DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

Moeller Operating Engineering GmbH
Fraunhoferstraße 3, 25524 Itzehoe

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

Power performance measurement of wind turbines; Measurement of mechanical loads on wind turbines; Determination of system behaviour of wind turbines; Determination of noise emissions of wind turbines; Determination of noise emissions in the neighbourhood; Measurement of electrical characteristics of power generation units (PGU), power generation facilities (PGF), consumer units, consumer facilities, energy storage systems (ESS) as well as transmission, distribution and power supply grids and their related components, Module Immission Control

The accreditation certificate shall only apply in connection with the notice of accreditation of 07.05.2018 with the accreditation number D-PL-12005-01 and is valid until 17.08.2021. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 7 pages.

Registration number of the certificate: **D-PL-12005-01-00**

Berlin, 07.05.2018	Dr. Heike Manke Head of Division	Translation issued: 18.05.2018	Head of Division

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

See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

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Spittelmarkt 10
10117 Berlin

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

Office Braunschweig
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The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). 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 Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

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 GmbH

Annex to the Accreditation Certificate D-PL-12005-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 07.05.2018 to 17.08.2021 Date of issue: 07.05.2018

Holder of certificate:

Moeller Operating Engineering GmbH
Fraunhoferstraße 3, 25524 Itzehoe

Tests in the fields:

Power performance measurement of wind turbines; Measurement of mechanical loads on wind turbines; Determination of system behaviour of wind turbines; Determination of noise emissions of wind turbines; Determination of noise emissions in the neighbourhood; Measurement of electrical characteristics of power generation units (PGU), power generation facilities (PGF), consumer units, consumer facilities, energy storage systems (ESS) as well as transmission, distribution and power supply grids and their related components, Module Immission Control

Abbreviations used: see last page

Within the scope of accreditation marked with *, the testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use standards or equivalent testing methods listed here with different issue dates.
The testing laboratory maintains a current list of all testing methods within the flexible scope of accreditation.

1. Measurement of Power performance on wind turbines

IEC 61400-12-1, ed 2.0 * 2015	Wind Turbines - Part 12-1: Power Performance Testing of Electricity Producing wind Turbines *(measurements without remote sensing devices only)*
IEC 61400-12-2, ed. 1.0 * 2013	Wind Turbines - Part 12-2, Power Performance Measurements Verification of Electricity Producing Wind Turbines
IEC 61400-2, ed 3.0 * 2013	Wind Turbines - Part 2: Small Wind Turbines
FGW TR 2, Rev. 16 * 2010-01	Determination of power curve and standardized energy yields
FGW TR 5, Rev. 6 * 2016-02	Determination and application of the reference yields
MEASNET PPM V5 2009-12	Power Performance Measurements Procedure - Version 5

2. Measurement of mechanical loads on wind turbines

IEC 61400-13, ed.1.0 * 2015	Wind Turbines - Part 13: Measurement of Mechanical Loads
IEC 61400-2, ed 3.0 * 2013	Wind Turbines - Part 2: Small Wind Turbines
IEC 61400-22, ed 1.0 * 2010	Wind Turbines - Part 22: Conformity Testing and Certification
GL 2010 2010-07	GL Renewables Certification, Guideline for the Certification of Wind Turbines
GL Offshore 2012-12	GL Renewables Certification, Guideline for the Certification of Offshore Wind Turbines

3. Determination of system behaviour of wind turbines

IEC 61400-1, ed 3.1 * 2005	Wind Turbines - Part 1: Design Requirements
IEC 61400-2, ed 3.0 * 2013	Wind Turbines - Part 2: Small Wind Turbines
IEC 61400-13, ed 1.0 * 2015	Wind Turbines - Part 13: Measurement of Mechanical Loads
IEC 61400-22, ed 1.0 * 2010	Wind Turbines - Part 22: Conformity Testing and Certification
GL 2010 2010-07	GL Renewables Certification, Guideline for the Certification of Wind Turbines
GL Offshore 2012-12	GL Renewables Certification, Guideline for the Certification of Offshore Wind Turbine

4. Determination of noise emissions of wind Turbines

IEC 61400-11 * 2012	Windturbine generator systems - Acoustic noise measurement techniques
DIN EN 61400-11 * (VDE 0127-11) 2013-09	Wind turbines - Part 11: Acoustic noise measurement techniques
DIN 45680 * 2013-09	Measurement and assessment of low-frequency noise immissions
FGW TR 1 Rev. 18 * 2008-02	Determination of noise emission
MEASNET ANMP V3 2011-11	Acoustic Noise - Measurement Procedure – Version 3

5. Measurement of electrical characteristics of power generation units (PGU), power generation facilities (PGF), consumer units, consumer facilities, energy storage systems (ESS) as well as transmission, distribution and power supply grids and their related components

IEC 61400-21 ed. 2.0 * 2008	Wind turbines - Part 21: Measurement and assessment of power quality characteristics of grid connected wind turbines
IEC 61400-21-1 ed. 1.0 CDV 2017	Wind turbines – Part 21-1: Measurement and assessment of electrical characteristics – Wind turbines
IEC 61000-4-30 ed. 3.0 * 2015	Electromagnetic compatibility (EMC) – Part 4-30: Testing and measurement techniques – Power quality measurement methods
IEC 61000-4-15 ed. 2.0 * 2010	Electromagnetic compatibility (EMC) – Part 4-15: Testing and measurement techniques – Flickermeter- Functional and design specifications
IEC 61000-4-7 ed. 2.1 * 2009	Electromagnetic compatibility (EMC) – Part 4-7: Testing and measurement techniques – General guide on harmonics and interharmonics and instrumentation, for power supply systems and equipment connected thereto
EN 50160 * 2010	Voltage characteristics of electricity supplied by public distribution networks
DIN EN 50160 * 2011-02	Voltage characteristics of electricity supplied by public distribution networks
DIN VDE V 0124-100 * 2012-07 VDE V 0124-100 * 2012-07	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
VDE-AR-N 4105 * 2011-08	Erzeugungsanlagen am Niederspannungsnetz - Technische Mindestanforderungen für Anschluss und Parallelbetrieb von Erzeugungsanlagen am Niederspannungsnetz
E VDE-AR-N 4110 2017-03	Technische Regeln für den Anschluss von Kundenanlagen an das Mittelspannungsnetz und deren Betrieb (TAR Mittelspannung)

VDE-AR-N 4120 * 2015-01	Technical requirements for the connection and operation of customer installations to the high-voltage network
FGW TR3, Rev24 * 2016-03	Determination of the electrical characteristics of power generating units and systems in medium-, high- and extra-high voltage grids
D-A-CH-CZ 2012	Technische Regeln zur Beurteilung von Netzrückwirkungen, Ergänzungsdokument zur Beurteilung von Anlagen für den Anschluss an Hochspannungsnetze, 1. Ausgabe 2012, Österreichs E-Wirtschaft, VSE Verband Schweizerischer Elektrizitätsunternehmen, CSRES Ceske sdruzeni regulovanych elektroenergetickych spolecnosti, Forum Netztechnik/Netzbetrieb im VDE (FNN)
DNV GL-SE-0124 2016-03	Certification of grid code compliance, edition March 2016
MEASNET, Version 4 2009-10	MEASNET Power Quality Measurement Procedure
PVVC PO 12.3, Version 9 17th May 2011	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

6. Determination of noise impact

Group V - Module Immission Control: Determination of noises (limited to emissions and immission of noise from wind turbines)			
Norm / Guideline / Technical Standard		QM-Document	Remark Location
Titel	Bezeichnung		
TA-Lärm 1998-08	Sechste Allgemeine Verwaltungsvorschrift zum Bundes-Immissionsschutzgesetz, Technische Anleitung zum Schutz gegen Lärm - TA Lärm, 1998-08 und den darin enthaltenen Normen	PL_PA_05_AW 2018-01	**Itzehoe**
IEC 61400-11: 2002 + A1 2006	Windturbine generator systems - Acoustic noise measurement techniques	PL_PA_04_AW 2018-01	
IEC 61400-11 2012-11	Windturbine generator systems - Acoustic noise measurement techniques		
DIN ISO 9613-2 1999-10	Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation		
DIN EN 61400-11 (VDE 0127-11) 2013-09	Wind turbines - Part 11: Acoustic noise measurement techniques		
FGW TR 1, Rev. 18 2008-02	Determination of noise emission		

The listed test methods meet the requirements of the “Special knowledge proofs of the determinations in the field of immission control” (Module Immission Control) as of 15th September 2011.

The competence is attested for Group V for the test and technical areas of activity regulated by the immission control.

Determination is limited to wind turbines

Technical in charge: Dipl.-Ing. (FH) Torben Arndt
Deputy technical in charge: Andreas Kaschwich (M.Eng.)

verwendete Abkürzungen:

D-A-CH-CZ	Technische Regeln zur Beurteilung der Netzrückwirkungen (Österreich, Schweiz und der Tschechischen Republik)
DNV GL	Det Norske Veritas Germanische Lloyd
FGW	Federation of German Windpower and other Renewable Energies
IEC	International Electrotechnical Commission
MEASNET	Measuring Network of Wind Energy Institutes
PL_P-Pro_...	In house method of M.O.E. GmbH
PVVC	Propuesta de procedimiento de verificacion, validacion y certificacion
TR	Technical Guideline