



# GOSSEN METRAWATT METRAHIT T-COM plus Handheld Multimeter Instruction Manual

[Home](#) » [GOSSEN METRAWATT](#) » GOSSEN METRAWATT METRAHIT T-COM plus Handheld Multimeter Instruction Manual 

## Contents

- 1 GOSSEN METRAHIT T-COM plus Handheld Multimeter
- 2 Product Information
- 3 Standard Equipment
- 4 Safety Instructions
- 5 Product Usage Instructions
- 6 Battery Replacement
- 7 Standard Equipment
- 8 Application of measuring cable set KS21-T
- 9 Safety Instructions
- 10 Observe the following safety precautions
- 11 Switching on / off / Light on
- 12 Battery Test
- 13 Battery Replacement
- 14 Select Measuring Function
- 15 Measuring Range Selection
- 16 Measuring Inputs
- 17 DATA-Hold/-Compare
- 18 Zero Balancing
- 19 Resistance Measurement
- 20 Temperature Measurement
- 21 Direct Voltage / Pulsating Voltage Measurement
- 22 AC Voltage – Frequency, without/with Low-pass Filter
- 23 Capacitance Cable Length Measurement
- 24 DC/Pulsating/Alternating Current/Frequency Measurement
- 25 Measurement with Clip-on Current Transformer
- 26 Device and Measuring Parameters
- 27 Loop Resistance Measurement Continuity Testing
- 28 Insulation Resistance Measurement Measuring Inputs
- 29 Capacitance (low disturbance) galv. Signature detection
- 30 Technical Data
- 31 Insulation Resistance Measurement
- 32 Electrical Safety
- 33 Electromagnetic Compatibility EMC
- 34 Ambient Conditions
- 35 Fuse
- 36 Internal Fuse Test
- 37 Fuse Replacement
- 38 Repair and Replacement Parts Service DAkkS Calibration Lab and Rental Instrument Service
- 39 Product Support
- 40 ABOUT COMPANY
- 41 Documents / Resources
  - 41.1 References



**GOSSEN METRAHIT T-COM plus Handheld Multimeter**



## Product Information

The METRAHITT-COM PLUS is a cable multimeter designed for the measurement of symmetrical copper cable units. It is equipped with a range of features and safety precautions to ensure accurate and safe measurements.

## Standard Equipment

- 1 Cable multimeter
- 1 Protective rubber cover
- 1 Cable set KS21-T (1000 V CAT III) consisting of:
  - 1 two-core measurement cable (yellow/blue), 2 m long with test probes
  - 1 earth connection line (black), 2 m long with test probe
- 1 Short-form operating instructions German/English\*
- 2 Batteries 1.5 V, type AA inserted in unit

\*Detailed operating instructions are available for download on the Internet at [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com).

## Safety Instructions

In order to maintain the flawless condition of the instrument and ensure its safe operation, it is important to read the operating instructions thoroughly and carefully before using the instrument. The following safety precautions should be observed:

- Use original fuses only for the current measuring ranges.
- Operate the instrument only with batteries inserted to ensure accurate indication of currents and voltages.
- Do not operate the device with the fuse or battery compartment cover removed.

## Product Usage Instructions

Before using the METRAHITT-COM PLUS, make sure to read the detailed operating instructions available for download at [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com). The short-form instructions provided here are not a substitute for the detailed instructions.

## Battery Replacement

To change the batteries, follow these steps:

1. Disconnect the instrument from the measuring circuit before opening the battery compartment lid.
2. Turn the slotted head screw counter-clockwise to remove the battery compartment lid.
3. Replace the batteries, ensuring correct polarity.
4. Insert the battery compartment lid, starting with the side with the guide hooks, and then turn the slotted head screw clockwise to secure it.

**Note:** Always observe the correct polarity of the batteries when replacing them.

For detailed instructions on how to use the various functions and features of the METRAHITT-COM PLUS, refer to the comprehensive operating instructions available for download.

Please make sure to read the detailed operating instructions in pdf format at [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com). The short-form instructions are no substitute for the detailed instructions!

## Standard Equipment

- 1 Cable multimeter
- 1 Protective rubber cover
- 1 Cable set KS21-T (1000 V CAT III) consisting of:
  - 1 ea. two-core measurement cable (yellow/blue),
  - 2 m long with test probes,
  - 1 ea. earth connection line (black) 2 m long with test probe
- 1 Short-form operating instructions German/English\*
- 2 Batteries 1.5 V, type AA inserted in unit

\* Detailed operating instructions are available for download on the Internet at [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com).

## Application of measuring cable set KS21-T

<i>Maximum Rated Voltage</i>	1000 V	1000 V
<i>Measuring Category</i>	CAT III	CAT II
<i>Maximum Rated Current</i>	1 A	16 A
<i>with safety cap applied</i>	.	—
<i>without safety cap applied</i>	—	.

Please observe the maximum values of the electrical safety of the device.

## Safety Instructions

In order to maintain the flawless condition of the instrument, and to ensure its safe operation, 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**

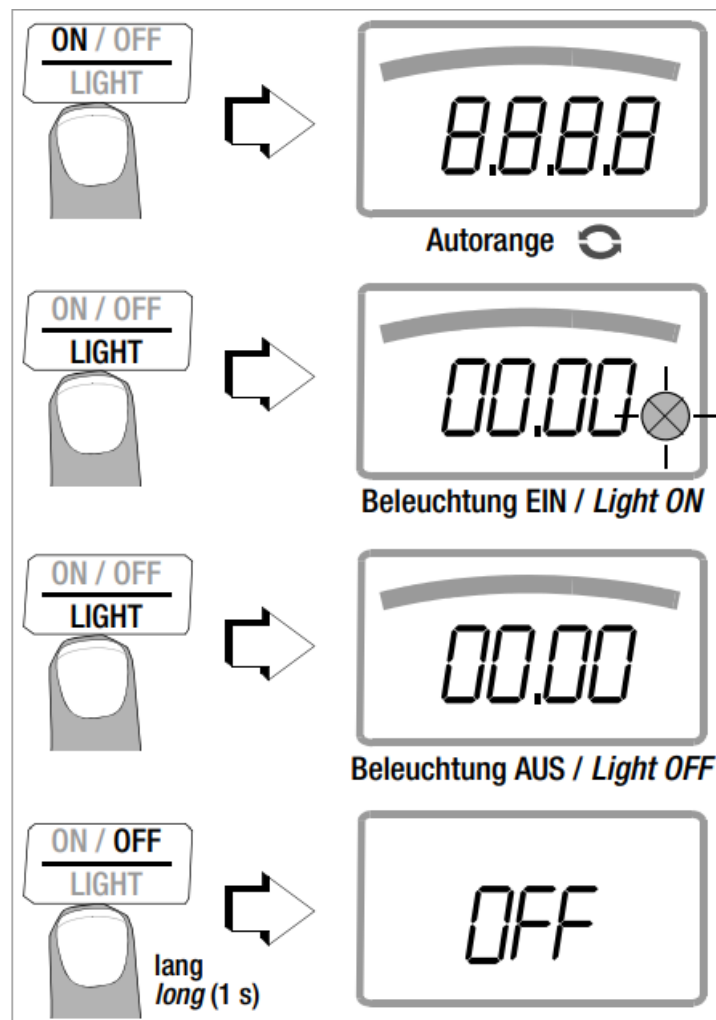
**The multimeter may not be used in potentially explosive atmospheres.**

- The multimeter may only be operated by persons who are able to recognize contact hazards and take the appropriate safety precautions. Contact hazards exist wherever voltages of more than 33 V (RMS value) and/or 70 V DC occur.
- The maximum voltage allowable according to standard between the voltage inputs or all inputs towards earth respectively is equal to 600 V, category II / 300 V, category III.

**Attention:** Unexpected voltages may occur at defective devices, capacitors,...!

- The insulation of the measurement cables may not be damaged, cables and plugs may not be interrupted!
- No measurements may be made in electrical circuits with corona discharge (high-voltage)!
- Special care is required when measurements are made in HF electrical circuits where dangerous pulsating voltages may be present.
- Measurements under moist ambient conditions are not permissible.
- Do not overload the measuring ranges beyond their allowable capacities!
- The input of the current measuring ranges is fitted with a fuse. Use original fuses only, see label on the housing or technical data section!
- Only operate the instrument with batteries inserted. Otherwise dangerous currents or voltages will not be indicated and your instrument may be damaged.
- The device may not be operated with the fuse or battery compartment cover removed.

## **Switching on / off / Light on**



## Battery Test

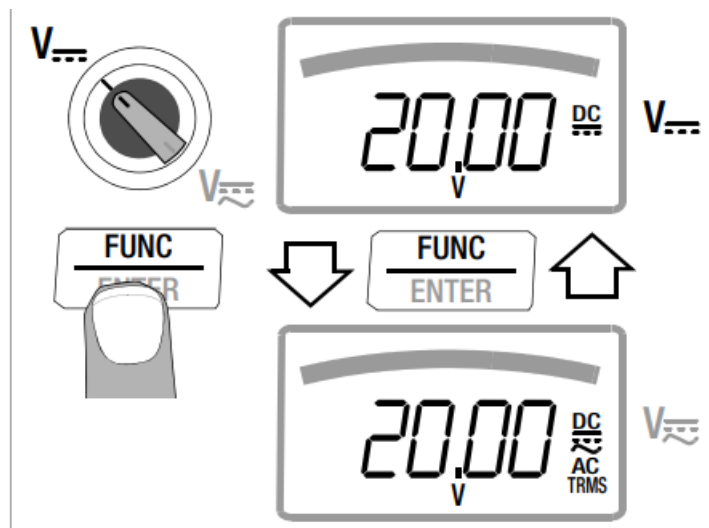


## Battery Replacement

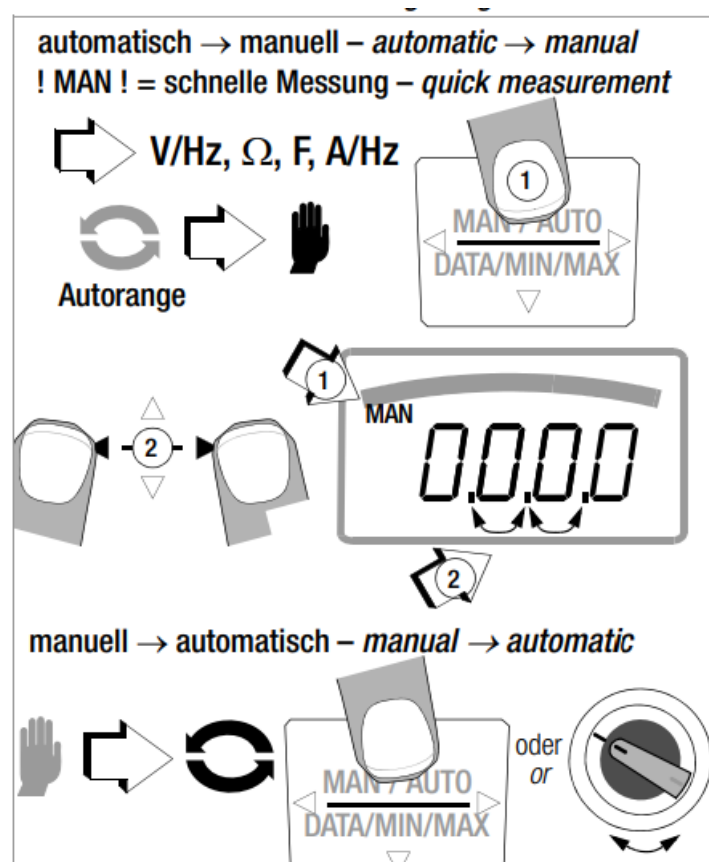
### 2 Batteries: IEC LR6 / AA – AM3 – Mignon

- Disconnect the instrument from the measuring circuit before opening the battery compartment lid! Turn the slotted head screw counter-clockwise for this purpose. Observe the correct polarity of the batteries!
- When refitting the battery compartment lid the side with the guide hooks must be inserted first. Then turn the slotted head screw clockwise.

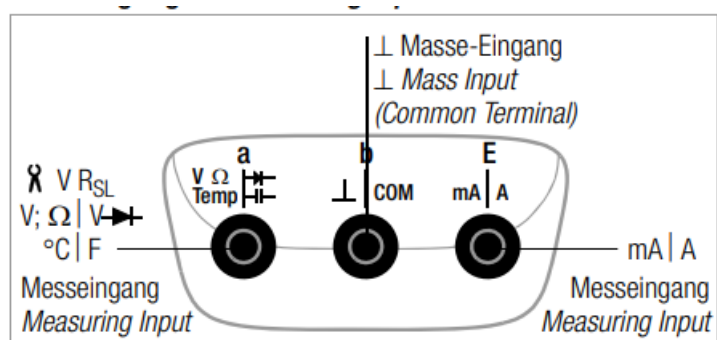
## Select Measuring Function



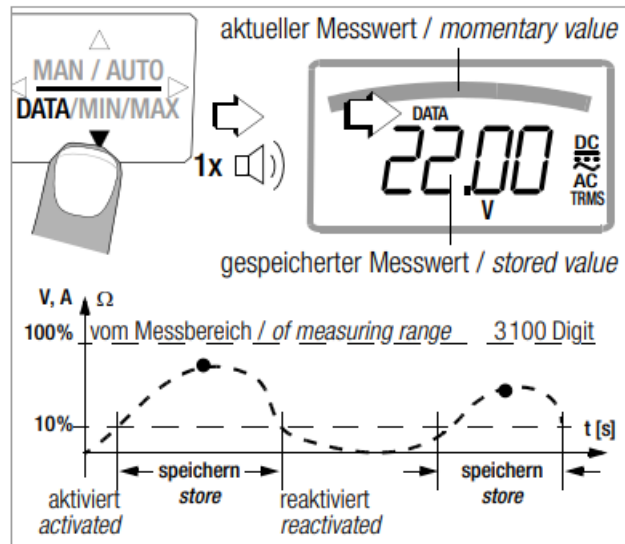
## Measuring Range Selection



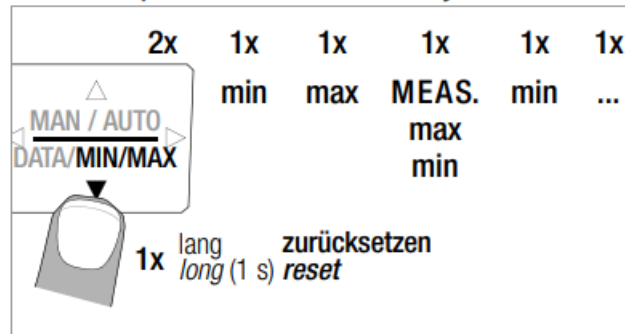
## Measuring Inputs



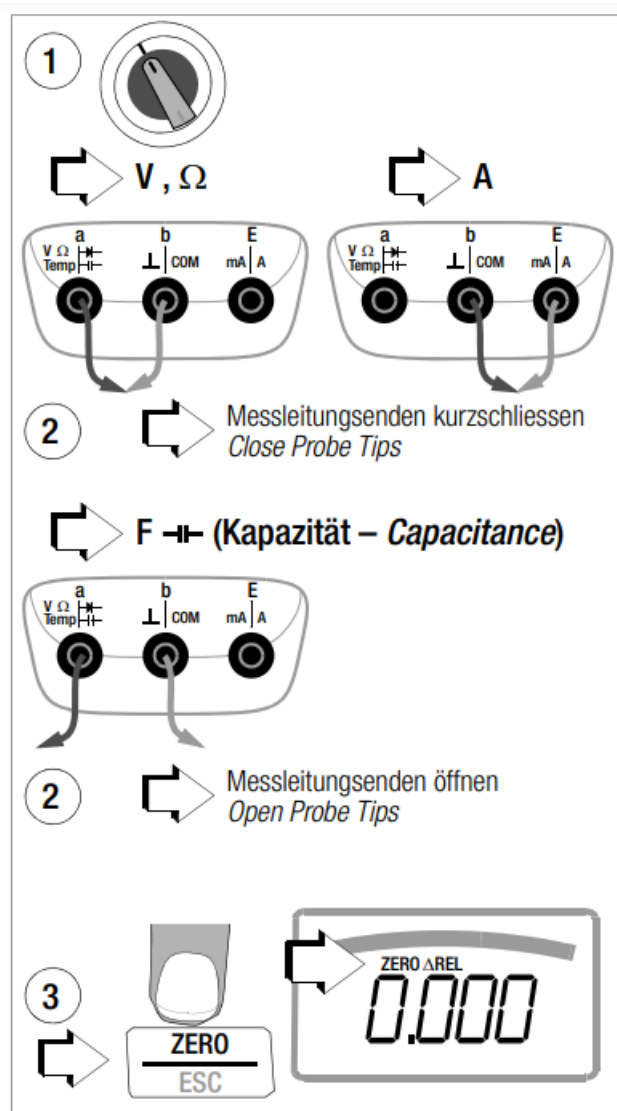
## DATA-Hold/-Compare



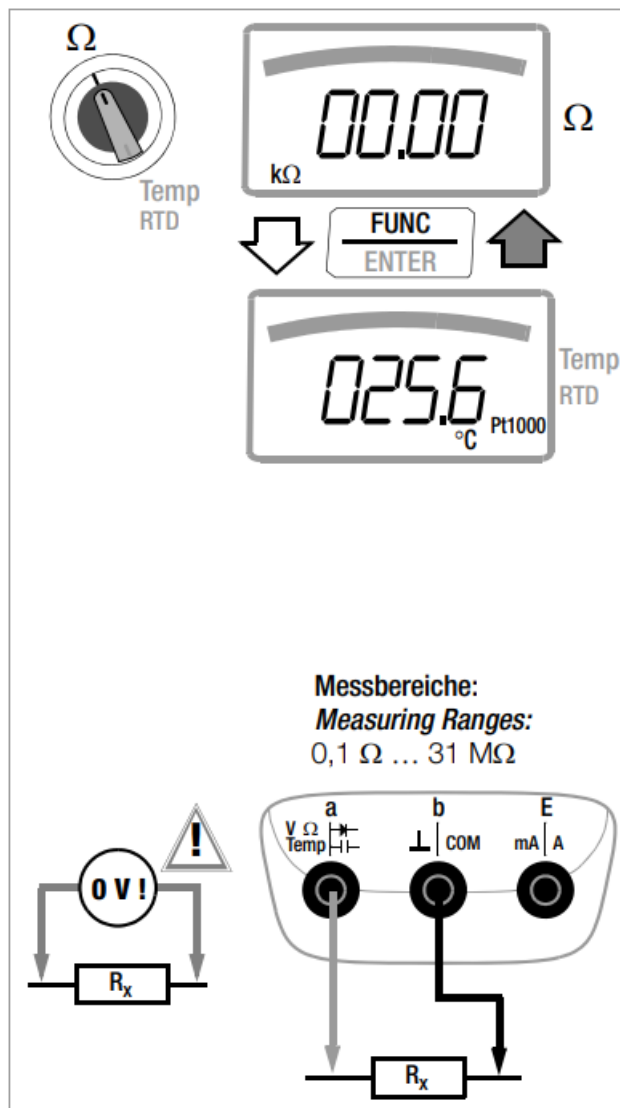
### MIN/MAX-Speicher – MIN/MAX memory



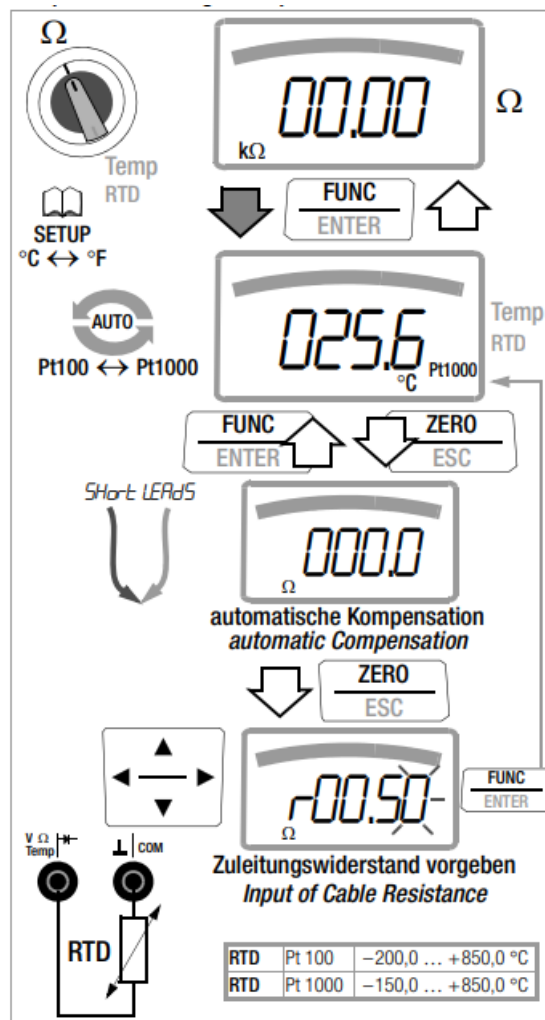
## Zero Balancing



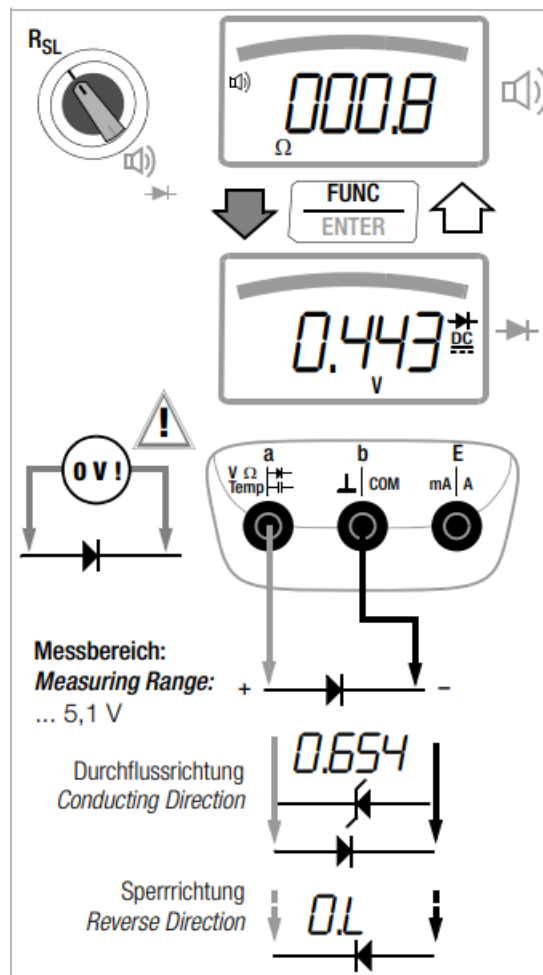
## Resistance Measurement



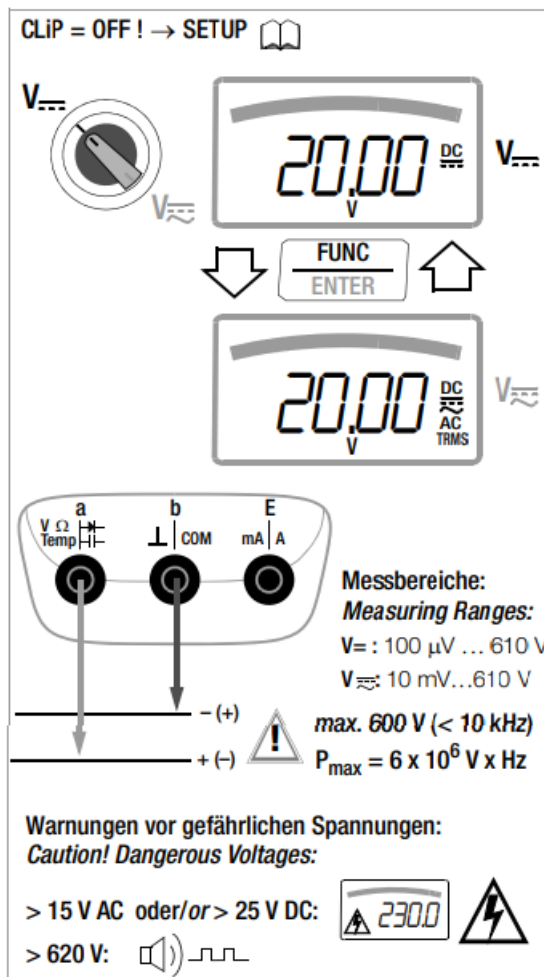
## Temperature Measurement



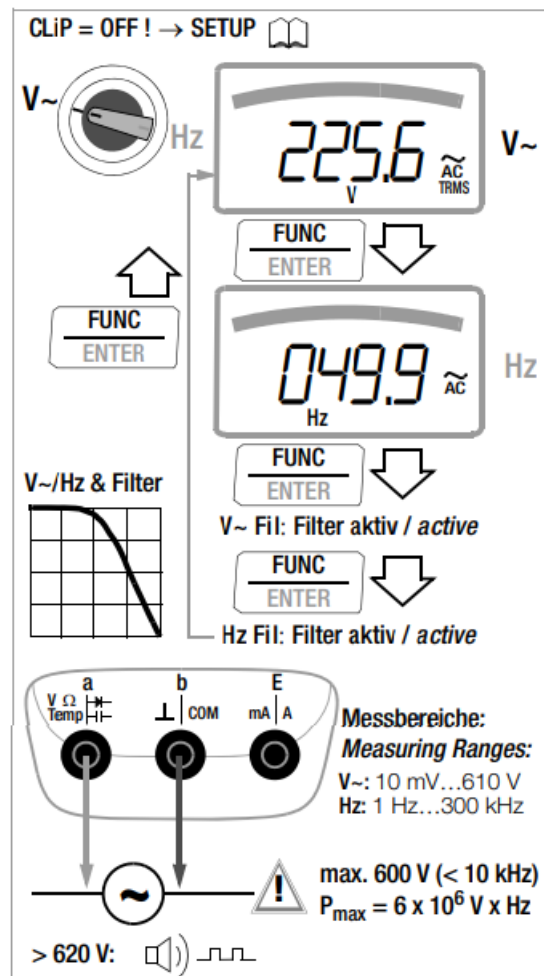
Diode Testing



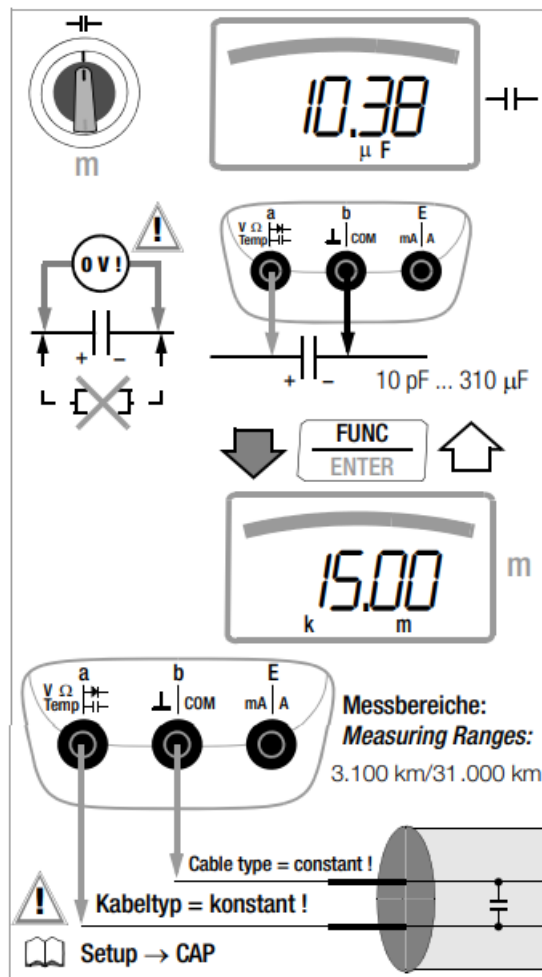
## Direct Voltage / Pulsating Voltage Measurement



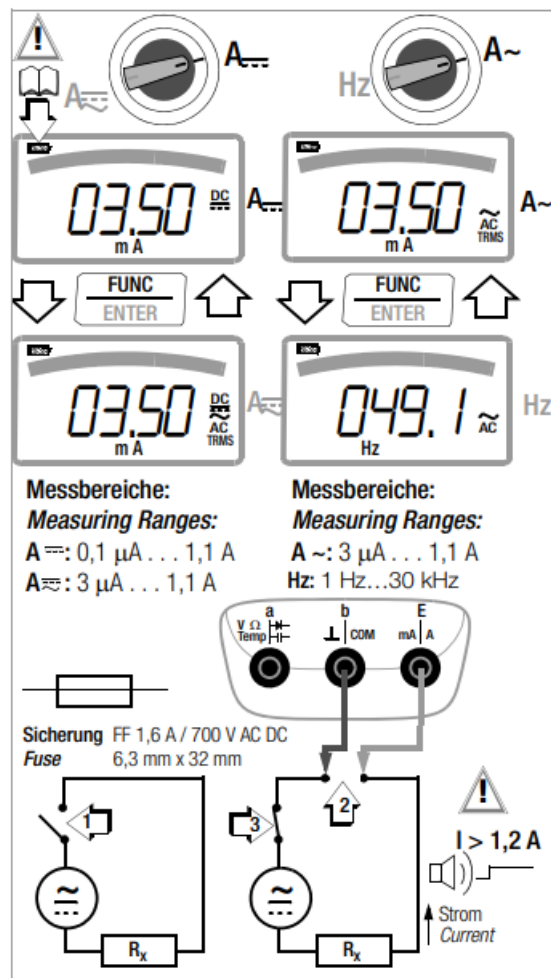
AC Voltage – Frequency, without/with Low-pass Filter



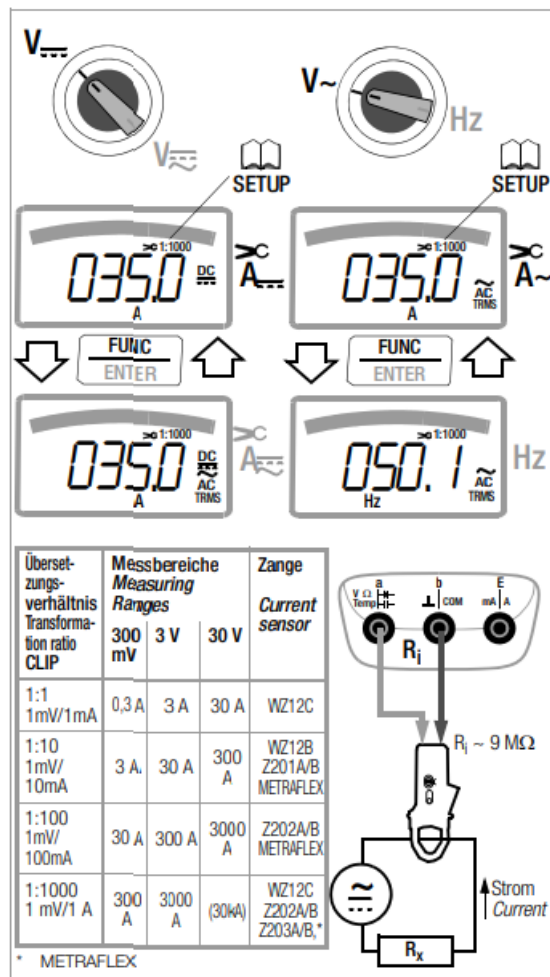
## Capacitance Cable Length Measurement



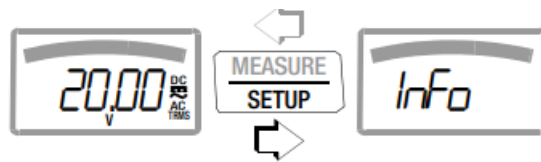
**DC/Pulsating/Alternating Current/Frequency Measurement**



## Measurement with Clip-on Current Transformer

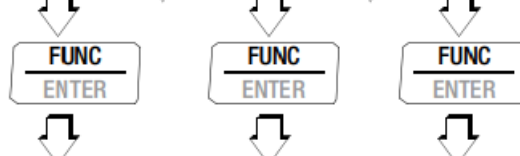


## Device and Measuring Parameters



Hauptmenüs / Main Menus → ... SEnd ... StorE ...

... InFo ← → SET ← → tEMP ...

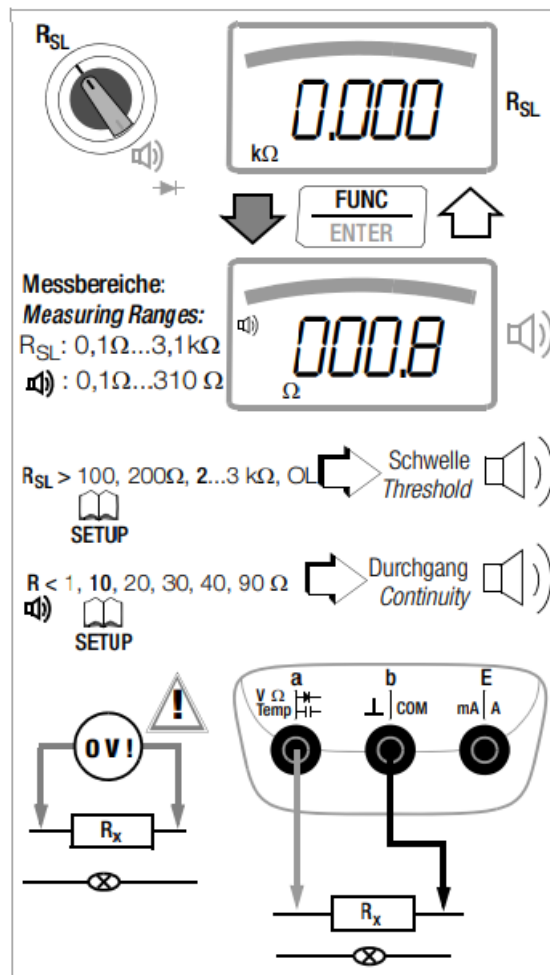


Untermenüs / Parameter / Sub-menus / Parameters ↓

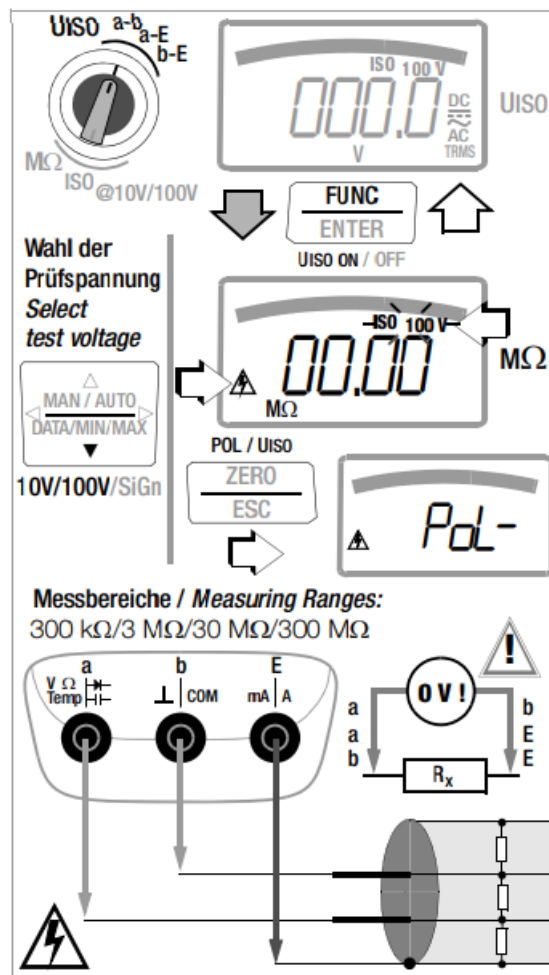
abfragen read		einstellen set		einstellen set	
bAtt: 2.92 V	△	rAtE 0:05:00	△	°C	△
verSion: 1.00	—	0.diSP 0000.0/0.0	—	°F	—
dAtE: 13.09.06	▼	A.diSP bArG/Point	▼		▼
tiME: 11:15:19		CLiP 0FF/1:1...100			
OCCUP: 100.0%		APoFF 10...59min/on			
		U_ISo 10V/100V			
		CAP 10 ... 500nF			
		r_SL 100...3,1KΩ,			
		bEEP 01... 90Ω			
		irStb ir on/off			
		Addr 01...15			
		dAtE 13.09.			
		tiME 11:15			

bestätigen  
confirm  
FUNC  
ENTER

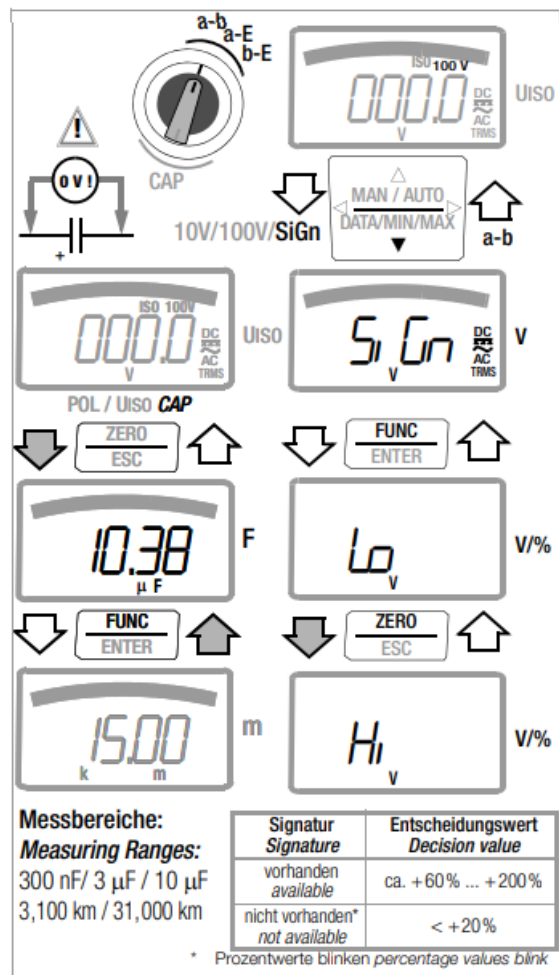
## Loop Resistance Measurement Continuity Testing




## Insulation Resistance Measurement Measuring Inputs



Capacitance (low disturbance) galv. Signature detection



## Technical Data

Messbereich <i>Measuring Range</i>	Messfehler / <i>Measuring Error</i>		Überlastbarkeit <sup>1)</sup> <i>Overload capacity</i>	
	$\overline{=}$	$\sim / \overline{\sim}$		
300 mV	$\pm(0,5\% + 3 D)$ <sub>2)</sub>	$\pm 1,5\% + 3 D$ ( $> 300 D$ )	600 V DC AC eff Sinus/ sine	dauernd <i>continuous</i>
3 V	$\pm(0,5\% + 1 D)$	$\pm 1,5\% + 3 D$ ( $> 100 D$ )		
30 V				
300 V				
600 V				
1 Hz ... 300,00 kHz		$\pm(0,5\% + 1 D)$	600 V <sup>3)</sup>	max. 10 s
	$\overline{=}$	$\sim / \overline{\sim}$		
300 $\mu A$	$\pm(0,5\% + 5 D)$	$\pm 1,5\% + 5 D$ ( $> 100 D$ )	0,3 A	dauernd <i>continuous</i>
3 mA	$\pm(0,5\% + 3 D)$			
30 mA				
300 mA	$\pm(0,5\% + 5 D)$		1,6 A	5 min
1 A				
1 Hz ... 30,00 kHz		$\pm(0,5\% + 1 D)$	<sup>4)</sup>	
	$\pm(\dots \% \text{ v. MW/rdg.} + \dots D)$			
300 $\Omega$	$0,5 + 3$ <sup>2)</sup>		600 V DC AC eff/rms Sinus/ sine	max. 10 s
3 k $\Omega$	0,5 + 1			
30 k $\Omega$				
300 k $\Omega$				
3 M $\Omega$				
30 M $\Omega$	2 + 5			
R <sub>SL</sub> 300 $\Omega$	3 + 5			
R <sub>SL</sub> 3 k $\Omega$	3 + 5			
4)) 300 $\Omega$	3 + 5			
5,100 V	2 + 5			
				
30 nF	$\pm(3\% + 6 D)$ <sup>2)</sup>		600 V DC AC eff Sinus/ sine	max. 10 s
300 nF	$\pm(1\% + 6 D)$			
3 $\mu F$				
30 $\mu F$				
300 $\mu F$	$\pm(5\% + 6 D)$			

1) bei 0°C ... + 40°C

1. at 0°C ... + 40°C
2. with function ZERO active
3. Power limiting:  $6 \cdot 10^6 \text{ V} \cdot \text{Hz}$  (max. 600 V 1 kHz)
4. max. current values see current measuring range

## Insulation Resistance Measurement

Messbereich <i>Measuring Range</i>	$U_{ISO}$	Messfehler <i>Measuring Error</i> $\pm(\% \text{ v. MW/rdg} + D)$
6 ... 110 V $\overline{\sim}$ <sup>1)</sup>	Ri ca. 120 k $\Omega$	3 + 30
5 ... 310,0 k $\Omega$	<b>10</b> //100 V	3 + 5
0,280 ... 3,100 M $\Omega$	<b>10</b> //100 V	3 + 5
02,80 ... 31,00 M $\Omega$	<b>10</b> //100 V	5 + 5
028,0 ... 310,0 M $\Omega$	100 V	5 + 5

1) Fremdspannungsmessung / Interference voltage measurement

## Electrical Safety

- **Protection class II**
- per IEC 61010-1:2010/EN 61010-1:2010/VDE 0411-1:2011
- **Measuring Category** CAT II / CAT III
- **Nominal Voltage** 600 V / 300 V
- **Pollution degree** 2
- **Test Voltage** 3,5 kV~
- per IEC 61010-1/EN 61010-1
- **Protection Housing:** IP54 (pressure equalization by means of the housing)
- Extract from table on the meaning of IP codes

IP XY (1. Ziffer X) (1 <sup>st</sup> digit X)	Schutz gegen Eindringen von festen Fremdkörpern <i>Protection against foreign object entry</i>	IP XY (2. Ziffer Y) (2 <sup>nd</sup> digit Y)	Schutz gegen Eindringen von Wasser <i>Protection against the penetration of water</i>
5	staubgeschützt <i>dust protected</i>	4	Spritzwasser <i>splashing water</i>

## Electromagnetic Compatibility EMC

- Interference Emission
- EN 61326-1:2013 class B
- Interference Immunity
- EN 61326-1:2013, EN 61326-2-1:2013

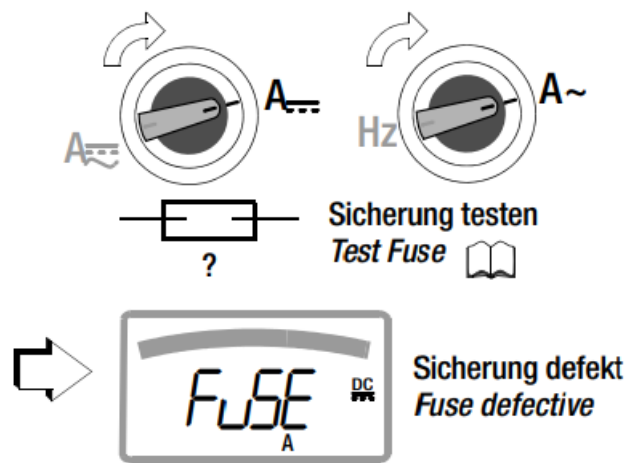
## Ambient Conditions

- **Accuracy range** 0C ... + 40 C
- **Operating temperature** –10 C ... + 50 C
- **Storage temperature without battery** – 25 C ... + 70 C
- **relative humidity** 40 ... 75 %
- no condensation allowed
- Elevation up to 2000 m maximum

## Fuse

- 700 V AC DC 6,3 mm x 32 mm
- breaking capacity: 50 kA (Min 10 kA)
- If you use other fuses than the one indicated above you forfeit your product guarantee.

## Internal Fuse Test



## Fuse Replacement

- Disconnect the instrument from the measuring circuit before opening the fuse compartment lid! Turn the (captive) slotted head screw counter-clockwise for this purpose. Remove the fuse with the flat end of the fuse compartment lid.
- When refitting the fuse compartment lid the side with the guide hooks must be inserted first. Then turn the slotted head screw clockwise.

## Repair and Replacement Parts Service DAkkS Calibration Lab and Rental Instrument Service

When you need service, please contact:

- GMC-I Service GmbH
- Service-Center
- Beuthener Strasse 41
- 90471 Nürnberg • Germany
- **Phone** +49 911 817718-0
- **Fax** +49 911 817718-253
- **E-Mail** [service@gossenmetrawatt.com](mailto:service@gossenmetrawatt.com)
- [www.gmci-service.com](http://www.gmci-service.com)

## Product Support


When you need support, please contact:

- Gossen Metrawatt GmbH
- Product Support Hotline
- Telefon D 0900 1 8602-00 A/CH +49 911 8602-0
- **Phone** +49 911 8602-0
- **Fax** +49 911 8602-709
- **E-Mail** [support@gossenmetrawatt.com](mailto:support@gossenmetrawatt.com)

## ABOUT COMPANY

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- [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)

## Documents / Resources

	<p><a href="#">GOSSEN METRAWATT METRAHIT T-COM plus Handheld Multimeter</a> [pdf] Instruction Manual</p> <p>METRAHIT T-COM plus Handheld Multimeter, METRAHIT T-COM plus, Handheld Multimeter, Multimeter</p>
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## References

- [Servicepartner für Kalibrierungen, Reparaturen, Ersatzteile, Mietgeräte | GOSSEN METRAWATT GMC-I Service GmbH](#)
- [GOSSEN METRAWATT, GMC-I Messtechnik, GMC-Instruments](#)