

Laboratory **Testing Laboratory, Mehru Electrical & Mechanical Engineers Pvt. Ltd.,
SP-2/180, RIICO Industrial Area, Kehrani, Bhiwadi, Alwar, Rajasthan**

Accreditation Standard **ISO/IEC 17025: 2005**

Discipline **Electrical Testing**

Issue Date **06.09.2015**

Certificate Number **T-2658**

Valid Until **05.09.2017**

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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
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I. TRANSFORMERS & REACTORS

1.	Current Transformers upto 400 kV Class	Verification of terminal marking and polarity	IS 2705 (Part 1): 1992 (RA 2002) Clause 9.2 IEC 61869-1: 2007 Clause 7.3.6	Qualitative
		Power frequency dry withstand tests on primary windings	IS 2705 (Part 1): 1992 (RA 2002) Clause 9.3 IEC 61869-1: 2007 Clause 7.3.1	Upto 400 kV CT 1 kV to 750 kV
		Power frequency dry withstand tests on secondary windings	IS 2705 (Part 1): 1992 (RA 2002) Clause 9.4 IEC 61869-1: 2007 Clause 7.3.4, 5.3.5	1.0 kV to 5 kV
		Over-voltage inter-turn test	IS 2705 (Part 1): 1992 (RA 2002) Clause 9.5.2 IEC 61869-1: 2007 Clause 7.3.204	0.5 A to 10 A 1 V to 3.5 kV
		Partial discharge test	IS 11322: 1985 Clause 9.1.2(e) IEC 60270: 2000 IEC 61869-1: 2007 Clause 7.3.2	Upto 400 kV CT 3.0 pC to 100 pC
		Determination of errors according to the requirements of the appropriate designation or accuracy class		
		Measuring current transformers	IS 2705 (Part 2): 1992 (RA 2002)	Metering class 0.2s , 0.5s, 0.2,0.5 &1 Class
		Protective current transformers	IS 2705 (Part 3): 1992 (RA 2002)	Protection Class 5P, 10P, 15P

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	Current Transformers upto 400 kV Class	Protective current transformers for special -purpose applications	IS 2705 (Part 4): 1992 (RA 2002) IEC 61869-1: 2007 Clause 7.3.5 IEC 61869-2: 2012 Clause 7.3	PS Class
		Instrument Security Current Test	IS 2705 (Part 2): 1992 (RA 2002) Clause 7.1.2 IEC 61869-2: 2012 Clause 7.2.6.202	1 A to 5 A ISF Value 1 to 10
		Composite Error	IS 2705 (Part 3): 1992 (RA 2002) Clause 7.1.2.2 IEC 61869-2: 2012 Clause 7.2.6.203	1 mA to 10 A 1 V to 5 kV
		Measurement of Knee-Point Voltage and Exciting Current	IS 2705 (Part 4): 1992 (RA 2002) Clause 6.1 IEC 61869-2: 2012 Clause 7.3.203	1 mA to 10 A 1V to 5 kV
		Measurement of Secondary Winding Resistance	IS 2705 (Part 4): 1992 (RA 2002) Clause 6.2 IEC 61869-2: 2012 Clause 7.3.201	0.01 Ω to 19.99 k Ω
		Capacitance & Dielectric Dissipation Factor	IS 2705 (Part 1): 1992 (RA 2002) Clause 9.12 IEC 61869-1: 2007 Clause 7.4.3	Upto 400 kV CT 0.0001 to 1 10 pF to 20000 pF
		Temperature-Rise Test	IS 2705 (Part 1): 1992 (RA 2002) Clause 9.7 IEC 61869-1: 2007 Clause 7.2.2,6.4.1	1 A to 3200 A 1 $^{\circ}$ C to 100 $^{\circ}$ C

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	Current Transformers upto 400 kV Class	Thermal Stability Test	PGCIL Specification C.ENGG/SPEC/SWGR/R9 Sept-2010	Upto 400 kV 1 A to 4000 A 1 kV to 750 kV, 1 °C to 100 °C
		Temperature Coefficient Test	PGCIL Specification C.ENGG/SPEC/SWGR/R9 Sept-2010	Upto 400 kV 5 °C to 120 °C
2.	Potential Transformer Upto 220 kV Class	Verification of terminal marking and polarity	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.2 IEC 61869-1: 2007 Clause 7.3.6	Qualitative
		Separate Source withstand test	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.3.1.1 IEC 61869-3(2011) Clause 7.3.3	1 kV to 5 kV
		Power frequency dry withstand tests on secondary windings	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.4 IEC 61869-1: 2007 Clause 7.3.4	1 kV to 5 kV
		Partial discharge test	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.1.2 (d) & IS 11322: 1985 IEC 61869-3: 2011 Clause 7.3.2 IEC 61869-1: 2007 Clause 7.3.2	Upto 220 kV 3.0 pC to 100 pC
		Determination of errors according to the requirements of the appropriate designation or accuracy class		
		Measuring Voltage Transformer	IS 3156 (Part 2): 1992 (RA 2002)	Metering class 0.2, 0.5, 1 & 3

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	Potential Transformer Upto 220 kV Class	Protective Voltage Transformer	IS 3156 (Part 3): 1992 (RA 2002) IEC-61869-3(2011) Clause 7.2.6	Protection class 3P, 6P, 5PR & 10 PR
		Induced Overvoltage withstand Test at 150 Hz on primary winding	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.3.1.2, IEC 61869-3: 2011 Clause 7.3.1.303	At 150 Hz Upto 460 kV
		Dielectric Dissipation Factor and Capacitance Test	IEC 61869-3: 2011 Clause 7.4.3 IEC 61869-1: 2007 Clause 7.4.3	Upto 220 kV PT 0.0001 to 1 10 pF to 20000 pF
		Temperature-Rise Test	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.5 IEC 61869-3: 2011 Clause 7.2.2 IEC 61869-1: 2007 Clause 7.2.2, 6.4.1	Upto 220 kV PT 1 °C to 100 °C
		Short-circuit withstand capability test	IEC 61869-3: 2011 Clause 7.2.301, 6.301	Upto 220 kV PT 1 A to 200 A
3.	Capacitor Voltage Transformer upto 400 kV Class	Verification of terminal marking and polarity	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.2 IEC 61869-5: 2011 Clause 6.13.501	Qualitative
		Power frequency withstand test	IS 3156 (Part 4): 1992 (RA 2002) Clause 9.3.1 IEC 61869-5: 2011 Clause 7.3.1 IEC 61869-1: 2007 Clause 7.3.1	Upto 400 kV CVT 1 kV to 750 kV
		Power frequency withstand test on Electromagnetic Unit	IS 3156 (Part 4): 1992 (RA 2002) Clause 9.3.1.3 IEC 61869-5: 2011 Clause 7.3.1.504	At 150 Hz 10 kV to 100 kV

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	Capacitor Voltage Transformer Upto 400 kV Class	Power frequency withstand test on Low voltage	IS 3156 (Part 4): 1992 (RA 2002) Clause 9.3.1, IEC 61869-5: 2011 Clause 7.3.1.503	1 kV to 10 kV
		Power frequency withstand test on secondary windings	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.4 IEC 61869-5: 2011, Table-10 IEC 61869-1: 2007, Clause 7.3.4	1 kV to 5 kV
		Errors according to the requirements of the appropriate designation or accuracy class		
		measuring capacitor voltage transformers	IS 3156 (Part 4): 1992 (RA 2002) Clause 9.3.2	Metering Class 0.2, 0.5, 1 & 3
		protective capacitor voltage transformer	IEC 61869-5: 2011 Table-511, Clause 7.3.5, 5.4	Protection Class 3P, 6P, 5PR & 10 PR
		Capacitance and tan delta measurement at power frequency	IS 3156 (Part 4): 1992 (RA 2002) Clause 9.3.1.1, IEC 61869-5: 2011 Clause 7.2.501, 7.4.3	Upto 400 kV CVT 0.0001 to 1 10 pF to 20000 pF
		Measurement of Partial Discharge	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.1.2(d), IEC 61869-5: 2011 Clause 7.3.2, IEC 61869-1: 2007 Clause 7.3.2	Upto 400 kV CVT 3.0 pC to 100 pC
		Ferro-resonance Test	IS 3156 (Part 4) (RA 2002) Clause 9.2.3, IEC 61869-5: 2011 Clause 7.2.503, 7.3.501 Table -506a	Upto 400 kV CVT 0.1 A to 200 A

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	Capacitor Voltage Transformer Upto 400 kV Class	Transient Response Test	IS 3156 (Part 4): 1992 (RA 2002) Clause 9.2.4 IEC 61869-5: 2011 Clause 7.2.504	Upto 400 kV CVT
		Temperature-rise test	IS 3156 (Part 4): 1992 (RA 2002) Clause 9.2.1 IEC 61869-5: 2011 Clause 7.2.2.501	Upto 400 kV CVT 1 °C to 100 °C
		Separate Source withstand test on primary winding of electromagnetic unit	IS 3156 (Part 1): 1992 (RA 2002) Clause 9.3.2.1, IEC 61869-5: 2011 Clause 7.3.1	1.0 kV to 5 kV
		Tightness test of a liquid filled emu unit	IEC 61869-5: 2011 Clause 6.1.4.502 ,7.2.8.501	0.1 kg/cm ² to 2.5 kg/cm ²
		Tightness design test of capacitor unit	IEC 61869-5: 2011 Clause 7.4.502,6.1.4.501 & 6.1(F) IEC 358	0.1 kg/cm ² to 2.5 kg/cm ²
		Short-circuit withstand capability test	IEC 61869-5: 2011 Clause 7.2.502	Upto 400 kV CVT 0.1 A to 200 A
		Temperature Coefficient Test	IEC 61869-5: 2011 Clause 7.4.501 and 6.2(h) of IEC 358	Upto 400 kV CVT 0.0001 to 1 10 pF to 20000 pF (-) 5 °C to 80 °C
4.	Coupling Capacitors upto 400 kV Class	Capacitance Measurement at power frequency	IS 9348: 1998 Clause 7 IEC 358: 1990 Clause 7	Upto 400 kV 10 pF to 20000 pF
		Capacitor loss measurement	IS 9348: 1998 Clause 8 IEC 358: 1990 Clause 8	Upto 400 kV 0.0001 to 1

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	Coupling Capacitors upto 400 kV Class	A.C. Voltage test between low voltage terminal and the earth terminal	IS 9348: 1998 Clause 10 IEC 358: 1990 Clause 10 IS 9348: 1998 Clause 13	1 kV to 10 kV
		Partial discharge test	IEC 358: 1990 Clause 13	Upto 400 kV 3.0 pC to 100 pC
		High frequency capacitance and equivalent series resistance measurements in the range of rated temperature category	IS 9348: 1998 Clause 12.1 IEC 358: 1990 Clause 12.1	Upto 400 kV 15 kHz to 1000 kHz 1 pF to 20,000 pF
		Stray Capacitance and stray conductance measurements of low voltage terminal	IS 9348: 1998 Clause 12.2 IEC 358: 1990 Clause 12.2	11 kV to 400 kV 15 kHz to 1000 kHz 1 pF to 1000 pF 0.01 μS to 10 μS
		A.C. Voltage test, dry	IS 9348: 1998 Clause 9.2.1 IEC 358: 1990 Clause 9.2.1	Upto 400 kV CC
		Temperature coefficient Test	IEC 60044-5 Clause 11.3 IEC 61869-5: 2011 Clause 7.4.501 and 6.2 (h) of IEC 358: 1990	Upto 400 kV CC 0.0001 to 1 10 pF to 20000 pF 5 °C to 80 °C

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