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Department of Science & Technology, India

SCOPE OF ACCREDITATION

Laboratory	Nisaki Technology Services-Power Product Test Laboratory, No. 46, Park Road, 2nd Main, 10th Cross, Wilson Garden, Bangalore		
Accreditation Standard	ISO/IEC 17025: 2005	Issue Date	15.10.2012
Discipline	Electrical Testing	Valid Until	30.05.2014
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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	
1.	UPS (Single Phase) ¹ Upto 3 kVA	Input Voltage test	IEC 62040-3: 1999	Upto 300V AC	
		a. Steady state input voltage tolerance test			
		UPS Output characteristics test-static condition - Normal and stored energy mode of operation	IEC 62040-3: 1999	Upto 300V AC	
		a. Output - normal mode - no load			
		b. Output - normal mode - full load			Upto 3kW
		c. Output- stored energy mode-no load			Upto 10V DC
		d. Output-stored energy mode-full load			
		e. DC component in the output			
		UPS output characteristics - overload and short-circuit	IEC 62040-3: 1999	Upto 3kW	
		a. Output - normal mode-overload			
b. Output - stored energy mode-overload					
c. Output - normal mode-short-circuit					
d. Output- stored energy mode- short- circuit	Time 1sec to 300sec				
e. UPS rated output fault clearing capability-normal mode					
f. UPS rated output fault clearing capability-stored energy mode					

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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) ¹ Upto 3kVA	Stored and restored energy time test	IEC 62040-3: 1999	Upto 3 kW
		a. Stored energy time		
		b. Restored energy time		
		Efficiency and input power factor	IEC 62040-3: 1999	Efficiency up to 100% Power factor 0.5 to unity
	UPS Output characteristic-reference non-linear loads	a. Reference non-linear load output distortion normal mode	IEC 62040-3: 1999	THD upto 10%
		b. Reference non-linear load output distortion stored energy mode		
	UPS output dynamic load Characteristics	a. Output Load steps – Linear load	IEC 62040-3: 1999	Up to 10%
2.	Solid state Inverters Run from storage Batteries ¹ Upto 2kVA/48V DC	a. Insulation resistance Test b. No- load Test c. Output test d. Harmonic content test	IS 13314: 1992 (RA 1998)	1MΩ to 100MΩ 150V to 300V, Upto 3A 150V to 300V, Upto 3A THD up to 10%
3.	Servo-Motor operated Automatic Line voltage Correctors ¹ Upto 3kVA	a. Insulation Resistance b. High voltage Test c. Output voltage d. No- load current	IS 9815 (Part 1): 1994 (RA 2004)	1M Ω to 100MΩ Upto 5kV 150V to 300V Upto 10A

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4.	Switch Mode Power Supply ¹ Upto 200W	a. Visual Inspection b. Line Effect c. Load Regulation d. Power Output e. Output Voltage f. Efficiency g. Overload protection	IS 14886: 2000. (RA 2003)	DC Voltage and Current-Upto 50V/10A Power upto 200W DC voltage up o 50V Efficiency upto 100%
5.	UPS ² (Single Phase and Three Phase Systems) Upto 30 kVA	a. Interconnection Cable check b. Light Load Test c. AC Input Failure Test e. Input Voltage test 1. Steady state input voltage tolerance test 2. Steady state input frequency tolerance test f. UPS Output characteristics test-static condition - Normal and stored energy mode of operation 1. Output - normal mode -no load 2. Output - normal mode -full load 3. Output- stored energy mode-no load 4. Output-stored energy mode-full load 5. DC component in the output	IEC 62040-3: 1999 IEC 62040-3: 1999 IEC 62040-3: 1999	Qualitative AC Voltage: 150V to 300V for 1Φ 300V to 470V for 3Φ 41.7 Hz to 52.9 Hz AC Voltage: 150V to 300V for 1Φ 300V to 470V for 3Φ AC Power: Upto 10 kVA for 1Φ Upto 30 kVA for 3 Φ Upto 10 V DC

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	UPS ² (Single Phase and Three Phase Systems) Upto 30kVA	g. UPS output characteristics – overload and short-circuit	IEC 62040-3: 1999	AC Power Upto 10kVA for 1Φ Up to 30kVA for 3Φ Time 1sec to 300sec
		1. Output – normal mode-overload	Cl.-6.3.5.1	
		2. Output – stored energy mode-overload	Cl.-6.3.5.2	
		3. UPS rated output fault clearing capability- normal mode	Cl.-6.3.5.3	
		4. UPS rated output fault clearing capability- store energy mode.	Cl.-6.3.5.6	
		h. Stored and restored energy time test	IEC 62040-3: 1999	
		1. Stored energy time		
		2. Restored energy time		
		i. Efficiency and input power factor	IEC 62040-3: 1999	
		j. UPS Output characteristic-reference non-linear loads	IEC 62040-3: 1999	
	1. Reference non-linear load output distortion normal mode		THD Upto 10%	
	2. Reference non-linear load output distortion stored energy mode			
	k. UPS output dynamic load Characteristics			
	1. Output Load steps – Linear load	IEC 62040-3: 1999	Upto 10%	

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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.	Solid state Inverters Run from storage Batteries ² Upto 2kVA/110V DC	a. Visual Inspection b. Insulation Resistance Test c. No- load Test d. Output test e. Harmonic content test	IS 13314: 1992 Reaffirmed 1998	-- 1M Ω to 100M Ω 150V to 300V, Upto 3A 150V to 300V, Upto 3A THD Upto 10%
7.	Servo-Motor operated Automatic Line voltage Correctors ² Upto 15kVA	a. Insulation Resistance b. High voltage Test c. Output voltage d. No- load current	IS 9815 (Part 1): 1994 (RA 2004)	1M Ω to 100M Ω Upto 5kV 150V to 300V Upto 10A
8.	Sealed Lead Acid (SMF) Tubular Batteries ¹	a. Construction b. Marking polarity c. Capacity (C/10, C/20)	JIS 8702-1: 2003 IS 13369:1992 IS 15549: 2005 JIS 8702-1:2003 IS 13369:1992 IS 1651: 1991 (RA 2002) Ed. 4.1 (2005-03) IS 15549: 2005 JIS 8702-1:2003 IS 13369:1992 IS 1651: 1991 (RA 2002) Ed. 4.1 (2005-03) IS 15549: 2005	Suitable for 2V to 6V to 12V C/20 Upto C/10, C/5, C/3 C/1 Upto 100Ah

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9.	Electrical Relays: - Over current relay - Earth Fault relay - Motor Protection - Differential (1Ph & 3 Ph)	a. Accuracy test	IEC 60255-3 Cl :4/ IEC 60255-6 Cl:7	AC Voltage: 0-250 V
		b. Pick up and Drop off Test	IEC 60255-23 Cl :4.4.2	DC Voltage:0-24 V 0-110 V
		c. Rated Burden	IEC 60255-6 Cl :8 / IEC 60255-13 Cl: 11/ IEC 60255-23 Cl :4.4.2	AC Current: 0-400 A
		d. Marking and Data	IEC 60255-13 Cl: 13	PF:0.00-1.00
		e. Test Related to Accuracy & Operating characteristics	IEC 60255-13 Cl: 15	Frequency:99.999 Hz - 999.99 Hz
		f. Input and auxiliary energizing quantities	IEC 60255-13 Cl: 3.1	Time :0-9999 Sec
		g. Characteristic quantities and setting range	IEC 60255-13 Cl: 3.3	
		h. Restraint percentage	IEC 60255-13 Cl: 3.4	
		i. Resetting and disengaging ratios	IEC 60255-13 Cl: 3.5	
		j. Operation and accuracy	IEC 60255-13 Cl: 4	
		k. Methods of presenting relay characteristics and performance	IEC 60255-13 Cl: 5.0	

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10.	<ul style="list-style-type: none"> - AC Voltage - Frequency Relay - PF Relay and all protection Relay Electrical Relays: <ul style="list-style-type: none"> - Over current relay - Earth Fault relay - Motor Protection - Differential (1Ph & 3Ph) 	Insulation Test a. Dielectric Test b. Measurement of the insulation resistance a. Accuracy test b. Pick up and Drop of Test c. Rated Burden d. Marking and Data e. Test Related to Accuracy & Operating characteristics f. Input and auxiliary energizing quantities g. Characteristics quantities and setting range h. Restraint percentage i. Resetting and disengaging ratios j. Operation and accuracy k. Methods of presenting relay characteristics and performance	IEC 755 Cl 8.8 IEC 60255-13 Cl: 12 IEC 60255-6 Cl: 9 IEC 60255-5 Cl: 6.0 IEC 60255-5 Cl: 7.0 IEC 60255-3 Cl :4 IEC 60255-6 Cl :7 IEC 60255-23 Cl :4.4.2 IEC 60255-6 Cl :8 / IEC 60255-13 Cl: 11/ IEC 60255-23 Cl :4.4.2 IEC 60255-13 Cl: 13 IEC 60255-13 Cl: 15 IEC 60255-13 Cl: 3.1 Cl: 3.3 Cl: 3.4 Cl: 3.5 Cl: 4 Cl: 5.0	HV Tester – DC V – 0-2000V / 0-1000V AC V- 0-1000V/ 0-5000V AC Voltage: 0-250 V DC Voltage:0-24 V 0-110 V AC Current:0-400 A PF:0.00-1.00 Frequency:99.999 Hz -999.99 Hz Time :0-9999 Sec

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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
	- AC Voltage - Frequency Relay - PF Relay and all protection Relay	Insulation Test a. Dielectric Test b. Measurements of the insulation resistance	IEC 755 Cl 8.8/ IEC 60255-13 Cl: 12 IEC 60255-6 Cl: 9 IEC 60255-5 Cl: 6.0 IEC 60255-5 Cl: 7.0	HV Tester – DC V – 0-2000V /0-1000V AC V- 0-1000V/0-5000V
11.	Stationary Cells & Batteries, Lead-acid type (with tubular positive plates) IS:1651-1991	Test for voltage during discharge Ampere hour & watt hour efficiency tests Test for Loss of capacity on storage Endurance test	IS:1651-1991, Cl.12.10 IS:1651-1991, Cl.12.9 IS:1651-1991, Cl.12.7 IS:1651-1991, Cl.12.8	Up to 120Ah Up to 120Ah Up to 120Ah
12.	Stationary Valve Regulated Lead-acid Batteries IS:15549-2005	Visual Examination Checking of Dimensions as per manufacturer's drawing Test for C ₁₀ Capacity and voltage during discharge Test for C ₁ Capacity and voltage during discharge Test for Capacity at other discharge rates Ampere hour efficiency test	IS:15549-2005, Cl.4.1 to 4.9& 8.1 IS:15549-2005, Cl.10.1.1.b IS:15549-2005, Cl.12.1 IS:15549-2005, Cl.12.2 IS:15549-2005, Cl.12.3 IS:15549-2005, Cl.12.4	Up to 120Ah Up to 120Ah Up to 120Ah Up to 120Ah Up to 120Ah Up to 120Ah

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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
		Watt hour efficiency test	IS:15549-2005, 12.5	Up to 120Ah
		Test for retention of charge	IS:15549-2005, Cl.12.6	Up to 120Ah
		Acid Retention Capability test on separators	IS:15549-2005, Cl.12.7	Up to 120Ah
		Wicking test on separators	IS:15549-2005, Cl.12.7	Up to 120Ah
		Test on vent seal operation	IS:15549-2005, Cl.12.8	Up to 120Ah
		Test for oxygen recombination efficiency	IS:15549-2005, Cl.12.9	Up to 120Ah
		Endurance life cycle test	IS:15549-2005, Cl.12.1	Up to 120Ah
13.	Stationary Lead-acid Batteries (with tubular positive plates) in monobloc container IS:13369-1992	Ampere hour & watt hour efficiency tests	IS:13369-1992, Cl.11.8	Up to 120Ah
		Test for Loss of capacity on storage	IS:13369-1992, Cl.11.6	Up to 120Ah
		Endurance test	IS:13369-1992, Cl.11.7	Up to 120Ah
14.	Small-sized valve regulated lead-acid batteries - General requirements, functional characteristics - Method of tests JIS C 8702-1-2009	Marking Items	JIS C 8702-1-2009, Cl.4.3	Up to 120Ah
		High Rate Discharge Characteristics	JIS C 8702-1-2009, Cl.7.2	Up to 120Ah
		Cycle Service Endurance	JIS C 8702-1-2009, Cl.5.3 & 7.3	Up to 120Ah
		Storage characteristics	JIS C 8702-1-2009, Cl.5.4 & 7.4	Up to 120Ah

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		Maximum permissible current characteristics	JIS C 8702-1-2009, Cl.5.5 & 7.5	Up to 120Ah
		Charge acceptance characteristics after deep discharge	JIS C 8702-1-2009, Cl.5.6 & 7.6	Up to 120Ah
		Endurance in trickle application	JIS C 8702-1-2009, Cl.5.7 & 7.7	Up to 120Ah
		Gas emission intensity	JIS C 8702-1-2009, Cl.5.9, 7.9.1 & 7.9.2	Up to 120Ah
		Gas recombination characteristics	JIS C 8702-1-2009, Cl.5.10, 7.10.1 & 7.10.2	Up to 120Ah
15.	Lead Acid Storage Batteries for Motor Vehicles with Light Weight and High Cranking Performance IS:14257-1995	Physical Examination	IS:14257-1995, Cl.9.3.1	Up to 120Ah
		Dimensions and Layout	IS:14257-1995, Cl.9.3.2	Up to 120Ah
		Marking	IS:14257-1995, Cl.9.3.3	Up to 120Ah
		Charging Acceptance	IS:14257-1995, Cl.9.3.6	Up to 120Ah
		Capacity (5 hr rate)	IS:14257-1995, Cl.9.3.4	Up to 120Ah
		Life Cycle Test	IS:14257-1995, Cl.9.3.7	Up to 120Ah
		Overcharge Endurance	IS:14257-1995, Cl.9.3.9	Up to 120Ah
16.	Secondary cells and batteries for photovoltaic energy systems (PVES) IEC 61427:2005	Capacity test	IEC 61427:2005, Cl.8.1	Up to 120Ah
		Endurance in Cycle test	IEC 61427:2005, Cl.8.2	Up to 120Ah
		Charge Retention Test	IEC 61427:2005, Cl.8.3	Up to 120Ah

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17.	Photovoltaic Systems - Power Conditioners IS/IEC/61683	Cycle endurance test in Photovoltaic application (Extreme conditions)	IEC 61427:2005, Cl.8.4	Up to 120Ah
		Charge Efficiency	IEC 61427:2005, Cl.5.2	Up to 120Ah
		Deep discharge protection	IEC 61427:2005, Cl.5.3	Up to 120Ah
		Marking	IEC 61427:2005, Cl.5.4	Visual
		Output Voltage and frequency	IEC 61683-1999 Cl.4.3	Voltage :upto 300V Frequency : Upto 70 Hz
		Input Voltage	IEC 61683-1999 Cl.4.4	Up to 300V
		Ripple and Distortion	IEC 61683-1999 Cl.4.5	THD up to 10%
		Resistive loads / utility grid	IEC 61683-1999 Cl.4.6	1MΩ to 100MΩ
		Reactive loads	IEC 61683-1999 Cl.4.7	150V – 300V, up to 3A
		Resistive plus non-linear loads	IEC 61683-1999 Cl.4.8	150V – 300V, up to 3A
		Complex loads	IEC 61683-1999 Cl.4.9	THD up to 10%
		Rated output efficiency	IEC 61683-1999 Cl.5.1	up to 3KW
		Partial output efficiency	IEC 61683-1999 Cl.5.2	
Energy Efficiency	IEC 61683-1999 Cl.5.3			
Efficiency tolerances	IEC 61683-1999 Cl.5.4			
No-load loss	IEC 61683-1999 Cl.7.1			
Standby loss	IEC 61683-1999 Cl.7.2			

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18.	IEC 62093 (Balance of system components for photo voltaic systems) IEC 62509 (Battery charge controller s for photovoltaic systems)	Input Voltage (PV input)	IEC62509 Cl.5.1.	6 to 36V/15 A
		Battery life time protection test	IEC62509 Cl.5.2.1,	6 to 36V/15 A
		Over view	IEC 62093-Cl.11.2.1.1	6 to 36V/15 A
		Determination of thresholds	IEC 62093-Cl.11.2.1.2	6 to 36V/15 A
		Determination of the end of charge voltage	IEC 62093-Cl.11.2.1.2.3.1	6 to 36V/15 A
		Determining the charge equalling voltage (if present)	IEC 62093-Cl.11.2.1.2.3.2	6 to 36V/15 A
		Determination of low charge disconnect and reconnect voltage	IEC 62093-Cl.11.2.1.2.3.3	6 to 36V/15 A
		Functioning test procedure - Batteries	IEC 62093-Cl.11.2	6 to 36V/15 A
		Functioning test procedure – inverters	IEC 62093-Cl.11.2.3	6 to 36V/15 A
		Voltage drop test	IEC 62093Cl.11.3.1.2	6 to 36V/15 A
		Reverse Polarity protection test	IEC 62093Cl.11.3.1.3	6 to 36V/15 A
		Overload protection test	IEC 62093Cl.11.3.1.4	6 to 36V/15 A
		Energy Performance test. & Efficiency	IEC62509 Cl 5.3	6 to 36V/15 A
PV over current protection test	IEC62509 Cl 5.4.2	6 to 36V/15 A		

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19.	Stationary Cells & Batteries, Lead-acid type (with tubular positive plates) IS:1651-1991	Load over current protection test	IEC62509Cl.5.4.3	
		Insulation test	IEC 62093Cl 11.4	
		User interface test	IEC62509 Cl.5.5	
		Verification of Constructional Requirements	IS:1651-1991, Cl.12.2	Visual
		Verification of Marking	IS:1651-1991, Cl.12.3	Visual
		Verification of Dimensions	IS:1651-1991, Cl.12.4	Up to 600 mm
20.	Stationary Valve Regulated Lead-acid Batteries IS:15549-2005	Test for Capacity (at C ₁ hr to C ₁₀ rate)	IS:1651-1991, Cl.12.5	Up to 120 Ah
		Test for voltage during discharge	IS:1651-1991, Cl.12.10	
		Visual Examination	IS:15549-2005, Cl.4.1 to 4.9 & 8.1	Visual
		Checking of Dimensions as per manufacturer's drawing	IS:15549-2005, Cl.10.1.1.b	Up to 600 mm
		Test for C ₁₀ Capacity and voltage during discharge	IS:15549-2005, Cl.12.1	Up to 120 Ah
		Test for C ₁ Capacity and voltage during discharge	IS:15549-2005, Cl.12.2	Up to 120 Ah
	Test for Capacity at other discharge rates	IS:15549-2005, Cl.12.3	Up to 120 Ah	

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21.	Stationary Lead acid Batteries (with tubular positive plates) in monobloc container IS:13369-1992 Stationary Lead-	Verification of Constructional Requirements	IS:13369-1992, Cl.11.2	Visual
		Verification of Marking	IS:13369-1992, Cl.11.4	Visual
		Verification of Dimensions	IS:13369-1992, Cl.11.4	Up to 600 mm
		Test for Capacity C10/C5/C3/C1	IS:13369-1992, Cl.11.5	Up to 120 Ah
22.	Small-sized valve regulated lead-acid batteries - General requirements, functional characteristics - Metod of tests JIS C 8702-1-2009/2003	Construction	JIS C 8702-1-2009, Cl.4.1	Visual
		Mechanical Strength	JIS C 8702-1-2009, Cl.4.2	
		Marking Items	JIS C 8702-1-2009, Cl.4.3	Visual
		Marking of Polarity	JIS C 8702-1-2009, Cl.4.4	Visual
		Actual Capacity at the 20 hr rate	JIS C 8702-1-2009, Cl.5.1a &7.1a	Up 120Ah
	Actual Capacity at the 1 hr rate	JIS C8702-1-2009, Cl.5.1 b&7.1b		
23.	Photovoltaic Systems - Power Conditioners As per IS/IEC/61683-1999	Output Voltage and frequency	IEC 61683-1999 Cl.4.3	Up to 10kW
		Input Voltage	IEC 61683-1999 Cl.4.4	Up to 300V
		Ripple and Distortion	IEC 61683-1999 Cl.4.5	THD up to 10%
		Resistive loads / utility grid	IEC 61683-1999 Cl.4.6	1MΩ to 100MΩ
		Reactive loads	IEC 61683-1999 Cl.4.7	150V – 300V, up to 3A
		Resistive plus non-linear loads	IEC 61683-1999 Cl.4.8	150V – 300V, up to 3A

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Department of Science & Technology, India

SCOPE OF ACCREDITATION

Laboratory Nisaki Technology Services-Power Product Test Laboratory, No. 46,
Park Road, 2nd Main, 10th Cross, Wilson Garden, Bangalore

Accreditation Standard ISO/IEC 17025: 2005

Discipline Electrical Testing Issue Date 15.10.2012

Certificate Number T-1401 Valid Until 30.05.2014

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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
		Complex loads	IEC 61683-1999 Cl.4.9	THD up to 10%
		Rated output efficiency	IEC 61683-1999 Cl.5.1	up to 10 kW
		Partial output efficiency	IEC 61683-1999 Cl.5.2	
		Energy Efficiency	IEC 61683-1999 Cl.5.3	
		Efficiency tolerances	IEC 61683-1999 Cl.5.4	
		No-load loss	IEC 61683-1999 Cl.7.1	
		Standby loss	IEC 61683-1999 Cl.7.2	

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¹ Only in Permanent Laboratory

² Only for Site Testing

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Convenor