



Certificate No.

**IECRE.WE.TC.19.0039-R0**

IECRE - IEC System for Certification  
to Standards Relating to Equipment  
for Use in Renewable Energy  
Applications

## TYPE CERTIFICATE

### Wind Turbines

This certificate is issued to

Siemens Gamesa Renewable Energy Innovation & Technology SL  
Avda. Ciudad de la Innovación 9-11  
31621 Sarriguren (Navarra)  
Spain

for the wind turbines

SG2.6-114 2.5 / 2.625 MW IEC-IIA HH 68 m, 80 m, 93 m & 125 m, 50/60 Hz  
SG2.6-114 2.5 / 2.625 MW IEC-IA HH 68 m, 75 m, 80 m & 93 m, 50/60 Hz  
SG2.6-114 2.5 / 2.625 MW IEC-IIB HH 80 m, IEC-S HH 63 m, 50/60 Hz  
SG2.6-114 2.5 / 2.625 MW FC IEC-IIA HH 93 m, 50/60 Hz

wind turbine class (class, standard, year)

WT class IA / IIA / IIB / S, IEC 61400-1, 2005

This certificate is transferred from IEC 61400-22 to IECRE and attests compliance with IEC 61400 Series as specified in subsequent pages. It is based on the following reference documents:

Design basis evaluation conformity statement  
Dated (\*covered in the design evaluation conformity statement)

STC – 151113-R8  
28.11.2018

Design evaluation conformity statement  
Dated

STC – 151113-R8  
28.11.2018

Type test conformity statement  
Dated

STC – 151104-R8  
28.11.2018

Manufacturing conformity statement  
Dated

STC – 151103-R8  
28.11.2018

Type characteristics conformity statement  
Dated

STC – 160907-R6  
28.11.2018

Final evaluation report  
Dated

R12658893-12-R0  
28.03.2019

The conformity evaluation was carried out in accordance with the rules and procedures of the IECRE System  
[www.iecre.org](http://www.iecre.org)

The wind turbine type specification begins on page 2 of this certificate.

Changes in the system design or the manufacturer's quality system are to be approved by the Certification Body. Without approval, the certificate loses its validity.

This certificate is valid until:  
29.11.2020

Approved for issue on behalf of the IECRE  
Certification Body:

UL Renewables



Jörn Gerlach  
Vice Head of Certification Body  
Cuxhaven 2019-03-28

DEWI-OCC GmbH  
Am Seedeich 9  
27472 Cuxhaven, Germany



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### Wind Turbine

#### Machine parameters:

Power regulation:	Variable speed and pitch control
Rotor orientation:	upwind
Number of rotor blades:	3
Rotor tilt:	6°
Cone angle:	-2°
Rated power:	2.5 MW / 2.625 MW
Rated wind speed $V_r$ :	See annex 1
Rotor diameter:	114 m
Hub height(s):	63 m, 68 m, 75 m, 80 m, 88 m, 93 m and 125 m
Hub height operating wind speed range $V_{in} - V_{out}$ :	3 m/s - 25 m/s
Design life time:	20 years
Software version:	Control Architecture V3 or superior

#### Wind conditions:

Characteristic turbulence intensity $I_{ref}$ at $V_{hub} = 15$ m/s:	See annex 1
Annual average wind speed at hub height $V_{ave}$ :	See annex 1
Reference wind speed $V_{ref}$ :	See annex 1
Mean flow inclination:	8 degrees
Hub height 50-year extreme wind speed $V_{e50}$ :	See annex 1

#### Electrical network conditions:

Normal supply voltage and range:	690 V $\pm$ 10%
Normal supply frequency and range:	50Hz $\pm$ 6% / 60Hz $\pm$ 6%
Voltage imbalance:	2% - 4%
Maximum duration of electrical power network outages:	not dimensioning
Number of electrical network outages	52/yr.



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**Other environmental conditions (where taken into account):**

Design conditions in case of offshore WT :	NA
Normal and extreme temperature ranges:	Normal: -10°C to +40°C Extreme: -20°C to +50°C
Relative humidity of the air:	Up to 95%
Air density:	1.225 kg/m <sup>3</sup> (IA / IIA / IIB) 1.184 kg/m <sup>3</sup> (S)
Solar radiation:	1000 W/m <sup>2</sup>
Lightning protection system (standard and protection class):	IEC 61400-24:2010, LPL I
Earthquake model and parameters (standard and key parameters e.g. spectrum, model, seismic zone, soil class, etc.):	NA
Other design conditions :	NA



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#### **Major components:**

\*\*If not otherwise stated, the certificate holder  
is the manufacturer.

#### **Blade:**

Type: B114 Infused blade, structural shells and  
adhesive joints  
Material: Fiberglass reinforced resin  
Blade length: 56 m  
Number of blades: 3  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: G114 2.5

#### **Blade:**

Type: G114 Infused blade, structural shells and  
adhesive joints  
Material: Fiberglass reinforced resin  
Blade length: 56 m  
Number of blades: 3  
Manufacturer: LM  
Drawing / Data sheet / Part No.: LM 56.0 P2

#### **Blade:**

Type: B114 Infused blade, structural shells and  
adhesive joints  
Material: Fiberglass reinforced resin  
Blade length: 56 m  
Number of blades: 3  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: G114 2.5 STD1

#### **Blade:**

Type: B114 Infused blade, structural shells and  
adhesive joints  
Material: Fiberglass reinforced resin  
Blade length: 56 m



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## TYPE CERTIFICATE

### Wind Turbines

Number of blades: 3  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: G114 2.0 STD

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: Rollix Defontaine  
Drawing / Data sheet / Part No.: 13-2418  
13-2425

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: Laulagun Bearing S.A.  
Drawing / Data sheet / Part No.: M00DST0125

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: Kaydon Bearings Division  
Drawing / Data sheet / Part No.: 18190001

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: Tianma (Chengdu) Railway Bearing Co.,  
Ltd  
Drawing / Data sheet / Part No.: B030.53.2418

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: TyssenKrupp Rothe Erde  
Drawing / Data sheet / Part No.: 090.55.2418.xxx.49.1422

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: Renogear S.L.  
Drawing / Data sheet / Part No.: 200.0/60.2425.000



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## **TYPE CERTIFICATE**

### **Wind Turbines**

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: Rollix Defontaine  
Drawing / Data sheet / Part No.: 13-2418

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: IMO  
Drawing / Data sheet / Part No.: 40-552418/0

#### **Blade bearing:**

Type: Four point contact double row  
Manufacturer: Laulagun.  
Drawing / Data sheet / Part No.: F2655M00DST0125

#### **Pitch System:**

Motor / Actuator Type: Double acting hydraulic cylinder  
Pitch Controller Type: Hydraulic  
Manufacturer: Glual / Hine

#### **Main shaft:**

Type: Steel Shaft  
Manufacturer: Siemens Gamesa  
Material: 34CrNiMo6 / 42CrMo4  
Drawing / Data sheet / Part No.: GP252557

#### **Main bearing:**

Type: Spherical roller bearing  
Manufacturer: KOYO  
Drawing / Data sheet / Part No.: RHAW33TS1



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### Wind Turbines

#### Main bearing:

Type: Spherical roller bearing  
Manufacturer: SKF  
Drawing / Data sheet / Part No.: CA/W 33VR646  
ECA/W 33VR646

#### Main bearing:

Type: Spherical roller bearing  
Manufacturer: ZKL Brno, a.s.  
Drawing / Data sheet / Part No.: EW33MH\_TPF11517-15\_NV

#### Main bearing:

Type: Spherical roller bearing  
Manufacturer: Fag-Schaeffler Technologies AG&Co. KG  
Drawing / Data sheet / Part No.: F-617840 / F-617839

#### Main bearing:

Type: Spherical roller bearing  
Manufacturer: Timken  
Drawing / Data sheet / Part No.: YMDWEW886C  
WE-A

#### Gearbox:

Type: Three stages gearbox (one planetary  
stage and two helical gear stages)  
Gear Ratio: 1:129.68 (50Hz)  
1:103.99 (60Hz)  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: gBOX2.5

#### Gearbox:

Type: Three stages gearbox (one planetary  
stage and two helical gear stages)  
Gear Ratio: 1:129.68 (50Hz)  
1:103.99 (60Hz)  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: gBOX2.5 MOD.ASS.EPD



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## TYPE CERTIFICATE

### Wind Turbines

#### **Gearbox:**

Type: Three stages gearbox (one planetary stage and two helical gear stages)  
Gear Ratio: 1:129.68 (50Hz)  
1:103.99 (60Hz)  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: gBOX2.5 G114 EPD

#### **Gearbox:**

Type: Three stages gearbox (one planetary stage and two helical gear stages)  
Gear Ratio: 1:129.68 (50Hz)  
1:103.99 (60Hz)  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: gBOX2.625 STD

#### **Yaw System:**

*Drive Type:* Activated by yaw drives  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: GD293701

*Bearing Type:* Friction Bearing  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: GP222733

*Gear Type:* Planetary gear with motor and brake  
Manufacturer: Bonfiglioli  
Drawing / Data sheet / Part No.: 710T4U

*Gear Type:* Planetary gear with motor and brake  
Manufacturer: Brevini Transmissions  
Drawing / Data sheet / Part No.: ELS2814-  
GE.L/9026922/1022/A.D.IEC100-112





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### Wind Turbines

*Gear Type:* Planetary gear with motor and brake  
*Manufacturer:* Comer  
*Drawing / Data sheet / Part No.:* PG 2504DSP

*Brake Type:* Hybrid  
*Manufacturer:* Frenos Iruña  
*Drawing / Data sheet / Part No.:* FIR-1-75

#### **Generator:**

*Type:* Doubly – fed induction machine  
*Manufacturer:* Gamesa Electric  
*Drawing / Data sheet / Part No.:* CR25-4P  
*Rated Power:* 2680 kW  
*Rated Frequency:* 50Hz  
*Rated Speed:* 1680 rpm  
*Max. speed:* 1900 rpm  
*Rated Voltage:* 690V  
*Rated Current:* 774A (rotor) / 1973.5A (stator)  
*Insulation Class:* F  
*Degree of Protection:* IP54/IP23

#### **Generator:**

*Type:* Doubly – fed induction machine  
*Manufacturer:* Gamesa Electric  
*Drawing / Data sheet / Part No.:* CR25-6P  
*Rated Power:* 2695 kW  
*Rated Frequency:* 50Hz / 60Hz  
*Rated Speed:* 1120 rpm / 1344 rpm  
*Max. speed:* 1900 rpm / 1520 rpm  
*Rated Voltage:* 690V  
*Rated Current:* 50Hz: 766A (rotor) / 2039A (stator)  
60 Hz: 749A (rotor) / 2039A (stator)  
*Insulation Class:* F



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## TYPE CERTIFICATE

### Wind Turbines

Degree of Protection: IP54/IP23

#### Generator:

Type: Permanent magnets  
Manufacturer: Siemens Gamesa  
Drawing / Data sheet / Part No.: CR25PM  
Rated Power: 2755 kW  
Rated Frequency: 67.3Hz (stator)  
Rated Speed: 1346 rpm  
Max. speed: 1669 rpm  
Rated Voltage: 690V  
Rated Current: 3 x 765A  
Insulation Class: F  
Degree of Protection: IP54

#### Converter:

Type: Back to back DFIG converter  
Manufacturer: Gamesa Electric  
Drawing / Data sheet / Part No: DAC 2.5 MW  
Rated Voltage (grid side): 690V  
Rated Current (grid side): 950A  
Degree of Protection: IP54

#### Converter:

Type: Full Converter  
Manufacturer: Gamesa Electric  
Drawing / Data sheet / Part No: 900 kW full converter module  
Rated Voltage (grid side): 690V  
Rated Current (grid side): 795A / 828A  
Degree of Protection: IP54



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### Wind Turbines

#### Transformer:

Type: Dry type vacuum cast resin transformer  
Manufacturer: ABB  
Drawing / Data sheet / Part No.: DTE 2775/AF  
Rated Voltage: 0.69 / 20 or 34.5 kV  
0.69 / 15.5 kV  
0.69 / 22 kV  
0.69 / 33 kV  
Rated Power: 2775 kVA  
Degree of Protection: IP00  
Location (e.g. tower bottom): nacelle

#### Transformer:

Type: Dry type vacuum cast resin transformer  
Manufacturer: SGB  
Drawing / Data sheet / Part No.: DTTH1NG 3150/20  
Rated Voltage: 0.69 / 20 kV  
Rated Power: 2910 kVA  
Degree of Protection: IP00  
Location (e.g. tower bottom): nacelle

#### Transformer:

Type: Dry type vacuum cast resin transformer  
Manufacturer: ABB  
Drawing / Data sheet / Part No.: 3160/20 Ecodesign  
Rated Voltage: 0.69 / 20 kV  
Rated Power: 3160 kVA  
Degree of Protection: IP00  
Location (e.g. tower bottom): nacelle

#### Transformer:

Type: Dry type vacuum cast resin transformer  
Manufacturer: ABB  
Drawing / Data sheet / Part No.: 2910/34.5 Optiloss



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## TYPE CERTIFICATE

### Wind Turbines

Rated Voltage: 0.69 / 34.5 kV

Rated Power: 2910 kVA

Degree of Protection: IP00

Location (e.g. tower bottom): nacelle

#### **Tower:**

Type: Tubular steel

Manufacturer: Siemens Gamesa

Sections: 3 / 4 / 5

Length: 68/80/93/125 m HH

Drawing / Data sheet / Part No.: GD286712 / GD222883 / GD212018 /  
GD233243

#### **Tower:**

Type: Tubular steel

Manufacturer: Siemens Gamesa

Sections: 3 / 4

Length: 68/75/80/93 m HH

Drawing / Data sheet / Part No.: GD353753 / GD358474 / GD360057 /  
GD362839

#### **Tower:**

Type: Tubular steel

Manufacturer: Siemens Gamesa

Sections: 3

Length: 63/80 m HH

Drawing / Data sheet / Part No.: GD368895 / GD367660

#### **Tower:**

Type: Tubular steel

Manufacturer: Siemens Gamesa

Sections: 4

Length: 93 m HH

Drawing / Data sheet / Part No.: GD362839



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**Foundation:**

Type: NA  
 Manufacturer: NA  
 Drawing / Data sheet / Part No: NA

**Foundation Adaptor:**

Type: NA  
 Manufacturer: NA  
 Drawing / Data sheet / Part No.: NA

**Manuals:**

Operation & maintenance manual: A17-01-ECM011  
 Transport manual: A17-01-ECM011  
 Installation & commissioning. manual: A17-01-ECM011

**Annex 1 – Configuration matrix**

Type Designation	IEC Class	Frequency	Rotor Blade	Hub Height	$V_{ave}$ (m/s)	$I_{ref}$	$V_{ref}$ (m/s)	$V_{e50}$ (m/s)	$V_r$ (m/s)
SG2.6-114 2.5MW	IIA	50 Hz / 60 Hz	G114 2.5 / LM56.0 P2	68 m	8.5	0.16	42.5	59.5	11
				80 m					
				93 m					
				125 m					
SG2.6-114 2.625MW	IIA	50 Hz / 60 Hz	G114 2.5 / LM56.0 P2	68 m	8.5	0.16	42.5	59.5	11
				80 m					
				93 m					
				125 m					
SG2.6-114 2.5 / 2.625MW	IA	50 Hz / 60 Hz	G114 2.5TB STD1	68 m	10	0.16	50	70.0	10
				75 m					
				80 m					
				93 m					
SG2.6-114 2.5 / 2.625MW	IIB	50 Hz / 60 Hz	G114 2.0 STD	80 m	8.5	0.16	42.5	59.5	10
SG2.6-114 2.5 / 2.625MW	S	50 Hz / 60 Hz	G114 2.0 STD	63 m	7.5	-	37.5	52.5	11
SG2.6-114 2.5 / 2.625MW Full Converter (FC)	IIA	50 Hz / 60 Hz	G114 2.5	93 m	8.5	0.16	42.5	59.5	11



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**Annex 2 – Major components configuration matrix**

Main component	SG2.6-114 2.5/2.625MW Class IIA	SG2.6-114 2.5/2.625MW FC Class IIA	SG2.6-114 2.5/2.625MW Class IA	SG2.6-114 2.5/2.625MW Class IIB/S
<b>Rotor Blade</b>				
G114 2.5	x	x		
LM 56 0 P2	x			
G114 2.5 STD1			x	
G114 2.0 STD				x
<b>Blade Bearing</b>				
13-2418 /13-2425 M00DST0125 18190001 B030.53.2418 090.55.2418.xxx.49.1422 200.0/60.2425.000	x	x	x	
13-2418 40-552418/0 F2655M00DST0125				x
<b>Pitch Cylinder</b>				
Glual	x	x	x	x
Hine	x	x		x
<b>Main shaft</b>	x	x	x	x
<b>Main bearings</b>	x	x	x	x
<b>Gearbox</b>				
gBOX2.5 gBOX2.5 MOD ASS EDP gBOX2.5 G114 EDP	x	x	x	x
gBOX2.625 STD	x	x	x	
<b>Yaw system</b>	x	x	x	x
<b>Generator</b>				
CR25-4P / CR25-6P	x		x	x
CR25PM		x		
<b>Converter</b>				
DAC 2.5 MW	x		x	x
900 kW full converter module		x		
<b>Transformer</b>				
DTE 2775/AF DTTH1NG 3150/20 2910/34.5 Optiloss	x		x	x
3160/20 Ecodesign	x	x	x	x
<b>Tower</b>				
GD286712 / GD222883 / GD212018 / GD233243	x			
GD353753 / GD358474 / GD360057 / GD362839			x	
GD368895 / GD367660				x
GD362839		x		