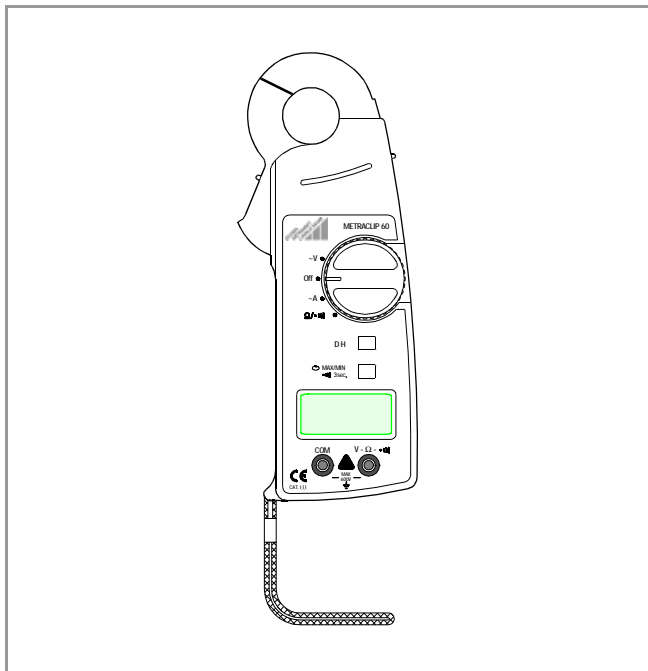


METRACLIP[®] 60

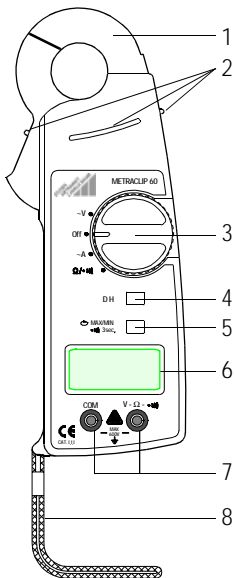
Digital Clip-On Ammeter

3-348-982-37

1/8.98



Controls



- 1 Clip
- 2 Safety Clearance Collar: **Do not extend fingers beyond safety collar!**
- 3 Function Selector Switch
- 4 "DH" Key (DATA HOLD): for saving measurement values
- 5 MAX/MIN Key: for saving maximum and minimum values /
•)) Key: starts continuity test
- 6 LCD Display
- 7 Input Jacks for contact-protected angle plugs on included measurement cables
- 8 Carrying Strap

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1 Safety Precautions

The METRACLIP®60 clip-on ammeter has been manufactured and tested in accordance with safety standards IEC 61010-1/ EN 61010-1/VDE 0411-1 and IEC 61010-2-032/EN 61010-2-032/ VDE 0411-2-032.

If used for its intended purpose, the safety of the operator and the instrument is assured. The instrument may only be used by appropriately trained personnel who are capable of recognizing the dangers which are associated with the measurement of current and voltage.

Read these operating instructions carefully and completely before placing your instrument into operation, and follow all instructions included herein.

Meaning of Symbols on the Instrument



Warning concerning a point of danger
(Attention: observe documentation!)



Ground



Continuous, doubled or reinforced insulation



Indicates EU conformity

CAT III Overvoltage category III instrument

The clip-on ammeter may not be used:

- if the battery compartment lid has been removed
- if visible, external damage is apparent
- with damaged connector cables
- if it no longer functions flawlessly
- after lengthy periods of storage under unfavorable conditions (e.g. humidity, dust, temperature).

**Attention!****Carefully observe the position of the function selector switch!**

Always disconnect the measurement cables from the measuring circuit before selecting a new measuring function with the function selector switch.

Before starting the measurement, always make sure that the desired function has been correctly selected with the function selector switch. Voltage measurements may never be performed with the function selector switch in the $\Omega/\mu\text{V}$ position.

**Attention!****Do not perform measurements which exceed the measuring range!**

Voltages and currents which exceed the measuring range of the respective functions may not be measured.

Safe Use

- The housing and the grips must be free of dust, grease and moisture
- Fingers may not be extended beyond the safety collar during measurement
- Avoid excessive mechanical stresses such as impacts and vibration, as well as excessive temperatures and strong magnetic fields

2 Initial Start-Up

2.1 Batteries

The instrument is delivered with two installed batteries.

When the **BAT** symbol appears at the display, the batteries must be replaced (see chapter 5.1 on page 15).

2.2 Measurement Cables

For reasons of safety, only cables which comply with IEC specifications may be used.

Insert the black measurement cable plug into the **COM** jack and the red plug into the **V- Ω - \bullet** jack. Connect the test probes to the measuring circuit. It is a good idea to always connect the black plug to the **COM** jack (minus pole), and the red plug to the **V- Ω - \bullet** jack (plus pole).

2.3 Switching the Instrument On and Off

The measuring instrument is switched on automatically as soon as a measuring function has been selected with the function selector switch. Switching out of the **OFF** position is acknowledged with an acoustic signal: for **-V** and **-A** with a long acoustic signal, for **Ω / \bullet** with two short acoustic signals. All of the segments at the LCD are briefly activated. The function selector switch must be turned to the **OFF** position in order to switch the instrument off.

2.4 Overrange Violations

If the measuring range for the respective measuring function is exceeded, "OL" appears at the display. An acoustic warning signal is also generated for current and voltage measurements. Refer to chapter 4 for limit values.



Attention!

Voltages and currents which exceed the measuring range for the selected function may not be measured. Bodily injury and damage to the instrument may result from overrange violations.

2.5 Automatic Shut-Down

If the function selector switch has not been activated for 15 minutes, the instrument is switched off automatically in order to prolong battery life.

Automatic shut-down can be deactivated for the performance of continuous measurements by pressing the **MAX/MIN** key.

3 Operation

3.1 Saving Measurement Values – DH Key (DATA HOLD)

Press the DH key in order to “freeze” the current measurement value or MIN/MAX values at the display. The DH symbol appears at the display. In order to deactivate the HOLD function, press the DH key again.

3.2 Storage of Maximum and Minimum Values – MAX/MIN Key

Minimum or maximum values can be displayed for long-term observation of measured quantities.

- Press the **MAX/MIN** key. The maximum/minimum value mode is activated. MAX MIN appears at the display. The instrument continues to display current measurement values.
- In order to display the MAX or the MIN value, press the **MAX/MIN** key again. MAX or MIN appears at the display.
- Exiting the MAX/MIN function:
Press and hold the **MAX/MIN** key for at least 3 seconds, or turn the function selector switch.

Function MIN/MAX	↓ Key MAX/MIN	MIN and MAX Measurement Values	Instrument Responds With:	
			Display	Acoustic Signal
1. Activate	brief ↓	current measurement value	MAX MIN	1 x
2. Save and Display	brief ↓	MAX value	MAX	1 x
3. Save and Display	brief ↓	MIN value	MIN	1 x
Return to 1	brief ↓			
Exit (possible from functions 1, 2 or 3)	long (> 3 s) ↓	current measurement value	—	2 x



Note!

Automatic shut-down is deactivated if the MAX/MIN function has been selected.

3.2.1 MAX/MIN Measurements + DATA-HOLD

During measurement of MAX/MIN values press the **DH** key in order to "freeze" the current value at the display. Press the **DH** key again in order to exit the DH function.

3.3 Clip Function: Alternating Current Measurement (~A)



Attention!

Line voltage **may not exceed a value of 600 V AC** during the measurement of alternating current.

Only **currents of up to 400 A** may be measured.

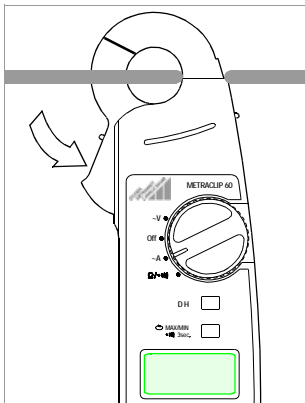


Attention!

The measurement cables are not required for the measurement of alternating current. **Remove the measurement cables from the input jacks to ensure safe operation.**

Your fingers **may not be extended beyond the safety collar** which is included on the instrument.

- Turn the function selector switch to the **~A** position.
- Close the clip around a **single conductor**.
- Read the measurement value from the display.
- After the measurement has been completed: Remove the clip from the conductor and turn the function selector switch to the **OFF** position.



3.4 Multimeter Function: Alternating Voltage Measurement ($\sim V$)



Attention!

Carefully observe the function selector switch position!

The function selector switch may not be set to the $\Omega/\bullet/\bullet/\bullet$) position.

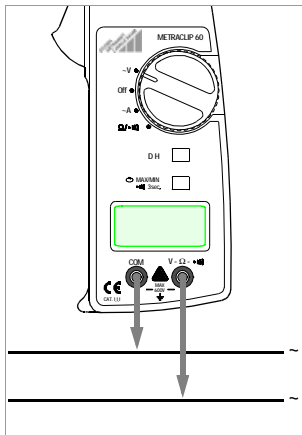


Attention!

Carefully observe voltage specifications!

Input voltage may not exceed 600 V AC.

- Insert the black measurement cable plug into the **COM** socket and the red plug into the socket with the **V- Ω - $\bullet/\bullet/\bullet$)** symbol.
- Turn the function selector switch to the **$\sim V$** position.
- Connect the black test probe to the minus pole (ground) of the measuring circuit and the red test probe to the plus pole (high-voltage) of the measuring circuit.
- Read the measurement value from the display.
- After the measurement has been completed: Remove the test probes from the measuring circuit and turn the function selector switch to the **OFF** position.



3.5 Multimeter Functions: Resistance Measurement (Ω) and Continuity Testing (•))



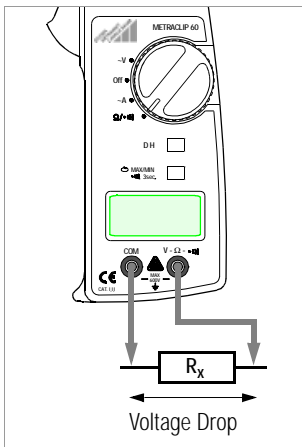
Attention!

Test for the absence of voltage!

The measuring circuit must first be disconnected from the mains for the following measurements, and all capacitive components within the measuring circuit must be discharged. Where applicable, test the resistor or measuring circuit for the absence of voltage as described in chapter 3.4 on page 9.

3.5.1 Resistance Measurement

- Insert the black measurement cable plug into the **COM** socket and the red plug into the socket with the **V- Ω -•))** symbol.
- Turn the function selector switch to the **Ω /•))** position.
- Disconnect one side of the resistor to be measured from the circuit and connect the test probes to both sides of the resistor (or the measuring circuit).
- Read the measurement value from the display.
- After the measurement has been completed: Remove the test probes from the resistor or the measuring circuit and turn the function selector switch to the **OFF** position. Restore the measuring circuit to its original condition.



3.5.2 Continuity Testing

- ⇨ Insert the black measurement cable plug into the **COM** socket and the red plug into the socket with the **V-Ω-•))** symbol.
- ⇨ Turn the selector switch to the **Ω/•))** position.
- ⇨ Press and hold the **•))** key for longer than 3 seconds in order to activate continuity testing.
"b .0L kΩ" appears at the display with a blinking "b".
- ⇨ Disconnect the measuring circuit from the mains and discharge all capacitive components within the measuring circuit.
- ⇨ Connect the test probes to the measuring circuit. An acoustic signal is generated if resistance is less than approximately 500 Ω.
- ⇨ After testing has been completed:
Remove the test probes from the measuring circuit and turn the function selector switch to the **OFF** position.

4 Characteristic Values

Sampling Rate 2.5 samples per second

Alternating Current, A AC

Measuring Range	Resolution	Accuracy	Max. Input Current	Overload Capacity	
				Value	Duration
40.00 A	10 mA	$\pm (2\% + 7 \text{ digits})$	400 A	1000 A AC	1 min.
400.0 A	100 mA				

Frequency Range 50 ... 60 Hz

Alternating Voltage, V AC

Measuring Range	Resolution	Accuracy	Max. Input Voltage	Overload Capacity	
				Value	Duration
400.0 V	100 mV	$\pm (1.0\% + 5d)$	600 V	1000 V AC	1 min.
600 V	1 V				

Frequency Range 50 ... 400 Hz

Resistance Measurement and Continuity Testing, Ω

Measuring Range	Resolution	Accuracy	Open-Circuit Voltage	Test Current	Overload Capacity	
					Value	Duration
400.0 Ω	0.1 Ω	$\pm (1.5\% + 5d)$	approx. 3 V	max. 1.2 mA	350 V AC	1 min.
4 000 k Ω	1 Ω		approx. 0.7 V	max. 0.7 mA		
•)))	signal is generated when $R < 500 \Omega$					

Reference Conditions

Ambient Temperature +23 °C \pm 5 °C

Temperature Coefficient temperature x 0.1/ °C
at 0 ... 18 °C and 28 ... 40 °C

LCD

Type/Character Height 7 segment characters / 8.8 mm
Number of Places 3 ³/₄



- 1 DATA-HOLD activated
- 2 MAX/MIN value measurement activated
- 3 Unit of measure display
- 4 Automatic measuring range selection activated
- 5 Periodic quantity for current and voltage measurement
- 6 Low battery display

Overflow Indication

Overrange violations are indicated for all measuring functions with the **OL** symbol. An acoustic signal is also generated for the current and voltage measurement functions. Signals are generated after the following limit values have been exceeded:

- ~V: 631 V
- ~A: 431 A
- Ω: 4.301 kΩ
-))) : 4.30 kΩ

Power Supply

Battery	2 ea. 1.5 V micro-cells (AAA, AM4) alkaline manganese cells per IEC LR03
Battery Service Life	with alkaline manganese cells: approx. 200 hr. continuous use (prox. 5 mW)
Battery Test	BAT symbol is automatically displayed when battery voltage is too low.

Automatic Shut-Down If the function selector switch has not been activated for a period of 15 minutes, the instrument is switched off automatically. A current of 12 to 13 μA continues to flow in the battery saving mode, which corresponds to 0.01 mW power consumption.

Electrical Safety

Protection Class II per IEC 61010-1/EN 61010-1/VDE 0411-1
Overvoltage Category III
Withstand Voltage 5.6 kV, 1 minute
between input jacks and housing, as well as
between input jacks and other metal
components

Electromagnetic Compatibility (EMC)

Interference Emission EN 50081-1: 1992
EN 55022: 1987 Class B
Interference Immunity EN 50082-1: 1992
IEC 801-2: 1991 8 kV atmospheric discharge
IEC 801-3: 1984 3 V/m
IEC 801-4: 1988 0.5 kV

Ambient Conditions

Operating Temperature 0 °C ... +40 °C
Storage Temperature -10 °C ... +50 °C (without batteries)
Relative Humidity max. 70%, no condensation
Elevation to 2000 m

Mechanical Design

Clip Opening max. 24 mm
Dimensions W x H x D: 69 mm x 191 mm x 33 mm
Weight approx. 220 gr. with batteries

5 Maintenance

5.1 Replacing the Batteries

If the BAT symbol appears at the display, the batteries are dead and must be replaced. The batteries should also be removed if the instrument is placed into storage for a lengthy period of time, because battery leakage might otherwise occur.



Attention!

First disconnect both measurement cables from the measuring circuit and then from the input jacks at the instrument. The rear housing panel may only be removed to replace the batteries after the cables have been disconnected.

- Turn the function selector switch to the **OFF** position.
- Loosen the two screws at the rear panel of the housing and remove the rear housing panel.
- Replace the dead batteries.
- Refasten the rear housing panel with the two screws.



Note!

The instrument is not equipped with replaceable fuses!

5.2 Housing

No special maintenance is required for the housing. Keep outside surfaces clean. Use a slightly dampened cloth for cleaning. Avoid the use of cleansers, abrasives or solvents.

Use silicon oil or antistatic fluid to remove excessive contamination.

6 Repair and Replacement Parts Service

When you need service, please contact:

GOSEN-METRAWATT GMBH
Service
Thomas-Mann-Str. 16 - 20
90471 Nürnberg, Germany
Telephone +49 911 86 02 - 410 / 256
Telefax +49 911 86 02 - 2 53
e-mail fr1.info@gmc-instruments.com

This address is for Germany only. Abroad, our representatives or establishments are at your disposal.

7 Product Support

When you need service, please contact:

GOSEN-METRAWATT GMBH
Product Support Hotline
Telephone +49 911 86 02 - 112
Telefax +49 911 86 02 - 709

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