Fox Valley Metrology
3114 Medalist Drive
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(920) 426-5894 • Fax (920) 426-8120
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CERTIFICATE OF CALIBRATION

ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 CALIBRATION AND DIMENSIONAL MEASUREMENT

Certificate No. ACT-1272

CERTIFICATION NUMBER	CP134-00374-840
FOR	Sample Manufacturing 3121 Medalist Drive Oshkosh, WI 54902
TEST INSTRUMENT	Analyzer Harmonic
MAKE	Fluke
MODEL	43B
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-023A
SERIAL NUMBER	374
PURCHASE ORDER #	

PROCEDURES FOLLOWED

EL-023A rev. 2

STANDARDS USED

INSTRUMENT	SERIAL NUMBER	TRACE NUMBER	NEXT CAL
COIL-001	20083512	CL088-28770-531	07/31/2025
FVS-845	FVS-845	CO191-37540-690	07/31/2025
FVS-A05	6375609	CP042-30961-087	07/31/2025

CALIBRATION RESULTS

* DENOTES "OUT OF TOLERANCE"

FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
INSTALLED INSTRUMENT FIRMWARE						
Firmware Version: V2.03						
BACKLIGHT POWER SAVE						
DISPLAY TESTS						
Maximum Darkness Result of Operator Evaluation						
Default Brightness Result of Operator Evaluation						
Maximum Brightness						

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FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
Result of Operator Evaluation						
FREQUENCY RESPONSE, Input 1						
0.00 dB @ 20 MHz	0	-3	3	0	0	6.0E-1
FREQUENCY MEASUREMENT ACCURACY						
Input 1						
1.00 MHz @ 1.2 Vpp	1.00	0.97	1.02	1.00	1.00	6.0E-3
10.0 MHz @ 1.2 Vpp	10.0	9.7	10.3	10.0	10.0	6.0E-2
40.0 MHz @ 2.4 Vpp	40.0	38.8	41.2	40.0	40.0	6.0E-2
Input 2						
15.0 kHz @ 0.6 Vpp	15.0	14.7	15.3	15.0	15.0	6.0E-2
TRIGGER SENSITIVITY, Input 1						
5 MHz						
25 MHz						
40 MHz						
TRIGGER SENSITIVITY, Input 2						
5 kHz						
20 kHz						
TRIGGER LEVEL and SLOPE TEST						
Input 1						
2 V @ (+)SLOPE	2	2	3	2	2	6.0E-1
2 V @ (-)SLOPE	2	2	3	2	2	6.0E-1
Input 2						
2 V @ (+)SLOPE	2	2	3	2	2	6.0E-1
2 V @ (-)SLOPE	2	2	3	2	2	6.0E-1

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DC VOLTAGE (Input 1)						
5 mV/div						
15.0 mV	15.0	14.4	15.6	15.0	15.0	6.0E-2
10 mV/div						
30.0 mV	30.0	29.4	30.6	30.0	30.0	6.0E-2
20 mV/div						
60.0 mV	60.0	59.2	60.8	60.0	60.0	6.0E-2
50 mV/div						
150.0 mV	150.0	148.8	151.3	150.0	150.0	6.0E-2
100 mV/div						
300.0 mV	300.0	298.0	302.0	300.0	300.0	6.0E-2
200 mV/div						
0.0 mV	0.0	-0.5	0.5	0.0	0.0	6.0E-2
500.0 mV	500.0	497.0	503.0	500.0	500.0	6.0E-2
-500.0 mV	-500.0	-503.0	-497.0	-500.0	-500.0	6.0E-2
500 mV/div						
1.500 V	1.500	1.488	1.513	1.500	1.500	6.0E-4
1 V/div						
3.000 V	3.000	2.980	3.020	3.000	3.000	6.0E-4
2 V/div						
0.000 V	0.000	-0.005	0.005	0.000	0.000	6.0E-4
5.000 V	5.000	4.970	5.030	5.000	5.000	6.0E-4
-5.000 V	-5.000	-5.030	-4.970	-5.000	-5.000	6.0E-4
5 V/div						
15.00 V	15.00	14.88	15.13	15.00	15.00	6.0E-3
10 V/div						
30.00 V	30.00	29.80	30.20	30.00	30.00	6.0E-3
20 V/div						
0.00 V	0.00	-0.05	0.05	0.00	0.00	6.0E-3
50.00 V	50.00	49.70	50.30	50.00	50.00	6.0E-3
-50.00 V	-50.00	-50.30	-49.70	-50.00	-50.00	6.0E-3
50 V/div						
150.0 V	150.0	148.8	151.3	150.0	150.0	6.0E-2
100 V/div						
300.0 V	300.0	298.0	302.0	300.0	300.0	6.0E-2

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FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
200 V/div						
0.0 V	0.0	-0.5	0.5	0.0	0.0	6.0E-2
500.0 V	500.0	497.0	503.0	500.0	500.0	6.0E-2
-500.0 V	-500.0	-503.0	-497.0	-500.0	-500.0	6.0E-2
500 V/div						
0 V	0	-5	5	0	0	6.0E-1
600 V	600	592	608	600	600	6.0E-1
-600 V	-600	-608	-592	-600	-600	6.0E-1
DC CURRENT (Input 2)						
5 A/div						
15.00 A	15.00	14.88	15.13	15.00	15.00	6.0E-3
10 A/div						
30.00 A	30.00	29.80	30.20	30.00	30.00	6.0E-3
20 A/div						
60.00 A	60.00	59.65	60.35	60.00	60.00	6.0E-3
50 A/div						
150.0 A	150.0	148.8	151.3	150.0	150.0	6.0E-2
100 A/div						
300.0 A	300.0	298.0	302.0	300.0	300.0	6.0E-2
200 A/div						
0.0 A	0.0	-0.5	0.5	0.0	0.0	6.0E-2
500.0 A	500.0	497.0	503.0	500.0	500.0	6.0E-2
-500.0 A	-500.0	-503.0	-497.0	-500.0	-500.0	6.0E-2
500 A/div						
1.500 kA	1.500	1.488	1.513	1.500	1.500	6.0E-4
1 kA/div						
3.000 kA	3.000	2.980	3.020	3.000	3.000	6.0E-4
2 kA/div						
0.000 kA	0.000	-0.005	0.005	0.000	0.000	6.0E-4
5.000 kA	5.000	4.970	5.030	5.000	5.000	6.0E-4
-5.000 kA	-5.000	-5.030	-4.970	-5.000	-5.000	6.0E-4
5 kA/div						
15.00 kA	15.00	14.88	15.13	15.00	15.00	6.0E-3
10 kA/div						
30.00 kA	30.00	29.80	30.20	30.00	30.00	6.0E-3
20 kA/div						

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0.00 kA	0.00	-0.05	0.05	0.00	0.00	6.0E-3
50.00 kA	50.00	49.70	50.30	50.00	50.00	6.0E-3
-50.00 kA	-50.00	-50.30	-49.70	-50.00	-50.00	6.0E-3
50 kA/div						
150.0 kA	150.0	148.8	151.3	150.0	150.0	6.0E-2
100 kA/div						
300.0 kA	300.0	298.0	302.0	300.0	300.0	6.0E-2
200 kA/div						
0.0 kA	0.0	-0.5	0.5	0.0	0.0	6.0E-2
500.0 kA	500.0	497.0	503.0	500.0	500.0	6.0E-2
-500.0 kA	-500.0	-503.0	-497.0	-500.0	-500.0	6.0E-2
500 kA/div						
0 kA	0	0	0	0	0	6.0E-1
600 kA	600	592	608	600	600	6.0E-1
-600 kA	-600	-608	-592	-600	-600	6.0E-1
AC VOLTAGE (Input 1)						
200 mV/div						
500.0 mV @ 60 Hz	500.0	494.0	506.0	500.0	500.0	6.0E-2
500.0 mV @ 20 kHz	500.0	486.0	514.0	500.0	500.0	6.0E-2
2 V/div						
5.000 V @ 60 Hz	5.000	4.940	5.060	5.000	5.000	6.0E-4
5.000 V @ 20 kHz	5.000	4.860	5.140	5.000	5.000	6.0E-4
20 V/div						
50.00 V @ 60 Hz	50.00	49.40	50.60	50.00	50.00	6.0E-3
50.00 V @ 20 kHz	50.00	48.60	51.40	50.00	50.00	6.0E-3
200 V/div						
500.0 V @ 60 Hz	500.0	494.0	506.0	500.0	500.0	6.0E-2
500.0 V @ 10 kHz	500.0	486.0	514.0	500.0	500.0	6.0E-2
500 V/div						
600 V @ 60 Hz	600	584	616	600	600	6.0E-1
600 V @ 10 kHz	600	570	630	600	600	6.0E-1
AC CURRENT (Input 2)						
200 A/div						

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500.0 A @ 60 Hz	500.0	494.0	506.0	500.0	500.0	6.0E-2
2 kA/div						
5.000 kA @ 60 Hz	5.000	4.940	5.060	5.000	5.000	6.0E-4
20 kA/div						
50.00 kA @ 60 Hz	50.00	49.40	50.60	50.00	50.00	6.0E-3
200 kA/div						
500.0 kA @ 60 Hz	500.0	494.0	506.0	500.0	500.0	6.0E-2
500 kA/div						
600 kA @ 60 Hz	600	584	616	600	600	6.0E-1
AC VOLTAGE (Input 1, AC Coupling)						
200 mV/div						
500.0 mV @ 10 Hz	500.0	344.0	500.0	500.0	500.0	6.0E-2
500.0 mV @ 33 Hz	500.0	469.0	500.0	500.0	500.0	6.0E-2
500.0 mV @ 60 Hz	500.0	486.5	500.0	500.0	500.0	6.0E-2
AC CURRENT (Input 2, AC Coupling)						
200 A/div						
500.0 A @ 10 Hz	500.0	344.0	500.0	500.0	500.0	6.0E-2
500.0 A @ 33 Hz	500.0	469.0	500.0	500.0	500.0	6.0E-2
500.0 A @ 60 Hz	500.0	486.0	500.0	500.0	500.0	6.0E-2
AC VOLTAGE (Input 1, Volts Peak)						
5 Vpp	5	5	6	5	5	6.0E-1
AC CURRENT (Input 2, Amps Peak)						
5 kApp	5	5	6	5	5	6.0E-1
PHASE MEASUREMENT (Input 1 to Input 2)						
0 °	0	-2	2	0	0	6.0E-1

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FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
RESISTANCE						
0.0 Ohm	0.0	-0.5	0.5	0.0	0.0	6.0E-2
400.0 Ohm	400.0	397.1	402.9	400.0	400.0	6.0E-2
4.000 kOhm	4.000	3.971	4.029	4.000	4.000	6.0E-4
40.00 kOhm	40.00	39.71	40.29	40.00	40.00	6.0E-3
400.0 kOhm	400.0	397.1	402.9	400.0	400.0	6.0E-2
4.000 MOhm	4.000	3.971	4.029	4.000	4.000	6.0E-4
30.00 MOhm	30.00	29.77	30.23	30.00	30.00	6.0E-3
CONTINUITY						
Beeper Audible						
Beeper NOT Audible						
DIODE TEST						
Current						
500.0 mV	500.0	425.0	575.0	500.0	500.0	6.0E-2
Voltage						
1.000 V	1.000	0.975	1.025	1.000	1.000	6.0E-4
CAPACITANCE						
50 nF Range						
40.00 nF	40.00	39.10	40.90	40.00	40.00	6.0E-3
500 nF Range						
300.0 nF	300.0	293.0	307.0	300.0	300.0	6.0E-2
5 µF Range						
3.000 µF	3.000	2.930	3.070	3.000	3.000	6.0E-4
50 µF Range						
30.00 µF	30.00	29.30	30.70	30.00	30.00	6.0E-3
500 µF Range						
300.0 µF	300.0	293.0	307.0	300.0	300.0	6.0E-2
50 nF Range						
0.00 nF	0.00	0.00	0.10	0.00	0.00	6.0E-3
INRUSH CURRENT MODE						
Cursor Position 1						
1.50 kA	1.50	1.38	1.63	1.50	1.50	6.0E-3
Cursor Position 2						

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1.50 kA	1.50	1.38	1.63	1.50	1.50	6.0E-3
SAGS & SWELLS						
Volts						
5.00 V	5.00	4.80	5.20	5.00	5.00	6.0E-3
Amps						
5.00 V	5.00	4.80	5.20	5.00	5.00	6.0E-3
HARMONICS						
Result of Operator Evaluation						
Result of Operator Evaluation						
VOLTS/AMPS/HERTZ MODE						
Volts						
0.000 V	0.000	-0.010	0.010	0.000	0.000	6.0E-4
5.500 V @ 70 Hz	5.500	5.340	5.660	5.500	5.500	6.0E-4
3.500 V @ 15 kHz	3.500	3.300	3.700	3.500	3.500	6.0E-4
Amps						
0.000 A	0.000	-0.100	0.100	0.000	0.000	6.0E-4
5.500 kA @ 70 Hz	5.500	5.340	5.660	5.500	5.500	6.0E-4
4.500 kA @ 70 Hz	4.500	4.445	4.555	4.500	4.500	6.0E-4
3.500 kA @ 15 kHz	3.500	3.300	3.700	3.500	3.500	6.0E-4
Hertz						
70.0 Hz @ 5.5 V	70.0	69.4	70.6	70.0	70.0	6.0E-2
70.0 Hz @ 4.5 kA	70.0	69.4	70.6	70.0	70.0	6.0E-2
POWER TEST						
0 V Applied						
0.00 W	0.00	-0.04	0.04	0.00	0.00	6.0E-3
0.00 VA	0.00	-0.04	0.04	0.00	0.00	6.0E-3
0.00 VAR_	0.00	-0.04	0.04	0.00	0.00	6.0E-3
4.472 V Applied						
20.0 kW @ 60 Hz	20.0	19.4	20.6	20.0	20.0	6.0E-2
20.0 kVA @ 60 Hz	20.0	19.4	20.6	20.0	20.0	6.0E-2

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0.00 kVAR_ @ 60 Hz	0.00	-0.40	0.40	0.00	0.00	6.0E-3
1.00 PF @ 60 Hz	1.00	0.96	1.00	1.00	1.00	6.0E-3
1.00 DPF @ 60 Hz	1.00	0.97	1.00	1.00	1.00	6.0E-3
60.0 Hz @ 4.472 V	60.0	59.5	60.5	60.0	60.0	6.0E-2
5.916 V Applied						
35.0 kW @ 60 Hz	35.0	34.3	35.7	35.0	35.0	6.0E-2
35.0 kVA @ 60 Hz	35.0	34.3	35.7	35.0	35.0	6.0E-2
0 VAR_ @ 60 Hz	0	-4	4	0	0	6.0E-1
1.00 PF	1.00	0.96	1.00	1.00	1.00	6.0E-3
1.00 DPF	1.00	0.97	1.00	1.00	1.00	6.0E-3
60.0 Hz @ 5.916 V	60.0	59.5	60.5	60.0	60.0	6.0E-2
TRANSIENT MODE						
No Transients Captured						
Transients Captured						

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.