

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

WINDTEST

Kaiser-Wilhelm-Koog GmbH



Acciona AW 82/1500 IEC IIIb T80A LM40.3P

Customer:	Acciona Windpower, S.A. Pol. Ind. Barasoain, Parcela 2 31395 – Barasoain, Navarra Spain	Site:	Moncayuelo Wind Farm A-3.3
Date of Order:	2006-10-31	Contractor:	WINDTEST Kaiser-Wilhelm-Koog GmbH Sommerdeich 14 b 25709 Kaiser-Wilhelm-Koog Germany
		Order No.:	4250 06 03531 64

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Wind Turbine Technical Data:

Type: Acciona AW 82/1500 IEC IIIb T80A LM40.3P
 Manufacturer: Acciona Windpower, S.A.
 Turbine serial number: 002
 Rated power: 1500 kW
 Power control: pitch
 Tower type: tubular/conical

Rotor manufacturer: LM
 Rotor blade type: 40.3P
 Rotor blade serial number: 0100, 0101, 0102
 Rotor diameter: 82,026 m
 Rotor blade pitch angle (degrees): variable (0-90°)
 Number of rotor blades: 3
 Rotor rated speed: 18,25 min⁻¹

Gearbox manufacturer: Fellar
 Gearbox type: TPH3-1600N
 Gearbox serial number: 480257700201

Generator manufacturer: INDAR
 Generator type: TAR-500-X6/R
 Generator serial number: 5170
 Generator speed range: 700 - 1350 min⁻¹
 Generator rated power: 1500 kW

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

Measurement geometry:

Hub height above ground: 80 m
 Measurement distance R_0 : 113 m
 Height of microphone h_A : -21 m
 Distance rotor centre to tower axis d : 3,6 m

Measurement conditions:

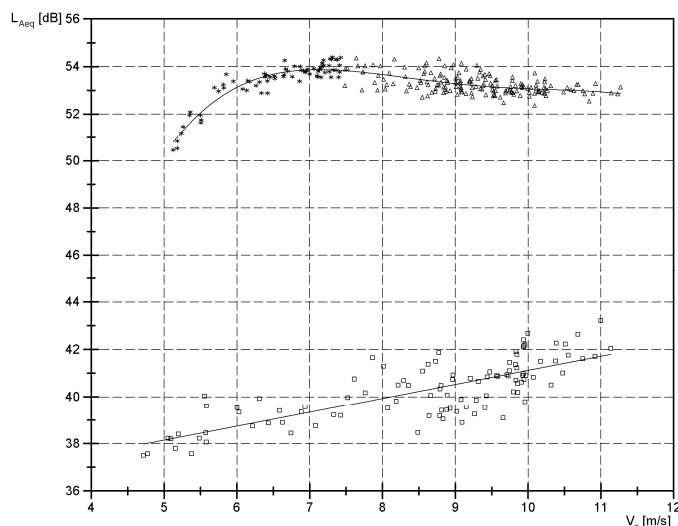
Measurement date: 2006-12-06
 Range of wind speed at 10m height, 1-min average
 WS_{10m} : 4,7 - 11,1 m/s
 Wind direction: WNW
 Range of power, 1-min-average P_{wel} : 556 - 1523 kW
 Air pressure p_{Luft} : 959 - 963 hPa
 Air temperature T_{Luft} : 7 - 10 °C
 Turbulence intensity: 10,4 %

Power curve:

From report: DEWI W-PV 06-012
 Testing Auth.: DEWI
 Measurement Period: 2006-08-04 - 2006-10-11

WS (m/s)	Power (kW)	WS (m/s)	Power (kW)	WS (m/s)	Power (kW)
1,61	-6,93	6,97	525,87	12,50	1513,74
2,03	-6,93	7,51	672,78	13,01	1513,51
2,53	-7,86	8,02	787,60	13,52	1515,39
3,00	-3,62	8,50	901,11	13,97	1516,41
3,51	9,55	9,00	1074,49	14,51	1516,39
4,02	68,27	9,50	1196,62	15,04	1516,98
4,52	107,41	10,01	1348,74	15,51	1518,00
5,02	176,77	10,49	1442,92	15,96	1517,43
5,52	241,98	10,99	1480,84	16,47	1515,96
5,99	321,57	11,50	1499,06	16,98	1516,38
6,51	423,68	12,03	1505,76	17,42	1516,85

Determination of the sound power level:



WS_{10m} [m/s]	6	7	8	9	10
P_{wel} [kW]	867	1270	1486	1514	1516
L_{WA} [dB]	101,7	102,5	102,2	101,8	101,5
U_C [dB]	0,8	0,7	0,8	0,8	0,7

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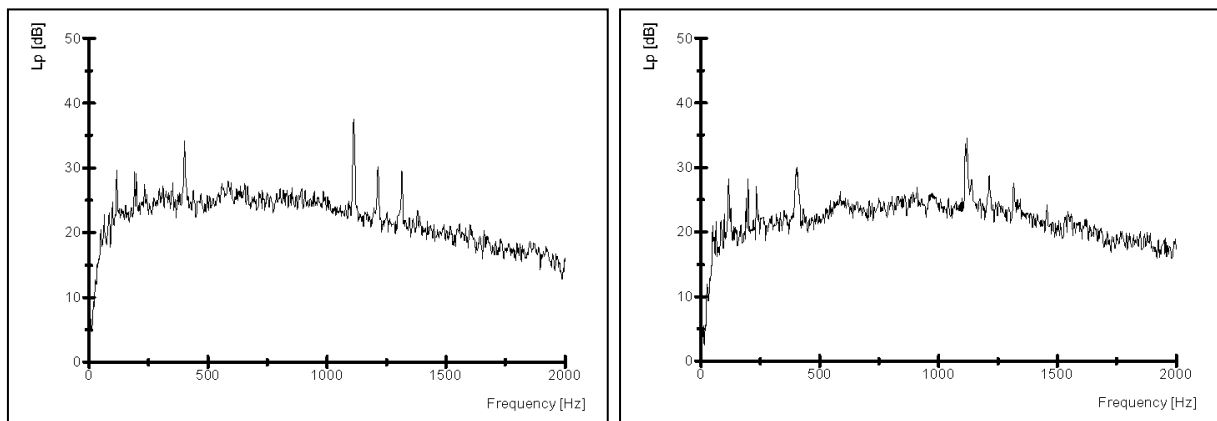


Third octave sound power spectrum in dB(A) for the wind speed in 10 m height corresponding to the maximum sound power level given on page 1:

1/3 octave freq. [Hz]	50	63	80	100	125	160	200	250	315	400	500	630
L_{WA} (7 m/s)	72,1	72,8	76,0	80,8	84,7	85,0	88,2	90,4	91,9	92,8	92,9	93,5
1/3 octave freq. [Hz]	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
L_{WA} (7 m/s)	92,6	93,2	92,3	88,9	86,7	86,1	82,0	79,5	76,0	71,3	65,8	63,4

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]	1086-1122	1114-1122	1088-1124	1112-1126	1084-1150
Tonality, ΔL_k [dB]	-0,87	-2,42	-0,51	-1,09	-1,71
Audibility, $\Delta L_{a,k}$ [dB]	2,05	0,51	2,41	1,84	1,21

Engineer:

Dipl.-Ing. A. Jensen.



Checked:

Dipl.-Ing. J. Neubert
Head of Acoustics Group

Laboratory accredited by DAP Deutsches Akkreditierungssystem
Prüfwesen according to DIN EN ISO/IEC 17025. This
accreditation is valid for the test and measurement procedures
given in the certificate.

