HADID
Solar Energy

SOLAR ENERGY

www.hadidglobalbd@gmail.com
+880 13250-74100

Hadid Solar Panel

HIGH EFFICIENCY
MONO CRYSTALLINE MODULE

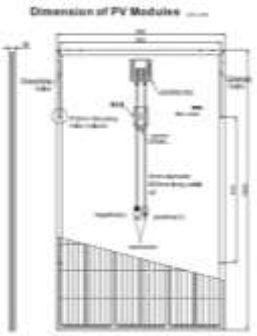
20.5%
Maximum Module Efficiency

0 ~+ 3W
Power Output Guarantee

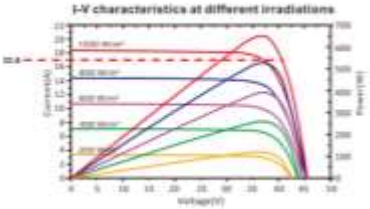
Technical Specifications

20 WP – 420 WP

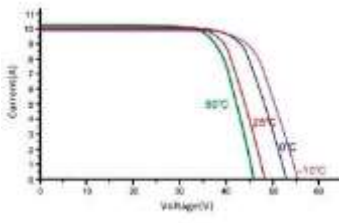
ELECTRICAL SPECIFICATION (STC)						
TYPE		**GP20M**	**GP30M**	**GP40M**	**GP50M**	**GP65M**
Maximum Power	Pmax(W)	20	30	40	50	65
Maximum Power Voltage	Vm(V)	18	18.9	119.5	19.15	19.95
Maximum Power Current	Im(A)	1.75	1.96	2.72	3.25	4.01
Open Circuit Voltage	Voc(V)	20.45	21.5	21.95	22.5	22.58
Short Circuit Current	Isc (A)	1.83	1.92	2.44	3.33	3.75
Power Output Tolerance	Pm(W)			0~+3		
Maximum System Voltage	(V)			1000		
Module Dimensions	(mm)	360*500*25	660*360*25	600*525*30	540*670*30	1000*540*30
Weight	(kg)	3	5	6	7	7.5



ELECTRICAL SPECIFICATION (STC)					
TYPE		**GP85M**	**GP100M**	**GP130M**	**GP150M**
Maximum Power	Pmax(W)	85	100	130	150
Maximum Power Voltage	Vm(V)	20.11	20.5	20.59	20.65
Maximum Power Current	Im(A)	4.72	5.35	6.92	9.06
Open Circuit Voltage	Voc(V)	22.59	22.65	22.71	22.75
Short Circuit Current	Isc (A)	4.33	5.25	6.25	8.33
Power Output Tolerance	Pm(W)			0~+3	
Maximum System Voltage	(V)			1000	
Module Dimensions	(mm)	1100*540*30	1100*670*30	1200*670*30	1480*670*35
Weight	(kg)	8	8.8	10.2	12



ELECTRICAL SPECIFICATION (STC)						
TYPE		**GP250M**	**GP290M**	**GP330M**	**GP350M**	**GP420M**
Maximum Power	Pmax(W)	250	290	330	350	420
Maximum Power Voltage	Vm(V)	32.52	32.52	32.52	38.95	41.96
Maximum Power Current	Im(A)	7.5	8.92	8.92	9.25	10.1
Open Circuit Voltage	Voc(V)	36.4	38.82	38.82	47.3	50.13
Short Circuit Current	Isc (A)	8.6	9.54	9.54	9.8	10.51
Power Output Tolerance	Pm(W)			0~+5		
Maximum System Voltage	(V)			1000		
Module Dimensions	(mm)	1640*992*35	1640*992*35	1640*992*35	1956*992*40	2010*1000*45
Weight	(kg)	18.6	18.6	18.6	22	28



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JA SOLAR

N-type Bifacial Double Glass
High Efficiency Mono Module

DEEP BLUE 4.0 Pro

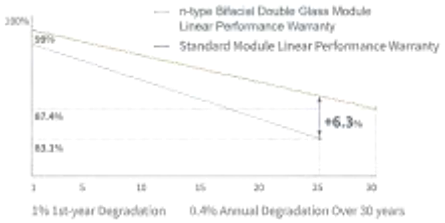
550 ~ 620 W

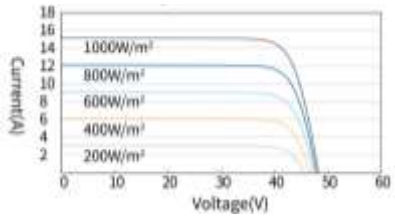
21.5%
Maximum Module Efficiency

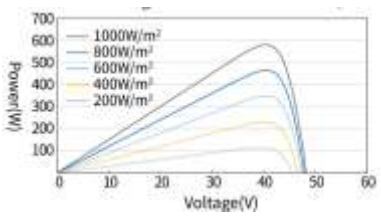
0 ~+ 5W
Power Output Guarantee

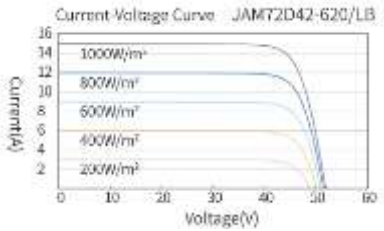
ELECTRICAL SPECIFICATION (STC)				
TYPE (STC)		**JAM72S30 -550/MR**	**JAM72D40 -580/LB**	**JAM72D42 -620/LB**
Maximum Power	Pmax(W)	550	580	620
Maximum Power Voltage	Vm(V)	49.9	51.6	52.07
Maximum Power Current	Im(A)	41.96	43.06	43.51
Open Circuit Voltage	Voc(V)	14	14.23	15.11
Short Circuit Current	Isc (A)	13.11	13,47	14.25
Module Efficiency	(%)	21.3	21.9	22.2
Power Output Tolerance	Pm(W)		0~+5	

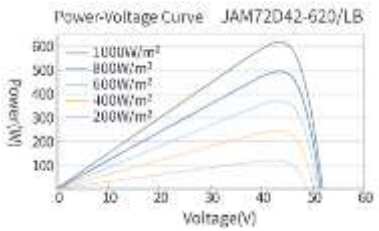
Values at Standard Test Conditions STC (Air Mass AM1.5, Irradiance $1000W/m^2$, Cell Temperature 25°C

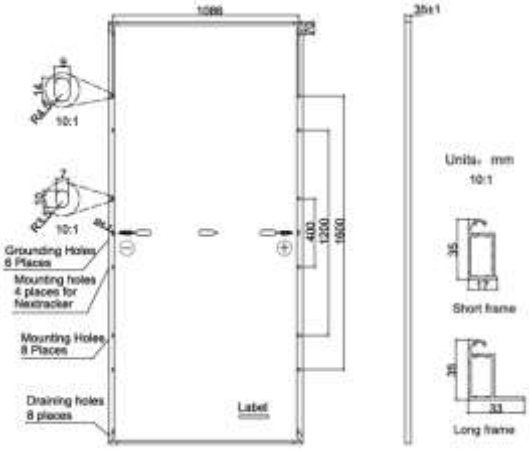












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CanadianSolar

700W N-TYPE BIFACIAL TOPCON TECHNOLOGY

ELECTRICAL DATA I STC*

	Nominal Max. Power (Pmax)	Opt.Operating Voltage (Vmp)	Opt.Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS7N-700TB-AG	700W	40.0V	17.51A	47.9V	18.49A
	735W	40.0V	18.39A	47.9V	19.41A
Bifacial Gain**	770W	40.0V	20.22A	47.9V	20.34A
	840W	40.0V	21.01A	47.9V	22.19A

ELECTRICAL DATA

Operating Temperature	-40° ~ + 85°C
Max. System Voltage	1500V (IEC/UL) or 1000V(IEC/UL)
Module Fire Performance	TYPE 29 (UL 61730) or CLASS C (IEC61730)
Max. Series Fuse Rating	35A
Application Classification	Class A
Power Bifaciality*	0.8
Power Tolerance	0 ~ + 10W

*Power Bifaciality = Pmax rear / Pmax front both Pmax rear and Pmax front are tested under STC, Bifaciality Tolerance: ±5%

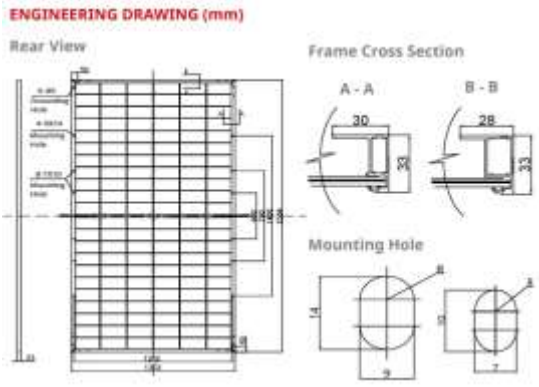
22.7%
Maximum Module Efficiency

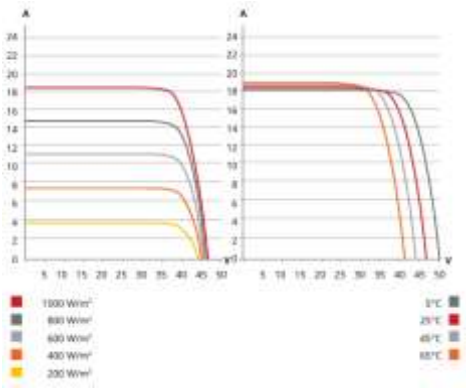
HiKu6 Mono PERC **550 W**

ELECTRICAL DATA I STC*		550MS
Maximum Power	Pmax (W)	550
Maximum Power Voltage	Vm (V)	41.7
Maximum Power Current	Im (A)	13.2
Open Circuit Voltage	Voc (V)	49.6
Short Circuit Current	Isc (A)	14

30 Years Linear Power Performance Warranty*

STC: Irradiance 1000W/M2, Cell Temperature 25°C , Air Mass AM1.5
NMOT: Irradiance at 800W/m2, Ambient Temperature 20°C, Air Mass AM1.5, Wind speed 1m/s.





HADID

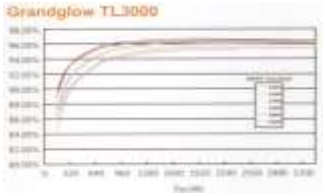
We are Sole Distributor of

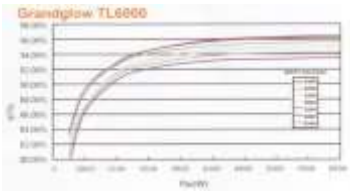
Grandglow® Solar String Inverter

Single Phase on Grid Inverter (1kW ~ 6kW)
Three Phase on Grid Inverter (3kW ~ 10kW)

Features

> With MPPT tacking system, MPPT efficiency 99.5%.
> Support multiple communication: RS485, RS232, WIFI, GPRS (Optional).
> Multiple Inverters can be operated in Parallel.
> 5 years warranty, can be extended to 10 years.
> OEM/ODM is available





Technical Specification

Model No.	Grandglow TL 1000	Grandglow TL 1500	Grandglow TL 2000	Grandglow TL 2500	Grandglow TL 3000	Grandglow TL 3600	Grandglow TL 4000	Grandglow TL 5000	Grandglow TL 6000
DC Input									
Max. DC Input Power	1100W	1600W	2300W	2700W	3200W	3800W	4200W	5400W	6500W
Max. Input Voltage	450V	450V	500V	500V	500V	500V	500V	500V	500V
Max. DC input Current	9A	10A	11A	12V	13A	17A	21A	26A	28A
MPPT Tracking Voltage Range	180~450V DC	180~450V DC	180~450V DC	180~450V DC	180~450V DC	180~450V DC	180~450V DC	180~450V DC	180~450V DC
MPPT Tracking Number	1	1	1	1	1	1	1/2	1/2	1/2
Power Off/ On Range	100/200V DC	100/200V DC	100/200V DC	100/200V DC	100/200V DC	100/200V DC	100/200V DC	100/200V DC	100/200V DC
AC Output									
Rated Power	1000W	1500W	2000W	2500W	3000W	3600W	4000W	5000W	6000W
Output Voltage Range	190-270v AC	190-270v AC	190-270v AC	190-270v AC	190-270v AC	190-270v AC	190-270v AC	190-270v AC	190-270v AC
Rated Voltage	230V AC	230V AC	230V AC	230V AC	230V AC	230V AC	230V AC	230V AC	230V AC
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Phase Number	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase
Power Factor	1	1	1	1	1	1	1/2	1/2	1/2
Max. Current	5A	7A	9A	11A	14A	15.5A	18A	23A	27A
Current THD	At rated power and in the sine wave<3.5%								
Max. Efficiency	97.60%	97.10%	97.40%	97.50%	97.50%	98.00%	98.00%	98.00%	98.00%
Europe Efficiency	96.50%	96.10%	96.20%	96.50%	97.00%	97.00%	97.20%	97.30%	97.00%
MPPT Efficiency	99.50%	99.50%	99.50%	99.50%	99.50%	99.50%	99.50%	99.50%	99.50%
Structure									
Protection Degree	P65	P65	P65	P65	P65	P65	P65	P65	P20
Cooling Method	Natural Cooling								Intelligent air Cooling
Noise	<50dB								

HADID

We are Sole Distributor of

Deye Solar String Inverter

1kW ~ 6kW (Single Phase)

3kW ~ 115kW (Three Phase)

Features

- 2 MPP trackers, Max. Efficiency up to 98.5%
- Zero export application, VSG application
- String intelligent monitoring
- Wide output voltage range
- Anti-PID function

Model	SUN-8K-G06	SUN-10K-G05	SUN-12K-G06	SUN-20K-G05	SUN-30K-G04	SUN-50K-G04	SUN100K-G03
INPUT SIDE							
Max. DC Input Power (KW)	10.4	13	15.6	26	39	65	150
Max. DC Input Voltage (V)		1100		1100	1100	1100	1100
Start-up DC Input Voltage (V)		140		250	250	250	250
MPPT Operating Range (V)		120-1000		200-1000	200-850	200-850	200-850
Max. DC Input Current (A)		13+13		26+26	40+40	40+40+40+40	40+40+40+40+40+40
Max. Short Circuit Current (A)		19.5+19.5		39+39	60+60	60+60+60+60	60+60+60+60+60+60
No. of MPP Trackers		2		2	2	4	6
No. of string per MPP Tracker		1+1		2+2	3+3	3+3+3+3	4+4+4+4+4+4
OUTPUT SIDE							
Rated Output Power (kW)	8	10	12	20	30	50	100
Max. Active power (kW)	8.8	11	13.2	22	33	55	110
Nominal Output Voltage / Range (V)				3L/N/PE220/380V, 230/400V			
Rated Grid Frequency (Hz)				50 / 60 (Optional)			
Operating Phase				Three Phase			
Rated AC Grid Output Current (A)	12.2/11.6	15.2/14.5	18.2/17.4	30.3/29	45.5/43.5	75.8/72.5	151.5/144.9
Max AC Output Current (A)	13.4/12.8	16.7/16	20/19.2	33.3/31.9	50/47.9	83.3/79.7	166.7/159.4
Output Power Factor				0.8 Leading to 0.8 lagging			
Grid Current THD				<3%			
DC Injection Current (mA)				<0.5%			
Grid Frequency Range				45~55 or 55~65 (Optional)			
EFFICIENCY							
Max. Efficiency		98.30%				98.50%	
Euro Efficiency		97.80%				98.00%	
MPP Efficiency				>99%			
PROTECTION							
DC Reverse Polarity Protection				Yes			
AC Short Circuit Protection				Yes			
AC Output Overcurrent Protection				Yes			
Output Overvoltage Protection				Yes			
Insulation Resistance Protection				Yes			
Ground Fault Monitoring				Yes			
Anti-islanding Protection				Yes			
Temperature Protection				Yes			
Integrated DC Switch				Yes			
Remote Software Upload				Yes			
Remote Change of Operating Parameters				Yes			
Surge Protection				DC Type II / AC Type II			
GENERAL DATA							
Grid Connection Standard				IEC 61727, IEC 62116, CEI 0-21,EN 50549, NRS 097, RD 140, UNE 217002, OVE-Richtlinie R25,G99,VDE-AR-N 4105			
Operating Surroundings Humidity				0-100%			
Safety EMC/ Standard				ICE/EN 61000-6-1/2/3/4, IEC/EN/ 62109-1, IEC/EN 62109-2			
FEATURES							
Display				LCD 1602			
Interface				RS485/RS232/Wifi/LAN			

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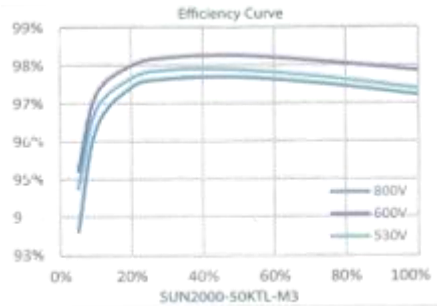
Channel Partner & Local Stocker of

HUAWEI

Grid Tie Inverter

Smart PV Controller

8kW ~ 100kW



Up to 30% More Energy with Optimizer

MODEL NO.	SUN2000-100KTL-M1	SUN2000-50KTL-M3	SUN2000-20KTL-M0
INPUT			
Max. Input Voltage	1,100V	1,100V	1,080V
Max.Current per MPPT	26A	20A	22A
Max. Short Circuit Current per MPPT	40A	30A	30A
Start Voltage	200V	200V	160V
MPPT Operating Voltage Range	200V ~ 1,00V	200V ~ 1,00V	160V ~ 950V
Rated Input Voltage	570V @380V;600V @400V;720V @480V	600V	600V
Number of Input	20	8	2
Number of MPP Trackers	10	4	2
OUTPUT			
Rated AC Active Power	100,000 W (380V /400V/ 480V @40°C)	50,000 W	20,000W
Max.AC Apparent Power	110,000 VA	55,000 VA	22,000 VA
Max.AC Active Power	110,000 W	55,000 W	22,000 W
Rated Output Voltage	380V / 400V / 480V ,3W+PE	400 Vac/480Vac,3w+(N)+PE	220 Vac/380 Vac, 230Vac/400Vac, 3W+N+PE
Rated AC Grid Frequency	50 Hz/ 60 Hz	50 Hz/ 60 Hz	50 Hz/ 60 Hz
Rated Output Current	152A @380V;144.4A @400V;120.3A @480V	72.2A @400Vac, 60.1A @480Vac	
Max. Output Current	168.8A @380V; 160.4A @400V;133.7A @480V	79.8A @400Vac, 66.5A @480Vac	33.5 A
Adjustable Power Factor	0.8 LG...0.8 LD	0.8 LG...0.8 LD	0.8 leading...0.8 lagging
Max. Total Harmonic Distortion	<3%	<3%	≤3%
PROTECION			
Input side Disconnection Device	Yes	Yes	Yes
Anti-islanding Protection	Yes	Yes	Yes
AC Overcurrent Protection	Yes	Yes	Yes
DC Reverse Polarity Protection	Yes	Yes	Yes
PV-array String Fault Monitoring	Yes	Yes	Yes
DC Surge Arrester	Type II	Type II	Type II
AC Surge Arrester	Type II	Type II	Type II
DC Insulation Resistance Detection	Yes	Yes	Yes
Residual Current Monitoring Unit	Yes	Yes	Yes
COMMUNICATION			
Display	LED Indicators ,APP	LED Indicators ,APP	
RS485	Yes	Yes	
Smart Dongle	No	Yes	
MBUS	Yes (Isolation Transformer Required)	Yes (Isolation Transformer Required)	
Max. Efficiency	98.80%	98.80%	98.65%

HADID

PRODUCTS AND SERVICES

- Design & Assembling PV Mounting Structure
- Supply & Installation Service
- Smart On-Grid Solution
- Smart Off-Grid Hybrid Solution
- Solar Net-Metering Service
- Smart Solar Irrigation Pump Solution
- Solar Street Light Solution
- Smart Design & Engineering Support
- After Sales Service
- Solar Inverter Service Center

Technical Specification	SmartLogger3000A03EU	SmartLogger3000A01EU
Device Management		
Max. Number of Connected Devices	80	
Communication Interface		
WAN	WAN x 1, 10 / 100 / 1000 Mbps	
LAN	LAN x 1, 10 / 100 / 1000 Mbps	
RS485	COM x 3, 1200 / 2400 / 4800 / 9600 / 19200 / 115200 bps, 1000 m	
MBUS	MBUS x 1, 115.2 kbps, Compatible with PLC	No MBUS Communication Interface
2G / 3G / 4G 1	LTE(FDD) : B1,B2,B3,B4,B5,B7,B8,B20 DC-HSPA+/HSPA+/HSPA/UMTS : 850/900/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz 2	
Digital / Analog Input / Output	DI x 4, DO x 2, AI x 4	
Active DO	12V, 100mA (connection with relay, sensor)	

Smart Data Logger

Dongle

Connect Inverters and Data Service
Via 4G connection, Smart Dongle supports up to 10 inverters to communicate with the solar management system through hassle-free plug and play.
Once plugged in, the WLAN access point can be used for local deployment to realize intelligent power management and plant maintenance. Both Fusion Solar Smart PVMS and the third-party management system can be bound to the inverters.
Being dustproof and waterproof for IP65 protection, Smart Dongle is ready to defy dust and rain after outdoor installation at any moment

By the term Solar panel mounting structures, we mean that these Solar panel mounting structures are the backbone of solar power plants. These structures provide support to the modules and uplift the solar panels so that they can absorb the maximum solar radiation.

There are five primary types of solar mounting structures.

1. RCC Roof Mounts
2. Ground Mounts
3. Solar Carports
4. Shed Mounts
5. Tracking structures

Mounting Structure

Solar Basic

Net Metering Calculation

1 sft Area can Generate **0.012289** kWp/h. Solar Power	
1 kW/h Solar Installation Require Area = **81.37516** sft	

Solaris PV Out

Average solar hour	4.00	Hour
PV Efficiency	90%	
Solar Output/day	3.6	KWh/KWp/day
Yearly	1314	KWh/KWp/Year

Tilt Angle (β)

General Rule: Set the tilt angle equal to the latitude of the location.
β=ϕ
Summer: Latitude minus 10° to 15°.
βsummer = ϕ−15
Winter: Latitude plus 10° to 15°.
βwinter=ϕ+15∘

For Dhaka, Bangladesh (latitude = 23.81°):

Year-round Tilt Angle: β = 23.81∘
Summer Tilt Angle: βsummer = 23.81∘ − 15∘ = 8.81∘
Winter Tilt Angle: βwinter = 23.81∘ + 15∘ = 38.81∘

Azimuth Angle (γ)

The azimuth angle (γ) for optimal energy capture in the northern hemisphere:
Optimal Azimuth Angle: γ =180 ∘ (true south)

Estimating Solar Irradiance (I)

Solar irradiance (I) on a tilted surface can be calculated using the following formula:
I = I direct · cos (θ) + I diffuse · F diffuse + I reflected · F reflected

Where:
• I direct: Direct solar irradiance.
• I diffuse: Diffuse solar irradiance.
• I reflected: Reflected solar irradiance.
• θ: Angle of incidence of the sunlight on the panel.
• F diffuse: Diffuse factor.
• F reflected: Reflected factor.

Energy Output (E)

Estimate the energy output of a solar panel system:
E = A · I · η · H
Where,
• A: Area of the solar panel (m²).
• I: Solar irradiance (W/m²).
• η: Efficiency of the solar panel.
• H: Number of sunlight hours per day.

Peak Sun Hours (PSH)

Estimate daily energy production:
E daily = P system· PSH
Where:
• E daily: Daily energy output (kWh).
• P system: System power rating (kW).
• PSH: Peak Sun Hours.

Inverter Sizing

Inverter should be sized to handle the peak power of the solar array:
P inverter = P array
Where:
• P inverter: Inverter power rating (kW).
• P array: Array power rating (kW).

Battery Storage

Sizing battery storage for a solar system:
C battery = (E daily x Days of Autonomy) / (Depth of Discharge x System Voltage)

Where:
• C battery: Battery capacity (Ah).
• E daily: Daily energy usage (Wh).
• Days of Autonomy: Number of days the system should operate without sunlight.
• Depth of Discharge (DoD): Percentage of battery capacity that can be used.
• System Voltage: Nominal voltage of the battery bank.

Array Size

Determine the size of the solar array needed:
P array = E daily / (PSH x η system)

Where:
P array: Array power rating (kW).
E daily: Daily energy usage (kWh).
PSH: Peak Sun Hours.
η system: System efficiency.

Cost Estimation

Estimating the cost of a solar system:
Total Cost=Cost per Watt × P system

Where:
• Cost per Watt: Cost of the system per watt of installed capacity.
• P system: System power rating (kW).

Head Office

House # 02 (1st Floor), Road # 12/A
Sector # 10, Uttara, Dhaka – 1100

Showroom

Shop no 41, Majed Sarder Tower, # 01
Hazi Osman Gani Road, Alu Bazar
Nawabpur, Dhaka – 1100

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Email: hadidglobalbd@gmail.com

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www.hadidglobal.com.bd