



GPS-313XC Series

Precision Benchtop LCR Meters



Four Parameters. One Measurement Cycle.

A bench bridge that reads four things at once. A main parameter, a second parameter beside it, and two monitor readings chosen from impedance, dissipation, quality factor, phase, resistance, reactance, conductance, susceptance, admittance, the actual drive voltage and current, or the deviation from a nominal. Main and second are six digits each.

Frequency is continuous rather than a list of points, and the three models differ only in how far it reaches: 100 kHz, 200 kHz or 300 kHz. The step is fine where it needs to be, 0.0001 Hz at the bottom of the range, and the setting is held to $\pm 0.01\%$.

Drive can be set as a voltage from 10 mV to 2 V or as a current from 100 μA to 20 mA, and automatic level control holds whichever you choose at the part rather than at the generator. Source impedance is selectable at 30 Ω , 50 Ω or 100 Ω , which matters for current-sensitive parts such as high-permeability cores and lets a reading be matched against one taken on another bridge.

An internal bias of $\pm 2.5\text{ V}$ can sit across the part while it is measured, and a separate DC resistance mode reads the winding itself. For production, nine pass bins with an auxiliary bin and an out-of-bin sort against absolute, percentage or sequential limits, counting to 999999 and reporting through the Handler interface.

KEY FEATURES

- Continuous frequency, to 300 kHz
- $\pm 0.05\%$ basic on six digits
- Four parameters in one cycle
- Voltage or current drive, level controlled
- Internal bias $\pm 2.5\text{ V}$ · DC resistance mode
- Nine-bin comparator · Handler · SCPI

IDEAL FOR

- Component development and characterisation
- Goods-in and incoming inspection
- Production sorting and binning
- Cores, transformers and windings
- Laboratory and teaching work

MEASUREMENT RANGES

Range	Accuracy	Resolution	Notes
Measurement display range · six digits on the main and second reading			
Inductance 0.00001 nH to 9999.99 H	±0.05% basic	—	Series or parallel
Capacitance 0.00001 pF to 999.999 mF	±0.05% basic	—	Series or parallel
Resistance, reactance and impedance 0.00001 Ω to 99.9999 MΩ	±0.05% basic	—	R, X and Z
Conductance and susceptance 0.01 nS to 999.999 S	±0.05% basic	—	G and B
DC resistance 0.00001 Ω to 99.9999 MΩ	—	—	Separate mode · square wave into 30 Ω
Test signal and bias			
Frequency 50 Hz to 300 kHz, model dependent	±0.01%	0.0001 Hz to 1 Hz, by decade	Continuously adjustable
Voltage 10 mV to 2.00 Vrms	±10%, or ±6% level controlled	0.01 V	Automatic level control
Current 100 μA to 20.00 mA rms	±10%, or ±6% level controlled	—	Automatic level control
Source impedance 30 Ω, 50 Ω or 100 Ω	±5%	—	100 Ω unless changed
Internal bias -2.5 V to +2.5 V	±(0.5% + 5 mV)	—	Superimposed on the AC drive

±0.05% is the basic figure and applies after at least 30 minutes warming, with open and short circuit correction run. The accuracy for a particular measurement is built from it by factors for impedance, temperature, calibration interpolation and cable length, so the figure for a given case is read from the accuracy tables rather than taken from the basic figure. The small ranges depend most on the open circuit correction and the large ranges on the short circuit correction, and both should be run again whenever the fixture or the leads change.



WHAT'S IN THE BOX

- GPS-313XC series meter
- Four-terminal Kelvin test clip
- Test leads and test fixture
- Short circuit slice
- RS232 communication cable
- Instruction manual and warranty certificate

AVAILABLE SEPARATELY · SMD test clip, and the RS485 and GPIB interfaces, neither of which is fitted as standard. The SCPI and Modbus command sets are documented in the instruction manual.

GENERAL SPECIFICATIONS

Code	Item	Part Number
GPS-3135C	Precision benchtop LCR meter, 50 Hz to 100 kHz continuous · ±0.05% basic	510150
GPS-3138C	Precision benchtop LCR meter, 50 Hz to 200 kHz continuous · ±0.05% basic	510283
GPS-3139C	Precision benchtop LCR meter, 10 Hz to 300 kHz continuous · ±0.05% basic	510933

MEASURES

Main and second parameter from Cs-Rs, Cs-D, Cp-Rp, Cp-D, Lp-Rp, Lp-Q, Ls-Rs, Ls-Q, Rs-Q, Rp-Q, R-X, Z-θ and DCR · two monitor readings alongside, from Z, D, Q, phase, R, X, G, B, Y, the drive voltage and current, or the deviation

SECOND PARAMETERS

Dissipation 0.00001 to 9.99999 · quality 0.00001 to 99999.9 · phase ±179.999° or ±3.14159 rad · deviation to ±999.999%

CORRECTION

Open and short circuit across every typical frequency, or at three user frequency points · load calibration available at a spot frequency

LIST SWEEP AND TRIGGER

Ten points of frequency or level, each with its own upper and lower limit · sequential or stepping · trigger internal, manual, external or bus, with a delay of 1 ms to 60 s

POWER, SIZE AND ENVIRONMENT

90 to 260 V AC · up to 30 VA · 264 × 107 × 350 mm, width by height by depth · 4.0 kg · operating 0 °C to 55 °C below 70% relative humidity · 30 minutes warming

ACCURACY AND SPEED

±0.05% basic · slow 3, medium 20 and fast 40 readings per second · averaging from 1 to 256

RANGING

Nine impedance ranges, 10 Ω, 30 Ω, 100 Ω, 300 Ω, 1 kΩ, 3 kΩ, 10 kΩ, 30 kΩ and 100 kΩ · automatic, held, or chosen from a nominal value

SORTING

Nine pass bins with an auxiliary bin and an out-of-bin · high, in and low indication on the main parameter · absolute, percentage or sequential limits · counting to 999999 · tone on pass or on fail

INTERFACES AND STORAGE

RS-232 to 115200 baud, with SCPI and Modbus RTU · Handler, opto-isolated, to 30 V · USB host socket for a memory stick · ten setups held internally · 10,000 readings buffered and written out as CSV

WARRANTY

1 year, subject to product registration with GPS LTD · service and calibration available