



## INSTRUCTION MANUAL

### MT350

## LOOP IMPEDANCE & PSC TESTER



# Contents

# Page no

1. Safety Information.....	3
2. Safety Symbols.....	3
3. Operating Instructions.....	3
3.1. Voltage Test.....	3
3.2. Loop Test.....	4
3.3. Prospective Short Current Test.....	4
4. Features.....	4
5. Electrical Specifications.....	5
5.1. Loop Resistance.....	5
5.2. Prospective Short Current.....	5
5.3. AC Voltage (50Hz).....	5
6. Parts & Controls.....	5
7. Measurement of Loop Impedance and Prospective Short Current.....	6
8. Battery Replacement.....	7

## 1. SAFETY INFORMATION

- Read the following safety information carefully before attempting to operate or service the meter.
- To avoid damages to the instrument do not apply the 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.

## 2. 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

## 3. OPERATING INSTRUCTIONS

### Link the test line

### Check the wires state:

Before pushing the "test" button, certificate the 3 led status

**P-E** - led light

**P-N** - led light

**P-N** - reverse led not light



If indicating light's status is not like this, don't test and check the wires again.

### 3.1. Voltage test

When the tester is linked to the power, LCD will update the voltage (P-E) per second. If the voltage is unusual or not expected value, don't proceed with the test!



The tester only used in AC230V +10% -15% (50Hz).

### 3.2. Loop test

Turn the tester to 20, 200 or 2000 $\Omega$  range. Push the test button, LCD will display the value and unit, the tester will beep once after the test is over. To get better value turn the tester to lower range as possible. If LCD flash "!" , disconnect the tester and power and make the tester cool down.

### 3.3. Prospective short current test

Turn the tester to 200A, 2000A or 20kA range. Push the test button, LCD will display the value and unit, the tester will beep once after the test is over.

To get better value set the tester to lower range as possible. If LCD flash "!" , disconnect the tester and power and make the tester cool down.

## 4. FEATURES

Function	Range
Lines test	3 LED indicates lines state. When reversed, the third LED lights up.
Over heat protect	When the temperature of the resistor is high, the tester will cut and lock. LCD will display "Temperature is High" and flash the flag "!"
Overload protect	When the volt of P-E is up to 250V, the tester will stop test to protect the tester and LCD will flash "250V"
Low Battery Indication	The flag "!" is displayed when the battery voltage drop below the operating voltage.
Test mode	When you press the key "test", tester will display the result for 5's 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	6 x AA batteries
Dimensions	200(L) x 92(W) x 50(H) mm
Weight	Approx 700g including battery .

## 5. ELECTRICAL SPECIFICATIONS

Accuracies are specified in the way:

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

### 5.1. LOOP RESISTANCE

Range	Resolution	Test Time	Full Scale Accuracy
20 $\Omega$	0.01 $\Omega$	25A/20ms	$\pm 2\%$ of F.S $\pm 5d$
200 $\Omega$	0.1 $\Omega$	2.3A/20ms	$\pm 2\%$ of F.S $\pm 5\%$
2000 $\Omega$	1 $\Omega$	15mA/20ms	$\pm 2\%$ of F.S $\pm 5d$

### 5.2. PROSPECTIVE SHORT CURRENT

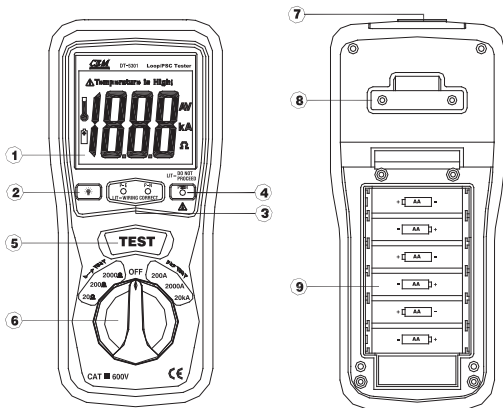
Range	Resolution	Test Time	Full Scale Accuracy
200A	0.1A	2.3A/20ms	$\pm 2\%$ of F.S $\pm 5d$
2KA	1A	25A/20ms	$\pm 2\%$ of F.S $\pm 5d$
20KA	10A	25A/20ms	$\pm 2\%$ of F.S $\pm 5d$

### 5.3. AC VOLTAGE (50HZ)

Range	Full Scale Accuracy
50~255V	$\pm 2\%$ of F.S $\pm 5d$

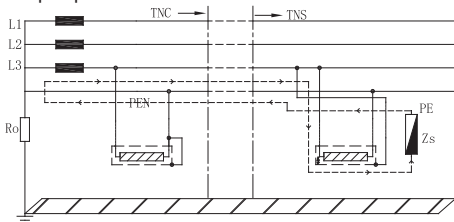
## 6. PARTS & CONTROLS

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



## 7. MEASUREMENT OF LOOP IMPEDANCE AND PROSPECTIVE SHORT CURRENT

If there is a RCD or fuse in the circuit, they must be bridged out prior to testing the loop impedance.



According to IEC 60364, every loop should meet the formula:  $R_a \leq 50/I_a$

**R<sub>a</sub>**: loop impedance

**50**: max of touch voltage

**I<sub>a</sub>**: the current that can make the protection device break down the circuit in 5 seconds.

When protection device is **RCD**, **I<sub>a</sub>** is rated residual current **I<sub>Δn</sub>**.

<b>I<sub>Δn</sub></b>	<b>10</b>	<b>30</b>	<b>100</b>	<b>300</b>	<b>500</b>	<b>1000</b>	<b>mA</b>
I <sub>a</sub> (50v)	5000	1667	500	167	100	50	Ω
I <sub>a</sub> (25v)	2500	833	250	83	50	25	Ω

According to IEC 60364, every loop should meet the formula:  $Z_s \leq U_o/I_a$

When protection device is **FUSE**,  $U_o=230V$ , **I<sub>a</sub>** and **Z<sub>s</sub>max**:

<b>Rated Current</b>	<b>Break time (5s)</b>		<b>Break time (0.4s)</b>	
	<b>I<sub>a</sub>(A)</b>	<b>Z<sub>s</sub>(Ω)</b>	<b>I<sub>a</sub>(A)</b>	<b>Z<sub>s</sub>(Ω)</b>
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

## **8. 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. Reattach the tilt stand



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