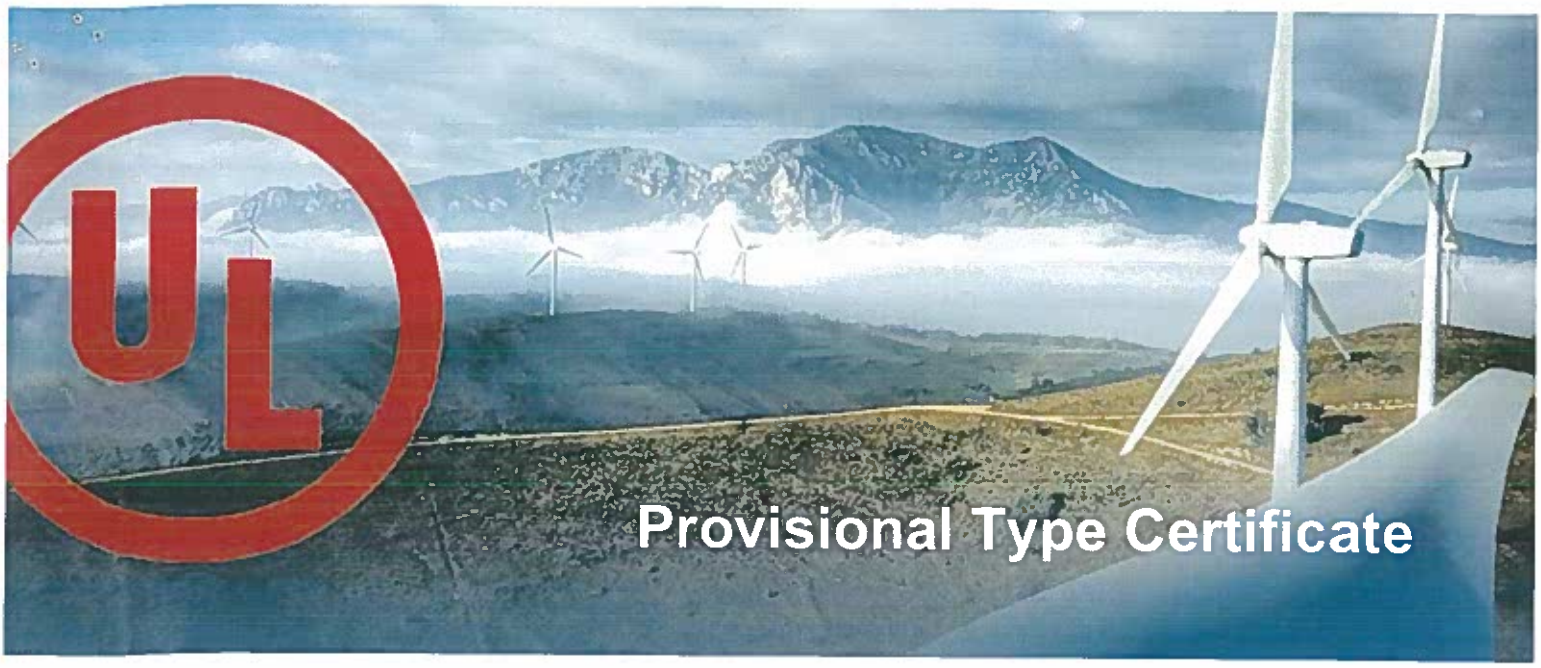

PTC -190401, Rev.0

This certificate is issued to	Suzlon Energy Limited One Earth, Opp. Magarpatta City Hadapsar, Pune 411 028 India
for the wind turbine	S128 2.6 MW / 2.8 MW
wind turbine class & standard	S, IEC 61400-1:2005+AMD1:2010

The conformity evaluation was carried out according to IEC 61400-22: Wind turbines - Part 22: Conformity testing and certification, Edition 1.0, 2010-05.

It is based on the reference documents listed on page 2 of this certificate.

The wind turbine type is specified in the annex of this document.

Changes in the system design or the manufacturer's quality system are to be approved by the DEWI-OCC Offshore and Certification Centre GmbH. Without approval, the certificate loses its validity.

This certificate is valid until 2020-04-29 ,subject to the mandatory TC maintenance.

Cuxhaven, 2019-04-30

Kai Grigutsch
Head of Certification Body
DEWI-OCC Offshore and Certification Centre GmbH

Suzlon Energy Limited

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PTC - 190401, Rev.0

This Certificate is based on the following reference documents:

Design basis and design evaluation conformity statement

DEWI-OCC Offshore and Certification Centre GmbH: Provisional Conformity Statement "Design basis and design evaluation provisional conformity statement - Wind Turbine S128 2.6 MW / 2.8 MW",
Doc. No. PSTC-190401 Rev. 0, 2019-04-30

Type test conformity statement

DEWI-OCC Offshore and Certification Centre GmbH: Provisional Conformity Statement "Type test evaluation provisional conformity statement - Wind Turbine S128 2.6 MW / 2.8 MW",
Doc. No. PSTC-190403 Rev. 0, 2019-04-30

Manufacturing conformity statement

DEWI-OCC Offshore and Certification Centre GmbH: Provisional Conformity Statement "Manufacturing evaluation provisional conformity statement - Wind Turbine S128 2.6 MW / 2.8 MW",
Doc. No. PSTC-190402 Rev. 0, 2019-04-30

Final evaluation report

DEWI-OCC Offshore and Certification Centre GmbH: Evaluation Report "Final Evaluation Report",
Doc. No. R11334479-12c Rev. 0, 2019-04-30

Outstanding Items:

- Final evaluation of Blade material test reports and material model for fatigue properties.
- Final evaluation of Blade Type Test reports and stiffness variance tests.
- Final evaluation of measurements for fibre volume fraction of the caps for the Blades.
- Eigen frequency measurement for S128 2.6 MW / 2.8 MW - HLT and final evaluation of its report
- Field test for the gearbox (option 2) type FD2920S and final evaluation of its report.

Annex - Wind Turbine details

Model Name	S128 2.6 MW / 2.8 MW	
Wind turbine manufacturer	Suzlon Energy Limited, One Earth, Opp. Magarapatta City Hadapsar, Pune 411 028 India	
Machine parameters:		
Variants	Configuration 1	Configuration 2
Power Regulation	Independent electromechanical pitch system for each blade	
Rotor Orientation	Upwind	
Number of rotor blades	3	
Rotor tilt	6°	
Cone Angle	3°	
Rated power	2600 kW / 2800 kW	
Rated wind speed Vr	9.5 m/s	
Rotor Diameter	129 m	
Tower	Tubular Steel Tower	Hybrid Lattice Tower
Hub height(s)	105 m	140 m
Hub height operating wind speed range	3 – 20 m/s	
Design life time	20 years	
Wind conditions:		
Characteristic turbulence intensity I_{ref} at V_{hub} = 15m/s:	15 %	
Annual average wind speed at hub height V_{ave}:	7.25	
Reference wind speed Vref:	37.5 m/s	36.5 m/s
Mean flow inclination	8°	
Hub height 50-year extreme wind speed V_{e50}:	52.5 m/s	51.1 m/s
Electrical network conditions:		
Normal supply voltage and range:	690 (-10% +15%) V	
Normal supply frequency and range:	50 (-6% +5%) Hz	
Normal and extreme temperature ranges:	Operation: -10 to 50 °C (derating from 45 °C) Survival: -20 to 50 °C	
Relative humidity of the air:	0 – 100 % (ambient) 30 - 99 % (inside WTG) 20 - 95 % (inside cabinet)	

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Air density:	1.16 kg/m³
Solar radiation:	1000 W/m²
Lightning protection system (protection level):	IEC 61400-24, LPL 1
Major components: **** If not otherwise stated, the certificate holder is the manufacturer**	
Blade:	
Type:	SB63S1
Material:	Glass-carbon epoxy
Blade length:	63 m
Number of blades:	3
Manufacturer:	Suzlon Energy Limited
Drawing / Data sheet / Part No.:	SB63S1-D-01-00002 Rev. 02, SB63S1-D-01-00001 Rev.01, SB63-R-01-00001 Rev. 0, SB63S1-S-1-00001 Rev. 03
Blade bearing:	
Type:	Double row four-point bearing
Manufacturer:	LAULAGUN BEARINGS, S.A.
Drawing / Data sheet / Part No.:	F3180M16DTTE125WN Rev. 02
Pitch system (option1):	
Motor / Actuator Type:	Asynchronous motor
Pitch Controller Type:	PCS Pitch Control System
Manufacturer:	Osterholz Antriebstechnik GmbH (OAT)
Pitch system (option2):	
Motor / Actuator Type:	Asynchronous motor
Pitch Controller Type:	Suzlon pitch system
Manufacturer:	Suzlon Energy Limited
Pitch gearbox / cylinder:	
Supplier	Bonfiglioli Trasmital
Type:	707TW
Ratio:	i = 160.7:1
Pitch lock assembly:	
Manufacturer:	Suzlon Energy Limited
Drawing / Data sheet / Part No.:	M481.300069-00 Rev. 00
Hub:	
Manufacturer:	Suzlon Energy Limited
Material:	5.3103 (EN-GJS-400-18-LT)

Drawing / Data sheet / Part No.:	M414.001030-01 Rev. 01
Main shaft:	
Manufacturer:	Suzlon Energy Limited
Material:	5.3103 (EN-GJS-400-18-LT)
Drawing / Data sheet / Part No.:	M334.001251-01 Rev. 01
Main bearing:	
Type:	F-624497.TR1-H50V (Front bearing) F-624800.TR1-H50V (Rear bearing)
Manufacturer:	Schaeffler Technologies AG & Co. KG
Drawing / Data sheet / Part No.:	EDD F-624497.TR1 000 Rev. AA (Front bearing) EDD F-624800.TR1 000 Rev. AA (Rear bearing)
Main bearing housing:	Part of the Main Frame
Type:	
Manufacturer:	
Material:	
Drawing / Data sheet / Part No.:	
Gearbox (Option 1):	
Type:	PZFB 3498
Gear Ratio:	i=1:102.189
Manufacturer:	Flender GmbH
Gearbox (Option 2):	
Type:	FD2920S
Gear Ratio:	i=1:102.1
Manufacturer:	Nanjing High Speed Gear Manufacturing Co., Ltd
Elastomer bearing:	
Type:	Hydraulic support
Manufacturer:	ESM
Drawing / Data sheet / Part No.:	ML07_008_73KD
Main frame:	
Manufacturer:	Suzlon Energy Ltd.
Material:	5.3103 (EN-GJS-400-18-LT)
Drawing / Data sheet / Part No.:	M314.001129-02 Rev. 02
Generator frame (Girder System):	
Manufacturer:	Suzlon Energy Ltd.
Material:	EN-GJS-400-18-LT
Drawing / Data sheet / Part No.:	M321.001003-01 Rev. 01
Mechanical brake:	
Type:	HE-2-90/96 THK=30mm
Manufacturer:	ANTEC, S.A.
Drawing / Data sheet / Part No.:	20.103.605 Rev.H
Rotor lock:	
Manufacturer:	Suzlon Energy Ltd.
Material:	1.0546 (S355NL) - Disc

Drawing / Data sheet / Part No.:	M331.001081-00 Rev. 00	
LSS shrink disc / LSS coupling:		
Type:	Bolted Connection	
Manufacturer:		
HSS coupling:		
Type:	ARPEX COUPLING ARV-4 KZR 520-4	
Manufacturer:	Siemens AG	
Yaw System:		
Bearing Type:	Friction Pads/ Friction Bearing	
Manufacturer:	Suzlon Energy Ltd.	
Drawing / Data sheet / Part No.:	M314.001113-01 Rev. 01; M314.001111-01 Rev. 01; M314.001133-01 Rev. 01	
Drive Type:	Electric yaw drive	
Manufacturer:	BONFIGLIOLI Trasmital Ltd.	
Drawing / Data sheet / Part No.:	M310.000102-01	
Gear Type:	712T5F	
Manufacturer:	BONFIGLIOLI Trasmital Ltd.	
Drawing / Data sheet / Part No.:	I7120T019400 Rev. 00	
Brake Type:	No explicit brake. The Yaw bearing friction combined with fail safe spring brakes on yaw motor	
Tower top flange / tower top adapter:		
Manufacturer:	Suzlon Energy Ltd.	
Material:	1.0546-Z35 (S355NL-Z35)	
Drawing / Data sheet / Part No.:	M214.002083-02 Rev. 02	M214.002094-01 Rev. 1
Generator (option 1):		
Type	SG055D06	
Manufacturer	Suzlon Energy Limited	
Connection (stator / rotor)	Δ / Y	
Rated active power	2776 Kw / 2865 kW	
Generator (option 2):		
Type	JFWA-560MR-06A	
Manufacturer	Siemens	
Connection (stator / rotor)	Y / Y	
Rated active power	2776 kW / 2865 kW	
Converter (option 1):		
Type	WF1000-06L0270-CPN-A	
Manufacturer	VERTIV	
Converter (option 2):		
Type	DFIG 2700LV2LSWC (PT0107)	
Manufacturer	Ingeteam	
Medium voltage switchgear:	Out of scope of the wind turbine	
Transformer:	Out of scope of the wind turbine	

Main low-voltage circuit breaker:		
Type	E4.2N 3200 Ekip Dip LSIG 3p F HR	
Manufacturer	ABB	
Tower:		
Designer	Suzlon Energy Ltd.	
Manufacturer (option 1)	Tool Fab Engineering Industries (P) Ltd.	Transrail Lighting Limited
Manufacturer (option 2)	Suzlon Energy Ltd.	APS
Manufacturer (option 3)	Barakath	Sanvijay Infrastructures Private Limited
Main drawing No.	M200.000264-04	M200.000273-01
Tower total length	102.551 m	137.592 m
Manuals:		
O&M Manual (with chapters: Safety, Operation, Maintenance	TGPM-MA-005163-S128-2.6-OMS Rev. 03-01	
Assembly Manual (with chapters: Transport, Installation, Lubrication chart, Torque list):	TGPM-MA-005163-S128-2.6-A Rev. 03-02	
Checklists (with checklists for: Transport, Installation, Commissioning, Maintenance):	TGPM-MA-005163-S128-2.6-CL Rev. 03	

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