Laboratory	**Wind Turbine Test Station (Large and Small Wind Turbines), National Institute of Wind Energy, 657/1A2, Velachery-Tambaram Main Road, Pallikaranai, Chennai, Tamil Nadu**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-5059** ***(in lieu of T-1144 & T-1145)***	**Page 1 of 4**	
Validity	**03.02.2017 to 02.02.2019**	**Last Amended on 27.02.2017**	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection

ELECTRICAL TESTING

AT SITE				
I.	**WIND TURBINE**			
1.	**Wind Turbine**	Power performance measurement (PPM)	IEC 61400–12–1 Year 2005-12	
		Wind speed (Hub height)		0-70 m/s; 0-113 Hz
		Wind speed (Reference height)		0-70 m/s; 0-113 Hz
		Wind direction		0°-360° mechanical angle (vector type)
		Relative humidity		0.8 to 100%RH
		Air temperature		-39.2°C to 60°C
		Air pressure		600 hPa to 1060 hPa
		Rotor speed(Generator speed)		0-3000 RPM
		Pitch angle		-6° to 90°
		Rain status (ON/OFF)		Qualitative (Status 1 or 0 Logic)
		Active power		P-1250 to + 1250W (430V type) P-2000 to + 2000W (660V type)
		Reactive power		Q-1250 to + 1250VAR (430V type) Q-2000 to + 2000VAR (660V type)
		Grid frequency		45 Hz to 55 Hz
		Generator status (ON/OFF)		Status 1 or 0Logic
		Brake status (ON/OFF)		Status 1 or 0 Logic

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Validity	**03.02.2017 to 02.02.2019**	**Last Amended on 27.02.2017**

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		MECHANICAL TESTING		
AT SITE				
I.	**PERFORMANCE / DURABILITY / SAFETY TEST**			
1.	**Wind Turbine**	**Performance Tests** Yaw efficiency test (YET)	Danish recommendations for basic tests Year 1997 (guiding document) IEC 61400–1, Edition 3.1, Year 2014-04	
		Wind speed (Hub height)		0-70 m/s; 0-113 Hz
		Wind speed (Reference height)		0-70 m/s; 0-113 Hz
		Wind direction		0°-360° mechanical angle (vector type)
		Yaw direction		2° to 346°
2.	**Wind Turbine**	**Safety tests** Safety and function testing (SFT)	IEC 61400–1, Edition 3.1, Year 2014-04 IEC 61400 – 13, Edition 1.0, Year 2015-12 Danish recommendations for basic tests Year 1997 (guiding document)	
		Wind speed (Hub height)		0-70 m/s; 0-113 Hz
		Wind direction		360° mechanical angle (vector type)
		Rotor speed		0-3000RPM
		Rotor azimuth position		0-360°
		Yaw direction		2° to 346°
		Edgewise bending moment		0-6000 kNm
		Flap wise bending moment		0-6000 kNm
		Shaft torsion		0-6000 kNm
		Active power		P-1250 to + 1250W (430V type) P-2000 to + 2000W (660V type)

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Reactive power		Q-1250 to + 1250VAR (430V type) Q-2000 to + 2000VAR (660V type)
		Grid frequency		45 Hz to 55 Hz
		Generator status		Status 1 or 0 Logic
		Brake status		Status 1 or 0 Logic
3.	**Wind Turbine**	**Performance Tests** Load Measurements (LM)	IEC 61400 – 13, Edition 1.0, Year 2015-12 IEC 61400 – 13, Edition 1.0, Year 2015-12	
		Wind speed (Hub height)		0-70 m/s; 0-113 Hz
		Wind speed (Reference height)		0-70 m/s; 0-113 Hz
		Wind direction		0°-360° mechanical angle (vector type)
		Relative humidity		0.8 to 100%RH
		Air temperature		-39.2°C to 60°C
		Air pressure		600 to 1060 hPa
		Rain status (on/off)		Status 1 or 0 Logic
		Rotor speed (Generator speed)		0-3000 RPM
		Rotor azimuth position		0-360^{o}
		Yaw direction		2° to 346°
		Active power		P-1250 to + 1250W (430V type) P-2000 to + 2000W (660V type)
		Grid frequency		45 Hz to 55 Hz
		Generator status (on/off)		Status 1 or 0 Logic
		Brake status (on/off)		Status 1 or 0 Logic
		Nacelle acceleration		-54.49 to +54.49 m/sec2
		Edgewise bending moment		0-6000 kNm
		Flapwise bending moment		0-6000 kNm

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Shaft bending moments		0-6000 kNm
		Shaft torsion		0-6000 kNm
		Tower top bending moment		0-20000 kNm
		Tower top torsion		0-20000 kNm

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