

Fluke 39 Power Meter/41B Power Harmonics Analyzer

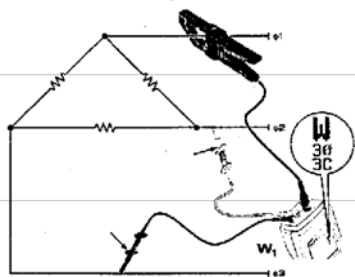
Power Tools for Power Quality

The Model 39 Power Meter and 41B Harmonics Analyzer combine the ease of use of a digital multimeter, the visual feedback of an oscilloscope and the power of a harmonics analyzer in a single instrument. If you're testing power on three-phase systems or troubleshooting harmonics on non-linear loads, no test tool makes it easier.

The Model 41B is ideal for further analyzing data and optimizing system performance. Use the Model 41B's FlukeView™ software (included) to download acquired data to a printer or an MS-DOS® or Windows® compatible computer for analysis and presentation.

Three Views of each reading:

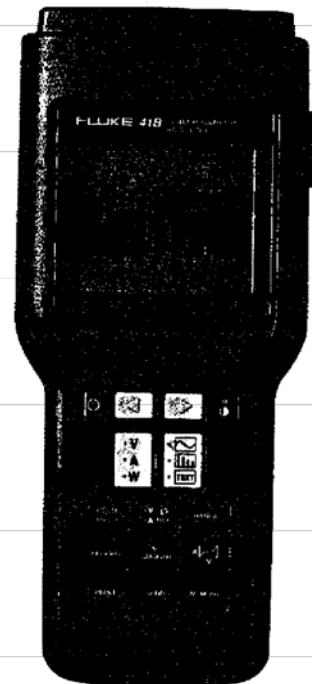
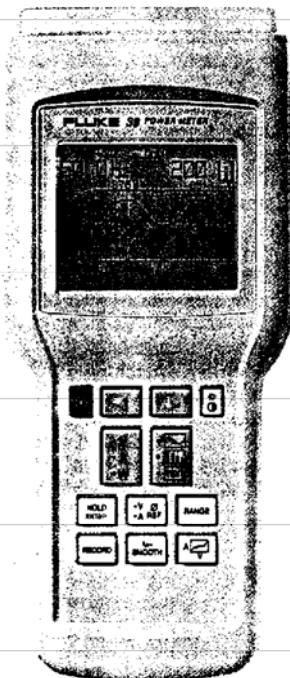
- Waveform
- Bargraph showing harmonic levels
- Numeric values
- Real-time display updates. Display updates three times per second, providing a dynamic view of actual circuit conditions
- Comprehensive measurements. Measure rms, peak and total harmonic distortion (THD) for complex voltages and currents - with no manual calculations required.



- **Three-Phase readings**
From a simple single-phase measurement, automatically calculates three-phase power and power factor for three-wire balanced loads.
- **System Critical Data** Immediate readings of Power Factors, KVAR, Crest Factor, K-Factor
- **Display Harmonics** individually to the 31st
- **Min/Max and Average** recording
- **Data Storage** of up to eight complete measurement sets (Fluke 41B)
- **On-line Data Logging** with connection to laptop computer (Fluke 41B)

Safety Conformance

Independently tested and approved for CSA C22.2 No. 1010-1, TUV to EN61010 and UL3111 listing. Protected to IEC 61010-1 Category III 600V.



True-rms

Features

	39	41B
Direct 3Φ power readouts 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)	●	●
K-factor	●	●
Frequency from 6Hz - 99.9Hz (fundamental)	●	●
Harmonics to 31st	●	●
Phase angle of fundamental and harmonics	●	●
Waveform, text and spectrum displays	●	●
Record mode - MIN, MAX and AVG	●	●
Zoom mode on harmonics bargraphs	●	●
Memory for 8 complete data sets		●
Data Logging		●
Optically isolated RS-232 interface		●
FlukeView™ PC software for Windows® and DOS included		●



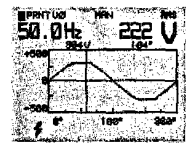
Fluke 39 Power Meter/41B Power Harmonics Analyzer

Applications

VOLTS

Display

One cycle of the fundamental waveform and its frequency.



Instantaneous voltage at cursor position.

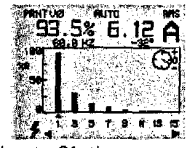
Application

Detecting flat-topped voltage caused by current harmonics, and notching caused by SCR switching.

AMPS

Display

%-fundamental or %-rms, rms value, frequency, and phase angle of fundamental or harmonic currents (up to 31st), as selected by cursor from bar graph.



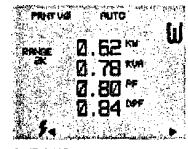
Application

Identifying sources of harmonic currents. Obtaining data for designing, specifying or sizing transformers, filters, etc.

WATTS

Display

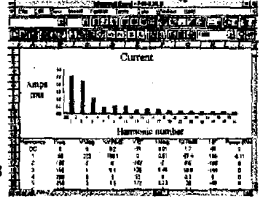
Watts, volt-amps, power factor (total) and displacement power factor (COS Ø) of single or three-phase power.



Application

Identifying displacement (COS Ø) versus total power factor. Determining proper power-factor correction methods.

Using the included FlukeView 41B software you can upload and download measurements and setups to a Windows or DOS based PC.



Accessories and Ordering Information

- Included Accessories**
- 39/41B: 801-500s ac Current Probe, TL24 Test Leads, AC20 Test Clips, TP20 Test Probes, operator's manual.
- 41B: PM9080-001 Isolated RS-232 Cable, FlukeView Software
- Optional Accessories**
- See accessories compatibility guide on pages 52-54.
- Ordering Information**
- Model 39 Power Meter.
- Model 41B Power harmonics Analyzer.

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

Frequency Range, Fundamental: 6-65 Hz and DC.		
Minimum Input Levels: 5V rms or 1A rms		
Function	Range & Resolution	Accuracy
Voltage	5.0V to 600V rms (AC+DC) ±5.0V to ±933V peak	(0.5% + 2 digits) Peak or DC: ±(2% + 3 digits) [Add 2 digits if <15V rms]
Current (1mV/A) Isolated input	1.00mV(A) to 1000mV(A) rms (AC+DC) ±1.0mV(A) to ±2000mV(A) peak	±(0.5% + 3 digits)+probe specs Peak or DC: ±(2% + 4 digits) + probe specs
Watts/Volt-Amps (1mV/A) Isolated input	0.0W(VA) to 600kW (kVA) average 0.0W(VA) to ±2000kW (kVA) peak	AC+DC: ±(1% + 4 digits) + probe specs
Harmonics (harmonic level >5% using Smooth 20)	Volts: Fundamental to 13th At 31st Amps/ Fundamental to 13th Watts: At 31st	±(2% + 2 digits) ±(8% + 2 digits) ±(3% + 3 digits) + probe specs ±(8% + 3 digits) + probe specs
Frequency	Fundamental: 6.0 Hz to 99.9 Hz	±0.3 Hz
Input Bandwidth	DC, 5 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 Ø (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	0.0% to 99.9%	±(0.03 Reading + 2.0%)

Battery Life: 4 alkaline "C" cells ANSI/NEDA-14A, IEC-LR14 (supplied) 48 hours typical (continuous)

Shock & Vibration: Per MIL-T-28800, Class 3

Case: Drip-Proof and Dust-Proof per IEC, IP 52

Size: 234 mm L x 100 mm W x 64 mm D

Weight: 0.9 kg

One-Year Warranty

39/41B Power Meter Glossary:

DPF Displacement Power Factor (COS Ø). DPF is used to measure the effect of inductive (motor, transformer) and capacitive loads on the efficiency of an ac distribution system. Such loads have a reactive component (see VARs) which must be taken into account when sizing system capacity, but they are still linear loads (current is drawn as a sine wave). DPF therefore does not include the effect of non-linear harmonic currents. However, a low DPF will often result in extra demand charges by utilities.

PF Power Factor or Total Power Factor. Active Power divided by Apparent Power. PF is a measurement of the efficiency of an ac power transmission and distribution system, including the effects of harmonics (as well as VARs). Harmonic currents cause PF to be lower than DPF.

%THD-F Percent Total Harmonic Distortion-Fundamental reference. This reading represents the ratio of the harmonic components of voltage (or current) to the voltage (or current) of the fundamental alone. All measurements are true-rms.

%THD-R Percent Total Harmonic Distortion-RMS reference. This reading represents the ratio of the harmonic components of voltage (or current) to the total voltage (or current), including the fundamental and all harmonics. All measurements are true-rms.

(k)W (kilo) Watts. Active power, also known as Real/True Power. Watts measure that portion of electrical power which does work, which by definition includes heat losses. Utility charges are based on Watts.

(k)VA (kilo) Volt-Amperes. Apparent power. VA is computed by taking the product of the rms values of voltage and current. It is a measure of the total electrical power capacity of a distribution system or component equipment. In addition to Watts, it includes the contributions of VARs and harmonic currents. This term is of interest because utility and facility engineers must size their system equipment in VA, in effect providing the current-carrying capacity to handle the worst-case situation.

(k)VAR (kilo) Volt-Amps Reactive. Reactive Power. VARs are the reactive component of VA (Apparent Power), caused by a phase shift between ac current and voltage in inductors (coils) and capacitors. In inductors, current lags voltage (in time), while in capacitors, current leads voltage. VARs are typically first present in a distribution system as a result of inductive loads such as motors, reactors and transformers. VARs are then used in sizing power factor correction capacitors, which are used to offset the effects of these inductive loads.