

METRACELL BT PRO

Portable Battery Tester

3-447-073-03
3/12.20



Read the full operating instructions which are available in PDF format at www.gossenmetrawatt.com. The condensed operating instructions do not replace the full operating instructions!



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1 Safety Instructions

Observe this documentation, in particular all included safety information, in order to protect yourself and others from injury, and to prevent damage to the instrument.

- Carefully and completely read and adhere to these condensed operating instructions, as well as the instrument's operating instructions.
The respective documents can be found at <http://www.gossenmetrawatt.com>. Retain these documents for future reference.
- Use only the specified accessories with the instrument.
- Carefully and completely read and adhere to the product documentation for optional accessories. Retain these documents for future reference.
- Tests may only be performed by a qualified electrician, or under the supervision and direction of a qualified electrician. The user must be instructed by a qualified electrician concerning performance and evaluation of the test.
- Wear suitable and appropriate personal protective equipment (PPE) whenever working with the instrument.
- Implement adequate measures for protection against electrostatic discharge (ESD).
- Observe and comply with all applicable DIN, VDE, EN, IEC and ANSI guidelines. Inform yourself concerning the operating company's specifications and guidelines, as well as those of the respective battery manufacturers.
- Batteries are electrochemical components with very high short-circuit currents. Avoid short-circuits which endanger yourself as a user, the entire system or operating personnel.
- If the instrument doesn't function flawlessly, remove it from operation and secure it against inadvertent use.
- The instrument may only be used as long as it's in good working order.
Inspect the housing before use. Pay particular attention to any possible cracks and the insulation around the sockets.
Damaged components must be replaced immediately.
- Accessories and cables may only be used as long as they're fully intact.
Inspect all cables and accessories before use. Pay particular attention to damaged housings, broken insulation or kinked cables.
Damaged components must be replaced immediately.
- Do not use the instrument after long periods of storage under unfavorable conditions (e.g. humidity, dust or extreme temperature).
- Do not use the instrument after extraordinary stressing due to transport.
- Do not use the instrument in potentially explosive atmospheres.
- Use the instrument only within the specified ambient conditions.
- Use the instrument only in accordance with the specified protection class (IP code).
- The instrument must not be exposed to direct sunlight.
- The instrument and the included accessories may only be used for the measurements described in this manual and in the operating instructions of the instrument.
- Only use the accessories and the charger which are included with the battery tester or listed as optional accessories.
- Only use the instrument as well as the accessories within the specified measuring category.

- The measurement cables and all external cabling must not exceed an overall length of 1 meter.
- Plugging in the measurement cables and the power pack must not necessitate any undue force.
- Connect the ground wire before connecting the voltage conducting cable, and disconnect the voltage conducting cable before disconnecting the ground wire.
- Check measurement cable continuity.
- Avoid short circuits due to incorrectly connected measurement cables.
- Make sure that the alligator clips, test probes and Kelvin probes make good contact.
- Do not move or remove the Kelvin probes during a measurement.
Unwanted sparking may otherwise occur due to test current.
- Do not remove or move the alligator clips, test probes or Kelvin probes until measurement has been completed. This is indicated by means of an acoustic acknowledgment.
- Avoid simultaneously contacting the battery and the frame or hardware, which may be grounded.
- The battery tester is equipped with a transponder module. Determine whether or not use of the 125 kHz frequency is permissible in your country.
- The battery tester is equipped with a Bluetooth[®] module. Determine whether or not use of the implemented range of frequencies from 2.402 to 2.480 GHz is permissible in your country.
- The input at the P+ measurement jack is equipped with a fuse link. The instrument may only be used as long as this fuse is in flawless condition.
A defective fuse may only be replaced by our repair service.
- The instrument only works with inserted batteries.
- The battery charger may only be connected to electrical systems (TN or TT) with a maximum of 230/400 V which comply with applicable safety regulations (e.g. IEC 60346, VDE 0100) and are protected with a fuse or circuit breaker with a maximum rating of 16 A.
- Do not use the instrument while the internal batteries are being charged.
- Do not use the instrument if the battery compartment cover has been removed.
Touch contact with dangerous voltage is otherwise possible.
- Always create a backup copy of your measurement data.

2 Applications

2.1 Intended Use / Use for Intended Purpose

Periodic testing and well-organized maintenance are necessary in order to assure the availability of stationary battery systems.

The METRACELL BT PRO is a multifunctional instrument for testing batteries and battery blocks* (referred to below as “devices under test” or “DUTs”). It can be used to determine the current status of a DUT, and to pinpoint concealed defects. The battery tester is used primarily for testing DUTs in stationary battery systems.

The instrument stores the measured values internally. All recorded measured values can be viewed on site. Each value can be conveniently re-measured if necessary. Management of devices under test, as well as evaluation and backup of the measured values, is handled by the included “BT PRO Manager” software. The measured values can also be transferred to an external computer as a CSV file.

The battery tester is a portable instrument which can be held in the hand while performing measurements.

Safety of the operator, as well as that of the instrument, is only assured when it's used for its intended purpose.



Attention!

Read and adhere to the operating instructions. Full operating instructions can be found at <http://www.gossenmetrawatt.com>.

2.2 Use for Other than Intended Purpose

Using the instrument for any purposes other than those described in these condensed operating instructions, or in the instrument's operating instructions, is contrary to use for intended purpose.

2.3 Liability and Guarantee

Gossen Metrawatt GmbH assumes no liability for property damage, personal injury or consequential damage resulting from improper or incorrect use of the product, in particular due to failure to observe the product documentation. Furthermore, all guarantee claims are rendered null and void in such cases.

Nor does Gossen Metrawatt GmbH assume any liability for data loss.

2.4 Opening the Instrument / Repairs

The instrument may only be opened by authorized, trained personnel in order to ensure flawless, safe operation and to assure that the guarantee isn't rendered null and void. Even original replacement parts may only be installed by authorized, trained personnel.

Unauthorized modifications to the instrument are prohibited.

* A block is the smallest unit. A group of two or more blocks is called a battery. From an organizational standpoint, a device under test is always set up in the battery tester as a battery which includes one or more blocks which will be measured.

If it can be ascertained that the battery tester has been opened by unauthorized personnel, no guarantee claims can be honored by the manufacturer with regard to personal safety, measuring accuracy, compliance with applicable safety measures or any consequential damages.

3 The Instrument

3.1 Scope of Delivery

Please check for completeness.

1	METRACELL BT PRO	2	Alligator clips (KY95-3)
4	1.2 V AA batteries	1	Set of multimeter test probes (KS29)
1	Power pack	1	Set of Kelvin probes for 4-wire measurement (Z227D)
1	Rubber holster	1	BT PRO Manager (battery tester management software)
1	Carrying strap	1	Test report / factory calibration certificate
1	Carrying case	1	Condensed operating instructions

3.2 Optional Accessories

Some measurements necessitate optional accessories:

- AC/DC current clamp sensor
 - CP1800 (Z204A) for measurements up to 1250 A_{DC} or
 - CP330 (Z202B) for measurements up to 300 A_{DC}
- METRATHERM IR BASE temperature sensor (Z680A)
- Replacement contact pins for the Kelvin probes (Z227F)

Please contact our product support team for further information on accessories (⇒ 14).

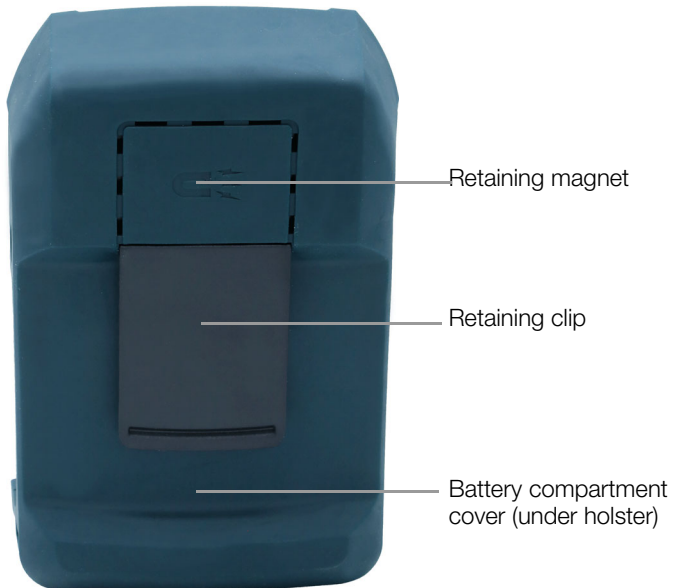
Values recorded and stored with a DMA 35 portable density meter from Anton Paar GmbH can be transferred to the battery tester. Referred to the operating instructions for information on how to use the density meter with the METRACELL BT PRO (available at <http://www.gossenmetrawatt.com>). Please contact Anton Paar GmbH for any further information concerning the DMA 35 density meter.

3.3 Instrument Overview

Front




Back



Measuring Inputs

All measuring inputs refer to ground and reference potential, P/COM input. The measuring inputs are not electrically isolated from each other.

The measuring ranges depend on the respective measuring inputs.

Measuring Input	Description
S-	Input for measuring DC voltage. Measuring range: $\pm 2450.00 \text{ mV}_{\text{DC}}$ Resolution: 0.01 mV Input impedance: $> 10 \text{ M}\Omega$ Sensing lead to minus pole during resistance measurement.
P-/COM	Reference potential (ground potential) of all measuring inputs. Current conducting cable to minus pole during resistance measurement.
S+	Measuring input for direct and alternating voltage measurements. Measuring ranges: $\pm 24.5000 \text{ V}_{\text{DC}}$ Resolution: 0.1 mV $\pm 600.000 \text{ V}_{\text{DC}}$ Resolution: 1 mV $0 \dots 300.00 \text{ V}_{\text{AC}}$ Resolution: 10 mV Input impedance: $1.6 \text{ M}\Omega$ Sensing lead to plus pole during resistance measurement.
P+	Current conducting cable to plus pole during resistance measurement.
	<div style="display: flex; align-items: center;">  <div> <p>Attention!</p> <p>Max. 24 V DC</p> <p>Maximum test voltage must not exceed 24 V_{DC} at input P+. The instrument is damaged if this value is exceeded.</p> </div> </div>



Note!





600 V CAT III refers to measuring inputs S+, S- and P-/COM.

RFID Reader

The display is surrounded by an RFID reader. If individual batteries are equipped with an RFID tag, the tag can be scanned before measurement, thus making it possible to subsequently assign the measurement data to the respective unit automatically.

The RFID reader can only read RFID tags which use a frequency of 125 kHz. In order to read an RFID tag, hold the battery tester display 1 to 2 cm above the RFID tag. **RF** appears at display.

Function Keys

Key	Function
	<p>“Function” key</p> <ul style="list-style-type: none"> – Switch on and off – Press briefly: Return to next higher menu level or cancel measurement – Press and hold: End measurement or reactivate
	<p>Scroll down key “▼” Selection of menu items or digits in downward direction.</p>
	<p>Scroll up key “▲” Selection of menu items or digits in upward direction.</p>
	<p>“OK” key</p> <ul style="list-style-type: none"> – Open menus – Execute functions – Confirm entries – Select digits – Proper termination of measurements – Press and hold: Repeat measurement

3.4 Relevant Standards

The battery tester has been manufactured and tested in accordance with the following safety regulations:

IEC 61 010-1 EN 61 010-1 VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use – general requirements
EN 60 529 VDE 0470, part 1	Test instruments and test procedures Degrees of protection provided by enclosures (IP code)
DIN EN 61 326-1 VDE 0843-20-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements

3.5 Technical Data

Power Supply	Rechargeable NiMH batteries, 4 ea. 1.2 V type 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 category: II per IEC 61 010-1 / 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 V _{DC} .
Electromagnetic Compatibility (EMC)	Interference emission: EN 61326-1:2013, class A Interference immunity: EN 61 326-1:2013 EN 61326-2-1:2013
Mechanical Design	Protection: Housing: IP40 per DIN VDE 0470, part 1/EN 60 529 (protection against ingress of solid foreign objects: ≥ 1.0 mm dia., protection against ingress of water: not protected) Housing: approx. 9.6 × 15.4 × 3.3 cm (W × H × D) Weight: approx. 0.45 kg (without rubber holster) Display: LCD, monochrome, luminous
Data Interfaces	IrDA: Connection for density meter, DMA 35 Basic (version 3) RFID: Connection for RFID tag (WorldTag™) Bluetooth®: Connection for PC, headset or density meter, DMA 35 (version 4)
Internal Memory	up to 300,000 data records



Note!

Technical data for the AC/DC current clamp sensor, the temperature sensor and the DMA 35 density meter can be found in the respective product documentation.

3.6 Characteristic Values

Measuring Function	Multimeter / Connector	Multimeter / Float / Discharging / Charging	Multimeter / Interval U / Interval U+	Multimeter	Resistance	Temperature
Measured Quantity	V_{DC}	V_{DC}	V_{DC}	V_{AC}	$R_{el} + R_{ct}$	$^{\circ}C$
Display Range	-2450.00 ... +2450.00 m V	-24.5000 ... +24.5000 V	-600.000 ... +600.000 V	0,00 ... 300.00 V	00.00 ... 1000.00 m Ω	-230.0... +230.0 $^{\circ}C$ ¹⁾
Measuring Range	-2450.00 ... +2450.00 m V	-24.5000 ... +24.5000 V	-600.000 ... +600.000 V	0,00 ... 300.00 V	00.10 ... 1000.00 m Ω	
Resolution	0.01 mV	0.1 mV	1 mV	10 mV	0.01 m Ω	0.1 $^{\circ}C$
Input Impedance / Test Current	> 10 M Ω	1.6 M Ω	1.6 M Ω	1.6 M Ω	I_p approx. 2 A	>10 M Ω
Intrinsic Uncertainty	$\pm(0.05\%$ rdg. + 10 d)	$\pm(0.05\%$ rdg. + 10 d)	$\pm(0.05\%$ rdg.+ 50 d)	$\pm(2.0\%$ rdg. + 10 d) ²⁾	$\pm(3.0\%$ rdg. + 8 d)	
S+	Measuring Connections	•	•	•	•	
S-		•			•	•
P+					•	
P-/COM		•	•	•	•	•

1) Only applicable if the temperature sensor is connected to the battery tester.

2) Within a frequency range of 45 to 500 Hz.







Note!

Characteristic values for the AC/DC current clamp sensor, the temperature sensor and the DMA 35 density meter can be found in the respective product documentation.

4 Initial Startup

These condensed operating instructions only explain initial startup of the instrument and basic operating procedures. Please refer to the full operating instructions for a complete description of all functions and settings (available at <http://www.gossenmetrawatt.com>).

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2. Attach the Carrying Strap (optional) ⇨  11
3. Switching the Instrument On ⇨  11
4. Getting Started ⇨  12

4.1 Electrical Power Supply

The battery tester is operated with rechargeable NiMH batteries. Pre-charged batteries are shipped loose. These must be inserted before initial use.



Attention!

Risk of injury due to contact with dangerous voltages.

Only use the instrument when the battery compartment cover is inserted and firmly screwed into place.

Required tools: Philips screwdriver

- ✓ The battery tester must be switched off.
 - ✓ All measurement cables and accessories must be removed from the instrument.
1. Remove the holster from the instrument: Press against the bottom of the holster at the front and push it back and off of the instrument. As soon as the lower part of the instrument is exposed, pull the instrument completely out of the holster.
 2. Place the instrument face down on a stable surface.
 3. Loosen and remove the screw from the battery compartment cover.
 4. Unlock and remove the battery compartment cover.
 5. Insert the 4 included rechargeable batteries into the battery compartment, making sure that the plus and minus poles match up with the provided polarity symbols.
-



Attention!

Only the included batteries or those specified in the technical data (⇨  8) may be inserted and used.

6. Place the battery compartment cover onto the battery compartment and press it until it audibly clicks into place.
 7. Secure the battery compartment cover with the screw.
 8. Pull the holster back over the instrument: Observe the cut-outs in the holster for the front panel and the connections. Push the instrument into the holster at the top first as far as it will go. Then press on the front at the bottom until the instrument is fully reinserted into the holster.
- ↳ The batteries have now been inserted. The instrument can be used.
-

Operating time is approximately 10 hours when the batteries are fully charged. A warning is generated when battery voltage drops to below 4.8 V. The battery tester can be operated for approximately one more hour after this warning is generated.

4.2 Attach the Carrying Strap (optional)

The battery tester gives an acoustic feedback after any important operation, such as, for example, readiness for the acquisition of measured values. Thus there is no need for you to observe the display permanently.

In order to ensure freedom of movement, convenience and faster working for the operator, the battery tester can be secured by means of various retaining devices for the entire duration of measurement:

- Carrying strap:
The operator can use the carrying strap to suspend the battery tester around his neck.
- Retaining clip:
The operator can attach the battery tester to his belt with the help of the retaining clip.
- Retaining magnet:
The battery tester can be attached to magnetic surfaces such as battery cabinet doors with the retaining magnet.

The carrying strap is shipped loose and must first be inserted:

1. Pull one end of the strap out of the locking clasp. The locking clasp remains on the strap.
2. Feed the end of the strap through the eyelets on the instrument: Push the strap into one of the eyelets at the bottom of the instrument until it comes out at the side of the instrument. The top side of the retaining clasp faces out.
3. Thread the end of the strap from above through the locking clasp on the strap.
4. Repeat steps 1 through 3 with the other end of the strap on the other side of the instrument.
5. Adjust the length of the carrying strap by pulling on its ends.
↳ The carrying strap has now been attached.

4.3 Switching the Instrument On/Off

Switching the Instrument On

1. Press and hold the **Function** key for approximately 2 seconds.
The initial display appears with the instrument's designation and version, as well as date and time.
2. Press any key.
↳ The main menu appears at the display. The instrument can now be used.

Switching the Instrument Off

Normally the instrument is switched off manually. If the battery tester has not been used for more than 10 minutes, it's switched off automatically.

1. Select → **SWITCH OFF** in the **main menu** with the help of the ▼ key.
2. Press the **OK** key.
↳ The display goes blank. The instrument has been switched off.

**Note!**

The battery tester can also be switched off by pressing the **Function** key. The key must be pressed and held for approximately 10 seconds to this end.

However, it's preferable to switch the instrument off using the **switch off** function.

4.4 Getting Started

After switching the instrument on (⇒ 1), the **main menu** appears at the display. This is the central menu from which all other hierarchically subordinate menus and functions can be accessed. All available functions can be selected via the ▼ and ▲ keys:

Function	Description
MEASUREMENT	Available measuring functions
DATA	Data management functions
SETTINGS	Parameter settings for system, measurements and data transfer
INFO	Information concerning firmware version, battery charge level and memory occupancy
SWITCH OFF	Switch off the battery tester

Various measurements can be performed with the battery tester:

Measurement	Description
MULTIMETER	DC and AC voltage measurements without storing measured values
FLOAT	Periodic measurement of block voltages. This measurement is used for recurring recordings of float voltage, for example in UPS systems.
DISCHARGING	Multiple measurement of block voltages at short intervals during discharging (capacity test of the blocks)
CHARGING	Multiple measurement of block voltages at short intervals during charging (capacity test of the blocks)
RESISTANCE	Periodic measurement of the internal resistance of the blocks
TEMPERATURE	Measurement of block temperature with an IR temperature sensor
CONNECTOR	Measurement of voltage drop to determine connector loss between blocks
INTERVAL U	Measurement of the voltage of a battery over freely definable time intervals (voltage curve / capacity test of the entire battery)
INTERVAL U + I	Measurement of the voltage and current of a battery over freely definable time intervals (voltage and current curves / capacity test of the entire battery) Example: Recording of discharge current during discharging.
DMA 35 (IrDA)	Measurement of acid density and electrolyte temperature within a block. Measurements are performed with the density meter DMA 35 Basic (version 3) from Anton Paar GmbH. Data is transferred from the sensor to the battery tester via infrared (IrDA).
DMA 35 (BT)	Measurement of acid density and electrolyte temperature within a block. Measurements are performed with the density meter DMA 35 (version 4) from Anton Paar GmbH. Data is transferred from the sensor to the battery tester via Bluetooth®.

The following additional functions provide support when performing measurements and evaluating measurement data:

Additional Function	Description
RFID	Battery identification through the use of transponders (RFID tags)
Bluetooth – PC	Transfer of measured values via Bluetooth® for backup and evaluation on a computer
Bluetooth – Headset	Transmission of acoustic signals to a headset via Bluetooth®
Bluetooth – DMA 35	Transmission of measured values from the density meter DMA 35 (version 4) from Anton Paar GmbH to the battery tester via Bluetooth®.
IrDA – DMA 35	Transmission of measured values from the density meter DMA 35 Basic (version 3) from Anton Paar GmbH to the battery tester via infrared.

Please refer to the full operating instructions for a complete description of how to perform the various measurements and how to display and transmit measured values (available at <http://www.gossenmetrawatt.com>).

5 Product Support

If required please contact:

Gossen Metrawatt GmbH

Product Support Hotline

Phone: +49-911-8602-0

Fax: +49-911-8602-709

E-mail: support@gossenmetrawatt.com

6 Repair and Replacement Parts Service / Calibration Center and Rental Instrument Service

If required please contact:

GMC-I Service GmbH

Service Center

Beuthener Str. 41

90471 Nürnberg, Germany

Phone: +49 911 817718-0

Fax: +49 911 817718-253

E-mail: service@gossenmetrawatt.com

Web: www.gmci-service.com

This address is only valid in Germany. Please contact our representatives or subsidiaries for service in other countries.

7 CE Declaration

The battery tester fulfills all requirements of applicable EU directives and national regulations. We confirm this with the CE mark. A factory calibration certificate or test report is included with the battery tester.



EU-KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY



Dokument-Nr./ Document-no: 20-001a
 Hersteller/ Manufacturer: Gossen Metrawatt GmbH
 Anschrift / Address: Südwestpark 15
 D - 90449 Nürnberg
 Produktbezeichnung/ Product name: Batterieprüfgerät
 Battery Tester
 Typ / Type: METRACELL BT PRO
 Artikel-Nr / Article no: B100A / B

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein, nachgewiesen durch die vollständige Einhaltung folgender Normen:

The above mentioned product has been manufactured according to the regulations of the following European directives proven through complete compliance with the following standards:

Nr. / No.	Richtlinie	Directive
2014/53/EU	Bereitstellung von Funkanlagen - RED Richtlinie – Anbringung der CE-Kennzeichnung : 2020	Making available of radio equipment - RED Directive - Attachment of CE mark : 2020

Anforderungen an die Sicherheit gemäß 2014/35/EU

Safety requirements according to 2014/35/EU

EN/Norm/Standard	IEC/Deutsche Norm	VDE-Klassifikation/Classification
EN 61010-1 : 2010	IEC 61010-1 : 2011	VDE 0411-1 : 2011

Anforderungen an die elektromagnetische Verträglichkeit gemäß 2014/30/EU

Requirements for electromagnetic compatibility according to 2014/30/EU

Grundnorm / Generic Standard
EN 61326-1 : 2013

Nürnberg, den 23.11.2020

Ort, Datum / Place, Date:

Geschäftsführung / Managing Director

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Die Sicherheitsanweisungen der mitgelieferten Produktdokumentationen sind zu beachten.

This declaration certifies compliance with the above mentioned directives but does not include a property guarantee. The safety notes given in the product documentations, which are part of the supply, must be observed.

8 Return and Disposal

This instrument is subject to directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE) and its German national equivalent implemented as the Waste Electrical and Electronic Equipment Act (ElektroG) on the marketing, return and environmentally sound disposal of electrical and electronic equipment. The instrument is a category 9 product (monitoring and control instrument) in accordance with ElektroG (German Waste Electrical and Electronic Equipment Act).



The symbol at the left indicates that this device and its electronic accessories must be disposed of in accordance with applicable legal regulations, and not together with household waste. In order to dispose of the device, bring it to a designated collection point or contact our product support department (☎ 14).

This instrument is also subject to directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators and its German national equivalent implemented as the Battery Act (BattG) on the marketing, return and environmentally sound disposal of batteries and accumulators.



The symbol at the left indicates that batteries and rechargeable batteries must be disposed of in accordance with applicable legal regulations. Batteries and rechargeable batteries may not be disposed of with household waste. In order to dispose of the batteries or rechargeable batteries, remove them from the instrument and bring them to a designated collection point.

Separate disposal and recycling conserves resources and protects our health and the environment.

Current and further information is available on our website at <http://www.gossenmetrawatt.com> under the search terms “WEEE” and “environmental protection”.

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