



## Data Sheet



### Automatic Dissipation Factor and Resistivity Test Equipment Dieptest DTL

DTL is the first fully automatic measuring bridge for ageing tests on insulating liquids.

- Dissipation factor ( $\tan \delta$ )
- Relative permittivity ( $\epsilon_r$ )
- Resistivity in  $\Omega\text{m}$

All known test sequences like IEC 60247, VDE 0380, BS 148, ASTM D924 etc. are programmed as standard.

#### Features:

- automatic calibration of empty cell
- resistance measurement 2.5  $\text{M}\Omega\text{m}$  to 20  $\text{T}\Omega\text{m}$  with both polarities up to 500 V DC (Option up to 100  $\text{T}\Omega\text{m}$ )
- $\tan \delta$  -measurement 4.0 to  $1 \times 10^{-5}$
- measurement of relative permittivity  $\epsilon_r$
- HF induction heating of cell: short heating times and uniform heating
- easy operation; measurement of dissipation factor and resistivity is made automatically according to the preselected standard or according to individually selectable parameters
- direct temperature measurement with a probe inside the measuring electrode
- plug-in fixed value calibrator additionally available
- built - in RS 232 interface for PC-communication
- extensive security features

#### Test cell MC 2A:

MC 2A is a three-electrode cell made of chromium-nickel steel. For heat-resistant isolation of measuring electrode, quartz glass insulating rings are used, depending on recommendation of the respective standard.

#### Features:

- test cell according to IEC 60247, ASTM D924
- magnetic valve for draining of test cell - dismantling of cell not necessary





## Technical data

	DTL
Test voltage AC	adjustment range 500 to 2000 V <sub>rms</sub> stability ± 100 ppm for ± 10 % mains voltage variation
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In many languages available	Software in German Software in English Software in French Software in Russian Software in Spanish Software in Dutch Software in Portuguese Software in Polish
Measuring unit AC	peak/√2, accuracy ± 1 %
Test voltage DC	adjustment range 125 to 500 V
Measuring unit DC	accuracy ± 0.5 %
Test frequency	50 Hz or 60 Hz selectable
Relative permittivity ε <sub>r</sub>	range 1.0 to 10.0 accuracy ± 1 % of measured value
Resistivity measurement Rho+/Rho-	range 2.5 MΩm to 20 TΩm (Option up to 100 TΩm) (1 Ωm = 100 Ωcm)
Temperature measurement	range 5 to 120° C, accuracy ± 0.4 % resolution 0.1° C adjustment of set value 11 to 110° C
Measuring time acc. to IEC 60247	cycle approx. 25 min for tan δ, ε <sub>r</sub> and ± Rho (including charging and discharging times)
Selectable standard programmes	IEC 60247-2004 VDE 0380 Part 2-1996 ASTM D924-03 (100° C) AS 1767.1-1999 BS 148-1998 JIS C2101-1999 ASTM D1169-02 (100° C) client specified parameters
Reference capacitor	SF6 compressed-gas capacitor, 115 pF tan δ ≤ 1 · 10 <sup>-5</sup>
Cell constant K (metric)	equal to 0.113 pF x empty cell capacitance
Dissipation factor measurement tan δ	max. resolution 1 · 10 <sup>-5</sup> ; resolution range: 4095 digits in 3 decades, automatic adjustment 0.00001 to 0.04095 0.0409 to 0.4095 0.409 to 4.095 (= 400 %) accuracy: ± 1 % of measured value + 0.00008
Display	2 x 40 digits, alphanumeric LCD display with cursor functions
Printer	24 digits matrix with ink ribbon paper, width 57 mm
External interface	RS 232 (V 24), 2400 baud, 8 bit no parity, socket DP 25
Measuring unit AC	peak/√2, accuracy ± 1 %
Test voltage DC	adjustment range 125 to 500 V
Measuring unit DC	accuracy ± 0.5 %
Test frequency	50 Hz or 60 Hz selectable





Relative permittivity $\epsilon_r$	range 1.0 to 10.0 accuracy $\pm 1$ % of measured value
Resistivity measurement Rho+/Rho-	range 2.5 M $\Omega$ m to 20 T $\Omega$ m (Option up to 100 T $\Omega$ m) (1 $\Omega$ m = 100 $\Omega$ cm)
Temperature measurement	range 5 to 120° C, accuracy $\pm 0.4$ % resolution 0.1° C adjustment of set value 11 to 110° C
Measuring time acc. to IEC 60247	cycle approx. 25 min for $\tan \delta$ , $\epsilon_r$ and $\pm$ Rho (including charging and discharging times)
Selectable standard programmes	IEC 60247-2004 ASTM D924-03 (100° C) BS 148-1998 ASTM D1169-02 (100° C) client specified parameters VDE 0380 Part 2-1996 AS 1767.1-1999 JIS C2101-1999
Reference capacitor	SF6 compressed-gas capacitor, 115 pF $\tan \delta \leq 1 \cdot 10^{-5}$
Cell constant K (metric)	equal to 0.113 pF x empty cell capacitance
Dissipation factor measurement $\tan \delta$	max. resolution $1 \cdot 10^{-5}$ ; resolution range: 4095 digits in 3 decades, automatic adjustment 0.00001 to 0.04095 0.0409 to 0.4095 0.409 to 4.095 (= 400 %) accuracy: $\pm 1$ % of measured value + 0.00008
Display	2 x 40 digits, alphanumeric LCD display with cursor functions
Printer	24 digits matrix with ink ribbon paper, width 57 mm
External interface	RS 232 (V 24), 2400 baud, 8 bit no parity, socket DP 25
Selectable parameters: Test number Test frequency Initial measuring temperature Temperature step size Final measuring temperature Test voltage AC Test voltage DC	24 numeric digits 50 Hz or 60 Hz $\geq 10^\circ$ C $\geq 1^\circ$ C max. 110° C 500 ... 2000 V <sub>rms</sub> $\pm 125$ ... $\pm 500$ V
Heater	HF induction method, heating time for cell: from 25° to 90° C; max. 16 min
Storage temperature	- 20 to + 50° C
Operation temperature	0 to 40° C
Air humidity	max. 95 RH (non condensing)
Power supply	selectable 110 - 120 V / 220 - 230 V / 240 V; 50 Hz to 60 Hz
Power consumption	300 VA
Battery	3 pcs. 1.5 V (IEC R6) for data memory, clock and date operating life approx. 4 years
Dimensions of measuring bridge with dust cover (w x h x d)	approx. 450 x 460 x 500 mm
Dimensions of measuring bridge in wooden transport case (w x h x d)	approx. 540 x 480 x 580 mm
Weight (incl. cell)	approx. 32 kg
Weight with case	approx. 40 kg





### Technical data: Test Cell MC 2A

Test Cell MC 2A	
Assembly	Three-electrode guard-ring cell with quartz glass insulator rings continuous flow with drain valve
Material	chromium-nickel steel
Sample volume	45 ml
Electrode gap	2 mm
Voltage withstand in air	2000 V <sub>rms</sub>
Empty cell capacitance	70 pf
Viscosity of liquid sample	max. 150 mm <sup>2</sup> /s at 20° C
Operating temperature	5 ... 120° C
Storage temperature	- 20 ... + 150° C without glass rings
Dimensions with transport case (w x h x d)	approx. 400 x 130 x 270 mm
Weight	approx. 5.20 kg

### Automatic Dissipation Factor and Resistivity Test Equipment DIELTEST DTL

#### Delivery includes:

Automatic dissipation factor and resistivity test equipment DTL without accessories

- Mains connection cable
- Dust cover
- Drain hose 1.5 m long; silicone
- In-line test cell MC 2A, with transport case
- Disposable syringe 50 ml
- Temperature sensor for test cell DTL
- Operating manual
- DVD "Test procedure of the oil testing with the BAUR DTL unit"

#### Options:

- Transport case made of plywood
- Testing device for DTL  $\tan \delta = 0.03$ ; KA 0.03
- Measuring range extension of resistivity to 100 T $\Omega$
- Enclosed test cell MC 2, with transport case
- Windows software with connection cables for DTL

#### Consumer parts for plain paper printer:

- Ink ribbon for plain paper printer
- Paper roll for plain paper printer, 57 mm width,  $\varnothing$  30 mm

