

CP TD12/15

Technical Data



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1 Technical data

1.1 Technical data of the *CP TD12/15* in combination with the *Control device*

1.1.1 High-voltage output

Conditions: Signals below 45 Hz with reduced values possible. Capacitive linear loads.

Table 1-1: *CP TD12* – High-voltage output

Terminal	U	THD	I _{max}	S _{max}	t _{max}
High-voltage output	0...12 kV AC	< 2 %	300 mA	3600 VA	> 2 min
			100 mA	1200 VA	> 60 min

Table 1-2: *CP TD15* – High-voltage output

Terminal	U	THD	I _{max}	S _{max}	t _{max}
High-voltage output	0...15 kV AC	< 2 %	300 mA	4500 VA ¹	> 2 min
			100 mA	1500 VA	> 60 min

1. Depending on Control device and power supply

1.1.2 Measurements

Test frequencies

Table 1-3: Test frequencies

Range	Typical accuracy ¹
15...400 Hz	error < 0.005 % of reading

1. "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Only *CPC 100* and *CPC 80*: TanDelta test card: Column "Hz" of the results table

Special displays in the frequency column "Hz" and their meanings:

- *50 Hz (*60 Hz) Measurement mode suppressing the mains frequency interferences; doubles the measurement time.
- !30 Hz The selected test voltage is not available in Automatic measurement (applies to frequencies below 45 Hz only).
- ?xx Hz Results with reduced accuracy, e.g., in case of a low testing voltage, influences of partial discharge etc.

Filter for selective measurements

Conditions: $f = 15 \dots 400 \text{ Hz}$

Table 1-4: Filter for selective measurements

Filter Bandwidth	Measurement time	Stop band specification (attenuation)
$f_0 \pm 5 \text{ Hz}$	2.2 s	> 110 dB at $f_x = f_0 \pm (5 \text{ Hz or more})$
$f_0 \pm 10 \text{ Hz}$	1.2 s	> 110 dB at $f_x = f_0 \pm (10 \text{ Hz or more})$
$f_0 \pm 20 \text{ Hz}$	0.9 s	> 110 dB at $f_x = f_0 \pm (20 \text{ Hz or more})$

Test current (RMS, selective)

Table 1-5: Test current

Terminal	Range	Typical accuracy ¹	Conditions
IN A or IN B ²	0...5 AAC	error < 0.3 % of reading + 100 nA	$I_x < 8 \text{ mA}$
		error < 0.5 % of reading	$I_x > 8 \text{ mA}$

1. "Typical accuracy" means at temperatures of $23 \text{ °C} \pm 5 \text{ K}$, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.
2. IN A (red) or IN B (blue), depending on the mode.

Test voltage (RMS, selective)

Table 1-6: CP TD12 – Test voltage

Condition: $U > 2 \text{ kV}$

Range	Typical accuracy ¹
2 kV...12 kV AC	error < 0.3 % of reading + 1 V

1. "Typical accuracy" means at temperatures of $23 \text{ °C} \pm 5 \text{ K}$, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Table 1-7: CP TD15 – Test voltage

Condition: $U > 2 \text{ kV}$

Range	Typical accuracy ¹
2 kV...15 kV AC	error < 0.3 % of reading + 1 V

1. "Typical accuracy" means at temperatures of $23 \text{ °C} \pm 5 \text{ K}$, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Capacitance Cp (equivalent parallel circuit)

Table 1-8: Capacitance Cp

Range	Typical accuracy ¹	Conditions
1 pF...3 μF	error < 0.05 % of reading + 0.1 pF	I _x < 8 mA, U _{test} = 2 kV...10 kV
	error < 0.2 % of reading	I _x > 8 mA, U _{test} = 2 kV...10 kV

- "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Dissipation factor DF (tan δ)

Table 1-9: Dissipation factor DF

Range	Typical accuracy ¹	Conditions
0...10 % (capacitive)	error < 0.1 % of reading + 0.005 % ²	f = 45...70 Hz, I < 8 mA, U _{test} = 2 kV...10 kV
0...10000 %	error < 0.5 % of reading + 0.02 %	U _{test} = 2 kV...10 kV

- "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.
- Reduced accuracy of DF at mains frequency or its harmonics. Mains frequency suppression available by precisely selecting a mains frequency of *50Hz or *60Hz in the "Hz" column.

Power factor PF (cos φ)

Table 1-10: Power factor Pf

Range	Typical accuracy ¹	Conditions
0...10 % (capacitive)	error < 0.1 % of reading + 0.005 % ²	f = 45...70 Hz, I < 8 mA, U _{test} = 2 kV...10 kV
0...100 %	error < 0.5 % of reading + 0.02 %	U _{test} = 2 kV...10 kV

- "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.
- Reduced accuracy of PF at mains frequency or its harmonics. Mains frequency suppression available by precisely selecting a mains frequency of *50Hz or *60Hz in the "Hz" column.

Phase angle φ

Table 1-11: Phase angle φ

Range	Typical accuracy ¹	Conditions
-90 °...+90 °	error < 0.01 °	U _{test} = 2 kV...10 kV

- "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Impedance Z

Table 1-12: Impedance Z

Range	Typical accuracy ¹	Conditions
1 kΩ...1200 MΩ	error < 0.5 % of reading	U _{test} = 2 kV...10 kV

1. "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Inductance Lx (equivalent serial circuit)

Table 1-13: Inductance Lx

Range	Typical accuracy ¹
1 H...1000 kH	error < 0.3 % of reading

1. "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Quality factor QF

Table 1-14: Quality factor QF

Range	Typical accuracy ¹
0...1000	error < 0.5 % of reading + 0.2 %
> 1000	error < 5 % of reading

1. "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Power P, Q, S (selective)

Table 1-15: CP TD12 – Power P, Q, S

Range	Typical accuracy ¹
0...3.6 kW	error < 0.5 % of reading + 1 mW
0...3.6 kVAR	error < 0.5 % of reading + 1 mVAR
0...3.6 kVA	error < 0.5 % of reading + 1 mVA

1. "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

Table 1-16: CP TD15 – Power P, Q, S

Range	Typical accuracy ¹
0...4.5 kW ²	error < 0.5 % of reading + 1 mW
0...4.5 kVAR ²	error < 0.5 % of reading + 1 mVAR
0...4.5 kVA ²	error < 0.5 % of reading + 1 mVA

1. "Typical accuracy" means at temperatures of 23 °C ± 5 K, after a warm-up time of more than 25 min, and in a frequency range of 45 Hz to 65 Hz, 98 % of all units have an accuracy which is better than specified.

2. Depending on Control device and power supply

1.2 Mechanical data

Table 1-17: Mechanical data

Characteristic		Rating
Dimensions (W × H × D)	<i>CP TD12/15</i>	460 × 317 × 223 mm 18.1 × 12.5 × 8.8 inches
Weight	<i>CP TD12</i>	23 kg / 51 lb
	<i>CP TD15</i>	24 kg / 53 lb

1.3 Environmental Conditions

Table 1-18: Climate


Characteristic		Rating
Temperature	Operating	-10...+55 °C / +14...+131 °F
	Storage and transportation	-20...+70 °C / -4...+158 °F
Max. altitude		2000 m
Relative humidity		5...95 %; no condensation, tested according to IEC 60068-2-78

Table 1-19: Noise Immunity

Characteristic	Rating
Noise Immunity	Electrostatic: 15 mA induced noise into any test lead without losing measurement accuracy at maximum interference to specimen current of 20:1 Electromagnetic: 500 μT, at 60 Hz in any direction

1.4 Standards

Table 1-20: Standards conformity

Safety		
Safety	IEC / EN / UL 61010-1	
EMC		
EMC	IEC/EN 61326-1 (industrial electromagnetic environment) FCC subpart B of part 15, class A	
Other		
Shock	IEC 60068-2-27 (operating), 15 g/11 ms, half-sinusoid	
Vibration	IEC 60068-2-6 (operating), 10...150 Hz, acceleration 2 g continuous (20 m/s ²); 10 cycles per axis	
Humidity	IEC/EN 60068-2-78 (5...95 % relative humidity, no condensation)	