

<b>Laboratory</b>	<b>Marsons Limited, Budge-Budge Trunk Road, Village – Chakmir, P.O. Maheshtala, Kolkata, West Bengal</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Electrical Testing</b>	<b>Issue Date</b>	<b>08.06.2015</b>
<b>Certificate Number</b>	<b>T-3474</b>	<b>Valid Until</b>	<b>07.06.2017</b>
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<b>S. No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
<b>I.</b>	<b>TRANSFORMERS AND REACTORS</b>			
<b>1</b>	<b>Power Transformer Upto 50 MVA , 132 kV</b>	Winding Resistance	IS 2026 (Part 1): 2011 Clause 10.2 IEC 600076 (Part 1): 2000 Clause.10.2	1 mΩ to 100 Ω
		Voltage ratio Vector Group	IS 2026 (Part 1): 2011 Clause 10.3 IEC 600076 (Part 1): 2000 Clause.10.3	2 to 200
		No Load Loss No Load Current	IS 2026 (Part 1): 2011 Clause 10.5 IEC 600076 (Part 1): 2000 Clause.10.5	0.01 kW to 30 kW 50 MVA / 132 kV (3 Phase)
		Load Loss Impedance Voltage	IS 2026 (Part 1): 2011 Clause 10.4 IEC 600076 (Part 1): 2000 Clause.10.4	1 kW to 200 kW 50 MVA / 132 kV (3 Phase)
		Insulation Resistance Polarization Index	IS 2026 (Part 1): 2011 Clause 10.1.3(i) IEC 600076(Part 1): 2000 Clause.10.1.3(i) CBIP Manual Pub.295: 2013	999 kΩ to 500 GΩ at 250 V to 5000 V 0.01 to 99.9
		Separate Source voltage withstand test	IS 2026 (Part 3): 2009 Clause 11.0 IEC 600076 (Part 3): 2000 Clause.11.0	2 kV to 300 kV at 50 Hz
		Induced Over Voltage Withstand Test	IS 2026 (Part 3): 2009 Clause 12.0 IEC 600076 (Part 3): 2000 Clause.12.0	2 kV to 275 kV

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<b>S. No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
	<b>Power Transformer Upto 50 MVA , 132 kV</b>	Temperature Rise Test	IS 2026 (Part 2): 2010 Clause 5.0	500 kVA to 30 MVA (3 Phase)
		Load loss	IEC 600076 (Part 2): 2000 Clause.5.0	
		Impedance Voltage Test	IEC 600076 (Part 6): 2000 Clause.7.8.14	
		Zero Sequence Impedance	IS 2026 (Part 1): 2011 Clause 10.7 IEC 600076 (Part 1): 2000 Clause.10.7	
2.	<b>Power Transformer Upto 50 MVA , 132 kV</b>	Lightning Impulse	IS 2026 (Part 3): 2009 Clause 13.0 & 14.0 IEC 600076 (Part 3): 2000 Clause.13.0 & 14.0	30 kV to 1600 kV 80 kJ
		Acoustic Noise Level	IS 2026 (Part 1): 2011 Clause 10.1.3(f) IEC 600076 (Part 10): 2001 NEEMA TR-1:2013	40 dB to 130 dB
		Harmonics of No Load	IS 2026 (Part 1): 2011 Clause 10.6 IEC 600076 (Part 1): 2000 Clause.10.6	1 <sup>st</sup> harmonic to 15 <sup>th</sup> harmonic
		Capacitance	IS 2026 (Part 3): 2009 Clause 10.1.3 (b)	100 pF to 10000 pF at 10 kV
		Tan-delta	IEC 600076 (Part 1): 2001 Clause.10.1.3(i)	0.00001 to 0.02

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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
	<b>Power Transformer Upto 50 MVA , 132 kV</b>	Power taken by the Fans	IS 2026 (Part 1): 2011 Clause 10.1.3(h) IEC 600076 (Part 1): 2000 Clause.10.1.3(h)	0.05 kW to 3 kW
		Bushing CT Knee point Voltage	IS 2705 (Part 4): 1992 (RA 2002) IEC 60044 (Part 1): 2003	1 kV
		Excitation Current at Three phase	CBIP Manual 317: 2013 Clause 3.23	5 V to 415 V 5 A
		Magnetic Balance Test on Three Phase Transformer	CBIP Manual 317: 2013 Clause 3.17	5 V to 415 V 5 A
		Oil BDV	IS 335: 1993 (RA 2005) BS 148: 2009 IEC 296: 1982	2 kV to 100 kV at 50 Hz
		Oil leakage	CBIP Manual 317: 2013 Clause. 3.28 CBIP Manual 317: 2013 Clause.17.3.2 (b)	2.5 kN/m <sup>2</sup> to 150 kN/m <sup>2</sup>
		Vacuum Test Tank Stage	CBIP Manual 317: 2013 Clause.17.3.2.(a)	0.5 mm Hg to 760 mm Hg
		Pressure Test Tank Stage	CBIP Manual 295: 2013 Clause.17.3.2(a1, b)	2.5 kN/m <sup>2</sup> to 150 kN/m <sup>2</sup>

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