

Alstom Wind ECO 122 3000 122.0 !O!

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Company Alstom Wind Class IEC IIIA/IIB
 Type/Version ECO 122
 Rated power 3 000,0 kW
 Secondary generator 0,0 kW
 Rotor diameter 122,0 m
 Tower Tubular
 Grid connection 50/60 Hz

Origin country ES
 Blade type
 Generator type Variable
 Rpm, rated power 12,3 rpm
 Rpm, initial 7,1 rpm
 Hub height(s) 89,0; 119,0; 139,0 m
 Maximum blade width 0,00 m
 Blade width for 90% radius 0,00 m
 Valid Yes
 Creator EMD
 Created 2015-07-10 08:22
 Edited 2015-07-10 08:22

Power curve: Level 0 - Measured - ID 4665 - 05-2015

Source Manufacturer

Source date	Creator	Created	Edited	Default	Stop windSpeed	Air density	Tip angle	Power control	CT curve type
					[m/s]	[kg/m3]	[°]		
2015-05-15 00:00	EMD	2012-08-15 14:51	2015-07-27 13:39	Yes	25,0	1,225	0,0	Pitch	User defined

Power curve

Wind speed [m/s]	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00	13,00	14,00	15,00	16,00	17,00	18,00	19,00
Power [kW]	29	171	389	703	1 139	1 694	2 275	2 715	2 928	2 990	3 000	3 000	3 000	3 000	3 000	3 000	3 000
Ce	0,150	0,373	0,435	0,455	0,464	0,462	0,436	0,379	0,307	0,242	0,191	0,153	0,124	0,102	0,085	0,072	0,061

Wind speed [m/s]	20,00	21,00	22,00	23,00	24,00	25,00
Power [kW]	3 000	3 000	3 000	3 000	3 000	3 000
Ce	0,052	0,045	0,039	0,034	0,030	0,027

Ct curve

Wind speed [m/s]	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00	13,00	14,00	15,00	16,00	17,00	18,00	19,00
Ct	1,060	0,900	0,830	0,820	0,810	0,770	0,690	0,560	0,430	0,320	0,250	0,190	0,160	0,130	0,110	0,090	0,080

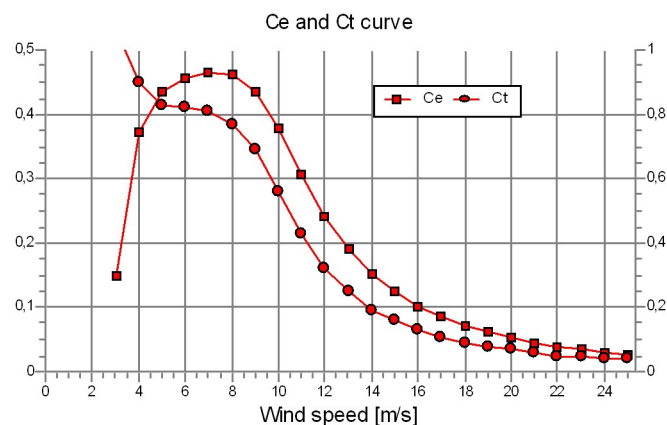
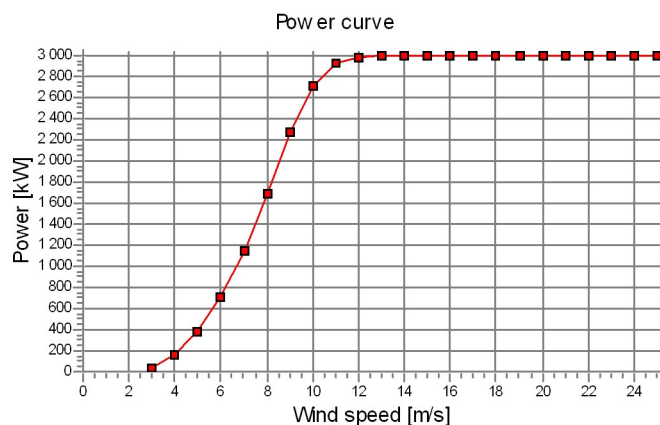
Wind speed [m/s]	20,00	21,00	22,00	23,00	24,00	25,00
Ct	0,070	0,060	0,050	0,050	0,040	0,040

HP curve comparison

Vmean	[m/s]	5	6	7	8	9	10
HP value	[MWh]	5 748	8 532	11 127	13 373	15 229	16 686

Level 0 - Measured - ID 4665 - 05-2015	[MWh]	5 818	8 576	11 142	13 365	15 195	16 620
Check value	[%]	-1	-1	0	0	0	0

The table shows comparison between annual energy production calculated on basis of simplified "HP-curves" which assume that all WTGs performs quite similar - only specific power loading (kW/m^2) and single/dual speed or stall/pitch decides the calculated values. Productions are without wake losses.
 For further details, ask at the Danish Energy Agency for project report J.nr. 51171/00-0016 or see WindPRO manual chapter 3.5.2.
 The method is refined in EMD report "20 Detailed Case Studies comparing Project Design Calculations and actual Energy Productions for Wind Energy Projects worldwide", jan 2003. Use the table to evaluate if the given power curve is reasonable - if the check value are lower than -5%, the power curve probably is too optimistic due to uncertainty in power curve measurement.
 Updated in WindPRO 2.8. Feb. 2012, see details in manual!



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Noise: Level 0 - Estimated - - 07-2014

Source Manufacturer

Source date	Creator	Created	Edited	Default
2014-07-01 00:00	EMD	2015-07-10 08:27	2015-07-10 10:00	No

Hub height [m]	Wind speed [m/s]	Lwa,ref [dB(A)]	Wind speed dependency [dB(A)/m/s]	Pure tones	Octave data								A weighted	
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]		
-3,0	9,0	106,2		1,0	No	86,6	94,1	100,0	101,5	100,3	95,5	86,8	73,6	Yes
	10,0	106,5		1,0	No	88,1	96,0	101,5	101,4	99,2	94,6	87,3	73,1	Yes
	11,0	106,0		1,0	No	87,4	95,0	100,2	101,1	99,5	94,8	87,4	74,3	Yes
	12,0	105,7		1,0	No	84,0	92,3	98,5	101,1	100,5	95,6	87,0	75,9	Yes
	13,0	105,6		1,0	No	81,5	90,9	97,0	100,5	101,1	96,9	87,8	73,6	Yes
	14,0	105,5		1,0	No	83,9	91,7	97,2	100,3	101,0	96,7	87,5	71,0	Yes
89,0	7,0	106,4		1,0	No	87,9	95,8	101,4	101,4	99,4	94,7	87,2	73,1	Yes
	8,0	105,9		1,0	No	86,4	94,2	99,7	101,1	99,8	95,1	87,3	74,7	Yes
	9,0	105,6		1,0	No	82,2	91,3	97,4	100,7	101,0	96,5	87,6	74,1	Yes
119,0	7,0	106,3		1,0	No	87,9	95,7	101,2	101,3	99,3	94,7	87,3	73,4	Yes
	8,0	105,8		1,0	No	84,9	93,0	99,0	101,1	100,3	95,4	87,1	75,4	Yes
	9,0	105,6		1,0	No	82,0	91,1	97,0	100,5	101,1	96,8	87,7	73,0	Yes
139,0	7,0	106,2		1,0	No	87,8	95,5	100,9	101,3	99,4	94,7	87,4	73,7	Yes
	8,0	105,7		1,0	No	84,0	92,3	98,6	101,1	100,5	95,6	87,1	75,8	Yes
	9,0	105,5		1,0	No	82,6	91,3	97,1	100,4	101,1	96,8	87,6	72,3	Yes

Based on Document n. DST-0747 Rev. 00.

Visual data

Name	Visual data
Source	Manufacturer

Hub height [m]	Source date	Creator	Created	Edited	Default
88,500	2012-09-27 13:36	EMD	2012-09-27 13:36	2015-08-26 16:06	Yes

Tower

Cabin

Distance cabin front (rotor) to tower center: 22 %

Shape	Height front [m]	Height back [m]	Width front [m]	Width back [m]	Length bottom [m]	Length top [m]	Front offset [m]	Rear offset [m]
Box	3,70	3,70	3,50	3,50	0,00	0,30	0,00	0,00
Box	3,70	3,70	6,30	6,00	1,00	1,00	0,00	0,00
Box	3,70	3,70	6,30	6,30	5,40	5,40	0,00	0,00
Box	3,70	3,70	3,50	6,30	1,60	1,60	0,00	0,00
Box	3,70	3,70	3,50	3,50	0,40	0,00	0,00	0,00

Rotor and hub

Distance cabin front (rotor) to tower center: 22 %

Number of blades	3
Blade position (center to cabin)	1,30 m
Chord max	0,00 m
Rotor position relative to tower	Up wind
Hub length (cabin to spinner tip)	3,70 m
Spinner length (0 = no spinner)	1,60 m
Hub diameter (2xradius from hub center to blade root)	4,60 m
Spinner max diameter	3,70 m
Shaft radius	3,70 m
Hub tilt angle	6,0 °
Blade cone angle	-2,5 °

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