HAEFELY

Current and voltage – our passion

2830 / 2831

Precision Oil and Solid Dielectric Analyzer

■ 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 δ, 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.

Up to two oil test cells (type 2903) **or** one solid test cell (type 2914) can be heated at the same time.



FEATURES

- ☑ **Capacitance and tan δ (Dissipation factor), resistivity ρ and relative permittivity ε_r** on liquid and solid insulating materials made easy – simple one-time-connection.
- ☑ Large 12” TFT display with touch screen interface and **full graphical test visualization**
- ☑ Customized programmable sequence and manual mode
- ☑ Integrated AC power supply 5 - 2500 V and 40 - 65 Hz adjustable control
- ☑ 2 independent integrated temperature control units
- ☑ Integrated ambient temperature and humidity sensor
- ☑ Place to connect two oil test cell heater 2903 **or** one solid test cell 2914
- ☑ Existing Tettex test cells 2903 (from 1990 and later) and 2914 (from 1985 and later) can be used
- ☑ **Data transfer** over USB memory-stick

BENEFITS

Reduced testing time by using three liquid oil test cells, two can be heated while the third is cleaned and refilled.

Pre-programed test sequences according most commons standards **guarantees test repeatability**. Additional sequences can be added by the user.

APPLICATIONS

C and tan δ 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.

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TECHNICAL SPECIFICATIONS

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 εr	1 .. 30	1 x 10^{-3}	
Resistance	120kΩ … 5TΩ [3]	1kΩ	< 1TΩ ± 5% rdg +3 digits ≥ 1TΩ ± 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	10uA .. 10mA	0.01 uA	± 0.1 % rdg ± 0.1 uA
Test Current @ Input Cn	10uA .. 10mA	0.01 uA	± 0.1 % rdg ± 0.1 uA
Test Frequency	45 - 65 Hz	0.1 Hz	± 0.1 % rdg ± 0.1 Hz
Power Supplies 2831	**Range**	**Max. Resolution**	**Accuracy**
AC Test voltage	5 ..2500V AC	1 V	± 0.3 % rdg ± 1 V
AC Frequency	40 – 65Hz	0.1Hz	
AC Current max.	5mA		
DC Test Voltage	250 – 2500V	25 V	+10 % rdg +20V
Heater Controller			
Heater Controller	Ambient - 200°C	0.1°C	± 0.5°C
Internal Standard capacitor [2]	**Value**		**Accuracy**
Dissipation Factor (tan δ)	1 x 10^{-5}		± 1 x 10^{-5}
Capacitance	1nF ± 5 % @25°C		± 20ppm/°C
Additional Specifications			
Preprogrammed Standards	IEC 60247:2004; ASTM D924-08; ASTM D1169:2002; VDE 0380-2:2005; BS 5737:1979		
Display	12” TFT, 800x600, integrated Touch-Screen		
Operating System	Windows 7 embeded		
Interfaces	3 x USB		
Data Format	XML, CSV		
Operating Temperature	10 .. 40°C		
Storage Temperature	-20 .. 70°C		
Humidity	10 .. 60 % RH. non-condensing		
Protection classes, Standards	CE mark, IP20, IEC 61010, , IEC 61326-1, IEC 61000-4-X, 61000-3-X, EN 55011, ANSI/IEEE C37.90		
Safety Specification	VDE 0411/part 1a , IEC/EN 61010-1:2002		
Supply	90 .. 264VAC, max. 1.7kVA, 50 / 60 Hz		
Weight	21kg (2830), 19kg (2831)		
W x H x D	2 pcs 48 x 27 x 44 cm (19” x 10.6” x 17.3”)		

1. Accuracy values @ 50/60Hz
2. Range limit is given by test current and voltage
3. @ 2.5 kV (Rmax = 2 GΩ x Utest [V])
4. Resistivity range is given by the resistance range multiplied with the cell factor of the test cell (2903 = 0.113 x Cair [in pF])
5. Typical range (calculated with Cair = 60.0pF 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 = 0.002m2 / distance in m)
7. Typical range (calculated with a distance of 0.1mm between the electrodes and 2kV test voltage)

SCOPE OF SUPPLY

- Oil and solid dielectric analyzer 2830 and 2831
- Test Certificate
- Set of connection cables
- User Manual

ACCESORIES

2903 TEST CELL FOR LIQUID INSULANTS



The precision test cell type 2903 is used to measure the dielectric properties of liquid insulants such as insulating oil. It determines for example the dissipation factor tan δ and the dielectric constant εr as well as the specific resistivity.

The test cell's design is in accordance with the specifications of IEC, ISO, and ASTM standards (USA).

Additional information and technical specifications available in the 2903 Datasheet at www.haefely.com

2914 TEST CELL FOR SOLID INSULANTS



The test cell is used for dielectric tests on solid test samples. It determines dissipation factor tan δ and relative permittivity (dielectric constant) εr on solid insulates such as paper and plastic foils, as well as specific resistivity.

The design is the result of longstanding experience in the field of test cell building. It has been designed in accordance with ASTM (USA), IEC and ISO standards and conforms to recommendations of CIGRE.

Additional information and technical specifications available in the 2914 Datasheet at www.haefely.com