CPC 80 + CP TD1

Test system for measuring power/dissipation factor

Test system for measuring power/dissipation factor

OMICRON's CPC 80 + CP TD1 is the perfect test system for analyzing the insulation condition of high voltage equipment by measuring the power/dissipation (tan delta) factor value and capacitance.

Test system

The test system consists of two units – the 12 kV insulation analyzing system CP TD1 and the CPC 80 control unit. With a weight of 26 kg / 57.32 lbs and 18 kg / 39.68 lbs respectively, the two units can easily be handled by one person.

Insulation condition assessment

The test set provides automated voltage and frequency sweeps. Measuring the power/dissipation factor over a broad frequency range delivers more details than a single power/dissipation factor measurement. This helps you to better assess the insulation condition and for example, detect whether moisture contamination is in the cellulose or if the oil is contaminated or otherwise affected.

Excellent noise suppression

CPC 80 + CP TD1 is designed to produce reliable, repeatable and exceptionally precise results as the test system offers excellent noise suppression even under extreme conditions.

Temperature correction

The measured values can be corrected using already saved temperature correction curves.

Report generation

After testing, the results and routines are automatically stored and reports in various languages can easily be generated with the software provided.

Safety features

Safety features provide the highest operator safety during the testing. These features include ground connection check, emergency switch-off button, safety key lock and the optional strobe light or 3-position safety switch.

Assets to be tested with CPC 80 + CP TD1:

- Power transformers
- Bushings
- Circuit breakers
- Rotating machines
- Surge arresters
- Cables
- Current and voltage transformers
- Oil insulations
- Capacitors

Parameters to be determined:

- Power factor (cos ϕ) / dissipation factor (tan δ)
- Capacitance (Cp||Rp; Cs+Rs)
- Exciting current
- Watts / power (P, Q, S)
- Inductance (Ls+Rs; Lp||Rp)
- Impedance
- Voltage
- Current
- Phase angle
- Quality factor QF
- Automated voltage sweeps (tip-up)
- Automated frequency sweeps (15 Hz ... 400 Hz)

CP TD1 - Tan Delta

High-voltage output

U/f	I	S	t_{max}	f
0 ... 12 kV AC	300 mA	3600 VA	> 2 min.	15 Hz ... 400 Hz
0 ... 12 kV AC	100 mA	1200 VA	> 60 min.	15 Hz ... 400 Hz

Internal measurement of voltage output / current inputs

Range	Resolution	Typical accuracy	Conditions
0 ... 12000 V AC	1 V	Error < 0.3 % of reading + 1 V	V > 2000 V
0 ... 5 A AC	5 digits	Error < 0.3 % of reading + 100 nA	Ix < 8 mA
	5 digits	Error < 0.5 % of reading	Ix > 8 mA

Capacitance Cp (equivalent parallel circuit)

Range	Resolution	Typical accuracy	Conditions
1 pF ... 3 µF	6 digits	Error < 0.05 % of reading + 0.1 pF	Ix < 8 mA, V_{test} = 300 V ... 10 kV
		Error < 0.2 % of reading	Ix > 8 mA, V_{test} = 300 V ... 10 kV

Power factor PF / Dissipation factor DF

Range	Resolution	Typical accuracy	Conditions
0 ... 10 % (capacitive)	5 digits	Error < 0.1 % of reading + 0.005 %	f = 45 Hz ... 70 Hz I < 8 mA Vtest = 300 V ... 10 kV
0 ... 100 % (PF) 0 ... 10000 % (DF)	5 digits	Error < 0.5 % of reading + 0.02 %	V_{test} = 300 V ... 10 kV

Impedance

Range	Resolution	Typical accuracy	Conditions
1 kΩ ... 1,200 MΩ	6 digits	Error < 0.5 % of reading	V_{test} = 300 V ... 10 kV

Watts / Power (P, Q, S)

Range	Resolution	Typical accuracy
0 ... 3.6 kW / kVA / kvar	5 digits	0.5 % reading + 1 mW / mVA / mvar

Mechanical data

Dimensions (W × H × D)	450 × 330 × 220 mm / 17.7 × 13 × 8.7 in
Weight	25 kg / 55.2 lbs

CPC 80 Control Unit

Power supply and mechanical data

Single-phase, nominal[1]	100 V AC ... 240 V AC, 16 A
Single-phase, permissible	85 V AC ... 264 V AC (L-N or L-L)
Frequency, nominal	50 Hz / 60 Hz
Power consumption	< 3500 VA (< 7000 VA for a time < 10 s)
Connection	IEC320/C20
PC Interface	Ethernet and USB stick
Dimensions (W x H x D)	468 x 394 x 233 mm / 18.42 x 15.51 x 9.17 in, (including cover, without handles).
Weight	18 kg / 39.68 lbs

[1] There are power restrictions for mains voltages below 190 V AC.

Environmental conditions for CPC 80 + CP TD1

Operating temperature	-10 °C ... +55 °C / +14 °F ... +131 °F
Storage temperature	-20 °C ... +70 °C / -4 °F ... +158 °F
Humidity range	5 % ... 95 % relative humidity, no condensation
EMC	EN 50081-2, EN 55011, EN 61000-3-2, FCC Subpart B of Part 15 Class A, EN 50082-2, IEC 61000-4-2/3/4/8, CE conformity (89/336/EEC)
Safety	EN 61010-1, EN 60950, IEC 61010-1, produced and tested in an EN ISO 9001 certified company
Shock	IEC68-2-27 (operating), 15 g / 11 ms, half-sinusoid
Vibration	IEC68-2-6 (operating), 10 Hz ... 150 Hz, acceleration 2 g continuous (20 m/s²); 10 cycles per axis
Noise Immunity	Electrostatic: 15mA induced noise into any test lead without loosing measurement accuracy at maximum interference to specimen current of 20:1 Electromagnetic: 500 µT, at 60 Hz in any direction

Ordering information

CPC 80 + CP TD1 (order no. VE000647)

Hardware

1 × CP TD1 high-voltage unit

1 × CPC 80 control unit with front panel control

Software

1 × Software for PC and CPC 80 control unit including test templates and user manual

(PTM Advanced Software for CPC 80 order no. VESM0676, optional)

Cables and accessories

2 × Transport cases (without wheels)

1 × Carry bag with cables, leads, clamps and CP TD1 reference manual (400 x 250 × 450 mm / 15.75 × 9.84 × 17.72 in; 11.1 kg / 24.47 lbs)

OMICRON is an international company serving the electrical power industry with innovative testing and diagnostic solutions. The application of OMICRON products allows users to assess the condition of the primary and secondary equipment on their systems with complete confidence. Services offered in the area of consulting, commissioning, testing, diagnosis and training make the product range complete.

Customers in more than 140 countries rely on the company's ability to supply leading edge technology of excellent quality. Service centers on all continents provide a broad base of knowledge and extraordinary customer support. All of this together with our strong network of sales partners is what has made our company a market leader in the electrical power industry.

For more information, additional literature, and detailed contact information of our worldwide offices please visit our website.

www.omicronenergy.com