

2830 / 2831

Precision Solid and Liquid Dielectric Analyzer

Datasheet



HAEFELY

Current and voltage – our passion

Designed by



General Description

The HAEFELY 2830/2831 is the result of extensive research and years of experience testing dielectric properties of liquid and solid insulating materials. It incorporates a fast and highly advanced procedure to measure Capacitance, $\tan \delta$, resistivity ρ and relative permittivity ϵ_r (dielectric constant) of liquid or solid insulating materials. A simple one-time-connection system together with resistivity measurement according to pre-selected standards drastically reduces measuring time.

The system consists of 2830, the measuring bridge and control unit, and 2831, the extension unit. This system is a complete replacement of the Tettex 2821 and 2822.

The 2830 contains the controller and the measurement part of the system.

The 2831 extension unit contains a standard capacitor, 2.5 kV AC & DC supplies and a temperature control unit.

Features	Advantages
▪ Capacitance, $\tan \delta$, resistivity ρ and relative permittivity ϵ_r on liquid and solid insulating materials.	☑ Simple and one-time connection
▪ Large 12" touch display	☑ Full graphical test visualization
▪ Customized programmable sequences and manual mode	☑ Guaranteed test repeatability and additional flexibility
▪ Integrated AC power supply 5 – 2500 V and 40 – 65 Hz	☑ Adjustable control
▪ Two independent integrated temperature control units	☑ Robust
▪ Integrated ambient temperature and humidity sensor	☑ Reliable measurement
▪ Place to connect two liquid test cell heater 2903 or one solid test cell 2914	☑ Reduced testing time
▪ Existing Tettex test cells 2901 (from 1990 and later) and 2914 (from 1985 and later) can be used	☑ Compatible
▪ Data transfer over USB memory stick	☑ Convenient memory storage and test recall

Applications

C and $\tan \delta$ measurement and resistance measurement on liquid and solid insulating materials.

- Liquids like mineral, natural or synthetic oils.
- Solid materials like insulation paper, silicone, rubber, polymeric plastics, etc.

The 2830/2831 is a valuable tool for factory tests, routine tests, R&D tests and regular maintenance.

Scope of Supply

- Solid and liquid dielectric analyzer 2830 and 2831
- Test certificate
- Set of connection cables
- Operating Manual

Technical Data

Measurement 2830	Range	Max. Resolution	Accuracy
Dissipation factor (tan δ) ¹	0 ... 100	1 x 10 ⁻⁶	±0.5 % rdg ± 1 x 10 ⁻⁵
Capacitance ²	≥ 10 pF	0.001 pF	±0.2 % rdg ± 0.01 pF
Relative permittivity ε _r	1 ... 30	1 x 10 ⁻³	
Resistance	120 kΩ ... 5 TΩ ³	1 kΩ	<1 TΩ ± 5 % rdg +3 digits ≥1 TΩ ± 15 % rdg +3 digits
Resistivity (Liquid) ⁴	900 kΩm ... 27 TΩm ⁵		
Resistivity (Solid) ⁶	2.4 MΩm ... 80 TΩm ⁷		
Test current @ Input Cx	10 μA ... 10 mA	0.01 μA	±0.1 % rdg ± 0.1 μA
Test current @ Input Cn	10 μA ... 10 mA	0.01 μA	±0.1 % rdg ± 0.1 μA
Test Frequency	45 – 65 Hz	0.1 Hz	±0.1 % rdg ± 0.1 Hz
AC test voltage	5 ... 2500 V	1 V	±0.3 % rdg ± 1 V
AC frequency	40 – 65 Hz	0.1 Hz	
AC current max.	5 mA		
DC test voltage	250 – 2500 V	25 V	±10 % rdg +20 V
Hardware			
Heater controller	Ambient – 200 °C	0.1 °C	±0.5 °C
Internal standard capacitor ² Dissipation factor (tan δ)	1 x 10 ⁻⁵		±1 x 10 ⁻⁵
Internal standard capacitor Capacitance	1 nF ± 5 % @ 25 °C		± 20 ppm/°C
Display	12" TFT, 800 x 600, integrated Touch-Screen		
Software			
Operating System	Windows 7 embedded		
Interfaces	3 x USB		
Data Format	XML, CSV		
Mains Power Supply			
Voltage	90 ... 264 V AC		
Power	Max. 1.7 kVA		
Frequency	50 / 60 Hz		
Environmental			
Operating temperature	10 °C +40 °C		
Storage temperature	-20 °C +70 °C		
Humidity	10 .. 60 % r.h. , non-condensing		
Mechanical			
Safety specifications	VDE 0411/part 1a , IEC/EN 61010-1:2002		
Dimensions (W x D x H)	2 pcs 480 x 440 x 270 mm (19 x 17.3 x 10.6 in)		
Weight	21 kg (46.3 lb) (2830), 19 kg (41.9 lb) (2831)		

1. Accuracy values @ 50/60 Hz
2. Range limit is given by test current and voltage
3. @ 2.5 kV ($R_{\text{max}} = 2 \text{ G}\Omega \times U_{\text{test}} [\text{V}]$)
4. Resistivity range is given by the resistance range multiplied with the cell factor of the test cell ($2903 = 0.113 \times C_{\text{air}} [\text{in pF}]$)
5. Typical range (calculated with $C_{\text{air}} = 60.0 \text{ pF}$ of 2903)
6. Resistivity range is given by the resistance range multiplied with the ratio: surface area of the measurement electrode / distance between the HV and the measurement electrode ($2914 = 0.002\text{m}^2 / \text{distance in m}$)
7. Typical range (calculated with a distance of 0.1mm between the electrodes and 2 kV test voltage)

Global Presence

Europe

HAEFELY AG
Birsstrasse 300
4052 Basel
Switzerland

☎ + 41 61 373 4111
✉ sales@haefely.com

China

HAEFELY AG Representative Office
8-1-602, Fortune Street, No. 67
Chaoyang Road, Beijing 100025
China

☎ + 86 10 8578 8099
✉ sales@haefely.com.cn

This document has been drawn up with the utmost care. We cannot, however, guarantee that it is entirely complete, correct or up to date.
©Copyright HAEFELY/ Subject to change without notice

V2021.03



HAEFELY

Current and voltage – our passion



HIGH VOLTAGE



INSTRUMENTS



EMC


precision.
swiss made.