

CardinalHealth

Nuclear & Precision Health Solutions

CERTIFICATE OF CALIBRATION

CUSTOMER: **William W. Backus Hospital** Location: **7013**

MFG	MODEL	SERIAL NO.	TYPE	CHK SRC.	cpm/1mR/hr	Cap
Biodex	14C	149133	SM			
Ludlum	44-9	PR144525	PGM	5.0 mR/hr	3300	No Cap

Calibration Date
7-Jan-21

FACE ID: 202-608 DETECTOR: 900 Volts
 PRI. RANGE 2.00 mR/hr INPUT SENS. 30 mV
 2ND RANGE 6600 cpm BATTERY: OK
 3RD RANGE na na

CALIBRATION PERFORMED	w/PROBE:	FIXED
CHECK SOURCE $\pm 10\%$	w/PROBE:	FIXED

Zeroed [X], Reset [X], Geotropism [X], Alarm [X]
 Mechanical [X], F/S Response [X], Audio [X]

NOTE: Source reading taken at the approximate 'center' of the probe tube and 'source' for 15 to 30 seconds.

Scale	Cal. Reference	Calibration Readings				
Setting	mR/hr	As Found	As Found Err	As Left	As Left Err	CorFac
x1000	1600.00	1.60	0.00%	1.60	0.00%	1.000
x1000	400.00	0.40	0.00%	0.40	0.00%	1.000
x100	160.00	1.60	0.00%	1.60	0.00%	1.000
x100	40.00	0.40	0.00%	0.40	0.00%	1.000
x10	16.00	1.60	0.00%	1.60	0.00%	1.000
x10	4.00	0.40	0.00%	0.40	0.00%	1.000
x1	1.50	1.50	0.00%	1.50	0.00%	1.000
x1	0.50	0.50	0.00%	0.50	0.00%	1.000

Scale	Reference	Equivalent		Equivalent			Equivalent
Setting	mR/hr	As found	As Found Err	As Left	As Left Err	CorFac	cpm
x1	1.50						4920
x0.1	0.15	1.50	0.00%	1.50	0.00%	1.000	492
x0.1	0.05	0.50	0.00%	0.50	0.00%	1.000	164

Calibration Source: 1.0 Ci of Cs-137; radiation output 192 x (1 \pm 5%) mR/hr at 100 cm on August 1, 2011.

J.L. Shepherd, Model 28-6A SN 10066. Cs-137 Amersham type X.19 Capsule

Ludlum Mini Pulser model 500-1 SN:174971. Ludlum model 2200 Rate Meter, sn:164597.

NOTES

CALIBRATION CONDITIONS

Radiation levels are based on standards whose calibration are traceable to the NIST. All readings are corrected for background radiation. Any corrections made to the survey instrument (e.g. energy dependence) are up to the user to apply. Care must be used in applying any such factors. The GM probe front will provide the most sensitive contamination survey. The longest dimension of the probe detector tube or tube array is placed in a plane perpendicular to, and centered in, the beam of radiation.

Calibrated by:

Reviewed by:

#1

RLP

Ovando Tellus

Richard Freyer / Ovando Tellus / Louie Goodson/ S. Brandi Williamson
 Radioactive Material License # 050-0794-2

PASS

Cal Due Date
7-Jan-22

REV: June 2016
 Print Cert

Calibration Certificate

Report No: AC-8179-66143

Calibration: As Calibrated

Results: In Tolerance



Fluke Biomedical: Pressurized Ion Chamber Survey Meter
Model: 451P-RYR Serial No: 8179 Asset No: n/a

Customer: NEW UNIT

PO: n/a BO/SO: 66876

Date Received: 10-Mar-21

Date Calibrated: 10-Mar-21

Manufacturer's Recommended Due Date: 10-Mar-22

Temperature: 21.81 degrees Celsius

Pressure: 741.76 mmHg

Humidity: 37.6 % Relative Humidity

NOTES

This calibration is traceable to the National Institute of Standards and Technology. This report must not be used to claim product recertification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

The calibration is warranted to be within specified accuracy limits, at the time of calibration. In the event of a calibration error, our liability is limited to standard recalibration cost.

Proper function and reliability of the instrument described in this document are highly dependent upon handling and use. It is recommended the user establish a technique to monitor the constancy of the instrument response before and after its return to the manufacturer.

This certificate applies only to the item(s) being calibrated. It shall not be reproduced except in full, without the written approval of the calibration laboratory.

If there are any problems with the calibration of the instrument, please contact the Calibration Laboratory Director.

Measurement uncertainties expressed in this report are calculated in accordance with the methods described in ANSI/NCLZ Z540-2 1997, U.S Guide to the Expression of Uncertainty in Measurement and IEC Guide to the Expression of Uncertainty in Measurement, 1995 using a coverage factor of $k=2$, corresponding to a confidence level of approximately 95%. Measurement uncertainty is not taken into account in the tolerance decision rule.

Calibrated by: Stessl, Tom
Technician

Date: 10-Mar-21

Reviewed by: M. Kirr
Mirela Kirr, Calibration Laboratory Manager

Date: 10-Mar-21