

Certificate number: o70021654i314801-1



Calibration Certificate

Customer
SET Y GAD SAS
CRA 48 NO 1-1 A-69
110111 BOGOTA
CO

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CUSTOMER INSTRUMENT

Product RaySafe 452
Serial number 314801
Manufacturer Fluke Biomedical

CALIBRATION INFORMATION

As found Not performed
As left 2024-07-15
Adjustment done Yes
Tested by Ida Wiholm
 Petter Olausson

Approved by 
 Afşana Arbab
 Service Technician
Certificate date 2024-07-16

CALIBRATION RESULT

AS LEFT: All measured and tested values of this certificate were found to be in conformance with the specification.

Relevant instrument specifications
Air Kerma rate: 15 %
Ambient dose equivalent rate: 15 %



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.

CONFORMANCE WITH SPECIFICATION

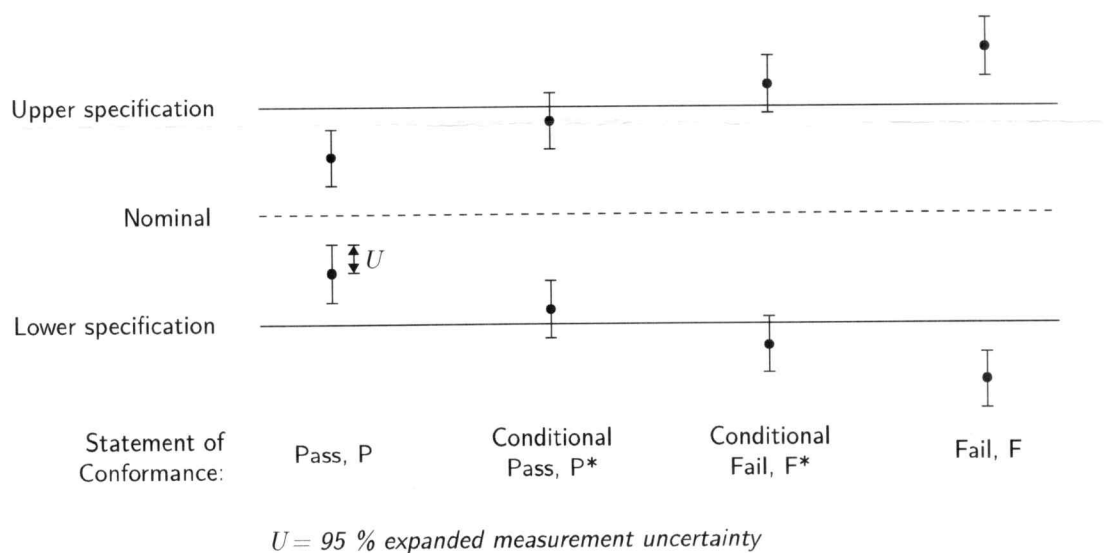
The conformance with specification (*Result*) has been determined in accordance with ILAC publication ILAC-G8:09/2019.

The statement of conformance is based on a 95 % coverage probability for the expanded uncertainty and is only valid for the tested measurements.

All statements of conformance with specification in this certificate are reported as:

- P PASS** – The measured value is within the specification by a margin greater than the expanded uncertainty.
- P* CONDITIONAL PASS** – The measured value is within the specification by a margin less than the expanded measurement uncertainty. Therefore, it is not possible to state conformance with specification using a 95 % coverage probability for the expanded uncertainty.
- F* CONDITIONAL FAIL** – The measured value is outside of the specification by a margin less than the expanded measurement uncertainty. Therefore, it is not possible to state non-conformance with specification using a 95 % coverage probability for the expanded uncertainty.
- F FAIL** – The measured value is outside of the specification by a margin greater than the expanded measurement uncertainty.

A summary of all performed tests is reported on the first page of this certificate.



Other terms that may be used:

- NS NO SPECIFICATION** – The measured value has no specification.
- NM NOT MEASURED** – The measurement has not been performed and no value is tested against the specification.

CALIBRATION AS LEFT

REFERENCE EQUIPMENT

INSTRUMENT	VALID UNTIL DATE
Eckert & Ziegler Cs 7.P20 Serial Number: AG002/18	2025-06-04
RaySafe X2 Survey Serial number: 304324	2025-02-01

MEASUREMENTS

AIR KERMA RATE

Anode target	Nominal tube filtration	Added filtration	Set voltage	Standard	Measured	Deviation from standard	Expanded uncertainty	Result
Cs-137	-	x4		0.344 $\mu\text{Gy/s}$	0.357 $\mu\text{Gy/s}$	3.8 %	4.6 %	P
W	2.5 mm Al	5.0 mm Cu + 1.5 mm Al	100 kV	0.469 $\mu\text{Gy/s}$	0.457 $\mu\text{Gy/s}$	-2.5 %	4.7 %	P

AMBIENT DOSE EQUIVALENT RATE

Anode target	Nominal tube filtration	Added filtration	Set voltage	Standard	Measured	Deviation from standard	Expanded uncertainty	Result
Cs-137	-	x4		0.419 $\mu\text{Sv/s}$	0.437 $\mu\text{Sv/s}$	4.4 %	5.2 %	P
W	2.5 mm Al	5.0 mm Cu + 1.5 mm Al	100 kV	0.795 $\mu\text{Sv/s}$	0.788 $\mu\text{Sv/s}$	-0.9 %	5.6 %	P