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PRILOGA K AKREDITACIJSKI LISTINI ***Annex to the accreditation certificate***

LK-011

1 AKREDITIRANI ORGAN / ACCREDITED BODY

METREL DUS d.d.
Ljubljanska cesta 77, 1354 Horjul
Kalibracijski laboratorij

2 STANDARD

SIST EN ISO/IEC 17025:2005

3 OBSEG AKREDITACIJE / SCOPE OF ACCREDITATION

V okviru te akreditacijske listine Slovenska akreditacija priznava akreditiranemu organu usposobljenost za opravljanje naslednjih dejavnosti: / *SA hereby acknowledges the accredited body as being competent for performing the following activities:*

3.1 Skrajšani opis obsega akreditacije / A short description of the scope

Kalibriranje na naslednjih področjih za našeta podpodročja (z oznako šifre harmonizirane klasifikacijske sheme EA): / *Calibration in the following fields for the enumerated sub-fields (including indication of the code of the harmonised EA classification scheme):*

- Elektriške veličine / *Electrical Quantities (1):*
 - Enosmerne in NF elektromagnetne veličine / *DC/LF Quantities (1.1):*



- napetost / *voltage* (1.1.1): enosmerna napetost, izmenična napetost, visoka napetost (DC, AC) / *DC voltage, AC voltage, High voltage (DC, AC)*;
- tok / *Current* (1.1.2): enosmerni tok, izmenični tok / *DC current, AC current*;
- upornost / *Resistance* (1.1.6): za enosmerni tok, za izmenični tok, impedanca zanke / *DC resistance, AC resistance, Loop impedance*
- Čas in frekvenca / *Time and frequency* (3):
 - Čas / *Time* (3.1):
 - časovni interval / *Time interval* (3.1.1);
 - frekvenca / *Frequency* (3.2).



3.2 Podrobni opis obsega akreditacije / Detailed scope of accreditation

3.2.1 Kalibracijski laboratorij, Ljubljanska cesta 77, 1354 Horjul

Tabela 1 / Table 1 - kalibracije v laboratoriju / in-lab calibrations

| Merjena veličina in območje <i>Measured quantity, range</i> | Frekvenca <i>Frequency</i> | Kalibracijska in merilna zmogljivost (CMC) izražena kot razširjena negotovost (Calibration and measurement Capability (CMC) Expressed as an Expanded Uncertainty)* | Opombe <i>Remarks</i> |
|--|--|---|---|
| 1 | ELEKTRIŠKE VELIČINE / Electrical Quantities | | |
| 1.1 | ENOSMERNE IN NF VELIČINE / DC/LF Quantities | | |
| 1.1.1 | Napetost / Voltage | | |
| 1.1.1.1 | Enosmerna napetost / DC Voltage <i>(U – merjena napetost / U - measured voltage)</i> | | |
| | 0 mV do/to 0,20 V | $0,15 \mu\text{V} + 6,1 \cdot 10^{-6} \cdot U$ | merjenje in generiranje / measuring and generating |
| | > 0,2 V do/to 2 V | $0,4 \mu\text{V} + 3,6 \cdot 10^{-6} \cdot U$ | |
| | > 2 V do/to 20 V | $4 \mu\text{V} + 3,6 \cdot 10^{-6} \cdot U$ | |
| | > 20 V do/to 200 V | $40 \mu\text{V} + 5,6 \cdot 10^{-6} \cdot U$ | |
| | > 200 V do/to 1050 V | $0,5 \text{ mV} + 5,6 \cdot 10^{-6} \cdot U$ | |
| 1.1.1.2 | Izmenična napetost / AC Voltage <i>(U – merjena napetost / U - measured voltage)</i> | | |
| | > 10 mV do/to 0,2 V | (50 do/to 100) Hz $4,1 \mu\text{V} + 12 \cdot 10^{-5} \cdot U$ | merjenje in generiranje / measuring and generating |
| | | > 100 Hz do/to 2 kHz $3,0 \mu\text{V} + 12 \cdot 10^{-5} \cdot U$ | |
| | | > (2 do/to 10) kHz $4,1 \mu\text{V} + 14 \cdot 10^{-5} \cdot U$ | |
| | | > (10 do/to 30) kHz $8,1 \mu\text{V} + 34 \cdot 10^{-5} \cdot U$ | |
| | | > (30 do/to 50) kHz $20 \mu\text{V} + 77 \cdot 10^{-5} \cdot U$ | |
| | > 0,2 V do/to 2 V | (20 do/to 40) Hz $20 \mu\text{V} + 12 \cdot 10^{-5} \cdot U$ | |
| | | (40 do/to 100) Hz $20 \mu\text{V} + 90 \cdot 10^{-6} \cdot U$ | |
| | | > 100 Hz do/to 2 kHz $20 \mu\text{V} + 75 \cdot 10^{-6} \cdot U$ | |
| | | > (2 k do/to 10) kHz $24 \mu\text{V} + 11 \cdot 10^{-5} \cdot U$ | |
| | | > (10 do/to 30) kHz $40 \mu\text{V} + 22 \cdot 10^{-5} \cdot U$ | |
| | | > (30 do/to 100) kHz $200 \mu\text{V} + 57 \cdot 10^{-5} \cdot U$ | |
| | > 2 V do/to 20 V | (20 do/to 40) Hz $200 \mu\text{V} + 12 \cdot 10^{-5} \cdot U$ | |
| | | > (40 do/to 100) Hz $200 \mu\text{V} + 90 \cdot 10^{-6} \cdot U$ | |
| | | > 100 Hz do/to 2 kHz $200 \mu\text{V} + 75 \cdot 10^{-6} \cdot U$ | |
| | | > (2 do/to 10) kHz $250 \mu\text{V} + 11 \cdot 10^{-5} \cdot U$ | |
| | | > (10 do/to 30) kHz $400 \mu\text{V} + 22 \cdot 10^{-5} \cdot U$ | |
| | | > (30 do/to 100) kHz $2,0 \text{ mV} + 57 \cdot 10^{-5} \cdot U$ | |
| | > 20 V do/to 200 V | (20 do/to 40) Hz $2,0 \text{ mV} + 12 \cdot 10^{-5} \cdot U$ | |
| | | > (40 do/to 100) Hz $1,9 \text{ mV} + 95 \cdot 10^{-6} \cdot U$ | |
| | | > 100 Hz do/to 2 kHz $2,0 \text{ mV} + 80 \cdot 10^{-6} \cdot U$ | |
| | | > (2 do/to 10) kHz $2,0 \text{ mV} + 11 \cdot 10^{-5} \cdot U$ | |
| | | > (10 do/to 30) kHz $4,0 \text{ mV} + 22 \cdot 10^{-5} \cdot U$ | |
| | > 200 V do/to 1050 V | 40 Hz do/to 10 kHz $20 \text{ mV} + 13 \cdot 10^{-5} \cdot U$ | |
| | > 10 mV do/to 0,2 V | (10 do/to 40) Hz $4,1 \mu\text{V} + 15 \cdot 10^{-5} \cdot U$ | merjenje / measuring |
| | | > (40 do/to 100) Hz $4,1 \mu\text{V} + 12 \cdot 10^{-5} \cdot U$ | |
| | | > 100 Hz do/to 2 kHz $3,0 \mu\text{V} + 12 \cdot 10^{-5} \cdot U$ | |
| | | > (2 do/to 10) kHz $4,1 \mu\text{V} + 14 \cdot 10^{-5} \cdot U$ | |
| | | > (10 do/to 30) kHz $8,1 \mu\text{V} + 34 \cdot 10^{-5} \cdot U$ | |
| | | > (30 do/to 100) kHz $20 \mu\text{V} + 77 \cdot 10^{-5} \cdot U$ | |
| | > 0,2 V do/to 2 V | (10 do/to 40) Hz $20 \mu\text{V} + 12 \cdot 10^{-5} \cdot U$ | |
| | | > (40 do/to 100) Hz $20 \mu\text{V} + 90 \cdot 10^{-6} \cdot U$ | |
| | | > 100 Hz do/to 2 kHz $20 \mu\text{V} + 75 \cdot 10^{-6} \cdot U$ | |
| | | > (2 do/to 10) kHz $24 \mu\text{V} + 11 \cdot 10^{-5} \cdot U$ | |
| | | > (10 do/to 30) kHz $40 \mu\text{V} + 22 \cdot 10^{-5} \cdot U$ | |
| | | > (30 do/to 100) kHz $200 \mu\text{V} + 57 \cdot 10^{-5} \cdot U$ | |
| | | > (100 do/to 300) kHz $2,0 \text{ mV} + 30 \cdot 10^{-4} \cdot U$ | |
| | | > 300 kHz do/to 1 MHz $20 \text{ mV} + 10 \cdot 10^{-3} \cdot U$ | |



| Merjena veličina in območje Measured quantity, range | Frekvenca Frequency | Kalibracijska in merilna zmogljivost (CMC) izražena kot razširjena negotovost (Calibration and measurement Capability (CMC) Expressed as an Expanded Uncertainty)* | Opombe Remarks | |
|---|------------------------|---|---|---|
| > 2V do/to 20 V | (10 do/to 40) Hz | $200 \mu\text{V} + 12 \cdot 10^{-5} \cdot U$ | | |
| | > (40 do/to 100) Hz | $200 \mu\text{V} + 90 \cdot 10^{-6} \cdot U$ | | |
| | > 100 Hz do/to 2 kHz | $200 \mu\text{V} + 75 \cdot 10^{-6} \cdot U$ | | |
| | > (2 do/to 10) kHz | $250 \mu\text{V} + 11 \cdot 10^{-5} \cdot U$ | | |
| | > (10 do/to 30) kHz | $400 \mu\text{V} + 22 \cdot 10^{-5} \cdot U$ | | |
| | > (30 do/to 100) kHz | $2,0 \text{ mV} + 57 \cdot 10^{-5} \cdot U$ | | |
| | > (100 do/to 300) kHz | $20 \text{ mV} + 30 \cdot 10^{-4} \cdot U$ | | |
| | > 300 kHz do/to 1 MHz | $200 \text{ mV} + 10 \cdot 10^{-3} \cdot U$ | | |
| | > 20V do/to 200 V | (10 do/to 40) Hz | | $2,0 \text{ mV} + 12 \cdot 10^{-5} \cdot U$ |
| | | > (40 do/to 100) Hz | | $1,9 \text{ mV} + 95 \cdot 10^{-6} \cdot U$ |
| | | > 100 Hz do/to 2 kHz | | $2,0 \text{ mV} + 80 \cdot 10^{-6} \cdot U$ |
| | | > (2 do/to 10) kHz | | $2,0 \text{ mV} + 11 \cdot 10^{-5} \cdot U$ |
| | | > (10 do/to 30) kHz | | $4,0 \text{ mV} + 22 \cdot 10^{-5} \cdot U$ |
| | | > (30 do/to 100) kHz | | $20 \text{ mV} + 57 \cdot 10^{-5} \cdot U$ |
| > 200 V do/to 1050 V | 40 Hz do/to 10 kHz | $20 \text{ mV} + 13 \cdot 10^{-5} \cdot U$ | | |
| | > (10 do/to 30) kHz | $39 \text{ mV} + 23 \cdot 10^{-5} \cdot U$ | | |
| 1.1.1.3 Visoka napetost / High Voltage | | | | |
| Enosmerna visoka napetost / DC High Voltage | | | | |
| 1 kV do/to 10,5 kV | | $3,5 \cdot 10^{-3} \cdot U$ | merjenje in generiranje / measuring and generating | |
| Izmenična visoka napetost / AC High Voltage | | | | |
| 1 kV do/to 6 kV | 50 Hz | $0,9 \text{ V} + 10 \cdot 10^{-3} \cdot U$ | merjenje in generiranje / measuring and generating (z napetostnim transformatorjem / with voltage transformer) | |
| 1.1.2 Tok / Current | | | | |
| 1.1.2.1 Enosmerni tok / DC Current (<i>I</i> – merjeni tok / <i>I</i> – measured current) | | | | |
| 0 μA do/to 200 μA | | $0,4 \text{ nA} + 15 \cdot 10^{-6} \cdot I$ | merjenje in generiranje / measuring and generating | |
| > 200 μA do/to 2 mA | | $4,0 \text{ nA} + 15 \cdot 10^{-6} \cdot I$ | | |
| > 2 mA do/to 20 mA | | $40 \text{ nA} + 15 \cdot 10^{-6} \cdot I$ | | |
| > 20 mA do/to 200 mA | | $0,8 \mu\text{A} + 50 \cdot 10^{-6} \cdot I$ | | |
| > 200 mA do/to 2 A | | $15 \mu\text{A} + 19 \cdot 10^{-5} \cdot I$ | | |
| > 2 A do/to 20 A | | $0,40 \text{ mA} + 40 \cdot 10^{-5} \cdot I$ | | |
| 3,2 A do/to 200 A | | $2,5 \cdot 10^{-3} \cdot I$ | generiranje / generating (s tuljavo 10 ovojev / with 10 turn coil) | |
| 16 A do/to 1000 A | | $2,5 \cdot 10^{-3} \cdot I$ | generiranje / generating (s tuljavo 50 ovojev / with 50 turn coil) | |
| 1.1.2.2 Izmenični tok / AC Current (<i>I</i> – merjeni tok / <i>I</i> – measured current) | | | | |
| 1 μA do/to 50 μA | (10 do/to 500) Hz | $10 \text{ nA} + 3 \cdot 10^{-3} \cdot I$ | generiranje / generating | |
| 10 μA do/to 200 μA | 40 Hz do/to 10 kHz | $20 \text{ nA} + 62 \cdot 10^{-5} \cdot I$ | merjenje in generiranje / measuring and generating | |
| > 200 μA do/to 2 mA | 40 Hz do/to 10 kHz | $0,2 \mu\text{A} + 31 \cdot 10^{-5} \cdot I$ | | |
| > 2 mA do/to 20 mA | 40 Hz do/to 10 kHz | $2,0 \mu\text{A} + 30 \cdot 10^{-5} \cdot I$ | | |
| > 20 mA do/to 200 mA | 40 Hz do/to 10 kHz | $20 \mu\text{A} + 50 \cdot 10^{-5} \cdot I$ | | |



| Merjena veličina in območje Measured quantity, range | | Frekvenca Frequency | Kalibracijska in merilna zmogljivost (CMC) izražena kot razširjena negotovost (Calibration and measurement Capability (CMC) Expressed as an Expanded Uncertainty)* | Opombe Remarks |
|--|--------------|------------------------|---|---|
| > 200 mA | do/to 2 A | 40 Hz do/to 2 kHz | $0,2 \text{ mA} + 62 \cdot 10^{-5} \cdot I$ $> (2 \text{ do/to } 10) \text{ kHz}$ $0,2 \text{ mA} + 75 \cdot 10^{-5} \cdot I$ | |
| > 2 A | do/to 20 A | 40 Hz do/to 2 kHz | $2,0 \text{ mA} + 83 \cdot 10^{-5} \cdot I$ $> (2 \text{ do/to } 10) \text{ kHz}$ $2,0 \text{ mA} + 25 \cdot 10^{-4} \cdot I$ | |
| 3,2 A | do/to 32 A | 10 Hz do/to 100 Hz | $5,2 \text{ mA} + 3,3 \cdot 10^{-3} \cdot I$ $> (100 \text{ do/to } 440) \text{ Hz}$ $31 \text{ mA} + 9,5 \cdot 10^{-3} \cdot I$ | generiranje / generating (s tuljavo 10 ovojev / with 10 turn coil) |
| > 32 A | do/to 200 A | 10 Hz do/to 100 Hz | $0,1 \text{ A} + 3,3 \cdot 10^{-3} \cdot I$ $> (100 \text{ do/to } 440) \text{ Hz}$ $0,3 \text{ A} + 8,5 \cdot 10^{-3} \cdot I$ | |
| 16 A | do/to 160 A | (10 do/to 100) Hz | $0,5 \text{ A} + 3,3 \cdot 10^{-3} \cdot I$ | generiranje / generating (s tuljavo 50 ovojev / with 50 turn coil) |
| > 160 A | do/to 1000 A | (10 do/to 100) Hz | $0,5 \text{ A} + 3,3 \cdot 10^{-3} \cdot I$ | |
| > 10 A | do/to 32 A | (50 do/to 100) Hz | $9 \text{ mA} + 15 \cdot 10^{-3} \cdot I$ | merjenje / measuring (Fluke 867B in tokovne klešče / Fluke 867B and current clamp) |
| > 32 A | do/to 200 A | > (100 do/to 440) Hz | $30 \text{ mA} + 17 \cdot 10^{-3} \cdot I$ | |
| > 32 A | do/to 200 A | (50 do/to 100) Hz | $10 \text{ mA} + 15 \cdot 10^{-3} \cdot I$ | |
| > 32 A | do/to 200 A | > (100 do/to 440) Hz | $0,25 \text{ A} + 17 \cdot 10^{-3} \cdot I$ | |
| 100 A | do/to 1100 A | (50 do/to 100) Hz | $0,51 \text{ A} + 6,6 \cdot 10^{-3} \cdot I$ | merjenje / measuring (Agilent 34401A in tokovne klešče / Agilent 34401A and current clamp) |
| 1.1.6 Upornost / Resistance | | | | |
| 1.1.6.1 Upornost za enosmerni tok / DC Resistance (R – merjena vrednost / R – measured value) | | | | |
| 1 mΩ | do/to 2 Ω | | $4,2 \mu\Omega + 25 \cdot 10^{-6} \cdot R$ | merjenje in generiranje / measuring and generating |
| > 2 Ω | do/to 20 Ω | | $16 \mu\Omega + 9,8 \cdot 10^{-6} \cdot R$ | |
| > 20 Ω | do/to 200 Ω | | $50 \mu\Omega + 8,3 \cdot 10^{-6} \cdot R$ | |
| > 200 Ω | do/to 2 kΩ | | $0,49 \text{ m}\Omega + 8,3 \cdot 10^{-6} \cdot R$ | |
| > 2 kΩ | do/to 20 kΩ | | $4,9 \text{ m}\Omega + 8,3 \cdot 10^{-6} \cdot R$ | |
| > 20 kΩ | do/to 200 kΩ | | $48 \text{ m}\Omega + 8,5 \cdot 10^{-6} \cdot R$ | |
| > 200 kΩ | do/to 2 MΩ | | $0,9 \Omega + 11 \cdot 10^{-6} \cdot R$ | |
| > 2 MΩ | do/to 20 MΩ | | $10 \Omega + 22 \cdot 10^{-6} \cdot R$ | U = 200 V |
| > 20 MΩ | do/to 200 MΩ | | $0,90 \text{ k}\Omega + 78 \cdot 10^{-6} \cdot R$ | |
| > 200 MΩ | do/to 2 GΩ | | $96 \text{ k}\Omega + 21 \cdot 10^{-5} \cdot R$ | |
| > 2 GΩ | do/to 20 GΩ | | $10 \text{ M}\Omega + 15 \cdot 10^{-4} \cdot R$ | |
| 10 μΩ | do/to 100 μΩ | | $32 \cdot 10^{-4} \cdot R$ | I = 10 A |
| > 100 μΩ | do/to 1 mΩ | | $90 \cdot 10^{-5} \cdot R$ | |
| > 1 mΩ | do/to 100 mΩ | | $75 \cdot 10^{-5} \cdot R$ | |
| 0,1 mΩ | do/to 1 mΩ | | $32 \cdot 10^{-4} \cdot R$ | I = 1 A |
| > 1 mΩ | do/to 10 mΩ | | $90 \cdot 10^{-5} \cdot R$ | |
| > 10 mΩ | do/to 1 Ω | | $75 \cdot 10^{-5} \cdot R$ | |
| 100 kΩ | do/to 1 MΩ | | $0,58 \cdot 10^{-3} \cdot R$ | 100 V < U < 1000 V |
| > 1 MΩ | do/to 1 GΩ | | $0,51 \cdot 10^{-3} \cdot R$ | |
| 1 GΩ | do/to 10 GΩ | | $1,5 \cdot 10^{-3} \cdot R$ | U = 100 V |
| > 10 GΩ | do/to 0,1 TΩ | | $3,0 \cdot 10^{-3} \cdot R$ | |
| 1 GΩ | do/to 10 GΩ | | $0,53 \cdot 10^{-3} \cdot R$ | U = 1000 V |
| > 10 GΩ | do/to 0,1 TΩ | | $1,5 \cdot 10^{-3} \cdot R$ | |
| > 0,1 TΩ | do/to 1,1 TΩ | | $3,0 \cdot 10^{-3} \cdot R$ | |
| > 1,1 TΩ | do/to 6 TΩ | | $16 \cdot 10^{-3} \cdot R$ | |
| 1.1.6.2 Upornost za izmenični tok / AC Resistance (R – merjena vrednost / R - measured value) | | | | |
| 1 Ω | do/to 11 Ω | (40 do/to 500) Hz | $4,5 \text{ m}\Omega + 2 \cdot 10^{-3} \cdot R$ | merjenje / measuring (I = 10 mA) |
| > 11 Ω | do/to 110 Ω | | $34 \text{ m}\Omega + 2 \cdot 10^{-3} \cdot R$ | |
| > 110 Ω | do/to 300 Ω | | $0,34 \Omega + 2 \cdot 10^{-3} \cdot R$ | |



| Merjena veličina in območje Measured quantity, range | | | Frekvenca Frequency | Kalibracijska in merilna zmogljivost (CMC) izražena kot razširjena negotovost (Calibration and measurement Capability (CMC) Expressed as an Expanded Uncertainty)* | Opombe Remarks |
|--|--|--|------------------------|---|--|
| 0,1 Ω do/to 1,1 Ω | | | (40 do/to 500) Hz | 0,46 mΩ + 2,1 · 10 ⁻³ · R | merjenje / measuring (I = 100 mA) |
| > 1,1 Ω do/to 11 Ω | | | | 3,4 mΩ + 2,1 · 10 ⁻³ · R | |
| > 11 Ω do/to 30 Ω | | | | 34 mΩ + 2,1 · 10 ⁻³ · R | |
| 10 mΩ do/to 0,11 Ω | | | (40 do/to 500) Hz | 46 μΩ + 2,5 · 10 ⁻³ · R | merjenje / measuring (I = 1 A) |
| > 0,11 Ω do/to 1,1 Ω | | | | 0,34 mΩ + 2,5 · 10 ⁻³ · R | |
| > 1,1 Ω do/to 2 Ω | | | | 4,8 mΩ + 1,2 · 10 ⁻³ · R | |
| 1 mΩ do/to 11 mΩ | | | (40 do/to 500) Hz | 4,5 μΩ + 3,5 · 10 ⁻³ · R | merjenje / measuring (I = 10 A) |
| > 11 mΩ do/to 0,11 Ω | | | | 34 μΩ + 3,4 · 10 ⁻³ · R | |
| > 0,11 Ω do/to 0,2 Ω | | | | 0,48 mΩ + 2,2 · 10 ⁻³ · R | |
| 0,4 mΩ do/to 4,4 mΩ | | | 50 Hz | 1,2 μΩ + 4,5 · 10 ⁻³ · R | merjenje / measuring (I = 25 A) |
| > 4,4 mΩ do/to 44 mΩ | | | | 7,9 μΩ + 4,4 · 10 ⁻³ · R | |
| > 44 mΩ do/to 0,44 Ω | | | | 79 μΩ + 4,4 · 10 ⁻³ · R | |
| > 0,44 Ω do/to 0,52 Ω | | | | 0,92 mΩ + 4,1 · 10 ⁻³ · R | |
| 1 Ω do/to 10 Ω | | | > (0 do/to 500) Hz | 0,6 mΩ + 5 · 10 ⁻³ · R | generiranje / generating General Radio 1433- H |
| > 10 Ω do/to 0,1 kΩ | | | | 0,6 mΩ + 2 · 10 ⁻³ · R | |
| > 0,1 kΩ do/to 10 kΩ | | | | 1,7 · 10 ⁻³ · R | |
| > 10 kΩ do/to 100 kΩ | | | | 2,6 · 10 ⁻³ · R | |
| > 100 kΩ do/to 1 MΩ | | | | 2,5 · 10 ⁻³ · R | |
| 1 mΩ do/to 10 mΩ | | | > (0 do/to 500) Hz | 4,5 μΩ + 3,5 · 10 ⁻³ · R | generiranje / generating (z referenčnimi upori / with reference resistors) |
| > 10 mΩ do/to 0,1 Ω | | | | 34 μΩ + 4,3 · 10 ⁻³ · R | |
| > 0,1 Ω do/to 1 Ω | | | | 0,46 mΩ + 2,1 · 10 ⁻³ · R | |
| > 1 Ω do/to 10 Ω | | | | 3,4 mΩ + 2,1 · 10 ⁻³ · R | |
| > 10 Ω do/to 100 Ω | | | | 34 mΩ + 2 · 10 ⁻³ · R | |
| 1 mΩ | | | > (0 do/to 500) Hz | 1,2 μΩ + 4,5 · 10 ⁻³ · R | generiranje / generating (referenčni upor / reference resistor) |
| 50 mΩ do/to 0,33 Ω | | | > (0 do/to 500) Hz | 79 μΩ + 4,4 · 10 ⁻³ · R | generiranje / generating (s testno enoto 2053 / with test unit 2053) |
| 0,45 Ω do/to 0,5 Ω | | | | 0,92 mΩ + 4,1 · 10 ⁻³ · R | |
| 1,3 Ω do/to 1,8 Ω | | | | 4,8 mΩ + 1,2 · 10 ⁻³ · R | |
| > 1,8 Ω do/to 10 Ω | | | | 34 mΩ + 2,1 · 10 ⁻³ · R | |
| > 10 Ω do/to 100 Ω | | | | 0,34 Ω + 2 · 10 ⁻³ · R | |
| 1.1.6.3 Impedanca zanke / Loop Impedance (Z – merjena impedanca / Z - measured impedance) | | | | | |
| 0,07 Ω do/to 0,2 Ω | | | 50 Hz | 2,0 mΩ + 22 · 10 ⁻³ · Z | (z referenčno omrežno linijo in Maxtestom / with reference power line and Maxtest) |
| 0,2 Ω do/to 1 Ω | | | 50 Hz | 13 mΩ + 5,5 · 10 ⁻³ · Z | (z referenčno omrežno linijo in uporovno dekado / with reference power line and line impedance box) Z = merjena impedanca / measured impedance |
| 1 Ω do/to 10 Ω | | | | 13 mΩ + 6,0 · 10 ⁻³ · Z | |
| 10 Ω do/to 100 Ω | | | | 7,0 · 10 ⁻³ · Z | |
| 100 Ω do/to 1 kΩ | | | | 6,0 · 10 ⁻³ · Z | |
| 3 ČAS IN FREKVENCA / Time and Frequency | | | | | |
| 3.1 ČAS / Time | | | | | |
| 3.1.1 Časovni interval / Time interval (t merjeni interval / t measured interval) | | | | | |
| 1 μs do/to 80 ms | | | | 60 ns | |
| > 80 ms do/to 1 s | | | | 46 ns + 1,8 · 10 ⁻⁷ · t | |
| > 1 s do/to 10 ⁵ s | | | | 2,2 · 10 ⁻⁷ · t | |



| Merjena veličina in območje <i>Measured quantity, range</i> | Frekvenca <i>Frequency</i> | Kalibracijska in merilna zmogljivost (CMC) izražena kot razširjena negotovost (<i>Calibration and measurement Capability (CMC) Expressed as an Expanded Uncertainty</i>)* | Opombe <i>Remarks</i> |
|--|---|---|-----------------------------|
| 3.2 | FREKVENCA / Frequency | | |
| | | (f – merjena frekvenca / f - measured frequency) | |
| 0,1 Hz do/to 100 MHz | | $2,2 \cdot 10^{-7} \cdot f$ | merjenje / measuring |
| 0,1 Hz do/to 10 MHz | samo dekadne vrednosti / decade values only | $2,1 \cdot 10^{-7} \cdot f$ | generiranje / generating |

Opombe / Notes:

* Razširjena negotovost je podana kot kombinirana standardna negotovost pomnožena s takšnim faktorjem pokritja k, da določa interval zaupanja približno 95 %. / Expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95 %.

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