

FLUKE

5790A

The Fluke 5790A is a highly accurate automated AC measurement standard designed for calibration and metrology applications. Combining the precision of a thermal transfer standard with the ease of use of a digital voltmeter, it provides exceptional AC voltage measurement accuracy, wideband capability, and robust system integration.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488.2), RS-232-C
Display	Vacuum Fluorescent Display (VFD)

Physical

Power Supply	100 V / 120 V / 220 V / 240 V AC ($\pm 10\%$), 47 Hz to 63 Hz, 120 VA
Operating Temperature	0 to 50 °C °C
Dimensions (W×H×D)	432 mm × 178 mm × 473 mm mm
Weight	24 kg (53 lb) kg

AC Voltage Measurement Performance

AC Voltage Ranges	2.2 mV, 7 mV, 22 mV, 70 mV, 220 mV, 700 mV, 2.2 V, 7 V, 22 V, 70 V, 220 V, 700 V, 1000 V
Frequency Range	10 Hz to 1 MHz
Best 24-Hour AC Voltage Uncertainty	± 24 ppm
Best 1-Year AC Voltage Uncertainty	± 110 ppm
Absolute Display Resolution	6.5 digits
Inputs 1 & 2 Impedance	1 M Ω shunted by 140 pF
Input 3 Impedance	1 M Ω shunted by 150 pF
Maximum Input Voltage	1000 V RMS
Maximum Peak Input Voltage	1414 V Peak

AC/DC Transfer Difference & Shunt Support

AC/DC Transfer Resolution	1 ppm (0.0001%)
AC/DC Transfer Repeatability	± 1 ppm
Compatible External Current Shunts	Fluke A40 and A40A series shunts
External Shunt Input Voltage Range	Up to 2.2 V (via Input 3 / Aux Input)

Analog & Guard Connections

Input 1 Connector Type	Type N female
Input 2 Connector Type	Type N female
Input 3 Connector Type	Dual binding posts
Guard Terminal Configurations	Binding post, switchable internally or externally
Isolation Input to Guard	$>10^{10} \Omega$, $<150 \text{ pF}$
Isolation Guard to Chassis	$>10^9 \Omega$, $<0.1 \mu\text{F}$
Chassis Ground Terminal	Rear-panel binding post

Wideband Voltage Performance (Optional)

Wideband Voltage Ranges	2.2 mV, 7 mV, 22 mV, 70 mV, 220 mV, 700 mV, 2.2 V, 7 V (with Option 5790A-03)
Wideband Frequency Range	10 Hz to 30 MHz (with Option 5790A-03)
Wideband Best 1-Year Uncertainty	$\pm 0.25\%$ to $\pm 0.5\%$ (frequency dependent)
Wideband Input Connector Type	Type N female (Input 4)
Wideband Input Impedance	50Ω

Frequency Measurement

Frequency Measurement Range	10 Hz to 1 MHz (up to 30 MHz with Wideband Option)
Frequency Measurement Accuracy	$\pm 0.01\%$ ($\pm 100 \text{ ppm}$)
Frequency Measurement Resolution	6 digits

Metrological Reliability & Reference

Internal Reference Type	Solid-state zener reference standard
Warm-up Time to Rated Accuracy	30 minutes
Recommended Calibration Cycle	1 year (or 90 days for higher accuracy requirements)

Environmental Specifications

Calibration Temperature Range	18°C to 28°C
Storage Temperature Range	-40°C to 75°C
Relative Humidity Limits (Operating)	Max 80% non-condensing up to 30°C , 75% up to 40°C , 45% up to 50°C
Operating Altitude	Up to 3,050 meters (10,000 feet)
Non-Operating Altitude	Up to 12,200 meters (40,000 feet)
Shock and Vibration Compliance	Complies with MIL-T-28800D Type III, Class 5, Style E

Physical & Mechanical Characteristics

Enclosure Style	Metal outer chassis with optional rack mount capability
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Compliance & Safety

Safety Compliance	IEC 1010-1, ANSI/ISA-S82.01, CAN/CSA-C22.2 No. 1010.1-92
Overvoltage Category	CAT II
EMC Compliance	EN 55011 Class A, EN 50082-1

Performance

Crest Factor	6:1 at full scale, up to 10:1 at downscale inputs
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Inputs

Input 1 Capacitance	< 150 pF
Input 2 Capacitance	< 150 pF
Wideband Input Maximum Continuous Power	1 W
Wideband Input Maximum Voltage	7 V RMS (10 V peak)

Outputs

Analog Output Voltage Range	0 V to 3 V DC (proportional to input)
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Power Requirements

Power Consumption	120 VA (maximum)
Line Frequency Range	47 Hz to 63 Hz
Mains Voltage Selection	90 V to 132 V AC / 180 V to 264 V AC, manually switchable

Options

Hardware Options	Option 5790A-03 Wideband AC Voltage (10 Hz to 30 MHz)
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Wideband Option (Option 5790A-03)

Wideband Input VSWR	< 1.01 (10 Hz to 1 MHz), < 1.02 (1 MHz to 10 MHz), < 1.05 (10 MHz to 30 MHz)
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DC Voltage Capability

DC Voltage Measurement Ranges	2.2 mV to 1000 V (in 13 ranges)
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Inputs & Outputs

Total Number of Input Channels	4 (Input 1, Input 2, Input 3, and Wideband Option Input)
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Measurement Technology

RMS Sensor Type	Patented solid-state RMS sensor
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TECHNOLOGY

Automated AC/DC Thermal Transfer Standard

APPLICATIONS

AC Voltage Calibration and Metrology Standard

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