



2400 Series Wideband Spectrum Power Analyzers

Single and Three-Phase Performance

The Valhalla 2400 Series Wideband Spectrum Power Analyzers provide a high-precision wattmeter, oscilloscope, and power analyzer in one unit. Offered in both single and three-phase configurations, the user can simultaneously monitor voltage and current measurements while displaying application-specific power parameters. Our instruments provide clear, consistent data points while coping with extreme, electronically generated signals.

- Suitable for stand-by, low power factor, and frequency inverter drivers
- IEEE, USB, RS-232, Ethernet, and Analog interfaces available
- Bright LCD with up to 10 measured values and wave form, bar graph, and trend plot visualizations
- Windows Operating Software
- 0.1% and 0.05% accuracy
- Optional harmonics analysis (1-99) of current, voltage, and power
- Built-in integrator
- Full control via membrane keys or LabVIEW Software
- Frequency measurements from 0.1Hz to 500kHz

With a goal of providing the highest performance at the lowest price, our power analyzers offer unmatched customization options ensuring the perfect fit for any application. Along with a variety of accuracy levels and harmonics; we can configure the instruments with RS-232, IEEE, USB, Ethernet, sensor modules, and additional software for testing motors and/or transformers. Each analyzer input is galvanically isolated and covers a wide .3V to 1000V, 1.5mA to 40A range. All test parameters of the instrument are configured through the Windows Operating Software. Additional accessories include current clamps, shunts, test leads, and rack mounts.



Voltage	8 ranges: 0.3 V, 1 V, 3 V, 10 V, 30 V, 100 V, 300 V, 1000 V		
	Frequency range	DC, 0.1 Hz – 1 MHz	
	Crest Factor	3:1 at 50 % full scale (fs)	
	Input Impedance	1 MOhm	
	Common Mode	50 Hz/100 kHz	160 dB/100 dB
	Standard accuracy 23°C; rms, mean, rectified mean; 0.3V typical		Improved accuracy ±(0.05 % rdg + 0.07 % range)
Current	13 ranges: 1.5 mA, 5 mA, 15 mA, 50 mA, 150 mA, 500 mA, 1.5 A, 5 A; 1, 3, 10, 30, 100 A.	Max. 1 A, 5 A, 30 A, resp.	
	Frequency range	DC, 0.1 Hz-300 kHz / 1 MHz	
	Crest Factor	3:1 at 50 % full scale (fs)	
	Common Mode	50 Hz/100 kHz	160 dB/120 dB
	Standard accuracy 23°C; 1 A-, 5 A-, shunt input	30 A input	Lowest ranges 1.5 mA, 15 mA, 1 A: typical. Improved accuracy 1Hz-400 Hz ±(0.05 % rdg + 0.07 % range)
	1 Hz-1 kHz	±(0.1 % rdg + 0.1 % rng)	±(0.1 % rdg + 0.1 % rng)
Power	104 ranges corresponding to the products V x A.		
	Frequency range	DC, 0.1 Hz-300 kHz	
	45 Hz-65 Hz	(0.1 % rdg + 0.01 % range)	PF= 0 to ±0.1
	1 Hz-1 kHz	Add accuracy percentage figures of current and voltage, +0.04 %/kHz P	PF= 0 to ±1
Frequency	0.1 Hz-400 kHz, V triggered; Accuracy ±0.1 %.		
	DC, 1 kHz-10 kHz		PF= 0 to ±1
Computed Values	Accuracy; Reactive Power, $Var = \pm(VA^2 - W^2)^{1/2}$, Apparent Power: $VA = Arms Vrms$; Power Factor: $PF = W/VA$; Crest Factor: $CF = Ap/Arms, Vp/Vrms$; Form Factor: $FF = At/Arms, Vt/Vrms$; Impedance: $Z = Vrms/Arms$; Total Harm Dist: $THD = (Irms^2 - Ifund^2)^{1/2}/Irms$		Add accuracy percentage figures of values involved in computation.
	10 kHz-100 kHz	±(0.3 % range + 0.04 %/kHz rdg), typical	PF=1
Integrator	Energy, Charge; Accuracy Wh, Vah, Varh, Ah; Basic accuracy of integrated quantity.		
Harmonic Analysis	Frequency range of fundamental	2.5 Hz-100 kHz	
	Range of harmonic		1-99
	Accuracy, Harmonic current and voltage		
Display	2 Hz-1 kHz	±(0.1 % rdg + 0.1 % range)	
	1 kHz-10 kHz	±(0.5 % rdg + 0.5 % range)	
	10 kHz-100 kHz	±(0.7 % range + 0.1 %/kHz rdg), typical	
Power	Blue liquid crystal graphic display with FL backlight	64x120 mm; 128 x 240 pixels	
Power	AC, 50-400 Hz; Fuse: Power		85 V-240 V; 2 A, 15 VA
Dielectric Strength	Inputs to case or power supply Line input to case Input to Input		2.5 kV/50 Hz/1 minute 1.5 kV/50 Hz/ 1 minute 4 kV/50 Hz/1 minute
Dimension	H x W x D; Weight		150 x 235 x 320 mm; 4 kg
Options	IEEE-488-2, RS232, Centronics printer output		
	4 programmable analog outputs; single-, sum-, or average values 4 analog inputs 0-±5V, input impedance 200 kΩ 4 analog inputs, 0-±10 V, input impedance 200 kΩ Rack Mounting Kit Windows Operating Software 95, 98, 2000, NT, XP; transformer-motor testing		0-±5 V, accuracy 0.2 % 0-±5 V, accuracy 0.2 % 0-±10 V accuracy 0.2 %
1.5mA-1A Inp/ Shunt Input	1 A input Hi against ILo		1 A input: set scaling to 0.1 Shunt input: 60 mV corresponds to 1.0000 A
	Shunt Hi Lo	1 A input, mA: 1.5, 5, 15, 50, 150, 500, 1500 Shunt input, mV: 60, 60√10, 600, 600√10, 6000, 6000√10 Input impedance: 60k	

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Models

2410-1HE:	Single-Phase Wideband Spectrum Power Analyzer with Harmonics and Enhanced Accuracy
2410-1HS:	Single-Phase Wideband Spectrum Power Analyzer with Harmonics Analysis
2410-1S:	Single-Phase Wideband Spectrum Power Analyzer
2430-3HE:	3-Phase Power Analyzer with Harmonics Analysis and Enhanced Accuracy
2430-3HS:	3-Phase Power Analyzer with Harmonics Analysis
2430-3S:	3-Phase Power Analyzer

Accessories

ACS 1:	Current clamp with connector to 106A shunt input; 0-200A / 0-1000A, DC-1kHz, 2% for 50/60Hz line current measurements only
ACS 2:	Current clamp with connector to 106A shunt input; 0-40A / 0-400A, DC-10kHz, 2% for 50/60Hz line current measurements only
ACS 3:	Current Shunt for Standby Power measurement. Current ranges: 0.1mA, 0.3mA, 1mA, 3mA, 10mA. Typical max error 0.5%, scale current by 0.0001.
ACS 4:	Set of Test Leads, max. 32A, 1.5m (2 red, 2 black)
ACS 5:	Shunt Input Connector
ACS 5a:	Assembled Shunt Input Connector
ACS 7:	Rack Mounting Kit
ACS 8:	Official Calibration Certificate from Swish Calibration Services Customized
ACS 9:	EPROM to read four-digit serial numbers via interface

Options

Option 1:	RS-232 Interface and Centronics printer output, and Windows Operating Software
Option 1a:	USB Interface and Centronics printer output, and Windows Operating Software
Option 1b:	Ethernet Interface and Centronics printer output, and Windows Operating Software
Option 2:	RS-232 and IEEE-488 Interface, Centronics printer output, and Windows Operating Software
Option 2a:	USB and IEEE-488 Interface, Centronics printer output, and Windows Operating Software
Option 2b:	Ethernet and IEEE-488 Interface, Centronics printer output, and Windows Operating Software
Option 3:	RS-232 and IEEE-488 Interface, Centronics printer output, 4 programmable analog outputs, 8 analog inputs, and Windows Operating Software
Option 3a:	USB and IEEE-488 Interface, Centronics printer output, 4 programmable analog outputs, 8 analog inputs, and Windows Operating Software
Option 3b:	Ethernet and IEEE-488 Interface, Centronics printer output, 4 programmable analog outputs, 8 analog inputs, and Windows Operating Software
Option 4:	Three-Phase Current Sensor Module 0-100A
Option 4a:	Three-Phase Current Sensor Module 0-200A
Option 6:	2400 Series LabVIEW Driver
Option 7m:	2400 Series Software for Motor Testing
Option 7t:	2400 Series Software for Transformer Testing
Option 8:	TTL-Input for External Synchronization
Option 9:	Network to form Artificial Neutral. Mainly for Frequency Inverter Measurements
Option 10:	0-300A, 0-3000A Flexible Current Clamps with Connector to Clamp Input o (One per phase, 1% 50/60Hz)