NABL

National Accreditation Board for Testing and Calibration Laboratories

(An Autonomous Body under Department of Science & Technology, Govt. of India)

CERTIFICATE OF ACCREDITATION

NISAKI TECHNOLOGY SERVICES

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

46, Park Road, 2nd Main, 10th Cross, Wilson Garden, Bangalore, Karnataka

in the discipline of

ELECTRICAL TESTING

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Certificate Number T-1401

Issue Date 04/07/2016

Valid Until 03/07/2018

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

N. Venkateswaran	Anil Relia	Prof. S. K. Joshi
Program Manager	Director	Chairman

रा.प्र.प्र.बो.

राष्ट्रीय परीक्षण और अंशशोधन प्रयोगशाला प्रत्यायन बोर्ड

(विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार के अधीन स्वायत्तशासी निकाय)

प्रत्यायन प्रमाण–पत्र

निसाकी टेक्नोलॉजी सर्विसेस्

का मूल्यांकन और प्रत्यायन निम्न मानक के अनुसार

आई.एस.ओ./आई.ई.सी. 17025:2005

"परीक्षण एवं अंशशोधन प्रयोगशालाओं की सक्षमता की सामान्य अपेक्षाएँ"

बैंगलोर, कर्नाटक

में स्थित इसकी सुविधाओं के लिए

विद्युत परीक्षण

के विषय क्षेत्र में किया गया।

(इस प्रयोगशाला के प्रत्यायन के विषय क्षेत्र की जानकारी एन ए बी एल वेबसाइट www.nabl-india.org से भी प्राप्त कर सकते हैं)

प्रमाण-पत्र संख्या प-1401

जारी करने की तिथि 04/07/2016

वैधता की तिथि 03/07/2018

यह प्रमाण-पत्र उपर्युक्त मानक तथा राष्ट्रीय परीक्षण और अंशशोधन प्रयोगशाला प्रत्यायन बोर्ड की अतिरिक्त अपेक्षाओं का निरंतर संतोषप्रद अनुपालन किए जाने पर अनुबंध में निर्दिष्टानुसार प्रत्यायन के क्षेत्र के लिए वैध रहेगा।

रा.प्र.प्र.बो. की ओर से हस्ताक्षरित

एन. वेंकटेस्वरन	अनिल रेलिया	प्रो. श्रीकृष्ण जोशी
एन. वेंकटेस्वरन	अनिल रेलिया	प्रो. श्रीकृष्ण जोशी
कार्यक्रम प्रबन्धक	निदेशक	अध्यक्ष

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Laboratory	**Nisaki Technology Services, # 46, Park Road, 2nd Main, 10th Cross Wilson Garden, Bangalore, Karnataka**		
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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		AT LABORATORY		
I.	**POWER STABILISERS AND UPS**			
1.	**Stabilized power Supplies, DC output**	Insulation Resistance	IS: 7204(Part 4) -1980	1M Ω- 100MΩ at 500 V DC
		Insulation Voltage	(RA 2006) Cl : 26	Upto 5 kV AC
		Efficiency	Cl : 27	Upto 100%
		Power factor	Table 3 of IS 7204(Part 2)	0.5 to unity
		Source Distraction	Table 3 (Part 2)	
		Relative harmonic content of	Table	Upto 40%
		source current	Table 3 (Part 2)	Upto 5%
		Ripple on DC source current	Table 3 (Part 2)	
2.	**Solid State Inverters Run from Storage Batteries Upto 2KVA/48 V DC**	Visual Inspection	IS 13314: 1992 (RA 1998)	1MΩ to100MΩ at 500 V DC
		High Voltage	Clause 7.5	150V to 300V, Upto 3A
		Insulation resistance	Clause 7.6	150V to 300V, Upto 3A
		No- load	Clause 7.7	Upto 10%
		Output	Clause 7.8	
		Harmonic content	Clause 7.9 (7.9.1- 7.9.3)	
			Clause 7.11	
3.	**Servo-Motor operated Automatic Line voltage Correctors Upto 3kW**	Insulation Resistance	IS: 9815:2000 (RA: 1994)	1 MΩ - 100 MΩ at
		High voltage	Cl 11.4	500 V DC
		Output voltage	Cl 11.5	Upto 5 kV
		No- load current	Cl 11.6	150 V - 300 V
		No load loss and efficiency	Cl 11.7	Upto 10 A
			Cl 11.9	3 kW
4.	**Switch Mode Power Supply Upto 200W**	Visual Inspection	IS: 14886:2000 (RA: 2003)	Qualitative
		Line Effect	Table 1	Upto 50 V/10A
		Load Regulation		Upto 10 A DC
		Power Output		Upto 200 W
		Output Voltage		Upto 50 V
		Efficiency		Upto 100 %
		Overload protection		

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
5.	**Photovoltaic Systems - Power Conditioners**	Output Voltage Frequency	IEC 61683-1999 Cl.4.3	Upto 10 kW
		Input Voltage	IEC 61683-1999 Cl.4.4	Upto 300 V
		Ripple and Distortion	IEC 61683-1999 Cl.4.5	Upto 10 %
		Resistive loads (utility grid)	IEC 61683-1999 Cl.4.6	1 MΩ to 100MΩ
		Reactive Loads	IEC 61683-1999 Cl.4.7	150 V to 300 V Up to 3A
II.	**POWER SYSTEM PROTECTION RELAYS**			
1.	**Electrical Relays: Over Current Relay Earth Fault relay Motor Protection Differential (1Ph & 3 Ph)**	-Accuracy	IEC 60255: 2008-2009-3 Cl :4/ IEC 60255: 2008-2009-6 Cl :7	Upto 250 V AC Upto 24 V DC Upto 110 VDC Up to 400 A AC P.F- 0.00-1.00 99.999 Hz to 999.99Hz Upto 9999 s
		-Pick up and Drop of	IEC 60255: 2008-2009-23 Cl :4.4.2	
		-Rated Burden	IEC 60255: 2008-2009-6 Cl :8 IEC 60255: 2008-2009-13 Cl: 11/ IEC 60255: 2008-2009-23 Cl :4.4.2	
		-Verification of Marking	IEC 60255: 2008-2009-13 Cl: 13	
		-Test Related to Accuracy & Operating characteristics	IEC 60255: 2008-2009-13 Cl: 15	
		-Input and auxiliary energizing quantities	IEC 60255: 2008-2009-13 Cl: 3.1	

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Electrical Relays: Over current relay Earth Fault relay Motor Protection Differential (1Ph & 3 Ph)	-Characteristics quantities and setting range	IEC 60255: 2008-2009-13 Cl: 3.3	
		-Restraint percentage	IEC 60255: 2008-2009-13 Cl: 3.4	
		-Resetting and disengaging ratios	IEC 60255: 2008-2009-13 Cl: 3.5	
		-Operation and accuracy	IEC 60255: 2008-2009-13 Cl: 4	
		-Methods of presenting relay characteristics and performance	IEC 60255: 2008-2009-13 Cl: 5.0	
2.	**AC Voltage Frequency Relay PF Relay and all protection Relay**	Insulation - Dielectric - Insulation Resistance	IEC 755 Cl 8.8/ IEC 60255: 2008-2009-13 Cl: 12 IEC 60255: 2008-2009-6 Cl: 9 IEC 60255: 2008-2009-5 Cl: 6.0 IEC 60255: 2008-2009-5 Cl: 7.0	DC V – Up to 2000 V AC V- Up to1000 V 1 MΩ to 100 MΩ at 500 V DC

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
III.	**BATTERIES**			
1.	**Sealed Lead Acid (SMF) Batteries. Tubular Batteries**	Verification for Construction and Designation	JIS 8702-1:2003 IS 13369:1992 IS 15549: 2005: Cl.4.1 to 4.9 8.1 JIS 8702-1:2003. Cl.1.0	2V-6V-12V C/20 C/10 , C/5, C/3 C/1
		Marking polarity(Visual)	IS 13369:1992. Cl.4.2.1-4.2.3 IS 1651: Cl. 4.2.1 -4.2.3 IS 15549: 2005: Cl.4.1 to 4.9 8.1	Upto 300Ah
		Capacity (C/10, C/20)	JIS 8702-1:2003. Cl.1.0 IS 13369:1992. Cl.11.1.2 IS 1651: 1991 Cl. 12.2 -3-4 IS 15549: 2005: Cl.4.1 to 4.9 8.1 JIS 8702-1:2003. Cl. IS 13369:1992. Cl.10.5 IS 1651: 1991 Cl. 11.7 IS 15549: 2005 Cl. 12.1& 12.2	
2.	**Stationary Cells & Batteries, Lead-acid type (with tubular Positive Plates)**	Voltage during discharge	I 1651: 1991, Cl.12.10	Upto 12 V/300Ah 2 V/600 Ah
		Ampere hour & watt hour efficiency tests	I 1651: 1991, Cl.12.9	Upto 12 V/300Ah 2 V/600 Ah
		Loss of capacity on storage	I 1651: 1991, Cl.12.7	Upto 12 V/300Ah 2 V/600 Ah
		Endurance test	I 1651: 1991, Cl.12.8	Upto 12 V/300Ah 2 V/600 Ah

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
3.	**Stationary Valve Regulated Lead-Acid Batteries**	Verification of Visual Examination	IS15549: 2005, Cl.4.1 to 4.9 & 8.1	Qualitative
		Checking of Dimensions as per manufacturer's drawing	IS15549: 2005, Cl.10.1.1.b	Upto 600 mm
		C_{10} Capacity and voltage during discharge	IS15549: 2005, Cl.12.1	Upto 12 V/300Ah 2 V/600 Ah
		C_1 Capacity and voltage during discharge	IS15549: 2005, Cl.12.2	Upto 12 V/300 Ah 2 V/600 Ah
		Capacity at other discharge rates	IS15549: 2005, Cl.12.3	Upto 12V/300Ah 2V/600Ah
		Ampere hour efficiency	IS15549: 2005, Cl.12.4	Upto 12 V/300 Ah 2 V/600 Ah
		Watt hour efficiency	IS15549: 2005, 12.5	Upto 12 V/300 Ah 2 V/600 Ah
		Retention of charge	IS15549: 2005, Cl.12.6	Upto 12V/300 Ah 2 V/600 Ah
		Acid Retention Capability test on separators	IS15549: 2005, Cl.12.7	Upto 12V/300 Ah 2 V/600 Ah
		Wicking test on separators	IS15549: 2005, Cl.12.7	Upto 12 V/300 Ah 2 V/600 Ah
		Test on vent seal operation	IS15549: 2005, Cl.12.8	Upto 12 V/300 Ah 2 V/600 Ah
		Oxygen recombination efficiency	IS15549: 2005, Cl.12.9	Upto 12 V/300 Ah 2 V/600 Ah
		Endurance life cycle	IS15549: 2005, Cl.12.1	Upto 12V/300 Ah 2 V/ 600Ah

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
4.	**Stationary Lead-Acid Batteries (with Tubular Positive Plates) in Monobloc Container**	Ampere hour & watt hour efficiency	IS13369: 1992, Cl.11.8	Upto 12 V/300 Ah
		Loss of capacity on storage	IS13369: 1992, Cl.11.6	Upto 12 V/300 Ah
		Endurance	IS13369: 1992, Cl.11.7	Upto 12 V/300 Ah
5.	**Small-Sized Valve Regulated Lead-Acid Batteries**	Verification of Marking Items	JIS C 8702-1-2009, Cl.4.3	Qualitative
		High Rate Discharge Characteristics	JIS C 8702-1-2009, Cl.7.2	Upto 300 Ah
		Cycle Service Endurance	JIS C 8702-1-2009, Cl.5.3 & 7.3	Upto 300 Ah
		Storage characteristics	JIS C 8702-1-2009, Cl.5.4 & 7.4	Upto 300 Ah
		Maximum permissible current characteristics	JIS C 8702-1-2009, Cl.5.5 & 7.5	Upto 300 Ah
		Charge acceptance characteristics after deep discharge	JIS C 8702-1-2009, Cl.5.6 & 7.6	Upto 300 Ah
		Endurance in trickle application	JIS C 8702-1-2009, Cl.5.7 & 7.7	Upto 300 Ah
		Endurance in trickle application at 40°C	JIS C 8702-1-2009, Cl.5.8 & 7.8	Upto 300 Ah
		Gas emission intensity	JIS C 8702-1-2009, Cl.5.9 , 7.9.1 & 7.9.2	Upto 300 Ah
		Gas recombination characteristics	JIS C 8702-1-2009, Cl.5.10 , 7.10.1 & 7.10.2	Upto 300 h

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
6.	**Lead Acid Storage Batteries for Motor Vehicles with Light Weight and High Cranking Performance**	Physical Examination	IS14257:1995, Cl.9.3.1	Qualitative
		Verification of Dimensions and Layout	IS14257:1995, Cl.9.3.2	Qualitative
		Verification of Marking	IS14257:1995, Cl.9.3.3	Qualitative
		Charging Acceptance	IS14257:1995, Cl.9.3.6	Upto 300 Ah
		Capacity (5 hr rate)	IS14257:1995, Cl.9.3.4	Upto 300 Ah
		Life Cycle	IS14257:1995, Cl.9.3.7	Upto 300 Ah
		Overcharge Endurance	IS14257:1995, Cl.9.3.9	Upto 300 Ah
7.	**Secondary Cells and Batteries for Photovoltaic Energy Systems (PVES)**	Capacity	IEC 61427:2005, Cl.8.1	Upto 300 Ah
		Endurance in Cycle	IEC 61427:2005, Cl.8.2	Upto 300 Ah
		Charge Retention	IEC 61427:2005, Cl.8.3	Upto 300 Ah
		Cycle endurance test in Photovoltaic application (Extreme conditions)	IEC 61427:2005, Cl.8.4	Upto 300 Ah
		Charge Efficiency	IEC 61427:2005, Cl.5.2	Upto 300 Ah
		Deep discharge protection	IEC 61427:2005, Cl.5.3	Upto 300 Ah
		Verification of Marking	IEC 61427:2005, Cl.5.4	Qualitative

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		AT SITE		
I.	**POWER STABILISERS & UPS**			
1.	**Stabilized power supplies, DC output**	Insulation Resistance	IS: 7204(Part 4) -1980 (RA 2006) Cl : 26	1 M Ω to 100MΩ at 500 V DC
		Insulation Voltage	Cl : 27	Upto 5kV
		Efficiency	Table 3	Upto 100%
		Power factor	Table 3	0.5 - unity
		Source Distraction		
		Relative harmonic content of source current	Table 3	Upto 40%
		Ripple on DC source current	Table 3	Ripple up to 5%
2.	**Solid state Inverters Run from storage Batteries Upto 500VA**		IS 13314: 1992 (RA1998)	
		Visual Inspection	Clause 7.5	Qualitative
		High Voltage	Clause 7.6	1MΩ to 100 MΩ
		Insulation resistance	Clause 7.7	at 500 V DC
		No- load	Clause 7.8	150 V to 300 V, upto 3A
		Output	Clause 7.9	150 V to 300V, upto 3A
		Harmonic content	Clause 7.11	Upto 10 %
3.	**Servo-Motor operated Automatic Line voltage Correctors Upto15kVA**	Insulation Resistance	IS: 9815:2000 (RA: 1994) Cl 11.4	1 MΩ - 100 MΩ at 500 V DC
		High voltage		
		Output voltage	Cl 11.5	Upto 5 kV
		No- load current	Cl 11.6	150 V to 300 V
			Cl 11.7	Upto 10A

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
4.	**Switch Mode Power Supply Upto 200W**	Visual Inspection Line Effect Load Regulation Power Output Output Voltage Efficiency Overload protection	IS: 14886:2000 (RA: 2003) Table 1	Qualitative Upto 50 V Upto 10 A DC Upto 200 W Upto 50 V Upto 100 %
5.	**UPS (Single Phase & 3 Phase) Upto 80kVA**	Control and monitoring signals Input Voltage -Steady state input voltage tolerance UPS Output characteristics test-static condition - Normal and stored energy mode of operation -Output – normal mode –no load -Output – normal mode –full load -Output- stored energy mode-no load -Output-stored energy mode-full load -Output – Voltage Unbalance test -DC component in the output	IEC 62040 – Part III-1999 Cl - 6.3.1 IEC 62040 – Part III-1999 6.3.2 Cl - 6.3.2.1 IEC 62040 – Part III-1999 Cl - 6.3.4 IEC 62040 – Part III-1999 Cl - 6.3.4.1 Cl - 6.3.4.2 Cl - 6.3.4.3 Cl - 6.3.4.4 Cl. -6.3.4.5 Cl - 6.3.4.6	150 V – 300 V for 1Φ AC 100 V – 300 V AC Upto 80 kVA Upto 10 V DC

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	UPS (Single Phase & 3 Phase) Upto 80kVA	UPS output characteristics – overload and short-circuit -Output – normal mode-overload -Output – stored energy mode-overload -Output – normal mode-short-circuit -Output- stored energy mode-short- circuit -UPS rated output fault clearing capability- normal mode -UPS rated output fault clearing capability- store energy mode	IEC 62040 – Part III-1999 Cl.-6.3.5.1 Cl.-.6.3.5.2 Cl.- 6.3.5.3 Cl.-6.3.5.4 Cl.- 6.3.5.5 Cl.- 6.3.5.6	Upto 3 kVA for 1 pH Upto 80 kVA for 3pH Time 1s - 300s
6.	**Photovoltaic Systems - Power Conditioners**	Output Voltage and frequency	IEC 61683-1999 Cl.4.3	Upto 10 kW
		Input Voltage	IEC 61683-1999 Cl.4.4	Upto 300V
		Ripple and Distortion	IEC 61683-1999 Cl.4.5	Upto 10%
		Resistive loads (utility grid)	IEC 61683-1999 Cl.4.6	1MΩ - 100MΩ at 500 V DC

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
III.	**BATTERIES**			
1.	**Stationary Cells & Batteries, Lead-acid Type (with tubular Positive Plates)**	Verification of Constructional Requirements	I 1651: 1991, Cl.12.2	Qualitative
		Verification of Marking	I 1651: 1991, Cl.12.3	Qualitative
		Verification of Dimensions	I 1651: 1991, Cl.12.4	Upto 600 mm
		Capacity (at C_1 hr to C_{10} rate)	I 1651: 1991, Cl.12.5	Upto 12 V/300 Ah 2 V/600 Ah
		Voltage during discharge	I 1651: 1991, Cl.12.10	-
2.	**Stationary Valve Regulated Lead-acid Batteries**	Visual Examination	IS15549: 2005, Cl.4.1 to 4.9 & 8.1	Qualitative
		Verification of Dimensions	IS15549: 2005, Cl.10.1.1.b	Upto 600 mm
		C_{10} Capacity and voltage during discharge	IS15549: 2005, Cl.12.1	Upto 12 V/300 Ah 2 V/600 Ah
		C_1 Capacity and voltage during discharge	IS15549: 2005, Cl.12.2	Upto 12 V/300 Ah 2 V/600 Ah
		Capacity at other discharge rates	IS15549: 2005, Cl.12.3	Upto 12 V/300 Ah 2 V/600 Ah
3.	**Stationary Lead Acid Batteries (with tubular Positive Plates) in Monobloc Container**	Verification of Constructional Requirements	IS13369: 1992, Cl.11.2	Qualitative
		Verification of Marking	IS13369: 1992, Cl.11.4	Qualitative
		Verification of Dimensions	IS13369: 1992, Cl.11.4	Upto 600 mm
		Capacity C/10/C5/C3/C1	IS13369: 1992, Cl.11.5	Upto 12 V/300 Ah 2 V/600 Ah

Ravi Johri
Convenor

N. Venkateswaran
Program Manager

NABL

SCOPE OF ACCREDITATION

Laboratory	**Nisaki Technology Services, # 46, Park Road, 2nd Main, 10th Cross Wilson Garden, Bangalore, Karnataka**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Discipline	**Electrical Testing**	**Issue Date**	**04.07.2016**
Certificate Number	**T-1401**	**Valid Until**	**03.07.2018**
Last Amended on	**22.09.2016**	**Page**	**12 of 12**

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
4.	**Small-Sized Valve Regulated Lead-Acid Batteries - General Requirements, Functional Characteristics - Method of tests**	Verification of Construction	JIS C 8702-1-2009, Cl.4.1	Qualitative
		Verification opf Mechanical Strength	JIS C 8702-1-2009, Cl.4.2	Qualitative
		Verification of Marking Items	JIS C 8702-1-2009, Cl.4.3	Qualitative
		Verification of Marking of Polarity	JIS C 8702-1-2009, Cl.4.4	Qualitative
		Actual Capacity at the 20 hr rate	JIS C 8702-1-2009, Cl.5.1a & 7.1a	Upto 12 V/300 Ah 2 V/600 Ah
		Actual Capacity at the 1 hr rate	JIS C 8702-1-2009, Cl.5.1 b & 7.1 b	Upto 12V/300 Ah 2 V/600 Ah

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