

## Power quality analyzer uses for electricians

Technology  
at Work

Your troubleshooting has come to a dead stop, while you wait for an outside expert to do a power quality analysis. Meanwhile, the customer is fuming about downtime and asking when you'll "have it fixed." Sound familiar?

Now you can prevent such situations, because you no longer need to rely on an outside expert or try to use a complicated power quality meter.

With the Fluke 430 Series Power Quality Analyzers, you can perform important measurements with the push of a button – it's that quick and easy. A dramatic improvement in power quality meters, the Fluke 430 series is the first high quality, three-phase tool that electricians can use at the service entrance to investigate power quality problems.

### Maintenance contracts

Preventive maintenance (PM) contracting is a growing business, but you need the right tools to do it. The goal of PM is to keep equipment and facilities in satisfactory operating condition by providing for systematic inspection, detection, and correction of problems in the early stages – before they develop into major defects or lead to catastrophic failures. To meet that goal with today's systems, you must identify power quality problems in their early stages. What tools are you using for that purpose?

Unfortunately, some contractors use DMMs to troubleshoot power quality problems "because we don't have time to learn to use a power quality meter."



Because customers need their power quality problems solved quickly, these contractors are putting their maintenance contracts – and themselves – at risk.

Others would say that limited time is exactly the reason to use Fluke power quality meters. Steve Urich, a supervisor with Valley Electric, Seattle, WA, says his crews make regular use of Fluke power quality meters because

"We can take all the measurements with one tool. We don't have to be swapping around. From an efficiency standpoint, this works very well."

What do the electricians in Urich's crew think about using Fluke power quality meters? "I have asked everyone in my crew, 'If you could have only one meter, what would you choose?' Everyone had the same answer, 'The Fluke power quality meter.'"

### Key functions

Why such a ringing endorsement from electricians in the field? Let's start by looking at how a power quality meter differs from a DMM. Most electrical systems support a range of voltage and phase requirements (see diagram on page 3). A DMM gives you single measurements on single phases in numeric format. The 430 Series Power Quality Analyzers, on the other hand, measures all three phases even in 600 V CAT IV/1000 V CAT III areas, allowing you to monitor the entire system simultaneously. It also graphically interprets the data for you.

- **Waveform display.** The waveform is a picture worth 1,000 voltage readings. It allows you to see what is actually going on in the system.

**Example:** Observe flat-topping to confirm an overloaded transformer, so you can correct the condition before the transformer overheats and fails.

**Bonus:** Some power quality meters allow you to export waveform captures for inclusion in reports.

- **History.** You can store waveforms from different times or locations and recall them for later comparison, analysis, or data transfer.

**Example:** Capture inrush current to troubleshoot motor-related nuisance tripping.

- **Analysis.** You can trend such measurements as RMS and peak voltage, RMS and peak current, crest factor, watts, VA, VARs, power factor, displacement power factor, and frequency. You can spot anomalies by looking at the trends rather than taking dozens of DMM measurements.

**Example:** See what's causing your peak load charges to be as high as they are.

**Bonus:** You can display harmonics in a spectrum view or in a table view.

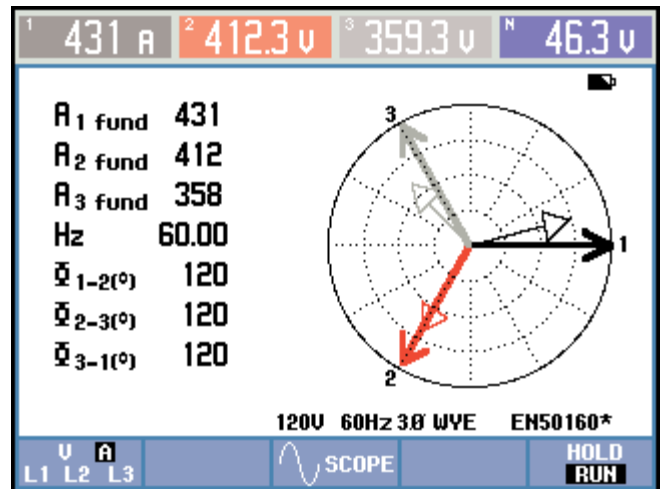
- **Multi-channel inputs.** You can compare phases in real time. Because current is so dynamic, you must compare phases simultaneously to be accurate. (A DMM-based comparison of Phase A to Phase B requires two DMMs and you're still limited to single measurements). **Example:** Compare phases in real time to see how much unbalance a motor is experiencing, so you can correct the unbalance before it burns the motor up.

### Standouts

The best power quality units provide even more functionality. For example, consider four useful actions you can easily perform with the Fluke 430 series:

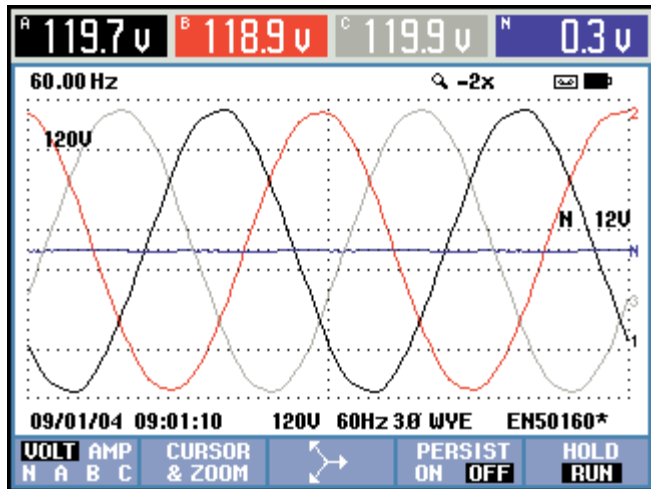
- **Trend automatically.**

Just push a button, and the Fluke 430 series will record and analyze power quality readings on all three phases. When you select a menu, the Fluke 430 series begins recording all functions in that menu automatically. You don't need to go through elaborate setups, choose between types of measurements to record, or choose between recording and looking at the readings. **Example:** Push a button to trend spikes and sags related to specific events or equipment.



VOLTS / AMPS / HERTZ				
	A	B	C	N
V <sub>rms</sub>	119.7	118.9	119.9	0.3
V <sub>pk</sub>	131.7	130.6	155.9	0.4
CF	1.1	1.1	1.3	1.2
Hz	59.99			
Amp	A	B	C	N
A <sub>rms</sub>	432	412	360	46
A <sub>pk</sub>	562	494	648	87
CF	1.3	1.2	1.8	1.9

09/01/04 09:02:59 120V 60Hz 3Ø WYE EN50160\* TREND HOLD RUN



- View on four channels.** Watch all three phases and the neutral. No more switching back and forth and juggling things in your head. You can see the current on all three phases and the neutral at the same time. **Example:** See if a motor is single-phasing, or see if a lighting ballast is causing excess current in the neutral.
- Perform simultaneous captures.** Capture voltage and

current waveform data on all phases simultaneously.

**Example:** Set the Fluke 430 series to trigger on a voltage sag. By looking at the waveform characteristics, you can trace the event to a faulty capacitor on a large AC unit.

- Perform system monitoring.** Capture system benchmarks and then run an automatic comparison on a regular basis. **Example:** For routine PM, you run an automatic comparison to detect problems arise from such causes as corroding grounding connections, arcing breaker contacts, leaking power factor capacitors, or motors in early stage winding failure.

It also runs on battery for 7 hours. And let's not forget the impressive safety designed into the Fluke 430 series. The Fluke 430 series meets several safety standards, and it's the only handheld three-phase power quality meter rated for 600 V CAT IV and 1000 V CAT III for service entrance use.

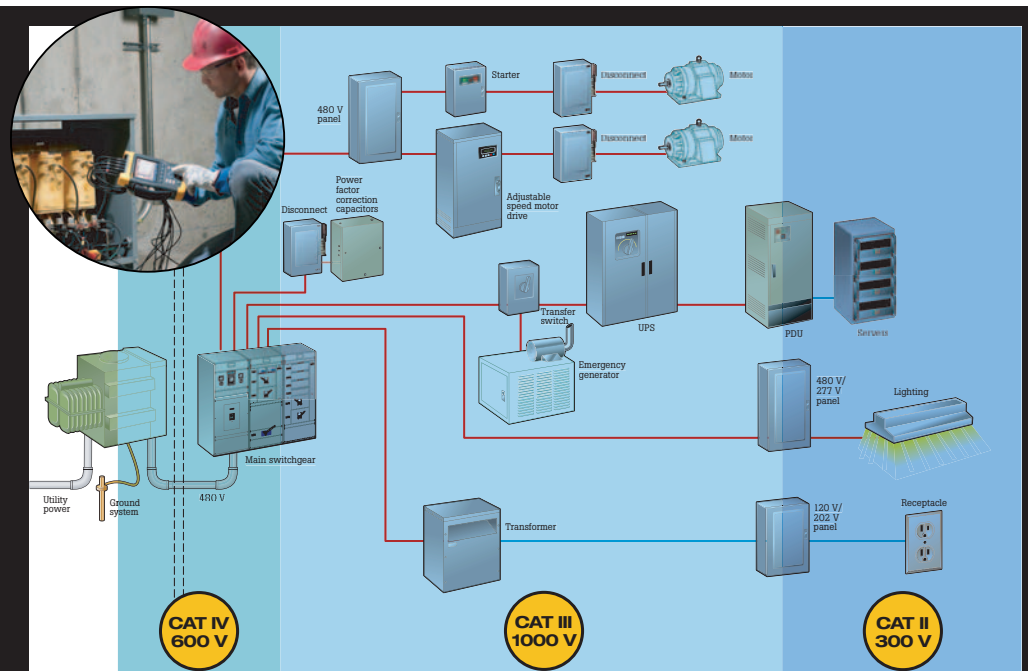
## Building business on power quality

The Fluke 430 series can handle all of your electrical measurement needs for preventive maintenance, but how can it help you gain new business?

Suppose a customer hired you to install a new 75kVA distribution transformer and panel. You can do that project and walk off with your margin on it and hope for another call. Or, you can turn that project into a stream of new projects by identifying other needs – while you are still on site. **Example:** You show the customer a graphical display of voltage distortion to support the need for work on the lighting system.

Valley Electric uses a Fluke power quality meter to gain new business. Uhrich says, "We show the customer a need, which they often can't understand. But when we have a screen capture, we can show the layperson what is happening and they can understand it."

This understanding builds trust, which leads to repeated sales. Uhrich says, "Using Fluke power quality meters allows us to get work we couldn't otherwise get." And, this is a win-win. Uhrich says, "We help customers avoid shutdown, and we build our business."



The Fluke 430 is the first handheld power quality analyzer rated for use at the service entrance (CAT IV). That means you can now prove where power quality problems are coming from – is it the utility, a conflict in the line, or an equipment malfunction? Without testing the utility power supply, you can't know for sure.

**Fluke.** Keeping your world up and running.

**Fluke Corporation**  
PO Box 9090, Everett, WA USA 98206

Fluke Europe B.V.  
PO Box 1186, 5602 BD  
Eindhoven, The Netherlands

For more information call:  
In the U.S.A. (800) 443-5853 or  
Fax (425) 446-5116  
In Europe/M-East/Africa (31 40) 2 675 200 or  
Fax (31 40) 2 675 222  
In Canada (800) 36-FLUKE or  
Fax (905) 890-6866  
From other countries +1 (425) 446-5500 or  
Fax +1 (425) 446-5116  
Web access: <http://www.fluke.com>

©2004 Fluke Corporation. All rights reserved.  
Printed in U.S.A. 9/2004 2394340 A-US-N Rev A