ISH®

ENERGY OF ISH AND POWER OF YOURS

ISH SOLAR

PV MODULE
Cleaning Manual

2 GW
Manufacturing Capacity

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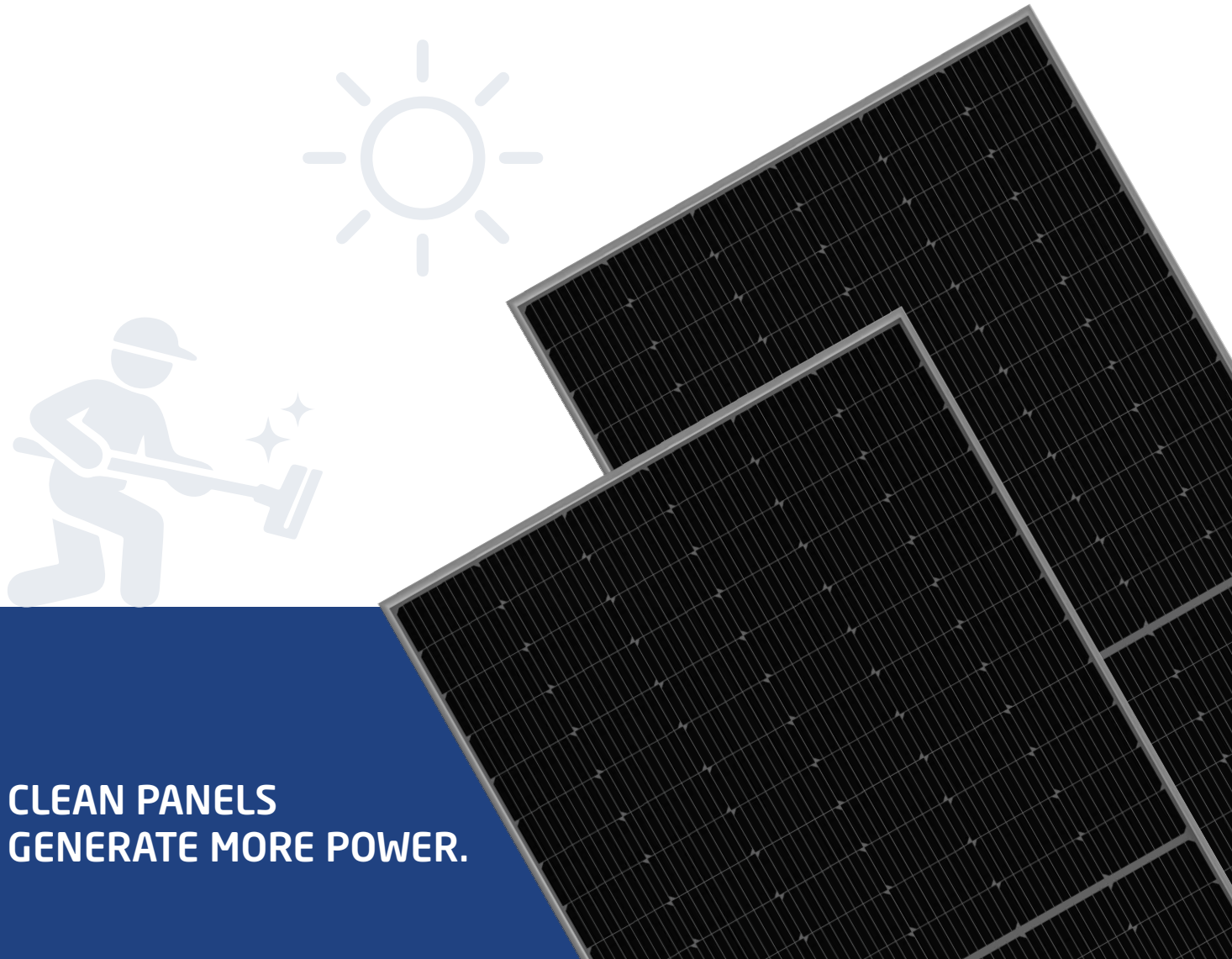

CLEAN PANELS
GENERATE MORE POWER.

GENERAL INFORMATION

Purpose
This manual outlines the cleaning procedures for ISH photovoltaic modules.

Importance
Essential for both system users and professional installers.

Consequences
Non-compliance may result in injury, property damage or voided warranty.

SAFETY INSTRUCTIONS

Risk Awareness
Cleaning can damage modules and increase electrical shock risk.

Inspection
Check for cracks, damage or loose connections before cleaning.

Electrical Shock Risk
High voltage and current during daylight hours can be fatal.

Disconnect Circuit
Ensure the circuit is disconnected from active components to prevent injury.

Protective Gear
Wear insulated gloves and suitable clothing.

Avoid Harmful Materials
Do not use abrasives, harsh cleaners or abrasive materials on glass.

A. CLEANING METHODS

Water Quality and Temperature

- Ensure the water is clean and free from floating oil, debris, immiscible liquids, excessive turbidity and unpleasant odors.
- For optimal results, use reverse osmosis (RO) water. If RO water is unavailable, use tap water with low mineral content (total hardness < 75 mg/L) or deionized water with a calcium concentration not exceeding 75 mg/L.
- If using hard water (75 mg/L < total hardness <180 mg/L), promptly squeegee off the water to prevent scale buildup. Do not use water with a mineral content greater than 180 mg/L.
- The water temperature should match the ambient temperature at the time of cleaning to avoid thermal shock and potential cracking. Clean the modules when they are cool.

Detergent and Cleaning Solution

- Use a mild, non-abrasive, non-caustic detergent mixed with fresh water, ensuring the final solution has a pH between 6.5 and 8.5.
- Avoid using cleaning solutions that contain hydrochloric acid, D-Limonene, ammonia or sodium hydroxide and do not use abrasive cleaners or degreasers.

Cleaning Procedure

- Do not exceed a water pressure of 35 bar at the nozzle.
- Avoid spraying pressurized water directly onto sealed interfaces such as junction boxes, edge seals and connectors.
- Refrain from brushing or cleaning the backside of the module to prevent damage to lead wires or the junction box.

B. EXCLUSIONS AND LIMITATIONS

Brush Material
Provide the details and data sheet of the brush material for review.

Robotic Cleaning Specifications
Submit the detailed specifications of the robotic cleaning system.

Non-Conductive Materials
Use agitating instruments or brushes made of non-conductive materials to minimize the risk of electric shock.

Frequency and Tools for Dry Cleaning
ARC modules can be dry-cleaned with soft cloths or mops up to six times a year. Use of bristle brushes, sponges or squeegees for dry cleaning is prohibited.

C. SNOW CLEARING

Design Tolerance
ISH modules are engineered to withstand high snow pressure. Manage snow conditions using the approved cleaning techniques and specified dry cleaning methods.

Prohibited Tools
Avoid using tools or objects not specified for snow removal, as they may damage the modules.

Alternative Techniques
Other snow removal methods such as blowers may be employed depending on snow conditions with prior approval from ISH.

Snow Removal Priority
Regularly remove snow from the bottom modules of the array first to prevent overload and accumulation.

Alternative Techniques
For stubborn dirt such as bird droppings, dead insector tar, use a soft sponge or microfiber cloth. After cleaning, rinse the module thoroughly with an adequate amount of water

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Contact Us

+91 99 333 92 333

info@ishsolar.com

Manufacturing Unit

Block No. 550/B, OM ISH Park, Olpad-Sayan Rd, Surat, Olpad, Gujarat 394540

www.ishsolar.com