

Multi-channel High Precision Power Analyzer AN87660(F) Series



- Six-channel synchronous power analysis.
- **Basic Accuracy:** 0.05% of reading + 0.05% of range
- **Measurement Bandwidth:** DC, 0.5Hz~100kHz
- **Sampling Rate:** 200kSps
- **Maximum Voltage:** Standard 1000V (DC1500V)
- **Maximum Current:** 20A (standard) 50A/5A (optional) , support for mixed configurations, optional sensors available
- **LCD Display:** Full touchscreen experience, customizable display interface, waveform display
- **Data Storage:** Customizable storage items, export in CSV format

Production Application //

- Analysis of standby power consumption and power for single-phase/three-phase household and commercial appliances
- Analysis of power, efficiency, and harmonics for photovoltaic inverters
- Measurement of electrical performance for electric vehicles and charging piles
- Power and harmonics analysis for power electronics, transformers, and generators
- Power and harmonics analysis for variable frequency drives and variable frequency motors
- Analysis of power, harmonics, and surge current for switching power supplies
- Power analysis for lighting systems and LED lighting

- **Perfect Size:** Standard 3U height, meets system integration requirements

Features //

- **Multi-channel Configuration:** Configurable with 1 to 6 channels for synchronous measurement units, adaptable for various load measurement needs such as single-phase, three-phase three by two, three-phase four by two, four-phase (DC + three-phase three), etc. (applicable to loads like air conditioners, inverters, variable frequency drives, motors).
- **High Accuracy:** Utilizes high-speed FPGA + ARM dual-core processing, 16-bit high-speed high-precision AD converter, achieving a basic accuracy of up to 0.1%, with a fastest data update cycle of 100ms.
- **Wide Power Range:** Each channel can measure currents up to 50A (optional specifications include 20A, 5A, 1A, etc., supporting mixed configurations), with a minimum power resolution of 0.1mW, meeting requirements for standby power consumption measurement and rated power measurement.
- **Wide Bandwidth:** Dual-use for AC and DC signals, with a power measurement bandwidth ranging from DC, 0.5Hz to 100kHz, suitable for measuring power of various standard and non-standard sinusoidal waveform loads.

- Multi-channel Harmonic Analysis:** Capable of simultaneous harmonic analysis on six channels, measuring up to 50th harmonic, distortion analysis, and displaying harmonic content of each order and total content intuitively.
- Multi-channel Frequency Measurement:** Six channels can perform frequency measurements simultaneously.
- Line Filtering:** Employs low-pass filters of 500Hz and 5.5kHz, capable of measuring the fundamental value of PWM waveforms and filtering out high-frequency interference from switch mode power supplies.
- Sensors:** Ratio function, supports conventional I-I, V-V type voltage/current transformers; supports BNC interface I-V type current sensors, with a maximum input voltage of 10V, optional high-current sensors available.
- Efficiency Calculation:** Simultaneously measures input and output energy consumption of devices, and calculates their efficiency.
- Energy Accumulation:** Capable of separately accumulating forward energy, reverse energy, and comprehensive energy, facilitating measurement for energy transactions.

UI



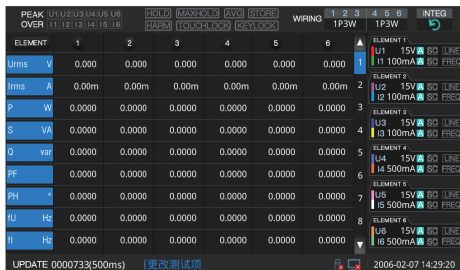
4-item display



8-item display



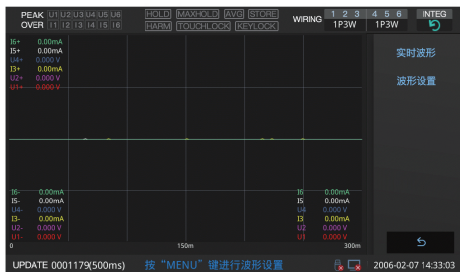
16-item display



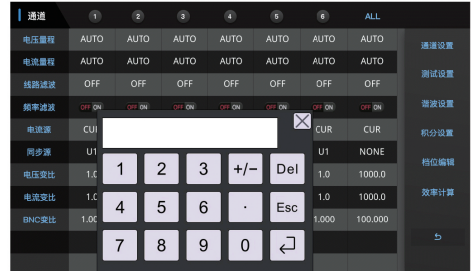
Full numerical



List display



Waveform Display



Touchscreen setting

Channel configuration

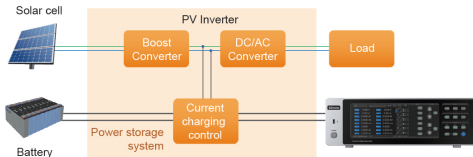
The multi-channel power analyzer supports various wiring configurations, including 1P2W, 1P3W, 3P3W, 3V3A, 3P4W, etc. In these configurations, adjacent input units with numbers greater than the currently selected unit are grouped together as a wiring set.

Wiring method	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
1P2W	1P2W	1P2W	1P2W	1P2W	1P2W	1P2W
1P3W	1P3W	1P3W	1P3W	1P3W	1P3W	1P3W
3P3W	3P3W	3P3W	3P3W	3P3W	3P3W	3P3W
3V3A	3V3A	3V3A	3V3A	3V3A	3V3A	3V3A
3P4W	3P4W	3P4W	3P4W	3P4W	3P4W	3P4W

Application

Photovoltaic inverter power measurement

- Complies with "GB/T 37409-2019 Technical Specification for Testing of Photovoltaic Grid-Connected Inverters"
- Voltage range: 0~1000V (DC1500V)
- Current range: 0~50A/current sensor
- Capable of simultaneously measuring input, output (single-phase, three-phase) power, and power factor
- Automatic efficiency calculation
- 50th harmonic, distortion analysis
- Bidirectional power measurement for buying and selling electricity

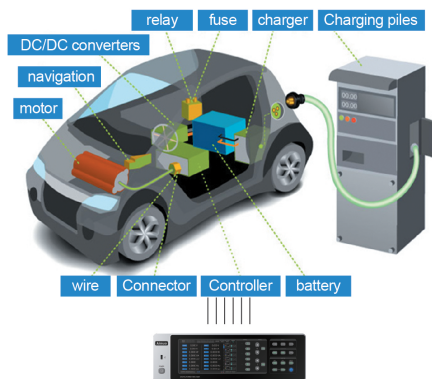


Wiring method	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
Single-phase	1P2W	1P2W	1P2W	1P2W	1P2W	1P2W
PV inverters	DC	AC				
Three-phase	3P3W/3V3A/3P4W			1P2W	1P2W	1P2W
PV inverters	AC			DC		

Electric vehicle electrical performance measurement

- Multi-channel, capable of simultaneously detecting multiple parameters: OBC (On-Board Charger), charging piles efficiency testing, battery charge and discharge performance, power conversion performance, motor performance, etc.
- AC/DC, maximum current 50A, expandable with larger current sensors.

- High accuracy, basic accuracy 0.1%, minimum power resolution 0.1mW
- Capable of measuring instantaneous effective value, average value, peak value, energy consumption, etc., of AC and DC signals.



Wiring method	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
Electric Vehicle	1P2W	1P2W	1P2W	1P2W	1P2W	1P2W

Frequency converters power measurement

- Complies with GB12668 standard
- Power bandwidth: DC, 0.5Hz~100kHz
- Current range: 0~50A/current sensor
- Capable of simultaneously measuring input and output power
- 50th harmonic, distortion analysis

Wiring method	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
Frequency Converter	3P3W/3V3A/3P4W			3P3W/3V3A/3P4W		

Power supplies, UPS power measurement

- Current range: 0~1A/5A/20A/50A
- Power bandwidth: DC, 0.5Hz~100kHz
- Capable of simultaneously measuring input, output (single-phase, three-phase) power, monitoring battery charge and discharge
- Automatic efficiency calculation

Wiring method	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
UPS	1P2W	1P2W	1P2W	3P3W/3V3A/3P4W		
	Mains Input	Battery	Battery	Power Supply Output		

Household appliance performance evaluation, standby power consumption measurement

- Complies with IEC 62301-2011 standard
- Current range: 0~1A/5A/20A/50A, capable of measuring rated power and standby power
- Minimum power resolution: 0.1mW
- 50th harmonic, distortion analysis

Wiring method	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
Household appliances	1P2W	1P2W	1P2W	1P2W	1P2W	1P2W
Commercial appliances	3P4W			3P4W		

Measurement of lighting and LED power

- Current range: 0~1A/5A/50A
- Minimum power resolution: 0.1mW
- Can measure input and output power, power factor, efficiency of the driver power supply
- 50th harmonic, distortion analysis

Wiring method	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
Lighting	1P2W	1P2W	1P2W	1P2W	1P2W	1P2W

Specifications

Model	AN8766Q(F)					
Measurement Channels - x	1 ~ 6					
Wiring Method	1P2W (Single-phase 2-wire) 1P3W (Single-phase 3-wire) 3P3W (3-phase 3-wire, 2 voltage 2 current) 3P3W (3V3A) (3-phase 3-wire, 3 voltage 3 current) 3P4W (3-phase 4-wire)					
Measurement Parameters	Voltage (U), Current (I), Active Power (P), Reactive Power (Q), Apparent Power (S), Power Factor (λ), Voltage Frequency (fU), Current Frequency (fI), Phase Angle (Φ), Efficiency (η), Total Energy (Wh), Forward Energy (Wh+), Reverse Energy (Wh-), Current Integration (Ah), 50th Harmonic Analysis (HDF), Voltage and Current Total Harmonic Distortion (THD), Peak Voltage (Vpk), Peak Current (Ip), Voltage Peak Factor (CfU), Current Peak Factor (CfI)...					
Input Impedance	Voltage: Approximately 2MΩ, Direct Current Input: Approximately 2.5mΩ (50A specification), Current Sensor Input: Approximately 100kΩ					
AD Sampling Rate	Around 200kS/s					
Peak Crest Factor at Full Range	3 or 6					
Voltage Rated Range (direct input)	When the crest factor is 3: 15/30/60/100/150/300/600/1000*[V], When the crest factor is 6: 7.5/15/30/50/75/150/300/500*[V], *The maximum range crest factor is 1.5					
Current Rated Range (direct input)	When the crest factor is 3: 20A current: 500m/1/2/5/10/20*[A] Optional: 50A current: 1/2/5/10/20/50*[A] 5A current: 100m/200m/500m/1/2/5*[A] 1A current: 20m/50m/100m/200m/500m/1*[A] When the crest factor is 6: 20A current: 250m/0.5/1/2.5/5/10*[A] Optional: 50A current: 0.5/1/2.5/5/10/25*[A] 2 5A current: 50m/100m/250m/0.5/1/2.5*[A] 1A current: 10m/25m/50m/100m/250m/0.5*[A] *The maximum range crest factor is 1.5					
Current Rated Range (BNC sensor)	Optional: 200m/500m/1/2/5/10[V]					
Voltage, Current Range	(1% ~ 110%)*range					
Accuracy Range	*For voltage 1000V and current maximum range, the accuracy range is (1% to 100%) * range					
Power Factor Range	±(0.001 ~ 1.000)					
Voltage Measurement Accuracy	DC ±(0.05% × display value + 0.05% × range) 0.1Hz≤f≤66Hz ±(0.05% × display value + 0.05% × range) 66Hz<f≤1kHz ±(0.1% × display value + 0.1% × range) 1kHz<f≤10kHz ±([0.1 + 0.05 × (f - 1)]% × display value + 0.2% × range) 10kHz<f≤100kHz ±([0.5 + 0.04 × (f - 10)]% × display value + 0.3% × range)					

Current Measurement Accuracy	DC	$\pm(0.05\% \times \text{display value} + 0.05\% \times \text{range})$
	0.1Hzsf≤66Hz	$\pm(0.05\% \times \text{display value} + 0.05\% \times \text{range})$
	66Hz<f≤1kHz	$\pm(0.1\% \times \text{display value} + 0.1\% \times \text{range})$
	1kHz<f≤10kHz	$\pm((0.1 \times f\% \text{ display value} + 0.2\% \times \text{range})$
	10kHz<f≤100kHz	$\pm((1 + 0.08 \times (f - 10))\% \times \text{display value} + 0.3\% \times \text{range})$
Power Measurement Accuracy	DC	$\pm(0.05\% \times \text{display value} + 0.05\% \times \text{range})$
	0.5Hzsf<45Hz	$\pm(0.1\% \times \text{display value} + 0.1\% \times \text{range})$
	45Hzsf≤66Hz	$\pm(0.05\% \times \text{display value} + 0.05\% \times \text{range})$
	66Hz<f≤1kHz	$\pm(0.2\% \times \text{display value} + 0.1\% \times \text{range})$
	1kHz<f≤10kHz	$\pm((0.2 + 0.1 \times (f - 1))\% \times \text{display value} + 0.2\% \times \text{range})$
	10kHz<f≤50kHz	$\pm((0.2 + 0.1 \times (f - 1))\% \times \text{display value} + 0.3\% \times \text{range})$
	50kHz<f≤100kHz	$\pm((5.1 + 0.18 \times (f - 50))\% \times \text{display value} + 0.3\% \times \text{range})$
Active Power Resolution	0.1mW	
Frequency Measurement Range	DC, 0.5Hz ~ 100kHz	
Frequency Measurement Accuracy	$\pm 0.1\% \times \text{display value}$	
Harmonic Measurement	11Hz to 600Hz, 1 to 50th harmonic content, total distortion	
Energy Measurement Range	0 to 999999MWh (Resolution: 1mWh / 0.01mAh)	
Energy Measurement Accuracy	$\pm(0.1\% \times \text{display value} + 0.1\% \times \text{full scale})$	
Extended Uncertainty	Voltage, current, power, frequency, and energy accuracy $\leq 0.20\%$	
Filtering Function	500Hz and 5.5kHz voltage line, current line, and frequency filtering	
Ratio Function	1 ~ 50000	
Data Update Cycle	100m / 200m / 500m / 1 / 2 / 5 / 10[s]	
Control Interface	Standard: RS-232, Digital Input/Output Interface, Ethernet Port; Optional: RS-485, GPIB	
Display	7-inch LCD touchscreen	
Dimensions	426×132.5×430.3 (W,front panel)×(H, front pane)×(D,excluding terminal posts)mm	
Cutout Dimensions	422×128.5 (W, chassis)×(H, chassis) mm	
Base Height	17.5 mm	
Total Weight	Around7.5 kg	

Any changes to the above parameter specifications will not be notified separately.

[Conditions]

Temperature: 23±5℃, Humidity: 30%~75%RH, Input Waveform: Sinusoidal Wave, Common Mode Voltage: 0V, Line Filter: OFF, Frequency Filter: ON below 440Hz, Power Factor λ: 1, Crest Factor: 3. After preheating, under wiring conditions, zero adjustment or change of range.

In the measurement accuracy formula, f represents frequency, with unit kHz.

When the data update rate is 100ms, all accuracies are added to 0.05% of the reading.

Due to the influence of temperature changes after zero adjustment or range change:

Voltage DC accuracy increases by 0.02%/℃ of the range, Current DC accuracy increases by 500μA/℃, External sensor DC accuracy increases by 50μV/℃, Power DC accuracy increases by the product of voltage and current influences.