

# PRODUCT WARRANTY

PHOTOVOLTAIC MODULE



## LIMITED WARRANTY STATEMENT PHOTOVOLTAIC MODULE PRODUCTS

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Instal l ing (for its own use) (the “Buyer” ) its “Econess Energy” brand crystal line solar PV modules, wi ll provide the limited warranty as below ( “L imited Warranty” ) :

### A. Single Glass Module

EN158P-144-XXX (XXX=300-355)  
 EN158P-120-XXX (XXX=250-295)  
 EN156P-144-XXX (XXX=300-355)  
 EN156P-72-XXX (XXX=300-350)  
 EN156P-120-XXX (XXX=250-295)  
 EN156P-60-XXX (XXX=250-290)  
 EN156P-54-XXX (XXX=225-260)  
 EN156P-48-XXX (XXX=200-230)  
 EN156P-36-XXX (XXX=150-175)  
 EN210M-132-XXX (XXX=645-670)  
 EN210M-120-XXX (XXX=585-610)  
 EN210M-110-XXX (XXX=540-555)  
 EN182M-156-XXX (XXX=570-605)  
 EN182M-144-XXX (XXX=520-555)  
 EN182M-120-XXX (XXX=435-460)  
 EN182M-108-XXX (XXX=390-415)  
 EN166M-144-XXX (XXX=405-460)  
 EN166M-120-XXX (XXX=335-380)  
 EN158M-144-XXX (XXX=370-415)  
 EN158M-120-XXX (XXX=310-345)  
 EN156M-144-XXX (XXX=345-395)  
 EN156M-72-XXX (XXX=330-370)  
 EN156M-120-XXX (XXX=290-330)  
 EN156M-60-XXX (XXX=275-305)  
 EN156M-54-XXX (XXX=245-275)  
 EN156M-48-XXX (XXX=220-245)  
 EN156M-36-XXX (XXX=165-185)  
 EN182N-156-XXX (XXX=600-640)  
 EN182N-144-XXX (XXX=555-585)  
 EN182N-120-XXX (XXX=460-485)  
 EN182N-108-XXX (XXX=415-440)

### B. Bifacial Dual Glass Moud le

EN210M-132D-XXX (XXX=635-670)  
 EN210M-120D-XXX (XXX=580-610)  
 EN210M-110D-XXX (XXX=530-555)  
 EN182M-156D-XXX (XXX=570-610)  
 EN182M-144D-XXX (XXX=525-555)  
 EN182M-120D-XXX (XXX=440-460)  
 EN182M-108D-XXX (XXX=395-415)  
 EN166M-144D-XXX (XXX=405-460)  
 EN166M-120D-XXX (XXX=335-380)  
 EN158M-144D-XXX (XXX=370-415)  
 EN158M-120D-XXX (XXX=310-345)  
 EN182N-156D-XXX (XXX=600-645)  
 EN182N-144D-XXX (XXX=555-595)  
 EN182N-120D-XXX (XXX=460-495)  
 EN182N-108D-XXX (XXX=415-445)

EN210N-132D-XXX (XXX=675-710)  
EN182/105RN-132D-XXX (XXX=600-630)  
EN182/96RN-144D-XXX (XXX=590-630)  
EN182/99.5RN-144D-XXX (XXX=610-635)  
EN182/99.5RN-132D-XXX (XXX=565-590)  
EN182/94RN-144D-XXX (XXX=575-600)  
EN182/94RN-108D-XXX (XXX=430-455)

**Note:**

M-Mono Module; P-Poly Module; M-n type Module

The product model includes but is not limited to the above model and shall be subject to the specific model purchased by the customer.

Econess Energy warrants its module types listed in the modules type table, will perform fully compliant to the materials and technical specifications under normal application, installation, utilization and service conditions. Econess Energy will promise, in the following the prescribed period of time, repair products or components that in line with the appearance of serious appearance defects and power definition abnormal defect of IEC61215, IEC61730, UL1703 standard, or replace or power compensation with new or remanufactured equivalent products or components, or Econess Energy will provide economic compensation according to the current price of the relevant components, Econess Energy to decide. but the attenuated power during the period used will be deducted, the labor and material costs generated in the process does not need to assume, specific details are as follows:

This warranty does not apply to the damage caused by non Econess Energy fault damage, including but not limited to appearance of damaged or defiled, caused due to the use of any abuse or unreasonable or non-standard maintenance structure caused by unauthorized design. In order to enforce the rights under this limited warranty, the Buyer should follow the steps set forth below and provide proof of purchase to Econess Energy

The limited warranty described herein is in addition to whatever implied warranties may be granted to the Buyer by law. All implied warranties including the warranties of merchantability and fitness for use are limited to the period(s) from the Warranty Effective Date set forth below. Neither the sales personnel of Econess Energy nor any other person is authorized to make any warranties other than those described herein, or to extend the duration of any warranties beyond the time period described below on behalf of Econess Energy.

The warranties described herein shall be sole and exclusive warranties granted by Econess Energy and shall be the sole and exclusive remedy available to the purchaser. Correction of defects, in the manner and for the period of time described herein, shall constitute complete fulfillment of all liabilities and responsibilities of Econess Energy to the Buyer with respect to the Products and shall constitute full satisfaction of all claims, whether based on contract, negligence, and strict liability otherwise. In no event shall Econess Energy be liable, or in any way responsible, for any damages or defects in the Products which were caused by repairs or attempted repairs performed by anyone other than Econess Energy or authorized service providers. Nor shall Econess Energy be liable or in any way responsible for any incidental or consequential economic or property damage. Econess Energy's aggregate liability, if any, in damages or otherwise, shall not exceed the invoice value as paid by the Buyer, for the Product(s) with problem.

## A. Limited warranty for single glass products

### 12 YEAR LIMITED PRODUCT WARRANTY

Except for the following topics included, Econess Energy to initial buyers ensure its production of photovoltaic modules, in normal use, installation and maintenance of the case, not as a result of materials and production processes do not meet the serious appearance defined IEC61215 and IEC61730, UL1703 standard defect and abnormal appearance or caused by power generation Defect.

Econess Energy guarantees that the Product(s) will maintain the mechanical integrity and stability in accordance with approved operation methods described in its installation instructions; the glass of a module will maintain its integrity provided there are no indications of localized impacts or external forces; and that the cable and connector plug of a module will remain safe and operational provided modules are professionally installed. Any damages caused by abrasion, improper installation or animals are exempt from this warranty.

Claims under the warranty can only be accepted if the Buyer can provide proof that the malfunctioning or non-conformity of the Product(s) results exclusively from defects in materials and/or workmanship

under normal application, installation, use and service conditions specified in Econess Energy's standard product specification. Any color change on module or any other changes on module appearance do not represent defects, insofar as the change in appearance does not stem from defects in material and/or workmanship, and does not cause degradation of functionality of the module.

If the module occurs during the warranty period of the material or production process in accordance with the appearance of serious appearance defects and power definition of abnormal IEC61215, IEC61730, UL1703 standard or defects caused by power effect, Econess Energy will repair, replace, compensation power or refund the customer in accordance with the current price of the relevant components, the specific way is decided by Econess Energy. but the attenuated power during the period used will be deducted.

## **25 YEAR LIMITED PERFORMANCE WARRANTY**

Econess Energy for modules 25 years power output limited warranty as follows:

### **Monocrystal line Solar Cell Modules:**

- a) From the first year of sale, the actual output power of the module is not less than 98% of the product of the maximum output power of the module and the minimum value of the module tolerance.
- b) From year 2 to year 24, the nominal power decline will be no more than 0.55% in each year; by the end of year 25, the actual output power of the module is not less than 85% of the maximum output power of the module's maximum peak output and the minimum of the module tolerance.

### **Polycrystal line Solar Cell Modules:**

- a) From the first year of sale, the actual output power of the module is not less than 97.5% of the product of the maximum output power of the module and the minimum value of the module tolerance.
- b) From year 2 to year 24, the nominal power decline will be no more than 0.6% in each year; by the end of year 25, the actual output power of the module is not less than 83.1% of the maximum output power of the module's maximum peak output and the minimum of the module tolerance.

### **N-type Solar Cell Modules:**

- a) From the first year of sale, the actual output power of the module is not less than 99% of the product of the maximum output power of the module and the minimum value of the module tolerance.
- b) From year 2 to year 24, the nominal power decline will be no more than 0.4% in each year; by the end of year 25, the actual output power of the module is not less than 89.4% of the maximum output power of the module's maximum peak output and the minimum of the module tolerance.

## **B. Limited warranty for bifacial double glass products**

### **12 YEAR LIMITED PRODUCT WARRANTY**

Except for the following topics included, Econess Energy to initial buyers ensure its production of photovoltaic modules, in normal use, installation and maintenance of the case, not as a result of materials and production processes do not meet the serious appearance defined IEC61215 and IEC61730, UL1703 standard defect and abnormal appearance or caused by power generation Defect.

Econess Energy guarantees that the Product(s) will maintain the mechanical integrity and stability in accordance with approved operation methods described in its installation instructions; the glass of a

module will maintain its integrity provided there are no indications of localized impacts or external forces; and that the cable and connector plug of a module will remain safe and operational provided modules are professionally installed. Any damages caused by abrasion, improper installation or animals are exempt from this warranty.

Claims under the warranty can only be accepted if the Buyer can provide proof that the malfunctioning or non-conformity of the Product(s) results exclusively from defects in materials and/or workmanship under normal application, installation, use and service conditions specified in Econess Energy's standard product specification. Any color change on module or any other changes on module appearance

do not represent defects, insofar as the change in appearance does not stem from defects in material and/or workmanship, and does not cause degradation of functionality of the module.

If the module occurs during the warranty period of the material or production process in accordance with the appearance of serious appearance defects and power definition of abnormal IEC61215, IEC61730, UL1703 standard or defects caused by power effect, Econess Energy will repair, replace, compensation power or refund the customer in accordance with the current price of the relevant components, the specific way is decided by Econess Energy. but the attenuated power during the period used will be deducted.

### **30 YEAR LIMITED PERFORMANCE WARRANTY**

Econess Energy for modules 30 years power output limited warranty as follows :

#### **Monocrystal Line Solar Cell Modules:**

- a) From the first year of sale, the actual output power of the module is not less than 98% of the product of the maximum output power of the module and the minimum value of the module tolerance.
- b) From year 2 to year 29, the nominal power decline will be no more than 0.45% in each year; by the end of year 30, the actual output power of the module is not less than 84.95% of the maximum output power of the module's maximum peak output and the minimum of the module tolerance.

#### **Polycrystal Line Solar Cell Modules:**

- a) From the first year of sale, the actual output power of the module is not less than 97.5% of the product of the maximum output power of the module and the minimum value of the module tolerance.
- b) From year 2 to year 29, the nominal power decline will be no more than 0.5% in each year; by the end of year 30, the actual output power of the module is not less than 83% of the maximum output power of the module's maximum peak output and the minimum of the module tolerance.

#### **N-type Solar Cell Modules:**

- a) From the first year of sale, the actual output power of the module is not less than 99% of the product of the maximum output power of the module and the minimum value of the module tolerance.
- b) From year 2 to year 29, the nominal power decline will be no more than 0.4% in each year; by the end of year 30, the actual output power of the module is not less than 87.4% of the maximum output power of the module's maximum peak output and the minimum of the module tolerance.

Description : the output power is the power of the PV module under standard test conditions (STC). The standard test conditions (STC) are as follows: (a) spectral AM1.5, (b) light intensity 1000W/m<sup>2</sup>, (c) temperature 25 + 2 DEG C. The test is based on the IEC61215 and IEC61836 components, the actual output power measurement is in the factory or by Econess Energy approved third party inspection agency, the test uncertainty of 2 sigma (Pmpp) less than 2.5%

If during the warranty period, the power output is lower than the actual module commitment power, by Econess Energy confirmed, Econess Energy will provide additional modules to customers in order to compensate for the loss of power, or maintenance and replacement of faulty components to eliminate power loss, or loss of power to customers of the corresponding economic compensation, the specific way by Econess Energy to decide. but the attenuated power during the period used will be deducted

Compensation for insufficient component power (see below):

- Pnc - compensation for insufficient module power in N;
- Pnt - module theoretic minimum output power of N;
- Pna - actual output power of modules for year N;



$\Delta t$  - absolute value of minimum tolerance of nameplate;

1. single glass products

(a) for polycrystalline components, the Pnt uses the following formula

$$Pnt = [97.5\% - 0.7\% * (N-1)] * Pm * (1 - \Delta t)$$

(b) for Monocrystalline modules, the Pnt uses the following formula

$$Pnt = [98\% - 0.55\% * (N-1)] * Pm * (1 - \Delta t)$$

(c) for N type modules, the Pnt uses the following formula

$$Pnt = [99\% - 0.4\% * (N-1)] * Pm * (1 - \Delta t)$$

2. double glass products

(a) for polycrystalline components, the Pnt uses the following formula

$$Pnt = [97.5\% - 0.5\% * (N-1)] * Pm * (1 - \Delta t)$$

(b) for Monocrystalline modules, the Pnt uses the following formula

$$Pnt = [98\% - 0.45\% * (N-1)] * Pm * (1 - \Delta t)$$

(c) for N type modules, the Pnt uses the following formula

$$Pnt = [99\% - 0.4\% * (N-1)] * Pm * (1 - \Delta t)$$

Note: Pm is the nominal output power of the product in the Econess Energy product data sheet,

(c) Pna is tested under standard test conditions (STC), tested at the Econess Energy plant or Econess Energy's third party testing organization, to test the actual output power of modules for the years N.

## WARRANTY EFFECTIVE DATE

The warranty effective date shall be defined as the date of sale with the certifiable invoice (SALES DATE) to the Buyer or 90 (ninety) days after the delivery by Econess Energy, whichever date is earlier.

## ADDITIONAL ITEM (S) EXCLUDED FROM WARRANTY COVERAGE:

Warranty coverage does not apply when:

- a) The Product is improperly installed or abused or misused;
- b) The Product is installed in a mobile or marine environment, subjected to improper voltage or power surges or abnormal environmental conditions (such as acid rain or other pollution);
- c) the assembly, base, structural component, or installation method of the component is defective
- d) External corrosion, mold discoloration or the like occurs;
- e) Defects caused by the Product being subjected to any of the following: extreme thermal or environmental conditions or rapid changes in such conditions, corrosion, oxidation, unauthorized modifications or connections, unauthorized opening or repair, repair by use of unauthorized spare parts, accident, force of nature (such as lightning strike), influence from chemical product or other acts beyond Econess Energy reasonable control (including but not limited to damage by fire, flood, etc.);
- f) Death or injury to persons resulting from any cause other than negligence of Econess Energy, its employees or representatives;
- g) Incidental, consequential or special damages such as loss of use, loss of profits, revenues, business, goodwill, damage to reputation or expensed payable to a third party.
- h) Module failed, such as PID (potential induced degradation) which worse system design, worse installation and worse system components mismatch induced.

## OTHER

The repair or replacement of the Products or the supply of additional Products does not cause the beginning of new warranty terms, nor shall the original terms of this "Limited Warranty for Solar PV Module" be extended. Any replaced Products shall become the property of Econess Energy made for their disposal. Econess Energy has the right to deliver another type (different in size, color, shape and/or power) in case Econess Energy discontinue producing the replaced Products at the time of the claim.

## **FORCE MAJEURE**

Econess Energy shall not be responsible or liable in any way to the purchaser or any third-party arising from any non-performance or delay in performance of any terms and conditions of sale, including this "Limited Warranty for Solar PV Module", due to acts of God, war, riots, strikes, unavailability of suitable labor, material, or capacity or technical or yield failures and any unforeseen event beyond its control, including, without limitations, any technological or physical event or condition which is not reasonably known or understood at the time of the sale of the Products or the claim.

## **HOW TO OBTAIN WARRANTY**

If the customer according to "standard PV products limited warranty" can make legitimate claims, complaints and belong to completely reasonable warranty scope, should be immediately in written notice of the complaint to the following address, Econess Energy, electronic mail or email to the following. The customer shall enclose the warranty certificate along with the corresponding components, serial number and purchase date. At the same time, invoices should be provided which clearly display the purchase date, purchase price, component type, seal or signature of Econess Energy or its distributor as evidence. Any return of the PV module will not be accepted if Econess Energy fails to issue written authorization and confirmation in advance.

The limited warranty does not cover the appropriate return modules and the heavy transport costs due to repair or replacement of modules, and does not include the installation, disassembly or reinstallation costs of these modules.

In case of any discrepancy in a warranty-claim, a first-class international test-institute such as TÜV Rheinland in Cologne, Germany or Arizona State University, USA shall be involved to judge the claim finally. The final explanation right shall be borne by Econess Energy. Warranty claims will not be honored if the type or serial number of the Products have been altered, removed or made illegible.

## **SEVERABILITY**

If a part, provision or clause of this "Limited Warranty for Solar PV Module", or the application thereof to any person or circumstance, is held invalid, void or unenforceable, such holding shall not affect and shall leave all other parts, provisions, clauses or applications of this "Limited Warranty for Solar PV Module", and to this end such other parts, provisions, clauses or applications of this "Limited Warranty for Solar PV Module" shall be treated as severable.

## **Econess Energy Co., Ltd.**

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