

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.

## EPD™ -N2

Electronic Personal  
Gamma-Neutron Dosimeter

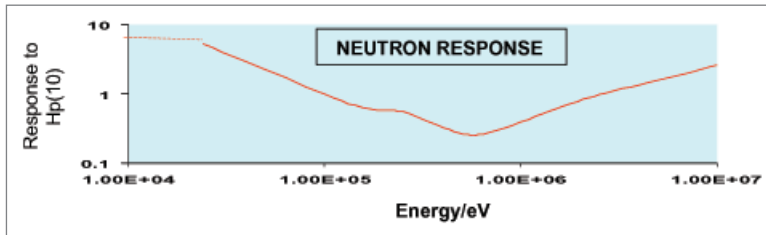


### Applications include:

- 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

## Radiological

- Sensitive to X- and  $\gamma$ -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  $\mu$ , 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:  $1\mu\text{Sv}$  ( $< 10\text{mSv}/1\text{rem}$ ) ( $\gamma$ , and neutron under best conditions)
- Resolution for storage:  $1/64\mu\text{Sv}$  ( $\sim 1.5\mu\text{rem}$ ) ( $\gamma$ ),  $1\mu\text{Sv}$  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:  $\sim 2.5$  months  
3.6V lithium:  $\sim 9$  months
- Assumptions: average dose rate  $< 5\mu\text{Sv}/\text{h}$  ( $< 0.5\text{mrem}/\text{h}$ ), IR communications  $< 5$ , 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:  $86 \times 63 \times 18.5$  mm, without clip, (approx  $3.4 \times 2.5 \times .75$ " )
- Weight::  $108$  g ( $\sim 4\text{oz}$ ) incl. battery & clip
- Case material: high impact polycarbonate blend
- Clip: high impact plastic, easily renewed,

- Energy response ( $\gamma$ ): strong clamp, with eyelets for lanyard (optional lanyard-only version)  $\pm 20\%$  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) ( $\gamma$ )  $\pm 20\%$  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) ( $\gamma$ ) 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)  $\gamma$  & 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:  $\sim 500$  dose data points for  $\gamma$  & neutron dose with date & time

## Environmental

- Operating temperature:  $-10^\circ\text{C}$  to  $40^\circ\text{C}$  ( $15$  to  $105^\circ\text{F}$ )
- Storage temperature:  $-25^\circ\text{C}$  to  $70^\circ\text{C}$  ( $-13$  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

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