DAkkS
Deutsche
Akkreditierungsstelle

Accreditation

The Deutsche Akkreditierungsstelle attests with this **Accreditation Certificate** that the calibration laboratory

EMH Energie-Messtechnik GmbH
Vor dem Hassel 2, 21438 Brackel

meets the requirements according to DIN EN ISO/IEC 17025:2018 for the conformity assessment activities listed in the annex to this certificate. This includes additional existing legal and normative requirements for the calibration laboratory, including those in relevant sectoral schemes, provided they are explicitly confirmed in the annex to this certificate.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

This accreditation was issued in accordance with Art. 5 Para. 1 Sentence 2 of Regulation (EC) 765/2008, after an accreditation procedure was carried out in compliance with the minimum requirements of DIN EN ISO/IEC 17011 and on the basis of a review and decision of the appointed accreditation committees.

This accreditation certificate only applies in connection with the notices of 18.03.2025 with accreditation number D-K-12011-01.
It consists of this cover sheet, the reverse side of the cover sheet and the following annex with a total of 4 pages.

Registration number of the accreditation certificate: **D-K-12011-01-00**

Berlin, 18.03.2025
Dr. Florian Witt
Head of Technical Unit

Translation issued:
01.03.2025
Dr. Florian Witt
Head of Technical Unit

The certificate together with the annex reflects the status as indicated by the date of issue. The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH (www.dakks.de).

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf

Deutsche Akkreditierungsstelle GmbH

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The Deutsche Akkreditierungsstelle GmbH (DAkkS) is the entrusted national accreditation body of the Federal Republic of Germany according to § 8 section 1 AkkStelleG in conjunction with § 1 section 1 AkkStelleGBV. DAkkS is designated as the national accreditation authority by Germany according to Art. 4 Para. 4 of Regulation (EC) 765/2008 and clause 4.7 of DIN EN ISO/IEC 17000.

Pursuant to Art. 11 section 2 of Regulation (EC) 765/2008, the accreditation certificate shall be recognised as equivalent by the national authorities within the scope of this Regulation as well as by the WTO member states that have committed themselves in bilateral or multilateral mutual agreements to recognise the certificates of accreditation bodies that are members of ILAC or IAF as equivalent.

DAkkS is a signatory to the multilateral agreements for mutual recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Co-operation (ILAC).

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-12011-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **18.03.2025**

Date of issue: 18.03.2025

Holder of accreditation certificate:

EMH Energie-Messtechnik GmbH
Vor dem Hassel 2, 21438 Brackel

with the location

EMH Energie-Messtechnik GmbH
Vor dem Hassel 2, 21438 Brackel

The calibration laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The calibration laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

Calibration in the fields:

Electrical Quantities

DC and Low Frequency Quantities

- **DC voltage**
- **DC current**
- **AC voltage**
- **AC current**
- **Electric energy**
- **Electric power**
- **Current ratio**

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
AC voltage	60V, 120V, 240V, 480V	45 Hz ≤ f ≤ 65 Hz	$44 \cdot 10^{-6}$	Comparison with HEG K2005
	30 V to 480 V		$50 \cdot 10^{-6}$	
AC current	25 mA		$51 \cdot 10^{-6}$	
	50 mA, 100 mA, 250 mA, 500 mA, 1 A, 2,5 A, 5 A, 10 A		$38 \cdot 10^{-6}$	f: Frequency
	25 A, 50 A, 100 A		$44 \cdot 10^{-6}$	
	20 mA to < 50 mA		$57 \cdot 10^{-6}$	
	50 mA to < 10 A		$45 \cdot 10^{-6}$	
	10 A to 100 A		$50 \cdot 10^{-6}$	
AC voltage	30 V to 480 V	45 Hz ≤ f ≤ 65 Hz	$64 \cdot 10^{-6}$	Comparison with EMH K2006
AC current	5 mA to 10 mA		$0{,}24 \cdot 10^{-3}$	
	> 10 mA to 20 mA		$0{,}17 \cdot 10^{-3}$	f: Frequency
	> 20 mA to 50 mA		$0{,}1 \cdot 10^{-3}$	
	> 50 mA to 160 A		$70 \cdot 10^{-6}$	
DC voltage	100 mV to 1000 V		$17 \cdot 10^{-6}$	Comparison with digital multimeter FLUKE 8588A
DC current	10 mA to 1 A		$68 \cdot 10^{-6}$	Comparison with digital multimeter FLUKE 8588A and current transformer Danisense DS400ID with transducer Danisense DSSIU-4-1U
	> 1 A to 100 A		$72 \cdot 10^{-6}$	
	> 100 A to 600 A		$0{,}23 \cdot 10^{-3}$	
AC active power and energy	750 mW to 4800 W 750 mWh to 4800 Wh	45 Hz ≤ f ≤ 65 Hz 0,25 ≤ cosφ ≤ 1 60 V, 120 V, 240 V, 480 V 50 mA, 100 mA, 250 mA, 500 mA, 1 A, 2,5 A, 5 A, 10 A	$51 \cdot 10^{-6}$	Comparison with HEG K2005 Relative measurement uncertainty related to the apparent power or energy
	375 W to 48 kW 375 Wh to 48 kWh	45 Hz ≤ f ≤ 65 Hz 0,25 ≤ cosφ ≤ 1 60 V, 120 V, 240 V, 480 V 25 A, 50 A, 100 A	$60 \cdot 10^{-6}$	
	150 mW to < 26 W 150 mWh to < 26 Wh	45 Hz ≤ f ≤ 65 Hz 0,25 ≤ cosφ ≤ 1 30 V to 480 V 20 mA to < 50 mA	$0{,}15 \cdot 10^{-3}$	
	375 mW to < 4,8 kW 375 mWh to < 4,8 kWh	45 Hz ≤ f ≤ 65 Hz 0,25 ≤ cosφ ≤ 1 30 V to 480 V 50 mA to < 10 A	$57 \cdot 10^{-6}$	
	> 75 W to 4,8 kW > 75 Wh to 4,8 kWh	45 Hz ≤ f ≤ 65 Hz 0,25 ≤ cosφ ≤ 1 30 V to 480 V 10 A to 100 A	$64 \cdot 10^{-6}$	

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
AC active power and energy, effective, reactive and apparent power	37,5 mW 37,5 mWh 37,5 mVAr 37,5 mVArh 150 mVA 150 mVAh	to to to to to to	2,4 W 2,4 Wh 2,4 VAr 2,4 VArh 2,4 VA 2,4 VAh	45 Hz ≤ f ≤ 65 Hz ± 0,25 ≤ cosφ ≤ ± 1 ± 0,25 ≤ sinφ ≤ ± 1 30 V to 240 V 5 mA to 10 mA	$0{,}24 \cdot 10^{-3}$	Comparison with EMH K2006 Relative measurement uncertainty related to the apparent power respectively energy
	> 75 mW > 75 mWh > 75 mVAr > 75 mVArh > 300 mVA > 300 mVAh	to to to to to to	4,8 W 4,8 Wh 4,8 VAr 4,8 VArh 4,8 VA 4,8 VAh	45 Hz ≤ f ≤ 65 Hz ± 0,25 ≤ cosφ ≤ ± 1 ± 0,25 ≤ sinφ ≤ ± 1 30 V to 240 V > 10 mA to 20 mA	$0{,}2 \cdot 10^{-3}$	
	> 150 mW > 150 mWh > 150 mVAr > 150 mVArh > 600 mVA > 600 mVAh	to to to to to to	12 W 12 Wh 12 VAr 12 VArh 12 VA 12 VAh	45 Hz ≤ f ≤ 65 Hz ± 0,25 ≤ cosφ ≤ ± 1 ± 0,25 ≤ sinφ ≤ ± 1 30 V to 240 V > 20 mA to 50 mA	$0{,}12 \cdot 10^{-3}$	
	> 375 mW > 375 mWh > 375 mVAr > 375 mVArh > 1,5 VA > 1,5 VAh	to to to to to to	9,6 kW 9,6 kWh 9,6 kVAr 9,6 kVArh 9,6 kVA 9,6 kVAh	45 Hz ≤ f ≤ 65 Hz ± 0,25 ≤ cosφ ≤ ± 1 ± 0,25 ≤ sinφ ≤ ± 1 30 V to 480 V > 50 mA to 20 A	$92 \cdot 10^{-6}$	
	> 150 W > 150 Wh > 150 VAr > 150 VArh > 600 VA > 600 VAh	to to to to to to	76,8 kW 76,8 kWh 76,8 kVAr 76,8 kVArh 76,8 kVA 76,8 kVAh	45 Hz ≤ f ≤ 65 Hz ± 0,25 ≤ cosφ ≤ ± 1 ± 0,25 ≤ sinφ ≤ ± 1 30 V to 480 V > 20 A to 160 A	$92 \cdot 10^{-6}$	
DC electric power and electric energy	1 mW 1 mWh	to to	1 kW 1 kWh	100 mV to 1000 V 10 mA to 1 A	$70 \cdot 10^{-6}$	Comparison with digital multimeter FLUKE 8588A and current transformer Danisense DS400ID with transducer Danisense DSSIU-4-1U
	100 mW 100 mWh	to to	100 kW 100 kWh	100 mV to 1000 V > 1 A to 100 A	$74 \cdot 10^{-6}$	
	10 W 10 Wh	to to	600 kW 600 kWh	100 mV to 1000 V > 100 A to 600 A	$0{,}23 \cdot 10^{-3}$	
Current transformers with transformation ratio 1:1	20 mA	to	< 50 mA	45 Hz ≤ f ≤ 65 Hz	$0{,}12 \cdot 10^{-3}$ 0,47´ ≙ 0,014 crad	Substitution method with two reference standards
	50 mA	to	160 A		$0{,}11 \cdot 10^{-3}$ 0,41´ ≙ 0,012 crad	

Abbreviations used:

CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
DIN	Deutsches Institut für Normung e.V. – German institute for standardization
EMH	EMH Energie-Messtechnik GmbH
EN	Europäische Norm – European Standard
IEC	International Electrotechnical Commission
HEG	Hamburger Elektronik Gesellschaft
ISO	International Organization for Standardisation

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