# Thermo Scientific EPD TruDose Electronic Dosimeter

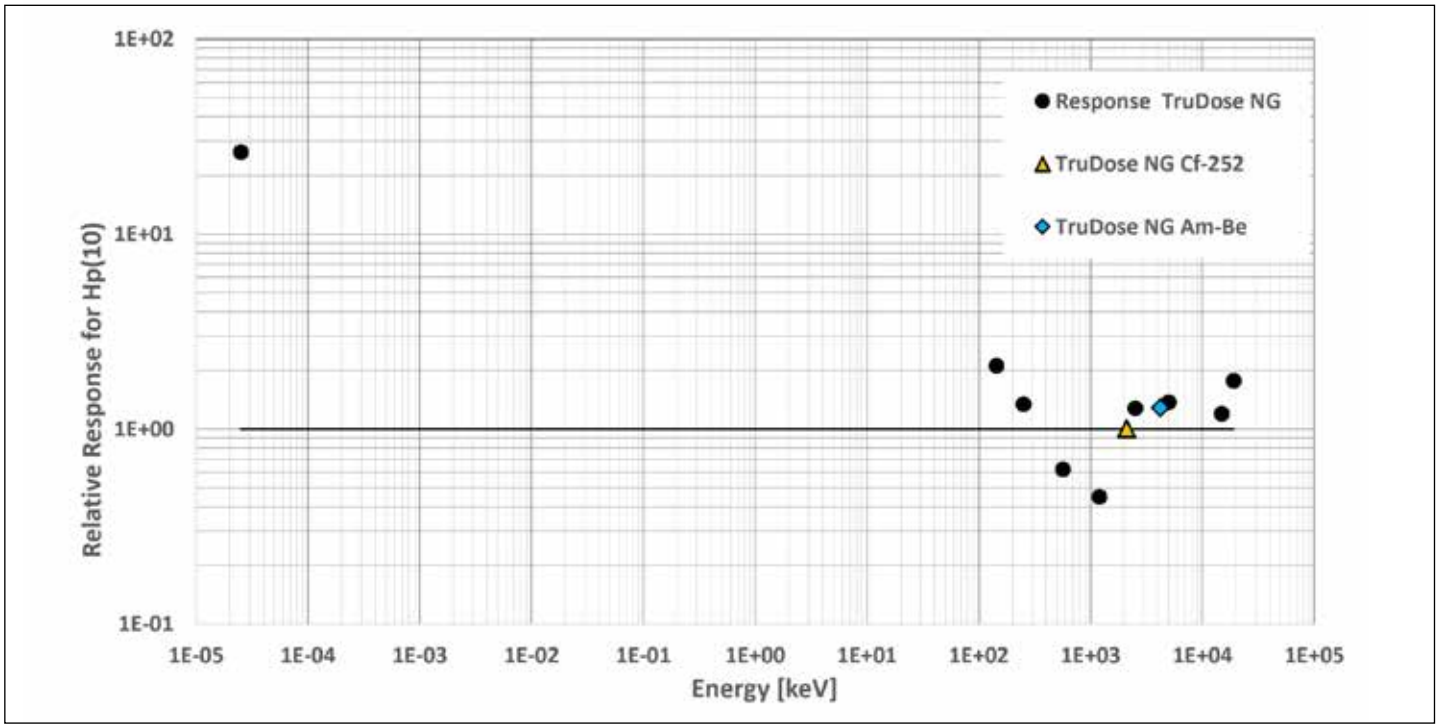
## Radiological performance information


Neutron/Gamma (NG)

Gamma (G)

Beta/Gamma (BG)

### EPD TruDose NG Neutron Radiological Properties




**Note:** For real life neutron workplace fields the overresponse for thermal neutrons (by a factor of ~27) typically results in only a small additional contribution to the measured dose due to the small thermal dose contribution of the neutron spectrum. For workplace fields with a high thermal neutron flux the weighing factors for albedo and fast neutrons can be adjusted by an experienced supervisor.

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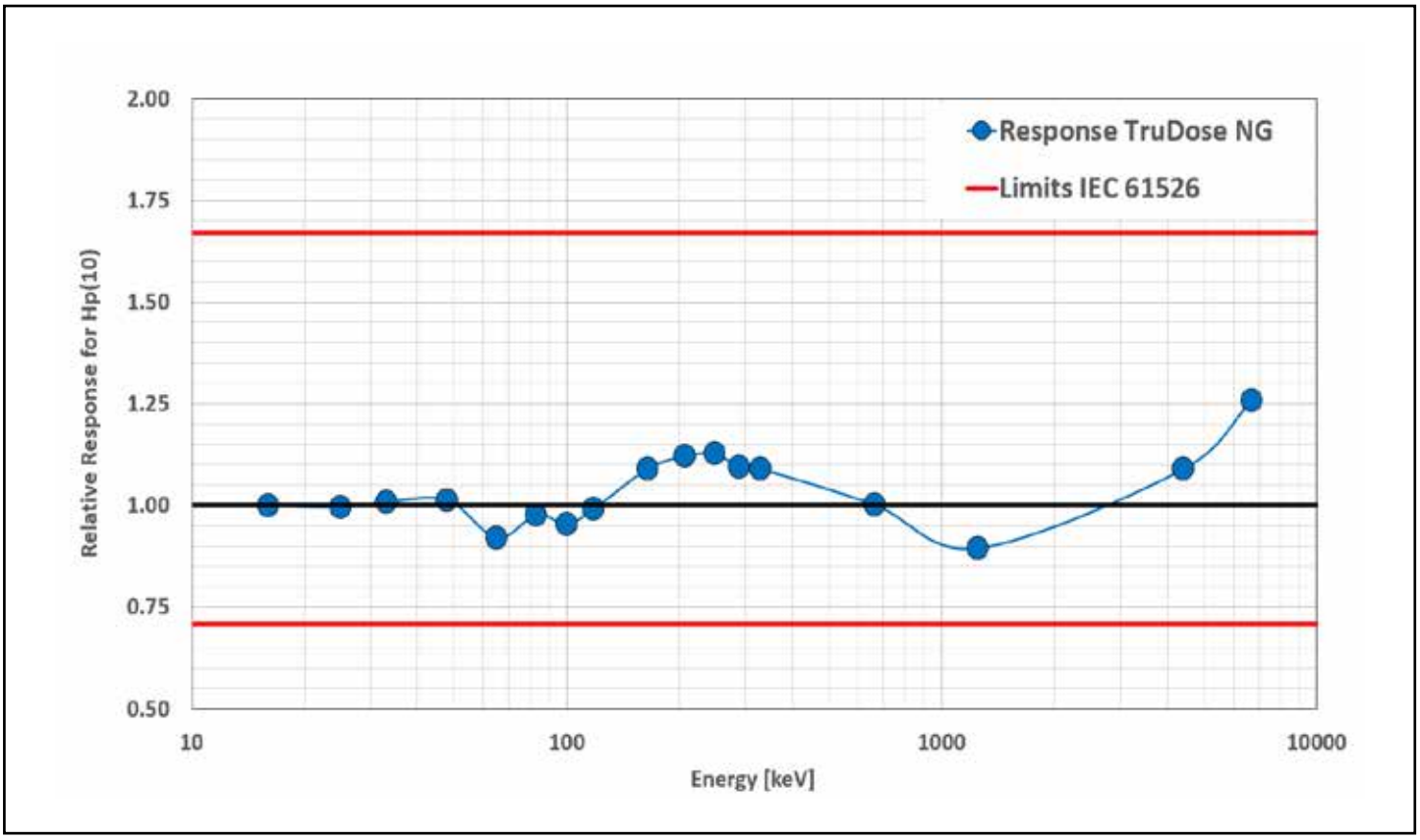
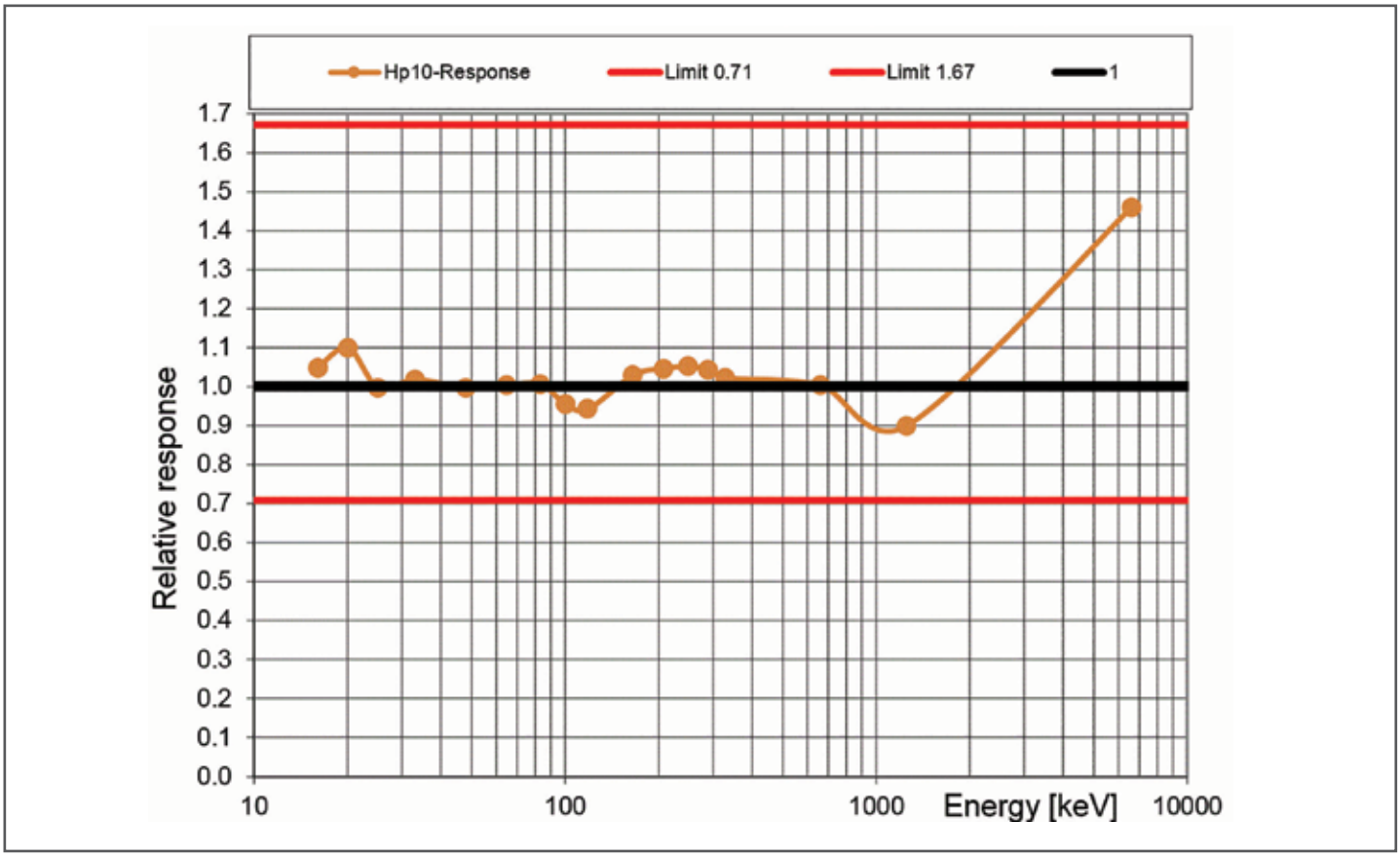
## EPD TruDose NG Gamma Radiological Properties



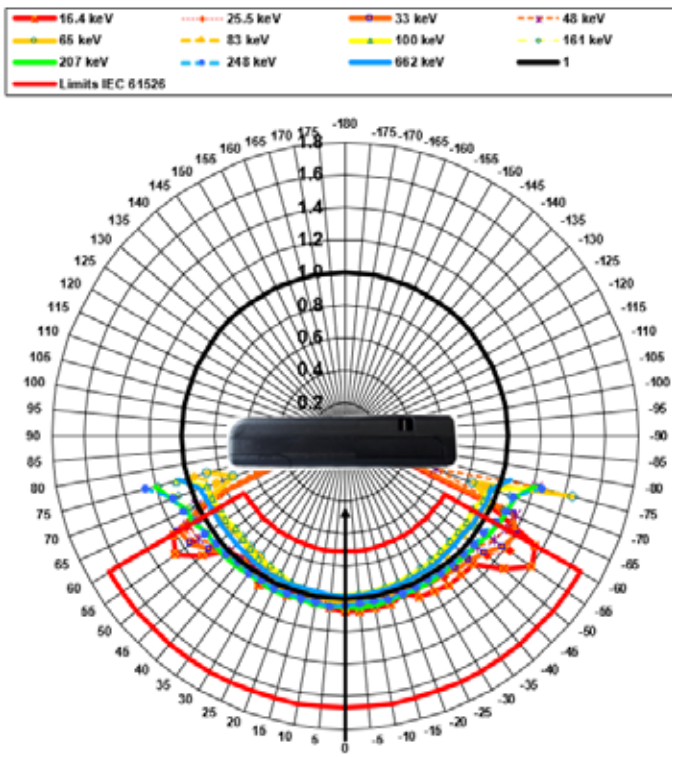

**Notes:**

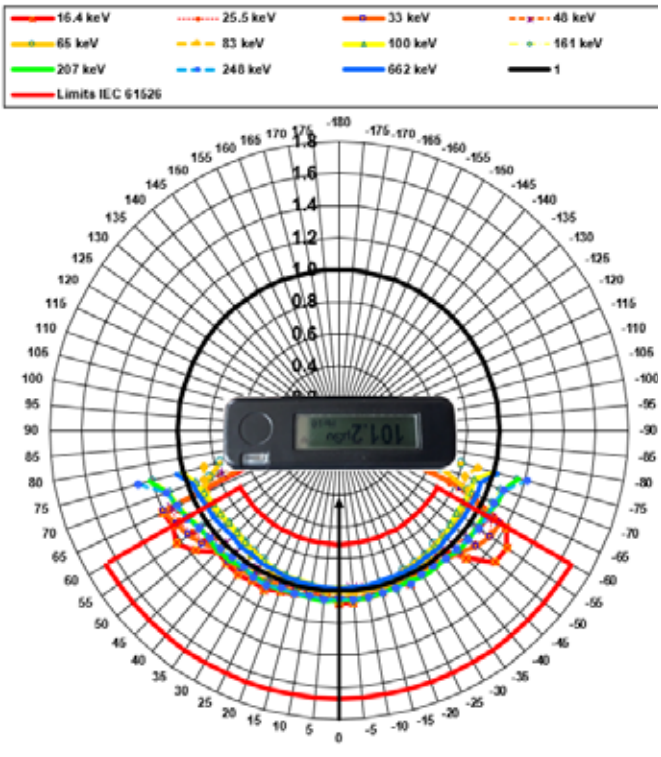
1) EPD TruDose NG can detect and measure pulsed gamma radiation.
2) For pulsed LINACs, an alarm is triggered in case of excessive prompt photon radiation (direct beam)

## EPD TruDose G and BG Energy Response

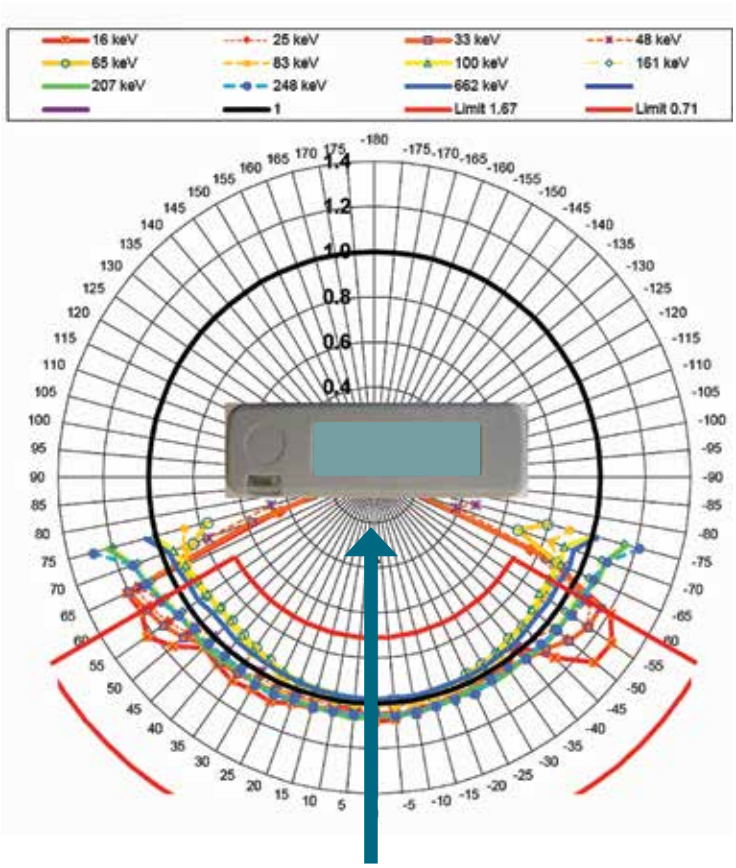


## EPD TruDose NG Gamma Angular Response




## EPD TruDose G and BG Angular Response



## TruDose NG Radiological Properties According to IEC61526 Ed. 3

| Specifications | | |
|---|---|---|
| | **Neutron Hp(10)** | **Gamma Hp(10)** |
| **Detector** | PIN Diode | PIN Diode |
| **Measurement Range** | Dose: 100 µSv - 10 Sv<br>Dose Overload: 10 Sv – 50 Sv<br>Dose Rate: 0.5 mSv/h – 10 Sv/h<br>Dose Rate for Dose Measurement: 1 µSv/h - 10 Sv/h<br>Dose Rate Overload: 10 Sv/h- 50 Sv/h | Dose: 1 µSv to 10 Sv<br>Dose Overload: 10 Sv - 50 Sv<br>Dose Rate: 1 µSv/h - 2 Sv/h<br>Dose Rate for Dose Measurement: 0.05 µSv/h - 2 Sv/h<br>Dose Rate Overload: 2 Sv/h - 50 Sv/h |
| **Accuracy** | Dose: ±5% (AmBe[a)c)])<br>Dose Rate: ±5% (AmBe[a)]) | Dose: ±5% (Cs-137[b)])<br>Dose Rate: -7% - +15% (Cs-137[b)]) |
| **Energy Response** | **See diagram.** | -15%...+25% for energies up to 1.5 MeV |
| **Angular Response** | -35% to +122% for AmBe; 0° to ±60° | -29% to 67% for 16.4 keV to 1.5 MeV 0° to ±60° |

a) AmBe dose response at 0° is 129%.
b) Cs-137 dose response at 0° is 100%.
c) Cf-252 dose response at 0° is 100%.

## EPD TruDose NG Neutron Radiological Properties (Improved High Energy Response)

**Reduced overresponse for high neutron energies (>10MeV);**

| Energy [MeV] | Overresponse TruDose NG | Overresponse EPD N2 |
|---|---|---|
| 14.8 | 26% | 100% |
| 19 | 52% | > 300% |

### Reduced background reading compared to EPD N2:

1µSv/d versus 2.5µSv/d measured in Erlangen @ 280 m altitude.*

**Theoretical real cosmic neutron background app. 0.5 µSv/d.*

## EPD TruDose G and BG Electronic Dosimeter Specifications

### Dose Range, IEC61526 Ed. 3 (Display & Measurement)

| Hp(10) | Hp(0.07) |
|---|---|
| • **Effective Range of Dose:** 1 µSv to ≥ 10 Sv (0.1 mrem to ≥ 1000 rem)<br>• **Overload Indication:** 10 Sv/h to >50 Sv/h (1000 rem/h to >5000 rem/h)<br>• **Display Resolution**: 0.1 µSv to 10.00 Sv (0.01 mrem to 1000 rem), up to four decimal places | • **Effective Range of Dose:**<br>- 500 µSv to 10 Sv , BG (50 mrem to 1000 rem)<br>- 50 µSv to 10 Sv, G (5 mrem to 1000 rem)<br>• **Overload Indication:** 10 Sv/h to >50 Sv/h (1000 rem/h to >5000 rem/h)<br>• **Display Resolution:** 0.1 µSv to 10.00 Sv (0.01 mrem to 1000 rem), up to four decimal places |

### Dose Rate Range (Display & Measurement)

| Hp(10) | Hp(0.07) |
|---|---|
| • **Effective Range of Dose Rate (IEC60846-1):** 1 µSv/h to 10 Sv/h (0.1 mrem/h to 1000 rem/h)<br>• **Dose Rate Range of Dose (IEC61526 Ed.3):** 0.05 µSv/h to 10 Sv/h (0.005 mrem/h to 1000 rem/h)<br>• **Display Resolution:** 0.1 µSv/h to 10 Sv/h (0.01 mrem/h to 1000 rem/h), up to three decimal places<br>• **Overload Indication:** 10 Sv/h to >50 Sv/h (1000 rem/h to >5000 rem/h | • **Effective Range of Dose Rate (IEC60846-1):**<br>10 µSv/h to 10 Sv/h, G (1 mrem/h to 1000 rem/h)<br>1 mSv/h to 10 Sv/h, BG (100 mrem/h to 1000 rem/h)<br>• **Dose Rate Range of Dose (IEC61526 Ed.3):**<br>1 µSv/h to 10 Sv/h (0.1 mrem/h to 1000 rem/h)<br>• **Display Resolution:** 0.1 µSv/h to 10 Sv/h (0.01 mrem/h to 1000 rem/h), up to three decimal places<br>• **Overload Indication:** 10 Sv/h to >50 Sv/h (1000 rem/h to >5000 rem/h) |

### On-axis Energy Response

| Photon Hp(10) (Ref. $^{137}$Cs) | Photon Hp(0.07) (Ref. $^{137}$Cs) | Beta Hp(0.07) (Ref: $^{90}$Sr) |
|---|---|---|
| ±15% 16keV to 1.5MeV<br>-15% to +50% 1.5MeV to 10MeV | ±30% 20keV to 1.5MeV<br>-15% to +50% 1.5MeV to 10MeV | ±30% 200keV to 1.5MeV<br>Detection of Pm-147 starts below 20cm distance |

### Combined Energy and Angular Response

| Photon Hp(10) (Ref. $^{137}$Cs) | Photon Hp(0.07) (Ref. $^{137}$Cs) | Beta Hp(0.07) (Ref: $^{90}$Sr) |
|---|---|---|
| -29% to +67% for 17keV to 6MeV, 0° to 60° | -29% to 67% for 24keV to 6MeV, 0° to 60° | -29% to 67%, 200keV to 1.5MeV, 0° to 45 |

### Accuracy

| Photon Hp(10) (Ref. $^{137}$Cs) | Photon Hp(0.07) (Ref. $^{137}$Cs) | Beta Hp(0.07) (Ref: $^{90}$Sr) |
|---|---|---|
| ±5% | ±15% | ±15% |

### Dose Rate Linearity

| Photon Hp(10) (Ref. $^{137}$Cs) | Photon Hp(0.07) (Ref. $^{137}$Cs) | Beta Hp(0.07) (Ref: $^{90}$Sr) |
|---|---|---|
| ±10%<br>Between 10Sv/h (1000rem/h) and 50Sv/h (5000 rem/h) accumulates dose at a rate >10Sv/h (>1000rem/h) | | |

### Characteristic for Pulsed Radiation

| Characteristic | Rated range | Relative response |
|---|---|---|
| **Medical X-Ray, pulse width > 2ms, medical pulse mode** | | |
| Max pulse dose rate | 0.05 µSv/h to 10 Sv/h | +/-20% for pulse width >2ms<br>(-60% at 10Sv/h in normal mode) |
| Max pulse dose | No limit | |
| Dose rate overload for dose measurement | 10 Sv/h to 1000 Sv/h | Indication greater as at 10 Sv/h |
| **Industrial X-Ray, pulse width < 1µs** | | |
| Max pulse dose rate | No limit | |
| Max pulse dose | 0.01 µSv | |
| Dose overload | Each pulse > 0.01 µSv and < 1 µs (industrial pulse mode only) | |

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Find out more at **thermofisher.com/epdtrudose**

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