



Certificate No.

IECRE.WE.TC.19.0075-R7

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

TYPE CERTIFICATE Wind Turbine

This certificate is issued to

Vestas Wind Systems A/S
Hedeager 42
Aarhus N, 8200
Denmark

for the wind turbine

Vestas V150-4.0 MW / V150-4.2 MW

wind turbine class(es) (class, standard, year)

IDs 1.1 & 1.5 & 2.1, class IIIB, IEC 61400-1:2005/AMD1:2010
ID 1.3, class IIIC, IEC 61400-1:2005/AMD1:2010
ID 1.2 & 1.4 & 1.6 & 2.2, class S, IEC 61400-1:2005/AMD1:2010

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:

DB-DNVGL-SE-0074-05341-4
2020-05-04

Design evaluation conformity statement
Dated:

DE-DNVGL-SE-0074-04352-7
2021-08-27

Type test conformity statement
Dated:

TT-DNVGL-SE-0074-05340-4
2020-05-04

Manufacturing conformity statement
Dated:

ME-DNVGL-SE-0074-05339-6
2020-12-22

Final evaluation report
Dated:

FER-TC-DNVGL-SE-0074-05338-7
2021-08-27

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:
2024-12-12

Approved for issue on behalf of the
IECRE Certification Body:

Vestergaard, Bente
Service Line Leader for Type and
Component Certification
Hellerup 2021-08-27



DNV Renewables Certification
Germanischer Lloyd Industrial Services GmbH
Brooktorkai 18
Hamburg, 20457
Germany



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Machine parameters:

Power regulation:	pitch-controlled
Rotor orientation:	Upwind
Number of rotor blades:	3
Rotor tilt:	6.0°
Cone angle:	-5.5°
Rated power:	4000 kW / 4200 kW
Rated wind speed V_r :	Annex 1
Rotor diameter:	150 m
Hub height(s):	Annex 1
Hub height operating wind speed range $V_{in} - V_{out}$:	3.0 – 24.5 m/s (HWO enabled)
Design life time:	20 years
Software version:	2019.06

Wind conditions:

Characteristic turbulence intensity I_{ref} at $V_{hub} = 15$ m/s:	Annex 1
Annual average wind speed at hub height V_{ave} :	Annex 1
Reference wind speed V_{ref} :	37.5 m/s
Mean flow inclination:	8°

Electrical network conditions:

Normal supply voltage and range:	720 V
Normal supply frequency and range:	50 or 60 Hz \pm 6 % Hz
Voltage imbalance:	IEC 61000-3-6 TR max 2 %
Maximum duration of electrical power network outages:	Two 3 months periods
Number of electrical network outages	Max 52 per year



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Other environmental conditions (where taken into account):

Normal and extreme temperature ranges:	Normal: -20°C to +45°C* Extreme: -30°C to +50°C
Low temperature turbine	Normal: -30°C to +45°C* Extreme: -40°C to +50°C
Relative humidity of the air:	100% (max 40% of time) and 90% (rest of life time)
Air density:	1.225 kg/m ³ (for normal operation) 1.325 kg/m ³ (for low temperature operation)
Solar radiation:	1000 W/m ²
Lightning protection system (standard and protection class):	Designed acc. to IEC 61400-24, Protection Level 1 and IEC 61312-1

*de-rating strategy above +30°C for 4.0MW and above +20°C for 4.2MW



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Major components:

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

Blade:

Type:	Hybrid / Infused
Material:	Carbon fibre reinforced epoxy and glass fibre reinforced epoxy
Blade length:	73.65 m
Number of blades:	3
Manufacturer:	Vestas Wind Systems A/S
Drawing / Data sheet / Part No.:	0069-0345, Rev. 3 0069-2202, Rev. 7 (OLPS)

Blade Aero Addons:

Type	STE's and RVG's
Manufacturer	Vestas Wind Systems A/S
Drawing / Data sheet / Part no.	STE Kit: 0072-2639, Rev. 0 RVG: 0073-5893, Rev. 0

Blade bearing:

Type:	Triple row cylinder bearing
Drawing / Data sheet / Part no.:	29110524, Rev. 3
TPS no.:	0023-3088, Rev. 5

Pitch System:

Type:	Hydraulic power unit
Manufacturer:	LJM/HINE/Liebherr/Hengli
Hydraulic Cylinder (180/110x922):	29111326, Rev. 1

Type	Pitch Actuation Module
Manufacturer	Vestas Wind Systems A/S
Drawing / Data sheet / Part no.	29111583, Rev. 1



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Main shaft:

Type: Cast iron
Material: EN-GJS-500-14
Drawing / Data sheet / Part no.: 29085300, Rev. 4

Main bearing:

Type: Spherical Roller Bearing
Manufacturer: FAG
Drawing / Data sheet / Part no.: F-582562.PRL-WPO 000

Main bearing:

Type: Spherical Roller Bearing
Manufacturer: SKF
Drawing / Data sheet / Part no.: 240/950 CA / C3LW33VQ113

Main bearing:

Type: Spherical Roller Bearing
Manufacturer: JTKET / KOYO
Drawing / Data sheet / Part no.: 240/950 RHAW33TS1CS

Gearbox:

Type: 2 stage planetary and 1 helical stage gearbox
Manufacturer: ZF (EH1052A)
Gear ratio: 1:143.37
Drawing / Data sheet / Part no.: 096-EH1052A001, Rev. A

Gearbox:

Type: 2 stage planetary and 1 helical stage gearbox
Manufacturer: Winergy (PZAB 3580)
Gear ratio: 1:142.76
Drawing / Data sheet / Part no.: A5E45622888A, rev.2

Yaw System:

Drive type: 8 x 2.7 kW, 400 V, 50 Hz asynchronous motors



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Drive manufacturer:	Lafert
Drawing / Data sheet / Part no.:	MZ10/A4A-55337
Drive type:	8 x 3.2 kW, 400 V, 60 Hz asynchronous motors
Drive manufacturer:	Lafert
Drawing / Data sheet / Part no.:	MZ10/A4A-55338
Drive type:	8 x 2.7 kW, 400 V, 50 Hz asynchronous motors
Drive manufacturer:	ABB
Drawing / Data sheet / Part no.:	3GZF500810-23 A 14 AA 100 A
Drive type:	8 x 3.2 kW, 400 V, 60 Hz asynchronous motors
Drive manufacturer:	ABB
Drawing / Data sheet / Part no.:	3GZF500810-23 A 14 AA 100 A
Drive type:	8 x 2.7 kW, 400 V, 50 Hz asynchronous motors
Drive manufacturer:	Bonfiglioli
Drawing / Data sheet / Part no.:	CD00006614-02
Drive type:	8 x 3.2 kW, 400 V, 60 Hz asynchronous motors
Drive manufacturer:	Bonfiglioli
Drawing / Data sheet / Part no.:	CD00007013-01
Gear type:	Bevel stage and three planetary stages, $i = 952.3$
Gear manufacturer:	Bonfiglioli
Drawing / Data sheet / Part no.:	I7090T010300
Gear type:	Bevel stage and three planetary stages, $i = 935$
Gear manufacturer:	Comer
Drawing / Data sheet / Part no.:	N07297_01
Bearing type:	Preloaded sliding bearing, PETP pads



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Bearing manufacturer: Vestas Wind Systems A/S
Drawing / Data sheet / Part no.: 29104726, Rev. 0

Generator:

Type: DASG 560/6M, Induction generator
Manufacturer: Vestas Nacelles Deutschland (VND)
Rated power: 4450 kW
Rated frequency: 74 Hz
Rated speed: 1485 rpm
Rated voltage: 800 V
Rated current: 3650 A
Insulation class: H
Degree of protection: IP54
Drawing / Data sheet / Part no.: 0071-4454, Rev. 0

Converter:

Type: Full quadrant IGBT
Manufacturer: Vestas Wind Systems A/S
Rated voltage machine/grid: 720 Vrms / 800 Vrms
Rated current: 3200 A
Degree of protection: IP54
Drawing / Data sheet / Part no.: 0069-2805, Rev. 0

Transformer:

Type: Cast-Resin transformer
4GY6781-1EY
Manufacturer: Siemens
Rated voltage: 33 / 0.72 V
Degree of protection: IP00
Drawing / Data sheet / Part no.: 0073-7914, Rev. 0

Type: Cast-Resin transformer
DTTH1N 5000/30
Manufacturer: SGB
Rated voltage: 33 / 0.72 V
Degree of protection: IP00



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Drawing / Data sheet / Part no.: 0073-7915, Rev. 02

Tower:

Type: Conical steel
Number of sections: 4
Length: 102.6 m (HH 105 m)
Drawing / Data sheet / Part no.: 0074-7302 Rev.1 (T966901)

Tower:

Type: Conical steel
Number of sections: 5
Length: 102.6 m (HH 105 m)
Drawing / Data sheet / Part no.: A005-4762, Rev.2 (T966906)

Tower:

Type: Conical steel
Number of sections: 5
Length: 102.6 m (HH 105 m)
Drawing / Data sheet / Part no.: 0068-6713, Rev.5 (T966900)

Tower:

Type: Conical steel
Number of sections: 6
Length: 152.6 m (HH 155 m)
Drawing / Data sheet / Part no.: 0078-9884 Rev.4 (T969B00)

Manuals:

Operating manual: 0079-9811, Rev. 1
Transportation and handling manual: 0079-9801, Rev. 2
Installation manual: 0079-9663, Rev. 2
Commissioning manual: 0079-9665, Rev. 0

Service lift:

Manufacturer: Avanti
Type: Avanti Shark / Avanti Dolphin / Avanti
Beluga



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Manufacturer: Power climber

Type: Sherpa-SD4

Crane:

Manufacturer: Star 071/95 Liftket

Maximum lifting capacity: max 800 kg



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Annex 1

Configurations covered by this Type Certificate

ID*	Variants	Hub Height	IEC WT class	Turbulence Intensity I_{ref}	Rated wind speed V_r	Mean wind speed V_{ave}
1.1	V150-4.0 MW	105 (T966901)	IEC 3B	0.14	9.7 m/s	7.5 m/s
1.2	V150-4.2 MW	105 (T966901)	S (based on IEC 3B)	0.14	9.9 m/s	7.0 m/s
1.3	V150-4.0MW	105 (T966900)	IEC 3C	0.12	9.8 m/s	7.5 m/s
1.4	V150-4.2 MW	105 (T966900)	S (based on IEC 3C)	0.12	10.1 m/s	7.0 m/s
1.5	V150-4.0MW	105 (T966906)	IEC 3B	0.14	9.7 m/s	7.5 m/s
1.6	V150-4.2 MW	105 (T966906)	S (based on IEC 3B)	0.14	9.9 m/s	7.0 m/s
2.1	V150-4.0MW	155 (T969B00)	IEC 3B	0.14	9.7 m/s	7.5 m/s
2.2	V150-4.2 MW	155 (T969B00)	S (based on IEC 3B)	0.14	9.9 m/s	7.0 m/s

* The ID follows the hub height with its first digit, the second digit is only consecutive to identify the different configurations within one hub height