



Cleaning Guidelines: Solar Panels

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Terms and Conditions

Thank you for purchasing a RSPL PV Module (“PV Module(s)”) manufactured by Ritika Systems Private Limited (“RSPL”). This manual applies to PV modules also commonly known as solar panels manufactured by Ritika Systems Private Limited. and is explicitly written for qualified professionals (“Installer” or “Installers”), including without limitation licensed electricians and RSPL Certified PV Installers.

Cleaning PV Module help ensure your solar installation generates optimal electricity. RSPL PV Modules have been designed for easy installation and minimal maintenance, however, dust, pollen, leaves and other contaminants often find their way onto the PV Modules and soil the surface. To overcome this, RSPL PV Modules are manufactured so that normal and regular levels of rainfall will clean them naturally if installed at a sufficient angle. Nonetheless, factors such as the amount of dust and dirt in the air, the amount and regularity of rainfall and the optimum angle of installation are dependent upon the location of each installation and any dirt-resistant properties of a PV Module will not necessarily guarantee a permanently clean and dirt-free PV Module surface. The dirt itself will not harm the PV Modules but allowing it to build up over time can affect system performance. Therefore, to optimize the electrical output, it is recommended to clean the PV Modules when dirt can be seen on the glass surface.

1. Introduction

Thank you for choosing RSPL as your PV module provider. We appreciate your business with us. This manual contains important information pertaining to the electrical and mechanical installation and maintenance of PV modules, and contains safety information that you must read carefully and be familiar with before handling, installing, and/or maintaining RSPL PV modules. RSPL does not assume responsibility and expressly disclaims liability for losses, damages, or expenses arising out of, or in any way connected with this Installation and User Manual. RSPL assumes no responsibility for any infringement of patents or other rights of third parties, which may result from using RSPL PV modules. No license is granted expressly or by implication or under any patent or patent rights. The information in this manual is believed to be reliable but does not constitute an expressed or implied warranty. RSPL reserves the right to make changes to its PV modules and other products, their specifications, or this manual without prior notice. RSPL and its subsidiaries are not liable for any damages caused by inappropriate installation, use, or maintenance of RSPL PV modules, including without limitation damages, losses, and expenses caused by non-observance of the instructions of this manual or caused by or in connection with products of other manufacturers. RSPL PV modules are designed to meet the requirements for the standards IEC 61215 and IEC 61730, application class A. Modules rated for use in this application class may be used in systems operating at greater than 50 V DC or 240 W, where general contact access is anticipated. Modules qualified for safety through IEC 61730-1 and IEC 61730-2 and within this application class are considered to meet the requirements for

safety class II. In the course of the PV module certification process, the compliance of this manual with the certification requirements has been verified by an independent certification laboratory. This Cleaning Guideline is available in different languages. In cases of discrepancy between versions, the English language version shall control. Failure to comply with the requirements listed in this manual will invalidate the Limited Warranty for PV Modules as provided by RSPL at the time of sale to the direct customer. Additional recommendations are provided to enhance safety practices and performance results. Please provide a copy of this manual to the PV system owner for their reference, and inform them of all relevant aspects of safety, operation, and maintenance.

2. Safety Warning

- Cleaning activities create risk of damaging the modules and array components, as well as increasing the potential electric shock hazard.
- Cracked or broken modules represent an electric shock hazard due to leakage currents, and the risk of shock is increased when modules are wet. Before cleaning, thoroughly inspect modules for cracks, damage, and loose connections.
- The voltage and current present in an array during daylight hours are sufficient to cause a lethal electrical shock.
- Ensure that the circuit is disconnected before starting the cleaning procedure as contact with leakage of electrically active parts can result in injury.
- Ensure that the array has been disconnected to other active components (such as inverter or combiner boxes) before starting with the cleaning.
- Wear suitable protection (Clothes, insulated gloves, etc.).
- Do not immerse the module, partially or totally, in water or any other cleaning solution.
- Never at any point stand on, walk on, lean on or apply pressure to the panels as this can cause both visible and non-visible damage to the panel.

3. Handling Warning

- Use a proper cleaning solution and suitable cleaning equipment.
- Do not use abrasive or electric cleaners on the module.
- Particular attention should be taken to avoid the module back sheet or frame to come in contact with sharp objects, as scratches may directly affect product safety.
- Do not use de-greasers on the module.

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- Do not use cleaning corrosive solutions containing acid, alkali, acetone, or industrial alcohol.

4. Operation Preparation

- Noticeable dirt must be rubbed away by gentle cleaning implement (soft cloth, sponge or brush with soft bristles).
- Ensure brushes or agitating tools are not abrasive to glass, EPDM, silicone, aluminum, or steel.
- Conduct the cleaning activities avoiding the hottest hours of the day, in order to avoid thermal stress on the module Recommended Water To Be Used:
 - Water with low mineral content
 - Near neutral PH water
 - The maximum water pressure recommended is 4MPa (40 bar). The water to be used should be free from grit and physical contaminants that could damage the panel surface.

5. Cleaning Method

- a. Wet Cleaning: When cleaning the module use a soft cloth together with a mild detergent and clean water. Take care to avoid severe thermal shocks which might damage the module by cleaning modules with water which has a similar temperature to the modules being cleaned
- b. Compressed Air: RSPL recommends cleaning the soft dirt (like dust) on modules just with air pressure. This technique can be applied as long as the method is efficient enough considering the existing conditions.
- c. Dry or Brush Cleaning: If excessive soiling is present on module surface, a nonconductive brush, sponge, or other mild agitating method may be used with caution. An agitating method maybe used with caution. Please note that any damage caused to the Anti-reflective coating of the glass due to this method voids the performance warranty clause.
 - i. If grease is present, an environmental friendly cleaning agent may be used with caution.
 - ii. Ensure that any brushes or agitating tools are constructed with non-conductive materials to minimize risk of electric shock and that they are not abrasive to the glass or the aluminum frame.

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- iii. Dirt must never be scraped or rubbed away when dry, as this will cause micro-scratches on the glass surface.
- d. Rotating Brush: RSPL recommends to avoid this kind of cleaning methods, as it could create micro-cracks in PV modules as well as damage the Anti-reflective coating.

6. Additional Points to be Noted:

- a. The back surface of the module normally does not need to be cleaned but, in the event this is deemed necessary, avoid the use of any sharp projects that might damage the substrate material.
- b. The benefit of cleaning dirt and debris from the array is a trade-off between the cost of the cleaning, increased energy production as a result of this cleaning, and the inevitable resoiling of the laminates over time once they have been cleaned.
- c. When cleaning the back surface of the module, take care to avoid penetrating the substrate material. Modules that are mounted flat (0° tilt angle) should be cleaned more often, as they will not "self-clean" as effectively as modules mounted at a 15° tilt or greater.
- d. If you are unsure whether the array or section thereof needs to be cleaned, then first select an array string that is particularly soiled then
 - i. Measure & record the inverter feed in current from that string
 - ii. Clean all modules in the string
 - iii. Measure the inverter feed in current again and calculate the % improvement from cleaning
 - iv. If the improvement is less than 5% then it is normally not worth spending the expense on cleaning the above verification should only be carried out when the insolation is effectively constant (clear sky, strong sunshine, no clouds)

7. Note:

These Guidelines to Best Practice are intended to help ensure a safe connection between PV Modules and between other balance of system components. RSPL accepts no responsibility for

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any damage caused by improper or incorrect use of connectors. The Warranty on the product is only valid if the instructions in the RSPL Installation Manual are observed at all times.

For additional questions regarding cleaning methods or approvals of mechanical cleaning methods, please contact us at info@ritikasytems.in.

Contact Information:

Contact Your Authorized RSPL Distributor

Or

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