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## Documents:

## Horay solar Co., Ltd.

### Limited warranty of Horay solar PV Modules

#### **1. Limited material warranty - Twelve years for Monofacial and Fifteen years for Bifacial, including replacement or repair**

Horay solar warrants its PV modules to be free from defects in materials and workmanship under normal application, installation, use and service conditions. If bifacial modules fail to conform to this warranty, then for a period ending 180 months (for monocrystalline models, this period is 144 months) from the date of sales to the original terminal customer (hereinafter referred to as "customer"), Horay solar will repair or replace the modules for the customers. The repair or the replacement shall be the sole and exclusive remedy provided under the "Limited product warranty" and shall not extend beyond the 180 months period set forth herein (for monocrystalline models, this period is 144 months). The "Limited product warranty" does not warrant a specific power output, which shall be exclusively covered under clause 2 hereinafter ("Limited peak power warranty").

#### **2. Limited Peak Power Warranty**

1) Power test conditions : The test of the peak power of the delivered modules should be made under standard test conditions - an irradiation of  $1000\text{W}/\text{m}^2$ , temperature  $25^{\circ}\text{C}$ , AM1.5.  $1000\text{W}/\text{m}^2$  is the standard light intensity when we test the solar cells. AM1.5 refers to the actual distance of light pass through the atmosphere is 1.5 times of the vertical thickness of the atmosphere.  $25^{\circ}\text{C}$  means the modules should work in the temperature of  $25^{\circ}\text{C}$ .

2) Warranty conditions : The customer must handle the product properly. The design, installation, operation environment and maintenance of the solar system should follow the installation guide and relevant regulations.

#### **3) Power Attenuation**

##### **3.1) PERC solar module**

##### **A. Monofacial**

The Warranty Start Date is the date of installation of the Product(s) or three months after delivery (Incoterms 2020) of the Products(s) to the Buyer, whichever date is earlier. In addition, Horay solar warrants that for a period of twenty-five years commencing on the Warranty Start Date, the loss of power output relating to the initial guaranteed power which is defined as Peak Power Watts  $P_{\text{max}}$  (Wp) plus Peak Power Watts  $P_{\text{max}}$  (Wp) multiplied by the lower limit of the Power Output Tolerance  $P_{\text{max}}(\%)$  – as specified in the relevant Product Data Sheet and measured at Standard Test Conditions (STC) for the Product(s) shall not exceed

- For monocrystalline products (according to the model in the IEC certificate) : 2% in the first year, 0.55% per year thereafter, at the end of the 25-year warranty not less than 84.8 % of the maximum output power.

- Actual output power must be verified under STC conditions and measured by Horay solar Energy or a third party testing facility approved by Horay solar Energy. (Note: According to the STC, the uncertainty of the measurement system will apply to all actual power output measurements.)
- The definition of high temperature and high humidity environment: temperature condition is annual average temperature  $> 23^{\circ}\text{C}$ , minimum monthly average temperature  $> 18^{\circ}\text{C}$ , humidity condition is annual average RH  $> 70\%$ , minimum monthly average RH  $> 60\%$

## **B. Bifacial With Transparent Backsheet**

The Warranty Start Date is the date of installation of the Product(s) or three months after delivery (Incoterms 2020) of the Products(s) to the Buyer, whichever date is earlier. In addition, Horay solar Energy warrants that for a period of thirty years commencing on the Warranty Start Date, the loss of power output relating to the initial guaranteed power which is defined as Peak Power Watts  $P_{\text{max}}$  (Wp) plus Peak Power Watts  $P_{\text{max}}$ (Wp) multiplied by the lower limit of the Power Output Tolerance  $P_{\text{max}}(\%)$  – as specified in the relevant Product Data Sheet and measured at Standard Test Conditions (STC) for the Product(s) shall not exceed

- For monocrystalline products (according to the model in the IEC certificate) : 2 % in the first year, 0.55% per year thereafter, at the end of the 30-year warranty not less than 82.05% of the maximum output power.
- Actual output power must be verified under STC conditions and measured by Horay solar Energy or a third party testing facility approved by Horay solar Energy. (Note: According to the STC, the uncertainty of the measurement system will apply to all actual power output measurements.)
- The definition of high temperature and high humidity environment: temperature condition is annual average temperature  $> 23^{\circ}\text{C}$ , minimum monthly average temperature  $> 18^{\circ}\text{C}$ , humidity condition is annual average RH  $> 70\%$ , minimum monthly average RH  $> 60\%$ .

## **C. Bifacial With Dual Glass**

The Warranty Start Date is the date of installation of the Product(s) or three months after delivery (Incoterms 2020) of the Products(s) to the Buyer, whichever date is earlier. In addition, Horay solar Energy warrants that for a period of thirty years commencing on the Warranty Start Date, the loss of power output relating to the initial guaranteed power which is defined as Peak Power Watts  $P_{\text{max}}$  (Wp) plus Peak Power Watts  $P_{\text{max}}$ (Wp) multiplied by the lower limit of the Power Output Tolerance  $P_{\text{max}}(\%)$  – as specified in the relevant Product Data Sheet and measured at Standard Test Conditions (STC) for the Product(s) shall not exceed.

- For mono crystalline products (according to the model in the IEC certificate) : 2% in the first year, 0.45% per year thereafter, at the end of the 30-year warranty not less than 84.95% of the maximum output power.

## **HORAY SOLAR CO., LTD.**

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- Actual output power must be verified under STC conditions and measured by Horay solar Energy or a third party testing facility approved by Horay solar Energy. (Note: According to the STC, the uncertainty of the measurement system will apply to all actual power output measurements.)

## 3.2) N-TYPE solar module

### A. Monofacial

The Warranty Start Date is the date of installation of the Product(s) or three months after delivery (Incoterms 2020) of the Products(s) to the Buyer, whichever date is earlier. In addition, Horay solar Energy warrants that for a period of thirty years commencing on the Warranty Start Date, the loss of power output relating to the initial guaranteed power which is defined as Peak Power Watts  $P_{max}$  (Wp) plus Peak Power Watts  $P_{max}$ (Wp) multiplied by the lower limit of the Power Output Tolerance  $P_{max}(\%)$  – as specified in the relevant Product Data Sheet and measured at Standard Test Conditions (STC) for the Product(s) shall not exceed.

- For mono crystalline products (according to the model in the IEC certificate) : 1% in the first year, 0.4% per year thereafter, at the end of the 30-year warranty not less than 87.4% of the maximum output power.
- Actual output power must be verified under STC conditions and measured by Horay solar Energy or a third party testing facility approved by Horay solar Energy. (Note: According to the STC, the uncertainty of the measurement system will apply to all actual power output measurements.)
- The definition of high temperature and high humidity environment: temperature condition is annual average temperature  $> 23^{\circ}\text{C}$ , minimum monthly average temperature  $> 18^{\circ}\text{C}$ , humidity condition is annual average RH  $> 70\%$ , minimum monthly average RH  $> 60\%$

### B. Bifacial With Transparent Backsheet

The Warranty Start Date is the date of installation of the Product(s) or three months after delivery (Incoterms 2020) of the Products(s) to the Buyer, whichever date is earlier. In addition, Horay solar Energy warrants that for a period of thirty years commencing on the Warranty Start Date, the loss of power output relating to the initial guaranteed power which is defined as Peak Power Watts  $P_{max}$  (Wp) plus Peak Power Watts  $P_{max}$ (Wp) multiplied by the lower limit of the Power Output Tolerance  $P_{max}(\%)$  – as specified in the relevant Product Data Sheet and measured at Standard Test Conditions (STC) for the Product(s) shall not exceed

- For monocrystalline products (according to the model in the IEC certificate) : 1 % in the first year, 0.4% per year thereafter, at the end of the 30-year warranty not less than 87.4% of the maximum output power.
- Actual output power must be verified under STC conditions and measured by Horay solar Energy or a third party testing facility approved by Horay solar Energy. (Note: According to the STC, the uncertainty of the measurement system will apply to all actual power output measurements.)

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- The definition of high temperature and high humidity environment: temperature condition is annual average temperature  $> 23^{\circ}\text{C}$ , minimum monthly average temperature  $> 18^{\circ}\text{C}$ , humidity condition is annual average RH  $> 70\%$ , minimum monthly average RH  $> 60\%$

### C.Bifacial With Dual Glass

The Warranty Start Date is the date of installation of the Product(s) or three months after delivery (Incoterms 2020) of the Products(s) to the Buyer, whichever date is earlier. In addition, Horay solar Energy warrants that for a period of thirty years commencing on the Warranty Start Date, the loss of power output relating to the initial guaranteed power which is defined as Peak Power Watts Pmax (Wp) plus Peak Power Watts Pmax(Wp) multiplied by the lower limit of the Power Output Tolerance Pmax(%) – as specified in the relevant Product Data Sheet and measured at Standard Test Conditions (STC) for the Product(s) shall not exceed

- For monocrystalline products (according to the model in the IEC certificate) : 1% in the first year, 0.4% per year thereafter, at the end of the 30-year warranty not less than 87.4% of the maximum output power.
- Actual output power must be verified under STC conditions and measured by Horay solar Energy or a third party testing facility approved by Horay solar Energy. (Note: According to the STC, the uncertainty of the measurement system will apply to all actual power output measurements.)

4) Within the limitation of the corresponding quality assurance if the product is doubt, can be sent to pointed by Horay solar Solar or admitted by the Horay solar Solar for testing, Horay solar authorized letter must be confirmed before send samples for testing, product must good appearance. During the testing, such as a power output is lower than the standards listed in the above form, and proved that the loss of power is Horay solar Solar reasons, after the customer provide the relevant documentary evidence, Horay solar Solar will providing additional product to compensate for the power loss portion;

The remedy provided in this article is the only and exclusive remedy under the "limited Peak power guarantee".

Defects caused by material and process problems should be given after-sales plan in accordance with the terms of "Limited Product Warranty", "Limited Peak Power Guarantee" No compensation will be given to the power loss caused by the above-mentioned defects.

### 3.Exclusions and Limitations

A . In any event, all warranty claims must be received within the applicable warranty period for this warranty to be effective.

B . The “Limited Product Warranty” and the “Limited Peak Power Warranty” do not apply to any MODULES which have been subjected to:

- Misuse, abuse, vandalism, neglect or accident;
- Alteration, improper installation or application;

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- Non-observance of Horay solar Energy's installation manual or maintenance instructions;
- Repair or modifications by someone other than an approved service technician of Horay solar Energy;
- Power failure surges, lightning, flood, fire, accidental breakage, improper connections resulting in hazardous reverse current or other events outside Horay solar Energy's control.

C . Both "Limited Product Warranty" and "Limited Peak Power Warranty" do not cover any costs associated with transportation, installation, removal or re-installation for return of the modules.

D . Warranty claims will not be honored if the type or serial number of the MODULES have been altered, removed or made illegible.

## **4.Limitation of Warranty Scope**

This "limited warranty for pv modules" as set forth herein is expressly in lieu of and excludes all other express or implied warranties, including but not limited to warranties of merchantability and of fitness for particular purpose, use, or application, and all other obligations or liabilities on the part of Horay solar Energy, unless such other obligations or liabilities are expressly agreed to in writing signed and approved by Horay solar Energy. Horay solar Energy shall have no responsibility or liability whatsoever for damage or injury to persons or property, or for other loss or injury resulting from any cause whatsoever arising out of or related to the modules, including, without limitation, any defects in the modules, or from use or installation. Under no circumstances shall Horay solar Energy be liable for incidental, consequential or special damages, howsoever caused. Loss of use, loss of profits, loss of production, and loss of revenues are specifically and without limitation excluded. Horay solar Energy's aggregate liability, if any, in damages or otherwise, shall not exceed the invoice value as paid by the customer, for the single unit of module.

## **5.Obtaining Warranty Performance**

If the customer has a justified claim covered by this "Limited Warranty of PV Modules", an immediate notification shall be filed in writing to (a) the vendor or (b) Horay solar Energy's authorized distribution partner, who supplied affected modules, or (c) Horay solar Energy office. Together with the notification, the customer should enclose the evidence of the date on which the modules have been purchased. If applicable, the vendor or distributor will give advice on the processing of the claim. If more assistance is required, the customer may request guidance from Horay solar Energy in writing. The return of any modules will not be accepted unless prior written authorization has been given by Horay solar Energy.

Obtain Horay solar service:

E-mail: [info@horaysolar.com](mailto:info@horaysolar.com)

NO.30-5, East Yanxin Road, Huishan District, Wuxi 214177 Jiangsu P.R China

## **6. Disputes**

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In any form, in the event of a dispute that has occurred for more than one year, the customer shall not make any dispute regarding this limited warranty.

## 7. Various

The repair or replacement of the modules or the supply of additional modules, does not cause the beginning of new warranty terms, nor shall the original terms of this “Limited Warranty of PV Modules” be extended. Any replaced modules shall become the property of Horay solar Energy for their disposal. Horay solar Energy has the right to deliver another type (different in size, color, shape and/or power) in case Horay solar Energy has discontinued producing the replaced modules at the time of the claim.

If the customer purchased module is not listed in “Limited Warranty of PV Modules”, customer may contact Horay solar Energy for more information on the applicable warranty.

## 8. Force Majeure

Horay solar Energy shall not be responsible or liable in any way to the customer or any third-party arising from any non-performance or delay in performance of any terms and conditions of sale, including but not limited to any technical and substantive events or environmental conditions that can not be reasonably foreseen and understood in the event of the sale of PV modules or claims, due to natural disasters, war, riots, strikes, etc. can not get appropriate and adequate labor, materials, mold, production capacity, technology; or any other similar cause or circumstance beyond the reasonable control of Horay solar Energy. In such cases, performance by Horay solar Energy of this Limited Warranty shall be suspended without liability for the period of delay reasonably attributable to such causes.

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Nominal Power Output in product datasheet is the power in Watt peak that a Photovoltaic Solar Modules generates in its Maximum Power Point under Standard Testing Conditions (STC). STC are as follows:

- (1) light spectrum of AM 1.5,
- (2) an irradiation of 1000 W per m<sup>2</sup>
- (3) a cell temperature of 25 degrees centigrade at right angle irradiation.

The measurements are carried out in accordance with IEC 61215 as tested at the connectors or junction box terminals – as applicable – per calibration and testing standards of Horay solar Energy valid at the date of manufacture of the PV-modules.