Confidential
Document no.: 0079-5337 V00
2018-10-24

Customer Engagement Package
V162-5.6 MW 50/60 Hz

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1 General Description

The Vestas V162-5.6 MW wind turbine is a pitch regulated upwind turbine with active yaw and a three-blade rotor. The Vestas V162-5.6 MW turbine has a rotor diameter of 162 m and a rated power of 5.6 MW.

2 Type Approvals and Available Hub Heights

The standard turbine is type certified according to the certification standards and available hub heights listed below:

Certification	Wind Class	Hub Height
IEC 61400-22	IEC S	125 / 149 m
DIBt 2012	DIBt S	119 / 148 / 166 m

3 Operational Envelope and Performance Guidelines

Actual climate and site conditions have many variables and should be considered in evaluating actual turbine performance. The design and operating parameters set forth in this section do not constitute warranties, guarantees, or representations as to turbine performance at actual sites.

3.1 Climate and Site Conditions

The standard turbine is designed for the wind climate conditions listed below. Values refer to hub height.

Wind Class	**IEC S**	**IEC S**
Power Rating	**5.6 MW**	**5.6 MW**
Hub Height	**125**	**149**
Average design parameters - IEC		
Wind Speed (10 min average), V_{ave}	8.5 m/s	7.9 m/s
Weibull Scale Factor, *C*	9.6 m/s	8.9 m/s
Weibull Shape Factor, *k*	2.3	2.3
I_{ref} acc. to IEC 61400-1, *[NTM]*	0.14	0.15
I_{ref} acc. to IEC 61400-1, *[ETM]*	0.16	0.16
Turbulence Intensity acc. to IEC 61400-1, Including Wind Farm Turbulence (@15 m/s) I_{90} (90% quantile) *[NTM]*	15.7 %	16.9 %
Wind Shear, *α*	0.20	0.20
Inflow Angle (vertical)	8°	8°
Extreme design parameters – IEC		
Extr. Wind Speed (10 min average), V_{50}	37.5 m/s	39.5 m/s
Survival Wind Speed (3 s gust), V_{e50}	52.5 m/s	55.3 m/s
Turbulence Intensity, I_{V50}	11 %	11 %

Wind Class	**DIBt S**	**DIBt S**	**DIBt S**
Hub Height	**119 m**	**148 m**	**166 m**
Power Rating	**5.6 MW**	**5.6 MW**	**5.6 MW**
Average design parameters – DIBt			
Wind Speed (10 min average), V_{ave}	7.1 m/s	7.3 m/s	7.5 m/s
I_{ref} acc. to IEC 61400-1	S	S	S
Turbulence Intensity, I_{90} (90% quant.)	S	S	S
Extreme design parameters – DIBt			
Extr Wind Speed (10 min average), V_{50}	39.4 m/s	37.0 m/s	37.6 m/s
Survival Wind Speed (3 s gust), V_{e50}	55.2 m/s	51.8 m/s	52.6 m/s
Turbulence intensity, $I_{v(z)}$	12.8%	12.3%	12.1%
Wind Shear, α	0.20	0.20	0.20
Inflow Angle	8°	8°	8°

NOTE The turbine is intended for low to medium wind speed sites and is classified as IEC S and DIBt S. Please contact Vestas Wind Systems A/S for further information if needed.

3.1.1 Wind Power Plant Layout

Turbine spacing is to be evaluated site-specifically. Spacing below two rotor diameters (2D) may require sector-wise curtailment.

3.2 Operational Envelope – Wind

Values refer to hub height and are determined by the sensors and control system of the turbine.

Wind Climate	**IEC S**	
	Mode 0	**SO2, SO3, SO4, SO5, SO6**
Cut-In, V_{in}	3 m/s	3 m/s
Cut-Out (10 min exponential avg.), V_{out}	24 m/s	20 m/s
Re-Cut In (10 min exponential avg.)	22 m/s	18 m/s

3.3 Operational Envelope – Temperature and Altitude

Values below refer to hub height and are determined by the sensors and control system of the turbine.

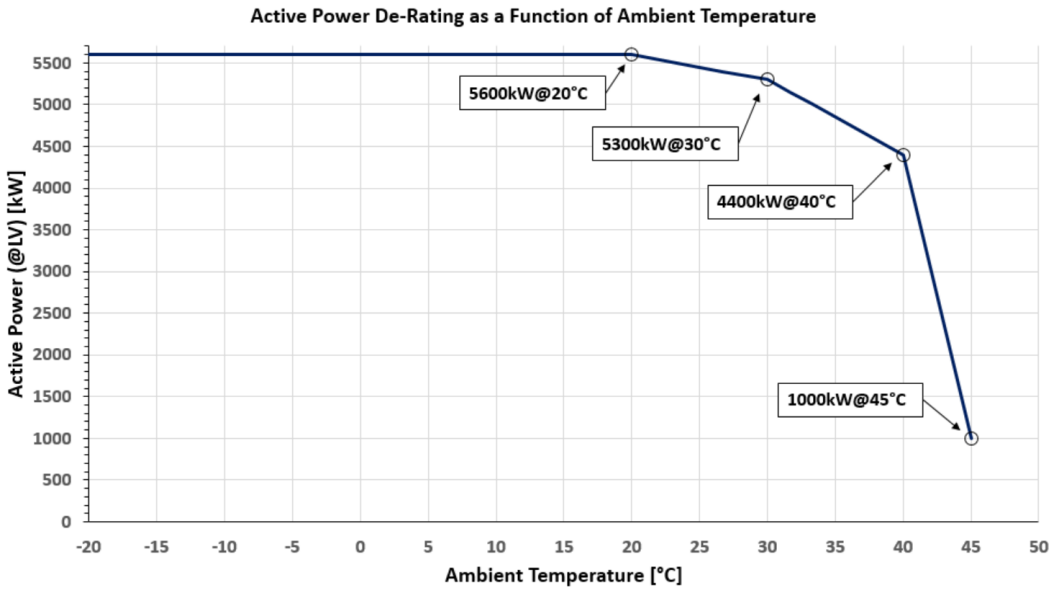
Operational Envelope – Temperature	
Ambient Temperature Interval (Standard Turbine)	-20° to +45°C
Ambient Temperature Interval (Low Temperature Turbine)	-30° to +45°C

NOTE The wind turbine will stop producing power at ambient temperatures above 45°C. For the low temperature options of the wind turbine, consult Vestas.

The turbine is designed for use at altitudes up to 1000 m above sea level as standard and optional up to 2000 m above sea level.

3.3.1 Temperature dependent operation

Values below refer to hub height and are determined by the sensors and control system of the turbine. At ambient temperatures above the thresholds shown for each operating mode, the turbine will maintain derated production. Additional derating will take place at altitudes above 1000 m.a.s.l.



NOTE All derating settings are preliminary and subject to change.

3.4 Operational Envelope – Conditions for Power Curve and Ct Values (at Hub Height)

Please consult section 6 and subsequent, for power curves and C_t values.

Conditions for Power Curve and C_t Values (at Hub Height)	
Wind Shear, *α*	0.00-0.30 (10-minute average)
Turbulence Intensity, *I*	6-12% (10-minute average)
Blades	Clean
Rain	No
Ice/Snow on Blades	No
Leading Edge	No damage
Terrain	IEC 61400-12-1
Inflow Angle (Vertical)	0 ±2°
Grid Voltage	Nominal Voltage ±2.5%
Grid Frequency	Nominal Frequency ±0.5 Hz
Grid Active Power (LV-side)	Per tabulated values in Section 6 and following sections
Grid Reactive Power (LV-side)	Power Factor 1.0

3.5 Sound Modes

The sound modes listed below are available for the turbine.

Sound modes			
Mode No.	**Maximum Sound Level**	**Serrated trailing edges**	**Available hub heights**
0	104 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m

In addition, Sound Optimized (SO) modes as listed below are available as options for the turbine.

Sound Optimized (SO) modes			
Mode No.	**Maximum Sound Level**	**Serrated trailing edges**	**Available hub heights**
SO2	102 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
SO3	101 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
SO4	100 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
SO5	99 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
SO6	98 dBA	Yes (standard)	Site specific

NOTE Sound Optimized (SO) modes are only available with serrated trailing edges on the blades. For further details on sound performance and in case of specific requests, please contact Vestas Wind Systems A/S.

4 Drawings

Overview drawings describing the wind turbines, tower and foundation are shown in these documents.

V162 HH119 – 0075-8518
V162 HH125 – 0079-6651
V162 HH148 – 0075-8517
V162 HH149 – 0079-6675
V162 HH166 – 0075-8514

NOTE For detailed drawings, please contact Vestas Wind Systems A/S.

4.1 Turbine visual impression – side view

5 General Reservations, Notes and Disclaimers

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- The performance specifications described in this document apply to the current version of the V162-5.6 MW wind turbine. Updated versions of the V162-5.6 MW wind turbine, which may be manufactured in the future, may differ from these performance specifications. In the event that Vestas supplies an updated version of the V162-5.6 MW wind, Vestas will provide an updated performance specification applicable to the updated version.
- All listed start/stop parameters (e.g. wind speeds) are equipped with hysteresis control. This can, in certain borderline situations, result in turbine stops even though the ambient conditions are within the listed operation parameters.
- This document, Performance Specification, is not an offer for sale, and does not contain any guarantee, warranty and/or verification of the power curve and sound (including, without limitation, the power curve and sound verification method). Any guarantee, warranty and/or verification of the power curve and sound (including, without limitation, the power curve and sound verification method) must be agreed to separately in writing.

6 Power Curves, Ct Values and Sound Curves, Mode 0

6.1 Power Curves, Mode 0

Air density [kg/m^3]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**52**	21	24	26	29	31	34	37	40	43	46	49	56	59
3.5	**166**	109	115	120	125	130	135	141	146	151	156	161	171	177
4.0	**304**	217	225	233	241	249	257	264	272	280	288	296	312	320
4.5	**470**	346	357	369	380	391	402	414	425	436	447	458	481	492
5.0	**672**	503	519	534	549	565	580	595	611	626	641	656	687	702
5.5	**922**	696	716	737	757	778	799	819	840	860	881	902	943	964
6.0	**1224**	929	955	982	1009	1036	1063	1090	1117	1144	1170	1197	1251	1277
6.5	**1579**	1205	1239	1273	1307	1342	1376	1410	1444	1478	1512	1545	1613	1647
7.0	**1996**	1530	1572	1615	1657	1700	1742	1785	1827	1869	1911	1954	2038	2080
7.5	**2472**	1902	1954	2006	2058	2110	2162	2214	2265	2317	2369	2420	2523	2575
8.0	**3012**	2324	2387	2450	2513	2576	2638	2701	2763	2826	2888	2950	3073	3135
8.5	**3614**	2798	2873	2948	3023	3097	3172	3246	3320	3394	3468	3541	3686	3758
9.0	**4245**	3312	3399	3486	3574	3661	3746	3831	3916	4001	4082	4164	4323	4402
9.5	**4813**	3841	3936	4032	4127	4222	4311	4399	4488	4576	4655	4734	4882	4951
10.0	**5238**	4360	4457	4554	4652	4749	4827	4905	4983	5062	5120	5179	5283	5328
10.5	**5472**	4830	4913	4996	5079	5163	5216	5270	5323	5377	5408	5440	5490	5509
11.0	**5574**	5205	5265	5325	5385	5445	5469	5494	5519	5544	5554	5564	5580	5585
11.5	**5597**	5424	5455	5486	5517	5548	5557	5566	5576	5585	5589	5593	5598	5599
12.0	**5600**	5523	5537	5551	5566	5580	5585	5589	5594	5598	5599	5599	5600	5600
12.5	**5600**	5559	5567	5576	5584	5592	5594	5596	5598	5600	5600	5600	5600	5600
13.0	**5600**	5575	5581	5586	5592	5597	5598	5599	5599	5600	5600	5600	5600	5600
13.5	**5600**	5586	5589	5593	5596	5599	5599	5599	5600	5600	5600	5600	5600	5600
14.0	**5600**	5591	5593	5595	5598	5600	5600	5600	5600	5600	5600	5600	5600	5600
14.5	**5600**	5593	5595	5596	5598	5600	5600	5600	5600	5600	5600	5600	5600	5600
15.0	**5600**	5595	5596	5597	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
15.5	**5600**	5596	5597	5598	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
16.0	**5600**	5597	5598	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
16.5	**5600**	5597	5598	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
17.0	**5600**	5597	5598	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
17.5	**5600**	5597	5598	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
18.0	**5600**	5598	5598	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
18.5	**5600**	5589	5591	5593	5594	5596	5596	5597	5598	5598	5599	5599	5600	5600
19.0	**5558**	5491	5499	5507	5514	5522	5527	5533	5538	5543	5548	5553	5562	5566
19.5	**5409**	5288	5301	5314	5326	5339	5349	5359	5370	5380	5390	5399	5419	5428
20.0	**5147**	5001	5014	5028	5042	5056	5069	5082	5095	5108	5121	5134	5160	5174
20.5	**4831**	4697	4710	4723	4735	4748	4760	4773	4785	4797	4808	4820	4844	4857
21.0	**4514**	4393	4404	4416	4428	4439	4450	4461	4472	4483	4493	4504	4525	4537
21.5	**4195**	4084	4094	4104	4114	4125	4134	4143	4152	4162	4173	4184	4204	4214
22.0	**3870**	3780	3789	3797	3806	3814	3822	3830	3839	3847	3855	3862	3880	3889
22.5	**3559**	3475	3482	3489	3496	3503	3511	3518	3526	3533	3542	3551	3566	3572
23.0	**3225**	3153	3159	3165	3171	3177	3184	3190	3197	3204	3211	3218	3231	3236
23.5	**2899**	2839	2844	2849	2854	2859	2865	2871	2877	2883	2889	2894	2906	2913
24.0	**2584**	2521	2527	2533	2539	2545	2548	2552	2556	2559	2567	2576	2588	2591

6.2 Ct Values, Mode 0

Air density kg/m^3														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.915**	0.839	0.859	0.879	0.899	0.918	0.918	0.918	0.917	0.917	0.916	0.916	0.923	0.931
3.5	**0.884**	0.892	0.892	0.891	0.891	0.890	0.889	0.888	0.888	0.887	0.886	0.885	0.883	0.882
4.0	**0.845**	0.854	0.853	0.852	0.851	0.850	0.849	0.848	0.848	0.847	0.846	0.846	0.845	0.844
4.5	**0.835**	0.836	0.836	0.836	0.836	0.836	0.836	0.836	0.836	0.836	0.835	0.835	0.835	0.835
5.0	**0.830**	0.833	0.833	0.832	0.832	0.832	0.832	0.831	0.831	0.831	0.830	0.830	0.829	0.829
5.5	**0.827**	0.831	0.831	0.831	0.830	0.830	0.830	0.829	0.829	0.829	0.828	0.828	0.827	0.827
6.0	**0.823**	0.829	0.828	0.828	0.827	0.827	0.826	0.826	0.825	0.824	0.824	0.823	0.822	0.821
6.5	**0.817**	0.825	0.824	0.824	0.823	0.822	0.821	0.821	0.820	0.819	0.818	0.818	0.816	0.815
7.0	**0.810**	0.821	0.820	0.819	0.818	0.817	0.816	0.815	0.814	0.813	0.812	0.811	0.809	0.808
7.5	**0.806**	0.818	0.817	0.816	0.815	0.814	0.813	0.812	0.811	0.810	0.809	0.807	0.805	0.804
8.0	**0.798**	0.812	0.811	0.809	0.808	0.807	0.806	0.804	0.803	0.802	0.800	0.799	0.797	0.795
8.5	**0.792**	0.810	0.809	0.807	0.806	0.804	0.802	0.801	0.799	0.798	0.796	0.794	0.790	0.787
9.0	**0.764**	0.798	0.796	0.794	0.792	0.790	0.786	0.783	0.780	0.777	0.772	0.768	0.759	0.754
9.5	**0.700**	0.765	0.760	0.755	0.750	0.745	0.739	0.734	0.728	0.722	0.715	0.707	0.692	0.684
10.0	**0.620**	0.715	0.708	0.701	0.694	0.687	0.678	0.669	0.660	0.651	0.641	0.630	0.609	0.598
10.5	**0.532**	0.655	0.645	0.635	0.625	0.615	0.604	0.592	0.580	0.569	0.557	0.544	0.520	0.508
11.0	**0.451**	0.587	0.575	0.563	0.551	0.539	0.526	0.513	0.500	0.486	0.474	0.462	0.440	0.429
11.5	**0.383**	0.512	0.499	0.486	0.473	0.460	0.448	0.437	0.425	0.413	0.403	0.393	0.375	0.366
12.0	**0.330**	0.442	0.430	0.418	0.406	0.394	0.384	0.374	0.365	0.355	0.347	0.338	0.323	0.316
12.5	**0.287**	0.382	0.372	0.361	0.351	0.341	0.333	0.325	0.316	0.308	0.301	0.294	0.281	0.275
13.0	**0.253**	0.333	0.324	0.316	0.307	0.299	0.291	0.284	0.277	0.270	0.264	0.259	0.248	0.242
13.5	**0.224**	0.294	0.286	0.279	0.271	0.264	0.257	0.251	0.245	0.239	0.234	0.229	0.220	0.215
14.0	**0.200**	0.260	0.254	0.247	0.241	0.234	0.229	0.224	0.218	0.213	0.209	0.204	0.196	0.192
14.5	**0.179**	0.233	0.227	0.221	0.215	0.210	0.205	0.200	0.196	0.191	0.187	0.183	0.176	0.172
15.0	**0.162**	0.209	0.204	0.199	0.193	0.188	0.184	0.180	0.176	0.172	0.169	0.165	0.159	0.156
15.5	**0.146**	0.188	0.184	0.179	0.175	0.170	0.167	0.163	0.159	0.156	0.153	0.150	0.144	0.141
16.0	**0.133**	0.171	0.167	0.163	0.159	0.155	0.151	0.148	0.145	0.141	0.139	0.136	0.131	0.128
16.5	**0.122**	0.155	0.152	0.148	0.144	0.141	0.138	0.135	0.132	0.129	0.127	0.124	0.120	0.117
17.0	**0.112**	0.142	0.139	0.135	0.132	0.129	0.126	0.124	0.121	0.118	0.116	0.114	0.110	0.108
17.5	**0.103**	0.131	0.128	0.125	0.122	0.119	0.117	0.114	0.112	0.109	0.107	0.105	0.101	0.099
18.0	**0.095**	0.120	0.118	0.115	0.112	0.110	0.107	0.105	0.103	0.101	0.099	0.097	0.093	0.092
18.5	**0.088**	0.111	0.108	0.106	0.104	0.101	0.099	0.097	0.095	0.093	0.091	0.090	0.086	0.085
19.0	**0.081**	0.100	0.098	0.096	0.094	0.092	0.090	0.089	0.087	0.085	0.084	0.082	0.079	0.078
19.5	**0.073**	0.090	0.088	0.086	0.085	0.083	0.081	0.080	0.078	0.077	0.076	0.074	0.072	0.071
20.0	**0.065**	0.079	0.078	0.076	0.075	0.073	0.072	0.071	0.069	0.068	0.067	0.066	0.064	0.063
20.5	**0.057**	0.070	0.068	0.067	0.066	0.064	0.063	0.062	0.061	0.060	0.059	0.058	0.056	0.056
21.0	**0.050**	0.061	0.060	0.059	0.058	0.056	0.056	0.055	0.054	0.053	0.052	0.051	0.050	0.049
21.5	**0.044**	0.053	0.053	0.052	0.051	0.050	0.049	0.048	0.047	0.046	0.046	0.045	0.044	0.043
22.0	**0.039**	0.047	0.046	0.045	0.044	0.043	0.043	0.042	0.041	0.040	0.040	0.039	0.038	0.038
22.5	**0.034**	0.041	0.040	0.039	0.039	0.038	0.037	0.037	0.036	0.035	0.035	0.034	0.033	0.033
23.0	**0.030**	0.035	0.035	0.034	0.033	0.033	0.032	0.032	0.031	0.031	0.030	0.030	0.029	0.029
23.5	**0.025**	0.031	0.030	0.029	0.029	0.028	0.028	0.027	0.027	0.027	0.026	0.026	0.025	0.025
24.0	**0.022**	0.026	0.026	0.025	0.025	0.024	0.024	0.024	0.023	0.023	0.023	0.022	0.022	0.021

6.3 Sound Curves, Mode 0

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Mode 0 (Blades with serrated trailing edge)**
3	93.4
4	93.5
5	94.0
6	96.5
7	99.3
8	102.4
9	104.0
10	104.0
11	104.0
12	104.0
13	104.0
14	104.0
15	104.0
16	104.0
17	104.0
18	104.0
19	104.0
20	104.0

7 Power Curves, Ct Values and Sound Curves, Sound Optimized Modes

7.1 Power Curves, Sound Optimized Mode SO2

Air density [kg/m^3]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**34**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**148**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**293**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**468**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**676**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**926**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**1228**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**1584**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**2002**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**2477**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**3000**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**3529**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**4029**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**4442**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**4740**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**4881**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**4927**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.2 Ct Values, Sound Optimized Mode SO2

Air density kg/m^3														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.857**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**0.919**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**0.902**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**0.881**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**0.855**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**0.838**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**0.831**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**0.827**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**0.822**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**0.813**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**0.783**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**0.729**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**0.667**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**0.600**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**0.528**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**0.453**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**0.384**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**0.328**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**0.282**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**0.245**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**0.215**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**0.189**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**0.168**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**0.150**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**0.135**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**0.121**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**0.110**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**0.100**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**0.091**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**0.083**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**0.076**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**0.070**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**0.064**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**0.059**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**0.054**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.3 Sound Curves, Sound Optimized Mode SO2

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Sound Optimized Mode SO1 (Blades with serrated trailing edge)**
3	93.4
4	93.5
5	94.0
6	96.5
7	99.3
8	102.0
9	102.0
10	102.0
11	102.0
12	102.0
13	102.0
14	102.0
15	102.0
16	102.0
17	102.0
18	102.0
19	102.0
20	102.0

7.4 Power Curves, Sound Optimized Mode SO3

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**34**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**148**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**293**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**468**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**676**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**926**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**1228**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**1584**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**2000**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**2463**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**2956**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**3441**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**3895**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**4279**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**4556**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**4680**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**4715**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.5 Ct Values, Sound Optimized Mode SO3

Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.857**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**0.919**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**0.902**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**0.881**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**0.855**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**0.838**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**0.832**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**0.828**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**0.817**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**0.792**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**0.750**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**0.694**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**0.634**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**0.572**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**0.505**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**0.433**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**0.367**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**0.313**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**0.271**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**0.236**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**0.207**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**0.182**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**0.162**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**0.144**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**0.130**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**0.117**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**0.106**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**0.097**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**0.088**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**0.081**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**0.074**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**0.068**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**0.062**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**0.058**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**0.053**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.6 Sound Curves, Sound Optimized Mode SO3

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Sound Optimized Mode SO3 (Blades with serrated trailing edge)**
3	93.4
4	93.5
5	94.0
6	96.5
7	99.3
8	101.0
9	101.0
10	101.0
11	101.0
12	101.0
13	101.0
14	101.0
15	101.0
16	101.0
17	101.0
18	101.0
19	101.0
20	101.0

7.7 Power Curves, Sound Optimized Mode SO4

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**34**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**148**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**293**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**468**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**676**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**926**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**1228**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**1583**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**1997**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**2441**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**2888**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**3313**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**3711**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**4054**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**4319**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**4461**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**4526**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**4535**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.8 Ct Values, Sound Optimized Mode SO4

Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.857**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**0.919**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**0.902**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**0.881**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**0.855**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**0.838**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**0.831**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**0.824**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**0.807**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**0.766**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**0.709**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**0.647**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**0.588**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**0.531**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**0.473**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**0.410**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**0.352**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**0.302**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**0.262**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**0.228**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**0.201**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**0.177**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**0.158**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**0.141**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**0.127**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**0.114**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**0.104**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**0.094**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**0.086**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**0.079**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**0.073**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**0.067**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**0.061**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**0.056**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**0.052**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.9 Sound Curves, Sound Optimized Mode SO4

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA] Sound Optimized Mode SO4 (Blades with serrated trailing edge)**
3	93.4
4	93.5
5	94.0
6	96.5
7	99.3
8	100.0
9	100.0
10	100.0
11	100.0
12	100.0
13	100.0
14	100.0
15	100.0
16	100.0
17	100.0
18	100.0
19	100.0
20	100.0

7.10 Power Curves, Sound Optimized Mode SO5

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**34**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**148**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**293**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**468**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**676**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**926**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**1227**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**1581**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**1984**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**2393**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**2782**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**3144**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**3481**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**3763**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**3966**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**4054**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**4079**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.11 Ct Values, Sound Optimized Mode SO5

Air density kg/m^3														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.857**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**0.919**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**0.902**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**0.881**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**0.855**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**0.839**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**0.832**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**0.816**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**0.786**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**0.728**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**0.660**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**0.595**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**0.537**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**0.482**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**0.426**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**0.367**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**0.313**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**0.268**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**0.233**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**0.204**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**0.180**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**0.159**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**0.142**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**0.128**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**0.115**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**0.104**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**0.095**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**0.086**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**0.079**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**0.073**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**0.067**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**0.062**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**0.057**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**0.053**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**0.049**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.12 Sound Curves, Sound Optimized Mode SO5

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m³**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA] Sound Optimized Mode SO5 (Blades with serrated trailing edge)**
3	93.4
4	93.5
5	94.0
6	96.5
7	98.9
8	99.0
9	99.0
10	99.0
11	99.0
12	99.0
13	99.0
14	99.0
15	99.0
16	99.0
17	99.0
18	99.0
19	99.0
20	99.0

7.13 Power Curves, Sound Optimized Mode SO6

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**34**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**148**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**293**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**468**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**676**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**926**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**1226**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**1566**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**1932**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**2276**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**2598**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**2898**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**3148**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**3306**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**3390**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**3431**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**3453**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.14 Ct Values, Sound Optimized Mode SO6

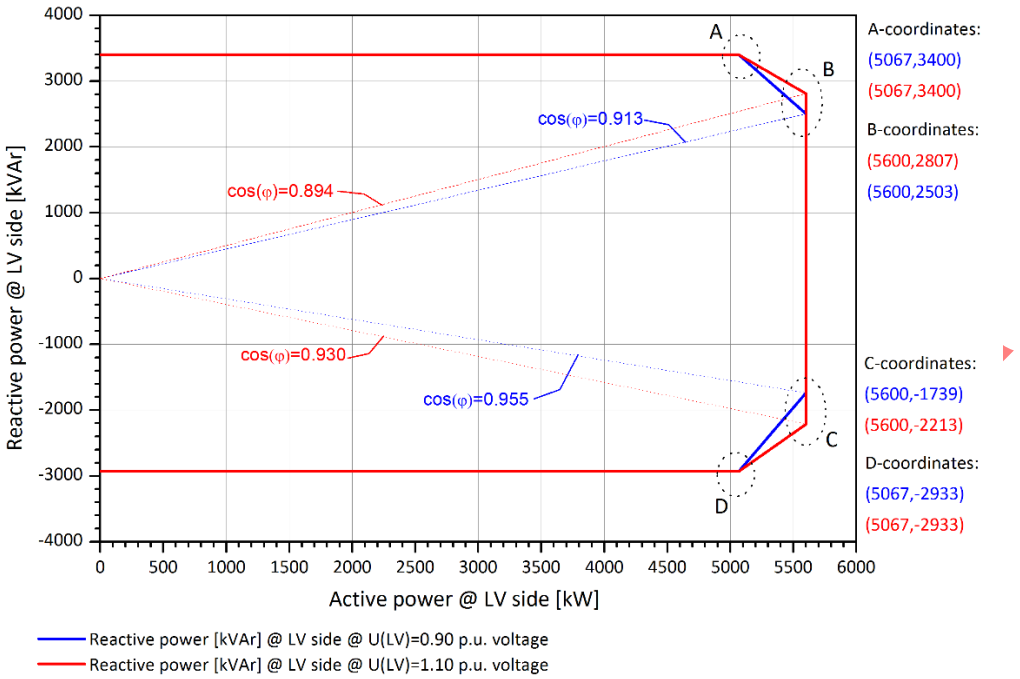
Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.857**	-	-	-	-	-	-	-	-	-	-	-	-	-
3.5	**0.919**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0	**0.902**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.5	**0.881**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0	**0.856**	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5	**0.838**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.0	**0.821**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.5	**0.784**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0	**0.728**	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	**0.659**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.0	**0.592**	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	**0.533**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.0	**0.475**	-	-	-	-	-	-	-	-	-	-	-	-	-
9.5	**0.414**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.0	**0.355**	-	-	-	-	-	-	-	-	-	-	-	-	-
10.5	**0.304**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	**0.261**	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	**0.225**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.0	**0.197**	-	-	-	-	-	-	-	-	-	-	-	-	-
12.5	**0.173**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0	**0.153**	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	**0.136**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.0	**0.122**	-	-	-	-	-	-	-	-	-	-	-	-	-
14.5	**0.110**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.0	**0.099**	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5	**0.090**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	**0.082**	-	-	-	-	-	-	-	-	-	-	-	-	-
16.5	**0.074**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.0	**0.068**	-	-	-	-	-	-	-	-	-	-	-	-	-
17.5	**0.063**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.0	**0.058**	-	-	-	-	-	-	-	-	-	-	-	-	-
18.5	**0.053**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.0	**0.049**	-	-	-	-	-	-	-	-	-	-	-	-	-
19.5	**0.046**	-	-	-	-	-	-	-	-	-	-	-	-	-
20.0	**0.042**	-	-	-	-	-	-	-	-	-	-	-	-	-

7.15 Sound Curves, Sound Optimized Mode SO6

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA] Sound Optimized Mode SO6 (Blades with serrated trailing edge)**
3	93.4
4	93.5
5	94.0
6	96.5
7	98.0
8	98.0
9	98.0
10	98.0
11	98.0
12	98.0
13	98.0
14	98.0
15	98.0
16	98.0
17	98.0
18	98.0
19	98.0
20	98.0

8 PQ performance

The following illustration shows the Vestas V162-5.6 MW PQ performance



The following table shows the electrical attributes of the V162-5.6 MW.

Performance	
Nominal power [kW]	5600
Nominal apparent power [kVA]	6800
Rated Short-time withstand current	1.45 * In
Rated peak withstand current	1.05 * In
Transformer	
Rated power [kVA]	7000
Positive sequence short-circuit impedance [%]	9.9

Restricted
Document no.: 0081-5098 V01
2019-01-24

Performance Specification

EnVentus™ 5 MW
V162-5.6 MW 50/60 Hz

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See general reservations, notes and disclaimers (including, Section 5, p. 13) to this Performance Specification.

1 General Description

The Vestas V162-5.6 MW is a wind turbine variant within the EnVentus™ 5 MW turbine range. It is a pitch regulated upwind turbine with active yaw and a three-blade rotor. The V162-5.6 MW turbine has a rotor diameter of 162 m and a rated power of 5.6 MW.

For more details, please refer to the General Description of the EnVentus™ 5MW turbine range (General Description EnVentus™ 5 MW - 0081-5017).

2 Type Approvals and Available Hub Heights

The standard turbine is type certified according to the certification standards and available hub heights listed below:

Certification	Wind Class	Hub Height
IEC 61400-22	IEC S	119 / 125 / 149 m
DIBt 2012	DIBt S	119 / 148 / 166 m

3 Operational Envelope and Performance Guidelines

Actual climate and site conditions have many variables and should be considered in evaluating actual turbine performance. The design and operating parameters set forth in this section do not constitute warranties, guarantees, or representations as to turbine performance at actual sites.

3.1 Climate and Site Conditions

The standard turbine is designed for the wind climate conditions listed below. Values refer to hub height.

Wind Climate	**IEC S**	**IEC S**	**IEC S**
Power Rating	**5.6 MW**	**5.6 MW**	**5.6 MW**
Hub Height	**119**	**125**	**149**
Average design parameters - IEC			
Wind Speed (10 min average), V_{ave}	7.4 m/s	8.5 m/s	7.9 m/s
Weibull Scale Factor, *C*	8.4 m/s	9.6 m/s	8.9 m/s
Weibull Shape Factor, *k*	2.48	2.3	2.48
I_{ref} acc. to IEC 61400-1	0.15	0.14	0.15
Turbulence Intensity acc. to IEC 61400-1, Including Wind Farm Turbulence (@15 m/s) I_{90} (90% quantile)	16.9%	15.7%	16.9 %
Wind Shear, *α*	0.30	0.20	0.30
Inflow Angle (vertical)	8°	8°	8°
Extreme design parameters – IEC			
Extr. Wind Speed (10 min average), V_{50}	37.1 m/s	37.5 m/s	39.5 m/s
Survival Wind Speed (3 s gust), V_{e50}	51.9 m/s	52.5 m/s	55.3 m/s
Turbulence Intensity, I_{V50}	11%	11 %	11 %

Wind Class	DIBt S	DIBt S	DIBt S
Hub Height	**119 m**	**148 m**	**166 m**
Power Rating	**5.6 MW**	**5.6 MW**	**5.6 MW**
Average design parameters – DIBt			
Wind Speed (10 min average), V_{ave}	7.1 m/s	7.3 m/s	7.5 m/s
I_{ref} acc. to IEC 61400-1	S	S	S
Turbulence Intensity, I_{90} (90% quant.)	S	S	S
Extreme design parameters – DIBt			
Extr Wind Speed (10 min average), V_{50}	39.4 m/s	37.0 m/s	37.6 m/s
Survival Wind Speed (3 s gust), V_{e50}	55.2 m/s	51.8 m/s	52.6 m/s
Turbulence intensity, $I_{v(z)}$	12.8%	12.3%	12.1%
Wind Shear, α	0.20	0.20	0.20
Inflow Angle	8°	8°	8°

NOTE The turbine is intended for low to medium wind speed sites and is classified as DIBt S. Please contact Vestas Wind Systems A/S for further information if needed.

3.1.1 Wind Power Plant Layout

Turbine spacing is to be evaluated site-specifically. Spacing below two rotor diameters (2D) may require sector-wise curtailment.

NOTE As evaluation of climate and site conditions is complex, consult Vestas for every project. If conditions exceed the above parameters, Vestas must be consulted.

3.2 Operational Envelope – Wind

Values refer to hub height and are determined by the sensors and control system of the turbine.

Wind Climate	IEC S / DIBt S	
	Mode 0	SO2, SO3, SO4, SO5, SO6
Cut-In, V_{in}	3 m/s	3 m/s
Cut-Out (10 min exponential avg.), V_{out}	24 m/s	20 m/s
Re-Cut In (10 min exponential avg.)	22 m/s	18 m/s

3.3 Operational Envelope – Temperature and Altitude

Values below refer to hub height and are determined by the sensors and control system of the turbine.

Operational Envelope – Temperature	
Ambient Temperature Interval (Standard Turbine)	-20° to +45°C
Ambient Temperature Interval (Low Temperature Turbine)	-30° to +45°C

NOTE The wind turbine will stop producing power at ambient temperatures above 45°C. For the low temperature options of the wind turbine consult Vestas.

The turbine is designed for use at altitudes up to 1000 m above sea level as standard and optional up to 2000 m above sea level.

3.3.1 Temperature dependent operation

Values below refer to hub height and are determined by the sensors and control system of the turbine. At ambient temperatures above the thresholds shown for each operating mode, the turbine will maintain derated production.

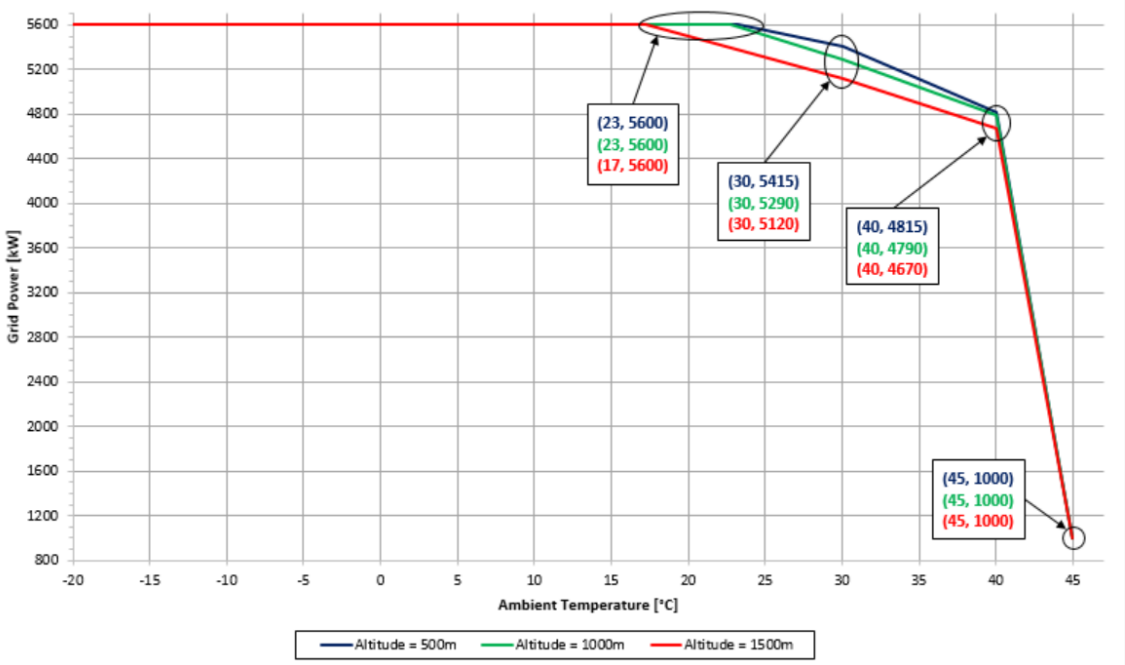


Figure 3-1: Temperature dependant derated operation.

NOTE All derating settings are preliminary and subject to change.

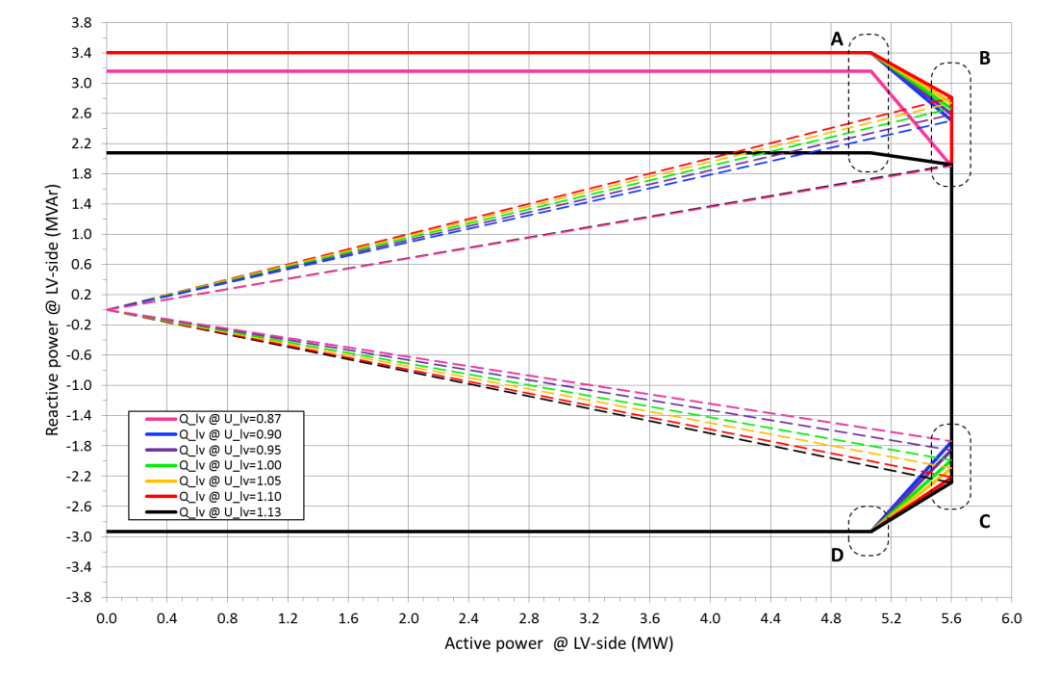
3.4 Operational Envelope – Conditions for Power Curve and Ct Values (at Hub Height)

Please consult section 6 and subsequent, for power curves and C_t values.

Conditions for Power Curve and C_t Values (at Hub Height)	
Wind Shear, *α*	0.00-0.30 (10-minute average)
Turbulence Intensity, *I*	6-12% (10-minute average)
Blades	Clean
Rain	No
Ice/Snow on Blades	No
Leading Edge	No damage
Terrain	IEC 61400-12-1
Inflow Angle (Vertical)	0 ±2°
Grid Voltage	Nominal Voltage ±2.5%
Grid Frequency	Nominal Frequency ±0.5 Hz
Grid Active Power (LV-side)	Per tabulated values in Section 6 and following sections
Grid Reactive Power (LV-side)	Power Factor 1.0

3.5 Operational Envelope – Reactive Power Capability

The turbine has a reactive power capability on the low voltage side of the HV transformer as illustrated in Figure 3-2:



		Coordinates								Power factor	
	Point:	A		B		C		D		B (Capacitive)	C (Inductive)
	Coordinate:	x (P)	y (Q)	x (P)	y (Q)	x (P)	y (Q)	x (P)	y (Q)		
	Reactive power [kVAr] @ LV side @ U_lv = 0.87 p.u. voltage	5.067	3.160	5.600	1.900	5.600	-1.739	5.067	-2.933	0.947	0.955
	Reactive power [kVAr] @ LV side @ U_lv = 0.90 p.u. voltage	5.067	3.400	5.600	2.503	5.600	-1.739	5.067	-2.933	0.913	0.955
	Reactive power [kVAr] @ LV side @ U_lv = 0.95 p.u. voltage	5.067	3.400	5.600	2.584	5.600	-1.856	5.067	-2.933	0.908	0.949
	Reactive power [kVAr] @ LV side @ U_lv = 1.00 p.u. voltage	5.067	3.400	5.600	2.664	5.600	-1.987	5.067	-2.933	0.903	0.942
	Reactive power [kVAr] @ LV side @ U_lv = 1.05 p.u. voltage	5.067	3.400	5.600	2.736	5.600	-2.093	5.067	-2.933	0.898	0.937
	Reactive power [kVAr] @ LV side @ U_lv = 1.10 p.u. voltage	5.067	3.400	5.600	2.807	5.600	-2.213	5.067	-2.933	0.894	0.930
	Reactive power [kVAr] @ LV side @ U_lv = 1.13 p.u. voltage	5.067	2.080	5.600	1.919	5.600	-2.283	5.067	-2.933	0.946	0.926

Figure 3-2: Reactive power capability.

The turbine is able to maintain the reactive power capability at low wind with no active power production.

NOTE

All reactive power capabilities are preliminary and subject to change.

3.6 Sound Modes

The sound modes listed below are available for the turbine.

Sound modes			
Mode No.	**Maximum Sound Level**	**Serrated trailing edges**	**Available hub heights**
0	104 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
0-0S	106.8 dBA	No (option)	119 / 125 / 148 / 149 / 166 m

In addition, Sound Optimized (SO) modes as listed below are available as options for the turbine.

Sound Optimized (SO) modes			
Mode No.	**Maximum Sound Level**	**Serrated trailing edges**	**Available hub heights**
SO2	102 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
SO3	101 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
SO4	100 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
SO5	99 dBA	Yes (standard)	119 / 125 / 148 / 149 / 166 m
SO6	98 dBA	Yes (standard)	Site specific

NOTE Sound Optimized (SO) modes are only available with serrated trailing edges on the blades. For further details on sound performance and in case of specific requests, please contact Vestas Wind Systems A/S.

4 Drawings

Overview drawings describing the wind turbines, tower and foundation are shown in these documents.

V162 HH119 – 0075-8518
V162 HH125 – 0079-6651
V162 HH148 – 0075-8517
V162 HH149 – 0079-6675
V162 HH166 – 0075-8514

NOTE For detailed drawings, please contact Vestas Wind Systems A/S.

4.1 Turbine visual impression – side view

5 General Reservations, Notes and Disclaimers

- The performance specifications described in this document apply to the current version of the V162-5.6 MW wind turbine. Updated versions of the V162-5.6 MW wind turbine, which may be manufactured in the future, may differ from these performance specifications. In the event that Vestas supplies an updated version of the V162-5.6 MW wind turbine, Vestas will provide an updated performance specification applicable to the updated version.
- All listed start/stop parameters (e.g. wind speeds) are equipped with hysteresis control. This can, in certain borderline situations, result in turbine stops even though the ambient conditions are within the listed operation parameters.
- This document, Performance Specification, is not an offer for sale, and does not contain any guarantee, warranty and/or verification of the power curve and sound (including, without limitation, the power curve and sound verification method). Any guarantee, warranty and/or verification of the power curve and sound (including, without limitation, the power curve and sound verification method) must be agreed to separately in writing.

6 Power Curves, Ct Values and Sound Curves, Mode 0

6.1 Power Curves, Mode 0

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**27**	9	10	12	13	15	16	18	20	21	23	25	29	32
3.5	**144**	91	95	100	105	110	115	120	125	129	134	139	149	153
4.0	**289**	205	212	220	228	235	243	251	258	266	274	281	297	304
4.5	**464**	341	352	363	375	386	397	408	419	430	441	452	475	486
5.0	**669**	502	517	532	547	563	578	593	608	624	639	654	685	700
5.5	**919**	693	714	734	755	775	796	816	837	857	878	899	940	960
6.0	**1220**	925	952	979	1005	1032	1059	1086	1113	1139	1166	1193	1246	1273
6.5	**1574**	1200	1235	1269	1303	1337	1371	1405	1439	1473	1506	1540	1608	1641
7.0	**1990**	1525	1567	1610	1652	1694	1737	1779	1821	1864	1906	1948	2032	2074
7.5	**2467**	1896	1948	2000	2052	2104	2156	2208	2260	2312	2364	2415	2519	2570
8.0	**3010**	2319	2382	2445	2508	2571	2634	2697	2760	2822	2885	2948	3073	3135
8.5	**3617**	2794	2869	2945	3020	3095	3170	3245	3320	3394	3469	3543	3690	3764
9.0	**4257**	3313	3401	3489	3577	3665	3751	3836	3922	4008	4091	4174	4337	4418
9.5	**4834**	3851	3947	4043	4139	4235	4324	4414	4504	4593	4673	4753	4903	4973
10.0	**5256**	4377	4475	4572	4670	4767	4846	4924	5002	5080	5139	5198	5301	5346
10.5	**5482**	4852	4934	5016	5098	5180	5233	5285	5338	5390	5421	5451	5499	5516
11.0	**5578**	5238	5294	5349	5405	5460	5483	5506	5528	5551	5560	5569	5583	5588
11.5	**5598**	5460	5485	5509	5533	5558	5565	5573	5581	5589	5592	5595	5598	5599
12.0	**5600**	5548	5558	5568	5578	5589	5591	5594	5597	5599	5600	5600	5600	5600
12.5	**5600**	5576	5582	5587	5592	5598	5598	5599	5599	5600	5600	5600	5600	5600
13.0	**5600**	5587	5590	5594	5597	5600	5600	5600	5600	5600	5600	5600	5600	5600
13.5	**5600**	5593	5595	5597	5598	5600	5600	5600	5600	5600	5600	5600	5600	5600
14.0	**5600**	5595	5596	5598	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
14.5	**5600**	5596	5597	5598	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
15.0	**5600**	5597	5598	5598	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
15.5	**5600**	5597	5598	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
16.0	**5600**	5598	5598	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600
16.5	**5600**	5598	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600	5600
17.0	**5600**	5599	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600	5600
17.5	**5600**	5599	5599	5599	5600	5600	5600	5600	5600	5600	5600	5600	5600	5600
18.0	**5600**	5594	5595	5596	5597	5598	5598	5598	5598	5599	5599	5599	5600	5600
18.5	**5568**	5528	5532	5536	5540	5544	5548	5551	5555	5558	5562	5565	5571	5574
19.0	**5418**	5335	5343	5351	5359	5367	5374	5381	5388	5396	5403	5410	5425	5432
19.5	**5179**	5073	5082	5091	5100	5110	5120	5129	5139	5149	5159	5169	5189	5199
20.0	**4894**	4796	4804	4812	4820	4828	4837	4846	4855	4864	4874	4884	4903	4913
20.5	**4609**	4516	4525	4533	4541	4549	4558	4566	4575	4584	4592	4601	4618	4628
21.0	**4329**	4242	4250	4257	4265	4272	4280	4288	4295	4303	4312	4320	4338	4346
21.5	**4043**	3960	3967	3974	3982	3989	3996	4004	4011	4019	4027	4035	4051	4059
22.0	**3764**	3689	3696	3702	3709	3715	3722	3729	3736	3744	3750	3757	3772	3780
22.5	**3488**	3414	3420	3425	3431	3437	3444	3451	3458	3465	3473	3480	3495	3501
23.0	**3203**	3133	3139	3145	3151	3156	3164	3170	3178	3184	3191	3197	3209	3214
23.5	**2914**	2849	2855	2860	2866	2872	2878	2885	2891	2897	2903	2909	2920	2926
24.0	**2616**	2551	2556	2562	2567	2573	2579	2585	2591	2598	2604	2610	2622	2627

6.2 Ct Values, Mode 0

Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.914**	0.911	0.912	0.913	0.914	0.915	0.915	0.915	0.915	0.915	0.915	0.914	0.913	0.913
3.5	**0.888**	0.894	0.893	0.893	0.893	0.892	0.892	0.891	0.891	0.890	0.890	0.889	0.888	0.887
4.0	**0.851**	0.857	0.856	0.855	0.855	0.854	0.854	0.853	0.853	0.852	0.852	0.852	0.851	0.850
4.5	**0.822**	0.823	0.823	0.823	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822
5.0	**0.801**	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801
5.5	**0.797**	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797
6.0	**0.797**	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797
6.5	**0.796**	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.796	0.796	0.796	0.796	0.795
7.0	**0.795**	0.797	0.797	0.797	0.797	0.797	0.796	0.796	0.796	0.796	0.795	0.795	0.794	0.794
7.5	**0.797**	0.800	0.800	0.800	0.799	0.799	0.799	0.799	0.798	0.798	0.798	0.797	0.796	0.796
8.0	**0.796**	0.801	0.800	0.800	0.800	0.799	0.799	0.799	0.798	0.798	0.797	0.797	0.796	0.795
8.5	**0.792**	0.798	0.798	0.798	0.797	0.797	0.796	0.795	0.795	0.794	0.794	0.793	0.791	0.790
9.0	**0.766**	0.789	0.788	0.787	0.786	0.785	0.783	0.781	0.778	0.776	0.773	0.770	0.762	0.758
9.5	**0.703**	0.761	0.757	0.753	0.749	0.745	0.739	0.734	0.729	0.723	0.717	0.710	0.695	0.687
10.0	**0.621**	0.713	0.707	0.700	0.693	0.687	0.678	0.669	0.660	0.651	0.641	0.631	0.610	0.599
10.5	**0.531**	0.654	0.644	0.634	0.624	0.614	0.603	0.591	0.580	0.568	0.556	0.543	0.519	0.507
11.0	**0.449**	0.589	0.577	0.564	0.551	0.538	0.525	0.511	0.498	0.485	0.473	0.461	0.438	0.428
11.5	**0.382**	0.515	0.501	0.487	0.473	0.459	0.447	0.435	0.423	0.411	0.402	0.392	0.373	0.364
12.0	**0.328**	0.443	0.430	0.418	0.406	0.393	0.383	0.373	0.363	0.353	0.345	0.337	0.321	0.314
12.5	**0.286**	0.382	0.371	0.361	0.351	0.340	0.332	0.323	0.315	0.307	0.300	0.293	0.280	0.274
13.0	**0.251**	0.332	0.324	0.315	0.306	0.297	0.290	0.283	0.276	0.269	0.263	0.257	0.246	0.241
13.5	**0.223**	0.293	0.285	0.278	0.270	0.262	0.256	0.250	0.244	0.238	0.233	0.228	0.218	0.214
14.0	**0.199**	0.259	0.253	0.246	0.240	0.233	0.228	0.223	0.217	0.212	0.208	0.203	0.195	0.191
14.5	**0.178**	0.232	0.226	0.220	0.214	0.209	0.204	0.199	0.195	0.190	0.186	0.182	0.175	0.171
15.0	**0.161**	0.208	0.203	0.198	0.193	0.187	0.183	0.179	0.175	0.171	0.168	0.164	0.158	0.155
15.5	**0.146**	0.188	0.183	0.179	0.174	0.169	0.166	0.162	0.159	0.155	0.152	0.149	0.143	0.140
16.0	**0.132**	0.170	0.166	0.162	0.158	0.154	0.151	0.147	0.144	0.141	0.138	0.135	0.130	0.128
16.5	**0.121**	0.155	0.151	0.147	0.144	0.140	0.137	0.134	0.131	0.128	0.126	0.123	0.119	0.117
17.0	**0.111**	0.141	0.138	0.135	0.131	0.128	0.126	0.123	0.120	0.118	0.115	0.113	0.109	0.107
17.5	**0.102**	0.130	0.127	0.124	0.121	0.118	0.116	0.113	0.111	0.109	0.107	0.105	0.101	0.099
18.0	**0.095**	0.120	0.117	0.114	0.112	0.109	0.107	0.104	0.102	0.100	0.098	0.096	0.093	0.091
18.5	**0.087**	0.109	0.107	0.104	0.102	0.100	0.098	0.096	0.094	0.092	0.090	0.089	0.085	0.084
19.0	**0.078**	0.097	0.095	0.093	0.091	0.089	0.087	0.086	0.084	0.082	0.081	0.080	0.077	0.076
19.5	**0.070**	0.086	0.084	0.082	0.081	0.079	0.077	0.076	0.075	0.073	0.072	0.071	0.069	0.068
20.0	**0.062**	0.076	0.074	0.073	0.071	0.070	0.068	0.067	0.066	0.065	0.064	0.063	0.061	0.060
20.5	**0.054**	0.067	0.065	0.064	0.063	0.061	0.060	0.059	0.058	0.057	0.056	0.055	0.054	0.053
21.0	**0.048**	0.059	0.058	0.057	0.055	0.054	0.053	0.052	0.051	0.051	0.050	0.049	0.048	0.047
21.5	**0.043**	0.052	0.051	0.050	0.049	0.048	0.047	0.046	0.045	0.045	0.044	0.043	0.042	0.041
22.0	**0.038**	0.046	0.045	0.044	0.043	0.042	0.041	0.041	0.040	0.039	0.039	0.038	0.037	0.037
22.5	**0.033**	0.040	0.039	0.039	0.038	0.037	0.036	0.036	0.035	0.035	0.034	0.034	0.033	0.032
23.0	**0.029**	0.035	0.034	0.034	0.033	0.033	0.032	0.032	0.031	0.031	0.030	0.030	0.029	0.028
23.5	**0.026**	0.031	0.030	0.029	0.029	0.028	0.028	0.028	0.027	0.027	0.026	0.026	0.025	0.025
24.0	**0.022**	0.026	0.026	0.025	0.025	0.025	0.024	0.024	0.024	0.023	0.023	0.023	0.022	0.022

6.3 Sound Curves, Mode 0

Sound Power Level at Hub Height		
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**	
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Mode 0 (Blades with serrated trailing edge)**	**Sound Power Level at Hub Height [dBA]** **Mode 0-0S (Blades without serrated trailing edge)**
3	93.5	96.3
4	93.7	96.5
5	94.3	97.1
6	97.3	100.1
7	100.2	103.0
8	102.9	105.7
9	104.0	106.8
10	104.0	106.8
11	104.0	106.8
12	104.0	106.8
13	104.0	106.8
14	104.0	106.8
15	104.0	106.8
16	104.0	106.8
17	104.0	106.8
18	104.0	106.8
19	104.0	106.8
20	104.0	106.8

6.4 Power Curves, Sound Optimized Mode SO2

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**27**	9	10	12	13	14	16	18	20	21	23	25	29	32
3.5	**144**	91	95	100	105	110	115	120	125	129	134	139	149	153
4.0	**289**	205	212	220	228	235	243	251	258	266	274	281	297	304
4.5	**464**	341	352	363	375	386	397	408	419	430	441	452	475	486
5.0	**669**	502	517	532	547	563	578	593	608	624	639	654	685	700
5.5	**919**	693	714	734	755	775	796	816	837	857	878	898	939	960
6.0	**1219**	925	952	979	1005	1032	1059	1086	1113	1140	1166	1193	1246	1272
6.5	**1574**	1201	1235	1269	1303	1337	1371	1405	1439	1473	1507	1540	1608	1642
7.0	**1991**	1525	1568	1610	1653	1695	1737	1780	1822	1864	1906	1948	2033	2075
7.5	**2461**	1892	1944	1995	2047	2099	2151	2203	2255	2306	2358	2410	2513	2564
8.0	**2983**	2299	2362	2424	2486	2549	2611	2673	2735	2797	2859	2921	3044	3106
8.5	**3530**	2729	2802	2876	2949	3022	3095	3168	3241	3314	3386	3458	3601	3672
9.0	**4079**	3173	3257	3342	3426	3511	3594	3677	3760	3843	3922	4001	4153	4226
9.5	**4500**	3611	3706	3800	3895	3989	4071	4152	4234	4316	4377	4438	4546	4592
10.0	**4745**	4028	4120	4212	4304	4396	4457	4518	4579	4640	4675	4710	4766	4787
10.5	**4860**	4381	4453	4526	4599	4672	4707	4743	4779	4815	4830	4845	4869	4877
11.0	**4928**	4650	4700	4750	4800	4851	4866	4881	4896	4911	4917	4923	4931	4934
11.5	**4972**	4824	4851	4878	4905	4932	4940	4947	4955	4963	4966	4969	4973	4974
12.0	**5009**	4928	4942	4957	4972	4986	4991	4996	5001	5006	5007	5008	5009	5008
12.5	**5038**	4987	4997	5006	5016	5026	5029	5032	5034	5037	5037	5037	5037	5037
13.0	**5052**	5016	5024	5031	5038	5045	5047	5049	5051	5052	5052	5052	5052	5052
13.5	**5057**	5028	5035	5041	5047	5053	5054	5055	5056	5057	5057	5057	5057	5057
14.0	**5057**	5033	5038	5043	5048	5053	5054	5055	5056	5057	5057	5057	5057	5057
14.5	**5052**	5029	5034	5038	5043	5048	5048	5049	5050	5051	5051	5051	5052	5052
15.0	**5037**	5012	5017	5022	5027	5032	5032	5033	5034	5035	5036	5036	5037	5038
15.5	**5015**	4992	4996	5000	5005	5009	5010	5011	5012	5013	5014	5014	5016	5016
16.0	**4990**	4968	4972	4976	4980	4984	4986	4986	4988	4988	4989	4990	4991	4992
16.5	**4964**	4942	4946	4950	4954	4958	4959	4960	4961	4962	4963	4964	4965	4966
17.0	**4938**	4916	4920	4924	4927	4931	4932	4933	4935	4936	4936	4937	4938	4939
17.5	**4912**	4888	4893	4897	4901	4905	4906	4907	4909	4910	4910	4911	4912	4913
18.0	**4885**	4864	4867	4871	4875	4879	4880	4881	4882	4882	4883	4884	4886	4886
18.5	**4859**	4841	4844	4847	4850	4853	4854	4855	4856	4857	4857	4858	4860	4860
19.0	**4836**	4818	4821	4824	4826	4829	4831	4832	4833	4834	4835	4836	4837	4837
19.5	**4813**	4789	4793	4796	4800	4803	4805	4806	4808	4810	4811	4812	4814	4815
20.0	**4736**	4690	4695	4701	4706	4711	4714	4718	4722	4726	4729	4732	4740	4744

6.5 Ct Values, Sound Optimized Mode SO2

Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.914**	0.912	0.913	0.913	0.914	0.915	0.915	0.915	0.915	0.915	0.915	0.914	0.913	0.913
3.5	**0.888**	0.894	0.893	0.893	0.893	0.892	0.892	0.891	0.891	0.891	0.890	0.889	0.888	0.887
4.0	**0.851**	0.857	0.856	0.856	0.855	0.854	0.854	0.853	0.853	0.852	0.852	0.852	0.851	0.850
4.5	**0.822**	0.823	0.823	0.823	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822
5.0	**0.801**	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801
5.5	**0.797**	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797
6.0	**0.797**	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797
6.5	**0.798**	0.799	0.799	0.799	0.799	0.799	0.799	0.799	0.799	0.798	0.798	0.798	0.798	0.798
7.0	**0.801**	0.804	0.804	0.803	0.803	0.803	0.803	0.803	0.802	0.802	0.802	0.802	0.801	0.801
7.5	**0.796**	0.798	0.798	0.798	0.798	0.798	0.797	0.797	0.797	0.797	0.796	0.796	0.795	0.795
8.0	**0.784**	0.787	0.787	0.786	0.786	0.786	0.786	0.785	0.785	0.785	0.784	0.784	0.783	0.783
8.5	**0.747**	0.751	0.750	0.750	0.750	0.749	0.749	0.749	0.748	0.748	0.748	0.747	0.746	0.745
9.0	**0.707**	0.717	0.717	0.717	0.716	0.716	0.715	0.715	0.714	0.713	0.711	0.709	0.703	0.699
9.5	**0.634**	0.683	0.682	0.681	0.680	0.679	0.675	0.670	0.665	0.660	0.651	0.643	0.624	0.613
10.0	**0.541**	0.631	0.627	0.623	0.619	0.615	0.606	0.597	0.588	0.578	0.566	0.554	0.528	0.516
10.5	**0.455**	0.566	0.559	0.552	0.544	0.537	0.525	0.513	0.502	0.490	0.478	0.466	0.444	0.433
11.0	**0.385**	0.500	0.490	0.481	0.471	0.461	0.450	0.438	0.427	0.415	0.405	0.395	0.376	0.368
11.5	**0.332**	0.437	0.427	0.416	0.406	0.395	0.386	0.376	0.366	0.357	0.348	0.340	0.325	0.317
12.0	**0.289**	0.382	0.372	0.363	0.353	0.343	0.335	0.327	0.319	0.311	0.303	0.296	0.283	0.277
12.5	**0.254**	0.335	0.326	0.318	0.309	0.301	0.294	0.287	0.280	0.273	0.267	0.261	0.249	0.244
13.0	**0.225**	0.294	0.287	0.280	0.272	0.265	0.259	0.253	0.247	0.241	0.235	0.230	0.220	0.216
13.5	**0.200**	0.260	0.254	0.248	0.241	0.235	0.230	0.224	0.219	0.214	0.209	0.205	0.196	0.192
14.0	**0.179**	0.232	0.226	0.220	0.215	0.209	0.205	0.200	0.195	0.191	0.187	0.183	0.175	0.172
14.5	**0.160**	0.207	0.202	0.197	0.192	0.187	0.183	0.179	0.175	0.171	0.167	0.164	0.157	0.154
15.0	**0.144**	0.185	0.181	0.177	0.172	0.168	0.164	0.161	0.157	0.153	0.150	0.147	0.142	0.139
15.5	**0.130**	0.167	0.163	0.159	0.155	0.151	0.148	0.145	0.142	0.138	0.136	0.133	0.128	0.125
16.0	**0.118**	0.151	0.147	0.144	0.140	0.137	0.134	0.131	0.128	0.125	0.123	0.120	0.116	0.114
16.5	**0.107**	0.136	0.133	0.130	0.127	0.124	0.122	0.119	0.116	0.114	0.112	0.109	0.105	0.103
17.0	**0.098**	0.124	0.121	0.119	0.116	0.113	0.111	0.108	0.106	0.104	0.102	0.100	0.096	0.094
17.5	**0.090**	0.114	0.111	0.109	0.106	0.104	0.102	0.100	0.097	0.095	0.094	0.092	0.088	0.087
18.0	**0.083**	0.104	0.102	0.100	0.097	0.095	0.093	0.091	0.089	0.087	0.086	0.084	0.081	0.080
18.5	**0.076**	0.096	0.094	0.092	0.090	0.087	0.086	0.084	0.082	0.080	0.079	0.078	0.075	0.073
19.0	**0.070**	0.088	0.086	0.084	0.082	0.080	0.079	0.077	0.075	0.074	0.073	0.071	0.069	0.067
19.5	**0.065**	0.081	0.079	0.078	0.076	0.074	0.073	0.071	0.070	0.068	0.067	0.066	0.064	0.063
20.0	**0.060**	0.074	0.072	0.071	0.069	0.068	0.067	0.065	0.064	0.063	0.062	0.061	0.059	0.058

6.6 Sound Curves, Sound Optimized Mode SO2

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Sound Optimized Mode SO2 (Blades with serrated trailing edge)**
3	93.5
4	93.7
5	94.3
6	97.3
7	100.2
8	102.0
9	102.0
10	102.0
11	102.0
12	102.0
13	102.0
14	102.0
15	102.0
16	102.0
17	102.0
18	102.0
19	102.0
20	102.0

6.7 Power Curves, Sound Optimized Mode SO3

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**27**	9	10	12	13	14	16	18	20	21	23	25	29	32
3.5	**144**	91	95	100	105	110	115	120	125	129	134	139	149	153
4.0	**289**	205	212	220	228	235	243	251	258	266	274	281	297	304
4.5	**464**	341	352	363	375	386	397	408	419	430	441	452	475	486
5.0	**669**	502	517	532	547	563	578	593	608	624	639	654	685	700
5.5	**919**	693	714	734	755	775	796	816	837	857	878	898	939	960
6.0	**1219**	925	952	979	1005	1032	1059	1086	1113	1140	1166	1193	1246	1272
6.5	**1574**	1201	1235	1269	1303	1337	1371	1405	1439	1473	1507	1540	1608	1642
7.0	**1990**	1525	1567	1610	1652	1694	1737	1779	1821	1864	1906	1948	2032	2074
7.5	**2453**	1886	1937	1989	2041	2092	2144	2196	2247	2299	2350	2402	2504	2556
8.0	**2953**	2277	2339	2400	2462	2524	2585	2647	2708	2770	2831	2892	3014	3076
8.5	**3458**	2674	2745	2817	2889	2960	3032	3103	3174	3246	3317	3387	3528	3598
9.0	**3940**	3059	3140	3222	3303	3385	3465	3546	3626	3706	3784	3862	4012	4083
9.5	**4306**	3423	3514	3604	3694	3784	3866	3948	4031	4113	4177	4242	4353	4400
10.0	**4532**	3760	3853	3945	4037	4130	4199	4268	4337	4406	4448	4490	4557	4582
10.5	**4659**	4070	4154	4237	4320	4403	4451	4498	4545	4592	4615	4637	4671	4683
11.0	**4742**	4331	4398	4466	4534	4602	4629	4657	4685	4713	4723	4733	4748	4754
11.5	**4800**	4532	4580	4628	4676	4723	4738	4753	4768	4782	4788	4794	4803	4806
12.0	**4829**	4647	4680	4714	4747	4780	4789	4799	4809	4818	4822	4826	4830	4832
12.5	**4839**	4698	4725	4751	4777	4803	4810	4817	4824	4831	4834	4836	4840	4840
13.0	**4841**	4724	4745	4767	4789	4811	4817	4823	4829	4835	4837	4839	4842	4842
13.5	**4841**	4731	4752	4774	4795	4817	4822	4827	4833	4838	4839	4840	4842	4842
14.0	**4840**	4746	4765	4783	4801	4820	4824	4828	4833	4837	4838	4839	4840	4841
14.5	**4834**	4754	4770	4786	4801	4817	4820	4824	4828	4831	4832	4833	4835	4835
15.0	**4819**	4744	4758	4773	4787	4801	4805	4808	4812	4816	4817	4818	4820	4820
15.5	**4798**	4728	4741	4754	4767	4781	4784	4788	4791	4794	4796	4797	4798	4799
16.0	**4773**	4707	4719	4732	4744	4756	4759	4763	4766	4770	4771	4772	4774	4774
16.5	**4746**	4685	4696	4708	4719	4730	4734	4737	4740	4743	4744	4745	4747	4748
17.0	**4720**	4664	4674	4684	4695	4705	4708	4710	4713	4716	4717	4718	4720	4720
17.5	**4693**	4637	4648	4658	4668	4679	4681	4684	4687	4690	4691	4692	4694	4694
18.0	**4666**	4620	4629	4637	4646	4654	4656	4659	4661	4664	4664	4665	4667	4668
18.5	**4640**	4604	4611	4617	4623	4630	4632	4634	4636	4638	4638	4639	4640	4641
19.0	**4617**	4584	4589	4595	4600	4606	4608	4610	4612	4614	4615	4616	4618	4618
19.5	**4598**	4574	4578	4582	4586	4590	4592	4593	4595	4596	4597	4597	4598	4599
20.0	**4575**	4548	4552	4555	4559	4563	4565	4567	4569	4571	4572	4573	4576	4577

6.8 Ct Values, Sound Optimized Mode SO3

Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.914**	0.912	0.913	0.913	0.914	0.915	0.915	0.915	0.915	0.915	0.915	0.914	0.913	0.913
3.5	**0.888**	0.894	0.893	0.893	0.893	0.892	0.892	0.891	0.891	0.891	0.890	0.889	0.888	0.887
4.0	**0.851**	0.857	0.856	0.856	0.855	0.854	0.854	0.853	0.853	0.852	0.852	0.852	0.851	0.850
4.5	**0.822**	0.823	0.823	0.823	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822
5.0	**0.801**	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801
5.5	**0.797**	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797
6.0	**0.797**	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797	0.797
6.5	**0.798**	0.799	0.799	0.799	0.799	0.799	0.799	0.799	0.799	0.798	0.798	0.798	0.798	0.798
7.0	**0.801**	0.803	0.803	0.803	0.803	0.802	0.802	0.802	0.802	0.802	0.801	0.801	0.801	0.800
7.5	**0.792**	0.794	0.794	0.794	0.794	0.794	0.793	0.793	0.793	0.793	0.792	0.792	0.792	0.791
8.0	**0.769**	0.772	0.771	0.771	0.771	0.771	0.770	0.770	0.770	0.770	0.769	0.769	0.768	0.768
8.5	**0.720**	0.723	0.723	0.722	0.722	0.722	0.722	0.721	0.721	0.721	0.720	0.720	0.719	0.718
9.0	**0.670**	0.676	0.676	0.676	0.676	0.675	0.675	0.675	0.674	0.674	0.672	0.671	0.667	0.663
9.5	**0.594**	0.622	0.621	0.621	0.621	0.620	0.618	0.616	0.613	0.611	0.605	0.600	0.585	0.576
10.0	**0.508**	0.562	0.560	0.559	0.557	0.556	0.551	0.545	0.540	0.535	0.526	0.517	0.497	0.487
10.5	**0.431**	0.506	0.502	0.499	0.495	0.491	0.483	0.476	0.468	0.460	0.450	0.440	0.421	0.412
11.0	**0.368**	0.454	0.448	0.442	0.436	0.431	0.422	0.413	0.404	0.395	0.386	0.377	0.360	0.352
11.5	**0.319**	0.405	0.397	0.390	0.383	0.376	0.367	0.359	0.350	0.342	0.334	0.327	0.312	0.305
12.0	**0.278**	0.357	0.349	0.342	0.335	0.328	0.320	0.313	0.305	0.298	0.291	0.285	0.272	0.266
12.5	**0.244**	0.313	0.306	0.300	0.293	0.286	0.280	0.274	0.267	0.261	0.255	0.249	0.239	0.234
13.0	**0.215**	0.276	0.270	0.264	0.258	0.252	0.246	0.241	0.235	0.230	0.225	0.220	0.211	0.206
13.5	**0.191**	0.244	0.239	0.234	0.229	0.223	0.219	0.214	0.209	0.204	0.200	0.195	0.187	0.183
14.0	**0.171**	0.218	0.213	0.208	0.204	0.199	0.195	0.191	0.186	0.182	0.178	0.174	0.167	0.164
14.5	**0.153**	0.195	0.191	0.187	0.183	0.178	0.175	0.171	0.167	0.163	0.160	0.156	0.150	0.147
15.0	**0.138**	0.175	0.171	0.168	0.164	0.160	0.157	0.153	0.150	0.147	0.144	0.141	0.135	0.133
15.5	**0.124**	0.158	0.154	0.151	0.148	0.144	0.141	0.138	0.135	0.132	0.130	0.127	0.122	0.120
16.0	**0.113**	0.143	0.140	0.137	0.134	0.130	0.128	0.125	0.122	0.120	0.117	0.115	0.111	0.109
16.5	**0.102**	0.129	0.127	0.124	0.121	0.118	0.116	0.114	0.111	0.109	0.107	0.105	0.101	0.099
17.0	**0.093**	0.118	0.115	0.113	0.110	0.108	0.106	0.103	0.101	0.099	0.097	0.095	0.092	0.090
17.5	**0.086**	0.108	0.106	0.104	0.101	0.099	0.097	0.095	0.093	0.091	0.089	0.088	0.084	0.083
18.0	**0.079**	0.099	0.097	0.095	0.093	0.091	0.089	0.087	0.085	0.084	0.082	0.080	0.077	0.076
18.5	**0.073**	0.091	0.089	0.087	0.085	0.084	0.082	0.080	0.079	0.077	0.075	0.074	0.071	0.070
19.0	**0.067**	0.084	0.082	0.080	0.078	0.077	0.075	0.074	0.072	0.071	0.069	0.068	0.066	0.064
19.5	**0.062**	0.078	0.076	0.074	0.073	0.071	0.070	0.068	0.067	0.065	0.064	0.063	0.061	0.060
20.0	**0.057**	0.072	0.070	0.069	0.067	0.066	0.064	0.063	0.062	0.061	0.060	0.058	0.056	0.055

6.9 Sound Curves, Sound Optimized Mode SO3

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Sound Optimized Mode SO3 (Blades with serrated trailing edge)**
3	93.5
4	93.7
5	94.3
6	97.3
7	100.2
8	101.0
9	101.0
10	101.0
11	101.0
12	101.0
13	101.0
14	101.0
15	101.0
16	101.0
17	101.0
18	101.0
19	101.0
20	101.0

6.10 Power Curves, Sound Optimized Mode SO4

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**27**	9	10	12	13	14	16	18	20	21	23	25	29	32
3.5	**144**	91	95	100	105	110	115	120	125	129	134	139	149	153
4.0	**289**	205	212	220	228	235	243	251	258	266	274	281	297	304
4.5	**464**	341	352	363	375	386	397	408	419	430	441	452	475	486
5.0	**669**	502	517	532	547	563	578	593	608	624	639	654	685	700
5.5	**919**	693	714	734	755	775	796	816	837	857	878	898	940	960
6.0	**1220**	926	953	979	1006	1033	1060	1087	1114	1140	1167	1194	1247	1274
6.5	**1575**	1201	1235	1269	1303	1337	1371	1405	1439	1473	1507	1541	1608	1642
7.0	**1986**	1522	1564	1606	1649	1691	1733	1776	1818	1860	1902	1944	2028	2070
7.5	**2437**	1874	1925	1977	2028	2079	2131	2182	2233	2284	2335	2386	2488	2539
8.0	**2909**	2243	2304	2365	2426	2486	2547	2607	2668	2728	2789	2849	2970	3030
8.5	**3367**	2602	2672	2742	2811	2881	2951	3020	3090	3160	3229	3298	3435	3504
9.0	**3783**	2932	3011	3089	3167	3246	3323	3401	3478	3556	3632	3708	3854	3924
9.5	**4086**	3219	3304	3390	3475	3560	3641	3722	3803	3884	3951	4019	4138	4190
10.0	**4294**	3496	3586	3675	3764	3854	3927	4001	4074	4147	4196	4245	4327	4359
10.5	**4434**	3770	3855	3941	4027	4113	4171	4228	4286	4344	4374	4404	4451	4469
11.0	**4519**	3996	4072	4148	4224	4299	4342	4384	4427	4469	4486	4502	4527	4536
11.5	**4548**	4117	4185	4254	4322	4390	4421	4453	4484	4515	4526	4537	4554	4559
12.0	**4556**	4182	4244	4306	4368	4430	4455	4480	4505	4530	4539	4548	4560	4564
12.5	**4559**	4228	4285	4341	4398	4454	4475	4496	4517	4538	4545	4552	4563	4566
13.0	**4562**	4274	4324	4375	4425	4476	4492	4509	4526	4543	4549	4555	4565	4568
13.5	**4566**	4308	4352	4396	4440	4484	4501	4517	4534	4550	4555	4560	4568	4570
14.0	**4566**	4347	4385	4423	4461	4500	4513	4526	4540	4553	4558	4562	4568	4570
14.5	**4561**	4372	4405	4438	4471	4504	4516	4528	4539	4551	4554	4558	4563	4564
15.0	**4547**	4374	4404	4434	4464	4494	4504	4515	4526	4536	4540	4544	4549	4550
15.5	**4526**	4368	4396	4423	4450	4477	4487	4497	4506	4516	4519	4523	4527	4529
16.0	**4502**	4360	4384	4409	4433	4458	4466	4475	4484	4492	4496	4498	4503	4504
16.5	**4475**	4352	4373	4394	4415	4436	4444	4452	4460	4467	4470	4473	4476	4478
17.0	**4449**	4347	4364	4382	4399	4417	4423	4430	4436	4442	4445	4447	4450	4452
17.5	**4424**	4322	4340	4358	4377	4395	4400	4406	4412	4418	4420	4422	4425	4426
18.0	**4397**	4319	4333	4347	4361	4375	4379	4384	4388	4392	4394	4396	4398	4399
18.5	**4371**	4314	4324	4334	4344	4354	4358	4361	4364	4367	4368	4370	4371	4372
19.0	**4348**	4303	4310	4318	4326	4333	4336	4339	4341	4344	4345	4346	4348	4349
19.5	**4329**	4298	4304	4309	4314	4320	4321	4323	4325	4327	4328	4328	4330	4330
20.0	**4316**	4296	4299	4303	4307	4310	4312	4313	4314	4315	4316	4316	4317	4317

6.11 Ct Values, Sound Optimized Mode SO4

Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.914**	0.912	0.913	0.913	0.914	0.915	0.915	0.915	0.915	0.915	0.915	0.914	0.913	0.913
3.5	**0.888**	0.894	0.893	0.893	0.893	0.892	0.892	0.891	0.891	0.891	0.890	0.889	0.888	0.887
4.0	**0.851**	0.857	0.856	0.856	0.855	0.854	0.854	0.853	0.853	0.852	0.852	0.852	0.851	0.850
4.5	**0.822**	0.823	0.823	0.823	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822
5.0	**0.801**	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801
5.5	**0.798**	0.797	0.797	0.797	0.798	0.798	0.798	0.798	0.798	0.798	0.798	0.798	0.798	0.798
6.0	**0.803**	0.804	0.804	0.804	0.804	0.804	0.804	0.804	0.804	0.804	0.803	0.803	0.803	0.803
6.5	**0.802**	0.803	0.803	0.803	0.803	0.803	0.803	0.803	0.803	0.802	0.802	0.802	0.802	0.802
7.0	**0.798**	0.800	0.800	0.800	0.800	0.800	0.800	0.799	0.799	0.799	0.799	0.799	0.798	0.798
7.5	**0.784**	0.786	0.786	0.786	0.786	0.786	0.785	0.785	0.785	0.785	0.785	0.784	0.784	0.784
8.0	**0.749**	0.751	0.751	0.751	0.751	0.750	0.750	0.750	0.750	0.749	0.749	0.749	0.748	0.748
8.5	**0.692**	0.694	0.694	0.694	0.694	0.693	0.693	0.693	0.693	0.692	0.692	0.692	0.691	0.691
9.0	**0.630**	0.633	0.633	0.633	0.633	0.632	0.632	0.632	0.632	0.631	0.631	0.630	0.628	0.626
9.5	**0.549**	0.563	0.563	0.563	0.563	0.563	0.562	0.561	0.560	0.559	0.555	0.552	0.543	0.537
10.0	**0.472**	0.504	0.504	0.503	0.503	0.502	0.499	0.496	0.493	0.490	0.484	0.478	0.464	0.456
10.5	**0.405**	0.456	0.454	0.452	0.450	0.448	0.443	0.438	0.433	0.428	0.420	0.413	0.397	0.389
11.0	**0.349**	0.410	0.407	0.403	0.400	0.396	0.390	0.384	0.378	0.371	0.364	0.356	0.341	0.334
11.5	**0.301**	0.361	0.357	0.353	0.349	0.346	0.339	0.333	0.327	0.321	0.314	0.308	0.295	0.288
12.0	**0.262**	0.316	0.312	0.309	0.305	0.301	0.296	0.290	0.284	0.279	0.273	0.267	0.256	0.251
12.5	**0.229**	0.278	0.275	0.271	0.268	0.264	0.259	0.254	0.249	0.244	0.239	0.234	0.225	0.220
13.0	**0.202**	0.247	0.244	0.240	0.237	0.233	0.229	0.224	0.220	0.215	0.211	0.207	0.198	0.194
13.5	**0.180**	0.221	0.218	0.214	0.211	0.207	0.203	0.200	0.196	0.192	0.188	0.184	0.177	0.173
14.0	**0.161**	0.199	0.195	0.192	0.189	0.186	0.182	0.178	0.175	0.171	0.168	0.164	0.158	0.155
14.5	**0.145**	0.179	0.176	0.173	0.170	0.167	0.164	0.160	0.157	0.154	0.151	0.148	0.142	0.139
15.0	**0.130**	0.161	0.159	0.156	0.153	0.150	0.147	0.144	0.141	0.138	0.136	0.133	0.128	0.125
15.5	**0.118**	0.146	0.143	0.141	0.138	0.135	0.133	0.130	0.127	0.125	0.122	0.120	0.115	0.113
16.0	**0.106**	0.132	0.130	0.127	0.125	0.122	0.120	0.118	0.115	0.113	0.111	0.109	0.104	0.102
16.5	**0.097**	0.120	0.118	0.116	0.114	0.111	0.109	0.107	0.105	0.103	0.101	0.099	0.095	0.093
17.0	**0.088**	0.110	0.108	0.106	0.104	0.102	0.100	0.098	0.096	0.094	0.092	0.090	0.087	0.085
17.5	**0.081**	0.101	0.099	0.097	0.095	0.093	0.092	0.090	0.088	0.086	0.084	0.083	0.080	0.078
18.0	**0.075**	0.093	0.091	0.089	0.088	0.086	0.084	0.082	0.081	0.079	0.077	0.076	0.073	0.072
18.5	**0.069**	0.086	0.084	0.082	0.081	0.079	0.077	0.076	0.074	0.073	0.071	0.070	0.067	0.066
19.0	**0.063**	0.079	0.077	0.076	0.074	0.072	0.071	0.070	0.068	0.067	0.065	0.064	0.062	0.061
19.5	**0.058**	0.073	0.072	0.070	0.069	0.067	0.066	0.064	0.063	0.062	0.061	0.060	0.057	0.056
20.0	**0.054**	0.068	0.067	0.065	0.064	0.062	0.061	0.060	0.059	0.057	0.056	0.055	0.053	0.052

6.12 Sound Curves, Sound Optimized Mode SO4

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Sound Optimized Mode SO4 (Blades with serrated trailing edge)**
3	93.5
4	93.7
5	94.3
6	97.3
7	99.7
8	100.0
9	100.0
10	100.0
11	100.0
12	100.0
13	100.0
14	100.0
15	100.0
16	100.0
17	100.0
18	100.0
19	100.0
20	100.0

6.13 Power Curves, Sound Optimized Mode SO5

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**27**	9	10	12	13	14	16	18	20	21	23	25	29	32
3.5	**144**	91	95	100	105	110	115	120	125	129	134	139	149	153
4.0	**289**	205	212	220	228	235	243	251	258	266	274	281	297	304
4.5	**464**	341	352	363	375	386	397	408	419	430	441	452	475	486
5.0	**669**	502	517	532	547	563	578	593	608	624	639	654	685	700
5.5	**919**	693	714	734	755	775	796	816	837	857	878	899	940	960
6.0	**1220**	926	952	979	1006	1032	1059	1086	1113	1140	1166	1193	1247	1274
6.5	**1570**	1198	1232	1266	1299	1333	1367	1401	1435	1469	1502	1536	1603	1637
7.0	**1968**	1509	1551	1593	1635	1677	1718	1760	1802	1844	1885	1927	2010	2051
7.5	**2386**	1835	1886	1936	1986	2036	2086	2136	2186	2236	2286	2336	2436	2486
8.0	**2788**	2147	2205	2264	2322	2380	2439	2497	2555	2613	2671	2730	2846	2904
8.5	**3160**	2438	2503	2569	2635	2701	2767	2833	2898	2964	3029	3095	3225	3290
9.0	**3480**	2693	2765	2837	2909	2980	3052	3124	3195	3267	3338	3409	3550	3620
9.5	**3719**	2891	2968	3044	3121	3198	3274	3350	3425	3501	3574	3646	3783	3848
10.0	**3888**	3047	3127	3208	3288	3369	3447	3525	3603	3681	3750	3819	3943	3998
10.5	**3984**	3155	3238	3320	3403	3486	3564	3642	3720	3798	3860	3922	4030	4075
11.0	**4029**	3234	3319	3404	3488	3573	3646	3719	3792	3864	3919	3974	4071	4112
11.5	**4069**	3302	3386	3471	3556	3641	3710	3779	3848	3917	3968	4018	4105	4141
12.0	**4106**	3375	3458	3542	3625	3708	3773	3838	3903	3968	4014	4060	4135	4164
12.5	**4138**	3455	3536	3617	3698	3779	3839	3899	3959	4019	4059	4099	4161	4184
13.0	**4162**	3531	3608	3686	3764	3841	3896	3952	4007	4063	4096	4129	4180	4198
13.5	**4171**	3594	3666	3738	3810	3882	3932	3983	4034	4084	4113	4142	4188	4205
14.0	**4185**	3652	3720	3789	3857	3926	3972	4019	4065	4111	4136	4161	4200	4214
14.5	**4199**	3713	3778	3842	3907	3972	4013	4054	4096	4137	4158	4178	4211	4223
15.0	**4209**	3773	3834	3896	3957	4018	4053	4088	4124	4159	4176	4192	4218	4228
15.5	**4219**	3839	3895	3951	4007	4063	4092	4121	4150	4180	4193	4206	4227	4234
16.0	**4228**	3909	3958	4007	4056	4105	4128	4152	4175	4198	4208	4218	4234	4240
16.5	**4237**	3978	4019	4060	4102	4143	4161	4178	4196	4213	4221	4229	4241	4246
17.0	**4244**	4041	4074	4107	4140	4174	4187	4200	4213	4226	4232	4238	4246	4249
17.5	**4246**	4074	4102	4130	4157	4185	4197	4209	4221	4233	4237	4242	4249	4251
18.0	**4251**	4122	4144	4166	4188	4209	4218	4226	4234	4242	4245	4248	4252	4253
18.5	**4253**	4164	4179	4195	4211	4226	4232	4237	4242	4248	4250	4251	4254	4254
19.0	**4253**	4189	4200	4211	4222	4234	4237	4241	4245	4248	4250	4251	4253	4254
19.5	**4254**	4212	4220	4227	4234	4242	4244	4247	4249	4252	4253	4253	4254	4255
20.0	**4255**	4228	4232	4237	4242	4247	4249	4250	4252	4254	4254	4255	4255	4255

6.14 Ct Values, Sound Optimized Mode SO5

Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.914**	0.912	0.913	0.913	0.914	0.915	0.915	0.915	0.915	0.915	0.915	0.914	0.913	0.913
3.5	**0.888**	0.894	0.893	0.893	0.893	0.892	0.892	0.891	0.891	0.891	0.890	0.889	0.888	0.887
4.0	**0.851**	0.857	0.856	0.856	0.855	0.854	0.854	0.853	0.853	0.852	0.852	0.852	0.851	0.850
4.5	**0.822**	0.823	0.823	0.823	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822
5.0	**0.801**	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801
5.5	**0.799**	0.798	0.798	0.798	0.799	0.799	0.799	0.799	0.799	0.799	0.799	0.799	0.799	0.799
6.0	**0.803**	0.803	0.803	0.804	0.804	0.804	0.804	0.803	0.803	0.803	0.803	0.803	0.803	0.803
6.5	**0.797**	0.798	0.798	0.798	0.798	0.798	0.798	0.798	0.798	0.797	0.797	0.797	0.797	0.797
7.0	**0.786**	0.788	0.788	0.787	0.787	0.787	0.787	0.787	0.787	0.787	0.787	0.786	0.786	0.786
7.5	**0.754**	0.756	0.756	0.756	0.756	0.756	0.756	0.755	0.755	0.755	0.755	0.755	0.754	0.754
8.0	**0.703**	0.705	0.705	0.705	0.704	0.704	0.704	0.704	0.704	0.704	0.703	0.703	0.703	0.703
8.5	**0.633**	0.635	0.635	0.635	0.634	0.634	0.634	0.634	0.634	0.633	0.633	0.633	0.633	0.633
9.0	**0.554**	0.555	0.555	0.555	0.555	0.555	0.554	0.554	0.554	0.554	0.554	0.554	0.553	0.553
9.5	**0.481**	0.484	0.484	0.484	0.483	0.483	0.483	0.483	0.483	0.483	0.482	0.481	0.479	0.477
10.0	**0.416**	0.422	0.422	0.422	0.422	0.422	0.421	0.421	0.420	0.420	0.419	0.417	0.413	0.409
10.5	**0.358**	0.367	0.367	0.367	0.367	0.367	0.366	0.365	0.365	0.364	0.362	0.360	0.354	0.350
11.0	**0.307**	0.320	0.320	0.320	0.320	0.319	0.318	0.317	0.316	0.315	0.312	0.310	0.304	0.301
11.5	**0.267**	0.281	0.281	0.281	0.280	0.280	0.279	0.277	0.276	0.275	0.272	0.270	0.264	0.261
12.0	**0.235**	0.250	0.249	0.249	0.249	0.248	0.247	0.245	0.244	0.242	0.240	0.237	0.232	0.228
12.5	**0.208**	0.224	0.224	0.223	0.222	0.222	0.220	0.219	0.217	0.215	0.213	0.210	0.205	0.202
13.0	**0.185**	0.203	0.202	0.201	0.200	0.199	0.198	0.196	0.194	0.192	0.190	0.187	0.182	0.179
13.5	**0.165**	0.183	0.182	0.181	0.180	0.179	0.177	0.175	0.174	0.172	0.170	0.167	0.162	0.160
14.0	**0.148**	0.166	0.165	0.164	0.163	0.162	0.160	0.158	0.157	0.155	0.153	0.150	0.146	0.143
14.5	**0.133**	0.152	0.151	0.150	0.148	0.147	0.145	0.144	0.142	0.140	0.138	0.136	0.131	0.129
15.0	**0.121**	0.139	0.138	0.137	0.136	0.134	0.133	0.131	0.129	0.127	0.125	0.123	0.119	0.117
15.5	**0.110**	0.128	0.127	0.126	0.124	0.123	0.121	0.119	0.118	0.116	0.114	0.112	0.108	0.106
16.0	**0.100**	0.119	0.117	0.116	0.115	0.113	0.111	0.110	0.108	0.106	0.104	0.102	0.099	0.097
16.5	**0.092**	0.110	0.109	0.107	0.106	0.104	0.102	0.101	0.099	0.097	0.095	0.094	0.090	0.089
17.0	**0.084**	0.103	0.101	0.099	0.098	0.096	0.094	0.093	0.091	0.089	0.088	0.086	0.083	0.081
17.5	**0.078**	0.096	0.094	0.092	0.091	0.089	0.088	0.086	0.084	0.083	0.081	0.080	0.077	0.075
18.0	**0.072**	0.089	0.088	0.086	0.084	0.083	0.081	0.080	0.078	0.076	0.075	0.074	0.071	0.070
18.5	**0.067**	0.083	0.082	0.080	0.078	0.077	0.075	0.074	0.072	0.071	0.069	0.068	0.066	0.064
19.0	**0.062**	0.077	0.076	0.074	0.072	0.071	0.069	0.068	0.067	0.065	0.064	0.063	0.061	0.060
19.5	**0.057**	0.072	0.070	0.069	0.067	0.066	0.065	0.063	0.062	0.061	0.060	0.059	0.056	0.055
20.0	**0.054**	0.067	0.066	0.064	0.063	0.061	0.060	0.059	0.058	0.057	0.056	0.055	0.053	0.052

6.15 Sound Curves, Sound Optimized Mode SO5

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Sound Optimized Mode SO5 (Blades with serrated trailing edge)**
3	93.5
4	93.7
5	94.3
6	97.2
7	99.0
8	99.0
9	99.0
10	99.0
11	99.0
12	99.0
13	99.0
14	99.0
15	99.0
16	99.0
17	99.0
18	99.0
19	99.0
20	99.0

6.16 Power Curves, Sound Optimized Mode SO6

Air density [kg/m³]														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**27**	9	10	12	13	14	16	18	20	21	23	25	29	32
3.5	**144**	91	95	100	105	110	115	120	125	129	134	139	149	153
4.0	**289**	205	212	220	228	235	243	251	258	266	274	281	297	304
4.5	**464**	341	352	363	375	386	397	408	419	430	441	452	475	486
5.0	**669**	502	517	532	547	563	578	593	608	624	639	654	685	700
5.5	**919**	693	714	734	755	775	796	817	837	858	878	899	940	960
6.0	**1219**	925	952	978	1005	1032	1059	1085	1112	1139	1165	1192	1245	1272
6.5	**1559**	1190	1224	1257	1291	1325	1358	1392	1425	1459	1492	1526	1592	1626
7.0	**1928**	1479	1520	1561	1602	1642	1683	1724	1765	1806	1847	1887	1969	2010
7.5	**2278**	1751	1799	1847	1895	1943	1991	2039	2087	2134	2182	2230	2326	2374
8.0	**2603**	2004	2058	2113	2168	2222	2277	2331	2386	2440	2495	2549	2658	2712
8.5	**2881**	2225	2285	2345	2404	2464	2524	2583	2643	2702	2762	2821	2939	2998
9.0	**3097**	2398	2462	2526	2590	2654	2717	2781	2845	2909	2972	3034	3157	3217
9.5	**3237**	2522	2588	2656	2722	2790	2856	2922	2988	3054	3115	3176	3290	3342
10.0	**3324**	2608	2676	2745	2814	2883	2950	3017	3083	3150	3208	3266	3369	3414
10.5	**3379**	2675	2745	2816	2886	2956	3023	3089	3155	3222	3274	3326	3419	3459
11.0	**3412**	2737	2809	2881	2952	3024	3086	3147	3209	3270	3318	3365	3449	3485
11.5	**3454**	2808	2879	2951	3022	3094	3152	3209	3267	3325	3368	3411	3486	3517
12.0	**3492**	2880	2950	3020	3090	3160	3214	3268	3322	3376	3414	3453	3517	3541
12.5	**3519**	2947	3014	3082	3150	3218	3268	3318	3368	3418	3451	3485	3538	3557
13.0	**3538**	3008	3072	3137	3201	3266	3312	3359	3406	3453	3481	3510	3554	3569
13.5	**3546**	3065	3124	3184	3244	3303	3346	3388	3431	3473	3498	3522	3561	3575
14.0	**3561**	3125	3181	3238	3294	3351	3389	3426	3464	3502	3522	3541	3573	3586
14.5	**3575**	3188	3240	3293	3346	3398	3431	3463	3495	3527	3543	3559	3585	3595
15.0	**3588**	3256	3304	3352	3400	3449	3475	3501	3527	3553	3565	3576	3595	3602
15.5	**3599**	3327	3369	3410	3452	3493	3513	3533	3553	3572	3581	3590	3604	3609
16.0	**3607**	3394	3428	3462	3496	3530	3545	3559	3573	3587	3594	3600	3610	3614
16.5	**3613**	3453	3479	3505	3532	3558	3568	3578	3588	3598	3603	3608	3615	3617
17.0	**3617**	3504	3523	3541	3560	3579	3586	3593	3601	3608	3611	3614	3618	3620
17.5	**3619**	3528	3543	3559	3575	3590	3596	3602	3608	3613	3615	3617	3620	3621
18.0	**3621**	3560	3571	3582	3593	3604	3607	3611	3614	3618	3619	3620	3622	3622
18.5	**3622**	3584	3592	3599	3606	3613	3615	3617	3619	3620	3621	3621	3622	3622
19.0	**3622**	3595	3600	3605	3610	3614	3616	3617	3619	3620	3621	3621	3622	3622
19.5	**3622**	3606	3609	3612	3615	3618	3619	3620	3621	3622	3622	3622	3622	3622
20.0	**3622**	3613	3615	3617	3618	3620	3621	3621	3622	3622	3622	3622	3622	3622

6.17 Ct Values, Sound Optimized Mode SO6

Air density kg/m³														
Wind speed [m/s]	**1.225**	**0.950**	**0.975**	**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.250**	**1.275**
3.0	**0.914**	0.912	0.913	0.913	0.914	0.915	0.915	0.915	0.915	0.915	0.915	0.914	0.913	0.913
3.5	**0.888**	0.894	0.893	0.893	0.893	0.892	0.892	0.891	0.891	0.890	0.890	0.889	0.888	0.887
4.0	**0.851**	0.857	0.856	0.856	0.855	0.854	0.854	0.853	0.853	0.852	0.852	0.852	0.851	0.850
4.5	**0.822**	0.823	0.823	0.823	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822	0.822
5.0	**0.801**	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801	0.801
5.5	**0.800**	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800
6.0	**0.802**	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802
6.5	**0.789**	0.789	0.789	0.789	0.789	0.789	0.789	0.789	0.789	0.789	0.789	0.789	0.788	0.788
7.0	**0.757**	0.758	0.758	0.758	0.758	0.758	0.758	0.758	0.758	0.758	0.757	0.757	0.757	0.757
7.5	**0.702**	0.704	0.704	0.703	0.703	0.703	0.703	0.703	0.703	0.703	0.703	0.703	0.702	0.702
8.0	**0.627**	0.629	0.629	0.628	0.628	0.628	0.628	0.628	0.627	0.627	0.627	0.627	0.626	0.626
8.5	**0.542**	0.544	0.544	0.544	0.544	0.544	0.543	0.543	0.543	0.543	0.543	0.543	0.542	0.542
9.0	**0.468**	0.469	0.469	0.469	0.469	0.469	0.469	0.468	0.468	0.468	0.468	0.468	0.467	0.466
9.5	**0.402**	0.406	0.406	0.406	0.405	0.405	0.405	0.405	0.405	0.404	0.404	0.403	0.400	0.398
10.0	**0.344**	0.350	0.350	0.350	0.350	0.350	0.349	0.349	0.349	0.348	0.347	0.346	0.342	0.339
10.5	**0.296**	0.304	0.304	0.304	0.304	0.303	0.303	0.302	0.302	0.301	0.300	0.298	0.293	0.290
11.0	**0.256**	0.266	0.266	0.266	0.266	0.266	0.265	0.264	0.263	0.262	0.260	0.258	0.253	0.250
11.5	**0.224**	0.236	0.236	0.236	0.235	0.235	0.234	0.233	0.231	0.230	0.228	0.226	0.222	0.219
12.0	**0.198**	0.212	0.211	0.211	0.210	0.210	0.208	0.207	0.206	0.204	0.202	0.200	0.195	0.193
12.5	**0.176**	0.190	0.190	0.189	0.188	0.188	0.186	0.185	0.183	0.182	0.180	0.178	0.173	0.170
13.0	**0.157**	0.172	0.171	0.170	0.170	0.169	0.167	0.166	0.164	0.163	0.161	0.159	0.154	0.152
13.5	**0.140**	0.156	0.155	0.154	0.153	0.152	0.150	0.149	0.147	0.146	0.144	0.142	0.138	0.135
14.0	**0.126**	0.142	0.141	0.140	0.139	0.138	0.137	0.135	0.133	0.132	0.130	0.128	0.124	0.122
14.5	**0.114**	0.131	0.129	0.128	0.127	0.126	0.124	0.123	0.121	0.120	0.118	0.116	0.112	0.110
15.0	**0.103**	0.120	0.119	0.118	0.117	0.116	0.114	0.112	0.110	0.109	0.107	0.105	0.102	0.100
15.5	**0.094**	0.112	0.110	0.109	0.108	0.106	0.104	0.103	0.101	0.099	0.098	0.096	0.092	0.091
16.0	**0.086**	0.104	0.102	0.101	0.099	0.098	0.096	0.094	0.093	0.091	0.089	0.088	0.084	0.083
16.5	**0.079**	0.096	0.095	0.093	0.092	0.090	0.088	0.087	0.085	0.083	0.082	0.080	0.077	0.076
17.0	**0.072**	0.090	0.088	0.086	0.085	0.083	0.081	0.080	0.078	0.077	0.075	0.074	0.071	0.070
17.5	**0.067**	0.083	0.082	0.080	0.079	0.077	0.076	0.074	0.073	0.071	0.070	0.068	0.066	0.065
18.0	**0.062**	0.078	0.076	0.074	0.073	0.071	0.070	0.068	0.067	0.066	0.064	0.063	0.061	0.060
18.5	**0.057**	0.072	0.071	0.069	0.068	0.066	0.065	0.063	0.062	0.061	0.060	0.059	0.056	0.055
19.0	**0.053**	0.067	0.065	0.064	0.062	0.061	0.060	0.059	0.057	0.056	0.055	0.054	0.052	0.051
19.5	**0.049**	0.062	0.061	0.059	0.058	0.057	0.056	0.055	0.053	0.052	0.051	0.050	0.049	0.048
20.0	**0.046**	0.058	0.057	0.055	0.054	0.053	0.052	0.051	0.050	0.049	0.048	0.047	0.045	0.045

6.18 Sound Curves, Sound Optimized Mode SO6

Sound Power Level at Hub Height	
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m^3**
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA]** **Sound Optimized Mode SO6 (Blades with serrated trailing edge)**
3	93.5
4	93.7
5	94.3
6	97.1
7	98.0
8	98.0
9	98.0
10	98.0
11	98.0
12	98.0
13	98.0
14	98.0
15	98.0
16	98.0
17	98.0
18	98.0
19	98.0
20	98.0