Thermo Scientific EPD TruDose Electronic Dosimeter

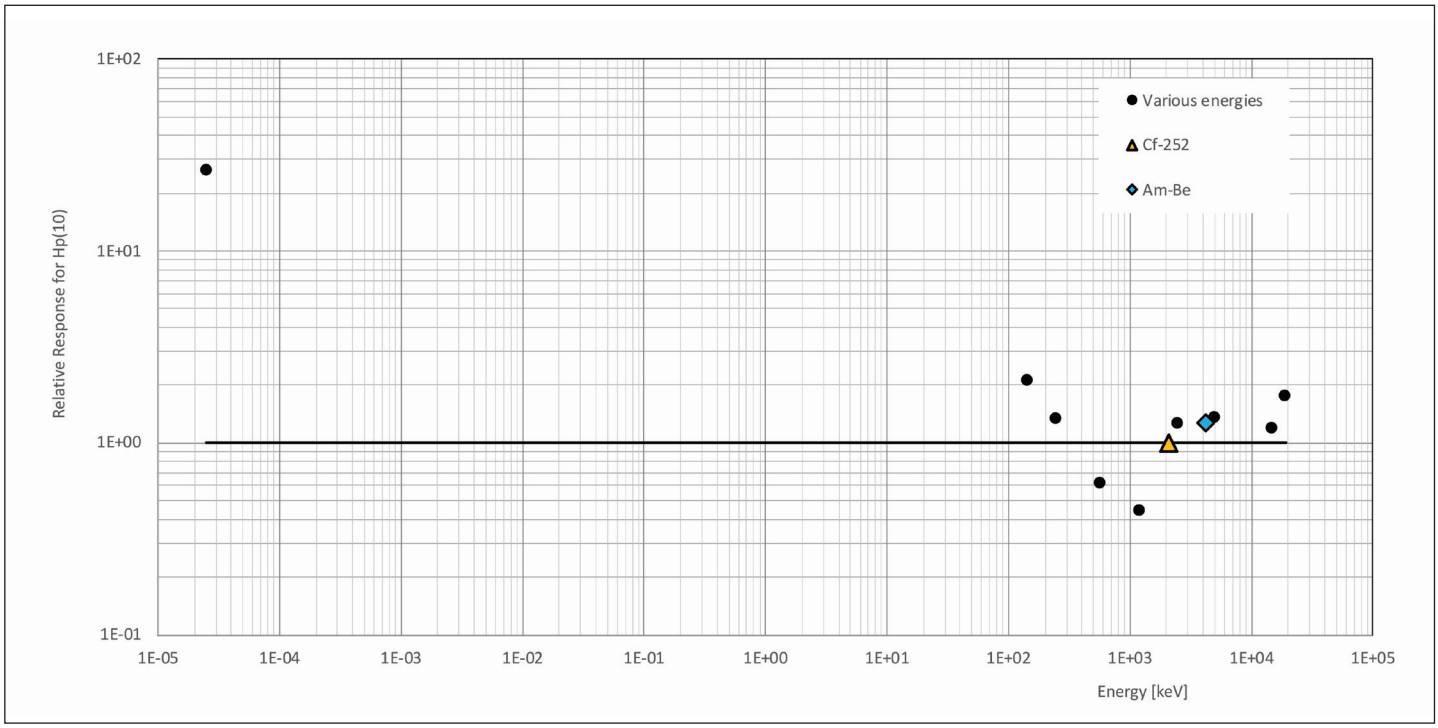
Radiological performance information

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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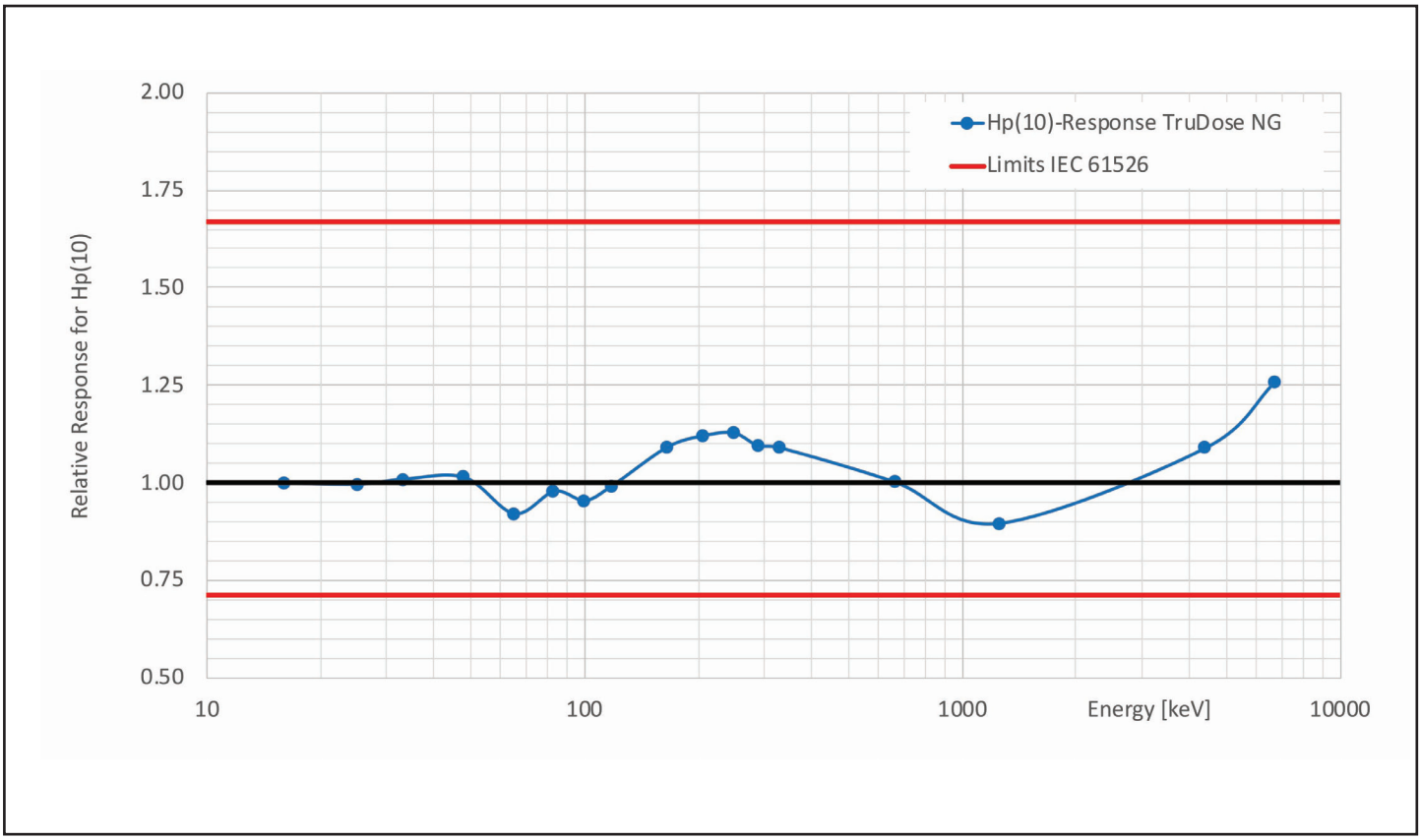
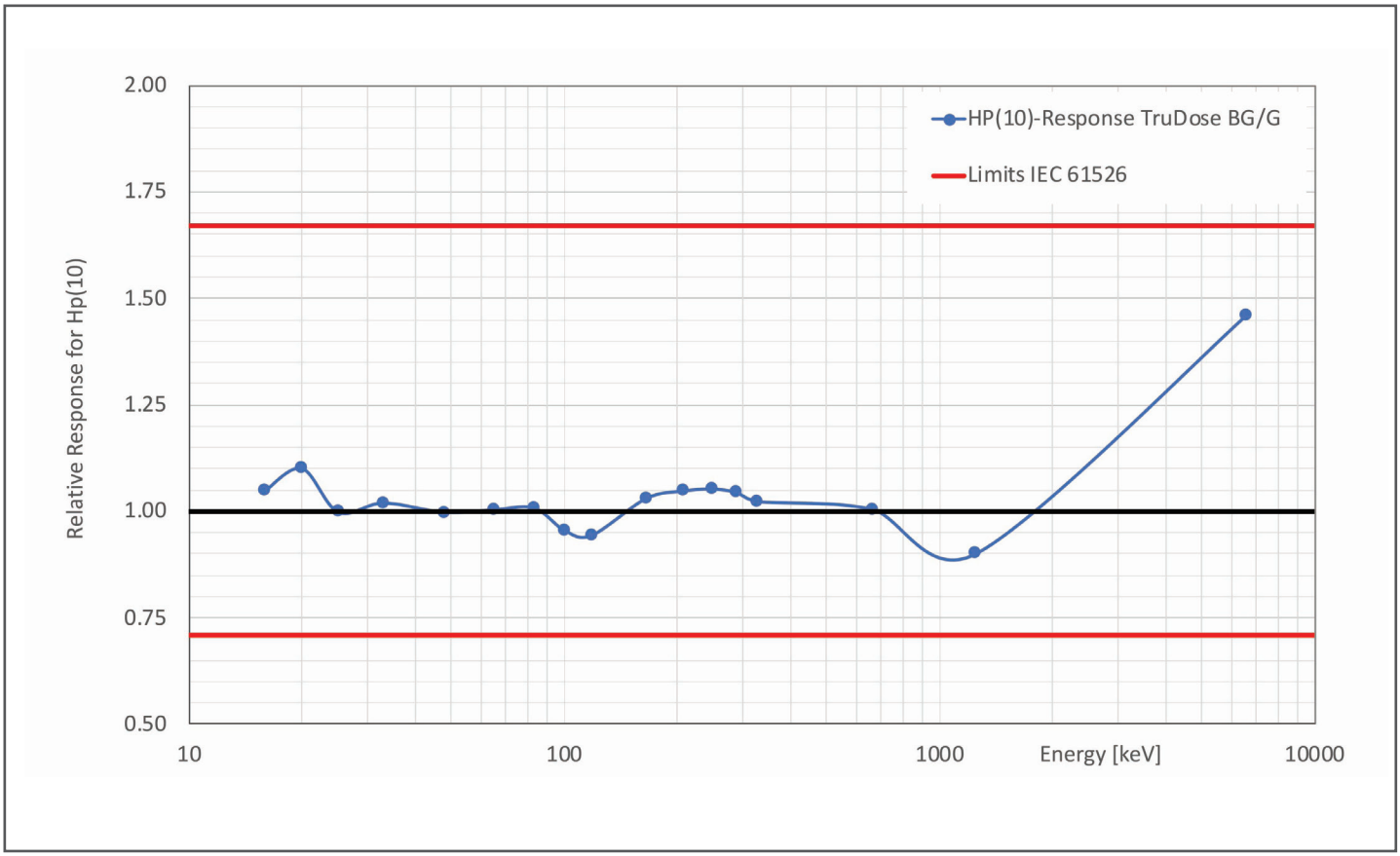
EPD TruDose NG Gamma Radiological Properties



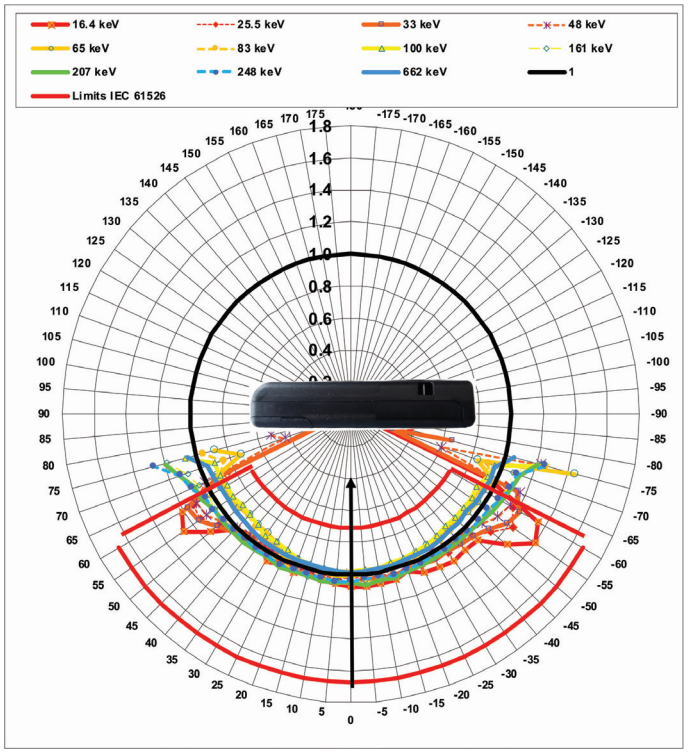
Notes:

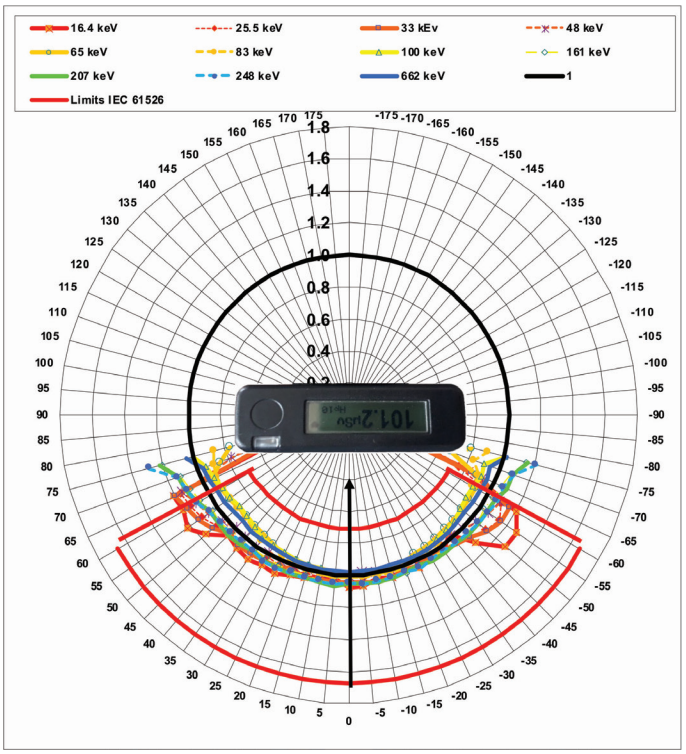
1) EPD TruDose NG can detect and measure pulsed gamma radiation.
2) For pulsed LINACs, an alarm is triggered in case of excessive prompt photon radiation (direct beam)

EPD TruDose BG and G Gamma Radiological Properties

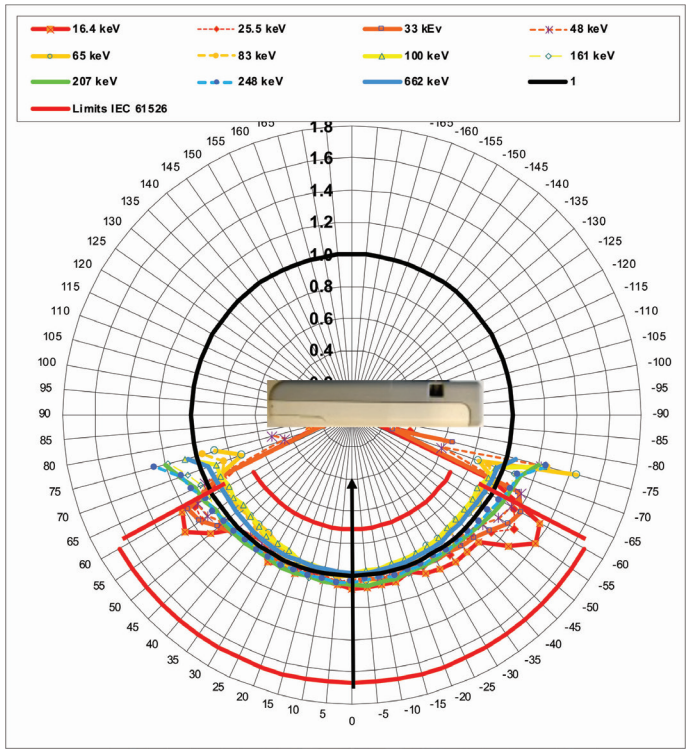


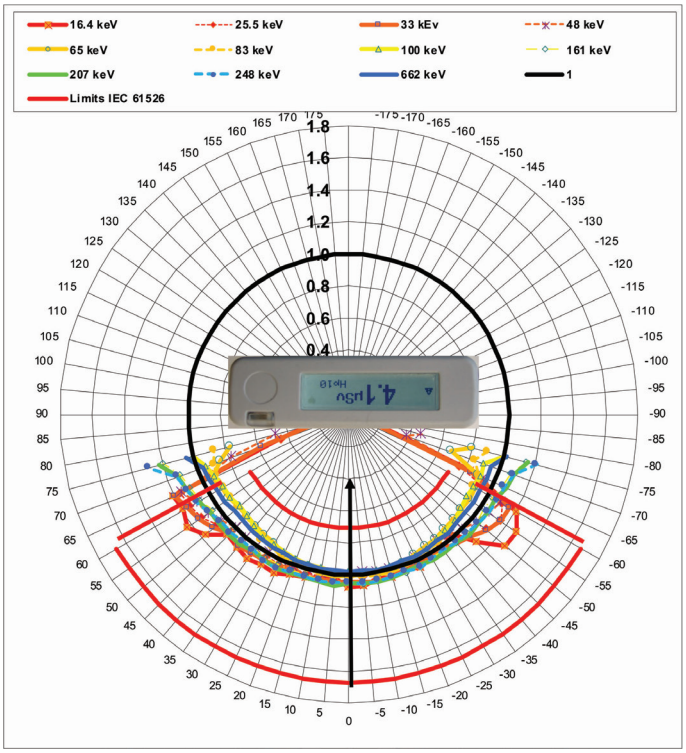
EPD TruDose NG Gamma Angular Response





EPD TruDose G and BG Angular Response





EPD TruDose NG Radiological Properties According to IEC61526 Ed. 3

Specifications		
	Neutron Hp(10)	Gamma Hp(10)
Detector	PIN Silicon Diode	PIN Silicon Diode
Measurement Range	Dose: 100 µSv -10 Sv Dose Overload: 10 Sv - 50 Sv Dose Rate: 0.5 mSv/h - 10 Sv/h Dose Rate for Dose Measurement: 1 µSv/h - 10 Sv/h Dose Rate Overload: 10 Sv/h - 50 Sv/h	Dose: 1 µSv - 10 Sv Dose Overload: 10 Sv - 50 Sv Dose Rate: 1 µSv/h - 2 Sv/h Dose Rate for Dose Measurement: 0.05 µSv/h - 2 Sv/h Dose Rate Overload: 2 Sv/h - 50 Sv/h
Accuracy	Dose: ±10% (AmBe[a)c)])	Dose: ±5% (Cs-137[b)])
Dose Rate Linearity	Dose Rate : ±15% (AmBe[a)])	Dose Rate: ±10% (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 Germany @ 280 m altitude.*

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

EPD TruDose G and BG Specifications According to IEC61526 Ed. 3

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) • **Overload Indication:** 10 Sv/h to >50 Sv/h (1000 rem/h to >5000 rem/h) • **Display Resolution**: 0.1 µSv to 10.00 Sv (0.01 mrem to 1000 rem), up to four decimal places	• **Effective Range of Dose:** - 500 µSv to 10 Sv , BG (50 mrem to 1000 rem) - 50 µSv to 10 Sv, G (5 mrem to 1000 rem) • **Overload Indication:** 10 Sv/h to >50 Sv/h (1000 rem/h to >5000 rem/h) • **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) • **Dose Rate Range of Dose (IEC61526 Ed.3):** 0.05 µSv/h to 10 Sv/h (0.005 mrem/h to 1000 rem/h) • **Display Resolution:** 0.1 µSv/h to 10 Sv/h (0.01 mrem/h to 1000 rem/h), up to three decimal places • **Overload Indication:** 10 Sv/h to >50 Sv/h (1000 rem/h to >5000 rem/h	• **Effective Range of Dose Rate (IEC60846-1):** 10 µSv/h to 10 Sv/h, G (1 mrem/h to 1000 rem/h) 1 mSv/h to 10 Sv/h, BG (100 mrem/h to 1000 rem/h) • **Dose Rate Range of Dose (IEC61526 Ed.3):** 1 µSv/h to 10 Sv/h (0.1 mrem/h to 1000 rem/h) • **Display Resolution:** 0.1 µSv/h to 10 Sv/h (0.01 mrem/h to 1000 rem/h), up to three decimal places • **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 -15% to +50% 1.5MeV to 10MeV	±30% 20keV to 1.5MeV -15% to +50% 1.5MeV to 10MeV	±30% 200keV to 1.5MeV 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[c])
±5%	G ±5% / BG ±10%	±15%

c) Sr-90 dose response at 0° is 95%.

Dose Rate Linearity		
Photon Hp(10) (Ref. ^{137}Cs)	Photon Hp(0.07) (Ref. ^{137}Cs)	Beta Hp(0.07) (Ref: ^{90}Sr)
±10% from 10 µSv/h to 10 Sv/h, (1 mrem/h to 1000 rem/h) 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 (-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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