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CERTIFICATE OF ACCREDITATION

This is to attest

DEKRA TESTING AND CERTIFICATION (SHANGHAI) LTD.

OFFICE: #250, JIANGCHANGSAN RD., BUILDING 16, HEADQUARTER ECONOMY PARK SHIBEI HI-TECH PARK, JING'AN DISTRICT, SHANGHAI, 200436, CHINA

Testing Laboratory TL-907

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date December 4, 2025



International Accreditation Service
Issued under the authority of IAS management

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SCOPE OF ACCREDITATION

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DEKRA TESTING AND CERTIFICATION (SHANGHAI) LTD.

www.dekra.com.cn

Location	Address	Contact Name	Contact Phone	Scope pages
Satellite 1	No.1050, Xingxian Road, Jiading District, Shanghai, 201815, China	Wayne Wang	+86 21 6056 7603	2-7
Satellite 2	No.16, Lane 1288, Luoning Road, Baoshan District, Shanghai, 200949, China	Wayne Wang	+86 21 6056 7603	7-18

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Satellite 1

Lighting Test	
ANSI C78.377	Electric Lamps — Specifications for the Chromaticity of Solid-State Lighting Products
ANSI C136.3	For Roadway and Area Lighting Equipment - Luminaire Attachments
ANSI C136.3-2005	For Roadway and Area Lighting Equipment - Luminaire Attachments
ANSI C136.31	Roadway and Area Lighting Equipment - Luminaire Vibration
ANSI C136.31-2001	Roadway and Area Lighting Equipment - Luminaire Vibration
ANSI_ANSLG C78.377-2011	Electric Lamps — Specifications for the Chromaticity of Solid-State Lighting Products
ANSI/PLATO FL1-2019	Flashlight Basic Performance Standard
ANSI/UL 153(ISTMT)	Standard for safety Portable Electric Luminaires
ANSI/UL 1574(ISTMT)	Standard for safety Track Lighting Systems
ANSI/UL 1598 (ISTMT)	Standard for safety Luminaires
ANSI/UL 1598C (ISTMT)	Standard for Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits
ANSI IES TM-30	IES method for evaluation light source color rendition
ANSI IES LM-98	Approved method: Measuring in-situ temperature of solid-state lighting components in lamps and luminaires
ANSI IES TM-33	Technical memorandum: Standard format for the electronic transfer of Luminaire Optical Data

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ANSI IES TM-39	Technical memorandum: Quantification and specification of visual responses to temporal light modulation (Flicker)
ASTM D3359-17	Standard Test Methods for Rating Adhesion by Tape Test
CIE 018:2019	The Basics of Physical Photometry
CIE 13.3	Method of Measuring and Specifying Colour Rendering Properties of Light Source
CIE 15	Colorimetry
CIE 15:2004	Colorimetry
CIE 18.2	The Basics of Physical Photometry
CIE 63	The Spectroradiometric Measurement of Light Sources
CIE 84	The Measurement of Luminous Flux
CIE 88:2004	Guide for the Lighting of Road Tunnels and Underpasses
CIE 97	Guide on the Maintenance of Indoor Electric Lighting Systems
CIE 115:2010	Lighting of Roads for Motor and Pedestrian Traffic
CIE 154:2003	The Maintenance of outdoor lighting systems
CIE S 010	Photometry - The CIE System of physical photometry
prEN 13032-4	Light and lighting - Measurement and presentation of photometric data of lamps and luminaires - Part 4: LED lamps, modules and luminaires
EN 50294 Amendments: A1:2001 and A2:2003	Measurement method of total input power of ballast-lamp circuits
EN 50689	Safety of laser products - Particular Requirements for Consumer Laser Products
IEC 60188:2001+A11:2019	High-pressure mercury vapour lamps – Performance specifications
IEC 60529:2013	Degrees of protection provided by enclosures (IP Code)
IEC 60598-1:2014+A1:2017	Luminaires - Part 1: General requirements and tests
IEC 60825-1	Safety of laser products – Part 1: Equipment classification and requirements
IEC 60825-2	Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCSS)
IEC 61643-11:2011	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods
IEC 62442-3	Energy performance of lamp controlgear – Part 3: Controlgear for tungstenhalogen lamps and LED light sources – Method of measurement to determine the efficiency of controlgear
IEC 62471-7	Photobiological safety of lamps and lamp systems – Part 7: Light sources and luminaires primarily emitting visible radiation

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IEC 62663-2 Ed. 1 (CDV)	Non-Integrated LED Lamps – Part 2: Performance requirements
IEC/EN 60081	Double-capped fluorescent lamps - Performance specifications
IEC/EN 60357	Tungsten halogen lamps (non-vehicle) - Performance specifications
IEC/EN 60598-2-3	Luminaires - Part 2-3: Particular requirements - Luminaires for road and street lighting
IEC/EN 60662	High-pressure sodium vapour lamps – Performance specifications
IEC/EN 60901	Single-capped fluorescent lamps - Performance specifications
IEC/EN 60921	Ballasts for tubular fluorescent lamps – Performance requirements
IEC/EN 61000-3-2	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions
IEC/EN 61140	Protection against electric shock - Common aspects for installation and equipment
IEC/EN 61167	Metal halide lamps
IEC/EN 61547:2009	Equipment for general lighting purposes – EMC immunity requirements
IEC/EN 62035	Discharge lamps (excluding fluorescent lamps) - Safety specifications
IEC/EN 62262	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
IEC/EN 62321-4	Determination of certain substances in electrotechnical products – Part 4: Mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS
IEC/EN 62384	DC or AC supplied electronic control gear for LED modules - Performance requirements
IEC/EN 62442-1	Energy performance of lamp controlgear – Part 1: Controlgear for fluorescent lamps – Method of measurement to determine the total input power of controlgear circuits and the efficiency of the controlgear
IEC/EN 62471	Photobiological safety of lamps and lamp systems
IEC/EN 62612	Self-ballasted LED lamps for general lighting services with supply voltages > 50 V-Performance requirements
IEC/EN 62717	LED modules for general lighting – Performance requirements
IEC/EN 62722-1	Luminaire performance – Part 1: General requirements
IEC/EN 62722-2-1	Luminaire performance – Part 2-1: Particular requirements for LED luminaires
IEC/TR 61341	Method of measurement of centre beam intensity and beam angle(s) of reflector lamps
IEC TR 61547-1	Equipment for general lighting purposes – EMC immunity requirements – Part 1: Objective light flickermeter and voltage fluctuation immunity test method
IEC TR 63158	Equipment for general lighting purposes – Objective test method for stroboscopic effects of lighting equipment

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IES LM-9	Approved Method: Electrical and Photometric Measurements of Fluorescent Lamps
IES LM-10	IESNA Approved Method for Photometric Testing of outdoor fluorescent luminaires
IES LM-41	Approved method: Photometric testing of indoor fluorescent luminaires
IES LM-66	Approved Method: Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps
IES LM-79	Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products
IES LM-79-08	Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products
IES LM-79-19	Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products
IES LM-80	Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules
IES LM-80-08	Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules
IES LM-82	Approved Method: Characterization of LED light Engines and LED lamps for Electrical and Photometric Properties as a Function of Temperature
IES LM-82-12	Approved Method: Characterization of LED light Engines and LED lamps for Electrical and Photometric Properties as a Function of Temperature
IES LM-84	Approved Method: Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires
IES LM-84-14	Approved Method: Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires
IES LM-85	Approved Method: Optical and Electrical Measurements Of LED Packages and Arrays
IES TM-21	Projecting Long Term Lumen Maintenance of LED light Sources
IES TM-21-11	Projecting Long Term Lumen Maintenance of LED light Sources
IES TM-28	Projecting Long-Term Luminous Flux Maintenance of LED Lamps and Luminaires
IES TM-28-14	Projecting Long-Term Luminous Flux Maintenance of LED Lamps and Luminaires
INMETRO Order No.62:2022	Approves the Technical Quality Regulation and the Conformity Assessment Requirements for Luminaires for Public Street Lighting - Consolidated
INMETRO Order No.69:2022	Approves the Technical Quality Regulation and Conformity Assessment Requirements for LED Lamps with Control Device Integrated into the Base - Consolidated

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ISO 4628-2:2016	Paints and Varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering
ISO 4628-3:2016	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting
ISO 4628-4:2016	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 4: Assessment of degree of cracking
ISO 9227:2017	Corrosion tests in artificial atmospheres - Salt spray tests
ISO 10289:1999	Methods for corrosion testing of metallic and other inorganic coatings on metallic substrates – Rating of test specimens and manufactured articles subjected to corrosion tests
ISO 23539	Photometry - The CIE System of physical photometry
L2(AP)005	Cone luminous flux
No. (25) of 2024 (Bahrain)	Energy efficiency, functionality and requirements for lighting products – Part 1 and Part 2
SASO 2870:2018	Energy Efficiency, Functionality and Labelling Requirements for Lighting Products – Part 1
SASO 2870:2018/AMD1:2021	Energy Efficiency, Functionality and Labelling Requirements for Lighting Products – Part 1
SASO 2902:2018	Energy Efficiency, Functionality and Labelling Requirements for Lighting Products – Part 2
SASO 2902:2018/AMD1:2021	Energy Efficiency, Functionality and Labelling Requirements for Lighting Products – Part 2
SASO 2902:2018/AMD2:2023	Energy efficiency, functionality and labelling requirements for lighting products - Part 2
SASO 2927:2019	Energy efficiency functionality and labelling requirements
SASO 2927:2019/AMD1:2021	Energy efficiency functionality and labelling requirements for lighting products – Part 3: Street lighting
SASO EN 13032-4	Light and lighting - Light and lighting - Measurement and presentation of photometric data of lamps and luminaires - Part 4: LED lamps, modules and luminaires
SASO GSO IEC 60064	Tungsten filament lamps for domestic and similar general lighting purposes - Performance requirements
SASO GSO IEC 60901	Single-capped fluorescent lamps - Performance specifications
SASO GSO IEC 60969	Self-ballasted compact fluorescent lamps for general lighting services – Performance requirements
SASO IEC 60682	Standard method of measuring the pinch temperature of quartz-tungsten-halogen lamps

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SASO IEC 62554	Sample preparation for measurement of mercury level in fluorescent lamps
SASO IEC/PAS 62707-1	LED-binning – Part 1: General requirements and white colour grid intended for automotive applications
SASO IEC/PAS 62717	LED modules for general lighting – Performance requirements
SASO IEC/TS 62504	General lighting - Light emitting diode (LED) products and related equipment - Terms and definitions
UN Regulation No.148	Uniform provisions concerning the approval of light-signaling devices (lamps) for power-driven vehicles and their trailers
UN Regulation No.149	Uniform provisions concerning the approval of road illumination devices (lamps) and systems for power-driven vehicles
UN Regulation No.150	Uniform provisions concerning the approval of retro-reflective devices and markings for power-driven vehicles and their trailers
Cybersecurity	
EN 18031-1	Common Security Requirements for Radio Equipment – Part 1: Internet Connected Radio Equipment
EN 18031-2	Common Security Requirements for Radio Equipment – Part 2: Radio Equipment Processing Data, Namely Internet Connected Radio Equipment, Childcare Radio Equipment, Toys Radio Equipment, and Wearable Radio Equipment
EN 18031-3	Common Security Requirements for Radio Equipment – Part 3: Internet Connected Radio Equipment Processing Virtual Money or Monetary Value
ETSI TS 103 732-1	CYBER; Consumer Mobile Device; Part 1: Base Protection Profile
ETSI TS 103 732-2	CYBER; Consumer Mobile Device; Part 2: Biometric Authentication Protection Profile Module

Satellite 2

Photovoltaic Products	
6/B. sz. Melléklet	Technical Conditions for the Grid Connection of Household-Scale Generating Units to Distribution Networks (Hungary)
A68 Terna (HV)	Photovoltaic plants - General conditions for connection to at networks - Protective systems regulation and control
ABNT NBR 16149	Technical specification of grid-connected PV inverter for Brazil
ABNT NBR 16150	Test procedure for grid-connected PV inverter
ABNT NBR IEC 62116	Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters

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Allegato A.18	Verification of Power Generation Plants' Compliance with the Grid Operator's Technical Specifications (Italy)
Arrêté ministériel du 9 février 2017 + Cahier des charges annexé	Specifications relating to the technical requirements for connecting and disposing of energy produced from renewable energy installations connected to the high and medium voltage Grid (Tunisia)
AS 60947.3	Low-voltage switchgear and controlgear, Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units (Applicable Annex D, Switches, disconnectors, switch-disconnectors and fuse-combination units for use in photovoltaic (PV) DC applications)
AS 62040.1	Uninterruptible power supply systems (UPS) - Part 1: Safety requirements
AS/NZS 4777.2	Grid connection of energy systems via inverters Part 2: Inverter requirements
BESF Grid Connection Code	GRID Connection code for battery energy storage facilities (BESF) connected to the electricity transmission system (TS) or the distribution system (DS) in South Africa
C10/11	Specific technical prescriptions regarding power-generating plants operating in parallel to the distribution network
CEA Regulation	Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations
CEI 0-16	Reference technical rules for the connection of active and passive consumers to the HV and MV electrical networks of distribution Company
CEI 0-21	Reference technical rules for the connection of active and passive users to the LV electrical Utilities
DANSK ENERGI LV	Guide for connection of power-generating plants to the low voltage grid (≤ 1 kV) Type A and B -Denmark Guide for Power generating plants LV
DANSK ENERGI MV and HV	Guide for connection of power-generating plants to the medium and high-voltage grid (> 1 kV) Type B, C and D - Denmark Guide for Power generating plants MV and HV
DIN VDE V 0124-100	Grid integration of generator plants – Low-voltage – Test requirements for generator units to be connected to and operated in parallel with low-voltage distribution networks

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DOC-030221-GAP	Conditions Governing the Connection and Operation of Mini-Generation
DOC-250221-GBT	Conditions Governing the Connection and Operation of Export Limiting Schemes at LV and MV, Up to and including 72 A three-phase (c. 50 kVA, LV) (Ireland)
DTIS-230206-BRL	Conditions Governing the Connection and Operation of Micro-Generation
DTIS-250701-BDW	Conditions Governing Connections to the Distribution System at Medium Voltage (Ireland)
Dubai Electricity & Water Authority (DEWA)	Standards for distributed renewable resources generators connected to the distribution network (DRRG) (Only applicable clauses, D3 & D4)
EHV-NPD-DC-14-108-08022	The Technical Requirements for connecting new generation to the transmission system
EIFS 2018:2	The Energy Market Inspectorate's Regulations on the determination of generally applicable requirements for network connection of generators
EIFS 2019:3	The Energy Market Inspectorate's regulations on establishing requirements for data exchange between electricity network companies and significant network users
EK 18	Grid Interconnection Requirements for Wind and Solar Energy-Based Photovoltaic Power Plants (Türkiye)
EN 50530	Overall efficiency of grid connected photovoltaic inverters
EN 50549-1	Requirements for generating plants to be connected in parallel with distribution networks - Part 1: Connection to a LV distribution network - Generating plants up to and including Type B
EN 50549-10	Requirements for generating plants to be connected in parallel with distribution networks - Part 10: Tests for conformity assessment of generating units
EN 50549-2	Requirements for generating plants to be connected in parallel with distribution networks - Part 2: Connection to a MV distribution network - Generating plants up to and including Type B
EN 62109-1	Safety of power converters for photovoltaic power generation systems – Part 1: General requirements
EN 62109-2	Safety of power converters for use in photovoltaic power systems – Part 2: Particular requirements for inverters

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EN IEC 61000-3-2	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase) (Exclusion clause, Annex B)
EN IEC 61000-3-3	Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection (Exclusion clause 4.2.4 and Annex A, B, and D)
EN IEC 62040-1	Uninterruptible power supply systems (UPS) - Part 1: Safety requirements
EN IEC 62477-1	Safety requirements for power electronic converter systems and equipment – Part 1: General (Exclusion clauses, 4.7.2, 4.7.3, 5.2.7)
ESMcv	Electricity Storage Modules type A, B, C and D according to Netcode elektriciteit (Netherlands)
ETGC	Solar Energy Plants Grid Connection Code - In addition to the Egyptian Transmission Grid Code and The Egyptian Distribution Network Code March 2017
FGW TR3/TG3	Determination of the Electrical Characteristics of Power Generating Units and Systems, Storage Systems as well for their Components in Medium-, High- and Extra-High Voltage Grids (German)
FGW TR4/TG4	Demands on Modelling and Validating Simulation Models of the Electrical Characteristics of Power Generating Units and Systems, Storage Systems as well as their Components (German)
FGW TR8/TG8	Certification of the Electrical Characteristics of Power Generating Units, Systems and Storage Systems as well as their Components on the Grid (German)
G100	Technical Requirements for Customers' Export and Import Limitation Schemes
G98	Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16 A per phase) in parallel with public Low Voltage Distribution Networks
G98/NI	Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16A per phase) in parallel with public Low Voltage Distribution Networks in Northern Ireland – Applicable section, Annex A
G99	Requirements for the connection of generation equipment in parallel with public distribution networks
G99/NI	Requirements for the connection of generation equipment in parallel with public distribution networks in Northern Ireland – Applicable sections, Annex A to D

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IEC 60068-2-1	Environmental testing –Part 2-1: Tests –Test A: Cold
IEC 60068-2-14	Environmental testing –Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-2	Environmental testing –Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-27	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock
IEC 60068-2-30	Environmental testing –Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)
IEC 60068-2-5	Environmental testing - Part 2-5: Tests - Test S: Simulated solar radiation at ground level and guidance for solar radiation testing and weathering
IEC 60068-2-64	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance
IEC 60891	Photovoltaic devices - Procedures for temperature and irradiance corrections to measured I-V characteristics
IEC 60904-1	Photovoltaic devices - Part 1: Measurement of photovoltaic current-voltage characteristics
IEC 60947-3	Low-voltage switchgear and controlgear, Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units (Applicable Annex D, Switches, disconnectors, switch-disconnectors and fuse-combination units for use in photovoltaic (PV) DC applications)
IEC 61683	Photovoltaic systems - Power conditioners Procedure for measuring efficiency
IEC 61727	Photovoltaic (PV) systems - Characteristics of the utility interface
IEC 62040-1	Uninterruptible power supply systems (UPS) - Part 1: Safety requirements
IEC 62093	Balance-of-system components for photovoltaic systems - Design qualification natural environments
IEC 62109-1	Safety of power converters for photovoltaic power generation systems – Part 1: General requirements
IEC 62109-2	Safety of power converters for use in photovoltaic power systems – Part 2: Particular requirements for inverters
IEC 62116	Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters
IEC 62477-1	Safety requirements for power electronic converter systems and equipment – Part 1: General (Exclusion clauses, 4.7.2, 4.7.3, 5.2.7)
IEC 62477-2	Safety requirements for power electronic converter systems and equipment - Part 2: Power electronic converters from 1000 V AC or 1500 V DC up to 36 kV AC or 54 kV DC

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IEC 62788-1-2	Measurement procedures for materials used in photovoltaic modules - Part 1-2: Encapsulants - Measurement of volume resistivity of photovoltaic encapsulants and other polymeric materials
IEC 62788-1-4	Measurement procedures for materials used in photovoltaic modules - Part 1-4: Encapsulants - Measurement of optical transmittance and calculation of the solar-weighted photon transmittance, yellowness index, and UV cut-off wavelength
IEC 62788-1-5	Measurement procedures for materials used in photovoltaic modules - Part 1-5: Encapsulants - Measurement of change in linear dimensions of sheet encapsulation material resulting from applied thermal conditions
IEC 62788-1-6	Measurement procedures for materials used in photovoltaic modules - Part 1-6: Encapsulants - Test methods for determining the degree of cure in Ethylene-Vinyl Acetate
IEC 62788-1-7	Measurement procedures for materials used in photovoltaic modules - Part 1-7: Encapsulants - Test procedure of optical durability
IEC 62788-2-1	Measurement procedures for materials used in photovoltaic modules - Part 2-1: Polymeric materials - Frontsheet and backsheet - Safety requirements
IEC 62788-5-1	Measurement procedures for materials used in photovoltaic modules - Part 5-1: Edge seals - Suggested test methods for use with edge seal materials
IEC 62788-5-2	Measurement procedures for materials used in photovoltaic modules - Part 5-2: Edge seals - Durability evaluation guideline
IEC 62788-6-2	Measurement procedures for materials used in photovoltaic modules - Part 6-2: General tests - Moisture permeation testing of polymeric materials
IEC 62788-7-3	Measurement procedures for materials used in photovoltaic modules - Part 7-3: Accelerated stress tests - Methods of abrasion of PV module external surfaces
IEC 62891	Maximum power point tracking efficiency of grid connected photovoltaic inverters
IEC 62933-1	Electrical energy storage (EES) systems - Part 1: Vocabulary
IEC 62933-2-1	Electrical energy storage (EES) systems - Part 2-1: Unit parameters and testing methods - General specification
IEC 62933-4-1	Electrical energy storage (EES) systems - Part 4-1: Guidance on environmental issues - General specification
IEC 62933-5-2	Electrical energy storage (EES) systems - Part 5-2: Safety requirements for grid-integrated EES systems - Electrochemical-based systems

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IEC 62933-5-3	Electrical energy storage (EES) systems - Part 5-3: Safety requirements for grid-integrated EES systems – Performing unplanned modification of electrochemical based system
IEC 63027	Photovoltaic power systems – DC arc detection and interruption
IEC TS 62788-7-2	Measurement procedures for materials used in photovoltaic modules - Part 7-2: Environmental exposures - Accelerated weathering tests of polymeric materials
IEC TS 62910	Utility-interconnected photovoltaic inverters - Test procedure for under voltage ride-through measurements
IEC TS 62933-2-2	Electrical energy storage (EES) systems - Part 2-2: Unit parameters and testing methods - Application and performance testing
IEC TS 62933-3-1	Electrical energy storage (EES) systems - Part 3-1: Planning and performance assessment of electrical energy storage systems - General specification
IEC TS 62933-3-2	Electrical energy storage (EES) systems - Part 3-2: Planning and performance assessment of electrical energy storage systems - Additional requirements for power intensive and renewable energy sources integration related applications
IEC TS 62933-5-1	Electrical energy storage (EES) systems - Part 5-1: Safety considerations for grid-integrated EES systems - General specification
IEC TS 63209-2	Photovoltaic modules - Extended-stress testing - Part 2: Polymeric component materials
INMETRO ORDINANCE No. 140	Approves the Technical Quality Regulation and the Conformity Assessment Requirements for Electric Energy Generation, Conditioning and Storage Equipment in Photovoltaic Systems – Consolidated
IRR-DCC-MV	Intermittent Renewable Resources (Wind and PV) Distribution Connection Code (DCC) At Medium Voltage (MV)
IRR-TIC	Intermittent Renewable Resources (IRR) Wind & PV Transmission interconnection code (TIC)
ISO 3744	Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane
ISO 4892-2	Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps
JETGR0002-1	General rules for testing methods for low-voltage grid-connected protection devices
JETGR0003-1	Individual test methods for grid-connected protection devices for solar power generation systems

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JETGR0003-4	Individual test method for grid-connected protection devices for multi-unit grid-connected solar power generation systems
JETGR0005-1	Test method for high voltage grid-connected protection devices
Kenya Electricity Grid Code	Kenya Electricity Grid Code – March 2008
KNDGC	THE KENYA ELECTRICITY GRID CODE PART 2: KENYA NATIONAL GRID DISTRIBUTION CODE (KNDGC) May 2022
KNTGC	THE KENYA ELECTRICITY GRID CODE PART 1: KENYA NATIONAL TRANSMISSION GRID CODE (KNTGC) April 2021
MEA	Metropolitan Electricity Authority's Grid-connected Inverter Regulation
NA/EEA-NE7-CH2020	Grid connection for power generation plants at the low-voltage grid Technical requirements for connection and parallel operation in NE7
NN 52/2020	NN 52/2020 (April 29, 2020), Amendments and Supplements to the Distribution System Network Rules
NORMA 14/12/2018	TECHNICAL RULE of December 14, 2018 regarding the technical requirements for connection to public interest electrical networks for generator modules, power plants made up of generator modules and power plants made up of offshore generator modules (located offshore)
NORMA_TECNICA_GENERACION_BT (NTB)	Technical standard for the connection and operation of low voltage generation equipment (Inclusion All Articles) (Chile)
NRS 097-2-1	Grid interconnection of embedded generation Part 2: Small-scale embedded generation Section 1: Utility interface
NTS 631	Technical standard for monitoring compliance of power generation modules in accordance with EU regulation 2016 / 631
Ordinance No. 515	Proposal to amend Inmetro Ordinance No. 140, of March 21, 2022, which approves the Technical Quality Regulation and the Conformity Assessment Requirements for Equipment for Generating, Conditioning, and Storing Electrical Energy in Photovoltaic Systems - Consolidated
OVE E 8001-4-712	Erection of electrical installations with rated voltages up to AC 1000 V and DC 1500 V – Part 4-712: Photovoltaic power-systems – Erection and safety requirements systems
OVE-Richtlinie R 25	Test requirements for generator units to be connected to and operated in parallel with low-voltage distribution networks
P.O.12.2	Generation and demand facilities: Minimum requirements for design, equipment, operation, commissioning and safety (Spanish grid code of the grid operator)

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P.O.12.3	Requirements regarding wind power facility response to grid voltage dips
PEA	Provincial Electricity Authority's Regulation on the Power Network System Interconnection Code (Only applicable clause, Attachment 6)
PGC Resolution No.09	Philippine Grid Code (PGC) - A resolution adopting the rules enabling the net-metering program for renewable energy
PGMcv	Power-Generating Modules type B, C and D according to NC RfG and Netcode elektriciteit (Netherlands)
Philippine Distribution Code	Philippine Grid Code PV Inverter Test Requirements
Philippine Grid Code	Philippines grid code, applicable clauses 3 & 5
Portaria n. ° 73/2020 (Ordinance No. 73/2020)	Non-exhaustive requirements for connecting generator modules to the Public Service Electrical Network (RESP)
PPDS	Rules for the operation of distribution systems - rules for parallel operation of production and storage equipment with the network of the distribution system operator (Czech grid code)
PSE	Wymogi ogólnego stosowania wynikające z Rozporządzenia Komisji (UE) 2016/631 z dnia 14 kwietnia 2016 r. ustanawiającego kodeks sieci dotyczący wymogów w zakresie przyłączenia jednostek wytwórczych do sieci (NC RfG) /Requirements for general application arising from Commission Regulation (EU) 2016/631 of 14 April 2016 establishing the Code network regarding connection requirements generating units to the grid (NC RfG)
PTPIREE	Conditions and procedures for the use of certificates in the process of connecting power generating modules to power grids
PV Large Scale Technical Connection Standards	Requirements for large scale solar PV (Photovoltaic) systems exceeding 2MW which intend to operate in parallel with the Low Voltage & Medium Voltage distribution networks of Saudi Arabia (Saudi Arabia)
RD1699	Regulating the connection to the electrical grid of small-scale power generation facilities
RD244	Regulates the administrative, technical, and economic conditions for self-consumption of electrical energy (Spain) – Applicable clause I.3
RD413	Regulating the connection to the electrical grid of small-scale power generation facilities
RD647	Regulating the connection to the electrical grid of small-scale power generation facilities

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RD661	Regulating the connection to the electrical grid of small-scale power generation facilities
RENBLAD 342	Technical functional requirements for connection and network rental agreement for supply customers in the low voltage network
Resolution No. 338	Resolution No. 338 of the Cabinet of UZBEKISTAN, Regarding the Approval of the Connection Rules for the Utilization of Main Electrical Network(Section III) (Uzbekistan)
NC RfG 2016/631	Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators (Journal of Laws UE L 112/1 of 27.4.2016) (NC RfG)
SAGC	The Saudi Arabian Grid Code July 2022
SAGC-RPPs	Grid Connection Code for Renewable Power Plants (RPPs) connected to the electricity Transmission System (TS) or the Distribution System (DS) in South Africa
ssPV	Technical Requirements for Connecting Small Scale PV (ssPV) Systems to Low Voltage Distribution Networks
TNB	TNB Technical Guidebook on Grid-interconnection of Photovoltaic Power Generation System to LV and MV Networks (Malaysia)
TOR Erzeuger Type A, B, C, D	TOR generators, Connection and parallel operation of Type A, B, C, D power generation systems
TR 3.3.1	Technical regulation for electrical energy storage facilities (Denmark)
Transmission Grid Code	Transmission Grid Code for Ministry of Energy of the Republic of Uzbekistan, regarding the planning, development and operation (including operational and technological control) of the transmission system within the Uzbekistan, as well as access to the transmission system (Uzbekistan)
UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources (Exclusion clause, 46)
UNE 217001 IN	Tests for systems intended to avoid the energy transmission to the distribution network
UNE 217002	Grid connected inverters – Testing of requirements for DC grid injection, overvoltage generation and island operation detection system
UTE C15-712-1	Low-voltage electrical installations -Practical guide- Photovoltaic installations without storage and connected to the public distribution network
UTE C15-712-2	Stand alone photovoltaic installations not connected to the public distribution network with battery storage

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VDE 0126-1-1	Automatic disconnection device between a generator and a public low voltage grid
VDE-AR-E 2510-2	Stationary electrical energy storage systems intended for connection to the low voltage grid
VDE-AR-E 2510-50	Stationary battery energy storage systems with lithium batteries – Safety requirements
VDE-AR-N 4105	Technical minimum requirements for the connection to and parallel operation with low-voltage distribution networks (TCR low voltage)
VDE-AR-N 4110	Technical requirements for the connection and operation of customer installations to the medium voltage network (TCR medium voltage)
VDE-AR-N 4120	Technical requirements for the connection and operation of customer installations to the high voltage network (TCR high voltage)
VDE-AR-N 4130	Technical requirements for the connection and operation of customer installations to the extra high voltage network (TCR extra high voltage)
VJV2018	Grid Code Specifications for Power Generating Facilities
WOS 2025	General Application Requirements resulting from the EU Commission Regulation 2016/631 of April 14, 2016 establishing a network code on the requirements for connecting generating units to the grid (NC RfG) - approved by the Decision of the President of the Energy Regulatory Office WKP.744.18.15.2024.WŻ.MKo4 of 15 May 2025 (Inclusion All Articles) (Poland)
XP C15-712-3	Photovoltaic installations with storage device and connected to a public distribution network
ΑΠΟΦΑΣΗ ΡΑΕ ΥΠ' ΑΡΙΘΜ. 1165/2020	Decision making a). by setting the maximum power thresholds applicable to power plants under Article 5.3 and b). on the general application requirements under Article 7.6 of Commission Regulation (EU) 2016/631 [RfG] establishing a network code on requirements for grid connection of generators
ПРАВИЛА ЗА ПРИКЉУЧЕЊЕ ОБЈЕКАТА НА ПРЕНОСНИ СИСТЕМ 2023.11	Rules for the Connection of Facilities to the Transmission System (Serbia)

ANSI: American National Standards Institute

ANSLG: American National Standard Lighting Group

ASTM: American Society for Testing and Materials

CIE: International Commission on Illumination

EN: European Standards

GSO: GCC Standardization Organization

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IEC: International Electrotechnical Commission

IES: Illuminating Engineering Society

ISO: International Organization for Standardization

SASO: Saudi Arabian Standards Organization

UL: Underwriters Laboratories

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