



Operating Instructions 3-349-729-15  
2/10.16

## METRALINE EXM25






GMC-I Messtechnik GmbH



- 1 Test electrodes of voltage measuring line (red conductor + /black conductor -)
- 2 Button DATA-HOLD
- 3 LED  $\Omega$  (green): 0 ... 10 k $\Omega$
- 4 LED Volt (red): 12 ... 1000 V
- 5 LCD display
- 6  $\perp$ -socket, black standard socket
- 7 7-pin universal connector for voltage measuring lines, temperature transmitter, clamp-on ammeter and power supply unit
- 8  $\Omega$ -socket, red standard socket for resistance measurements
- 9 A-socket, blue standard socket fuse socket for current measurements
- 10 ON/OFF button
- 11 Function button
- 12 Handgear

**Symbols on the instrument**

-  Attention! Observe user instructions!
-  Ex marking:  
Approved for potentially explosive atmospheres in accordance with ATEX (EN 60079-0 and EN 60079-11) see section 5.1
-  EC-conformity

## 1. Application

The METRALINE EXM25 is an intrinsically safe multimeter which can be used in areas with a potentially explosive atmosphere in accordance with ATEX (EN 60079-0 and EN 60079-11) and EN/IEC 61010 for voltage, resistance, current, frequency measurements with measurement accessories for measurement of temperature and high current. Model M210A with rechargeable battery and model M210B with Lithium battery.

### 1.1 Intended use

This device is intended for use in applications as described in the operating instructions only. Thus, it is imperative to observe the notes on safety and the technical data in conjunction with the ambient conditions.

Any other form of usage is not permitted and can lead to accidents or destruction of the unit. Any misuse will result in the expiry of all guarantee and warranty claims.

## 2. Safety Precautions

When used for its intended purpose, safety of the operator, as well as that of the instrument, is assured. The voltage measurement tips contain moulded multipliers within both test prods. They are extremely safe and comply with overvoltage category CAT IV. In order to maintain flawless technical safety conditions, and to assure safe use, it is imperative that you read these operating instructions thoroughly and carefully before placing your instrument into service, and that you follow all instructions contained therein.

- The device may only be used in the designated Ex zones (see section 5.1) and inside of the safety-related limit values (see section 5.2).
- Before starting resistance measurements make sure that the test object is at zero-potential.
- Perform voltage measurements most up to the following limits:  
With probes EXM 72010 up to 1000 V
- Faultless indication of display values is only guaranteed between -10 °C ... +40 °C.
- Hold the instrument by its handgears only, to avoid covering the display or touching the test electrodes.

- Only qualified persons may carry out work with these device. The user needs to be familiar with the risks for measuring and compliance with safety regulations and the proper use of the tester.
- Workings may only be performed with appropriate personal protective equipment. Observe the minimum object distance to other plant components that are energized or earthed and use personal protective equipment as specified by national accident prevention regulations (in Germany: DGUV regulation 3 previously BGV A3 or VDE 0105-100).
- The function of the measuring device must be checked briefly before and whenever possible after the use. Carry out the function test and check the instrument at a known voltage source (AC and DC). If the indication of one or several systems fails in the course of checking, the instrument must not be used again.
- The tester may only be dismantled by authorised personnel.
- Maintenance is only allowed by the manufacturer or explicitly authorised repair shops (see section 7).
- Before using the device check the housing and connecting line for visible damage. If damages are visible the voltage tester may not be placed into operation. In case of strong dirt contamination, the tester must be cleaned before use.
- The device has to be stored in a clean and dry environment.

### 3. Putting into operation

#### 3.1 Battery

Your instrument is already supplied with an energy-block. Solely use the following energyblocks:

**NiMH accumulator** for class I and II T4:

type Z209A EXM-AK9

**Lithium battery** for class I and II T6:

type Z209B EXM-LB3

#### Attention!

Please observe section 6 before initial startup or after your device has been in storage for a long period of time.

#### 3.2 Testing display and function

At every day of use the METRALINE EXM25 has to be checked to ensure that it works properly and faultlessly.

##### Self test 1 (Display test):

Press and hold button „ON/OFF“. All display segments light up on the display, additionally the V-LED and the  $\Omega$ -LED light up. When you release button „ON/OFF“, the value 000 ... 001 V is indicated on the display.

##### Self test 2 (Voltage measuring line):

Connect and lock the voltage measurement tips EXM 72010 to the 7-pin universal connector. Switch on the device. Display: 000..001 V, in the upper display line 1000 V. Put the test electrodes, one after another, inclined 5 mm into the W-socket. Display shows 'Test' and 'rdy' and green LED lights up.

##### Note:

In case the display continues showing 000 V the measurement tip is damaged, please exchange.

##### Self test 3 (Voltage indication):

Check functions at a known voltage source - e.g. a 230 V socket.

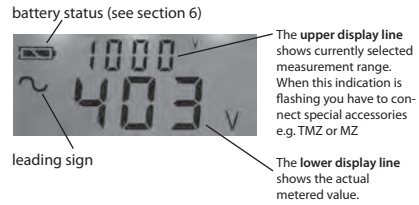
##### Self test 4 (Resistance measurement):

Put the standard test lines into the  $\Omega$ - and  $\perp$ -socket. Adjust the device to  $\Omega$ , display: OL k $\Omega$ , hold test prods together, display indication needs to be about 0.0  $\Omega$  and the green LED needs to light up.

#### Attention!

If indication of one or several systems fail in the course of performing the self test, if function standby is not indicated or if the device is damaged, the METRALINE EXM25 must not be used again.

**4. Measuring and testing**  
**4.1. General information**



The instrument is switched off automatically approximately 60 seconds after the last measurement in order to extend battery life. In the display the indication „off“ appears (exception: see section 4.6 frequency measurements). The backlight turns off when no measurement result is applied or when the battery is low.



With the ON/OFF button engaging the METRALINE EXM25 to voltage, call the display test and switch-off the device.



With the function button you can select the designated measurement range:

Function	upper display line
Voltage with tip EXM 72010	1000 V
Voltage, automatic range mV, V	AuTo
resistance	Ω
current	I
current with clamp-on ammeter	I flashes*
frequency	FrE
temperature with TMZ	T flashes*

\* When the measurement ranges are indicated by a flashing symbol the connection of special accessories is necessary, e.g. a clamp-on ammeter or the temperature transmitter

#### 4.2 Testing voltage and polarity

##### Attention!

Connect the voltage measurement tips to the 7-pin universal connector only when the device is switched-off. Switch-on the device not until they are locked and select rang if necessary.

Put both test prods with safe contact onto the metering point and the voltage value is indicated in the lower display line.

At a voltage of 12 V flashes the red LED and button functions are locked.

##### Notes:

- If Hold appears permanently, probably the tip has been attached when the device was switched-on. Switch METRALINE EXM25 off and on.
- Because of integrated multipliers the device indicates few mV while in open-circuit operation, this has no influence on the result of measurement.
- The METRALINE EXM25 casing is made of conductive material. We recommend unearthed operation for precise voltage measurements >100 Hz. Avoid contact with grounded parts, e.g. control cabinet. For this purpose, the use of a leather bag should be preferred.

##### 1000 V voltage range (1000 V)

The voltage range adjusts automatically to the used DATA-HOLD measurement tip EXM 72010.

The measurement range serves for a fast detection of measurement values between 0 to 1000 V without decimal places.

The display range of the METRALINE EXM25 extends to 1160 V AC / 1610 V DC with EXM 72010.

Observe the safety precautions (see section 2) for Ex-areas.

##### Automatic voltage range (AuTo)

The voltage range adjusts automatically to the used voltage measurement tip EXM 72010.

The measurement range serves for a fast detection of measurement values between 1 mV – 1000 V, the optimal measurement range is selected automatically.

##### Indication of polarity

Type of voltage is indicated by the symbols

~ and -. Direct voltage: is minus applied to the test prod with Hold button, the leading sign „-“ appears, is plus applied, no leading sign appears in front of the indicated value.

#### **HOLD function**

The maximum voltage value can be „stored“ on the display when activated the button „HOLD“. The value is recorded for approx. 30 seconds or until you press button „HOLD“ again. The Hold-function is stopped when again a voltage is impressed.

**Note:** When the measured value does not vary for 2 sec, then the maximum value is recorded.

#### **4.3 Resistance measurements ( $\Omega$ )**

Before taking any resistance measurements always check that the test object is at zero-potential. Connect 4 mm standard test lines to the  $\Omega$ - and  $\perp$ -socket. Adjust the device to  $\Omega$ . Ohm is indicated in the upper display line.

##### **Note:**

The arrow signalizes „out of measurement range“. The measurement range serves for a definite determination of impedances of 0,1  $\Omega$  – 20 M $\Omega$ . A selection between  $\Omega$ -, k $\Omega$ - and M $\Omega$  ranges occurs automatically after applying to the impedance. The green LED signalises resistance values that a lower than 10 k $\Omega$ .

#### **4.4 Current measurement (I)**

##### **Attention!**

You may perform current measurement in Ex-areas only in measuring circuits with peak values of maximum 50 V.

You may only measure currents up to maximum 2 A. Connect 4 mm standard test lines to the A- and  $\perp$ -socket.

The measurement range serves for measuring AC/DC currents in the range of 1 mA – 2 A.

A selection between mA and A occurs automatically after attaching the test prods.

##### **Attention!**

The moulded fuse activates with currents of more than 2 A.

The fuse can only be changed by the manufacturer (see section 7).

#### **4.5 Current measurement with clamp-on ammeter**

##### **MZ 1005 (I flashes)**

##### **Attention!**

Measurements with MZ 1005 are **only permissible in Ex I-areas.**

Please observe the separate user instructions of the clamp-on ammeter MZ 1005. Connect the MZ 1005 to the 7-pin universal connector.

Within the clamp-on ammeter range you can measure AC/DC currents between 0,1 and 1000 A, the optimal measurement range is selected automatically.

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#### 4.6 Frequency measurements (FrE)

Connect the voltage measurement tip EXM 72010 to the 7-pin universal connector.

The measurement range serves for measurements of frequencies in the range of 0,1 Hz – 10 kHz with voltages > 5 V. A selection between Hz and kHz occurs automatically after attaching the test prods.

**Note:**

While the device is in open-circuit operation the display may show 0,00 Hz/kHz  $\pm 1$  digit.

With low frequencies the measurement signal needs to be placed for a few seconds before it indicates a reliable value.

The automatic shut-down can be deactivated by interfering signals, e.g. because of low frequencies with attached measurement tips.

#### 4.7 Temperature measurements with TMZ 25 (T flashes)

Measurements with the intrinsically safe TMZ 25 and a Fe-CuNi-sensor are only permissible in Ex I- and Ex II-areas. Connect the TMZ 25 to the 7-pin universal connector and plug temperature sensor on the TMZ until it's caught.

With the TMZ 25 you can measure temperatures between - 80 and + 600 °C. The optimal measurement range is selected automatically.

**Note:**

With the universal sensor indication on the display is first readable after approx. 30 s, with surface sensors after approx. 10 s. Special sensors can be delivered.

## 5. Technical data METRALINE EXM25

### 5.1 Identification marking / Ex zones

EC-Type Examination Certificate  
BVS 13 ATEX E 089  
II 2G Ex ib IIC T4/T6 Gb  
I M2 Ex ib I Mb

### 5.2 Safety-related limit values

Intrinsically electric circuits  
Voltage (by  $U_{pp} = 50$  V tip) 2 A  
Internal inductance Li < 5  $\mu$ H

Voltage with measurement tips:

Type EXM 72010

Class IIC AC/DC  $\leq 690$  V with tip EXM 72010

Class IIB AC/DC  $\leq 690$  V with tip EXM 72010

Class I AC/DC  $\leq 1000$  V with tip EXM 72010

Resistance ranges maximum values in case of fault:

Voltage 6 V

Current 2 mA

Maximum permissible external  
capacitance/inductance:

Ex group IIC 40  $\mu$ F/1000mH

Ex group IIB 1000  $\mu$ F/1000mH

Ex group I 3000  $\mu$ F/1000mH

Frequency 2 up to 10 kHz

Current (up to 50 V  $U_{sc}$ ) 2 A  
internal inductance Li < 5  $\mu$ H

Energie source (moulded design):

NiMH accumulator

Type Typ **Z209A/T4**

Nominal voltage DC 8,4V

Maximum voltage  $U_0$  11,2V

Temperature range T4

Lithium battery

Type **EXM Z209B Li/T6**

Nominal voltage DC 3,6V

Maximum voltage  $U_0$  3,9V

Temperature range T6

Temperature with TMZ 25:

-80 °C <TA< +600 °C

Curent with clamp-on ammeter type MZ 1005:

(solely for class I)

AC/DC 1000 A

Frequency up to 500 Hz

### 5.3 Technical data METRALINE EXM25

#### Norm

EN 60079-0 and EN 60079-11 also

EN 61010-1 and 61010-031

#### EC type examination certificate

BVS 13 ATEX E 089

Ⓢ II 2G Ex ib IIC T6/T4 Gb & Ⓢ I M2 Ex ib I Mb

#### Nominal measurement ranges

usable in electricity networks group Ex I up to

1 kV, Ex IIB and Ex IIC up to 690 V

#### Direct current 1 kV with EXM 72010

red LED up to 12 V, LCD 3 1/2-digit:

1, 10, 100, 1000 V (1610 V),

± 1,5% + 3 digit, resolution 0,001 ... 1 V

#### Alternating voltage 1 kV with EXM 72010

red LED up to 12 V, LCD 3 1/2-digit, TRMS;

10, 100, 1000 V (1160 V)

± 1,5% + 3 digit up to 0 ... 100 Hz

± 5% + 5 digit up to 101 ... 500 Hz

resolution 0,01 ... 1 V

#### Input resistance with EXM 72010

2 MΩ distributed to 4 resistances,

moulded into DATA-HOLD test prods

#### Continuity/resistance

green LED LCD 3 1/2-digit

200, 2000 Ω

20, 200, 2000 kΩ, 2 MΩ, 20 MΩ ± 1 % + 5 digit,

resolution 0,1 Ω ... 10 kΩ

#### Current

AC/DC 1000 mA, 2 A ± 1 % + 2 digit,

resolution 1 ... 10 mA

#### Current with clamp

AC/DC 100, 1000 A, ± 1,5 % + 2/3 digit,

resolution 0,1 ... 1 A

#### Frequency

200, 2000 Hz ± 1 % + 2 digit, resolution 0,1 ... 1 Hz

10 kHz ± 3 % + 2 digit, resolution 0,01 kHz

#### Temperature with measurement accessory

-80 ... +150° C ± 1,5 % + 3 digit, resolution 0,1° C

-80 ... +600° C ± 1,5 % + 2 digit, resolution 1° C

#### Further functions

automatic selection of measurement range,

indication of function, self-test, automatic switch-off

**Power supply**

intrinsically safe energy source, exchangeable  
Li-battery (T6) or NiMH accu (T4)  
exchange in Ex-areas admitted

**Operating temperature**

- 10°C ... + 40° C

**Electromagnetic compatibility**

EMV requirements DIN-EN 61326

**Casing**

PA impact resistant, antistatic, LCD cover  
PC unbreakable

**Circuit points**

3 standard jacks  
7-pin universal connector

**Protection category**

IP 54, device can be used in moist environments

**Dimensions/weight**

85 x 180 x 38 mm / 335 g

**6. Maintainance**

The METRALINE EXM25 is completely maintainance-free except for ist own energy source (see section 6.1). Nevertheless, for safe operation observe the following information:

The METRALINE EXM25 is to be stored in a dry place. The plastic housing can be cleaned with a cloth dampened with alcohol (isopropyl) or soapy water.

**6.1 Battery status**

The latest status of the battery or the accumulator is symbolised by a 3 stage battery symbol in the display.



= battery full



= battery half-full.  
Many measurements still  
can be performed.



= batterie empty.  
The backlight deactivates  
automatically.

**Attention!**

When the empty battery symbol flashes, taking measurements is not possible anylonger. The battery needs to be exchanged or the accumulator recharged immediately.

**6.2 Change battery**

The change of battery is possible in Ex-areas.

Solely use the following energyblocks:

**Lithium battery for class I and II T6:**

type Z209B EXM-LB3

**NiMH accumulator for class I and II T4:**

type Z209A EXM-AK9

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### 6.3 Load accu

#### Attention!

Recharge accumulators outside of Ex-areas.

#### 6.3.1 Safety Precautions for loading

- The device NG4 is used to charge NiMH accumulators from GOSSEN METRAWATT (Art. no. Z209A) installed in the METRALINE EXM25.
- Lithium batteries (Art. no. Z209B) are not to be re-charged. Attempting to recharge them may cause risk to personal safety and damage to the equipment.
- The charging has to be stopped manually no later than 24 hours.
- The charger can only be connected to and operated with 230 V AC.
- The product is only to be used in dry indoor locations.
- avoid possible damage
- The charger and the connected METRALINE EXM25 should not be operated unattended.
- Ensure that the insulation of the housing or the main cable is neither damaged or destroyed.
- The charger may not be placed into operation, if the device exhibits visible damage or the device does not operate any longer.
- The batteries may not to be opened.
- Depleted batteries must not be disposed with the domestic waste. Please, return batteries at a local retailer or municipal recycling depot. Return is free of charge and required by law.

#### Technical data NG4:

Operating voltage:	230 V AC 50 Hz
Power input:	ca. 5 W
Charging current:	ca. 30 mA
Operating instructions:	0 ... + 40 °C rel. humidity < 75 % not condensing

#### 6.3.2 Recharge

Make sure a rechargeable accumulator (Art. no. Z209A) and no battery is installed in the METRALINE EXM25. Recharging occurs with the power supply unit NG4 without removing the accumulator from the METRALINE EXM25:

The NG4 is connected with the 7-pin universal connector of the EXM25 and put into the 230 V/50 Hz socket. Charging takes about 14 hours.

**Note:**

Accumulators were only shortly charged by the manufacturer. Before the first initial startup the akku should be charged for 14 hours . Full capacitance of NiMH accumulators ist first reached after 2 - 3 cycles of charging and discharging.

(BAT symbol = maximum half box)

The accumulator suffers damages with frequent supercharging.

**7. Maintenance****7.1 General information**

The METRALINE EXM25 is absolutely maintenance-free. Nevertheless, observe the following information in order to maintain safe operation: Always keep the voltage tester dry and clean. The housing can be cleaned with a cloth dampened with isopropyl (alcohol) or soapy water.

**7.2 Repeated inspection**

According to EN 61243-3 it is recommended to carry out repeated examinations.

It should not exceed the time-limit of 6 years.

Depending on operation conditions and frequency, a previous inspection may be recommendable.

The serial number with the date of manufacturing (WWYYNN=Week Year Number) is imprinted on the backside of the device. Repeated inspections are offered by the manufacturer and indicated by the inspection plate.

**7.3 Device Return and Environmentally Compatible Disposal**

The instrument is a category 9 product (monitoring and control instrument) in accordance with ElektroG (German Electrical and Electronic Device Law).

This device is subject to the RoHS directive.

We identify our electrical and electronic devices in accordance with WEEE 2012/19/EU and ElektroG with the symbol shown to the right per DIN EN 50419 .

These devices may not be disposed of with the trash. Please contact our service department regarding the return of old devices (address see chapter 8).

**8. Repair and Replacement Parts Service  
Calibration Center**

**10. Limited warranty and limitation of liability**

By continuous quality checks and production controls, most modern electronics and high quality materials we guarantee that the device will be free from defects in material and workmanship for three years.

This warranty does not cover batteries, improper handling, not intended purpose, opening the housing, improper storage or damages from accidents.

No other warranties such as fitness for a particular purpose will be given.

We are not liable for any indirect, incidental or consequential damages or losses arising from any cause or theory.

## 10. Accessories / Spares

### Leather bag EXM-LED

Art.no. Z209L

The case for the METRALINE EXM25 and the test cables is designed in such a way that the unit does not have to be taken out for measurements. Using the additional lugs and push-buttons on the shoulder strap and case the unit can be secured in a comfortable position to facilitate readings.



### Clamp-on ammeter MZ 1005

Art. no. Z209C

for current measurements of 0,1 – 1000 A  
only in Ex – I areas.

### Power supply unit NG64

Art. no. Z209P

for charging the accumulator

### NiMH accumulator EXM-AK9/T4

Art. no. Z209A

### Lithium battery EXM-LB3 Li/T6

Art. no. Z209B

### Temperature transmitter TMZ 25

Art. no. Z209T

between – 80 and + 600 °C in Ex-I and Ex-II areas

universal sensor EXM-TFU Art. no. Z209U

surface sensor EXM-TFO Art. no. Z209S

### Voltage measurement tips EXM 72010

Art. no. Z209V

up to 690 V Ex II and 1000 V Ex I:  
with DATA-HOLD button



## Quick user guide METRALINE EXM25



This quick user guide serves für a quick start. In regard of your own safety please observe safety-related Ex-characteristic values and for further information the detailed user instructions.

### 1 Attach tips or accessories



<p><b>Voltage</b> Ex-Group IIC ≤ 690 V +10 % IIB ≤ 690 V +10 % I ≤ 1000 V Temperature with TMZ Current with MZ</p>	<p><b>Resistance</b> 0,1Ω - 20 MΩ <b>Attention:</b> At first check voltage-free parts!</p>	<p><b>Current</b> 1 mA - 2 A <b>Attention:</b> Up to max. 50 V only!</p>
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### 2 Switching-on and self-test



On/Off/test

Select function

### 3 Select range/function

Function	upper display line
Voltage with tip EXM 72010	1000 V
Voltage, automatic range mV / V	AuTo
resistance	Ω
current	I
current with clamp-on ammeter	I flashes*
frequency	FrE
temperature with TMZ	T flashes*

battery status



leading sign

The upper display line shows currently selected measurement range.

The lower display line shows the actual metered value.

\*When the measurement ranges are indicated by a flashing symbol the connection of special accessories is necessary, e.g. clamp-on ammeter or temperature transmitter.