

PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:

Accurate Calibration, LLC

565 Washington Ave. Suite 6, North Haven, CT 06473

(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2005

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (as outlined by the joint ISO-ILAC-IAF Communiqué dated January 2009):

Calibration of Dimensional, Electrical, Mechanical, Mass and Time & Frequency Devices (As detailed in the supplement)

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

DRAFT

Tracy Szerszen President/Operations Manager

Perry Johnson Laboratory Accreditation, Inc. (PJLA) 755 W. Big Beaver, Suite 1325 Trov, Michigan 48084 Initial Accreditation Date:Issue Date:E.March 2, 2016December 31, 2017Issue Date:Accreditation No:Certificate No:75000L17-549

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: <u>www.pjlabs.com</u>

Expiration Date:

April 30, 2020



Accurate Calibration, LLC

565 Washington Ave. Suite 6, North Haven, CT 06473 Contact Name: Salvatore La Monaca III Phone: 203-787-6682

Accreditation is granted to the facility to perform the following calibrations:

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Calipers ^{FO}	0.05 in to 6 in	(290 + 4.5L) µin	Grade 0 Gage Blocks
Outside Micrometer ^{FO}	0.05 in to 1 in	(58 µin + 0.6L) µin	Grade 0 Gage Blocks
Cylindrical Outside ^{FO}	0.01 in to 1 in	54 µin	Laser Micrometer, Class Y, Z, ZZ

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Output	0 μA to 329.999 μA	0.015 % of reading + 20 nA	Fluke 5502A
DC Current ^{FO}	0 mA to 3.299 99 mA	0.01 % of reading + 50 nA	Calibrator
	0 mA to 32.999 mA	0.01 % of reading + 250 nA	
	0 mA to 329.999 mA	0.01 % of reading + 2.5 µA	
	0 A to 1.099 99 A	0.038 % of reading + 44 µA	
	1.1 A to 2.999 99 A	0.038 % of reading + 44 µA	
	0 A to 10.999 9 A	0.06 % of reading + 500 µA	
	11 A to 20.5 A	0.1 % of reading + 750 μA	
Equipment to Output AC Vo At the listed frequencies ^{FO}	bltage		
10 Hz to 45 Hz	0.33 mV to 33 mV	0.15 % of reading $+20 \mu V$	
45 Hz to 10 kHz	0.33 mV to 33 mV	0.1 % of reading + 20 μ V	
10 kHz to 20 kHz	0.33 mV to 33 mV	0.1 % of reading $+20 \mu V$	
20 kHz to 50 kHz	0.33 mV to 33 mV	0.2 % of reading $+20 \mu V$	
50 kHz to 100 kHz	0.33 mV to 33 mV	0.35 % of reading $+ 33 \mu V$	
100 kHz to 500 kHz	0.33 mV to 33 mV	1.0 % of reading $+ 60 \mu V$	
Equipment to Output AC V At the listed frequencies ^{FO}	oltage		
10 Hz to 45 Hz	3.3 mV to 330 mV	0.05 % of reading + 20 μ V	
45 Hz to 10 kHz	3.3 mV to 330 mV	0.03 % of reading $+20 \mu V$	
10 kHz to 20 kHz	3.3 mV to 330 mV	0.07 % of reading + 20 μ V	
20 kHz to 50 kHz	3.3 mV to 330 mV	0.1 % of reading $+40 \mu V$	
50 kHz to 100 kHz	3.3 mV to 330 mV	0.23 % of reading $+ 170 \mu V$]
100 kHz to 500 kHz	3.3 mV to 330 mV	0.5 % of reading + 330 μ V	



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AS AN UNCERTAINTY (±) S Equipment to Output AC Voltage Flu	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED ike 5502A librator
at the listed frequenciesCall10 Hz to 45 Hz $3.3 V to 33 V$ 0.05% of reading $+ 60 \mu V$ 45 Hz to 10 kHz $3.3 V to 33 V$ 0.03% of reading $+ 60 \mu V$ 10 kHz to 20 kHz $3.3 V to 33 V$ 0.07% of reading $+ 60 \mu V$ 20 kHz to 50 kHz $3.3 V to 33 V$ 0.1% of reading $+ 60 \mu V$ 50 kHz to 100 kHz $3.3 V to 33 V$ 0.23% of reading $+ 200 \mu V$ Equipment to Output AC Voltage 0.23% of reading $+ 200 \mu V$	
10 Hz to 45 Hz $3.3 V$ to $33 V$ 0.05% of reading $+ 60 \mu V$ 45 Hz to 10 kHz $3.3 V$ to $33 V$ 0.03% of reading $+ 60 \mu V$ 10 kHz to 20 kHz $3.3 V$ to $33 V$ 0.07% of reading $+ 60 \mu V$ 20 kHz to 50 kHz $3.3 V$ to $33 V$ 0.1% of reading $+ 60 \mu V$ 50 kHz to 100 kHz $3.3 V$ to $33 V$ 0.23% of reading $+ 200 \mu V$ Equipment to Output AC Voltage 0.23% of reading $+ 200 \mu V$	librator
45 Hz to 10 kHz 3.3 V to 33 V 0.03 % of reading + 60 μV 10 kHz to 20 kHz 3.3 V to 33 V 0.07 % of reading + 60 μV 20 kHz to 50 kHz 3.3 V to 33 V 0.1 % of reading + 60 μV 50 kHz to 100 kHz 3.3 V to 33 V 0.23 % of reading + 200 μV Equipment to Output AC Voltage 0.23 % of reading + 200 μV	
10 kHz to 20 kHz 3.3 V to 33 V 0.07 % of reading + 60 μV 20 kHz to 50 kHz 3.3 V to 33 V 0.1 % of reading + 60 μV 50 kHz to 100 kHz 3.3 V to 33 V 0.23 % of reading + 200 μV Equipment to Output AC Voltage AC Voltage	
20 kHz to 50 kHz 3.3 V to 33 V 0.1 % of reading + 60 μV 50 kHz to 100 kHz 3.3 V to 33 V 0.23 % of reading + 200 μV Equipment to Output AC Voltage Δ	
50 kHz to 100 kHz 3.3 V to 33 V 0.23 % of reading + 200 μV Equipment to Output AC Voltage Δ	
Equipment to Output AC Voltage	
at the listed frequencies.	
45 kHz to 1 kHz 33 V to 330 V 0.05 % of reading + 3 mV	
1 kHz to 10 kHz 33 V to 330 V 0.08 % of reading + 9 mV	
10 kHz to 20 kHz 33 V to 330 V 0.09 % of reading + 9 mV	
20 kHz to 50 kHz 33 V to 330 V 0.12 % of reading + 9 mV	
50 kHz to 100 kHz 33 V to 330 V 0.24 % of reading + 80 mV	
Equipment to Output AC Voltage at the listed frequencies ^{FO}	
45 kHz to 1 kHz 330 V to 1 020 V 0.05 % of reading + 20 mV	
1 kHz to 5 kHz 330 V to 1 020 V 0.08 % of reading + 20 mV	
5 kHz to 10 kHz 330 V to 1 020 V 0.09 % of reading + 20 mV	
Equipment to Output AC Current at the listed frequencies ^{FO}	
10 Hz to 20 Hz $29 \mu\text{A}$ to 330 μA 0.2 % of reading + 0.1 μA	
20 Hz to 45 Hz 29 μA to 330 μA 0.15 % of reading + 0.1 μA	
45 Hz to 1 kHz 29 μA to 330 μA 0.125 % of reading + 0.1 μA	
1 kHz to 5 kHz 29 μA to 330 μA 0.3 % of reading + 0.15 μA	
5 kHz to 10 kHz 29 μA to 330 μA 0.8 % of reading + 0.2 μA	
10 kHz to 30 kHz 29 μA to 330 μA 1.6 % of reading + 0.4 μA	
Equipment to Output AC Current at the listed frequencies ^{FO}	
10 Hz to 20 Hz 0.33 mA to 3.3 mA 0.2 % of reading + 0.15 μA	
20 Hz to 45 Hz 0.33 mA to 3.3 mA 0.125 % of reading + 0.15 μA	
45 Hz to 1 kHz 0.33 mA to 3.3 mA 0.1 % of reading + 0.15 μA	
1 kHz to 5 kHz 0.33 mA to 3.3 mA 0.2 % of reading + 0.2 μA	
5 kHz to 10 kHz 0.33 mA to 3.3 mA 0.5 % of reading + 0.3 μA	
10 kHz to 30 kHz 0.33 mA to 3.3 mA 1 % of reading + 0.6 μA	



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Equipment to Output AC C	urrent		Fluke 5502A
at the listed frequencies ^{FO}			Calibrator
10 Hz to 20 Hz	3.3 mA to 33 mA	0.18 % of reading + 2 μ A	_
20 Hz to 45 Hz	3.3 mA to 33 mA	0.09 % of reading + 2 μ A	_
45 Hz to 1 kHz	3.3 mA to 33 mA	0.04 % of reading + 2 μ A	
1 kHz to 5 kHz	3.3 mA to 33 mA	0.08 % of reading + $2 \mu A$	
5 kHz to 10 kHz	3.3 mA to 33 mA	0.2 % of reading + 3 μ A	
10 kHz to 30 kHz	3.3 mA to 33 mA	0.4 % of reading + 4 μ A	
Equipment to Output AC C at the listed frequencies ^{FO}	urrent		
10 Hz to 20 Hz	33 mA to 330 mA	0.18 % of reading + 20 µA	-
20 Hz to 45 Hz	33 mA to 330 mA	0.09 % of reading + 20 µA	
45 Hz to 1 kHz	33 mA to 330 mA	0.04 % of reading + 20 µA	
1 kHz to 5 kHz	33 mA to 330 mA	0.1 % of reading + 50 µA	-
5 kHz to 10 kHz	33 mA to 330 mA	0.2 % of reading + 100 µA	-
10 kHz to 30 kHz	33 mA to 330 mA	0.4 % of reading + 200 µA	_
Equipment to Output AC C at the listed frequencies ^{FO}	urrent		
10 Hz to 45 Hz	0.33 A to 1.1 A	0.18 % of reading + 100 µA	-
45 Hz to 1 kHz	0.33 A to 1.1 A	0.05 % of reading + 100 µA	_
1 kHz to 5 kHz	0.33 A to 1.1 A	0.6 % of reading + 1 mA	_
5 kHz to 10 kHz	0.33 A to 1.1 A	2.5 % of reading + 5 mA	_
Equipment to Output AC C at the listed frequencies ^{FO}	urrent		
10 Hz to 45 Hz	1.1 A to 3 A	0.18 % of reading + 100 µA	
45 Hz to 1 kHz	1.1 A to 3 A	0.06 % of reading + 100 µA	
1 kHz to 5 kHz	1.1 A to 3 A	0.6 % of reading + 1 mA	
5 kHz to 10 kHz	1.1 A to 3 A	2.5 % of reading + 5 mA	_
Equipment to Output AC C at the listed frequencies ^{FO}	urrent		
10 Hz to 45 Hz	3 A to 11 A	0.06 % of reading + 2 mA	1
45 Hz to 1 kHz	3 A to 11 A	0.1 % of reading + 2 mA	1
1 kHz to 5 kHz	3 A to 11 A	3 % of reading + 2 mA	1
Equipment to Output AC C at the listed frequencies ^{FO}	urrent	1	1
10 Hz to 45 Hz	11 A to 20.5 A	0.12 % of reading + 5 mA	1
45 Hz to 1 kHz	11 A to 20.5 A	0.15 % of reading + 5 mA	1
1 kHz to 5 kHz	11 A to 20.5 A	3 % of reading + 5 mA	

This supplement is in conjunction with certificate #L17-549



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Equipment to Output DC	0.01 mV to 330 mV	0.006 % of reading + 3 μ V	Fluke 5502A
Voltage ^{FO}	330 mV to 3.3 V	0.005 % of reading + 5 μ V	Calibrator
	3.3 V to 33 V	0.005 % of reading + 50 μ V	-
	30 V to 330 V	0.005 5 % of reading + 500 μ V	-
	100 V to 1 020 V	0.005 5 % of reading + 1.5 mV	-
Equipment to Output	Up to 399.9 pF	0.5 % of reading + 0.01 nF	-
Capacitance ^{FO}	0.4 nF to 1.099 9 nF	0.5 % of reading + 0.01 nF	-
	1.1 nF to 3.299 9 nF	0.5 % of reading + 0.01 nF	_
	3.3 nF to 10.999 nF	0.25 % of reading + 0.01 nF	_
	11 nF to 32.999 nF	0.25 % of reading + 0.1 nF	-
	33 nF to 109.99 nF	0.25 % of reading + 0.1 nF	
	110 nF to 329.99 nF	0.25 % of reading + 0.3 nF	
	0.33 µF to 1.099 9 µF	0.25 % of reading + 1 nF	
	1.1 µF to 3.299 9 µF	0.25 % of reading + 3 nF	
	3.3 µF to 10.999 µF	0.25 % of reading + 10 nF	
	11 μF to 32.999 μF	0.4 % of reading + 30 nF	
	33 µF to 109.99 µF	0.45 % of reading + 100 nF	_
	110 µF to 329.99 µF	0.45 % of reading + 300 nF	_
	0.33 to 1.099 9 mF	0.45 % of reading + 1 μ F	1
	1.1 mF to 3.299 9 mF	0.45 % of reading + 3 µF	1
	3.3 mF to 10.999 mF	0.45 % of reading + 10 µF	1
	11 mF to 32.999 mF	0.75 % of reading + 30 µF	1
	33 mF to 110 mF	1.1 % of reading + 100 µF	1



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Electrical			
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Equipment to Output	0.01 Ω to 11 Ω	0.012 % of reading + 1 m Ω	Fluke 5502A
Resistance ^{FO}	11 Ω to 33 Ω	0.012 % of reading + 1.5 m Ω	Calibrator
	33 Ω to 110 Ω	0.009 % of reading + 1.5 m Ω	
	110 Ω to 330 Ω	0.009 % of reading + 2.0 m Ω	
	330 Ω to 1.1 k Ω	0.009 % of reading + 2.0 m Ω	
	1.1 k Ω to 3.3 k Ω	0.009 % of reading + 20 m Ω	
	3.3 k Ω to 11 k Ω	0.009 % of reading + 20 m Ω	
	11 k Ω to 33 k Ω	0.009 % of reading + 200 m Ω	
	33 kΩ to 110 kΩ	0.011 % of reading + 200 m Ω	
	110 kΩ to 330 kΩ	0.012 % of reading + 2 Ω	
	330 kΩ to 1.1 MΩ	0.015 % of reading + 2 Ω	
	1.1 MΩ to 3.3 MΩ	0.015 % of reading + 30 Ω	
	3.3 M Ω to 11 M Ω	0.06 % of reading + 50 Ω	
	11 MΩ to 33 MΩ	0.1 % of reading + 2 500 Ω	
	33 MΩ to 110 MΩ	0.5 % of reading + 3 k Ω	
	110 M Ω to 330 M Ω	0.5 % of reading + 100 k Ω	
	330 MΩ to 1 100 MΩ	1.5 % of reading + 500 k Ω	
Equipment to Measure AC	Current at the listed Frequencies	FO	Fluke 8846A
10 Hz to 5 kHz	0.1 μA to 100 μA	0.1 % of reading + 0.4 μ A	
5 kHz to 10 kHz	0.1 µA to 100 µA	0.2 % of reading + 2.5 µA	
Equipment to Measure AC	Current at the listed Frequencies	FO	
10 Hz to 5 kHz	100 µA to 1 mA	0.15 % of reading + $6 \mu A$	
5 kHz to 10 kHz	100 µA to 1 mA	0.35 % of reading + 70 µA	
Equipment to Measure AC	Current at the listed Frequencies	FO	
10 Hz to 5 kHz	1 mA to 10 mA	0.1 % of reading + 40 μ A	
5 kHz to 10 kHz	1 mA to 10 mA	0.2 % of reading + 250 μ A	
Equipment to Measure AC	Current at the listed Frequencies	FO	
10 Hz to 5 kHz	10 mA to 100 mA	0.1 % of reading + 0.4 mA]
5 kHz to 10 kHz	10 mA to 100 mA	0.2 % of reading + 2.8 mA	
Equipment to Measure AC	Current at the listed Frequencies	FO	
10 Hz to 1 kHz	100 mA to 400 mA	0.1 % of reading + 0.4 μ A	
1 kHz to 10 kHz	100 mA to 400 mA	0.2 % of reading + 2.5 µA]
Equipment to Measure AC	Current at the listed Frequencies	FO	
10 Hz to 5 kHz	0.4 A to 1 A	0.1 % of reading + 0.4 μ A	
5 kHz to 10 kHz	0.4 A to 1 A	0.35 % of reading + 7 µA	

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Electrical MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED	CALIBRATION EQUIPMENT AND REFERENCE
Equipment to Measure AC Current at the listed Frequencies ^{FO}			STANDARDS USED Fluke 8846A
10 Hz to 5 kHz	1 A to 3 A	0.15 % of reading + 6 mA	Fluke 8640A
5 kHz to 10 kHz	1 A to 3 A		
		0.35 % of reading + 70 mA	
	Current at the listed Frequencies		_
10 Hz to 5 kHz	3 A to 10 A	0.15 % of reading + 6 mA	_
5 kHz to 10 kHz	3 A to 10 A	0.35 % of reading + 70 mA	_
Equipment to Measure DC Voltage ^{FO}	1 µV to 100 mV	0.003 7 % of reading + 3.5 µV	
DC Voltage	100 mV to 1 V	0.002 5 % of reading + 7 μ V	
	1 V to 10 V	0.002 4 % of reading + 0.05 mV	
	10 V to 100 V	0.003 8 % of reading + 0.6 mV	
	100 V to 1 000 V	0.004 1 % of reading + 10 mV	
Equipment to Measure	0.1 mV to 100 mV	0.06 % of reading + 0.04 mV	
AC Voltage ^{FO}	100 mV to 1 V	0.06 % of reading + 0.3 mV	
10 Hz to 20 kHz	1 V to 10 V	0.06 % of reading + 3 mV	
	10 V to 100 V	0.06 % of reading + 30 mV	
	100 V to 1 000 V	0.06 % of reading + 225 mV	-
Equipment to Measure	0.1 nF to 1 nF	2 % of reading + 0.025 nF	-
Capacitance ^{FO}	1 nF to 10 nF	1 % of reading + 0.05 nF	
	10 nF to 100 nF	1 % of reading + 0.5 nF	-
	0.1 µF to 1 µF	1 % of reading + 5 nF	
	1 μF to 10 μF	1 % of reading + 50 nF	
	10 μF to 100 μF	1 % of reading $+ 0.5 \mu\text{F}$	-
	0.01 mF to 1 mF	1 % of reading + 0.005 mF	
	1 mF to 10 mF	1 % of reading + 0.05 mF	
Equipment to Measure	0.1 Ω to 10 Ω	0.01 % of reading + 3 m Ω	-
Resistance ^{FO}	10 Ω to 100 Ω	0.01 % of reading + 4 m Ω	
	100 Ω to 1 k Ω	0.01 % of reading + 10 m Ω	1
	1 kΩ to 10 kΩ	0.01 % of reading + 100 m Ω	1
	10 k Ω to 100 k Ω	0.01 % of reading + 1 Ω	1
	100 k Ω to 1 M Ω	0.01 % of reading + 10 Ω	4
	1 MΩ to 10 MΩ	0.04 % of reading + 100 Ω	4
	10 MΩ to 100 MΩ	0.8 % of reading + 10 k Ω	4



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Equipment to Measure	0.01 µA to 100 µA	0.05% of reading + 0.025 µA	Fluke 8846A
DC Current ^{FO}	100 µA to 1 mA	0.05 % of reading + 0.05 µA	
	1 mA to 10 mA	0.05 % of reading + 2 µA	
	10 mA to 100 mA	0.05 % of reading + 5 µA	
	100 mA to 400 mA	0.05 % of reading + 20 µA	
	0.4 A to 1 A	0.05 % of reading + 0.2 mA	
	1 A to 3 A	0.1 % of reading + 2 mA	
	3 A to 10 A	0.15 % of reading + 0.8 mA	
Temperature Calibration,	600 °C to 800 °C	0.51 °C	Electrical
Indication and Control	800 °C to 1 000 °C	0.39 °C	Simulation of
Equipment used with Thermocouple Type B ^{FO}	1 000 °C to 1 550 °C	0.35 °C	ThermocoupleOutput Fluke
Thermocoupie Type D	1 550 °C to 1 820 °C	0.38 °C	5502A
Temperature Calibration,	0 °C to 150 °C	0.35 °C	
Indication and Control	150 °C to 650 °C	0.3 °C	
Equipment used with Thermocouple Type C ^{FO}	650 °C to 1 000 °C	0.36 °C	
Thermocoupie Type C	1 000 °C to 1 800 °C	0.58 °C	
	1 800 °C to 2 316 °C	0.97 °C	_
Temperature Calibration,	-250 °C to -100 °C	0.58 °C	
Indication and Control	-100 °C to -25 °C	0.2 °C	
Equipment used with Thermocouple Type E ^{FO}	-25 °C to 350 °C	0.18 °C	
Thermocoupie Type L	350 °C to 650 °C	0.20 °C	
	650 °C to 1 000 °C	0.25 °C	
Temperature Calibration,	-210 °C to -100 °C	0.32 °C	
Indication and Control Equipment used with	-100 °C to -30 °C	0.2 °C	
Thermocouple Type J ^{FO}	-30 °C to 150 °C	0.18 °C	
Thermocoupie Type y	150 °C to 760 °C	0.21 °C	
	760 °C to 1 200 °C	0.27 °C	7
Temperature Calibration,	-200 °C to -100 °C	0.39 °C	
Indication and Control	-100 °C to -25 °C	0.22 °C	7
Equipment used with Thermocouple Type K ^{FO}	-25 °C to 120 °C	0.2 °C	
	120 °C to 1 000 °C	0.31 °C	7
	1 000 °C to 1 372 °C	0.47 °C	1



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QUANTITI OK GAUGE	SIZE AS ALL KOLKIATE	CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	AND REFERENCE STANDARDS USED
Temperature Calibration,	-200 to -100 C	0.43 °C	Electrical
Indication and Control	-100 C to 800 °C	0.31 °C	Simulation of
Equipment used with Thermocouple Type L ^{FO}	800 °C to 900 °C	0.21 °C	 Thermocouple Output Fluke
Temperature Calibration,	-200 to -100 °C	0.47 °C	5502A
Indication and Control	-100 °C to -25 °C	0.26 °C	
Equipment used with Thermocouple Type N ^{FO}	-25 °C to 120 °C	0.23 °C	
Thermoeouple Type IV	120 °C to 410 °C	0.22 °C	
	410 °C to 1 300 °C	0.32 °C	
Temperature Calibration,	0 °C to 250 °C	0.66 °C	
Indication and Control	250 °C to 400 °C	0.41 °C	
Equipment used with Thermocouple Type R ^{FO}	400 °C to 1 000 °C	0.39 °C	
1 51	1 000 °C to 1 767 °C	0.47 °C	
Temperature Calibration,	0 °C to 250 °C	0.55 °C	
Indication and Control	250 °C to 1 000 °C	0.42 °C	
Equipment used with Thermocouple Type S ^{FO}	1 000 °C to 1 400 °C	0.43 °C	
	1 400 °C to 1 767 °C	0.54 °C	
Temperature Calibration,	-250 to -150 °C	0.73 °C	
Indication and Control	-150 °C to 0 °C	0.29 °C	
Equipment used with Thermocouple Type T ^{FO}	0 °C to 120 °C	0.2 °C	
1 11	120 °C to 400 °C	0.18 °C	
Temperature Calibration,	-200 °C to 0 °C	0.65 °C	
Indication and Control Equipment used with			
Thermocouple Type U ^{FO}			

Mass, Force, and Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Laboratory Balances ^{FO}	20 mg to 200 g (Resolution: 0.1 mg)	0.63 mg	Class 1 Weights



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QUANTITY OR GAUGE	DEVICE SIZE AS	CAPABILITY EXPRESSED	EQUIPMENT AND REFERENCE
	APPROPRIATE	AS AN UNCERTAINTY (±)	STANDARDS USED
Pressure Gages FO	-12 psi to 20 psi	0.145% of indicated value + 0.03 psig	Crystal – M1-
			100PSI
	20 psi to 100 psi	0.223 % of indicated value + 0.011 psig	Crystal – M1-
			100PSI
	100 psi to 500 psi	0.112 % of indicated value + 0.021 psig	Crystal –
			500PSIXP2I
	200 psi to 1 000 psi	0.103 % of indicated value + 0.17 psig	Crystal –
			1KPSIXP2I
	1 000 psi to 5 000 psi	0.113 % of indicated value + 0.31 psig	Crystal –
			5KPSIXP2I
	-12 psi to 20 psi	0.145% of indicated value + 0.03 psig	Crystal – M1-
			100PSI
	20 psi to 100 psi	0.223 % of indicated value + 0.011 psig	Crystal – M1-
			100PSI
	100 psi to 500 psi	0.112 % of indicated value + 0.021 psig	Crystal –
			500PSIXP2I
Torque Wrenches FO	25 lbf·in to 250 lbf·in	0.51 % of indicated value $+$ 0.17 lbf·in	Mountz – LTT-
			2501
	25 lbf·ft to 250 lbf·ft	0.582 % of indicated value + 0.16 lbf ft	Mountz –
			BMX250F

Time & Frequency

MEASURED INSTRUMENT,	RANGE OR NOMINAL	CALIBRATION AND MEASUREMENT	CALIBRATION
QUANTITY OR GAUGE	DEVICE SIZE AS	CAPABILITY EXPRESSED	EQUIPMENT
	APPROPRIATE	AS AN UNCERTAINTY (±)	AND REFERENCE
			STANDARDS USED
Stopwatch/ Timer FO	1 minute to 24 hr	0.61 s	Agilent 53131A

- 1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represents the smallest measurement uncertainty attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is typically expressed at a confidence level of 95 % using a coverage factor k (usually equal to 2). The actual measurement uncertainty associated with a specific calibration performed by the laboratory will typically be larger than the CMC for the same calibration since capability and performance of the device being calibrated and the conditions related to the calibration may reasonably be expected to deviate from ideal to some degree.
- 2. The laboratories range of calibration capability for all disciplines for which they are accredited is the interval from the smallest calibrated standard to the largest calibrated standard used in performing the calibration. The low end of this range must be an attainable value for which the laboratory has or has access to the standard referenced. Verification of an indicated value of zero in the absence of a standard is common practice in the procedure for many calibrations but by its definition it does not constitute calibration of zero capacity.



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- 3. The presence of a superscript FO means that the laboratory performs calibration of the indicated parameter both at its fixed location and onsite at customer locations. Example: Outside Micrometer^{FO} would mean that the laboratory performs this calibration at its fixed location and onsite at customer locations.
- 4. Measurement uncertainties obtained for calibrations performed at customer sites can be expected to be larger than the measurement uncertainties obtained at the laboratories fixed location for similar calibrations. This is due to the effects of transportation of the standards and equipment and upon environmental conditions at the customer site which are typically not controlled as closely as at the laboratories fixed location.
- 5. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.
- 6. The term R represents the numerical value of the resolution of the device in micro inches.

