

Akkreditierung



Die Deutsche Akkreditierungsstelle bestätigt mit dieser **Akkreditierungsurkunde**, dass das Prüflaboratorium

WINDTEST Grevenbroich GmbH
Frimmersdorfer Straße 73 a, 41517 Grevenbroich

die Anforderungen gemäß DIN EN ISO/IEC 17025:2018 für die in der Anlage zu dieser Urkunde aufgeführten Konformitätsbewertungstätigkeiten erfüllt. Dies schließt zusätzliche bestehende gesetzliche und normative Anforderungen an das Prüflaboratorium ein, einschließlich solcher in relevanten sektoralen Programmen, sofern diese in der Anlage zu dieser Urkunde ausdrücklich bestätigt werden.

Die Anforderungen an das Managementsystem in der DIN EN ISO/IEC 17025 sind in einer für Prüflaboratorien relevanten Sprache verfasst und stehen insgesamt in Übereinstimmung mit den Prinzipien der DIN EN ISO 9001.

Diese Akkreditierung wurde gemäß Art. 5 Abs. 1 Satz 2 VO (EG) 765/2008, nach Durchführung eines Akkreditierungsverfahrens unter Beachtung der Mindestanforderungen der DIN EN ISO/IEC 17011 und auf Grundlage einer Bewertung und Entscheidung durch den eingesetzten Akkreditierungsausschuss ausgestellt.

Diese Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 22.09.2023 mit der Akkreditierungsnummer D-PL-11233-01.

Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 9 Seiten.

Registrierungsnummer der Akkreditierungsurkunde: **D-PL-11233-01-00**

Berlin, 22.09.2023

Im Auftrag B. Sc. Maik Kadraba
Fachbereichsleitung

Diese Urkunde gibt den Stand zum Zeitpunkt des Ausstellungsdatums wieder. Der jeweils aktuelle Stand der gültigen und überwachten Akkreditierung ist der Datenbank akkreditierter Stellen der Deutschen Akkreditierungsstelle zu entnehmen (www.dakks.de).

Deutsche Akkreditierungsstelle

Standort Berlin
Spittelmarkt 10
10117 Berlin

Standort Frankfurt am Main
Europa-Allee 52
60327 Frankfurt am Main

Standort Braunschweig
Bundesallee 100
38116 Braunschweig

Die Deutsche Akkreditierungsstelle GmbH (DAkkS) ist die beliebte nationale Akkreditierungsstelle der Bundesrepublik Deutschland gemäß § 8 Absatz 1 AkkStelleG i. V. m. § 1 Absatz 1 AkkStelleGBV.
Die DAkkS ist als nationale Akkreditierungsbehörde gemäß Art. 4 Abs. 4 VO (EG) 765/2008 und Tz. 4.7 DIN EN ISO/IEC 17000 durch Deutschland benannt.

Die Akkreditierungsurkunde ist gemäß Art. 11 Abs. 2 VO (EG) 765/2008 im Geltungsbereich dieser Verordnung von den nationalen Behörden als gleichwertig anzuerkennen sowie von den WTO-Mitgliedsstaaten, die sich in bilateralen- oder multilateralen Gegenseitigkeitsabkommen verpflichtet haben, die Urkunden von Akkreditierungsstellen, die Mitglied bei ILAC oder IAF sind, als gleichwertig anzuerkennen.

Die DAkkS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der European co-operation for Accreditation (EA), des International Accreditation Forum (IAF) und der International Laboratory Accreditation Cooperation (ILAC).

Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:

EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu



**TRANSLATION
FROM THE GERMAN LANGUAGE**



Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-11233-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: September 22, 2023
Date of Issue: September 22, 2023

Holder of the Accreditation Certificate:

WINDTEST Grevenbroich GmbH
Frimmersdorfer Strasse 73 a, 41517 Grevenbroich

The test laboratory 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 test 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 test laboratories and conform generally with the principles of DIN EN ISO 9001.

Tests in the following areas:

- 1 Power measurements on wind turbines (anemometer, LiDAR) as well as verification and classification of remote sensing devices (RSD);
- 2 Wind potential measurements and calculations as well as determination of the energy yield determination of the site quality;
- 3 Measurements and calculations of the electrical properties of decentralized power generation units (PGU) in connection with the electrical supply grid (electromagnetic compatibility EMC) as well as measurement of the grid connection sizes (power plant behavior) of PGUs and power generation plants (PGA);
- 4 Stress measurements on wind turbines
- 5 Reference yield calculations
- 6 Assessment and evaluation of optical immissions of wind turbines (shadow flicker impact assessment)
- 7 Assessment of noises—Specifications according to the Immission Control Module and DIN 45688
- 8 Further methods for the determination of noises

This annex to the certificate is only valid together with the written accreditation certificate and reflects the status as indicated by the date of issue. The current status of the valid and monitored accreditation can be found in the Database of Accredited Bodies maintained by Deutsche Akkreditierungsstelle GmbH (DAkkS). <https://www.dakks.de/content/datenbank-akkreditierter-stellen>

Abbreviations used: see last page



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The test laboratory is permitted to use the standards/test procedures marked with * with different issue dates without being required to inform and obtain prior approval from DAkkS.

The test laboratory maintains a current list of all test procedures within the flexible scope of accreditation.

- 1 Power performance measurements of wind turbines (anemometer, LiDAR) as well as verification of Remote Sensing Devices (RSD);

Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
IEC-61400-12-1 Ed.2* 2017-03	Wind turbines – Part 12-1: Power performance measurement of electricity producing wind turbines <i>(withdrawn standard)</i>
IEC-61400-12-2 Ed.1* 2013-03	Wind turbines – Part 12-2: Power performance of electricity-producing wind turbines based on nacelle anemometry <i>(withdrawn standard)</i>
IEC 61400-12-3 Ed.1 * 2022-08	Wind energy generation systems – Part 12-3: Power performance- Measurement based site calibration
IEC 61400-12-5 Ed.1 * 2022-08	Wind energy generation systems – Part 12-5: Power performance- Assessment of obstacles and terrain
IEC 61400-12-6 Ed.1 * 2022	Wind energy generation systems – Part 12-6: Measurement based nacelle transfer function of electricity producing wind turbines
IEC 61400-50 Ed.1 * 2022-08	Wind energy generation systems – Part 50: Wind measurement - Overview
IEC 61400-50-1 Ed.1 * 2022-11	Wind energy generation systems – Part 50-1: Wind measurement - Application of meteorological mast, nacelle and spinner - Application of meteorological mast, nacelle and spinner
IEC 61400-50-2 Ed.1 * 2022-11	Wind energy generation systems – Part 50-2: Wind measurement - Application of ground-mounted remote sensing technology
IEC 61400-50-3 Ed.1 * 2022-01	Wind energy generation systems – Part 50-3: Use of nacelle-mounted lidars for wind measurements
ANSI/AWEA SWT-1 2016	Small Wind Turbine Standard
Renewable UK Small Wind Turbine Standard	Renewable UK Small Wind Turbine Standard



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2017-01	
DIN ISO 2533 * 1979-12	Standard Atmosphere

Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
FGW TR2, Rev. 17 * 2018-03	Determination of power curve and standardized energy yields
MEASNET 2009-12	Power Performance Measurement Procedure, Rev. 5
QMPA 01 2016-07	Measurement of power curve
QMPA 02 2019-08	Measurement of the Wind Potential using a wind measuring mast or remote sensing procedure (SoDAR /LiDAR system) and analyzing the wind data
QMPA 04 2019-05	Validation service [VS] Validation and classification of remote sensing devices

2 Measurements and calculations of wind potential as well as the determination of energy yield, determination of the site quality

Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
FGW TR6, Rev. 10 * 2017-10	Determination of wind potential and energy yields
Measnet Guideline 2016-04	Evaluation of Site-Specific Wind Conditions, Version 2
QMPA 02 2019-08	Measurement of the wind potential using a wind measuring mast or remote sensing device (SoDAR /LiDAR system) and analyzing the test results
QMPA 03 2019-08	Determination of the wind potential and the energy yield as well as the quality of the site ("Site Assessment")



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- 3 Measurements and calculations of the electrical properties of decentralized energy production units (EPU) in combination with the electrical grid (electro-magnetic compatibility EMC) as well as measurement of characteristic grid parameters (power plant behavior) of EPU and energy production devices (EPD)

Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
IEC 61000-4-30 Ed. 3.0 * 2015-02	Electromagnetic compatibility (EMC) – Part 4-30: Testing and measurement techniques – Power quality measurement methods
IEC 61000-4-15 Ed. 2.0 * 2010-08	Electromagnetic compatibility (EMC) – Part 4-15: Testing and measurement techniques - Flickermeter – Functional and design specifications
IEC 61000-4-7 Ed. 2.1 * 2009-10	Electromagnetic compatibility (EMC) – Part 4-7: Testing and measurement techniques – General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto
IEC 61400-21-1 Ed. 1.0 * 2019-05	Wind energy generation systems - Part 21-1: Measurement and assessment of electrical characteristics – Wind turbines <i>(apparent power up to 9 MVA to 10 kV and ≥ 10 MVA to ≤ 36 kV)</i>
IEC 61683 Ed. 1.0 * 1999-11	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
IEC TS 62910 Ed. 1.0 * 2015-10	Utility-interconnected photovoltaic inverters – Test procedure for low voltage ride-through measurements <i>(apparent power up to 9 MVA to 10 kV and ≥ 10 MVA to ≤ 36 kV)</i>
IEEE Std 1453 * 2015	Recommended Practice for the Analysis of Fluctuating Installations on Power Systems
IEEE Std 519 * 2014	Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
DIN EN 50160 * 2011-02	Voltage characteristics of electricity supplied by public distribution networks
DIN EN 50530 * 2013-12	Overall efficiency of photovoltaic inverters
DIN VDE V 0124-100 * 2013-10	Grid integration of generator plants Low-voltage – Test requirements for generator units to be connected to and operated in parallel with low-voltage distribution networks <i>(apparent power up to 9 MVA to 10 kV and ≥ 10 MVA to ≤ 36 kV)</i>
FGW TR3 Rev. 25 * 2018-09	Determination of electrical characteristics of generating units and installations connected to the medium, high, and ultra-high voltage grid; including test requirements according to TR 8 <i>(apparent power up to 9 MVA to 10 kV and ≥ MVA to ≤ 36 kV)</i>



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Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
FGW TR8 Rev. 9 * 2019-02	Certification of the electrical properties of generation units and installations, storage facilities and their components on the electricity grid <i>(only the areas relating to measurements)</i>
FERC, Order No. 661-A USA 2005-12	FERC, Order No. 661-A, Interconnection for Wind Energy (Appendix G to LGIA), Dec-05, Issued December 2005 <i>(apparent power up to 9 MVA to 10 kV and ≥ 10 MVA to ≤ 36 kV)</i>
CEI 0-16 2014-09	Reference technical rules for the connection of active and passive consumers to the HV and MV electrical networks of distribution companies <i>(apparent power up to 9 MVA to 10 kV and ≥ 10 MVA to ≤ 36 kV)</i>
DNVGL-ST-0125 2016-03	Grid Code compliance, edition March 2016 <i>(apparent power up to 9 MVA to 10 kV and ≥ MVA to ≤ 36 kV)</i>
GL 2010 2010	Guideline for the Certification of Wind Turbines, Edition 2010 <i>(apparent power up to 9 MVA to 10 kV and ≥ 10 MVA to ≤ 36 kV)</i>
MEASNET 2009-10	Power Quality Measurement Procedure, Version 4, October 2009
PVVC Version 10 2012-01	Procedure for Verification Validation and Certification of the Requirements of the PO 12.3 on the Response of Wind Farms and Photovoltaic Plants in the Event of Voltage Dips <i>(apparent power up to 9 MVA to 10 kV and ≥ 10 MVA to ≤ 36 kV)</i>
Z501-2 2013	Requirements for specific type testing <i>(apparent power up to 9 MVA to 10 kV and ≥ 10 MVA to ≤ 36 kV)</i>
QMPA05 2019-06	Measurement of the grid feedback (power quality) of decentralized energy production units (EPU) as well as energy production devices (EPD)
QMPA 11 2019-06	Determination of grid characteristics of EPD regulators
QMPA 13 2019-06	Measurement of LVRT behavior of decentralized energy production units (EPU) as well as energy production devices (EPD)
QMPA 19 2019-06	Measurement of control behavior of decentralized energy production units (EPU) as well as energy production devices (EPD)
QMPA 20 2019-06	Measurement of grid protection of decentralized energy production units (EPU) as well as energy production devices (EPD)



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Measuring ranges

ACV	17.3kV/50Hz
ACV	5V/9kHz
DCV	5V
ACA	6000A/50Hz
ACA	10A/9kHz
DCA	1000A

4 Load measurements of wind turbines

Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
IEC 61400-2 * 2013-12	Wind turbines - Part 2: Requirements for small wind turbines (here only: Chapter 9)
IEC 61400-13 * 2015-12	Wind Turbine Generator Systems Part 13: Measurement of mechanical loads
ANSI/AWEA SWT-1 2016	Small Wind Turbine Standard
International Energy Agency 1990	"Recommended practices for wind turbine testing and evaluation, 3rd Fatigue Loads", 2nd Edition 1990, Madsen, DK
European Wind Turbine Standards, Volume 6 1996-02	Mechanical Load Measurements
Renewable UK Small Wind Turbine Standard 2016-07	Renewable UK Small Wind Turbine Standard
QMPA 08 2016-07	Load measurements for wind turbines

5 Reference yield calculations

Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
FGW TR5, Rev. 7 * 2017-10	Determination and application of the reference yield
FGW TR6, Rev. 10 * 2017-01	Determination of wind potential and energy yields
QMPA 14 2019-06	Determination of the reference energy yield of wind turbines



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**6 Assessment and evaluation of optical immissions of wind turbines
(shadow flicker impact assessment)**

Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
QMPA 17 2014-01	Assessment and evaluation of optical immissions of wind turbines (shadow flicker impact assessment)

**7 Assessment of noises—Specifications according to the Immission Control Module and
DIN 45688**

Group V - Immission Control Module: Determination of Noises			
Title	Standard / Guideline / Technical Rule Designation	QM Document	Remark
			Site
TI Noise 1968-07	General administrative provision on installations requiring approval in accordance with Section 16 of the German Industrial Code; Technical Instructions on Noise Abatement – TI Noise (in conjunction with: VDI 2058 sheet 1:1985-09 "Assessment of industrial noise in the neighborhood")	QMPA 06 2019-06, Rev.4 QMPA 07 2019-06, Rev.4 QMPA 12 2019-06, Rev. 4 QMPA 22 2019-06, Rev.1	Grevenbroich
TI Noise 1998-08	Sixth General Administrative Provision to the Federal Immission Control Act (Technical Instructions on Noise Abatement – TI Noise)	QMPA 06 2019-06, Rev.4 QMPA 07 2019-06, Rev.4 QMPA 12 2019-06, Rev. 4 QMPA 22 2019-06, Rev.1	



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8 Further procedures for the determination of noises

Standard / Date of issue In-house procedure / Version	Title of the standard or in-house procedure (specify any deviations / modifications of standard procedures)
FGW TR1, Rev. 18 * 2008-02	Determination of sound emission values
IEC 61400-11 Ed. 2.1 * 2006-11	Wind turbines Generator Systems – Part 11: Acoustic noise measurement techniques
IEC 61400-11 Ed. 3 * 2012-11	Wind turbines Generator Systems – Part 11: Acoustic noise measurement techniques
ISO 1996-2 * 2017-07	Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels (only industrial plants)

The specified procedures comply with the requirements of "Certificate of technical qualification for assessments in the area of immission control" ("Immission Control Module") as amended on September 15, 2011.

Competence is confirmed for the technical scope of activities of

Group V

regulated by immission control law.



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Abbreviations used:

CEI	Italian Electrotechnical Committee
DIN	Deutsches Institut für Normung e. V. (German Institute for Standardization)
DNVGL	Det Norske Veritas Germanische Lloyd (DNV GL SE)
EN	European Standard
FGH	Forschungsgemeinschaft für Elektrische Anlagen und Stromwirtschaft e.V. (Research Association for Electrical Systems and the Power Industry [non-profit])
FGW	Promotional Society for Wind Energy and Other Renewable Energies
GL	Renewables Certification Guidelines and Technical Notes of the DNVGL
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Organization for Standardization
QMPA	Special procedure of windtest grevenbroich gmbh
PVVC	Procedure for Verification, Validation and Certification – Spanish Grid Code – Ministry of Industry, Trade and Tourism
Z 501-2	Requirements Regulation of FGH GmbH (subsidiary of Forschungsgemeinschaft für Elektrische Anlagen und Stromwirtschaft e.V.)

Valid from: September 22, 2023
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This is to certify that the above translation from the German text into the English language is correct and complete.

Neuss, October 21, 2023

Ulrike Baumann-O'Flaherty
Certified translator of the English language authorized for the jurisdiction of Düsseldorf Higher Regional Court

