

Certificate number: o60240450i202861-B-1



Calibration Certificate

Customer
SET Y GAD SAS
CRA 48 NO 101A-69
110111 BOGOTA
CO

Laboratory
Unfors RaySafe Inc.
2 Science Road
Glenwood, IL 60425-1586
USA
+1-833-296-9240
customerservice.us@raysafe.com

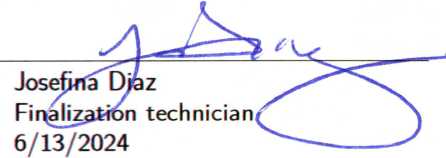
CUSTOMER INSTRUMENT

Product	X2 MAM
Serial number	202861
Manufacturer	RaySafe

CALIBRATION INFORMATION

As found	6/3/2024
As left	6/11/2024
Adjustment done	Yes
Tested by	Amber Ramos Armad Bryant Nate Barnes Rosio Ramos

Approved by


Josefina Diaz
Finalization technician
6/13/2024

Certificate date



GENERAL INFORMATION

LABORATORY CALIBRATION

All reference standards used for this calibration are valid for one year. Voltage, Time, Electrical current, Electrical charge, Illuminance and Luminance standards are traceable to RISE Research Institute of Sweden. All Air kerma and Air kerma rate standards are traceable to Physikalisch-Technische Bundesanstalt (PTB). HVL standards are traceable to RISE and PTB.

CALIBRATION ENVIRONMENTAL CONDITIONS

Ambient temperature: 15 – 30 °C

Relative humidity: < 80 %

CALIBRATION UNCERTAINTY

All measurements are associated with some level of uncertainty. The measurement uncertainties in this certificate are stated in accordance with EA-4/02 (Expression of the Uncertainty of Measurement in Calibration) and JCGM 100:2008, Guide to the Expression of Uncertainty in Measurement (GUM).

The term *Expanded uncertainty* in this certificate, is defined as the standard uncertainty multiplied by a coverage factor $k = 2$. For a normal distribution, this gives approximately 95 % probability that the measurement result is within the stated uncertainty.

SCOPE OF CERTIFICATE

The results in this calibration certificate only relate to the customer instrument specified on the first page of the certificate. Whether the device under test conforms to the requirements for its intended use or not, has to be decided by its user.

CALIBRATION AS FOUND

REFERENCE EQUIPMENT

INSTRUMENT	VALID UNTIL DATE
Siemens Mammomat 3000 Serial number: 5853	9/7/2024
Siemens P40 Mo W Serial number: 574357	
Siemens Mammomat 3000 Serial number: 5904	2/27/2025
Siemens P40 Mo W Serial number: 576363	
Hologic Selenia Serial number: 28410072450RM	5/23/2025
Varian M-113T Serial number: 69061-U9	
GE Medical systems Seno DMR+ Serial number: 447233BU8	5/17/2025
Varian M-152 Serial number: 97122-U4	

MEASUREMENTS

HVL

Set voltage	Anode target	Nominal tube filtration	Added filtration	Air kerma rate $\mu\text{Gy/s}$	Instrument setting	Standard	Measured	Deviation from standard	Expanded uncertainty
23 kV	Mo	30 μm Mo	0.1 mm Al	6778	Mo/Mo paddle	0.300 mm Al	0.290 mm Al	-3.4 %	3.4 %
28 kV	Mo	30 μm Mo	0.1 mm Al	12530	Mo/Mo paddle	0.365 mm Al	0.365 mm Al	-0.1 %	2.9 %
35 kV	Mo	30 μm Mo	0.1 mm Al	19954	Mo/Mo paddle	0.419 mm Al	0.409 mm Al	-2.5 %	2.9 %
23 kV	Mo	25 μm Rh	0.1 mm Al	4547	kVp off	0.359 mm Al	0.345 mm Al	-4.1 %	3.1 %
28 kV	Mo	25 μm Rh	0.1 mm Al	9087	kVp off	0.435 mm Al	0.437 mm Al	0.4 %	3.0 %
35 kV	Mo	25 μm Rh	0.1 mm Al	14546	kVp off	0.480 mm Al	0.482 mm Al	0.3 %	2.8 %
23 kV	W	50 μm Ag	0.1 mm Al	2474	W/Ag paddle	0.462 mm Al	0.450 mm Al	-2.6 %	3.0 %
28 kV	W	50 μm Ag	0.1 mm Al	5158	W/Ag paddle	0.616 mm Al	0.612 mm Al	-0.6 %	2.9 %

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HVL – continued

Set voltage	Anode target	Nominal tube filtration	Added filtration	Air kerma rate $\mu\text{Gy/s}$	Instrument setting	Standard	Measured	Deviation from standard	Expanded uncertainty
35 kV	W	50 μm Ag	0.1 mm Al	7322	W/Ag paddle	0.697 mm Al	0.707 mm Al	1.4 %	3.0 %
23 kV	W	0.5 mm Al	0.1 mm Al	7981	W/Al	0.329 mm Al	0.309 mm Al	-6.2 %	3.5 %
28 kV	W	0.5 mm Al	0.1 mm Al	13701	W/Al	0.432 mm Al	0.427 mm Al	-1.2 %	3.4 %
35 kV	W	0.5 mm Al	0.1 mm Al	19683	W/Al	0.565 mm Al	0.559 mm Al	-1.1 %	4.1 %
47 kV	W	0.3 mm Cu	0 mm Al	566.3	W/Al	3.305 mm Al	3.270 mm Al	-1.1 %	2.8 %
23 kV	W	50 μm Rh	0.1 mm Al	2841	W/Rh Siemens paddle	0.448 mm Al	0.435 mm Al	-2.9 %	3.0 %
28 kV	W	50 μm Rh	0.1 mm Al	5131	W/Rh Siemens paddle	0.547 mm Al	0.536 mm Al	-2.2 %	3.4 %
35 kV	W	50 μm Rh	0.1 mm Al	6854	W/Rh Siemens paddle	0.604 mm Al	0.606 mm Al	0.3 %	2.7 %
27 kV	Rh	30 μm Ag	0.1 mm Al	3467	Rh/Ag paddle	0.454 mm Al	0.442 mm Al	-2.7 %	3.1 %
34 kV	Rh	30 μm Ag	0.1 mm Al	6476	Rh/Ag paddle	0.566 mm Al	0.566 mm Al	-0.1 %	2.8 %
40 kV	Rh	30 μm Ag	0.1 mm Al	8506	Rh/Ag paddle	0.616 mm Al	0.631 mm Al	2.3 %	2.8 %

CALIBRATION AS LEFT

REFERENCE EQUIPMENT

INSTRUMENT	VALID UNTIL DATE
Siemens Mammomat 3000 Serial number: 5904	2/27/2025
Siemens P40 Mo W Serial number: 576363	
Hologic Selenia Serial number: 28410072450RM	5/23/2025
Varian M-113T Serial number: 69061-U9	
GE Medical systems Seno DMR+ Serial number: 447233BU8	5/17/2025
Varian M-152 Serial number: 97122-U4	

MEASUREMENTS

HVL

Set voltage	Anode target	Nominal tube filtration	Added filtration	Air kerma rate $\mu\text{Gy/s}$	Instrument setting	Standard	Measured	Deviation from standard	Expanded uncertainty
23 kV	Mo	30 μm Mo	0.1 mm Al	6846	Mo/Mo paddle	0.299 mm Al	0.295 mm Al	-1.6 %	3.4 %
28 kV	Mo	30 μm Mo	0.1 mm Al	12387	Mo/Mo paddle	0.364 mm Al	0.370 mm Al	1.4 %	2.9 %
35 kV	Mo	30 μm Mo	0.1 mm Al	19180	Mo/Mo paddle	0.417 mm Al	0.415 mm Al	-0.6 %	2.9 %
23 kV	Mo	25 μm Rh	0.1 mm Al	4549	kVp off	0.359 mm Al	0.344 mm Al	-4.4 %	3.1 %
28 kV	Mo	25 μm Rh	0.1 mm Al	9082	kVp off	0.435 mm Al	0.442 mm Al	1.5 %	3.0 %
35 kV	Mo	25 μm Rh	0.1 mm Al	14559	kVp off	0.480 mm Al	0.482 mm Al	0.3 %	2.8 %
23 kV	W	50 μm Ag	0.1 mm Al	2928	W/Ag paddle	0.452 mm Al	0.446 mm Al	-1.5 %	3.0 %
28 kV	W	50 μm Ag	0.1 mm Al	6039	W/Ag paddle	0.600 mm Al	0.604 mm Al	0.5 %	2.9 %
35 kV	W	50 μm Ag	0.1 mm Al	8519	W/Ag paddle	0.681 mm Al	0.694 mm Al	1.8 %	3.0 %
23 kV	W	0.5 mm Al	0.1 mm Al	8597	W/Al	0.326 mm Al	0.311 mm Al	-4.7 %	3.5 %
28 kV	W	0.5 mm Al	0.1 mm Al	14846	W/Al	0.425 mm Al	0.425 mm Al	-0.1 %	3.4 %
35 kV	W	0.5 mm Al	0.1 mm Al	21408	W/Al	0.555 mm Al	0.550 mm Al	-1.0 %	4.1 %

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HVL – continued

Set voltage	Anode target	Nominal tube filtration	Added filtration	Air kerma rate $\mu\text{Gy/s}$	Instrument setting	Standard	Measured	Deviation from standard	Expanded uncertainty
47 kV	W	0.3 mm Cu	0 mm Al	566.6	W/Al	3.305 mm Al	3.290 mm Al	-0.5 %	2.8 %
23 kV	W	50 μm Rh	0.1 mm Al	2684	W/Rh Siemens paddle	0.463 mm Al	0.461 mm Al	-0.5 %	3.0 %
28 kV	W	50 μm Rh	0.1 mm Al	4947	W/Rh Siemens paddle	0.553 mm Al	0.562 mm Al	1.6 %	3.4 %
35 kV	W	50 μm Rh	0.1 mm Al	6677	W/Rh Siemens paddle	0.616 mm Al	0.624 mm Al	1.2 %	2.7 %
27 kV	Rh	30 μm Ag	0.1 mm Al	3451	Rh/Ag paddle	0.454 mm Al	0.448 mm Al	-1.4 %	3.1 %
34 kV	Rh	30 μm Ag	0.1 mm Al	6419	Rh/Ag paddle	0.566 mm Al	0.573 mm Al	1.1 %	2.8 %
40 kV	Rh	30 μm Ag	0.1 mm Al	8441	Rh/Ag paddle	0.616 mm Al	0.639 mm Al	3.6 %	2.8 %