

# 2903

## Test Cell 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  $\tan \delta$  and the dielectric constant  $\epsilon_r$  as well as the specific resistivity.

The test cell has been designed as a cylindrical capacitor with a shielded measuring electrode (three terminal cell) thus avoiding stray capacitances that might influence the test results.

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

### DESIGN

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.



### FEATURES

- High precision measurements of samples with low  $\tan \delta$  by using guarded measurement electrodes.
- Temperature range up to 150°C (externally controlled by measuring bridge).
- Easy to dismount and clean.
- High viscosity liquids like synthetic oils can be measured.
- The vacuum-sealed design allows to evacuate the cell and to degas the insulating oil
- Ready for automatic sequences with the embedded Pt100 temperature sensors
- Embedded analog thermometer for optical control.
- Durable stainless steel electrodes and precise mechanical design guarantees reproducible test results.

### APPLICATIONS

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

- Mineral oil
- Natural oil
- Synthetic oil
- Other liquids

### COMPLETE TEST SYSTEM

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).

## SCOPE OF SUPPLY

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

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

## OPTIONAL SUPPLY

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

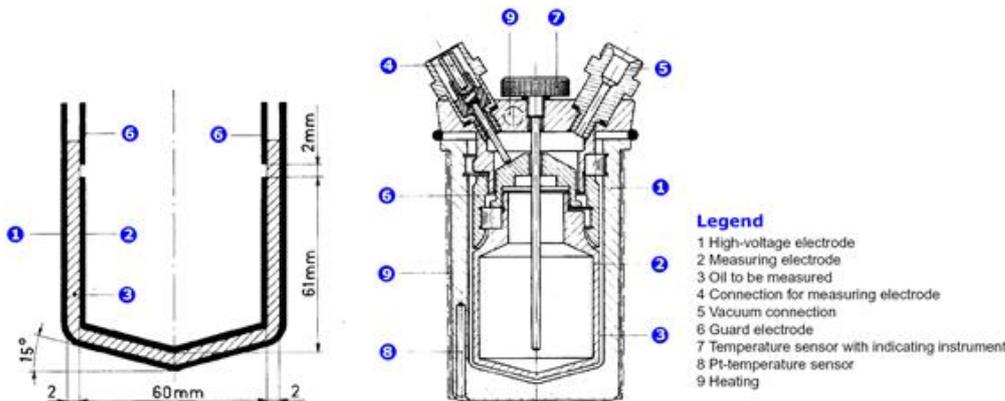


2830/2831



2914 Solid Test Cell

## TECHNICAL SPECIFICATIONS



Empty cell capacitance	≈ 60 pF
Electrode spacing	2 mm
Amount of liquid	40 cm <sup>3</sup> / 40 ml
Electrode surface	0.0134 m <sup>2</sup>
Electrode material	stainless steel
Surface finish	micro finished
Electrode temperature	ambient temperature .. 150°C
Heating capacity	heating jacket 300 W, heating cartridge 150 W, total 450W
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
Max. test voltage	2000 V RMS, 50/60 Hz
Dimensions Test cell type 2903a	ø 95 x 175 mm (3.7 x 6.9 in)
Heater 2903	ø 240 x 220 mm (9.4 x 8.9 in)
Weight Test cell type 2903a	4 kg (8.8 lbs)
Heater 2903h	2.4 kg (5.3 lbs)

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