

# AKM Calibrations

NC License # 032-1057-1 Registration # S000454

AKM Calibrations/AKM Services LLC

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## Calibration Report/Certification

REPORT# **114400**

PREPARED FOR: **Mazur Instruments**

We certify that the following meter was calibrated on the indicated date using an NIST traceable radiation field source

**Model** Mazur PRM-8000  
**Detector 1** Internal GM (LND 712)  
**Detector 2** None  
**ID** None

SN 81744

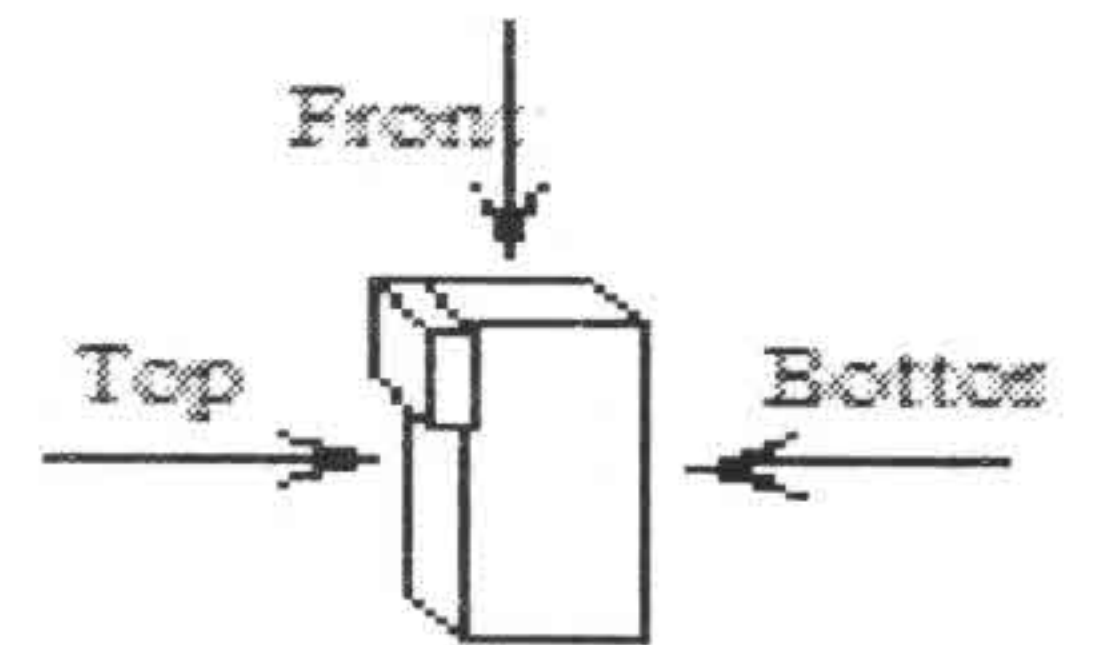
**Date** 8/23/2014  
**PO#** Vince Mazur  
**Contact** Vince Mazur  
**Calibrated By** Robert D. Pearlstein

### PRE-CALIBRATION CHECK

Contamination  No  Yes; returned without calibration  
 Batteries  OK  Replaced  Used AC Power  
 Audio  OK  Malfunction  No Audio Function  
 Detector  OK  Malfunction  Repaired  
 Cables  OK  Malfunction  Repaired  
 Switches  OK  Malfunction  Repaired  
 HV Circuit  OK As Received  Reset to 900V  Repaired  
 Pulse Detector  OK  Malfunction  Repaired  
 Electrometer  OK  Malfunction  Repaired

### CALIBRATION CONDITIONS

Temperature (°F) 74      Relative Humidity 66%      Pressure (mmHg) 1008 mbar  
**Radiation Beam / Detector Alignment:**  
 normal to detector long axis       normal to bottom surface  
 parallel to detector long axis       normal to front surface  
 normal to detector window       normal to side surface  
 normal to top surface  
**Shield/Build-up Cap**  
 No shield       Shield closed  
 Shield open       Build-up cap used



### ACCURACY

Determined using a NIST Traceable Cs-137 source (collimated beam, gamma emission)

Scale: mR/hr  
 Range / Exposure Rate  
 0.5 to 200      Error ≤ 10%

Note: Detector response may vary with energy of the photon radiation. Consult manufacturer's technical sheet for details.

### CALIBRATION SOURCES

Cesium 137 gamma Source #773-555  
 Approximate Point Source      Not Available  
 Horizontal collimated beam.  
 Exposure through bottom surface/side wall of internal detector.

### CHECK SOURCE      No Check Source

### PRECISION/CONSTANCY

Readout Stability (Relative Standard Deviation)	Repeated Measurements of Same Field			Test Result
	Obs 1	Obs 2	Obs 3	
1.7% @ 0.5 mR/hr	49 mR/h	50mR/h	49 mR/h	OK

RSD = StDev x 100 / Mean  
 of 5 to 10 observation made at 3-5 second intervals.  
 Meter powered down and re-positioned in radiation field between each observation

### ENERGY RESPONSE      Photons

Typical (from Manufacturer's Technical Specifications, not measured)

Not Available

### DETECTOR LINEARITY

Exposure Rate  
 Linear over entire operating range       Linear to at least 200 mR/hr

Count Rate (Radiation Response)      Exposure Rate      Count Rate  
 Linear to at least

Exposure Rate	Count Rate

### OBSERVATIONS / CALIBRATION FACTORS

Range	Scale	"True"*	As Found	As Returned	SEM**	CalFact***
0.1 to 1	mR/hr	0.5	0.497	0.497	0.003	1.01
1 to 10	mR/hr	2.0	1.94	1.94	0.02	1.03
1 to 10	mR/hr	5.0	4.86	4.86	0.03	1.03
10 to 100	mR/hr	20	20.0	20.0	0.1	1.00
10 to 100	mR/hr	50	49.7	49.7	0.3	1.01
100 to 1000	mR/hr	100	100	100	0.7	1.00
100 to 1000	mR/hr	150	151	151	0.2	0.99
100 to 1000	mR/hr	200	201	201	1	1.00
100 to 1000	mR/hr	500	>200	>200	ND	ND
100 to 1000	mR/hr	1000	>200	>200	ND	ND

\* "True" Exposure Rate/Exposure values calculated from NIST traceable source calibration measurements after correcting for source decay, filtration, and source-detector distance (to center of detector).

\*\* SEM = Standard Error of Mean, N = 5 to 10 Observations

\*\*\* CalFact = "True" / As Returned (Corrected = Indicated X CalFact)

NA = Not Applicable; ND = Not Determined; NL = Non-Linear; Over = OverRange; PPM = electronically generated pulses per minute (PPS = per second).

### COMMENTS

Meter calibrated for survey of photon radiation fields. Readings should be corrected for energy response if using for radionuclides other than Cs-137.

Reviewed by: \_\_\_\_\_

Robert D. Pearlstein Ph.D..

**SUGGESTED RECALIBRATION DATE: August 23, 2015**