



# Unit Certificate

## UC -220011, Rev.2

Certificate Holder	Siemens Gamesa Renewable Energy Innovation & Technology S.L. Avenida Ciudad de la innovación, 2 31621, Sarriguren Spain
PGU Type	SG3.4-132 and SG3.4-145
Rated Power	3300, 3465, 3550 and 3650 kW
Rated Voltage	690 V
Rated frequency	50 Hz
PGM types	B, C and D

This Unit Certificate approves the compliance to the following Standards and Guidelines on the basis of the Evaluation Report listed on Page 2 of this Certificate.

- **37-GC-P0853** Global Certification Policy, Evaluation of Grid Code Compliance, Issue 9.0, 2021-01-26 on the basis of:
- **RfG (EU)2016/631** of 14 April 2016 establishing a network code on requirements for grid connection of generators, 2016-04
- **EqC:** Implementation of the requirements under the Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators, Revision 1.2, 2021-04 *Warunki i procedury wykorzystania certyfikatów w procesie przyłączenia modułów wytwarzania energii do sieci elektroenergetycznych, Rev. 1.2, 2021-04*
- **RoGA:** General operational requirements resulting from Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators, 2018-12 *Wymogi ogólnego stosowania wynikające z Rozporządzenia Komisji (UE) 2016/631 z dnia 14 kwietnia 2016 r. ustanawiającego kodeks sieci dotyczący wymogów w zakresie przyłączenia jednostek wytwórczych do sieci (NC RfG), 2018-12*

Changes at the PGU must be accepted by the Certification Body or the Unit Certificate loses its validity. The Unit Certificate is valid until 2027-10-31.

Bremen, 2022-11-01

Guido Bröring  
Global Head of Grid Integration  
DEWI Offshore and Certification Centre GmbH



**UC - 220011, Rev.2**

Basis of this Unit Certificate are the following Reports:

<b>Evaluation Report</b> DEWI-OCC GmbH: Evaluation Report “EVALUATION REPORT UNIT CERTIFICATE”, Doc. No. R14194895-27 Rev. 0, 31 pages, Date 2022-02-28
<b>Restrictions/Deviations:</b> None

**EqC requirements**

EqC Requirement	EqC chapter	RoGA Article no.	Chapter of R14194895-27	Evaluation
LFSM-O	7	13.2.a	3.1	Test
LFSM-U	7	15.2.c.i	3.2	Test
FRT	7	16.3.a.i and 16.3.c	3.3	Test
Injection of fast short-circuit current	7	20.2.b and 20.2.c	3.4	Test
Post-fault active power recovery	7	20.3.a	3.5	Test
Required range frequency	9	13.1.a.i	3.6.1	Test
Rate of Change of Frequency (RoCoF)	9	13.1.b	3.6.2	Test
Remote cessation of active power (only for PPM type B)	9	13.6	-	to be tested on project level for PPM type B.
Reduction of active power output (only for PPM type B)	9	14.2.a	-	to be tested on project level for PPM type B.



**Technical data of the PGU**

General				
Type of PGU	Wind turbine			
Manufacturer and address	Siemens Gamesa Renewable Energy Innovation & Technology S.L. Avenida Ciudad de la innovación, 9-11, 31261 Sarriguren (Navarra), Spain			
Type	SG3.4-132 and SG3.4-145			
Rated active power (Pn)	3.3 MW	3.465 MW	3.55 MW	3.65 MW
Nominal voltage (Un)	690 V			
Rated frequency	50 Hz			
Power control	Pitch			
Contribution to short-circuit current	0.19 – 0.26 kA (at 20 kV)			
Generator				
Unit	SG3.4-132 and SG3.4-145			
Manufacturer and address	Siemens Gamesa Renewable Energy Innovation & Technology S.L. Avenida Ciudad de la innovación, 9-11, 31261 Sarriguren (Navarra), Spain			
Concept	Doubly-fed induction generator			
Type	CR33-6P (6-pole)			
Rated voltage	690 V			
Rated active power	3.3 MW	3.465 MW	3.55 MW	3.65 MW
Rated current (690 V)	2761 A	2899 A	2970 A	3054 A
Rotor rotational speed	1120 rpm			
Rotational speed range	700 – 1332 rpm			
Rated frequency:	50 Hz			
Converter				
Unit	SG3.4-132 and SG3.4-145			
Manufacturer and address	Gamesa Electric C. del Mar Mediterráneo, 16, 28830 San Fernando de Henares, Madrid, Spain			
Concept	4 quadrant DFIG converter			
Type	DAC 3.3MW DAC CONVERTER 3,4MW PREMIUM DAC CONVERTER 3,465 MW FIRE FIGHTING			



Rated voltage (grid side)	690 V		
Rated apparent power	790 kVA (cabinet)		
Rated current	1250 A (machine side) / 660 A (grid side)		
Software version	FIP079		
Control System / Control			
Manufacturer and address	Siemens Gamesa Renewable Energy Innovation & Technology S.L. Avenida Ciudad de la innovación, 9-11, 31261 Sarriguren (Navarra), Spain		
Power control type	Variable pitch and speed		
Type	SGRE control integrated in Phoenix Contact PLC		
Software version	Control Concept V0		
Other electrical data			
Grid protection	Integrated in the wind turbine control / converter control unit. The circuit breaker is from ABB, type E4.2N.		
Transformer (project specific). Not in scope of certification, measurements performed on Low-Voltage side			
Nominal short-circuit voltage of tested transformer	10.54%		
Rotor blades			
Unit	SG3.4-132		SG3.4-145
Manufacturer and address	Siemens Gamesa Renewable Energy Innovation & Technology S.L. Avenida Ciudad de la innovación, 9-11, 31261 Sarriguren (Navarra), Spain	LM Wind Power Jupitervej 6, 6000 Kolding, Denmark	Siemens Gamesa Renewable Energy Innovation & Technology S.L. Avenida Ciudad de la innovación, 9-11, 31261 Sarriguren (Navarra), Spain
Type	SG3.4-132 T-Bolts SG3.4-132FL T-Bolts	LM 64.5 P	SG145 TB V1
Length	64.5 m	64.5 m	71 m
Gearbox			
Unit	SG3.4-132 and SG3.4-145		
Manufacturer and address	Siemens Gamesa Renewable Energy Innovation & Technology S.L.	Winergy / Flender International GmbH	Nanjing High Speed Gear manufacturing (NGC)

	Avenida Ciudad de la innovación, 9-11, 31261 Sarriguren (Navarra), Spain	Alfred-Flender-Strasse 77 46395 Bocholt, Germany	No.30, Houjiao Road, Jiangning High-tech Park, Nanjing, China
Concept	Three stages (two planetary gear stages plus one helical gear stage)		
Type	gBOX3.3 gBOX 3.465 STD gBOX3.65 gBOX 3.75	PZAB3539 PZAB3539,1	FD3815G FD4130G
Gear ratio	1:106.40	1:106.76	1:106.91

### Schematic diagram of PGU

