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CERTIFICATE OF ACCREDITATION

This is to attest that

UL INTERNATIONAL GERMANY GMBH

ADMIRAL ROSENDAHL STRASSE 23
NEU ISENBURG, ST 63263, GERMANY

Testing Laboratory TL-437

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 June 20, 2024



A handwritten signature in black ink, reading "Raj Nathan".

President

Visit www.iasonline.org for current accreditation information.

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

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www.ul.com

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Accredited to ISO/IEC 17025:2017

Effective Date June 20, 2024

Electrical	
ABNT NBR 16149	Photovoltaic (PV) systems - characteristics of the utility interface
ABNT NBR 16150	Photovoltaic (PV) systems - characteristics of the utility interface - conformity test procedure
ANSI/AAMI ES60601-1 IEC/EN 60601-1	Medical electrical equipment - part 1: general requirements for basic safety and essential performance
ANSI/AAMI/IEC 62304	Medical device software — Software life cycle processes
ANSI/AAMI/IEC/EN 60601-2-2	Medical electrical equipment - part 2-2: particular requirements for the basic safety and essential performance of high frequency surgical equipment and high frequency surgical accessories
CAN CEI/IEC 62304	Medical device software — Software life cycle processes
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
E-Control TOR D4	Parallel operation of generating plants with distribution networks
EN 50438	Requirements for the connection of micro-generators in parallel with public low-voltage distribution networks
IEC 60601-2-28 Edition 2.0 2010—03	Medical electrical equipment – Part 2-28: Particular requirements for the basic safety and essential performance of X-ray tube assemblies for medical diagnosis
IEC 60601-2-43 - Ed. 2.0 2010-03	Medical electrical equipment – part 2-43: Particular requirements for the safety and essential performance of X-ray equipment for interventional procedures
IEC 60601-2-43 Edition 2.1 2017-05 CONSOLIDATED VERSION	Medical electrical equipment – part 2-43: Particular requirements for the safety and essential performance of X-ray equipment for interventional procedures
IEC 60601-2-43 Edition 2.2 2019-10	Medical electrical equipment - part 2-43: particular requirements for the safety of X-ray equipment for interventional procedures
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 60904-2	Photovoltaic devices – part 2: requirements for photovoltaic reference devices
IEC 60904-3	Photovoltaic devices - part 3: measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data

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IEC 60904-4	Photovoltaic devices - part 4: reference solar devices - Procedures for establishing calibration traceability
IEC 60904-5	Photovoltaic devices - part 5: determination of the equivalent cell temperature (ECT) of photovoltaic (PV) devices by the open-circuit voltage method
IEC 60904-6	Photovoltaic devices - part 6: requirements for reference solar modules
IEC 60904-7	Photovoltaic devices - part 7: computation of the spectral mismatch correction for measurements of photovoltaic devices
IEC 60904-8	Photovoltaic devices - part 8: measurement of spectral responsivity of a photovoltaic (PV) device
IEC 60904-9	Photovoltaic devices - part 9: solar simulator performance requirements
IEC 60904-10	Photovoltaic devices - part 10: methods of linearity measurement
IEC 61010-1 Edition 3.1 2017-01	Safety requirements for electrical equipment for measurement, control, and laboratory use - part 1: general requirements (except 6.7.1.2, 10.5.3, 12.3, 12.4, 12.5.1, 12.5.2, 12.6, 13.3)
IEC 61194	Characteristic parameters of stand-alone photovoltaic (PV) systems
IEC 61345	UV test for photovoltaic (PV) modules
IEC 61702	Rating of direct coupled photovoltaic (PV) pumping systems
IEC 61829	Photovoltaic (PV) array - on-site measurement of current-voltage characteristics
IEC/EN 60601-1-1	Medical electrical equipment - part 1-1: general requirements for safety - collateral standard: safety requirements for medical electrical systems
IEC/EN 60601-1-3	Medical electrical equipment - part 1-3: general requirements for basic safety and essential performance - collateral standard: radiation protection in diagnostic X-ray equipment
IEC/EN 60601-1-4	Medical electrical equipment - part 1-4: general requirements for safety - collateral standard: programmable electrical medical systems
IEC/EN 60601-1-6	Medical electrical equipment - part 1-6: general requirements for basic safety and essential performance - collateral standard: usability
IEC/EN 60601-1-9	Medical electrical equipment – Part 1-9: General requirements for basic safety and essential performance – Collateral Standard: Requirements for environmentally conscious design
IEC/EN 60601-2-3	Medical electrical equipment - part 2-3: particular requirements for the basic safety and essential performance of short-wave therapy equipment
IEC/EN 60601-2-5	Medical electrical equipment - part 2-5: particular requirements for the basic safety and essential performance of ultrasonic physiotherapy equipment (except 202.6.1.1.2 and 202.6.2.1.10)
IEC/EN 60601-2-7	Particular requirements for the safety of high-voltage generators of diagnostic X-ray generators
IEC/EN 60601-2-10	Medical electrical equipment - part 2-10: particular requirements for the basic safety and essential performance of nerve and muscle stimulators (except 202.6.1.1.2)
IEC/EN 60601-2-18	Medical electrical equipment - part 2-18: particular requirements for the basic safety and essential performance of endoscopic equipment
IEC/EN 60601-2-28	Medical electrical equipment - part 2-28: particular requirements for the

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	basic safety and essential performance of X-ray tube assemblies for medical diagnosis
IEC/EN 60601-2-32	Medical electrical equipment - part 2: particular requirements for the safety of associated equipment of X-ray equipment (except section 6)
IEC/EN 60601-2-40	Medical electrical equipment - part 2-40: particular requirements for the basic safety and essential performance of electromyographs and evoked response equipment (except section 6)
IEC/EN 60601-2-41	Medical electrical equipment - part 2-41: particular requirements for the basic safety and essential performance of surgical luminaires and luminaires for diagnosis
IEC/EN 60601-2-43	Medical electrical equipment - part 2-43: particular requirements for the safety of X-ray equipment for interventional procedures
IEC/EN 60601-2-46	Medical electrical equipment - part 2-46: particular requirements for the basic safety and essential performance of operating tables
IEC/EN 60601-2-52	Medical electrical equipment - part 2-52: particular requirements for the basic safety and essential performance of medical beds
IEC/EN 60601-2-54	Medical electrical equipment - part 2-54: particular requirements for the basic safety and essential performance of X-ray equipment for radiography and radioscopy
IEC/EN 60601-2-63	Medical electrical equipment - part 2-63: particular requirements for the basic safety and essential performance of dental extra-oral X-ray equipment
IEC/EN 60950-1	Information technology equipment – safety – part 1: general requirements ((except, 2.10.8.4 (abrasion resistance), 3.12 (flammable liquids), 4.2.8 (CRT), 4.3.13 (radiation), annex AA (mandrel test), annex A3 (hot flaming oil))
IEC/EN 61010-2-010	Safety requirements for electrical equipment for measurement, control and laboratory use - part 2-010: particular requirements for laboratory equipment for the heating of materials
IEC/EN 61010-2-011	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-011: Particular requirements for refrigerating equipment
IEC/EN 61010-2-012	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 2-012: Particular requirements for climatic and environmental testing and other temperature conditioning equipment
IEC/EN 61010-2-020	Safety requirements for electrical equipment for measurement, control, and laboratory use - part 2-020: particular requirements for laboratory centrifuges (except annex AA)
IEC/EN 61010-2-030	Safety requirements for electrical equipment for measurement, control, and laboratory use - part 2-030: particular requirements for equipment having testing or measuring circuits
IEC/EN 61010-2-032	Safety requirements for electrical equipment for measurement, control and laboratory use - part 2-032: particular requirements for hand-held and hand-manipulated current sensors for electrical test and measurement
IEC/EN 61010-2-033	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-033: Particular requirements for hand-held multimeters and other meters, for domestic and professional use, capable of measuring mains voltage

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IEC/EN 61010-2-034	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-034: Particular requirements for measurement equipment for insulation resistance and test equipment for electric strength
IEC/EN 61010-2-040	Safety requirements for electrical equipment for measurement, control, and laboratory use - part 2-040: particular requirements for sterilizers and washer- disinfectors used to treat medical materials (except 13.1, 13.101)
IEC/EN 61010-2-041	Safety requirements for electrical equipment for measurement, control, and laboratory use - part 2-041: particular requirements for autoclaves using steam for the treatment of medical materials, and for laboratory processes
IEC/EN 61010-2-051	Safety requirements for electrical equipment for measurement, control and laboratory use - part 2-051: particular requirements for laboratory equipment for mixing and stirring
IEC/EN 61010-2-061	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-061: Particular requirements for laboratory atomic spectrometers with thermal atomization and ionization
IEC/EN 61010-2-081	Safety requirements for electrical equipment for measurement, control and laboratory use – part 2-081: particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes
IEC/EN 61010-2-091	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 2-091: Particular requirements for cabinet x-ray systems
IEC/EN 61010-2-101	Safety requirements for electrical equipment for measurement, control and laboratory use – part 2-101: particular requirements for in vitro diagnostic (IVD) medical equipment
IEC/EN 61010-2-201	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-201: Particular requirements for control equipment
IEC/EN 62304	Medical device software — Software life cycle processes
IEC/EN 62368-1	Audio/video, information and communication technology equipment – Part 1: Safety requirements
IEC/EN 80601-2-60	Medical electrical equipment -- part 2-60: particular requirements for basic safety and essential performance of dental equipment (except 201.10.4)
IEC/EN/BS 61215	Crystalline silicon terrestrial photovoltaic (PV) modules - design qualification and type approval
IEC/EN/BS 61646	Thin-film terrestrial photovoltaic (PV) modules - design qualification and type approval
IEC/EN/BS 61730-1	Photovoltaic (PV) module safety qualification - part 1: requirements for construction
IEC/EN/BS 61730-2	Photovoltaic (PV) module safety qualification - part 2: requirements for testing
IEC/EN/BS 62116	Utility-interconnected photovoltaic inverters - test procedure of islanding prevention measures
IEC PVR511	Portable solar photovoltaic (PV) lanterns - blank detail specification – approval under the IEC system for conformity testing and certification of electrical equipment and components (IECEE)
IEC PVR511A	Portable solar photovoltaic (PV) lanterns – design qualification and type approval amendment 1, extension to include lanterns with nickel-metal

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	hydride batteries
IEEE 1547	Standard for interconnecting distributed resources with electric power systems
ISO 9919	Medical electrical equipment - particular requirements for the basic safety and essential performance of pulse oximeter equipment for medical use
ISO 11197	Medical supply units
ISO 14457	Dentistry - handpieces and motors
UL 1703	Standard for flat-plate photovoltaic modules and panels
UL 1741	Standard for inverters, converters, controllers and interconnection system equipment for use with distributed energy resources (to 25kw only)
UL/IEC/EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use - part 1: general requirements (except 6.7.1.2, 10.5.3, 12.3, 12.4, 12.5.1, 12.5.2, 12.6, 13.3)
VDE-AR-N 4100	Technical rules for the connection and operation of customer installations to the low voltage network (TCR low voltage)
VDE-AR-N 4105	Generators connected to the low-voltage distribution network – Technical requirements for the connection to and parallel operation with low-voltage distribution networks
Electronic Energy Star	
Audio/Video	ENERGY STAR program requirements product specification for Audio Video
Computer Servers	ENERGY STAR program requirements product specification for computer servers
Computers	ENERGY STAR program requirements product specification for computers
Displays	ENERGY STAR program requirements product specification for displays
Imaging Equipment	ENERGY STAR program requirements, product specification for imaging equipment
Set-top Boxes & Cable Boxes	ENERGY STAR program requirements for set-top boxes
Telephony	ENERGY STAR program requirements product specification for telephony
Televisions	ENERGY STAR program requirements product specification for computers
Hazardous Location (limited to Non-Explosive Type Testing)	
IEC 60079-0 Ed.6.0	Explosive atmospheres – Part 0: Equipment – General requirements Clause 26.5.1 - Temperature Measurement Clause 26.4.3 - Drop Test for Hand Held Apparatus Clause 26.4.2 - Resistance to Impact Clauses 26.8 and 26.9 - Thermal Endurance to Heat and Cold
IEC 60079-0 Ed.7.0	Explosive atmospheres – Part 0: Equipment – General requirements Clause 26.5.1 - Temperature Measurement Clause 26.5.2 - Thermal Shock test Clauses 26.8 and 26.9 - Thermal Endurance to Heat and Cold

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	Clause 26.4.3 - Drop Test Clause 26.4.2 - Resistance to Impact
IEC 60079-7	Explosive atmospheres - part 7: equipment protection by increased safety "e"
IEC 60079-11 Ed.5	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i" Clause 10.6.2 - Sealing of components before encapsulation
IEC 60079-11 Ed.6	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i" Clause 10.6.2 - Determination of the acceptability of fuses requiring encapsulation
IEC 60079-15 Ed.4	Explosive atmospheres – Part 15: Equipment protection by type of protection "n" Clause 5.1 - Maximum surface temperature Clause 6.5 - Electric Strength Clause 22.5 - Tests for Sealed Devices Clause 22.3.1 - Thermal Endurance test Section 7.3.5 - Connector Secureness Test
IEC 60079-15 Ed.5	Explosive atmospheres – Part 15: Equipment protection by type of protection "n" Clause 5 - Maximum Surface Temperature Measurement Clause 11.2.2 - Voltage Test Clause 11.2 - Tests for Sealed Devices Clause 6.2 - Electric strength insulation from earth or frame
IEC 60079-18	Explosive atmospheres - part 18: equipment protection by encapsulation "m" (clause 8.2.4)
IEC 60079-31	Explosive atmospheres - part 31: equipment dust ignition protection by enclosure "t"
IEC/EN 60529	Degrees of protection provided by enclosures (IP codes: IPX1, IPX2, IPX3, IPX4, IPX5, IPX6, IPX7, IPX8, IP5X and IP6X, IPX9, IPX9K) – for small enclosures
Signaling & Security	
EN 54-2	Fire detection and fire alarm systems – Part 2: Control and indicating equipment (clause 15.8 is not included)
EN 54-4	Fire detection and fire alarm systems Part4: Power supply equipment (clause 9.9 is not included)
EN 54-17	Fire detection and fire alarm systems – Part 17: Short-circuit isolators (clause 5.13 is not included)
EN 54-18	Fire detection and fire alarm systems – Part 18: Input/Output devices (clause 5.12 is not included)
EN 50130-4	Alarm Systems - Part 4: Electromagnetic Compatibility - Product Family Standard: Immunity Requirements for Components of Fire, Intruder, Hold Up, CCTV, Access Control and Social Alarm Systems
EN 50130-5	Alarm Systems - Part 5: Environmental Test Methods
EN 50131-1	Alarm Systems - Intrusion and Hold-Up Systems, Part 1: System Requirements
EN 50131-2-2	Alarm Systems - Intrusion and Hold-Up Systems, Part 2-2: Intrusion Detectors
EN 50131-2-4	Alarm Systems - Intrusion and Hold-Up Systems, Part 2-4: Requirements for

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	Combined Passive Infrared and Microwave Detectors.
EN 50131-2-5	Alarm Systems - Intrusion and Hold-Up Systems, Part 2-5: Requirements for Combined and Passive Infrared and Ultrasonic Detectors.
EN 50131-2-6	Alarm Systems - Intrusion and Hold-Up Systems, Part 2-6: Opening Contacts (EMC is not included)
EN 50131-2-7-1	Alarm Systems - Intrusion and Hold-Up Systems, Part 2-7-1: Intrusion Detectors, Glass Break Detectors (Acoustic)
EN 50131-2-7-3	Alarm Systems - Intrusion and Hold-Up Systems, Part 2-7-3: Intrusion Detectors, Glass Break Detectors (Active)
EN 50131-3	Alarm Systems - Intrusion and Hold-Up Systems, Part 3: Control and Indicating Equipment
EN 50131-4	Alarm Systems - Intrusion and Hold-Up Systems, Part 4: Warning Devices. Except cl. 6.4 Acoustic test
EN 50131-5-3	Alarm Systems - Intrusion Systems, Part 5-3: Requirements for Interconnections Equipment Using Radio Frequency Techniques
EN 50131-6	Alarm systems. Intrusion and hold-up systems. Power supplies
EN 50131-10	Alarm Systems - Intrusion and Hold-Up Systems, Part 10: Application Specific Requirements for Supervised Premises Transceiver (SPT)
EN 50136-1	Alarm Systems - Alarm Transmission Systems and Equipment, Part 1: General Requirements for Alarm Transmission Systems
EN 50136-1-1	Alarm Systems - Alarm Transmission Systems and Equipment, Part 1-1: General Requirements for Alarm Transmission Systems.
EN 50136-1-2	Alarm Systems - Alarm Transmission Systems and Equipment, Part 1-2: Requirements for Systems Using Dedicated Alarm Paths
EN 50136-1-3	Alarm Systems - Alarm Transmission Systems and Equipment, Part 1-3: Requirements for Systems with Digital Communicators Using the Public Switched Telephone Network
EN 50136-1-5	Alarm Systems - Alarm Transmission Systems and Equipment, Part 1-5: Requirements for Packet Switched Network PSN
EN 50136-2	Alarm Systems - Alarm Transmission Systems and Equipment, Part 2: Requirements for Supervised Premises Transceiver (SPT)
EN 50136-2-1	Alarm Systems - Alarm Transmission Systems and Equipment, Part 2-1: General Requirements for Alarm Transmission Equipment
EN 50136-2-2	Alarm Systems - Alarm Transmission Systems and Equipment, Part 2-2: Requirements for Equipment Used in Systems Using Dedicated Alarm Paths
EN 50136-2-3	Alarm Systems - Alarm Transmission Systems and Equipment, Part 2-3: Requirements for Equipment Used in Systems with Digital Communicators Using the Public Switched Telephone Network
EN 50136-2-4	Alarm Systems - Alarm Transmission Systems and Equipment, Part 2-4: Requirements for Equipment Used in Systems with Voice Communicators Using the Public Switched Telephone Network
EN 50291-1	Electrical Apparatus for the Detection of Carbon Monoxide in Domestic Premises, Part 1: Test Methods and Performance Requirements
IEC 62599-1	Alarm Systems, Part 1: Environmental Test Methods
IEC 62599-2	Alarm Systems, Part 2: Electromagnetic Compatibility - Immunity

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	Requirements for Components of Fire and Security Alarm Systems
IEC/EN 60839-11-1	Alarm and Electronic Security Systems, Part 11-1: Electronic Access Control Systems - System and Components Requirements.
UL 294	Access Control System Units
UL 864	Control Units and Accessories for Fire Alarm Systems (Clauses 84, 85 and 86 not included)