



Designer and Manufacturer
of
Scientific and Industrial
Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.

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20220185/390464

CUSTOMER CABRERA SERVICES

Mfg. Ludlum Measurements, Inc. Model 2221 Serial No. 271437
Mfg. Ludlum Measurements, Inc. Model 44-110 Serial No. PR327576
Cal. Date 15-APR-13 Cal Due Date 15-APR-14 Cal. Interval 1 Year Meterface 202-159

Check mark Applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 36 % Alt 702.8 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 Geotropism
 Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

Instrument Volt Set 1650 V Input Sens. 4 mV Det. Oper. 1650 V at 4 mV Threshold Dial Ratio 100 = 4 mV

HV Readout (2 points) Ref./Inst. 500 / 505 V Ref./Inst. 2000 / 2005 V

COMMENTS:

H3 SN:LC 306, Size:1872dpm, Counts:1068cpm, Background:288cpm, 4pi Eff:41.66%
H3 SN:LC 306, Size:936cpm, Counts:1068cpm, Background:288cpm, 2pi Eff:83.33%
C14 SN:1476, Size:229767dpm, Counts:30339cpm, Background:288cpm, 4pi Eff:13.07%
C14 SN:1476, Size:114883cpm, Counts:30339cpm, Background:288cpm, 2pi Eff:26.15%
Cal'd with 5ft cable. Firmware:261027

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

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

ALL Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	Log Scale	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
400kcpm	40024(0)	40024(0)		500kcpm	500 Kcpm	500 Kcpm
40kcpm	4002	4002		50kcpm	50	50
4kcpm	400	400		5kcpm	5	5
400cpm	40	40		500cpm	500 cpm	500 cpm
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/NCSL Z540-1-1994 and ANSI N323-1978

State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: 059 280 720 734 781 1131 1616 1696 5105 5717CO 5719CO
 60646 70897 73410 E551 E552 G112 M565 S-394 S-1054 T-304 T879 T10081 T10082 Y982

Alpha S/N _____ Beta S/N H3SN:306, Tc99SN:5280 Other _____
 m 500 S/N 190566 Oscilloscope S/N _____ Multimeter S/N 86250390

Calibrated By: [Signature] Date 15-APR-13
Reviewed By: [Signature] Date 16 APR 13

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

