

2903

Test Cell for Liquid Insulants

Datasheet



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Designed by



General Description

The precision test cell type 2903 measures the dielectric properties of liquid insulants such as insulating oil, it determines the dissipation factor $\tan \delta$ and the relative permittivity (dielectric constant) r as well as the specific resistivity. The test cell has been designed as a cylindrical capacitor with a shielded measuring electrode (guard ring capacitor) & thus avoids partial capacitances, which might influence the test results.

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

The complete test cell type 2903 consists of the actual test cell type 2903a as well as the heating pot 2903h with built-in heating.

The test cell 2903a consists of a cylindrical container (high-voltage electrode) with a shielded measuring

electrode inside. The cell is vacuum-sealed by an O-ring. The measuring cell head includes a socket for the measuring electrode, two vacuum connections and analog thermometer.

The heating pot 2903h consists of the heating system, two temperature sensors, one thermometer for optical temperature indication and an additional heating stick.

To conduct measurements the test cell is inserted into the pot. The sockets for high voltage, the temperature controller and the temperature measuring bridge are mounted on the pot's top panel made of insulation material.

For most efficient dielectric measurement, the test cell is combined with a Tettex measuring bridge (type 2830) and a power supply with temperature regulator (type 2831). A test cell for solid insulating material is also available (type 2914).

Features	Advantages
<ul style="list-style-type: none"> ▪ Guarded measurement electrodes 	<ul style="list-style-type: none"> ☑ High precision measurements of samples with low $\tan \delta$
<ul style="list-style-type: none"> ▪ Temperature range up to 150 °C (externally controlled by measuring bridge) 	<ul style="list-style-type: none"> ☑ Wider dynamic measurement range
<ul style="list-style-type: none"> ▪ Vacuum-sealed design 	<ul style="list-style-type: none"> ☑ Possible to evacuate the cell and degas the insulating oil
<ul style="list-style-type: none"> ▪ Embedded pt100 temperature sensors 	<ul style="list-style-type: none"> ☑ Ready for automatic sequences
<ul style="list-style-type: none"> ▪ Embedded analog thermometer 	<ul style="list-style-type: none"> ☑ For optical control
<ul style="list-style-type: none"> ▪ Durable stainless-steel electrodes and precise mechanical design 	<ul style="list-style-type: none"> ☑ Guaranteed reproducible test results

Applications

Capacitance, $\tan \delta$ (dissipation /power factor) and relative permittivity measurements on liquid insulating materials.

- Mineral oil, natural oil or synthetic oil
- Non-conventional liquid samples with high viscosity
- Research & Development in industry and university

Scope of Supply

- Test cell for liquid insulation type 2903a with additional heating device.
- Heating pot 2903h with main heating device
- Accessories set
- Connection cable set (power cable, 2 temperature control cables, High voltage connection and measuring cable)
- Operating Manual

Note: Input voltage (230 V / 130 V) and Measuring bridge to be specified at time of ordering.

Accessories (optional)

- **2830/2831** Precision solid and liquid dielectric analyzer including measuring bridge, power supply and heater controller.
- **2914** Test cell for solid insulants



2830/2831



2914 Solid Test Cell

Technical Data

Measurement		
Empty cell capacitance	≈ 60 pF	
Electrode spacing	2 mm	
Amount of liquid	40 cm ³ / 40 ml	
Electrode surface	0.0134 m ²	
Electrode temperature	ambient temperature ... 150 °C	
Max. test voltage	2000 V RMS, 50/60 Hz	
Hardware		
Electrode material	Stainless steel	
Surface finish	Micro finished	
Heating capacity	heating jacket 300 W, heating cartridge 150 W, total 450 W	
Heat-up time	approx. 45 min (for ΔT = 65 K , air filled) approx. 30 min (for ΔT = 65 K , oil filled)	
Built-in fuses	4 A	
Environmental		
Operating temperature	0 °C +55 °C	
Storage temperature	-20 °C +70 °C	
Humidity	5 .. 90 % r.h. , non-condensing	
Mechanical		
Dimensions	Test cell type 2903a	ø 95 x 175 mm (3.7 x 6.9 in)
	Heater 2903h	ø 240 x 220 mm (9.4 x 8.9 in)
Weight	Test cell type 2903a	4 kg (8.8 lb)
	Heater 2903h	2.4 kg (5.3 lb)

Global Presence

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HIGH VOLTAGE



INSTRUMENTS



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