

Deutsche Akkreditierungsstelle GmbH

Beliehene gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

WINDTEST Grevenbroich GmbH
Frimmersdorfer Straße 73 a, 41517 Grevenbroich

die Kompetenz nach DIN EN ISO/IEC 17025:2018 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

Leistungsmessungen an Windenergieanlagen (Leistungskurve) sowie Verifizierung und Klassifizierung von Remote Sensing Devices (RSD); Windpotenzialmessungen und -berechnungen sowie Bestimmung des Energieertrages; Bestimmung der Standortgüte; Messungen und Berechnungen der elektrischen Eigenschaften von dezentralen Energieerzeugungseinheiten (EZE) in Verbindung mit dem elektrischen Versorgungsnetz (Elektromagnetische Verträglichkeit EMV) sowie Messung der Netzanschlussgrößen (Kraftwerksverhalten) von EZE und Energieerzeugungsanlagen (EZA); Beanspruchungsmessungen an Windenergieanlagen; Referenzertragsberechnungen; Schattenwurfermittlung; Modul Immissionsschutz: Ermittlung von Geräuschen; weitere Verfahren zur Bestimmung von Geräuschen

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 08.11.2019 mit der Akkreditierungsnummer D-PL-11233-01. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 8 Seiten.

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

Berlin, 08.11.2019

Im Auftrag Dr. Heike Manke
Abteilungsleiterin



Die Urkunde samt Urkundenanlage gibt den Stand zum Zeitpunkt des Ausstellungsdatums wieder. Der jeweils aktuelle Stand des Geltungsbereiches der Akkreditierung ist der Datenbank akkreditierter Stellen der Deutschen Akkreditierungsstelle GmbH (DAkKS) zu entnehmen. <https://www.dakks.de/content/datenbank-akkreditierter-stellen>



TRANSLATION

FROM THE GERMAN LANGUAGE

Deutsche Akkreditierungsstelle GmbH

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

Valid from: November 8, 2019

Date of Issue: November 8, 2019

Holder of the Certificate:

WINDTEST Grevenbroich GmbH

Frimmersdorfer Strasse 73 a, 41517 Grevenbroich

Tests in the following areas:

Power measurements on wind turbines (power curve) as well as verification and classification of remote sensing devices (RSD); wind potential measurements and calculations as well as determination of the energy yield; determination of the site quality; 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 behaviour) of PGUs and power generation plants (PGA); stress measurements on wind turbines; reference yield calculations; determination of shadow casting; immission control module: determination of noises; further methods for the determination of noises

Without any prior information and approval by DAkkS being required, the test laboratory is allowed to use – within the fields of accreditation designated by an * – the application of the standardized test procedures listed here or equivalent test procedures with different issue statuses.
The test laboratory maintains a current list of all test procedures in the flexible field of accreditation.

Abbreviations used: see last page

The certificate together with its appendix indicates the status at the time of issue. The current status of the scope of the accreditation can be found in the Database of Accredited Bodies of the Deutsche Akkreditierungsstelle GmbH (DAkkS). <https://www.dakks.de/content/datenbank-akkreditierter-stellen>

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

IEC-61400-12-1 * 2017-03	Wind turbines – Part 12-1: Power performance measurement of electricity producing wind turbines
IEC-61400-12-2 * 2013-03	Wind turbines – Part 12-2: Power performance of electricity-producing wind turbines based on nacelle anemometry
ANSI/AWEA SWT-1 2016	Small Wind Turbine Standard
Renewable UK Small Wind Turbine Standard 2017-01	Renewable UK Small Wind Turbine Standard
DIN ISO 2533 * 1979-12	Standard Atmosphere
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)

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

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")

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 behaviour) of EPU and energy production devices (EPD)

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>

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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 * 2013-12	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 ≥ 10 MVA to ≤ 36 kV)</i>
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 ≥ 10 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

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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>
Z 501-2 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 behaviour of decentralized energy production units (EPU) as well as energy production devices (EPD)
QMPA 19 2019-06	Measurement of control behaviour 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)

Measuring ranges

1600 A DC
1600 A AC @50Hz
500 V AC @50Hz
300 V AC @1KHz
264 V DC

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4 Load measurements of wind turbines

IEC 61400-2 * 2013-12	Wind turbines - Part 2: Requirements for small wind turbines (<i>here only: Chapter 9</i>)
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

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

**6 Determination and evaluation of visual immissions of wind turbines
(Shadow cast determination)**

QMPA 17 2014-01	Determination and evaluation of visual immissions of wind turbines (shadow casting)
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7 Determination of Noise - Specifications according to the Immission Control Module and DIN 45688

Group V - Immission Control Module: Determination of Noise			
Standard / Guideline / Technical Rule		QM Document	Remark Site
Title	Designation		
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 neighbourhood")	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	

8 Further Procedures for the Determination of Noises

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)

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The specified procedures are in compliance with the requirements of
"Proof of expertise for ascertainties in the area of immission control"
("immission control module") in the version of September 15, 2011.

The competence for the technical fields of duties of
Group V
legally regulated by the immission control law is confirmed.

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.)

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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, June 15, 2020

Ulrike Baumann-O'Flaherty

Certified translator of the English language authorized for the
jurisdiction of Düsseldorf Higher Regional Court

