU, HEU, 233U, HBPu, MBPu, LBPu, 241Pu, 237Np	
Nuclear accident	I131, I132, I133, Xs133, Cs134, Cs137	I131, Cs134, Cs137
Others	H(n-g), Bremsstrahlung Pb X rays, 511keV, Unknown	

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