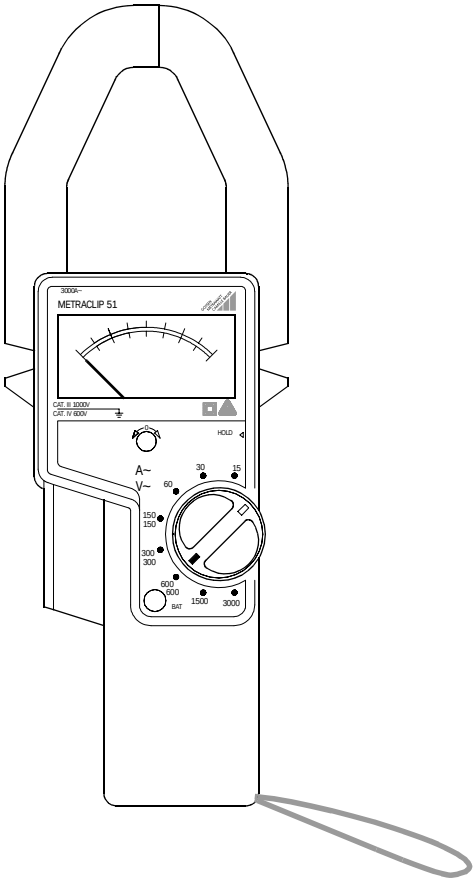
Operating Instructions

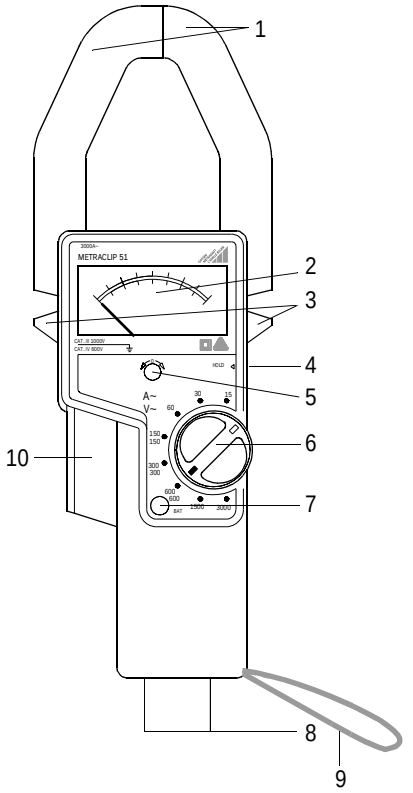
METRACLIP®51

Clip-On Ammeter with Analog Indicator

3-349-051-37
1/7.99



Operating Elements



1 Clip for the measurement of alternating current to 3000 A
2 Analog indicator for current and voltage
3 Safety zone delimiter:
Do not reach beyond the safety collar!
4 HOLD key for measurement value memory
5 Adjusting screw for mechanically setting the pointer to zero
6 Measuring range selector switch
7 Battery test key
8 Input jacks for the measurement of alternating voltage to 600 V
9 Carrying strap
10 Toggle lever button for opening clip

Table of Contents Page

1 General Description

The METRACLIP®51 clip-on ammeter can be used for the rapid measurement of alternating current of up to 3000 A without interrupting the measuring circuit, as well as for the measurement of alternating voltage of up to 600 V with a measurement cable. The mean value is displayed at the instrument. It is balanced to the RMS value for sinusoidal signals at a frequency of 50 Hz.

The pointer at the analog indicator can be locked electrically for measurements at difficult to access locations, or at measuring points which require the operator's full attention. The clip jaws can be opened, or the test probes can be removed from the measuring point after the measurement has been completed, and the measurement value can then be read from the indicator.

The instrument consists of a measuring transducer for clip-on current measurements, electronic circuitry and a meter movement.

The measuring transducer is split asymmetrically and is opened with a toggle lever. The core consists of two clip jaws whose end surfaces make full contact with one another after closing, even after they have been opened many times.

Measuring ranges for current and voltage can be selected with the rotary switch.

The toggle lever, the rotary switch and the pointer locking key can all be activated in single hand operation.

2 Safety Precautions

The METRACLIP®51 clip-on ammeter has been manufactured and tested in accordance with safety regulations IEC 61010-1/EN 61010-1/VDE 0411-1 and IEC 61010-2-032/EN 61010-2-032/ VDE 0411-2-032.

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

Read the operating instructions completely and carefully before placing your instrument into service, and follow all instructions contained therein.

Meaning of symbols on the instrument:

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

Continuous, doubled or reinforced insulation

CE mark of conformity

CAT III Overvoltage category III device

CAT IV Overvoltage category IV device

The clip-on ammeter may not be used:

- If it demonstrates visible damage
- With damaged connector cables
- If it no longer functions flawlessly
- After lengthy periods of storage under unfavorable conditions (e.g. humidity, dust, excessive temperature).

Safe Handling

- The housing and the handle must be free of dust, grease and moisture.
- The operator's fingers may not be extended beyond the safety collar during the performance of measurements, in order to avoid dangerous contact with the conductor.
- Avoid excessive mechanical stresses such as impact or vibration, as well as excessive temperatures and strong magnetic fields.
- The pointer should not be locked during long periods of non-use, for example during transport or storage.

Attention!
No Measurements Allowed with Values in Excess of the Measuring Ranges!
Voltages and currents which exceed the measuring range of the respective function may not be measured.

Attention!
The operator's fingers may not be extended beyond the safety limit, which is identified by means of the safety collar.

3 Initial Start-Up

3.1 Power Supply

Check battery voltage by pressing the BAT key. The pointer should come to rest within the area marked BAT in the analog display scale. If the pointer is no longer deflected into this area, the HOLD function can no longer be relied upon (see chapter 6, "Maintenance").

3.2 Measurement Cables

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

Voltage measurement is only possible with measurement cables which have been equipped with contact-protected banana plugs.

3.3 Zero Balancing

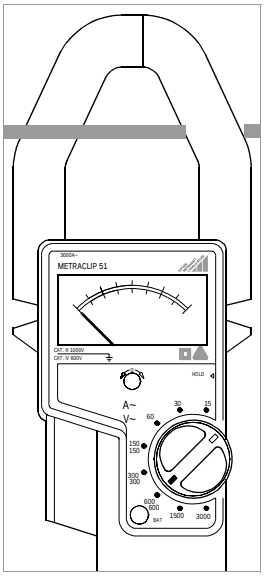
If required, the pointer can be set to zero with the adjusting screw. Zero balancing should only be performed after the instrument has been disconnected from the measuring circuit.

4 Operation

4.1 Alternating Current Measurements

Attention!
Line voltage (or the highest allowable conductor to earth operating voltage) may not exceed a value of 1000 V AC for alternating current measurements.
Current in excess of 1200 A continuous, and 4000 A intermittent may not be measured.

- ⇨ Remove any measurement cables which may have been plugged into the input jacks: clip-on current measurement is otherwise not possible.
- ⇨ First set the selector switch to the highest current measuring range.
- ⇨ Insert one conductor only into the clip.



Make certain that the clip surfaces are clean and that they make good contact with one another.

The conductor should be approximately at the center of the clip opening, and may not make contact with the clip jaws.

- ⇨ Depending upon the measurement value, switch to a lower measuring range with higher resolution. If possible, pointer deflection should be greater than one third of the overall scale.
- ⇨ Read the measurement value with the help of the pointer.
- ⇨ Remove the clip from the conductor after completion of the measurement.

4.1.1 Measuring Small Value Currents

If small value currents need to be measured, the conductor can be coiled around the clip jaw in order to increase sensitivity in direct relationship to the number of coils. The corrected value is determined by dividing the measurement value by the number of coils.

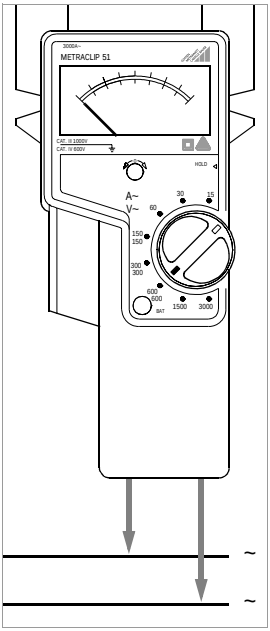
Measurement accuracy may be influenced by current conductors in close proximity to the instrument, especially if they conduct a current which is substantially greater than the current to be measured. Maintain greatest possible distance to nearby current conductors.

Measurement accuracy may also be influenced by extraneous magnetic stray fields. See chapter 5, “Characteristic Values” concerning limitations.

4.2 Alternating Voltage Measurements

Attention!
Input voltage may not exceed 600 V AC.

- ⇨ Plug the measurement cables into the jacks (8). The COM jack should be connected to ground (conductor with low voltage to ground).
- ⇨ First set the selector switch to the highest voltage measuring range (600 V AC).
- ⇨ Connect the test probes to the measuring circuit.



- ⇨ Depending upon the measurement value, switch to a lower measuring range with higher resolution. If possible, pointer deflection should be greater than one third of the overall scale.
- ⇨ Read the measurement value with the help of the pointer.
- ⇨ Remove the test probes from the measuring circuit after completion of the measurement.

5 Characteristic Values

Alternating Current, A AC

Measuring Range in A	Nominal Frequency in Hz	Input Current		Max. Ext. Magnetic Field in A/m
		Max. in A	Max. Duration in Min.	
15	40 ... 100	15	continuous	400
30		30		
60		60		
150		150		
300		300		
600		600		
1000	40 ... 60	1500		
1500			20	
2000		3000	10	
2500			5	
3000			3	

Max. input voltage: 1000 V AC

Max. allowable overload: 1200 A continuous
4000 A intermittent

Alternating Voltage, V AC

Measuring Range in V	Nominal Frequency in Hz	Input Voltage	
		Max. in V	Duration
150	40 ... 400	150	continuous
300		300	
600		600	

Max. allowable overload 720 V continuous
1000 V intermittent

Internal resistance in voltage measuring range 500 kΩ ±1%

Display

Accuracy Class	2.5
Zero Drift	max. 50% of accuracy class
Scale Length	64 mm

Reference Conditions

Ambient Temperature	+23° C ±5° C
Relative Humidity	40 ... 60%
Atmospheric Pressure	80 ... 106 kPa
Periodic Quantity Peak Factor	1.414 ±0.5% (sinusoidal waveshape)
Periodic Quantity Frequency	50 Hz ±1 Hz
External Magnetic Field	max. 40 A/m (DC to 65 Hz) in any direction
External Electrical Field	max. 1 kV/m (DC to 65 Hz) in any direction, any working position

Influences

Position of the conductor within the clip jaws	max. 100% of accuracy class
Data stability after pressing HOLD key	for 10 s with change in pointer deflection by max. 50% of accuracy class
Temperature Coefficient	max. 10% of accuracy class / K

Power Supply

2 lithium batteries for the HOLD function (measurement value memory). Anticipated service life: 3 years.

Electrical Safety

Safety Class	II per IEC 61010-1/ EN 61010-1/ VDE 0411-1
Contamination Level	2
Overvoltage Category	III for 1000 V operating voltage or IV for 600 V operating voltage
Withstand Voltage	7.4 kV AC for 1 minute between input jacks and housing, and between input jacks and metal parts

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	+5° C ... +40° C
Storage Temperature	−25° C ... +55° C (without batteries)
Relative Humidity	max. 85%, no condensation allowed
Elevation	to 2000 m

Mechanical Design

Protection	IP40
Clip Opening	60 mm dia. or, 70 mm x 30 mm
Dimensions	W x H x D: 112 mm x 313 mm x 60 mm
Weight	approx. 0.9 kg

6 Maintenance

Clip Jaw Surfaces

The ends of the clip jaws must be kept clean in order to assure good contact. The clip jaw surfaces should be lightly oiled from time to time in order to prevent corrosion (e.g. with an anticorrosive oil, or with Vaseline).

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.

Batteries

Make certain that the lithium batteries are sufficiently charged before initial start-up of the instrument, and after long periods of storage. Repeat this inspection at short, regular intervals.

If the pointer is no longer deflected into the field marked BAT at the display scale, you should have the lithium batteries replaced as soon as possible. You can continue to take measurements, but data stability for the HOLD function can no longer be relied upon. Send the clip-on ammeter to our Repair and Replacement Parts Service Department only, in order to have the lithium batteries changed (see chapter 7 for address).

7 Repair and Replacement Parts Service DKD Calibration Lab and Rental Instrument Service

When you need service, please contact:

GOSSEN-METRAWATT GMBH
Service Center
Thomas-Mann-Strasse 20
90471 Nuremberg, Germany
Phone +49 911 86 02 - 410 / 256
Fax +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.

8 Product Support

When you need support, please contact:

GOSSEN-METRAWATT GMBH
Product Support Hotline
Phone +49 911 86 02 - 112
Fax +49 911 86 02 - 709

Printed in Germany • Subject to change without notice

GOSSEN-METRAWATT GMBH
Thomas-Mann-Str. 16-20
90471 Nuremberg, Germany
Phone +49 911 8602-0
Fax +49 911 8602-669
e-mail: info@gmc-instruments.com
http://www.gmc-instruments.com