

Reference Power Analyzer LMG 95 REF

for Calibration Laboratories and National Metrology Institutes

Basic Accuracy 100ppm • PTB Protocol available
Reference in ISO9000 Compliant Calibration Systems



LMG 95 REF

General	The LMG95REF is a high precision measuring instrument (uncertainty <100ppm) for current, voltage, active power and energy, also at very small	power factors. It is needed for calibration of precision power meters, energy counters etc. The LMG95REF itself is calibrated by the PTB (Physikalisch	Technische Bundesanstalt, the national metrology institute of Germany) and stands therefore in highest position in the chain of traceability.
Design	Using the LMG95 with its excellent measuring accuracy as a base, ZES ZIMMER has designed the LMG95REF with still more stable and precise measuring inputs. The accuracy and the stability of the LMG95REF is guaranteed by <ul style="list-style-type: none"> • use of ultrastable and selected precision components • very careful aging • optimised heatsinks for tem- 	perature flow and cooling <ul style="list-style-type: none"> • direct calibration at the national metrology institute PTB This concept – going on in development of the running standard LMG95 while maintaining the operating shell and interface software – gives a lot of advantages for the user. By keeping the consistency in operation and software you	can write and test all calibration routines with a standard instrument. When higher calibration accuracy is needed, the standard LMG95 can then be replaced by the LMG95REF. The improved measuring accuracy of LMG95REF is valid for all current and voltage measuring ranges.
Application	The LMG95REF is mainly used as standard in calibration systems. This standard is traceable to PTB standards, so that a calibration system built up in this way provides calibration in compliance with ISO9000 with the measuring uncertainty of the LMG95REF (<100ppm). In calibration systems stable sources with sinusoidal output signals at negligibly small distortion are needed. When calibrating power the voltage and current sources have to run on same frequency with settable	phase angle. This kind of sources you can get so far only at very high prices and with relatively low accuracy. When using a LMG95REF, the accuracy of these sources may be specified quite low. When building up a calibration system with LMG95REF as standard you can use for example the FLUKE™ multiproduct-calibrator 5500A with a stable output signal. The 5500A is specified with a measuring uncertainty of maximum 0.25%. But this is not relevant as the	precision and traceability is guaranteed by the LMG95REF. Without LMG95REF the calibrator 5500A is suitable for power meters of class 1, with LMG95REF the accuracy of the total system is significantly increased and the usable range of power factor remarkably enlarged. With only two instruments and a PC you can build up a calibration system for power meter and energy counters at a very moderate price. Instruments of all brands can be calibrated.

Technical data

Measuring uncertainty

Measuring uncertainty	± (% measuring value + % measuring range)							
	DC	0.05...15Hz	15...45Hz	45...65Hz	65Hz...1kHz	1...3kHz	3...15kHz	15...50kHz
Voltage	0.02+0.06	0.02+0.04	0.015+0.03	0.0033+0.0066	0.015+0.03	0.03+0.06	0.1+0.2	0.5+1.0
Current	0.02+0.06	0.02+0.04	0.015+0.03	0.0033+0.0066	0.015+0.03	0.03+0.06	0.1+0.2	0.5+1.0
Shunt Voltage Input	0.02+0.06	0.02+0.04	0.015+0.03	0.0033+0.0066	0.015+0.03	0.03+0.06	0.1+0.2	0.5+1.0
Active Power	0.03+0.06	0.035+0.04	0.025+0.03	0.0050+0.0066	0.025+0.03	0.05+0.06	0.2+0.2	1.0+1.0

Measuring uncertainties are rated at:

1. Sinusoidal voltages and currents
2. Ambient temperature 23°C
3. Warming up time 1h

4. Definition measuring range for power: product of current and voltage measuring range
5. Calibration interval 12 months

Traceable calibration certificates can be provided for values, respectively measuring points, for which national or international standards exist!

Further functions

- As standard: • Harmonic analysis according to EN61000-4-7
- As option: • L95-01 computer interface RS232, IEEE488.2, printer interface
- L95-04 flicker meter according EN61000-4-15 with evaluation in accordance with EN61000-3-3

Mechanical design

- Bench type case, W 320mm x H 147mm x D 274mm,
- With mounting kit (fixing brackets) to be modified to 19" plug-in, 84TU, 3HU, D 274mm about 5.5kg

Weight

Protection class

Electromagnetic compatibility

Protection class

Operating/storage temperature

Climatic class

Power Supply

EN61010 (IEC61010, VDE0411), protection class I, Overvoltage class III

EN61000 (IEC61000), EN50081, EN50082

IP20 in accordance to DIN40050

20...25°C, -20...50°C

KYG in accordance with DIN40040

90...250V, 45...65Hz, about 35W

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