2400 Series Power Analyzer

Solid performances and simple operation in a compact easy to use package.

Valhalla's state of the art 2400 Series Power Analyzers offer high performance in both single and three phase. Unlike other instruments at this price level the 2400 is designed to operate with extreme signals generated on frequency inverter drivers. These analyzers provide precise reliable measurements for any waveform. Large clear monitor lets you read displayed values from a distance of four meters.

Simple to use:
Checking power to determine the pertinent power parameters of a frequency inverter driven system is simple. All values display large letters easily read even in dark rooms. The user menu makes operation easy.

Measured values can be:
Printed, (Centronics Printer Interface)
Sent to a PC via IEEE-488 or RS232 interface
Sent to a chart recorder via the analog outputs
You can have all available options installed in your instrument.

Extraordinary features, attractive display:
Much effort went into the design of the 2400 Power Analyzers to give the highest performance at low costs.
-The analyzer inputs are all galvanically isolated.
-Broad band DC-300kHz.
-Wide input range (0.3V - 1000V, 15mA - 40A).
-Exceptional common mode rejection for use in frequency inverter driven systems.
-The accuracy is 0.1% (0.05% versions are available).
-The bright LCD monitor displays up to 10 measured values in well legible 9mm high numbers.
-The Three-Phase Power Analyzer puts up to 32 measured values on the screen.

You have the choice to visualize wave forms, bar graphs or trend plots. A unique feature of these instruments allows a combination of meter mode and graphic mode.

Computed Values
The new 2400 power analyzer measures, computes, and displays all of your critical power variable to let you concentrate on more efficient reliable testing. It is available in single or three phase versions and combines a wattmeter, oscilloscope, and a power spectrum analyzer in a single compact package.

From the simultaneous and precise voltage and current measurements, you can measure and monitor all of the power parameters you need. You can display them in the format that fits your application.

Current and Voltage. RMS, Peak and Harmonics through the 99th order.

Power. Watts, VA, VAR, and Power Factor

Integrated Measurements. Watt-Hours, VA Hours, VARH and Amp Hours

General Values. Frequency, Harmonic Distortion, Crest Factor, Form Factor, and Oscilloscope Display

- **Single-Phase and 3-Phase**
- **Perfect Resolution for Stand-by Power Measurements (your solution for 1Watt Testing)**
- **Suitable for frequency inverter drivers**
- **Large and bright display for up to 10 values**
- **Scope function, 20 setups can be stored**
- **Harmonics 1-99, Bar charts**
- **DC-300KHz, 15mA-40A, 0.3V-1000V**
- **0.1% or 0.05% accuracy**
- **Interfaces: IEEE 488, RS 232, Centronics**

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VALHALLA SCIENTIFIC
Leading Technology in Precision Electronic Measurements & Calibration Instrumentation

2400 Series Specifications

Voltage

Ranges	.3V, 1V, 3V, 10V, 30V,100V, 300V, 1000V
Frequency Range	DC, 0.1Hz-300kHz
Crest Factor	4:1 at 50% full scale (fs)
Input Impedance	>1MΩ
Common Mode - 50Hz/100kHz	155dB/95dB
Standard Accuracy 23°K ±3°K 1Hz-1kHz DC, 1kHz - 10kHz 10kHz - 100kHz 100kHz - 300kHz Improved Accuracy	 ±(0.1%rdg + 0.1% range) ±(0.2%rdg + 0.2% range) ±(0.3%rdg + 0.04% range) ±(0.2%rdg + 0.2% range) ±(0.05%rdg + 0.05% range)

Current

Ranges	15mA, 50mA, 150mA, 500mA, 1.5A, 5A, 1,3,10,30,100,300A
Frequency Range	DC, 0.1Hz-300kHz
Crest Factor	4:1 at 50% full scale (fs)
Common Mode - 50Hz/100kHz	160dB/120dB
Standard Accuracy 23°K ±3°K 5A Input/Shunt Input 1Hz-1kHz DC, 1kHz - 10kHz 10kHz - 100kHz 100kHz - 300kHz Improved Accuracy	 ±(0.1%rdg + 0.1% range) ±(0.2%rdg + 0.2% range) ±(0.3%rdg + 0.04% range) ±(0.3%rdg + 0.04% range) ±(0.05%rdg + 0.05% range)
Standard Accuracy 23°K ±3°K 30A Input 1Hz-1kHz DC, 1kHz - 10kHz 10kHz - 100kHz 100kHz - 300kHz Improved Accuracy	 ±(0.1%rdg + 0.1% range) ±(0.9%rdg + 0.2% range) ±(0.3%rdg + 0.5% range) ±(0.3%rdg + 0.5% range) ±(0.05%rdg + 0.05% range)

Power

Ranges	80 Ranges corresponding to the products V x A
Frequency Range	DC, 0.1Hz-300kHz
Accuracy 23°K ±3°K 1Hz-1kHz DC, 1kHz 10kHz 10kHz 100kHz	Add accuracy % of I and V PF = 0 to ±1 PF = 0 to ±1 PF = 1

Frequency

0.1Hz-300kHz, A or V triggered Accuracy	±0.1%

Computed Values

Accuracy; Reactive Power, Var = ±(VA2-W2)_;
Apparent Power: VA = ArmsVrms;
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 = (Irms2 - Ifund2)_/Irms

Integrator

Energy, Charge; Accuracy - Wh, Vah, Varh, Ah; Basic accuracy of integrated quantity.

Harmonic

Frequency range of fundamental - 2.5Hz - 100kHz

Analysis

Accuracy, Harmonic current and voltage 2Hz-1kHz 1kHz-10kHz 10kHz-100kHz	 ±(0.2% rdg + 0.1% range) ±(0.5% rdg + 0.5% range) ±(0.7%range + 0.1%/kHzrdg)

Display

Blue liquid crystal graphic display with FL back light; 64x120mm; 128x240 pixels

Power

AC, 50-400Hz;
85V-240V; 2AF/30VA

Dielectric Strength

Input to case or power supply Line input to case Input to Input	 2.5kV/50Hz/1minute 1.5kV/50Hz/1minute 4kV/50Hz/1minute

Dimensions

H 150mm x W 235mm x D 320mm
Weight 4Kg

Power Analyzers

2410-1S:	Single Phase Basic Model, 0.1% accuracy
2410-1HS:	Single Phase Power Analyzer,w/Harmonics & Scope 0.1% accuracy
2410-1HE:	Single Phase Power Analyzer, w/ Harmonics or Scope, 0.05% accuracy
2430-3S:	Three-Phase Basic Model, 0.1% accuracy
2430-3HS:	Three-Phase Power Analyzer,w/Harmonics & Scope 0.1% accuracy
2430-3HE:	Three-Phase Power Analyzer, w/ Harmonics or Scope, 0.05% accuracy

Accessories:

ACS1:	Current clamp with connector to 106A shunt input; 0-200A / 0-1000A, DC-1kHz, 2 %, other ranges and accuracies on request
ACS2:	Portable printer (106 x 180 x 88mm) with Centronics interface and cable (weight400gr.)
ACS3:	Soft carrying case for 2400
ACS4:	Set of test leads, max. 32A, 1.5m (2 red, 2 black)
ACS5:	Shunt input connector
ACS6:	Service Manual
ACS7:	Rack Mounting Kit

Options:

Option-01:	RS-232 Interface and Centronics printer output including Windows Operating Software (95, 98, NT, 2000, ME, XP) to control, read, and store data
Option-02:	RS-232- and IEEE-488 Interface, Centronics printer output including Windows Operating Software (95, 98, NT, 2000, ME, XP) to control, read, and store data
Option-03:	RS-232- and IEEE-488 Interface, Centronics printer output, and 4 analog outputs, 8 analog inputs including Windows Operating Software (95, 98, NT, 2000, ME, XP) to control, read, and store data, read analog inputs. inputs
Option-03A:	RS-232 and IEEE-488 Interface, Centronics printer output 4 analog outputs with provision to also output total power, 8 analog inputs including Windows Operating Software (95, 98, NT, 2000, ME, XP) to control, read, and store data, read analog inputs. inputs
Option-04:	3-Phase current sensors model 0-100A (supply by 2400)
Option-05:	Operating software under DOS to control 2400, read data and store data via RS-232 or IEEE-488 (National, Keithly Interface)
Option-06:	2400 driver for Nat. Instrument LabView
Option-07:	Standalone software based on LabView
Option-07M:	Software for Motor Testing
Option-07T:	Software for Transformer Testing
Option-08:	TTL-input for external synchronization
Option-09:	Network to form artificial neutral (mainly frequency inverter measurements)
Option-10:	0-300A, 0-3000A flexible current clamps with connector to clamp input of Power Analyzer (1 per phase). 1% 50/60Hz.