

Laboratory Karandikar Laboratories Pvt. Ltd., Gat No. 142, Boisar Chilhar Road, At Betegaon, Boisar (E), Taluka Palghar, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Discipline Electrical Testing **Issue Date** 07.01.2014

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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	SAFETY			
1.	Safety Testing IEC 61010:2010	Single Fault Conditions	IEC 61010-1 Cls. 4.4 And Similar	Visual checks
		Verification of electrical parameters given on label	IEC 61010 -1 Cls. 5.1.3 And Similar	Visual checks
		Protection against electric shock	IEC 61010 -1 Cls. 6; Cls. 6.1.1	Force: 0.25 N to 30N Dielectric Voltage : 0.5 kV to 25kV Clearance and Creepage: 0 to 1000mm Impact Test; 1J to 20J Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA
		Openings above parts that is hazardous live	IEC 61010 -1 Cls. 6.2.3	0.25N to 30N
		Openings for preset controls	IEC 61010 -1 Cls. 6; Cls. 6.2.4	0.25N to 30N
		Limit Values for accessible parts	IEC 61010-1 Cls. 6; Cls. 6.3	Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA 1 to 1000µC charge 0.5 kV to 25kV

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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
		Levels in normal condition	IEC 61010-1 Cls. 6; Cls. 6.3.1	Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA 1 to 1000µC charge 0.5 kV to 25kV
		Levels in single fault condition	IEC 61010-1 Cls. 6; Cls. 6.3.2	Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA 1 to 1000µC charge 0.5 kV to 25kV
		Enclosures and protective barriers	IEC 61010-1 Cls. 6; Cls. 6.4.2	Static Test: 0.25N to 30N Dielectric Voltage : 0.5kV to 25kV Clearance and creepage: 0.01mm to 1000mm Impact Test; 1 to 20J
		Basic Insulation-Clearance and creepage	IEC 61010-1 Cls. 6; Cls. 6.4.3	0.01mm to 1000mm 0.5kV to 25kV
		Basic Insulation-Clearance and Creepage	IEC 61010-1 Cls. 6.4.3	0.01mm to 1000mm 0.5kV to 25kV
		Impedance	IEC 61010-1 Cls. 6; Cls. 6.4.4	Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA Clearance and creepage: 0.01mm to 1000mm

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		Protective bonding	IEC 61010-1 Cls. 6; Cls. 6.5.2	0.1Nm to 10Nm 1A to 40A 0.1V to 600V
		Supplementary & Reinforced Insulation	IEC 61010-1 Cls. 6; Cls. 6.5.3	Clearance and creepage: 0.01mm to 1000mm
		Protective Impedance	IEC 61010-1 Cls. 6; Cls. 6.5.4	Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA Clearance and creepage: 0.01mm to 1000mm
		Automatic disconnection of the supply	IEC 61010-1 Cls. 6; Cls. 6.5.5	5ns to 5s 0.1V 500V 1 to 50A
		Current -Voltage limiting device	IEC 61010-1 Cls. 6; Cls. 6.5.6	Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA Clearance and creepage: 0.01mm to 1000mm
		General	IEC 61010-1 Cls. 6; Cls. 6.6.1	Force: 0.25 N to 30N Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA Clearance and creepage: 0.01mm to 1000mm Dielectric Test: 0.5 kV to 25kV

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		Terminals for standard conductors	IEC 61010-1 Cls. 6; Cls. 6.6.4	Visual checks
		Insulation requirements: The nature of insulation	IEC 61010-1 Cls. 6; Cls. 6.7	Clearance and creepage: 0.01mm to 1000mm Dielectric Test: 0.5kV to 25kV
		Constructional requirements for protection against electric shock Voltage Test	IEC 61010-1 Cls. 6; Cls. 6.9 IEC 61010-1 Cls. 6; Cls. 6.8	0.01mm to 1000mm Dielectric Test: 0.5kV to 25kV Clearance and creepage: 0.01mm to 1000mm Humidity Preconditioning: 30% RH to 95% RH. 25°C to 95°C Impulse Test: 0.5kV to 10kV at 1.2µs/50 µs
		Constructional requirements for protection against electric shock	IEC 61010-1 Cls. 6; Cls. 6.9	Clearance and creepage: 0.01mm to 1000mm
		Connection to mains supply source and connections between parts of equipments	IEC 61010-1 Cls. 6; Cls. 6.10	0.25 N to 100 N, 0.01 Nm to 0.35 Nm
		Disconnection from supply source	IEC 61010-1 Cls. 6; Cls. 6.11	Visual checks
		Stability	IEC 61010-1 Cls. 6; Cls. 7.4	0.25N to 500N

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		Resistance to mechanical stresses	IEC 61010-1 Cls. 6; Cls. 8	Static Test: 0.25 Nto 30N Impact Test: 1J to 20J Drop Test: 0.1m to 1m
		Temperature of windings	IEC 61010-1 Cls. 6; Cls. 10.2	0.1V to 500V 1A to 50A Ambient to 500°C
		Other temperature Measurements	IEC 61010-1 Cls. 6; Cls. 10.3	0.1V to 500V 1A to 50A Ambient to 500°C
		Conduct other temperaure tests	IEC 61010-1 Cls. 6; Cls. 10.4	0.1V to 500V 1A to 50A Ambient to 500°C
		Resistance to heat	IEC 61010-1 Cls. 6; Cls. 10.5	0.25N to 250°C 0.01mm to 150mm 0.25N to100N
		Integrity of clearances and creepage distances	IEC 61010-1 Cls. 6; Cls. 10.5.1	0.01mm to 1000mm Ambient to 250°C
		Non Metallic enclosures	IEC 61010-1 Cls. 6; Cls. 10.5.2	Static Test: 0.25N to 30N Impact Test: 1J to20J Drop Test: 1 m Conditioning: Ambient to 250°C
		Insulating Material	IEC 61010-1 Cls. 6; Cls. 10.5.3	0.25N to 30N 0.01mm to 100mm Ambient to 250°C

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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
		Protection against hazards from fluids	IEC 61010-1 Cls. 6; Cls. 11	Clearance and creepage: 0.01mm to 1000mm Humidity Preconditioning: 30%RH to 95% RH 25°C to 95°C Dielectric Test: 0.5kV to 25kV Impulse Test: 0.5kV to 10kV at 1.2µs/50 µs Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA
		Specially protected equipments	IEC 61010-1 Cls. 6; Cls. 11.6	Dielectric Test: 0.5kV to 25kV Impulse Test: 0.5kV to 10kV at 1.2µs/50 µs Limit values for Accessible part; 0.1V to 600V 0.1mA to 100mA
		Fluid pressure and leakage	IEC 61010-1 Cls. 6; Cl 11.7	0.001bar to 300bar
		Protection against liberated gases and substances, explosion and implosion	IEC 61010-1 Cls. 6; Cls. 13	Visual checks
		Protection against injurious gases and substances	IEC 61010-1 Cls. 6; Cls. 13.1	Visual checks

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		Explosion and implosion	IEC 61010-1 Cls. 6; Cls. 13.2	Visual checks
		Components	IEC 61010-1 Cls. 6; Cls. 13.2.1	Visual checks
		Battery Charging	IEC 61010-1 Cls. 6; Cls. 13.2.2	Visual checks
		Motor Temperatures	IEC 61010-1 Cls. 6; Cls. 14.2.1	0.1V to 500V 1 to 50A Ambient to 500°C
		Series excitation motors	IEC 61010-1 Cls. 6; Cls.14.2.2	Visual checks
		Over temperature protection devices	IEC 61010-1 Cls. 6; Cls. 14.3	0.1V to 500V 1A to 50A Ambient to 500°C
		Fuse holders	IEC 61010-1 Cls. 6; Cls. 14.4	0.25N to 30N
		Mains voltage selection device	IEC 61010-1 Cls. 6; Cls. 14.5	Visual checks
		Main transformer outside the equipment	IEC 61010-1 Cls. 6; Cls. 14.6	0.1V to 500V 1A to 50A Ambient to 500°C
		Printed wiring boards: Flammability test	IEC 61010-1 Cls. 6; Cls. 14.7	Visual checks
		Protection by interlocks	IEC 61010-1 Cls. 6; Cls. 15	Visual checks
		Prevention of reactivating	IEC 61010-1 Cls. 6; Cls. 15.2	Visual checks
		Reliability	IEC 61010-1 Cls. 6; Cls.15.3	Inspection or Endurance test as applicable.

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		Hazards resulting from application	IEC 61010-1 Cls. 6; Cls. 16	Inspection and by evaluation of the RISK assessment documentation
		Reasonable foreseeable misuse	IEC 61010-1 Cls. 6; Cls. 16	Inspection and by evaluation of the RISK assessment documentation
		Ergonomic aspects	IEC 61010-1 Cls. 6; Cls. 16.1	Inspection and by evaluation of the RISK assessment documentation
		Risk Assessment	IEC 61010-1 Cls. 6; Cls. 17	Inspection and by evaluation of the RISK assessment documentation.
2.	Weather proof tests	Ingress Protection		
		Electrical equipments and enclosures	IS/IEC 60529 : 2001 , IS 12063 and equivalent	IP 1 X to 6 X and X 1 to X 8
		Rotating Machines	IS/IEC 60034 – 5 and IS 4691	IP 1 X to 6 X and X 1 to X 8
		Luminaries	IS 10322 Part 4	IP 1 X to 6 X and X 1 to X 8
		Low voltage switchgear and control gear	IS/IEC 60947: 2007 Part 1 Appendix C	IP X 1 to 6 X and X 1 to X 8

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3.	Environmental Conditioning	Dry Heat Test	S 9000 part III and similar	Ambient to 250°C Width-1250mm Depth-900mm Height-900mm
		Cold Test	IS 9000 part II and similar	-65°C to +50 °C Width-400mm Depth-400mm Height-600mm
		Humidity Steady Test	IS 9000 part IV and similar	Ambient to 90 °C 20%RH to 95%RH Width-800mm Depth-700mm Height-1200mm
		Humidity Cyclic	IS 9000 part V and similar	10 to 90 °C and 20%RH to 95%RH Width-800mm Depth-700mm Height-1200mm
		Composite temperature and humidity test	IS 9000 part VI and similar	10 to 90 °C and 20%RH to 95%RH Width-800mm Depth-700mm Height-1200mm
		Temperature cycling	IS 9000 part XXIV and similar	-60°C to 250°C Width-1200mm Depth-700mm Height-1000mm

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		Salt Mist Test	IS 9000 Part XI and similar	Ambient to 70°C 30 to 100%RH NaCl at 5% Width-800mm Depth-700mm Height-1200mm
II. FLAME PROOF TESTING				
1.	Non-electrical Equipment for use in potentially explosive atmospheres.	Determination of the maximum surface temperature	EN 13463-1:2009 Cls. No. 8.2	Temperature Rise Ambient to 500 °C
		Flammability test	EN 13463-1:2009 Cls. No. 8.3	Visual Test
		Resistance to Impact Test	EN 13463-1:2009 Cls. No. 8.4.1	2m to 0.1 m drop of 1 kg mass on a base of 20 kg
		Drop Test	EN 13463-1:2009 Cls. No. 8.4.2	Drop from 1 Meter height on concrete surface
		Impact ignition test in explosive mixture	EN 13463-1:2009 Cls. No. 8.4.4.2	2m to 0.1 m drop of 25 kg mass
		Thermal endurance to heat	EN 13463-1:2009 Cls. No. 8.5.4	Ambient to 250°C
		Thermal endurance to cold	EN 13463-1:2009 Cls. No. 8.5.5	Ambient to -65°C
		Resistance to chemical substance	EN 13463-1:2009 Cls. No. 8.5.6	Oil No.2 & fire resistance Hydraulic fluid. Oven for temperature Ambient to 250 °C

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		Surface resistivity test of non-conductive parts of equipment relevant for explosion prevention and protection	EN 13463-1:2009 Cls. No. 8.5.8	A 1000 mega-ohm meter & stencil & conducting paint
		Thermal shock test	EN 13463-1:2009 Cls. No. 8.5.9	1mm Jet of water at 10 +/- 5 °C
		Charging test within non conductive materials	EN 13463-1:2009 Annex D	Measurement of charge in capacitance using voltmeter
2.	Non Electrical equipment intended for use in potentially explosive atmosphere Part 5 Protection by Constructional Safety "c"	Ingress Protection	EN 13463-5 2003 (E)	IP X1 to IP X 8
		Seals for Moving parts	EN 13463-5: 2003 (E) Cls 4.4	IP 1X TO IP 6X
		Resistance to chemical substance	EN 13463-1:2009 Cls. No. 8.5.6	Oil No.2 & fire resistance Hydraulic fluid. Oven for temperature Ambient to 250 deg C
		Stuffing box seals Temperature rise determination	EN 13463-5:2009 Cls. EN 4.4.2	Measurement of Temperature Rise Ambient to 500 deg C
		Requirements of Bearings. Dimensional Measurements	EN 13463-1:2009 Cls. Cls 6	Vernier 0.01mm to 1 m, Micrometer 250mm, Assorted Thread gauges 0.01 mm to 50 mm

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3.	Electrical Apparatus in Explosive Gas Atmospheres.- Part 0 General Requirements IS/IEC 60079-0: 2004 / IS/IEC 60079-0: 2007.	Resistance to Impact Test	IS/IEC 60079-0: 2004 Cls. No 26.4.2 and A 3.4 IS/IEC 60079-0: 2007 Cls. No 26.4.2 and A 3.3	2m to 0.1 m drop of 1 kg mass on a base of 20 kg
		Drop Test	IS/IEC 60079-0: 2004 Cls. 26.4.3 IS/IEC 60079-0: 2007 Cls. 26.4.3	Drop from 1 Meter height on concrete surface
		IP test for degree of protection for non rotating machines	IS/IEC 60079-0: 2004 Cls. s. 26.4.5 IS/IEC 60079-0: 2007 Cls. 26.4.5	IP 1 to 6X & IP X1 to X7
		IP test for degree of protection for rotating machines	IS/IEC 60079-0: 2004 Cls. 26.4.5 IS/IEC 60079-0: 2007 Cls. 26.4.5 & IS/IEC 60034-5:2000	IP 1 to 6X & IP X1 to X7
		Temperature Measurement	IS/IEC 60079-0 : 2004 Cls. 26.5.1 IS/IEC 60079-0 : 2007 Cls. 26.5.1	Temperature Rise Ambient to 500 °C
		Thermal Shock Test for Glass parts	IS/IEC 60079-0 : 2004 Cls. 26.5.2 IS/IEC 60079-0 : 2007 Cls. 26.5.2	1mm Jet of water at 10 +/- 5 °C

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		Small Component Ignition Test (Group I and Group II)	IS/IEC 60079-0 : 2004 Cls. 26.5.3 IS/IEC 60079-0 : 2007 Cls. 26.5.3	Power supply capable of sourcing 0.1V to 240 V & mixture of diethyl ether air applicable gas mixture
		Torque Test for bushings	IS/IEC 60079-0 : 2004 Cls. 26.6 IS/IEC 60079-0 : 2007 Cls. 26.6	Torque 1 to 200Nm
		Thermal Endurance to heat (non metallic)	IS/IEC 60079-0 : 2004 Cls. 26.8 IS/IEC 60079-0 : 2007 Cls. 26.8	Relative Humidity of (90+/-5)% & Temperature of 95 deg C +/-2
		Thermal Endurance to cold (Non metallic)	IS/IEC 60079-0 : 2004 Cls. 26.9 IS/IEC 60079-0 : 2007 Cls. 26.9	Cold Chamber going down to minus 50 °C
		Resistance to Chemicals agents for Group I electrical apparatus	IS/IEC 60079-0 : 2004 Cls. 26.11 IS/IEC 60079-0 : 2007 Cls. 26.11	Oil No.2 & fire resistance Hydraulic fluid. Oven for temperature Ambient to 250 °C
		Earth Continuity	IS/IEC 60079-0 : 2004 Cls. 26.12 IS/IEC 60079-0 : 2007 Cls. 26.12	Oven volume one meter cube at 250 deg maxi temperature & a 25 Amps DC supply and a milli voltmeter

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		Surface resistance test of non metallic materials	IS/IEC 60079-0 : 2004 Cls. 26.13 IS/IEC 60079-0 : 2007 Cls. 26.13	A Million mega-ohm meter & stencil & conducting paint
		Charging Test	IS/IEC 60079-0 : 2004 Cls. 26.14 IS/IEC 60079-0 : 2007 Cls. 26.14 IS 13346: 2004 Cls. 23.4.7.8	Measurement of charge in capacitance using voltmeter
		Test of clamping of cable(Non Armoured, Braided and Armoured)	IS/IEC 60079-0 : 2004 Cls. A 3.1 & 3.2 IS/IEC 60079-0 : 2007 Cls. A 3.1 & 3.2	Max pull force of 1 to 1000N
		Impact Test on Cable gland	IS/IEC 60079-0 : 2007 Cls. A 3.3	2m to 0.1m drop of 1 kg mass on a base of 20 kg
		Ageing Test for materials	IS/IEC 60079-0 : 2004 Cls. A 3.3	Shore hardness
		IP Test on glands.	IS/IEC 60079-0 : 2007 Cls. A 3.4 IS/IEC 60079-0 : 2004 Cls. A 3.5	IP X1 TO IP X8

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4.	Explosive Atmospheres Part 1 Equipment Protection by Flameproof Enclosures "d" IS/IEC 60079-1 : 2007 (Superseding IS 2148: 2004)	Pressure Determination Test	IS/IEC 60079-1: 2007 Cls. 15.1.2 & IS 2148: 2004 Cls. 15.1.2	0.1 bar to 50 bars max dynamics pressure (Restriction because of connectors)
		Over Pressure Test – 1.5 X Ref Pressure	IS/IEC 60079-1: 2007 Cls. 15.1.3.1 & IS 2148 : 2004 Cls. 15.1.3.1	0.1 bar to 50 bars max dynamics pressure (Restriction because of connectors)
		Over Pressure Test - 4 X Ref Pressure	IS/IEC 60079-1: 2007 Cls. 15.1.3.1 & IS 2148: 2004 Cls. 15.1.3.1	0.1 bar to 50 bars max dynamics pressure (Restriction because of connectors)
		Flame Non Transmission Test	IS/IEC 60079-1: 2007 Cls. 15.2 & IS 2148: 2004 Cls. 15.2	Gas mixing with Oxygen content 0% to 100%
		Test for flameproof enclosures with breathing & draining devices	IS/IEC 60079-1: 2007 Cls. 15.4 & IS 2148: 2004 Cls. 15.4	Gas mixing with Oxygen content 0% to 100%
		Tests for flameproofness including ability to withstand pressure Flame Erosion and Non Transmission Test	IS/IEC 60079-1: 2007 Cls. 19.3.1 & IS 2148: 2004. but Cls.19.3.1	Gas mixing with Oxygen content 0% to 100% 0.1 bar to 50 bar dynamic pressure
		Flammability Test – Non Metallic Parts	IS/IEC 60079-1: 2007 Cls.19.3.2 & IEC 60695-11-10 & IS 2148 Cls. 19.3.2	--

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		Sintered Metal Elements Pressed Metal Wire Elements Metal Foam Elements	IS/IEC 60079-1: 2007 Cls. B1, B2,B3	
		Non Transmission Test for crimped ribbon elements & multiple screen devices of Breathing & draining devices Annex A – A.4	IS/IEC 60079-1: 2007 A 4	Gas mixing with Oxygen content 0% to 100%
		Pressed Metal Wire Elements	IS/IEC 60079-1: 2007 Cls. B2	
		Metal Form Elements	IS/IEC 60079-1: 2007 Cls. B3	
		Sealing Test – Cable Glands	IS/IEC 60079-1: 2007 Cls. C 3.1 & IS 2148: 2004 Cls. 3.1	0.1 bar to 50 bars max dynamics pressure (Restriction because of connectors)
		Mechanical Strength Test for Cable Glands	IS/IEC 60079-1: 2007 Cls. C 3.2 & IS 2148: 2004 Cls. 3.2	2 Nm to 200 Nm
		Torque Test for Ex stopping plugs/Blanking elements	IS/IEC 60079-1: 2007 Cls. C 3.3.1	2 Nm to 200 Nm
		Over Pressure Test for Ex stopping plugs/Blanking elements	IS/IEC 60079-1: 2007 Cls. C 3.3.2	0.1 bar to 50 bar
		Torque Test for Ex thread adapters	IS/IEC 60079-1: 2007 Cls. C 3.4.1	2 Nm to 200 Nm

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		Impact Test for Ex thread adaptors	IS/IEC 60079-1: 2007 Cls. C 3.4.2	1 to 20 Joules
		Over pressure test for Ex thread adaptors	IS/IEC 60079-1: 2007 Cls. C 3.4.3	0.1 bar to 50 bars max dynamics pressure (Restriction because of connectors)
		Pressure Determination with Obstruction Plate	IS/IEC 60079-1: 2007 Cls. D.3.6	0.1 bar to 50 bars max dynamics pressure (Restriction because of connectors)
		Over Pressure Test for Ex-component Enclosures	IS/IEC 60079-1: 2007 Cls. D.3.7	0.1 bar to 50 bars max dynamics pressure (Restriction because of connectors)
5.	Explosive Atmospheres Part 2 Equipment protection by pressurized enclosure "p"	Maximum overpressure test	IS/IEC 60079-2:2007 Cls. 16.1, 16.5,16.7,	Application and Measurement of pressure 10 Pa to 1000 Pa for 2 min.
		Leakage Test: Other than static pressurization	IS/IEC 60079-2:2007 Cls. 16.2.1	Application and Measurement of pressure 10 Pa to 10000 Pa + flow rate 300 lpm
		Static Pressurization	IS/IEC 60079-2:2007 Cls. 16.2.2	Application and Measurement of pressure 10Pa to 10000 Pa, Time measurement for max. 3 hours.

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		Pressurized enclosure where protective gas is air	IS/IEC 60079-2:2007 Cls. 16.3.1 and Annex A	Application and Measurement of pressure 10 Pa to 10000 Pa, + flow rate 300 lpm Time measurement for max. 3 hours. Oxygen content 0 to 100 %
		Pressurized enclosure where protective gas is inert	IS/IEC 60079-2:2007 Cls. 16.3.2 and Annex A	Oxygen content 0 to 100 %
		Pressurized enclosure where protective gas is inert or air with density equal to air +/-10%	IS/IEC 60079-2: 2007 Cls. 16.3.3 and Annex A	Oxygen content 0 to 100 %
		Filling procedure test for a pressurized enclosure protected by static pressurization	IS/IEC 60079-2: 2007 Cls. 16.3.4	Oxygen content 0 to 100 %
		Purging test	IS/IEC 60079-2: 2007 Cls. 16.4.2.1, 16.4.3.1, 16.4.4.1, and Annex A	Oxygen content 0 to 100 %
		Dilution test	IS/IEC 60079-2: 2007 Cls. 16.4.2.2, 16.4.3.2, 16.4.4.2 and Annex A	Oxygen content 0 to 100 %
		Verification of minimum overpressure	IS/IEC 60079-2: 2007 Cls. 16.5	Pressure -20 mbar to +20 mbar and flow

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		Infallibility test	IS / IEC 60079-2 : 2007 Cls. 16.6 and Annex G	Pressure -20 mbar to +20 mbar and flow
		Ability of pressurized enclosure to limit internal pressure	IS/IEC 60079-2:2007 Cls. 16.8	Pressure -20 mbar to +20 mbar and flow
6.	Equipment Protection by Explosive Atmospheres Part 5 Equipment Protection by Powder Filling "q"	Pressure type test of enclosure	IS/IEC 60079-5:2007 Cls. 5.1.1	Application of overpressure 10 Pa to 6MPa.
		Verification of the degree of protection of	IS/IEC 60079-5:2007 Cls. 5.1.2	IP1 X to 6 X and X 1 to X 8
		Flammability of materials	IS/IEC 60079-5:2007 Cls. 5.1.3	Refer Cls of IS/IEC 60079-1: 2007 Cls.19.3.2 & IEC 60695-11-10 & IS 2148 Cls. 19.3.2
		Dielectric strength test of the filling material	IS/IEC 60079-5:2007 Cls. 5.1.4	0.5 kV to 30kV @ 3Amps maximum.
		Maximum temperatures	IS/IEC 60079-5:2007 Cls. 5.1.5	Temperature Rise Measurement Ambient to 500 deg C using thermocouples and data loggers.
		Routine pressure test of enclosure	IS/IEC 60079-5:2007 Cls. 5.2.1	Application of overpressure 10 Pa to 6MPa.

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		Dielectric strength test of the filling material	IS/IEC 60079-5:2007 Cls. 5.2.2	0.5 kV to 30kV@ 3Amps maximum.
7.	Equipment Protection By Oil Immersion "o" Part 6	Overpressure Test on sealed enclosures	IS/IEC 60079-6:2007 Cls. 5.1.1	0.001 bar to 60bar
		Reduced Pressure test on sealed enclosures	IS/IEC 60079-6:2007 Cls. 5.1.2	0.001 bar to 60bar
		Overpressure Test on unsealed enclosures	IS/IEC 60079-6:2007 Cls. 5.1.3	0.001 bar to 60bar
8.	Explosive Atmospheres Part 7 Equipment Protection by Increased Safety "e"	Dielectric Strength Test	IS/IEC 60079-7: 2006 Cls. 6.1,	0.5kV to 30 kV a.c. @ 3 Amps
		Determination of starting current ratio	IS/IEC 60079-7: 2006 Cls. 6.2.1,	0.1 A to 50 A @ 440 V a.c.
		Stator winding Insulation system (Steady state)	IS/IEC 60079-7: 2006 Cls. 6.2.3.1.3,	0.5 kV to 30 kV a.c. @ 3 Amps
		Stator winding Insulation system (Steady state)	IS/IEC 60079-7: 2006 Cls. 6.2.3.1.4,	Max Impulse voltage of 0.5kV to 37.5 kV a.c. 200 - 1500 nsecs. Rise time and 20µsecs to 60µsecs time to half value
		Cage rotor construction	IS/IEC 60079-7: 2006 Cls. 6.2.3.2, plus Annex A	Max voltage 0.5kV to 415 kV a.c. @ 50 Amps

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	Luminaires		IS/IEC 60079-7: 2006 Cls. 6.3.1, 6.3.2 IS 6381 / IEC 60079-7: 2001 Cls. 6.3	270 VAC, 10 Amps temperature sensing Ambient to 500°C
	Measuring instruments and instrument transformers		IS/IEC 60079-7: 2006 Cls. 6.4, IS 6381 / IEC 60079-7: 2001 Cls. 6.4	Temperature measurement Ambient to 450°C, Max Current measurement 1A to 100 A
	Transformers other than instrument transformers		IS/IEC 60079-7: 2006 Cls. 6.5, IS 6381 / IEC 60079-7: 2001 Cls. 6.5	Temperature measurement Ambient to 450°C, Max Current measurement 1A to 100 A
	IR of Secondary Batteries		IS/IEC 60079-7: 2006 Cls. 6.6, IS 6381 / IEC 60079-7: 2001 Cls. 6.6	Million mega ohms 1012 Ω max resistance measurement @ 500V d.c.
	General Purpose connection and junction boxes measurement of temperature and power dissipated		IS/IEC 60079-7: 2006 Cls. 6.7, IS 6381 / IEC 60079-7: 2001 Cls. 6.7	Temperature measurement Ambient to 450°C, current measurement 1A to 50 A
	Resistance to heating devices and heating units-Electrical insulation, thermal stability, impact, cold start current		IS/IEC 60079-7: 2006 Cls. 6.8, IS 6381 / IEC 60079-7: 2001 Cls. 6.8	IR 1M Ohm to 1000 M Ohm, Temperature rise Ambient to 500°C, Current 1A to 50 A

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		Terminal Insulating material for terminals	IS/IEC 60079-7: 2006 Cls.6.9, IS 6381 / IEC 60079-7: 2001 Cls. 6.9	Upto 1000 m Ohm
9.	Explosive Atmospheres Part 11 Equipment Protection by Intrinsic Safety "i"	Spark Ignition Test	IS/IEC 60079-11:2006 Cls.10.1.3 IS 5780: 2002 Cls. 10.1 IEC 60079-11: 1999 Cls. 10.1.3	1 mA to 3A for circuit's up to 1.5Mhz with voltage not exceeding 10 mV to 300V DC And inductance of 100nH to 1H maximum. Oxygen Meter 1-100.00%
		Test Gas mixtures and Spark test apparatus Calibration Current	IS/IEC 60079-11:2006 Cls.10.1.3.1 IS 5780: 2002 Cls. 10.1.3 IEC 60079-11: 1999 Cls. 10.1.3	24V dc Voltage source@ 150mA, having Inductance of 110mH. Oxygen Meter 0-100.00%
		Tests with the spark test apparatus	IS/IEC 60079-11:2006 Cls.10.1.4 IS 5780: 2002 Cls.10.4 IEC 60079-11: 1999 Cls.10.4	1mA to 3A for circuit's up to 1.5Mhz with voltage not exceeding 10 mV to 300V dc. And inductance of 1H maximum. Oxygen Meter 1-100.00%
		Testing Considerations	IS/IEC 60079-11:2006 Cls. 10.1.5 IS 5780: 2002 Cls. 10.4.3 IEC 60079-11: 1999 Cls. 10.4.3	Max measuring Limits using LCR meter, Oscilloscopes. 20MΩ, 200mF, 100H

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		Temperature tests.	IS/IEC 60079-11:2006 Cls. 10.2 IS 5780: 2002 Cls. 10.5 IEC 60079-11: 1999 Cls. 10.5	Cold Chamber Temp range -50°C Dry heat Oven Temp. range Ambient to 250 °C max. Source max of Voltage 10mV to 440V a.c. @ 50Amps.
		Temperature Tests	IS/IEC 60079-11:2006 Cls.10.2; IS 5780:2002 Cls.10.4.3; IEC 60079-11: 1999 Cls.10.4.3	Cold chamber temp. Range Ambient to - 50°C, Dry Heat Oven Temp. Range 250OC max. Voltage up to 440 V AC max @50 A
		Dielectric strength tests.	IS/IEC 60079-11:2006 Cls.10.3	0.5kV to 30kV @ 3A with Short Circuit Protection.
		Voltage Test	IS 5780: 2002 Cls. 10.6 IEC 60079-11: 1999 Cls. 10.6	0.5kV to 25kV with Short Circuit Protection.
		Determination of parameters of loosely specified components.	IS/IEC 60079-11:2006 Cls.10.4 IS 5780: 2002 Cls.10.8 IEC 60079-11: 1999 Cls.10.8	Max measuring Limits using LCR meter, Multimeter, Current probes, Oscilloscopes. 20MΩ, 200mF, 100H, 100Amps.

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		Electrolyte leakage Tests for Cell and Batteries	IS/IEC 60079-11:2006 Cls. 10.5.2 IS 5780: 2002 Cls. 10.9.2 IEC 60079-11: 1999 Cls. 10.9.2	Constant current Source. 0-20 Amps. Constant voltage Source. 0-30V dc.
		Spark Ignition and Surface temperature	IS/IEC 60079-11:2006 Cls. 10.5.3 IS 5780: 2002 Cls. 10.9.3 IEC 60079-11: 1999 Cls. 10.9.3	Spark Ignition Tester: 1mA to 3A for circuit's up to 1.5Mhz with voltage not exceeding 10mV to 300V dc. And inductance of 1nH to 1H maximum. Temp. Measurement Ambient to 500°C maximum using THC.
		Battery container pressure tests.	IS/IEC 60079-11:2006 Cls. 10.5.3	Maximum Pressure measurement 0.001bar to 60 bar.
		Mechanical Tests. Casting Compound.	IS/IEC 60079-11:2006 Cls.10.6.1 IS 5780: 2002 Cls. 10.10.1 IEC 60079-11: 1999 Cls. 10.10.1	Max force of 0.25 N to 50N applied
		Sealing of Components before encapsulation	IS/IEC 60079-11:2006 Cls. 10.6.2	Temperature measurement of Ambient to 500°C maximum

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		Partitions	IS/IEC 60079-11:2006 Cls. 10.6.3 IS 5780: 2002 Cls. 10.10.2 IEC 60079-11: 1999 Cls. 10.10.2	Max force of 0.25 N to 50N applied
		Tests for apparatus containing piezo electric device.	IS/IEC 60079-11:2006 Cls. 10.7 IS 5780: 2002 Cls. 10.11 IEC 60079-11: 1999 Cls. 10.11	Maximum measuring limits using LCR meter, Oscilloscope 20M Ω , 200mF, 100H.
		Cable Pull test	IS/IEC 60079-11:2006 Cls. 10.9 IS 5780: 2002 Cls. 10.13 IEC 60079-11: 1999 Cls. 10.13	Maximum pulling force of 1000N or 100kg
		Tests on Transformers	IS/IEC 60079-11:2006 Cls. 10.10 IS 5780: 2002 Cls. 11.2 IEC 60079-11: 1999 Cls. 11.2	Temperature measurement of Ambient to 500° C maximum. Current measuring capacity of 1A to 1.5kA maximum. Max AC voltage source of 440V ac @ 50 Amps.

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10.	Electrical Apparatus for Explosive & Gas Atmospheres Part 14 for Electrical Installations in hazardous areas (Other than Mines)	Protection from dangerous (Incendive) sparking	IEC 60079-14: 2007 Cls. 6	Measurement of Earth Bonding resistance using 1A to 40 A current source, measurement of voltage 0.01 V to 650 V AC
		Electrical Protection Assessment of IA/IN ratio, and checking time tE, Temperature Rise of short circuited transformer. Single phasing protection w.r.t. automatic disconnection Overload, Short Circuit, Earth Faults	IEC 60079-14: 2007 Cls. 7	Measurement current max 1A to 500 A, Voltage Max 0.5kV to 25 kV AC Temperature max Ambient to 500°C, Sourcing of Voltage max 440 VAC , Current 50 A
		Emergency switch off and electrical Isolation	IEC 60079-14: 2007 Cls. 8	Insulation resistance measurement capacity 1M Ohm to 10 ⁶ M Ohm
		Wiring System	IEC 60079-14: 2007 Cls. 9	Inspection and Measurement of Core diameter using Vernier (0.01 mm LC) scale; Scale (1 mm LC); Clearance, creepage and separation distance measurement using scale(1 mm LC); measurement of surface temperature of cables .Measuring capacity Ambient to 500° C. Cable pull test 1N to 1000 N.

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		Additional requirements for type of protection "d" Flameproof enclosure	IEC 60079:14:2007 Cls. 10 IS/IEC 60079-0:2007 and IS/IEC 60079-1:2007	Refer the FULL scope for IS/IEC 60079-1:2007
		Additional requirements for type of protection "e" Increased safety	IEC 60079-14:2007 Cls.11; IEC 60034-5 IS/IEC 60079-07, Cls. 4.2, 4.6, 4.7, 4.9, 5.2, 5.8, 5.9, 6.2, 6.7, 6.8, 6.9 and annex E	
		Additional requirement for type of protection "P" intrinsic safety	IEC 60079-14:2007. Cls. 12 IS/IEC 60079-11:2006	Dielectric test 5kV AC maximum, IP protection IP 20 to IP 68, clearance and creepage. Measurements of L, C and R on LCR Bridge. Range: C:10pF to 10 mF L:1µH to 1 H R: 1 Ohm to 10 KOhm. Bonding Resistance of Cables armour using 30A earth bond tester to measure resistance 0.01 Ohm to 2 Ohms.
		Additional requirements for type of protection "p" pressurized apparatus	IEC 60079-14:2007. Cls. 13 IS/IEC 60079- 2 : 2007	---

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		Additional requirements for apparatus suitable only for use in zone 2	IEC 60079-14:2007. Cls. 14 IS/IEC 60079-15:2005	---
		Verification of intrinsically safe circuits with more than one associated apparatus with linear current and voltage characteristics	IEC 60079-14:2007. Annex A (Normative)	LCR Meter, Multimeter V=750 V AC,I=10 A Measurement of L, C and R on LCR bridge. Range C:10pF to 10 mF L:1μH to 1 H R: 1 Ohm to 10 MOhm.
		Methods of determining maximum system voltages and currents in intrinsically safe circuits with more than one associated apparatus with linear current and voltage characteristics	IEC 60079-14:2007. Annex B (Normative)	Inspection and Measurements of L, C and R on LCR Bridge. Range: C:10pF to 10 mF L:1μH to 1 H R:1 Ohm to 10 MOhm Measurement of voltage and current V=750 V AC,I=10 A
		Determination of cable parameters	IEC 60079-14:2007. Annex C (Informative)	Measurements of L, C and R on LCR Bridge. Range: C:10pF to 10 mF L:1μH to 1 H R:1 Ohm to 10 MOhm Measurement of voltage and current V=750 V AC,I=10 A

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11.	Electrical Apparatus for Explosive Gas Atmospheres – Part 15 Construction, Tests and marking of type of protection - “n” electrical apparatus	Thermal Endurance to Heat	IS/IEC 60079-15:2005 Cls. 33.3.2.1	Temp 70 °C to 95°C and 90 RH to % 95 RH
		Thermal Endurance to Cold	IS/IEC 60079-15:2005 Cls. 33.3.2.2	Cold Ambient to -65°C
		Mechanical strength tests	IS/IEC 60079-15:2005 Cls. 33.3.3	Refer Cls 26.4.2. of IS/IEC 60079-0: 2004 for Resistance to Impact and Drop Test
		IP tests on enclosures	IS/IEC 60079-15: 2005 Cls. 33.3.4 IS/IEC 60529: 2001 IS/IEC 60034: 2000	IP Tests: 1X to 6X and X1 to X8 as per IS/IEC 60529:2001
		Tests on enclosed break devices – Non-Incendive components	IS/IEC 60079-15:2005 Cls. 33.4	Gas mixing set 0.1 bar to 50 bar maximum pressure
		Tests on sealed and encapsulated devices	IS/IEC 60079-15: 2005 Cls. 33.5	Dry Hest Oven Ambient to 300°C, High Voltage 0.5kV to 30 kV @3Amps

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		Assessment and Test of energy limited apparatus and circuits	IS/IEC 60079-15: 2005 Cls. 33.6	Cold Chamber Temp range Ambient to -60°C Dry heat oven temp range 250°C max. 0.5 kV to 25 kV with Short Circuit Protection. Max Measuring limits using LCR Meter, multimeter, current probes, oscilloscopes 20MΩ, 200 mF, 100H, 100A
		Tests on restricted breathing enclosures	IS/IEC 60079-15:2005 Cls. 33.7	Measurement and Production of Vacuum up to 0.01 kPa to 5kPa in an enclosure Measurement and production of Pressure 0.01 kPa to 5kPa in an enclosure, Supply of air up to 300litres/ minute
		Tests for cage rotor construction	IS/IEC 60079-15:2005 Cls. 33.14.1.	415V ac @ 50 Amps. Voltage Supply source. Temperature measurement Ambient to 500°C

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		Tests for stator winding insulation system	IS/IEC 60079-15:2005 Cls. 33.14.2	HV 0.5kV to 30kV AC @ 3 Amps for Steady State condition. Impulse Test up to 36kV 20 to 60µsecs time to half, and a rise time between 200 to 1500nsecs.
12.	Electrical Equipments in explosive atmospheres- Artificial ventilation protection for analyzer houses Part 16	Air flow measurements and purging test	IS/IEC 60079-16:1990 Cls. 7(3)	Air flow 1lpm to 100 lpm and pressure 0.001 bar to 2 bar
		Minimum overpressure test	IS/IEC 60079-16:1990 Cls. 7(4)	0.001 bar to 2 bar
		Test to prove operation of safeguarding systems	IS/IEC 60079-16:1990 Cls. 7(5)	0.001 bar to 2 bar and 1 lpm to 100 lpm
		Verification & test for flow restrictions	IS/IEC 60079-16:1990 Cls. 7(6)	0.001bar to 2 bar and 1 lpm to 100 lpm
		By assessment	IS/IEC 60079-16:1990	Only assessment. No testing involved

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13.	Electrical Apparatus for Explosive Gas Atmospheres Part 18 Construction, Test and Marking of type of protection ENCAPSULATION – “m” Electrical Apparatus	Water Absorption Test	IS/IEC 60079-18: 2009 Cls. 8.1	0.01 g to 300 g
		Maximum Temperature	IS/IEC 60079-18: 2009 Cls. 8.2.2	Measuring Max Ambient to 500°C with THC Maximum loading from max. 415V ac @ 0Amps
		Thermal endurance to heat	IS/IEC 60079-18: 2009 Cls. 8.2.3.1	Max of 95°C at max of 95% RH
		Thermal endurance to cold	IS/IEC 60079-18: 2009 Cls. 8.2.3.2	-60°C to Ambient Cold chamber capacity
		Thermal Cycling	IS/IEC 60079-18: 2009 Cls. 8.2.3.3	-60°C to 250°C, Chamber Capacity
		Di electric Strength Test	IS/IEC 60079-18: 2009 Cls. 8.2.4	Maximum Sourcing of 0.5 kV to 30 kV @ 3 Amps. Measuring of 0.5 kV to 37kV
		Cable Pull Test	IS/IEC 60079-18: 2009 Cls. 8.2.5	2 Nm to 1000 Nm
Pressure Test	IS/IEC 60079-18: 2009 Cls. 8.2.6	Application of Pressure from 50Pa to Max 60bar		

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14	Part 25 : Intrinsically safe systems by assessment , evaluation and testing	Grouping and classification- Measurement of surface temperature for determining temperature class	IS/IEC 60079-25:2003 Cls. 5	Temperature measurement capacity of Ambient to 500°C using thermocouples, Electrical source of 440 V @ 50 A
		Ambient temperature rating	IS/IEC 60079-25:2003 Cls. 7	Temperature measurement capacity of Ambient to 500°C using thermocouples [---
		Field wiring	IS/IEC 60079-25:2003 Cls. 8 and IS/IEC 60079-14	---
		Earthing and bonding of intrinsically safe systems	IS/IEC 60079-25:2003 Cls. 9	Dielectric test: 0.5 kV to 5 kV max. & Inspection & Assessment
		Protection against lightening and other electrical surges	IS/IEC 60079-25:2003 Cls. 10	8 to 20 µsecs impulse for 10 operations. Ammeter range 2µA to 10 A
		Type verification and type tests	IS/IEC 60079-25:2003 Cls. 11.4 and IS/IEC 60079-11 Cls. 10	1mA to 3A for circuit's DC to 1.5 MHz with voltage not exceeding 300 VDC. And inductance of 1H maximum. Oxygen Meter 0-100 %

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		Assessment of Simple Intrinsically safe system	IS/IEC 60079-25:2003 Annex A	1 mA to 3A for circuit's DC to 1.5 MHz with voltage not exceeding 300 VDC. And inductance of 1H maximum. Oxygen Meter 0-100 %
		Assessment of circuits with more than one power source	IS/IEC 60079-25:2003 Annex B and IS/IEC 60079-11	--
		Interconnection of non linear and linear intrinsically safe circuits- Test with spark test apparatus	IS/IEC 60079-25:2003 Annex C	1mA to 3A for circuit's DC to 1.5 MHz with voltage not exceeding 300 V DC and inductance of 1H maximum. Oxygen meter 0 to 100%
		Verification of inductive parameters-Test with spark test apparatus	IS/IEC 60079-25:2003 Annex D	1mA to 3A for circuit's DC to 1.5 MHz with voltage not exceeding 300 V DC and inductance of 1H maximum. Oxygen meter 0 to 100%

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15.	Explosive Atmosphere Equipment Assessment & Test for equipment protection level (epl) Ga	Type tests for Standardized type of protection	IEC 60079-26: 2006 Cls. 5.1	Type Testing as per respective standards
		Separation elements	IEC 60079-26:2006 Cls. 5.2	Pressure: 0.001 bar to 50 bar max Temp.: Ambient to 500°C Max
		Temperature Evaluation	IEC 60079-26:2006 Cls. 5.3	Temp. rise Ambient to 500°C
		Marking	IEC 60079-26:2006 Cls. 6	Inspection
		Introduction of an alternative risk assessment encompassing” Equipment Protection Levels” for Ex equipments”	IEC 60079-26:2006 Annex A	Evaluation of Risk of ‘ Ignition Protection provided as per table A2
16.	Explosive Atmospheres Part 31 Equipment Dust Ignition Protection by Enclosure “t”	Thermal endurance to heat	IS/IEC 60079-31:2008 Cls. No. 6.1.1	Relative Humidity of (90+/-5)% & Temperature of 95° C +/-2
		Thermal endurance to cold	IS/IEC 60079-31:2008 Cls. No. 6.1.1	Cold Chamber going down -60 °C to Ambient
		Resistance to Impact Test	IS/IEC 60079-31:2008 Cls. No. 6.1.1	2m to 0.1 m drop of 1 kg mass on a base of 20 kg
		Drop Test	IS/IEC 60079-31:2008 Cls. No. 6.1.1	Drop from 1 Meter height on concrete surface

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		Ingress of protection	IS/IEC 60079-31:2008 Cls. No. 6.1.1	IP 5X and 6X with depression of 4kPa
		Thermal test (temperature rise test)	IS/IEC 60079-31:2008 Cls. No. 6.1.2	Ambient to 500°C
		Pressure Test	IS/IEC 60079-31:2008 Cls. No. 6.1.3	0.001kPa to 10kPa
17.	Weather proof tests	Ingress Protection		
		Electrical equipments and enclosures	IS/IEC 60529 : 2001 , IS 12063 and equivalent	IP 1 X to 6 X and X 1 to X 8
		Rotating Machines	IS/IEC 60034 – 5 and IS 4691	IP 1 X to 6 X and X 1 to X 8
		Luminaries	IS 10322 Part 4	IP 1 X to 6 X and X 1 to X 8
		Low voltage switchgear and control gear	IS/IEC 60947: 2007 Part 1 Appendix C	IP X 1 to 6 X and X 1 to X 8
18.	REPAIRS & OVERHAUL Additional requirement for Ex “d”#	Measurement of flame paths, minimum thickness of enclosures Clearance and creepage measurement for termination	IS/IEC 60079-19:2006 Cls. 5.2 and 5.2.3	Vernier upto 1 m. micrometer 250 mm, assorted thread gauges

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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
19.	Additional requirements for Ex “e”#	Testing after repair of windings Winding resistance Insulation resistance HV Test Measurement of Current/voltage and phase balance	IS/IEC 60079-19:2006 Cls. 5.2.6.3	Winding resistance from 0.001Ohm to 1k Ohm, IR 1MOhm to 10 G Ohm and HV 0.5kV to 30 kV @ 3Amps. Current 1A to 1000A
20.	Additional requirements for Repair, Overhaul and Reclamation of equipment with type of protection Ex “n”#	Tests on reclaimed products: Enclosures, Overpressure Test, dimensional measurements Clearance and creepage and temp. measurement	IS/IEC 60079-19:2006 Cls. 5.3.1 IS/IEC 60079-19:2006 Cls. 5.4.3	Pressures 0.01bar to 30bar and measurements 0.01 mm to 1 m Distance measurement 0.1mm to 50 mm
21.	Additional requirements for Repair, Overhaul and Reclamation of equipment with type of protection “i” Intrinsically Safe#	Tests for ensuring IP rating Clearance and creepage Evaluation of fuses Voltage test	IS/IEC 60079-19:2006 Cls. 6.2.1 and 6.2.2 IS/IEC 60079-19:2006 Cls. 6.2.3 IS/IEC 60079-19:2006 Cls. 6.2.5 IS/IEC 60079-19:2006 Cls. 6.2.16	IP X1 to X6 and 1X to 8X Distance measurement 0.1mm to 50 mm 1A to 500 A 0.1 V to 500 V

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22.	Additional requirements for Repair, Overhaul and Reclamation of equipment with type of protection “p” pressurized[#]	Mechanical strength and leakage rate for enclosures	IS/IEC 60079-19:2006 Cls. 7.2.1	0.001 bar to 2 bar and 1lpm to 100 lpm	
		Testing of winding after repairs	IS/IEC 60079-19:2006 Cls. 7.2.6.3	IR 1 MOhm to 100 G Ohm	
		Test on rotating machines	IS/IEC 60079-19:2006 Cls. 7.2.6.3.2	H.V. 0.5 kV to 40 kV	
		Reclaimed products overpressure test	IS/IEC 60079-19:2006 Cls. 5.3.1	0.01 bar to 50 bar	
		Internal Connections creepage and clearance distances	IS/IEC 60079-19:2006 Cls. 5.4.4	0.01mm to 50mm and 1m	
		Windings:			
		Resistance of each winding	IS/IEC 60079-19:2006 Cls. 5.2.6.3.1 a	1 mΩ to 100 Ω	
		Insulation resistance	IS/IEC 60079-19:2006 Cls. 5.2.6.3.1 b	1 MΩ to 1 TΩ	
		High voltage withstand	IS/IEC 60079-19:2006 Cls. 5.2.6.3.1 c	0.5kV to 40 kV	
		Rotating Machines	IS/IEC 60079-19:2006 Cls. 5.2.6.3.2	0.5kV to 40 kV	
	Locked rotor test:Temp.rise	IS/IEC 60079-19:2006 Cls. 5.2.6.3.2 b	Ambient to 450°C		

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		High Voltage Test	IS/IEC 60079-19:2006 Cls. 5.2.6.3.2 c	0.5kV to 40 kV
		Enclosures-IP rating	IS/IEC 60079-19:2006 Cls. 6.2.1	IP X1 to X6 and 1X to 8X
		Cable entries IP rating	IS/IEC 60079-19:2006 Cls. 6.2.2	IP X1 to X6 and 1X to 8X
		Terminations	IS/IEC 60079-19:2006 Cls. 6.2.3	0.01mm to 50mm and 1m
		Soldered connections	IS/IEC 60079-19:2006 Cls. 6.2.4	0.01mm to 50mm and 1m
		Fuses	IS/IEC 60079-19:2006 Cls. 6.2.5	verification
		Shunt barriers-safety barriers	IS/IEC 60079-19:2006 Cls. 6.2.7	0.01 mm to 100 mm clearance measurement
		Testing	IS/IEC 60079-19:2006 Cls. 6.2.16	Voltage applied 10 to 500 V at 50 Hz to 60 Hz
23.	Electrical Apparatus for Explosive Gas Atmospheres: Part 7 Increases Safety'e*	Determination of starting current ratio	IS/IEC 60079-7: 2006 Cls. 6.2.1, IS 6381: 2004 / IEC 60079-7: 2001 Cls. 6.2.1	Measurement of Max current of 500 A @11 kV AC

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		Stator winding Insulation system	IS/IEC 60079-7: 2006 Cls. 6.2.3.1, IS 6381: 2004 / IEC 60079-7: 2001 Cls. 6.2.3.1	Measurement of max voltage of 30kV @ 1Amp. Measurement of Impulse voltage of 36kV @ 20 to 60 µsecs with rise time of 200nsec to 1500nsec.
		Cage rotor construction	IS/IEC 60079-7: 2006 Cls. 6.2.3.2, IS 6381: 2004 / IEC 60079-7: 2001 Cls. 6.2.3.2 plus Annex A	Measurement of Max current of 500A @11 kV AC.
24.	Electrical Apparatus for Explosive Gas Atmospheres: Part 15 Construction, Test and marking of type of Protection-“n” Electrical Apparatus*	Tests for cage rotor construction	IS/IEC 60079-15 Cls. s. 33.14.1	Measurement of Max current of 500A @11 kV AC.
		Test for Stator winding Insulation system	IS/IEC 60079-15 Cls. 33.14.2	Measurement of max voltage of 30kV @ 1Amp. Measurement of Impulse voltage of 36kV @ 20 to 60 µsecs with rise time of 200nsec to 1500nsec.
25.	Electrical Equipments in explosive atmospheres- Artificial ventilation protection for analyzer houses*	Air flow measurements and purging test	IS/IEC 60079-16:1990 Cls. 7(3)	Air flow 1 lpm to 100 lpm and pressure 0.01 bar to 2 bar
		Minimum overpressure test	IS/IEC 60079-16:1990 Cls. 7(4)	0.01bar to 2 bar
		Test to prove operation of safeguarding systems	IS/IEC 60079-16:1990 Cls. 7(5)	0.01bar to 2 bar and 1lpm to 100 lpm

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		Verification & test for flow restrictions	IS/IEC 60079-16:1990 Cls. 7(6)	0.01bar to to 2 bar and 1lpm to 100 lpm
26.	Weather Proof Test*	Ingress Protection	IS/IEC 60529 : 2001 , and equivalent	IPX3, X4, X5, X6 IP1X to 4X
			IS/IEC 60034 – 5 and IS 4691	IPX3, X4, X5, X6 IP1X to 4X
			IS 10322 Part 4 and equivalent	IPX3, X4, X5, X6 IP1X to 4X
			IS/IEC 60947: 2007 Part 1 Appendix C	IPX3, X4, X5, X6 IP1X to 4X

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*Only for Site Calibration

The laboratory is also capable for site calibration however, the uncertainty at site depends on the prevailing actual environmental conditions and master equipment used