

EPD™-N2

Electronic Personal Gamma-Neutron Dosimeter



The Thermo Fisher Scientific EPD-N2 combines excellent photon dosimetry with full-spectrum neutron response, making this dosimeter ideal for those working in mixed neutron/gamma fields.

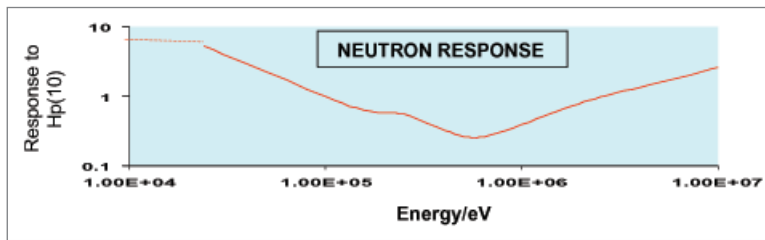
Applications include:

- Reactors
- Spent fuel and glass waste transport
- Reprocessing and plutonium finishing
- MOX - plants
- Neutron source manufacture
- Many types of nuclear and university research
- Accelerator facilities
- Medical facilities
- Advanced radiological performance, 20keV-10MeV (photon), thermal (0.025eV) - 15MeV (neutron)
- Excellent performance in mixed gamma/neutron fields
- Multi-detector technology
- Excellent performance for low-dose measurements
- Direct display of Hp(10) for neutrons and for photons
- Outstanding immunity to electromagnetic interference
- AA battery, lithium or alkaline, interchangeable
- Compatible with current or upgradeable Thermo Scientific EPD readers, software and accessories

EPD N2 Specifications

Radiological

- Sensitive to X- and γ -radiation ($E > 20\text{keV}$) and neutrons $0,025\text{eV} < E < 15\text{MeV}$
- Direct readout of Hp(10) for neutron & photon dose
- Multiple diode detectors with converters and energy compensation shields
- Display units: Sv & rem (with prefixes μ , m), set via internal software
- Generally in accordance with ANSI standards 13.11, 13.27 & 42.20 (photons performance) and most aspects of IEC 61525 (neutrons & photons)
- Dose display & storage: $0\mu\text{Sv}$ to $> 16\text{Sv}$, auto-ranging
- Resolution for display: $1\mu\text{Sv}$ ($< 10\text{mSv}/1\text{rem}$) (γ , and neutron under best conditions)
- Resolution for storage: $1/64\mu\text{Sv}$ ($\sim 1.5\mu\text{rem}$) (γ), $1\mu\text{Sv}$ for neutron dose under best conditions
- Dose rate display: $0\mu\text{Sv}/\text{h}$ to $> 4\text{Sv}/\text{h}$ ($400\text{rem}/\text{h}$), auto-ranging, variable resolution



Electrical & Mechanical

- Power supply: 1 x AA battery, 1.5V alkaline or 3.6V lithium, interchangeable without any adjustment
- Operating life (see assumptions below)
 - Continuous use: 1.5V alkaline: typically 42 days
3.6V lithium: 4.5 - 5 months
 - 8h/24 with use of 'OFF' standby state:
1.5V alkaline: ~ 2.5 months
3.6V lithium: ~ 9 months
 - Assumptions: average dose rate $< 5\mu\text{Sv}/\text{h}$ ($< 0.5\text{mrem}/\text{h}$), IR communications $< 5\text{s}$, 2x/day, audible alarm sounding $< 2\text{h}$ total during battery life
- Communications: IR interface, $< 1\text{m}$ range (39")
- Display and enabled functions controlled by button on front face of EPD (button recessed and sealed)
- Size: 86 x 63 x 18.5 mm, without clip, (approx 3.4 x 2.5 x .75")
- Weight: 108 g ($\sim 4\text{oz}$) incl. battery & clip
- Case material: high impact polycarbonate blend
- Clip: high impact plastic, easily renewed,

- Energy response (γ):
 - $\pm 20\%$ 25keV to 1.5MeV
 - $\pm 30\%$ 20keV to 6MeV
 - $\pm 50\%$ 6MeV to 10MeV
- Energy response (n): see energy response curve above
With a single calibration, the neutron dose estimated by the EPD-N2 will be within approximately $\pm 30\%$ of the true value for many workplace fields
- Angular response: Hp(10) (γ) $\pm 20\%$ up to $\pm 75^\circ$ Cs-137
Hp(10) (n) $\pm 30\%$ up to $\pm 60^\circ$ Am-Be
- Internal detector self-test under CPU control
- Accuracy: Hp(10) (γ) 10% Cs-137
Hp(10) (n) 20% Am-Be

Alarms

- Audible & visual alarms: Photon dose rate (2), photon dose, combined photon + neutron dose, neutron dose rate, neutron dose, over-range, failure, count - down timer, low battery, 'return for read'. Alarm tone, pattern, sound level, mutability and red LED configurable via external software
- 'Beep' for gamma dose with configurable sensitivity
- Alarm sounder: sealed, typically 98-100 dB(A) @ 20cm on 4kHz 'loud' setting

Memory

- 10 year data retention without battery
- Short term and Total dose registers for Hp(10) γ & n
- Storage of peak photon & neutron dose rates, with date & time (1s resolution for all stored times)
- 23 most recent alarms or events stored with date & time
- Dose profile storage: ~ 500 dose data points for γ & neutron dose with date & time

Environmental

- Operating temperature: -10°C to 40°C (15 to 105 $^\circ\text{F}$)
- Storage temperature: -25°C to 70°C (-13 to 158 $^\circ\text{F}$)
- Humidity: 20% - 90% RH, non-condensing
- Protection rating: IP55 (protection against dust ingress & low pressure jets of water from all directions)
- Vibration: IEC 1283 (2 g, 15 min., 10-33 Hz)
- Shock: 1.5 m drop onto concrete on each surface
- EMI/EMC: Exceeds MIL STD 461D RS103; IEC 1283 & IEC 61525

