



ZGS - Active Sample Cell for the Alpha-A Modular Measurement System

- Active sample cell for dielectric, conductivity, and electrochemical impedance measurements at frequencies from 3 μ Hz to 40 MHz
- Extremely wide impedance range: 10 m Ω to 100 T Ω , i.e., 16 decades
- Excellent $\tan(\delta)$ resolution (10 μ) and accuracy (30 μ)
- Wide temperature range: -200 $^{\circ}$ C to 400 $^{\circ}$ C
- Including precision Pt100 temperature sensor, located closely to the sample position
- Fully compatible with Novocontrol temperature control systems Quatro Cryosystem, Novocool Cryosystem, Novotherm
- Extensible by liquids cells BDS 1307, BDS 1308, BDS 1309
- Compatible with Novocontrol interdigitated electrodes and corresponding sample holders

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DISTRIBUTOR CONTACT:
CALTRON PTE LTD
email: caltron@caltron.sg
www.caltron.sg

ZGS

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Active Sample Cell ZGS

The accurate characterisation of electrical properties of materials over the widest ranges of impedance and frequency not only requires an appropriate impedance analyzer, but also a suitable sample cell that allows easy and reproducible sample mounting, appropriate electrical insulation of the sample electrodes and perfect connection to the temperature control environment. The Novocontrol passive sample cell ZGS combines all these features.

Methods

- Electrical characterisation of materials (solids/liquids/powder) in parallel-plate configuration
- Electrical characterisation of liquids on interdigitated electrodes
- Dielectric Spectroscopy
- Conductivity Spectroscopy
- Electrochemical Impedance Spectroscopy

Features:

- Extremely wide impedance range: 10 mΩ to 100 TΩ, i.e., 16 decades
- Excellent $\tan(\delta)$ resolution (10 μ) and accuracy (30 μ)
- Seamless integration into the Novocontrol temperature control systems **Quatro**, **Novocool**, and **Novotherm**
- Integrated precision Pt100 temperature sensor
- Massive stainless steel construction
- Gold-plated electrodes
- Easy to use sample mounting mechanism
- Sample diameter up to 40 mm
- Sample thickness from 0 to 15 mm
- Wide range of useful accessories
- Particular electrical insulation properties, enabling the accurate dielectric characterisation of high-impedance/low-loss samples

ZGS Specifications:

Ranges

Frequency: 3 μ Hz ... 40 MHz (13.1 decades) ¹⁾
 Impedance: 10^{-2} .. 10^{14} Ω (16 decades)
 Capacitance: 1 fF ... 10 F (16 decades)
 Loss factor $\tan(\delta)$: 10^{-5} .. 10^4
 AC signal out: 100 μ V .. 3 Vrms
 DC bias out: -40 VDC .. +40 VDC, 70 mA max ²⁾
 Signal generator output impedance: 50 Ω
 Voltage input: $< \pm 4.3$ Vp dc or ac coupled

Base Accuracy

Relative Impedance, Relative Capacity,
 Loss factor $\tan(\delta)$: $< 3 \cdot 10^{-5}$ ³⁾
 Phase Angle: $< 0.002^\circ$ ³⁾

Resolution

Relative Impedance, Relative Capacity,
 Loss factor $\tan(\delta)$: $< 10^{-5}$
 Phase Angle: $< 0.0006^\circ$

User Calibrations:

load, short, open, internal self calibration and diagnostics

¹⁾ in combination with the Alpha-AT mainframe

²⁾ requires dc bias option B of the Alpha-A mainframe

³⁾ for details refer to specification charts

Extensions/Accessories

- Disposable electrodes BDS 1301 (in sizes of 10/20/30/40 mm diameter)
- Cylindrical cell for liquids (BDS 1307)
- Parallel plate cell for liquids (BDS 1308)
- Parallel plate cell for liquids with high permittivity/conduction (BDS 1309)
- Interdigitated electrodes (BDS 1410, BDS 1411)
- Sample holders for interdigitated electrodes (BDS 1420)
- NanoKit
- Shielding unit (BDS 1230)

System requirements

- Alpha-A series analyzer
- Shielding unit or temperature control system Quatro, Novocool, Novotherm