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SIST EN ISO/IEC 17025
LK-011

The results marked by # relate to **non-accredited** activity

CALIBRATION CERTIFICATE

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Customer	**Electro Power Solution SH.P.K** **RRUGA "DIBRES", KOMPLEKSI "HALILI"** **1015 Tirane, Albania**
Instrument	**WR Analyser**
Manufacturer	**Metrel**
Type	**MI 3281**
Serial No.	**22510864**
Calibration procedure	Calibration was carried out by comparision 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: 21.9 °C ± 1 °C Relative humidity: 40 % ± 10 %
Date of calibration	**2026-02-12**
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: Head of Calibration Laboratory	Date of issue:
Matic Rodošek	**Jure Božnar**	**2026-02-12**

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Merilna in testna oprema d.o.o.
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Object calibrated (UUC):
WR Analyser
Calibrated parameters:
- DC current
- Resistance

Calibration procedure:
- L-KP-DCI
- L-KP-DCR

Metrel template: WR Analyser Metrel MI 3281_a1

The calibration was carried out with resistor decades and multimeter.

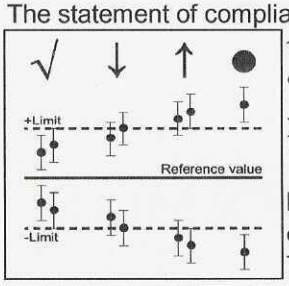
Measurement conditions:
For the purpose of temperature stabilization, the UUC was stored in the measurement room prior to calibration for at least four hours.
UUC power supply: 230 V ± 5 V, 50 Hz
Calibration was performed using test leads/accessories owned by calibration laboratory.

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:
MI 3281 WR Analyser, Instruction manual, Ver.1.5.6, code no. 20753098

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.

MEASUREMENT RESULTS

1. Rwind
Resistance (1 Phase)
UUC set-up: TAP name 1, Side to measure H, Average 10 s, Temp conversion Disable

Range	Reference	Test current	UUC	Uncertainty	Error	Limit	
µΩ	µΩ	A	µΩ	µΩ	µΩ	µΩ	
RH; 1999,9	502,4	10	503,9	1,5	1,5	± 3,3	√
RX; 1999,9	502,4	10 *	503,1	1,5	0,7	± 3,3	√
RH; 1999,9	502,4	20 #	503,6	1,5	1,2	± 3,3	√

 # - measurement not within the scope of accredited capabilities
** Side to measure X*

mΩ	mΩ	A	mΩ	mΩ	mΩ	mΩ	
RH; 19,999	0,500	1	0,516	0,002	0,016	± 0,021	√
RH; 19,999	0,500	5	0,505	0,002	0,005	± 0,021	√
RH; 1999,9	20,2	0,01	21,6	0,1	1,4	± 2,1	√
RH; 199,99	20,15	0,1	20,29	0,06	0,14	± 0,25	√
RH; 199,99	20,15	1	20,17	0,06	0,02	± 0,25	√
RH; 199,99	20,15	5	20,16	0,06	0,01	± 0,25	√
RH; 199,99	20,15	20 #	20,16	0,06	0,01	± 0,25	√
RH; 1999,9	1004,2	1	1004,9	2,4	0,7	± 4,5	√
RH; 1999,9	1004,2	5	1005,0	2,4	0,8	± 4,5	√
RH; 1999,9	1004,2	10	1004,3	2,4	0,1	± 4,5	√
RH; 1999,9	1004,2	20 #	1004,3	2,4	0,1	± 4,5	√

 # - measurement not within the scope of accredited capabilities

Ω	Ω	A	Ω	Ω	Ω	Ω	
RH; 999,9	907,0	0,01	904,4	0,3	-2,6	± 3,3	√

kΩ	kΩ	A	kΩ	kΩ	kΩ	kΩ	
RH; 9,999	9,099	0,01	8,969	0,003	-0,130	± 0,382	√

Test current I
Restistance: 20 mΩ

Reference	UUC	Uncertainty	Error
mA	mA	mA	mA
9,07	9,09	0,04	0,02
104	104	1	0
995	996	9	1

A	A	A	A
4,86	4,86	0,04	0,00
9,60	9,59	0,06	-0,01
14,3	14,3	0,1	0,0
19,1	19,1	0,2	0,0

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CALIBRATION CERTIFICATE

Resistance (3 Phases)

UUC set-up: H-X Configuration Y-y, Vector Group Yy0, TAP name 1, Side to measure Both, Average 10 s, Temp Conversion Disable

Range	Reference	Test current	UUC	Uncertainty	Error	Limit	
Ω	Ω	A	Ω	Ω	Ω	Ω	
RH12; 19,999	2,002	1	2,004	0,005	0,002	± 0,025	√
RH23; 19,999	2,000	1	2,001	0,005	0,001	± 0,025	√
RH31; 19,999	2,007	1	2,008	0,005	0,001	± 0,025	√
mΩ	mΩ	A	mΩ	mΩ	mΩ	mΩ	
RX12; 1999,9	999,0	1	1000,5	2,4	1,5	± 4,5	√
RX23; 1999,9	998,5	1	1000,2	2,4	1,7	± 4,5	√
RX31; 1999,9	1001,5	1	1003,2	2,4	1,7	± 4,5	√