GOSSEN METRAWATT

METRACELL BT PRO

Portable Battery Tester for Storage Batteries

3-447-057-03
1/11.19

- Internal resistance measurement for storage batteries
- Simultaneous measurement of electrical resistance (Rel) and electrochemical (charge-transfer) resistance (Rct)
- Measurement of block voltages
- Measurement of total voltage up to 600 V
- Measurement of charging and discharging current
- Measurement of block temperatures
- Ascertainment of acid densities
- Transfer of complete battery databases
- Storage of up to 300,000 data records
- Integrated Bluetooth interface
- Battery identification by means of transponders
- Direct connection of a DMA35 density meter from Anton Paar
- Battery operation for up to 10 hours

Applications

Periodic testing and well-organized maintenance are necessary in order to assure the availability of stationary battery systems. The METRACELL BT PRO is a universal, multifunctional test instrument for user-friendly, professional maintenance of these battery systems. It can be used to determine the current status of the battery and pinpoint concealed battery defects. The battery tester is used primarily for testing stationary battery systems.

Features

- Simple, intuitive menu prompting
- Easy-to-understand measured value display
- PC-aided measured value analysis
- Illuminated display
- Mobile, safe use on-site
- Compact design and easy to carry
- Unrestricted motion with attachment to carrying strap, fastening clip or magnet
- Kelvin connection (4-wire measurement) suppresses influence on the measurement results due to cable and contact resistance
- Battery operation – furnished with 4 rechargeable NiMH batteries as standard equipment

Meanings of Abbreviations

Symbol	Meaning
Rel	Electrical Resistance Resistance is a measure of strictly electrical losses. These losses occur at, for example, plate straps, plate grids and electrolytes. The battery delivers rapidly changing currents via this resistance, for example for switched-mode DC/DC converters.
Rct	Charge Transfer Resistance The battery can be charged or discharged via this resistance. This makes it possible to identify battery blocks which are operating at a loss during trickle charging. Together, these two values (Rct and Rel) constitute the battery's internal resistance. The battery delivers current which is as constant as possible over a lengthy period of time via this internal resistance.

METRACELL BT PRO
Portable Battery Tester for Storage Batteries

Relevant Standards

IEC 61010-1 **EN 61010-1** **VDE 0411-1**	Safety requirements for electrical equipment for measurement, control and laboratory use – General requirements
EN 60529 **VDE 0470, part 1**	Test instruments and test procedures Degrees of protection provided by enclosures (IP code)
DIN EN 61326-1 **VDE 0843-20-1**	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements

Characteristic Values

Measuring Function	Measured Quantity	Display Range	Measuring Range	Resolution	Input Imp. / Test Current	Intrinsic Uncertainty	Measuring Connections			
							S+	S-	P+	P-/COM
Multimeter	VDC	-2450.00 ... +2450.00 mV	-2450.00 ... +2450.00 mV	0.01 mV	> 10 MΩ	± (0.05% rdg.+ 10 d)		•		•
Multimeter	VDC	-24.5000 ... +24.5000 V	-24.5000 ... +24.5000 V	0.1 mV	> 10 MΩ	± (0.05% rdg.+ 10 d)	•			•
Multimeter	VDC	-600.000 ... +600.000 V	-600.000 ... +600.000 V	1 mV	1.6 MΩ	± (0.05% rdg.+ 50 d)	•			•
Multimeter	VAC	-300.000 ... +300.000 V	-300.000 ... +300.000 V	10 mV	1.6 MΩ	± (2.0% rdg.+ 10 d) [1]	•			•
Circuit	V	-24.5000 ... +24.5000 V	-24.5000 ... +24.5000 V	100 µV	1.6 MΩ	± (0.05% rdg.+ 10 d)	•			•
Test	V	-24.5000 ... +24.5000 V	-24.5000 ... +24.5000 V	100 µV	1.6 MΩ	± (0.05% rdg.+ 10 d)	•			•
Resistance	REL + RCT	00.00 ... 1000.00 mΩ	00.10 ... 1000.00 mΩ	10 µΩ	Ip approx. 2 A	±(3.0% rdg.+ 8 d)	•	•	•	•
Temperature	V	-2450.0 ... +2450.0 °C	-2450.0 ... +2450.0 °C	0.1 °C	> 10 MΩ	± (0.05% rdg.+ 10 d)		•		•
Connector	V	-2450.00 ... +2450.00 mV	-2450.00 ... +2450.00 mV	0.01 mV	> 10 MΩ	± (0.05% rdg.+ 10 d)		•		•
Interval U	V	-600.000 ... +600.000 V	-600.000 ... +600.000 V	1 mV	1.6 MΩ	± (0.05% rdg.+ 10 d)	•			•
Interval U+I	V	-600.000 ... +600.000 V	-600.000 ... +600.000 V	1 mV	1.6 MΩ	± (0.05% rdg.+ 10 d)	•	•		•

[1] Within a frequency range of 45 to 500 Hz

Measuring Inputs

Measurement Input	Meaning
S-	Measuring input for direct voltage measurement (e.g. temperature sensor, current clamp, connector). Sensing lead to minus pole for resistance measurement. Measuring range: ± 2.45 V, resolution: 0.01 mV Input impedance: > 10 MΩ
P-/COM	Reference potential (ground potential) of all measuring inputs. Current conducting cable to minus pole for resistance measurement.
S+	Measuring input for direct and alternating voltage measurements, e.g. for block voltages and total battery voltages, sensing lead to plus pole during resistance measurement. Range 1: ± 24.50 V, resolution: 0.1 mv Range 2: ± 600.00 VDC, resolution: 1 mV ± 300.00 VAC, resolution: 10 mV Input impedance: 1.6 MΩ
P+	Current conducting cable to minus pole during resistance measurement. **Max. 24 VDC**

Note
600 V CAT III: S-, S+ and P-/COM
24 VDC: P+

Caution!
Test voltage at input P+ may not exceed 24 VDC. The input leads directly to the power transistor via a fuse for resistance measurement.

Power Supply

Rechargeable NiMH batteries	4 ea. 1.2 V AA (recommended: Ansmann maxE 2500 mAh)

Input Impedance

Measuring input S+	1.6 MΩ
Measuring input S-	> 10 MΩ

Ambient Conditions

Operating temperature	+5 ... +40 °C
Storage temperature	-20 ... +60 °C
Relative humidity	Max. 75%, no condensation allowed
Elevation	Max. 2000 m

Electrical Safety

Measuring category	600 V CAT III
Pollution degree	2
Protection class	II per IEC 61010-1/EN 61010-1/ VDE 0411-1
Fuse link	1 ea. SIBA 600 V/10 A FF
Test voltage	Test voltage at measuring connection P+ may not exceed 24 VDC.

Electromagnetic Compatibility (EMC)

Interference emission	EN 61326-1:2013, class A
Interference immunity	EN 61326-1:2013 EN 61326-2-1:2013

Mechanical Design

Protection	Housing: IP 40 per DIN VDE 0470 part 1/EN 60529

Table Excerpt Regarding Significance of IP Codes

IP XY (1st digit X)	Protection Against Foreign Object Ingress	IP XY (2nd digit Y)	Protection Against Water Ingress
4	≥ 1.0 mm ∅	0	Not protected

Dimensions	Housing (WxHxD): approx. 9.6 x 15.4 x 3.3 cm
Weight	Approx. 0.45 kg (without rubber holster)
Display	LCD, monochrome, luminous

Data Interfaces

IrDA	Connection for DMA 35 V4 density meter
RFID	Connection for RFID tag (World Tag™)
Bluetooth	Connection for PC, headset or DMA 35 V4 density meter

Temperature Sensor

Optional IR sensor	1 mV/1 °C
Measuring range	-2.45 ... +2.45 V

Scope of Delivery

1	METRACELL BT PRO
1	Rubber holster
1	Power pack
1	Set of multimeter test probes (KS 29)
1	Carrying strap
2	Alligator clips
2	Kelvin probes for 4-wire measurement
1	Carrying case
1	Battery management software
1	Test report / factory calibration certificate

Optional Accessories

1	Current clamp sensor
1	Temperature sensor

Order Information

Description	Type	Article No.
Portable battery tester for voltage measurement, resistance measurement for electrical internal resistance and electrochemical resistance of battery blocks, including set of multimeter test probes and alligator clips	METRACELL BT PRO	B100B
AC/DC current clamp sensor 0.5 ... 125 A, 5 ... 1250 A, 10 mV/A, 1 mV/A	CP1800	Z204A
Temperature sensor	METRATHERM IR BASE	Z680A

METRACELL BT PRO

Portable Battery Tester for Storage Batteries

Prepared in Germany • Subject to change without notice • PDF version available on the Internet

GOSSEN METRAWATT

GMC-I Messtechnik GmbH
Südwestpark 15
D-90449 Nürnberg • Germany

Phone: +49 911 8602-111
Fax: +49 911 8602-777
e-mail: info@gossenmetrawatt.com
www.gossenmetrawatt.com