

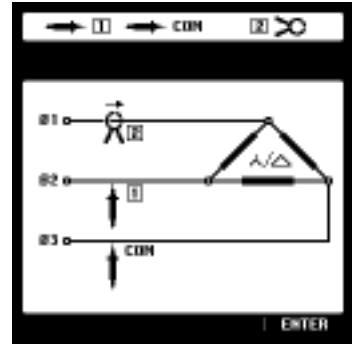
Fluke 43B Power Quality Analyzer

Maintain power systems, troubleshoot power problems, diagnose equipment failures



The Fluke 43 Power Quality Analyzer performs the measurements you need to maintain power systems, troubleshoot power problems and diagnose equipment failures. All in a rugged handheld package.

- Combines the most useful capabilities of a power quality analyzer, multimeter and scope
- **New!** Calculates three-phase power on balanced loads, from a single-phase measurement
- Measures power harmonics, and captures voltage sags, transients and inrush current.
- Monitoring functions help track intermittent problems and power system performance
- Menus use familiar electrical terminology
- **New!** Toggle through the most commonly used power quality modes with a single keystroke
- Records two selectable parameters for up to 16 days
- **New!** 20 measurement memories to save/recall screens and data with cursor readings
- **New!** FlukeView Software can log harmonics and all other readings over time
- **New!** FlukeView Software provides a complete harmonics profile up to the 51st harmonic
- Measures resistance, diode voltage drop, continuity, and capacitance
- Users / applications manual and power quality video to help answer tough questions
- Complete package with voltage probes and 500A current clamp, FlukeView® Software and optically isolated interface cable
- 3 year warranty on the Fluke 43B, 1 year on accessories



- On screen graphics show you how to set up 3 phase power measurements



- Watts, power factor, displacement power factor ($\cos \phi$), VA and VAR
- Voltage and current waveforms



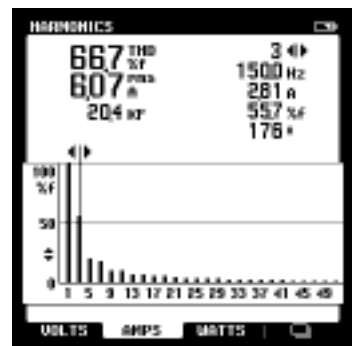
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UL 1244



- Voltage and current waveforms
- True-rms voltage and current
- Frequency

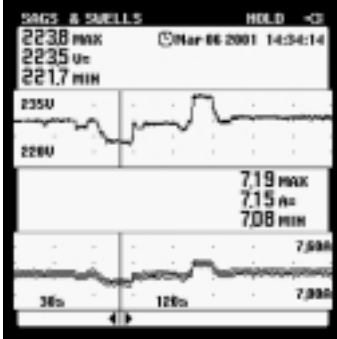


- Voltage, current, and power harmonics
- Up to 51st harmonic
- Total harmonic distortion (THD)
- Phase angle of individual harmonics

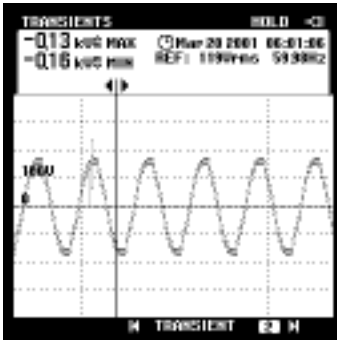
Specifications

Accuracies are stated as \pm (percentage of reading + counts) without probes unless otherwise noted.

Specifications are valid for signals with a fundamental between 40 and 70 Hz



- Continuously measure volts and amps on a cycle-by-cycle basis for up to 24 hours
- Use cursors to read time and date of sags and swells



- Catch voltage transients and waveform distortion
- Catch and save up to 40 transients
- Correlate the cause of transients with time and date stamps

Input Characteristics	Ranges	Accuracy
Input impedance	1 M Ω , 20 pF	
Voltage rating	600 Vrms, CAT III	
Volt / Amps / Hertz		
True-rms voltage (AC+DC)	5.000 V, 50.00 V, 500.0 V, 1250 V*	\pm (1 % + 10 counts)
True-rms current (AC+DC)	50.00 A, 500.0 A, 5.000 kA, 50.00 kA, 1250 kA	\pm (1 % + 10 counts)
Frequency	10.0 Hz to 15.0 kHz	\pm (0.5 % + 2 counts)
CF Crest Factor	1.0 to 10.0	\pm (5% + 1 count)
Power		
W, VA, VAR Reactive Power 1-phase and 3-phase, 3 conductor balanced loads	250 W 2.50 kW, 25.0 kW, 250kW, 2.50 MW, 25 MW, 250 MW, 625 MW, 1.56 GW	\pm (2 % + 6 counts) Total Power \pm (4 % + 4 counts) Fundamental Power
PF Power Factor	0.00 to 1.00	\pm 0.04
DPF Displacement Power Factor	0.00 to 0.25 0.25 to 0.90 0.90 to 1.00	not specified \pm 0.04 \pm 0.03
Hz Frequency Fundamental	40.0 to 70.0 Hz	\pm (0.5 % + 2 counts)
Harmonics		
Volts, Amps, Watts	Fundamental	V,A \pm (3 % + 2 counts), W \pm (5 % + 2 counts)
	2 to 31st Harmonic	V,A \pm (5 % + 3 counts), W \pm (10 % + 10 counts)
	32 to 51st Harmonic	V,A \pm (15 % + 5 counts), W \pm (30 % + 5 counts)
Frequency of fundamental	40 Hz to 70 Hz	\pm 0.25 Hz
Phase	Volt & Amps (between Fund. & Harmonic)	2nd (\pm 3°) ... 51st (\pm 15°)
	Watts (between Volt Fund. & Amps Harmonic)	Fund (\pm 5°) ... 51st (\pm 15°)
K-Factor (Amps & Watts)	1.0 to 30.0	\pm 10 %
THD	0.00 to 99.99	\pm (3% + 8 counts)
Sags & Swells		
Recording times (selectable)	4 min to 16 days	
Vrms Actual, Vrms max, min (AC + DC)	5.000V, 50.00V 500.0V, 1250V*	Readings \pm (2% + 10 counts) Cursor readings \pm (2% + 12 counts) Cursor Readings Average \pm (2% + 10 counts)
Arms Actual, Arms max, min (AC + DC)	50.00A, 500.0A, 5.000 kA, 50.00 kA	
Recording		
Recording times (selectable)	4 min to 16 days	
Parameters	Choose one or two parameters from one of the groups below	
V/A/Hz	Line Voltage, Current, Frequency	
Power	Watts, VA, VAR, PF, DPF, Frequency	
Harmonics	THD, Volt(Fund. & Harmonic), Amps(F&H) Watts(F&H) Freq.(H), % (H) of total, Phase(H), KF	
Ohms	Ohms, Diode, Continuity, Capacitance	
Temperature	$^{\circ}$ C or $^{\circ}$ F	
Scope	DC Voltage, DC Current, AC Voltage, AC Current, Frequency, Pulse Width + or -, Phase, Duty cycle + or -, Peak max, Peak min, Peak min-max, Crest Factor	
Transients		
Minimum pulse width	40 ns	
Useful bandwidth input 1	DC to 1 MHz (with test leads TL24)	
Number of transients	40	
Voltage threshold settings	20%, 50%, 100%, 200% above or below reference signal	
Reference signal	After START, the Vrms and frequency of the signal are measured. From these data a pure sinewave is calculated as reference for threshold setting.	
Vpeak min, Vpeak max at cursor	10 V, 25 V, 50 V, 125 V, 250 V, 500 V, 1250 V	\pm 5% of full scale

*Rated 600V CAT III

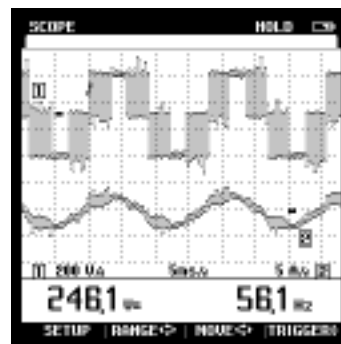
Inrush Current	Ranges	Accuracy
Current ranges (selectable)	1 A, 5 A, 10 A, 50 A, 100 A, 500 A, 1000 A	
Inrush times (selectable)	1 s, 5 s, 10 s, 50 s, 100 s, 5 min	
Cursor readings	A peak max at cursor 1 and cursor 2	± 5% of full scale
Time between cursors**	4 to 235 pixels	± (0.2% + 2 pixels)
Scope, dual channel scope with measurement reading		
Input Impedance		
Input 1	1 MΩ//12 pF; with BB120: 20 pF	± 2 pF; with BB120 ±3 pF
Input 2	1 MΩ//10 pF; with BB120: 18 pF	± 2 pF; with BB120 ±3 pF
Vertical		
Voltage ranges	50 mV/div to 500V/div	± (1% + 2 pixels)
Vertical sensitivity, resolution	5 mV/div to 500V/div, 8 bit (256 levels)	
Bandwidth channel [1] (voltage)	DC to 20 MHz at inputs, or with BB120 and VPS100-R probe (Opt); 1 MHz with TL24 Leads	
Bandwidth channel [2] (current)	DC to 15 kHz at inputs 10 kHz with 80i-500s Current Clamp	
Coupling	DC, AC (10 Hz -3 dB)	
Horizontal		
TimeBase modes	Normal, roll, single	
TimeBase ranges	60 s/div to 20 ns/div	± (0.4% + 1 pixel)
Sampling rate	25 MS/s	
Record length (min / max samples)	512 per channel	
Trigger source	Input 1 or Input 2 or Automatic selection	
Trigger Mode	Automatic Connect-and-View™, Free Run, Single Shot.	
Connect-and-View™	Advanced automatic triggering that recognizes signal patterns and automatically adjusts triggering, timebase and amplitude. Automatically displays stable pictures of complex and dynamic signals like motor drive and control signals.	
Pre-trigger	Up to 10 divisions	
Measurement readings, per channel selectable	Volts & Amps (DC, AC, AC + DCrms, Peak max, Peak min, Peak min / max), Frequency, Duty cycle + or - , Phase, Pulse Width + or - , Crest factor	
Ohms, Diode, Continuity, Capacitance		
Ohms	500.0Ω 5.000 kΩ, 50.00 kΩ, 500.0 kΩ, 5.000 MΩ, 30.00 MΩ	± (0.6% +5 counts)
Diode voltage	0 to 3.000 V	± (2% +5 counts)
Continuity, shorts > 1 ms	Beeper on at < 30Ω ± 5Ω,	
Capacitance	50.00 nF, 500.0 nF, 5.000 μF, 50.00 μF, 500.0 μF	±(2% +10 counts)
Temperature***	-100.0 °C to 400.0 °C, -200.0 °F to 800.0 °F	±(0.5% +5 counts)
Max current, max open circuit volt.	0.5 mA, < 4 V (all functions above)	
Memory		
Number of screens	20	
Optical Isolated RS-232 Interface		
To printer	Supports HP LaserJet, DeskJet, Epson FX/LQ and Postscript printers with optional PAC91 Printer Adapter Cable	
To PC	FlukeView® Power Quality Analyzer software with PM9080 Interface Adapter included	
FlukeView® Power Quality Software		
Hardware requirements	PC or 100% compatible with Windows 95, 98, Me, 2000, NT4.0.	

** 1 pixel = inrush time/250

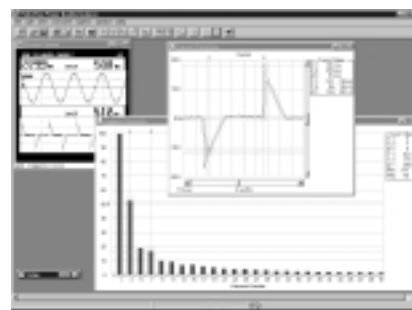
*** Requires optional temperature accessory



- Inrush current up to 500A with supplied current probe
- Use cursors to measure inrush current timing



- Connect-and-View™ scope for quick waveform display
- voltage and current channels
- 20MHz bandwidth with optional 10:1 voltage probe. 15kHz on current channel with optional current clamp



- FlukeView® Power Quality Analyzer software (included)
- Capture measurement screens for professional-looking reports
- Log readings to your computer disk drive
- Works with Windows word processing, spreadsheet and analysis software
- Windows 95 / 98 / Me / 2000 / NT 4.0

General Specifications

Power	
Line voltage adapter/battery charger included	
Installed battery	Rechargeable NiCd pack (4 to 6 Vdc)
Operating time	4 hours
Charging time	4 hours (Fluke 43B OFF) 12 hours (Fluke 43B ON)
Refresh Cycle	8 to 14 hours (to keep NiCd battery capacity optimal)
Environmental	
Temperature	0°C to 50°C (32°F to 122°F)
Environmental	MIL 28800E, Type 3, Class III, Style B
Enclosure	IP51 (dust, drip water proof)
Mechanical Data	
Size (H x W x D)	232 x 115 x 50 mm (9.1 x 4.5 x 2 inches)
Weight	1.1 kg (2.5 lbs.) incl. battery pack
Safety	
For measurements on 600 Vrms Category III installations, Pollution Degree 2 in accordance with EN61010-1 (1993) (IEC1010-1) ANSI/ISA S82.01-1994 CAN/CSA-C22.2 No. 1010.1-92 UL3111-1	
Surge protection	6 kV on input 1 and 2
Floating measurements	600 Vrms from any terminal to ground
Warranty	3 years parts and labor on Fluke 43B, 1 year on accessories

Ordering Information

Fluke 43B Power Quality Analyzer

Included Accessories

C120 Hard Case
 TL24 Test Leads
 AC20 Industrial Test Clips
 AC85 Large Jaw Alligator Clips
 TP1 Flat-tipped Slim-Reach™ Test Probes
 TP4 4 mm Round Slim-Reach™ Test Probes
 80i-500s 500A AC Current Clamp
 PM 9080 Optically Isolated RS232 Interface Adapter
 BP120 Rechargeable Ni-Cd Battery Pack (installed)
 PM 8907 Line Voltage Adapter/Battery Charger
 SW43W FlukeView™ Power Quality Analyzer Software for Windows
 FlukeView® Power Quality Analyzer Users Manual
 Shielded Banana-to-BNC Adapter
 Users Manual / Application Guide
 Power Quality Video

Optional Accessories

C789 Soft Carrying Case
 80i-110s 100A AC/DC Current Probe
 i200s AC Current Clamp
 i1000s 1000A AC Current Clamp
 i2000flex Flexible 2000A AC Current Probe
 i3000s Clamp-On AC Current Clamp
 VPS100-R Red 10:1 Voltage Probe (requires BB120, one included)
 BB120 Two Shielded Banana-to-BNC Adapters
 80TK Thermocouple Module
 80T-IR Non Contact Infrared Temperature Probe
 80T-150U Universal Temperature Probe
 PAC91 parallel Printer Adapter
 PM9087 Isolated Automotive Lighter Plug Charging Adapter



TL20 63" Test Lead Set
 TL21 Extension Lead Set
 TL22 63" Right Angle Silicone Test Lead Set
 TL23F Electrical Test Lead Set
 TL23R Electrical Test Lead Set
 TL24 63" Right Angle/Straight Silicone Test Leads
 TL26A 60" 5-Way Test Lead Set
 TL28A 63" Alligator Clip Test Lead Set
 TL71 Premium DMM Test Lead Assembly
 TL74 4 mm Diameter Test Leads
 TL75 48" Hardpoint Test Lead Set

Specifications Fluke 39 Power Meter and 41B Power Harmonics Analyzer



Ordering Information

Fluke 39 Power Meter
 Fluke 41B Power Harmonics Analyzer

Included Accessories Fluke 39

80i-500s AC Current Probe
 TL24 Test Leads
 AC20 Test Clips
 TP20 Test Probes, Operator's manual

Included Accessories Fluke 41B

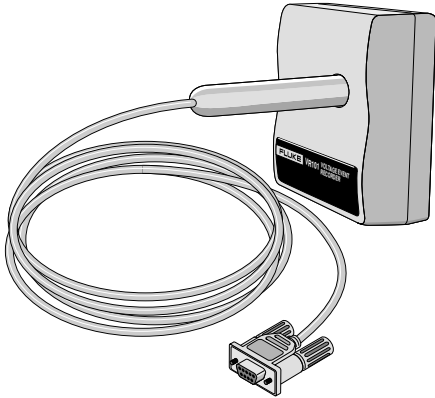
80i-500s AC Current Probe
 TL24 Test Leads
 AC20 Test Clips
 TP20 Test Probes, Operator's manual
 Isolated RS-232 Cable, FlukeView
 Software, Software Manual

Function	Ranges	Accuracy
Volts		
True rms voltage (ac + dc)	5.0V to 600V rms (933V peak)	±(0.5% + 2 digits) (Add 2 digits if <15V rms)
Current (1 mV/A isolated input)		
True rms current (ac + dc)	1.00A to 1000A rms (2000A peak)	±(0.05% + 3 digits) + probe specs
Watts/Volts-Amps (1 mV/A isolated input)		
Active W (VA) (ac + dc)	0.0W (VA) to 600kW (kVA) (2000kW peak)	±(1%+4 digits)+ probe specs
Harmonics (harmonic level >5% using smooth 20)		
Volts	Fundamental to 13th harmonic At 31st	±(2% + 2 digits) ±(8% + 2 digits)
Amps or watts	Fundamental to 13th harmonic At 31st	±(3% + 3 digits) + probe specs ±(8% + 3 digits) + probe specs
Other		
Frequency	Fundamental 6.0 Hz to 99.9 Hz	± 0.3 Hz
Input Bandwidth	DC, 6 Hz to 2.1 kHz	
Crest Factor (CF)	1.00 to 5.00	±4%
Power Factor (PF)	0.00 to 1.00	± 0.02
COS Δ (DPF)	0.00 to 1.00	± 0.04 to ±0.03 (0.30 to 0.89) ± 0.02 (0.90 to 1.00)
Phase	-179° to 180°	
K-factor (KF)	1.0 to 30.00	± 10%
% THD-F	0.00% to 99.9%	±(0.03 reading + 2.0%)
% THD-R	0.00% to 99.9%	±(0.03 reading + 2.0%)

Power	
Battery type/life	4 Alkaline °C cells ANSUNEDA -14A, IEC-ER 14 / 48 hr typical (continuous)
Mechanical	
Size / Weight	234mm 1x100mm Wx 64 mmD /0.9 kg
Enviremental	
Shock & Vibration	Per MEL-T-28800, Class 3
Case	Drip-proof and Dorst-Proof per IEC, IP 52
Safety	
	IEC 1010-1 Installation category III, Material Group II, 600V, Tested in UL 1244
Warranty	1 year

Features Fluke 39 Power Meter and 41B Power Harmonics Analyzer	39	41B
Direct 3ϕ readout from simple single-phase measurement	●	●
True-rms voltage from 5.0V to 600V	●	●
True-rms current from 1A to 500A (1000A with optional probe)	●	●
Peak, DC, and Crest Factor	●	●
Total harmonic distortion (% THDF and % THDR)	●	●
Active power from 10W to 300kW (600kW with optional probe)	●	●
Apparent power (VA) & Reactive Power (VAR)	●	●
Total power factor (PF)	●	●
Displacement power factor (DPF) Cos ϕ	●	●
K-factor	●	●
Frequency from 6Hz -99.9Hz (fundamental)	●	●
Harmonics to 31st	●	●
Phase angle of fundamental and harmonics	●	●
Waveform and spectrum displays	●	●
Record mode - MIN, MAX and AVG	●	●
Zoom mode on harmonics bargraph	●	●
Handheld, 1 kg (2 lb)	●	●
Surge protection, 6kV per IEC 1010-1 CAT III - 600V	●	●
Marks - CE, TUV/GS	●	●
Includes 500A current clamp and video	●	●
Memory for 8 complete data sets		●
Optically isolated RS-232 interface		●
FlukeView™ PC Software on Windows and DOS incl.		●

Specifications Fluke VR101S Voltage Event Recorder System



Ordering Information

(Note: At least one VR101S is required for proper operation)
 VR101S Voltage Event Recorder System
 VR101 Voltage Event Recorder

Computer Hardware Requirements for EventView software

IBM PC or 100% compatible,
 with Windows® 3.1 or Windows 95
 installed and operating
 At least one free RS-232 serial port
 A pointing device (recommended)
 2 MB hard drive space
 4 MB RAM (8 MB for Windows 95)

Included Accessories VR101S

VR101 Voltage Event Recorder,
 Optical interface cable, 9-to-25 pin adapter,
 EventView Software on two 3 1/2 inch
 floppies, Users Manual

Included Accessories VR101

VR101 Voltage Event Recorder,
 Instruction Sheet

Electrical			
(voltage versions, plug style, and manual languages are determined by country)			
Voltage Version	Operating range	Nominal frequencies	Power consumption
120V	70V to 140V	50 Hz or 60 Hz	2W
230V	140V to 270V	50 Hz or 60 Hz	3W
Sags, Swells and Outage Measurements			
Voltage Version	Range	Accuracy	Resolution
120V Hot-to-neutral	0 to 200V rms	±2V rms	1V rms
Neutral-to-ground	3 to 200V rms	±2V rms	1V rms
230V Hot-to-neutral	0 to 400V rms	±4V rms	2V rms
Neutral-to-ground	3 to 120V rms	±2V rms	1V rms
Transient Measurements			
	Range	Accuracy	Resolution
Hot-to-neutral	100 to 2500V peak	±(10% reading + 10V)	10V
Neutral-to-ground	50 to 2500V peak	±(10% reading + 10V)	10V
Phase angle	20° to 180°	±1°	1°
	200° to 360°		
Minimum pulse width: 1 µs			
Frequency Measurements			
	Range	Accuracy	Resolution
	45 to 65 Hz	±0.1 Hz (3 cycles min)	0.1 Hz
Time Measurements: Events < 1 second			
	Accuracy	Resolution	
Hot-to-neutral	±0.5 cycles	0.5 cycles	
Neutral-to-ground	±1 cycle	1 cycle	
Events ≥1 second (time stamp)			
	Accuracy	Resolution	
	±(2 sec/day + 8 sec)	8 sec	

General Specifications	
Memory size	4000 events
Power	
Battery type	3.5V lithium (non-replaceable)
Battery life	7 years
Mechanical	
Physical size	85 mm x 68 mm x 35 mm
Weight	120g
Environmental	
Operating temperature	-40 to 70°C
Relative Humidity	0 to 95% (non-condensing)
Safety	
	CSA Certification pending, CSA-NRTL (to UL 3111) certification pending, Complies with requirements of EN61010-1:1993
Warranty	1 year

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