Data Sheet

ENERCON Wind Energy Converter E-101 / 3050 kW
Operating Modes 0, I, II and Power-Reduced Modes

ENERCON
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Related documents

The titles of the documents listed are either the title of the original language version or an approximate translation of the title. Document ID always refers to the original language version.

Document ID	Title
DIN 45645-1:1996	Determination of rating levels from measurement data - Part 1: Noise immission in the neighbourhood
DIN 45681:2005	Acoustics - Determination of tonal components of noise and determination of a tone adjustment for the assessment of noise immissions
IEC 61400-11:2012	Wind turbine generator systems – Part 11: Acoustic noise measurement techniques
IEC 61400-12-1:2005	Wind turbines – Part 12-1: Power performance measurements of electricity producing wind turbines
TR 1:2008	Technical directives for WECs, Part 1: Determination of noise emission values

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1 Framework conditions

The power values, power coefficients (c_p) and thrust coefficients (c_t) listed in this document are valid only within the framework conditions according to IEC 61400-12-1:2005. Further limitations apply and are defined in the following sections.

1.1 Location

The power, c_p and c_t curves listed in this document have been calculated for the conditions described in tab. 1, p. 5 with an undamaged leading edge. The calculations are based on experience with wind energy converters in a variety of locations.

Table 1: Site conditions

Parameter	Value (10-minute mean)
Standard air density	1.225 kg/m³
Turbulence intensity	6 % to 12 %
Wind shear exponent	0.0 to 0.3
Maximum difference of wind direction between upper and lower tip	10°
Maximum flow inclination	±2°
Maximum temperature difference between upper and lower tip	10 °C
Terrain	According to IEC 61400-12-1:2005
Snow/ice	No
Rain	No

1.2 Operating parameters

The settings of the wind energy converter's reactive power generation and wind farm open-loop and closed-loop control systems influence the power performance. The calculated power, c_p and c_t curves listed in this document apply only to operation without limitations.

1.3 Sound power level

Allocation of the sound power levels to the standardised wind speed v_s at a height of 10 m is valid only if based on a logarithmic wind shear law with a roughness length of 0.05 m. Allocation of the sound power levels to the wind speed at hub height is valid for all hub heights. The wind speed is determined from the power output and the power curve during measurements.

Maximum tonality KTN across the entire power range is at 1 dB (applies to close range acc. to TR 1:2008 of the FGW and DIN 45681:2005) or $\Delta L_{a,k} < 2$ dB (applies to close range acc. to IEC 61400-11:2012).

Impulsiveness KIN across the entire power range is at 0 dB (applies to close range acc. to TR 1:2008 and DIN 45645-1:1996).

Due to uncertainty in acoustic measurements and serial product variation, the sound power level values indicated in this document are subject to an uncertainty of ±1 dB(A). Therefore, if a measurement is performed in accordance with valid standards, measuring results in the range of stated values ±1 dB(A) may be expected. Standards are TR 1:2008 and IEC 61400-11:2012. If, during measurement, the difference between total noise and extraneous noise is less than 6 dB(A), a greater uncertainty should be assumed.

This data sheet must not be regarded as a guarantee that project or site-specific sound power level requirements are met.

2 Operating mode 0

2.1 Calculated power, cp and ct values operating mode 0

Table 2: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode 0

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	258	0.42	0.96
6	479	0.45	0.94
7	790	0.47	0.92
8	1200	0.48	0.90
9	1710	0.48	0.86
10	2340	0.48	0.84
11	2867	0.44	0.81
12	3034	0.36	0.50
13	3050	0.28	0.37
14	3050	0.23	0.29
15	3050	0.18	0.23
16	3050	0.15	0.19
17	3050	0.13	0.16
18	3050	0.11	0.13
19	3050	0.09	0.12
20	3050	0.08	0.10
21	3050	0.07	0.09
22	3050	0.06	0.08
23	3050	0.05	0.07
24	3050	0.05	0.06
25	3050	0.04	0.06

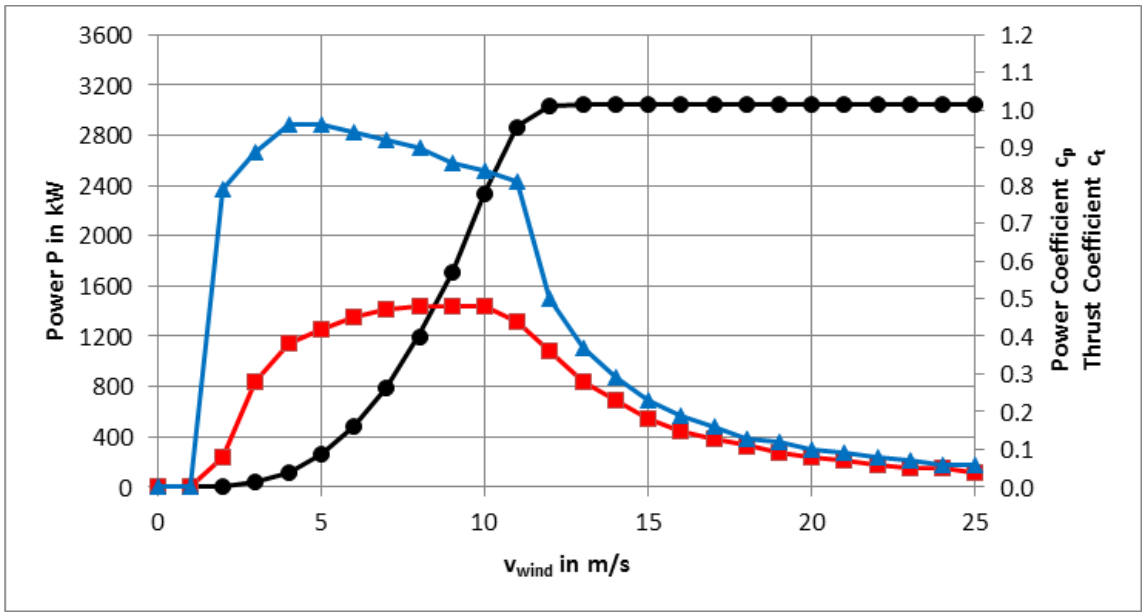

Fig. 1: Power, c_p and c_t curve E-101 / 3050 kW operating mode 0

	Power P in kW
	c_t value
	c_p value

2.2 Calculated sound power levels – Operating mode 0

In mode 0, the wind energy converter operates in a power-optimised mode to achieve optimum yield. The highest expected sound power level is 105.5 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 3: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	3050	kW
Nominal wind speed	12.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	14.7	rpm

Table 4: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	98.9	99.4	99.4	99.9
6 m/s	102.0	102.5	102.6	102.8
7 m/s	104.1	104.4	104.4	104.6
8 m/s	105.2	105.3	105.3	105.3
9 m/s	105.5	105.5	105.5	105.5
10 m/s	105.5	105.5	105.5	105.5
11 m/s	105.5	105.5	105.5	105.5
12 m/s	105.5	105.5	105.5	105.5
95 % of P_n	105.5	105.5	105.5	105.5

Table 5: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	98.5	100.9	102.7	104.0	104.9	105.3	105.5	105.5	105.5

3 Operating mode I

3.1 Calculated power, cp and ct values operating mode I

Table 6: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode I

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	258	0.42	0.96
6	479	0.45	0.94
7	790	0.47	0.92
8	1200	0.48	0.90
9	1710	0.48	0.87
10	2250	0.46	0.84
11	2720	0.42	0.80
12	2940	0.35	0.50
13	3020	0.28	0.37
14	3050	0.23	0.29
15	3050	0.18	0.23
16	3050	0.15	0.19
17	3050	0.13	0.16
18	3050	0.11	0.13
19	3050	0.09	0.12
20	3050	0.08	0.10
21	3050	0.07	0.09
22	3050	0.06	0.08
23	3050	0.05	0.07
24	3050	0.04	0.06
25	3050	0.04	0.06

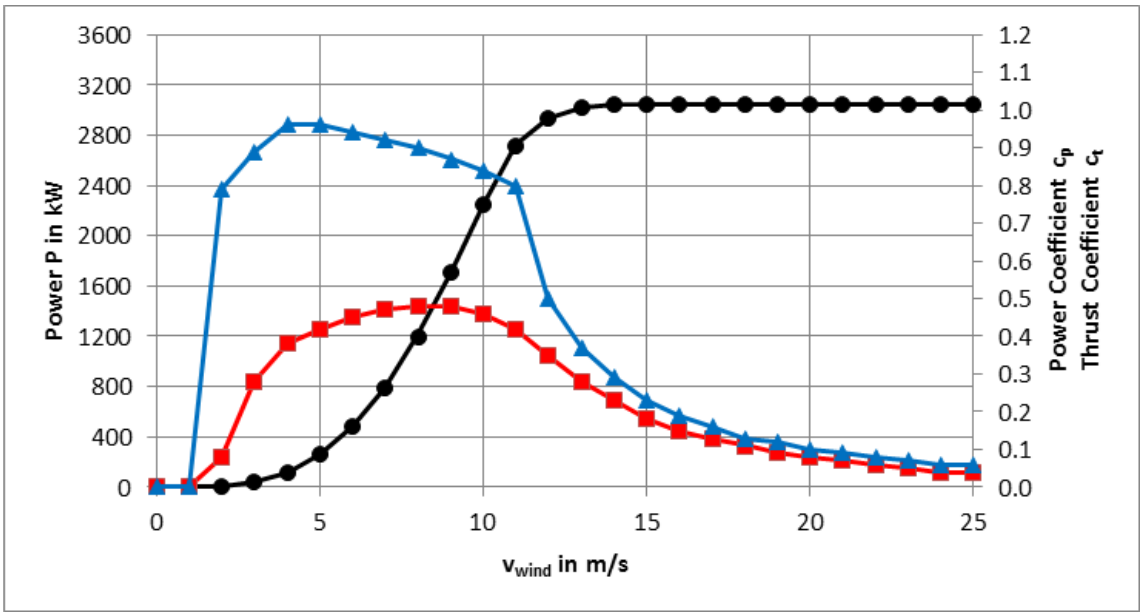

Fig. 2: Power, c_p and c_t curve E-101 / 3050 kW operating mode I

◆—◆—◆	Power P in kW
▲—▲—▲	c_t value
■—■—■	c_p value

3.2 Calculated sound power levels – Operating mode I

In mode I, the wind energy converter operates with reduced sound emission. The highest expected sound power level is 104.5 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 7: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	3050	kW
Nominal wind speed	14.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	14.3	rpm

Table 8: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	98.4	98.9	99.0	99.3
6 m/s	101.2	101.6	101.8	101.9
7 m/s	103.1	103.3	103.4	103.5
8 m/s	104.1	104.2	104.3	104.3
9 m/s	104.5	104.5	104.5	104.5
10 m/s	104.5	104.5	104.5	104.5
11 m/s	104.5	104.5	104.5	104.5
12 m/s	104.5	104.5	104.5	104.5
95 % of P_n	104.5	104.5	104.5	104.5

Table 9: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	98.1	100.2	101.8	103.0	103.8	104.3	104.5	104.5	104.5

4 Operating mode II

4.1 Calculated power, cp and ct values operating mode II

Table 10: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode II

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	258	0.42	0.96
6	479	0.45	0.94
7	790	0.47	0.92
8	1200	0.48	0.90
9	1680	0.47	0.86
10	2200	0.45	0.83
11	2660	0.41	0.74
12	2900	0.34	0.48
13	3010	0.28	0.36
14	3050	0.23	0.28
15	3050	0.18	0.22
16	3050	0.15	0.18
17	3050	0.13	0.15
18	3050	0.11	0.13
19	3050	0.09	0.11
20	3050	0.08	0.10
21	3050	0.07	0.09
22	3050	0.06	0.08
23	3050	0.05	0.07
24	3050	0.04	0.06
25	3050	0.04	0.06

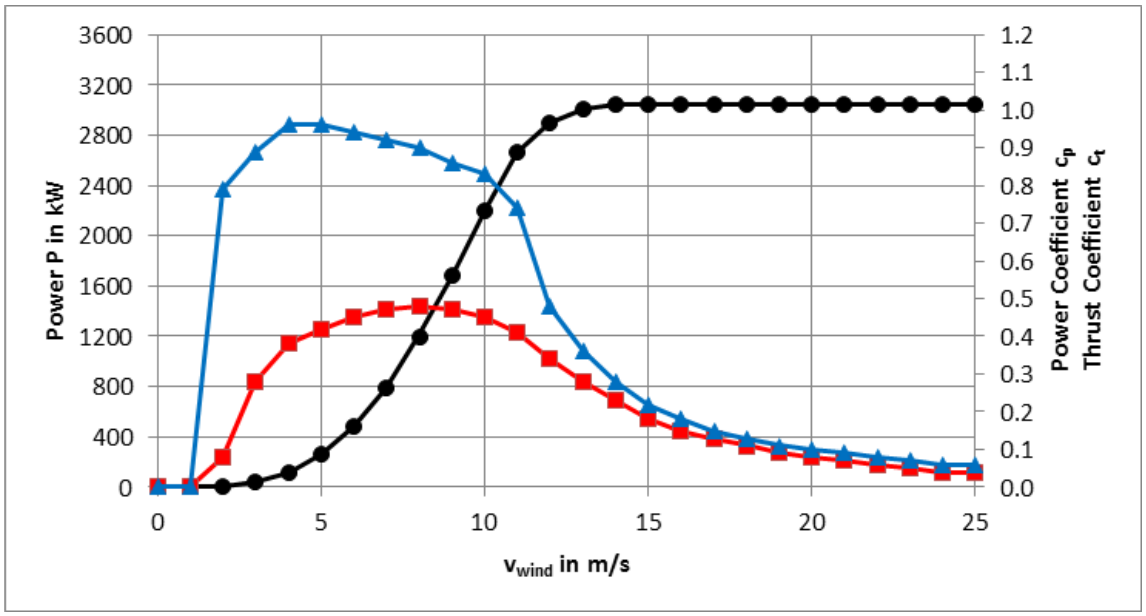

Fig. 3: Power, c_p and c_t curve E-101 / 3050 kW operating mode II

	Power P in kW
	c_t value
	c_p value

4.2 Calculated sound power levels – Operating mode II

In mode II, the wind energy converter operates with reduced sound emission. The highest expected sound power level is 103.5 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 11: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	3050	kW
Nominal wind speed	14.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	14.0	rpm

Table 12: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	98.4	98.8	99.0	99.2
6 m/s	100.9	101.3	101.4	101.5
7 m/s	102.5	102.8	102.8	102.9
8 m/s	103.3	103.4	103.5	103.5
9 m/s	103.5	103.5	103.5	103.5
10 m/s	103.5	103.5	103.5	103.5
11 m/s	103.5	103.5	103.5	103.5
12 m/s	103.5	103.5	103.5	103.5
95 % of P_n	103.5	103.5	103.5	103.5

Table 13: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	98.0	100.0	101.5	102.5	103.1	103.5	103.5	103.5	103.5

5 Operating mode 2500 kW

5.1 Calculated power, cp and ct values in operating mode 2500 kW

Table 14: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode 2500 kW

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	258	0.42	0.96
6	479	0.45	0.94
7	790	0.47	0.92
8	1200	0.48	0.90
9	1700	0.48	0.86
10	2200	0.45	0.84
11	2460	0.38	0.55
12	2500	0.29	0.40
13	2500	0.23	0.30
14	2500	0.19	0.24
15	2500	0.15	0.19
16	2500	0.12	0.16
17	2500	0.10	0.13
18	2500	0.09	0.11
19	2500	0.07	0.10
20	2500	0.06	0.09
21	2500	0.06	0.08
22	2500	0.05	0.07
23	2500	0.04	0.06
24	2500	0.04	0.06
25	2500	0.03	0.05

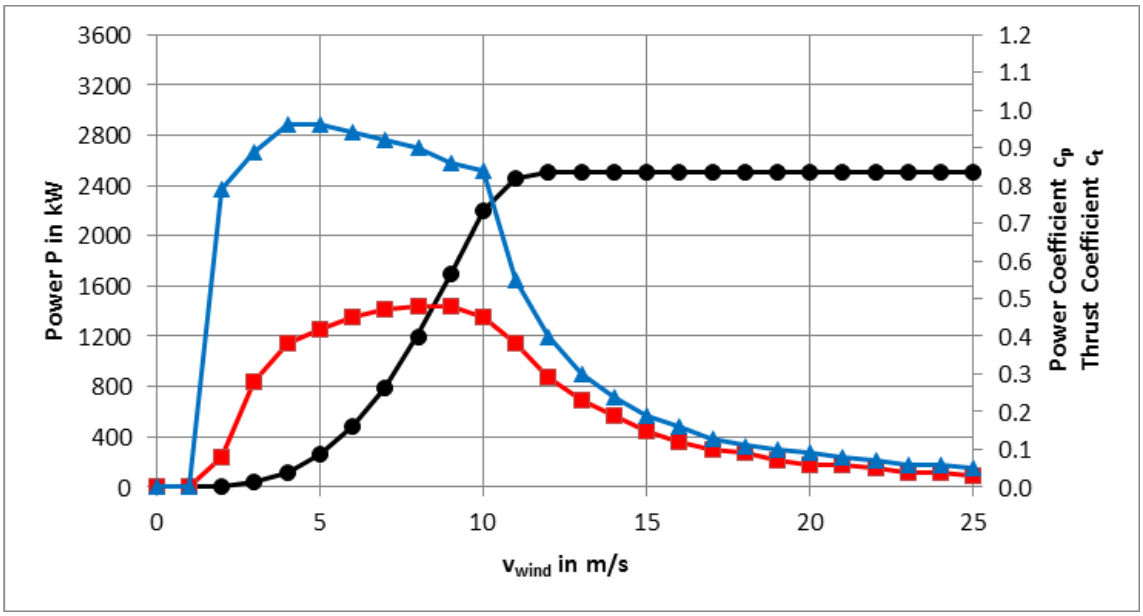

Fig. 4: Power, c_p and c_t curve E-101 / 3050 kW operating mode 2500 kW

	Power P in kW
	c_t value
	c_p value

5.2 Calculated sound power levels – Operating mode 2500 kW

In 2500 kW, mode the wind energy converter operates with reduced power. The highest expected sound power level is 105.0 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 15: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	2500	kW
Nominal wind speed	12.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	14.4	rpm

Table 16: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	98.8	99.3	99.4	99.7
6 m/s	101.9	102.4	102.6	102.7
7 m/s	104.0	104.3	104.4	104.5
8 m/s	105.0	105.0	105.0	105.0
9 m/s	105.0	105.0	105.0	105.0
10 m/s	105.0	105.0	105.0	105.0
11 m/s	105.0	105.0	105.0	105.0
12 m/s	105.0	105.0	105.0	105.0
95 % of P_n	105.0	105.0	105.0	105.0

Table 17: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	98.3	100.7	102.6	104.0	104.7	105.0	105.0	105.0	105.0

6 Operating mode 2000 kW

6.1 Calculated power, cp and ct values in operating mode 2000 kW

Table 18: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode 2000 kW

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	258	0.42	0.96
6	479	0.45	0.94
7	790	0.47	0.92
8	1200	0.48	0.90
9	1640	0.46	0.86
10	1930	0.39	0.62
11	2000	0.31	0.42
12	2000	0.24	0.31
13	2000	0.19	0.24
14	2000	0.15	0.19
15	2000	0.12	0.15
16	2000	0.10	0.13
17	2000	0.08	0.11
18	2000	0.07	0.10
19	2000	0.06	0.08
20	2000	0.05	0.07
21	2000	0.04	0.07
22	2000	0.04	0.06
23	2000	0.03	0.05
24	2000	0.03	0.05
25	2000	0.03	0.04

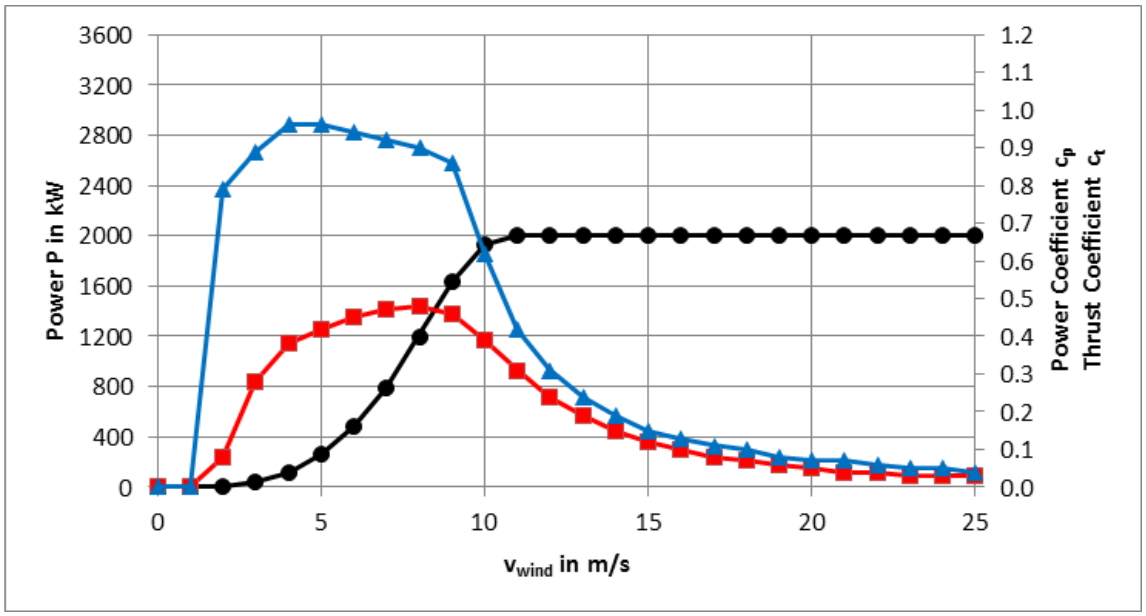

Fig. 5: Power, c_p and c_t curve E-101 / 3050 kW operating mode 2000 kW

	Power P in kW
	c_t value
	c_p value

6.2 Calculated sound power levels – Operating mode 2000 kW

In 2000 kW, mode the wind energy converter operates with reduced power. The highest expected sound power level is 104.0 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 19: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	2000	kW
Nominal wind speed	11.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	14.0	rpm

Table 20: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	98.8	99.3	99.4	99.8
6 m/s	101.9	102.3	102.6	102.6
7 m/s	103.7	103.9	104.0	104.0
8 m/s	104.0	104.0	104.0	104.0
9 m/s	104.0	104.0	104.0	104.0
10 m/s	104.0	104.0	104.0	104.0
11 m/s	104.0	104.0	104.0	104.0
12 m/s	104.0	104.0	104.0	104.0
95 % of P_n	104.0	104.0	104.0	104.0

Table 21: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	98.3	100.7	102.5	103.7	104.0	104.0	104.0	104.0	104.0

7 Operating mode 1500 kW

7.1 Calculated power, cp and ct values in operating mode 1500 kW

Table 22: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode 1500 kW

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	258	0.42	0.96
6	479	0.45	0.94
7	790	0.47	0.92
8	1170	0.47	0.90
9	1460	0.41	0.67
10	1500	0.31	0.43
11	1500	0.23	0.31
12	1500	0.18	0.23
13	1500	0.14	0.18
14	1500	0.11	0.15
15	1500	0.09	0.12
16	1500	0.07	0.10
17	1500	0.06	0.09
18	1500	0.05	0.08
19	1500	0.04	0.07
20	1500	0.04	0.06
21	1500	0.03	0.05
22	1500	0.03	0.05
23	1500	0.03	0.04
24	1500	0.02	0.04
25	1500	0.02	0.04

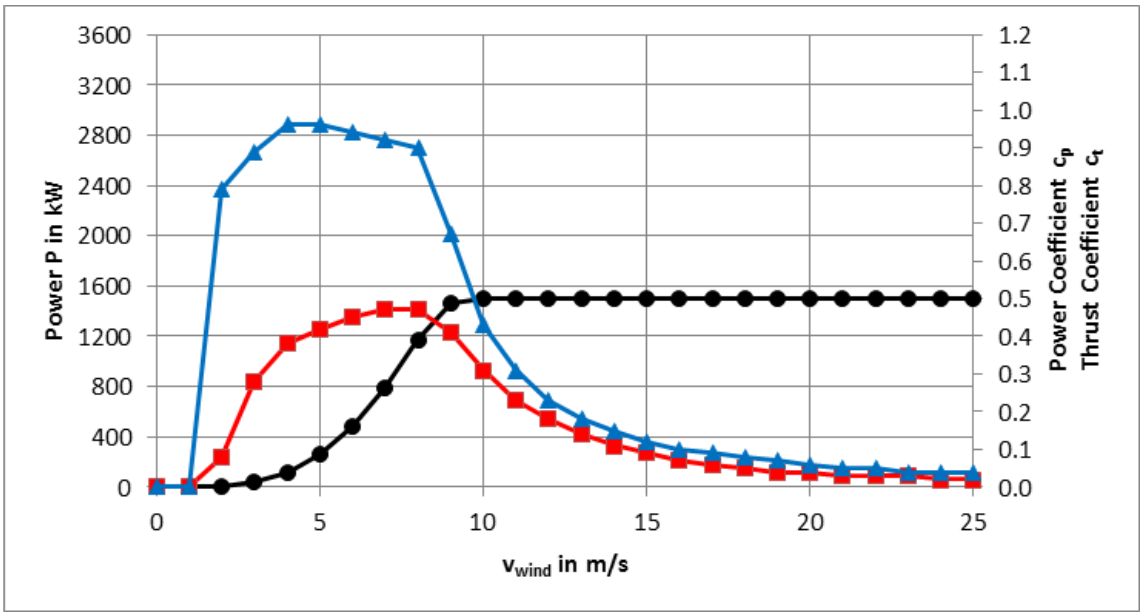

Fig. 6: Power, c_p and c_t curve E-101 / 3050 kW operating mode 1500 kW

	Power P in kW
	c_t value
	c_p value

7.2 Calculated sound power levels – Operating mode 1500 kW

In 1500 kW, mode the wind energy converter operates with reduced power. The highest expected sound power level is 102.0 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 23: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	1500	kW
Nominal wind speed	10.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	13.0	rpm

Table 24: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	98.6	99.1	99.4	99.4
6 m/s	100.9	101.2	101.4	101.4
7 m/s	102.0	102.0	102.0	102.0
8 m/s	102.0	102.0	102.0	102.0
9 m/s	102.0	102.0	102.0	102.0
10 m/s	102.0	102.0	102.0	102.0
11 m/s	102.0	102.0	102.0	102.0
12 m/s	102.0	102.0	102.0	102.0
95 % of P_n	102.0	102.0	102.0	102.0

Table 25: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	98.3	100.1	101.3	102.0	102.0	102.0	102.0	102.0	102.0

8 Operating mode 1000 kW

8.1 Calculated power, cp and ct values in operating mode 1000 kW

Table 26: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode 1000 kW

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	258	0.42	0.96
6	479	0.45	0.94
7	740	0.44	0.92
8	970	0.39	0.64
9	1000	0.28	0.40
10	1000	0.20	0.28
11	1000	0.15	0.20
12	1000	0.12	0.16
13	1000	0.09	0.13
14	1000	0.07	0.11
15	1000	0.06	0.09
16	1000	0.05	0.08
17	1000	0.04	0.07
18	1000	0.03	0.06
19	1000	0.03	0.05
20	1000	0.03	0.05
21	1000	0.02	0.04
22	1000	0.02	0.04
23	1000	0.02	0.03
24	1000	0.01	0.03
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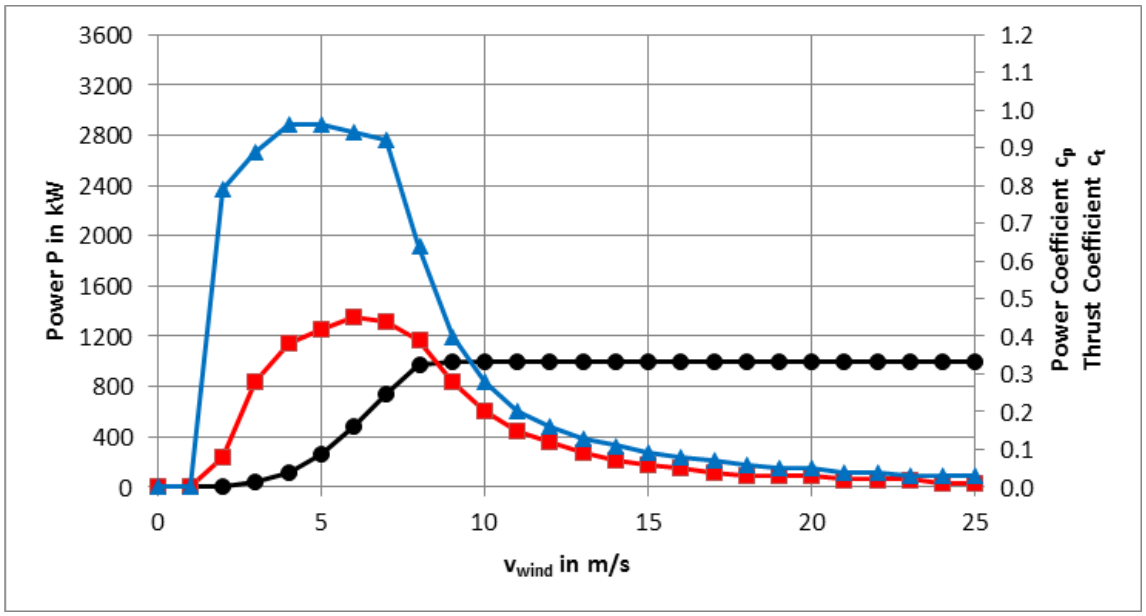

Fig. 7: Power, c_p and c_t curve E-101 / 3050 kW operating mode 1000 kW

◆—◆—◆	Power P in kW
▲—▲—▲	c_t value
■—■—■	c_p value

8.2 Calculated sound power levels – Operating mode 1000 kW

In 1000 kW, mode the wind energy converter operates with reduced power. The highest expected sound power level is 100.0 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 27: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	1000	kW
Nominal wind speed	9.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	11.4	rpm

Table 28: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	98.1	98.4	98.6	98.6
6 m/s	100.0	100.0	100.0	100.0
7 m/s	100.0	100.0	100.0	100.0
8 m/s	100.0	100.0	100.0	100.0
9 m/s	100.0	100.0	100.0	100.0
10 m/s	100.0	100.0	100.0	100.0
11 m/s	100.0	100.0	100.0	100.0
12 m/s	100.0	100.0	100.0	100.0
95 % of P_n	100.0	100.0	100.0	100.0

Table 29: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	97.8	99.1	99.9	100.0	100.0	100.0	100.0	100.0	100.0

9 Operating mode 800 kW

9.1 Calculated power, cp and ct values in operating mode 800 kW

Table 30: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode 800 kW

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	258	0.42	0.96
6	468	0.44	0.94
7	720	0.43	0.92
8	800	0.32	0.49
9	800	0.22	0.32
10	800	0.16	0.23
11	800	0.12	0.17
12	800	0.09	0.14
13	800	0.07	0.11
14	800	0.06	0.09
15	800	0.05	0.08
16	800	0.04	0.07
17	800	0.03	0.06
18	800	0.03	0.05
19	800	0.02	0.05
20	800	0.02	0.04
21	800	0.02	0.04
22	800	0.02	0.03
23	800	0.01	0.03
24	800	0.01	0.03
25	800	0.01	0.02

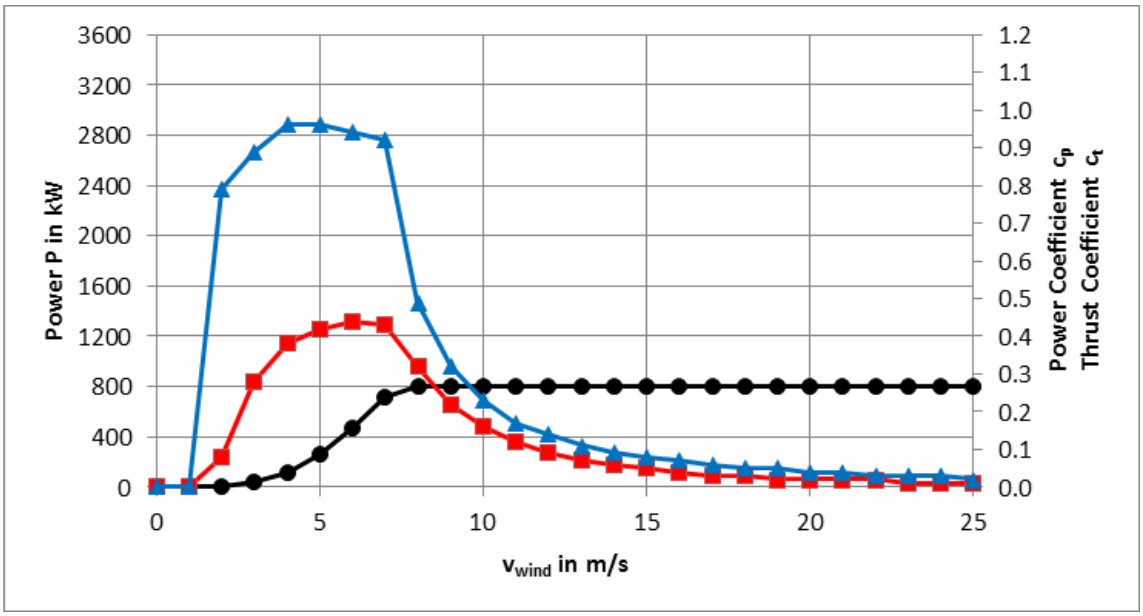

Fig. 8: Power, c_p and c_t curve E-101 / 3050 kW operating mode 800 kW

	Power P in kW
	c_t value
	c_p value

9.2 Calculated sound power levels – Operating mode 800 kW

In 800 kW, mode the wind energy converter operates with reduced power. The highest expected sound power level is 98.0 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 31: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	800	kW
Nominal wind speed	8.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	10.8	rpm

Table 32: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	97.3	97.4	97.6	97.6
6 m/s	98.0	98.0	98.0	98.1
7 m/s	98.1	98.0	98.0	98.0
8 m/s	98.0	98.0	98.0	98.0
9 m/s	98.0	98.0	98.0	98.0
10 m/s	98.0	98.0	98.0	98.0
11 m/s	98.0	98.0	98.0	98.0
12 m/s	98.0	98.0	98.0	98.0
95 % of P_n	98.0	98.0	98.0	98.0

Table 33: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	97.1	97.8	98.0	98.0	98.0	98.0	98.0	98.0	98.0

10 Operating mode 600 kW

10.1 Calculated power, cp and ct values in operating mode 600 kW

Table 34: Calculated power, c_p and c_t values E-101 / 3050 kW operating mode 600 kW

Wind speed v in m/s	Power P in kW	c_p value	c_t value
0	0	0.00	0.00
1	0	0.00	0.00
2	3	0.08	0.79
3	37	0.28	0.89
4	118	0.38	0.96
5	254	0.41	0.96
6	440	0.42	0.94
7	580	0.35	0.56
8	600	0.24	0.34
9	600	0.17	0.23
10	600	0.12	0.17
11	600	0.09	0.13
12	600	0.07	0.10
13	600	0.06	0.09
14	600	0.05	0.07
15	600	0.04	0.06
16	600	0.03	0.05
17	600	0.03	0.05
18	600	0.02	0.04
19	600	0.02	0.04
20	600	0.02	0.03
21	600	0.01	0.03
22	600	0.01	0.03
23	600	0.01	0.02
24	600	0.01	0.02
25	600	0.01	0.02

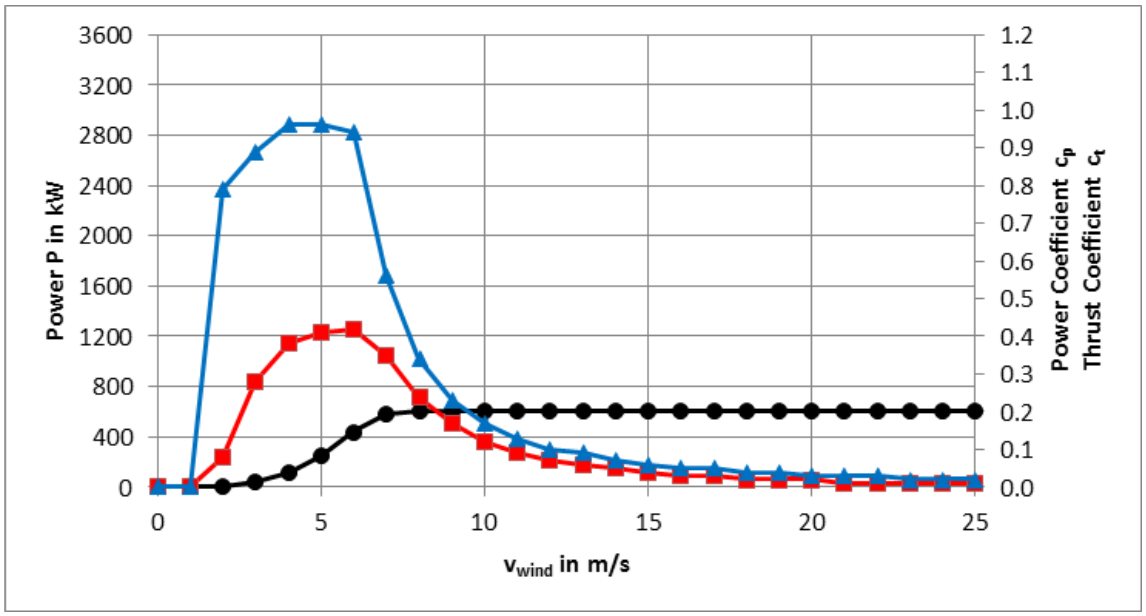

Fig. 9: Power, c_p and c_t curve E-101 / 3050 kW operating mode 600 kW

	Power P in kW
	c_t value
	c_p value

10.2 Calculated sound power levels – Operating mode 600 kW

In 600 kW, mode the wind energy converter operates with reduced power. The highest expected sound power level is 94.0 dB(A) in the nominal power range. Once nominal power has been achieved a steady level is guaranteed.

Table 35: Technical specifications

Parameter	Value	Unit
Nominal power (P_n)	600	kW
Nominal wind speed	8.0	m/s
Minimum operating speed	4.8	rpm
Speed setpoint	9.8	rpm

Table 36: Calculated sound power level in dB(A), based on standardised wind speed v_s at a height of 10 m

v_s at a height of 10 m	Hub height			
	99 m	124 m	135 m	149 m
3 m/s	87.5	87.8	87.9	88.0
4 m/s	92.2	92.7	93.0	93.0
5 m/s	94.0	94.0	94.0	94.0
6 m/s	94.0	94.0	94.0	94.0
7 m/s	94.0	94.0	94.0	94.0
8 m/s	94.0	94.0	94.0	94.0
9 m/s	94.0	94.0	94.0	94.0
10 m/s	94.0	94.0	94.0	94.0
11 m/s	94.0	94.0	94.0	94.0
12 m/s	94.0	94.0	94.0	94.0
95 % of P_n	94.0	94.0	94.0	94.0

Table 37: Calculated sound power level in dB(A), based on wind speed at hub height

5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s
89.5	93.1	93.9	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0