

YOKOGAWA

WT3000

The Yokogawa WT3000 is an industry-standard precision power analyzer designed to deliver ultra-high-accuracy power measurements. With a basic voltage/current reading accuracy of 0.01% and power reading accuracy of 0.02%, a broad measurement bandwidth of DC and 0.1 Hz to 1 MHz, and support for up to four input elements, the WT3000 provides high-precision evaluation of inverter efficiency, motor characteristics, and power semiconductor loss. Equipped with an 8.4-inch color LCD display and advanced mathematical calculation functions, it is widely utilized in R&D and calibration laboratories worldwide.

SPECIFICATIONS

General

Display	8.4-inch color TFT LCD, 640 × 480 (VGA)
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Physical

Power Supply	100 to 240 VAC, 50/60 Hz, 150 VA max
Operating Temperature	5 to 40 °C °C
Dimensions (W×H×D)	426 × 177 × 459 mm mm
Weight	15 kg kg

Input Specifications

Number of Input Elements	Up to 4 elements (mix of 2 A and 30 A elements possible)
Input Element Configuration Types	1P2W, 1P3W, 3P3W, 3P3W (3V3A), 3P4W
Voltage Direct Input Ranges (Crest Factor 3)	15, 30, 60, 100, 150, 300, 600, 1000 V
Voltage Direct Input Ranges (Crest Factor 6)	7.5, 15, 30, 50, 75, 150, 300, 500 V
Current Direct Input Ranges (2 A Element, Crest Factor 3)	0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500 mA, 1, 2 A
Current Direct Input Ranges (2 A Element, Crest Factor 6)	0.25, 0.5, 1, 2.5, 5, 10, 25, 50, 100, 250 mA, 0.5, 1 A
Current Direct Input Ranges (30 A Element, Crest Factor 3)	0.5, 1, 2, 5, 10, 20, 30 A
Current Direct Input Ranges (30 A Element, Crest Factor 6)	0.25, 0.5, 1, 2.5, 5, 10, 15 A
External Current Sensor Input Ranges (Crest Factor 3)	50, 100, 200, 500 mV, 1, 2, 5, 10 V
External Current Sensor Input Ranges (Crest Factor 6)	25, 50, 100, 250 mV, 0.5, 1, 2.5, 5 V
Voltage Input Impedance	Approx. 10 MOhm, approx. 5 pF
Current Input Impedance (2 A Element)	Approx. 100 mOhm + 0.15 uH
Current Input Impedance (30 A Element)	Approx. 5.5 mOhm + 0.15 uH
Maximum Input Voltage (Continuous)	1000 Vrms or 1500 Vpeak, whichever is less
Maximum Continuous Input Current (2 A Element)	3 Arms or 6 Apeak, whichever is less
Maximum Continuous Input Current (30 A Element)	33 Arms or 150 Apeak, whichever is less
A/D Converter Resolution	16-bit
Sampling Rate	Approx. 200 kS/s
External Current Sensor Input Impedance	1 MΩ (approx. 100 pF)
Voltage Input Terminal Type	Safety terminal (female)
Current Input Terminal Type	Safety terminal (female)

Measurement Accuracy

Basic Voltage Accuracy (AC, 50/60 Hz)	±(0.01% of reading + 0.03% of range)
Basic Voltage Accuracy (DC)	±(0.05% of reading + 0.05% of range)
Basic Current Accuracy (AC, 50/60 Hz)	±(0.01% of reading + 0.03% of range)
Basic Current Accuracy (DC, 2 A Element)	±(0.05% of reading + 0.05% of range)
Basic Current Accuracy (DC, 30 A Element)	±(0.05% of reading + 0.1% of range)
Basic Active Power Accuracy (AC, 50/60 Hz)	±(0.02% of reading + 0.04% of range)
Basic Active Power Accuracy (DC, 2 A Element)	±(0.05% of reading + 0.05% of range)
Basic Active Power Accuracy (DC, 30 A Element)	±(0.05% of reading + 0.1% of range)
Frequency Bandwidth	DC, 0.1 Hz to 1 MHz
Influence of Power Factor	±0.03% of S (apparent power) when PF = 0 (at 50/60 Hz)
Influence of Common Mode Voltage	±0.01% of range or less (1000 Vrms, 50/60 Hz)

Measurement Parameters & Calculation Functions

Voltage/Current Crest Factor	Selectable 3 or 6
Frequency Measurement Range	0.15 Hz to 1 MHz
Integration Accuracy	±(Power/Current Accuracy + 0.02% of reading)
Integration Auto-Range	Supported
Efficiency Calculation	Up to 4 efficiency equations can be defined (eta1 to eta4)
User-Defined Calculations	Up to 20 equations (F1 to F20)

Harmonic Measurement Capabilities

Harmonic Measurement Frequency Range	Fundamental frequency from 10 Hz to 2.6 kHz (PLL synchronization)
Maximum Harmonic Order Analysed	Up to 100th order (fundamental frequency of 50/60 Hz)
Total Harmonic Distortion (THD) Calculations	IEC standard or CSA standard selectable
Dual Harmonic Measurement	Supported (with option /G6)

Motor Evaluation Function (Option)

Motor Channels Supported	1 channel
Torque Sensor Input Type	Analog (DC voltage) or Pulse (frequency)
Speed Sensor Input Type	Analog (DC voltage) or Pulse (frequency)
Mechanical Power (Pm) Calculation	$P_m = \text{Speed} * \text{Torque} * \text{Constant}$
Electrical Angle Measurement Capability	Supported with option /MTR

Display & User Interface

Display Type	8.4-inch color TFT LCD
Display Resolution	640 × 480 pixels (VGA)
Display Update Rate	50 ms to 20 s (selectable)
Numeric Display Formats	4, 8, 16, All items, Single list, Dual list
Waveform Display Mode	Supported
Harmonic Bar Graph Display Mode	Supported
Vector Display Mode	Supported
Trend Display Mode	Supported

Interfaces & Connectivity

GP-IB Interface	IEEE-488.2 compliant
Ethernet Port	100BASE-TX/10BASE-T
RS-232/Serial Interface	9-pin D-sub (male)
USB PC Link Port (Device)	USB Type B (USB 1.1 compliant)
USB Storage Port (Host)	USB Type A (USB 1.1 compliant)
D/A Output Channels (Option)	20 channels (with option /DA)
External Trigger Input	BNC terminal, TTL level
Video Output	VGA, 15-pin D-sub (female)

Power Supply & Physical Specifications

Line Voltage Frequency	50/60 Hz
Supply Voltage Range	100 to 240 VAC
Power Consumption (Max)	150 VA
Warm-up Time	Approx. 30 minutes

Environmental & Safety Standards

Operating Temperature Range	5 to 40 °C
Operating Humidity Range	20% to 80% RH (no condensation)
Storage Temperature Range	-25 to 60 °C
Safety Standard Compliance	EN61010-1
Measurement Category (CAT Rating)	CAT II 1000V
EMC Directive Compliance	EN61326-1 Class A

Filters

Line Filter Cutoff Frequencies	500 Hz, 5.5 kHz, 50 kHz, 1 MHz
Frequency Filter Cutoff Frequencies	100 Hz, 500 Hz, 2 kHz, 20 kHz

Storage & Interface Options

Internal Data Storage Capacity	Approx. 30 MB
PC Card Slot	Type II PC Card slot

Measurement Options

Voltage Fluctuation & Flicker Measurement	Compliant with IEC61000-3-3 and IEC61000-4-15 (option /FL)
Delta Calculation Functions	Line-to-line voltage, phase voltage, and neutral current calculations (option /DT)

Physical Options

Built-in Printer Specification	Thermal line dot printer, 112 mm paper width (option /B5)
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Environmental

Operating Altitude	Up to 2000 m
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Accuracy Specifications

Voltage/Current Temperature Coefficient	Add $\pm 0.01\%$ of reading/ $^{\circ}\text{C}$ (within 5 to 18 $^{\circ}\text{C}$ or 28 to 40 $^{\circ}\text{C}$)
Active Power Temperature Coefficient	Add $\pm 0.02\%$ of reading/ $^{\circ}\text{C}$ (within 5 to 18 $^{\circ}\text{C}$ or 28 to 40 $^{\circ}\text{C}$)
Influence of Self-Heating (30 A Element Current)	Add $0.004 \times I^2$ % of reading to current and active power accuracy (where I is the current in A)
Influence of Magnetic Field	Add $\pm 0.1\%$ of range or less (at 400 A/m, 50/60 Hz)

Measurement

Effective Measurement Range (Voltage/Current)	1% to 110% of range (Crest Factor 3)
Effective Measurement Range (Power)	1% to 121% of range (Crest Factor 3)
Integration Time Setting Range	0 hours 00 minutes 00 seconds to 10000 hours 00 minutes 00 seconds
Data Update Rate Options	50 ms, 100 ms, 250 ms, 500 ms, 1 s, 2 s, 5 s, 10 s, 20 s, and Auto

Harmonic Measurement

Advanced Harmonic Measurement Maximum Order	500th order (with Option /G6, fundamental frequency 50/60 Hz)
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Motor Evaluation Option

Speed Input Range (Analog)	± 1 V, ± 2 V, ± 5 V, ± 10 V (with Option /MTR)
Torque Input Range (Analog)	± 1 V, ± 2 V, ± 5 V, ± 10 V (with Option /MTR)
Speed/Torque Pulse Input Frequency Range	2 Hz to 1 MHz (with Option /MTR)

D/A Output

D/A Output Resolution	16-bit (with Option /DA)
D/A Output Voltage Range	± 5 V FS (approx. ± 7.5 V maximum)

Safety & General

Insulation Resistance	50 M Ω or more at 500 VDC (between input terminals and case, and between input elements)
Withstand Voltage	5.55 kVAC for 1 minute (between input terminals and case)

TECHNOLOGY

Precision Power Analyzer

APPLICATIONS

Inverter evaluation, high-efficiency motor testing, power semiconductor loss measurement, calibration, and power grid quality testing

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