

Power Analyzer/Meter

Mult-channel Power Analyzer 89600 series

Product description:

Power analyzer is the ideal tool for engineers, capable of accurately measuring power, power quality and generation efficiency. In motor and drive design, engineers often need to consider whether multi-input analysis is possible or whether the stringent energy efficiency standards of photovoltaic inverters are met. The feature-rich helps engineers successfully bring their product concepts to market. This is a multi-functional power analyzer whose precise power measurement capabilities help researchers, designers, and engineers perform a wide range of testing applications in the fields of energy efficiency, energy conservation, and renewable energy. Whether in the production of energy-saving equipment, appliances, hybrid power systems, electric vehicles, or in the technology of renewable energy, it is a versatile instrument capable of performing electronic measurements and energy analysis.

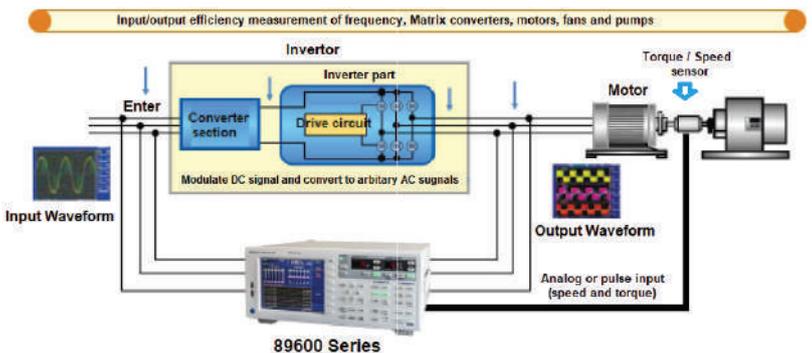
Features

- 8-inch color touch screen for more convenient operation.
- 1-6 channels can be freely selected and the motor-specific interface can be expanded, multi-mode, multi-range selection, flexible and free.
- Using Fanelesb processor, 16-bit of chip 6-channel voltage and current sampling at the same time Bandwidth of 0.5Hz - 300kHz and accuracy $\pm(0.1\%$ of reading + 0.05% of range), capable of performing up to 500 harmonic analyses (fundamental power frequency).
- Sampling rate is 200k/s, and the data update period is freely adjustable (50/100/200/500ms, 1/2/5/10/20s) and the fastest can reach 10ms.
- Voltage (1000VAC/1500VDC) and current 50A can be switched between 8 gears.
- 1-500th harmonic test, support fundamental wave range 10Hz-10kHz, inter-harmonic test function can be added.
- Multi-mode filter, support fixed 1000Hz, 1-100kHz adjustable line filter, frequency filter 10Hz-10kHz adjustable.
- Support external sensor access, freely expand the test range of voltage and current.
- Many communication interfaces, standard USB, RS485, RS232, Ethernet ports.



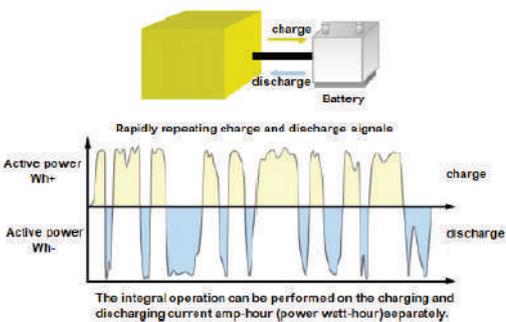
Applications for Motor, Inverter industry

In recent years, with the increasing demand for energy saving, the demand for high-precision measurement of motor/inverter efficiency is also increasing. The 8962A1 can provide 6 and 6 current inputs, enabling high-precision measurements in the efficiency evaluation of single-phase input/three-phase output inverters. Select the motor expansion function accessories (optional), while observing the changes of voltage, current and power, you can also observe the changes of speed and torque and show the mechanical power and total efficiency.



Applications for Electrical industry

- High-precision measurement battery charge and discharge (Ah/Wh).
- Testing of automotive batteries or DC drives / full data recording and measurement of battery charging and discharging.
- It can directly measure large currents up to 50A, and can test the DC drive of automobiles without the use of external current sensors, providing users with an economical and accurate evaluation method.
- The charging and discharging energy of the battery (+/-Wh, +/-Ah) is measured in approx.
- The high sampling rate of 200K/s captures instantaneous positive and negative values,

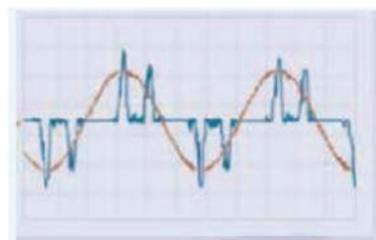


and integrates them separately. While presenting the real characteristics of the battery, it can help users reduce costs and improve the efficiency of inverter/motor testing and maintenance. For battery-powered products such as portable devices and electric bicycles, engineers must often perform short-term charge-discharge tests under actual working conditions. Because the 8962A1 uses a digital sampling system, it can continuously integrate each rapidly changing charge and discharge current and power. This is useful in calculating and evaluating battery life in ampere-hours & watt-hours.

Applications for Power Industry

89600 series are more suitable for power consumption measurement of switching power supply and variable frequency home appliances. More and more electronic products and home appliances on the market use switching power supply or frequency conversion technology, which saves energy consumption and distorts the waveform signal of the product. These distorted waveforms are all non-sinusoidal signals, such as pulse waves, triangular waves, rectangular waves, trapezoidal waves, pulse trains, etc., which are rich in high-frequency harmonic components. Due to the limitation of sampling rate and bandwidth, ordinary power meters cannot accurately measure high-frequency components, so there is a huge difference between the measured value and the real one. For the test of frequency conversion equipment and switching power supply, 89600 series has the following advantages.

1. With a high sampling rate, it can measure the rich high-order harmonic components in the distorted waveform, No energy is lost.
2. The high-bandwidth power meter can filter out high-order harmonics in the signal to ensure accurate measurement. It can also ensure that the high-frequency components in the signal are not filtered out by the analog front-end circuit, resulting in energy lost. Fully meet the power consumption measurement of new technology products such as variable frequency home appliances and switching power supplies.



Inverter home appliance input signal waveform

Applications for Charging pile industry

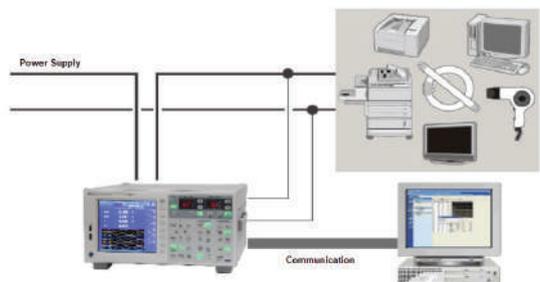
Charging pile efficiency test The charging pile industry is currently mainly subdivided into DC piles and AC piles. AC charging piles are small in size and only provide power output. The DC charging pile has a wide adjustable range of output voltage and current, so it can realize fast charging of electric vehicles. This series provides 6 power input boards, which can support the synchronous measurement of charging pile input and output. In addition, the simultaneous sampling of voltage and current of all power input modules can ensure the measurement accuracy of power and efficiency. Support custom efficiency measure formula, can display 6 efficiencies at the same time. Measurement results, in the power product development test, can simultaneously test the inverter circuit efficiency, AC/DC conversion efficiency, Parameters such as the total efficiency of the power supply.



Harmonic & unbalance measurement of charging pile : 89600 series power analyzer can measure up to 500 harmonics, and has a variety of combined display modes to display the harmonic content of each order at the same time. The user can open the function of viewing any harmonic value in the menu. Through this function, the user can view the harmonic content. The value of each harmonic. Since the input of the charging pile is directly connected to the power grid, it is also possible to directly input a large number of harmonics to the power grid in the reverse direction. In the new standard for charging piles in 2015, it is stipulated that when the output power is 50% and 100% of the rated power, the total harmonic current of the charging pile. The content rate should not be greater than 8%. Power analyzer accurately measures voltage, current, total harmonic distortion (THD) in harmonic mode. When the charging pile uses multiple high-frequency switching rectifier modules to work in parallel, each module should be able to share the load proportionally. When the average output current of each module is 50% to 100% of the rated current value, its current sharing imbalance Should not exceed $\pm 5\%$. 89600 series power analyzer provides 6 power measurement channels, which can synchronously, real-time and accurately evaluate the current sharing imbalance of charging piles



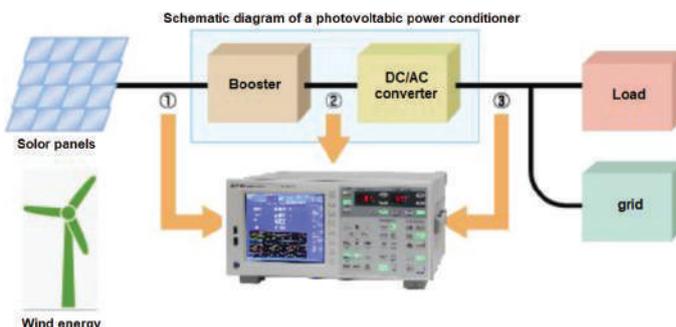
Applications for Appliance industry



Standby power consumption and running power measurement of household appliances The measurement complies with international standards (IEC62301, ENERGY STAR, SPEC power) in the measurement fields of household appliances, digital equipment, LED lights, LED drivers, and mobile phone chargers. State-of-the-art energy analysis. The test of high current equipment such as induction cooker/electric water heater can directly measure high current up to 50Arms without external current sensor. The automatic current range conversion function in the integration mode not only provides users with more accurate measurements, but also reduces investment costs.

Applications for Renewable energy testing industry

wind and solar inverter systems
0.15% high precision, frequency test as low as 0.5Hz, can add 6 channels of simultaneous sampling, 500th harmonic, inter-harmonic function, can realize simultaneous measurement of the input and output of wind power equipment and inverters in the field of new energy, can directly calculate and Displays the efficiency of the inverter.



Specifications

Model		89600 Series	
Measurement channel		1 ~ 6 channels	
Basic Accuracy		Grade : 0.1 ±(0.1% of reading + 0.05% of range)	
Wiring System		Selectable : 1P2W, 1P3W, 3P3W, 3P4W, 3V3A	
Measuring Bandwidth		DC & 0.5Hz ~ 300kHz	
Voltage Input		1000VDC/1500VAC [Crest factor 3 : 15/30/60/100/150/300/600/1000V] [Crest factor 6 : 7.5/15/30/50/75/150/300/500V]	
Direct Current Input	50A input element	Crest factor CF3 : 200mA/500mA/1A/2A/10A/20A/50A Crest factor CF6 : 100mA/200mA/500mA/1A/2A/5A/10A/20A	
	5A input element	Crest factor CF3: 20mA, 50mA, 100mA, 200mA, 500mA, 1A, 2A, 5A Crest factor CF6: 10mA, 20mA, 50mA, 100mA, 200mA, 500mA, 1A, 2A	
External current sensor input		Crest factor CF3: 50mV, 100mV, 200mV, 500mV, 1V, 2V, 5V, 10V Crest factor CF6: 20mV, 50mV, 100mV, 200mV, 500mV, 1V, 2V, 5V Or Crest factor CF3: 5mV, 10mV, 20mV, 50mV, 100mV, 200mV, 500mV, 1V Crest factor CF6: 2mV, 5mV, 10mV, 20mV, 50mV, 100mV, 200mV, 500mV Or Crest factor CF3: 5mA, 10mA, 20mA, 50mA, 100mA, 200mA, 500mA, 1A Crest factor CF6: 2mA, 5mA, 10mA, 20mA, 50mA, 100mA, 200mA, 500mA Or Crest factor CF3: 1mA, 2mA, 5mA, 10mA, 20mA, 50mA, 100mA, 200mA Crest factor CF6: 0.5mA, 1mA, 2mA, 5mA, 10mA, 20mA, 50mA, 100mA	
		Measurement Parameters	
		Input Impedance	
		Allow Overload	
		Sampling Rate	
		Line Filtering	
Frequency Filter			
Efficiency Measurement			
Speed & Torque			
Display method			
Communication Interface			
Environmental			
Power supply			
Dimension (W×H×D)			
Weight			

Accuracy Specifications			
Parameter	Range	Accuracy	
Voltage(V) Current (A)	Crest factor CF=3 : range Crest factor CF=6 : range/2	DC ±(reading0.1% +range 0.2%)	
		0.5 Hz ≤ f < 45 Hz ±(reading0.1% +range 0.2%)	
		45 Hz ≤ f ≤ 66 Hz ±(reading0.1% +range 0.05%)	
		66 Hz < f ≤ 1 kHz ±(reading0.1% +range 0.2%)	
		1 kHz < f ≤ 10 kHz ±[reading((0.07*f)%)+range 0.3%]	
		10 kHz < f ≤ 100 kHz ±(reading0.5% +range 0.5%) ±[reading[0.04*(f-10)]]%	
Active power (PF=1.0)	U*I	DC ±(reading0.1% +range 0.2%)	
		0.5 Hz ≤ f < 45 Hz ±(reading0.3% +range 0.2%)	
		45 Hz ≤ f ≤ 66 Hz ±(reading0.1% +range 0.05%)	
		66 Hz < f ≤ 1 kHz ±(reading0.2% +range 0.2%)	
		1 kHz < f ≤ 10 kHz ±(reading0.1% +range 0.3%) ±[reading{0.067*(f-1)}%]	
		10 kHz < f ≤ 100 kHz ±(reading0.5% +range 0.5%) ±[reading{0.09*(f-10)}%]	
Frequency (Hz)	0.1%* reading, when value >0.1*present range		
Energy accumulation	0 ~ 999999 MWh /0 ~ -99999 MWh	DC ±(reading0.1% +range 0.2%)	
		0.5 Hz ≤ f < 45 Hz ±(reading0.3% +range 0.2%)	
		45 Hz ≤ f ≤ 66 Hz ±(reading0.1% +range 0.05%)	
		66 Hz < f ≤ 1 kHz ±(reading0.2% +range 0.2%)	
		1 kHz < f ≤ 10 kHz ±(reading0.1% +range 0.3%) ±[reading{0.067*(f-1)}%]	
		10 kHz < f ≤ 100 kHz ±(reading0.5% +range 0.5%) ±[reading{0.09*(f-10)}%]	
Ampere-hour	0 ~ 999999 MAh /0 ~ -99999 MAh	DC ±(reading0.1% +range 0.2%)	
		0.5 Hz ≤ f < 45 Hz ±(reading0.3% +range 0.2%)	
		45 Hz ≤ f ≤ 66 Hz ±(reading0.1% +range 0.05%)	
		66 Hz < f ≤ 1 kHz ±(reading0.2% +range 0.2%)	
		1 kHz < f ≤ 10 kHz ±(reading0.1% +range 0.3%) ±[reading{0.067*(f-1)}%]	
		10 kHz < f ≤ 100 kHz ±(reading0.5% +range 0.5%) ±[reading{0.09*(f-10)}%]	
Energy time	99999h	± 2 seconds/hour	
Harmonic (Grade: A/I)	1 ~ 500 orders	Fundamental wave frequency	Order maximum
		5Hz ~ 1000Hz	500

Ordering Informations

89600-X : High-precision Power Analyzer (1000Vdc/1500Vac) / 50A direct current

 Number of channel (1 ~ 6) with details spec of requirement(s)

Standard Accessories :

- User Manual
- Power cord