



Designer and Manufacturer  
of  
Scientific and Industrial  
Instruments

# CERTIFICATE OF CALIBRATION

**LUDLUM MEASUREMENTS, INC.**

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Sweetwater, TX 79556, U.S.A. Knoxville, TN 37932, U.S.A.

CUSTOMER CABRERA SERVICES INC. ORDER NO. 20278428/428072

Mfg. Ludlum Measurements, Inc. Model 2221 Serial No. 216472

Mfg. Bicron Model G-1 Serial No. 6442E

Cal. Date 3-Nov-15 Cal Due Date 3-Nov-16 Cal. Interval 1 Year Meterface 202-159

Check mark  applies to applicable instr. and/or detector IAW mfg. spec. T. 75 °F RH 37 % 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. (Min. Volt) 4.4 VDC

Calibrated in accordance with LMI SOP 14.8  Calibrated in accordance with LMI SOP 14.9

Instrument Volt Set 850 V Input Sens. 10 mV Det. Oper. 850 V at 10 mV Threshold Dial Ratio 100 = 10 mV

HV Readout (2 points) Ref./Inst. 500 / 495 V Ref./Inst. 2000 / 1990 V

### COMMENTS:

Firmware: 261028 OL checked but not set.

Calibrated with window in OUT position.

Calibrated with 50' cable.

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*
x1K	400kcpm	380	400
x1K	100kcpm	90	100
x100	40kcpm	380	400
x100	10kcpm	90	100
x10	4kcpm	380	400
x10	1kcpm	90	100
x1	400cpm	380	400
x1	100cpm	90	100

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

ALL Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
400kcpm	40045 (0)	40045 (0)	500kcpm	500K cpm	500K cpm
40kcpm	4005	4005	50kcpm	50	50
4kcpm	40	40	5kcpm	5	5
400cpm	40	40	500cpm	500	500
40cpm	4	4	50cpm	50	50

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/NCCL Z540-1-1994 and ANSI N323-1978

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  5105  5717CO  5719CO  60646  70897  73410  E552  G112  M565  S-394  S-1054  T10081  T10082 Neutron Am-241 Be S/N:  T-304 Ra-226 S/N:  Y982

Alpha S/N  Beta S/N  Other

m 500 S/N 289158  Oscilloscope S/N  Multimeter S/N 93870637

Calibrated By: Jeremy Thompson Date 3 Nov 15

Reviewed By: Donnie Mickos Date 3 Nov 15

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

