

	DIAMON	NEUTRON MONITOR	BONNER SPHERE SYSTEM
High Voltage free	✓	✗	✗
H*(10) monitor	✓	✓	✓
Portable	✓	✓	✗
Spectrometry	✓	✗	✓
3D Field viewer	✓	✗	✗
Real time unfolding SW	✓	✗	✗

DIAMON TECHNICAL DATA	
Overall weight	6.0 kg (Low Energy version) 8.5 kg (High Energy version)
H*(10) rate measuring range	10 nSv/h - 100 mSv/h
Neutron energy range	Thermal - 20 MeV (Low Energy version) hundreds of MeV or higher (High Energy version)
γ sensitivity	$1 \cdot 10^{-4}$ counts per nSv ¹³⁷ Cs $1 \mu\text{Sv/h}$ at 10 mSv/h ¹³⁷ Cs
H*(10) calibration factor	3.5 μSv/h per cps (AmBe)
H*(10) response	1.03 counts per nSv (AmBe)
Connectivity	Ethernet, dedicated Wifi

ABOUT US

RAYLAB is an Italian start-up enterprise, spin off of Politecnico di Milano, focused on innovation in neutron spectrometry and radiation protection.



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DIAMON

Direction aware, Isotropic and Active neutron **MON**itor with spectrometric capabilities



DIAMON is the first all-in-one portable detection system able to perform neutron spectrometry, to reconstruct neutron direction distributions and to properly derive field and operational quantities... in real-time.

A patented design guarantees isotropic response and an optimized energy dependence, in a single, ultra-light device. DIAMON improves the quality of the radiation protection with an extremely simple, handable and smart instrument.

SPECTROMETRY, DOSIMETRY AND FIELD DIRECTION

SPECTROMETRY: innovative design and proprietary unfolding code (UNCLE) allow a direct and real-time assessment of the neutron spectrum.

DOSIMETRY: the neutron spectrum is used to perform an accurate evaluation of the field and operational quantities of interest (Fluence, $H^*(10)$, $h^*(10)$, field fractions...).

FIELD DIRECTION: a proprietary method and algorithm give real-time information about the 3D direction distribution of neutrons.

PORTABLE, FAST AND SMART

PORTABLE: lightweight, small and compact. DIAMON can be used as a portable monitor in battery mode (rechargeable) or as a stationary measuring instrument for continuous monitoring.

FAST: zero set-up time, "one-shot" measurement, prompt results.

SMART: wired and wireless web-browsing control, no drivers needed, no software/app required.

FEATURES

- ▶ Active spectrometer with real-time unfolding
- ▶ Neutron field direction viewer
- ▶ $H^*(10)$ Neutron Monitor

STRENGTHS

- 🍃 Portable and light
- 📶 ETH + WIFI web-based control
- ⚡ Fast measurements

DESIGNED TO BE USEFUL

A simple and intuitive system, easily portable through a handle and able to operate for a whole working day without any power connection, embeds low-power electronics with full connectivity.

As portable or stationary instrument, DIAMON can be applied to different workplaces of industry, medicine and research.

UNCLE UNFOLDING CODE FOR LIVE SPECTRAL ESTIMATION

The embedded real-time proprietary unfolding code UNCLE allows to derive the energy spectrum of neutron fields from thermal energies to 20 MeV (low energy version) or 5 GeV (high energy version).

Unlike standard neutron monitors, radiation protection quantities are directly calculated from the neutron spectrum and the recommended ICRP conversion coefficients.

SMART CONNECTION

WIRED or WIRELESS: DIAMON can be controlled from a PC, tablet or smartphone without any application or software, with full data management capabilities.

PATENT AND CALIBRATION

Italian Patent n. 102018000003885

ENEA Calibration report n. IFNG2018

γ sensitivity tested at the calibration facility of Politecnico di Milano.

