National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : POWER TRANSFORMER FACTORY - 2 TESTING LABORATORY, HITACHI ENERGY INDIA LIMITED, MANEJA WORKS, MANEJA, VADODARA, GUJARAT, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number TC-5086 **Page No** 1 of 3

Validity 20/05/2022 to 09/01/2024 **Last Amended on** 17/02/2023

S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
Permanent Facility				
1	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Induced Over Voltage Withstand Test	IEC 60076, Part – 3, Clause 11:2013+AMD1:2018 and IS 2026 Part – 3, Clause 11
2	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Lightning / Chopped Impulse	IEC 60076, Part – 3, Clause 13:2013+AMD1:2018 and IS 2026 (Part 3) clause 13
3	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Line Terminal AC Voltage Withstand Test	IEC 60076, Part – 3, Clause 12:2013+AMD1
4	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Magnetic Balance & Magnetizing Current Test	CBIP Manual (No. 317)
5	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Magnetic Balance & Magnetizing Current Test	CBIP Manual (No. 317)
6	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Acoustic Noise Level	IEC 60076 -10 - 1:2016+AMD1:2020 and NEMA TR1:2013 and IS 2026, Part – 1, Clause 10.1.3 (f)
7	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Auxiliary Losses	IS 2026, Part – 1, Clause 10.1.3(h) and IEC 60076 Part 1, Cl. 11.1.3.(d)
8	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Capacitance of Bushing	As per IS 2026 Clause 10.1.3 (j) ,2011 and IEC 60137
9	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Capacitance of Winding	IS 2026 Part I Clause 10.1.3(b) IEC 60076, Part 1, Clause 11.1.2.2
10	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Insulation Resistance	IS 2026, Part – 1, Clause – 10.1.3 (j) and IEC – 60076, Part – 1, Clause 11.1.2.2 (a)
11	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Load Losses	IS 2026, Part -1, Clause 10.4, 2011 and IEC 60076, Part I Clause- 11.4
12	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of No load Current Harmonics	IS 2026, Part - 1, Clause 10.6 and IEC 60076, Part 1, Clause 10.6
13	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Short Circuit Impedance in Percentage	IS 2026, Part -1, Clause 10.4 : 2011 and IEC 60076, Part I Clause- 11.4
14	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Tan delta of Bushing	IS 2026 Part - 1 Clause 10.1.3 (j) 2011 and IEC 60137

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15	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Tan Delta of Winding	IS 2026 Part I Clause 10.1.3(b) IEC 60076, Part 1, Clause 11.1.2.2 (a)
16	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Voltage Ratio	IS 2026, Part – 1, Clause – 10.3 and IEC – 60076, Part – 1, Clause 11.3
17	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Winding Resistance	IS 2026, Part – 1, Clause – 10.2 and IEC – 60076, Part – 1, Clause 11.2
18	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Measurement of Zero Phase Sequence Impedance	IS 2026, Part -1, Clause 10.7: 2011 and IEC 60076, Part 1, Clause 11.6
19	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	No Load Excitation Current	IS 2026, Part -1, Clause 10.5 : 2011 and IEC 60076, Part -1,Clause 11.5 & 11.1.2.2 (e)
20	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	No Load Loss	IS 2026, Part -1, Clause 10.5 : 2011 and IEC 60076, Part -1,Clause 11.5 & 11.1.2.2 (e)
21	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Separate Source AC High Voltage Withstand Test (Applied Voltage Test)	IEC 60076, (Part – 3) Clause 10:2013+AMD1:2018 and IS 2026 (Part – 3) clause 10
22	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Switching Impulse	IEC 60076, Part – 3, Clause 14:2013+AMD1:2018 and IS 2026 Part – 3, Clause 14
23	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Temperature Rise	IS 2026, Part 2 : 2010 and IEC 60076, Part 2
24	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Test On OLTC	IS 2026 Part I, Cl. 10.8 & IEC 60076 Part I, Cl. 11.7
25	ELECTRICAL- INDUCTORS & TRANSFORMERS	Power Transformers Up to 125 MVA, 220 kV Class	Vector Group Test	IS 2026, Part – 1, Clause – 10.3 and IEC – 60076, Part – 1, Clause 11.3
26	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Breakdown Voltage	IS 6792:2017 & IEC 60156
27	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis- Acetylene (C2H2)	IEC 60567:2011 & IS 9434
28	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis- Ethane (C2H6)	IEC 60567:2011 & IS 9434

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29	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis-Ethylene(C2H4)	IEC 60567:2011 & IS 9434
30	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis-Methane (CH4)	IEC 60567:2011 & IS 9434
31	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis-Carbon Dioxide (CO2)	IEC 60567:2011 & IS 9434
32	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis-Carbon Monoxide (CO)	IEC 60567:2011 & IS 9434
33	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis-Hydrogen (H2)	IEC 60567:2011 & IS 9434
34	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis-Nitrogen (N2)	IEC 60567:2011 & IS 9434
35	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Dissolved Gas Analysis-Oxygen (O2)	IEC 60567:2011 & IS 9434
36	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Resistivity	IEC 60247:2004 & IS 16840
37	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Tan delta	IEC 60247:2004 & IS 16840
38	ELECTRICAL- INSULATING MATERIALS & INSULATORS	Transformer Insulating Oil	Water content	IEC 60814:1997 & IS 13567