

NATIONAL INSTITUTE OF WIND ENERGY

(An autonomous institution under the
Ministry of New and Renewable Energy (MNRE), Government of India)

Type Certificate

Type Certificate Number

TC-1700-05, Rev. 02

This certificate is issued to

M/s. Inox Wind Limited,
Plot No 1, Khasra No - 264 to 267, Industrial Area, Village -
Basol, District - Una, Himachal Pradesh – 174303.

For the Wind Turbine

**INOX DF/3000/145 3.0 MW Power Booster Mode 3.3 MW
Rotor Blade Type SR71 V2 (T-Bolt) / WBSR146-3.0 Hub
Height 100m / 122.5m / 140m IEC WT Class III_B / Class S**

This certificate attests compliance with the following normative reference, concerning the Design, Type test and Manufacturing of the above mentioned wind turbine model, Class III_B / Class S.

IS/IEC 61400-22: 2010, “Wind turbines - Part 22: Conformity Testing and Certification”

in combination with

IEC 61400-1, Edition 4.0, Dated: 2019-02, “Wind energy generation systems – Part 1: Design requirements”

The conformity evaluation was carried out according to IS/IEC 61400-22: 2010, “Wind turbines - Part 22: Conformity Testing and Certification”, Published in June 2018 by the Bureau of Indian Standards (BIS).

The associated documents/reports are listed in Annex 1. The wind turbine type is specified in Annex 2 of this certificate.

Any changes in the design or manufacturer's quality system are to be approved by National Institute of Wind Energy (NIWE), Product Certification Body (PCB). Without approval, this type certificate loses its validity.

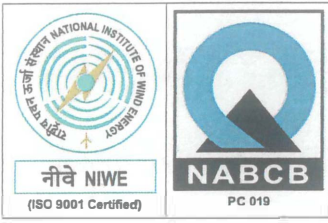
This type certificate is valid until : 18.02.2028

Place: Chennai, India.
Date: 19.02.2025

S. Paramasivan
Assistant Engineer, Certification
Prepared by

S. A. Mathew
Director & Head, Certification
Approved by





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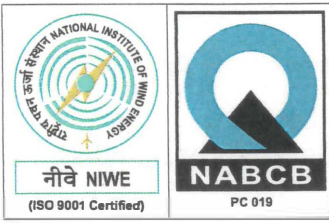
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Wind Turbine Type Specification	
Certificate No:	TC-1700-05, Rev. 02
Wind Turbine Manufacturer:	M/s. Inox Wind Limited
Wind Turbine Type:	INOX DF/3000/145 3.0 MW Power Booster Mode 3.3 MW, Hub Height (HH) 100m / 122.5m / 140m, IEC wind Class III _B / Class S

Annex 1:

Document Title	Document Number	Date issued	Issued by
Design Evaluation Conformity Statement	DE-CS-1693-01, Rev. 02	13.02.2025	NIWE
Type Test Conformity Statement	TT-CS-1693-02, Rev. 02	13.02.2025	NIWE
Manufacturing Conformity Statement	ME-CS-1693-03, Rev. 02	13.02.2025	NIWE
Final Evaluation Report	TC-FER-1700, Rev. 02	19.02.2025	NIWE

--- End of Annex 1 ---





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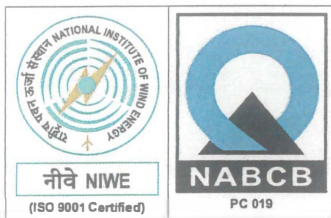
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Annex 2:

Machine Parameters			
IEC Wind Turbine Class	Class III _B (HH 100m & 122.5m)		
	Class S (HH 140m)		
Wind Turbine axis of rotation	Horizontal Axis Wind turbine		
Power Regulation (Pitch / Stall system)	Pitch System (3 Independent Electro-mechanical Pitch Systems)		
Rated Power	3000 kW (3300 kW Power Boost)		
Rotor Orientation	Upwind		
Rotor Tilt	4.5 deg		
Rotor Cone angle	-3 deg		
Rated Wind Speed, V_r	10.5 m/s		
Rated Rotational speed	11.0 rpm (HH 100m & 122.5m)		
	10.89 rpm (HH 140m)		
Rotor Diameter	145.0 m		
Hub Height(s)	100 m		
	122.5 m		
	140 m		
Operating Wind Range ($V_{in} - V_{out}$)	3 m/s – 20 m/s		
Design Life time	25 years		
Generator Type	Double-fed Asynchronous Induction type Generator		
Tower Type	Tubular Steel Tower		
Wind Conditions			
Reference Turbulence Intensity, I_{ref}	HH 100m	HH 122.5m	HH 140m
	0.14	0.14	Site 1, I_{ref} = 0.12 Site 3, I_{ref} = 0.11
Annual Average Wind Speed, V_{ave}	7.5 m/s	7.5 m/s	Site 1, V_{ave} = 6.7 m/s Site 3, V_{ave} = 7.11 m/s
Reference Wind Speed, V_{ref}	37.5 m/s	37.5 m/s	30 m/s
50-year Extreme Wind Speed, V_{e50}	52.5 m/s	52.5 m/s	42 m/s
Mean flow inclination	8 deg		





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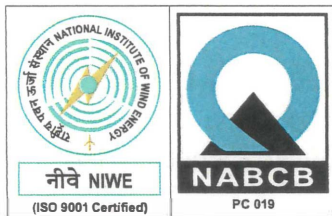
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Wind Turbine Type:	INOX DF/3000/145 3.0 MW Power Booster Mode 3.3 MW, Hub Height (HH) 100m / 122.5m / 140m, IEC wind Class III _B / Class S

Electrical Network Connection		
Normal Supply Voltage and Range	3~690VAC ± 10% (For 3000 kW) 3~670V – 759V (For 3300 kW)	
Normal Supply Frequency and Range	50Hz ± 2%	
Voltage imbalance	Less than 2%	
Maximum duration of electrical power network outages	6 Hours	
Number of electrical network outages per year	20 times per year	
Other Environmental conditions		
Operating Temperature Range	-5°C to +50°C	
Extreme Temperature Range	-5°C to +60°C	
Relative Humidity of the air	up to 100%	
Air density	HH 100m & 122.5m	HH 140m
	1.225 kg/m³	Site-1, 1.165 kg/m³, Site-3, 1.141 kg/m³
Weibull Shape parameter	Site 1: 2.36, Site 3: 2.73 (HH 140m)	
Solar Radiation	1000 W/m²	
Lightening Protection System	As per IEC 61400-24	
Major Wind Turbine Components		
Rotor Blade:		
Manufacturer	Inox Wind Limited	
Model	SR71-V2 with T-Bolts (HH 100m & 122.5m)	
	WBSR146-3.0 (HH 140m)	
Blade Material	GFRP	
Blade length	71.3 m	
Number of Blades	3	
Drawing number	00239-07-15-09.02.01 Rev. 5 (HH100m & 122.5m)	
	40611-01-15-09.03.01, Rev. 01 (HH140m)	
Blade Bearing:		
Type	83823060	

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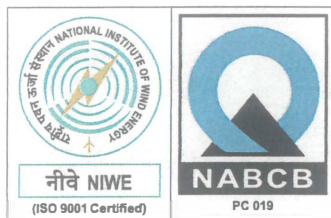
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Manufacturer	Thyssenkrupp Rothe Erde
Drawing number	092.80.2958.000.48.140D Rev. C
Specification	Double-row ball slewing bearing
Pitch System:	
Type	Electro-mechanical with AC-motors and capacitor backups
Pitch Motor:	
Model	SMATBRY-KB01
Manufacturer	Brusatori
Rated Voltage	400 V
Rated Current	47.6 A
Rated Speed	1580 rpm
Pitch Gearbox:	
Type	Multi-stage gearbox
Manufacturer	BONFIGLIOLI
Gear ratio	1:204 ± 2%
Drawing number	I7110T004500 (version 2019-08-01)
Hub:	
Type	Cast
Material	EN-GJS-400-18U-LT
Manufacturer	Dalian Huarui Heavy Industry Casting Co. Ltd., China (DHHI)
Drawing number	10142874 Rev. D
Main Shaft:	
Type	Cast
Material	EN-GJS-400-18-LT
Manufacturer	Dalian Huarui Heavy Industry Casting Co. Ltd., China (DHHI)
Drawing number	10139080 Rev. E
Main Bearing 1:	
Type	Two tapered roller bearings in O-arrangement





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Manufacturer	Beijing Jingye Bearing Co., Ltd. (JYB)
Drawing number	T5GD/1730/X2
Main Bearing 2:	
Type	Two tapered roller bearings in O-arrangement
Manufacturer	Beijing Jingye Bearing Co., Ltd. (JYB)
Drawing number	T5GC/1600/YA
Main Bearing Housing:	
Type	Cast
Material	EN-GJS-400-18-LT
Manufacturer	Dalian Huarui Heavy Industry Casting Co. Ltd., China (DHHI)
Drawing number	10139081 Rev. G
Gearbox:	
Type	CWTG3300/145-110-50
Model	Two helical planetary stages and one helical spur gear stage
Manufacturer	Dalian Huarui Heavy Industry Group Co., Ltd.
Gear ratio	1:110.217
Main drawing number	8187 Rev. A
Gear oil Type	Mobilgear SHC XMP 320
Coupling between Gearbox and Generator:	
Type	CENTALINK Torsional stiff dogbone coupling
Manufacturer	CENTA
Drawing number	019-64489-000-xxx Rev. C
Generator:	
Manufacturer	ELIN Motoren
Model	Double-fed asynchronous induction type generator
Type	MRM-063 Z06
Rated Power	3200 kW (with power boost 3300kW)
Rated Voltage	690 V (±10 %)
Rated Current	2939 A



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Rated Speed	1200 rpm
Operating Speed Range	620 to 1380 rpm
Type of Duty	S1
Insulation Class	Stator – F; Rotor – H
Degree of Protection	IP 54/ IP 23 (slip ring)
Cooling System	Water Air Cooling (Water-to-air heat exchanger)
Rotor Brake:	
Type	JHS-300/30
Position	Brake Disc with High-speed shaft with a hydraulically actuated brake calliper
Manufacturer	DELLNER BRAKES JHS GmbH
Drawing number	VA001932 Rev. F
Brake disc drawing number	26118908
Rotor Lock:	
Type	Hydraulically operated pin
Material	30CrNiMo8+QT
Manufacturer	DELLNER BRAKES JHS GmbH
Drawing number	VA002995 Rev. D
Main Frame:	
Type	Cast
Manufacturer	EN-GJS-400-18-LT
Material	Dalian Huarui Heavy Industry Casting Co. Ltd., China (DHHI)
Drawing number	10141540 Rev. D
Yaw System:	
Type	Electro-mechanical with AC-motors
Yaw Motor:	
Type	BN 100LB 4
Number of motors	6
Manufacturer	BONFIGLIOLI
Drawing number	26117943.C





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Specification	Asynchronous, 3 KW, 3~400 VAC, 50 Hz
Yaw Gearbox:	
Type	Multi-stage gearbox
Manufacturer	BONFIGLIOLI
Drawing number	I7120T023700 (version 2019-07-29)
Yaw Bearing:	
Type	Single-row ball slewing bearing
Manufacturer	Thyssenkrupp Rothe Erde
Material	42CrMo4 V / +QT
Drawing number	061.70.3024.000.48.150D Rev. A
Hydraulic System:	
Manufacturer	Hydratech Industries
Model	HWP Hydraulic System B6900
Drawing number	B6900-D, Rev. 0
Hydraulic Diagram	B6900-D
Yaw Brake:	
Type	JHS-32
Manufacturer	DELLNER BRAKES JHS GmbH
Drawing number	VA001914 Rev. C
Nacelle Cover:	
Material	Polyester resin
Manufacturer	Hindustan FRP Products
Drawing number	26119932
Spinner:	
Material	GRP
Manufacturer	Hindustan FRP Products
Drawing number	26119526
Converter:	
Model	AMSC P/N 73001135
Manufacturer	AMSC
Rated Power	3300 kW (Smart Boost Power)



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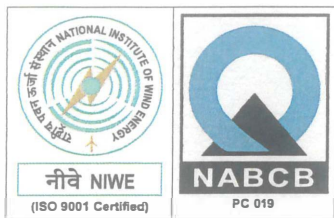
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Rated frequency	50Hz / 60Hz (+/- 2%)		
Rated Voltage (Generator side)	690Vrms +/-10% (phase-phase)		
Rated Current (Generator side)	1250 A		
Rated Voltage (Grid side)	0 - 759 Vrms (phase-phase)		
Rated Current (Grid side)	2950 A		
Degree of protection	IP54		
Cooling type	Water Air Cooling (Water-to-air heat exchanger)		
Tower:			
Tower Type	Tubular Steel tower		
Tower height(s)	97.54 m (HH 100m)		
	117.54 m (HH 122.5m)		
	137.5 m (HH 140m)		
Manufacturer	Inox Wind Limited		
No. of Sections	HH 100m	HH 122.5m	HH 140m
	5 Sections	6 Sections	6 Sections
Drawing number(s)	26120516, Rev. A	NEXHS-INS-086-DWG-1001-01, rev. 01	26200516, Rev D
Controller:			
Model	PLC based control and Protection system		
Manufacturer	AMSC		
Software version	V 1.4.1		
Control and Safety system:			
Design	PLC based control and protection system		
Document number	0020627.01C - Monitoring System Documentation		
Manuals:			
Operation & Maintenance Manual	0700147.01D – Mechanical Maintenance Manual 1000095.01C – WEC Operating Manual 3100057.01B – Electrical Maintenance Manual		
Transport, Installation, Commissioning and Safety Manuals	1000092.01B – WEC Erection Manual 0250185.01A – Transport Guidelines		





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	1000054.01A – Commissioning Protocol 1000053.01A – Safety System Commissioning Protocol
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