

## DATA SHEET

3-447-224-03

2/11.25

# METRALINE MF

INSTALLATION TESTER FOR TESTING THE EFFECTIVENESS OF PROTECTIVE MEASUREMENTS IN ELECTRICAL INSTALLATIONS PER IEC 60364-6, EN 61557 AND EN 50110-1 (DIN VDE 0100-600, DIN VDE 0105-100, VDE 0413)



- Installation tester for testing the electrical safety of installations per DIN VDE 0100 and EN 61557
- All-in-one instrument for all required measurements
- Easy-to-read 3½" color TFT display
- Memory for 1000 measurements
- PC software for generating test reports (Excel)
- Battery charging inside the instrument
- Automatic polarity reversal
- Convenient service functions (calibration reminder, firmware update via USB)

## APPLICATION

The METRALINE MF installation tester is a rugged, portable measuring instrument for testing electrical safety in residential buildings and in industrial applications, and for measurements at AC charging points. The device and all necessary accessories can be securely stowed away in the included carrying pouch and easily transported to various locations.

All measurements required for testing the electrical safety of installations in buildings can be performed with the multifunctional instrument.

## INCLUDED FEATURES

Measurement of:

- Loop resistance L-PE with calculation of short-circuit current
- Loop resistance L-N
- Low-resistance protective conductor continuity
- Insulation resistance
- Testing of type A, AC, B, B+ and F RCDs, as well as 6 mA DC (RDC-DD) for e-charging stations
- Voltage (TRMS)
- Phase sequence and frequency
- Earth resistance
- EVSE measurements

## DESCRIPTION OF FEATURES

### ALL-IN-ONE

A single instrument for all required measurements.

### FLEXIBLE USE

Portable, battery-operated, hand-held measuring instrument with carrying pouch for flexible use in various test environments

### EASY OPERATION

Large color TFT display with background illumination for quick reading of displays and measurement results. Simple and straightforward operation.

### EXTENSIVE ACCESSORIES

Includes a comprehensive range of accessories for conveniently performing all measurements required for testing the electrical safety of installations in buildings

### CONVENIENT DATA EVALUATION

Internal memory for 1000 measurements and PC software for generating external test reports

## TECHNICAL DATA

|                                            |                                |                                                                                                                                                                                                                                                       |
|--------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power Supply</b>                        |                                | 7,2 V DC (six 1.2 V AA rechargeable batteries)                                                                                                                                                                                                        |
| <b>Ambient Conditions</b>                  | Operating temperatures:        | 0 ... +40 °C                                                                                                                                                                                                                                          |
|                                            | Storage temperatures:          | -10 ... +70 °C                                                                                                                                                                                                                                        |
|                                            | Relative atmospheric humidity: | Max. 95%, no condensation allowed                                                                                                                                                                                                                     |
|                                            | Elevation:                     | Max. 2000 m                                                                                                                                                                                                                                           |
| <b>Electrical Safety</b>                   | Pollution degree:              | 2                                                                                                                                                                                                                                                     |
|                                            | Protection category:           | II                                                                                                                                                                                                                                                    |
|                                            | Surge protection:              | 600 V CAT III                                                                                                                                                                                                                                         |
|                                            |                                | 300 V CAT IV                                                                                                                                                                                                                                          |
| <b>Electromagnetic Compatibility (EMC)</b> | Interference emission:         | EN 61326-1, class B                                                                                                                                                                                                                                   |
|                                            | Interference immunity:         | DIN EN 61326-1 / IEC 61326-1<br>DIN EN 61326-2-33 / IEC 61326-2-33<br>EN 55011:2016 + A1:2017                                                                                                                                                         |
| <b>Mechanical Design</b>                   | Protection:                    | Housing: IP42<br>per DIN EN 60529 / IEC 60529<br>(protection against ingress of solid foreign objects: $\geq 1.0$ mm dia.,<br>protection against water ingress: protection against falling dripping water,<br>when the housing is inclined up to 15°) |
|                                            | Housing (W × H × D):           | Approx. 25 × 10.7 × 13.5 cm                                                                                                                                                                                                                           |
|                                            | Weight:                        | Approx. 1.30 kg<br>(without rechargeable batteries)                                                                                                                                                                                                   |
|                                            | Display:                       | 480 × 320 TFT LCD                                                                                                                                                                                                                                     |
| <b>Data Interfaces</b>                     | COM port:                      | USB                                                                                                                                                                                                                                                   |
| <b>Internal Memory</b>                     |                                | 1000 measurements                                                                                                                                                                                                                                     |

## RELEVANT STANDARDS

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

|                               |                                                                                                                                                                                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DIN EN 60529<br>IEC 60529     | Test instruments and test procedures<br>Degrees of protection provided by enclosures (IP code)                                                                                                                         |
| DIN EN 61010-1<br>IEC 61010-1 | Safety requirements for electrical equipment for measurement, control and laboratory use –<br>Part 1: General requirements                                                                                             |
| DIN EN 61010-031              | Safety requirements for electrical equipment for measurement, control and laboratory use –<br>Part 031: Safety requirements for hand-held and hand-manipulated probe assemblies for electrical<br>test and measurement |
| DIN EN IEC 61326-1            | Electrical equipment for measurement, control and laboratory use – EMC requirements –<br>Part 1: General requirements                                                                                                  |
| DIN EN IEC 61557-1            | Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC –<br>Equipment for testing, measuring or monitoring of protective measures –<br>Part 1: General requirements (IEC 61557-1:2019)    |
| IEC 62955                     | Residual direct current detecting device (RDC-DD) to be used for mode 3 charging of electric vehicles                                                                                                                  |

## CHARACTERISTIC VALUES

| Function                            | Measured Quantity                     | Measuring Range                                                                           |
|-------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------|
| Continuity ( $R_{LO}$ )             | Test current: 7 mA (2-wire method)    | 0.0 $\Omega$ ... 1999 $\Omega$                                                            |
|                                     | Test current: 200 mA (2-wire method)  | 0.00 $\Omega$ ... 1999 $\Omega$                                                           |
| Insulation resistance ( $R_{INS}$ ) | Test voltages: 50, 100 and 250 V      | 0.000 M $\Omega$ ... 199.9 M $\Omega$                                                     |
|                                     | Test voltages: 500 and 1000 V         | 0.000 M $\Omega$ ... 999 M $\Omega$                                                       |
| RCD                                 | $U_c$                                 | 0.0 V ... 99.9 V                                                                          |
|                                     | $t$                                   | 0.0 ms ... 500.0 ms                                                                       |
|                                     | $I$ (ramp)                            | $0.2 \times I_{\Delta N} \dots 1.1 \times I_{\Delta N}$ (AC)                              |
|                                     |                                       | $0.2 \times I_{\Delta N} \dots 1.5 \times I_{\Delta N}$ (A), ( $I_{\Delta N} \geq 30$ mA) |
|                                     |                                       | $0.2 \times I_{\Delta N} \dots 2.2 \times I_{\Delta N}$ (A), ( $I_{\Delta N} < 30$ mA)    |
|                                     |                                       | $0.2 \times I_{\Delta N} \dots 2.2 \times I_{\Delta N}$ (B)                               |
| Impedance ( $Z_L$ )                 | $Z_{line}$ L-L, L-N, $I_{psc}$        | 0.0 $\Omega$ ... 9999 $\Omega$                                                            |
|                                     | $Z_{loop}$ L-PE, $I_{pfc}$            | 0.0 $\Omega$ ... 9999 $\Omega$                                                            |
|                                     | $Z_{loop}$ L-PE, $I_{pfc}$ , non-trip | 0.0 $\Omega$ ... 9999 $\Omega$                                                            |
| Voltage (V)                         | TRMS                                  | 0 V ... 550 V                                                                             |
|                                     | Frequency                             | 10.0 Hz ... 499.9 Hz                                                                      |
| Rotary field                        | TRMS                                  | 50 V AC ... 550 V AC                                                                      |
|                                     |                                       | 45 Hz ... 400 Hz                                                                          |
| Earthing resistance ( $R_E$ )       | 3-wire method, 4-wire method          | 0.00 $\Omega$ ... 9999 $\Omega$                                                           |
|                                     | Soil resistivity                      | 0.0 $\Omega$ ... 9999 $\Omega$                                                            |

## SCOPE OF DELIVERY

Standard Scope of Delivery:

|   |                                                                       |                                                                                                                                 |
|---|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1 | METRALINE MF (M520F)                                                  |                                                                                                                                 |
| 1 | Carrying pouch                                                        |                                                                                                                                 |
| 3 | Measurement cables, 1 m ea.                                           |                                                                                                                                 |
| 1 | Measurement cable with earthing contact plug                          |                                                                                                                                 |
| 3 | Test Probes                                                           |                                                                                                                                 |
| 3 | Alligator clips                                                       |                                                                                                                                 |
| 1 | USB cable, type A to type B                                           |                                                                                                                                 |
| 6 | 1.2 V rechargeable batteries                                          |                                                                                                                                 |
| 1 | Power pack                                                            |                                                                                                                                 |
| 1 | Remote Probe (Test lead with test button for triggering measurements) |                                                                                                                                 |
| 1 | Condensed operating instructions                                      |                                                                                                                                 |
| 1 | Operating instructions (download)                                     | <a href="https://www.gmc-instruments.de/services/download-center/">https://www.gmc-instruments.de/services/download-center/</a> |
| 1 | METRAreport software (download)                                       | <a href="https://www.gossenmetrawatt.de/services/mygmc/">https://www.gossenmetrawatt.de/services/mygmc/</a>                     |

Available accessories ⇒ "Order Information" 4.

Instrument sets with additional accessories ⇒ "Scope of Delivery" 4.

## ORDER INFORMATION

### INSTRUMENT

| Type         | Description                                                                                                                                                                                                     | Article Number |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| METRALINE MF | Installation tester for testing the effectiveness of protective measurements in electrical installations in accordance with IEC 60364-6, EN 61557 and EN 50110-1 (DIN VDE 0100-600, DIN VDE 0105-100, VDE 0413) | M520F          |

### ACCESSORIES

| Description                                                | Article Number |
|------------------------------------------------------------|----------------|
| Remote Probe                                               | Z520A          |
| Probe Set (3 test leads, 3 crocodile clips, 3 test probes) | Z520B          |
| Charger                                                    | Z520C          |
| Accu Set (6 units)                                         | Z520D          |
| Test lead with the SCHUKO Adapter                          | Z520E          |

| Description                   | Article Number |
|-------------------------------|----------------|
| Test lead with the UK Adapter | Z520F          |
| Test lead with the CH Adapter | Z520G          |
| Test lead with the US Adapter | Z520H          |
| Carrying pouch                | Z520T          |
| E set                         | Z590R          |
|                               |                |

Further information is available:

- our Measuring Instruments and Testers catalog
- on the Internet at [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)



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