



Certificate No.

IECRE.WE.TC.20.0082-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

SG 2.6-114 2.625 - 2.9 MW

wind turbine class (class, standard, year)

S, IEC 61400-1/A1, 2010

This certificate 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)

IECRE.WE.CS.20.0045-R0
15.05.2020

Design evaluation conformity statement
Dated

IECRE.WE.CS.20.0045-R0
15.05.2020

Type test conformity statement
Dated

STC-TT-200404-R0
25.05.2020

Manufacturing conformity statement
Dated

STC-ME-200405-R0
15.05.2020

Final evaluation report
Dated

R13169675-12a-R0
25.05.2020

The conformity evaluation was carried out in accordance with the rules and procedures of the IECRE System 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:
24.05.2025

Approved for issue on behalf of the IECRE
Certification Body:

UL Renewables



Jörn Gerlach
Vice Head of Certification Body
Cuxhaven 25.05.2020

DEWI-OCC GmbH
Am Seedeich 9
27472 Cuxhaven, Germany



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Annex I - Wind turbine characteristics

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:	2.625 / 2.725 / 2.825 / 2.9 MW
Rated wind speed V_r :	11.2 m/s
Rotor diameter:	114 m
Hub height(s):	63 m
Hub height operating wind speed range $V_{in} - V_{out}$:	3 - 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:	9.5 %
Annual average wind speed at hub height V_{ave} :	11 m/s
Reference wind speed V_{ref} :	37.5 m/s
Mean flow inclination:	8 degrees
Hub height 50-year extreme wind speed V_{e50} :	52.5 m/s

Electrical network conditions:

Normal supply voltage and range:	690 V \pm 10%
Normal supply frequency and range:	50Hz \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:	1.184 kg/m ³
Solar radiation:	1000 W/m ²
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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Annex II - Wind turbine variants

SG 2.6-114 2.625-2.9 MW wind turbine family variants:

Wind turbine variant	Rated power (MW)	IEC class	Rotor blade	Hub height (m)
SG 2.6-114 2.6-2.9 MW CS	2.625	S	G114 2.0MW STD	63
	2.725		G114 V2	
	2.825			
	2.9			

SG 2.6-114 2.625-2.9 MW wind turbine application modes:

Application mode	Active power (MW)
AM 0	2.625
AM +1	2.725
AM +2	2.825
AM +3	2.9



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Annex IV - Major components:

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

Blade:

Manufacturer: SGRE
Shanghai Aeolon Wind Energy Technology

Type: G114 Infused blade, structural shells and adhesive joints

Material: Fiberglass reinforced resin

Blade length: 56 m

Number of blades: 3

Drawing / Data sheet / Part No.: G114 2.0 STD
G114 V2

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.: M0-0DST0125

Blade bearing:

Type: Four point contact double row

Manufacturer: Kaydon Bearings Division

Drawing / Data sheet / Part No.: 18190001
18190A01
18222001
18222A01

Blade bearing:

Type: Four point contact double row

Manufacturer: Tianma (Chengdu) Precision Machinery, Co. Ltd
(TMB)

Drawing / Data sheet / Part No.: B030.53.2418



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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: IMO
Drawing / Data sheet / Part No.: 40-552418,0

Pitch System:

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

Main shaft:

Type: Steel Shaft
Manufacturer: SGRE
Material: Forged steel
Drawing / Data sheet / Part No.: GP439104

Main bearing:

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

Main bearing:

Type: Spherical roller bearing
Manufacturer: ZKL Group
Drawing / Data sheet / Part No.: EW33MH TPF 11528-16
EW33MH TPF 11517-15



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Main bearing:

Type: Spherical roller bearing
Manufacturer: Timken
Drawing / Data sheet / Part No.: YMDWEW886C
2WE-A

Gearbox:

Type: Three stages gearbox (two planetary stages and one helical gear stage)
Gear Ratio: 1:129.68 (50Hz)
1:103.99 (60Hz)
Manufacturer: SGRE
Drawing / Data sheet / Part No.: gBOX2.9

Gearbox:

Type: Three stages gearbox (one planetary stage and two helical gear stages)
Gear Ratio: 1:128.95 (50Hz)
Manufacturer: ZF
Drawing / Data sheet / Part No.: EH822A-023
EH822A-033

Gearbox:

Type: Three stages gearbox (one planetary stage and two helical gear stages)
Gear Ratio: 1:128.70(50Hz)
Manufacturer: NGC
Drawing / Data sheet / Part No.: FD3190SB



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Yaw System:

Drive Type: Active by yaw drives

Manufacturer: SGRE

Drawing / Data sheet / Part No.: Included in yaw gear

Bearing Type: Friction Bearing

Manufacturer: SGRE

Drawing / Data sheet / Part No.: GD293701

Gear Type: Planetary gear with motor and brake

Manufacturer: Comer

Drawing / Data sheet / Part No.: 5718.050.0508 (PG 2504DSP)
5718.050.0505 (PG 2504DSP)

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-E.L/9026922/1022/A.D.IEC100-112

Gear Type: Planetary gear with motor and brake

Manufacturer: NGC

Drawing / Data sheet / Part No.: FDX204S-01-00R1

Gear Type: Planetary gear with motor and brake

Manufacturer: SEW

Drawing / Data sheet / Part No.: P4W034 M4 – i1060.2

Brake Type: Friction – brake on motor

Manufacturer: SGRE

Drawing / Data sheet / Part No.: Included in yaw gear motor



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Generator:

Type:	Doubly – fed induction machine
Manufacturer:	SGRE
Drawing / Data sheet / Part No.:	CR25-4P C3
Rated Power:	2695 kW
Rated Frequency:	50 Hz
Rated Speed:	1680 rpm
Max. speed:	1900 rpm
Rated Voltage:	690 V
Rated Current:	798-894 A (rotor) / 2039-2108 A (stator)
Insulation Class:	F
Degree of Protection:	IP54/IP23

Converter:

Type:	Back to back DFIG converter
Manufacturer:	SGRE
Drawing / Data sheet / Part No:	DAC 2.625 MW
Rated Voltage (grid side):	690 V
Rated Current (MSC / LSC):	950 A / 400 A
Degree of Protection:	IP54

Transformer:

Type:	Dry type vacuum cast resin transformer
Manufacturer:	ABB
Drawing / Data sheet / Part No.:	DTE 2910/24
Rated Voltage:	0.69 / 21 kV
Rated Power:	2910 kVA
Degree of Protection:	IP00
Location (e.g. tower bottom):	nacelle



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Transformer:

Type: Dry type vacuum cast resin transformer
Manufacturer: ABB
Drawing / Data sheet / Part No.: DTE 2910/36
Rated Voltage: 0.69 / 35 kV
Rated Power: 2910 kVA
Degree of Protection: IP00
Location (e.g. tower bottom): nacelle

Transformer:

Type: Dry type vacuum cast resin transformer
Manufacturer: Hainan Jinpan Electric Co., Ltd.
Drawing / Data sheet / Part No.: SCLB10 2910/33
Rated Voltage: 0.69 / 33 kV
Rated Power: 2910 kVA
Degree of Protection: IP00
Location (e.g. tower bottom): nacelle

Tower:

Type: Tubular steel
Manufacturer: SET – EL SEWEDY Electric Towers
Sections: 2 (T63.2) (T63.2.1)
3 (T63.1B)
Length: HH 63 m
Drawing / Data sheet / Part No.: GD432183 (T63.2)
GD457790 (T63.2.1)
GD447993 (T63.1B)

Foundation:

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



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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