



Certificate No.

**IECRE.WE.TC.19.0039-R1**

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, 50/60 Hz

wind turbine class (class, standard, year)

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

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.19.0023-R0  
06.09.2019

Design evaluation conformity statement  
Dated

IECRE.WE.CS.19.0023-R0  
06.09.2019

Type test conformity statement  
Dated

STC – 151104-R9  
06.09.2019

Manufacturing conformity statement  
Dated

STC – 151103-R9  
06.09.2019

Type characteristics conformity statement  
Dated

STC – 160907-R6  
28.11.2018

Final evaluation report  
Dated

R12658893-12-R9  
06.09.2019

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 2019-09-06

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, 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: G114 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: G114 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



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## **TYPE CERTIFICATE**

### **Wind Turbines**

#### **Blade:**

Type: G114 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 2.0 STD

#### **Blade:**

Type: G114 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 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.: M00DST0125



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## **TYPE CERTIFICATE**

### **Wind Turbines**

#### **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

#### **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

#### **Blade bearing:**

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



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## **TYPE CERTIFICATE**

### **Wind Turbines**

#### **Pitch System:**

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

#### **Main shaft:**

Type: Steel Shaft  
Manufacturer: Siemens Gamesa  
Material: 34CrNiMo6 / 42CrMo4  
Drawing / Data sheet / Part No.: GP280230

#### **Main shaft:**

Type: Steel Shaft  
Manufacturer: Siemens Gamesa  
Material: 42CrMo4  
Drawing / Data sheet / Part No.: GP439104

#### **Main bearing:**

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

#### **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



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## **TYPE CERTIFICATE**

### **Wind Turbines**

#### **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

#### **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

#### **Main bearing:**

Type: Spherical roller bearing  
Manufacturer: Timken  
Drawing / Data sheet / Part No.: YMDWEW886C  
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## TYPE CERTIFICATE

### Wind Turbines

#### **Gearbox:**

Type: Three stages gearbox (two planetary stages and one helical gear stage)  
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

#### **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

#### **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 MOD



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## TYPE CERTIFICATE

### Wind Turbines

#### Yaw System:

*Drive Type:* Active by yaw drives  
*Manufacturer:* Siemens Gamesa  
*Drawing / Data sheet / Part No.:* Included in yaw gear

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

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



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## TYPE CERTIFICATE

### Wind Turbines

#### 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
Degree of Protection:	IP54/IP23



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## **TYPE CERTIFICATE**

### **Wind Turbines**

#### **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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## **TYPE CERTIFICATE**

### **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  
Rated Power: 2775 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.: DTE 2775/AF  
Rated Voltage: 0.69 / 15.5 kV  
Rated Power: 2775 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.: DTE 2775/AF  
Rated Voltage: 0.69 / 22 kV  
Rated Power: 2775 kVA  
Degree of Protection: IP00  
Location (e.g. tower bottom): nacelle



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## TYPE CERTIFICATE

### Wind Turbines

#### Transformer:

Type: Dry type vacuum cast resin transformer  
Manufacturer: ABB  
Drawing / Data sheet / Part No.: DTE 2775/AF  
Rated Voltage: 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



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## TYPE CERTIFICATE

### Wind Turbines

#### Transformer:

Type: Dry type vacuum cast resin transformer  
Manufacturer: ABB  
Drawing / Data sheet / Part No.: 2910/34.5 Optiloss  
Rated Voltage: 0.69 / 34.5 kV  
Rated Power: 2910 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.: DTTHG 2910/24  
Rated Voltage: 0.69 / 22 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.: DTE 2910/36  
Rated Voltage: 0.69 / 30 kV  
Rated Power: 2910 kVA  
Degree of Protection: IP00  
Location (e.g. tower bottom): nacelle



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## TYPE CERTIFICATE

### Wind Turbines

#### Transformer:

Type: Dry type vacuum cast resin transformer  
Manufacturer: ABB  
Drawing / Data sheet / Part No.: DTE 2910/36  
Rated Voltage: 0.69 / 34.5 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.: DTE 2910/36  
Rated Voltage: 0.69 / 33 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.: DTE 2910/22  
Rated Voltage: 0.69 / 22 kV  
Rated Power: 2910 kVA  
Degree of Protection: IP00  
Location (e.g. tower bottom): nacelle





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## TYPE CERTIFICATE

### Wind Turbines

#### Transformer:

Type: Dry type vacuum cast resin transformer  
Manufacturer: Hainan Jinpan Electric Co., Ltd.  
Drawing / Data sheet / Part No.: SCLB10 2910/40.5  
Rated Voltage: 0.69 / 35 kV  
Rated Power: 2910 kVA  
Degree of Protection: IP00  
Location (e.g. tower bottom): nacelle

#### Tower:

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 3  
Length: HH 68 m  
Drawing / Data sheet / Part No.: GD286712

#### Tower:

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 4  
Length: HH 80 m  
Drawing / Data sheet / Part No.: GD222883

#### Tower:

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 4  
Length: HH 93 m  
Drawing / Data sheet / Part No.: GD212018



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### **Wind Turbines**

#### **Tower:**

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 5  
Length: HH 125 m  
Drawing / Data sheet / Part No.: GD233243

#### **Tower:**

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 3  
Length: HH 68 m  
Drawing / Data sheet / Part No.: GD353753

#### **Tower:**

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 3  
Length: HH 75 m  
Drawing / Data sheet / Part No.: GD358474

#### **Tower:**

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 4  
Length: HH 80 m  
Drawing / Data sheet / Part No.: GD360057



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## TYPE CERTIFICATE

### Wind Turbines

#### **Tower:**

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 4  
Length: HH 93 m  
Drawing / Data sheet / Part No.: GD362839

#### **Tower:**

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 3  
Length: HH 63 m  
Drawing / Data sheet / Part No.: GD368895

#### **Tower:**

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 4  
Length: HH 80 m  
Drawing / Data sheet / Part No.: GD367660

#### **Tower:**

Type: Tubular steel  
Manufacturer: Siemens Gamesa  
Sections: 4  
Length: HH 80 m  
Drawing / Data sheet / Part No.: GD415761



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## **TYPE CERTIFICATE**

### **Wind Turbines**

#### **Tower:**

Type:	Tubular steel
Manufacturer:	Siemens Gamesa
Sections:	4
Length:	HH 93 m
Drawing / Data sheet / Part No.:	GD414936

#### **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



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**TYPE CERTIFICATE**

**Wind Turbines**

**Annex 1 – Configuration matrix**

Type Designation	IEC Class	Frequency	Rotor Blade	Hub Height	V <sub>ave</sub> (m/s)	I <sub>ref</sub>	V <sub>ref</sub> (m/s)	V <sub>e50</sub> (m/s)	V <sub>r</sub> (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	68 m	8.5	0.16	42.5	59.5	11
			G114 2.5 / LM56.0 P2	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
SG2.6-114 MY18 IIA	IIA	50 Hz / 60 Hz	G114 V2 / LM56.0 P2	80 m	8.5	0.16	42.5	59.5	11
				93 m					
				125 m					