FLUKE®

Calibration

5080A Multi-Product Calibrator

Calibration solutions for your analog and digital workload

FLUKE®
Calibration

General Specifications

All specifications are valid after a warm-up period of 30 minutes, or twice the time since last warmed up, to a maximum of 30 minutes. For example, if the 5080A has been turned off for 5 minutes, the warm-up period is 10 minutes.

All specifications apply for the temperature and time period indicated. For temperatures outside of tcal ±5 °C (tcal is the ambient temperature when the 5080A was calibrated), the temperature coefficient as stated in the General Specifications must be applied.

The specifications also assume the 5080A is zeroed every seven days or whenever the ambient temperature changes by more than 5 °C.

Warmup Time	Twice the time since last warmed up, to a maximum of 30 minutes.
Settling Time	Less than 7 seconds for all functions and ranges except as noted.
Standard Interfaces	RS-232 and Ethernet
Temperature	
Operating	0 °C to 50 °C
Calibration (tcal)	15 °C to 35 °C
Storage	-20 °C to +70 °C
Temperature Coefficient	Temperature coefficient for temperatures outside tcal ±5 °C is 10 % of the stated specification per °C for temperatures in the range of 0 °C to 35 °C. Above 35 °C, the temperature coefficient is 20 % of the stated specification per °C.
Relative Humidity	
Operating	<80 % to 30 °C, <70 % to 40 °C, <40 % to 50 °C.
Storage	<95 %, non-condensing
Altitude	
Operating	2,000 m (6,500 ft) maximum
Non-operating	12,200 m (40,000 ft) maximum
Safety	Meets EN 61010-1:2001, CAN/CSA-C22.2 No. 61010-1-04, UL 61010-1:2004 Insulation Class I (bonded enclosure) Pollution Degree 2 Indoor use only.
Analog Low Isolation	20 V
EMC	Meets EN 61326-1:2006.
Line Power	
Line Voltage (selectable)	100 V, 120 V, 220 V, 240 V
Line Frequency	47 to 63 Hz
Line Voltage Variation	±10 % about line voltage setting
Power Consumption	600 VA
Dimensions	
Height	19.3 cm (7.6 in)
Width	43.2 cm (17 in), 44.3 cm (17.5 in) including handles
Depth	53.8 cm (21.2 in)
Weight	22 kg (48 lb)
Specification Definition	The specifications include stability, temperature coefficient, linearity, line and load regulation, and the traceability of the external standards used for calibration. It is not necessary to add anything to determine the total specification for the temperature range indicated.
Specification Confidence Level	99 %

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Detailed Specifications

DC Voltage

Range	Specification, tcal ±5 °C ±(% of output + µV)		Stability	Resolution (µV)	Max Burden [1]
	90 days	1 year	24 hours, ±1 °C ±(% of output + µV)		
0 to 329.999 mV	0.011 % + 10	0.013 % + 10	0.0035 % + 6	1	60 Ω
0 to 3.29999 V	0.008 % + 15	0.010 % + 15	0.0025 % + 10	10	300 mA
0 to 32.9999 V	0.008 % + 150	0.010 % + 150	0.0025 % + 100	100	600 mA
10 to 101.999 V	0.010 % + 1500	0.012 % + 1500	0.003 % + 1000	1000	300 mA
30 to 329.999 V	0.010 % + 1500	0.012 % + 1500	0.003 % + 1000	1000	120 mA
100 to 1020.00 V	0.010 % + 5500	0.012 % + 5500	0.003 % + 5000	10000	40 mA
Auxiliary Output (dual output mode only)					
0 to 329.99 mV	0.10 % + 1000	0.12 % + 1000	0.03 % + 300	10	5 mA
0.33 to 3.2999 V	0.10 % + 1000	0.12 % + 1000	0.03 % + 300	100	5 mA
3.3 to 7.000 V	0.10 % + 1000	0.12 % + 1000	0.03 % + 300	1000	5 mA

[1] Remote sensing is not provided. Output resistance is 60 Ω for outputs <330 mV. Output resistance is <5 mΩ for outputs ≥0.33 V. The AUX output has an output resistance of <1 Ω.

Range	Noise	
	Bandwidth 0.1 Hz to 10 Hz, p-p ±(ppm of output + floor)	Bandwidth 10 Hz to 10 kHz, rms ±(floor)
0 to 329.999 mV	0 + 3 µV	20 µV
0 to 3.29999 V	0 + 30 µV	200 µV
0 to 32.9999 V	0 + 300 µV	2 mV
10 to 101.999 V	30 + 5 mV	60 mV
30 to 329.999 V	30 + 5 mV	60 mV
100 to 1020.00 V	30 + 20 mV	100 mV
Auxiliary Output (dual output mode only)		
0 to 329.99 mV	0 + 20 µV	60 µV
0.33 to 3.2999 V	0 + 200 µV	600 µV
3.3 to 7.000 V	0 + 2 mV	3 mV

DC Current

Range	Specification, tcal ±5 °C ±(% of output + µA)		Resolution	Max. Compliance Voltage (V)	Max. Inductive Load
	90 days	1 year			
0 to 329.99 µA	0.07 % + 0.1	0.075 % + 0.1	10 nA	9	2.5 H
0 to 3.2999 mA	0.06 % + 0.25	0.065 % + 0.25	0.1 µA	9	
0 to 32.999 mA	0.048 % + 1.25	0.05 % + 1.25	1 µA	50	
0 to 329.99 mA	0.048 % + 16.5	0.05 % + 16.5	10 µA	35	
0 to1.0999 A (in 3 A range)	0.14 % + 220	0.15 % + 220	100 µA	6	
1.1 to 2.9999 A	0.18 % + 220	0.19 % + 220	100 µA	6	
0 to 10.999 A (in 20 A range)	0.23 % + 2500	0.25 % + 2500	1 mA	4	
11 to 20.500 A [1]	0.48 % + 3750	0.5 % + 3750	1 mA	4	

[1] Duty Cycle: Currents <11 A may be provided continuously. For currents >11 A, the current may be provided 60–T–I minutes in any 60 minute period where T is the temperature in °C (room temperature is about 23 °C) and I is the output current in Amps. For example, 17 A at 23 °C could be provided for 60–17–23 = 20 minutes each hour. When the 5080A is outputting currents between 5 and 11 amps for long periods, the internal self-heating reduces the duty cycle. Under those conditions, the allowable "on" time indicated by the formula is achieved only after the 5080A is outputting currents <5 A for the "off" period first.

Range	Noise	
	Bandwidth 0.1 Hz to 10 Hz, p-p	Bandwidth 10 Hz to 10 kHz, rms
0 to 329.99 µA	20 nA	60 nA
0 to 3.2999 mA	200 nA	600 nA
0 to 32.999 mA	2 µA	6 µA
0 to 329.99 mA	20 µA	60 µA
0 to 2.9999 mA	200 µA	3 mA
0 to 20.500 A	2 mA	30 mA

Resistance

Nominal Value	Specification of Characterized Value, tcal ±5 °C, ±(% of value or Ω) [1]		Max. Difference of Characterized Value to Nominal Value, ± (%) [2]	2-Wire Adder, ±(Ω) [3]	Full Spec. Load Range, I_{min} to I_{max} [4]	Max. Peak Current
	90 days	1 year				
0 Ω	0.01 Ω	0.01 Ω	–	0.001 Ω	8 to 210 mA	220 mA
1 Ω	0.99 %	1.0 %	1.75 %	0.001 Ω	8 to 210 mA	220 mA
1.9 Ω	0.49 %	0.5 %	0.85 %	0.001 Ω	8 to 210 mA	220 mA
10 Ω	0.14 %	0.15 %	0.23 %	0.001 Ω	5 to 90 mA	220 mA
19 Ω	0.09 %	0.1 %	0.18 %	0.001 Ω	4 to 65 mA	160 mA
100 Ω	0.035 %	0.04 %	0.05 %	0.001 Ω	2 to 15 mA	70 mA
190 Ω	0.035 %	0.04 %	0.05 %	0.001 Ω	1 to 11 mA	50 mA
1000 Ω	0.022 %	0.025 %	0.045 %	0.01 Ω	0.5 to 4.5 mA	22 mA
1.9 kΩ	0.022 %	0.025 %	0.045 %	0.01 Ω	0.2 to 3.3 mA	16 mA
10 kΩ	0.022 %	0.025 %	0.045 %	0.1 Ω	0.1 to 1.5 mA	3 mA
19 kΩ	0.026 %	0.029 %	0.045 %	0.2 Ω	0.05 to 1 mA	1.6 mA
100 kΩ	0.035 %	0.038 %	0.045 %	2 Ω	10 to 280 µA	0.3 mA
190 kΩ	0.039 %	0.042 %	0.045 %	8 Ω	5 to 150 µA	0.16 mA
1 MΩ	0.035 %	0.04 %	0.055 %	–	1 to 28 µA	30 µA
1.9 MΩ	0.035 %	0.04 %	0.055 %	–	0.5 to 15 µA	16 µA
10 MΩ	0.09 %	0.1 %	0.18 %	–	0.1 to 2.8 µA	3 µA
19 MΩ	0.14 %	0.15 %	0.23 %	–	0.05 to 1.5 µA	1.6 µA
100 MΩ	0.49 %	0.5 %	1.45 %	–	10 to 280 nA	300 nA
190 MΩ	0.99 %	1.0 %	1.5 %	–	5 to 150 nA	160 nA

[1] Specifications apply to the displayed value, using 4-wire connections up to 190 kΩ.

[2] For 21 to 25 °C, <70 % RH.

[3] For all except 4-wire (COMP 4 wire) mode, 2-wire internal (COMP off) and external (COMP 2-wire) compensation is available up to 190 kΩ.

[4] For currents less than the specified load range, where I_{min} is the minimum load current in the table and I_{actual} is the actual load current: Specification = Table specification X (I_{min} / I_{actual}).

AC Voltage (Sine Wave)

Range	Frequency	Specification, tcal ±5 °C ±(% of output + µV)		Resolution	Max. Burden [1]	Max. Distortion & Noise 10 Hz to 100 kHz Bandwidth [2] ±(% of output + floor)
		90 days	1 year			
1.00 to 32.99 mV	45 to 65 Hz	0.31 % + 60	0.33 % + 60	10 µV	60 Ω	0.1 % + 300 µV
	65 Hz to 1 kHz	0.32 % + 60	0.34 % + 60			
33 to 329.99 mV [3]	45 to 65 Hz	0.13 % + 60	0.15 % + 60	10 µV	60 Ω	0.1 % + 300 µV
	65 Hz To 1 KHz	0.14 % + 60	0.16 % + 60			
0.33 to 3.2999 V [3]	45 to 65 Hz	0.09 % + 180	0.10 % + 180	100 µV	300 mA	0.2 % + 600 µV
	65 Hz to 1 kHz	0.10 % + 180	0.11 % + 180			
3.3 to 32.999 V	45 to 65 Hz	0.09 % + 1800	0.10 % + 1800	1 mV	800 mA	0.5 % + 6 mV
	65 Hz to 1 kHz	0.11 % + 1800	0.12 % + 1800			
33 to 101.99 V	45 to 65 Hz	0.12 % + 18000	0.14 % + 18000	10 mV	400 mA	0.5 % + 30 mV
	65 Hz to 1 kHz	0.13 % + 18000	0.15 % + 18000			
102 to 329.99 V	45 to 65 Hz	0.12 % + 18000	0.14 % + 18000	10 mV	120 mA	0.5 % + 30 mV
	65 Hz to 1 kHz	0.13 % + 18000	0.15 % + 18000			
330 to 1020.0 V	45 to 65 Hz	0.12 % + 180000	0.14 % + 180000	100 mV	40 mA	0.5 % + 100 mV
	65 Hz to 1 kHz	0.13 % + 180000	0.15 % + 180000			
Auxiliary Output (dual output mode only)						
10 to 329.99 mV	45 to 65 Hz	0.18 % + 1000	0.20 % + 1000	10 µV	5 mA	0.2 % + 600 µV
	65 Hz to 1 kHz	0.20 % + 1000	0.22 % + 1000			
0.33 to 3.2999 V	45 to 65 Hz	0.18 % + 1000	0.20 % + 1000	100 µV	5 mA	0.2 % + 600 µV
	65 Hz to 1 kHz	0.20 % + 1000	0.22 % + 1000			
3.3 to 5.000 V	45 to 65 Hz	0.18 % + 1000	0.20 % + 1000	1 mV	5 mA	0.2 % + 600 µV
	65 Hz to 1 kHz	0.20 % + 1000	0.22 % + 1000			

[1] Remote sensing is not provided. Output resistance is 60 Ω for outputs <330 mV. Output resistance is <5 mΩ for outputs ≥0.33 V. The AUX output resistance is <1 Ω. The maximum load capacitance is 500 pF.

[2] For a resistive load. Bandwidth of 10 Hz to 10 kHz for Auxiliary Output.

[3] In dual output mode with output currents >0.33 A, the floor specification is 3X for specified outputs.

AC Current (Sine Wave)

Range	Frequency	Specification, tcal ±5 °C ±(% of output + µA)		Compliance Adder [2] (µA/V)	Max. Distortion & Noise 10 Hz to 10 kHz Bandwidth ±(% of output + floor)	Max. Inductive Load (µH)
		90 days	1 year			
LCOMP OFF						
29.0 to 329.9 µA	45 to 65 Hz	0.24 % + 0.75	0.25 % + 0.75	0.05	0.2 % + 3 µA	200
	65 Hz to 1 kHz	0.25 % + 0.75	0.26 % + 0.75	0.15		
0.33 to 3.2999 mA	45 to 65 Hz	0.21 % + 0.9	0.22 % + 0.9	0.05	0.2 % + 5 µA	200
	65 Hz to 1 kHz	0.22 % + 0.9	0.23 % + 0.9	0.15		
3.3 to 32.999 mA	45 to 65 Hz	0.09 % + 12	0.10 % + 12	0.05	0.2 % + 15 µA	50
	65 Hz to 1 kHz	0.18 % + 12	0.19 % + 12	0.15		
33 to 329.99 mA	45 to 65 Hz	0.09 % + 120	0.10 % +120	0.1	0.2 % + 150 µA	50
	65 Hz to 1 kHz	0.18 % + 120	0.19 % +120	0.2		
0.33 to 1.0999 A	45 to 65 Hz	0.09 % + 1200	0.10 % + 1200	10	0.35 % + 1.5 mA	2.5
	65 Hz to 1 kHz	0.22 % + 1200	0.24 % + 1200	125		
1.1 to 2.9999 A	45 to 65 Hz	0.09 % + 1500	0.10 % + 1500	10	0.35 % + 1.5 mA	2.5
	65 Hz to 1 kHz	0.26 % + 1500	0.28 % + 1500	125		
3.0 to 10.999 A	45 to 65 Hz	0.24 % + 6000	0.25 % + 6000	10	0.6 % + 15 mA	1
	65 Hz to 1 kHz	0.38 % + 6000	0.40 % + 6000	125		
11 to 20.500 A [1]	45 to 65 Hz	0.48 % + 15000	0.50 % + 15000	10	0.6 % + 15 mA	1
	65 Hz to 1 kHz	0.50 % + 15000	0.52 % + 15000	125		
LCOMP ON						
29.0 to 329.9 µA	45 to 65 Hz	0.24 % + 0.75	0.25 % + 0.75	0.05	0.3 % + 3 µA	2.5 H [3]
0.33 to 3.2999 mA		0.21 % + 0.9	0.22 % + 0.9	0.05	0.5 % + 5 µA	
3.3 to 32.999 mA		0.19 % + 9	0.20 % + 9	0.05	0.5 % + 15 µA	
33 to 329.99 mA		0.19 % + 90	0.20 % + 90	0.1	0.5 % + 150 µA	
0.33 to 1.0999 A		0.20 % + 900	0.21 % + 900	10	0.6 % + 1.5 mA	
1.1 to 2.9999 A		0.22 % + 900	0.23 % + 900	10	0.6 % + 1.5 mA	
3.0 to 10.999 A		0.24 % + 6000	0.25 % + 6000	10	0.6 % + 1.5 mA	
11 to 20.500 A [1]		0.48 % + 15000	0.50 % + 15000	10	0.6 % + 1.5 mA	

[1] Duty Cycle: Currents <11 A may be provided continuously. For currents >11 A, the current may be provided 60–T–I minutes in any 60 minute period where T is the temperature in °C (room temperature is about 23 °C) and I is the output current in amps. For example, 17 A at 23 °C could be provided for 60–17–23 = 20 minutes each hour. When the 5080A is outputting currents between 5 and 11 amps for long periods, the internal self-heating reduces the duty cycle. Under those conditions, the allowable "on" time indicated by the formula is achieved only after the 5080A is outputting currents <5 A for the "off" period first.

[2] To be applied for compliance voltages >1 V rms.

[3] Subject to compliance voltage limits.

Range	Resolution (µA)	Max. Compliance Voltage, LCOMP Off, V rms	Max. Compliance Voltage, LCOMP On, V rms
29.0 to 329.9 µA	0.1	3.3 [1]	3.3 [1]
0.33 to 3.2999 mA	0.1	6.5	6.5
3.3 to 32.999 mA	1	6.5	44
33 to 329.99 mA	10	6	25
0.33 to 2.9999 A	100	4	4
3 to 20.500 A	1000	3	3

[1] Load impedance <10 kΩ.

DC Power Summary

Time	Voltage	Currents			
		0.33 to 3.2999 mA	3.3 to 329.99 mA	0.33 to 2.9999 A	3 to 20.5 A
		Specification, tcal ±5 °C, ±(% of watts output) [1]			
90 days	33 mV to 1020 V	0.14	0.11	0.21	0.52
1 year	33 mV to 1020 V	0.15	0.11	0.22	0.54

[1] To determine the actual dc power specification, see the individual "DC Voltage Specifications", "DC Current Specifications", and "Calculating Power Specifications" sections. The actual specification at the operating point will usually be significantly better than the table value, since the specifications state the minimum performance for the voltages and currents listed.

AC Power Summary

Time	Voltages	Currents			
		3.3 to 8.9999 mA	9 to 32.999 mA	33 to 89.99 mA	90 to 329.99 mA
		Specification, tcal ±5 °C, 45 to 65 Hz, PF = 1, ±(% of watts output)			
90 days	33 to 329.999 mV	0.56	0.43	0.56	0.43
	330 mV to 1020 V	0.50	0.34	0.50	0.34
1 year	33 to 329.999 mV	0.58	0.45	0.58	0.45
	330 mV to 1020 V	0.51	0.36	0.51	0.36
		Currents			
		0.33 to 0.8999 A	0.9 to 2.1999 A	2.2 to 4.499 A	4.5 to 20.5 A
		Specification, tcal ±5 °C, 45 to 65 Hz, PF = 1, ±(% of watts output)			
90 days	33 to 329.999 mV	0.57	0.43	0.54	0.69
	330 mV to 1020 V	0.51	0.35	0.47	0.64
1 year	33 to 329.999 mV	0.59	0.46	0.56	0.72
	330 mV to 1020 V	0.52	0.37	0.49	0.67

Notes

To determine the actual ac power specification, see the individual "AC Voltage Specifications", "AC Current Specifications", "Phase Specifications", and "Calculating Power Specifications" sections. The actual specification at the operating point will usually be significantly better than the table value, since the specifications state the minimum performance for the voltages and currents listed.

Power and Dual Output Limits

Frequency	Voltages (NORMAL)	Currents	Voltages (AUX)	Power Factor (PF)
DC	0 to ±1020 V	0 to ±20.5 A	0 to ±7 V	–
45 to 65 Hz	33 mV to 1000 V	3.3 mA to 20.5 A	100 mV to 5 V	0 to 1
65 to 500 Hz	330 mV to 1000 V	33 mA to 2.9999 A	100 mV to 5 V	0 to 1
	3.3 V to 1000 V	33 mA to 20.5 A	100 mV to 5 V	0 to 1
500 Hz to 1 kHz	330 mV to 1000 V	33 mA to 20.5 A	100 mV to 5 V	1

Notes

The range of voltages and currents shown in "DC Voltage Specifications", "DC Current Specifications", "AC Voltage Specifications", and "AC Current Specifications" are available in the power and dual output modes, except that the minimum current for AC power is 0.33 mA However, only the voltages and currents shown in this table are specified. See "Calculating Power Specifications" to determine the specification at any points within this table.

The phase adjustment range for dual AC outputs is 0 ° to ±179.9°. The phase resolution for dual AC outputs is 0.1 degree.

Power and dual output amplitude settling times are typically <9 seconds.

Phase

Specification, 1 year, tcal ±5 °C, ±(ΔΦ) [1][2]		
45 TO 65 Hz	**65 to 500 Hz**	**500 Hz to 1 kHz**
0.25 °	1.5 °	5.0 °

[1] See Power and Dual Output Limit specifications for applicable outputs.
[2] Phase settling times are typically <18 seconds additional.

Phase (Φ) Watts	Phase (Φ) VARs	PF	Power Factor Adder due to Phase Error, ±(%)		
			45 to 65 Hz	65 to 500 Hz	500 Hz to 1 kHz
0 °	90 °	1.000	0.00 %	0.03 %	0.38 %
10 °	80 °	0.985	0.08 %	0.50 %	-
20 °	70 °	0.940	0.16 %	0.99 %	-
30 °	60 °	0.866	0.25 %	1.55 %	-
40 °	50 °	0.766	0.37 %	2.23 %	-
50 °	40 °	0.643	0.52 %	3.15 %	-
60 °	30 °	0.500	0.76 %	4.57 %	-
70 °	20 °	0.342	1.20 %	7.23 %	-
80 °	10 °	0.174	2.48 %	14.88 %	-
90 °	0 °	0.000	-	-	-

Notes

To calculate exact ac watts power factor adders due to phase error for values not shown, use the following formula:

$$Adder(\%) = 100(1 - \frac{Cos(\Phi + \Delta\Phi)}{Cos(\Phi)})$$

For example, for a PF of 0.9205 (Φ = 23) and a phase specification of ΔΦ = 0.15, the ac watts power factor adder is:

$$Adder(\%) = 100(1 - \frac{Cos(23 + .15)}{Cos(23)}) = 0.11\%$$

Calculating Power Specifications

The Overall specification for power output in watts (or VARs) is based on the root sum square (rss) of the individual specifications in percent for the selected voltage, current, and power factor or VARs parameters:

Watts specification $$Spec_{\text{power}} = \sqrt{Spec^2{}_{\text{voltage}} + Spec^2{}_{\text{current}} + Spec^2{}_{\text{PFadder}}}$$

VARs specification $$Spec_{\text{VARs}} = \sqrt{Spec^2{}_{\text{voltage}} + Spec^2{}_{\text{current}} + Spec^2{}_{\text{VARsadder}}}$$

Because there are a tremendous number of combinations, you should calculate the actual power specification for your selected voltages and currents. The method of calculation is best shown in the following examples (using 1-year specifications):

Example 1 Output: 100 V, 1 A, 60 Hz, Power Factor = 1.0 (Φ=0), 1-year specifications

Voltage Specification Specification for 100 V at 60 Hz is 0.14 % + 18 mV, totaling:
100 V x 0.0014 = 140 mV added to 18 mV = 158 mV. Expressed in percent:
158 mV/100 V x 100 = 0.158 % (see "AC Voltage Specifications").

Current Specification Specification for 1 A at 60 Hz is 0.10 % + 1200 µA, totaling:
1 A x 0.001 = 1000 µA added to 1200 µA = 2.2 mA. Expressed in percent:
2.2 mA/1 A x 100 = 0.22 % (see "AC Current Specifications").

PF Adder Watts Adder for PF = 1 (Φ=0) at 60 Hz is 0 % (see "Phase Specifications").

Total Watts Output Specification = $Spec_{\text{power}} = \sqrt{0.158^2 + 0.22^2 + 0^2} = 0.27\%$

Example 2 Output: 100 V, 1 A, 50 Hz, Power Factor = 0.5 (Φ=60), 1-year specifications

Voltage Specification Specification for 100 V at 50 Hz is, 0.14 % + 18 mV, totaling:
100 V x 0.0014 = 140 mV added to 18 mV = 158 mV. Expressed in percent:
158 mV/100 V x 100 = 0.158 % (see "AC Voltage Specifications").

Current Specification Specification for 1 A is 0.10 % + 1200 µA, totaling:
1 A x 0.001 = 1000 µA added to 1200 µA = 2.2 mA. Expressed in percent:
2.2 mA/1 A x 100 = 0.22 % (see "AC Current Specifications").

PF Adder Watts Adder for PF = 0.5 (Φ=60) at 50 Hz is 0.76 % (see "Phase Specifications").

Total Watts Output Specification = $Spec_{power} = \sqrt{0.158^2 + 0.22^2 + 0.76^2} = 0.81\%$

VARs When the Power Factor approaches 0.0, the watts output specification becomes unrealistic because the dominant characteristic is the VARs (volts-amps-reactive) output. In these cases, calculate the Total VARs Output Specification, as shown in example 3:

Example 3 Output: 100 V, 1 A, 400 Hz, Power Factor = 0.174 (Φ=80), 1-year specifications

Voltage Specification Specification for 100 V at 400 Hz is, 0.15 % + 18 mV, totaling:
100 V x 0.0015 = 150 mV added to 18 mV = 168 mV. Expressed in percent:
168 mV/100 V x 100 = 0.168 % (see "AC Voltage Specifications").

Current Specification Specification for 1 A at 400 Hz is 0.24 % + 1200 µA, totaling:
1 A x 0.0024 = 2400 µA added to 1200 µA = 3.6 mA. Expressed in percent:
3.6 mA/1 A x 100 = 0.36 % (see "AC Current Specifications").

VARs Adder VARs Adder for Φ = 80 at 400 Hz is 0.50 % (see "Phase Specifications").

Total VARS Output Specification = $Spec_{VARs} = \sqrt{0.168^2 + 0.36^2 + 0.5^2} = 0.64\%$

Frequency

Frequency Range	Resolution	Specification, tcal ±5 °C, 1 year	Jitter
45.00 to 119.99 Hz	0.01 Hz	0.0050 % ±2 mHz	4 µs
120.0 to 1000.0 Hz	0.1 Hz		

FLUKE®
Calibration

Ordering information

Models

5080A	Multi-product calibrator
5080A/MEG	Calibrator with megohm meter calibration option
5080A/SC	Calibrator with oscilloscope calibration option
5080A/SC/MEG	Calibrator with megohm meter and oscilloscope calibration option

Accessories

9100-200	10/50 turn coils
5500A/COIL	50 turn coil
5080A/CASE	Transit case with wheels

Software

5080/CAL	5080/CAL calibration software
5080A/WS1[1]	Calibrator with MET/CAL® Lite software

Value-added services

Gold CarePlan[2]	Priority extended warranties and annual calibration services
Silver CarePlan[2]	Extended warranties with calibration on repair

Upgrades[3]

5080A->5080A/MEG	Upgrade 5080A to 5080A/MEG
5080A->5080A/SC	Upgrade 5080A to 5080A/SC
5080A->5080A/SC/MEG	Upgrade 5080A to 5080A/SC/MEG

[1] MET/CAL Lite is also available for 5080A/MEG, 5080A/SC, and 5080A/SC/MEG.
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