

SPECIFICATIONS FOR

The Supply, Installation of a Climatic Chamber

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I. **GENERAL CONDITIONS :**
1. **TERMS OF THE CONSULTATION :**

ARTICLE 1 : OBJECT AND TYPE OF THE TENDER

The GREEN ENERGY PARK (GEP), the project's contracting authority, is launching a tender for the supply, installation, training and commissioning of a climatic chamber.
The purpose of this regulation is to set up the terms and conditions for this tender, as well as the participation conditions.

ARTICLE 2 : REFERENCE DOCUMENTS

2.1 LAW

The contract resulting from this tender will be subject to Moroccan law.
Any disagreement between GREEN ENERGY PARK and the Provider shall be settled amicably by a cooperation between both parties; otherwise, litigation will be submitted to the competent court in Rabat unless specific clauses figure in the selling engagement of the supplier, in which case they shall prevail.

2.2 CONTRACTUAL DOCUMENTS

The obligation of the supplier for the performance of works that are the subject of this Tender will result in the whole constituent pieces of the engagement designated as bellow:

- *The contract concluded with its annexes and amendments
- *This Document
- *The orders
- *The submission and, where necessary annexes

After its notification, the engagement will be able to be modified only by amendments or letter exchanges accepted by both contracting sides.

ARTICLE 3 : DEADLINE AND PLACE OF SUBMISSION OF TENDER

Tenders must be submitted according to conditions and delays planned by these specifications to the purchasing department by June 8th, 2020 before 12 PM GMT.

All suppliers must establish a price quotation according to the Incoterm DAP, disaggregating the cost of transporting the equipment.

Local suppliers must be able to submit a proposal including the shipping. This latter is their responsibility to the delivery place: Benguerir.

As an institute, GREEN ENERGY PARK benefits from the UNESCO exemption of customs duties. So, Moroccan companies can submit a proposal excluding customs duties.

ARTICLE 4 : SUBMISSION FOLDER

Any tenderer is required to present a folder of submission containing:

4.1. ADMINISTRATIVE FILE :

This folder must contain :

- a. A declaration on honor, in a single copy, which must be presented following to the model below.
- b. Excerpt of K-BIS or the certificate of registration in the commercial register for persons subject to the obligation to register in accordance with the legislation in force
- c. A certificate or its certified copy of the original issued less than a year ago by the competent administration of the place of taxation certifying that the competitor is in a regular tax situation. This certificate must mention the activity under which the competitor is taxed;
- d. Company presentation
- e. The document or documents justifying the powers conferred on the person acting on behalf of the tenderer
- f. These specifications initialed, signed and sealed

4.2. TECHNICAL OFFER

The supplier's technical offer must comply with, or exceed, the technical specifications as specified in article 6 "**CHARACTERISTICS AND TECHNICAL SPECIFICATIONS**".

The technical offer must also include the references of the tenderer.

4.3. FINANCIAL OFFER

The detailed price schedule must be clearly specified.

The offer presented by each tenderer is put in a signed and sealed envelope. This folder contains three (03) envelopes:

- The first envelope: the administrative file. This envelope must be sealed and show, in addition to the information on the envelope, the mention "Administrative file".
- The second envelope: contains the technical offer. This envelope must be sealed and bear, in addition to the indications on the envelope, the words "Technical Offer".
- The third envelope: contains the tenderer's financial offer. This envelope must be sealed and bear, in addition to the information on the envelope, the words "Financial Offer".

ARTICLE 5 : PROCEDURE FOR AWARDING

This consultation will be sold following the needs of GREEN ENERGY PARK. The supplier will be chosen based on the material's quality, the respect of the formulated needs in article 6 and the financial offer;

2. SCOPE OF DELIVERY

ARTICLE 6 : CHARACTERISTICS AND TECHNICAL SPECIFICATIONS

The purpose of acquiring this climatic chamber is to be able to carry out environmental tests according to standards IEC 61215 and IEC 61730 on the photovoltaic modules listed as well.:

- Thermal cycling :

The purpose of this test is to determine the ability of the module to withstand stresses of thermal imbalance, fatigue or other stresses caused by repeated variations in temperature.

- Damp Heat :

The purpose of this test is to determine the ability of the module to withstand the effects of long-term moisture penetration.

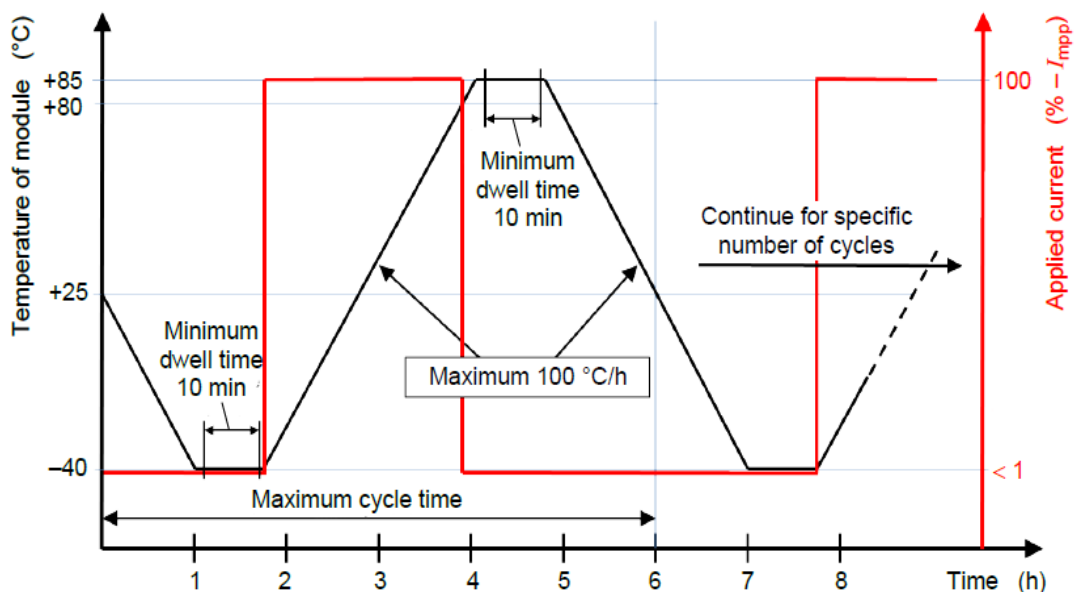
- Humidity Freeze :

The purpose of this test is to determine the ability of a photovoltaic module to withstand the effects due to the succession of high temperature and humidity conditions followed by stay at temperature below zero. This is not a thermal shock test.

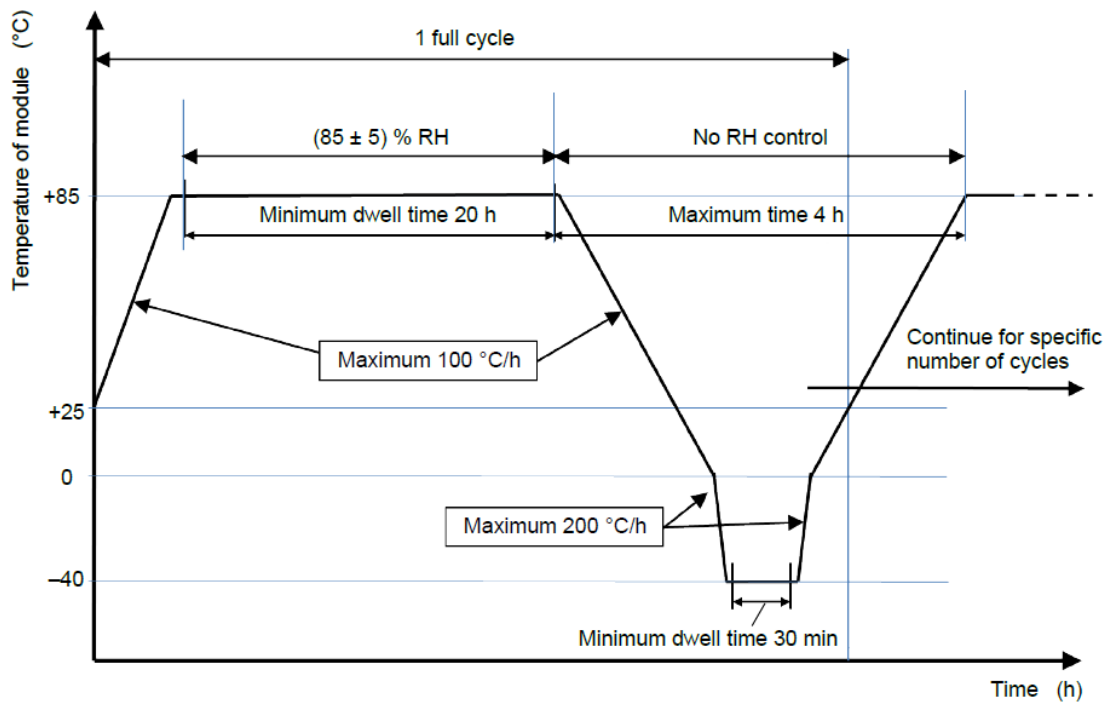
The thermal cycling, damp heat, and humidity freeze test chamber comply with the following:

- Temperature controlled test chamber:
 - The test chamber must have an internal capacity of at least 4300 liters approx. with a minimum dimensions of 2200x1500x1300 mm (HxDxW);
 - The test chamber must be able to simultaneously test at least 4 photovoltaic modules with dimensions up to 2m x 1.5m;
 - The door must have an opening to give full access to the room for a maximum load of the photovoltaic modules;
 - The chamber must be provided with a system for supporting the photovoltaic module during the test;
 - The chamber must be provided with a release mechanism locked from the interior of the chamber;
 - The test chamber must have an observation window of approximately 300 mm x 300 mm located at the observation height;
 - The test chamber must be operational at an external ambient temperature of + 10 ° C to + 55 ° C;
 - The operating temperature range inside the test chamber must be at least between -50 ° C and + 150 ° C when testing the modules with a stability of $\pm 0.5^{\circ}\text{C}$;
 - The relative humidity range inside the test chamber should be 20% to 90% with an accuracy of $\pm 5\%$;

- The test chamber must be fitted with 4 temperature monitoring devices with an accuracy of $\pm 2^\circ\text{C}$ and a repeatability of $\pm 0.5^\circ\text{C}$ to measure the temperature of the modules;
- The test chamber must be fitted with a relative humidity monitoring device with an accuracy of $\pm 5\%$;
- The temperature variation must not exceed 100°C/h ;
- The room must be equipped with the following protection device:
 - A circuit breaker against leakage currents for the power supply;
 - Protection against overheating;
 - Overload alarm for compressor and fan motor
 - A fan motor and compressor overload protection relay;
 - An emergency stop button;
 - A compressor thermal switch
- The test chamber must allow access to the photovoltaic modules in order to connect them to an external DC power source;
- The test chamber must allow the thermal cycle test according to the following diagram :



- The test chamber must allow the gel humidity test according to the following diagram:



➤ Structure for PV modules

- The support for the modules must be provided in the test chamber to contain up to 4 modules with maximum dimensions of 2m x 1.5m;
- The support must be adjustable to securely hold the modules during the test;
- The support must include a roller slot to facilitate the installation of the modules on it;
- The support must withstand exposure to the test temperature from -50 ° C to + 150 ° C;
- The support must be designed to allow free circulation of the surrounding air during the test;
- The support structure and its fixings must be designed with a material with low thermal conduction in order to thermally isolate the photovoltaic modules during the test;
- The tenderer must provide the technical drawings of the support.

➤ Control and power measurement panel

The tenderer must provide a control and measurement panel which consists of the following:

- Program controller with touch screen or buttons;
- Display of program monitoring;
- Temperature adjustment;

- Relative humidity adjustment;
- Automatic operation adjustment;
- Adjustment of the recovery process for malfunctions;
- Description and history of alarms;
- Trend graph for the temperature of each module;
- Data recording system:
 - o A data logging system must be provided to monitor module temperature and relative humidity data;
 - o The data must be associated with the data acquisition system provided for 1000 hours in assisted copy;
- Data acquisition, processing and monitoring system:
- Able to capture real-time data of the module under test;
- Able to display data in digital color, including:
 - o Module temperature in ° C;
 - o Relative humidity in%;
 - o Able to store recorded system data via USB port and LAN port;
 - o Able to convert historical data to CSV and PDF format.

Norms and standards

The climatic chamber object of this Tender must fulfill the recommendations dictated by the following standards:

- IEC 61215: Photovoltaic (PV) modules for terrestrial applications - Design qualification and approval;
- IEC 61730: Qualification for the dependability of photovoltaic modules.
- IEC 60068-2-78: Environmental tests - Part 2-78: Tests - Cab test: Damp heat, continuous test;

ARTICLE 7 : WARRANTY PERIOD

The material with all its components is guaranteed on the installation site in Benguerir for a period of **24 months**, spare parts, labor included.

Spare parts :

The systems should be delivered with spare parts deemed necessary for at least 1 year use.

ARTICLE 8 : MAINTENANCE

The offer must contain 3 years maintenance contract after the warranty period, containing:

- Annual Preventive Maintenance Visit
- Spare parts
- Telephonic support and advice
- Annual software update
- Travel

All services and parts mentioned above will have to be delivered to the installation site (transport and accommodation costs on the supplier's charges).

During the warranty period and maintenance engagement, the whole fees will be charged on the supplier or its representative and include supply of spare parts, labor and transportation fees, accommodation and living expenses.

ARTICLE 9 : INSTALLATION AND COMMISSIONING

All the elements required for the installation of the equipment and for its commissioning must be provided by the supplier. Installation, commissioning, good performance and training must be carried out within the deadlines mentioned in Article 12 of these specifications, with the consequences mentioned in case of non-respect of deadlines.

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ARTICLE 10 : TRAINING

The supplier must provide a training session that is no less than 3 days duration for the client teams on the use and the maintenance of the climate chamber and auxiliary equipment. This training session shall start as soon as the installation of the climate chamber is finished.

ARTICLE 11 : TECHNICAL DOCUMENTATION

The supplier must provide the following documents upon delivery of the equipment:

- Warranty document for all equipment provided
- All calibration certificate for each equipment provided. The calibration certificate must be delivered by an accredited laboratory according to ISO/IEC 17025.
- The conformity certificate to the current standards
- User Manual for each equipment
- The bill of material used
- Manual for the maintenance of all equipment
- The table "Summary of specifications" in annex 1 with all information asked

ARTICLE 12 : TERMS AND EXECUTION CONDITIONS

The climatic chamber must be delivered within a maximum period of 12 weeks from receipt of the purchase order.

If the delivery delay is other than 12 weeks, it must be specified on the offer.

ARTICLE 13 : LATE PENALTIES

In case of exceeding the execution time specified in Article 12, the supplier is liable to a penalty of 1% of the contract amount per day of late, with a maximum cumulative flat rate of 10% of the engagement amount, beyond which are applied dispositions of Article 17.

ARTICLE 14 : RECEPTION - VERIFICATION

a) Verification

The verification of the equipment subject of this tender will take place in the site of installation; it will be performed under the supervision of the project leader.

No delivery even if partial is accepted if the whole equipment does not respect the order form.

b) Reception

PROVISIONAL ACCEPTANCE

- a) Before any delivery, the supplier must invite the administration of the GREEN EN ERGY PARK to appoint the project manager for checking the conformity of the item in all respects with the market specifications and with the documentation presented during the tender procedure.
- b) When it finds that the supplies do not meet the required specifications, the commission refuses to declare acceptance. The supplier has ten (10) days to comment. After this deadline, the commission's decision is irrevocable, and the supplies are rejected.
- c) In the event of acceptance by the project manager of the supplies presented, the delivery must be subject to a certificate of receipt of the equipment bearing the inventory number signed jointly by the supplier and the project manager. Provisional acceptance will be declared after total delivery, installation and handing over under the normal conditions of use of the material subject to the contract.
- d) In the event of split delivery, provisional acceptance can only be declared if all the equipment, subject of the contract, is delivered, installed, and put in service.
- e) In addition to the technical verifications proper to the reception, the supplier will be asked to carry out demonstrations of the functioning of his equipment and thus ensure its handing over to the qualified personnel of the establishment intended.
- f) At the reception, the documentation in French and / or in English will be delivered with the material.
- g) Provisional acceptance will be pronounced in the beneficiary establishment.

FINAL ACCEPTANCE

Final acceptance will be declared after expiration of the warranty period under the same conditions of provisional acceptance.

ARTICLE 15 : PAYMENT CONDITIONS

The payment will be made on 30 days end of month after receiving the invoice and the final acceptance receipt.

The Supplier must produce a commercial numbered invoice established in 03 copies signed, dated on letters written. It must indicate the references of the contract of the related order.

These invoices must be addressed to GREEN ENERGY PARK's Accounting department, located at 16, Rue Amir Sidi Mohamed Souissi, Rabat-Morocco.

ARTICLE 16 : HOLDBACK

A 10% holdback is provided upon the purchase of equipment that will be released after the warranty period and the final acceptance.

ARTICLE 17 : CONTRACT CANCELLATION

Regardless of expected cases of common Law, the Contract resulting from these specifications may be terminated with plain rights by GREEN ENERGY PARK, with Recipient faults, and after formal notice by registered letter within a period of 20 days in the following cases:

- Fraudulent acts relating to the nature, the quality and reliability of the equipment and services covered by these specifications
- In case of exceeding the maximum flat rate of late penalties as indicated in Article 13.

ARTICLE 18 : RISKS INSURANCE

The Supplier declares to be covered by a professional civil insurance against the risks that he incurs during his activity and throughout the duration of the execution of this contract. This insurance must cover all risks that encounter his staff at GREEN ENERGY PARK. The Client reserves the right to request copies of the insurance policy or certificate of cover.

ANNEX 1: Table “Summary of specifications”

1. General specifications

| | |
|---|--|
| External dimensions in mm (HxWxD) | |
| Internal dimensions in mm (HxWxD) | |
| Capacity | |
| Temperature range (without humidification) | |
| Accuracy | |
| Uniformity | |
| Humidity range | |
| Accuracy | |
| Uniformity | |
| Number of shelves or Trolley | |
| Cable port | |
| Humidity water supply | |
| Heater capacity | |
| Electric Requirement | |
| Power rating | |
| Power plug | |
| Temperature sensor | |
| Number of sensors for temperature | |
| Humidity sensor | |
| Observation window | |
| Operating temperature | |
| Temperature variation °C/h | |
| Controller resolution for Temperature | |
| Controller temperature for humidity | |
| Over-temperature cut-off | |
| Maximum temperature cut-off | |
| Over Current cut-off | |
| Material used | |