**Section II: Schedule of Requirements:**

**RFQ title: Supply, Delivery, and Test New Hybrid Solar Pump Inverters With All Accessories for Water and Sanitation Local Corporations Authority– Taiz City, Yemen.**

**Technical specifications for Goods and Comparative Data Table:**

# Scope :

* The Scope Shall Consist of Supply and Delivery , inspect , and test New Hybrid Solar Pump Inverters with all accessories as the below table and as specified in technical specifications ,BoQs and the other tender documents to warehouses of Water and Sanitation Local Corporations /Authorities in specified hereunder destination cities:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **LOT 4 : Supply, Delivery, and Test New Hybrid Solar Pump Inverters With All Accessories for Water and Sanitation Local Corporations/Authorities – in specified destination cities , Yemen.** | | | | |
| **Bill item#** | **Destination City** | **Description** | **Unit** | **QTY** |
| **Bill#11-D-01** | **Taiz City** | **MIN. 22 kW, 3-phase hybrid pump inverter: AC&DC power inputs , built-in MPPTs, flexible 3-phase AC output, intelligent pump control, include all necessary protections for the pumping system in particular dry running protection, and motor high temperature protection, suitable for outdoor installation, and remote monitoring capabilities, efficient cooling and the efficiency not less than 98%.** | **No** | **2** |
| **Bill#11-D-02** | **Taiz City** | **Ditto but Inverter Related Power (KW) = Min.26 kw** | **No** | **2** |
| **Bill#11-D-03** | **Taiz City** | **Ditto but Inverter Related Power (KW) = Min. 30 kw** | **No** | **2** |
| **Bill#11-D-04** | **Taiz City** | **Ditto but Inverter Related Power (KW) =Min. 37 kw** | **No** | **2** |
| **Bill#11-D-05** | **Taiz City** | **Ditto but Inverter Related Power (KW) = Min. 45 kw** | **No** | **2** |

# GENERAL

1. **Delivery and unloading:** To warehouses of Local water and sanitation corporations/authorities-in specified destination cities as mentioned in the scope above.
2. **Technical Documents and Certificates:** Documentary evidence to prove that the material and design is according to specifications.
3. **Standards**: All goods shall comply with the requirements of the latest issue (with up to date amendments) of the appropriate standard or standards of the American Society for Testing of Material (ASTM) British Standards Institution (BS) or International Organisation for Standardisation (ISO) standards, German Standards (DIN) or their equivalents as approved by the Purchaser. Once the Bid has been accepted and a Contract awarded, the successful Bidder shall furnish two (2) original copies of the standards with which the goods are complying in English. If the original standards are in a language other than English, then authenticated English translations must be submitted in addition. Where reference is made to a particular manufacturer's product, such reference shall be taken only as an indication of design and quality unless otherwise stated.
4. **Climate**: All materials and equipment incorporated in the work shall be capable of withstanding shade temperatures of 45°C and if exposed to direct sunlight shall be capable of withstanding the additional heat gain up to 50°C , approx. 90% humidity and altitude up to 100 - 1700 m above sea level. All materials and equipment shall take into account the generally tropical conditions with occasional dust storms, intense rain storms.
5. **Markings**: Unless otherwise specified in the relevant standard, products are to have the following legible marks as appropriate, cast, stamped or indelibly painted:

- Manufacturer’s name, initials and identification mark.

- Class designation.

- Date of manufacture.

- Initials and number of relevant standards.

1. **Warranty:** The supplier shall provide manufacturer’s warranty to the employer/UNOPs that the Goods Supplied under the contract will comply strictly with the Contract and shall be first class in every case and shall be free from defects. The supplier further warrants to the Purchaser that all materials, equipment and supplies furnished by the supplier for the purpose of the goods will be new, merchantable of the most suitable grade, and fit for their intended purposes. This warranty shall remain valid for a one-year period starting of the date of the final acceptance delivery. After the final acceptance, any part of the equipment which fails or does not give satisfactory performance during this period of warranty, shall be replaced within three months from the date the Supplier has been notified to do so.All expenses involved in this connection shall be borne by the supplier who should take this into consideration when bidding.
2. **Technical Data/Brochures:** bidders **Must** provide relevant technical data sheets and manufacturer catalogues for all supplied items.
3. **Manufacturing and Country of origin Certificate:** All materials shall comply with specified International Standards and shall be supplied from **reputable manufacturers.**
4. **Manufacturing and test Certificates:** The bidder shall submit a test certificate from the manufacturer certifying that all supplied items have been tested and that they have successfully passed the tests prescribed by the relative international standard specifications and test certificates for each item (according to serial number) shall be submitted for applicable items.
5. **Certification Standard:** All materials supplied shall be the best of their respective kinds and in accordance with the current and relevant Standards for those particular classes of material where such standards are applicable and do not conflict with this specification.
6. **Transportation and Storage:** Transport, handle and store all products and materials in accordance with the manufacturer’s recommendations and in a manner that prevents damage or deterioration or excessive distortion.
7. **The employer (UNOPS) shall have the right to reject any damaged or defective product material.**
8. **Tests after Delivery:** The Employer (UNOPS) has the right to take samples of the supplied materials, and the following tests (or any other required tests) shall be carried out in accordance with the relevant international standards or regulations by an approved laboratory at own bidder cost.
   * Material type and equipment performance

# Technical Specifications

# Solar PUMPING Inverters

This specification covers the design, material, construction features, manufacture, inspection, testing the performance of solar hybrid pump inverter and control panels complete with all accessories.

1. **Inverters**

|  |  |  |
| --- | --- | --- |
| NO. | ITEM | SPECIFICATIONS |
|  | **General** | * The SOLAR PUMPING INVERTERS shall be new ,heavy duty and robust enough to operate under harsh conditions. All components shall adhere to recognized international standards and be sourced from **reputable manufacturers**. * Setup Wizard: Built-in library for easy setup. * AC/DC Compatibility: Can be connected to grid or generator for backup. * Built in more than two MPPTs * Inverters shall be equipped with efficient heavy duty cooling fans. * Built-In Data Loggers and Stores historical data for review. |
|  | **Application** | * inverters shall be designed for outdoor installation and operating three phase 400 V AC deep well submersible pump-motor assembles. * Suitable for continuous and intermittent operation. * Ideal for various water supply pumping applications. |
|  | **Type** | * 3-phase hybrid pump inverter: AC&DC power inputs , built-in MPPTs, flexible 3-phase AC output, intelligent pump control, include all necessary protections for the pumping system in particular dry running protection, and motor high temperature protection, suitable for outdoor installation, and remote monitoring capabilities. * A Solar Pumping inverter should have the ability to work in different modes like Soft Starter, V/F Speed Control, Auto/ Manual Speed Control during solar radiation changes and Auto wake up after hibernation time on cloudy days. * include DC to AC adapter and regulator for voltages, frequency and ampere according to the required load |
|  | **Ambient conditions:** | * Operation Temperature: -10°C to +50°C * Outdoor installation (IP 65 ) * Humidity: up to 95% * Altitude: up to 2500m |
|  | **Rated Power (KW)** | as specified in BoQ and Form C |
|  | Power supply: | * Two inputs AC and DC ports * Input Voltage (Uin): 380-500V AC; -10% to +10% * 400-840V DC - Minimum Starting Voltage 440V * Input Frequency: 47-65Hz |
|  | Output Power supply: | * Voltage: 380- 415 VAC * Output Frequency: 50 Hz |
|  | Min .Efficiency: | 97.5% |
| 9 | Communication | * RS-485: Standard: Modbus * Ethernet: Standard: TCP/IP * Communication Connection: * Programmable Inputs: Solar Pumping Inverter should be equipped with Programmable inputs to be used for Discharge pressure switch to protect the pump against high discharge pressure, well water level sensor to protect pump against dry running, Tank level switch for overflow protection and closed pipeline (high pressure). * Solar Pumping inverter should be equipped with programmable outputs to be programmed for any required actions |
| 11 | Immunity & Emissions: | Complies with EN 61800-3, Category C2 - First and Second Environment or equivalent |
| 12 | **Protection** | **Protection for Inverter:**   * Overvoltage/undervoltage protection * Overload protection * Overcurrent protection * Overtemperature protection * No-load protection   **Protection for drived Motors**   * Dry-running protection * Overvoltage/undervoltage protection * Overload protection * Overcurrent protection * phase sequence * Overtemperature protection: as Thermostat motor protection relay for PT 100, to protect the motor starter winding from overheating. * No-load protection * Overload, pump Phase Loss, pump Short-Circuit, ground fault, solar low power, DC Input Anti-reverse, AC output unbalance (3Phase) * Pressure protection. * Excess starting time protection. * Earth fault protection. * Gauge indication for volts, Ampere (with selector switches for both volts & amp. And 3 phase. * Running hours counter. * Operation switch (manual – automatic and remote). * Emergence stop switch. * Surge protection. * Cable glands. |
| 13 | Display | * LCD Screen display with Cover + LED status indicator * Display content: PV status (Current, Voltage, Power, Energy), AC input voltage, AC output voltage, Load, Running Status, RPM, and Frequency |
| 14 | **Inspection and test** | **Factory Tests:**  The supplier shall furnish the Purchaser/Engineer with certified results of the factory acceptance tests acc. to applicable international standards before shipment.  **Site Acceptance Tests:**  After the delivery each pumping inverter shall be field tested (if required by the UNOPS Engineer) to ensure compliance with the performance requirements.  Any additional costs that may have to be incurred due to non – performance of the equipment shall be recovered from the supplier. |

**Delivery Requirements and Comparative Data Table:**

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| --- | --- | --- | --- |
| **UNOPS Requirements** | | **Is quotation compliant? Bidder to complete** | **Details**  **Bidder to complete** |
| **Delivery time** | The Bidder shall deliver the goods ***within 6 months*** after the Contract signature. | ☐ Yes ☐ No | Insert details |
| **Delivery place and Incoterms rules** | DAP as per Incoterms 2020 at ***Local water and sanitation corporations-* Taiz City*, Yemen.*** | ☐ Yes ☐ No | Insert details |
| **UNOPS Right to vary requirements** | At the time the Contract is awarded, UNOPS reserves the right to vary the quantity of the goods and associated services specified above, provided this does not exceed +/- [20%] , without any change in the unit prices or other terms and conditions of the RFQ. | ☐ Yes ☐ No | Insert details |