

APD Active Dosimeter



Technical Specifications



APD Specifications

OVERVIEW & DIMENSIONS

Astrowright's **Active Personal Dosimeter** (APD) solution utilizes an environmentally-rugged, wearable, combined gamma photon/full-spectrum neutron dosimeter, and proprietary (patent-pending) data processing to estimate a spaceflight participant and/or crew member's total exposure to the increased radiation environment of near-Earth space.

- Size: 8.6 x 6.3 x 1.9 cm, without clip, (approx 3.4 x 2.5 x .75")
- Weight:: 108 g (~4oz) including battery & clip

APD ENVIRONMENTAL TOLERANCE ATTRIBUTES

- Exceeds MIL STD 461D RS103; IEC 1283 & IEC 61525 for electromagnetic interference
- Compliant with IEC 1283 standards for vibration and acceleration during use
- Can survive the shock of a 1.5-meter drop onto concrete at any angle
- Compliant with IP55 standards for protection against dust and moisture
- Can operate in relatively humidity environments up to 90%
- Can operate in temperatures from -10 °C to 40 °C (15 to 105 °F)

APD ELECTRICAL ATTRIBUTES

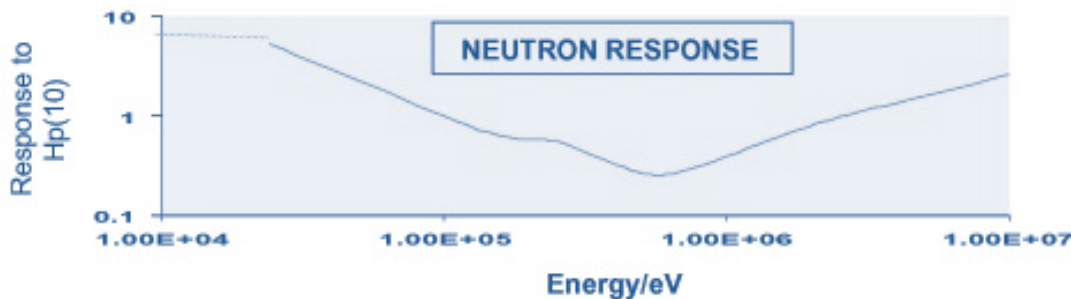
- Power supply: 1 x AA battery, 1.5V alkaline or 3.6V lithium, interchangeable without any adjustment
- Operating life [*assumptions: average dose rate < 5 μ Sv/h (<0.5mrem/h), IR communications < 5s, 2x/day, audible alarm sounding < 2h total during use*]:
 - Continuous use w/ 1.5V alkaline battery = ~ 42 days;
w/ 3.6V lithium: 4.5 - 5 months
 - 8h/24 use w/ use of standby mode w/ 1.5V alkaline = ~ 2.5 months;
w/ 3.6V lithium = ~ 9 months
- Onboard IR interface for communications, < 1m range
- Data storage and retention w/ 1s resolution - 10 years (without battery)
- Automatic data logging of peak photon & neutron dose rates, with date & time
- Automatic data logging of - 23 most recent alarms or events, with date & time



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APD RADIOLOGICAL ATTRIBUTES

- Sensitive to X- and γ -radiation ($E > 20\text{keV}$) and neutrons $0,025\text{eV} < E < 15\text{MeV}+$
- Multiple diode detectors with converters and energy compensation shields
- Display units: Sv & rem (with prefixes μ , m), set via internal software
- Compliant 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
- - Energy response (γ):
 - $\pm 20\%$ 25keV to 1.5MeV
 - $\pm 30\%$ 20keV to 6MeV
 - $\pm 50\%$ 6MeV to 10MeV
- Energy response (n):



- With a single calibration, the neutron dose estimated by the APD will be within approximately $\pm 30\%$ of the true value as tested under terrestrial conditions
- Angular response:
 - $\text{Hp}(10) (\gamma) \pm 20\%$ up to $\pm 75^\circ$ Cs-137
 - $\text{Hp}(10) (n) \pm 30\%$ up to $\pm 60^\circ$ Am-Be
- Accuracy of internal detector self-test under CPU control
 - $\text{Hp}(10) (\gamma) 10\%$ Cs-137
 - $\text{Hp}(10) (n) 20\%$ Am-Be



Contact Information

PRICING AND QUOTES

For more information and to request a quote for Astrowright's in-flight radiation dosimetry solutions and analytical services, please see our website at www.astrowright.com, and/or email us at info@astrowright.com.



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radiation dosimetry

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