CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Transcat – San Diego
7726 Arjons Drive
San Diego, CA 92126

Fulfills the requirements of

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 01 September 2024
Certificate Number: L2214

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

AND

ANSI/NCSL Z540-1-1994 (R2002)

Transcat – San Diego

7726 Arjons Drive
San Diego, CA 92126
Martin Bakker 858-621-2630

CALIBRATION

Valid to: **September 1, 2024** Certificate Number: **L2214**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Source [2]	Up to 220 µA (0.22 to 2.2) mA (2.2 to 22) mA (22 to 220) mA (0.22 to 2.2) A	45 µA/A + 6.9 nA 39 µA/A + 8.1 nA 39 µA/A + 46nA 58 µA/A + 0.7 µA 0.24 mA/A + 12 µA	Fluke 5720A Multiproduct Calibrator
DC Voltage – Source [2]	Up to 220 mV (0.22 to 2.2) V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1 000) V	9.1 µV/V + 0.4 µV 5.7 µV/V + 0.7 µV 4.4 µV/V + 2.5 µV 4 µV/V + 4 µV 6.3 µV/V + 40 µV 7.6 µV + 0.4 mV	Fluke 5720A Multiproduct Calibrator
AC Current – Source [2]	Up to 220 µA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (0.22 to 2.2) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	 0.032 % of reading + 16 nA 0.019 % of reading + 10 nA 0.014 % of reading + 8 nA 0.026 % of reading + 10 nA 0.11 % of reading + 65 nA 0.031 % of reading + 40 nA 0.019 % of reading + 35 nA 0.014 % of reading + 35 nA 0.026 % of reading + 0.11 µA 0.11 % of reading + 0.65 µA	Fluke 5720A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Source [2]	(2.2 to 22) mA		Fluke 5720A Multiproduct Calibrator
	(10 to 20) Hz	0.033 % of reading + 0.4 µA	
	(20 to 40) Hz	0.02 % of reading + 0.35 µA	
	40 Hz to 1 kHz	0.015 % of reading + 0.35 µA	
	(1 to 5) kHz	0.022 % of reading + 0.55 µA	
	(5 to 10) kHz	0.11 % of reading + 5 µA	
	(22 to 220) mA		
	(10 to 20) Hz	0.033 % of reading + 4 µA	
	(20 to 40) Hz	0.018 % of reading + 3.5 µA	
	40 Hz to 1 kHz	0.014 % of reading + 2.5 µA	
	(1 to 5) kHz	0.021 % of reading + 3.5 µA	
	(5 to 10) kHz	0.11 % of reading + 10 µA	
	(0.22 to 2.2) A		
	20 Hz to 1 kHz	0.047 % of reading + 0.17 mA	
	(1 to 5) kHz	0.095 % of reading + 0.38 mA	
	(5 to 10) kHz	0.36 % of reading + 0.16 mA	
AC Voltage – Source [2]	Up to 2.2 mV		Fluke 5720A Multiproduct Calibrator
	(10 to 20) Hz	0.16 % of reading + 4 µV	
	(20 to 40) Hz	0.1 % of reading + 4 µV	
	40 Hz to 20 kHz	0.077 % of reading + 4 µV	
	(20 to 50) kHz	0.12 % of reading + 4 µV	
	(50 to 100) kHz	0.17 % of reading + 5 µV	
	(100 to 300) kHz	0.33 % of reading + 10 µV	
	(300 to 500) kHz	0.47 % of reading + 20 µV	
	500 kHz to 1 MHz	0.58 % of reading + 20 µV	
	(2.2 to 22) mV		
	(10 to 20) Hz	0.044 % of reading + 4 µV	
	(20 to 40) Hz	0.031 % of reading + 4 µV	
	40 Hz to 20 kHz	0.015 % of reading + 4 µV	
	(20 to 50) kHz	0.031 % of reading + 4 µV	
	(50 to 100) kHz	0.059 % of reading + 5 µV	
	(100 to 300) kHz	0.12 % of reading + 10 µV	
	(300 to 500) kHz	0.16 % of reading + 20 µV	
	500 kHz to 1 MHz	0.3 % of reading + 20 µV	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Source [2]	(22 to 220) mV		Fluke 5720A Multiproduct Calibrator
	(10 to 20) Hz	0.028 % of reading + 12 µV	
	(20 to 40) Hz	0.011 % of reading + 7 µV	
	40 Hz to 20 kHz	0.009 % of reading + 7 µV	
	(20 to 50) kHz	0.021 % of reading + 7 µV	
	(50 to 100) kHz	0.047 % of reading + 17 µV	
	(100 to 300) kHz	0.092 % of reading + 20 µV	
	(300 to 500) kHz	0.14 % of reading + 25 µV	
	500 kHz to 1 MHz	0.28 % of reading + 45 µV	
	(0.22 to 2.2) V		
	(10 to 20) Hz	0.028 % of reading + 40 µV	
	(20 to 40) Hz	0.01 % of reading + 15 µV	
	40 Hz to 20 kHz	0.005 % of reading + 8 µV	
	(20 to 50) kHz	0.008 % of reading + 10 µV	
	(50 to 100) kHz	0.012 % of reading + 30 µV	
	(100 to 300) kHz	0.043 % of reading + 80 µV	
	(300 to 500) kHz	0.1 % of reading + 0.2 mV	
	500 kHz to 1 MHz	0.18 % of reading + 0.3 mV	
	(2.2 to 22) V		
	(10 to 20) Hz	0.028 % of reading + 0.4 mV	
	(20 to 40) Hz	0.01% of reading + 0.15 mV	
	40 Hz to 20 kHz	0.005 % of reading + 0.05 mV	
	(20 to 50) kHz	0.008 % of reading + 0.1 mV	
	(50 to 100) kHz	0.011 % of reading + 0.2 mV	
	(100 to 300) kHz	0.03 % of reading + 0.6 mV	
	(300 to 500) kHz	0.1 % of reading + 2 mV	
	500 kHz to 1 MHz	0.17 % of reading + 3.2 mV	
	(22 to 220) V		
	(10 to 20) Hz	0.028 % of reading + 4 mV	
	(20 to 40) Hz	0.01% of reading + 1.5 mV	
	40 Hz to 20 kHz	0.006 % of reading + 0.6 mV	
	(20 to 50) kHz	0.009 % of reading + 1 mV	
	(50 to 100) kHz	0.016 % of reading + 2.5 mV	
	(100 to 300) kHz	0.09 % of reading + 16 mV	
	(220 to 750) V		
	(30 to 50) kHz	0.061 % of reading + 11 mV	
	(50 to 100) kHz	0.23 % of reading + 45 mV	

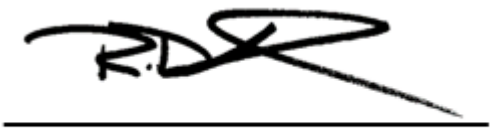
Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Resistance – Source [2] (Fixed-Simulated Values)	1 Ω	98 μΩ/Ω	Fluke 5720A Multiproduct Calibrator
	1.9 Ω	96 μΩ/Ω	
	10 Ω	24 μΩ/Ω	
	19 Ω	25 μΩ/Ω	
	100 Ω	11 μΩ/Ω	
	190 Ω	11 μΩ/Ω	
	1 kΩ	9.4 mΩ/kΩ	
	1.9 kΩ	10 mΩ/kΩ	
	10 kΩ	10 mΩ/kΩ	
	19 kΩ	10 mΩ/kΩ	
	100 kΩ	12.6 mΩ/kΩ	
	190 kΩ	29.5 mΩ/kΩ	
	1 MΩ	22 Ω/MΩ	
	1.9 MΩ	125 Ω/MΩ	
	10 MΩ	74 Ω/MΩ	
	19 MΩ	0.65 kΩ/MΩ	
	100 MΩ	0.6 kΩ/MΩ	

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. Based on an accredited calibration by the manufacturer, used at the temperature in which the Multiproduct Calibrator was calibrated (tcal = ± 5 °C) and assuming the instrument is zeroed at least every seven days or when the ambient temperature changes more than 5 °C.
3. This scope is formatted as part of a single document including Certificate of Accreditation No. L2214.



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