Fox Valley Metrology
3114 Medalist Drive
Oshkosh, WI 54902
(920) 426-5894 • Fax (920) 426-8120
https://www.FoxValleyMetrology.com

CERTIFICATE OF CALIBRATION

ilac-MRA
ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17025
CALIBRATION AND DIMENSIONAL MEASUREMENT
Certificate No. ACT-1272

CERTIFICATION NUMBER CP134-00055-840

FOR Sample Manufacturing
3121 Medalist Drive
Oshkosh, WI 54902

TEST INSTRUMENT Test System
EMC Immunity

MAKE Teseq

MODEL NSG 3060

CUSTOMER LOCATION Location1
Location2

CONDITION RECEIVED In Tolerance

CONDITION RETURNED In Tolerance

CALIBRATED BY Brian L Gliszinski

REVIEWED/ISSUED D.P. 07/29/2025

CALIBRATION LOCATION FVM

ENVIRONMENT 69.0°F, 31.0%RH, 28.92inHg

CALIBRATION DATE 05/14/2025

RECALIBRATION DUE 05/14/2026

IDENTIFICATION EL-016C

SERIAL NUMBER 55

PURCHASE ORDER #

PROCEDURES FOLLOWED

EL-000A rev. 0
EL-016C rev. 1

STANDARDS USED

INSTRUMENT	SERIAL NUMBER	TRACE NUMBER	NEXT CAL
FVS-945A	DS8A240900071	CP073-43013-816	03/31/2026
FVS-945C	P2237267299	CP076-37797-816	03/31/2026
FVS-945D	P2208260996	CP076-39154-816	03/31/2026
FVS-945F	202859	CP076-35329-816	03/31/2026
FVS-945G	202859	CP076-35047-816	03/31/2026
FVS-A44D	A552D41404976	CP016-27436-690	01/31/2026

CALIBRATION RESULTS

* DENOTES "OUT OF TOLERANCE"

FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
POSITIVE EFT PULSE TESTS (50 Ohm Load)						
.25kV Test						
0.125 kV @ Ampl.	0.1250	0.1125	0.1375	0.1217	0.1217	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	4.500	4.500	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	48.80	48.80	6.0E-3
.5kV Test						
0.250 kV @ Ampl.	0.2500	0.2250	0.2750	0.2545	0.2545	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	3.500	3.500	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	52.50	52.50	6.0E-3
1kV Test						
0.500 kV @ Ampl.	0.5000	0.4500	0.5500	0.5017	0.5017	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	3.650	3.650	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	54.10	54.10	6.0E-3
2kV Test						
1.00 kV @ Ampl.	1.000	0.900	1.100	1.004	1.004	6.0E-4
5.00 ns @ Rise	5.000	3.500	6.500	3.540	3.540	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	54.90	54.90	6.0E-3

Reviewed

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4kV Test						
2.00 kV @ Ampl.	2.000	1.800	2.200	2.033	2.033	6.0E-4
5.00 ns @ Rise	5.000	3.500	6.500	4.250	4.250	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	55.20	55.20	6.0E-3
NEGATIVE EFT PULSE TESTS (50 Ohm Load)						
-.25kV Test						
-0.125 kV @ Ampl.	-0.1250	-0.1375	-0.1125	-0.1188	-0.1188	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	3.700	3.700	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	49.90	49.90	6.0E-3
-.5kV Test						
-0.250 kV @ Ampl.	-0.2500	-0.2750	-0.2250	-0.2509	-0.2509	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	3.960	3.960	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	52.80	52.80	6.0E-3
-1kV Test						
-0.500 kV @ Ampl.	-0.5000	-0.5500	-0.4500	-0.4981	-0.4981	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	4.040	4.040	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	54.40	54.40	6.0E-3
-2kV Test						
-1.00 kV @ Ampl.	-1.000	-1.100	-0.900	-0.994	-0.994	6.0E-4
5.00 ns @ Rise	5.000	3.500	6.500	4.220	4.220	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	55.60	55.60	6.0E-3
-4kV Test						
-2.00 kV @ Ampl.	-2.000	-2.200	-1.800	-2.009	-2.009	6.0E-4
5.00 ns @ Rise	5.000	3.500	6.500	5.250	5.250	6.0E-4
50.0 ns @ Duration	50.00	35.00	65.00	44.90	44.90	6.0E-3
POSITIVE EFT PULSE TESTS (1 kOhm Load)						
.25kV Test						
0.240 kV @ Ampl.	0.2400	0.1920	0.2880	0.2418	0.2418	6.0E-5

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5.00 ns @ Rise	5.000	3.500	6.500	3.800	3.800	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	113.30	113.30	6.0E-3
.5kV Test						
0.480 kV @ Ampl.	0.4800	0.3840	0.5760	0.4886	0.4886	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	3.700	3.700	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	104.00	104.00	6.0E-3
1kV Test						
0.950 kV @ Ampl.	0.9500	0.7600	1.1400	0.9694	0.9694	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	4.200	4.200	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	116.00	116.00	6.0E-3
2kV Test						
1.90 kV @ Ampl.	1.900	1.520	2.280	1.912	1.912	6.0E-4
5.00 ns @ Rise	5.000	3.500	6.500	4.310	4.310	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	92.20	92.20	6.0E-3
4kV Test						
3.80 kV @ Ampl.	3.800	3.040	4.560	3.966	3.966	6.0E-4
5.00 ns @ Rise	5.000	3.500	6.500	4.450	4.450	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	116.10	116.10	6.0E-3
NEGATIVE EFT PULSE TESTS (1 kOhm Load)						
-.25kV Test						
-0.240 kV @ Ampl.	-0.2400	-0.2880	-0.1920	-0.2312	-0.2312	-0.2400
5.00 ns @ Rise	5.000	3.500	6.500	4.510	4.510	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	114.80	114.80	6.0E-3
-.5kV Test						
-0.480 kV @ Ampl.	-0.4800	-0.5760	-0.3840	-0.4788	-0.4788	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	4.140	4.140	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	104.70	104.70	6.0E-3
-1kV Test						
-0.950 kV @ Ampl.	-0.9500	-1.1400	-0.7600	-0.9455	-0.9455	6.0E-5
5.00 ns @ Rise	5.000	3.500	6.500	4.270	4.270	6.0E-4

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50.0 ns @ Duration	50.00	35.00	150.00	114.90	114.90	6.0E-3
-2kV Test						
-1.90 kV @ Ampl.	-1.900	-2.280	-1.520	-1.883	-1.883	6.0E-4
5.00 ns @ Rise	5.000	3.500	6.500	4.070	4.070	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	115.20	115.20	6.0E-3
-4kV Test						
-3.80 kV @ Ampl.	-3.800	-4.560	-3.040	-3.858	-3.858	6.0E-4
5.00 ns @ Rise	5.000	3.500	6.500	4.100	4.100	6.0E-4
50.0 ns @ Duration	50.00	35.00	150.00	112.60	112.60	6.0E-3
Combination Wave IEC 61000-4-5 1.2/50µs DIRECT/IMPULSE OUTPUT						
POSITIVE VOLTAGE OPEN CIRCUIT 500V Test						
Vpeak (V)	500	450	550	485	485	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.44	1.44	6.0E-3
Duration(uS)	50.0	40.0	60.0	46.9	46.9	6.0E-2
Overshoot(%)	0.0	0.0	30.0	1.4	1.4	6.0E-2
1000V Test						
Vpeak (V)	1000	900	1100	975	975	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.47	1.47	6.0E-3
Duration(uS)	50.0	40.0	60.0	46.0	46.0	6.0E-2
Overshoot(%)	0.0	0.0	30.0	0.3	0.3	6.0E-2
2000V Test						
Vpeak (V)	2000	1800	2200	1933	1933	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.27	1.27	6.0E-3
Duration(uS)	50.0	40.0	60.0	47.9	47.9	6.0E-2
Overshoot(%)	0.0	0.0	30.0	0.8	0.8	6.0E-2
4000V Test						
Vpeak (V)	4000	3600	4400	3915	3915	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.27	1.27	6.0E-3
Duration(uS)	50.0	40.0	60.0	48.0	48.0	6.0E-2
Overshoot(%)	0.0	0.0	30.0	1.0	1.0	6.0E-2
6000V Test						
Vpeak (V)	6000	5400	6600	5827	5827	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.47	1.47	6.0E-3
Duration(uS)	50.0	40.0	60.0	46.8	46.8	6.0E-2
Overshoot(%)	0.0	0.0	30.0	1.2	1.2	6.0E-2

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FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
NEGATIVE VOLTAGE OPEN CIRCUIT TESTS						
-500V Test						
Vpeak (V)	-500	-550	-450	-485	-485	6.0E-1
Front Time (uS)	1.20	0.84	1.56	0.94	0.94	6.0E-3
Duration(uS)	50.0	40.0	60.0	45.9	45.9	6.0E-2
Overshoot(%)	0.0	0.0	30.0	0.5	0.5	6.0E-2
-1000V Test						
Vpeak (V)	-1000	-1100	-900	-959	-959	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.34	1.34	6.0E-3
Duration(uS)	50.0	40.0	60.0	47.6	47.6	6.0E-2
Overshoot(%)	0.0	0.0	30.0	1.2	1.2	6.0E-2
-2000V Test						
Vpeak (V)	-2000	-2200	-1800	-1954	-1954	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.40	1.40	6.0E-3
Duration(uS)	50.0	40.0	60.0	45.0	45.0	6.0E-2
Overshoot(%)	0.0	0.0	30.0	0.8	0.8	6.0E-2
-4000V Test						
Vpeak (V)	-4000	-4400	-3600	-3873	-3873	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.40	1.40	6.0E-3
Duration(uS)	50.0	40.0	60.0	46.0	46.0	6.0E-2
Overshoot(%)	0.0	0.0	30.0	1.0	1.0	6.0E-2
-6000V Test						
Vpeak (V)	-6000	-6600	-5400	-5827	-5827	6.0E-1
Front Time (uS)	1.20	0.84	1.56	1.27	1.27	6.0E-3
Duration(uS)	50.0	40.0	60.0	45.2	45.2	6.0E-2
Overshoot(%)	0.0	0.0	30.0	1.2	1.2	6.0E-2
CURRENT SHORT CIRCUIT						
500V Test						
Apeak (A)	250	225	275	264	264	6.0E-1
Front Time (uS)	8.00	6.40	9.60	8.45	8.45	6.0E-3
Duration(uS)	20.0	16.0	24.0	23.0	23.0	6.0E-2
Overshoot(%)	0.0	0.0	30.0	10.3	10.3	6.0E-2
1000V Test						
Apeak (A)	500.0	450.0	550.0	532.2	532.2	6.0E-2
Front Time (uS)	8.00	6.40	9.60	8.40	8.40	6.0E-3
Duration(uS)	20.0	16.0	24.0	23.0	23.0	6.0E-2
Overshoot(%)	0.0	0.0	30.0	11.8	11.8	6.0E-2
2000V Test						
Apeak (A)	1000	900	1100	1064	1064	6.0E-1
Front Time (uS)	8.00	6.40	9.60	8.35	8.35	6.0E-3
Duration(uS)	20.0	16.0	24.0	23.0	23.0	6.0E-2
Overshoot(%)	0.0	0.0	30.0	12.5	12.5	6.0E-2
4000V Test						
Apeak (A)	2000	1800	2200	2140	2140	6.0E-1
Front Time (uS)	8.00	6.40	9.60	8.55	8.55	6.0E-3
Duration(uS)	20.0	16.0	24.0	23.0	23.0	6.0E-2

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Overshoot(%)	0.0	0.0	30.0	12.2	12.2	6.0E-2
6000V Test						
Apeak (A)	3000.0	2700.0	3300.0	3246.0	3246.0	6.0E-2
Front Time (uS)	8.00	6.40	9.60	8.35	8.35	6.0E-3
Duration(uS)	20.0	16.0	24.0	22.9	22.9	6.0E-2
Overshoot(%)	0.0	0.0	30.0	12.7	12.7	6.0E-2
-500V Test						
Apeak (A)	-250	-275	-225	-260	-260	6.0E-1
Front Time (uS)	8.00	6.40	9.60	8.45	8.45	6.0E-3
Duration(uS)	20.0	16.0	24.0	23.1	23.1	6.0E-2
Overshoot(%)	0.0	0.0	30.0	10.3	10.3	6.0E-2
-1000V Test						
Apeak (A)	-500	-550	-450	-520	-520	6.0E-1
Front Time (uS)	8.00	6.40	9.60	8.40	8.40	6.0E-3
Duration(uS)	20.0	16.0	24.0	22.1	22.1	6.0E-2
Overshoot(%)	0.0	0.0	30.0	12.2	12.2	6.0E-2
-2000V Test						
Apeak (A)	-1000	-1100	-900	-1048	-1048	6.0E-1
Front Time (uS)	8.00	6.40	9.60	8.20	8.20	6.0E-3
Duration(uS)	20.0	16.0	24.0	22.8	22.8	6.0E-2
Overshoot(%)	0.0	0.0	30.0	12.2	12.2	6.0E-2
-4000V Test						
Apeak (A)	-2000	-2200	-1800	-2100	-2100	6.0E-1
Front Time (uS)	8.00	6.40	9.60	8.60	8.60	6.0E-3
Duration(uS)	20.0	16.0	24.0	22.7	22.7	6.0E-2
Overshoot(%)	0.0	0.0	30.0	11.9	11.9	6.0E-2
-6000V Test						
Apeak (A)	-3000	-3300	-2700	-3160	-3160	6.0E-1
Front Time (uS)	8.00	6.40	9.60	8.60	8.60	6.0E-3
Duration(uS)	20.0	16.0	24.0	23.0	23.0	6.0E-2
Overshoot(%)	0.0	0.0	30.0	12.3	12.3	6.0E-2
Ring Wave IEC 61000-4-12						
Open Circuit Tests 12 Ohm Positive Polarity 250V Level						
1st Peak (Vpk)	250	225	275	240	240	6.0E-1
Decay 2nd Pk (Ratio)	0.75	0.40	1.10	0.75	0.75	6.0E-3
Decay 3rd Pk (Ratio)	0.60	0.40	0.80	0.41	0.41	6.0E-3
Decay 4th Pk (Ratio)	0.60	0.40	0.80	0.45	0.45	6.0E-3
Risetime (uS)	0.50	0.35	0.65	0.61	0.61	6.0E-3
500V Level						
1st Peak (Vpk)	500	450	550	478	478	6.0E-1

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Decay 2nd Pk (Ratio)	0.75	0.40	1.10	0.72	0.72	6.0E-3
Decay 3rd Pk (Ratio)	0.60	0.40	0.80	0.45	0.45	6.0E-3
Decay 4th Pk (Ratio)	0.60	0.40	0.80	0.44	0.44	6.0E-3
Risetime (uS)	0.50	0.35	0.65	0.43	0.43	6.0E-3
1kV Level						
1st Peak (Vpk)	1000	900	1100	963	963	6.0E-1
Decay 2nd Pk (Ratio)	0.75	0.40	1.10	0.73	0.73	6.0E-3
Decay 3rd Pk (Ratio)	0.60	0.40	0.80	0.47	0.47	6.0E-3
Decay 4th Pk (Ratio)	0.60	0.40	0.80	0.50	0.50	6.0E-3
Risetime (uS)	0.50	0.35	0.65	0.44	0.44	6.0E-3

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 base 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/NCSL Z540-1-1994 and ANSI/NCSL Z540.3-2006. Other standards listed upon request.