

Fluke 430 Series three-phase and Fluke 43B single-phase Power Quality Analyzers

Technical Data

Analyze your power network quickly

In industry, healthcare, and business – in fact wherever electrical and electronic equipment is indispensable – power quality plays a critical role in maintaining continuity. Non-linear loads, switching, load changes and equipment problems can result in poor power quality. Poor power quality is not only costly in terms of wasted energy and unnecessary downtime, it's also dangerous and increases risk of equipment failure.

Fluke has an unrivalled range of power quality analyzers to help you maintain high-quality power systems. The tools give you the power to analyze every parameter, power-related event or anomaly faster, safer and in more detail than ever before.

The range comprises the Fluke 430 Series three-phase power quality analyzers and the 43B single-phase power quality analyzer.



Power Quality Selection Table

	434	433	43B*
Application	Three-phase		Single-phase
Inputs	4 voltage and 4 current (for 3 phases and neutral)		1 voltage and 1 current
Measurements			
Vrms, Arms, Hz, W, VAR, VA, PF, Cos ϕ (DPPF), Crest Factors	●	●	●
Harmonics and THD (V,A,W), k-factor	●	●	●
Inter-harmonics	●	Optional*	●
kWh and kVARh, kVAh, demand interval	●	Optional*	●
Flicker (Plt, Pst, PF5)	●	●	●
Unbalance	●	●	●
Recorder/ AutoTrend	●/●	●/●	●/-
System-Monitor	●	●	-
Real time scope/Phasor diagrams	●/●	●/●	●/-
Dips and swells/Half cycle based	●/●	●/●	●/-
Transient display/capture	●	Optional*	●
Inrush current	●	Optional*	●
EN50160 compliance	●	●	-
IEC61000-4-30, -4-7, -4-15 compliance	●	●	-
Built-in general purpose Scope and DMM	-	-	●
Memory (screens/data)	50/10	25/5 standard 50/10 optional*	20 for screens and data
FlukeView software and interface cable	●	Optional*	Depending on configuration*
EN61010 safety rating	600 V CAT IV/1000 V CAT III		600 V CAT III

* Optional functionality can be added with upgrade kit. For details see ordering information.

Technical Specifications Fluke 430 Series three-phase Power Quality Analyzers

Input characteristics			
Voltage inputs			
Number of inputs	4 (3 phases + neutral)		
Maximum input voltage	1000 Vrms		
Maximum peak voltage	6 kV		
Input impedance	4 M Ω // 5 pF		
Bandwidth	9 kHz, up to 100 kHz for transient display		
Scaling	1:1, 10:1, 100:1, 1000:1 and variable		
Current inputs			
Number of inputs	4 (3 phases + neutral)		
Type	Clamp on current transformer with mV output		
Range	1.400 Arms with included clamps (i400s) 0.1..3000 Arms with optional clamps		
Input impedance	50 k Ω		
Bandwidth	9 kHz		
Scaling	0.1, 1, 10, 100, 1000 mV/A and variable		
Nominal frequency	40..70 Hz		
Sampling system			
Resolution	16 bit analog to digital converter on 8 channels		
Maximum sampling speed	200kS/s on each channel simultaneously		
RMS sampling	5000 samples on 10/12 ² cycles according IEC 61000-4-30		
PLL synchronization	4096 samples on 10/12 ² cycles according IEC 61000-4-7		
Display modes			
Waveform display	Available in Scope and Transient mode Captures 8 waveforms simultaneously Display update rate 5x per second Up to 10/12 times horizontal zoom Cursors: Single vertical line showing min, max, avg reading at cursor position.		
Phasor	Shows real time phasor diagram Available in Scope and Unbalance mode Display update rate 5x per second		
Matrix readings	Available in Volts/Amps/Hertz, Harmonics, Power & Energy, Flicker and Unbalance mode.		
AutoTrend graph	Available in Volts/Amps/Hertz, Dips & Swells, Harmonics, Power & Energy, Flicker, Unbalance, Inrush and Monitor mode Cursors: single vertical line showing with min, max, avg reading at cursor position.		
Bargraph	Available in Harmonics and Monitor mode		
Eventlist	Available in Dips & Swells and Monitor mode		
Measurement modes			
Scope	Vrms, Arms, Vcursor, Acursor, Vfund, Afund, Hz, V phase angles, A phase angles		
Volts/Amps/Hertz	Vrms, Vpk, V Crest Factor, Arms, Apk, A Crest Factor, Hz		
Dips and Swells	Vrms ^{1/2} , Arms ^{1/2} Captures up to 1000 events with date, time, duration, magnitude and phase identification with programmable thresholds		
Harmonics DC, 1 ... 50	Harmonic Volts, THD Volt, Harmonic Arms, THD Arms, K Arms, Harmonic Watts, THD Watts, K Watts, Interharmonic Volts [†] , Interharmonic Arms [†] (relative to fundamental or to total rms)		
Power and Energy [†]	Watts, VA, VAR, Power factor, Cos ϕ / DPF, Arms, Vrms, kWh, kVAh, KVARh, peak demand interval using trend, KYZ revenue meter verification via optional input		
Flicker	Pst _(1min) , Pst, Plt, PF5, Vrms ^{1/2} , Arms ^{1/2} , Dc, Dmax, TDEX		
Unbalance	Vneg, Vzero, Aneg, Azero, Vfund, Afund, Hz, V phase angles, A phase angles		
Transients [†]	Vrms, Arms, Vcursor, Acursor		
Inrush Currents [†]	Inrush Current, Inrush duration, Arms ^{1/2} , Vrms ^{1/2}		
System Monitor	Vrms, Arms, Harmonic Volts, THD Volts, Plt, Vrms ^{1/2} , Arms ^{1/2} , Vneg, Hz, dips and swells, unbalance. All parameters are measured simultaneously in accordance with EN50160. Using Flagging to indicate unreliable readings according IEC61000-4-30.		
Accuracy, resolution and range			
Volt/Amps/Hertz	Measurement range	Resolution	Accuracy
Vrms (AC+DC)	1...1000 Vrms	0.1 Vrms	\pm 0.5% of nominal voltage
Vpk	1...1400 Vpk	1 V	5% of nominal voltage
CFV	1.0 ... > 2.8	0.1	\pm 5%
Arms (AC+DC)	0 ... 20,000 Arms ¹ 0...400 Arms	0,001 ... 10 Arms ¹ 0.1 and 1 Arms	\pm 1% of reading \pm 5 counts ³
Apk	using 1mV/A scaling	0 - 5500 Apk	\pm 5%
CFA	using 1mV/A scaling	1 ... 10	\pm 5%
Hz	50Hz nominal	42.50 ... 57.50 Hz	\pm 0.1% of nominal frequency
	60Hz nominal	51.00 ... 69.00 Hz	\pm 0.1% of nominal frequency
Dips and swells			
Vrms ^{1/2} (AC+DC)	0.0% ... 100% of nominal voltage	0.1 Vrms	\pm 1% of nominal voltage
Arms ^{1/2} (AC+DC)	0 ... 20,000 Arms ¹ 0 ... 400 Arms	0,001 Arms...10 Arms 0.1 Arms and 1 Arms	\pm 1% of reading \pm 5 counts ³
Threshold levels	Programmable in percent of nominal voltage		
Duration	hhh,mm,ss,mmm with half-cycle cycle time resolution		

	Measurement range	Resolution	Accuracy
Harmonics			
Harmonic selection (n)	DC, 1..50		
Inter-Harmonic selection	Off, 1..49		
Vrms	Relative (%f): 0.0 ... 100.0% Absolute: 0.0 ... 1000 Vrms	0.1%, 0.1 Vrms	± 0.1% ± n x 0.1% (± 0.4% for %r) ± 5% of reading ± 2 counts
Vrms	Relative (%f): 0.0 ... 100.0% Absolute: 0.0 ... 4000 mV x selected clamp scaling	0.1%, 1 mVrms x selected clamp scaling	± 0.1% ± n x 0.1% (± 0.4% for %r) ± 5% of reading ± 5 counts
Watts	Relative: 0.0 ... 100.0% Absolute: depends on selected clamp and voltage scaling	0.1%	± n x 2% ± 5% of reading ± n x 2% of reading, ± 10 counts
DC voltage	Relative: 0.0 ... 100.0% Absolute: 0.0 ... 1000V	0.1% 0.1V	± 1% ± 5% of reading ± 10 counts
THD	0.0 ... 100.0 %	0.1%	± 2.5%
Hz	0 ... 3500 Hz	1 Hz	± 1Hz
Phase angle	-360° ... +360°	1°	± n x 1.5°
Power and Energy			
Watt	1.0 W ... 20.00 MW ¹	0.1 W ... 1 kW ¹	± 1.5% of reading ± 10 counts ³
VA	1.0 VA ... 20.00 MVA ¹	0.1 VA ... 1 kVA ¹	± 1.5% of reading ± 10 counts ³
VAR	1.0 VAR ... 20.00 MVAR ¹	0.1 VAR ... 1 kVAR ¹	± 1.5% of reading ± 10 counts ³
kWh	00.00 kWhr...200.0 GWhr ¹	0.01 Whr...100 Whr ¹	± 1.5% of reading ± 10 counts ³
kVA	00.00 kVAhr...200.0 GVAhr ¹	0.01 VAhr...100 VAhr ¹	± 1.5% of reading ± 10 counts ³
kVAR	00.00 kVARhr ... 200.0 GVARhr ¹	0.01 VARhr...100 VARhr ¹	± 1.5% of reading ± 10 counts ³
Power Factor	0...1	0.01	± 0.03 ³
Cos φ / DPF	0...1	0.01	± 0.03 ³
Flicker			
Pst (1min), Pst, Plt, PF5 instantaneous Flicker	0.00 ... 20.00	0.01	Within ±5% of tabulated values according IEC61000-4-15
Dc%, Dmax% and Time d(t) exceeds limits. As described per IEC 61000-3-3	0.0 ... ± 100.0% for Dc% and Dmax% ... 9.999s for Time ± 1% for Time	0.1% for Dc% and Dmax% and 10 ms for Time	± 1% for Dc% and Dmax% and 20 ms for Time
Unbalance			
Volts	0.0 ... 5.0%	0.1%	± 0.5%
Current	0.0 ... 20%	0.1%	± 1%
Transient capture			
Volts	± 6000 Vpk	1 V	± 15% of cursor reading ± 2.5% of Vrms
Minimum detect duration	5 μs		
Sampling rate	200 kS/s		
Inrush mode			
Arms (AC+DC)	0.000 ... 20.00 kArms ¹	0.001.. 10 Arms ¹	± 1% of meas ± 5 counts
Inrush Duration	mm:ss:mmm between 7.5 s ... 30 m selectable	10 ms	± 20 ms (Fnominal = 50 Hz)
Trend recording			
Method	AutoTrend automatically records min, max and average values over time for all readings being displayed for the 3 phases and neutral simultaneously.		
Volts/Amperes/Hertz, Harmonics, Power & Energy, Flicker and Unbalance mode			
Sampling	5 readings/sec continuous sampling per channel		
Memory	1800 min, max and avg points for each reading		
Recording time	From 30 min with 1 second display resolution up to 450 days with 6 hour display resolution		
Zoom	Up to 6x horizontal zoom		
Dips & Swells mode			
Sampling	100/120 ² readings/sec continuous sampling per channel		
Memory	3600 min, max and avg points for each reading		
Recording time	From 90 sec with 25 msec display resolution up to 450 days with 3 hr display resolution		
Zoom	Up to 12x horizontal zoom		
Inrush Currents and Flicker PF5 mode			
Sampling	100/120 ² readings/sec continuous sampling per channel		
Memory	3600 min, max and avg points for each reading		
Recording time	From 7.5 sec with 25 msec display resolution up to 30 min with 500msec display resolution for Inrush measurements and up to 2.5 hr with 2.5 sec display resolution for PF5 recordings		
Zoom	Up to 12x horizontal zoom		
Monitor mode			
Sampling	Combination of 5 readings/sec and 100/120 ² readings/sec continuous sampling per channel depending on the parameter measured		
Recording time	Up to 1 week with 10 min resolution		
Memory	1008 min, max and avg points for each reading		
Limits	According EN50160 or customer definable		
Measurement method			
Vrms, Arms	10/12 ² cycle contiguous non overlapping intervals using 500/416 ² samples per cycle in accordance with IEC 61000-4-30		
Vpeak, Apeak	Absolute highest sample value within 10/12 ² cycle interval with 40μs sample resolution		
V Crest Factor	Measures ratio between the Vpeak and Vrms		
A Crest Factor	Measures ratio between the Apeak and Arms		
Hz	Measured every 10 sec in accordance with IEC61000-4-30		
Vrms ^{1/2} , Arms ^{1/2}	Value is measured over 1 cycle, commencing at a fundamental zero crossing, and refreshed each half-cycle. This technique is independent for each channel in accordance with IEC 61000-4-30		

Technical Specifications Fluke 430 Series three-phase Power Quality Analyzers

Measurement method (continued)	
Harmonics	Calculated from 10/12-cycle gapless harmonic group measurements on Voltage and Amps according to IEC 61000-4-7
Watt	Selectable Total or Fundamental real power display Calculates average value of instantaneous power over 10/12 cycle period for each phase Total Active Power $P_T = P_1 + P_2 + P_3$
VA	Selectable Total or Fundamental apparent power display Calculates apparent power using V_{rms} x I_{rms} value over 10/12 cycle period Total Apparent Power is root mean square of real and apparent power
VAR	Selectable Total of Fundamental reactive power display Calculates reactive power as root of VA squared minus Watt squared over 10/12 cycle period. Capacitive and inductive load is indicated with capacitor and inductor icons
Power Factor	Calculated Watt / VA
Cos ϕ / DPF	Cos of angle between fundamental voltage and current
Unbalance	The supply voltage unbalance is evaluated using the method of symmetrical components according to IEC61000-4-30
Flicker	According to IEC 61000-4-15 Flickermeter - Functional and design specification. Includes 230V 50Hz lamp and 120V 60Hz lamp models
Transient capture	Captures waveform triggered on signal envelope. Additionally triggers on dips, swells, interruptions and Amps level as specified by IEC61000-4-30
Inrush current	The inrush current begins when the Arms half cycle rises above the inrush threshold, and ends when the Arms half cycle rms is equal to or below the inrush threshold minus a user-selected hysteresis value. The measurement is the square root of the mean of the squared Arms half cycle values measured during the inrush duration. Each half-cycle interval is contiguous and non-overlapping as recommended by IEC 61000-4-30. Markers indicate inrush duration. Cursors allow measurement of peak Arms half cycle.
General Specifications	
Case	
Design	Rugged, shock proof with integrated protective holster
Drip and dust proof	IP51 according to IEC60529 when used in tilt stand position
Shock and Vibration	Shock 30g, Vibration: 3g Sinusoid, Random 0.03g ² /Hz according to MIL-PRF-28800F Class 2
Display	Bright Full-Color LCD with CCFL backlight, 80cd/m ²
Size	115.2 x 86.4 mm
Resolution	320 x 240 pixels
Contrast and brightness	User adjustable, temperature compensated
Memory	
Screens	50 screen memories on Fluke 434 25 screen memories on Fluke 433
Data	10 data memories for storing data including recordings on Fluke 434 5 data memories for storing data including recordings on Fluke 433
Limit templates	2 preprogrammed, 2 administrator (programmable via FlukeView), 2 user locations
Real-time clock	Time and date stamp for AutoTrend, Transient display and SystemMonitor
Mechanical	
Size	256 x 169 x 64 mm
Weight	2 kg
Power	
Line power	Switchable 115V, 230V adapter with country specific plug
Battery power	Rechargeable NiMH (installed)
Battery operating time	> 7 hours
Battery charging time	4 hours
Power saving	Adjustable time for dimmed backlight with on screen power indicator
Standards	
Measurement methods used	IEC61000-4-30 class A
Power Quality	EN50160
Flicker	IEC 61000-4-15
Harmonics	IEC 61000-4-7
Safety	
Compliance	IEC/EN61010-1 (2nd edition) pollution degree 2; CAN/CSA C22.2 No 101.1 ANSI/ISA S82.01
Max voltage on banana input	1000 V CAT III / 600 V CAT IV
Max voltage on current BNC input	42 Vpeak
Environmental	
Operating temperature	0 °C to +50 °C
Storage temperature	-20 °C to +60 °C
Humidity	10 .. 30 °C: 95% RH non condensing 30 .. 40 °C: 75% RH non condensing 40 .. 50 °C: 45% RH non condensing
Maximum operating altitude	3000 m. Derate to 1000 V CAT II / 600 V CAT III / 300 V CAT IV above 2000 m
Maximum storage altitude	12 km
Warranty	3 years on mainframe, 1 year on included accessories

Ordering Information

Fluke 433 Power Quality Analyzer (three-phase)

Fluke 434 Power Quality Analyzer (three-phase)

Fluke 433 UGK Upgrade Kit for Fluke 433
(includes 433AF, OC4USB and SW43W)

Fluke 433AF Advanced Functions Upgrade Kit for Fluke 433

OC4USB Serial Interface Adapter/Cable (USB)

PM9080 Serial Interface Adapter/Cable (RS232)

SW43W FlukeView Software

¹ depending clamp scaling

² 50Hz/60Hz nominal frequency according to IEC 61000-4-30

³ Add clamp accuracy

⁴ The advanced functions: interharmonics, Energy, Transients and Inrush are optional for the Fluke 433 and standard available on the Fluke 434

Accessories Fluke 430 Series

Accessories	
Included	C430 Hard case with clamp holders
	i400s current clamps (4)
	TLS430 Test leads and alligator clips (4 black, 1 green)
	BP190 NiMH Battery pack (installed)
	BC430 Battery charger/line voltage adapter
	SW43W FlukeView Software (Fluke 434 only)
	OC4USB Serial interface adapter cable (USB) (Fluke 434 only)
	WC100 Color localization set
	Getting Started (printed)
	User Manual (CD-ROM)

Technical Specifications Fluke 43B single-phase Power Quality Analyzer

The Fluke 43B Power Quality Analyzer is optimized for industrial measurements on the 50 Hz fundamental frequency. Since its usable fundamental frequency range extends from 10 Hz to 400 Hz, the 43B is ideal for industrial, aviation, marine and railway applications.

Mode	Usable bandwidth	Harmonics on 400 Hz fundamental	Typical accuracy for 400 Hz fundamental
Volt Amp Hz	10 Hz ... 3.5 kHz	9th harmonic	5%
Power	20Hz ... 2 kHz	5th harmonic	10%
Harmonics	10 Hz ... 3.5 kHz	9th harmonic	10% Channel 1 50% Channel 2

Note: Current harmonics measurements can be done via channel 1 with improved accuracy

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.

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, 250 kW, 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)	5.000 V, 50.00 V 500.0 V, 1250 V*	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)	50.00 A, 500.0 A, 5.000 kA, 50,00 kA	

Technical Specifications Fluke 43B single-phase Power Quality Analyzer

Recording	Ranges	Accuracy
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	°C or °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	± 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 VPS40 (standard with Fluke 43B); 1 MHz with TL24 Leads	
Bandwidth channel [2] (current)	DC to 15 kHz at inputs 10 kHz with supplied current clamps	
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	500.0 Ω 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	
General specifications		
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 with 43B and 43Kit	
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

Power	
Line voltage adapter/battery charger included	
Installed battery	Rechargeable NiCd pack (4 to 6 Vdc)
Operating time	4 hours
Charging time	4 hours (unit OFF) 12 hours (unit ON)
Refresh Cycle	8 to 14 hours (to keep NiCd battery capacity optimal)
Environmental	
Operating Temperature	0°C to 50°C (32°F to 122°F)
Shock & Vibration	MIL 28800E, Type 3, Class III, Style B
Case	IP51 (dust, drip water proof)
Mechanical Data	
Size (H x W x D)	232 x 115 x 50 mm
Weight	1.1 kg
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

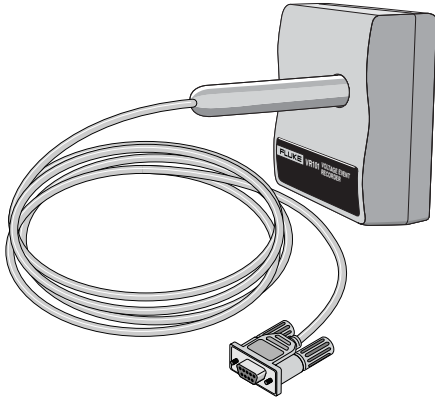
Fluke 43Basic Power Quality Analyzer (Single-phase)

Fluke 43B Power Quality Analyzer (Single-phase)

Fluke 43Kit Power Quality Analyzer (Single-phase)

Standard available in all models	43Basic	43B	43Kit
Fluke 43B Power Quality Analyzer	●	●	●
BP120 NiCd Battery Pack (installed)	●	●	●
PM 8907 Battery Charger/Line Voltage Adapter	●	●	●
TL24 Test Leads	●	●	●
AC20 Industrial Test Clips	●	●	●
TP4 Slim Reach Test Probe Set (4 mm)	●	●	●
BB120 Banana-to-BNC Adapter Plug	●	●	●
Model difference			
i200s AC Current Clamp (200 A)	●		
80i500s AC Current Clamp (500 A)		●	●
SW43W FlukeView® Software for Windows		●	●
PM 9080 Serial Interface/Adapter Cable		●	●
C120 Hard Case		●	●
TP1 Slim Reach Test Probe Set (flat blade)		●	●
AC85 Large Jaw Alligator Clips		●	●
Power Quality Video		●	●
Users Manual / Application Guide		●	
Manual CD 43B	●		●
Promotional Model Numbers			
VPS40 Voltage Probe		●	
Fluke 61 IR Thermometer		●	
Fluke VR101S Voltage Event Recorder System			●

Technical 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 95/98/NT/XP
or 2000 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 95/98 or higher)

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
120 V	70 V to 140 V	50 Hz or 60 Hz	2 W
230 V	140 V to 270 V	50 Hz or 60 Hz	3 W

Sags, Swells and Outage Measurements			
Voltage Version	Range	Accuracy	Resolution
120 V Hot-to-neutral	0 to 200 V rms	±2 V rms	1 V rms
Neutral-to-ground	3 to 200 V rms	±2 V rms	1 V rms
230 V Hot-to-neutral	0 to 400 V rms	±4 V rms	2 V rms
Neutral-to-ground	3 to 120 V rms	±2 V rms	1 V rms

Transient Measurements			
	Range	Accuracy	Resolution
Hot-to-neutral	100 to 2500 V peak	±(10% reading + 10 V)	10 V
Neutral-to-ground	50 to 2500 V peak	±(10% reading + 10 V)	10 V
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

Fluke Corporation
P.O. Box 9090
Everett, WA USA 98206

Fluke Europe B.V.
P.O. Box 1186
5602 BD Eindhoven
The Netherlands

Fluke (UK) Ltd
52 Hurricane Way
Norwich
Norfolk
NR6 6JB
United Kingdom
Tel.: 0207 942 0700
Fax: 0207 942 0701
E-mail: industrial@uk.fluke.nl

For more information call:
In the U.S.A. (800) 443-5853
or Fax (425) 456-5116
In Europe/M-East/Africa
+31 (0)40 2 675 200
or Fax +31 (0)40 2 675 222
In Canada (905) 890-7600
or Fax (905) 890-6866
From other countries
+1 (425) 456-5500
or Fax +1 (425) 456-5116

Visit us on the world wide web at:
<http://www.fluke.com>

© Copyright 2004 Fluke Corporation.
All rights reserved.
Printed in the Netherlands 09/04
Data subject to alteration without notice.
Pub_ID: 10808-eng

Visit us on the world wide web at:
<http://www.fluke.co.uk>