



Calibration Certificate
ID Number: 1074121299-0

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

Instrument
Victoreen Model 451B

Serial Number
1074

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
108.00 mR/hr	108.00 mR/hr	110.00 mR/hr	108.67 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
Rate	40 R/hr	36 R/hr	36 R/hr
Rate	10 R/hr	10.4 R/hr	10.4 R/hr
Rate	4 R/hr	4.1 R/hr	4.1 R/hr
Rate	1 R/hr	1.06 R/hr	1.06 R/hr
Rate	400 mR/hr	410 mR/hr	410 mR/hr
Rate	100 mR/hr	108 mR/hr	108 mR/hr
Rate	40 mR/hr	43 mR/hr	43 mR/hr
Rate	10 mR/hr	10.4 mR/hr	10.4 mR/hr
Rate	4 mR/hr	4.2 mR/hr	4.2 mR/hr
Rate	1 mR/hr	0.97 mR/hr	0.97 mR/hr
Integrate	200 mR	200 mR	200 mR
Integrate	50 mR	53 mR	53 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: Pass
Internal Check: Pass
Tap Test: Pass
Desiccant Check: Pass

Comments: All readings higher than 4 mR/hr 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).

Argo Banerjee
Calibration
Technician

QA
Review:

Calibration Date: 05/09/2018
Expires: 05/09/2019

Atmospheric Conditions - Temperature: 71°F Humidity: 35% Barometric Pressure: 30.17"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.



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.
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Customer:	Instrument	Serial Number
Upstate Medical Physics 1290 Blossom Drive Victor, NY 14564	Victoreen Model 451P	3869

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
36.00 mR/hr	36.00 mR/hr	36.00 mR/hr	36.00 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
Rate	4 R/hr	3.7 R/hr	3.7 R/hr
Rate	1 R/hr	0.91 R/hr	0.91 R/hr
Rate	400 mR/hr	370 mR/hr	370 mR/hr
Rate	100 mR/hr	92 mR/hr	92 mR/hr
Rate	40 mR/hr	36 mR/hr	36 mR/hr
Rate	10 mR/hr	9.2 mR/hr	9.2 mR/hr
Rate	4 mR/hr	3.6 mR/hr	3.6 mR/hr
Rate	1 mR/hr	1.01 mR/hr	1.01 mR/hr
Rate	400 µR/hr	390 µR/hr	390 µR/hr
Rate	100 µR/hr	102 µR/hr	102 µR/hr
Integrate	80 mR	72 mR	72 mR
Integrate	20 mR	18.1 mR	18.1 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>	Tap Test: <i>Pass</i>
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Comments: All readings higher than 4 mR/hr 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).

Mark Nelson
 Calibration
 Technician

QA
 Review:

Calibration Date: 01/21/2019
 Expires: 01/21/2020

Atmospheric Conditions - Temperature: 70°F Humidity: 24% Barometric Pressure: 29.53"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 UPSTATE MEDICAL ORDER NO. 20348009/473596

Mfg. Ludlum Measurements, Inc. Model 9DP-1 Serial No. 25006598

Mfg. _____ Model _____ Serial No. _____

Cal. Date 24-Jan-19 Cal Due Date 24-Jan-20 Cal. Interval 1 Year Meterface Digital

Check mark applies to applicable instr. and/or detector IAW mfg. spec. T. 71 °F RH 20 % Alt 704.0 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 is auto-ranging.
Peak Value, Correction Factor, Pulsed Mode, & Integrated Dose are the available functions.
All undocumented features are currently set to off.

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

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
AUTO	40 R/hr	N/A	40.0 R/hr
AUTO	10 R/hr		9.85
	4 R/hr		4.00
	1 R/hr		0.99
	400 mR/hr		400 mR/hr
	100 mR/hr		97.2
	40 mR/hr		40.0
	10 mR/hr		9.43
	4 mR/hr		4.00
	1 mR/hr		0.90

*Uncertainty within ± 10% C.F. within ± 20%

Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	Log Scale	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout						

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. The calibration system conforms to the requirements of ANSI/NCSS Z540-1-1994 and ANSI N323-1978 ISO/IE 17025:2005(E) State of Texas Calibration License No. LO-1963

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

Alpha S/N _____ Beta S/N _____ Other _____

m 500 S/N _____ Oscilloscope S/N _____ Multimeter S/N 15060230

Calibrator James McBeth Title Calibrator Date 24 JAN 19

QC'd By [Signature] Title Final QC Date 24 Jan 19

AC Inst. Passed Dielectric (Hi-Pot) and Continuity Test
Only Failed: _____

Dimension Configuration Manager - Calibration Report

Ludlum Measurements, Inc.

501 Oak Street
Sweetwater, Texas 79556 USA
Toll Free: (800) 622-0828
Voice: (325) 235-5494
Fax: (325) 235-4672
<http://www.ludlums.com/>

Report Generated: 24 Jan 2019 11:14:04

LMI Model	9DP-1
Firmware Version	29307.03.00.03
LMI Serial Number	25006598
Calibration Date	24 Jan 2019
Calibration Due Date	24 Jan 2020
Time Format	12 Hours (AM/PM)
ADC Offset Reading	0
ADC Offset	0
High Voltage DAC 1 Offset	9
HV Correction	1137
High Voltage Reading 1	-192.3
Battery Correction	979
Battery Reading	11.25
Meter Offset 1	995
Meter Offset 2	998
Meter Offset 3	1019
Electrometer Offset	1500
Electrometer Temperature	26.5
Cold Temperature Offset	0.000
Hot Temperature Offset	1.500
Jitter Threshold	100
Checkout Technician	James McBeth
Checkout Date	24 Jan 2019
Calibration Constant Range x1	806
Calibration Constant Range x10	810
Calibration Constant Range x100	857
Calibration Constant Range x1k	888
Calibration Constant Range x10k	1367
Calibration Technician	James McBeth



Calibration Certificate
ID Number: 264306123740-0

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

Instrument
 Ludlum Model 3-241R

Serial Number
 264306

Probe Model
 Ludlum 44-9
 Ludlum 44-38

Serial Number
 283689
 567

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
4.00 mR/hr	4.00 mR/hr	4.00 mR/hr	4.00 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
X100	160 mR/Hr	40 mR/Hr *	170 mR/Hr
X100	40 mR/Hr	10 mR/Hr *	40 mR/Hr
X10	16 mR/Hr	4.5 mR/Hr *	16.5 mR/Hr
X10	4 mR/Hr	1 mR/Hr *	4 mR/Hr
X1	1.6 mR/Hr	0.55 mR/Hr *	1.55 mR/Hr
X1	0.4 mR/Hr	0.15 mR/Hr *	0.4 mR/Hr
X.1	0.16 mR/Hr	0.06 mR/Hr # *	0.165 mR/Hr #
X.1	0.04 mR/Hr	0.01 mR/Hr # *	0.04 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
 Readings with # indicate ranges where pulser was used.

Probe Model & SN	Isotope	Efficiency	NIST Source ID	Geometry
44-9 283689	Tc-99m	0.0004 C/D	Co-57 (SN: 1867-29-1)	@1cm

MTE Instrument Type	Model	CalDueDate
Pulser	Ludlum 500-4 SN: 98756	09/08/2018

Outer Physical Check: <i>Pass</i>	Mechanical Zero: <i>Pass</i>
Internal Check: <i>Pass</i>	Tap Test: <i>Pass</i>
Geotropism Check: <i>Pass</i>	

Electronics Checks	As Found	As Left
High Voltage	891 Volts	891 Volts

Comments: Unless indicated with a "#" in the table above to indicate a pulser was used, all readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1110). Geometry: Detector Perpendicular To Source

Patrick
 Cashman
 Calibration
 Technician

QA
 Review:

Calibration Date: 08/15/2018
 Expires: 08/15/2019

Atmospheric Conditions - Temperature: 71°F Humidity: 40% Barometric Pressure: 29.67"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.





Calibration Certificate
ID Number: 452124250-0

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

Instrument
 Victoreen Model 451B

Serial Number
 452

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
106.00 mR/hr	106.00 mR/hr	104.00 mR/hr	105.33 mR/hr	Satisfactory

Accuracy Check				
Range	Target Value	As Found	As Left	
Rate	40 R/hr	38 R/hr	38 R/hr	
Rate	10 R/hr	10.9 R/hr	10.9 R/hr	
Rate	4 R/hr	4.1 R/hr	4.1 R/hr	
Rate	1 R/hr	1.05 R/hr	1.05 R/hr	
Rate	400 mR/hr	390 mR/hr	390 mR/hr	
Rate	100 mR/hr	106 mR/hr	106 mR/hr	
Rate	40 mR/hr	38 mR/hr	38 mR/hr	
Rate	10 mR/hr	10.3 mR/hr	10.3 mR/hr	
Rate	4 mR/hr	3.8 mR/hr	3.8 mR/hr	
Rate	1 mR/hr	0.95 mR/hr	0.95 mR/hr	
Integrate	200 mR	200 mR	200 mR	
Integrate	50 mR	51 mR	51 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>	Tap Test: <i>Pass</i>
Internal Check: <i>Pass</i>	Desiccant Check: <i>Pass</i>

Comments: All readings higher than 4 mR/hr 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). Dried/replaced desiccant.

Patrick
 Cashman
 Calibration
 Technician

QA
 Review:

Calibration Date: 08/23/2018
 Expires: 08/23/2019

Atmospheric Conditions - Temperature: 72°F Humidity: 44% Barometric Pressure: 29.68"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%
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 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.
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 This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, Inc.



Customer: Mark Wu
Upstate Medical Physics
29 Penny Lane
Amherst, NY 14228

Instrument
InoVision Model 451B

Serial Number
799

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
106.00 mR/hr	106.00 mR/hr	106.00 mR/hr	106.00 mR/hr	Satisfactory

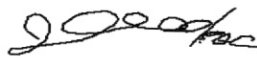
Accuracy Check			
Range	Target Value	As Found	As Left
Rate	40 R/hr	38 R/hr	38 R/hr
Rate	10 R/hr	11.0 R/hr	11.0 R/hr
Rate	4 R/hr	4.1 R/hr	4.1 R/hr
Rate	1 R/hr	1.06 R/hr	1.06 R/hr
Rate	400 mR/hr	390 mR/hr	390 mR/hr
Rate	100 mR/hr	106 mR/hr	106 mR/hr
Rate	40 mR/hr	39 mR/hr	39 mR/hr
Rate	10 mR/hr	10.2 mR/hr	10.2 mR/hr
Rate	4 mR/hr	4.1 mR/hr	4.1 mR/hr
Rate	1 mR/hr	1.06 mR/hr	1.06 mR/hr
Integrate	200 mR	200 mR	200 mR
Integrate	50 mR	52 mR	52 mR

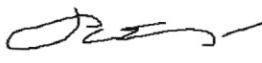
Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value

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

Comments: All readings higher than 4 mR/hr 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). Dried/replaced desiccant.

Patrick
Cashman
Calibration
Technician



QA
Review: 

Calibration Date: 08/23/2018
Expires: 08/23/2019

Atmospheric Conditions - Temperature: 72°F Humidity: 44% Barometric Pressure: 29.68"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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