



MULTIMETER CURRENT CLAMP

CPM

(Code: M80430)

INSTRUCTION MANUAL

(M98111201-03-10A)


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CPM ANALYZER INDEX

page no.

SAFETY NOTES

Before using the equipment please read the user manual, paying special attention to the SAFETY REQUIREMENTS section.

The symbol  on the equipment means "CONSULT THE INSTRUCTION MANUAL". It can also appear as a symbol of warning or caution in this manual.

WARNING and CAUTION statements can appear throughout this manual to avoid hazard to persons or damage to equipment or other property.

1.- OVERVIEW


1.1.- Description

The CPM Current clamp provides functions for the measurement of voltage, current, resistance, continuity sound alarm, diode test, as well as frequency measurement.

Three push buttons allow for the selection of functions such as measurement hold (HOLD), maximum value (MAX) and reset for current measurement DC (DCA ZERO).

The analyzer is powered by a 9 V battery. Its design and its double insulation makes the CPM a robust and secure instrument.

1.2.- Specifications

Display	3 ½ digit LCD display with a maximum reading of 1999.
Display functions Hold MAX	Measurement value hold. Maximum measurement value hold.
Polarity	Automatic, positive by default and indication of negative polarity (-).
Overrange	(OL) or (-OL) appears on the display.
Zero	Automatic
Low battery indication	The “  ” indicator appears when the battery voltage is below the level of operation.
Reading rate	2.5 measurements a second, nominal.

Power Supply	9 V, IEC 6F22 battery.
Battery life	Typically 200 hours for a zinc-carbon battery
Environmental conditions Operating temperature Storage temperature	0 °C to 40 °C (H.R. 0-70%) 20 °C to 60 °C, (H.R. 0-80%) with the battery removed
Dimensions	250 (W) x 100 (H) x 46 mm. (D.)
Weight	380 g, including the battery.
Accessories	A pair of test probes Transport case
Reference conditions	Referring to environmental conditions: 23 °C ± 5 °C, HR < 75%.

DC Voltage	
Range	600 V
Accuracy	± (0.5% read. + 1 digit)
Input impedance	10 MΩ
Overload protection	600 V DC or AC rms
AC Voltage (50-500 Hz)	
Ranges	200 V, 600 V
Accuracy	± (1.2% read. + 4 digits)
Input impedance	10 MΩ
Overload protection	600 V DC or AC rms
Resistance	
Ranges	2 kΩ, 200 kΩ
Accuracy	± (1.2% read. + 1 digit)
Open circuit voltage	0.3 V DC
Overload protection	600 V DC or AC rms
Frequency (Autoranging)	
Ranges	2 kHz, 20 kHz
Accuracy	± 0.1% read. + 3 digits.
Sensitivity	80 V rms minimum
Overload protection	600 V DC or AC rms

Continuity	
Sound alarm	Less than 30Ω in the range of 2kΩ.
Overload protection	600 V DC or AC rms
Diode test	
Test current	1.0 mA ± 0.6 mA
Accuracy	± (6.0% read. + 3 digits)
Open circuit tension	3.0 V DC typically
Sound alarm	< 30 mV
Overload protection	600 V DC or AC rms
DC Current (Place the conductor in the centre of the clamp).	
Ranges	200 A, 700 A
Resolution	100 mA
Accuracy	± (1.5% read. + 5 digits)
Overload protection	700 A DC Max. during 1 minute.
AC Current (40 Hz to 500 Hz) (Place the conductor in the centre of the clamp.)	
Ranges	200 A, 700 A
Resolution	100 mA
Accuracy	±(1.5% read. + 5 digits) from 50 to 60 Hz
Overload protection	±(3.5% read. + 5 digits) from 40 to 500 Hz














700 A AC Max. during 1 minute.

2.-SAFETY REQUIREMENTS

2.1.- General

- This equipment can be used in environments of Pollution Degree 2.
Overvoltage Category: See sections 2.2 and 2.3.
- In order to ensure safety only the following specified types of the accessories must be used:
Test probes:
 - Always keep the specified ranges in mind for both power supply and measurement.
 - Obey the maximum environmental conditions specified for the apparatus at all times.
 - Remember that voltages higher than 60 V DC or 30 V AC rms are potentially dangerous.
 - The operator is only authorized to intervene for: Battery replacement
 - Specific instructions for these interventions are defined in the Maintenance section.
 - Any other change made to the equipment must be done exclusively by specialized personnel.
 - Strictly follow the cleaning recommendations that are described in the Maintenance section.

Symbols:

	The analyzer is protected by double or reinforced insulation.
	Caution! Risk of electric shock.
	Caution! See this manual before using the analyzer.
	Fuse
	Alternating current
	Direct current
	Alternate and direct
	Earth terminal
	Protection terminal
	Shell terminal
	Equipotentiality
	Start
	Stop

2.2.- Special precautions

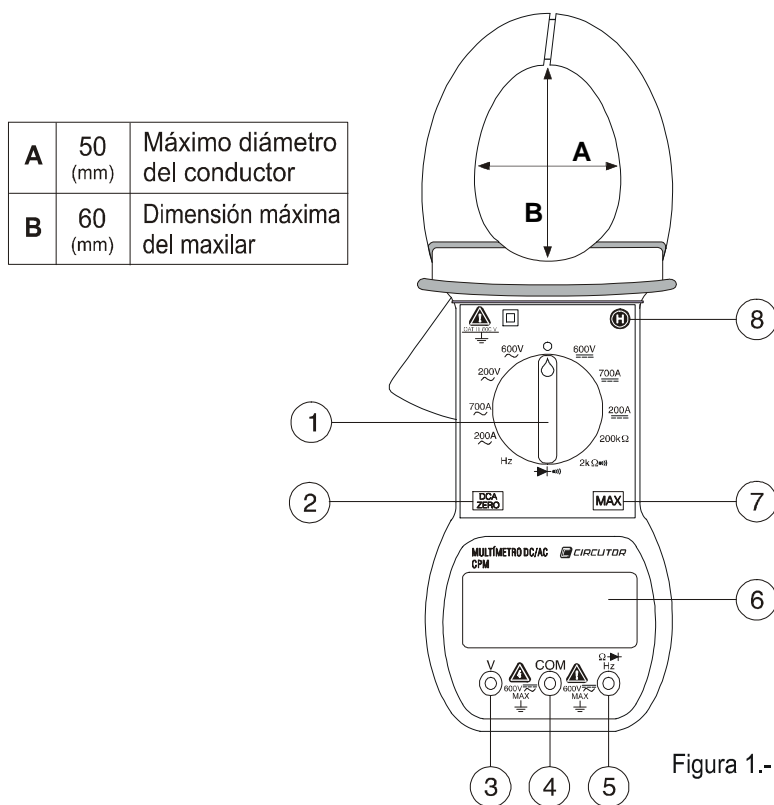
- This equipment can be used for Overvoltage Category II installations. The clamp can be used exclusively for the measurement of current for installations of up to 600 V with Overvoltage Category IV.
- When using the test probes fingers must be kept behind the protection outcrops.
- Maintain the test probes in good condition.
- Note the correspondence between the connection of the probes and the measurement to be taken.

2.3.- Descriptive examples of overvoltage categories

- Cat I** Low voltage installations isolated from the mains.
- Cat II** Portable domestic installations.
- Cat III** Fixed domestic installations.
- Cat IV** Industrial installations.

3.-INSTRUCTIONS FOR USE

3.1.- Description of controls and elements



[1] Rotary function switch

○ Analyzer off

600V DC voltage measurement, range 600 V

700A DC current measurement, range 700 A

200A DC current measurement, range 200 A

200k Ω Resistance measurement, range 200 k Ω

2k Ω Continuity test and resistance measurement, range 2 k Ω

▶ Diode test

Hz Frequency measurement

200A AC current measurement, range 200 A

700A AC current measurement, range 700 A

200V AC voltage measurement, range 200 V

600V AC voltage measurement, range 600 V

[2] DCA ZERO

In DC current measurement mode, press this key to select/deselect the relative measurement mode, the ZERO indicator will appear on the display and the measurement will change to zero, while the reading is stored as a reference value.

[3] V input terminal for AC/DC voltage measurement

[4] COM common input terminal for test probes for all measurements.

[5] Input terminal for resistance measurements, frequency and diode tests.

[6] DISPLAY

Display of measured values and operating mode

[7] MAX maximum value hold key

This key selects/deselects the MAX measuring mode. In this measuring mode the absolute maximum value is held. When this function is activated "MAX" appears on the upper part of the display. This function does not operate in frequencymeter mode.

[8] Measurement hold key.

This key allows to select/deselect the "HOLD" function (measurement hold). When this function is activated a "H" appears on the upper line of the display. The HOLD function is deactivated on function or range change.

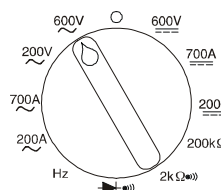
3.2.- Use

ATTENTION

When the value to be measured is unknown always place the rotary switch to the highest range and reduce it progressively in function of the value in question.

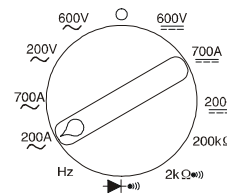
3.2.1.- Voltage measurement

1. Connect the red test probe to the "V" terminal [3] and the black test probe to "COM" terminal [4].
2. Set the rotary switch [1] to the appropriate "V" position (AC or DC and suitable range). If the size of the voltage to be measured is unknown, set the switch to the highest range and then start reducing it until the highest accuracy is obtained.
3. Connect the test probes to the points to be measured and read the display. For DC voltages, the "-" sign indicates a negative polarity.



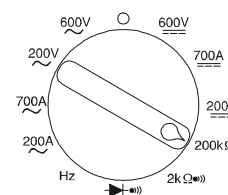
3.2.2.- Current measurement

1. Set the rotary switch [1] to the desired higher range 700 A (AC or DC). In DC current measurement mode use the DCA ZERO button [2] to delete the offset due to the residual magnetism of the clamp.
2. Press the trigger to open the clamp and encompass one conductor only. Read the current value directly from the display [6]. It is recommended to place the conductor in the centre of the clamp for maximum accuracy.
3. When the reading is less than 200 counts, set the switch [1] to the measurement range below the current position. For maximum accuracy, select the lowest range margin in which the measurement can be taken (i.e. the overrange indicator does not appear).



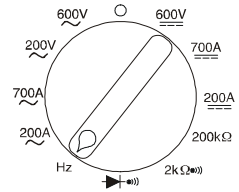
3.2.3.- Resistance measurement

1. Set the rotary switch [1] to the desired resistance measurement range.
2. Disconnect the power supply to the circuit being measured.
3. Connect the red test probe to the $\overline{\sigma}$ terminal [5] and the black test probe to the COM terminal [4].
4. Connect the load using the test probes. On the display [6] the value of the tested resistance will appear in ohms.



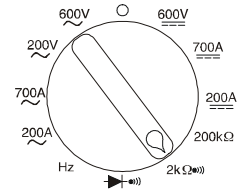
3.2.4.- Frequency measurement

1. Set the rotary switch [1] to the Hz position.
2. Connect the red test probe to the $\overset{H\Omega}{\sigma}$ terminal [5] and the black test probe to the COM terminal [4].
3. Connect the test probes in parallel with the points to be measured and read the frequency value on the display [6].



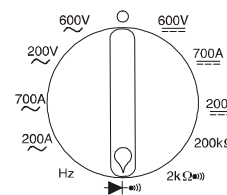
3.2.5.- Continuity sound alarm

1. Set the rotary switch [1] to position " $2k\Omega$ ".
2. Connect the black test probe to the COM terminal [4] and the red test probe to the $\overset{\Omega}{Hz}$ terminal [5].
3. Connect the test probes to the points to be verified.
4. If the resistance value is less than 30Ω the built in alarm will sound.




3.2.6.- Diode test


1. Connect the black test probe to the COM terminal [4] and the red test probe to the Ω \rightarrow Hz terminal [5].
2. Set the rotary switch [1] to the position “ \rightarrow ” “.”.
3. Disconnect the power supply to the circuit being tested.
4. Connect the black test probe to the negative (-) side of the diode and the red test probe to the positive (+) side. Normally the direct voltage of a good silicon diode is of 0.6 V.
5. On inverting the test probes, if the diode is good “OL” will appear on the display [1] and if it is faulty, 000 or another value will appear.
6. If the diode is open, the “OL” indicator will appear for each direction.
7. If the diode of a circuit is measured and a low measurement is obtained for each measurement direction, then the junction must be in parallel and with a resistance of less than 1 k Ω . In this case the diode must be disconnected from the circuit in order to perform an exact measurement.



4.- MAINTENANCE


Attention : Disconnect the test probes before changing the battery or performing any maintenance service.


4.1.- Battery replacement

When the symbol “” appears on the lower left corner of the LCD indicator, the batteries must be replaced:

1. Loosen the screws with a suitable screwdriver and remove the back cover.
2. Replace the battery with an IEC 6F22 9 V.
3. Close the back cover.

4.2.- Cleaning and storage

Caution : To clean the case, make sure that the equipment is disconnected.

Caution : Do not use aromatic hydrocarbons or chlorinated solvents for cleaning. These products can attack the materials used to make the case.

Clean the case periodically with a soft cloth moistened with water and detergent. Do not use abrasives or solvents. Dry thoroughly before reusing the equipment.

4.3.- TECHNICAL SERVICE

In the case of any query regarding the operation or fault of the equipment contact the CIRCUTOR S.A technical service.

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