

5.) Summary of results for hub height 135 m

Summary of Test Report (Conversion of 99 m hub height to 135 m) /1/												
Basic sheet "Geräusche" (Noise), according to the												
"Technische Richtlinien für Windenergieanlagen, Teil 1: Bestimmung der Schallemissionswerte"												
(Technical Guidelines for Wind Turbine Generators, Part 1: Determination of sound emission values)												
Rev. 18 of February 1, 2008 (Editor: Fördergesellschaft Windenergie e.V. Stresemannplatz 4, D-24103 Kiel)												
Extract of Test Report 213122-03.02 IEC on noise emission of wind turbine generator of type E-101												
General Data				Technical Data (manufacturer's specifications)								
Manufacturer of WTG:	Enercon GmbH			Rated power (generator):	3,050 (3,250) kW							
Serial number:	1010002			Diameter of rotor:	101 m							
Location of WTG (approx.):	49733 Haren			Hub height above ground:	135 m ***							
Geographic co-ordinates:	GK longitude:	25.76.214		Type of tower:	conical tubular concrete							
	GK latitude:	58.59.856		Power control:	Pitch							
Complementary rotor data (manufacturer's specifications)				Complementary data of gear unit and generator (manufacturer's specifications)								
Manufacturer of rotor blade:	Enercon			Manufacturer of gear unit:	not applicable							
Type of rotor blade:	E-101-1			Type of gear unit:	not applicable							
Blade setting angle:	variable			Manufacturer of generator:	Enercon							
Number of rotor blades:	3			Type of generator:	G-101/30-G2							
Rotor speed range:	5 to 14.7 rpm. (mode OM I)			Rated speed of generator:	5 to 14.7 rpm (mode OM I)							
Calculated Performance Chart: Leistungskennlinie E101 3 MW OM I (berechnet); calculated by ENERCON (Rev. 1.0)												
	Reference Point		Noise emission parameters	Observations								
	standardized wind speed at a height of 10 m	true electrical power										
sound power level $L_{WA,P}$	6 ms^{-1}	1,562 kW	103.8 dB(A)									
	7 ms^{-1}	2,314 kW	104.5 dB(A)									
	8 ms^{-1}	2,859 kW	104.8 dB(A)									
	9 ms^{-1}	3,021 kW	--	(1)								
	10 ms^{-1}	3,050 kW	--	(1)								
tonal audibility $\Delta L_{a,k}$	6 ms^{-1}	1,562 kW	- 1.5 dB									
	7 ms^{-1}	2,314 kW	0 dB									
	8 ms^{-1}	2,859 kW	0 dB									
	9 ms^{-1}	3,021 kW	--	(1)								
	10 ms^{-1}	3,050 kW	--	(1)								
impulse adjustment for immediate vicinity K_{IN}	6 ms^{-1}	1,562 kW	0 dB									
	7 ms^{-1}	2,314 kW	0 dB									
	8 ms^{-1}	2,859 kW	0 dB									
	9 ms^{-1}	3,021 kW	--	(1)								
	10 ms^{-1}	3,050 kW	--	(1)								
Third-octave band sound power level for $v_s = 6 ms^{-1}$ in dB(A)												
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P}$	78.5	82.*	83.2**	84.4	89.8	85.9*	89.4	92.9	94.3	94.8	95.3	95.1
Frequency	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000
$L_{WA,P}$	93.7	91.8	90.2	89.2	85.6	84.3	82.5	79.5	75.0	68.0*	64.9**	65.5**
Octave band sound power level for $v_s = 6 ms^{-1}$ in dB(A)												
Frequency	63	125	250	500	1,000	2,000	4,000	8,000				
$L_{WA,P}$	85.8*	92.1	97.4	99.8	96.9	91.7	84.8	70.5*				
Third-octave band sound power level for $v_s = 7 ms^{-1}$ in dB(A)												
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P}$	79.1	83.5	84.2	85.1	88.4	86.6*	89.8	94.9	95.1	95.6	96.0	95.7
Frequency	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000
$L_{WA,P}$	94.2	92.2	90.6	89.5	86.3	84.9	83.1	80.1	74.6*	68.6*	64.8**	62.9**

Octave band sound power level for $v_s = 7 \text{ ms}^{-1}$ in dB(A)												
Frequency	63	125	250	500	1,000	2,000	4,000	8,000				
L _{WA,P}	87.5	91.7	98.6	100.5	97.3	92.1	85.2	71.7**				
Third-octave band sound power level for $v_s = 8 \text{ ms}^{-1}$ in dB(A)												
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
L _{WA,P}	78.8	82.1	82.8	84.4	88.4	86.8	90.1	94.8	95.0	95.6	96.3	96.2
Frequency	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000
L _{WA,P}	95.0	93.3	91.5	90.4	86.7	85.4	83.7	80.9	75.9	69.7*	67.1**	65.5**
Octave band sound power level for $v_s = 8 \text{ ms}^{-1}$ in dB(A)												
Frequency	63	125	250	500	1,000	2,000	4,000	8,000				
L _{WA,P}	86.3	91.6	98.6	100.8	98.3	92.8	86.0	73.3**				

This summary of the test report is valid only in combination with the manufacturer's certificate dated 12/03/2013.

These specifications do not replace the test report mentioned above (particularly for noise immission predictions).

- Observations:
- (1) Due to weather conditions, no data available during WTG operation
 - * Difference between working and background noise < 6 dB, correction by 1.3 dB
 - ** Difference between working and background noise < 3 dB, values shall not be presented
 - *** Conversion of 99 m hub height to 135 m

/1/ Wind turbine generator systems – Part 11: Acoustic noise; measurement techniques (IEC 61400-11:2002 and A1:2006); German version DIN EN 61400-11:2007

Measured by: KÖTTER Consulting Engineers
- Rheine -




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