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	FILE	TIPO D	

PROCEDURA DI VALUTAZIONE IMPATTO AMBIENTALE

PROGETTO DEFINITIVO

IMPIANTO EOLICO "SAMBUCELLO" DI POTENZA 50 MW DA REALIZZARE NEL TERRITORIO DEI COMUNI DI MARCELLINARA, MAIDA E CARAFFA DI CATANZARO IN PROVNCIA DI CATANZARO

Titolo Elaborato:		AEROGENERATORI: SPECIFICHE TECNICHE E DATI DI TARGA AEROGENERATORE DI RIFERIMENTO
Formato	Scala	
A4	-	

Codice Elaborato:	Identificativo	Provincia	Nazione	Procedura	Settore	Tipo Elaborato	Revisione	Numero Progressivo
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Committente:

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INDEX

RECORD OF CHANGES

Rev.	Date	Author	Description
0	15/04/2019	SNOVO / JSANMARTIN	Initial Version
1	18/06/2019	SNOVO / JSANMARTIN	Updated spectra curves after SG 4.5-145 changes
2	28/06/2019	SNOVO / JSANMARTIN	Updated spectra curves due to Mk-II upgrade
3	07/01/2020	SNOVO	Included AM-6 4.2 MW and AM-7 4.0 MW.
4	29/09/2020	SNOVO	Included AM+1 5.2 MW.
5	25/06/2021	SNOVO	Updated spectra for the Flexible Rating Application Modes due to updated noise levels.

1 AIM

This document aims to give an estimation of the noise spectra for the SG 5.0-145 wind turbine.

2 SCOPE

The values in the present document are applicable to all the existing configurations for SG 5.0-145 wind turbine, for standard and low noise operation modes.

Performance included in the present document is specific of the MKII product configuration (blade inboard add-ons, control system, etc) and must always be considered together.

3 ABBREVIATIONS, DEFINITIONS

- **WT**: Wind turbine.
- **Wind speed ($W_{S.}$):** Expressed in m/s, it is the horizontal wind component value at the height of the hub averaged every 10 minutes.
- **Frequency (f):** Central frequency of a given band spectra, expressed in Hz.
- **L_{WA}:** A-weighted sound power level, expressed in dB(A).
- **Noise level:** The expected sound power level values, expressed in dB(A), represent the sound power that the WT emits at the height of the hub for a given wind speed.
  The noise levels shown in this document are average expected values, called Lw in IEC-61400-14. To obtain the Lwd value, as defined in IEC-61400-14, an increase of 2 dB(A) shall be considered over said Lw values.
- **dB(A):** An A type frequency filter is applied, in accordance with the IEC standard.

4 DESCRIPTION

When not specified otherwise, data in following sections is calculated using the parameters from **Table 1**. All noise values in this document are subject to the validity ranges presented in **Table 2**.

Rated power	Flexible Rating up to 5.2MW
Frequency	50 Hz/60 Hz
Rotor Diameter	145m
Angle of blade tip	Pitch control regulation
Air density reference	1.225 kg/m^3

Table 1 Calculation parameter values for the SG 5.0-145 noise spectra.

Wind Shear (10min average)	≤ 0.3
Turbulence intensity TI [%] for bin i	$5\%\frac{(0.75v_i+5.6)}{v_i} < TI_i < 12\%\frac{(0.75v_i+5.6)}{v_i}$
Terrain	Not complex according to IEC 61400-12-1
Upflow β [º]	-2º ≤ β ≤ +2º
Grid frequency [Hz]	± 0.5 Hz

Table 2 Validity ranges of the noise spectra for the SG 5.0-145.

Noise values included in the present document correspond to the wind turbine configuration with noise reduction add-ons attached to the blade.

5 NOISE SPECTRA

Table 3 shows the noise curves for the SG 5.0-145 MW expressed as A-weighted sound power level in function of wind speed at hub height, for the standard, Flexible Rating and Noise Reduction System operation and application modes.

Wind Speed [m/s]	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**Up to cut-out**
SG 5.0-145 AM+1 @ 5.2MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 Baseline AM0 @ 5.0MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 AM-1 @ 4.9MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 AM-2 @ 4.8MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 AM-3 @ 4.7MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 AM-4 @ 4.6MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 AM-5 @ 4.5MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 AM-6 @ 4.2MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 AM-7 @ 4.0MW	99.2	102.7	105.7	106.3	106.3	106.3	106.3	106.3	106.3
SG 5.0-145 NRS Mode N1	99.2	102.7	105.7	105.7	105.7	105.7	105.7	105.7	105.7
SG 5.0-145 NRS Mode N2	99.2	102.7	105.2	105.2	105.2	105.2	105.2	105.2	105.2
SG 5.0-145 NRS Mode N3	99.2	102.7	103.7	103.7	103.7	103.7	103.7	103.7	103.7
SG 5.0-145 NRS Mode N4	99.2	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7
SG 5.0-145 NRS Mode N5	99.2	101.7	101.7	101.7	101.7	101.7	101.7	101.7	101.7
SG 5.0-145 NRS Mode N6	99.2	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
SG 5.0-145 NRS Mode N7	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
SG 5.0-145 NRS Mode N8	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0

Table 3 Noise curves for the SG 5.0-145 MW for the standard, Flexible Rating and Noise Reduction System operation and application modes (ref: *SG145spectra_5000KW_R05_25032021*).

Tables 4 to 11 show the 1/3 octave band noise spectra for the SG 5.0-145 MW expressed as A-weighted sound power level for a given frequency band, for the standard, Flexible Rating and Noise Reduction System operation and application modes, at different wind speeds at hub height.

Central Frequency [Hz]	10	12.5	16	20	25	31.5	40	50	63	80	100
SG 5.0-145 AM+1 @ 5.2MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 Baseline AM0 @ 5.0MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 AM-1 @ 4.9MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 AM-2 @ 4.8MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 AM-3 @ 4.7MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 AM-4 @ 4.6MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 AM-5 @ 4.5MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 AM-6 @ 4.2MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 AM-7 @ 4.0MW	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 NRS Mode N1	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 NRS Mode N2	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 NRS Mode N3	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 NRS Mode N4	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 NRS Mode N5	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 NRS Mode N6	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.4	76.7	79.2	81.1
SG 5.0-145 NRS Mode N7	37.5	43.2	48.9	54.3	58.9	63.6	67.8	72.3	76.6	79.1	81.0
SG 5.0-145 NRS Mode N8	37.5	43.2	48.9	54.2	58.8	63.4	67.5	72.1	76.2	78.6	80.4
Central Frequency [Hz]	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**
SG 5.0-145 AM+1 @ 5.2MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 Baseline AM0 @ 5.0MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 AM-1 @ 4.9MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 AM-2 @ 4.8MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 AM-3 @ 4.7MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 AM-4 @ 4.6MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 AM-5 @ 4.5MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 AM-6 @ 4.2MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 AM-7 @ 4.0MW	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 NRS Mode N1	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 NRS Mode N2	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 NRS Mode N3	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 NRS Mode N4	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 NRS Mode N5	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 NRS Mode N6	82.6	83.6	84.8	86.3	86.7	86.4	86.5	88.1	87.9	88.9	89.6
SG 5.0-145 NRS Mode N7	82.5	83.4	84.6	86.1	86.5	86.2	86.3	87.9	87.7	88.7	89.4
SG 5.0-145 NRS Mode N8	81.7	82.6	83.6	85.1	85.5	85.2	85.3	86.9	86.7	87.7	88.4

Central Frequency [Hz]	1600	2000	2500	3150	4000	5000	6300	8000	10000
SG 5.0-145 AM+1 @ 5.2MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 Baseline AM0 @ 5.0MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 AM-1 @ 4.9MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 AM-2 @ 4.8MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 AM-3 @ 4.7MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 AM-4 @ 4.6MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 AM-5 @ 4.5MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 AM-6 @ 4.2MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 AM-7 @ 4.0MW	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 NRS Mode N1	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 NRS Mode N2	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 NRS Mode N3	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 NRS Mode N4	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 NRS Mode N5	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 NRS Mode N6	89.5	88.4	87.0	84.8	81.7	77.4	72.2	66.4	61.8
SG 5.0-145 NRS Mode N7	89.3	88.2	86.8	84.6	81.5	77.2	72.0	66.2	61.6
SG 5.0-145 NRS Mode N8	88.3	87.2	85.8	83.6	80.5	76.2	71.0	65.2	60.6

Table 4 One-third octave band noise spectra of SG 5.0-145 @ 6 m/s
(*ref: SG145spectra_5000KW_R05_25032021*)

Central Frequency [Hz]	10	12.5	16	20	25	31.5	40	50	63	80	100
SG 5.0-145 AM+1 @ 5.2MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 Baseline AM0 @ 5.0MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 AM-1 @ 4.9MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 AM-2 @ 4.8MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 AM-3 @ 4.7MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 AM-4 @ 4.6MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 AM-5 @ 4.5MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 AM-6 @ 4.2MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 AM-7 @ 4.0MW	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 NRS Mode N1	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 NRS Mode N2	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 NRS Mode N3	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 NRS Mode N4	41.0	46.7	52.4	57.8	62.4	67.1	71.3	75.9	80.2	82.7	84.6
SG 5.0-145 NRS Mode N5	41.0	46.7	52.4	57.7	62.3	67.0	71.1	75.6	79.8	82.2	84.0
SG 5.0-145 NRS Mode N6	41.0	46.7	52.3	57.6	62.1	66.7	70.7	75.1	79.1	81.3	82.9
SG 5.0-145 NRS Mode N7	41.0	46.7	52.3	57.6	62.0	66.5	70.5	74.8	78.8	80.9	82.4
SG 5.0-145 NRS Mode N8	41.0	46.7	52.3	57.5	61.9	66.4	70.3	74.5	78.4	80.4	81.8
Central Frequency [Hz]	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**
SG 5.0-145 AM+1 @ 5.2MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 Baseline AM0 @ 5.0MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 AM-1 @ 4.9MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 AM-2 @ 4.8MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 AM-3 @ 4.7MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 AM-4 @ 4.6MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 AM-5 @ 4.5MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 AM-6 @ 4.2MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 AM-7 @ 4.0MW	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 NRS Mode N1	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 NRS Mode N2	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 NRS Mode N3	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 NRS Mode N4	86.1	87.1	88.3	89.8	90.2	89.9	90.0	91.6	91.4	92.4	93.1
SG 5.0-145 NRS Mode N5	85.4	86.2	87.3	88.8	89.2	88.9	89.0	90.6	90.4	91.4	92.1
SG 5.0-145 NRS Mode N6	84.1	84.7	85.4	86.9	87.3	87.0	87.1	88.7	88.5	89.5	90.2
SG 5.0-145 NRS Mode N7	83.4	83.9	84.5	86.0	86.4	86.1	86.2	87.8	87.6	88.6	89.3
SG 5.0-145 NRS Mode N8	82.7	83.0	83.4	84.9	85.3	85.0	85.1	86.7	86.5	87.5	88.2

Central Frequency [Hz]	1600	2000	2500	3150	4000	5000	6300	8000	10000
SG 5.0-145 AM+1 @ 5.2MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 Baseline AM0 @ 5.0MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 AM-1 @ 4.9MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 AM-2 @ 4.8MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 AM-3 @ 4.7MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 AM-4 @ 4.6MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 AM-5 @ 4.5MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 AM-6 @ 4.2MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 AM-7 @ 4.0MW	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 NRS Mode N1	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 NRS Mode N2	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 NRS Mode N3	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 NRS Mode N4	93.0	91.9	90.5	88.3	85.2	80.9	75.7	69.9	65.3
SG 5.0-145 NRS Mode N5	92.0	90.9	89.5	87.3	84.2	79.9	74.7	68.9	64.3
SG 5.0-145 NRS Mode N6	90.1	89.0	87.6	85.4	82.3	78.0	72.8	67.0	62.4
SG 5.0-145 NRS Mode N7	89.2	88.1	86.7	84.5	81.4	77.1	71.9	66.1	61.5
SG 5.0-145 NRS Mode N8	88.1	87.0	85.6	83.4	80.3	76.0	70.8	65.0	60.4

Table 5 One-third octave band noise spectra of SG 5.0-145 @ 7 m/s
(*ref: SG145spectra_5000KW_R05_25032021*)

Central Frequency [Hz]	10	12.5	16	20	25	31.5	40	50	63	80	100
SG 5.0-145 AM+1 @ 5.2MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 Baseline AM0 @ 5.0MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 AM-1 @ 4.9MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 AM-2 @ 4.8MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 AM-3 @ 4.7MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 AM-4 @ 4.6MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 AM-5 @ 4.5MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 AM-6 @ 4.2MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 AM-7 @ 4.0MW	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 NRS Mode N1	44.0	49.7	55.4	60.8	65.4	70.1	74.3	78.9	83.2	85.7	87.6
SG 5.0-145 NRS Mode N2	44.0	49.7	55.4	60.8	65.4	70.0	74.2	78.8	83.0	85.5	87.3
SG 5.0-145 NRS Mode N3	44.0	49.7	55.4	60.7	65.2	69.8	73.9	78.3	82.4	84.7	86.4
SG 5.0-145 NRS Mode N4	44.0	49.7	55.3	60.6	65.1	69.7	73.7	78.0	82.0	84.2	85.8
SG 5.0-145 NRS Mode N5	44.0	49.7	55.3	60.6	65.0	69.5	73.4	77.7	81.7	83.7	85.2
SG 5.0-145 NRS Mode N6	44.0	49.7	55.3	60.5	64.8	69.2	73.0	77.2	80.9	82.8	84.1
SG 5.0-145 NRS Mode N7	44.0	49.7	55.2	60.4	64.7	69.1	72.8	76.9	80.6	82.4	83.5
SG 5.0-145 NRS Mode N8	44.0	49.7	55.2	60.4	64.6	68.9	72.6	76.6	80.2	81.9	82.9
Central Frequency [Hz]	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**
SG 5.0-145 AM+1 @ 5.2MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 Baseline AM0 @ 5.0MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 AM-1 @ 4.9MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 AM-2 @ 4.8MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 AM-3 @ 4.7MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 AM-4 @ 4.6MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 AM-5 @ 4.5MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 AM-6 @ 4.2MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 AM-7 @ 4.0MW	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 NRS Mode N1	89.1	90.1	91.3	92.8	93.2	92.9	93.0	94.6	94.4	95.4	96.1
SG 5.0-145 NRS Mode N2	88.7	89.7	90.8	92.3	92.7	92.4	92.5	94.1	93.9	94.9	95.6
SG 5.0-145 NRS Mode N3	87.7	88.4	89.2	90.7	91.1	90.8	90.9	92.5	92.3	93.3	94.0
SG 5.0-145 NRS Mode N4	86.9	87.5	88.2	89.7	90.1	89.8	89.9	91.5	91.3	92.3	93.0
SG 5.0-145 NRS Mode N5	86.2	86.6	87.2	88.7	89.1	88.8	88.9	90.5	90.3	91.3	92.0
SG 5.0-145 NRS Mode N6	84.8	85.0	85.3	86.8	87.2	86.9	87.0	88.6	88.4	89.4	90.1
SG 5.0-145 NRS Mode N7	84.1	84.2	84.3	85.8	86.2	85.9	86.0	87.6	87.4	88.4	89.1
SG 5.0-145 NRS Mode N8	83.4	83.3	83.3	84.8	85.2	84.9	85.0	86.6	86.4	87.4	88.1

Central Frequency [Hz]	1600	2000	2500	3150	4000	5000	6300	8000	10000
SG 5.0-145 AM+1 @ 5.2MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 Baseline AM0 @ 5.0MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 AM-1 @ 4.9MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 AM-2 @ 4.8MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 AM-3 @ 4.7MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 AM-4 @ 4.6MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 AM-5 @ 4.5MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 AM-6 @ 4.2MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 AM-7 @ 4.0MW	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 NRS Mode N1	96.0	94.9	93.5	91.3	88.2	83.9	78.7	72.9	68.3
SG 5.0-145 NRS Mode N2	95.5	94.4	93.0	90.8	87.7	83.4	78.2	72.4	67.8
SG 5.0-145 NRS Mode N3	93.9	92.8	91.4	89.2	86.1	81.8	76.6	70.8	66.2
SG 5.0-145 NRS Mode N4	92.9	91.8	90.4	88.2	85.1	80.8	75.6	69.8	65.2
SG 5.0-145 NRS Mode N5	91.9	90.8	89.4	87.2	84.1	79.8	74.6	68.8	64.2
SG 5.0-145 NRS Mode N6	90.0	88.9	87.5	85.3	82.2	77.9	72.7	66.9	62.3
SG 5.0-145 NRS Mode N7	89.0	87.9	86.5	84.3	81.2	76.9	71.7	65.9	61.3
SG 5.0-145 NRS Mode N8	88.0	86.9	85.5	83.3	80.2	75.9	70.7	64.9	60.3

Table 6 One-third octave band noise spectra of SG 5.0-145 @ 8 m/s
(*ref: SG145spectra_5000KW_R05_25032021*)

Central Frequency [Hz]	10	12.5	16	20	25	31.5	40	50	63	80	100
SG 5.0-145 AM+1 @ 5.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 Baseline AM0 @ 5.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-1 @ 4.9MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-2 @ 4.8MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-3 @ 4.7MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-4 @ 4.6MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-5 @ 4.5MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-6 @ 4.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-7 @ 4.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 NRS Mode N1	46.1	51.8	57.4	62.8	67.3	71.9	75.9	80.4	84.5	86.8	88.4
SG 5.0-145 NRS Mode N2	46.1	51.8	57.4	62.8	67.3	71.8	75.8	80.2	84.3	86.5	88.1
SG 5.0-145 NRS Mode N3	46.1	51.8	57.4	62.7	67.1	71.6	75.5	79.8	83.7	85.8	87.2
SG 5.0-145 NRS Mode N4	46.1	51.8	57.4	62.6	67.0	71.4	75.3	79.5	83.3	85.3	86.6
SG 5.0-145 NRS Mode N5	46.1	51.8	57.4	62.6	66.9	71.3	75.1	79.2	82.9	84.8	86.0
SG 5.0-145 NRS Mode N6	46.1	51.8	57.3	62.5	66.7	71.0	74.6	78.6	82.2	83.8	84.8
SG 5.0-145 NRS Mode N7	46.1	51.7	57.3	62.4	66.6	70.8	74.4	78.3	81.8	83.4	84.2
SG 5.0-145 NRS Mode N8	46.1	51.7	57.3	62.3	66.5	70.7	74.2	78.0	81.4	82.8	83.6
Central Frequency [Hz]	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**
SG 5.0-145 AM+1 @ 5.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 Baseline AM0 @ 5.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-1 @ 4.9MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-2 @ 4.8MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-3 @ 4.7MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-4 @ 4.6MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-5 @ 4.5MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-6 @ 4.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-7 @ 4.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 NRS Mode N1	89.7	90.4	91.2	92.7	93.1	92.8	92.9	94.5	94.3	95.3	96.0
SG 5.0-145 NRS Mode N2	89.3	90.0	90.7	92.2	92.6	92.3	92.4	94.0	93.8	94.8	95.5
SG 5.0-145 NRS Mode N3	88.2	88.6	89.2	90.7	91.0	90.8	90.9	92.5	92.3	93.3	94.0
SG 5.0-145 NRS Mode N4	87.5	87.7	88.1	89.6	90.0	89.7	89.8	91.4	91.2	92.2	92.9
SG 5.0-145 NRS Mode N5	86.7	86.8	87.1	88.6	89.0	88.7	88.8	90.4	90.2	91.2	91.9
SG 5.0-145 NRS Mode N6	85.3	85.2	85.2	86.7	87.1	86.8	86.9	88.5	88.3	89.3	90.0
SG 5.0-145 NRS Mode N7	84.6	84.3	84.2	85.7	86.1	85.8	85.9	87.5	87.3	88.3	89.0
SG 5.0-145 NRS Mode N8	83.8	83.4	83.2	84.7	85.0	84.7	84.8	86.4	86.3	87.3	88.0

Central Frequency [Hz]	1600	2000	2500	3150	4000	5000	6300	8000	10000
SG 5.0-145 AM+1 @ 5.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 Baseline AM0 @ 5.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-1 @ 4.9MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-2 @ 4.8MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-3 @ 4.7MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-4 @ 4.6MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-5 @ 4.5MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-6 @ 4.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-7 @ 4.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 NRS Mode N1	95.9	94.8	93.4	91.2	88.1	83.8	78.6	72.8	68.2
SG 5.0-145 NRS Mode N2	95.4	94.3	92.9	90.7	87.6	83.3	78.1	72.3	67.7
SG 5.0-145 NRS Mode N3	93.9	92.8	91.4	89.2	86.1	81.8	76.6	70.8	66.2
SG 5.0-145 NRS Mode N4	92.8	91.7	90.3	88.1	85.0	80.7	75.5	69.7	65.1
SG 5.0-145 NRS Mode N5	91.8	90.7	89.3	87.1	84.0	79.7	74.5	68.7	64.1
SG 5.0-145 NRS Mode N6	89.9	88.8	87.4	85.2	82.1	77.8	72.6	66.8	62.2
SG 5.0-145 NRS Mode N7	88.9	87.8	86.4	84.2	81.1	76.8	71.6	65.8	61.2
SG 5.0-145 NRS Mode N8	87.9	86.8	85.4	83.2	80.1	75.8	70.6	64.8	60.2

Table 7 One-third octave band noise spectra of SG 5.0-145 @ 9 m/s
(*ref: SG145spectra_5000KW_R05_25032021*)

Central Frequency [Hz]	10	12.5	16	20	25	31.5	40	50	63	80	100
SG 5.0-145 AM+1 @ 5.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 Baseline AM0 @ 5.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-1 @ 4.9MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-2 @ 4.8MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-3 @ 4.7MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-4 @ 4.6MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-5 @ 4.5MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-6 @ 4.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-7 @ 4.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 NRS Mode N1	46.1	51.8	57.4	62.8	67.3	71.9	75.9	80.4	84.5	86.8	88.4
SG 5.0-145 NRS Mode N2	46.1	51.8	57.4	62.8	67.3	71.8	75.8	80.2	84.3	86.5	88.1
SG 5.0-145 NRS Mode N3	46.1	51.8	57.4	62.7	67.1	71.6	75.5	79.8	83.7	85.8	87.2
SG 5.0-145 NRS Mode N4	46.1	51.8	57.4	62.6	67.0	71.4	75.3	79.5	83.3	85.3	86.6
SG 5.0-145 NRS Mode N5	46.1	51.8	57.4	62.6	66.9	71.3	75.1	79.2	82.9	84.8	86.0
SG 5.0-145 NRS Mode N6	46.1	51.8	57.3	62.5	66.7	71.0	74.6	78.6	82.2	83.8	84.8
SG 5.0-145 NRS Mode N7	46.1	51.7	57.3	62.4	66.6	70.8	74.4	78.3	81.8	83.4	84.2
SG 5.0-145 NRS Mode N8	46.1	51.7	57.3	62.3	66.5	70.7	74.2	78.0	81.4	82.8	83.6
Central Frequency [Hz]	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**
SG 5.0-145 AM+1 @ 5.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 Baseline AM0 @ 5.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-1 @ 4.9MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-2 @ 4.8MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-3 @ 4.7MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-4 @ 4.6MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-5 @ 4.5MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-6 @ 4.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-7 @ 4.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 NRS Mode N1	89.7	90.4	91.2	92.7	93.1	92.8	92.9	94.5	94.3	95.3	96.0
SG 5.0-145 NRS Mode N2	89.3	90.0	90.7	92.2	92.6	92.3	92.4	94.0	93.8	94.8	95.5
SG 5.0-145 NRS Mode N3	88.2	88.6	89.2	90.7	91.0	90.8	90.9	92.5	92.3	93.3	94.0
SG 5.0-145 NRS Mode N4	87.5	87.7	88.1	89.6	90.0	89.7	89.8	91.4	91.2	92.2	92.9
SG 5.0-145 NRS Mode N5	86.7	86.8	87.1	88.6	89.0	88.7	88.8	90.4	90.2	91.2	91.9
SG 5.0-145 NRS Mode N6	85.3	85.2	85.2	86.7	87.1	86.8	86.9	88.5	88.3	89.3	90.0
SG 5.0-145 NRS Mode N7	84.6	84.3	84.2	85.7	86.1	85.8	85.9	87.5	87.3	88.3	89.0
SG 5.0-145 NRS Mode N8	83.8	83.4	83.2	84.7	85.0	84.7	84.8	86.4	86.3	87.3	88.0

Central Frequency [Hz]	1600	2000	2500	3150	4000	5000	6300	8000	10000
SG 5.0-145 AM+1 @ 5.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 Baseline AM0 @ 5.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-1 @ 4.9MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-2 @ 4.8MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-3 @ 4.7MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-4 @ 4.6MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-5 @ 4.5MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-6 @ 4.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-7 @ 4.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 NRS Mode N1	95.9	94.8	93.4	91.2	88.1	83.8	78.6	72.8	68.2
SG 5.0-145 NRS Mode N2	95.4	94.3	92.9	90.7	87.6	83.3	78.1	72.3	67.7
SG 5.0-145 NRS Mode N3	93.9	92.8	91.4	89.2	86.1	81.8	76.6	70.8	66.2
SG 5.0-145 NRS Mode N4	92.8	91.7	90.3	88.1	85.0	80.7	75.5	69.7	65.1
SG 5.0-145 NRS Mode N5	91.8	90.7	89.3	87.1	84.0	79.7	74.5	68.7	64.1
SG 5.0-145 NRS Mode N6	89.9	88.8	87.4	85.2	82.1	77.8	72.6	66.8	62.2
SG 5.0-145 NRS Mode N7	88.9	87.8	86.4	84.2	81.1	76.8	71.6	65.8	61.2
SG 5.0-145 NRS Mode N8	87.9	86.8	85.4	83.2	80.1	75.8	70.6	64.8	60.2

Table 8 One-third octave band noise spectra of SG 5.0-145 @ 10 m/s
(*ref: SG145spectra_5000KW_R05_25032021*)

Central Frequency [Hz]	10	12.5	16	20	25	31.5	40	50	63	80	100
SG 5.0-145 AM+1 @ 5.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 Baseline AM0 @ 5.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-1 @ 4.9MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-2 @ 4.8MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-3 @ 4.7MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-4 @ 4.6MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-5 @ 4.5MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-6 @ 4.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-7 @ 4.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 NRS Mode N1	46.1	51.8	57.4	62.8	67.3	71.9	75.9	80.4	84.5	86.8	88.4
SG 5.0-145 NRS Mode N2	46.1	51.8	57.4	62.8	67.3	71.8	75.8	80.2	84.3	86.5	88.1
SG 5.0-145 NRS Mode N3	46.1	51.8	57.4	62.7	67.1	71.6	75.5	79.8	83.7	85.8	87.2
SG 5.0-145 NRS Mode N4	46.1	51.8	57.4	62.6	67.0	71.4	75.3	79.5	83.3	85.3	86.6
SG 5.0-145 NRS Mode N5	46.1	51.8	57.4	62.6	66.9	71.3	75.1	79.2	82.9	84.8	86.0
SG 5.0-145 NRS Mode N6	46.1	51.8	57.3	62.5	66.7	71.0	74.6	78.6	82.2	83.8	84.8
SG 5.0-145 NRS Mode N7	46.1	51.7	57.3	62.4	66.6	70.8	74.4	78.3	81.8	83.4	84.2
SG 5.0-145 NRS Mode N8	46.1	51.7	57.3	62.3	66.5	70.7	74.2	78.0	81.4	82.8	83.6
Central Frequency [Hz]	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**
SG 5.0-145 AM+1 @ 5.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 Baseline AM0 @ 5.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-1 @ 4.9MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-2 @ 4.8MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-3 @ 4.7MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-4 @ 4.6MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-5 @ 4.5MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-6 @ 4.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-7 @ 4.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 NRS Mode N1	89.7	90.4	91.2	92.7	93.1	92.8	92.9	94.5	94.3	95.3	96.0
SG 5.0-145 NRS Mode N2	89.3	90.0	90.7	92.2	92.6	92.3	92.4	94.0	93.8	94.8	95.5
SG 5.0-145 NRS Mode N3	88.2	88.6	89.2	90.7	91.0	90.8	90.9	92.5	92.3	93.3	94.0
SG 5.0-145 NRS Mode N4	87.5	87.7	88.1	89.6	90.0	89.7	89.8	91.4	91.2	92.2	92.9
SG 5.0-145 NRS Mode N5	86.7	86.8	87.1	88.6	89.0	88.7	88.8	90.4	90.2	91.2	91.9
SG 5.0-145 NRS Mode N6	85.3	85.2	85.2	86.7	87.1	86.8	86.9	88.5	88.3	89.3	90.0
SG 5.0-145 NRS Mode N7	84.6	84.3	84.2	85.7	86.1	85.8	85.9	87.5	87.3	88.3	89.0
SG 5.0-145 NRS Mode N8	83.8	83.4	83.2	84.7	85.0	84.7	84.8	86.4	86.3	87.3	88.0

Central Frequency [Hz]	1600	2000	2500	3150	4000	5000	6300	8000	10000
SG 5.0-145 AM+1 @ 5.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 Baseline AM0 @ 5.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-1 @ 4.9MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-2 @ 4.8MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-3 @ 4.7MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-4 @ 4.6MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-5 @ 4.5MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-6 @ 4.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-7 @ 4.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 NRS Mode N1	95.9	94.8	93.4	91.2	88.1	83.8	78.6	72.8	68.2
SG 5.0-145 NRS Mode N2	95.4	94.3	92.9	90.7	87.6	83.3	78.1	72.3	67.7
SG 5.0-145 NRS Mode N3	93.9	92.8	91.4	89.2	86.1	81.8	76.6	70.8	66.2
SG 5.0-145 NRS Mode N4	92.8	91.7	90.3	88.1	85.0	80.7	75.5	69.7	65.1
SG 5.0-145 NRS Mode N5	91.8	90.7	89.3	87.1	84.0	79.7	74.5	68.7	64.1
SG 5.0-145 NRS Mode N6	89.9	88.8	87.4	85.2	82.1	77.8	72.6	66.8	62.2
SG 5.0-145 NRS Mode N7	88.9	87.8	86.4	84.2	81.1	76.8	71.6	65.8	61.2
SG 5.0-145 NRS Mode N8	87.9	86.8	85.4	83.2	80.1	75.8	70.6	64.8	60.2

Table 9 One-third octave band noise spectra of SG 5.0-145 @ 11 m/s
(*ref: SG145spectra_5000KW_R05_25032021*)

Central Frequency [Hz]	10	12.5	16	20	25	31.5	40	50	63	80	100
SG 5.0-145 AM+1 @ 5.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 Baseline AM0 @ 5.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-1 @ 4.9MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-2 @ 4.8MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-3 @ 4.7MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-4 @ 4.6MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-5 @ 4.5MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-6 @ 4.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-7 @ 4.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 NRS Mode N1	46.1	51.8	57.4	62.8	67.3	71.9	75.9	80.4	84.5	86.8	88.4
SG 5.0-145 NRS Mode N2	46.1	51.8	57.4	62.8	67.3	71.8	75.8	80.2	84.3	86.5	88.1
SG 5.0-145 NRS Mode N3	46.1	51.8	57.4	62.7	67.1	71.6	75.5	79.8	83.7	85.8	87.2
SG 5.0-145 NRS Mode N4	46.1	51.8	57.4	62.6	67.0	71.4	75.3	79.5	83.3	85.3	86.6
SG 5.0-145 NRS Mode N5	46.1	51.8	57.4	62.6	66.9	71.3	75.1	79.2	82.9	84.8	86.0
SG 5.0-145 NRS Mode N6	46.1	51.8	57.3	62.5	66.7	71.0	74.6	78.6	82.2	83.8	84.8
SG 5.0-145 NRS Mode N7	46.1	51.7	57.3	62.4	66.6	70.8	74.4	78.3	81.8	83.4	84.2
SG 5.0-145 NRS Mode N8	46.1	51.7	57.3	62.3	66.5	70.7	74.2	78.0	81.4	82.8	83.6
Central Frequency [Hz]	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**
SG 5.0-145 AM+1 @ 5.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 Baseline AM0 @ 5.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-1 @ 4.9MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-2 @ 4.8MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-3 @ 4.7MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-4 @ 4.6MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-5 @ 4.5MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-6 @ 4.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-7 @ 4.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 NRS Mode N1	89.7	90.4	91.2	92.7	93.1	92.8	92.9	94.5	94.3	95.3	96.0
SG 5.0-145 NRS Mode N2	89.3	90.0	90.7	92.2	92.6	92.3	92.4	94.0	93.8	94.8	95.5
SG 5.0-145 NRS Mode N3	88.2	88.6	89.2	90.7	91.0	90.8	90.9	92.5	92.3	93.3	94.0
SG 5.0-145 NRS Mode N4	87.5	87.7	88.1	89.6	90.0	89.7	89.8	91.4	91.2	92.2	92.9
SG 5.0-145 NRS Mode N5	86.7	86.8	87.1	88.6	89.0	88.7	88.8	90.4	90.2	91.2	91.9
SG 5.0-145 NRS Mode N6	85.3	85.2	85.2	86.7	87.1	86.8	86.9	88.5	88.3	89.3	90.0
SG 5.0-145 NRS Mode N7	84.6	84.3	84.2	85.7	86.1	85.8	85.9	87.5	87.3	88.3	89.0
SG 5.0-145 NRS Mode N8	83.8	83.4	83.2	84.7	85.0	84.7	84.8	86.4	86.3	87.3	88.0

Central Frequency [Hz]	1600	2000	2500	3150	4000	5000	6300	8000	10000
SG 5.0-145 AM+1 @ 5.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 Baseline AM0 @ 5.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-1 @ 4.9MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-2 @ 4.8MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-3 @ 4.7MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-4 @ 4.6MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-5 @ 4.5MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-6 @ 4.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-7 @ 4.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 NRS Mode N1	95.9	94.8	93.4	91.2	88.1	83.8	78.6	72.8	68.2
SG 5.0-145 NRS Mode N2	95.4	94.3	92.9	90.7	87.6	83.3	78.1	72.3	67.7
SG 5.0-145 NRS Mode N3	93.9	92.8	91.4	89.2	86.1	81.8	76.6	70.8	66.2
SG 5.0-145 NRS Mode N4	92.8	91.7	90.3	88.1	85.0	80.7	75.5	69.7	65.1
SG 5.0-145 NRS Mode N5	91.8	90.7	89.3	87.1	84.0	79.7	74.5	68.7	64.1
SG 5.0-145 NRS Mode N6	89.9	88.8	87.4	85.2	82.1	77.8	72.6	66.8	62.2
SG 5.0-145 NRS Mode N7	88.9	87.8	86.4	84.2	81.1	76.8	71.6	65.8	61.2
SG 5.0-145 NRS Mode N8	87.9	86.8	85.4	83.2	80.1	75.8	70.6	64.8	60.2

Table 10 One-third octave band noise spectra of SG 5.0-145 @ 12 m/s
(*ref: SG145spectra_5000KW_R05_25032021*)

Central Frequency [Hz]	10	12.5	16	20	25	31.5	40	50	63	80	100
SG 5.0-145 AM+1 @ 5.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 Baseline AM0 @ 5.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-1 @ 4.9MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-2 @ 4.8MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-3 @ 4.7MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-4 @ 4.6MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-5 @ 4.5MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-6 @ 4.2MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 AM-7 @ 4.0MW	46.1	51.8	57.5	62.8	67.4	72.0	76.1	80.6	84.7	87.1	88.8
SG 5.0-145 NRS Mode N1	46.1	51.8	57.4	62.8	67.3	71.9	75.9	80.4	84.5	86.8	88.4
SG 5.0-145 NRS Mode N2	46.1	51.8	57.4	62.8	67.3	71.8	75.8	80.2	84.3	86.5	88.1
SG 5.0-145 NRS Mode N3	46.1	51.8	57.4	62.7	67.1	71.6	75.5	79.8	83.7	85.8	87.2
SG 5.0-145 NRS Mode N4	46.1	51.8	57.4	62.6	67.0	71.4	75.3	79.5	83.3	85.3	86.6
SG 5.0-145 NRS Mode N5	46.1	51.8	57.4	62.6	66.9	71.3	75.1	79.2	82.9	84.8	86.0
SG 5.0-145 NRS Mode N6	46.1	51.8	57.3	62.5	66.7	71.0	74.6	78.6	82.2	83.8	84.8
SG 5.0-145 NRS Mode N7	46.1	51.7	57.3	62.4	66.6	70.8	74.4	78.3	81.8	83.4	84.2
SG 5.0-145 NRS Mode N8	46.1	51.7	57.3	62.3	66.5	70.7	74.2	78.0	81.4	82.8	83.6
Central Frequency [Hz]	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**
SG 5.0-145 AM+1 @ 5.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 Baseline AM0 @ 5.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-1 @ 4.9MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-2 @ 4.8MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-3 @ 4.7MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-4 @ 4.6MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-5 @ 4.5MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-6 @ 4.2MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 AM-7 @ 4.0MW	90.1	90.9	91.9	93.4	93.7	93.5	93.6	95.2	95.0	96.0	96.7
SG 5.0-145 NRS Mode N1	89.7	90.4	91.2	92.7	93.1	92.8	92.9	94.5	94.3	95.3	96.0
SG 5.0-145 NRS Mode N2	89.3	90.0	90.7	92.2	92.6	92.3	92.4	94.0	93.8	94.8	95.5
SG 5.0-145 NRS Mode N3	88.2	88.6	89.2	90.7	91.0	90.8	90.9	92.5	92.3	93.3	94.0
SG 5.0-145 NRS Mode N4	87.5	87.7	88.1	89.6	90.0	89.7	89.8	91.4	91.2	92.2	92.9
SG 5.0-145 NRS Mode N5	86.7	86.8	87.1	88.6	89.0	88.7	88.8	90.4	90.2	91.2	91.9
SG 5.0-145 NRS Mode N6	85.3	85.2	85.2	86.7	87.1	86.8	86.9	88.5	88.3	89.3	90.0
SG 5.0-145 NRS Mode N7	84.6	84.3	84.2	85.7	86.1	85.8	85.9	87.5	87.3	88.3	89.0
SG 5.0-145 NRS Mode N8	83.8	83.4	83.2	84.7	85.0	84.7	84.8	86.4	86.3	87.3	88.0

Central Frequency [Hz]	1600	2000	2500	3150	4000	5000	6300	8000	10000
SG 5.0-145 AM+1 @ 5.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 Baseline AM0 @ 5.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-1 @ 4.9MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-2 @ 4.8MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-3 @ 4.7MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-4 @ 4.6MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-5 @ 4.5MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-6 @ 4.2MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 AM-7 @ 4.0MW	96.6	95.5	94.1	91.9	88.8	84.5	79.3	73.5	68.9
SG 5.0-145 NRS Mode N1	95.9	94.8	93.4	91.2	88.1	83.8	78.6	72.8	68.2
SG 5.0-145 NRS Mode N2	95.4	94.3	92.9	90.7	87.6	83.3	78.1	72.3	67.7
SG 5.0-145 NRS Mode N3	93.9	92.8	91.4	89.2	86.1	81.8	76.6	70.8	66.2
SG 5.0-145 NRS Mode N4	92.8	91.7	90.3	88.1	85.0	80.7	75.5	69.7	65.1
SG 5.0-145 NRS Mode N5	91.8	90.7	89.3	87.1	84.0	79.7	74.5	68.7	64.1
SG 5.0-145 NRS Mode N6	89.9	88.8	87.4	85.2	82.1	77.8	72.6	66.8	62.2
SG 5.0-145 NRS Mode N7	88.9	87.8	86.4	84.2	81.1	76.8	71.6	65.8	61.2
SG 5.0-145 NRS Mode N8	87.9	86.8	85.4	83.2	80.1	75.8	70.6	64.8	60.2

Table 11 One-third octave band noise spectra of SG 5.0-145 @ 13 m/s and up to cut out wind speed (*ref: SG145spectra_5000KW_R05_25032021*)

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RECORD OF CHANGES

Rev.	Date	Author	Description
0	12/04/2019	SNOVO / MAALONSO	Initial Version
1	08/05/2019	JEJGUERRERO / MAALONSO	Section 4 wording and table updated. Figure 1 updated.
2	28/06/2019	SNOVO / MAALONSO	Updated power and noise curves due to Mk-II upgrade
3	15/10/2019	SNOVO/MAALONSO	Inclusion of AM-6 (4.2MW) & AM-7 (4.0MW) Flexible Rating modes
4	18/02/2020	SNOVO/MAALONSO	Updated definitions Updated maximum termperature values.
5	31/08/2020	SNOVO/MAALONSO	Inclusion of AM+1 (5.2MW) Flexible Rating mode
6	17/02/2021	MAALONSO	Update Figure 1 SG 5.0-145 FLEXIBLE RATING electrical performance. P vs Q.
7	04/03/2021	SNOVO	Updated noise curves due to new noise level at full power. Misprint corrections.
8	29/03/2021	JEJGUERRERO / MAALONSO	Document updated including additional clarifications about Flexible Rating functionality operation.

1 AIM

This document describes the FLEXIBLE RATING functionality for the SG 5.0-145 wind turbine.

2 SCOPE

In order to have the best product and solution for our clients, SGRE SG 5.0-145 wind turbine is designed including OPTIMAFLEX philosophy: wind turbine rated power and tower configurations can be highly adapted case by case. Within OPTIMAFLEX, this document describes the FLEXIBLE RATING functionality (modification of the wind turbine rated power).

The information included in the present document is applicable to SG 5.0-145 wind turbine configuration with following hypothesis:

- STD thermal configuration.
- Altitude up to 1000m. For altitudes above this value, power de-ratings due to altitude and external ambient temperature shall be considered.

Performance included in the present document is specific of the MKII product configuration (blade inboard add-ons, control system, etc) and must always be considered together.

3 ABBREVIATIONS

- **WT**: Wind turbine.
- **OPTIMAFLEX:** Design philosophy aiming to a highly adaptable product that includes wind turbine rated power and tower configurations optimization.
- **FLEXIBLE RATING:** Within OPTIMAFLEX, functionality that allows increase/decrease WT rated power if specific conditions related to temperature, noise, reactive power production, grid conditions and mechanical loads are fulfilled.
- **AM**: Application Mode.
- **Maximum temperature (Text)**: Expressed in ºC, it is the maximum ambient temperature outside of the nacelle that allows full power operation for each Application Mode.
- **Power coefficient (cos PHI)**: Reactive and active power ratio. Cos phi equals to 1 means no reactive power production.
- **Nominal Voltage (Un):** Nominal Voltage.
- **Grid frequency (f):** Grid frequency 50/60Hz.
- **Power (P):** Expressed in kW, this is the electric power obtained at the generator terminals without considering the losses in the transformer or high voltage cables of the wind turbine, or the occasional power consumption which may exist in the same to supply a component. Averaged every 10 minutes.
- **Wind speed ($W_{S.}$):** Expressed in m/s, it is the horizontal wind component value at the height of the hub averaged every 10 minutes.
- **Power curve (PC):** Represents the change in the P in accordance with the W_S for the different WT operating modes.

- **Annual Output / Annual Energy Production (AEP)**: Expressed in [MWh], it is the total electrical energy produced by a wind turbine during a one-year period, in accordance with a given PC and a given wind distribution.

- **Wind distribution:** Weibull distribution is used for different K-distribution parameters and for annual average wind speed values (W_{ave}).

- **Power coefficient:** C_P

- **Thrust coefficient:** C_T

- **Noise level:** The expected sound power level values, expressed in dB(A), represent the sound power that the WT emits at the height of the hub for a given wind speed.
  The noise levels shown in this document are average expected values, called Lw in IEC-61400-14. To obtain the Lwd value, as defined in IEC-61400-14, an increase of 2 dB(A) shall be considered over said Lw values.

- **dB(A):** An A type frequency filter is applied, in accordance with the IEC standard.

4 FLEXIBLE RATING GENERAL DESCRIPTION

SG 5.0-145 wind turbine can be configured to operate with a flexible power rating, enabling site specific optimization. It is designed to work at 5.0 MW rated power as baseline, but additional are also available under certain project and environmental conditions.

SG 5.0-145 baseline design conditions at rated power 5.0 MW are:

- Wind class IIB.
- Maximum external ambient temperature below 1000m +25ºC (STD thermal configuration).
- Electrical performance description: Cos PHI 0.9 @[0.95,1.12]Un @ ±3%frequency. 0.9Un@1.06f.

In the SG 5.0-145 Flexible Rating strategy, 9 Application Modes (AM) with different power ratings are available. Each Application Mode is associated with a specific set of performance conditions.

- From an electrical and thermal conditioning point of view, the availability of a specific rated power other than the baseline 5.0 MW depends on several factors, such as: ambient temperature, reactive power production, grid voltage and grid frequency.

- From a mechanical loads point of view, it is possible to modify the rated power depending on the specific wind conditions in the wind farm. Each site shall be analysed to verify the viability of the rated power modification and the maximum rated power value allowed in each case.

Flexible Rating feature is optional and applicability depends on the fulfilment of the defined temperature, electrical and mechanical loads requirements.

Flexible Rating application procedure and concept:

- Upfront analysis: If Flexible Rating optional strategy wants to be enabled, an upfront analysis is needed for each project in order to define which is the maximum Application Mode admissible considering the specific site mechanical loads and general grid requirements.

- Wind turbine operation: Flexible Rating controller algorithm dynamically defines which is the active power than can be delivered depending on the ambient temperature and grid demands, always limited by the maximum Application Mode defined in the upfront analysis for each site. Temperature and reactive power demand is prioritized. If grid demands higher reactive power (Q) than the one allowed for an AM, active power (P) will be decreased.

In the following table, a summary of the SG 5.0-145 Flexible Rating strategy is presented.

AM	Rated power	Wind Conditions [1]	Maximum Temperature (full power operation) [2]	Maximum Temperature (with power derating) [3]	Electrical performance limits	Maximum Noise Emission level [dB(A)] [4]
AM+1	5.2 MW	Less demanding wind conditions	+20.0ºC	+45ºC	cos PHI 0.95 @[0.95,1.12]Un @±2%frequency	106.3
AM0	**5.0 MW**	**IIB**	**+25.0ºC**	**+45ºC**	cos PHI 0.9 @[0.95,1.12]Un @±3%frequency	**106.3**
AM-1	4.9 MW	More demanding wind conditions	+30.0ºC	+45ºC		106.3
AM-2	4.8 MW		+35.0ºC	+45ºC		106.3
AM-3	4.7 MW		+36.6ºC	+45ºC		106.3
AM-4	4.6 MW		+38.3ºC	+45ºC		106.3
AM-5	4.5 MW		+40.0ºC	+45ºC		106.3
AM-6	4.2 MW		+41.0ºC	+45ºC		106.3
AM-7	4.0 MW		+41.6ºC	+45ºC		106.3

Table 1 SG 5.0-145 FLEXIBLE RATING application modes description.

[1] Each "Application Mode" is associated with a specific set of wind conditions.
[2] Maximum external ambient temperature outside nacelle that allows full power operation with the STD (Standard) thermal configuration, for altitudes below 1000m.
[3] Maximum external ambient temperature outside nacelle including power derating with the STD (Standard) thermal configuration, for altitudes below 1000m.
[4] Noise values presented correspond to the wind turbine configuration equipped with noise reduction add-ons attached to the blade. WTG can be supplied without noise reduction add-ons, if required, without impact in the other performance parameters.

5 FLEXIBLE RATING ELECTRICAL PERFORMANCE ADDITIONAL INFORMATION

As described in section 4, FLEXIBLE RATING allows the modification of the rated power in accordance with the conditions associated with the different "Application Modes (AM)". In the present section, further information about electrical performance under the different AM scenarios is presented.

The SG 5.0-145 FLEXIBLE RATING wind turbine reactive power capability delivered at the LV terminals of the WTG transformer is defined in the following figures. Reactive power values shown in Figure 1 and Figure 2 can be permanently sustained under steady operational conditions. The variation of reactive power capability within operative voltage range is indicated in Figure 2 and linear interpolation between different voltage points shall be considered to obtain available Q at intermediate points.

It is also possible to offer the capability of providing Q at P=0 (when the WTG is not producing power at low winds). This is shown in the Figure 3.

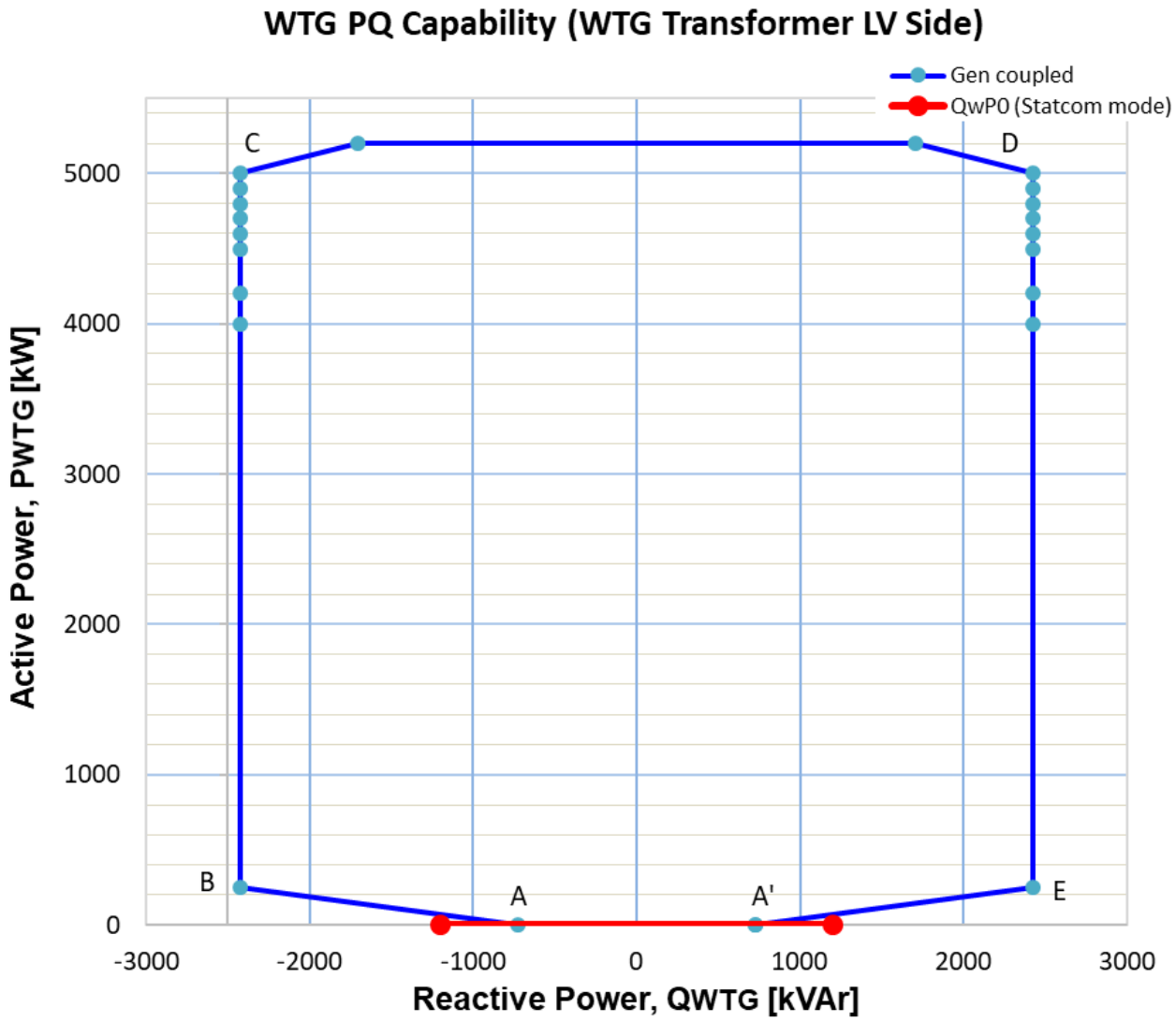

Figure 1 SG 5.0-145 FLEXIBLE RATING electrical performance. P vs Q.

	PWTG: 4.0 MW Qmax=±2422 tª ext ≤41.6ºC F=±3%fn U=-5%/+12%Un		**PWTG: 4.2 MW** Qmax=±2422 tª ext ≤ 41.0ºC F=±3%fn U=-5%/+12%Un		**PWTG: 4.5 MW** Qmax=±2422 tª ext ≤ 40.0ºC F=±3%fn U=-5%/+12%Un		**PWTG: 4.6 MW** Qmax=±2422 tª ext ≤ 38.3ºC F=±3%fn U=-5%/+12%Un	
	Q (kVAr)	P (kW)	Q (kVAr)	P (kW)	Q (kVAr)	P (kW)	Q (kVAr)	P (kW)
A/A'*	±726	0	±726	0	±726	0	±726	0
B	2422	250	2422	250	2422	250	2422	250
C	2422	4000	2422	4200	2422	4500	2422	4600
D	-2422	4000	-2422	4200	-2422	4500	-2422	4600
E	-2422	250	-2422	250	-2422	250	-2422	250

	PWTG: 4.7 MW Qmax=±2422 tª ext ≤36.6ºC F=±3%fn U=-5%/+12%Un		**PWTG: 4.8 MW** Qmax=±2422 tª ext ≤ 35ºC F=±3%fn U=-5%/+12%Un		**PWTG: 4.9 MW** Qmax=±2422 tª ext ≤30ºC F=±3%fn U=-5%/+12%Un		**PWTG: 5.0 MW** cos ϕ=±0.90 tª ext ≤25ºC F=±3%fn U=-5%/+12%Un		**PWTG: 5.2 MW** cos ϕ=±0.95 tª ext ≤20ºC F=±2%fn U=-5%/+12%Un	
	Q (kVAr)	P (kW)	Q (kVAr)	P (kW)	Q (kVAr)	P (kW)	Q (kVAr)	P (kW)	Q (kVAr)	P (kW)
A/A'*	±726	0	±726	0	±726	0	±726	0	±726	0
B	2422	250	2422	250	2422	250	2422	250	2422	250
C	2422	4700	2422	4800	2422	4900	2422	5000	-1709	5200
D	-2422	4700	-2422	4800	-2422	4900	-2422	5000	-1709	5200
E	-2422	250	-2422	250	-2422	250	-2422	250	-2422	250

Table 2 SG 5.0-145 FLEXIBLE RATING electrical performance. P vs Q.

+Q represents capacitive mode: reactive power into the grid
-Q represents inductive mode: reactive power absorbed from the grid

*Point A'/": WTG in coupled state: Q=±726 kVAr applies to -5%/+5% Un. At higher voltage Qcapacitive will be reduced.

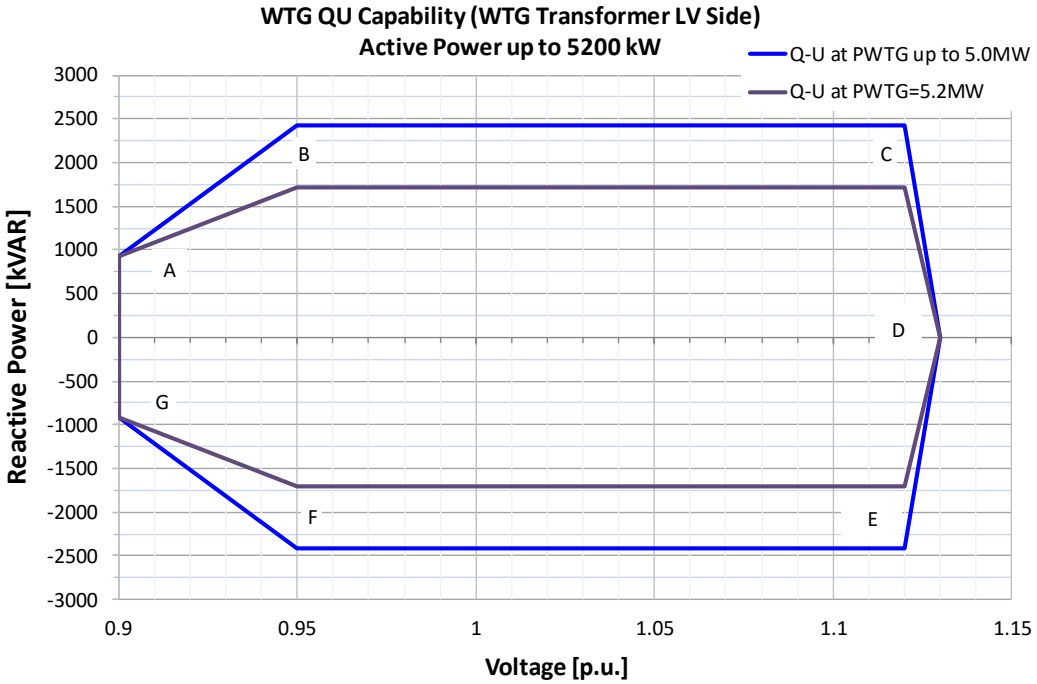

Figure 2 SG 5.0-145 FLEXIBLE RATING electrical performance. Q vs V**.**

	PWTG: 4.0 MW Qmax=±2422 tª ext ≤35ºC PWTG=+5%/+100% F=±3%		**PWTG: 4.2 MW** Qmax=±2422 tª ext ≤ 35ºC PWTG=+5%/+100% F=±3%		**PWTG: 4.5 MW** Qmax=±2422 tª ext ≤35ºC PWTG=+5%/+100% F=±3%		**PWTG: 4.6 MW** Qmax=±2422 tª ext ≤ 35ºC PWTG=+5%/+100% F=±3%	
	Q (kVAr)	U (p.u.)	Q (kVAr)	U (p.u.)	Q (kVAr)	U (p.u.)	Q (kVAr)	U (p.u.)
A	921	0.90	921	0.90	921	0.90	921	0.90
B	2422	0.95	2422	0.95	2422	0.95	2422	0.95
C	2422	1.12	2422	1.12	2422	1.12	2422	1.12
D	0	1.13	0	1.13	0	1.13	0	1.13
E	-2422	1.12	-2422	1.12	-2422	1.12	-2422	1.12
F	-2422	0.95	-2422	0.95	-2422	0.95	-2422	0.95
G	-921	0.90	-921	0.90	-921	0.90	-921	0.90

	PWTG: 4.7 MW Qmax=±2422 tª ext ≤36.6ºC PWTG=+5%/+100% F=±3%		**PWTG: 4.8 MW** Qmax=±2422 tª ext ≤ 35ºC PWTG=+5%/+100% F=±3%		**PWTG: 4.9 MW** Qmax=±2422 tª ext ≤30ºC PWTG=+5%/+100% F=±3%		**PWTG: 5.0 MW** Qmax=±2422 tª ext ≤25ºC PWTG=+5%/+100% F=±3%		**PWTG: 5.2 MW** cos ϕ=±0.95 tª ext ≤20ºC PWTG=+5%/+100% F=±2%	
	Q (kVAr)	U (p.u.)	Q (kVAr)	U (p.u.)	Q (kVAr)	U (p.u.)	Q (kVAr)	U (p.u.)	Q (kVAr)	U (p.u.)
A	921	0.90	921	0.90	921	0.90	921	0.90	921	0.90
B	2422	0.95	2422	0.95	2422	0.95	2422	0.95	1709	0.95
C	2422	1.12	2422	1.12	2422	1.12	2422	1.12	1709	1.12
D	0	1.13	0	1.13	0	1.13	0	1.13	0	1.13
E	-2422	1.12	-2422	1.12	-2422	1.12	-2422	1.12	-1709	1.12
F	-2422	0.95	-2422	0.95	-2422	0.95	-2422	0.95	-1709	0.95
G	-921	0.90	-921	0.90	-921	0.90	-921	0.90	-921	0.90

Table 3 SG 5.0-145 FLEXIBLE RATING electrical performance. Q vs V**.**

The FLEXIBLE RATING functionality also includes the generation of Q at P = 0 (QwP0). (According to document GD414141)

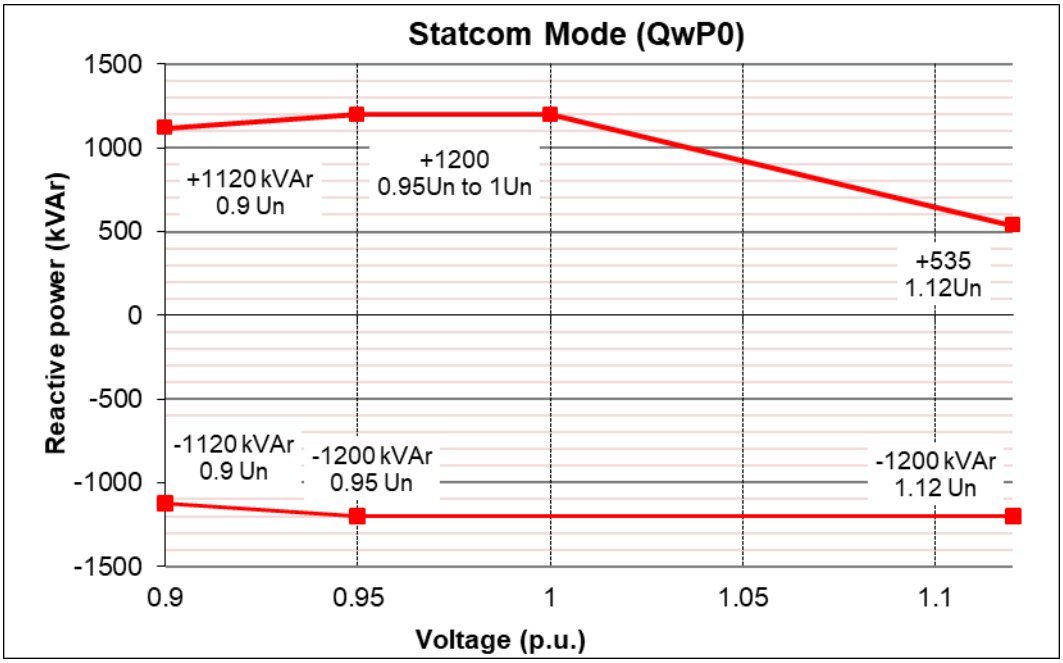

Figure 3 Q at P=0 (QwP0)

6 FLEXIBLE RATING POWER CURVES AND NOISE

6.1 GENERAL COMMENTS

When not specified otherwise, power curve data in the following sections are calculated using the parameters from Table 5. All power curve and annual energy production values in this document are subject to the validity ranges presented in Table 6.

Frequency	50 Hz / 60 Hz
Rotor Diameter	145 m
Angle of blade tip	Pitch control regulation
Air density	1.225 kg/m^3

Table 5: Calculation parameter values for the SG 5.0-145 wind turbine power curve.

Wind Shear (10min average)	≤ 0.3
Turbulence intensity TI [%] for bin i	$5\%\frac{(0.75v_i+5.6)}{v_i} < TI_i < 12\%\frac{(0.75v_i+5.6)}{v_i}$
Terrain	Not complex according to IEC 61400-12-1
Upflow β [º]	-2º ≤ β ≤ +2º
Grid frequency [Hz]	± 0.5 Hz

Table 6 Validity ranges for the SG 5.0-145 wind turbine power curve.

6.2 SG 5.0-145 BASELINE AM0 (@5.0 MW RATED POWER) PERFORMANCE

Please, refer to the following official SG 5.0-145 documentation:

[1] GD410616_SG 5.0-145 DEVELOPER PACKAGE
[2] GD411360_SG 5.0-145 POWER CURVE
[3] GD411361_SG 5.0-145 POWER CURVE & NOISE
[4] GD411362_SG 5.0-145 LOW NOISE MODES

6.3 SG 5.0-145 AM-7 (@4.0 MW RATED POWER) PERFORMANCE

6.3.1 Standard Power Curve

Table 7 shows the electrical power [kW] as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

P [kW]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	56	30	33	36	38	41	44	46	49	52	54	57	60
3.5	130	86	90	95	100	104	109	113	118	123	127	132	137
4.0	241	170	178	185	192	200	207	215	222	230	237	245	252
4.5	383	278	289	300	311	322	333	344	355	366	377	388	399
5.0	555	410	425	441	456	471	486	502	517	532	547	563	578
5.5	762	569	590	610	630	651	671	691	711	732	752	772	792
6.0	1009	759	785	812	838	864	891	917	943	969	996	1022	1048
6.5	1300	982	1016	1049	1082	1116	1149	1183	1216	1250	1283	1316	1350
7.0	1638	1242	1284	1325	1367	1409	1451	1492	1534	1576	1617	1659	1700
7.5	2026	1540	1591	1642	1694	1745	1796	1847	1898	1950	2000	2051	2102
8.0	2458	1875	1937	1999	2061	2123	2184	2246	2307	2368	2428	2488	2547
8.5	2907	2240	2313	2386	2458	2530	2602	2672	2741	2809	2875	2939	3001
9.0	3321	2618	2702	2783	2864	2942	3018	3091	3161	3227	3291	3351	3407
9.5	3648	2989	3077	3162	3242	3318	3389	3456	3517	3573	3624	3671	3713
10.0	3864	3327	3411	3489	3559	3623	3680	3731	3776	3816	3849	3878	3902
10.5	3960	3606	3677	3739	3792	3837	3874	3904	3926	3943	3955	3964	3970
11.0	3985	3813	3862	3901	3928	3948	3961	3970	3976	3980	3983	3986	3988
11.5	3993	3934	3955	3968	3976	3981	3985	3987	3989	3991	3992	3994	3994
12.0	3997	3977	3982	3986	3989	3991	3993	3994	3995	3996	3997	3997	3998
12.5	3999	3989	3991	3993	3995	3996	3997	3997	3998	3998	3998	3999	3999
13.0	3999	3994	3996	3997	3998	3998	3998	3999	3999	3999	3999	3999	3999
13.5	4000	3997	3998	3998	3999	3999	3999	3999	3999	4000	4000	4000	4000
14.0	4000	3999	3999	3999	3999	4000	4000	4000	4000	4000	4000	4000	4000
14.5	4000	3999	3999	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
15.0	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
15.5	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
16.0	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
16.5	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
17.0	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
17.5	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
18.0	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
18.5	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
19.0	3999	3999	3999	3999	3999	3999	3999	3999	3999	3999	3999	3999	3999
19.5	3998	3998	3998	3998	3998	3998	3998	3998	3998	3998	3998	3998	3998
20.0	3996	3996	3996	3996	3996	3996	3996	3996	3996	3996	3996	3996	3996
20.5	3991	3991	3991	3991	3991	3991	3991	3991	3991	3991	3991	3991	3991
21.0	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983
21.5	3972	3972	3972	3972	3972	3972	3972	3972	3972	3972	3972	3972	3972
22.0	3956	3956	3956	3956	3956	3956	3956	3956	3956	3956	3956	3956	3956
22.5	3936	3936	3936	3936	3936	3936	3936	3936	3936	3936	3936	3936	3936
23.0	3914	3914	3914	3914	3914	3914	3914	3914	3914	3914	3914	3914	3914
23.5	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889
24.0	3863	3863	3863	3863	3863	3863	3863	3863	3863	3863	3863	3863	3863
24.5	3835	3835	3835	3835	3835	3835	3835	3835	3835	3835	3835	3835	3835
25.0	3811	3811	3811	3811	3811	3811	3811	3811	3811	3811	3811	3811	3811
25.5	3787	3787	3787	3787	3787	3787	3787	3787	3787	3787	3787	3787	3787
26.0	3764	3764	3764	3764	3764	3764	3764	3764	3764	3764	3764	3764	3764
26.5	3745	3745	3745	3745	3745	3745	3745	3745	3745	3745	3745	3745	3745
27.0	3726	3726	3726	3726	3726	3726	3726	3726	3726	3726	3726	3726	3726

Table 7 Electric power [kW] of the SG 5.0-145 WT AM-7 (@4.0 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3].
(ref: *SG145FR5000kW_R03_15102019*)

6.3.2 Annual Energy Production

Table 8 shows the annual yield [MWh] for the SG 5.0-145 WT AM-7 (@4.0 MW rated power) for different Weibull K-distribution parameter values and annual average wind speeds W_{ave} [m/s]. The values are calculated for 1.225 kg/m^3 standard air density and 10% turbulence intensity.

AEP [MWh]		**Wave [m/s]**										
		5.0	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Weibull K	**1.5**	8846	10444	11958	13371	14671	15852	16913	17854	18679	19391	19998
	2.0	8231	10178	12083	13898	15593	17156	18583	19875	21034	22065	22972
	2.5	7517	9665	11851	13984	16001	17865	19562	21090	22455	23668	24741

Table 8: Annual energy production [MWh] of the SG 5.0-145 WT AM-7 (@4.0 MW rated power) calculated as a function of W_{ave} [m/s]. (ref: *SG145FR5000kW_R03_15102019*)

6.3.3 C_P Curves

Table 9 shows the C_P values for the SG 5.0-145 WT AM-7 (@4.0 MW rated power).

Ws [m/s]	CP [-]
3.0	0.2045
3.5	0.2992
4.0	0.3723
4.5	0.4150
5.0	0.4390
5.5	0.4529
6.0	0.4618
6.5	0.4679
7.0	0.4722
7.5	0.4748
8.0	0.4747
8.5	0.4680
9.0	0.4504
9.5	0.4207
10.0	0.3821
10.5	0.3382
11.0	0.2960
11.5	0.2596
12.0	0.2287
12.5	0.2024
13.0	0.1800
13.5	0.1607
14.0	0.1441
14.5	0.1297
15.0	0.1172
15.5	0.1062
16.0	0.0966
16.5	0.0880
17.0	0.0805
17.5	0.0738
18.0	0.0678
18.5	0.0625
19.0	0.0576
19.5	0.0533
20.0	0.0494
20.5	0.0458
21.0	0.0425
21.5	0.0395
22.0	0.0367
22.5	0.0342
23.0	0.0318
23.5	0.0296
24.0	0.0276
24.5	0.0258
25.0	0.0241
25.5	0.0226
26.0	0.0212
26.5	0.0199
27.0	0.0187

Table 9: C_P values for the SG 5.0-145 WT AM-7 (@4.0 MW rated power).
(ref: *SG145FR5000kW_R03_15102019*)

6.3.4 C_T Curves

Table 10 shows the C_T curves as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

C_T [-]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948
3.5	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674
4.0	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438
4.5	0.8290	0.8280	0.8282	0.8283	0.8284	0.8285	0.8286	0.8287	0.8288	0.8288	0.8289	0.8290	0.8290
5.0	0.8207	0.8180	0.8184	0.8188	0.8191	0.8194	0.8197	0.8199	0.8202	0.8204	0.8206	0.8207	0.8209
5.5	0.8183	0.8154	0.8158	0.8163	0.8166	0.8170	0.8173	0.8175	0.8178	0.8180	0.8182	0.8183	0.8185
6.0	0.8185	0.8165	0.8168	0.8171	0.8174	0.8176	0.8178	0.8180	0.8181	0.8183	0.8184	0.8185	0.8186
6.5	0.8191	0.8179	0.8181	0.8183	0.8184	0.8185	0.8187	0.8188	0.8189	0.8190	0.8190	0.8191	0.8192
7.0	0.8192	0.8185	0.8186	0.8187	0.8188	0.8189	0.8189	0.8190	0.8191	0.8191	0.8192	0.8192	0.8193
7.5	0.8166	0.8164	0.8165	0.8166	0.8166	0.8167	0.8167	0.8168	0.8168	0.8167	0.8167	0.8165	0.8163
8.0	0.8044	0.8072	0.8073	0.8073	0.8072	0.8072	0.8070	0.8067	0.8063	0.8058	0.8050	0.8039	0.8025
8.5	0.7722	0.7857	0.7855	0.7852	0.7847	0.7840	0.7829	0.7814	0.7795	0.7771	0.7741	0.7705	0.7662
9.0	0.7142	0.7501	0.7491	0.7476	0.7455	0.7429	0.7394	0.7352	0.7303	0.7245	0.7180	0.7107	0.7026
9.5	0.6361	0.7020	0.6990	0.6950	0.6900	0.6840	0.6771	0.6693	0.6608	0.6515	0.6416	0.6311	0.6201
10.0	0.5514	0.6442	0.6380	0.6306	0.6222	0.6129	0.6027	0.5920	0.5809	0.5693	0.5576	0.5456	0.5336
10.5	0.4715	0.5802	0.5708	0.5604	0.5493	0.5378	0.5258	0.5137	0.5016	0.4895	0.4776	0.4658	0.4544
11.0	0.4026	0.5145	0.5029	0.4909	0.4786	0.4663	0.4541	0.4421	0.4304	0.4190	0.4080	0.3974	0.3872
11.5	0.3455	0.4517	0.4393	0.4270	0.4149	0.4031	0.3916	0.3806	0.3700	0.3599	0.3502	0.3410	0.3322
12.0	0.2989	0.3949	0.3829	0.3713	0.3601	0.3493	0.3391	0.3293	0.3201	0.3113	0.3030	0.2951	0.2876
12.5	0.2609	0.3456	0.3346	0.3240	0.3140	0.3045	0.2956	0.2871	0.2791	0.2715	0.2644	0.2576	0.2512
13.0	0.2296	0.3036	0.2937	0.2844	0.2756	0.2673	0.2595	0.2522	0.2453	0.2387	0.2326	0.2267	0.2212
13.5	0.2035	0.2682	0.2594	0.2512	0.2435	0.2363	0.2295	0.2232	0.2171	0.2115	0.2061	0.2010	0.1962
14.0	0.1815	0.2382	0.2305	0.2233	0.2166	0.2103	0.2043	0.1987	0.1935	0.1885	0.1838	0.1793	0.1751
14.5	0.1628	0.2128	0.2061	0.1997	0.1938	0.1882	0.1830	0.1780	0.1734	0.1690	0.1648	0.1609	0.1571
15.0	0.1468	0.1912	0.1852	0.1795	0.1743	0.1693	0.1647	0.1603	0.1562	0.1522	0.1485	0.1450	0.1417
15.5	0.1329	0.1725	0.1672	0.1622	0.1575	0.1530	0.1489	0.1450	0.1413	0.1378	0.1345	0.1313	0.1284
16.0	0.1208	0.1564	0.1516	0.1471	0.1429	0.1389	0.1352	0.1317	0.1284	0.1252	0.1222	0.1194	0.1167
16.5	0.1102	0.1424	0.1380	0.1340	0.1302	0.1266	0.1232	0.1201	0.1171	0.1142	0.1115	0.1090	0.1066
17.0	0.1009	0.1300	0.1261	0.1225	0.1190	0.1158	0.1127	0.1098	0.1071	0.1046	0.1021	0.0998	0.0976
17.5	0.0927	0.1192	0.1156	0.1123	0.1092	0.1062	0.1034	0.1008	0.0984	0.0960	0.0938	0.0917	0.0897
18.0	0.0854	0.1096	0.1063	0.1033	0.1004	0.0977	0.0952	0.0928	0.0906	0.0884	0.0864	0.0845	0.0826
18.5	0.0789	0.1010	0.0981	0.0953	0.0927	0.0902	0.0879	0.0857	0.0836	0.0817	0.0798	0.0780	0.0764
19.0	0.0731	0.0934	0.0907	0.0881	0.0857	0.0835	0.0813	0.0793	0.0774	0.0756	0.0739	0.0723	0.0707
19.5	0.0678	0.0865	0.0840	0.0817	0.0795	0.0774	0.0754	0.0736	0.0718	0.0702	0.0686	0.0671	0.0657
20.0	0.0631	0.0803	0.0780	0.0759	0.0738	0.0719	0.0701	0.0684	0.0668	0.0652	0.0638	0.0624	0.0611
20.5	0.0588	0.0747	0.0726	0.0706	0.0687	0.0669	0.0653	0.0637	0.0622	0.0608	0.0594	0.0582	0.0569
21.0	0.0548	0.0696	0.0676	0.0658	0.0640	0.0624	0.0608	0.0594	0.0580	0.0567	0.0554	0.0543	0.0531
21.5	0.0512	0.0649	0.0631	0.0614	0.0598	0.0582	0.0568	0.0555	0.0542	0.0530	0.0518	0.0507	0.0497
22.0	0.0479	0.0606	0.0589	0.0573	0.0558	0.0544	0.0531	0.0518	0.0506	0.0495	0.0484	0.0474	0.0465
22.5	0.0449	0.0567	0.0551	0.0537	0.0523	0.0509	0.0497	0.0485	0.0474	0.0464	0.0454	0.0444	0.0435
23.0	0.0421	0.0531	0.0517	0.0503	0.0490	0.0478	0.0466	0.0455	0.0445	0.0435	0.0426	0.0417	0.0408
23.5	0.0396	0.0499	0.0485	0.0472	0.0460	0.0448	0.0438	0.0427	0.0418	0.0409	0.0400	0.0392	0.0384
24.0	0.0373	0.0469	0.0456	0.0444	0.0433	0.0422	0.0412	0.0402	0.0393	0.0385	0.0377	0.0369	0.0362
24.5	0.0352	0.0442	0.0430	0.0419	0.0408	0.0398	0.0388	0.0379	0.0371	0.0363	0.0355	0.0348	0.0341
25.0	0.0333	0.0418	0.0407	0.0396	0.0386	0.0376	0.0367	0.0359	0.0351	0.0343	0.0336	0.0329	0.0323
25.5	0.0315	0.0396	0.0385	0.0375	0.0366	0.0357	0.0348	0.0340	0.0333	0.0326	0.0319	0.0312	0.0306
26.0	0.0300	0.0376	0.0366	0.0356	0.0347	0.0339	0.0331	0.0323	0.0316	0.0309	0.0303	0.0297	0.0291
26.5	0.0285	0.0358	0.0348	0.0339	0.0331	0.0322	0.0315	0.0308	0.0301	0.0294	0.0288	0.0283	0.0277
27.0	0.0272	0.0341	0.0332	0.0323	0.0315	0.0308	0.0300	0.0294	0.0287	0.0281	0.0275	0.0270	0.0264

Table 10 C_T curves of the SG 5.0-145 WT AM-7 (@4.0 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3]. (ref: *SG145FR5000kW_R03_15102019*)

6.3.5 Noise Levels

Table 11 includes the numerical values for the estimated L_{WA} noise level in dB(A) for the different wind speeds, from the start-up speed, 3m/s.

Ws [m/s]	LWA [dB(A)]
3.0	95.1
3.5	95.1
4.0	95.1
4.5	95.1
5.0	95.1
5.5	97.2
6.0	99.2
6.5	101.1
7.0	102.7
7.5	104.3
8.0	105.7
8.5	106.3
9.0	106.3
9.5	106.3
10.0	106.3
10.5	106.3
11.0	106.3
11.5	106.3
12.0	106.3
12.5	106.3
13.0	106.3
13.5	106.3
14.0	106.3
14.5	106.3
15.0	106.3

Table 11: Noise levels of the SG 5.0-145 WT AM-7 (@4.0 MW rated power) calculated as a function of W_S [m/s]. (ref: *SG145FR5000kW_R07_04032021*)

6.4 SG 5.0-145 AM-6 (@4.2 MW RATED POWER) PERFORMANCE

6.4.1 Standard Power Curve

Table 12 shows the electrical power [kW] as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

P [kW]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	56	30	33	36	38	41	44	46	49	52	54	57	60
3.5	130	86	90	95	100	104	109	113	118	123	127	132	137
4.0	241	170	178	185	192	200	207	215	222	230	237	245	252
4.5	383	278	289	300	311	322	333	344	355	366	377	388	399
5.0	555	410	425	441	456	471	486	502	517	532	547	563	578
5.5	762	569	590	610	630	651	671	691	711	732	752	772	792
6.0	1009	759	785	812	838	864	891	917	943	969	996	1022	1048
6.5	1300	982	1016	1049	1082	1116	1149	1183	1216	1250	1283	1316	1350
7.0	1638	1242	1284	1325	1367	1409	1451	1492	1534	1576	1617	1659	1700
7.5	2026	1540	1591	1642	1694	1745	1796	1847	1898	1950	2001	2052	2103
8.0	2460	1875	1937	1999	2061	2123	2184	2246	2308	2369	2430	2491	2551
8.5	2920	2240	2313	2386	2459	2532	2604	2676	2747	2817	2886	2953	3019
9.0	3359	2620	2704	2788	2870	2952	3031	3108	3183	3256	3325	3391	3454
9.5	3725	2997	3089	3179	3266	3348	3427	3501	3571	3636	3696	3752	3803
10.0	3986	3351	3444	3531	3612	3687	3755	3816	3872	3922	3966	4005	4038
10.5	4130	3659	3742	3817	3884	3942	3992	4035	4071	4100	4121	4138	4151
11.0	4177	3902	3968	4023	4069	4104	4129	4147	4160	4168	4174	4179	4182
11.5	4190	4071	4112	4139	4157	4169	4176	4181	4184	4187	4189	4191	4192
12.0	4195	4156	4170	4178	4183	4186	4189	4191	4192	4194	4195	4196	4196
12.5	4198	4182	4186	4189	4192	4193	4195	4196	4196	4197	4198	4198	4198
13.0	4199	4191	4193	4195	4196	4197	4198	4198	4198	4199	4199	4199	4199
13.5	4200	4195	4197	4198	4198	4198	4199	4199	4199	4199	4199	4200	4200
14.0	4200	4198	4198	4199	4199	4199	4199	4200	4200	4200	4200	4200	4200
14.5	4200	4199	4199	4199	4199	4200	4200	4200	4200	4200	4200	4200	4200
15.0	4200	4199	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
15.5	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
16.0	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
16.5	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
17.0	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
17.5	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
18.0	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
18.5	4199	4199	4199	4199	4199	4199	4199	4199	4199	4199	4199	4199	4199
19.0	4197	4197	4197	4197	4197	4197	4197	4197	4197	4197	4197	4197	4197
19.5	4194	4194	4194	4194	4194	4194	4194	4194	4194	4194	4194	4194	4194
20.0	4187	4187	4187	4187	4187	4187	4187	4187	4187	4187	4187	4187	4187
20.5	4176	4176	4176	4176	4176	4176	4176	4176	4176	4176	4176	4176	4176
21.0	4159	4159	4159	4159	4159	4159	4159	4159	4159	4159	4159	4159	4159
21.5	4136	4136	4136	4136	4136	4136	4136	4136	4136	4136	4136	4136	4136
22.0	4107	4107	4107	4107	4107	4107	4107	4107	4107	4107	4107	4107	4107
22.5	4073	4073	4073	4073	4073	4073	4073	4073	4073	4073	4073	4073	4073
23.0	4035	4035	4035	4035	4035	4035	4035	4035	4035	4035	4035	4035	4035
23.5	3995	3995	3995	3995	3995	3995	3995	3995	3995	3995	3995	3995	3995
24.0	3955	3955	3955	3955	3955	3955	3955	3955	3955	3955	3955	3955	3955
24.5	3915	3915	3915	3915	3915	3915	3915	3915	3915	3915	3915	3915	3915
25.0	3881	3881	3881	3881	3881	3881	3881	3881	3881	3881	3881	3881	3881
25.5	3847	3847	3847	3847	3847	3847	3847	3847	3847	3847	3847	3847	3847
26.0	3816	3816	3816	3815	3816	3816	3816	3815	3815	3816	3816	3815	3815
26.5	3789	3789	3789	3789	3789	3789	3789	3789	3789	3789	3789	3789	3789
27.0	3765	3765	3765	3765	3765	3765	3765	3765	3765	3765	3765	3765	3765

Table 12 Electric power [kW] of the SG 5.0-145 WT AM-6 (@4.2 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3].
(ref: *SG145FR5000kW_R03_15102019*)

6.4.2 Annual Energy Production

Table 13 shows the annual yield [MWh] for the SG 5.0-145 WT AM-6 (@4.2 MW rated power) for different Weibull K-distribution parameter values and annual average wind speeds W_{ave} [m/s]. The values are calculated for 1.225 kg/m^3 standard air density and 10% turbulence intensity.

AEP [MWh]		**Wave [m/s]**										
		5.0	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Weibull K	**1.5**	9023	10681	12259	13734	15095	16333	17446	18434	19301	20050	20688
	2.0	8329	10338	12315	14208	15985	17629	19134	20499	21726	22818	23779
	2.5	7561	9757	12011	14227	16336	18298	20092	21714	23169	24464	25613

Table 13: Annual energy production [MWh] of the SG 5.0-145 WT AM-6 (@4.2 MW rated power) calculated as a function of W_{ave} [m/s]. (ref: *SG145FR5000kW_R03_15102019*)

6.4.3 C_P Curves

Table 14 shows the C_P values for the SG 5.0-145 WT AM-6 (@4.2 MW rated power).

Ws [m/s]	CP [-]
3.0	0.2045
3.5	0.2992
4.0	0.3723
4.5	0.4150
5.0	0.4390
5.5	0.4529
6.0	0.4618
6.5	0.4679
7.0	0.4722
7.5	0.4748
8.0	0.4751
8.5	0.4700
9.0	0.4555
9.5	0.4295
10.0	0.3941
10.5	0.3528
11.0	0.3103
11.5	0.2724
12.0	0.2400
12.5	0.2125
13.0	0.1890
13.5	0.1688
14.0	0.1513
14.5	0.1362
15.0	0.1230
15.5	0.1115
16.0	0.1014
16.5	0.0924
17.0	0.0845
17.5	0.0775
18.0	0.0712
18.5	0.0656
19.0	0.0605
19.5	0.0559
20.0	0.0517
20.5	0.0479
21.0	0.0444
21.5	0.0411
22.0	0.0381
22.5	0.0354
23.0	0.0328
23.5	0.0304
24.0	0.0283
24.5	0.0263
25.0	0.0246
25.5	0.0229
26.0	0.0215
26.5	0.0201
27.0	0.0189

Table 14: C_P values for the SG 5.0-145 WT AM-6 (@4.2 MW rated power).
(ref: *SG145FR5000kW_R03_15102019*)

6.4.4 C_T Curves

Table 15 shows the C_T curves as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

C_T [-]	***Density [kg/m³]***												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948
3.5	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674
4.0	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438
4.5	0.8290	0.8280	0.8282	0.8283	0.8284	0.8285	0.8286	0.8287	0.8288	0.8288	0.8289	0.8290	0.8290
5.0	0.8207	0.8180	0.8184	0.8188	0.8191	0.8194	0.8197	0.8199	0.8202	0.8204	0.8206	0.8207	0.8209
5.5	0.8183	0.8154	0.8158	0.8163	0.8166	0.8170	0.8173	0.8175	0.8178	0.8180	0.8182	0.8183	0.8185
6.0	0.8185	0.8165	0.8168	0.8171	0.8174	0.8176	0.8178	0.8180	0.8181	0.8183	0.8184	0.8185	0.8186
6.5	0.8191	0.8179	0.8181	0.8183	0.8184	0.8185	0.8187	0.8188	0.8189	0.8190	0.8190	0.8191	0.8192
7.0	0.8192	0.8185	0.8186	0.8187	0.8188	0.8189	0.8189	0.8190	0.8191	0.8191	0.8192	0.8192	0.8193
7.5	0.8168	0.8164	0.8165	0.8166	0.8166	0.8167	0.8167	0.8168	0.8168	0.8168	0.8168	0.8168	0.8167
8.0	0.8061	0.8072	0.8073	0.8073	0.8073	0.8073	0.8073	0.8072	0.8070	0.8067	0.8064	0.8058	0.8050
8.5	0.7781	0.7858	0.7858	0.7857	0.7855	0.7851	0.7846	0.7838	0.7827	0.7812	0.7794	0.7770	0.7741
9.0	0.7270	0.7509	0.7505	0.7497	0.7486	0.7470	0.7449	0.7421	0.7387	0.7346	0.7299	0.7243	0.7181
9.5	0.6555	0.7050	0.7033	0.7009	0.6976	0.6934	0.6884	0.6825	0.6758	0.6683	0.6601	0.6512	0.6417
10.0	0.5742	0.6511	0.6470	0.6418	0.6354	0.6280	0.6197	0.6105	0.6008	0.5906	0.5799	0.5689	0.5576
10.5	0.4947	0.5918	0.5847	0.5763	0.5670	0.5569	0.5462	0.5350	0.5236	0.5121	0.5006	0.4890	0.4777
11.0	0.4239	0.5300	0.5203	0.5097	0.4985	0.4869	0.4752	0.4635	0.4519	0.4405	0.4294	0.4186	0.4081
11.5	0.3642	0.4694	0.4581	0.4465	0.4348	0.4231	0.4116	0.4004	0.3896	0.3791	0.3691	0.3595	0.3503
12.0	0.3150	0.4130	0.4014	0.3899	0.3786	0.3676	0.3570	0.3469	0.3373	0.3281	0.3193	0.3110	0.3030
12.5	0.2748	0.3628	0.3517	0.3409	0.3306	0.3207	0.3113	0.3024	0.2940	0.2860	0.2784	0.2712	0.2644
13.0	0.2415	0.3193	0.3091	0.2994	0.2902	0.2815	0.2733	0.2655	0.2582	0.2512	0.2447	0.2385	0.2326
13.5	0.2139	0.2821	0.2730	0.2644	0.2563	0.2487	0.2415	0.2347	0.2283	0.2223	0.2166	0.2112	0.2061
14.0	0.1906	0.2506	0.2425	0.2349	0.2278	0.2211	0.2148	0.2089	0.2033	0.1980	0.1930	0.1883	0.1838
14.5	0.1709	0.2238	0.2167	0.2099	0.2036	0.1977	0.1922	0.1870	0.1820	0.1774	0.1730	0.1688	0.1648
15.0	0.1539	0.2009	0.1946	0.1886	0.1830	0.1778	0.1729	0.1682	0.1638	0.1597	0.1558	0.1521	0.1486
15.5	0.1393	0.1812	0.1756	0.1702	0.1653	0.1606	0.1562	0.1521	0.1482	0.1445	0.1410	0.1376	0.1345
16.0	0.1266	0.1642	0.1591	0.1544	0.1499	0.1457	0.1418	0.1380	0.1345	0.1312	0.1281	0.1251	0.1223
16.5	0.1154	0.1494	0.1448	0.1405	0.1365	0.1327	0.1292	0.1258	0.1226	0.1196	0.1168	0.1141	0.1116
17.0	0.1057	0.1364	0.1322	0.1284	0.1247	0.1213	0.1181	0.1151	0.1122	0.1095	0.1069	0.1045	0.1021
17.5	0.0970	0.1249	0.1212	0.1177	0.1144	0.1113	0.1083	0.1056	0.1030	0.1005	0.0981	0.0959	0.0938
18.0	0.0893	0.1148	0.1114	0.1082	0.1052	0.1023	0.0997	0.0971	0.0948	0.0925	0.0904	0.0883	0.0864
18.5	0.0825	0.1058	0.1027	0.0997	0.0970	0.0944	0.0919	0.0896	0.0875	0.0854	0.0834	0.0816	0.0798
19.0	0.0764	0.0978	0.0949	0.0922	0.0897	0.0873	0.0850	0.0829	0.0809	0.0790	0.0772	0.0755	0.0739
19.5	0.0708	0.0905	0.0879	0.0854	0.0831	0.0809	0.0788	0.0769	0.0750	0.0733	0.0716	0.0700	0.0685
20.0	0.0658	0.0839	0.0815	0.0792	0.0771	0.0751	0.0732	0.0714	0.0697	0.0681	0.0665	0.0651	0.0637
20.5	0.0612	0.0780	0.0757	0.0736	0.0716	0.0698	0.0680	0.0664	0.0648	0.0633	0.0619	0.0606	0.0593
21.0	0.0570	0.0725	0.0704	0.0685	0.0666	0.0649	0.0633	0.0618	0.0603	0.0590	0.0576	0.0564	0.0552
21.5	0.0531	0.0675	0.0655	0.0637	0.0621	0.0605	0.0590	0.0575	0.0562	0.0549	0.0537	0.0526	0.0515
22.0	0.0496	0.0628	0.0610	0.0594	0.0578	0.0563	0.0550	0.0536	0.0524	0.0512	0.0501	0.0491	0.0480
22.5	0.0463	0.0586	0.0569	0.0554	0.0539	0.0526	0.0513	0.0501	0.0489	0.0478	0.0468	0.0458	0.0449
23.0	0.0433	0.0547	0.0532	0.0517	0.0504	0.0491	0.0479	0.0468	0.0457	0.0447	0.0438	0.0429	0.0420
23.5	0.0406	0.0512	0.0498	0.0484	0.0472	0.0460	0.0449	0.0438	0.0428	0.0419	0.0410	0.0401	0.0393
24.0	0.0381	0.0480	0.0467	0.0454	0.0443	0.0432	0.0421	0.0411	0.0402	0.0393	0.0385	0.0377	0.0369
24.5	0.0358	0.0451	0.0439	0.0427	0.0416	0.0406	0.0396	0.0387	0.0378	0.0370	0.0362	0.0355	0.0348
25.0	0.0338	0.0425	0.0414	0.0403	0.0393	0.0383	0.0374	0.0365	0.0357	0.0349	0.0342	0.0335	0.0328
25.5	0.0320	0.0402	0.0391	0.0381	0.0371	0.0362	0.0353	0.0345	0.0338	0.0330	0.0323	0.0317	0.0311
26.0	0.0303	0.0381	0.0371	0.0361	0.0352	0.0343	0.0335	0.0327	0.0320	0.0313	0.0307	0.0300	0.0294
26.5	0.0289	0.0362	0.0352	0.0343	0.0334	0.0326	0.0318	0.0311	0.0304	0.0298	0.0292	0.0286	0.0280
27.0	0.0275	0.0345	0.0335	0.0327	0.0318	0.0311	0.0303	0.0296	0.0290	0.0284	0.0278	0.0272	0.0267

Table 15 C_T curves of the SG 5.0-145 WT AM-6 (@4.2 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3]. (ref: *SG145FR5000kW_R03_15102019*)

6.4.5 Noise Levels

Table 16 includes the numerical values for the estimated L_{WA} noise level in dB(A) for the different wind speeds, from the start-up speed, 3m/s.

Ws [m/s]	LWA [dB(A)]
3.0	95.1
3.5	95.1
4.0	95.1
4.5	95.1
5.0	95.1
5.5	97.2
6.0	99.2
6.5	101.1
7.0	102.7
7.5	104.3
8.0	105.7
8.5	106.3
9.0	106.3
9.5	106.3
10.0	106.3
10.5	106.3
11.0	106.3
11.5	106.3
12.0	106.3
12.5	106.3
13.0	106.3
13.5	106.3
14.0	106.3
14.5	106.3
15.0	106.3

Table 16: Noise levels of the SG 5.0-145 WT AM-6 (@4.2 MW rated power) calculated as a function of W_S [m/s]. (ref: *SG145FR5000kW_R07_04032021*)

6.5 SG 5.0-145 AM-5 (@4.5 MW RATED POWER) PERFORMANCE

6.5.1 Standard Power Curve

Table 17 shows the electrical power [kW] as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

P [kW]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	56	30	33	36	38	41	44	46	49	52	54	57	60
3.5	130	86	90	95	100	104	109	113	118	123	127	132	137
4.0	241	170	178	185	192	200	207	215	222	230	237	245	252
4.5	383	278	289	300	311	322	333	344	355	366	377	388	399
5.0	555	410	425	441	456	471	486	502	517	532	547	563	578
5.5	762	569	590	610	630	651	671	691	711	732	752	772	792
6.0	1009	759	785	812	838	864	891	917	943	969	996	1022	1048
6.5	1300	982	1016	1049	1082	1116	1149	1183	1216	1250	1283	1316	1350
7.0	1638	1242	1284	1325	1367	1409	1451	1492	1534	1576	1617	1659	1700
7.5	2026	1540	1591	1642	1694	1745	1796	1847	1898	1950	2001	2052	2103
8.0	2462	1875	1937	1999	2061	2123	2185	2246	2308	2370	2431	2492	2553
8.5	2930	2240	2313	2387	2460	2533	2606	2679	2751	2823	2894	2965	3034
9.0	3395	2620	2705	2790	2875	2958	3041	3123	3203	3281	3358	3431	3503
9.5	3809	3001	3097	3191	3284	3374	3462	3546	3626	3703	3775	3843	3906
10.0	4133	3370	3471	3569	3662	3751	3834	3911	3982	4046	4105	4158	4206
10.5	4349	3708	3806	3898	3983	4060	4129	4190	4244	4291	4331	4365	4393
11.0	4452	3997	4084	4161	4228	4287	4336	4375	4407	4429	4445	4457	4466
11.5	4482	4224	4291	4346	4390	4422	4444	4459	4469	4475	4480	4484	4486
12.0	4492	4381	4420	4446	4463	4473	4479	4484	4487	4489	4491	4492	4493
12.5	4496	4458	4471	4479	4484	4488	4490	4492	4493	4495	4496	4496	4497
13.0	4498	4482	4487	4490	4492	4494	4495	4496	4497	4498	4498	4498	4499
13.5	4499	4491	4493	4495	4496	4497	4498	4498	4499	4499	4499	4499	4499
14.0	4500	4495	4496	4497	4498	4499	4499	4499	4499	4499	4500	4500	4500
14.5	4500	4498	4498	4499	4499	4499	4499	4500	4500	4500	4500	4500	4500
15.0	4500	4499	4499	4499	4499	4500	4500	4500	4500	4500	4500	4500	4500
15.5	4500	4499	4499	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
16.0	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
16.5	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
17.0	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
17.5	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
18.0	4499	4499	4499	4499	4499	4499	4499	4499	4499	4499	4499	4499	4499
18.5	4498	4498	4498	4498	4498	4498	4498	4498	4498	4498	4498	4498	4498
19.0	4495	4495	4495	4495	4495	4495	4495	4495	4495	4495	4495	4495	4495
19.5	4488	4488	4488	4488	4488	4488	4488	4488	4488	4488	4488	4488	4488
20.0	4475	4475	4475	4475	4475	4475	4475	4475	4475	4475	4475	4475	4475
20.5	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455
21.0	4425	4425	4425	4425	4425	4425	4425	4425	4425	4425	4425	4425	4425
21.5	4386	4386	4386	4386	4386	4386	4386	4386	4386	4386	4386	4386	4386
22.0	4337	4337	4337	4337	4337	4337	4337	4337	4337	4337	4337	4337	4337
22.5	4281	4281	4281	4281	4281	4281	4281	4281	4281	4281	4281	4281	4281
23.0	4221	4221	4221	4221	4221	4221	4221	4221	4221	4221	4221	4221	4221
23.5	4159	4159	4159	4159	4159	4159	4159	4159	4159	4159	4159	4159	4159
24.0	4099	4099	4099	4099	4099	4099	4099	4099	4099	4099	4099	4099	4099
24.5	4040	4040	4040	4040	4040	4040	4040	4040	4040	4040	4040	4040	4040
25.0	3989	3989	3989	3989	3989	3989	3989	3989	3989	3989	3989	3989	3989
25.5	3940	3940	3940	3940	3940	3940	3940	3940	3940	3940	3940	3940	3940
26.0	3896	3896	3896	3896	3896	3896	3896	3896	3896	3896	3896	3896	3896
26.5	3860	3860	3860	3860	3860	3860	3860	3860	3860	3860	3860	3860	3860
27.0	3827	3827	3827	3827	3827	3827	3827	3827	3827	3827	3827	3827	3827

Table 17 Electric power [kW] of the SG 5.0-145 WT AM-5 (@4.5 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3].
(ref: *SG145FR5000kW_R02_28062019*)

6.5.2 Annual Energy Production

Table 18 shows the annual yield [MWh] for the SG 5.0-145 WT AM-5 (@4.5 MW rated power) for different Weibull K-distribution parameter values and annual average wind speeds W_{ave} [m/s]. The values are calculated for 1.225 kg/m^3 standard air density and 10% turbulence intensity.

AEP [MWh]		Wave [m/s]										
		5.0	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Weibull K	**1.5**	9264	11010	12680	14247	15696	17018	18209	19268	20197	21002	21688
	2.0	8457	10549	12627	14633	16527	18290	19911	21385	22715	23900	24944
	2.5	7614	9873	12217	14548	16788	18891	20828	22590	24178	25599	26861

Table 18: Annual energy production [MWh] of the SG 5.0-145 WT AM-5 (@4.5 MW rated power) calculated as a function of W_{ave} [m/s]. (ref: *SG145FR5000kW_R02_28062019*)

6.5.3 C_P Curves

Table 19 shows the C_P values for the SG 5.0-145 WT AM-5 (@4.5 MW rated power).

Ws [m/s]	CP [-]
3.0	0.2045
3.5	0.2992
4.0	0.3723
4.5	0.4150
5.0	0.4390
5.5	0.4529
6.0	0.4618
6.5	0.4679
7.0	0.4722
7.5	0.4749
8.0	0.4754
8.5	0.4716
9.0	0.4604
9.5	0.4393
10.0	0.4086
10.5	0.3714
11.0	0.3307
11.5	0.2914
12.0	0.2570
12.5	0.2276
13.0	0.2024
13.5	0.1808
14.0	0.1621
14.5	0.1459
15.0	0.1318
15.5	0.1195
16.0	0.1086
16.5	0.0990
17.0	0.0906
17.5	0.0830
18.0	0.0763
18.5	0.0702
19.0	0.0648
19.5	0.0598
20.0	0.0553
20.5	0.0511
21.0	0.0472
21.5	0.0436
22.0	0.0403
22.5	0.0372
23.0	0.0343
23.5	0.0317
24.0	0.0293
24.5	0.0272
25.0	0.0252
25.5	0.0235
26.0	0.0219
26.5	0.0205
27.0	0.0192

Table 19: C_P values for the SG 5.0-145 WT AM-5 (@4.5 MW rated power).
(ref: *SG145FR5000kW_R02_28062019*)

6.5.4 C_T Curves

Table 20 shows the C_T curves as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

C_T [-]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948
3.5	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674
4.0	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438
4.5	0.8290	0.8280	0.8282	0.8283	0.8284	0.8285	0.8286	0.8287	0.8288	0.8288	0.8289	0.8290	0.8290
5.0	0.8207	0.8180	0.8184	0.8188	0.8191	0.8194	0.8197	0.8199	0.8202	0.8204	0.8206	0.8207	0.8209
5.5	0.8183	0.8154	0.8158	0.8163	0.8166	0.8170	0.8173	0.8175	0.8178	0.8180	0.8182	0.8183	0.8185
6.0	0.8185	0.8165	0.8168	0.8171	0.8174	0.8176	0.8178	0.8180	0.8181	0.8183	0.8184	0.8185	0.8186
6.5	0.8191	0.8179	0.8181	0.8183	0.8184	0.8185	0.8187	0.8188	0.8189	0.8190	0.8190	0.8191	0.8192
7.0	0.8192	0.8185	0.8186	0.8187	0.8188	0.8189	0.8189	0.8190	0.8191	0.8191	0.8192	0.8192	0.8193
7.5	0.8169	0.8164	0.8165	0.8166	0.8166	0.8167	0.8168	0.8168	0.8168	0.8169	0.8169	0.8169	0.8169
8.0	0.8071	0.8072	0.8073	0.8073	0.8074	0.8074	0.8074	0.8074	0.8074	0.8073	0.8072	0.8070	0.8068
8.5	0.7830	0.7859	0.7859	0.7859	0.7858	0.7858	0.7856	0.7854	0.7849	0.7843	0.7835	0.7824	0.7810
9.0	0.7396	0.7513	0.7512	0.7510	0.7507	0.7501	0.7492	0.7479	0.7462	0.7440	0.7412	0.7379	0.7340
9.5	0.6774	0.7069	0.7063	0.7053	0.7039	0.7019	0.6991	0.6957	0.6914	0.6864	0.6806	0.6742	0.6670
10.0	0.6031	0.6567	0.6546	0.6519	0.6483	0.6439	0.6383	0.6319	0.6245	0.6164	0.6078	0.5986	0.5889
10.5	0.5263	0.6029	0.5986	0.5933	0.5869	0.5796	0.5712	0.5621	0.5523	0.5421	0.5317	0.5210	0.5102
11.0	0.4546	0.5472	0.5401	0.5321	0.5233	0.5137	0.5034	0.4928	0.4819	0.4709	0.4600	0.4493	0.4387
11.5	0.3921	0.4911	0.4818	0.4719	0.4615	0.4508	0.4399	0.4289	0.4181	0.4075	0.3971	0.3871	0.3775
12.0	0.3395	0.4369	0.4264	0.4157	0.4049	0.3941	0.3834	0.3731	0.3630	0.3533	0.3440	0.3351	0.3266
12.5	0.2959	0.3868	0.3761	0.3654	0.3550	0.3448	0.3350	0.3256	0.3166	0.3080	0.2999	0.2921	0.2847
13.0	0.2599	0.3421	0.3317	0.3217	0.3121	0.3029	0.2941	0.2858	0.2779	0.2704	0.2633	0.2565	0.2501
13.5	0.2298	0.3030	0.2935	0.2843	0.2757	0.2675	0.2598	0.2525	0.2455	0.2390	0.2328	0.2269	0.2214
14.0	0.2046	0.2694	0.2607	0.2526	0.2449	0.2377	0.2308	0.2244	0.2183	0.2126	0.2072	0.2020	0.1972
14.5	0.1832	0.2405	0.2328	0.2256	0.2188	0.2124	0.2063	0.2007	0.1953	0.1902	0.1855	0.1809	0.1766
15.0	0.1649	0.2158	0.2089	0.2025	0.1964	0.1907	0.1854	0.1804	0.1756	0.1711	0.1669	0.1629	0.1591
15.5	0.1491	0.1945	0.1884	0.1826	0.1772	0.1722	0.1674	0.1629	0.1587	0.1547	0.1509	0.1473	0.1439
16.0	0.1354	0.1761	0.1706	0.1654	0.1606	0.1561	0.1518	0.1478	0.1440	0.1404	0.1370	0.1338	0.1307
16.5	0.1234	0.1601	0.1551	0.1505	0.1461	0.1420	0.1382	0.1346	0.1312	0.1279	0.1248	0.1219	0.1192
17.0	0.1128	0.1461	0.1416	0.1374	0.1335	0.1298	0.1263	0.1230	0.1199	0.1170	0.1142	0.1115	0.1090
17.5	0.1036	0.1337	0.1297	0.1259	0.1223	0.1189	0.1158	0.1128	0.1100	0.1073	0.1048	0.1024	0.1001
18.0	0.0953	0.1228	0.1191	0.1156	0.1124	0.1093	0.1064	0.1037	0.1012	0.0987	0.0964	0.0942	0.0921
18.5	0.0880	0.1131	0.1097	0.1066	0.1036	0.1008	0.0981	0.0957	0.0933	0.0911	0.0890	0.0870	0.0851
19.0	0.0814	0.1044	0.1013	0.0984	0.0957	0.0931	0.0907	0.0884	0.0863	0.0842	0.0823	0.0804	0.0787
19.5	0.0754	0.0966	0.0937	0.0911	0.0886	0.0862	0.0840	0.0819	0.0799	0.0780	0.0762	0.0745	0.0729
20.0	0.0699	0.0894	0.0868	0.0844	0.0821	0.0799	0.0779	0.0759	0.0741	0.0724	0.0707	0.0692	0.0677
20.5	0.0650	0.0829	0.0805	0.0783	0.0761	0.0741	0.0723	0.0705	0.0688	0.0672	0.0657	0.0642	0.0629
21.0	0.0603	0.0769	0.0747	0.0726	0.0706	0.0688	0.0671	0.0654	0.0639	0.0624	0.0610	0.0597	0.0584
21.5	0.0561	0.0713	0.0693	0.0674	0.0656	0.0639	0.0623	0.0608	0.0593	0.0580	0.0567	0.0555	0.0543
22.0	0.0521	0.0662	0.0643	0.0625	0.0609	0.0593	0.0578	0.0564	0.0551	0.0539	0.0527	0.0516	0.0505
22.5	0.0485	0.0614	0.0597	0.0581	0.0565	0.0551	0.0537	0.0525	0.0512	0.0501	0.0490	0.0480	0.0470
23.0	0.0451	0.0571	0.0555	0.0540	0.0526	0.0513	0.0500	0.0488	0.0477	0.0466	0.0456	0.0447	0.0437
23.5	0.0421	0.0532	0.0517	0.0503	0.0490	0.0478	0.0466	0.0455	0.0445	0.0435	0.0425	0.0417	0.0408
24.0	0.0394	0.0497	0.0483	0.0470	0.0458	0.0446	0.0436	0.0425	0.0416	0.0407	0.0398	0.0390	0.0382
24.5	0.0369	0.0465	0.0452	0.0440	0.0429	0.0418	0.0408	0.0398	0.0389	0.0381	0.0373	0.0365	0.0358
25.0	0.0347	0.0437	0.0425	0.0414	0.0403	0.0393	0.0384	0.0375	0.0366	0.0358	0.0351	0.0344	0.0337
25.5	0.0327	0.0412	0.0400	0.0390	0.0380	0.0370	0.0362	0.0353	0.0345	0.0338	0.0331	0.0324	0.0318
26.0	0.0309	0.0389	0.0378	0.0368	0.0359	0.0350	0.0342	0.0334	0.0326	0.0319	0.0313	0.0306	0.0300
26.5	0.0294	0.0369	0.0359	0.0349	0.0340	0.0332	0.0324	0.0317	0.0310	0.0303	0.0297	0.0291	0.0285
27.0	0.0279	0.0350	0.0341	0.0332	0.0323	0.0316	0.0308	0.0301	0.0294	0.0288	0.0282	0.0276	0.0271

Table 20 C_T curves of the SG 5.0-145 WT AM-5 (@4.5 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3]. (ref: *SG145FR5000kW_R02_28062019*)

6.5.5 Noise Levels

Table 21 includes the numerical values for the estimated L_{WA} noise level in dB(A) for the different wind speeds, from the start-up speed, 3m/s.

Ws [m/s]	LWA [dB(A)]
3.0	95.1
3.5	95.1
4.0	95.1
4.5	95.1
5.0	95.1
5.5	97.2
6.0	99.2
6.5	101.1
7.0	102.7
7.5	104.3
8.0	105.7
8.5	106.3
9.0	106.3
9.5	106.3
10.0	106.3
10.5	106.3
11.0	106.3
11.5	106.3
12.0	106.3
12.5	106.3
13.0	106.3
13.5	106.3
14.0	106.3
14.5	106.3
15.0	106.3

Table 21: Noise levels of the SG 5.0-145 WT AM-5 (@4.5 MW rated power) calculated as a function of W_S [m/s]. (ref: *SG145FR5000kW_R07_04032021*)

6.6 SG 5.0-145 AM-4 (@4.6 MW RATED POWER) PERFORMANCE

6.6.1 Standard Power Curve

Table 22 shows the electrical power [kW] as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

P [kW]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	56	30	33	36	38	41	44	46	49	52	54	57	60
3.5	130	86	90	95	100	104	109	113	118	123	127	132	137
4.0	241	170	178	185	192	200	207	215	222	230	237	245	252
4.5	383	278	289	300	311	322	333	344	355	366	377	388	399
5.0	555	410	425	441	456	471	486	502	517	532	547	563	578
5.5	762	569	590	610	630	651	671	691	711	732	752	772	792
6.0	1009	759	785	812	838	864	891	917	943	969	996	1022	1048
6.5	1300	982	1016	1049	1082	1116	1149	1183	1216	1250	1283	1316	1350
7.0	1638	1242	1284	1325	1367	1409	1451	1492	1534	1576	1617	1659	1700
7.5	2026	1540	1591	1642	1694	1745	1796	1847	1898	1950	2001	2052	2103
8.0	2462	1875	1937	1999	2061	2123	2185	2246	2308	2370	2431	2493	2554
8.5	2931	2240	2313	2387	2460	2533	2606	2679	2752	2824	2896	2967	3037
9.0	3403	2620	2706	2790	2875	2959	3043	3126	3207	3287	3364	3440	3514
9.5	3830	3002	3098	3193	3287	3379	3469	3555	3639	3718	3794	3866	3933
10.0	4173	3373	3476	3576	3673	3765	3852	3934	4010	4080	4143	4201	4254
10.5	4411	3718	3821	3917	4007	4090	4165	4232	4292	4345	4390	4430	4463
11.0	4537	4020	4113	4196	4270	4335	4392	4439	4477	4507	4528	4545	4557
11.5	4578	4264	4338	4401	4454	4495	4525	4546	4559	4569	4575	4580	4583
12.0	4590	4441	4490	4526	4549	4564	4573	4579	4584	4587	4589	4591	4592
12.5	4595	4541	4561	4573	4580	4585	4588	4590	4592	4593	4595	4596	4596
13.0	4598	4577	4583	4587	4590	4592	4594	4595	4596	4597	4598	4598	4598
13.5	4599	4588	4591	4593	4595	4596	4597	4598	4598	4599	4599	4599	4599
14.0	4599	4594	4595	4597	4598	4598	4599	4599	4599	4599	4599	4600	4600
14.5	4600	4597	4598	4598	4599	4599	4599	4599	4600	4600	4600	4600	4600
15.0	4600	4598	4599	4599	4599	4599	4600	4600	4600	4600	4600	4600	4600
15.5	4600	4599	4599	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600
16.0	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600
16.5	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600
17.0	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600
17.5	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600
18.0	4599	4599	4599	4599	4599	4599	4599	4599	4599	4599	4599	4599	4599
18.5	4598	4598	4598	4598	4598	4598	4598	4598	4598	4598	4598	4598	4598
19.0	4594	4594	4594	4594	4594	4594	4594	4594	4594	4594	4594	4594	4594
19.5	4586	4586	4586	4586	4586	4586	4586	4586	4586	4586	4586	4586	4586
20.0	4571	4571	4571	4571	4571	4571	4571	4571	4571	4571	4571	4571	4571
20.5	4548	4548	4548	4548	4548	4548	4548	4548	4548	4548	4548	4548	4548
21.0	4514	4514	4514	4514	4514	4514	4514	4514	4514	4514	4514	4514	4514
21.5	4469	4469	4469	4469	4469	4469	4469	4469	4469	4469	4469	4469	4469
22.0	4414	4414	4413	4413	4414	4414	4414	4413	4414	4414	4413	4414	4413
22.5	4351	4351	4351	4351	4351	4351	4351	4351	4351	4351	4351	4351	4351
23.0	4283	4283	4283	4283	4283	4283	4283	4283	4283	4283	4283	4283	4283
23.5	4214	4214	4214	4214	4214	4214	4214	4214	4214	4214	4214	4214	4214
24.0	4147	4147	4146	4146	4147	4147	4147	4146	4146	4147	4146	4146	4146
24.5	4081	4081	4081	4081	4081	4081	4081	4081	4081	4081	4081	4081	4081
25.0	4025	4025	4025	4024	4025	4025	4025	4024	4025	4025	4025	4025	4024
25.5	3971	3971	3971	3971	3971	3971	3971	3971	3971	3971	3971	3971	3971
26.0	3923	3923	3923	3923	3923	3923	3923	3923	3923	3923	3923	3923	3923
26.5	3883	3883	3883	3883	3883	3883	3883	3883	3883	3883	3883	3883	3883
27.0	3848	3848	3848	3848	3848	3848	3848	3848	3848	3848	3848	3848	3848

Table 22 Electric power [kW] of the SG 5.0-145 WT AM-4 (@4.6 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3].
(ref: *SG145FR5000kW_R02_28062019*)

6.6.2 Annual Energy Production

Table 23 shows the annual output [MWh] for the SG 5.0-145 WT AM-4 (@4.6 MW rated power) for different Weibull K-distribution parameter values and annual average wind speeds W_{ave} [m/s]. The values are calculated for 1.225 kg/m^3 standard air density and 10% turbulence intensity.

AEP [MWh]		**Wave [m/s]**										
		5.0	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Weibull K	**1.5**	9339	11113	12812	14409	15888	17238	18454	19536	20487	21309	22011
	2.0	8494	10613	12723	14764	16697	18498	20157	21668	23031	24247	25319
	2.5	7629	9906	12278	14644	16926	19074	21058	22866	24498	25961	27261

Table 23: Annual energy production [MWh] of the SG 5.0-145 WT AM-4 (@4.6 MW rated power) calculated as a function of W_{ave} [m/s]. (ref: *SG145FR5000kW_R02_28062019*)

6.6.3 C_P Curves

Table 24 shows the C_P values for the SG 5.0-145 WT AM-4 (@4.6 MW rated power).

Ws [m/s]	CP [-]
3.0	0.2045
3.5	0.2992
4.0	0.3723
4.5	0.4150
5.0	0.4390
5.5	0.4529
6.0	0.4618
6.5	0.4679
7.0	0.4722
7.5	0.4749
8.0	0.4754
8.5	0.4719
9.0	0.4615
9.5	0.4417
10.0	0.4126
10.5	0.3767
11.0	0.3370
11.5	0.2976
12.0	0.2626
12.5	0.2326
13.0	0.2069
13.5	0.1848
14.0	0.1657
14.5	0.1492
15.0	0.1348
15.5	0.1221
16.0	0.1110
16.5	0.1012
17.0	0.0926
17.5	0.0849
18.0	0.0780
18.5	0.0718
19.0	0.0662
19.5	0.0611
20.0	0.0565
20.5	0.0522
21.0	0.0482
21.5	0.0445
22.0	0.0410
22.5	0.0378
23.0	0.0348
23.5	0.0321
24.0	0.0297
24.5	0.0274
25.0	0.0255
25.5	0.0237
26.0	0.0221
26.5	0.0206
27.0	0.0193

Table 24: C_P values for the SG 5.0-145 WT AM-4 (@4.6 MW rated power).
(ref: *SG145FR5000kW_R02_28062019*)

6.6.4 C_T Curves

Table 25 shows the C_T curves as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m³].

C_T [-]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948
3.5	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674
4.0	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438
4.5	0.8290	0.8280	0.8282	0.8283	0.8284	0.8285	0.8286	0.8287	0.8288	0.8288	0.8289	0.8290	0.8290
5.0	0.8207	0.8180	0.8184	0.8188	0.8191	0.8194	0.8197	0.8199	0.8202	0.8204	0.8206	0.8207	0.8209
5.5	0.8183	0.8154	0.8158	0.8163	0.8166	0.8170	0.8173	0.8175	0.8178	0.8180	0.8182	0.8183	0.8185
6.0	0.8185	0.8165	0.8168	0.8171	0.8174	0.8176	0.8178	0.8180	0.8181	0.8183	0.8184	0.8185	0.8186
6.5	0.8191	0.8179	0.8181	0.8183	0.8184	0.8185	0.8187	0.8188	0.8189	0.8190	0.8190	0.8191	0.8192
7.0	0.8192	0.8185	0.8186	0.8187	0.8188	0.8189	0.8189	0.8190	0.8191	0.8191	0.8192	0.8192	0.8193
7.5	0.8169	0.8164	0.8165	0.8166	0.8166	0.8167	0.8168	0.8168	0.8168	0.8169	0.8169	0.8169	0.8170
8.0	0.8073	0.8072	0.8073	0.8073	0.8074	0.8074	0.8074	0.8074	0.8074	0.8074	0.8073	0.8072	0.8070
8.5	0.7839	0.7859	0.7859	0.7859	0.7859	0.7858	0.7858	0.7856	0.7853	0.7849	0.7843	0.7835	0.7823
9.0	0.7423	0.7514	0.7513	0.7512	0.7510	0.7506	0.7499	0.7490	0.7477	0.7459	0.7437	0.7410	0.7377
9.5	0.6829	0.7072	0.7068	0.7061	0.7050	0.7035	0.7014	0.6986	0.6950	0.6907	0.6858	0.6801	0.6737
10.0	0.6112	0.6577	0.6562	0.6540	0.6511	0.6474	0.6428	0.6372	0.6307	0.6234	0.6155	0.6070	0.5979
10.5	0.5358	0.6054	0.6018	0.5973	0.5918	0.5853	0.5779	0.5696	0.5605	0.5509	0.5410	0.5307	0.5203
11.0	0.4643	0.5514	0.5453	0.5381	0.5300	0.5212	0.5116	0.5015	0.4910	0.4804	0.4697	0.4591	0.4485
11.5	0.4012	0.4970	0.4885	0.4792	0.4694	0.4591	0.4486	0.4379	0.4272	0.4166	0.4063	0.3962	0.3864
12.0	0.3476	0.4440	0.4339	0.4236	0.4130	0.4024	0.3919	0.3815	0.3714	0.3616	0.3522	0.3432	0.3345
12.5	0.3030	0.3943	0.3837	0.3732	0.3628	0.3526	0.3428	0.3333	0.3241	0.3154	0.3071	0.2991	0.2916
13.0	0.2660	0.3494	0.3390	0.3290	0.3193	0.3100	0.3011	0.2926	0.2845	0.2768	0.2695	0.2626	0.2561
13.5	0.2352	0.3099	0.3002	0.2910	0.2822	0.2738	0.2659	0.2584	0.2513	0.2446	0.2382	0.2322	0.2265
14.0	0.2093	0.2756	0.2668	0.2585	0.2507	0.2432	0.2363	0.2297	0.2234	0.2175	0.2120	0.2067	0.2017
14.5	0.1873	0.2461	0.2382	0.2308	0.2238	0.2173	0.2111	0.2053	0.1998	0.1946	0.1897	0.1850	0.1806
15.0	0.1685	0.2208	0.2138	0.2071	0.2009	0.1951	0.1896	0.1845	0.1796	0.1750	0.1706	0.1665	0.1626
15.5	0.1524	0.1990	0.1927	0.1868	0.1813	0.1761	0.1712	0.1666	0.1622	0.1581	0.1542	0.1505	0.1470
16.0	0.1383	0.1801	0.1745	0.1692	0.1642	0.1596	0.1552	0.1511	0.1472	0.1435	0.1400	0.1367	0.1335
16.5	0.1260	0.1637	0.1586	0.1538	0.1494	0.1452	0.1412	0.1375	0.1340	0.1307	0.1276	0.1246	0.1217
17.0	0.1153	0.1493	0.1447	0.1404	0.1364	0.1326	0.1290	0.1257	0.1225	0.1195	0.1166	0.1139	0.1114
17.5	0.1058	0.1367	0.1325	0.1286	0.1249	0.1215	0.1183	0.1152	0.1123	0.1096	0.1070	0.1045	0.1022
18.0	0.0973	0.1255	0.1217	0.1182	0.1148	0.1117	0.1087	0.1059	0.1033	0.1008	0.0985	0.0962	0.0941
18.5	0.0898	0.1156	0.1121	0.1088	0.1058	0.1029	0.1002	0.0977	0.0953	0.0930	0.0908	0.0888	0.0868
19.0	0.0830	0.1066	0.1035	0.1005	0.0977	0.0951	0.0926	0.0903	0.0881	0.0860	0.0840	0.0821	0.0803
19.5	0.0769	0.0986	0.0957	0.0930	0.0904	0.0880	0.0857	0.0836	0.0815	0.0796	0.0778	0.0761	0.0744
20.0	0.0713	0.0913	0.0886	0.0861	0.0838	0.0815	0.0794	0.0775	0.0756	0.0738	0.0721	0.0706	0.0690
20.5	0.0662	0.0846	0.0821	0.0798	0.0776	0.0756	0.0737	0.0719	0.0701	0.0685	0.0670	0.0655	0.0641
21.0	0.0615	0.0784	0.0761	0.0740	0.0720	0.0701	0.0683	0.0667	0.0651	0.0636	0.0621	0.0608	0.0595
21.5	0.0571	0.0726	0.0705	0.0686	0.0667	0.0650	0.0634	0.0618	0.0604	0.0590	0.0577	0.0564	0.0552
22.0	0.0530	0.0673	0.0654	0.0636	0.0619	0.0603	0.0588	0.0574	0.0560	0.0547	0.0535	0.0524	0.0513
22.5	0.0492	0.0624	0.0606	0.0590	0.0574	0.0559	0.0546	0.0533	0.0520	0.0508	0.0497	0.0487	0.0477
23.0	0.0457	0.0579	0.0563	0.0548	0.0533	0.0520	0.0507	0.0495	0.0483	0.0473	0.0462	0.0453	0.0443
23.5	0.0426	0.0539	0.0524	0.0510	0.0496	0.0484	0.0472	0.0461	0.0450	0.0440	0.0431	0.0422	0.0413
24.0	0.0398	0.0503	0.0489	0.0475	0.0463	0.0451	0.0440	0.0430	0.0420	0.0411	0.0402	0.0394	0.0386
24.5	0.0372	0.0470	0.0457	0.0444	0.0433	0.0422	0.0412	0.0402	0.0393	0.0385	0.0376	0.0369	0.0361
25.0	0.0350	0.0441	0.0429	0.0417	0.0407	0.0396	0.0387	0.0378	0.0369	0.0361	0.0354	0.0346	0.0339
25.5	0.0330	0.0415	0.0403	0.0393	0.0383	0.0373	0.0364	0.0356	0.0348	0.0340	0.0333	0.0326	0.0320
26.0	0.0311	0.0392	0.0381	0.0371	0.0361	0.0352	0.0344	0.0336	0.0329	0.0321	0.0315	0.0308	0.0302
26.5	0.0295	0.0371	0.0361	0.0351	0.0342	0.0334	0.0326	0.0318	0.0311	0.0305	0.0298	0.0292	0.0287
27.0	0.0281	0.0352	0.0343	0.0334	0.0325	0.0317	0.0310	0.0303	0.0296	0.0290	0.0283	0.0278	0.0272

Table 25 C_T curves of the SG 5.0-145 WT AM-4 (@4.6 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m³]. (ref: *SG145FR5000kW_R02_28062019*)

6.6.5 Noise Levels

Table 26 includes the numerical values for the estimated L_{WA} noise level in dB(A) for the different wind speeds, from the start-up speed, 3m/s.

Ws [m/s]	LWA [dB(A)]
3.0	95.1
3.5	95.1
4.0	95.1
4.5	95.1
5.0	95.1
5.5	97.2
6.0	99.2
6.5	101.1
7.0	102.7
7.5	104.3
8.0	105.7
8.5	106.3
9.0	106.3
9.5	106.3
10.0	106.3
10.5	106.3
11.0	106.3
11.5	106.3
12.0	106.3
12.5	106.3
13.0	106.3
13.5	106.3
14.0	106.3
14.5	106.3
15.0	106.3

Table 26: Noise levels of the SG 5.0-145 WT AM-4 (@4.6 MW rated power) calculated as a function of W_S [m/s]. (ref: *SG145FR5000kW_R07_04032021*)

6.7 SG 5.0-145 AM-3 (@4.7 MW RATED POWER) PERFORMANCE

6.7.1 Standard Power Curve

Table 27 shows the electrical power [kW] in function of the horizontal wind speed at hub height Ws [m/s] for different air densities [kg/m^3].

P [kW]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	56	30	33	36	38	41	44	46	49	52	54	57	60
3.5	130	86	90	95	100	104	109	113	118	123	127	132	137
4.0	241	170	178	185	192	200	207	215	222	230	237	245	252
4.5	383	278	289	300	311	322	333	344	355	366	377	388	399
5.0	555	410	425	441	456	471	486	502	517	532	547	563	578
5.5	762	569	590	610	630	651	671	691	711	732	752	772	792
6.0	1009	759	785	812	838	864	891	917	943	969	996	1022	1048
6.5	1300	982	1016	1049	1082	1116	1149	1183	1216	1250	1283	1316	1350
7.0	1638	1242	1284	1325	1367	1409	1451	1492	1534	1576	1617	1659	1700
7.5	2026	1540	1591	1642	1694	1745	1796	1847	1898	1950	2001	2052	2103
8.0	2462	1875	1937	1999	2061	2123	2185	2246	2308	2370	2431	2493	2554
8.5	2933	2240	2313	2387	2460	2533	2606	2679	2752	2825	2897	2968	3039
9.0	3409	2620	2706	2791	2876	2960	3044	3127	3210	3291	3370	3447	3523
9.5	3848	3003	3099	3195	3289	3383	3474	3563	3649	3732	3810	3885	3956
10.0	4209	3375	3480	3582	3681	3776	3868	3954	4034	4109	4177	4240	4297
10.5	4468	3726	3832	3933	4028	4116	4196	4269	4335	4393	4445	4489	4528
11.0	4618	4039	4138	4227	4308	4379	4442	4496	4542	4578	4607	4628	4644
11.5	4672	4298	4380	4451	4511	4561	4600	4627	4647	4660	4669	4675	4680
12.0	4688	4494	4553	4599	4630	4652	4666	4674	4680	4684	4687	4689	4691
12.5	4694	4618	4646	4664	4674	4681	4685	4688	4690	4692	4693	4695	4696
13.0	4697	4670	4678	4684	4688	4690	4692	4694	4695	4696	4697	4698	4698
13.5	4699	4686	4689	4692	4694	4695	4696	4697	4698	4698	4699	4699	4699
14.0	4699	4692	4694	4696	4697	4698	4698	4699	4699	4699	4699	4699	4699
14.5	4700	4696	4697	4698	4698	4699	4699	4699	4699	4700	4700	4700	4700
15.0	4700	4698	4698	4699	4699	4699	4700	4700	4700	4700	4700	4700	4700
15.5	4700	4699	4699	4699	4700	4700	4700	4700	4700	4700	4700	4700	4700
16.0	4700	4699	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700
16.5	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700
17.0	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700
17.5	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700
18.0	4699	4699	4699	4699	4699	4699	4699	4699	4699	4699	4699	4699	4699
18.5	4697	4697	4697	4697	4697	4697	4697	4697	4697	4697	4697	4697	4697
19.0	4693	4693	4693	4693	4693	4693	4693	4693	4693	4693	4693	4693	4693
19.5	4684	4684	4684	4684	4684	4684	4684	4684	4684	4684	4684	4684	4684
20.0	4667	4667	4667	4667	4667	4667	4667	4667	4667	4667	4667	4667	4667
20.5	4641	4641	4641	4641	4641	4641	4641	4641	4641	4641	4641	4641	4641
21.0	4603	4603	4603	4603	4603	4603	4603	4603	4603	4603	4603	4603	4603
21.5	4552	4552	4552	4552	4552	4552	4552	4552	4552	4552	4552	4552	4552
22.0	4490	4490	4490	4490	4490	4490	4490	4490	4490	4490	4490	4490	4490
22.5	4420	4420	4420	4420	4420	4420	4420	4420	4420	4420	4420	4420	4420
23.0	4345	4345	4345	4345	4345	4345	4345	4345	4345	4345	4345	4345	4345
23.5	4268	4268	4268	4268	4268	4268	4268	4268	4268	4268	4268	4268	4268
24.0	4194	4194	4194	4194	4194	4194	4194	4194	4194	4194	4194	4194	4194
24.5	4122	4122	4122	4122	4122	4122	4122	4122	4122	4122	4122	4122	4122
25.0	4061	4061	4061	4061	4061	4061	4061	4060	4060	4061	4061	4061	4060
25.5	4003	4003	4003	4003	4003	4003	4003	4002	4002	4003	4003	4003	4002
26.0	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950
26.5	3907	3907	3907	3907	3907	3907	3907	3907	3907	3907	3907	3907	3907
27.0	3868	3868	3868	3868	3868	3868	3868	3868	3868	3868	3868	3868	3868

Table 27 Electric power [kW] of the SG 5.0-145 WT AM-3 (@4.7 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3].
(ref: *SG145FR5000kW_R02_28062019*)

6.7.2 Annual Energy Production

Table 28 shows the annual output [MWh] for the SG 5.0-145 WT AM-3 (@4.7 MW rated power) for different Weibull K-distribution parameter values and annual average wind speeds W_{ave} [m/s]. The values are calculated for 1.225 kg/m^3 standard air density and 10% turbulence intensity.

AEP [MWh]		Wave [m/s]										
		5.0	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Weibull K	**1.5**	9411	11213	12941	14568	16075	17452	18694	19799	20771	21612	22330
	2.0	8529	10673	12814	14891	16861	18700	20397	21944	23341	24588	25688
	2.5	7642	9936	12334	14735	17058	19250	21280	23134	24810	26314	27654

Table 28: Annual energy production [MWh] of the SG 5.0-145 WT AM-3 (@4.7 MW rated power) calculated as a function of W_{ave} [m/s]. (ref: *SG145FR5000kW_R02_28062019*)

6.7.3 C_P Curves

Table 29 shows the C_P values for the SG 5.0-145 WT AM-3 (@4.7 MW rated power).

Ws [m/s]	CP [-]
3.0	0.2045
3.5	0.2992
4.0	0.3723
4.5	0.4150
5.0	0.4390
5.5	0.4529
6.0	0.4618
6.5	0.4679
7.0	0.4722
7.5	0.4749
8.0	0.4754
8.5	0.4721
9.0	0.4623
9.5	0.4438
10.0	0.4161
10.5	0.3816
11.0	0.3431
11.5	0.3037
12.0	0.2682
12.5	0.2376
13.0	0.2114
13.5	0.1888
14.0	0.1693
14.5	0.1524
15.0	0.1377
15.5	0.1248
16.0	0.1134
16.5	0.1034
17.0	0.0946
17.5	0.0867
18.0	0.0797
18.5	0.0733
19.0	0.0676
19.5	0.0625
20.0	0.0577
20.5	0.0533
21.0	0.0491
21.5	0.0453
22.0	0.0417
22.5	0.0384
23.0	0.0353
23.5	0.0325
24.0	0.0300
24.5	0.0277
25.0	0.0257
25.5	0.0239
26.0	0.0222
26.5	0.0208
27.0	0.0194

Table 29: C_P values for the SG 5.0-145 WT AM-3 (@4.7 MW rated power).
(ref: *SG145FR5000kW_R02_28062019*)

6.7.4 C_T Curves

Table 30 shows the C_T curves as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

C_T [-]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948
3.5	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674
4.0	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438
4.5	0.8290	0.8280	0.8282	0.8283	0.8284	0.8285	0.8286	0.8287	0.8288	0.8288	0.8289	0.8290	0.8290
5.0	0.8207	0.8180	0.8184	0.8188	0.8191	0.8194	0.8197	0.8199	0.8202	0.8204	0.8206	0.8207	0.8209
5.5	0.8183	0.8154	0.8158	0.8163	0.8166	0.8170	0.8173	0.8175	0.8178	0.8180	0.8182	0.8183	0.8185
6.0	0.8185	0.8165	0.8168	0.8171	0.8174	0.8176	0.8178	0.8180	0.8181	0.8183	0.8184	0.8185	0.8186
6.5	0.8191	0.8179	0.8181	0.8183	0.8184	0.8185	0.8187	0.8188	0.8189	0.8190	0.8190	0.8191	0.8192
7.0	0.8192	0.8185	0.8186	0.8187	0.8188	0.8189	0.8189	0.8190	0.8191	0.8191	0.8192	0.8192	0.8193
7.5	0.8169	0.8164	0.8165	0.8166	0.8166	0.8167	0.8168	0.8168	0.8168	0.8169	0.8169	0.8170	0.8170
8.0	0.8074	0.8072	0.8073	0.8073	0.8074	0.8074	0.8074	0.8074	0.8075	0.8074	0.8074	0.8073	0.8072
8.5	0.7845	0.7859	0.7859	0.7859	0.7859	0.7859	0.7858	0.7857	0.7856	0.7853	0.7848	0.7842	0.7834
9.0	0.7446	0.7514	0.7514	0.7513	0.7511	0.7509	0.7505	0.7498	0.7488	0.7474	0.7457	0.7434	0.7407
9.5	0.6877	0.7074	0.7071	0.7066	0.7058	0.7047	0.7031	0.7009	0.6980	0.6944	0.6901	0.6852	0.6796
10.0	0.6185	0.6585	0.6573	0.6556	0.6533	0.6503	0.6465	0.6417	0.6362	0.6296	0.6224	0.6146	0.6062
10.5	0.5447	0.6073	0.6044	0.6006	0.5959	0.5903	0.5838	0.5763	0.5681	0.5590	0.5496	0.5398	0.5298
11.0	0.4737	0.5550	0.5497	0.5433	0.5360	0.5280	0.5192	0.5096	0.4997	0.4894	0.4789	0.4685	0.4581
11.5	0.4101	0.5022	0.4945	0.4859	0.4767	0.4670	0.4569	0.4465	0.4360	0.4255	0.4152	0.4051	0.3953
12.0	0.3557	0.4504	0.4409	0.4310	0.4208	0.4105	0.4001	0.3898	0.3797	0.3699	0.3603	0.3512	0.3424
12.5	0.3101	0.4013	0.3911	0.3807	0.3704	0.3603	0.3505	0.3409	0.3316	0.3227	0.3142	0.3061	0.2984
13.0	0.2722	0.3564	0.3462	0.3362	0.3264	0.3170	0.3080	0.2994	0.2911	0.2833	0.2758	0.2687	0.2620
13.5	0.2406	0.3166	0.3069	0.2975	0.2886	0.2801	0.2721	0.2644	0.2571	0.2502	0.2437	0.2376	0.2317
14.0	0.2140	0.2818	0.2729	0.2644	0.2564	0.2488	0.2417	0.2349	0.2285	0.2225	0.2168	0.2114	0.2062
14.5	0.1915	0.2517	0.2437	0.2361	0.2289	0.2222	0.2159	0.2099	0.2043	0.1990	0.1939	0.1891	0.1846
15.0	0.1722	0.2258	0.2186	0.2118	0.2055	0.1995	0.1939	0.1886	0.1836	0.1789	0.1744	0.1702	0.1661
15.5	0.1557	0.2035	0.1970	0.1910	0.1853	0.1800	0.1750	0.1702	0.1658	0.1616	0.1576	0.1538	0.1502
16.0	0.1413	0.1841	0.1783	0.1729	0.1678	0.1631	0.1586	0.1543	0.1503	0.1466	0.1430	0.1396	0.1364
16.5	0.1287	0.1673	0.1621	0.1572	0.1526	0.1483	0.1443	0.1405	0.1369	0.1335	0.1303	0.1272	0.1243
17.0	0.1177	0.1526	0.1479	0.1435	0.1393	0.1355	0.1318	0.1283	0.1251	0.1220	0.1191	0.1163	0.1137
17.5	0.1080	0.1396	0.1354	0.1314	0.1276	0.1241	0.1208	0.1176	0.1147	0.1119	0.1092	0.1067	0.1043
18.0	0.0993	0.1282	0.1243	0.1207	0.1173	0.1140	0.1110	0.1082	0.1055	0.1029	0.1005	0.0982	0.0960
18.5	0.0916	0.1180	0.1145	0.1111	0.1080	0.1051	0.1023	0.0997	0.0972	0.0949	0.0927	0.0906	0.0886
19.0	0.0847	0.1089	0.1056	0.1026	0.0997	0.0971	0.0945	0.0921	0.0899	0.0877	0.0857	0.0838	0.0819
19.5	0.0784	0.1007	0.0977	0.0949	0.0923	0.0898	0.0875	0.0853	0.0832	0.0812	0.0793	0.0776	0.0759
20.0	0.0727	0.0931	0.0904	0.0878	0.0854	0.0832	0.0810	0.0790	0.0771	0.0753	0.0736	0.0719	0.0704
20.5	0.0675	0.0862	0.0837	0.0814	0.0791	0.0771	0.0751	0.0732	0.0715	0.0698	0.0682	0.0667	0.0653
21.0	0.0626	0.0799	0.0775	0.0754	0.0733	0.0714	0.0696	0.0679	0.0663	0.0647	0.0633	0.0619	0.0606
21.5	0.0580	0.0739	0.0718	0.0698	0.0679	0.0662	0.0645	0.0629	0.0614	0.0600	0.0587	0.0574	0.0562
22.0	0.0538	0.0684	0.0665	0.0646	0.0629	0.0613	0.0598	0.0583	0.0569	0.0556	0.0544	0.0532	0.0521
22.5	0.0499	0.0634	0.0616	0.0599	0.0583	0.0568	0.0554	0.0541	0.0528	0.0516	0.0505	0.0494	0.0484
23.0	0.0464	0.0588	0.0571	0.0555	0.0541	0.0527	0.0514	0.0502	0.0490	0.0479	0.0469	0.0459	0.0449
23.5	0.0431	0.0546	0.0530	0.0516	0.0502	0.0490	0.0478	0.0466	0.0456	0.0446	0.0436	0.0427	0.0418
24.0	0.0402	0.0508	0.0494	0.0481	0.0468	0.0456	0.0445	0.0435	0.0425	0.0415	0.0406	0.0398	0.0390
24.5	0.0376	0.0474	0.0461	0.0449	0.0437	0.0426	0.0416	0.0406	0.0397	0.0388	0.0380	0.0372	0.0365
25.0	0.0353	0.0445	0.0432	0.0421	0.0410	0.0400	0.0390	0.0381	0.0373	0.0364	0.0357	0.0349	0.0342
25.5	0.0332	0.0418	0.0407	0.0396	0.0386	0.0376	0.0367	0.0359	0.0350	0.0343	0.0336	0.0329	0.0322
26.0	0.0313	0.0394	0.0383	0.0373	0.0364	0.0355	0.0346	0.0338	0.0331	0.0323	0.0317	0.0310	0.0304
26.5	0.0297	0.0373	0.0363	0.0353	0.0344	0.0336	0.0328	0.0320	0.0313	0.0306	0.0300	0.0294	0.0288
27.0	0.0282	0.0354	0.0344	0.0335	0.0327	0.0319	0.0311	0.0304	0.0297	0.0291	0.0285	0.0279	0.0274

Table 30 C_T curves of the SG 5.0-145 WT AM-3 (@4.7 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3]. (ref: *SG145FR5000kW_R02_28062019*)

6.7.5 Noise Levels

Table 31 includes the numerical values for the estimated L_{WA} noise level in dB(A) for the different wind speeds, from the start-up speed, 3m/s.

Ws [m/s]	LWA [dB(A)]
3.0	95.1
3.5	95.1
4.0	95.1
4.5	95.1
5.0	95.1
5.5	97.2
6.0	99.2
6.5	101.1
7.0	102.7
7.5	104.3
8.0	105.7
8.5	106.3
9.0	106.3
9.5	106.3
10.0	106.3
10.5	106.3
11.0	106.3
11.5	106.3
12.0	106.3
12.5	106.3
13.0	106.3
13.5	106.3
14.0	106.3
14.5	106.3
15.0	106.3

Table 31: Noise levels of the SG 5.0-145 WT AM-3 (@4.7 MW rated power) calculated as a function of W_S [m/s]. (ref: *SG145FR5000kW_R07_04032021*)

6.8 SG 5.0-145 AM-2 (@4.8 MW RATED POWER) PERFORMANCE

6.8.1 Standard Power Curve

Table 32 shows the electrical power [kW] as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

P [kW]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	56	30	33	36	38	41	44	46	49	52	54	57	60
3.5	130	86	90	95	100	104	109	113	118	123	127	132	137
4.0	241	170	178	185	192	200	207	215	222	230	237	245	252
4.5	383	278	289	300	311	322	333	344	355	366	377	388	399
5.0	555	410	425	441	456	471	486	502	517	532	547	563	578
5.5	762	569	590	610	630	651	671	691	711	732	752	772	792
6.0	1009	759	785	812	838	864	891	917	943	969	996	1022	1048
6.5	1300	982	1016	1049	1082	1116	1149	1183	1216	1250	1283	1316	1350
7.0	1638	1242	1284	1325	1367	1409	1451	1492	1534	1576	1617	1659	1700
7.5	2026	1540	1591	1642	1694	1745	1796	1847	1898	1950	2001	2052	2103
8.0	2462	1875	1937	1999	2061	2123	2185	2246	2308	2370	2431	2493	2554
8.5	2933	2240	2313	2387	2460	2533	2606	2680	2752	2825	2897	2969	3041
9.0	3414	2620	2706	2791	2876	2960	3045	3129	3212	3294	3374	3453	3530
9.5	3864	3003	3099	3196	3291	3385	3478	3569	3657	3742	3824	3902	3977
10.0	4241	3377	3483	3587	3688	3786	3880	3970	4054	4133	4207	4274	4336
10.5	4520	3732	3841	3946	4044	4137	4223	4302	4373	4437	4494	4544	4588
11.0	4695	4055	4158	4254	4341	4418	4488	4548	4600	4644	4680	4707	4728
11.5	4765	4329	4417	4495	4563	4620	4667	4704	4729	4748	4760	4769	4775
12.0	4785	4541	4609	4664	4706	4735	4754	4767	4775	4780	4784	4787	4789
12.5	4793	4687	4726	4751	4766	4775	4781	4785	4788	4790	4792	4793	4795
13.0	4797	4758	4772	4780	4785	4788	4791	4793	4794	4795	4796	4797	4798
13.5	4798	4782	4786	4790	4792	4794	4795	4796	4797	4798	4798	4799	4799
14.0	4799	4790	4793	4795	4796	4797	4798	4798	4799	4799	4799	4799	4799
14.5	4800	4795	4796	4797	4798	4798	4799	4799	4799	4799	4800	4800	4800
15.0	4800	4797	4798	4799	4799	4799	4799	4800	4800	4800	4800	4800	4800
15.5	4800	4799	4799	4799	4799	4800	4800	4800	4800	4800	4800	4800	4800
16.0	4800	4799	4799	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
16.5	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
17.0	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
17.5	4800	4799	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
18.0	4799	4799	4799	4799	4799	4799	4799	4799	4799	4799	4799	4799	4799
18.5	4797	4797	4797	4797	4797	4797	4797	4797	4797	4797	4797	4797	4797
19.0	4792	4792	4792	4792	4792	4792	4792	4792	4792	4792	4792	4792	4792
19.5	4782	4782	4782	4782	4782	4782	4782	4782	4782	4782	4782	4782	4782
20.0	4763	4763	4763	4763	4763	4763	4763	4763	4763	4763	4763	4763	4763
20.5	4734	4734	4734	4734	4734	4734	4734	4734	4734	4734	4734	4734	4734
21.0	4692	4692	4692	4692	4692	4692	4692	4692	4692	4692	4692	4692	4692
21.5	4635	4635	4635	4635	4635	4635	4635	4635	4635	4635	4635	4635	4635
22.0	4567	4567	4567	4567	4567	4567	4567	4567	4567	4567	4567	4567	4567
22.5	4490	4489	4490	4490	4490	4490	4490	4489	4489	4490	4490	4490	4489
23.0	4407	4407	4407	4407	4407	4407	4407	4407	4407	4407	4407	4407	4407
23.5	4323	4323	4323	4323	4323	4323	4323	4323	4323	4323	4323	4323	4323
24.0	4242	4242	4242	4242	4242	4242	4242	4242	4242	4242	4242	4242	4242
24.5	4164	4164	4164	4164	4164	4164	4164	4164	4164	4164	4164	4164	4164
25.0	4097	4096	4097	4096	4097	4097	4097	4096	4096	4097	4097	4096	4096
25.5	4034	4034	4034	4034	4034	4034	4034	4034	4034	4034	4034	4034	4034
26.0	3977	3977	3977	3977	3977	3977	3977	3977	3977	3977	3977	3977	3977
26.5	3931	3930	3931	3930	3931	3930	3930	3930	3930	3931	3930	3930	3930
27.0	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889

Table 32 Electric power [kW] of the SG 5.0-145 WT AM-2 (@4.8 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3].
(ref: *SG145FR5000kW_R02_28062019*)

6.8.2 Annual Energy Production

Table 33 shows the annual output [MWh] for the SG 5.0-145 WT AM-2 (@4.8 MW rated power) for different Weibull K-distribution parameter values and annual average wind speeds W_{ave} [m/s]. The values are calculated for 1.225 kg/m^3 standard air density and 10% turbulence intensity.

AEP [MWh]		**Wave [m/s]**										
		5.0	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Weibull K	**1.5**	9480	11309	13066	14722	16258	17662	18929	20058	21050	21910	22644
	2.0	8562	10730	12902	15012	17019	18897	20631	22214	23645	24923	26050
	2.5	7654	9964	12387	14821	17184	19419	21494	23394	25115	26660	28039

Table 33: Annual energy production [MWh] of the SG 5.0-145 WT AM-2 (@4.8 MW rated power) calculated as a function of W_{ave} [m/s]. (ref: *SG145FR5000kW_R02_28062019*)

6.8.3 C_P Curves

Table 34 shows the C_P values for the SG 5.0-145 WT AM-2 (@4.8 MW rated power).

Ws [m/s]	CP [-]
3.0	0.2045
3.5	0.2992
4.0	0.3723
4.5	0.4150
5.0	0.4390
5.5	0.4529
6.0	0.4618
6.5	0.4679
7.0	0.4722
7.5	0.4749
8.0	0.4754
8.5	0.4723
9.0	0.4630
9.5	0.4455
10.0	0.4193
10.5	0.3861
11.0	0.3487
11.5	0.3098
12.0	0.2738
12.5	0.2426
13.0	0.2159
13.5	0.1928
14.0	0.1729
14.5	0.1557
15.0	0.1406
15.5	0.1274
16.0	0.1159
16.5	0.1056
17.0	0.0966
17.5	0.0885
18.0	0.0814
18.5	0.0749
19.0	0.0691
19.5	0.0638
20.0	0.0589
20.5	0.0543
21.0	0.0501
21.5	0.0461
22.0	0.0424
22.5	0.0390
23.0	0.0358
23.5	0.0329
24.0	0.0303
24.5	0.0280
25.0	0.0259
25.5	0.0241
26.0	0.0224
26.5	0.0209
27.0	0.0195

Table 34: C_P values for the SG 5.0-145 WT AM-2 (@4.8 MW rated power).
(ref: *SG145FR5000kW_R02_28062019*)

6.8.4 C_T Curves

Table 35 shows the C_T curves as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

C_T [-]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948
3.5	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674
4.0	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438
4.5	0.8290	0.8280	0.8282	0.8283	0.8284	0.8285	0.8286	0.8287	0.8288	0.8288	0.8289	0.8290	0.8290
5.0	0.8207	0.8180	0.8184	0.8188	0.8191	0.8194	0.8197	0.8199	0.8202	0.8204	0.8206	0.8207	0.8209
5.5	0.8183	0.8154	0.8158	0.8163	0.8166	0.8170	0.8173	0.8175	0.8178	0.8180	0.8182	0.8183	0.8185
6.0	0.8185	0.8165	0.8168	0.8171	0.8174	0.8176	0.8178	0.8180	0.8181	0.8183	0.8184	0.8185	0.8186
6.5	0.8191	0.8179	0.8181	0.8183	0.8184	0.8185	0.8187	0.8188	0.8189	0.8190	0.8190	0.8191	0.8192
7.0	0.8192	0.8185	0.8186	0.8187	0.8188	0.8189	0.8189	0.8190	0.8191	0.8191	0.8192	0.8192	0.8193
7.5	0.8169	0.8164	0.8165	0.8166	0.8166	0.8167	0.8168	0.8168	0.8168	0.8169	0.8169	0.8170	0.8170
8.0	0.8075	0.8072	0.8073	0.8073	0.8074	0.8074	0.8074	0.8075	0.8075	0.8075	0.8075	0.8074	0.8074
8.5	0.7850	0.7859	0.7859	0.7859	0.7859	0.7859	0.7859	0.7858	0.7857	0.7855	0.7852	0.7848	0.7841
9.0	0.7463	0.7514	0.7514	0.7514	0.7513	0.7511	0.7508	0.7503	0.7496	0.7486	0.7472	0.7454	0.7432
9.5	0.6917	0.7075	0.7073	0.7070	0.7064	0.7056	0.7044	0.7027	0.7004	0.6974	0.6938	0.6895	0.6846
10.0	0.6251	0.6590	0.6581	0.6568	0.6550	0.6526	0.6495	0.6455	0.6408	0.6350	0.6286	0.6215	0.6137
10.5	0.5530	0.6088	0.6065	0.6033	0.5994	0.5946	0.5889	0.5822	0.5748	0.5665	0.5576	0.5484	0.5388
11.0	0.4827	0.5580	0.5534	0.5478	0.5414	0.5341	0.5259	0.5171	0.5078	0.4979	0.4878	0.4776	0.4674
11.5	0.4189	0.5068	0.4998	0.4920	0.4834	0.4743	0.4646	0.4546	0.4444	0.4341	0.4239	0.4139	0.4040
12.0	0.3637	0.4563	0.4474	0.4380	0.4282	0.4182	0.4080	0.3979	0.3879	0.3780	0.3684	0.3591	0.3502
12.5	0.3172	0.4080	0.3980	0.3879	0.3778	0.3678	0.3580	0.3484	0.3390	0.3300	0.3214	0.3132	0.3053
13.0	0.2784	0.3632	0.3531	0.3432	0.3334	0.3240	0.3148	0.3061	0.2977	0.2897	0.2821	0.2749	0.2680
13.5	0.2460	0.3231	0.3134	0.3040	0.2950	0.2864	0.2782	0.2704	0.2630	0.2559	0.2492	0.2429	0.2369
14.0	0.2188	0.2879	0.2789	0.2703	0.2621	0.2544	0.2471	0.2402	0.2336	0.2274	0.2216	0.2160	0.2108
14.5	0.1957	0.2573	0.2491	0.2414	0.2341	0.2272	0.2207	0.2146	0.2088	0.2033	0.1982	0.1933	0.1886
15.0	0.1760	0.2308	0.2235	0.2165	0.2100	0.2039	0.1981	0.1927	0.1876	0.1827	0.1782	0.1738	0.1697
15.5	0.1590	0.2080	0.2014	0.1952	0.1894	0.1839	0.1788	0.1739	0.1693	0.1650	0.1609	0.1571	0.1534
16.0	0.1443	0.1882	0.1822	0.1767	0.1715	0.1666	0.1620	0.1576	0.1535	0.1497	0.1460	0.1425	0.1392
16.5	0.1314	0.1709	0.1656	0.1606	0.1559	0.1515	0.1474	0.1435	0.1398	0.1363	0.1330	0.1299	0.1269
17.0	0.1201	0.1559	0.1510	0.1465	0.1423	0.1383	0.1346	0.1310	0.1277	0.1245	0.1216	0.1187	0.1160
17.5	0.1102	0.1426	0.1382	0.1341	0.1303	0.1267	0.1233	0.1201	0.1171	0.1142	0.1115	0.1089	0.1064
18.0	0.1013	0.1309	0.1269	0.1232	0.1197	0.1164	0.1133	0.1104	0.1076	0.1050	0.1025	0.1002	0.0979
18.5	0.0935	0.1205	0.1168	0.1134	0.1102	0.1072	0.1044	0.1017	0.0992	0.0968	0.0946	0.0924	0.0904
19.0	0.0864	0.1111	0.1078	0.1047	0.1018	0.0990	0.0964	0.0940	0.0917	0.0895	0.0874	0.0854	0.0835
19.5	0.0800	0.1027	0.0997	0.0968	0.0941	0.0916	0.0892	0.0870	0.0848	0.0828	0.0809	0.0791	0.0774
20.0	0.0741	0.0950	0.0922	0.0896	0.0871	0.0848	0.0826	0.0805	0.0786	0.0767	0.0750	0.0733	0.0717
20.5	0.0687	0.0879	0.0853	0.0829	0.0807	0.0785	0.0765	0.0746	0.0728	0.0711	0.0695	0.0680	0.0665
21.0	0.0637	0.0813	0.0790	0.0768	0.0747	0.0727	0.0709	0.0691	0.0675	0.0659	0.0644	0.0630	0.0617
21.5	0.0590	0.0752	0.0731	0.0710	0.0691	0.0673	0.0656	0.0640	0.0625	0.0610	0.0597	0.0584	0.0571
22.0	0.0547	0.0696	0.0676	0.0657	0.0639	0.0623	0.0607	0.0592	0.0578	0.0565	0.0553	0.0541	0.0529
22.5	0.0507	0.0643	0.0625	0.0608	0.0592	0.0576	0.0562	0.0549	0.0536	0.0524	0.0512	0.0501	0.0491
23.0	0.0470	0.0596	0.0579	0.0563	0.0548	0.0534	0.0521	0.0508	0.0497	0.0485	0.0475	0.0465	0.0455
23.5	0.0436	0.0553	0.0537	0.0522	0.0509	0.0496	0.0484	0.0472	0.0461	0.0451	0.0441	0.0432	0.0423
24.0	0.0406	0.0514	0.0499	0.0486	0.0473	0.0461	0.0450	0.0439	0.0429	0.0420	0.0411	0.0402	0.0394
24.5	0.0379	0.0479	0.0466	0.0453	0.0441	0.0430	0.0420	0.0410	0.0401	0.0392	0.0383	0.0376	0.0368
25.0	0.0356	0.0449	0.0436	0.0425	0.0414	0.0403	0.0394	0.0384	0.0376	0.0367	0.0360	0.0352	0.0345
25.5	0.0335	0.0421	0.0410	0.0399	0.0389	0.0379	0.0370	0.0361	0.0353	0.0345	0.0338	0.0331	0.0325
26.0	0.0315	0.0397	0.0386	0.0376	0.0366	0.0357	0.0348	0.0340	0.0333	0.0326	0.0319	0.0312	0.0306
26.5	0.0299	0.0375	0.0365	0.0355	0.0346	0.0338	0.0330	0.0322	0.0315	0.0308	0.0302	0.0296	0.0290
27.0	0.0283	0.0356	0.0346	0.0337	0.0329	0.0320	0.0313	0.0306	0.0299	0.0292	0.0286	0.0281	0.0275

Table 35 C_T curves of the SG 5.0-145 WT AM-2 (@4.8 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3]. (ref: *SG145FR5000kW_R02_28062019*)

6.8.5 Noise Levels

Table 36 includes the numerical values for the estimated L_{WA} noise level in dB(A) for the different wind speeds, from the start-up speed, 3m/s.

Ws [m/s]	LWA [dB(A)]
3.0	95.1
3.5	95.1
4.0	95.1
4.5	95.1
5.0	95.1
5.5	97.2
6.0	99.2
6.5	101.1
7.0	102.7
7.5	104.3
8.0	105.7
8.5	106.3
9.0	106.3
9.5	106.3
10.0	106.3
10.5	106.3
11.0	106.3
11.5	106.3
12.0	106.3
12.5	106.3
13.0	106.3
13.5	106.3
14.0	106.3
14.5	106.3
15.0	106.3

Table 36: Noise levels of the SG 5.0-145 WT AM-2 (@4.8 MW rated power) calculated as a function of W_S [m/s]. (ref: *SG145FR5000kW_R07_04032021*)

6.9 SG 5.0-145 AM-1 (@4.9 MW RATED POWER) PERFORMANCE

6.9.1 Standard Power Curve

Table 37 shows the electrical power [kW] in function of the horizontal wind speed at hub height Ws [m/s] for different air densities [kg/m^3].

P [kW]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	56	30	33	36	38	41	44	46	49	52	54	57	60
3.5	130	86	90	95	100	104	109	113	118	123	127	132	137
4.0	241	170	178	185	192	200	207	215	222	230	237	245	252
4.5	383	278	289	300	311	322	333	344	355	366	377	388	399
5.0	555	410	425	441	456	471	486	502	517	532	547	563	578
5.5	762	569	590	610	630	651	671	691	711	732	752	772	792
6.0	1009	759	785	812	838	864	891	917	943	969	996	1022	1048
6.5	1300	982	1016	1049	1082	1116	1149	1183	1216	1250	1283	1316	1350
7.0	1638	1242	1284	1325	1367	1409	1451	1492	1534	1576	1617	1659	1700
7.5	2026	1540	1591	1642	1694	1745	1796	1847	1898	1950	2001	2052	2103
8.0	2462	1875	1937	1999	2061	2123	2185	2246	2308	2370	2431	2493	2554
8.5	2934	2240	2313	2387	2460	2533	2607	2680	2753	2825	2898	2970	3042
9.0	3418	2620	2706	2791	2876	2961	3045	3129	3213	3296	3377	3458	3536
9.5	3876	3003	3100	3196	3292	3387	3481	3573	3663	3751	3835	3916	3994
10.0	4269	3378	3485	3590	3693	3793	3890	3983	4071	4155	4233	4305	4371
10.5	4568	3737	3848	3956	4058	4155	4246	4330	4407	4477	4539	4595	4644
11.0	4764	4067	4176	4277	4369	4453	4528	4595	4654	4704	4746	4780	4807
11.5	4855	4354	4450	4535	4609	4674	4728	4772	4807	4831	4848	4860	4869
12.0	4882	4584	4659	4723	4774	4812	4838	4856	4868	4875	4880	4884	4887
12.5	4891	4749	4799	4833	4855	4868	4876	4882	4886	4888	4891	4892	4893
13.0	4896	4843	4863	4874	4881	4886	4889	4891	4893	4894	4895	4896	4897
13.5	4898	4877	4883	4887	4890	4892	4894	4895	4896	4897	4898	4898	4899
14.0	4899	4888	4891	4893	4895	4896	4897	4898	4898	4899	4899	4899	4899
14.5	4899	4893	4895	4896	4897	4898	4899	4899	4899	4899	4899	4900	4900
15.0	4900	4897	4898	4898	4899	4899	4899	4899	4900	4900	4900	4900	4900
15.5	4900	4898	4899	4899	4899	4899	4900	4900	4900	4900	4900	4900	4900
16.0	4900	4899	4899	4899	4900	4900	4900	4900	4900	4900	4900	4900	4900
16.5	4900	4899	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900
17.0	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900
17.5	4900	4899	4899	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900
18.0	4899	4899	4899	4899	4899	4899	4899	4899	4899	4899	4899	4899	4899
18.5	4897	4896	4896	4896	4896	4896	4896	4896	4896	4897	4897	4897	4897
19.0	4891	4891	4891	4891	4891	4891	4891	4891	4891	4891	4891	4891	4891
19.5	4880	4880	4880	4880	4880	4880	4880	4880	4880	4880	4880	4880	4880
20.0	4859	4859	4859	4859	4859	4859	4859	4859	4859	4859	4859	4859	4859
20.5	4827	4827	4827	4827	4827	4827	4827	4827	4827	4827	4827	4827	4827
21.0	4780	4780	4780	4780	4780	4780	4780	4780	4780	4780	4780	4780	4780
21.5	4719	4719	4719	4719	4719	4719	4719	4719	4719	4719	4719	4719	4719
22.0	4643	4643	4643	4643	4643	4643	4643	4643	4643	4643	4643	4643	4643
22.5	4559	4559	4559	4559	4559	4559	4559	4559	4559	4559	4559	4559	4559
23.0	4469	4469	4469	4469	4469	4469	4469	4469	4469	4469	4469	4469	4469
23.5	4378	4378	4378	4378	4378	4378	4378	4378	4378	4378	4378	4378	4378
24.0	4290	4290	4290	4290	4290	4290	4290	4290	4290	4290	4290	4290	4290
24.5	4205	4205	4205	4205	4205	4205	4205	4205	4205	4205	4205	4205	4205
25.0	4132	4133	4133	4132	4132	4133	4132	4132	4132	4132	4132	4132	4132
25.5	4065	4065	4065	4065	4065	4065	4065	4065	4065	4065	4065	4065	4065
26.0	4004	4004	4004	4004	4004	4004	4004	4004	4004	4004	4004	4004	4004
26.5	3954	3954	3954	3954	3954	3954	3954	3954	3954	3954	3954	3954	3954
27.0	3910	3910	3910	3909	3910	3910	3910	3909	3909	3910	3910	3909	3909

Table 37 Electric power [kW] of the SG 5.0-145 WT AM-1 (@4.9 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3].
(ref: *SG145FR5000kW_R02_28062019*)

6.9.2 Annual Energy Production

Table 38 shows the annual output [MWh] for the SG 5.0-145 WT AM-1 (@4.9 MW rated power) for different Weibull K-distribution parameter values and annual average wind speeds W_{ave} [m/s]. The values are calculated for 1.225 kg/m^3 standard density and 10% turbulence intensity.

AEP [MWh]		**Wave [m/s]**										
		5.0	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Weibull K	**1.5**	9547	11402	13187	14872	16436	17867	19160	20311	21324	22203	22952
	2.0	8593	10784	12985	15129	17172	19087	20858	22477	23942	25251	26406
	2.5	7665	9990	12437	14902	17303	19581	21701	23646	25411	26998	28415

Table 38: Annual energy production [MWh] of the SG 5.0-145 WT AM-1 (@4.9 MW rated power) calculated as a function of W_{ave} [m/s]. (ref: *SG145FR5000kW_R02_28062019*)

6.9.3 C_P Curves

Table 39 shows the C_P values for the SG 5.0-145 WT AM-1 (@4.9 MW rated power).

Ws [m/s]	CP [-]
3.0	0.2045
3.5	0.2992
4.0	0.3723
4.5	0.4150
5.0	0.4390
5.5	0.4529
6.0	0.4618
6.5	0.4679
7.0	0.4722
7.5	0.4749
8.0	0.4755
8.5	0.4724
9.0	0.4635
9.5	0.4470
10.0	0.4221
10.5	0.3901
11.0	0.3539
11.5	0.3156
12.0	0.2793
12.5	0.2476
13.0	0.2203
13.5	0.1968
14.0	0.1765
14.5	0.1589
15.0	0.1435
15.5	0.1301
16.0	0.1183
16.5	0.1078
17.0	0.0986
17.5	0.0904
18.0	0.0831
18.5	0.0765
19.0	0.0705
19.5	0.0651
20.0	0.0601
20.5	0.0554
21.0	0.0510
21.5	0.0469
22.0	0.0431
22.5	0.0396
23.0	0.0363
23.5	0.0334
24.0	0.0307
24.5	0.0283
25.0	0.0261
25.5	0.0242
26.0	0.0225
26.5	0.0210
27.0	0.0196

Table 39: C_P values for the SG 5.0-145 WT AM-1 (@4.9 MW rated power).
(ref: *SG145FR5000kW_R02_28062019*)

6.9.4 C_T Curves

Table 40 shows the C_T curves as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

C_T [-]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948
3.5	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674
4.0	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438
4.5	0.8290	0.8280	0.8282	0.8283	0.8284	0.8285	0.8286	0.8287	0.8288	0.8288	0.8289	0.8290	0.8290
5.0	0.8207	0.8180	0.8184	0.8188	0.8191	0.8194	0.8197	0.8199	0.8202	0.8204	0.8206	0.8207	0.8209
5.5	0.8183	0.8154	0.8158	0.8163	0.8166	0.8170	0.8173	0.8175	0.8178	0.8180	0.8182	0.8183	0.8185
6.0	0.8185	0.8165	0.8168	0.8171	0.8174	0.8176	0.8178	0.8180	0.8181	0.8183	0.8184	0.8185	0.8186
6.5	0.8191	0.8179	0.8181	0.8183	0.8184	0.8185	0.8187	0.8188	0.8189	0.8190	0.8190	0.8191	0.8192
7.0	0.8192	0.8185	0.8186	0.8187	0.8188	0.8189	0.8189	0.8190	0.8191	0.8191	0.8192	0.8192	0.8193
7.5	0.8169	0.8164	0.8165	0.8166	0.8166	0.8167	0.8168	0.8168	0.8168	0.8169	0.8169	0.8170	0.8170
8.0	0.8075	0.8072	0.8073	0.8073	0.8074	0.8074	0.8074	0.8075	0.8075	0.8075	0.8075	0.8075	0.8074
8.5	0.7854	0.7859	0.7859	0.7859	0.7859	0.7859	0.7859	0.7859	0.7858	0.7857	0.7855	0.7852	0.7847
9.0	0.7477	0.7514	0.7514	0.7514	0.7513	0.7512	0.7510	0.7507	0.7502	0.7495	0.7484	0.7470	0.7452
9.5	0.6951	0.7076	0.7075	0.7072	0.7069	0.7062	0.7053	0.7040	0.7022	0.6999	0.6969	0.6932	0.6890
10.0	0.6309	0.6594	0.6588	0.6578	0.6564	0.6544	0.6519	0.6487	0.6446	0.6397	0.6340	0.6276	0.6205
10.5	0.5607	0.6100	0.6081	0.6056	0.6023	0.5982	0.5932	0.5875	0.5807	0.5733	0.5650	0.5563	0.5472
11.0	0.4913	0.5604	0.5566	0.5518	0.5461	0.5394	0.5321	0.5240	0.5152	0.5059	0.4962	0.4863	0.4763
11.5	0.4274	0.5108	0.5046	0.4975	0.4896	0.4809	0.4718	0.4623	0.4525	0.4425	0.4324	0.4224	0.4126
12.0	0.3716	0.4616	0.4535	0.4446	0.4352	0.4254	0.4156	0.4057	0.3957	0.3860	0.3763	0.3670	0.3580
12.5	0.3243	0.4142	0.4047	0.3949	0.3850	0.3751	0.3653	0.3557	0.3464	0.3373	0.3286	0.3202	0.3121
13.0	0.2847	0.3698	0.3599	0.3500	0.3403	0.3308	0.3216	0.3128	0.3043	0.2962	0.2884	0.2810	0.2740
13.5	0.2515	0.3295	0.3199	0.3104	0.3013	0.2926	0.2843	0.2763	0.2688	0.2616	0.2547	0.2483	0.2421
14.0	0.2235	0.2939	0.2848	0.2761	0.2678	0.2600	0.2525	0.2455	0.2388	0.2324	0.2264	0.2207	0.2153
14.5	0.1999	0.2628	0.2545	0.2466	0.2392	0.2321	0.2255	0.2192	0.2133	0.2077	0.2024	0.1974	0.1927
15.0	0.1797	0.2358	0.2283	0.2212	0.2146	0.2083	0.2024	0.1969	0.1916	0.1866	0.1819	0.1775	0.1733
15.5	0.1623	0.2125	0.2057	0.1994	0.1934	0.1878	0.1826	0.1776	0.1729	0.1685	0.1643	0.1603	0.1566
16.0	0.1472	0.1922	0.1861	0.1805	0.1751	0.1701	0.1654	0.1609	0.1568	0.1528	0.1490	0.1455	0.1421
16.5	0.1341	0.1746	0.1691	0.1640	0.1592	0.1547	0.1504	0.1464	0.1427	0.1391	0.1357	0.1325	0.1295
17.0	0.1226	0.1592	0.1542	0.1496	0.1453	0.1412	0.1373	0.1337	0.1303	0.1271	0.1240	0.1211	0.1184
17.5	0.1124	0.1456	0.1411	0.1369	0.1330	0.1293	0.1258	0.1225	0.1194	0.1165	0.1137	0.1111	0.1086
18.0	0.1034	0.1336	0.1295	0.1257	0.1221	0.1188	0.1156	0.1126	0.1098	0.1071	0.1046	0.1022	0.0999
18.5	0.0953	0.1229	0.1192	0.1157	0.1125	0.1094	0.1065	0.1038	0.1012	0.0987	0.0964	0.0942	0.0921
19.0	0.0881	0.1134	0.1100	0.1068	0.1038	0.1010	0.0983	0.0958	0.0935	0.0912	0.0891	0.0871	0.0852
19.5	0.0815	0.1048	0.1016	0.0987	0.0960	0.0934	0.0909	0.0887	0.0865	0.0844	0.0825	0.0806	0.0788
20.0	0.0755	0.0969	0.0940	0.0913	0.0888	0.0864	0.0842	0.0821	0.0801	0.0782	0.0764	0.0747	0.0731
20.5	0.0700	0.0896	0.0870	0.0845	0.0822	0.0800	0.0779	0.0760	0.0742	0.0724	0.0708	0.0692	0.0677
21.0	0.0648	0.0828	0.0804	0.0782	0.0760	0.0740	0.0721	0.0703	0.0687	0.0671	0.0655	0.0641	0.0627
21.5	0.0600	0.0765	0.0743	0.0722	0.0703	0.0685	0.0667	0.0651	0.0635	0.0621	0.0607	0.0593	0.0581
22.0	0.0555	0.0707	0.0687	0.0668	0.0650	0.0633	0.0617	0.0602	0.0588	0.0574	0.0561	0.0549	0.0538
22.5	0.0514	0.0653	0.0634	0.0617	0.0600	0.0585	0.0570	0.0557	0.0544	0.0531	0.0519	0.0508	0.0498
23.0	0.0476	0.0604	0.0587	0.0571	0.0556	0.0541	0.0528	0.0515	0.0503	0.0492	0.0481	0.0471	0.0461
23.5	0.0442	0.0559	0.0544	0.0529	0.0515	0.0502	0.0489	0.0478	0.0467	0.0456	0.0446	0.0437	0.0428
24.0	0.0411	0.0520	0.0505	0.0491	0.0478	0.0466	0.0455	0.0444	0.0434	0.0424	0.0415	0.0406	0.0398
24.5	0.0383	0.0484	0.0470	0.0458	0.0446	0.0434	0.0424	0.0414	0.0404	0.0396	0.0387	0.0379	0.0371
25.0	0.0359	0.0453	0.0440	0.0428	0.0417	0.0407	0.0397	0.0388	0.0379	0.0370	0.0363	0.0355	0.0348
25.5	0.0337	0.0425	0.0413	0.0402	0.0391	0.0382	0.0373	0.0364	0.0356	0.0348	0.0341	0.0334	0.0327
26.0	0.0317	0.0400	0.0389	0.0378	0.0369	0.0359	0.0351	0.0343	0.0335	0.0328	0.0321	0.0314	0.0308
26.5	0.0300	0.0378	0.0367	0.0358	0.0348	0.0340	0.0332	0.0324	0.0317	0.0310	0.0303	0.0297	0.0291
27.0	0.0285	0.0358	0.0348	0.0339	0.0330	0.0322	0.0314	0.0307	0.0300	0.0294	0.0288	0.0282	0.0276

Table 40 C_T curves of the SG 5.0-145 WT AM-1 (@4.9 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3]. (ref: *SG145FR5000kW_R02_28062019*)

6.9.5 Noise Levels

Table 41 includes the numerical values for the estimated L_{WA} noise level in dB(A) for the different wind speeds, from the start-up speed, 3m/s.

Ws [m/s]	LWA [dB(A)]
3.0	95.1
3.5	95.1
4.0	95.1
4.5	95.1
5.0	95.1
5.5	97.2
6.0	99.2
6.5	101.1
7.0	102.7
7.5	104.3
8.0	105.7
8.5	106.3
9.0	106.3
9.5	106.3
10.0	106.3
10.5	106.3
11.0	106.3
11.5	106.3
12.0	106.3
12.5	106.3
13.0	106.3
13.5	106.3
14.0	106.3
14.5	106.3
15.0	106.3

Table 41: Noise levels of the SG 5.0-145 WT AM-1 (@4.9 MW rated power) calculated as a function of W_S [m/s]. (ref: *SG145FR5000kW_R07_04032021*)

6.10 SG 5.0-145 AM+1 (@5.2 MW RATED POWER) PERFORMANCE

6.10.1 Standard Power Curve

Table 42 shows the electrical power [kW] in function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

P [kW]	*Density [kg/m³]*												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	56	30	33	36	38	41	44	46	49	52	54	57	60
3.5	130	86	90	95	100	104	109	113	118	123	127	132	137
4.0	241	170	178	185	192	200	207	215	222	230	237	245	252
4.5	383	278	289	300	311	322	333	344	355	366	377	388	399
5.0	555	410	425	441	456	471	486	502	517	532	547	563	578
5.5	762	569	590	610	630	651	671	691	711	732	752	772	792
6.0	1009	759	785	812	838	864	891	917	943	969	996	1022	1048
6.5	1300	982	1016	1049	1082	1116	1149	1183	1216	1250	1283	1316	1350
7.0	1638	1242	1284	1325	1367	1409	1451	1492	1534	1576	1617	1659	1700
7.5	2026	1540	1591	1642	1694	1745	1796	1847	1898	1950	2001	2052	2103
8.0	2462	1875	1937	1999	2061	2123	2185	2246	2308	2370	2431	2493	2554
8.5	2935	2240	2313	2387	2460	2533	2607	2680	2753	2826	2899	2971	3044
9.0	3424	2620	2706	2791	2876	2961	3046	3131	3215	3299	3383	3466	3547
9.5	3902	3003	3100	3197	3294	3390	3486	3581	3674	3767	3857	3945	4031
10.0	4333	3379	3488	3595	3701	3806	3909	4009	4107	4200	4290	4375	4454
10.5	4686	3744	3861	3975	4086	4194	4296	4393	4485	4570	4649	4721	4785
11.0	4943	4092	4211	4325	4432	4533	4626	4710	4786	4855	4915	4968	5014
11.5	5102	4409	4523	4627	4722	4806	4880	4946	5002	5049	5086	5114	5135
12.0	5166	4683	4781	4867	4942	5005	5057	5098	5126	5147	5161	5170	5176
12.5	5185	4900	4977	5041	5090	5124	5148	5163	5173	5179	5183	5187	5189
13.0	5193	5057	5106	5138	5159	5171	5179	5184	5187	5190	5192	5193	5194
13.5	5196	5144	5164	5175	5182	5186	5189	5192	5193	5195	5196	5197	5197
14.0	5198	5176	5183	5187	5190	5193	5194	5196	5197	5197	5198	5198	5199
14.5	5199	5188	5191	5193	5195	5196	5197	5198	5198	5199	5199	5199	5199
15.0	5200	5193	5195	5196	5197	5198	5199	5199	5199	5199	5199	5200	5200
15.5	5200	5196	5197	5198	5199	5199	5199	5199	5200	5200	5200	5200	5200
16.0	5200	5198	5199	5199	5199	5199	5200	5200	5200	5200	5200	5200	5200
16.5	5200	5199	5199	5199	5200	5200	5200	5200	5200	5200	5200	5200	5200
17.0	5200	5199	5200	5200	5200	5200	5200	5200	5200	5200	5200	5200	5200
17.5	5200	5199	5199	5199	5199	5199	5199	5199	5200	5200	5200	5200	5200
18.0	5198	5198	5198	5198	5198	5198	5198	5198	5198	5198	5198	5198	5198
18.5	5195	5195	5195	5195	5195	5195	5195	5195	5195	5195	5195	5195	5195
19.0	5188	5188	5188	5188	5188	5188	5188	5188	5188	5188	5188	5188	5188
19.5	5174	5174	5174	5174	5174	5174	5174	5174	5174	5174	5174	5174	5174
20.0	5148	5148	5148	5148	5148	5148	5148	5148	5148	5148	5148	5148	5148
20.5	5106	5106	5106	5106	5106	5106	5106	5106	5106	5106	5106	5106	5106
21.0	5046	5046	5046	5046	5046	5046	5046	5046	5046	5046	5046	5046	5046
21.5	4968	4968	4968	4968	4968	4968	4968	4968	4968	4968	4968	4968	4968
22.0	4873	4873	4873	4873	4873	4873	4873	4873	4873	4873	4873	4873	4873
22.5	4767	4767	4767	4767	4767	4767	4767	4767	4767	4767	4767	4767	4767
23.0	4655	4655	4655	4655	4655	4655	4655	4655	4655	4655	4655	4655	4655
23.5	4542	4542	4542	4542	4542	4542	4542	4542	4542	4542	4542	4542	4542
24.0	4433	4433	4433	4433	4433	4433	4433	4433	4433	4433	4433	4433	4433
24.5	4329	4329	4329	4329	4329	4329	4329	4329	4329	4329	4329	4329	4329
25.0	4240	4240	4240	4240	4240	4240	4240	4240	4240	4240	4240	4240	4240
25.5	4158	4158	4158	4158	4158	4158	4158	4158	4158	4158	4158	4158	4158
26.0	4085	4085	4085	4085	4085	4085	4085	4085	4085	4085	4085	4085	4085
26.5	4025	4025	4025	4024	4025	4025	4025	4024	4024	4025	4025	4024	4024
27.0	3971	3971	3971	3971	3971	3971	3971	3971	3971	3971	3971	3971	3971

Table 42 Electric power [kW] of the SG 5.0-145 WT AM+1 (@5.2 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3].
(ref: *SG145FR5000kW_R05_20082020*)

6.10.2 Annual Energy Production

Table 43 shows the annual output [MWh] for the SG 5.0-145 WT AM+1 (@5.2 MW rated power) for different Weibull K-distribution parameter values and annual average wind speeds W_{ave} [m/s]. The values are calculated for 1.225 kg/m^3 standard density and 10% turbulence intensity.

AEP [MWh]		**Wave [m/s]**										
		5.0	**5.5**	**6.0**	**6.5**	**7.0**	**7.5**	**8.0**	**8.5**	**9.0**	**9.5**	**10.0**
Weibull K	**1.5**	9732	11663	13530	15298	16944	18455	19822	21043	22117	23051	23849
	2.0	8675	10930	13212	15452	17600	19624	21503	23228	24793	26196	27435
	2.5	7691	10055	12566	15119	17628	20028	22278	24355	26250	27962	29496

Table 43: Annual energy production [MWh] of the SG 5.0-145 WT AM+1 (@5.2 MW rated power) calculated as a function of W_{ave} [m/s]. (ref: *SG145FR5000kW_R05_20082020*)

6.10.3 C_P Curves

Table 44 shows the C_P values for the SG 5.0-145 WT AM+1 (@5.2 MW rated power).

Ws [m/s]	CP [-]
3.0	0.2045
3.5	0.2992
4.0	0.3723
4.5	0.4150
5.0	0.4390
5.5	0.4529
6.0	0.4618
6.5	0.4679
7.0	0.4722
7.5	0.4749
8.0	0.4755
8.5	0.4725
9.0	0.4644
9.5	0.4499
10.0	0.4284
10.5	0.4002
11.0	0.3672
11.5	0.3317
12.0	0.2956
12.5	0.2625
13.0	0.2337
13.5	0.2088
14.0	0.1873
14.5	0.1686
15.0	0.1523
15.5	0.1381
16.0	0.1255
16.5	0.1144
17.0	0.1046
17.5	0.0959
18.0	0.0881
18.5	0.0811
19.0	0.0748
19.5	0.0690
20.0	0.0636
20.5	0.0586
21.0	0.0539
21.5	0.0494
22.0	0.0452
22.5	0.0414
23.0	0.0378
23.5	0.0346
24.0	0.0317
24.5	0.0291
25.0	0.0268
25.5	0.0248
26.0	0.0230
26.5	0.0214
27.0	0.0199

Table 44: C_P values for the SG 5.0-145 WT AM+1 (@5.2 MW rated power).
(ref: *SG145FR5000kW_R05_20082020*)

6.10.4 C_T Curves

Table 45 shows the C_T curves as a function of the horizontal wind speed at hub height W_S [m/s] for different air densities [kg/m^3].

C_T [-]	***Density [kg/m³]***												
Ws [m/s]	**1.225**	**0.94**	**0.97**	**1.00**	**1.03**	**1.06**	**1.09**	**1.12**	**1.15**	**1.18**	**1.21**	**1.24**	**1.27**
3.0	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948	0.8948
3.5	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674	0.8674
4.0	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438	0.8438
4.5	0.8290	0.8280	0.8282	0.8283	0.8284	0.8285	0.8286	0.8287	0.8288	0.8288	0.8289	0.8290	0.8290
5.0	0.8207	0.8180	0.8184	0.8188	0.8191	0.8194	0.8197	0.8199	0.8202	0.8204	0.8206	0.8207	0.8209
5.5	0.8183	0.8154	0.8158	0.8163	0.8166	0.8170	0.8173	0.8175	0.8178	0.8180	0.8182	0.8183	0.8185
6.0	0.8185	0.8165	0.8168	0.8171	0.8174	0.8176	0.8178	0.8180	0.8181	0.8183	0.8184	0.8185	0.8186
6.5	0.8191	0.8179	0.8181	0.8183	0.8184	0.8185	0.8187	0.8188	0.8189	0.8190	0.8190	0.8191	0.8192
7.0	0.8192	0.8185	0.8186	0.8187	0.8188	0.8189	0.8189	0.8190	0.8191	0.8191	0.8192	0.8192	0.8193
7.5	0.8169	0.8164	0.8165	0.8166	0.8166	0.8167	0.8168	0.8168	0.8168	0.8169	0.8169	0.8170	0.8170
8.0	0.8075	0.8072	0.8073	0.8073	0.8074	0.8074	0.8074	0.8075	0.8075	0.8075	0.8075	0.8076	0.8076
8.5	0.7859	0.7859	0.7859	0.7859	0.7859	0.7860	0.7860	0.7860	0.7860	0.7859	0.7859	0.7858	0.7856
9.0	0.7501	0.7514	0.7514	0.7514	0.7514	0.7514	0.7514	0.7513	0.7511	0.7508	0.7504	0.7498	0.7489
9.5	0.7020	0.7077	0.7077	0.7076	0.7075	0.7073	0.7069	0.7063	0.7056	0.7044	0.7029	0.7008	0.6983
10.0	0.6440	0.6599	0.6597	0.6593	0.6587	0.6578	0.6565	0.6548	0.6525	0.6496	0.6460	0.6417	0.6367
10.5	0.5797	0.6119	0.6111	0.6098	0.6081	0.6057	0.6026	0.5988	0.5943	0.5890	0.5830	0.5762	0.5688
11.0	0.5139	0.5651	0.5630	0.5602	0.5565	0.5520	0.5466	0.5405	0.5337	0.5262	0.5181	0.5095	0.5005
11.5	0.4510	0.5194	0.5153	0.5104	0.5045	0.4978	0.4903	0.4822	0.4738	0.4649	0.4557	0.4463	0.4368
12.0	0.3943	0.4742	0.4680	0.4610	0.4532	0.4449	0.4360	0.4269	0.4177	0.4083	0.3989	0.3896	0.3805
12.5	0.3450	0.4298	0.4219	0.4134	0.4045	0.3953	0.3859	0.3765	0.3673	0.3582	0.3494	0.3407	0.3324
13.0	0.3031	0.3871	0.3782	0.3690	0.3596	0.3503	0.3412	0.3322	0.3235	0.3151	0.3070	0.2992	0.2918
13.5	0.2677	0.3473	0.3380	0.3288	0.3196	0.3108	0.3022	0.2939	0.2860	0.2784	0.2712	0.2643	0.2577
14.0	0.2378	0.3111	0.3020	0.2932	0.2846	0.2764	0.2686	0.2611	0.2540	0.2473	0.2409	0.2348	0.2290
14.5	0.2125	0.2789	0.2703	0.2621	0.2543	0.2469	0.2398	0.2332	0.2268	0.2209	0.2152	0.2098	0.2047
15.0	0.1908	0.2505	0.2427	0.2352	0.2281	0.2215	0.2152	0.2092	0.2036	0.1983	0.1933	0.1885	0.1840
15.5	0.1723	0.2258	0.2187	0.2119	0.2056	0.1996	0.1940	0.1886	0.1836	0.1789	0.1744	0.1702	0.1661
16.0	0.1562	0.2043	0.1978	0.1917	0.1860	0.1806	0.1756	0.1708	0.1663	0.1621	0.1581	0.1543	0.1507
16.5	0.1421	0.1854	0.1796	0.1741	0.1690	0.1642	0.1596	0.1553	0.1513	0.1475	0.1439	0.1404	0.1372
17.0	0.1298	0.1690	0.1637	0.1587	0.1541	0.1497	0.1456	0.1418	0.1381	0.1347	0.1314	0.1283	0.1253
17.5	0.1190	0.1545	0.1497	0.1452	0.1410	0.1371	0.1333	0.1298	0.1265	0.1234	0.1204	0.1176	0.1149
18.0	0.1094	0.1417	0.1373	0.1333	0.1294	0.1258	0.1225	0.1193	0.1162	0.1134	0.1107	0.1081	0.1057
18.5	0.1008	0.1303	0.1263	0.1226	0.1191	0.1158	0.1128	0.1098	0.1071	0.1045	0.1020	0.0996	0.0974
19.0	0.0931	0.1201	0.1165	0.1131	0.1099	0.1069	0.1040	0.1014	0.0989	0.0965	0.0942	0.0920	0.0900
19.5	0.0861	0.1109	0.1075	0.1044	0.1015	0.0987	0.0961	0.0937	0.0914	0.0892	0.0871	0.0851	0.0832
20.0	0.0797	0.1024	0.0994	0.0965	0.0938	0.0913	0.0889	0.0867	0.0845	0.0825	0.0806	0.0788	0.0771
20.5	0.0737	0.0946	0.0918	0.0892	0.0867	0.0844	0.0822	0.0801	0.0782	0.0763	0.0746	0.0729	0.0713
21.0	0.0682	0.0873	0.0847	0.0823	0.0800	0.0779	0.0759	0.0740	0.0722	0.0705	0.0689	0.0674	0.0659
21.5	0.0629	0.0805	0.0781	0.0759	0.0738	0.0719	0.0700	0.0683	0.0667	0.0651	0.0636	0.0622	0.0609
22.0	0.0581	0.0741	0.0719	0.0699	0.0680	0.0662	0.0646	0.0630	0.0615	0.0601	0.0587	0.0574	0.0562
22.5	0.0536	0.0682	0.0662	0.0644	0.0627	0.0610	0.0595	0.0580	0.0567	0.0554	0.0541	0.0530	0.0519
23.0	0.0494	0.0628	0.0610	0.0594	0.0578	0.0563	0.0549	0.0535	0.0523	0.0511	0.0500	0.0489	0.0479
23.5	0.0457	0.0580	0.0563	0.0548	0.0533	0.0520	0.0507	0.0495	0.0483	0.0472	0.0462	0.0452	0.0443
24.0	0.0424	0.0537	0.0521	0.0507	0.0494	0.0481	0.0469	0.0458	0.0448	0.0438	0.0428	0.0419	0.0411
24.5	0.0394	0.0498	0.0484	0.0471	0.0458	0.0447	0.0436	0.0426	0.0416	0.0407	0.0398	0.0389	0.0382
25.0	0.0368	0.0464	0.0451	0.0439	0.0428	0.0417	0.0407	0.0397	0.0388	0.0380	0.0371	0.0364	0.0356
25.5	0.0344	0.0434	0.0422	0.0411	0.0400	0.0390	0.0381	0.0372	0.0363	0.0355	0.0348	0.0341	0.0334
26.0	0.0323	0.0408	0.0396	0.0386	0.0376	0.0366	0.0358	0.0349	0.0341	0.0334	0.0327	0.0320	0.0314
26.5	0.0305	0.0384	0.0374	0.0364	0.0354	0.0346	0.0337	0.0330	0.0322	0.0315	0.0309	0.0302	0.0296
27.0	0.0289	0.0364	0.0354	0.0344	0.0335	0.0327	0.0319	0.0312	0.0305	0.0298	0.0292	0.0286	0.0280

Table 45 C_T curves of the SG 5.0-145 WT AM+1 (@5.2 MW rated power) calculated as a function of wind speed at hub height Ws [m/s], for different air densities [kg/m^3]. (ref: *SG145FR5000kW_R05_20082020*)

6.10.5 Noise Levels

Table 46 includes the numerical values for the estimated L_{WA} noise level in dB(A) for the different wind speeds, from the start-up speed, 3m/s.

Ws [m/s]	LWA [dB(A)]
3.0	95.1
3.5	95.1
4.0	95.1
4.5	95.1
5.0	95.1
5.5	97.2
6.0	99.2
6.5	101.1
7.0	102.7
7.5	104.3
8.0	105.7
8.5	106.3
9.0	106.3
9.5	106.3
10.0	106.3
10.5	106.3
11.0	106.3
11.5	106.3
12.0	106.3
12.5	106.3
13.0	106.3
13.5	106.3
14.0	106.3
14.5	106.3
15.0	106.3

Table 46: Noise levels of the SG 5.0-145 WT AM+1 (@5.2 MW rated power) calculated as a function of W_S [m/s]. (ref: *SG145FR5000kW_R07_04032021*)

7 LOW NOISE MODES

SG 5.0-145 wind turbine NRS (Noise Reduction System) low noise modes data are the same for all the FLEXIBLE RATING Application Modes. Please, refer to the information included in [1] and [4] for details.

8 REFERENCES

[1] GD410616_SG 5.0-145 DEVELOPER PACKAGE
[2] GD411360_SG 5.0-145 POWER CURVE
[3] GD411361_SG 5.0-145 POWER CURVE & NOISE
[4] GD411362_SG 5.0-145 LOW NOISE MODES