

# CALIBRATION CERTIFICATE

Number: E-26-0164

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|                          |                                                                                                                                                                                                                                                    |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Customer                 | <b>Electro Power Solution SH.P.K</b><br><b>RRUGA "DIBRES", KOMPLEKSI "HALILI"</b><br><b>1015 Tirane, Albania</b>                                                                                                                                   |
| Instrument               | <b>Insulation resistance tester</b>                                                                                                                                                                                                                |
| Manufacturer             | <b>Metrel</b>                                                                                                                                                                                                                                      |
| Type                     | <b>MI 3210 TeraOhmXA 10kV</b>                                                                                                                                                                                                                      |
| Serial No.               | <b>23110169</b>                                                                                                                                                                                                                                    |
| Calibration procedure    | Calibration was carried out by comparison of values indicated, or set, on the object calibrated, with values of measurands, realized with measurement standards. Detailed descriptions, where necessary, are given along with measurement results. |
| Environmental conditions | Temperature: 23 °C ± 1 °C    Relative humidity: 30 % ± 10 %                                                                                                                                                                                        |
| Date of calibration      | <b>2026-01-29</b>                                                                                                                                                                                                                                  |
| Calibration results      | are given on the following pages                                                                                                                                                                                                                   |

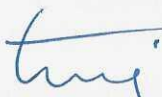
This calibration certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI). The SA is one of the signatories of multilateral agreements of the European co-operation for Accreditation (EA) and of the International Laboratory Accreditation Cooperation (ILAC) for the mutual recognition of calibration certificates. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by coverage factor  $k=2$ , which for a nominal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA Publication EA-4/02.

Performed by:

Approved by:

Date of issue:

Head of Calibration Laboratory

**Tine Žnidaršič****Jure Božnar****2026-01-29**

Reproduction of the complete certificate is allowed. Parts of the certificate may only be reproduced with written approval of the calibration laboratory. This certificate is issued provided that the Slovenian Accreditation do not assume any liability.

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**Object calibrated (UUC):**

Insulation resistance tester

Calibrated parameters:

- DC voltage
- AC voltage
- DC current
- DC resistance

**Calibration procedure:**

- L-KP-DCV
- L-KP-ACV
- L-KP-DCI
- L-KP-DCR

Metrel template: Merilnik izolacije Metrel MI 3210 TeraOhmXA 10kV\_a4

The calibration was carried out with multifunction calibrator, resistor decades and digital multimeter.

**Measurement conditions:**

For the purpose of temperature stabilization, the UUC was stored in the measurement room prior to calibration for at least four hours.

UUC power supply: 230 V / 50 Hz

Calibration was performed using test leads/accessories owned by calibration laboratory.

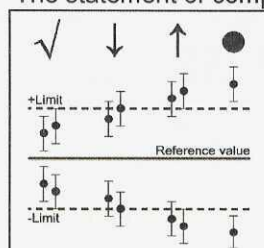
**The tables includes following data:**

|             |                                                |
|-------------|------------------------------------------------|
| Range       | Set on UUC (function, subfunction)             |
| Reference   | set or indicated value on the standard         |
| UUC         | set or indicated value on the calibration item |
| Uncertainty | expanded measurement uncertainty ( $k = 2$ )   |
| Error       | UUC - Reference                                |
| Limit       | limit of error, specifications                 |

Limits of error for individual measured parameters are stated along with the measurement results and are calculated from manufacturer's specification given in:

Metrel, TeraOhmXA 10 kV, MI 3210, Version 1.2, coda Nr. 20 752 390

The statement of compliance is based on a 95% coverage probability for the expanded uncertainty.



√ - Compliance with the specification limit.

● - Non-compliance with the specification limit.

↓ - It is not possible to state compliance although the error is within the limit.

↑ - It is not possible to state non-compliance although the error is outside the limit.

Measurement results and their respective uncertainties refer to the measurements carried out during calibration and have no implication to the long term stability of the object. The results relate only to the object of calibration.

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## MEASUREMENT RESULTS

### 1. DC VOLTAGE

| Range<br>V | Reference<br>V | UUC<br>V | Uncertainty<br>V | Error<br>V | Limit<br>V |   |
|------------|----------------|----------|------------------|------------|------------|---|
| 49,9       | 40             | 39,7     | 0,1              | -0,3       | ± 1,0      | ✓ |
| 550        | 100            | 100      | 1                | 0          | ± 4        | ✓ |
| 550        | 230            | 230      | 1                | 0          | ± 7        | ✓ |

### 2. AC VOLTAGE

| Range<br>V | Reference<br>V | Frequency<br>Hz | UUC<br>V | Uncertainty<br>V | Error<br>V | Limit<br>V |   |
|------------|----------------|-----------------|----------|------------------|------------|------------|---|
| 49,9       | 40             | 50              | 39,8     | 0,2              | -0,2       | ± 1,0      | ✓ |
| 550        | 230            | 50              | 230      | 1                | 0          | ± 7        | ✓ |

### 3. INSULATION RESISTANCE

#### Resistance

| Range<br>MΩ | Test voltage<br>V | Reference<br>MΩ | UUC<br>MΩ | Uncertainty<br>MΩ | Error<br>MΩ | Limit<br>MΩ |   |
|-------------|-------------------|-----------------|-----------|-------------------|-------------|-------------|---|
| 9,99        | 50                | 1               | 1,00      | 0,01              | 0,00        | ± 0,08      | ✓ |
| 9,99        | 100               | 1               | 1,00      | 0,01              | 0,00        | ± 0,08      | ✓ |
| 9,99        | 250               | 1               | 1,00      | 0,01              | 0,00        | ± 0,08      | ✓ |
| 9,99        | 500               | 0,5             | 0,50      | 0,01              | 0,00        | ± 0,06      | ✓ |
| 9,99        | 1000              | 1               | 1,00      | 0,01              | 0,00        | ± 0,08      | ✓ |
| 9,99        | 1000              | 5               | 4,99      | 0,03              | -0,01       | ± 0,28      | ✓ |
| 99,9        | 1000              | 50              | 50,1      | 0,4               | 0,1         | ± 2,8       | ✓ |
| 999         | 1000              | 500             | 498       | 3                 | -2          | ± 28        | ✓ |
| GΩ          |                   | GΩ              | GΩ        | GΩ                | GΩ          | GΩ          |   |
| 9,99        | 1000              | 5               | 4,99      | 0,03              | -0,01       | ± 0,28      | ✓ |
| 99,9        | 1000              | 50              | 50,1      | 0,5               | 0,1         | ± 2,8       | ✓ |
| 999         | 1000              | 499             | 528       | 15                | 29          | ± 76        | ✓ |
| 9,99        | 2500              | 5               | 4,99      | 0,03              | -0,01       | ± 0,28      | ✓ |
| 99,9        | 2500              | 50              | 50,0      | 0,3               | 0,0         | ± 2,8       | ✓ |
| 999         | 2500              | 499             | 521       | 8                 | 22          | ± 76        | ✓ |
| TΩ          |                   | TΩ              | TΩ        | TΩ                | TΩ          | TΩ          |   |
| 10          | 5000              | 3,2             | 3,4       | 0,3               | 0,2         | ± 0,6       | ✓ |
| 10          | 10000             | 5,2             | 5,5       | 0,2               | 0,3         | ± 0,9       | ✓ |

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## DC test voltage

| Test voltage<br>V | Load<br>MΩ | Reference<br>V | UUC<br>V | Uncertainty<br>V | Error<br>V | Limit<br>V |   |
|-------------------|------------|----------------|----------|------------------|------------|------------|---|
| 50                | 100        | 55             | 55       | 1                | 0          | ± 6        | √ |
| 100               | 100        | 110            | 111      | 1                | 1          | ± 9        | √ |
| 250               | 100        | 262            | 264      | 2                | 2          | ± 16       | √ |
| 500               | 100        | 514            | 517      | 4                | 3          | ± 29       | √ |
| kV                | MΩ         | kV             | kV       | kV               | kV         | kV         |   |
| 1                 | 100        | 1,04           | 1,05     | 0,01             | 0,01       | ± 0,08     | √ |
| 2,5               | 100        | 2,54           | 2,56     | 0,02             | 0,02       | ± 0,16     | √ |
| 5                 | 100        | 5,05           | 5,09     | 0,03             | 0,04       | ± 0,28     | √ |
| 10                | 100        | 10,1           | 10,2     | 0,1              | 0,1        | ± 0,8      | √ |

## DC test current at test voltage 1000 V.

| Nominal<br>V | Load<br>MΩ | Reference<br>mA | UUC<br>mA | Uncertainty<br>mA | Error<br>mA | Limit<br>mA |   |
|--------------|------------|-----------------|-----------|-------------------|-------------|-------------|---|
| 1000         | 0          | 5,06            | >5        | 0,02              |             |             | √ |
| 1000         | 1          | 1,04            | 1,05      | 0,01              | 0,01        | ± 0,08      | √ |