



Essco Calibration Laboratory
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Certificate of Calibration

Issue Date: 08/22/2024 Certificate #: 3196468

CUSTOMER / LOCATION ILLIANA INSTRUMENTATION SERVICE 1831 GOVERT DRIVE SCHERERVILLE, IN 46375	EQUIPMENT INFORMATION MANUFACTURER: FLUKE MODEL #: 525B SERIAL #: 2041092 CONTROL #: 1546 TYPE: TEMPERATURE CALIBRATOR
PURCHASE ORDER: 4534	

PERFORMED: IN LAB	AS FOUND: IN TOLERANCE AS LEFT: IN TOLERANCE	Remarks:
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ENV: TEMP: 20.29°C REL HUMIDITY: 42.71 %RH BAR PRESSURE: 1013.31 hPa	CALIBRATION DATE: 08/22/2024	CALIBRATION DUE: 08/22/2025
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Method	Description	Report No.	Last Cal. Date	Cal. Due Date
FLUKE 525B				
Standard	Description	Report No.	Last Cal. Date	Cal. Due Date
E3750	FLUKE 5522A-OPT SC1100 CALIBRATOR	2880959	09/21/2023	09/21/2024
E4150	KAYE X0240 ICE POINT REFERENCE	3142871	06/20/2024	06/20/2025
E5221	FLUKE 8588A REFERENCE MULTIMETER	3067009	03/08/2024	03/08/2025
E5227	NBS 172142-J-48 THERMOCOUPLE 1/2 JUNC	3104328	05/09/2024	05/09/2025

The ESSCO Quality System is accredited to ISO/IEC 17025:2017

The results above relate only to the item(s) calibrated. This report shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the United States Federal Government. Any number of factors may cause a nonconformance (i.e. out of tolerance) between calibrations.
 Expanded Measurement uncertainties were calculated per ISO/IEC Guide 98-3:2008 Guide to the Expression of Uncertainty in Measurement with approximately a 95% confidence level and a coverage factor of k=2.
 Statements of conformity are made based on the Simple Acceptance binary decision rules as defined in ILAC G8:2019 with measurement uncertainty not taken into account. It is the responsibility of the user to consider the measurement uncertainty when determining compliance to their own processes. The measurement results are traceable to the International System of Units (SI Units) through a National Metrology Institute (NMI), such as NIST, a competent laboratory (i.e. ISO/IEC 17025), or competent producer (i.e. ISO 17034).
 This calibration was performed in compliance with the ESSCO Quality System manual, ECL1 Rev 50, dated 27 June 2024, ISO/IEC 17025:2017, ISO 9001:2015, ANSI/INCSL Z540-1-1994 part 1, ISO 10012:2003, ISO 13485:2016, and when required contractually, 10 CFR 21 and 10 CFR 50 App. B.
 This certificate shall not be reproduced, except in full, without the written approval of Essco.

Ron White

Ron White
Metrologist

Philip Thai

PHILIP THAI
Releasing Authority

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Test #	Function Tested	Nominal	Limits	Unit of Measure	As Found	As Left	Uncertainty
1	DCV, 100 mV RANGE	0.0000000	0.00000300 -0.00000300	V	0.00000110	0.00000110	0.00000035 V
2	DCV, 100 mV RANGE	0.02500000	0.02500375 0.02499625	V	0.02500120	0.02500120	0.00000061 V
3	DCV, 100 mV RANGE	0.07500000	0.07500525 0.07499475	V	0.07500120	0.07500120	0.0000011 V
4	DCV, 100 mV RANGE	0.10000000	0.10000600 0.09999400	V	0.10000120	0.10000120	0.0000013 V
5	DCV, 1V RANGE	0.0000000	0.0000100 -0.0000100	V	0.0000019	0.0000019	0.00000035 V
6	DCV, 1V RANGE	0.2500000	0.2500175 0.2499825	V	0.2500064	0.2500064	0.0000027 V
7	DCV, 1V RANGE	0.7500000	0.7500325 0.7499675	V	0.7500160	0.7500160	0.0000073 V
8	DCV, 1V RANGE	1.0000000	1.0000400 0.9999600	V	1.0000223	1.0000223	0.000011 V
9	DCV, 10 V RANGE	0.000000	0.000100 -0.000100	V	0.000007	0.000007	0.00000067 V
10	DCV, 10 V RANGE	2.500000	2.500175 2.499825	V	2.500037	2.500037	0.000025 V
11	DCV, 10 V RANGE	7.500000	7.500325 7.499675	V	7.500078	7.500078	0.000075 V
12	DCV, 10 V RANGE	10.000000	10.000400 9.999600	V	10.000139	10.000139	0.00081 V
13	DCV, 100 V RANGE	0.000000	0.00100 -0.00100	V	0.00013	0.00013	0.0000058 V
14	DCV, 100 V RANGE	25.00000	25.00175 24.99825	V	25.00015	25.00015	0.00023 V
15	DCV, 100 V RANGE	75.00000	75.00325 74.99675	V	74.99992	74.99992	0.00069 V
16	DCV, 100 V RANGE	100.00000	100.00400 99.99600	V	100.00020	100.00020	0.0018 V
17	DCI, 100 mA RANGE	0.000	0.002 -0.002	mA	0.000	0.000	0.00058 mA
18	DCI, 100 mA RANGE	25.0000	25.0045 24.9955	mA	24.9988	24.9988	0.0018 mA
19	DCI, 100 mA RANGE	75.0000	75.0095 74.9905	mA	74.9979	74.9979	0.0037 mA
20	DCI, 100 mA RANGE	100.0000	100.0120 99.9880	mA	99.9979	99.9979	0.031 mA

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Test #	Function Tested	Nominal	Limits	Unit of Measure	As Found	As Left	Uncertainty
21	THERMOCOUPLE OUTPUT	-5.000	-4.997 -5.003	mV	-5.000	-5.000	0.00070 mV
22	THERMOCOUPLE OUTPUT	15.000	15.004 14.996	mV	14.999	14.999	0.00077 mV
23	THERMOCOUPLE OUTPUT	30.000	30.004 29.996	mV	29.999	29.999	0.00087 mV
24	THERMOCOUPLE OUTPUT	50.000	50.005 49.995	mV	49.999	49.999	0.0011 mV
25	THERMOCOUPLE OUTPUT	70.000	70.005 69.995	mV	69.999	69.999	0.0012 mV
26	J THERMOCOUPLE, CJC TEST	0.00	0.16 -0.16	°C	0.12	0.12	0.07°C
27	THERMOCOUPLE INPUT	-5.000	-4.997 -5.003	mV	-5.000	-5.000	0.00058 mV
28	THERMOCOUPLE INPUT	15.000	15.004 14.996	mV	15.000	15.000	0.00058 mV
29	THERMOCOUPLE INPUT	30.000	30.004 29.996	mV	30.000	30.000	0.00058 mV
30	THERMOCOUPLE INPUT	50.000	50.005 49.995	mV	49.999	49.999	0.00058 mV
31	THERMOCOUPLE INPUT	70.000	70.005 69.995	mV	70.000	70.000	0.00058 mV
32	OHM OUT, 400 OHM RANGE	5.000	5.015 4.985	Ohm	5.000	5.000	0.00058 mV
33	OHM OUT, 400 OHM RANGE	100.000	100.015 99.985	Ohm	100.001	100.001	0.0022 Ohm
34	OHM OUT, 400 OHM RANGE	200.000	200.015 199.985	Ohm	200.003	200.003	0.0044 Ohm
35	OHM OUT, 400 OHM RANGE	300.000	300.015 299.985	Ohm	300.006	300.006	0.0066 Ohm
36	OHM OUT, 400 OHM RANGE	400.000	400.015 399.985	Ohm	400.010	400.010	0.0088 Ohm
37	OHM OUT, 4000 OHM RANGE	5.0	5.3 4.7	Ohm	5.0	5.0	0.058 Ohm
38	OHM OUT, 4000 OHM RANGE	1000.0	1000.3 999.7	Ohm	1000.0	1000.0	0.061 Ohm
39	OHM OUT, 4000 OHM RANGE	2000.0	2000.3 1999.7	Ohm	2000.0	2000.0	0.065 Ohm
40	OHM OUT, 4000 OHM RANGE	3000.0	3000.3 2999.7	Ohm	3000.0	3000.0	0.071 Ohm

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41	OHM OUT, 4000 OHM RANGE	4000.0	4000.3 3999.7	Ohm	4000.1	4000.1	0.088 Ohm
42	OHM IN, 400 OHM RANGE	0.000	0.003 -0.003	Ohm	-0.001	-0.001	0.0013 Ohm
43	OHM IN, 400 OHM RANGE	100.000	100.007 99.993	Ohm	100.000	100.000	0.0052 Ohm
44	OHM IN, 400 OHM RANGE	200.000	200.011 199.989	Ohm	199.997	199.997	0.0096 Ohm
45	OHM IN, 400 OHM RANGE	300.000	300.015 299.985	Ohm	299.996	299.996	0.013 Ohm
46	OHM IN, 400 OHM RANGE	400.000	400.019 399.981	Ohm	399.996	399.996	0.019 Ohm
47	OHM IN, 4000 OHM RANGE	0.00	0.03 -0.03	Ohm	-0.02	-0.02	0.0059 Ohm
48	OHM IN, 4000 OHM RANGE	1000.00	1000.07 999.93	Ohm	999.99	999.99	0.037 Ohm
49	OHM IN, 4000 OHM RANGE	2000.00	2000.11 1999.89	Ohm	1999.97	1999.97	0.096 Ohm
50	OHM IN, 4000 OHM RANGE	3000.00	3000.15 2999.85	Ohm	2999.98	2999.98	0.13 Ohm
51	OHM IN, 4000 OHM RANGE	4000.00	4000.19 3999.81	Ohm	3999.97	3999.97	0.19 Ohm

End of Data

Note: A = Adjusted F = Failed L = Limited N/A = Outside Scope of Accreditation