INSTRUCTION MANUAL

TEMPO COMMUNICATIONS



CmA-360 TRMS Milliamp Clamp Meter

Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.

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KEEP THIS MANUAL

1. SAFETY INFORMATION

1. Do not operate the tester if there is any sign of damage to the tester or the test leads.
2. Check the main function dial and make sure it is in the correct position before each measurement.
3. Do not perform resistance and continuity tests on a live power system.
4. Do not apply voltage between the test terminals and test terminal to ground that exceed the maximum limits stated in this manual.
5. Keep your fingers behind the protection ring on the test probes when using the test leads.
6. Change the battery when the symbol appears to avoid incorrect data.

Environmental Conditions

Operation Temperature: 0°C to 40°C (32°F to 104°F); < 80 % RH
Storage Temperature: -10°C to 60°C (14°F to 140°F); < 80 % RH

Explanation of Symbols

Attention refer to operating instructions.

Dangerous voltage may be present at the terminals.

This instrument is double insulated.

Approvals: CE 61010 600V CAT-III

2. GENERAL SPECIFICATION

Digital Display:
4 digit liquid crystal (LCD), Maximum reading 6000.

Polarity:
When a negative signal is applied, the "▬" sign appears.

Low Battery Indication:
When the battery voltage is below that required for proper operation then the **symbol** will appear on the LCD display.

Sample Rate:
2 times/sec for digital data.

Power Source:
1.5V size AAA battery X 2
Typical battery Life: (without buzzer, backlight)
40 hours at AC mA and ACA and ACV function;
60 hours at DCV and Ohm function. (Alkaline battery)

Auto Power Off:
If there is no key or dial operation for 30 minutes, the meter will power itself off to save battery life. This function can be disabled by pressing and holding the " **HOLD** " button and powering on the unit.

Overload Indication:
When the applied signal is larger than the maximum for the range in use the display will show OL.

Maximum Jaw Opening:
∅ 23 mm

Dimensions:
206 x 76 x 33.5 mm

Weight:
262g (with battery)

Accessories:
Carrying case, Batteries, Test Leads & Instruction Manual.

3. ELECTRICAL SPECIFICATION

The accuracy specification is defined as ± (percentage of reading + number of counts) At 23±5°C, ≦80 %RH.

3-1 ACmA (True RMS)

Range	Resolution	Accuracy	
		50~60 Hz	50~500 Hz
6.000 mA	0.001 mA	1.0% + 8 counts	2.0% + 8 counts
60.00 mA	0.01 mA	1.0% + 5 counts	2.0% + 5 counts
600.0 mA	0.1 mA		

Zero correction: Fractions smaller than approximately 0.006 mA are calibrated to zero.

Low Pass Filter

Range	Resolution	Accuracy
6.000 mA	0.00 1mA	2.0% + 8 counts
60.00 mA	0.01 mA	2.0% + 5 counts
600.0 mA	0.1 mA	

3-2 ACA (True RMS)

Range	Resolution	Accuracy	
		50~60 Hz	50~500 Hz
6.000 A	0.001 A	1.0% + 5dgts	2.0% + 5dgts
60.00 A	0.01 A		

Low Pass Filter

Range	Resolution	Accuracy
6.000 A	0.001 A	2.0% + 5dgts
60.00 A	0.01 A	

3-3 ACV (True RMS)

Range	Resolution	Accuracy
		50~500 Hz
60.00 V	0.01 V	1.0% + 3dgts
300.V	0.1 V	

Input impedance: 2 MΩ

3-4 DCV

Range	Resolution	Accuracy
60.00 V	0.01 V	1.0% + 2dgts
600.0 V	0.1 V	

Input impedance: 2 MΩ

3-5 Continuity

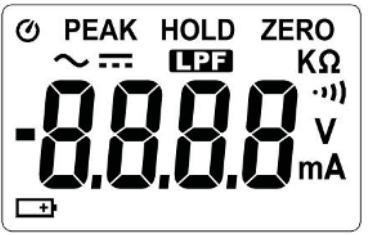
Range	Buzzer Function
	Ohm < 45 Ω

3-6 Resistance (Ω)

Range	Resolution	Accuracy
600.0 Ω	0.1 Ω	1.0% + 2dgts
6.000 kΩ	0.001 kΩ	
60.00 kΩ	0.01 kΩ	
600.0 kΩ	0.1 kΩ	

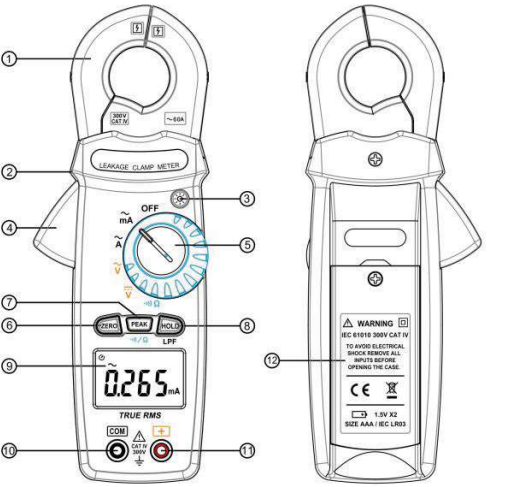
4.DESCRIPTION OF THE INSTRUMENT

4-1 Description of the Display



	Auto power off indication
	Polarity indication
	Low battery indication
	AC measurement indication
	DC measurement indication
A	Current measurement indication
V	Voltage measurement indication
ZERO	ZERO indication
HOLD	Data hold indication
PEAK	PEAK hold indication
LPF	Low pass filter indication
	Continuity test indication
K	Measurement unit
Ω	Resistance measurement indication
m	Measurement unit

4-2 Description Of Front And Rear



① Current Sensing Clamp
② Safety protection ring
③ Backlight button
④ Clamp opening handle
⑤ Function select dial
⑥ ZERO button
⑦ PEAK & ·ıı)) / Ω button
⑧ Data hold & LPF button
⑨ LCD display
⑩ COM input terminal
⑪ Positive input terminal
⑫ Battery compartment

5. BUTTON INSTRUCTION

5-1 HOLD & LPF Function

It is possible to freeze the displayed value by pressing on the "**HOLD**" button. Press the "**HOLD**" button again to exit the Hold mode.

To activate the Low Pass Filter (LPF) feature, press and hold the "**LPF**" button until the symbol displays. To deactivate the LPF feature, press and hold the "LPF" button for 2 seconds. The meter will return to normal mode of operation.

The Cut-Off frequency of the low pass filter is about 160 Hz with attenuation characteristic of approx. -24 dB/octave.

Note: The LPF function operates on the AC A and AC mA ranges.

5-2 PEAK Hold & ·))| / Function Selection

Press "**PEAK**" button to enter the PEAK mode, the meter records the peak maximum value. Press the " **PEAK** " button again, to exit the peak mode.

When you turn the rotary switch to the Ohms / Continuity Test position, press the "**PEAK**" button to select Resistance measurement, press the "**PEAK**" button again to select continuity test with buzzer.

5-3 ZERO Function

Press "**ZERO**" button to enter the Zero mode, **ZERO** Annunciate will appear and Zero the display. The reading is stored as reference value for subsequent measurement.

Press the " **ZERO** " button again, to exit the zero mode.

5-4 BACKLIGHT Function

When the "☼" button is pressed, the backlight will be turned on.

Press the button again to turn the backlight off. If the button is not pressed again then the backlight will be automatically turned off in about 30 seconds after it is turned on.

6. MEASURING INSTRUCTION

6-1 **AC A and AC mA measurement:**

1. Set the range selector switch to the desired position. The current to be measured should be within the selected measuring range.

2. Normal measurement (see Fig.1):
Press the jaw trigger to open the clampmeter jaws and close them over one conductor only. The measured current value is shown on the display. Earth leakage current or any small AC current that flows through a ground wire can also be measured by this method.

3. Measuring out of balance leakage current (see Fig.2):
Clamp onto all conductors except the ground wire. The measured imbalance current value is shown on the display.
Before this measurement, disconnect any test leads from the meter for safety.
In some cases wherein reading the display is difficult, press the HOLD button and read the result after the clamp is removed from the conductors.

Fig.1 Normal measurement:

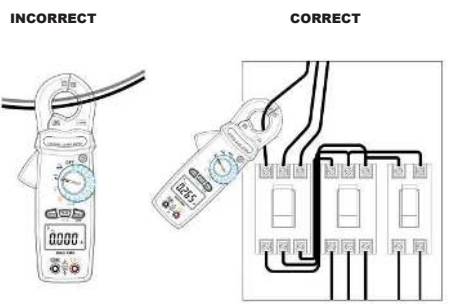
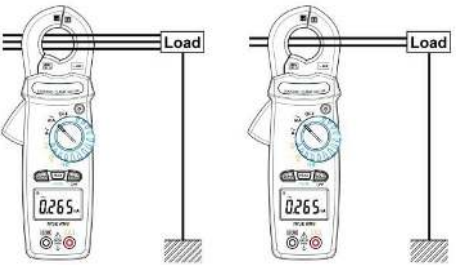


Fig.2 Measuring out of balance leakage current:



3-Phase 3-Wire system

Single-Phase 2-Wire system

6-2 AC V Measurement：

> **⚠ WARNING!**
>
> Maximum Input Voltage is 600V AC/DC. Do not attempt to Take any voltage measurement that may exceed this maximum to avoid Electrical shock hazard and/or damage to this instrument.

Switch the main function selector to $\widetilde{V}$ range.

Connect the red test lead to the "+ " terminal and the black lead to the "COM" terminal.

Measure the voltage by touching the test lead tips to the test circuit where the voltage measurement is required.

Read the result from the LCD display.



6-3 DC V Measurement：

Switch the main function selector to $\overline{\text{V}}$ range.

Connect the red test lead to the “+” terminal and black lead to the “COM” terminal.

Measure the voltage by touching the test lead tips to the test circuit where the value of voltage is needed.

Read the result from the LCD.



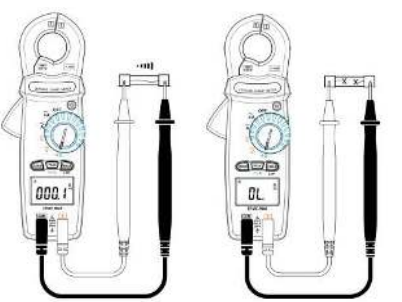
6-4 Continuity Test With Buzzer：

Switch the main function to •))Ω range.

Connect the red test lead to the “+” terminal and the black lead to the “COM” terminal.

Connect tip of the test leads to the points between which continuity is to be measured.

If the resistance is under 45Ω, the beeper will sound continuously.



Short circuit **Open circuit**

6-5 Resistance Measurement

Switch the main function to ·ıl| Ω range.

Connect the red test lead to the "+" terminal and the black lead to the "COM" terminal.

Connect tip of the test leads to the points where the value of the resistance is to be measured.

Read the result from the LCD.



Note :

When measuring resistance in a circuit, make sure any power on the circuit is turned off and any capacitors are discharged.

7. CHANGING THE BATTERY

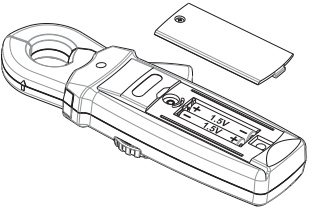
When the battery voltage drops below that required for proper operation of the instrument, the battery symbol will appear on the LCD display and the battery should be changed.

Before changing the battery, switch the main dial to "OFF "and disconnect test leads.

Open the back cover using a screwdriver.

Replace the old batteries with two new 1.5V (AAA Size) batteries.

Close the back cover and tighten the screw before using the meter.



8. MAINTENANCE

> **⚠ WARNING!**
>
> Before opening the meter, disconnect both test leads. Never use the meter unless the battery cover is in place and the screw is tightened.

> **CAUTION!**
>
> To avoid contamination or static damage, do not touch the circuit board without proper static protection.

8-1 REMARKS:

- If the meter is not going to be used for a long time then please remove the battery and do not store the meter in a high temperature or high humidity environment.
- Keep the cable in the center of the clamp will return a more accurate test result when making current measurements.
- Repairs or servicing not covered in this manual should only be performed by qualified personnel.

8-2 CLEANING:

Periodically wipe the case with a dry cloth. Do not use abrasives or solvents on these instruments.

Tempo Communications
1390 Aspen Way • Vista, CA 92081 • USA
800-642-2155 • FAX: 760-598-9263
Latin America 760-510-0558 • An ISO 9001 Company

Tempo Europe Ltd. • Brecon House, William Brown Close Cwmbran,
NP44 3AB, UK • Tel: +44 1633 927 050
www.TempoCom.com