

Summary of results of the noise emission measurement, in accordance with IEC 61400-11, of a WTGS of the type

Nordex N100/2500

Customer:	Nordex Energy GmbH Langenhorn Chaussee 600 22419 Hamburg Germany	Site:	Wiemersdorf
Date of Order:	2010-11-04	Contractor:	GL Garrad Hassan Deutschland GmbH Sommerdeich 14 b 25709 Kaiser-Wilhelm-Koog Germany
		Order No.:	4285 10 07249 258

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This report consists of 2 pages in total.

Wind Turbine Technical Data:

Type: Nordex N100/2500
 Manufacturer: Nordex Energy GmbH
 Turbine serial number: 81498
 Rated power: 2500 kW
 Power control: pitch
 Tower type: cylindrical/conical
 Rotor manufacturer: LM Glasfiber A/S
 Rotor blade type: LM 48.8P
 Rotor blade serial number: E-0366/E-0367/E-0368
 Rotor diameter: 99,8 m
 Rotor blade pitch angle (degrees): variabel
 Number of rotor blades: 3
 Rotor speed(s) (or range): 9,6 - 16,9 min⁻¹
 Gearbox manufacturer: Eickhoff
 Gearbox type: EBN 1785 A02 R00A
 Gearbox serial numbers: 23249.2
 Generator manufacturer: Winergy
 Generator type: JFWC-560MR-06A
 Generator serial number: 6005078
 Generator speed(s) (or range): 1300 min⁻¹
 Generator rated power: 2500 kW

These data do not replace the corresponding manufacturer's certificate.

Measurement geometry:

Hub height above ground: 100 m
 Measurement distance R_0 : 132 m
 Height of microphone h_A : 0 m
 Distance rotor centre to tower axis d : 3,96 m

Measurement conditions:

Measurement date(s): 2011-09-06
 Range of wind speed at 10m height,
 1-min average WS_{10m} : 4,8 - 10,6 m/s
 Wind direction: SSW
 Range of power, 1-min-average $P_{W el}$: 1363 - 2537 kW
 Air pressure p_{Luft} : 1009 - 1010 hPa
 Air temperature T_{Luft} : 16,4 - 18,6 °C
 Turbulence intensity: 23,6 %

Power curve:

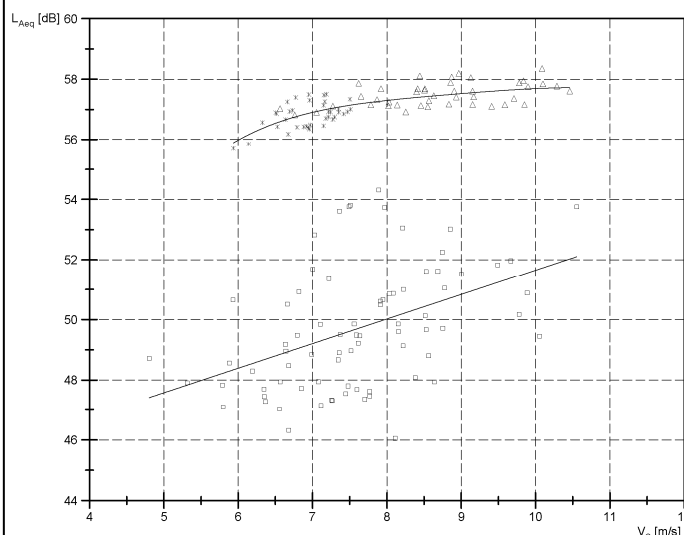
From report: vom Hersteller berechnet

Testing Auth.: --

Measurement Period: --

WS (m/s)	Power (kW)	WS (m/s)	Power (kW)	WS (m/s)	Power (kW)
3	3	9	1615	15	2500
3,5	46	9,5	1877	15,5	2500
4	101	10	2108	16	2500
4,5	171	10,5	2282	16,5	2500
5	256	11	2401	17	2500
5,5	356	11,5	2473	17,5	2500
6	472	12	2498	18	2500
6,5	608	12,5	2500	18,5	2500
7	756	13	2500	19	2500
7,5	945	13,5	2500	19,5	2500
8	1148	14	2500	20	2500
8,5	1372	14,5	2500		

Determination of the sound power level:



WS_{10m} [m/s]	6	7	7,59 *	8	9	10
$P_{W el}$ [kW]	1424	2123	2375	2470	2500	2500
L_{WA} [dB]	104,7	105,6	105,9	105,9	106,0	106,0
U_C [dB]	0,9	0,9	0,9	0,9	1,0	1,1

* wind speed at 95% of rated power

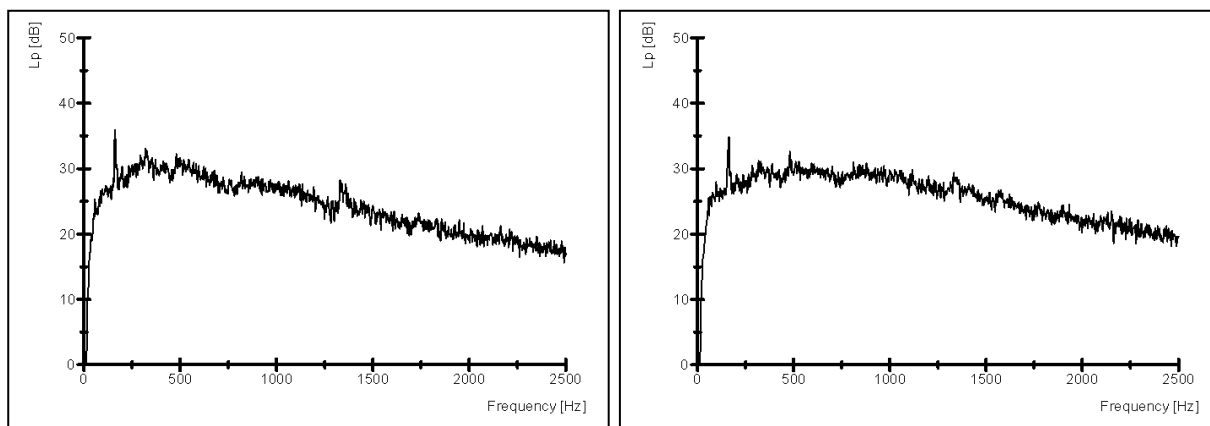
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Third octave sound power spectrum in dB(A) for winds speed at 10 m height:

1/3 octave freq. [Hz]	50	63	80	100	125	160	200	250	315	400	500	630
L _{WA} (6,0 m/s)	77,6	80,1	82,9	85,0	85,8	89,9	90,8	93,3	95,6	95,6	95,7	95,1
L _{WA} (7,0 m/s)	77,8	80,6	83,3	85,7	86,9	91,5	92,2	94,6	96,6	96,4	96,3	95,8
L _{WA} (8,0 m/s)	78,8	81,5	84,0	86,2	87,0	92,8	92,0	94,0	96,1	96,2	96,5	96,1
L _{WA} (9,0 m/s)	78,4	81,0	83,8	86,2	87,3	92,3	92,7	94,8	96,8	96,7	96,5	96,1
L _{WA} (10,0 m/s)	77,4	80,1	82,7	84,7	85,5	91,7	89,6	92,2	94,3	94,9	96,1	96,1
1/3 octave freq. [Hz]	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
L _{WA} (6,0 m/s)	94,2	93,7	92,5	91,0	88,4	87,1	84,9	82,0	80,3	74,5	66,6	50,8
L _{WA} (7,0 m/s)	94,7	94,1	94,0	92,1	89,9	88,5	86,7	84,4	82,6	77,8	70,2	94,7
L _{WA} (8,0 m/s)	95,8	95,8	94,7	92,9	90,1	88,2	85,8	83,8	80,6	75,2	63,5	48,5
L _{WA} (9,0 m/s)	95,2	94,8	94,5	92,7	90,1	89,0	87,0	84,9	83,6	79,3	73,1	65,4
L _{WA} (10,0 m/s)	96,2	96,5	95,9	94,7	92,9	91,3	89,3	87,5	85,0	81,0	75,4	67,2

Tonality according to IEC 61400-11/Ed.2:

Representative FFT - Spectra (left 8 m/s and right 10 m/s at a height of 10 m):



WS in 10 m height [m/s]	6,0	7,0	8,0	9,0	10,0
Freq. of most prevalent tone, f [Hz]	308	1326	162	162	160
Tonality, ΔL_k [dB]	-14,44	-9,02	-7,24	-7,13	-7,39
Audibility, $\Delta L_{a,k}$ [dB]	-12,33	-5,93	-5,21	-5,11	-5,36
K _{TN} according to FGW [dB]	0	0	0	0	0

Remarks:

Checked:

Engineer:

Dipl.-Ing. K. Buchmann

Dipl.-Ing. J. Dedert



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