



Certificate No.

IECRE.WE.CC.19.0008-R0

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

COMPONENT CERTIFICATE

Wind Turbine

This certificate is issued to

Siemens Gamesa Renewable Energy A/S
Borupvej 16
7330 Brande
Denmark

for the component

Tower Internals

wind turbine class (class, standard, year)

Direct Drive Onshore Platform MK II, IEC 61400-1:2005 and Amendment 1, 2010-10

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

TÜV NORD Report No. 8113 745 421-0 E, Rev.1
(no separate conformity statement issued)
2018-05-29

Design evaluation conformity statement
Dated

TÜV NORD Report No. 8115 171 003-8 E, Rev.3
(no separate conformity statement issued)
2019-04-05

Type test conformity statement
Dated

Not applicable for tower internals, see final evaluation report.

Manufacturing conformity statement
Dated

Not applicable for tower internals, see final evaluation report.

Final evaluation report
Dated

TÜV NORD Report No. 8116 043 390-20 E, Rev. 0
2019-05-10

The conformity evaluation was carried out in accordance with the rules and procedures of the IECRE System www.iecre.org

The component specification begins on page 2 of this certificate.

Changes in the system design or the manufacturer's quality system are to be approved by TÜV NORD CERT GmbH. Without approval, the certificate loses its validity.

This certificate is valid until:
2024-05-09

Approved for issue on behalf of the IECRE
Certification Body:



Dipl.-Ing., Dr. Michael Broschart
Deputy of Specialist Manager Wind Energy
Essen 2019-05-10

TÜV NORD CERT GmbH
Langemarckstraße 20
45151 Essen

Machine parameters :

Design life time: 20 y

Other environmental conditions (where taken into account):

Normal and extreme temperature ranges: -30 °C to +50 °C
(with minimum operating temperature for service lifts -25 °C and for fall arrester system -10 °C.

The following Tower Internals are evaluated as applicable for tubular steel towers:

- Platforms for tower top section:
Yaw platform D=2820 mm; lift platform D=2970 mm; damper platform D=2990 mm; splice platform D=3190 mm
- Platforms for tower middle section:
Section platforms: D=3360 mm, D=3820 mm, D=4080 mm, D=4160 mm, D=4360 mm, D=4860 mm
- Platforms for tower bottom section:
PUTUSU stack with PU/TU platforms D=4300 mm and D=4500 mm
- Ladder (verified by tests)
- Ladder support
- Fall arrester system (covered by approval)
- Anchor points for fall arresting devices (covered by approval) and corresponding support structures
- External stairs
- Aluminum steps (covered by specification)
- Railings
- Lift beam for service lift
- Service lifts (lifting capacity 240 kg, evaluated by DNV GL and covered by approvals)

Interfaces:

Design loads for the component (without safety factors):

Railings:	300 N/m (horizontal line load)
Platforms:	2.0 kN/m ² (distributed) and 1.5 kN/0.2m x 0.2m (load area)
Fall arrest at ladder/platform:	15 kN (incl. safety factor)
Damper platform:	2.0 kN/m ² (distributed) and 1.75 kN/0.2m x 0.2m (load area)
External stairs, outer platform & step plate:	2.0 kN/m ² (distributed) and 1.5 kN/0.2m x 0.2m (load area)
External stairs, steps:	5.0 kN/m ² (distributed) and 1.5 kN/0.1m x 0.1m (load area)
PUTUSU stack:	Mass of 17.500 kg considered.
Lift beam:	30.8 kN (incl. static and dynamic load factor)
Attachment points:	16 kN
Lashing bracket:	24 kN

Materials

Component	Material	Standard
Platform plates, beams, supports	S235JR	EN 10025-2:2005-04
Platform suspension bracket	S235JR	EN 10025-2:2005-04
Ladder brackets	S235JR	EN 10025-2:2005-04
Ladder brackets (yaw platform)	S355JR	EN 10025-2:2005-04
Ladder support bars	S355JR	EN 10025-2:2005-04
Bushings	S355JR	EN 10025-2:2005-04
Lift beam IPE200, end plates	S355J2	EN 10025-2:2005-04
Lift beam brackets	S235JR	EN 10025-2:2005-04
Lift beam wire brackets	S355J2	EN 10025-2:2005-04
PU, TU platform plates	EN AW-5754/H111	EN 485-2:2016-10
PU, TU threaded plates	EN AW-5754/H114	EN 485-2:2016-10
PU, TU guard rails	S235JR	EN 10025-2:2005-04
PU, TU platform supporting beams	S235JR	EN 10025-2:2005-04
TU platform brackets	S355JR	EN 10025-2:2005-04
Staircase steps, supporting structure	EN AW-5083/H111	EN 485-2:2016-10
Staircase platform plates	EN AW-5083/H111	EN 485-2:2016-10
Staircase and platform guardrail	EN AW-6060/T6	EN 755-2:2016-10
Platform profile structure	EN-AW 6060/T6	EN 755-2:2016-10
PUTUSU stack structure	S355J2	EN 10025-2:2005-04
Lashing bracket	S355J2	EN 10025-2:2005-04