Determination of Wind Turbine Power Curves

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
IEC 61400-12 Ed. 1 2022-09	Wind energy generation systems - Part 12: Power performance measurements of electricity producing wind turbines - Overview	1	2022-09	☑
IEC 61400-12-1 Ed. 3 2022-09	Wind turbines - Part 12-1: Power performance measurements of electricity producing wind turbines	3	2022-09	☑
IEC 61400-12-2 Ed. 2 2022-09	Wind turbines - Part 12-2: Power performance measurements of electricity producing wind turbines based on nacelle anemometry	2	2022-09	☑
IEC 61400-12-3 Ed. 1 2022-08	Wind energy generation systems – Part 12-3: Power Performance – Measurement based site calibration	1	2022-08	☑
IEC 61400-12-5 Ed. 1 2022-08	Wind energy generation systems – Part 12-5: Power performance – Assessment of obstacles and terrain	1	2022-08	☑
IEC 61400-12-6 Ed. 1 2022-08	Wind energy generation systems – Part 12-6: Measurement based nacelle transfer function of electricity producing wind turbines	1	2022-08	☑
IEC 61400-50 Ed. 1 2022-08	Wind energy generation systems - Part 50: Wind measurements - Overview	1	2022-08	☑
IEC 61400-50-1 Ed. 1 2022-08	Wind energy generation systems – Part 50-1: Wind measurements Application of meteorological mast, nacelle and spinner mounted instruments	1	2022-08	☑
IEC 61400-50-2 Ed. 1 2022-08	Wind energy generation systems – Part 50-2: Wind Measurement – Application of ground mounted remote sensing technology	1	2022-08	☑
IEC 61400-50-3 Ed. 1* 2022-01	Wind energy generation systems – Part 50-3: Use of nacelle mounted lidars for wind measurements	1	2022-01	☑
DIN EN 61400-12-1* 2017-12	Power performance measurements of electricity producing wind turbines	1	2017-12	☑
DIN EN 61400-12-2* 2014-02	Power performance of electricity producing wind turbines based on nacelle anemometry	2	2014-02	☑
FGW TG5, Rev. 9* 2023-04	Determination and application of the reference yields	9	2023-04	☑
FGW TG 2, Rev. 18* 2023-01	Determination of power performance and standardized energy yields	18	2023-01	☑

MEASNET, Version 5 2009-12	MEASNET „Power Performance measurement procedure"	5	2009-12	☒

Execution and Evaluation of Wind Measurements by Anemometer and Remote Sensing

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
IEC 61400-12-1, Ed. 2* 2017	Wind turbines - Part 12-1: Power performance measurements of electricity producing wind turbines	2	2017	☑
IEC 61400-12-3 Ed. 1 2022-08	Wind energy generation systems – Part 12-3: Power Performance – Measurement based site calibration	1	2022-08	☑
IEC 61400-12-5 Ed. 1 2022-08	Wind energy generation systems – Part 12-5: Power performance – Assessment of obstacles and terrain	1	2022-08	☑
IEC 61400-12-6 Ed. 1 2022-08	Wind energy generation systems – Part 12-6: Measurement based nacelle transfer function of electricity producing wind turbines	1	2022-08	☑
IEC 61400-50 Ed. 1 2022-08	Wind energy generation systems - Part 50: Wind measurements - Overview	1	2022-08	☑
IEC 61400-50-1 Ed. 1 2022-08	Wind energy generation systems – Part 50-1: Wind measurements Application of meteorological mast, nacelle and spinner mounted instruments	1	2022-08	☑
IEC 61400-50-2 Ed. 1 2022-08	Wind energy generation systems – Part 50-2: Wind Measurement – Application of ground mounted remote sensing technology	1	2022-08	☑
DIN EN 61400-12-1* 2017-12	Wind turbines - part 12-1: Power performance measurements of electricity producing wind turbines	1	2017-12	☑
FGW TG 6, Rev. 11* 2020-09	Determination of wind potential and energy yields	11	2020-09	☑
MEASNET, Version 2 2016-04	Evaluation of Site Specific Wind Conditions	2	2016-04	☒

Determination of Site Quality; Determination of Wind Potential and Energy Yields

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
FGW TG 6, Rev. 12* 2023-11	Determination of wind potential and energy yields	12	2023-11	☑
MEASNET, Version 2 2016-04	Evaluation of Site Specific Wind Conditions	2	2016-04	☒
D5871, Rev. 10 2018-11	Standard Operating Procedure VA EE-Energy Yield Evaluation	10	2018-11	☒
FGW TG 10 Rev. 3* 2023-12	Determination of site quality following commissioning	3	2023-12	☑

Determination of Noise Emissions of Wind Turbines

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
IEC 61400-11, Ed. 3* 2012 + Amendment 1 2018	Wind turbines - Part 11: Acoustic noise measurement techniques	3	2012+2018	☑
DIN EN 61400-11* 2019-05	Windenergieanlagen - Teil 11: Schallmessverfahren		2019-05	☑
FGW TG 1, Rev. 18* 2008-02	Determination of noise emission	18	2008-02	☑
FGW TG 1, Rev. 19* 2021-03	Determination of noise emission	19	2021-03	☑
IEC 61400-14* 2005	Wind turbine generator systems - Part 14: Declaration of sound power level and tonality values of wind turbines		2005	☑
MEASNET, V.3 2011	Acoustic Noise Measurement Procedure	3	2011	☒

Determination of Shadow Flicker Immission by Calculation

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
DIN 5034-2* 1985-02	Daylight in interiors; principles		1985-02	☑
D5885, Rev. 4 2020-05	Standard Operating Procedure VA PS-Forecast of Shadow Flicker	4	2020-05	☒
LAI 2020-01	Notes on determination and assessment of optical immissions of wind turbines (German federal commitee for immission protection)		2020-01	☒

VDI 3789 Blatt 2 1994-10	Environmental meteorology - Interactions between atmosphere and surfaces - Calculation of spectral short-wave and long-wave radiation		1994-10	☒

Determination of Turbulence Intensity by Means of Measurement and Calculation

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
IEC 61400-1 Ed. 4 2019-02	Wind turbines - Part 1: Design Requirements	4	2019-02	☒
DIN EN 61400-1 2019-02	Wind turbines - Part 1: Design Requirements	1	2019-02	☒
MEASNET Procedure Version 2 2016-04	Evaluation of Site Specific Wind Conditions	2	2016-04	☒
ESDU 87034 2012-03	World-wide extreme wind speeds. Part 1: origins and methods of analysis		2012-03	☒
ESDU 88037 2012-03	World-wide extreme wind speeds. Part 2: examples using various methods of analysis.		2012-03	☒
DIBt Richtlinie Für Windenergieanlagen 2012-10	Impacts on and proof of structural safety of tower and foundation		2012-10	☒
D5896, Rev. 5 2020-05	Standard Operating Procedure VA Site Suitability Studies	5	2020-05	☒

Load Measurement on Wind Turbine

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
D5877, Rev. 4 2018-06	Standard Operating Procedure VA Load Measurement	4	2018-06	☒
IEC 61400-13 Ed.1 * 2015-12	Wind turbines - Part 13: Measurement of mechanical loads	1	2015-12	☑
IEC 61400-22 Ed. 1* 2010-05	Wind turbines - Part 22: conformity testing and verification Chapters: 8.4 Type testing 8.8 Type characteristics measurements 9.11 Project characteristics measurements Annex C Minimum requirements for load measurements Annex D Requirements for safety and function tests	1	2010-05	☑
DIN EN 61400-13 * 2017-06	Wind turbines - Part 13: Measurement of mechanical loads		2017-06	☑
DIN EN 61400-22* 2011-10	Wind turbines - Part 22: Conformity testing and certification Chapter: 8.4 Type testing 8.8 Type characteristics measurements 9.11 Project		2011-10	☑

	characteristics measurements Annex C Minimum requirements for load measurements Annex D Requirements for safety and function tests			
DNV-ST-0437 2021-11	Loads and site conditions for wind turbines Section 5. Measurements		2021-11	☒
DNV-ST-0438 2021-11	Control and protection systems for wind turbines Section 6. Test of the wind turbine behaviour Appendix C Test of turbine behaviour, specification		2021-11	☒

Determination of noise in the neighbourhood

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
DIN 45645-1* 1996-07	Determination of rating levels from measurement data - Part 1: Noise immission in the neighborhood	1	1996-07	☑
DIN 45680* 1997-03 + Beiblatt	Measurement and assessment of low-frequency noise immissions in the neighborhood		1997-03	☑
DIN 45681* 2005-03 + Berichtigung 2 2006-08	Acoustics - Determination of tonal components of noise and determination of a tone adjustment for the assessment of noise immissions		2005-03	☑
IEA R&D Wind Recommended Practices 10, 1st Edition 1997-01	Recommended Practices for Wind Turbine Testing 10. Measurement of Noise Immission from Wind Turbines at Noise Receptor Locations	1	1997-01	☒

Determination of Noise Immission in the neighbourhood

Designation	Title	Rev. Nr.	Rev. Date	Flexible?
TA Lärm 1968-07 in Verbindung mit *VDI 2058 Blatt 1 1985-09*	General administrative regulation on installations requiring licensing according to the German Industrial Code - Technical instructions on protection against noise - TA Noise (in connection with: VDI 2058 Blatt 1:1985-09 “Assessment of work noise in the neighborhood”)		1968-07 *1985-09*	☒
TA Lärm 1998-08	Sixth general administrative regulation of the Federal Immission Control Act - Technical instruction for the protection against noise - TA Noise		1998-08	☒