

RaySafe Solo

Specifications



RAYSAFE SOLO GENERAL

EMC TESTED	According to EN 61000-6-1:2007 and EN 61000-6-3:2007
EXPOSURE NEEDED	One
RESET	Automatic
TEMP. RANGE	15 – 35 °C (59 – 95 °F)
DETECTOR CABLE LENGTH	2 and 10 m (6.5 and 33 ft)
PATENT	Germany DE69430268.6-08 UK 0758522 Japan 3449721 Sweden 9302909-8 France 075822 USA 5761270
SIZE BASE UNIT	28 x 74 x 142 mm (1.1 x 2.9 x 5.6 in)
WEIGHT	250 g (9 oz)
POWER OFF	Never, or after 5, 20 or 60 min of inactivity
POWER SOURCE	Rechargeable 7.4 V Li-on battery
BATTERY TIME	20 – 40 hours (depending on detector and if Bluetooth is used)
READ OUT	Three row alphanumerical backlit display with four digits numerical resolution

RAYSAFE SOLO mAs

RANGE mA	0.2 – 2000 mA
UNCERTAINTY mA	1 % or ± 0.02 mA
RANGE mAs	0.05 – 9999 mAs
UNCERTAINTY mAs	1 % or ± 0.02 mAs
MAX LOAD	< 200 mA continuously, 500 mA < 1 s, 1000 mA < 0.5 s
REPRODUCIBILITY	< 0.5 %
OVER VOLTAGE PROTECTION	70 V
EXPOSURE TIME	
RANGE	1 ms – 999 s
UNCERTAINTY	0.5 % or 0.2 ms
PULSE	
RANGE	1 – 9999 pulses
PEAK TRIG LEVEL	> 8 mA
PULSE RATE	
RANGE	1/6 – 120 pulses/s
mAs PER PULSE	
RANGE	0.001 – 2000 mAs/pulse

RAYSAFE SOLO R/F

SIZE DETECTOR	12 x 22 x 117 mm (0.5 x 0.9 x 4.6 in)
WEIGHT	50 g (2 oz)
DOSE (R/F LOW)	
RANGE	10 nGy – 9999 Gy (1 µR – 9999 R)
TRIG LEVEL	200 nGy/s (1.4 mR/min)
UNCERTAINTY	5 % or ± 10 nGy (1 µR) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE (R/F HIGH)	
RANGE	10 µGy – 9999 Gy (1 mR – 9999 R)
TRIG LEVEL	100 µGy/s (0.7 R/min)
UNCERTAINTY	5 % or ± 10 µGy (1 mR) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE RATE (R/F LOW)	
RANGE	20 nGy/s – 1 mGy/s (140 µR/min – 7 R/min)
MIN. PEAK TRIG LEVEL	200 nGy/s (1.4 mR/min)
UNCERTAINTY	5 % or ± 10 nGy/s (70 µR/min) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE RATE (R/F HIGH)	
RANGE	20 µGy/s – 1000 mGy/s ⁽²⁾ (140 mR/min – 7000 R/min)
MIN. PEAK TRIG LEVEL	100 µGy/s (0.7 R/min)
UNCERTAINTY	5 % or ± 10 µGy/s (70 mR/min) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)

kV/kVp	
RANGE	45 – 150 kV/kVp
UNCERTAINTY	2 % (for total filtrations from 2.5 mm Al up to 15 mm Al or equivalent, Active Compensation)
SENSITIVITY (R/F LOW)	0.4 mA, 40 kV, 40 cm (15.7 in), no added filtration
SENSITIVITY (R/F HIGH)	0.8 mA, 70 kV, 50 cm (19.7 in), no added filtration
EXPOSURE TIME	
RANGE	1 ms – 999 s
UNCERTAINTY	0.5 % or 0.2 ms
PULSE	
RANGE	1 – 9999 pulses
PEAK TRIG LEVEL (R/F LOW)	> 3 µGy/s
PEAK TRIG LEVEL (R/F HIGH)	> 1 mGy/s
HVL ⁽³⁾	
RANGE	1.0 – 14.0 mm Al
UNCERTAINTY	10 % or ± 0.2 mm Al (at signal levels above 1/1000 of max dose rate for selected sensor)
TOTAL FILTRATION ⁽⁴⁾	
RANGE	1.5 – 35 mm Al (60 – 120 kV)
UNCERTAINTY	10% or ± 0.3 mm Al (at signal levels above 1/1000 of max dose rate for selected sensor)

⁽¹⁾ 45 mm Al added filtration at 145 kVp gives a HVL of ~13 mm Al.
⁽²⁾ 1000 mGy/s up to 70 kVp, 400 mGy/s at 100 kVp, 250 mGy/s at 140 kVp.
⁽³⁾ HVL is an option to RaySafe Solo R/F.
⁽⁴⁾ Total filtration is included in the HVL option.

RAYSAFE SOLO DOSE

SIZE DETECTOR	12 x 22 x 117 mm (0.5 x 0.9 x 4.6 in)
WEIGHT	50 g (2 oz)
DOSE (R/F LOW)	
RANGE	10 nGy – 9999 Gy (1 µR – 9999 R)
TRIG LEVEL	200 nGy/s (1.4 mR/min)
UNCERTAINTY	5 % or ± 10 nGy (1 µR) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE (R/F HIGH)	
RANGE	10 µGy – 9999 Gy (1 mR – 9999 R)
TRIG LEVEL	100 µGy/s (0.7 R/min)
UNCERTAINTY	5 % or ± 10 µGy (1 mR) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE RATE (R/F LOW)	
RANGE	10 nGy/s – 1 mGy/s (70 µR/min – 7 R/min)
MIN. PEAK TRIG LEVEL	200 nGy/s (1.4 mR/min)
UNCERTAINTY	5 % or ± 10 nGy/s (70 µR/min) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE RATE (R/F HIGH)	
RANGE	20 µGy/s – 1000 mGy/s ⁽²⁾ (140 mR/min – 7000 R/min)
MIN. PEAK TRIG LEVEL	100 µGy/s (0.7 R/min)
UNCERTAINTY	5 % or ± 10 µGy/s (70 mR/min) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
EXPOSURE TIME	
RANGE	1 ms – 999 s
UNCERTAINTY	0.5 % or 0.2 ms
HVL ⁽³⁾	
RANGE	1.0 – 14.0 mm Al
UNCERTAINTY	10 % or ± 0.2 mm Al (at signal levels above 1/1000 of max dose rate for selected sensor)
PULSE	
RANGE	1 – 9999 pulses
PEAK TRIG LEVEL (R/F LOW)	> 3 µGy/s
PEAK TRIG LEVEL (R/F HIGH)	> 1 mGy/s

RAYSAFE SOLO RAD

SIZE DETECTOR	12 x 22 x 117 mm (0.5 x 0.9 x 4.6 in)
WEIGHT	50 g (2 oz)
DOSE	
RANGE	10 µGy – 9999 Gy (1 mR – 9999 R)
TRIG LEVEL	100 µGy/s (0.7 R/min)
UNCERTAINTY	5 % or ± 10 µGy (1 mR) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE RATE	
RANGE	20 µGy/s – 1000 mGy/s ⁽²⁾ (140 mR/min – 7000 R/min)
MIN. PEAK TRIG LEVEL	100 µGy/s (0.7 R/min)
UNCERTAINTY	5 % or ± 10 µGy/s (70 mR/min) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
kV/kVp	
RANGE	45 – 150 kV/kVp
UNCERTAINTY	2 % (for total filtrations from 2.5 mm Al up to 15 mm Al or equivalent, Active Compensation)
SENSITIVITY	0.8 mA, 70 kV, 50 cm (19.7 in), no added filtration
EXPOSURE TIME	
RANGE	1 ms – 999 s
UNCERTAINTY	0.5 % or 0.2 ms
PULSE	
RANGE	1 – 9999 pulses
PEAK TRIG LEVEL	> 1 mGy/s
HVL ⁽³⁾	
RANGE	1.0 – 14.0 mm Al
UNCERTAINTY	10 % or ± 0.2 mm Al (at signal levels above 1/1000 of max dose rate for selected sensor)
TOTAL FILTRATION ⁽⁴⁾	
RANGE	1.5 – 35 mm Al (60 – 120 kV)
UNCERTAINTY	10% or ± 0.3 mm Al (at signal levels above 1/1000 of max dose rate for selected sensor)

⁽¹⁾ 45 mm Al added filtration at 145 kVp gives a HVL of ~13 mm Al.
⁽²⁾ 1000 mGy/s up to 70 kVp, 400 mGy/s at 100 kVp, 250 mGy/s at 140 kVp.
⁽³⁾ HVL is an option to RaySafe Solo dose and RaySafe Solo RAD.
⁽⁴⁾ Total filtration is included in the HVL option for RaySafe Solo RAD.

RAYSAFE SOLO DENT

SIZE DETECTOR	12 x 22 x 117 mm (0.5 x 0.9 x 4.6 in)
WEIGHT	50 g (2 oz)
DOSE (DENT LOW)	
RANGE	10 nGy – 9999 Gy (1 µR – 9999 R)
TRIG LEVEL	1 µGy/s (7 mR/min)
UNCERTAINTY	5 % or ± 10 nGy (1 µR) (40 –150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE (DENT HIGH)	
RANGE	10 µGy – 9999 Gy (1 mR – 9999 R)
TRIG LEVEL	100 µGy/s (0.7 R/min)
UNCERTAINTY	5 % or ± 10 µGy (1 mR) (40 –150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE RATE (DENT LOW)	
RANGE	10 nGy/s –1 mGy/s (70 µR/min – 7 R/min)
MIN. PEAK TRIG LEVEL	1 µGy/s (7 mR/min)
UNCERTAINTY	5 % or ± 10 nGy/s (70 µR/min) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
DOSE RATE (DENT HIGH)	
RANGE	20 µGy/s –1000 mGy/s ⁽²⁾ (140 mR/min – 7000 R/min)
MIN. PEAK TRIG LEVEL	100 µGy/s (0.7 R/min)
UNCERTAINTY	5 % or ± 10 µGy/s (70 mR/min) (40 – 150 kVp, HVL: 1.5 – 14 mm Al ⁽¹⁾ , Active Compensation)
kV/kVp	
RANGE	45 – 150 kV/kVp
UNCERTAINTY	2 % (for total filtrations from 2.5 mm Al up to 1 mm Cu or equivalent, Active Compensation)
SENSITIVITY (DENT LOW)	0.4 mA, 40 kV, 40 cm (15.7 in), no added filtration
SENSITIVITY (DENT HIGH)	0.8 mA, 70 kV, 50 cm (19.7 in), no added filtration

EXPOSURE TIME	
RANGE	1 ms – 999 s
UNCERTAINTY	0.5 % or 0.2 ms
PULSE	
RANGE	1 – 9999 pulses
PEAK TRIG LEVEL (DENT LOW)	> 3 µGy/s
PEAK TRIG LEVEL (DENT HIGH)	> 1 mGy/s
HVL ⁽³⁾	
RANGE	1.0 – 14.0 mm Al
UNCERTAINTY	10 % or ± 0.2 mm Al (at signal levels above 1/1000 of max dose rate for selected sensor)
TOTAL FILTRATION ⁽⁴⁾	
RANGE	1.5 – 35 mm Al (60 – 120 kV)
UNCERTAINTY	10% or ± 0.3 mm Al (at signal levels above 1/1000 of max dose rate for selected sensor)

⁽¹⁾ 45 mm Al added filtration at 145 kVp gives a HVL of ~13 mm Al.

⁽²⁾ 1000 mGy/s up to 70 kVp, 400 mGy/s at 100 kVp, 250 mGy/s at 140 kVp.

⁽³⁾ HVL is an option to RaySafe Solo DENT.

⁽⁴⁾ Total filtration is included in the HVL option.

RAYSAFE SOLO MAM

SIZE DETECTOR	117 x 22 x 12 mm
WEIGHT	50 g (2 oz)
DOSE	
BEAM QUALITES	Mo/Mo, Mo/Al, Mo/Rh, Rh/Rh, Rh/Al, W/Rh, W/Ag
RANGE	5 µGy – 9999 Gy (0.5 mR – 9999R)
TRIG LEVEL	10 µGy/s (70 mR/min)
UNCERTAINTY	5 % or ± 5 µGy (0.5 mR) (20 – 40 kV: Mo/Mo 22 – 49 kV: Mo/Al, Rh/Rh, Rh/Al 22 – 40 kV: Mo/Rh, W/Rh, W/Ag, 0 – 2.5 mm Al added filtration, Active Compensation)

DOSE RATE	
RANGE	10 µGy/s – 100 mGy/s (70 mR/min – 700R/min)
MIN. PEAK TRIG LEVEL	10 µGy/s (70 mR/min)
UNCERTAINTY	5 % or ± 5 µGy/s (35 mR/min) (20 – 40 kV: Mo/Mo 22 – 49 kV: Mo/Al, Rh/Rh, Rh/Al 22 – 40 kV: Mo/Rh, W/Rh, W/Ag, 0 – 2.5 mm Al added filtration, Active Compensation)

kV (only RaySafe Solo MAM, not RaySafe Solo MAM Dose)

BEAM QUALITIES	Mo/Mo, W/Rh
RANGE	20 – 40 kV
UNCERTAINTY	2 % or ± 0.5 kV (no paddle) 2 % or ± 0.7 kV (paddle) (Active Compensation for inherent Mo filtration of 25 – 35 µm and for inherent Rh filtration of 50 – 60 µm. User selectable paddle compansation.) ⁽¹⁾
SENSITIVITY	10 mA, 28 kV, 65 cm (25.6 in), no added filtration

HVL ⁽²⁾

BEAM QUALITIES	Mo/Mo, Mo/Al, Mo/Rh, Rh/Rh, Rh/Al, W/Rh, W/Ag
RANGE	0.2 – 1.2 mm Al, depending on beam quality
UNCERTAINTY	5 % (for up to 2.5 mm Al added filtration to each beam quality)

EXPOSURE TIME	
RANGE	1 ms – 999 s
UNCERTAINTY	0.5 % or 0.2 ms
⁽¹⁾ Definition: Paddle = 0.1 mm Al Note! Variation in paddle thickness and homogeneity may affect kV results. To achieve the most accurate result, kV measurements without paddle is recommended.	
⁽²⁾ HVL is an option to RaySafe Solo MAM.	

RAYSAFE SOLO CT

SIZE DETECTOR	200 x 20 x 12 mm (7.9 x 0.8 x 0.5 in)
SIZE Ø DETECTOR	7.5 mm (0.30 in)
SIZE Ø PHANTOM ADAPTER	12.5 mm (0.49 in)
EFFECTIVE LENGTH	100 mm (3.94 in)
WEIGHT	50 g (1.75 oz)
RANGE	10 µGy – 9999 Gy (1 mR – 9999 R) 20 µGy/s – 100 mGy/s (140 mR/min – 680 R/min)
UNCERTAINTY	5 % (at reference point RQA9; 120 kV, 42.5 mm Al)
ENERGY DEPENDENCE	< 5 % (at 80 kV to 150 kV; RQR and RQA qualities)
RADIAL UNIFORMITY	± 2 %
AXIAL UNIFORMITY	± 3 %, within rated length
INFLUENCE OF RELATIVE HUMIDITY	< 0.3 % (for RH < 80 %)
UNCERTAINTY IN TEMP. AND PRESSURE CORRECTION	2 %
PRESSURE RANGE	80.0 – 106.0 kPa
INTERNATIONAL STANDARD	Fulfills requirements in IEC 61674

RaySafe Solo CT detector comes with a phantom adapter to fit a standard head and/or body phantom.

RAYSAFE SOLO LIGHT

WEIGHT	170 g (6 oz)
RELATIVE AIR HUMIDITY RANGE	< 80 %
UNCERTAINTY	3 %
ILLUMINANT A	
DETECTOR MEMORY	30 measurements per sensor
CLASSIFICATION	Class B (according to DIN 5032, part 7)
MAX. DEVIATION FROM THE CIE CURVE FOR THE HUMAN EYE (V(λ))	4 % (see figure Photopic Response)

SIZE

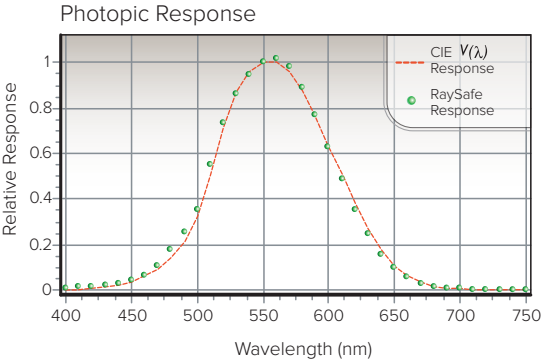
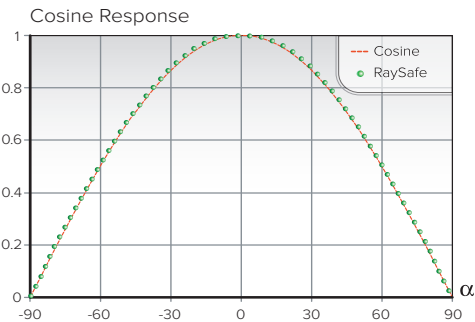
LIGHT DETECTOR	30 x 104 x 21 mm (1.2 x 4.1 x 0.83 in)
LUMINANCE TUBE	Ø = 29 mm (1.1 in) L = 84 mm (3.3 in)
SHADOW RING	Ø = 50 mm (2 in)

LUMINANCE

RANGE (AUTO)	0.05 – 50 000 cd/m²
RESOLUTION	0.01 cd/m²
LUMINANCE DETECTOR OPTICS	Ø 10 mm (0.4 in) measuring field. Contact measurement focusing lens 1:1

ILLUMINANCE

RANGE (AUTO)	0.05 – 50 000 lux
RESOLUTION	0.01 lux
MAX. DEVIATION FROM COSINE ANGULAR RESPONSE	1.7 % (see figure Cosine Response)



RAYSAFE SOLO PC KIT

COMPATIBLE WITH	Windows 10, Windows 8, Windows 8.1, Windows 7, Windows Vista, Windows XP, Windows 2000
FILE FORMAT	XML
COMMUNICATION	RS-232 /USB or Bluetooth
BLUETOOTH OPTION	
CONNECTOR	9-pin D-SUB, pre-configured for communication with Xi View
OPERATING DISTANCE	100 m nominal (actual performance depends on environment and receiving Bluetooth module)
WAVEFORM	
BANDWIDTH (R/F LOW, DENT LOW)	0.1 kHz
BANDWIDTH (R/F HIGH, DENT HIGH & RAD)	2.5 kHz
BANDWIDTH (MAM)	2.4 kHz
BANDWIDTH (mAs)	1 kHz
MEMORY DEPTH	1 200 ms

RAYSAFE UNCERTAINTY DEFINITION

The expanded uncertainty is stated as the combined uncertainty of measurement multiplied by the coverage factor $k=2$, which assuming a normal distribution has a coverage probability of 95 % (complies with GUM by ISO (1995, ISBN 92-67-10188-9)).

Instrument specifications are subject to purchased configuration.
All specifications may change without notice.