



**Customer:** Jen Newtown  
 Upstate Medical Physics  
 1290 Blossom Drive  
 Victor NY 14564

**Instrument**  
 Victoreen Model 451B

**Serial Number**  
 799

Precision Check				
Test1	Test2	Test3	Mean	Results
10.30 mR/hr	10.30 mR/hr	10.30 mR/hr	10.30 mR/hr	Pass

Accuracy Check				
Range	Target Value	As Found	As Left	Source ID
Rate	40 R/hr	37 R/hr	37 R/hr	R-028/R-122
Rate	10 R/hr	10.7 R/hr	10.7 R/hr	R-028/R-122
Rate	4 R/hr	4 R/hr	4 R/hr	R-028/R-122
Rate	1 R/hr	1.05 R/hr	1.05 R/hr	R-028/R-122
Rate	400 mR/hr	400 mR/hr	400 mR/hr	R-028/R-122
Rate	100 mR/hr	106 mR/hr	106 mR/hr	R-028/R-122
Rate	40 mR/hr	40 mR/hr	40 mR/hr	R-137
Rate	10 mR/hr	10.3 mR/hr	10.3 mR/hr	R-137
Rate	4 mR/hr	3.9 mR/hr	3.9 mR/hr	R-137
Rate	1 mR/hr	1.05 mR/hr	1.05 mR/hr	R-137
Integrate	200 mR	200 mR	200 mR	R-028/R-122
Integrate	50 mR	51 mR	51 mR	R-028/R-122

Readings with \* indicate ranges where As-Found readings are >20% of Target value.

Readings with \*\* indicate As-left readings are >10% of Target value.

Readings with # indicate ranges were calibrated using a pulser

Physical Checks
Outer Physical Check: Pass
Internal Physical Check: Pass
Tap Test: Pass
Desiccant Check: Pass (Changed 1/30/25)

Comments: Dried / Replaced Desiccant.

Customer Equipment ID: 00494

Calibrated By Alana Sullivan

QC Review By Matthew Hunter

Date: Jan 30, 2025

Expires: Jan 30, 2026

QC Date: Jan 31, 2025

Atmospheric Conditions - Temperature: 70.8 °F, Humidity: 22.8 %, Barometric Pressure: 29.90 in/hg.

In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated.

Unless otherwise stated, this calibration was performed by RSCS at 93 Ledge Rd, Seabrook, NH utilizing the following NIST Traceable sources: R-028/R-122 - J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7% (Cal Due: Jan 03, 2026)

R-137 - Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0% (Cal Due: Jan 03, 2026)

Worked on calibration: Alana Sullivan

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.

Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.

Calibration Laboratory is operated in accordance with ANSI/NCCL Z540-1-1994.

RSCS, Inc. has been assessed by ANAB and meets the requirements of ISO/IEC 17025:2017 while demonstrating technical competence in the field of

calibration. Refer to the Scope of Accreditation AC-2079 for information on the types of calibrations to which this accreditation applies. This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, Inc.



**Customer:** Jen Newtown  
 Upstate Medical Physics  
 1290 Blossom Drive  
 Victor NY 14564

**Instrument**  
 Ludlum Model 3-241R  
**Probe Model**  
 Ludlum 44-38  
 Ludlum 44-9

**Serial Number**  
 264306  
**Serial Number**  
 567  
 388694

Precision Check				
Test1	Test2	Test3	Mean	Results
4.00 mR/hr	4.00 mR/hr	4.00 mR/hr	4.00 mR/hr	Pass

Accuracy Check				
Range	Target Value	As Found	As Left	Source ID
X100	160 mR/hr	160 mR/hr	160 mR/hr	R-200/R-201
X100	40 mR/hr	40 mR/hr	40 mR/hr	R-200/R-201
X10	16 mR/hr	16 mR/hr	16 mR/hr	R-200/R-201
X10	4 mR/hr	4 mR/hr	4 mR/hr	R-200/R-201
X1	1.6 mR/hr	1.65 mR/hr	1.6 mR/hr	R-200/R-201
X1	0.4 mR/hr	0.45 mR/hr	0.4 mR/hr	R-200/R-201
X.1	0.16 mR/hr #	0.135 mR/hr #	0.15 mR/hr #	4084.01
X.1	0.04 mR/hr #	0.04 mR/hr #	0.04 mR/hr #	4084.01

Readings with \* indicate ranges where As-Found readings are >20% of Target value.  
 Readings with \*\* indicate As-left readings are >10% of Target value.  
 Readings with # indicate ranges were calibrated using a pulser

Probe	Isotope	Efficiency	NIST Source ID	Geometry	Comment
44-9 388694	Tc-99m	0.0004 C/D (4 Pi)	2501-1 Co-57	1 cm	

Physical Checks
Outer Physical Check: Pass
Internal Physical Check: Pass
Geotropism Check: Pass
Mechanical Zero Check: Pass
Tap Test: Pass
Audio Function Check: Pass
Cord check: Pass

Electronics Checks	As Found	As Left
High Voltage	900 Volts	900 Volts

Comments: Geometry: Detector Perpendicular To Source.

Customer Equipment ID:

Calibrated By Alana Sullivan

QC Review By Matthew Hunter

Date: Jan 29, 2025  
 Expires: Jan 29, 2026  
 QC Date: Jan 29, 2025

Atmospheric Conditions - Temperature: 73.0 °F, Humidity: 20.8 %, Barometric Pressure: 29.32 in/hg.

In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated.

Unless otherwise stated, this calibration was performed by RSCS at 93 Ledge Rd, Seabrook, NH utilizing the following NIST Traceable sources: 4084.01 - (Cal Due: May 21, 2025)

R-200/R-201 - J.L. Shepherd and Associates Model 81-12 Cs-137 Dual Source Gamma Calibrator (SN 7145), characterized using Exradin Models A6 (S/N 185) / A4 (S/N 220) / A5 (S/N 261), GE RSS-131 (S/N 95100178), and Standard Imaging Electrometer Model Maxx4000 (S/N J171510) in accordance with methods specified in RSCS TSD 20-059, with estimated uncertainty of 6.26%. (Cal Due: Jan 03, 2026)

Worked on calibration: Alana Sullivan\ Nicole Wedig

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.

Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.

Calibration Laboratory is operated in accordance with ANSI/NCCL Z540-1-1994.

RSCS, Inc. has been assessed by ANAB and meets the requirements of ISO/IEC 17025:2017 while demonstrating technical competence in the field of calibration. Refer to the Scope of Accreditation AC-2079 for information on the types of calibrations to which this accreditation applies.

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**Customer:** Jen Newtown  
Upstate Medical Physics  
1290 Blossom Drive  
Victor NY 14564

**Instrument**  
Victoreen Model 451B

**Serial Number**  
1074

Precision Check				
Test1	Test2	Test3	Mean	Results
38.00 mR/hr	39.00 mR/hr	38.00 mR/hr	38.33 mR/hr	Pass

Accuracy Check				
Range	Target Value	As Found	As Left	Source ID
Rate	40 R/hr	36 R/hr	36 R/hr	R-028/R-122
Rate	10 R/hr	10.7 R/hr	10.7 R/hr	R-028/R-122
Rate	4 R/hr	4.1 R/hr	4.1 R/hr	R-028/R-122
Rate	1 R/hr	1.06 R/hr	1.06 R/hr	R-028/R-122
Rate	400 mR/hr	380 mR/hr	380 mR/hr	R-028/R-122
Rate	100 mR/hr	103 mR/hr	103 mR/hr	R-028/R-122
Rate	40 mR/hr	39 mR/hr	39 mR/hr	R-137
Rate	10 mR/hr	10 mR/hr	10 mR/hr	R-137
Rate	4 mR/hr	3.9 mR/hr	3.9 mR/hr	R-137
Rate	1 mR/hr	1.01 mR/hr	1.01 mR/hr	R-137
Integrate	200 mR	200 mR	200 mR	R-028/R-122
Integrate	50 mR	52 mR	52 mR	R-028/R-122

Readings with \* indicate ranges where As-Found readings are >20% of Target value.

Readings with \*\* indicate As-left readings are >10% of Target value.

Readings with # indicate ranges were calibrated using a pulser

Physical Checks
Outer Physical Check: Pass
Internal Physical Check: Pass
Tap Test: Pass
Desiccant Check: Pass

Comments: As-Found/As-Left Calibration Factors: F1 = 96/96, F2 = 93/93, F3 = 97/97, F4 = 99/99, F5 = 93/93, INT = (100/100)/(100/100).

Customer Equipment ID:

Calibrated By Chris Hartman

QC Review By Matthew Hunter

Date: Jul 30, 2024

Expires: Jul 30, 2025

QC Date: Jul 30, 2024

Atmospheric Conditions - Temperature: 68.5 °F, Humidity: 48.0 %, Barometric Pressure: 29.90 in/hg.

In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated.

Unless otherwise stated, this calibration was performed by RSCS at 93 Ledge Rd, Seabrook, NH utilizing the following NIST Traceable sources: R-028/R-122 - J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7% (Cal Due: Feb 02, 2025)

R-137 - Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0% (Cal Due: Jan 12, 2025)

Worked on calibration: Chris Hartman

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.

Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.

Calibration Laboratory is operated in accordance with ANSI/NCSL Z540-1-1994.

RSCS, Inc. has been assessed by ANAB and meets the requirements of ISO/IEC 17025:2017 while demonstrating technical competence in the field of

**Customer:** Jen Newtown  
 Upstate Medical Physics  
 1290 Blossom Drive  
 Victor NY 14564

**Instrument**  
 Victoreen Model 451P

**Serial Number**  
 3869

Precision Check				
Test1	Test2	Test3	Mean	Results
39.00 mR/hr	39.00 mR/hr	39.00 mR/hr	39.00 mR/hr	Pass

Accuracy Check				
Range	Target Value	As Found	As Left	Source ID
Rate	4 R/hr	3.9 R/hr	3.9 R/hr	R-028/R-122
Rate	1 R/hr	0.95 R/hr	0.95 R/hr	R-028/R-122
Rate	400 mR/hr	370 mR/hr	370 mR/hr	R-028/R-122
Rate	100 mR/hr	94 mR/hr	94 mR/hr	R-028/R-122
Rate	40 mR/hr	39 mR/hr	39 mR/hr	R-137
Rate	10 mR/hr	10.1 mR/hr	10.1 mR/hr	R-137
Rate	4 mR/hr	4 mR/hr	4 mR/hr	R-137
Rate	1 mR/hr	1.02 mR/hr	1.02 mR/hr	R-137
Rate	400 µR/Hr	400 µR/Hr	400 µR/Hr	R-137
Rate	100 µR/Hr	100 µR/Hr	100 µR/Hr	R-137
Integrate	80 mR	78 mR	78 mR	R-028/R-122
Integrate	20 mR	18.8 mR	18.8 mR	R-028/R-122

Readings with \* indicate ranges where As-Found readings are >20% of Target value.  
 Readings with \*\* indicate As-left readings are >10% of Target value.  
 Readings with # indicate ranges were calibrated using a pulser

Physical Checks
Outer Physical Check: Pass
Internal Physical Check: Pass
Tap Test: Pass

Comments: As-Found/As-Left Calibration Factors: F1 = 95/95, F2 = 111/111, F3 = 106/106, F4 = 90/90, F5 = 90/90, F6 = 100/100 / 100/100;

Customer Equipment ID:

Calibrated By Chris Hartman

QC Review By Matthew Hunter

Date: May 20, 2024

Expires: May 20, 2025

QC Date: May 20, 2024

Atmospheric Conditions - Temperature: 69.1 °F, Humidity: 48.0 %, Barometric Pressure: 30.00 in/hg.

In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated.

Unless otherwise stated, this calibration was performed by RSCS at 93 Ledge Rd, Seabrook, NH utilizing the following NIST Traceable sources: R-028/R-122 - J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7% (Cal Due: Feb 02, 2025)

R-137 - Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0% (Cal Due: Jan 12, 2025)

Worked on calibration: Chris Hartman

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.

Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.

Calibration Laboratory is operated in accordance with ANSI/NCSL Z540-1-1994.

RSCS, Inc. has been assessed by ANAB and meets the requirements of ISO/IEC 17025:2017 while demonstrating technical competence in the field of calibration. Refer to the Scope of Accreditation AC-2079 for information on the types of calibrations to which this accreditation applies.



**Customer:** Jen Newtown  
 Upstate Medical Physics  
 1290 Blossom Drive  
 Victor NY 14564

**Instrument**  
 Victoreen Model 451B

**Serial Number**  
 452

Precision Check				
Test1	Test2	Test3	Mean	Results
110.00 mR/hr	109.00 mR/hr	109.00 mR/hr	109.33 mR/hr	Pass

Accuracy Check				
Range	Target Value	As Found	As Left	Source ID
Rate	40 R/hr	37 R/hr	37 R/hr	R-028/R-122
Rate	10 R/hr	10.7 R/hr	10.7 R/hr	R-028/R-122
Rate	4 R/hr	4.2 R/hr	4.2 R/hr	R-028/R-122
Rate	1 R/hr	1.09 R/hr	1.09 R/hr	R-028/R-122
Rate	400 mR/hr	400 mR/hr	400 mR/hr	R-028/R-122
Rate	100 mR/hr	108 mR/hr	108 mR/hr	R-028/R-122
Rate	40 mR/hr	38 mR/hr	38 mR/hr	R-137
Rate	10 mR/hr	9.8 mR/hr	9.8 mR/hr	R-137
Rate	4 mR/hr	3.8 mR/hr	3.8 mR/hr	R-137
Rate	1 mR/hr	1 mR/hr	1 mR/hr	R-137
Integrate	200 mR	210 mR	210 mR	R-028/R-122
Integrate	50 mR	54 mR	54 mR	R-028/R-122

Readings with \* indicate ranges where As-Found readings are >20% of Target value.  
 Readings with \*\* indicate As-left readings are >10% of Target value.  
 Readings with # indicate ranges were calibrated using a pulser

Physical Checks
Outer Physical Check: Pass (Tape on Battery Door; Functional; )
Internal Physical Check: Pass
Tap Test: Pass
Desiccant Check: Pass

Comments: As-Found/As-Left Calibration Factors: F1 = 96/96 F2 = 92/92, F3 = 105/105, F4 = 102/102, F5 = 95/95, INT = (100/100)/(100/100).

Customer Equipment ID:

Calibrated By Jarod Fagan

QC Review By Matthew Hunter

Date: Sep 17, 2024

Expires: Sep 17, 2025

QC Date: Sep 17, 2024

Atmospheric Conditions - Temperature: 70.8 °F, Humidity: 52.1 %, Barometric Pressure:30.15 in/hg.

In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated.

Unless otherwise stated, this calibration was performed by RSCS at 93 Ledge Rd, Seabrook, NH utilizing the following NIST Traceable sources: R-028/R-122 - J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7% (Cal Due: Feb 02, 2025)

R-137 - Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0% (Cal Due: Jan 12, 2025)

Worked on calibration: Chris Hartman\ Jarod Fagan

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.

Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.



**Calibration Certificate**  
**ID Number: 3096132196-0**

**Customer:**  
**Upstate Medical Physics**  
 1290 Blossom Drive  
 Victor, NY 14564

**Instrument**  
 Fluke Biomedical Model 451P

**Serial Number**  
 3096

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
10.10 mR/hr	10.30 mR/hr	9.80 mR/hr	10.07 mR/hr	Satisfactory

Accuracy Check				
Range	Target Value	As Found	As Left	
Rate	4 R/hr	3.4 R/hr	4.1 R/hr	
Rate	1 R/hr	0.84 R/hr	0.99 R/hr	
Rate	400 mR/hr	340 mR/hr	400 mR/hr	
Rate	100 mR/hr	88 mR/hr	104 mR/hr	
Rate	40 mR/hr	37 mR/hr	39 mR/hr	
Rate	10 mR/hr	9.2 mR/hr	10.1 mR/hr	
Rate	4 mR/hr	3.2 mR/hr	3.6 mR/hr	
Rate	1 mR/hr	0.9 mR/hr	0.95 mR/hr	
Rate	400 µR/hr	370 µR/hr	370 µR/hr	
Rate	100 µR/hr	103 µR/hr	103 µR/hr	
Integrate	80 mR	69 mR	81 mR	
Integrate	20 mR	16.6 mR	19 mR	

Readings with \* indicate ranges where As-Found readings are >20% of Target value. Readings with \*\* indicate As-left readings are >10.00% of Target value

Outer Physical Check: <i>Pass</i>	Internal Check: <i>Pass</i>	Tap Test: <i>Pass</i>
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**Comments:** All readings 10 mR/hr or higher and the integrate readings were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1110).  
 As-Found/As-Left Calibration Factors: F1 = 107/107, F2 = 115/120, F3 = 110/115, F4 = 100/117, F5 = 92/105, INT = 100/100

Chris Pirie  
 Calibration  
 Technician

QA  
 Review:

Calibration Date: 04/10/2019  
 Expires: 04/10/2020

Atmospheric Conditions - Temperature: 71°F Humidity: 33% Barometric Pressure: 29.64"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:  
 Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.  
 J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.  
 RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%.  
 The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.  
 Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.  
 Calibration Laboratory is operated in accordance with ANSI/NCSL Z540-1-1994  
 RSCS, Inc. has been assessed by ANAB and meets the requirements of ISO/IEC 17025:2005 while demonstrating technical competence in the field of calibration. Refer to the Scope of Accreditation AC-2079 for information on the types of calibrations to which this accreditation applies.  
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**Customer:**  
**Upstate Medical Physics**  
 1290 Blossom Drive  
 Victor, NY 14564

**Instrument**  
 Ludlum Model 9DP-1

**Serial Number**  
 25006598

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
38.70 mR/hr	38.50 mR/hr	38.70 mR/hr	38.63 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
X10K	40 R/hr	40.4 R/hr	40.4 R/hr
X10K	10 R/hr	10.9 R/hr	10.9 R/hr
X1K	4 R/hr	4.29 R/hr	4.29 R/hr
X1K	1 R/hr	1.10 R/hr	1.10 R/hr
X100	400 mR/hr	428 mR/hr	428 mR/hr
X100	100 mR/hr	103 mR/hr	103 mR/hr
X10	40 mR/hr	38.7 mR/hr	38.7 mR/hr
X10	10 mR/hr	10.5 mR/hr	10.5 mR/hr
X1	4 mR/hr	3.91 mR/hr	4.32 mR/hr
X1	1 mR/hr	0.86 mR/hr	0.91 mR/hr

Readings with \* indicate ranges where As-Found readings are >20% of Target value. Readings with \*\* indicate As-left readings are >10.00% of Target value

Outer Physical Check: *Pass*                      Tap Test: *Pass*

Comments: All readings 10 mR/hr or higher were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1110).

As Found/As Left Calibration Factor: X1 = 806/900 X10 = 810/810 X100 = 857/857 X1K = 888/888 X10K = 1367/1367

Mark Nelson  
 Calibration  
 Technician



QA  
 Review: 

Calibration Date: 01/31/2020  
 Expires: 01/31/2021

Atmospheric Conditions - Temperature: 72°F Humidity: 26% Barometric Pressure: 30.22"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:  
 Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.  
 J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.  
 RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%  
 The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%  
 Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.  
 Calibration Laboratory is operated in accordance with ANSI/NCSL Z540-1-1994  
 RSCS, Inc. has been assessed by ANAB and meets the requirements of ISO/IEC 17025:2005 while demonstrating technical competence in the field of calibration. Refer to the Scope of Accreditation AC-2079 for information on the types of calibrations to which this accreditation applies.  
 This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, Inc.



Designer and Manufacturer  
of  
Scientific and Industrial  
Instruments

www.ludlums.com

# CERTIFICATE OF CALIBRATION

**LUDLUM MEASUREMENTS, INC.**

501 Oak Street  
325-235-5494  
Sweetwater, TX 79556, U.S.A.



CERT # 4084.01

Customer LANDAUER MEDICAL PHYSICS ORDER NO. 20440721/536615  
Mfg. Fluke Model 451P-RYR Serial No. 7206  
Mfg. \_\_\_\_\_ Model \_\_\_\_\_ Serial No. \_\_\_\_\_  
Cal. Date 18-Feb-23 Cal Due Date 18-Feb-24 Cal. Interval 1 Year Meterface Digital

Check mark  applies to applicable instr. and/or detector IAW mfg. spec. T. 76 °F RH 15 % Alt 706.6 mm Hg

- New Instrument
- Instrument Received
- Within Toler. +-10%
- 10-20%
- Out of Tol.
- Requiring Repair
- Other-See comments
- Mechanical ck.
- Meter Zeroed
- Background Subtract
- Input Sens. Linearity
- F/S Resp. ck
- Reset ck.
- Window Operation
- Geotropism
- Audio ck.
- Alarm Setting ck.
- Batt. ck.
- Calibrated in accordance with LMI SOP 14.8
- Calibrated in accordance with LMI SOP 14.9

Instrument Volt Set \_\_\_\_\_ V Input Sens. \_\_\_\_\_ mV Det. Oper. \_\_\_\_\_ V at \_\_\_\_\_ mV Threshold Dial Ratio \_\_\_\_\_ = \_\_\_\_\_ mV  
 HV Readout (2 points) Ref./Inst. \_\_\_\_\_ / \_\_\_\_\_ V Ref./Inst. \_\_\_\_\_ / \_\_\_\_\_ V

**COMMENTS:**

Instrument received with chamber depressurized.

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

Multimeter uncertainty within 1.3% of reading, Gamma uncertainty within 5.0% of reading, Neutron uncertainty within 7.0% of reading, Count rate uncertainty within 5.4% of reading

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING
Digital			
Digital			
Digital			
Digital			
Digital			
Digital			
Digital			
Digital			
Digital			
Digital			

Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING	Log Scale	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital						
Readout	<u>2 R/hr</u>	<u>N/A</u>				<u>2.0 R/hr</u>
	<u>200 mR/hr</u>					<u>200 mR/hr</u>
	<u>20 mR/hr</u>					<u>20</u>
	<u>2 mR/hr</u>					<u>2.0</u>
	<u>200 µR/hr</u>					<u>200 µR/hr</u>

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. All pass/fail determinations are based on the manufacturer's specifications without considering uncertainty factors. Measurement results represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k=2. ISO/IEC 17025:2017[E] State of Texas Calibration License No. LO-1963 The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323AB-2013

Reference Instruments and/or Sources: Cs-137 S/N:  059  2171CP  2261CP  720  734  781  1131  1616  1696  1909  1916CP  2324/2521  
 5717CO  5719CO  60646  70897  73410  E552  G112  2168CP  S-394  S-1054  T10081  T10082 Neutron Am-241 Be  T-304 Ra-226  Y982  
 E551  5105  CSV280

Alpha S/N \_\_\_\_\_  Beta S/N \_\_\_\_\_  Other \_\_\_\_\_  
 m 500 S/N \_\_\_\_\_  Oscilloscope S/N \_\_\_\_\_  Multimeter S/N \_\_\_\_\_

Calibrator Donnie Miekos / Donnie Miekos Title Calibrator Date 18 Feb 23  
QC'd By Rud. B. Title Final QC Date 20 Feb 23

AC Inst. <input type="checkbox"/>	Passed Dielectric (Hi-Pot) and Continuity Test
Only <input type="checkbox"/>	Failed: _____