

2830 / 2831

Precision Oil and Solid Dielectric Analyzer

Datasheet



Sold & Serviced in USA by:



HV TECHNOLOGIES, Inc.

8526 Virginia Meadows Dr.

Manassas, VA 20109

(703) 365-2330

www.hvtechnologies.com

hvsales@hvtechnologies.com



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, 2.5kV AC & DC supplies and a temperature control unit.

Features	Advantages
<ul style="list-style-type: none"> Capacitance, $\tan \delta$, resistivity ρ and relative permittivity ϵ_r on liquid and solid insulating materials. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Simple and one-time connection
<ul style="list-style-type: none"> Large 12" TFT display with touch interface 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Full graphical test visualization
<ul style="list-style-type: none"> Customized programmable sequence and manual mode 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Guaranteed test repeatability and additional flexibility
<ul style="list-style-type: none"> Integrated AC power supply 5 – 1500 V and 40 – 65 Hz 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Adjustable control
<ul style="list-style-type: none"> 2 independent integrated temperature control units 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Robust
<ul style="list-style-type: none"> Integrated ambient temperature and humidity sensor 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Reliable measurement
<ul style="list-style-type: none"> Place to connect two oil test cell heater 2903 or one solid test cell 2914 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Reduced testing time
<ul style="list-style-type: none"> Existing Tettex test cells 2901 (from 1990 and later) and 2914 (from 1985 and later) can be used 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Compatible
<ul style="list-style-type: none"> Data transfer over USB memory stick 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> 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, etc.**

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

Scope of Supply

- Oil and solid dielectric analyzer 2830 and 2831
- Test certificate
- Set of connection cables
- Operating Manual

Technical Data

Measurement 2830	Range	Max. Resolution	Accuracy
Dissipation factor ($\tan \delta$) ¹	0 ... 100	1×10^{-6}	$\pm 0.5 \% \text{ rdg} \pm 1 \times 10^{-5}$
Capacitance ²	$\geq 10 \text{ pF}$	0.001 pF	$\pm 0.2 \% \text{ rdg} \pm 0.01 \text{ pF}$
Relative permittivity ϵ_r	1 ... 30	1×10^{-3}	
Resistance	120 k Ω ... 5 T Ω ³	1 k Ω	<1 T Ω $\pm 5 \% \text{ rdg} +3 \text{ digits}$ $\geq 1 \text{ T}\Omega \pm 15 \% \text{ rdg} +3 \text{ digits}$
Resistivity (Liquid) ⁴	900 k Ωm ... 27 T Ωm^5		
Resistivity (Solid) ⁶	2.4 M Ωm ... 80 T Ωm^7		
Test current @ Input Cx	10 μA ... 10 mA	0.01 μA	$\pm 0.1 \% \text{ rdg} \pm 0.1 \mu\text{A}$
Test current @ Input Cn	10 μA ... 10 mA	0.01 μA	$\pm 0.1 \% \text{ rdg} \pm 0.1 \mu\text{A}$
Test Frequency	45 – 65 Hz	0.1 Hz	$\pm 0.1 \% \text{ rdg} \pm 0.1 \text{ Hz}$
AC test voltage	5 ... 2500 V	1 V	$\pm 0.3 \% \text{ rdg} \pm 1 \text{ V}$
AC frequency	40 – 65 Hz	0.1 Hz	
AC current max.	5 mA		
DC test voltage	250 – 2500 V	25 V	$\pm 10 \% \text{ rdg} +20 \text{ V}$

Hardware			
Heater controller	Ambient – 200 °C	0.1 °C	$\pm 0.5 \text{ }^\circ\text{C}$
Internal standard capacitor ² Dissipation factor ($\tan \delta$)	1×10^{-5}		$\pm 1 \times 10^{-5}$
Internal standard capacitor Capacitance	1 nF $\pm 5 \% @ 25 \text{ }^\circ\text{C}$		$\pm 20 \text{ ppm}/^\circ\text{C}$
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)

- Accuracy values @ 50/60 Hz
- Range limit is given by test current and voltage
- @ 2.5 kV (Rmax = 2 G Ω x Utest [V])
- Resistivity range is given by the resistance range multiplied with the cell factor of the test cell (2903 = 0.113 x Cair [in pF])
- Typical range (calculated with Cair = 60.0 pF of 2903)
- 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 = 0.002m² / distance in m)
- Typical range (calculated with a distance of 0.1mm between the electrodes and 2 kV test voltage)

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hvsales@hvtechnologies.com

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

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