

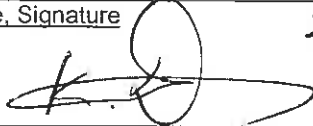
LIMITED WARRANTY

For Kaneka Thin film PV Modules

KANEKA CORPORATION

SOLAR ENERGY DIVISION

**3-2-4, NAKANOSHIMA, KITA-KU
OSAKA 530-8288, JAPAN**

Place, Date, Signature
OSAKA <i>22/06/2010</i> 



Limited Warranty

1. Scope and period of warranty

This warranty applies exclusively to ENERECO Energy Solutions Srl. hereinafter referred to as Guarantee) for the Kaneka thin-film silicon photovoltaic module(s) (hereinafter referred to as the MODULE(S)) which is/are purchased directly or indirectly from Kaneka Corporation. The warranty is limited to the terms and conditions stated herein.

2. Terms of warranty

(1) Warranty on Material and Workmanship

Kaneka warrants the MODULES to be free from following defects (hereinafter jointly referred to as Defects) at the time of shipment:

- a) any flaws, cracks and chips in appearance, which affect the power generation performance or mechanical strength of the products, and
- b) unconformity to requirements of IEC61730.

If it is found that any Defects existed at the time of shipment, within five (5) years from the shipment, Kaneka will repair or replace the MODULES. However, in case the repair or the replacement is impossible or impracticable in Kaneka's judgment, KANEKA shall refund the purchase price of Guarantee.

Output shortage of the MODULES which is caused by the Defects is covered by this Warranty on Material and Workmanship.

(2) Warranty on Output

Kaneka warrants that Modules generate the output of 90% of the Nominal Power's low tolerance described in SPECIFICATIONS 1.1 (hereinafter referred to as Minimum Output) for a 12-year period, and 80% of the Minimum Output for a 25-year period after the installation. However, Kaneka does not warrant the output of any Modules if it has passed 25 years and 6 months or more since its shipment from Kaneka.

Measurement of the output shall be made by Kaneka or the testing laboratory specified by Kaneka. Sampling of Modules for the measurement shall be made by Kaneka or Guarantee in accordance with Kaneka's request and instruction.

Standard test Conditions are (a) a module temperature of 25 degree Centigrade, (b) an irradiation of 1kW per square meter and (c) light spectrum of AM1.5.

If the output becomes less than the value above-mentioned for the corresponding period, Kaneka shall compensate output shortage by repairing, replacing Modules or adding extra Modules. However, in case the repair, the replacement or the

addition is impossible or impracticable in Kaneka's judgment, KANEKA shall refund the price of the MODULES which are supposed to be replaced or KANEKA shall pay the price of modules which are supposed to be added. This warranty on Output set out in this Section 2 (2) shall not be applied to any output shortage caused by Defects.

- (3) If any Defects or output shortage are found, Guarantee will notify Kaneka or its sales agent of the following items immediately:
 - a) Model Name
 - b) Serial number of the MODULES
 - c) Details of the Defects or output shortage
- (4) The Repair, the replacement, or the addition of the MODULES, or the refund shall be performed free of charge only if the breach of Warranty on Materials and Workmanship or the breach of Warranty on Output are found through an inspections by Kaneka or the testing laboratory specified by Kaneka.
- (5) The Repair, the replacement, addition of the MODULES, or the refund shall be the sole and exclusive remedy under this warranty. Kaneka hereby disclaims any other responsibility or liability in connection with MODULES.
- (6) If the breach of Warranty on Materials and Workmanship or the breach of Warranty on Output are not found through an inspection by Kaneka or the testing laboratory specified by Kaneka, the MODULES shall be returned to Guarantee. Guarantee shall bear all expenses incurred by Kaneka.
- (7) If Kaneka requests Guarantee to repair the MODULES and Guarantee agrees that, Guarantee shall repair them in accordance with Kaneka's instruction at Kaneka's cost.
- (8) If Kaneka requests Guarantee to replace the MODULES, and if Guarantee has its available stock and agrees that, Guarantee shall replace the MODULES at Kaneka's cost.
- (9) NO WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, HAVE BEEN MADE UNLESS EXPRESSLY INCLUDED HEREIN.
- (10) **Other condition**

The MODULES shall be away from water, moisture, and sunshine for storage. The MODULES shall be warranted only if they are installed under the "normal condition": the MODULES are not to be placed in an area exposed to brine or mist of brine, an area where snow piles up on them significantly. The MODULE shall also be installed where the ambient temperature is in the range between -20 and 50°C, and with angle more than 5°. The temperature of MODULES should be in the range between -20 and 80°C.

3. Warranty Exemptions

This warranty does not apply to the Defects or the output shortage, caused by the following reasons:

- (1)** failure to comply with the installation/handling procedures and precautions described in the module installation manual, operational manual, "Instruction for using G/Z/U-type (IEC grade)", caution labels, and other written information provided by Kaneka;
- (2)** use for unusual purposes;
- (3)** use under an unusual condition or environment;
- (4)** any modification to the MODULES which has not been approved by Kaneka;
- (5)** force majeure, such as fire, explosion, war, riot, earthquake, eruption, tidal wave, lightning, induced lightning, snow, freeze, frost, briny air, ground movement, ground cracking, earth flow, sand storms, and pollution; provided, however, that exemption for these reasons for which IEC set out the standard shall apply when they exceed IEC's standard;
- (6)** noise, voltage fluctuation, and other trouble in an grid connected commercial power supply system;
- (7)** negligence or intention of Guarantee, its customer or a third party;
- (8)** naturally occurred scratches, stains, mechanical wear, rust, mold, degradation, discoloring, and other alteration that occurred after shipment from Kaneka but do not affect the power generation performance or mechanical strength of the product.

4. DISCLAIMERS

Kaneka disclaims any and all warranty in the cases that:

- a)** the warranty period for the MODULES has been expired;
- b)** the Defects or the output shortage which were discovered or should have been discovered is not notified to Kaneka immediately; or
- c)** the MODULES are repaired by anyone other than Kaneka except when Kaneka instructed Guarantee to do so.

SPECIFICATIONS

**For Kaneka Thin film PV Modules
(U-EA100)**

Date of Issue: March 1st, 2010

KANEKA CORPORATION

SOLAR ENERGY DIVISION

3-2-4, NAKANOSHIMA, KITA-KU
OSAKA 530-8288, JAPAN



Specifications – U- type

1. 1 Module Specifications

Table 1.

PRODUCT:THIN-FILM SILICON PV MODULE			
MODEL: U-EA100			
SPECIFICATION LISTS	UNIT	VALUE	REMARK
Performance at STC (stabilized)			
Nominal Power (Pmax)	W	100 (+10%/ -5%)	
Open Circuit Voltage (Voc)	V	71.0 (±10%)	
Short Circuit Current (Isc)	A	2.25 (±10%)	
Voltage at Pmax (Vpm)	V	53.5	
Current at Pmax (Ipm)	A	1.87	
Max. System Voltage	V	600	
Dimension	mm	1210.0 ± 2.5 x 1008.0 ± 2.5	
Depth	mm	40.0 ± 1.0	
Weight	kg	18	
(Reference)			
Performance at STC (initial)			
Power (Pmax)	W	114	(typical)
Open Circuit Voltage (Voc)	V	71	
Short Circuit Current (Isc)	A	2.2	
Voltage at Pmax (Vpm)	V	55	
Current at Pmax (Ipm)	A	2.1	
(REMARK)			
<ul style="list-style-type: none"> • Even though we don't define the tolerances of Ipm and Vpm, those tolerances are close to ±10% according to the tolerances of Isc and Voc. • The nominal output value is defined as average value for modules using Kaneka's original evaluate method. • The performance at STC of the thin film silicon photovoltaic module at the outdoor use has seasonal variations. The amount of solar radiation also fluctuates monthly. The annual average of output could be estimated in consideration of both the variations. • MODULES are certified by IEC61646 and IEC61730-1/-2 (Application Class A) 			

1.2 Materials

1.2.1 Photovoltaic cell

Amorphous silicon / micro-crystalline-based

1.2.2 Superstrate (glass substrate)

Float glass (dimensions: 1200 ± 1 mm x 998 ± 1 mm x 5 ± 0.2 mm, squareness: 1/300 or less)

1.2.3 Back cover sheet

Stacked fluorine-based films (reference thickness: 0.18 mm) are fusion bonded by using EVA resin (reference thickness: 600 μ m).

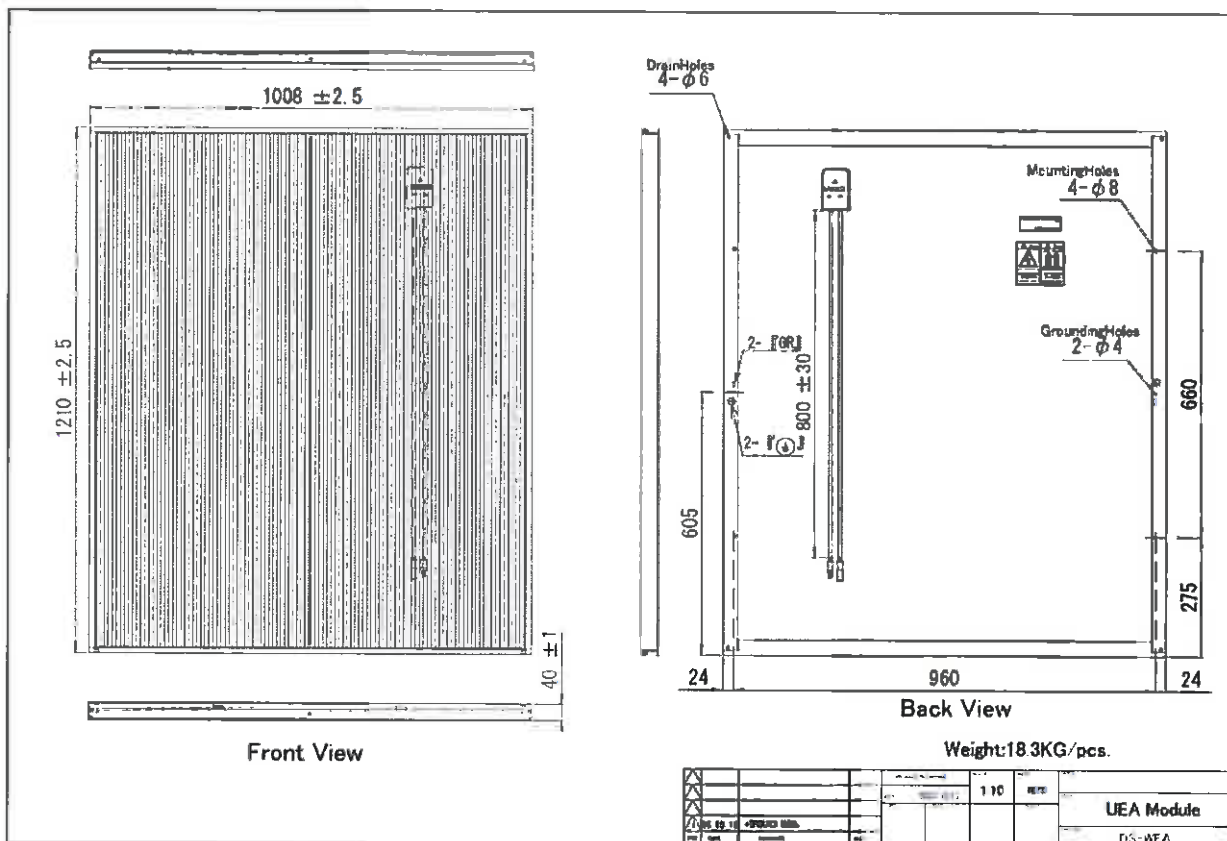
1.2.4 Frame, junction box, output cable, connectors

Frame: aluminum extrusion mold (inner-brim-type frame)

Junction box and cable: Onamba's FNMC80D2S3 (ONAMBA Photovoltaic Cable (TUV), MC3 connectors)

1.3 Dimensions

U-EA100 – Refer to the following diagram.



1.4 Standard operating conditions

The MODULES should be installed at a place where they can receive sufficient sunlight. Places subjected to seawater or snowfall (1 m or more) should be avoided. Ambient temperature should be in the range between -20°C and 50°C and with installation angle more than 5°. The temperature of MODULES should be in the range between -20°C and 80°C.

2. Packing Specifications

20pcs are packed in a carton, and one carton is placed on a pallet.

3. If the specifications hereof are changed, Kaneka will notify such change in writing to Customer as soon as possible.