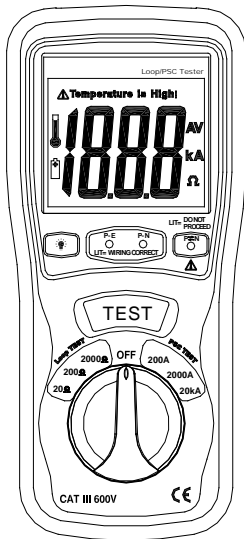




Earth Loop Impedance / PSC Tester

User Guide

CZ20054



I. SAFETY INFORMATION

- Read the following safety information carefully before attempting to operate or service the meter.
- To avoid damage to the instrument do not apply signals which exceed the maximum limits shown in the technical specifications tables.
- Do not use the meter or test leads if they look damaged. Use extreme caution when working around bare conductors or bus bars.
- Accidental contact with the conductor could result in electric shock.
- Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.
- Read the operating instructions before use and follow all safety Information.

Safety symbols:



Caution refer to this manual before using the meter.



Dangerous voltages.



Meter is protected throughout by double insulation or reinforced insulation.

When servicing, use only specified replacement parts.

CE Comply with EN-61010-1

II. OPERATING INSTRUCTION

Link the test line

Wiring Check:

Before pushing the “test” button, verify the 3 led status

P-E LED “ON”

P-N LED “ON”

P-N reverse LED “OFF”



If indicating LEDs status is not correct, do not test and check the wiring again.

Voltage test:


When the tester is connected to the power, LCD will update the voltage (P-E) every second. If the voltage is an unexpected value, do not test!



The tester is only to be used on AC230v +10% -15% (50Hz).


Loop test:

Turn the tester to 20 Ω , 200 Ω or 2000 Ω range. Push the test button, LCD will display the value and unit, and the tester will send a Buzz out after test is completed.

For more accurate results select lower test range. If LCD flashes “”, disconnect the tester and allow the tester to cool down.


Prospective short current test:

Turn the tester to 200A, 2000A or 20kA range. Push the test button, LCD will display the value and unit, and the tester will send a Buzz out after test is completed.


For more accurate results select lower test range. If LCD flashes “”, disconnect the tester and power and allow the tester to cool down.

III. FEATURES

Line test: 3 LED indicates line state. When reversed, the third LED will light.

Over heat protect: When the protection resistor is overheated, the tester will cut out and lock. LCD will display “Temperature is High” and will flash the flag “”

Overload protect: When the voltage of P-E is exceeds 250v, the tester will stop testing to protect the tester and LCD will flash “250v”.

Low Battery Indication: The flag “” is displayed when the battery voltage drops below the required operating voltage.

Test mode: Press the “test”. The tester will display the result for 5 seconds then display the voltage.

Operating Temperature:

0°C to 40°C (32°F to 104°F) and Humidity below 80% RH

Storage Temperature:

-10°C to 60°C (14°F to 140°F) and Humidity below 70% RH

Power source:

6x1.5V Size “AA” battery or Equivalent (DC9V)

Dimensions: 200(L) x 92(W) x 50(H) mm

Weight: Approx 700g include battery

IV. Electrical Specifications

Accuracies are specified as follows:

\pm (...% of reading +...digits) at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, below 80% RH.

Loop resistance

Range	Resolution	Test times	Full scale accuracy
20 Ω	0.01 Ω	25A/20ms	$\pm 2\%$ of F.S $\pm 5\text{d}$
200 Ω	0.1 Ω	2.3A/40ms	$\pm 2\%$ of F.S $\pm 5\%$
2000 Ω	1 Ω	15mA/280ms	$\pm 2\%$ of F.S $\pm 5\text{d}$

Prospective short current

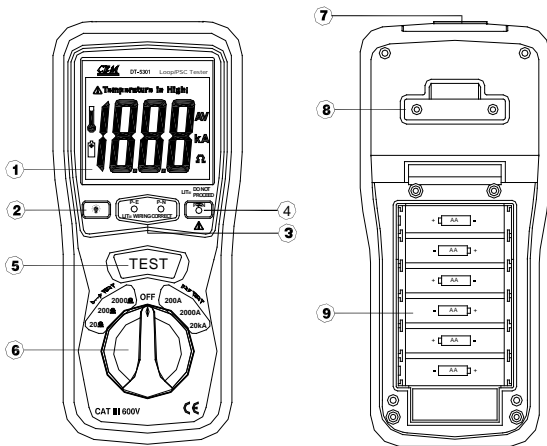
Range	Resolution	Test times	Full scale accuracy
200A	0.1A	2.3A/40ms	$\pm 2\%$ of F.S $\pm 5\text{d}$
2KA	1A	25A/20ms	$\pm 2\%$ of F.S $\pm 5\text{d}$
20KA	10A	25A/20ms	$\pm 2\%$ of F.S $\pm 5\text{d}$

AC Voltage (50HZ)

Range	Full scale accuracy
50~250V	$\pm 2\%$ of F.S $\pm 5\text{d}$

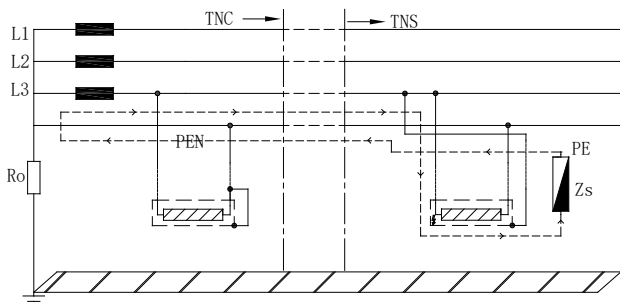
V. PARTS & CONTROLS

- ① Digital Display
- ② Backlight Button
- ③ P-E, P-N, Lights
- ④ P-N REVERSE Light
- ⑤ Test Button
- ⑥ Rotary Function switch
- ⑦ POWER Jack
- ⑧ Belt Hook
- ⑨ Battery Cover



VI. Measurement of loop impedance and prospective short current

If there is a RCD or fuse in circuit, it should test loop impedance.



According to IEC 60364, every loop should meet the formula, as follows :

$$R_a \leq 50 / I_a$$

R_a: loop impedance

50: max of touch voltage

I_a: the current that can make the protection device break down the circuit in 5 seconds.

When protection device is **RCD**, **I_a** is rated residual current

I Δ n.

IΔn	10	30	100	300	500	1000	mA
IΔa(50v)	5000	1667	500	167	100	50	Ω
IΔa(25v)	2500	833	250	83	50	25	Ω

According to IEC 60364, every loop should meet the formula,
as follows:


$$\mathbf{Z_s \leq U_o/I_a}$$

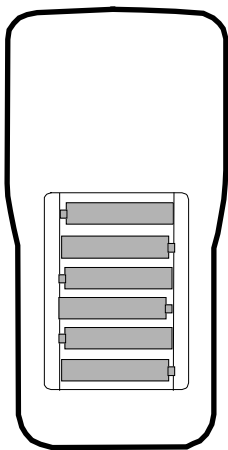
When protection device is a **FUSE**, **U $_o$ =230v**, **I Δ a** and **Z $_s$ max**:

Rated Current	Break time (5s)		Break time (0.4s)	
	IΔa(A)	Z$_s(\Omega)$	IΔa(A)	Z$_s(\Omega)$
6	28	8.2	47	4.9
10	46	5	82	2.8
16	65	3.6	110	2.1
20	85	2.7	147	1.56
25	110	2.1	183	1.25
32	150	1.53	275	0.83
40	190	1.21	320	0.72
50	250	0.92	470	0.49
63	320	0.71	550	0.42
80	425	0.54	840	0.27
100	580	0.39	1020	0.22

Prospective short current must be bigger than **I Δ a**.

VII. Battery Replacement

1. When the low battery symbol "  " appears on the LCD, the six 1.5V 'AA' batteries must be replaced.
2. Turn the meter off and remove the test leads
3. Unsnap the tilt stand from the rear of the meter
4. Remove the four Phillips head screws holding the battery cover
5. Remove the battery compartment cover
6. Replace the batteries observing polarity
7. Affix the rear cover and secure the screws.
8. Re attach the tilt stand



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