Annexe I Spectre des fréquences d'émission sonore des éoliennes ENERCON E-82 3 MW

Extract of test report

Master Sheet "Noise", according to "Technische Richtlinien für Windenergieanlagen, Teil 1: Bestimmung der Schallemissionswerte"
Method of calculating apparent sound power level to another hub height according to Annex C of [1] and [2]

Extract of test report M89 031/2
regarding noise emission of wind turbine (WT) Enercon E-82 E3

General		Technical specifications (manufacturer)	
Manufacturer:	Enercon GmbH	Rated power (generator):	3.000 kW
	Dreekamp 5	Rotor diameter:	82 m
	26605 Aurich	Hub height above ground:	85 m
Serial number:	82001	Tower design:	tube tower
WT-location:	RW: 2.592.266	material:	concrete
	HW: 5.914.847	Power control:	pitch
Complementations of rotor (manufacturer)		**Complementations of gear and generator (manufacturer)**	
blades:	Enercon GmbH	Manufacturer of gear:	---
Type of blades:	E-82-2	Type of gear:	---
Pitch angel:	variabel	Manufacturer of generator:	Enercon GmbH
Number of blades:	3	Type of generator:	E-82 E3
Rated speed(s)/speed range:	6 - 18 rpm (mode I)	Rated speed(s)/speed range:	6 - 18 rpm (mode I)

test report of power curve: Enercon GmbH: Calculated output curve of the E-82 E3 Rev. 2.0

	Reference		Noise emission parameter	Remarks
	Standardized wind speed at 10 m above ground	Electric power		
Sound Power level $L_{WA,P}$	6 m/s	-- kW	-- dB(A)	[3]
	7 m/s	1503 kW	104,5 dB(A)	
	8 m/s	1941 kW	104,5 dB(A)	
	9 m/s	2370 kW	104,7 dB(A)	
	10 m/s	2702 kW	105,3 dB(A)	
	10,7 m/s	*2850 kW*	-- dB(A)	[3]
Tonality (close-up range) K_{TN}	6 m/s	-- kW	--- dB	[3]
	7 m/s	1503 kW	--- dB	
	8 m/s	1941 kW	--- dB	
	9 m/s	2370 kW	--- dB	
	10 m/s	2702 kW	--- dB	
	10,7 m/s	*2850 kW*	--- *dB*	[3]
Impulsivity (close-up range) K_{IN}	6 m/s	-- kW	--- dB	[3]
	7 m/s	1503 kW	--- dB	
	8 m/s	1941 kW	--- dB	
	9 m/s	2370 kW	--- dB	
	10 m/s	2702 kW	--- dB	
	10,7 m/s	*2850 kW*	--- dB	[3]

one third octave sound power level at reference point v_{10} = 6 m/s

frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,\ 1/3\ octave}$	---	---	---	---	---	---	---	---	---	---	---	---
frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,\ 1/3\ octave}$	---	---	---	---	---	---	---	---	---	---	---	---

octave sound power level at reference point v_{10} = 6 m/s

frequency	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,\ octave}$	---	---	---	---	---	---	---	---

one third octave sound power level at reference point v_{10} = 7 m/s

frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,\ 1/3\ octave}$	77,9	82,3	86,1	88,6	90,2	91,0	93,6	95,4	95,6	93,3	94,2	94,4
frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,\ 1/3\ octave}$	92,7	91,8	90,4	91,1	89,3	86,3	85,3	82,7	80,5	74,8	76,5	73,4

octave sound power level at reference point v_{10} = 7 m/s

frequency	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,\ octave}$	88,0	94,8	99,7	98,7	96,5	94,1	88,0	79,8

one third octave sound power level at reference point v_{10} = 8 m/s

frequency	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,\ 1/3\ octave}$	79,9	83,7	86,8	89,1	89,5	92,9	95,3	96,0	94,1	95,2	95,2	92,9
frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,\ 1/3\ octave}$	91,2	89,4	90,3	88,6	86,0	84,5	81,8	77,7	74,1	78,2	63,4	63,6

octave sound power level at reference point v_{10} = 8 m/s

frequency	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,\ octave}$	89,1	95,7	100,0	99,4	95,2	91,5	83,8	78,5

one third octave sound power level at reference point v_{10} = 9 m/s

Frequenz	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,Terz}$	75,4	79,0	82,4	85,6	89,1	88,5	92,2	94,9	95,9	94,4	95,6	96,0
Frequenz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,Terz}$	93,7	91,6	89,6	90,4	89,1	88,7	86,2	83,8	79,3	76,1	80,4	75,7

octave sound power level at reference point v_{10} = 9 m/s

Frequenz	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,Terz}$	84,6	92,8	99,4	100,2	96,8	94,3	88,7	82,8

one third octave sound power level at reference point v_{10} = 10 m/s

Frequenz	50	63	80	100	125	160	200	250	315	400	500	630
$L_{WA,P,Terz}$	76,4	80,2	83,6	85,9	89,4	88,8	92,2	94,8	95,8	94,6	96,2	96,8
Frequenz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P,Terz}$	94,7	92,7	90,9	91,6	90,3	90,0	89,1	85,5	82,0	79,4	82,3	72,6

octave sound power level at reference point v_{10} = 10 m/s

Frequenz	63	125	250	500	1000	2000	4000	8000
$L_{WA,P,Terz}$	85,8	93,1	99,3	100,7	97,8	95,5	91,2	84,4

This test report extract is only valid with the manufacturer's certificate from 25.9.2010.
The declarations in this extract are only valid in combination with the test report M89 031/2 from 19.1.2011 [4]
(especially for calculations of sound propagation).

Remarks:

[1] Technische Richtlinien für Windenergieanlagen, Teil 1: Bestimmung der Schallemissionswerte
Rev. 18 vom 01. February 2008 (Herausgeber: Fördergesellschaft Windenergie e.V., Stresemannplatz 4, D-24103 Kiel)

[2] IEC 61400-14 TS ed. 1, Declaration of Sound Power Level und Tonality Values of Wind Turbines, 2005-03

[3] In this windclass no values were determined

[4] The working point of 95% of the rated power, for which the maximum sound power level was stated, is according to the reference power curve and the hub height of the measured WT under standardized meteorological conditions v10= 10,7 m/s

[5] Müller-BBM testreport M89 031/2 from 19.1.2011

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Schallemission FGW renewable energies 2011 Konformitätssiegel

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