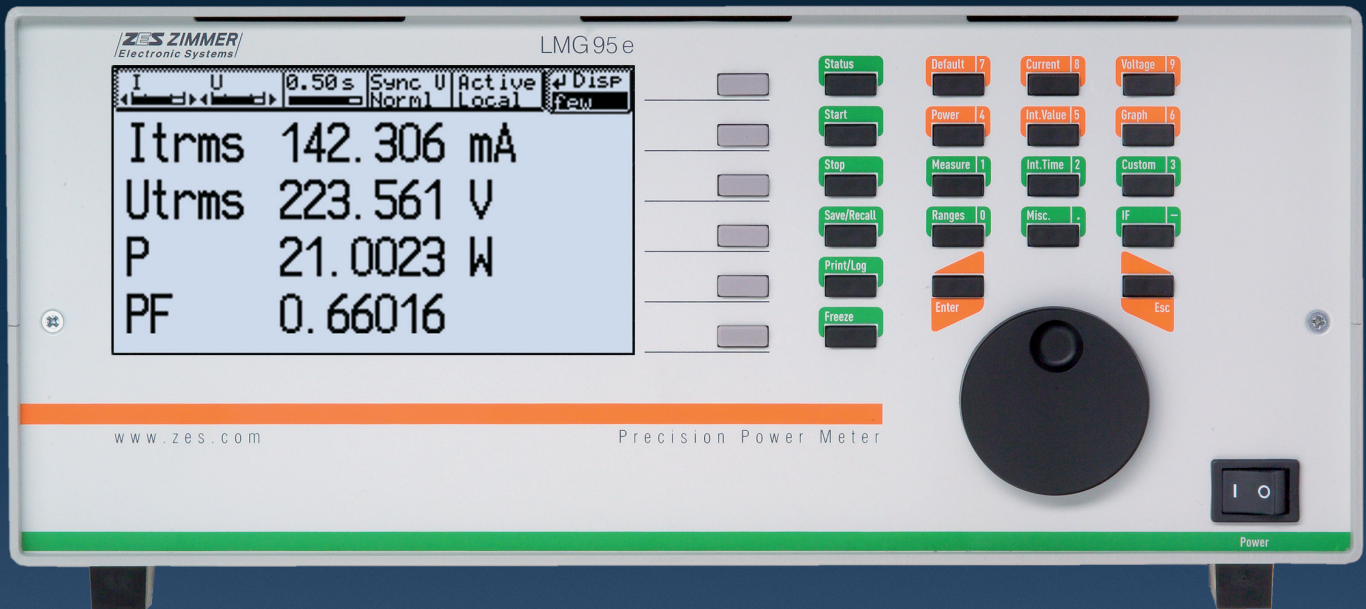


# LMG95e

## Precision Power Meter



- **Uncertainty:**  
 $U, I : 0.03\% + 0.08\%$   
 $P : 0.05\% + 0.12\%$   
 (% of reading + % of range)
- **RS232, IEEE488.2 and Printer interface**
- **Software for configuration, logging and analysis LMG-CONTROL-B**

Features	LMG95	LMG95e
RS232, IEEE488.2, printer interface	01	✓
CE Harm (full compliance)	✓	-
CE Harm (pre compliance)	-	✓
Process signal interface	03	-
Flicker	04	-
Monitoring of transients	05	-
Extension up to 500kHz	06	-
Modification U-input	07	-
Modification I-input	08	-
Measuring input sockets on rear panel	09	✓
Harm 100	010	-
Memory extension for scope mode	011	-
Waveform analysis for LMG-CONTROL	LMG-CONTROL-WA	-

Oxx: option

The precision power meter LMG95e is the economic version of the proven LMG95. Available in a fixed configuration, it is the entry-level model of the LMG product family and balances price, accuracy and features.

# Precision Power Meter LMG95e

## Voltage measuring ranges

Rated range value /V	6	12.5	25	60	130	250	400	600
Permissible trms value /V	7.2	14.4	30	60	130	270	560	720
Permissible peak value for full scale /V	12.5	25	50	100	200	400	800	1600
Overload capability	1500V for 1s							
Input resistance	1M $\Omega$ , 20pF							

## Current measuring ranges

Rated range value /A	0.15	0.3	0.6	1.2	2.5	5	10	20	120	240	480	960
Permissible trms value /A	0.3	0.6	1.3	2.6	5.2	10	21	21	21	21	21	21
Permissible peak value for full scale /A	0.469	0.938	1.875	3.75	7.5	15	30	60	120	240	480	960
Overload capability	160A for 1s											
Input resistance	5m $\Omega$											

## Voltage inputs for current measuring with shunt / transducer

Rated range value /V	0.03	0.06	0.12	0.25	0.5	1	2	4
Permissible trms value /V	0.06	0.13	0.27	0.54	1	2	4	8
Permissible peak value for full scale /V	0.0977	0.1953	0.3906	0.7813	1.563	3.125	6.25	12.5
Overload capability	250V for 1s							
Input resistance	100k $\Omega$							

**Measuring range selection** Auto, manual or remote control

**Isolation** Current and voltage path are isolated against each other and may float against earth with 1000V/CAT III

**Measuring method** Simultaneous sampling of the current and voltage signals and A/D conversion of the instantaneous values (100kHz)

**Measuring cycle, synchronization, averaging** For measurements of the trms values for current, voltage and active power the measuring cycle time is adjustable in the range of 50ms to 60s. In each measuring cycle gapless 100kHz sampling and evaluation. The synchronization can be performed on the measuring signal, the fundamental harmonic, the envelope or the mains. Average from 1 to 1000 cycles.

## Measuring uncertainty

Measuring uncertainty	$\pm$ (% of reading + % of range)		
	DC, 0.05Hz...3kHz	3...15kHz	15...50kHz
Voltage	0.03+0.08	0.1+0.2	0.5+1.0
Current	0.03+0.08	0.1+0.2	0.5+1.0
Shunt Voltage Input	0.03+0.08	0.1+0.2	0.5+1.0
Active Power	0.05+0.12	0.2+0.2	1.0+1.0

## Measuring uncertainties based on:

1. sinusoidal voltage and current
2. ambient temperature 23°C  $\pm$  3°C
3. warm-up time 1h
4. definition of power range as the product of current and voltage range,  $0 \leq |\lambda| \leq 1$ ,  $\lambda = P/S$  (power factor)
5. calibration interval 12 month

## Other values

All other values are derived from the values for current, voltage and active power. Accuracies for the derived values depend on the functional relation (e.g.  $S = I \cdot U$ ,  $\Delta S/S = \Delta I/I + \Delta U/U$ )

**Internal time base**  $\pm 100$ ppm

**Frequency measuring** 0.05Hz...50kHz  $\pm$  0.01% of measuring value, measuring channel selectable

## Display of measured and computed values

**Representation** With standard abbreviation of measured magnitudes, numeral values 6 digits (0...999999), with sign, decimal point and unit (e.g.  $I_{trms}$  0.73851mA), 4 to 8 values can be displayed simultaneously, selectable via default or user defined menus

**Voltage, current** Trms value, peak values (min, max, pp), rectified value (rect), mean value (dc), trms value of ac component (ac), form factor, crest factor

**Power** Active power (P), reactive power (Q), apparent power (S), phase angle ( $\varphi$ ), power factor ( $\lambda$ )

**Impedance** Amount (Z), real and imaginary part of resistor in serial equivalent circuit

**Integrated values depending on the measuring time** The integration can be controlled manually, automatically using start and stop times or remote controlled via computer interface

**Energy, charge** Active energy (Ep), reactive energy (Eq), apparent energy (Es), charge (q)

**Date and time, measuring time** Current date (day, month, year) with time (hour, minutes, seconds), accu buffered real time clock, start time for measurement, running measuring time, on-time, each with days, hours, minutes, seconds

**Adjustable parameters** Scaling factors for external shunt, current and voltage transducer

**Synchronization** Synchronization is made on the periodicity of the measured signal. Periodicity can be determined by the signals  $u(t)$ ,  $i(t)$ ,  $p(t)$ ,  $u^2(t)$ ,  $i^2(t)$ , each of them can be adapted with selectable filters. By this stable displays also with pulse width modulated signals (e.g. frequency inverter) and amplitude modulated signals (e.g. electronic ballast). Synchronization also on mains.

**Scope function** Graphical representation of sampled values (waveform of the signal)

**Plot function** Time diagram of calculated values, e.g. trms value and power

**Harmonic analysis CE-Hrm** Analysis of current and voltage up to the 40<sup>th</sup> harmonic (total of 41 with DC component), fundamental in the range 45Hz to 65Hz. Analyzer in accordance with EN61000-4-7 with evaluation in accordance with EN61000-3-2 (pre compliance)

**Computer interface** Interfaces: **RS232** and **IEEE488.2**, only one interface can be used at the same time

**Remote control** All functions can be remote controlled

**Output data** Output of all displayable data possible, data formats of all interfaces are the same, SCPI command set

**Transfer rates** RS232: max. 115200 Baud, IEEE488.2: max. 1MByte/sec

**Printer interface** Parallel PC-printer interface with 25 pin SUB-D socket for printing of values, tables and graphics on needle, ink or laser printer

## Other data

**Service RS232 interface** For firmware update and service diagnostics

**Auxiliary power supply output** +15V/0.4A and -15V/0.2A for external current transducers

**Dimensions/weight** Desktop case, (w)320mm x (h)147mm x (d)274mm, subrack 84PU, 3HU, (d)274mm, about 5.5kg

**Safety regulation** EN61010-1, protection class I, overvoltage class III

**Electromagnetic compatibilty** EN61326-1, EN61000-3-2, EN61000-3-3

**Protection class** IP20 acc. to EN60529

**Operation temperature, storage temperature** 5...40°C, -20...+55°C

**Supply** 90...250V, 45...65Hz, about 30W

Subject to technical changes, especially to improve the product, at any time without prior notification.