

4.8 kW Hybrid Solar Energy System

600W N-Type Panels | 10.24 kWh Lithium Battery | 5.5 kW Hybrid Inverter



ARDH NAJIM AL-ARAB AND CONTRACTING CO. LTD

Karadeh Street #18, Building #14, Room #113, District #905, Baghdad, Iraq

Postal code 10096 | Tax No. 900189176

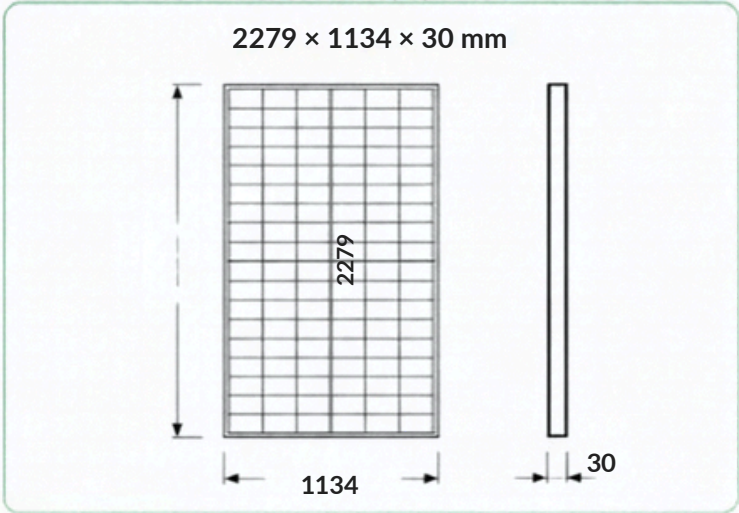
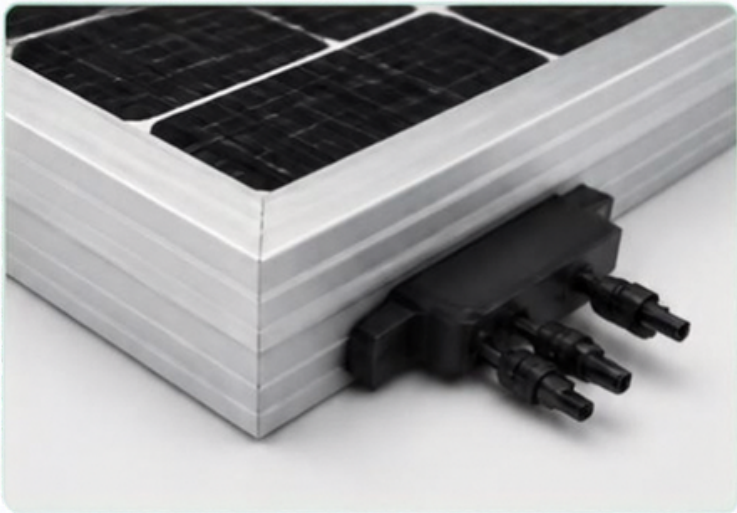
Tel: +964 790 634 2670 | ana-iq.com

600W Monocrystalline Solar Panel

Product Overview

High-efficiency 600W Half-Cell Monocrystalline Solar Panel powered by cutting-edge LONGi N-Type TOPCon cell technology. Engineered for superior energy yield, exceptional durability, and high resistance to cell micro-cracking.

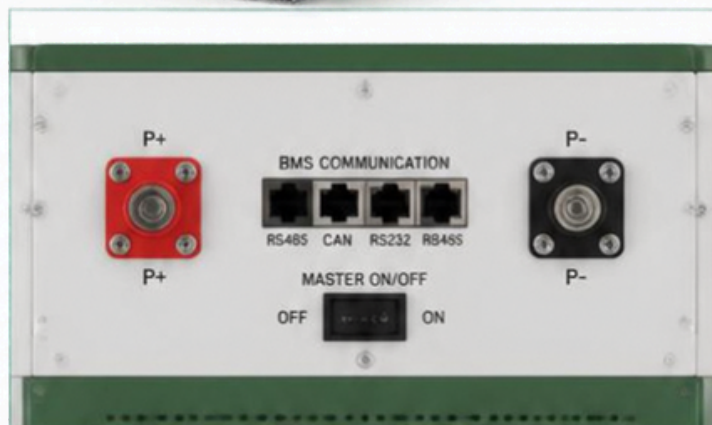
Parameter	Specification
Model & Type	TFD600W Half-Cell Monocrystalline
Solar Cell Type	LONGi N-Type TOPCon Solar Cell
Rated Maximum Power (Pmax)	600 W
Module Efficiency	23.22%
Voltage at Pmax (Vmp)	43.3 V
Current at Pmax (Imp)	13.86 A
Open-Circuit Voltage (Voc)	51.41 V
Package Quantity & Wiring	8 pcs (Connected in Series)
Dimensions	2279 × 1134 × 30 mm
Weight	31.2 kg
Structural Advantage	Strong Anti-Cracking Protection
Product Warranty	30 Years Warranty



10.24 kWh Lithium Energy Storage Battery

Product Overview

Premium 10.24 kWh Lithium Energy Storage System engineered with Grade-A prismatic cells and an integrated LCD monitor, designed specifically for residential and commercial solar backup applications.



Parameter	Specification
Model Number	TFES-S48200
Nominal Energy Capacity	10.24 kWh
Nominal Amp-Hour Capacity	200 AH
Nominal Voltage	51.2 V
Max Continuous Discharge Current	100 A
Cycle Life	6,000 Cycles
Cell Quality / Material	Grade A Material
Monitoring System	Integrated Digital LCD Display Monitor
Dimensions	580 x 230 x 680 mm
Application	Solar Power Storage & Backup
Product Warranty	5 Years Warranty

5.5 kW Hybrid Solar Inverter

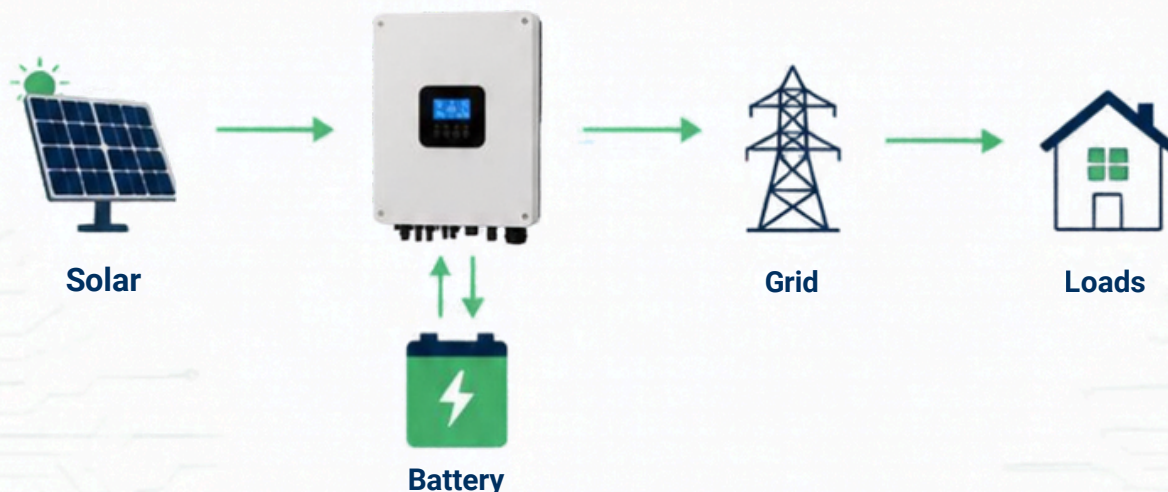


Product Overview

Smart 5.5 kW Hybrid Solar Inverter providing seamless power management between solar arrays, battery storage, and utility grid power with uninterrupted switchover.



Parameter	Specification
Rated AC Output Power	5.5 kW (5500 W)
Inverter Type	Hybrid (On-Grid / Off-Grid / Backup)
AC Output Voltage	230 V AC
Grid Frequency	50/60 Hz
Compatible Battery Voltage	48 V / 51.2 V DC
Product Warranty	5 Years Warranty



Mounting Rack & Electrical Accessories



Section 1: Panel Mounting Rack

Installation Compatibility: Sloped Rooftop / Flat Rooftop / Ground Mounting.

Angle Adjustment: Fully Angle-Adjustable for optimal solar irradiance.

Construction Material: Anodized Aluminum + Stainless Steel fasteners.

Wind Load Resistance: Up to 55 m/s.

Snow Load Capacity: 1.5 kN/m².



Section 2: Solar Cables & Safety Components

Battery Power Cables: 16 mm² Power Cable, 2 meters × 2 pcs.

Solar PV Cable: 4 mm² Dedicated PV Cable, 100-meter spool.

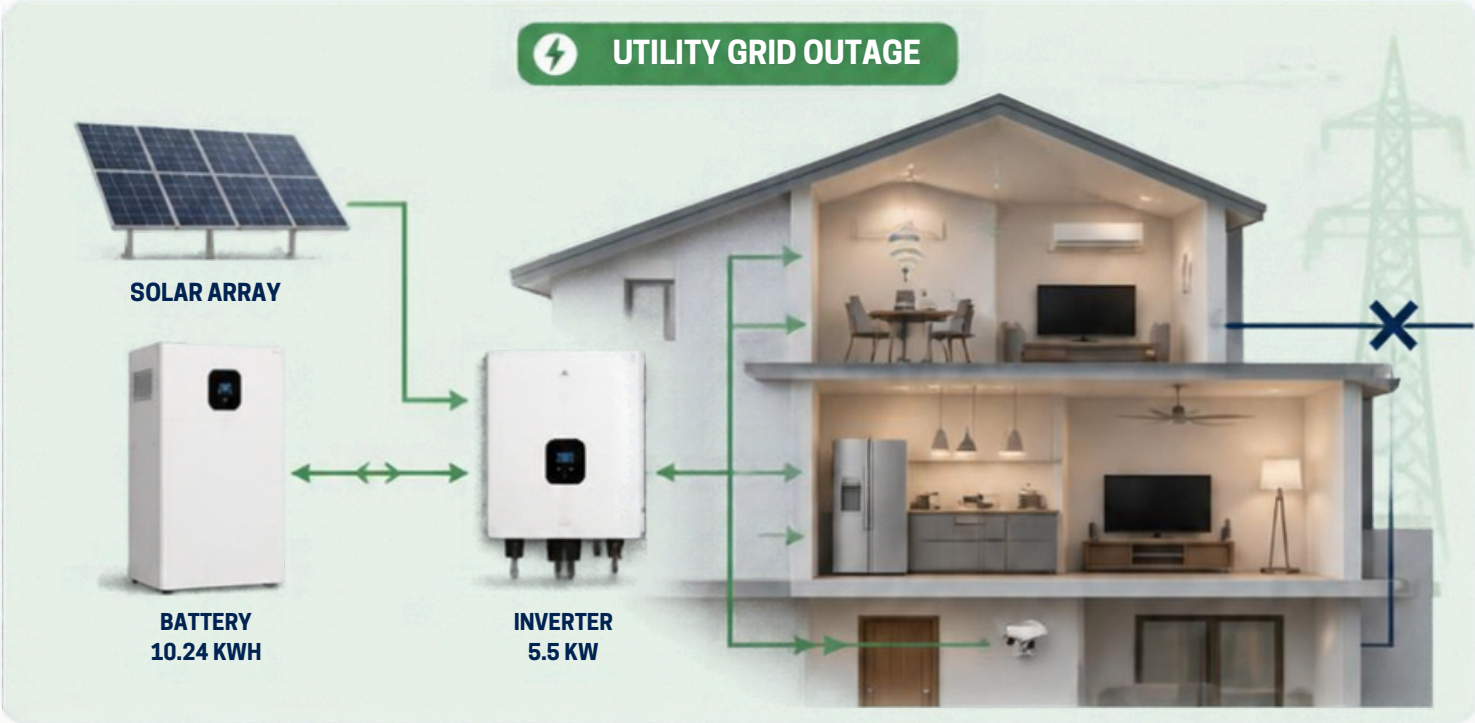
Cable Terminals: 2 pcs Heavy-Duty Cable Terminals.

Battery Circuit Breaker: 1 pc. 2-Pole (2P) 32A DC Battery Isolation Switch.



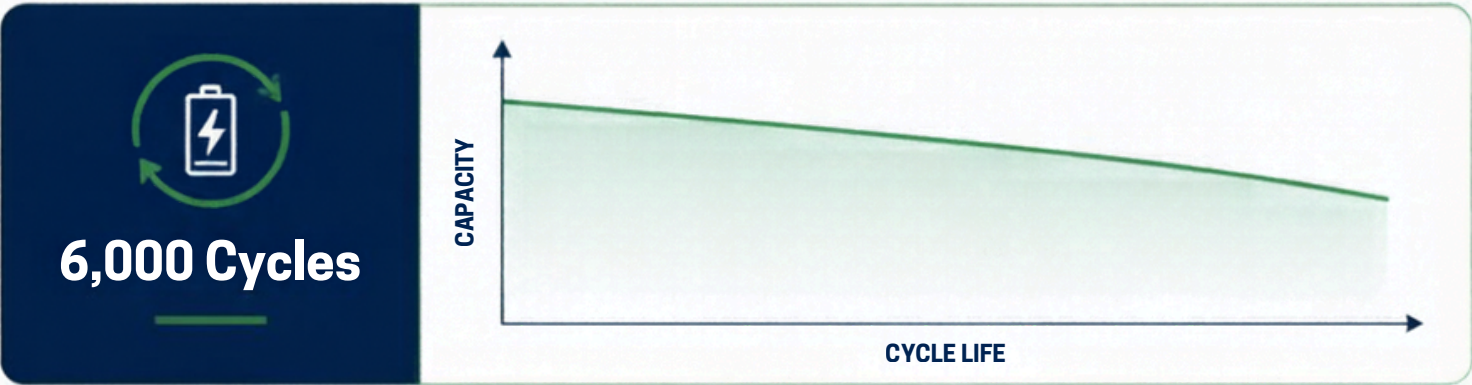
Power Outage Capability & Backup Analysis

During a utility grid failure, this integrated system (10.24 kWh Battery + 5.5 kW Inverter + 4.8 kW Solar Array) provides reliable backup capability according to the following operational scenarios:



Outage Performance & Backup Runtime Matrix:

Usage Scenario	Connected Appliances / Equipment	Average Power Load	Est.Runtime (Battery Alone)	Daytime Performance (With Solar Generation)
Level 1: Essential / Critical	Refrigerator, Full LED Lighting, Wi-Fi router, Laptop/Phone charging, Security/CCTV	400 W – 500 W	~ 20 to 22 Hours	Continuous / Unlimited (Solar array recharges battery concurrently)
Level 2: Standard Residential / Office	Refrigerator, Lighting, Workstations/PCs, TV, Fans, Intermittent Water Pump	1,000 W – 1,200 W	~ 8 to 10 Hours	Continuous during daylight + Full power throughout the night
Level 3: Heavy Loads & Cooling	Inverter Air Conditioner (up to 12k BTU) + Refrigerator + Basic loads	2,000 W – 2,500 W	~ 4 to 5 Hours	Directly powered by solar during peak hours; battery used for transitions
Level 4: Maximum Inverter Load	Simultaneous heavy appliances / workshop tools up to inverter threshold	5,000 W – 5,500 W	~ 1.8 to 2 Hours	Operates up to full inverter rated capacity (5.5 kW) via combined solar + battery



Backup Power during Grid Outages

Basis: 10.24 kWh battery, approx. 9 kWh usable energy (90% depth of discharge, incl. inverter losses). Runtimes below are for battery-only operation (night, no solar).

Runtime per appliance (used alone)

Appliance	Approx. Power	Qty	Backup Runtime
LED Lights	100 W (10 lamps × 10 W)	10	~90 hours
Refrigerator	200 W (avg. ~100 W due to compressor cycling)	1	~90 hours (3–4 days)
Television	120 W	1	~75 hours
Computer	150 W each (300 W total)	2	~30 hours
Water Pump	750 W	1	~12 hours continuous operation

Runtime with simultaneous use

Scenario	Total Load	Backup Runtime
Lights + Refrigerator + TV + 2 Computers	~620 W	~14 hours
Same + Water Pump (1 hour total per day)	~620 W + pump	~13 hours
All appliances running continuously (pump always on)	~1,470 W	~6 hours

Daytime operation: The 4.8 kW solar array generates approx. 18–20 kWh per day in good sunlight (output is lower on cloudy or dusty days). With typical household loads (first scenario above), the system powers all loads directly from solar during the day while recharging the battery at the same time, so extended outages can be covered without interruption.

Designed capacity: Suitable for a home or small office with a daily consumption of approx. 10–15 kWh. Maximum simultaneous load is 5.5 kW (inverter rating). The system can run one 12,000 BTU inverter air conditioner during daytime, but it is not designed for multiple air conditioners or electric heaters.

Note: Runtimes are estimates and vary with appliance efficiency, usage patterns and battery condition.