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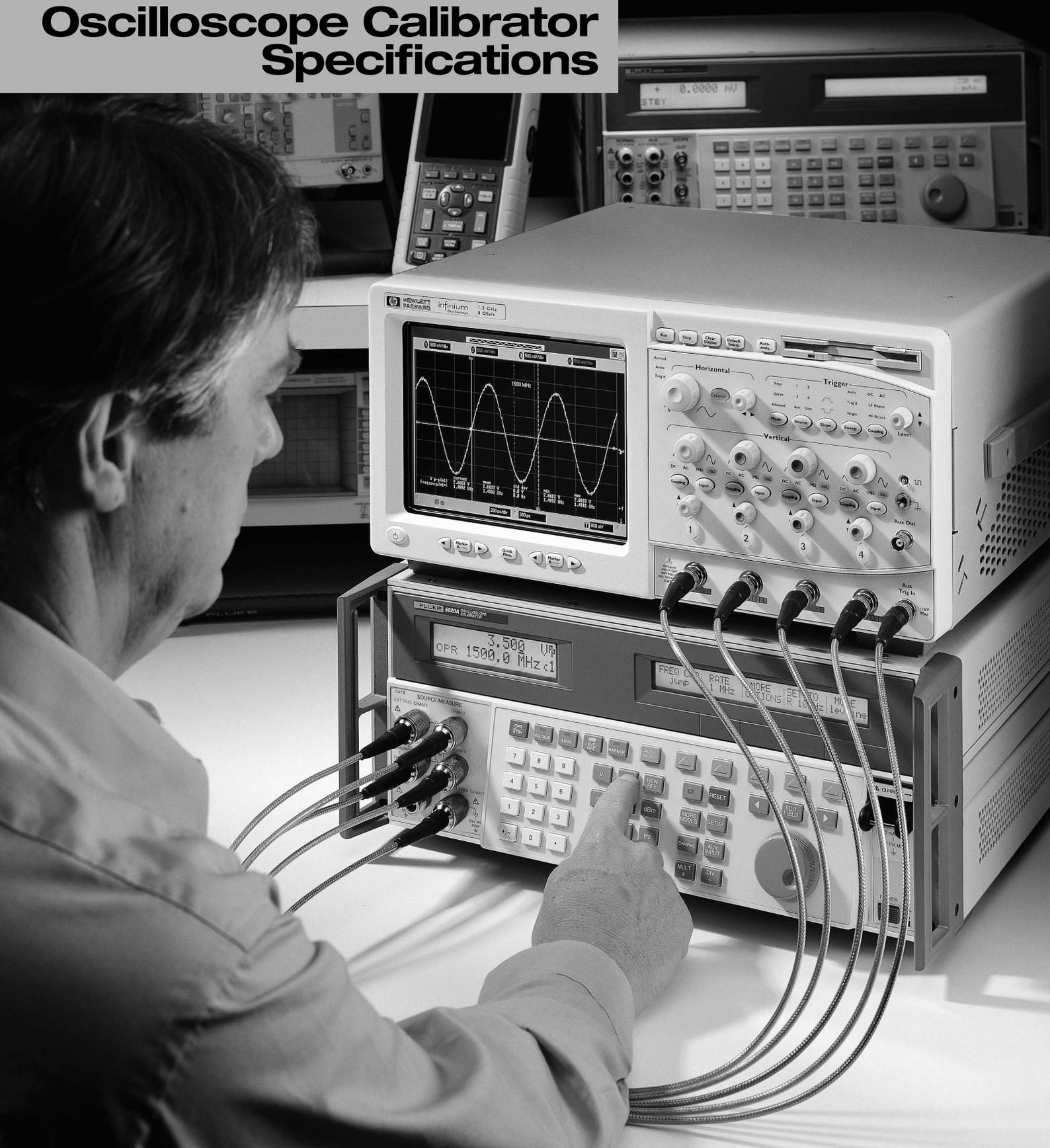
Fluke 5820A Oscilloscope Calibrator Specifications



Voltage Function

Volt Function	DC Signal		Square Wave Signal[1]	
Load	**into 50Ω**	**into 1 MΩ**	**into 50Ω**	**into 1 MΩ**
Amplitude Range	0V to ±6.6V	0V to ±130V	±1 mV to ±6.6V p-p	±1 mV to ±130V p-p
1-Year Absolute Uncertainty, tcal ±5°C	±(0.25% of output + 40 µV)	±(0.025% of output + 25 µV)	±(0.25% of output + 40 µV)	±(0.05% of output + 5 µV)
Sequence	1-2-5 (e.g., 10 mV, 20 mV, 50 mV)			
Frequency Range	10 Hz to 10 kHz			
1-Year Absolute Uncertainty, tcal ±5°C	±(0.33 ppm of setting)			

[1] *Positive or negative, zero referenced square wave.*

Edge Function

Edge Characteristics into 50Ω		1-Year Absolute Uncertainty, tcal ±5°C
Amplitude Range (p-p)	4.0 mV to 2.5V	±(2% of output + 200 µV)
Frequency Range	1 kHz to 10 MHz	±(0.33 ppm of setting)
Rise Time	≤300 ps	+0/-100 ps
Typical Jitter, edge to trigger	<3 ps (p-p)	•
Leading Edge Aberrations	within 2 ns from 50% of rising edge	< (3% of output + 2 mV)
	2 ns to 5 ns	< (2% of output + 2 mV)
	5 ns to 15 ns	< (1% of output + 2 mV)
	after 15 ns	< (0.5% of output + 2 mV)

Fast Edge Function (2.1 GHz Option)

Edge Characteristics into 50Ω		1-Year Absolute Uncertainty, tcal ±5°C
Amplitude Range (p-p)	250 mV	
Frequency Range	1 kHz to 100 kHz	±(0.33 ppm of setting)
Rise Time	≤150 ps	+0/-25 ps

Leveled Sine Wave Function ≤600 MHz

Leveled Sine Wave Characteristics into 50Ω	Frequency Range				
	50 kHz (reference)	**50 kHz to 100 MHz**	**100 MHz to 300 MHz**	**300 MHz to 500 MHz**	**500 MHz to 600 MHz**
Amplitude Range (p-p)	5 mV to 5.5V				
1-Year Absolute Amplitude Uncertainty, tcal ±5°C	±(2% of output + 300 µV)	±(3.5% of output + 300 µV)	±(4% of output + 300 µV)	±(5.5% of output + 300 µV)	±(6% of output + 300 µV)
Flatness (relative to 50 kHz)	Not applicable	±(1.5% of output + 100 µV)	±(2% of output + 100 µV)	±(3.5% of output + 100 µV)	±(4% of output + 100 µV)
Short-term Amplitude Stability	≤1%[1]				
Frequency Resolution	10 kHz				
1-Year Absolute Frequency Uncertainty, tcal ±5°C	±0.33 ppm				
2nd Harmonic	≤-33 dBc				
3rd and Higher Harmonics	≤-38 dBc				

[1] *Within one hour after reference amplitude setting, provided temperature varies no more than ±5°C.*

Leveled Sine Wave Function >600 MHz (2.1 GHz Option)

Leveled Sine Wave Characteristics into 50Ω	Frequency Range			
	10 MHz (reference)	600 MHz to 1.1 GHz	1.1 GHz to 1.6 GHz	1.6 GHz to 2.1 GHz
Amplitude Range (p-p)	5 mV to 3.5V			
1-Year Absolute Amplitude Uncertainty, tcal ±5°C	±(2% of output + 300 µV)	±(7% of output + 300 µV)	±(7% of output + 300 µV)	±(8% of output + 300 µV)
Flatness (relative to 50 kHz)	Not applicable	±(5% of output + 100 µV)	±(5% of output + 100 µV)	±(6% of output + 100 µV)
Short-term Amplitude Stability	≤1%[1]			
Frequency Resolution	100 kHz			
1-Year Absolute Frequency, Uncertainty, tcal ±5°C	±0.33 ppm			
2nd Harmonic	≤-33 dBc			
3rd and Higher Harmonics	≤-38 dBc			

[1] *Within one hour after reference amplitude setting, provided temperature varies no more than ±5°C.*

Time Marker Function

Time Marker into 50Ω	5s to 50 ms	20 ms to 100 ns (max)	50 ns to 20 ns	10 ns	5 ns to 2 ns	2 ns to 500 ps (2.1 GHz Option)
Wave Shape	spike or square	spike, square, or 20%-pulse	spike or square	square or sine	sine	sine
Sequence	5-2-1 from 5s to 2 ns (e.g., 500 ms, 200 ms, 100 ms)					
Period Resolution	4 digits					
1-Year Absolute Uncertainty, tcal ±5°C	±(2.5 ppm + 5 µHz)	±0.33 ppm	±0.33 ppm	±0.33 ppm	±0.33 ppm	±0.33 ppm

Wave Generator

Wave Generator Characteristics	Sine and Square Wave into 50Ω or 1 MΩ	Triangle Wave into 50Ω or 1 MΩ
Amplitude Range	into 1 MΩ: 1.8 mV to 55V p-p; into 50Ω: 1.8 mV to 2.5V p-p	
1-Year Absolute Uncertainty, tcal ±5°C, 10 Hz to 10 kHz	±(3% of p-p output + 100 µV)	
Sequence	1-2-5 (e.g., 10 mV, 20 mV, 50 mV)	
Typical DC Offset Range	0 to ±(≥40% of p-p amplitude)[1]	
Ramp Linearity		better than 0.1% 10 Hz to 10 kHz
Frequency Range	0.01 Hz to 100 kHz[2]	
1-Year Absolute Uncertainty, tcal ±5°C	±(2.5 ppm + 5 µHz)	

[1] *The dc offset plus the wave signal must not exceed 30V rms.*
[2] *Sine wave to 500 kHz..*

1 ns Pulse Generation

Pulse Generator Characteristics	Positive Pulse into 50Ω
Typical rise/fall times	≤500 ps
Typical Available Amplitudes	1.5V, 600 mV, 150 mV, 60 mV, 15 mV
Pulse Width Range	1 ns to 500 ns
Pulse Width Uncertainty	5% ± 200 ps
Pulse Period	20 ms to 200 ns
1-Year Absolute Uncertainty, tcal ±5°C	±0.33 ppm
Pulse Skew with Trigger Range	+30 ns to -10 ns with 250 ps resolution
Pulse Skew with Trigger Uncertainty	± 500 ps

Trigger Function

Available for pulse, time mark, edge and voltage functions.
TV Trigger is provided at the Output Terminal.

Trigger Signal Type	Parameters
Frame Formats	Selectable: NTSC, SECAM, PAL, PAL-M
Polarity	positive or negative
Line Marker	Selectable Line Video Marker

Tunnel Diode Drive Function

TD pulse drive	Square wave at 100 Hz to 100 kHz, with variable amplitude of 60V to 100V p-p

Current Output Function

	DC	Square Wave
Amplitude (compliance voltage 2V max)	±100 µA to ±100 mA	100 µA p-p to 100 mA p-p
Accuracy	±(0.25% + 0.5 µA)	±(0.25% + 0.5 µA[1]
Frequency Range	N/A	10 Hz to 100 kHz
Accuracy		2.5 ppm + 5 µHz
Steps		1, 2, 5 or continuous

[1] *Amplitude uncertainty for frequency range 45 Hz to 1 kHz at <120 mV compliance voltage.*

Measurement Functions

Voltage Measurement		
DC Voltage Range[1]	±10V	
DC Accuracy 0 to ±5.99V	0.05% + 1 mV	
DC Accuracy ±6 to ±10V	0.25% + 10 mV	
Resistance Measurement		
Measurement Range	40Ω to 60Ω and 500 kΩ to 1.5 MΩ	0.1%
Capacitance Measurement		
Measurement Range	5 pF to 50 pF	±(5% of input + 0.5 pF)[2]

[1] *Voltages exceeding 30 VDC may cause damage to the 5820A.*
[2] *Measurement made within 30 minutes of capacitance zero reference.*

Auxiliary Input

Operates under the control of the 5820A. Frequency range up to 3 GHz.
Voltage rating 0–40V p-p. VSWR: <1.2:1 at 600 MHz; <1.5:1 at 2 GHz; <2.0:1 at 3 GHz.

General Specifications

Warm-up Time	Twice the time since last warmed up, to a maximum of 30 minutes
Settling Time	5 seconds or faster for all functions and ranges
Standard Interfaces	IEE-488 (GPIB), RS-232
Temperature Performance	Operating: 0 °C to 50 °C Calibration (tcal): 15 °C to 35 °C Storage: -20 °C to 70 °C
Electromagnetic Compatibility	Designed to operate in Standard Laboratory environments where the Electromagnetic environment is highly controlled. If used in areas with Electromagnetic fields > 1 V/m, there could be errors in current output values.
Temperature Coefficient	Temperature Coefficient for temperatures outside tcal ±5°C: add 0.1 x 1-year specification/°C
Relative Humidity	Operating: <80% to 30 °C, <70% to 40 °C, <40% to 50 °C Storage: <95%, non-condensing
Altitude	Operating: 3,050m (10,000 ft) maximum Non-operating: 12,200m (40,000 ft) maximum
Safety	Designed to comply with IEC 1010-1 (1992-1); ANSI/ISA-S82.01-1994; CAN/CSA-C22.2 No. 1010, 1-92
Analog Low Isolation	20V
EMC	Complies with EN 61326-1
Line Power	Line Voltage (selectable): 100V, 120V, 220V, 240V
	Line Frequency: 47 to 63 Hz
	Line Voltage Variation: ± 10% about line voltage setting
Power Consumption	250 VA
Dimensions	Height: 17.8 cm (7 in), standard rack increment, plus 1.5 cm (0.6 in) for feet on bottom of unit Width: 43.2 cm (17 in), standard rack width Depth: 47.3 cm (18.6 in) overall
Weight	20 kg (44 lb)

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Ordering Information

Calibrators

5820A Oscilloscope Calibrator
5500A Multi-Product Calibrator
5520A High-Performance Multi-Product Calibrator

Options

2.1 GHz Bandwidth Extension for the 5820A
Five Channel Output for the 5820A
300 MHz Oscilloscope Calibration Option for the 5500A or 5520A
600 MHz/300 ps Oscilloscope Calibration Option for the 5500A or 5520A

Upgrades

5800A-GHZK 2.1 GHz Bandwidth Extension Upgrade for Existing 5800As
5820A-GHZK 2.1 GHz Bandwidth Extension Upgrade for Existing 5820As

Accessories

5800A/TDP 125 ps Tunnel Diode Pulser for the 5800A, 5820A and 5500A-SC600
5500A/COIL 50-Turn Current Coil for the 5500A and 5520A
5500A/CASE Transit Case with wheels for the 5500A, 5520A, 5800A and 5820A
5500A/HNDL Side handle for the 5500A, 5520A, 5800A and 5820A
Y5537 Rack mount kit for the 5500A, 5520A, 5800A and 5820/a
5500A/LEADS Comprehensive test lead kit for the 5500A and 5520/a
5800A-7004K Oscilloscope Cal Cable and Accessory Kit
5800A-7002K Two Piece Replacement Output Cable Set
5800A-7003K Five Piece Replacement Output Cable Set
PM9581/011 Feed through Termination, 3W, tp Ohm
PM9584/021 Feed through T-Piece (matched power splitter), 50 Ohm
PM 9061/001 Coupling, BNC (2x Female)
PM9067/001 T-Piece, BNC (1 x Mail 2 x Female)
TC100 Test Cart

Software

MET/CAL-5 Automated Calibration and Asset Management
5500/CAL-5 Automated Calibration and Asset Management for the 5500 and 5800 Series Calibrators
MET/TRACK Metrology Asset Management

Fluke. *Keeping your world up and running.*

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