

Testing Energy-Efficient Washing Machines with the PA900 Power Analyzer



INTRODUCTION

Today's consumers demand home appliances that use less energy and water. Washing machines are no exception. Manufacturers must meet strict energy labeling standards and provide proof that their products are truly efficient. This means accurate, repeatable measurements of electrical power and energy use throughout a full wash cycle are essential. The Vitrek PA900 Power Analyzer is an ideal tool for this task.

TESTING CHALLENGES

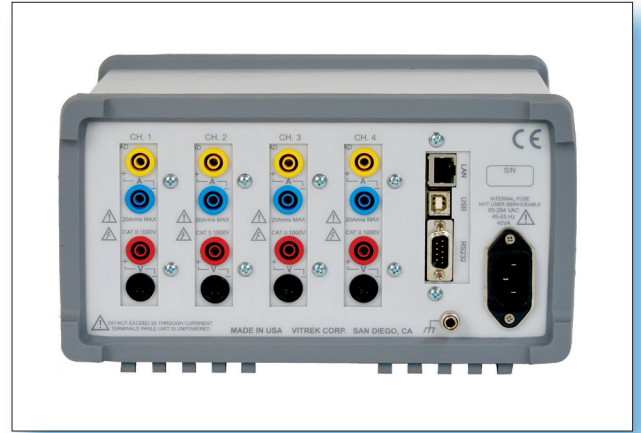
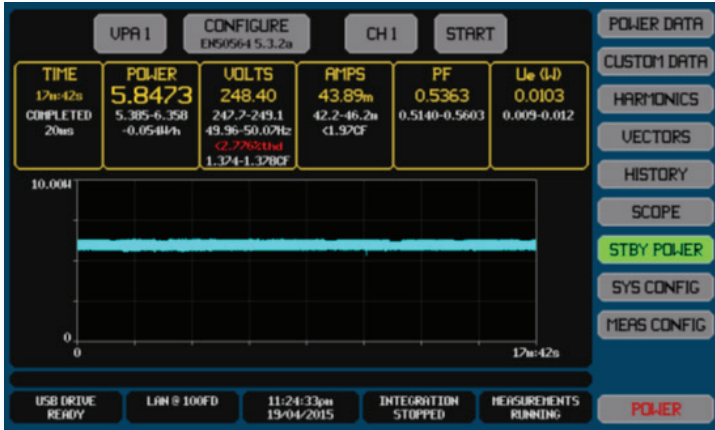
Testing a washing machine for energy efficiency isn't as simple as reading its average power draw. Wash cycles can last over an hour and involve many different modes: filling, heating, spinning, and idle periods. Each mode uses different amounts of power—some only for a few seconds. For example, in an eco-mode cycle, a heater might only switch on briefly, using bursts of power. To understand the machine's real performance, we need a power analyzer that can:

- Capture fast-changing power levels (like short heater bursts)
- Accurately integrate power over a long time (like a 90-minute wash)
- Handle variable loads and standby power levels
- Provide precise readings at both low and high current levels

WHY THE PA900?

The PA900 Power Analyzer stands out for its ability to measure power usage across a wide range of load conditions, all while maintaining high accuracy and speed. Key Features Include:

- **Long-term integration:** The PA900 can measure and integrate power and energy over extended periods — ideal for full wash cycles.
- **High-speed sampling:** With an effective sampling rate of 384MS/s, the PA900 can capture brief, high-power events like inrush currents or short events like heating elements turning on.
- **Low-power accuracy:** Its exceptional measurement accuracy, even at very low power levels (such as standby or idle modes), helps assess compliance with energy-saving standards like IEC 62301 (standby power).
- **Multi-phase support:** The PA900 handles multi-phase measurements, which is helpful when testing appliances designed for global markets or unique electrical configurations.
- **Harmonics analysis:** Built-in harmonic analysis up to the 500th harmonic helps identify waveform distortion from internal appliance electronics or motors, offering in sights into design inefficiencies.
- **Flexible display and data export:** The PA900's touchscreen display and USB/Ethernet interfaces make it easy to review data in real-time or export it for analysis and reporting.



REAL-WORLD USE

When testing a modern washing machine, engineers can connect the PA900 to the mains supply line and record voltage, current, power, and energy consumption over the entire cycle.

The analyzer's long data capture capability ensures that no detail is missed—from short spikes during heating to the low draw during rinse or spin. The PA900's ability to maintain accuracy throughout different power levels helps deliver confidence in energy label ratings. stations to ensure compatibility with different vehicle models and power grids. Engineers rely on these tools to verify energy transfer efficiency and prevent overcharging, which can degrade battery lifespan.

CONCLUSION

Energy-efficient appliances must be tested with instruments that match their complexity. The Vitrek PA900 Power Analyzer provides the accuracy, speed, and flexibility needed to evaluate the full performance of washing machines. Its ability to handle both fast transient events and long integration periods makes it a top choice for manufacturers looking to certify and improve their designs.

For greater accuracy or simultaneous channel evaluations more than 4, consider the PA910 or PA920 Power Analyzers available from Vitrek.

View Vitrek's full line of Power Analyzers at Vitrek.com.

