

**CERTIFICATE OF
 CALIBRATION**



Certificate No. ACT-1272

CERTIFICATION NUMBER	CP134-00354-840	IDENTIFICATION	EL-001D
FOR	Sample Manufacturing 3121 Medalist Drive Oshkosh, WI 54902	SERIAL NUMBER	354
TEST INSTRUMENT	Multimeter Benchtop	PURCHASE ORDER #	
MAKE	Keysight	PROCEDURES FOLLOWED	EL-000A rev. 0 EL-001D rev. 0
MODEL	3458A	STANDARDS USED	
CUSTOMER LOCATION	Location1 Location2	INSTRUMENT	SERIAL NUMBER
CONDITION RECEIVED	In Tolerance	FVS-275E	16783134
CONDITION RETURNED	In Tolerance	FVS-920	5913502
CALIBRATED BY	Brian L Gliszinski	FVS-980	MY44017846
REVIEWED/ISSUED	D.P. 07/29/2025	FVS-982	618182363
CALIBRATION LOCATION	FVM	TRACE NUMBER	NEXT CAL
ENVIRONMENT	69.0°F, 31.0%RH, 28.92inHg	C0134-20963-690	07/31/2025
CALIBRATION DATE	05/14/2025	C0228-48963-741	07/31/2025
RECALIBRATION DUE	05/14/2026	C0218-45153-823	07/31/2025
		C0219-40703-524	07/31/2025



CALIBRATION RESULTS

* DENOTES "OUT OF TOLERANCE"

FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
Self Test						
Offset Tests:						
Rear Terminals						
DC Voltage	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)
100 mV Range						
0.00000 mV	0.00000	-0.00100	0.00100	0.00000	0.00000	6.0E-6
	(V)	(V)	(V)	(V)	(V)	(V)
1 V Range						
0.0000000 V	0.0000000	-0.0000100	0.0000100	0.0000000	0.0000000	6.0E-9
10 V Range						
0.000000 V	0.000000	-0.0000020	0.0000020	0.000000	0.000000	6.0E-8
100 V Range						
0.000000 V	0.000000	-0.0000030	0.0000030	0.000000	0.000000	6.0E-7
1000 V Range						
0.00000 V	0.00000	-0.00010	0.00010	0.00001	0.00001	6.0E-6
2-Wire Ohms	(ohm)	(ohm)	(ohm)	(ohm)	(ohm)	(ohm)
0.000000 Ohm	0.000000	-0.250050	0.250050	0.000002	0.000002	6.0E-7
Offset Tests:						
Front Terminals						
DC Voltage	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)
100 mV Range						
0.00000 mV	0.00000	-0.00100	0.00100	0.00000	0.00000	6.0E-6

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	(V)	(V)	(V)	(V)	(V)	(V)
1 V Range						
0.0000000 V	0.0000000	-0.00000100	0.00000100	0.00000000	0.00000000	6.0E-9
10 V Range						
0.0000000 V	0.0000000	-0.0000020	0.0000020	0.0000000	0.0000000	6.0E-8
100 V Range						
0.000000 V	0.000000	-0.000030	0.000030	0.000000	0.000000	6.0E-7
1000 V Range						
0.00000 V	0.00000	-0.00010	0.00010	0.00000	0.00000	6.0E-6
2-Wire Ohms	(ohm)	(ohm)	(ohm)	(ohm)	(ohm)	(ohm)
0.000000 Ohm	0.000000	-0.250050	0.250050	0.000000	0.000000	6.0E-7
4-Wire Ohms	(ohm)	(ohm)	(ohm)	(ohm)	(ohm)	(ohm)
10 Ohm Range						
0.000000 Ohm	0.000000	-0.000050	0.000050	0.000000	0.000000	6.0E-7
100 Ohm Range						
0.00000 Ohm	0.00000	-0.00050	0.00050	0.00000	0.00000	6.0E-6
	(kohm)	(kohm)	(kohm)	(kohm)	(kohm)	(kohm)
1 kOhm Range						
0.0000000 kOhm	0.0000000	-0.0000005	0.0000005	0.0000000	0.0000000	6.0E-8
10 kOhm Range						
0.000000 kOhm	0.000000	-0.000005	0.000005	0.000001	0.000001	6.0E-7
100 kOhm Range						
0.00000 kOhm	0.00000	-0.00005	0.00005	0.00000	0.00000	6.0E-6
	(Mohm)	(Mohm)	(Mohm)	(Mohm)	(Mohm)	(Mohm)
1 MOhm Range						
0.0000000 MOhm	0.0000000	-0.0000020	0.0000020	0.0000002	0.0000002	6.0E-8
10 MOhm Range						
0.000000 MOhm	0.000000	-0.000100	0.000100	0.000002	0.000002	6.0E-7
100 MOhm Range						
0.00000 MOhm	0.00000	-0.00100	0.00100	0.00001	0.00001	6.0E-6
	(Gohm)	(Gohm)	(Gohm)	(Gohm)	(Gohm)	(Gohm)
1 GOhm Range						
0.0000000 GOhm	0.0000000	-0.0000005	0.0000005	0.0000000	0.0000000	6.0E-8
DC Current	(nA)	(nA)	(nA)	(nA)	(nA)	(nA)
100 nA Range						
0.000 nA	0.000	-0.040	0.040	0.000	0.000	6.0E-4
	(µA)	(µA)	(µA)	(µA)	(µA)	(µA)
1 µA Range						
0.0000000 µA	0.0000000	-0.0000400	0.0000400	0.0000000	0.0000000	6.0E-8
10 µA Range						
0.000000 µA	0.000000	-0.000100	0.000100	0.000001	0.000001	6.0E-7
100 µA Range						
0.00000 µA	0.00000	-0.00080	0.00080	0.00000	0.00000	6.0E-6
	(mA)	(mA)	(mA)	(mA)	(mA)	(mA)
1 mA Range						
0.0000000 mA	0.0000000	-0.0000050	0.0000050	0.0000001	0.0000001	6.0E-8
10 mA Range						
0.000000 mA	0.000000	-0.000050	0.000050	0.000000	0.000000	6.0E-7

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100 mA Range						
0.00000 mA	0.00000	-0.00050	0.00050	0.00000	0.00000	6.0E-6
	(A)	(A)	(A)	(A)	(A)	(A)
1 A Range						
0.0000000 A	0.0000000	-0.0000100	0.0000100	0.0000000	0.0000000	6.0E-8
Gain Tests						
DC Voltage	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)
100 mV Range						
100.00000 mV	100.00000	99.99854	100.00147	100.00001	100.00001	6.0E-6
-100.00000 mV	-100.00000	-100.00147	-99.99854	-99.99998	-99.99998	6.0E-6
	(V)	(V)	(V)	(V)	(V)	(V)
1 V Range						
1.0000000 V	1.0000000	0.9998959	1.00001041	1.0000001	1.0000001	6.0E-9
-1.0000000 V	-1.0000000	-1.00001041	-0.9998959	-0.9999999	-0.9999999	6.0E-9
10 V Range						
10.000000 V	10.000000	9.998987	10.0001013	10.0000001	10.0000001	6.0E-8
-10.000000 V	-10.000000	-10.0001013	-9.998987	-10.0000000	-10.0000000	6.0E-8
100 V Range						
100.00000 V	100.00000	99.998759	100.001241	100.000001	100.000001	6.0E-7
-100.00000 V	-100.00000	-100.001241	-99.998759	-100.000000	-100.000000	6.0E-7
1000 V Range						
1000.00000 V	1000.00000	999.97582	1000.02418	1000.00001	1000.00001	6.0E-6
-1000.00000 V	-1000.00000	-1000.02418	-999.97582	-999.99998	-999.99998	6.0E-6
4-Wire Resistance	(ohm)	(ohm)	(ohm)	(ohm)	(ohm)	(ohm)
10 Ohm Range						
10.00000 Ohm	9.99959	9.99918	10.00000	9.99959	9.99959	6.0E-6
100 Ohm Range						
100.00000 Ohm	99.99857	99.99477	100.00237	99.99858	99.99858	6.0E-6
	(kohm)	(kohm)	(kohm)	(kohm)	(kohm)	(kohm)
1 kOhm Range						
1.0000000 kOhm	1.0000236	1.0000082	1.0000390	1.0000237	1.0000237	6.0E-8
10 kOhm Range						
10.000000 kOhm	9.999825	9.999672	9.999978	9.999825	9.999825	6.0E-7
100 kOhm Range						
100.00000 kOhm	99.99879	99.99726	100.00032	99.99880	99.99880	6.0E-6
	(Mohm)	(Mohm)	(Mohm)	(Mohm)	(Mohm)	(Mohm)
1 MOhm Range						
1.0000000 MOhm	0.9999749	0.9999522	0.9999976	0.9999750	0.9999750	6.0E-8
10 MOhm Range						
10.000000 MOhm	9.999008	9.998342	9.999674	9.999009	9.999009	6.0E-7
100 MOhm Range						
100.00000 MOhm	100.00454	99.93163	100.07745	100.00455	100.00455	6.0E-6
AC Voltage Analog Mode	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)
100 mV Range						
100.0000 mV @ 1 kHz	99.9950	99.9648	100.0252	99.9951	99.9951	6.0E-5

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	(V)	(V)	(V)	(V)	(V)	(V)
1 V Range						
1.000000 V @ 1 kHz	1.000000	0.999698	1.000302	1.000001	1.000001	6.0E-7
10 V Range						
1.00000 V @ 1 kHz	1.00000	0.99880	1.00120	1.00000	1.00000	6.0E-6
1.00000 V @ 50 kHz	1.00000	0.99450	1.00550	1.00000	1.00000	6.0E-6
1.00000 V @ 1 MHz	1.00000	0.75000	1.25000	1.00000	1.00000	6.0E-6
10.00000 V @ 10 Hz	10.00000	9.95798	10.04202	10.00000	10.00000	6.0E-6
10.00000 V @ 20 Hz	10.00000	9.98298	10.01702	10.00000	10.00000	6.0E-6
10.00000 V @ 200 Hz	10.00000	9.99698	10.00302	10.00000	10.00000	6.0E-6
10.00000 V @ 500 Hz	10.00000	9.99698	10.00302	10.00000	10.00000	6.0E-6
10.00000 V @ 1 kHz	10.00000	9.99698	10.00302	10.00000	10.00000	6.0E-6
10.00000 V @ 20 kHz	10.00000	9.99698	10.00302	10.00000	10.00000	6.0E-6
10.00000 V @ 50 kHz	10.00000	9.98098	10.01902	10.00000	10.00000	6.0E-6
10.00000 V @ 100 kHz	10.00000	9.93198	10.06802	10.00000	10.00000	6.0E-6
10.00000 V @ 1 MHz	10.00000	9.29998	10.70002	10.00000	10.00000	6.0E-6
100 V Range						
100.0000 V @ 1 kHz	100.0000	99.9598	100.0402	100.0001	100.0001	6.0E-5
1000 V Range						
700.000 V @ 1 kHz	700.000	699.379	700.621	700.000	700.000	6.0E-4
DC Current	(μ A)	(μ A)	(μ A)	(μ A)	(μ A)	(μ A)
100 μ A Range						
100.00000 μ A	99.99895	99.99444	100.00345	99.99895	99.99895	6.0E-6
-100.00000 μ A	-99.99981	-100.00431	-99.99530	-99.99980	-99.99980	6.0E-6
1 mA Range	(mA)	(mA)	(mA)	(mA)	(mA)	(mA)
1.0000000 mA	0.99999161	0.99994957	1.00003365	0.99999162	0.99999162	6.0E-9
-1.0000000 mA	-0.99999797	-1.00001457	-0.99998137	-0.99999796	-0.99999796	6.0E-9
10 mA Range						
10.0000000 mA	9.99991883	9.99960643	10.00023122	9.99991883	9.99991883	6.0E-9
-10.0000000 mA	-10.00004055	-10.00035295	-9.99972815	-10.00004054	-10.00004054	6.0E-9
100 mA Range						
100.000000 mA	99.999784	99.995160	100.004408	99.999785	99.999785	6.0E-7
-100.000000 mA	-100.000638	-100.005262	-99.996014	-100.000637	-100.000637	6.0E-7
1 A Range	(A)	(A)	(A)	(A)	(A)	(A)
1.00000000 A	1.00000000	0.99987376	1.00012624	1.00000001	1.00000001	6.0E-9

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-1.0000000 A	-1.0000000	-1.00012624	-0.99987376	-1.0000000	-1.0000000	6.0E-9
Frequency Tests	(V)	(V)	(V)	(V)	(V)	(V)
1.00000 Hz @ 1 Vpp	1.00000	0.999500	1.000500	1.00000	1.00000	6.0E-7
10.00000 MHz @ 1 Vpp	10.00000	9.99900	10.00100	10.00000	10.00000	6.0E-6

COMMENTS

Example certificate, actual results and uncertainties will be reported at the time of calibration.
 Nominal and limits may vary based on actual make/model.

- This certificate shall not be altered in any form or reproduced, except in full, without prior written approval from originating lab. These results relate only to the item(s) calibrated. Form Revision 10: 06/04/2024
- Total expanded measurement uncertainties expressed are based on a confidence level of 95%; coverage factor of (k=2). The statement of compliance in this certificate was issued without taking the uncertainty of measurement into consideration. The customer shall assess the results and uncertainty when determining if the results meet their needs. (This is considered "shared responsibility.") Uncertainties expressed in nominal units.
- The calibrations within the certificate/report are traceable through NIST or another National Metrology Institute to the International System of Units (SI). Calibration was completed in accordance with ISO/IEC 17025:2017, ANSI/NCCL Z540-1-1994 and ANSI/NCCL Z540.3-2006. Other standards listed upon request.