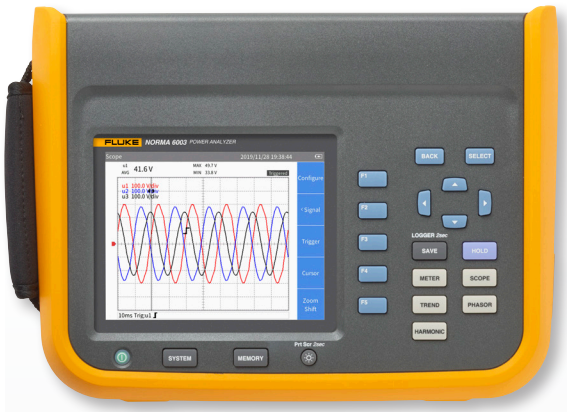
TECHNICAL DATA

Fluke Norma 6000 Series Portable Power Analyzers



Accurate enough for the lab, built for the field

The Fluke Norma 6000 Series Portable Wideband Precision Power Analyzers give you more freedom than ever before to make high accuracy power measurements wherever you need to—whether in the lab, or in the field. Designed for portability the lightweight, battery powered Fluke 6000 Series eliminates the need to carry large, fragile, expensive analyzers into the field, allowing you to make measurements directly at the load in nearly any environment. By measuring directly at the load, you can discover how the equipment operates under real-world conditions, with real-world variables, not just at a test bench or in the lab.

The Fluke 6003 includes three measurement channels which each consist of a voltage and current input making it ideal for three-phase power measurements. The Fluke 6004 includes four measurement channels giving it the capability to measure three-phase power and DC power simultaneously to enable real-time inverter efficiency measurements under real-world conditions. The Fluke 6003+ and 6004+ models both add the capability to measure mechanical parameters such as speed and torque (from separate transducers) to discover the electrical to mechanical efficiency of the load under a variety of typical operating modes. With the addition of optional measurement accessories, you can even make measurements up to 1,500V DC and 2,000A AC+DC on conductors with a diameter of up to 52mm.

The instrument's compact, battery-powered design combined with a wideband frequency response makes it easier than ever to make measurements on hard to access systems such as inverter drive systems, DC-AC and AC-DC power conversion systems and electric motors without removing them from service. Making these measurements in the field simplifies the troubleshooting and performance measurement processes without sacrificing uptime, giving you more accurate test results that will enable you to discover whether your loads are operating as effectively and efficiently as they should be.

- Highly portable and easily installed in tight spaces—only 9.6 cm thick.
- Operate continuously for up to 10 hours without an external power supply using the 5000mAh Li-ion Internal Battery.
- Measure safely—safety rated for CAT III 1000V, CAT IV 600V environments.
- Measure three phase power and DC output power at the same time with 3 or 4 channel models, with voltage and current inputs on each channel.
- Make mechanical torque and speed measurements using the included inputs and outputs of the Fluke 6003+ and 6004+.

KEY MEASUREMENTS

Voltage, Current, Active Power, Reactive Power, Apparent Power, Power Factor and Harmonics with associated values

HIGH ACCURACY AND WIDE BANDWIDTH

0.1 % measurement accuracy and 500kHz bandwidth

HIGHLY PORTABLE

Battery powered, weighs 3.5kg, operates for up to 10 hours without a power cord

- 0.1% accuracy, 500kHz bandwidth, 200ks/s sample rate so you can rely on the power conversion system measurements you take no matter what distortion may be present.
- USB and RS485 interface and open communication protocol for easy system integration and software platform flexibility.
- Combine two analyzers to enable simultaneous measurement of multiple circuits for even more troubleshooting capability—configurable to 6 or 8 channels using dual analyzer synchronization.
- View critical data in the field on the main display—Meter, Waveform, Harmonics up to the 100th, Vector and Trend.
- Ensure high common-mode rejection and allow flexible configurations according to measurement requirements using the electrically isolated channels.
- User adjustable measurement rate from 100ms to 1s with continuous logging via 32GB of onboard storage.
- Easy in-field set up using the integrated front panel or a remote PC connection (USB or RS485).
- Online measuring, data download and analysis with included PC software (Fluke Power Analyzer Software).
- Full remote control of the connected instrument using Fluke Power Analyzer Software and a local USB or long-distance RS485 connection.

Specifications		
Inputs	Norma 6003	3 Voltage + 3 Current
	Norma 6003+	3 Voltage + 3 Current + 1 Motor
	Norma 6004	4 Voltage + 4 Current
	Norma 6004+	4 Voltage + 4 Current + 1 Motor
Sample rate	200ks/s	
Measurement update rate	100ms, 200ms, 500ms, 1s	
Dimensions (H * W * L)	298mm x 215m x 96mm	
Weight	3.5 kg (7.7 lbs)	
Display	5.7 inch, TFT LCD, 640x480	
Operating temperature	-10 °C to +50 °C	
Storage temperature	-30 °C to +60 °C	
Operating humidity	Non-condensing (< 10 °C) ≤ 90 % RH (at 10 °C to 30 °C) ≤ 75 % RH (at 30 °C to 40 °C) ≤ 45 % RH (at 40 °C to 50 °C)	
Operating altitude	2000m	
Storage altitude	12000m	
Ingress protection	IP 50 (Terminals mated) according to IEC 60529:	
Battery	BP 291, 10.8V/5000mAh, 54Wh IEC 62133, UN38.3 Operating time: 10 Hours (on battery)	
Safety	IEC 61010-1: Pollution Degree 2 IEC 61010-2-030: CAT IV 600V, CAT III 1000 V	
EMC	IEC 61326-1: Industrial IEC 61326-2-2	
Warranty	1 Year	

Communication Interface	USB/RS485
Dual Analyzer Synchronization Mode	Able to extend to 6, 7 or 8 channels (using multiple instruments)
PC Software	Fluke Power Analyzer software
Storage Capacity	32GB
Data trend storage rate	As per display rate
Main Function	Meter, Scope, Harmonic, Phasor, Trend
Measuring Parameters	RMS, DC Component, AC Component, Rectified Mean, Peak Value, Peak-Peak, Crest Factor, Form Factor, Fundamental Component, Fundamental Content, Harmonic Distortion, Harmonic Content, Harmonic Factor for voltages and currents, Active Power, Reactive Power, Apparent Power, Power Factor, Phase Shift, Efficiency, Impedance, Electric Energy, Charge/Discharge capacity (Ah), Frequency, Motor Speed, Torque, Mechanical Power, Mechanical Energy, Summation function

Electrical specifications

Voltage

Range	10 V, 100 V, 1000 V
Crest Factor	CF ≤ 2
Maximum Voltage	10 % overload
Input Impedance	2M Ω/10pF (Typical)
Temperature Coefficient	0.05 * (Spec)/k
Bandwidth	1000V range: 500kHz; 100V range: 200 kHz; 10V range:100 kHz
CMRR	120 dB @ 50/60 Hz

Accuracy (% reading + % range)

Range	1000 V	100 V	10 V
DC	0.1 + 0.1	0.1 + 0.1	0.1 + 0.2
AC (10Hz to 1kHz)	0.1 + 0.1	0.1 + 0.1	0.1 + 0.2
AC (10kHz)	5 + 0.5	5 + 0.5	5 + 0.5

Current

Crest Factor	CF ≤ 2
Temperature Coefficient	0.05 x (Spec)/k
Overload capacity	10 % overload
CMRR	120 dB @ 50/60 Hz
Shunt (current input)	
Measuring Range	0.1 A, 1 A, 10 A
Input Impedance	0.025 Ω (Typical)
Bandwidth	10 A range: 500 kHz; 1 A range: 200 kHz; 0.1 A range: 100 kHz
BNC (voltage input)	
Range	0.1 V, 1 V, 10 V
Input Impedance	100k Ω/100pF (Typical)
Bandwidth	10 V range: 500 kHz; 1 V range: 200 kHz; 0.1 V range: 100 kHz

Accuracy (% reading + % range)						
Range	**10 A**	**1 A**	**0.1 A**	**10 V**	**1 V**	**0.1 V**
DC	0.1 + 0.2	0.1 + 0.5	0.1+2	0.1+0.1	0.1+0.2	0.1+1
AC (10Hz to 1kHz)	0.1+0.1	0.1+0.2	0.1+1	0.1+0.1	0.1+0.1	0.1+0.5
AC (10kHz)	5+1	5+1	5+1	5+1	5+1	5+1

Motor Module (Torque and Speed)	
Voltage Range	± 10 V dc, 10 % overload
Voltage Channels	2
Input Impedance	1.1M Ω (Typical)
Accuracy at dc	0.1 % range + 0.1 % reading
Pulse Channels	3
Pulse Logic High Threshold	2 V (Typical)
Pulse Logic Low Threshold	0.8 V (Typical)
Maximum Pulse Frequency	100 kHz

Frequency Domain Measurement	
Frequency Accuracy	0.05 % range + 0.05 % reading
Harmonics	100 (50Hz/60Hz)
Calculation method	FFT/Interpolation

Optional Accessory: Fluke U1500s High Voltage Differential Probe

Product Feature

The Fluke U1500s High Voltage Differential Probe is a portable voltage sensor with a 1500 V range and 0.1 % accuracy.

General Specifications	
Modules	U1500s
Maximum Voltage	1000 V ac rms, continuous, 1500 V dc (Single-range)
Dimensions	138 mm x 75 mm x 45 mm
Weight	295 g, battery included
Input terminal	4 mm banana jacks

Output terminal	BNC (female)
Accessory Cable	BNC to Banana, 1.6 m
Ingress Protection	IEC 60529: IP40 (Terminals Mated)
Battery Type	4 AA, IEC LR6
Battery Life	168 hours (typical)
Indicator	Low battery flashes red Working flashes green
Operating Temperature	–10 °C to 50 °C
Storage Temperature	–30 °C to 60 °C
Operating Humidity	Non-condensing (<10 °C) ≤ 90 % RH (at 10 °C to 30 °C) ≤ 75 % RH (at 30 °C to 40 °C) ≤ 45 % RH (at 40 °C to 50 °C)
Operating Altitude	2000 m
Storage Altitude	12 000 m
Safety General	IEC 61010-1: Pollution Degree 2
Safety Measurement	IEC 61010-2-030: CAT III 1000 V, CAT IV 600 V, DC 1500 V

Electrical Specifications	
Measurement Range	1000 V ac rms, 1500 V dc
Accuracy	0.1 % of reading +0.1 % of Range
Bandwidth	100 kHz (Max)
Input Impedance	10 MΩ / <10 pF
Scale	4 mV/V
Common Mode Rejection Ratio	60 dB at 50 Hz
Temperature Coefficients	0.05 % / °C (<18 °C or >28 °C)
Over-range Protection	10 % over range

Optional Accessory: Fluke 80i-2010s AC/DC Current Clamp

Product Feature

The Fluke 80i-2010s AC/DC Current Clamp is a clamp-on current probe with 2000A range and 0.8 % accuracy.

General Specifications	
Modules	80i-2010s
Dimensions	110 mm x 270 mm x 46mm
Weight	0.710 kg (1.6 lbs), including battery
Output Cable	1.5 m (60 in) Shielded Coaxial cable with BNC plug
Maximum Conductor Size	52.0 mm (2.05 in)
Maximum Jaw Opening	81.5 mm
Output to Zero	Auto adjustment with Zero button
Temperature Operating	-10 °C to 50 °C (14 °F to 122 °F)
Storage (battery removed)	-30 °C to +60 °C (-22 °F to +140 °F)
Operating Humidity	≤ 90 % RH (at 10 °C to 30 °C) ≤ 75 % RH (at 30 °C to 40 °C) ≤ 45 % RH (at 40 °C to 50 °C)
Altitude Operating	2,000 m (6560 ft)
Storage	12,000 m (40,000 ft)
Demagnetize Clamp	Open and close the Clamp jaws several times with soft click, use of the clamp on uninsulated conductors is limited to 1000 Vac rms or DC and frequencies 1 kHz or less.
Safety	IEC 61010-1, Pollution Degree 2, IEC 61010-2-032: CAT III 1000 V /CAT IV 600 V
Ingress Protection	IEC 60529, IP40
Power Supply Type	2 x AA alkaline battery, IEC LR6
Battery Life	150 hours (typically)
Low battery indicator	Yes

Electrical Specifications	
Current Range	2000 A ac rms, ± 2000 A dc
Output Sensitivity	1 mV/A
Accuracy	± 0.8 % of reading ± 0.2 % of range
Bandwidth for Accuracy Specification	DC to 400 Hz
Load impedance	>1 MΩ and <10 pF
Frequency Response (small signal)	DC to 20 kHz (–3 dB)
Temperature Coefficient	0.1 x specified accuracy for each degree C above 28 °C or below 18 °C
Working Voltage	1000 V AC RMS or DC

Ordering information

Fluke-Norma 6003	Portable power analyzer with 3 voltage inputs and 3 current inputs
Fluke-Norma 6003+	Portable power analyzer with 3 voltage inputs, 3 current inputs, and 1 motor input
Fluke-Norma 6004	Portable power analyzer with 4 voltage inputs and 4 current inputs
Fluke-Norma 6004+	Portable power analyzer with 4 voltage inputs, 4 current inputs, and 1 motor input

Optional accessories

Fluke U1500S	High Voltage Differential Probe
Fluke 80i-2010S	2,000 A AC/DC Current Clamp
Fluke 80i-2010S/3PK	2,000 A AC/DC Current Clamp 3 pack

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Printed in U.S.A. 12/2019 6013111a-en

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