



RFQ – PAL10- 0000186180

**Supply, installation and commissioning of PV Solar Energy for
Turkish Palestinian Friendship Hospital**

Technical Specification

Technical Specifications of the Photovoltaic Solar system

Technical Specifications of the P.V. Solar system components

Item No	Name of Item	Technical Specifications and Standards
1	PV array:	<ul style="list-style-type: none"> • Module Efficiency at NOCT at least 20.9% and more • Operating Module Temperature -40 °C to +85 °C • Maximum System Voltage 1000 V DC (IEC) • Positive Power Tolerance 0 –10 watt. • Maximum Series Fuse Rating 35A • Junction Box IP68 rated (3 bypass diodes) • Connectors MC4 connectors or Amphenol H4 • Temperature Coefficients of P not more than - 0.42 % / °C • Certifications • Anti- Potential Induced Degradation • IEC 61215 & IEC 61730 Application Class A • ISO 9001 quality standards and ISO 14001 environmental standards <p style="text-align: right;">Warranty: 20 Years on performance.</p>

2	Inverters 45KW	<ul style="list-style-type: none"> • 3-phase inverters • String inverters • Island grid operation setting • Input (DC) • Max. DC power (@ $\cos \phi=1$)45000 W • Max. input voltage 1000 VDC • MPP voltage range /rated input voltage 320V – 800V/600V • Min. input voltage / initial input voltage 150 V / 188 V • Output (AC) • Rated power (@400 V, 50 Hz) 45000 W • Max. apparent AC power 45000 VA • Nominal AC voltage 3 / N / PE; 220 / 380V 3 / N / PE; 230 / 400V 3 / N / PE; 240 / 415 V • Nominal AC voltage range 160 V – 280 V • AC power frequency / range 50 Hz, 60Hz / -6 Hz ... +5 Hz • Rated grid frequency / rated grid voltage 50 Hz / 230 V • Max. output current 64 A • Power factor at rated power 1 • Adjustable displacement factor 0.8 overexcited 0.8 under excited • Phase conductors / connection phases 3/3 • surge arrestor type 2 • Efficiency • Max. efficiency 98% • Must include all necessary Interface modules & data cables and all connections needed to complete and connect the monitoring system to internet. • Certificates: • CE (European Markets Made not china Export), VDE0126-1-1,AS4777,IEC61727 • Note: The inverters capacity must be divided at least 3 inverters. <p style="text-align: right;">Warranty: 5 Years</p>
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3	Inverters 40KW	<ul style="list-style-type: none"> • 3-phase inverters • String inverters • Island grid operation setting • Input (DC) • Max. DC power (@ $\cos \phi=1$) 40000 W • Max. input voltage 1000 VDC • MPP voltage range /rated input voltage 320V – 800V/600V • Min. input voltage / initial input voltage 150 V / 188 V • Output (AC) • Rated power (@400 V, 50 Hz) 40000 W • Max. apparent AC power 40000 VA • Nominal AC voltage 3 / N / PE; 220 / 380V 3 / N / PE; 230 / 400V 3 / N / PE; 240 / 415 V • Nominal AC voltage range 160 V – 280 V • AC power frequency / range 50 Hz, 60Hz / -6 Hz ... +5 Hz • Rated grid frequency / rated grid voltage 50 Hz / 230 V • Max. output current 60 A • Power factor at rated power 1 • Adjustable displacement factor 0.8 overexcited 0.8 under exited • Phase conductors / connection phases 3/3 • surge arrester type 2 • Efficiency • Max. efficiency 98% • Must include all necessary Interface modules & data cables and all connections needed to complete and connect the monitoring system to internet. • Certificates: • CE (European Markets Made not china Export), VDE0126-1-1, AS4777, IEC61727 • Note: The inverters capacity must be divided at least 3 inverters. <p>Warranty: 5 Years</p>
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<p>3</p>	<p>Inverters 25KW</p>	<ul style="list-style-type: none"> • 3-phase inverters • String inverters • Island grid operation setting • Input (DC) • Max. DC power (@ $\cos \varphi=1$)25000 W • Max. input voltage 1000 VDC • MPP voltage range /rated input voltage 390V – 800V/600V • Min. input voltage / initial input voltage 150 V / 188 V • Output (AC) • Rated power (@400 V, 50 Hz) 25000 W • Max. apparent AC power 25000 VA • Nominal AC voltage 3 / N / PE; 220 / 380V 3 / N / PE; 230 / 400V 3 / N / PE; 240 / 415 V • Nominal AC voltage range 180 V – 280 V • AC power frequency / range 50 Hz, 60Hz / -6 Hz ... +5 Hz • Rated grid frequency / rated grid voltage 50 Hz / 230 V • Max. output current 36.2 A • Power factor at rated power 1 • Adjustable displacement factor 0.8 overexcited 0.8 under exited • Phase conductors / connection phases 3/3 • surge arrester type 2 • Efficiency • Max. efficiency 98.3% • Must include all necessary Interface modules & data cables and all connections needed to complete and connect the monitoring system to internet. • Certificates: • CE (European Markets Made not china Export), VDE0126-1-1,AS4777,IEC61727 <p>Warranty: 5 Years</p>
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4	PV steel Mounting Structure	The mounting structures for the PV panels should include the following: <ul style="list-style-type: none">• The mounting structure uses double hot galvanized steel Profile and angles structures for stands and PV modules.• The mounting system provides a fixed inclination of the modules from 30 degrees.• The mounting structure components are bonded together to guarantee potential equalization.• The mounting structure is earthed according to internationally accepted standards.• Bidder can prove that the mounting structures and the foundations thereof are structurally suitable to withstand all static loads (weight of modules, wind loads etc) that might occur according to the Site conditions.• The mounting structure uses standardized profiles and mounting• The contractor should provide shop drawing to the mounting structure of the PV before start the work.
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5	DC and PVCables	<p><u>PV, DC wires and Cables:</u></p> <ul style="list-style-type: none"> • All PV, DC cables and wires are designed to withstand the demanding environmental conditions that arise in any fixed, mobile, roof or architecturally integrated photovoltaic installation, all should be according to the following specifications: • Solar guarantees the maximum efficiency in the energy transmission throughout the full service life of your installation. • Conductor: tinned copper flexible Class 5. • Insulation: halogen-free cross-linked elastomer • Jacket: halogen-free cross-linked elastomer • Standards: TÜV 2 Pfg 1169/08.2007 , UTE C 32-502 • Voltage: 1.8 kV DC - 0.6/1 kV AC • The DC cables must be sized such that the voltage drop between the PV array and the inverter is less than 1% of the total PV array DC voltage. • Handle 1, 3 times the source short-circuit current (PV modules) for the string wires. • Cable tray must be installed for DC cables minimum 10*10 cm tray • Maximum conductor temperature 120° C (1) IEC 60216 • Resistance to extreme temperatures Minimum: -40°C IEC 60811-504, -505, -506 • Resistance to ultraviolet radiation (UV) UL 1581 • Resistance to ozone IEC 60811-403 • Resistance to water absorption IEC 60811-402 • The sizes of Dc cables must be two colours and sized in accordance with the installation requirements applicable on site. <p style="text-align: right;">Warranty: 3 Years</p>
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6	3-Phase Digital Meter (KWH meter)	<ul style="list-style-type: none">• Voltage Input: 230 VAC \pm 15% per phase.• Current Input: / 5 A, /1 A (optional)• Low Current: 1% (50mA).• Include a currents transformer (CT's).• The KWh meter has digital screen with data & interface connections for monitoring by the Remote Monitoring System <p style="text-align: center;">Warranty: 2 Years</p>
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General Requirements

Office Facilities

At proposed location, to be agreed upon with the municipality, temporary site offices will be established by the Contractor at his own cost, to the sole use of the Engineer's and his staff.

The office will not be part of the project and shall not disturb the construction of the project. The Contractor is responsible to keep and maintain the office and office facilities; also he is responsible to keep the office as well as his temporary buildings clean during the entire period of construction.

The Contractor should remove all temporary buildings and the connecting facilities on his own expense after the completion of the project.

The site offices should have windows, floors, doors, electric lighting, telecommunication system, A/C units or system, current clean water, and connected to a suitable sewage hygienic disposal system.

The contractor shall provide the office with Tea-boy, to work under the instructions of both the owner and the consultant. Salaries, allowances and expenses of the Tea-Boy of all kinds will be made by the contractor, and shall be included in his prices.

(In the absence of the tea-boy for any reason, the contractor should substitute him by another one through the whole period of such absence).

The offices shall consist of the following:

- Site Engineers office with WC 2x 20 m2.
- Meeting Room 20 m2.
- Buffet 9 m2.

The following furniture and equipment shall be provided by the contract at his own costs to the satisfactory of the Engineer or his Representative:

- Desk with two locking drawers and chair for Supervision Staff 2
- Sitting Chairs 6
- Non-plastic Meeting Table with chairs (at least for 8 persons) Complete Set
- Steel Filing Cabinet 4
- Telephone line 1
- Fax machine 1
- Internet Line (Min. Speed 16Mb)
- Photocopier machine (A4/A3) 1
- HP ProBook Laptop according to the following: 4

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- Processor: Core I7 10th Gen
- RAM: 16 G Byte
- Hard disk: 1T SSD
- HP Desk Jet Printer (A4/A3) 1
- Dry Fire Extinguisher (5 kg) 3
- Digital Camera 1



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- Kitchen utilities 1
- Refrigerator 1
- Water, Café and tea service sets 1
- Supply of stationary required during the whole period of construction 1

Necessary watchman during day and night shall also be provided by the Contractor at his own expense.

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