

# Deutsche Akkreditierungsstelle GmbH

## Annex to the Accreditation Certificate D-PL-11098-01 according to DIN EN ISO/IEC 17025:2018

Valid from: 14.05.2020

Date of issue: 14.05.2020

Holder of certificate:

### **WIND-consult**

**Ingenieurgesellschaft für umweltschonende Energiewandlung mbH  
Reuterstraße 9, 18211 Admannshagen - Bargeshagen**

Tests in the fields:

**Power performance measurement of wind turbines (WT); Implementation and evaluation of wind measurements using anemometer and remote sensing device; Measurement of power quality characteristics of power generating units and -plants; Determination of wind potential and energy yield; Determination of the site quality for commissioning according to the Renewable Energy Sources Act (EEG 2017); Determination of noise emissions of WT; Noise in the neighbourhood of WT; Determination of shadow impact of WT on areas; Measurement of mechanical loads of WT; Measurement of the system behaviour of WT; Assessment of site suitability; Determination of noises (group V); Module immission control**

**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 standards / equivalent testing procedures within the flexible scope of accreditation.**

*The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.  
<https://www.dakks.de/en/content/accredited-bodies-dakks>*

**Annex to the accreditation certificate D-PL-11098-01**

**1 Power performance measurement of WT**

IEC 61400-12* 1998-02	Wind turbine generator systems - Part 12: wind turbines power performance testing <i>(withdrawn standard)</i>
IEC 61400-12-2* Ed. 1.0 2013-03	Wind turbines - Part 12-2: Power performance of electricity-producing wind turbines based on nacelle anemometry
IEC 61400-12-1* Ed. 2 2017-03	Wind turbines - Part 12-1: Power performance measurement of electricity producing wind turbines
DIN EN 61400-12-1* 2017-12 VDE 0127-12-1 2017-12	Wind Turbines - Part 12-1: Power performance measurements of electricity producing wind turbines
DIN EN 61400-12* 1999-07 VDE 0127 Part 12 1999-07	Wind turbine generator systems - Part 12: Wind turbines power performance testing <i>(withdrawn standard)</i>
FGW TR 2, Rev. 16* 2010-01	Determination of power curve and standardized energy yields
FGW TR 5, Rev. 7* 2017-01	Determination and application of the reference yields
MEASNET 2009-12	Power Performance Measurement Procedure Version 5

**2 Measurement of power quality characteristics of power generating units and -plants**

IEC 61400-21 Ed.2* 2008-08	Wind turbines – Part 21: Measurement and assessment of power quality characteristics of grid connected wind turbines
IEC 61400-21-1 Ed.1* 2019-05	Wind energy generation systems – Part 21-1: Measurement and assessment of electrical characteristics – Wind turbines
IEEE Std 519-2014* 2014-03	IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems
IEEE Std 1453-2015* 2015-09	IEEE Recommended Practice for the Analysis of Fluctuating Installations on Power Systems

**Annex to the accreditation certificate D-PL-11098-01**

FGW TR 3, Rev. 25* 2018-09	Determination of the electrical characteristics of power generating units and systems in medium-, high- and extra-high voltage grids
MEASNET 2009-10	Power Quality Measurement Procedure, Version 4
CEI 0-16 Ed.4 2014	Reference Technical Rules for the Connection of Active and Passive Consumers to the HV and MV Electrical Networks of Distribution Company
AEE PVVC V 10 2018-09	PROCEDIMIENTOS DE VERIFICACIÓN; VALIDACIÓN Y CERTIFICACIÓN DE LOS REQUISITOS DEL PO 12:3 SOBRE LA RESPUESTA DA LAS INSTALACIONES EÓLICAS ANTE HUECOS DE TENSIÓN; Versión 11
IEC 61000-4-7 2002-08	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 61000-4-15 2010-08	Electromagnetic compatibility (EMC) - Part 4-15: Testing and measurement techniques - Flickermeter - Functional and design specification
DIN 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
RED ELÉCTRICA DE ESPAÑA aeléc 2019-07	Norma técnica de supervisión de la conformidad de los módulos de generación de electricidad según el Reglamento UE 2016/631

**3 Implementation and evaluation of wind measurements using anemometer and remote sensing device**

IEC 61400-12-1 Ed.2* 2017-03	Wind turbines - Part 12-1: Power performance measurement of electricity producing wind turbines
FGW TR 6, Rev. 10* 2017-10	Determination of wind potential and energy yields
MEASNET 2016-04	Evaluation of Site-Specific Wind Conditions Version 2
WICO QMP 05 2020-03	Measurement of wind speed and wind direction for the determination of wind potential

**Annex to the accreditation certificate D-PL-11098-01**

**4 Determination of wind potential and energy yield; Determination of the site quality for commissioning according to the Renewable Energy Sources Act (EEG2017)**

FGW TR 6, Rev. 10* 2017-10	Determination of wind potential and energy yields
MEASNET 2016-04	Evaluation of Site-Specific Wind Conditions Version 2
WICO QMP 10 2018-03	Determination of wind potential and energy yields

**5 Determination of noise emissions of WT**

IEC 61400-11: 2002 +A1:2006*	Wind turbine generator systems - Part 11: Acoustic noise measurement techniques <i>(withdraw standard)</i>
IEC 61400-11* 2012+AMD1:2018 CSV	Wind turbines - Part 11: Acoustic noise measurement techniques
FGW TR 1, Rev. 18* 2008-02	Determination of noise emission
MEASNET 2011-11	Acoustic Noise Measurement Procedure Version 3
VDE 0127-11* 2007-03	Wind turbine generator systems - Part 11: Acoustic noise measurement techniques

**6 Noise in the neighbourhood of WT**

109. Sitzung LÄNDERAUSSCHUSS FÜR IMMISSIONSSCHUTZ (LAI) 2005-03	Advices on noise immission protection for wind turbines
134.Sitzung LÄNDERAUSSCHUSS FÜR IMMISSIONSSCHUTZ (LAI) 2017-09	Notes on noise immission protection for wind turbines (WT) revised draft of 17.03.2016 with changes PhysE from 23.06.2016 Issue 30.06.2016

Valid from: 14.05.2020  
Date of issue: 14.05.2020

**Annex to the accreditation certificate D-PL-11098-01**

NA 001-02-03-19 UA 2015-05	Documentation on sound propagation - Interim procedure for the prediction of noise immissions from wind turbines Version 2015-05.1
TA Lärm 1998-08	Sixth general Administrative Regulation for the Federal Immission Control Act (Technical Guidance for protection against noise - TA Lärm)

**7 Determination of noise emission und immission of WT**

TA Lärm 1998-08	Sixth general Administrative Regulation for the Federal Immission Control Act (Technical instructions for protection against noise - TA Lärm)
DIN ISO 9613-2* 1999-10	Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation
DIN 45645-1* 1996-07	Determination of rating levels from measurement data - Part 1: Noise immission in the neighbourhood
DIN 45680* 2013-09	Measurement and assessment of low-frequency noise immissions
DIN 45680 B1* 2013-09	Measurement and assessment of low-frequency noise immissions - Guidelines for the assessment - Technical equipment
DIN 45681* 2005-03	Acoustics - Determination of tonal components of noise and determination of a tone adjustment for the assessment of noise immissions
RLS-90-04 1990	Guidelines for noise protection on roads, RLS-90, 1990 edition
DIN EN ISO 3746* 2011-03	Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane
DIN EN ISO 3744* 2011-02	Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane

**Annex to the accreditation certificate D-PL-11098-01**

<p>16. BImSchV 1990-06 BGBl. S. 2271 2014-12</p>	<p>Sixteenth regulation for the implementation of the Federal Immission Control Act (Traffic Noise Protection Regulation – 16. BImSchV) – Appendix 1 (to §3): Calculation of the evaluation level for roads; Appendix 2 (to §4): Calculation of the evaluation level for railways (Acoustic noise 03)</p>
<p>18. BImSchV 1991-07 BGBl. S. 1468 2017-06</p>	<p>Eighteenth regulation for the implementation of the Federal Immission Control Act (Sports Facilities Noise Regulation – 18. BImSchV) – Appendix 1: Investigation- and evaluation procedures</p>
<p>LAI-Freizeitlärm-RL 2015-03</p>	<p>Advice on assessing the noise generated by leisure facilities – Chap. 3 Determination and evaluation of the noise emitted by leisure facilities</p>

**8 Determination of shadow impact of WT on areas**

<p>WICO QMP 12 2018-03</p>	<p>Determination of shadow flicker</p>
<p>LÄNDERAUSSCHUSS FÜR IMMISSIONSSCHUTZ (LAI) 2002-03</p>	<p>Notes on the determination and assessment of the optical immission of wind turbines, WT shadow impact advice</p>

**9 Measurement of mechanical loads of WT**

<p>IEC TS 61400-13* 2001</p>	<p>Wind turbine generator systems – Part 13: Measurement of mechanical loads (<i>withdrawn standard</i>)</p>
<p>IEC 61400-13 Ed.1.0* 2015-12</p>	<p>Wind turbines – Part 13: Measurement of mechanical loads</p>
<p>Guideline Edition 2010 GERMANISCHER LLOYD 2010-07</p>	<p>Guideline for the Certification of Wind Turbines</p>
<p>Guideline Edition 2012 GERMANISCHER LLOYD 2012-12</p>	<p>Guideline for the Certification of Offshore Wind Turbines</p>

**Annex to the accreditation certificate D-PL-11098-01**

IEC 61400-22 Ed.1.0 2010-05	Wind turbines Part 22: Conformity testing and certification <i>(only chapter 8.4.4, annex C)</i> <i>(withdrawn standard)</i>
DIN EN 61400-22 Ed.1.0 2011-10	Wind turbines - Part 22: Conformity testing and certification <i>(only Chapter 8.4.4, annex C)</i>
VDI 3834 Part 1 2015-08	Measurement and evaluation of the mechanical vibration of wind turbines and their components Wind turbines with gearbox
IEC 61400-4 2012-12	Wind turbines – Part 4: Design requirements for wind turbine gearboxes, Chapter: 8. Design verification

**10 Measurement of the wind turbine behaviour**

IEC 61400-13 Ed. 1.0* 2015-12	INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC): Wind turbines – Part 13: Measurement of mechanical loads
IEC 61400-22 Ed.1.0* 2010-05	Wind turbines – Part 22 : Conformity testing and certification <i>(withdrawn standard)</i>
DIN EN 61400-22 Ed.1.0 2011-10	Wind turbines - Part 22: Conformity testing and certification <i>(only Chapter 8.4.2, annex D)</i>
Guideline Edition 2010 GERMANISCHER LLOYD 2010-07	Guideline for the Certification of Wind Turbines
Guideline Edition 2012 GERMANISCHER LLOYD 2012-12	Guideline for the Certification of Offshore Wind Turbines
WICO QMP 09 2018-03	Measurement of wind turbine behaviour for certification

**11 Assessment of the site suitability of WT**

DIBt Reihe B, Heft 8 2012-10 – corrected version March 2015	Guideline for wind turbines: Actions and proof of stability for tower and foundation
FGW TR 6, Rev. 10* 2017-10	Determination of wind potential and energy yields
WICO QMP 13 2018-03	Assessment of the site suitability of WT



**12 Requirements according to module immission control and DIN 45688:2014**

<b>Group V: Determination of noises</b>			
<b>Standard / Guideline / Technical Rule</b>		<b>QM-Document</b>	<b>Comment Location</b>
<b>Title</b>	<b>Description</b>		
TA Lärm 1998-08 (Issue 2017)	Sixth general administrative regulation for the Federal Immission Control Act (Technical instructions for protection against noise – TA Lärm) including the standards and guidelines named therein.	WICO QMP 02 2020-03  WICO QMP 03 2020-03  WICO QMP 11 2019-09	<b>Admannshagen – Bargeshagen</b>
TA Lärm 1968-07	General administrative regulation on installations requiring a permit according to § 16 of the Industrial Code; Technical Instructions on Noise Protection - TA Lärm (in connection with: VDI 2058 Part 1:1985-09 "Assessment of industrial noise in the neighbourhood")	WICO QMP 02 2020-03  WICO QMP 03 2020-03  WICO QMP 11 2019-09	

The named procedures correspond to the requirements of the  
 “Proof of competence in the field of immission control”  
 “LAI Module Immission Control” (updated version by the L/W/V of 30-01-2018).

For the immission control regulated professional task range

Group V

the competence is confirmed.

**Abbreviations used:**

AEE	Spanish Wind Energy Association
BImSchV	Regulation to the Federal Immission Control Act
CEI	COMITATO ELETTROTECNICO ITALIANO
DIBt	German Institute for Structural Engineering
DIN	German Institute for Standardization
EN	European Standard
FGW	German Federation of Wind energy and other Decentralized Energies e.V.
IEA	International Energy Agency
IEC	International Energy Committee
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Standardisation Organisation
LAI	Federal state committee for Immission Control
MEASNET	Measuring Network of Wind Energy Institutes
PVVC	Procedure for Verification, Validation and Certification
TA	Technical Instruction
TR	Technical Guideline
VDE	Association for Electrical, Electronic & Information Technologies e.V.
VDI	Association of German Engineers e.V.
WT	Wind turbine
WICO QMP	In house method of the WIND-consult Ingenieurgesellschaft für umweltschonende Energiewandlung mbH