Operating Instructions

GOSSEN METRAWATT

METRACLIP | 63 / 64

Milliampere Current Clamp
for Measuring Fault, Leakage and Stray Current

3-349-488-03
1/10.08

Measuring Instrument

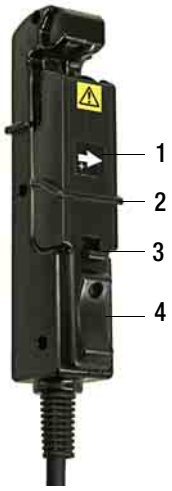
1 **CT INPUT**: Current clamp connector socket
2 **REC OUT:** Connector sockets for data logger

3 LCD panel
4 **AC / DC**: Selector key for direct or alternating current
5 **Range**: Measuring range selector key
6 **NOT AUTO POWER OFF**: Key for deactivating auto-shutdown

7 **POWER**: On/off key
8 **0 SET**: Zero balancing key

9 **DATA HOLD**: Key for saving measured values

Current Clamp METRA**CLIP** 63



1 Arrow must point in direction of current flow
2 Safety collar
3 Locking lever
4 Slider for opening the clamp

Description in section 4.1

Current Clamp METRA**CLIP** 64

1 Arrow must point in direction of current flow
2 Safety collar
3 Key for opening the clamp

Scope of Delivery

1 measuring instrument
4 LR6 batteries (AA)
1 current clamp
1 carrying pouch
1 set of operating instructions

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1 Safety Precautions

1.1 General

You have selected an instrument which provides you with high levels of safety. This instrument fulfills all requirements of applicable European and national EC guidelines. We confirm this with the CE mark. The relevant declaration of conformity can be obtained from GMC-I Messtechnik GmbH.

The **METRACLIP 63 / 64** current clamp is 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. Their safety is however not guaranteed, if the instrument is used improperly or handled carelessly.

In order to maintain flawless technical safety conditions, and to assure safe use, it is imperative that you read the operating instructions thoroughly and carefully before placing your instrument into service, and that you follow all instructions contained therein.

Observe the following safety precautions:

- Avoid excessive mechanical stress such as impact and vibration, as well as high temperatures and humidity, because this may result in damage to the instrument.
- Do not use this instrument in close proximity to acids, alkaline salts, organic solutions, corrosive gases etc.
- Do not use this instrument in proximity to devices which generate strong magnetic and/or electrical fields, because this may result in malfunctioning.
- Do not use this instrument in operating environments where dust or splash water occur.

Attention!
Do not perform measurements at cables with voltages of greater than **600 V AC**.
Before using the instrument, test the voltage of the electrical circuit to be measured.
Do not perform measurements on bare wires!
Do not subject the input and output sockets to voltages of greater than 10 V AC.

The current clamp may not be used:

- If the device, the housing or the cable is damaged
- If the battery compartment lid has been removed
- For current values which are impermissible high for the current clamp
- In the rain, with wet hands, in the presence of splashing water or in moist environments

1.1.1 Meaning of Symbols on the Instrument

Meaning of Symbols on the Instrument

Warning concerning a source of danger (attention: observe documentation)

EC label of conformity

This device may not be disposed of with the trash. Further information regarding the WEEE mark can be accessed on the Internet at

entering the search term WEEE.

CAT II / III Measuring category **II** or **III** device

Closing the clamp around dangerously active conductors is permissible.

2 Applications

The instrument is capable of measuring direct and alternating current, and is equipped with a connectable current clamp. In the case of direct current measurement, conventional current clamps are not capable of performing accurate measurement in the light current range due to influences resulting from magnetization and geomagnetism. This device is a current clamp measuring instrument which is capable of very accurate measurement of direct and alternating current thanks to the use of highly sensitive materials and a magnetization method.

Attention!
The specified maximum input quantities may not be exceeded in order to prevent damage to the instrument and injury to the user: voltage range: 600 V AC/DC, current range: 10 A AC/DC.

3 Initial Start-Up

Batteries

Your instrument requires four 1.5 V batteries (size AA) in accordance with IEC LR6.
Make sure that no battery leakage has occurred before initial start-up, as well as after long periods of storage. Continue to inspect the batteries for leakage at short, regular intervals.
If battery leakage has occurred, carefully and completely clean the electrolyte from the instrument with a damp cloth, and replace the batteries before using the instrument.
If the "**B**" symbol appears at the LCD panel, the batteries should be replaced as soon as possible.

Battery Replacement

Attention!
Disconnect the current clamp from the measuring circuit before opening the device in order to replace the batteries!

Remove the screw from the battery compartment lid with a screwdriver. Push the battery compartment lid in the direction indicated by the arrow and remove it. Remove the 4 batteries and replace them. Return the battery compartment lid to its original position and tighten the screw.
Do not use battery sets consisting of old and new batteries, or batteries with different brand names.

Automatic Shutdown

After switching the device on, "**APO**" appears at the LCD (automatic power off). The device is switched off automatically after 10 minutes if none of its keys have been activated during this time.

Disabling Automatic Shutdown

The instrument can be set to continuous operation.

➪ Press the **NOT AUTO POWER OFF** key to this end.

4 Operation

Attention!
For reasons of safety, use the instrument on electrical circuits with less than 500 V only. Be sure to ascertain the voltage level of the circuit to be measured before starting the instrument.

Do not activate the **0 SET** key with open current clamp. This may lead to erroneous measurements.

Do not apply direct currents of more than 1.5 A. This may result in measurement error and damage to the device.

4.1 Using the METRA**CLIP** 63 Current Clamp

Opening and Closing the Clamp

➪ Press the **locking lever** down in order to unlock the device.

➪ Press the **slider** down in order to open the clamp.

➪ Press the **slider** up in order to close the clamp.

➪ Slowly press the **locking lever** up in order to securely lock the clamp.

Note!
Correct measurement is only possible when the current clamp is fully closed.

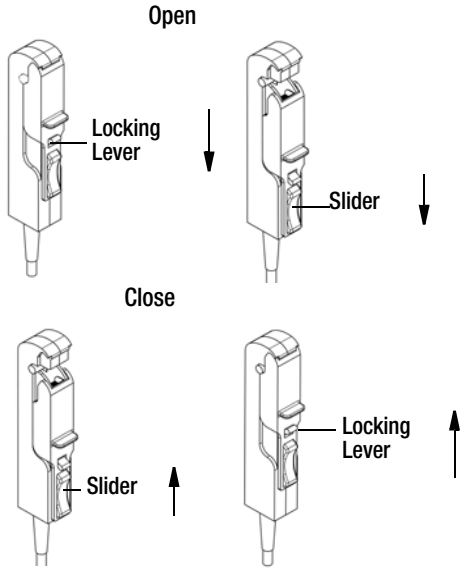

*Figure 1: Operation, **METRACLIP 63***

4.2 Direct Current Measurement

➪ Connect the current clamp to the **CT INPUT** socket at the measuring instrument.

➪ Press the **POWER** key. At first, the 100 mA ⎓ measuring range is displayed.

➪ Select a suitable measuring range at the measuring instrument with the **Range** key.

➪ Position the current clamp in proximity to the conductor to be measured and fully close it.

➪ Press the **0 SET** key in order to execute zero balancing.

The "0" display may be unsteady due to geomagnetism or external magnetic fields, but this condition does not indicate malfunctioning.

If the measuring range is changed, zero balancing must be executed again.

➪ Open the current clamp and close it around the conductor to be measured.

➪ Make sure that the direction of the arrow on the current clamp corresponds with the flow direction of the current to be measured.

- Fully close the current clamp.
- Read the displayed value. In the event of overloading, "**OL**" appears at the display.
- Complete measurement and remove the clamp from the conductor.

4.3 Alternating Current Measurement

- Connect the current clamp to the **CT INPUT** socket at the measuring instrument.
- Press the **POWER** key. At first, the 100 mA ⎓ measuring range is displayed.
- Press the **AC / DC** key. The 100 mA ~ range is displayed.
- Select a suitable measuring range at the measuring instrument with the **Range** key.
- Open the current clamp and close it around the conductor to be measured.
- Fully close the current clamp.
- Read the displayed value. In the event of overloading, "**OL**" appears at the display.
- Press the **DATA HOLD** key in order to freeze the measured value at the display. "**DH**" appears at the display.
- Press the **DATA HOLD** key again in order to return to the measurement.
- Complete measurement and remove the clamp from the conductor.

4.4 Measuring Leakage and Stray Current

Measuring DC Leakage Current

- Measurement is executed in the same way as for direct current.
- However, the clamp is closed around two conductors simultaneously.

Measuring AC Leakage Current with Grounded Conductors

- Measurement is executed in the same way as for alternating current.

Measuring AC Leakage Current in Single or 3-Phase Systems, with the Exception of the Ground Conductor

- Proceed in the same way as for the alternating current measurement, except that in the case of
  single phase systems
  2 conductors are simultaneously enclosed by the current clamp,
  and in the case of
  3-phase systems
  3 conductors are simultaneously enclosed by the current clamp.

4.5 Using a Data Logger

If current measurements will be executed over a period of hours, the output signal can be redirected to a data logger (e.g. a multimeter with memory).

- Connect the data logger to the **REC OUT** sockets.
- Connect the current clamp to the **CT INPUT** socket at the measuring instrument.
- Switch the measuring instrument on by pressing the **POWER** key.
- Press the **NOT AUTO POWER OFF** key in order to deactivate automatic shutdown.
  "**APO**" is cleared from the display.
- Switch the data logger on.
- Select the appropriate settings for the desired measurement.
- Close the current clamp around the conductor to be measured.
- Select a suitable measuring range (see output signal under "Device Data" on page 9) and start recording.

Before changing the measuring range for a direct current measurement, first remove the current clamp from the conductor under test, press the **0 SET** key and close the current clamp around the conductor once again in order to perform a new measurement.

Please refer to the section entitled "Direct Current Measurement" for further details.

The output signal for the data logger corresponds to 100 mV DC full scale for all ranges.

In the event of overloading amounting to more than 110% of the selected range, the output signal generates a display of "0 mV" in order to draw attention to this situation.

5 Characteristic Values

Direct Current (after zero balancing with the 0 SET key)

METRA**CLIP** 63			
Range	**Measuring Range**	**Resolution**	**Accuracy**
100 mA	0.1 ...±50.00 mA	0.01 mA	±1% rdg. ± 5 d
	±50.01 ...±99.99 mA		±1% rdg. ±10 d
1000 mA	1 ... ±300 mA	0.1 mA	±1% rdg. ±10 d
	±300 ... ±700 mA		±2% rdg. ±10 d
	±700 ...±999.9 mA		±3% rdg. ±10 d
METRA**CLIP** 64			
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100 mA	0.1 ...±99.99 mA	0.01 mA	±1% rdg. ±10 d
1000 mA	1 ... ±300 mA	0.1 mA	±1% rdg. ±10 d
	±300 ... ±700 mA		±2% rdg. ±10 d
	±700 ...±999.9 mA		±3% rdg. ±10 d

Key

rdg. = reading (measured value)
d = digit(s)

Reference Conditions

Ambient temperature: +23° C ±5° C
Relative humidity: Max. 85% (no condensation allowed)

Influencing Quantities

Geomagnetism influence: Less than ±0.5 mA
Magnetization influence: Less than ±0.5 mA at 1.5 A DC on/off
Influence caused by open/ closed current clip: Less than ±0.7 mA

Maximum input current: 1.5 A DC (if current greater than 1.5 A DC is applied, current clamp output is reduced and "**OL**" does not appear at the display.

Alternating Current

Range	**Measuring Range**	**Resolution**	**Accuracy**
100 mA	0 ... 99.99 mA	0.01 mA	±1% rdg. ±10 d (50/60 Hz)
1000 mA	0 ... 999.9 mA	0.1 mA	±1% rdg. ±10 d (50/60 Hz)
10 A	0 ... 9.999 A	0.001 mA	±1% rdg. ±10 d (50/60 Hz)

Maximum input current: 20 A AC

Device Data

Measuring function:	Alternating current / direct current
Measuring method:	Current clamp
Measuring ranges:	DC: 100 mA / 1000 mA AC: 100 mA / 1000 mA / 10 A (45 Hz ... 65 Hz)
Detection of alternating current:	Average sampling
A-D converter:	Dual integration method
Display:	LCD, up to 2000 with signal generator
Overload display:	“OL” appears at the LCD
“Data Hold” display:	“DH” appears at the LCD
Sampling rate:	6 per second for AC and 1 per second for DC
Output signal:	100 mV DC full scale for each range; converted to an analog signal which becomes zero if it exceeds 110% of the measuring range in order to indicate overloading (output impedance: less than 10 kΩ)
Power supply:	4 alkaline batteries (LR6), size AA
Current consumption:	Approx. 9 mA (roughly 200 operating hours) Operating voltage: Light current range, less than 600 V AC / DC
Operating temperature:	0 ... 50° C, < 85% relative humidity (no condensation allowed)
Storage temperature:	10 ... 60° C, < 70% relative humidity (no condensation allowed)
Dielectric strength:	3700 V AC / 1 minute between current clamp core and handle
Insulation value:	100 MΩ for 500 V DC insulation test between current clamp core and handle
Safety standard:	EC 61010-1/ 61010-2-032, CAT II 600 V or CAT III 300 V
Dimensions and weight:	W x H x D: 78 x 155 x 32 mm, approx. 280 g

Current Clamp Transformer Data for METRA**CLIP** 63

Clamp jaw opening capacity:	5 mm diameter
Dielectric strength:	3700 V AC / 1 minute between metal core and handle
Cable length:	1.2 meters
Safety standard:	EC 61010-2-032, CAT II 600 V or CAT III 300 V
Dimensions and weight:	W x H x D: 19 x 113 x 28 mm, approx. 100 g

Current Clamp Transformer Data for METRA**CLIP** 64

Clamp jaw opening capacity:	30 mm diameter
Dielectric strength:	3700 V AC / 1 minute between metal core and handle
Cable length:	1.2 meters
Safety standard:	EC 61010-2-032, CAT II 600 V or CAT III 300 V
Dimensions and weight:	W x H x D: 33 x 170 x 24 mm, approx. 165 g