



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005
& ANSI/NCSL Z540-1-1994

Brylen Technologies

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CALIBRATION AND TESTING

Valid to: July 11, 2010

Certificate Number: ACT-1201

I. Electromagnetic-DC/Low Frequency

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Voltage - Source	Up to 330 mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V 330 V to 1.02 kV	60 μ V/V + 3 μ V 50 μ V/V + 5 μ V 50 μ V/V + 50 μ V 55 μ V/V + 500 μ V 55 μ V/V + 1.5 mV	Fluke 5500A SC600	
DC Current - Source	Up to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 2.2 A (2.2 to 11) A	130 μ A/A + 50 nA 100 μ A/A + 250 nA 100 μ A/A + 3.3 μ A 300 μ A/A + 44 μ A 600 μ A/A + 330 μ A		
Resistance - Source	Up to 11 Ω (11 to 33) Ω (33 to 330) Ω 330 Ω to 1.1 k Ω (1.1 to 3.3) k Ω (3.3 to 11) k Ω (11 to 33) k Ω (33 to 110) k Ω (110 to 330) k Ω 330 k Ω to 1.1 M Ω (1.1 to 3.3) M Ω (3.3 to 11) M Ω (11 to 33) M Ω (33 to 110) M Ω (110 to 330) M Ω	120 μ Ω / Ω + 8 m Ω 120 μ Ω / Ω + 15 m Ω 90 μ Ω / Ω + 15 m Ω 90 μ Ω / Ω + 60 m Ω 90 μ Ω / Ω + 60 m Ω 90 μ Ω / Ω + 600 m Ω 90 μ Ω / Ω + 600 m Ω 110 μ Ω / Ω + 6 Ω 120 μ Ω / Ω + 6 Ω 150 μ Ω / Ω + 55 Ω 150 μ Ω / Ω + 55 Ω 600 μ Ω / Ω + 550 Ω 1 m Ω / Ω + 550 Ω 5 m Ω / Ω + 5.5 k Ω 5 m Ω / Ω + 16.5 k Ω	Fluke 5500A SC600	OEM and GIDEP Sourced Procedures
Fixed	500 μ Ω 2 m Ω 5 m Ω 10 m Ω	5 μ Ω / Ω 20 μ Ω / Ω 50 μ Ω / Ω 100 μ Ω / Ω	Simpson Current Shunts	



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Source	<p>Up to 33 mV (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz</p> <p>(33 to 330) mV (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz</p> <p>330 mV to 3.3 V (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz</p> <p>(3.3 to 33) V (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz</p> <p>(33 to 330) V 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz</p> <p>330 V to 1.02 kV 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz</p>	<p>3.5 mV/V + 20 μV 1.5 mV/V + 20 μV 2 mV/V + 20 μV 2.5 mV/V + 20 μV 3.5 mV/V + 33 μV 10 mV/V + 60 μV</p> <p>2.5 mV/V + 50 μV 500 μV/V + 20 μV 1 mV/V + 20 μV 1.6 mV/V + 40 μV 2.4 mV/V + 170 μV 7 mV/V + 330 μV</p> <p>1.5 mV/V + 250 μV 300 μV/V + 60 μV 800 μV/V + 60 μV 1.4 mV/V + 300 μV 2.4 mV/V + 1.7 mV 5 mV/V + 3.3 mV</p> <p>1.5 mV/V + 2.5 mV 400 μV/V + 600 μV 800 μV/V + 2.6 mV 1.9 mV/V + 5 mV 2.4 mV/V + 17 mV</p> <p>500 μV/V + 6.6 mV 800 μV/V + 15 μV 900 μV/V + 33 μV</p> <p>500 μV/V + 80 mV 2 mV/V + 100 μV 2 mV/V + 500 μV</p>	Fluke 5500A SC600	OEM and GIDEP Sourced Procedures
AC Current - Source	<p>(30 to 330) μA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz</p> <p>330 μA to 3.3 mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz</p>	<p>2.5 mA/A + 150 nA 1.25 mA/A + 150 nA 1.25 mA/A + 250 nA 4 mA/A + 150 nA 12.5 mA/A + 150 nA</p> <p>2 mA/A + 300 nA 1 mA/A + 300 nA 1 mA/A + 300 nA 2 mA/A + 300 nA 6 mA/A + 300 nA</p>		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current – Source (Cont.)	(3.3 to 33) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (33 to 330) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz 330 mA to 2.2 A (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (2.2 to 11) A (45 to 65) Hz 65 Hz to 500 Hz 500 Hz to 1 kHz	2 mA/A + 3 μA 1 mA/A + 3 μA 900 μA/A + 3 μA 2 mA/A + 3 μA 6 mA/A + 3 μA 2 mA/A + 30 μA 1 mA/A + 30 μA 900 μA/A + 30 μA 2 mA/A + 30 μA 6 mA/A + 30 μA 2 mA/A + 300 μA 1 mA/A + 300 μA 7.5 mA/A + 300 μA 600 μA/A + 2 mA 1 mA/A + 2 mA 3.3 mA/A + 2 mA	Fluke 5500A SC600	OEM and GIDEP Sourced Procedures
Capacitance - Source	(330 to 500) pF 500 pF to 1.1 nF (1.1 to 3.3) nF (3.3 to 11) nF (11 to 33) nF (33 to 110) nF (110 to 330) nF 330 nF to 1.1 μF (1.1 to 3.3) μF (3.3 to 11) μF (11 to 33) μF (33 to 110) μF (110 to 330) μF 330 μF to 1.1 mF	5 mF/F + 10 pF 5 mF/F + 10 pF 5 mF/F + 10 pF 5 mF/F + 10 pF 2.5 mF/F + 100 pF 2.5 mF/F + 100 pF 2.5 mF/F + 100 pF 2.5 mF/F + 100 pF 2.5 mF/F + 1 nF 3.5 mF/F + 3 nF 3.5 mF/F + 10 nF 4 mF/F + 30 nF 5 mF/F + 100 nF 7 mF/F + 300 nF 10 mF/F + 300 nF		
Electrical Simulation of Thermocouple Indicators Type B Type C	(600-800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C (0 to 15) °C (150 to 650) °C (650 to 1 000) °C (1 000 to 1 800) °C (1 800 to 2 316) °C	0.44 °C 0.34 °C 0.3 °C 0.33 °C 0.3 °C 0.26 °C 0.31 °C 0.5 °C 0.84 °C		



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Electrical Simulation of Thermocouple Indicators (Cont.)				
Type E	(-250 to -100) °C	0.5 °C		
	(-100 to -25) °C	0.16 °C		
	(-25 to 350) °C	0.14 °C		
	(350 to 650) °C	0.16 °C		
	(650 to 1 000) °C	0.21 °C		
Type J	(-210 to -100) °C	0.27 °C		
	(-100 to -30) °C	0.16 °C		
	(-30 to 150) °C	0.14 °C		
	(150 to 760) °C	0.17 °C		
	(760 to 1 200) °C	0.23 °C		
Type K	(200 to -100) °C	0.33 °C		
	(-100 to -25) °C	0.18 °C		
	(-25 to 120) °C	0.16 °C		
	(120 to 1 000) °C	0.26 °C		
	(1 000 to 1 372) °C	0.4 °C		
Type L	(200 to -100) °C	0.37 °C		
	(-100 to 800) °C	0.26 °C		
	(800 to 900) °C	0.17 °C	Fluke 5500A SC600	OEM and GIDEP Sourced Procedures
Type N	(-200 to -100) °C	0.4 °C		
	(-100 to -25) °C	0.22 °C		
	(-25 to 120) °C	0.19 °C		
	(120 to 410) °C	0.18 °C		
	(410 to 1 300) °C	0.27 °C		
Type R	(0 to 250) °C	0.57 °C		
	(250 to 400) °C	0.35 °C		
	(400 to 1 000) °C	0.33 °C		
	(1 000 to 1 767) °C	0.4 °C		
Type S	(0 to 250) °C	0.47 °C		
	(250 to 1 000) °C	0.36 °C		
	(1 000 to 1 400) °C	0.37 °C		
	(1 400 to 1 767) °C	0.46 °C		
Type T	(-250 to -150) °C	0.63 °C		
	(-150 to 0) °C	0.24 °C		
	(0 to 120) °C	0.16 °C		
	(120 to 400) °C	0.14 °C		
Type U	(-200 to 0) °C	0.56 °C		
	(0 to 600) °C	0.27 °C		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Electrical Simulation of RTDs				
Pt 385 (100 Ω)	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C	0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C 0.23 °C		
Pt 3926 (100 Ω)	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C		
Pt 3916 (100 Ω)	(-200 to -190) °C (-190 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.25 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.19 °C 0.1 °C 0.23 °C		
Pt 385 (200 Ω)	(-200 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.04 °C 0.05 °C 0.12 °C 0.13 °C 0.14 °C 0.16 °C	Fluke 5500A SC600	OEM and GIDEP Sourced Procedures
Pt 385 (500 Ω)	(-200 to -80) °C (-80 to 100) °C (100 to 260) °C (260 to 400) °C (400 to 600) °C (600 to 630) °C	0.04 °C 0.05 °C 0.06 °C 0.08 °C 0.09 °C 0.11 °C		
Pt 385 (1 000 Ω)	(-200 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 600) °C (600 to 630) °C	0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.23 °C		
Ni 120 (120 Ω)	(-80 to 100) °C (100 to 260) °C	0.08 °C 0.14 °C		
Cu 427 (10 Ω)	(-100 to 260) °C	0.3 °C		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Oscilloscopes				
Amplitude DC Signal into 50 Ω load into 1M Ω load	(-6.6 to 6.6) V (-130 to 130) V	2.5 mV/V + 40 μV 500 μV/V + 40 μV	Fluke 5500A SC600	OEM and GIDEP Sourced Procedures
Amplitude Squarewave 50 Ω load	±1 mV to ±6.6 V p-p 10 Hz to 10 kHz	2.5 mV/V + 40 μV		
1MΩ load	±1 mV to ±130 V p-p 10 Hz to 10 kHz (1 to 10) kHz	1 mV/V + 40 μV 2.5 mV/V + 40 μV		
Rise Time	< 300 ps	+0 ps/-100 ps		
Leveled Sine Wave Relative to 50 kHz [5 mV to 5.5 V] p-p	50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	1.5 μV/V + 100 μV 2 μV/V + 100 μV 4 μV/V + 100 μV		
Time Marker into 50 Ω Load-Source	5 s to 50 ms 20 ms to 2 ns	(25 + 1 000t) μs/s 2.5 μs/s		
Rise Time 50 Ω Load Range (p-p)	≤350 ps 5 mV to 2.5 V	(0/-100) ps 20 mV/V + 200 μV		
Wave Generator - Source Amplitude (10 Hz to 10 kHz) square, sine, triangle into 1 MΩ	1.8 mV to 55 V p-p	30 mV/V + 100 μV		
square, sine, triangle into 50 Ω	1.8 mV to 2.5 V p-p	30 mV/V + 100 μV		
DC Voltage - Measure	Up to 100 mV 100 mV to 1 V (1 to 10) V (10 to 100) V 100 V to 1 kV	7 μV/V + 1 μV 6 μV/V + 1 μV 6 μV/V + 2 μV 8 μV/V + 30 μV 8 μV/V + 100 μV + 12 μV/V*(V _{in} /1000) ²		
Resistance - Measure	Up to 10 Ω (10 to 100) Ω 100 Ω to 1 kΩ (1 to 10) kΩ (10 to 100) kΩ 100 k Ω to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ 100 M Ω to 1 GΩ	18 μΩ/Ω + 50 μΩ 15 μΩ/Ω + 500 μΩ 13 μΩ/Ω + 500 μΩ 13 μΩ/Ω + 5 mΩ 13 μΩ/Ω + 50 mΩ 18 μΩ/Ω + 2 Ω 53 μΩ/Ω + 100 Ω 503 μΩ/Ω + 1 kΩ 5 mΩ/Ω + 10 kΩ		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Current - Measure	Up to 100 nA 100 nA to 1 μ A (1 to 10) μ A (10 to 100) μ A 100 μ A to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	35 μ A/A + 40 pA 25 μ A/A + 40 pA 25 μ A/A + 100 pA 25 μ A/A + 800 pA 25 μ A/A + 5 nA 25 μ A/A + 50 nA 40 μ A/A + 500 nA 115 μ A/A + 10 μ A	HP 3458A	OEM and GIDEP Sourced Procedures
AC Voltage - Measure	Up to 10 mV (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 4) MHz (4 to 8) MHz (10 to 100 mV) (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 4) MHz (4 to 8) MHz (8 to 10) MHz 100 mV to 1 V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 4) MHz (4 to 8) MHz (8 to 10) MHz	302 μ V/V + 3 μ V 202 μ V/V + 1.1 μ V 302 μ V/V + 1.1 μ V 1 mV/V + 1.1 μ V 5 mV/V + 1.1 μ V 40 mV/V + 2 μ V 12 mV/V + 5 μ V 70 mV/V + 7 μ V 70 mV/V + 7 μ V 72 μ V/V + 4 μ V 72 μ V/V + 2 μ V 142 μ V/V + 2 μ V 302 μ V/V + 2 μ V 802 μ V/V + 2 μ V 3 mV/V + 10 μ V 10 mV/V + 10 μ V 15 mV/V + 10 μ V 40 mV/V + 8 μ V 150 mV/V + 100 μ V 72 μ V/V + 40 μ V 72 μ V/V + 20 μ V 142 μ V/V + 20 μ V 302 μ V/V + 20 μ V 802 μ V/V + 20 μ V 3 mV/V + 100 μ V 10 mV/V + 100 μ V 15 mV/V + 100 μ V 40 mV/V + 800 μ V 150 mV/V + 1 mV		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage – Measure (Cont.)	<p>(1 to 10) V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 4) MHz (4 to 8) MHz (8 to 10) MHz</p> <p>(10 to 100) V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz</p> <p>100 to 1 kV (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz</p>	<p>72 $\mu\text{V}/\text{V}$ + 400 μV 72 $\mu\text{V}/\text{V}$ + 200 μV 142 $\mu\text{V}/\text{V}$ + 200 μV 302 $\mu\text{V}/\text{V}$ + 200 μV 802 $\mu\text{V}/\text{V}$ + 200 μV 3 mV/V + 1 mV 10 mV/V + 1 mV 15 mV/V + 1 mV 40 mV/V + 8 mV 150 mV/V + 10 mV</p> <p>202 $\mu\text{V}/\text{V}$ + 4 mV 202 $\mu\text{V}/\text{V}$ + 2 mV 202 $\mu\text{V}/\text{V}$ + 2 mV 352 $\mu\text{V}/\text{V}$ + 2 mV 1.2 mV/V + 2 mV 4 mV/V + 10 mV 15 mV/V + 10 mV</p> <p>402 $\mu\text{V}/\text{V}$ + 40 mV 402 $\mu\text{V}/\text{V}$ + 20 mV 602 $\mu\text{V}/\text{V}$ + 20 mV 1.2 mV/V + 20 mV 3 mV/V + 20 mV</p>	HP 3458A	OEM and GIDEP Sourced Procedures
AC Current - Measure	<p>(5 to 100) μA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 1 kHz</p> <p>100 μA to 1 mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz</p> <p>(1 to 10) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz</p>	<p>4 mA/A + 30 nA 1.5 mA/A + 30 nA 600 $\mu\text{A}/\text{A}$ + 30 nA 600 $\mu\text{A}/\text{A}$ + 30 nA</p> <p>4 mA/A + 200 nA 1.5 mA/A + 200 nA 600 $\mu\text{A}/\text{A}$ + 200 nA 300 $\mu\text{A}/\text{A}$ + 200 nA 600 $\mu\text{A}/\text{A}$ + 200 nA 4 mA/A + 400 nA 5.5 mA/A + 1.5 μA</p> <p>4 mA/A + 2 μA 1.5 mA/A + 2 μA 600 $\mu\text{A}/\text{A}$ + 2 μA 300 $\mu\text{A}/\text{A}$ + 2 μA 600 $\mu\text{A}/\text{A}$ + 2 μA 4 mA/A + 4 μA 5.5 mA/A + 15 μA</p>		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current – Measure (Cont.)	(10 to 100) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz 100 mA to 1 A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz	4 mA/A + 20 μ A 1.5 mA/A + 20 μ A 600 μ A/A + 20 μ A 300 μ A/A + 20 μ A 600 μ A/A + 20 μ A 4 mA/A + 40 μ A 5.5 mA/A + 150 μ A 4 mA/A + 200 μ A 1.6 mA/A + 200 μ A 800 μ A/A + 200 μ A 1 mA/A + 200 μ A 3 mA/A + 200 μ A 10 mA/A + 400 μ A	HP 3458A	OEM and GIDEP Sourced Procedures

II. Time & Frequency

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Frequency - Source	1 μ Hz to 50 kHz 50 kHz to 600 MHz	5 μ Hz/Hz 2.5 μ Hz/Hz	HP 3325A 5500A SC 600	OEM and GIDEP Sourced Procedures
Frequency - Measure	(1 to 40) Hz 40 Hz to 10 kHz 10 kHz to 10 MHz (10 to 100) MHz	500 μ Hz/Hz 100 μ Hz/Hz 3.6 μ Hz/Hz + 1 Hz 3.6 μ Hz/Hz + 10 Hz	HP 3458A Opt 002 HP 5314A	
Stopwatches and Timers	Up to 24 h	0.12 s	Time Signal Receiver	BP-026

III. Thermodynamic

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Humidity	(10 to 90) %RH	1.41 %RH	Vaisala HMI41 with Salts	OEM, ASTM and Internal Procedures
Temperature – Measure	(-20 to 60) °C	0.25 °C	Vaisala HMI41	OEM, ASTM and Internal Procedures
	(-270 to -210) °C	0.7 °C	Datalogger, Thermocouple	
	(-210 to 400) °C	0.62 °C	Fluke 5500A Calibrator with 3458A Opt 002 Multimeter	
	(400 to 1370) °C	1.32 °C		
(-270 to 400) °C	0.57 °C	PRT 5628 with 3458A Opt 002 Multimeter		
(400 to 1370) °C	1.26 °C			
Temperature – Generate	(-200 to 660) °C	0.061 °C		
	(-270 to 400) °C	0.57 °C	Fluke 5500A Calibrator with 3458A Opt 002 Multimeter	OEM, ASTM and Internal Procedures
(400 to 1370) °C	1.26 °C			
	(-20 to 400) °C	0.061 °C	PRT 5628 with 3458A Opt 002 Multimeter	
Thermocouple Wires	(-25 to 400) °C	0.03 °C	Fluke 5500A Calibrator with 3458A Opt 002 Multimeter	OEM, ASTM and Internal Procedures
Infrared Thermometers	(0 to 660) °C	0.31 °C	PRT 5628 with Keithley 2100 Multimeter	OEM, ASTM and Internal Procedures

IV. Mechanical

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Airspeed	(50 to 200) fpm (200 to 1 200) fpm	1.3 % reading + 5.8 fpm 1.5 % reading + 1.2 fpm	Anemometer	BP-024
Balances and Scales	Up to 210 g (210 to 2 000) g (2 to 20) kg Up to 300 lb (300 to 400) lb (400 to 2 000) lb	0.29 mg 6.56 mg 74.4 mg (0.01 + 0.56R) lb (0.02 + 0.56R) lb (0.1 + 1.1R) lb	Class 1 Weights Class 4 Weights Class 6 Weights	BP-042
Barometers	(28 to 32) in Hg	0.09 in Hg	351-DN 2000 Manometer and Princo 453X Barometer	BP-010
Durometers	Up to 135 duro pt	0.14 g	Class 4 Weights Analytical Balance	BP-035
Dynamometer	Up to 5 000 g (11 to 400) lb (400 to 1 000) lb (1 000 to 10 000) lb	(0.02 + 0.56R) g (0.02 + 0.56R) lb (0.64 + 0.43R) lb (3.91 to 0.28R) lb	Class 1 & S Weights Class 6 Weights Load Cell, Multimeter	BP-008
Flow Meters	Up to 2 L/min (2 to 20) L/min	0.34 % reading (0.15 + 0.5R) L/min	Flow Meter Calibrator, Stopwatch, Flow Meter	BP-037
Flow Calibrator	Up to 500 ml (500 to 2 000) ml	0.002 ml 0.015 ml	Balances	BP-161
Hardness Testers (Indirect Verification)	Scale HRA HRB HRC HRD HRE HRF	1.6 HRA 1.4 HRB 1.7 HRC 1.6 HRD 1.6 HRE 2.1 HRF	Test Blocks	BP-009
Force	Up to 210 g Up to 400 lb (400 to 1 000) lb (1 000 to 5 000) lb (5 000 to 10 000) lb	0.64 mg (0.03 %) as lb (0.02 % + 0.4) lb (0.03 % + 1.3) lb (0.02 % + 3.5) lb	Class 1 Weights Class 6 Weights Load Cell, Fluke 8842A Multimeter, Fluke 701 Calibrator	BP-044

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Mass / Weights	Up to 2 g (2 to 200) g (200 to 2 000) g (2 000 to 20 000) g	(0.67 % + 0.01) mg (0.34 % + 0.01) mg (0.84 % + 2) mg (0.2 % + 56) mg	Sartorius MC 210 S Sartorius 1518 AND EP20KA Class 1 and Class 6 Weights	BP-066
Pipettes	(0.5 to 10 000) µL	(0.04 % + 0.03) µL	Precision Balances, Distilled Water	BP-080, BP-108 (Gravimetric Method)
Volumetric Ware	Up to 2 000 mL	(0.04 %) as mL	Precision Balances, Distilled Water	BP-108 (Gravimetric Method)
Position Transducers	Up to 24 in (24 to 48) in (48 to 72) in	(0.003 x V/L) V (0.006 x V/L) V (0.009 x V/L) V	Height Gage, Keithley 2100 Multimeter	BP-109
Pressure Gages and Transducers	Up to 2 in H ₂ O (0.072 to 7.5) psi (7.5 to 60) psi (60 to 1 000) psi (1 000 to 10 000) psi	(0.000 6 + 0.53R) in H ₂ O (0.009 % + 0.47R) psi (0.018 % + 0.54R) psi (0.045 % + 0.47R) psi (0.057 % + 0.22R) psi	Microtector, Dead Weight Tester, Mensor 2400, Manometer	BP-145
Vacuum Gages	(0 to 30) in Hg	0.09 in Hg	351-DN 2000 Manometer	BP-103
Rate of Pull	Up to 24 in/min	(0.14 % + 0.013) in/min	Steel Rule, Stopwatch	BP-090
RPM Devices	Up to 30 000 rpm	(0.041 % + 0.5) rpm	Tachometer	BP-173
Tachometers	(20 to 300) rpm (300 to 3 000) rpm (3 000 to 30 000) rpm	(0.011 % + 0.014) rpm (0.011 % + 0.13) rpm (0.011 % + 1.33) rpm	Ametek 1965 Digistrobe	BP-087
Torque Measuring Devices and Transducers	Up to 27.6 lbf-in 27.6 lbf-in to 250 lbf-ft (250 to 1 000) lbf-ft Up to 90 in-lb	(0.016 % + 0.0033) lbf-in (0.31 % + 0.008) lbf-ft (0.088 % + 0.5) lbf-ft 0.59 lbf-in	CPT5002, Torque Arms, Class 6 Weights, Torque Tester, HP-100	BP-060

III. Dimensional

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Angle Plates	Up to 6 in	56 μin	Granite Cube, Mu-Checker, Surface Plate	BP-082
Angle Blocks	(0 to 99) $^{\circ}$	5 "	Rotary Table, Autocollimator	BP-079
Caliper Checker	Up to 8 in	(57 + 2L) μin	Mu-Checker, Height Master, Surface Plate	BP-095
Calipers	Up to 8 in (8 to 12) in (12 to 20) in (20 to 40) in (40 to 72) in Depth Inside Diameter	294 μin 289 μin 299 μin 594 μin 647 μin 285 μin 290 μin	Caliper Checker, Gage Blocks	BP-018
Depth Micrometers	Up to 12 in	(46 + 2.3L) μin	Gage Blocks and Surface Plate	BP-106
Dial Caliper Gages	Up to 4 in	(244 + 32L) μin	P&W Supermicrometer, Ring Gages	BP-137
Feeler Gages	Up to 0.01 in	35 μin	P&W Supermicrometer, Gage Blocks	BP-036
Gage Blocks	Up to 0.05 in (0.05 to 1) in (1 to 4) in (4 to 20) in (0.5 to 25.0) mm (25.0 to 100.0) mm	5.1 μin (4.3 + 0.3L) μin (3.2 + 1.5L) μin 2.5L μin (0.12 + 0.0003L) μm (0.085 + 0.0015L) μm	Gage Block Comparator or Mu-Checker and Grade 1 Gage Blocks	BP-038 BP-226
Height Gages	Up to 24 in	(297 + 0.8L) μin	Gage Blocks, Surface Plate, Test Indicator	BP-084
Height Master	Up to 18 in	(38.2 + 1.6L) μin	Mu-checker, Surface Plate, Gage Blocks	BP-025

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Indicators Drop and Test	Up to 4 in (4 to 10) in	(43 + 13L) μin (255 + 10.6L) μin	Micrometer Head, Gage Blocks Surface Plate	BP-034
Coax	Up to 0.2 in	36 μin	P&W Supermicrometer	BP-071
Inside Micrometers	Up to 4 in (4 to 24) in	72 μin (69 + 3.2L) μin	Ring Gages	BP-148
Levels	All	1.1 ”	Autocollimator	BP-043
Micrometers	Up to 3 in (3 to 20) in	34 μin (52 + 1.9L) μin	Gage Blocks	BP-045
Micrometer Heads	Up to 2 in	18 μin	Mu-Checker and Gage Blocks	BP-098
Mu Checkers	Up to 150 μin	3.9 μin	Gage Blocks	BP-091
Optical Comparator Linear Measurement X-axis and Y-axis	Up to 6 in (6 to 30) in	(60 + 0.6L) μin (13 + 8.3L) μin	Microrule Gage Blocks	BP-046
Angular Measurement	360 °	34 ”	Angle Blocks	
Plugs Cylindrical Pin Gage	Up to 3 in	(35 + 1.3L) μin	P&W Supermicrometer, Gage Blocks	BP-086
Protractors, Digital	360 °	22 ”	Rotary Table, Level	BP-112
Protractors, Bevel Angle Blade Parallelism	360 ° Up to 0.001 in	1’ 31” 34 μin	Angle Blocks, Mu-Checker, Surface Plate	BP-048
Threaded Plugs Pitch Diameter Major Diameter Angle	Up to 3 in Up to 3 in Up to 60 °	204 μin (35 + 1.3L) μin 80 ”	Gage Blocks, Thread Wires, P&W Supermicrometer Gage Blocks, Optical Comparator	BP-062
Threaded Ring Gages	Up to 1.25 in	304 μin	Setting Plug Gages	BP-147

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Radius Gauge	Up to 1 in	0.0006 in	Optical Comparator, Radius Screen	BP-073
Ring Gauge - Plain	(0.25 to 1) in (1 to 3) in	(22 + 2L) μin (11 + 13L) μin	Ring Comparator, Ring Gages	BP-049
Rotary Tables Angle Flatness/Parallelism	360 ° Up to 0.1 in	1.4 ” 35 μin	Autocollimator, Reflecting Cube, Mu Checker, Surface Plate	BP119
Sine Plate Angle Flatness & Parallelism	(15, 30, 45)° (5, 10) in Roller Spacing Up to 0.001 in	4.6 ” 35 μin	Angle Blocks, Gauge Blocks, Mu Checker, Surface Plate Mu Checker, Surface Plate	BP-051
Steel Rules	Up to 78 in	(131 + 32L) μin	Optical Comparator	BP-050
Surface Plates	Up to (72 x 144) in Flatness Repeat reading	(12.5 + 2.7D) μin 20.9 μin	Mu Checker or Autocollimator	BP-056
Thread Wires	(4 to 120) TPI	68 μin	Plug Gages, Supermicrometer, Gage Blocks	BP-089
Tri Mics	Up to 3 in	88 μin	Ring Gages	BP-148
V Anvil Micrometers	Up to 1 in	84 μin	Plain Plug Gages	BP-045
Vee Block Parallelism to Adjacent Side Parallelism to Opposite Side Side Squareness Surface Flatness & Parallelism	Up to 0.001 in Up to 0.001 in Up to 0.001 in Up to 0.001 in	67 μin 36 μin 56 μin 34 μin	Plug Gauge, Mu Checker, Surface Plate Angle Block, Mu Checker, Surface Plate Granite Cube, Mu Checker, Surface Plate Mu Checker, Surface Plate	BP-063

VI. Dimensional Inspection / Measurement

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Length	Up to 4 in	47 μ in	P&W Supermicrometer	BP -203
	(0 to 1) in x (3 to 4) in	76 μ in	Micrometer Set	
	Up to (4 x 2) in	(133 + L) μ in	Optical Comparator	
	Up to 18 in	(60 + 2.6L) μ in	Height Master, Mu Checker, Surface Plate	
	Up to 24 in	(32 + 1.3L) μ in	Gage Blocks, Mu Checker, Surface Plate	
	Up to 1 200 in (100 ft)	(0.009 + 0.00027L) in	Steel Rule	
Depth	(0 to 1) in	150 μ in	Drop Indicator	BP -203
Flatness & Parallelism	Up to 0.001 in	35 μ in	Mu Checker, Surface Plate	BP -203
Pin Gage Measurement	Up to 1 in	(118 + 8L) μ in	Pin Gage	BP -203
Squareness	Up to (8 x 8) in	56 μ in	Granite Cube, Mu Checker, Surface Plate	BP -203

Notes:

1. Best Measurement Capability (Expanded Uncertainties) are based on approximately a 95% confidence interval, using a coverage of $k=2$. The uncertainty of a specific calibration performed by the laboratory may differ from the reported uncertainty due to customer's device.
2. The listed uncertainties are based on calibrations done in Brylen's laboratory. Calibrations done at our customer's sites typically have greater uncertainties than listed in this scope.
3. The use of (L) represents Length in inches, (D) refers to Diagonal length in inches, (R) represents the Resolution of the unit under test and (%) signifies percent of applied load.
4. Uncertainties for Electromagnetic – DC/Low Frequency do not include possible contributions to uncertainty from the unit under test.
5. This scope is part of and must be included with the Certificate of Accreditation No. ACT-1201.

Karl Greenway

Vice President