

HYD 3000/4000/5000/6000-ES

User Manual



2018-8-16

Version V1.00



HYD-ES inverter Introduction

The HYD-ES hybrid inverter is used in PV system with battery storage.

Energy produced by the PV system will be optimized for maximum self-consumption.

The HYD-ES inverter can work in auto or time-of-use (TOU) mode, charge / discharge the battery when needed. In auto mode, the HYD-ES inverter will charge surplus PV energy into the battery & discharge battery to supply power to local load when PV energy is not enough.

In case of blackout, HYD-ES inverter can work in Emergency Power Supply (EPS) mode. HYD-ES inverter will utilize power from PV panels & energy stored in the battery to supply power to critical load.



Fig. 1 HYD-ES inverter schematic diagram

Technical Data

Model	HYD 3000-ES	HYD 4000-ES	HYD 5000-ES	HYD 6000-ES
Battery Parameters				
Battery Type	Lead-acid, Lithium-ion			
Nominal battery voltage	48V			
Battery voltage range	42 - 58V			
Recommended battery capacity	200Ah (100 – 500 Ah optional)			
Recommended storage capacity	9.6 kWh			
Max charge current	60A			
Charge current range	0 – 65A programmable			
Charge curve	3 - stage adaptive with maintenance			
Max discharge current	0 – 70A programmable			
Battery protection	Over voltage protection / Over current protection / Over temperature protection			
Depth of discharge	Lithium: 0 – 80% DOD adjustable			
	Lead acid: 0 – 50% DOD adjustable			
PV parameters				
The max input power	3500W	4400W	5500W	6600W
Max DC power for single MPPT	2000W (160V-520V)	2600W (200V-520V)	3000W (250V-520V)	3500W (300V-520V)
The max DC input voltage	600V			
Start-up DC voltage	120V			
Nominal DC Voltage	360V			
MPPT operating voltage range	90-580V			
Full load DC voltage range	160V-520V	200V-520V	250V-520V	300V-520V
MPPT number	2			
The max DC input current	12A/12A			
The max DC input short current	15A/15A			
AC parameters				
Max output power	3000W	4000W	5000W	6000W
Max output current	13.7A	18.2A	22.8A	27.3A
Nominal grid voltage & frequency	230V, 47 – 53Hz or 57 – 63Hz			
AC voltage range	150 – 275V (according to local authority requirements)			
THDi	<3%			

Power factor	1 (+ / - 0.8 adjustable)
Inrush current	0.8A / 1us
Max output fault current	100A / 1us
System parameters	
Max efficiency	Charge: 94.1% / discharge 94.3%
Standby losses	< 8W (PV SPS)
Topology	High frequency transformer isolated
Ingress protection ratings	IP 65
Safety protection	Anti-islanding, RCMU, ground fault monitoring
Communication	Wi-Fi, RS485, CAN2.0B
Environmental data	
Ambient temperature range	-25C to +60C (derating above +45C)
Relative humidity range	0% - 100% (no condensing)
Protective class	Class I
Max operating altitude	2000m
Current transformer connection	Hard wired
General data	
Noise	<25dB
Weight	20.5kg
Cooling	Natural convection
Dimensions (W*H*D)	532 x 360 x 173 mm
Display	LCD display
Warranty	5 years
EPS (Emergency Power Supply) data	
EPS rated power	3000VA
EPS nominal voltage/frequency	230V, 50/60Hz
EPS rated current	13A
THDi	<3%
Switch time	20mS default



Residential BESS

US5000



Safety

Multi-protection from self developed BMS



Optimal Electricity Cost

Long cycle life and superior performance



Compact Size & East Installation

Module design help for quick installation



Easy to Scale Up

Be workable to be parallel based on 48V



Compatibility

Compatible with Tier 1 inverter brands

PYLON

SPECIFICATION



Module

US5000

US5000-B

Basic Parameters

Nominal Voltage (Vdc)		48	48
Nominal Capacity(Wh)		4800	4800
Depth of discharge (%)		95	95
Usable Capacity(Wh)		4560	4560
Dimension(mm)		442*420*161	442*420*161
Weight (Kg)		38	39
Discharge Voltage (V)		44.5 ~ 53.5	44.5 ~ 53.5
Charge Voltage (V)		52.5 ~ 53.5	52.5 ~ 53.5
Charge/Discharge Current (A)	Recommend	75	75
Charge/Discharge Current(A)	Max.	120@15min	120@15min
Charge/Discharge Current (A) 2	Peak 2	200@15sec	200@15sec
Communication		RS485, CAN	RS485, CAN
Configuration (max. in 1 battery group)		16pcs	16pcs
Working Temperature	Charge	0°C ~55°C	0°C ~55°C
Working Temperature	Discharge	-10°C ~55°C	-10°C ~55°C
Shelf Temperature		-20°C ~60°C	-20°C ~60°C
Short current/duration time		<4000A/2ms	<4000A/2ms
Cooling type		Natural	Natural
Breaker		No	Yes
IP rating of enclosure		IP20	IP20
Humidity		5% ~ 95%(RH) No Condensation	5% ~ 95%(RH) No Condensation
Altitude(M)		<4000	<4000
Certification		IEC / CE / UN38.3/UL	IEC / CE / UN38.3/UL
Design life		15+ Years (25°C/77°F)	15+ Years (25°C/77°F)
Cycle Life		>6,000 25°C	>6,000 25°C
Reference to standards)		IEC62619, IEC63056,CE, UN38.3,UL1973, UKCA	IEC62619, IEC63056,CE, UN38.3,UL1973, UKCA,CEC

HiPower Series

144-CELL HALF CUT MONOCRYSTALLINE
SOLAR MODULE

450 Watt

STPXXXS - B72H/Vnh



Features



High power output

Compared to 158.75mm module, the power output can increase 25W-30W



Suntech current sorting process

System output maximized by reducing mismatch losses up to 2% with modules sorted & packaged by amperage



Excellent weak light performance

More power output in weak light condition, such as haze, cloudy, and morning



Lower operating temperature

Lower operating temperature and temperature coefficient increases the power output



Extended load tests

Module certified to withstand front side maximum static test load (5400 Pascal) and rear side maximum static test loads (3800 Pascal) *



Withstanding harsh environment

Reliable quality leads to a better sustainability even in harsh environment like desert, farm and coastline

Certifications and standards:
IEC 61215, IEC 61730, conformity to CE



Trust Suntech to Deliver Reliable Performance Over Time

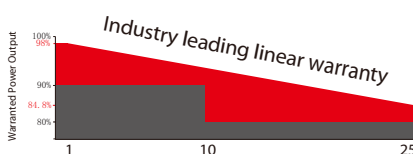
- World-class manufacturer of crystalline silicon photovoltaic modules
- Unrivaled manufacturing capacity and world-class technology
- Rigorous quality control meeting the highest international standards: ISO 9001, ISO 14001 and ISO17025
- Regular independently checked production process from international accredited institute/company
- Long-term reliability tests
- 2 × 100% EL inspection ensuring defect-free modules

Special Cell Design



The unique cell design leads to reduced electrodes resistance and smaller current, thus enables higher fill factor. Meanwhile, it can reduce losses of mismatch and cell wear, and increase total reflection.

Industry-leading Warranty based on nominal power



- 98% in the first year, thereafter, for years two (2) through twenty-five (25), 0.55% maximum decrease from MODULE's nominal power output per year, ending with the 84.8% in the 25th year after the defined WARRANTY STARTING DATE.****
- 15-year product warranty
- 25-year linear performance warranty

IP68 Rated Junction Box



The Suntech IP68 rated junction box ensures an outstanding waterproof level, supports installations in all orientations and reduces stress on the cables. High reliable performance, low resistance connectors ensure maximum output for the highest energy production.

* Please refer to Suntech Standard Module Installation Manual for details. **WEEE only for EU market.

*** Please refer to Suntech Product Warranty for details.
made in China & Vietnam

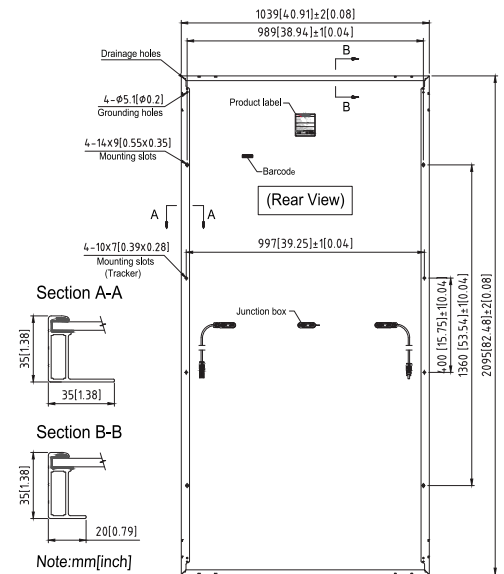
Electrical Characteristics

STC	STPXXS-B72H/Vnh				
Maximum Power at STC (Pmax)	450 W	445 W	440 W	435 W	430 W
Optimum Operating Voltage (Vmp)	41.4 V	41.2 V	41.0 V	40.8 V	40.6 V
Optimum Operating Current (Imp)	10.87 A	10.81 A	10.74 A	10.67 A	10.60 A
Open Circuit Voltage (Voc)	49.2 V	49.0 V	48.8 V	48.6 V	48.4 V
Short Circuit Current (Isc)	11.61 A	11.54 A	11.47 A	11.40 A	11.32 A
Module Efficiency	20.7%	20.4%	20.2%	20.0%	19.8%
Operating Module Temperature	-40 °C to +85 °C				
Maximum System Voltage	1500 V DC (IEC)				
Maximum Series Fuse Rating	20 A				
Power Tolerance	0/+5 W				

STC: Irradiance 1000 W/m², module temperature 25 °C, AM=1.5;
Tolerance of Pmax is within +/- 5% and tolerances of Voc and Isc are within +/- 5%.

NMOT	STPXXS-B72H/Vnh				
Maximum Power at NMOT (Pmax)	339.4 W	335.8 W	332.7 W	327.7 W	324.6 W
Optimum Operating Voltage (Vmp)	38.2 V	38.0 V	37.8 V	37.6 V	37.5 V
Optimum Operating Current (Imp)	8.89 A	8.84 A	8.78 A	8.73 A	8.67 A
Open Circuit Voltage (Voc)	46.2 V	46.0 V	45.8 V	45.5 V	45.4 V
Short Circuit Current (Isc)	9.37 A	9.31 A	9.25 A	9.20 A	9.13 A

NMOT: Irradiance 800 W/m², ambient temperature 20 °C, AM=1.5, wind speed 1 m/s.



Temperature Characteristics

Nominal Module Operating Temperature (NMOT)	42 ± 2 °C
Temperature Coefficient of Pmax	-0.36%/°C
Temperature Coefficient of Voc	-0.304%/°C
Temperature Coefficient of Isc	0.050%/°C

Mechanical Characteristics

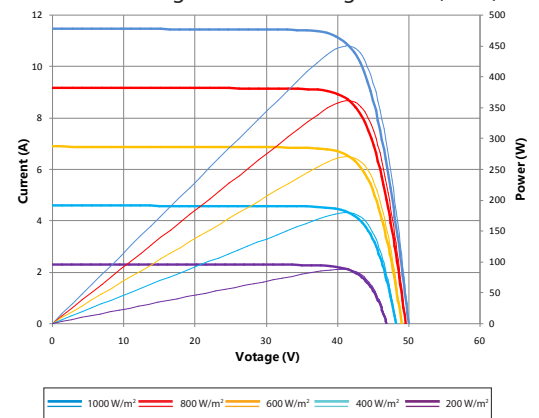
Solar Cell	Monocrystalline silicon 166 mm
No. of Cells	144 (6 × 24)
Dimensions	2095 × 1039 × 35 mm (82.5 × 40.9 × 1.4 inches)
Weight	24.5 kgs (54.0 lbs.)
Front Glass	3.2 mm (0.13 inches) tempered glass
Frame	Anodized aluminium alloy
Junction Box	IP68 rated (3 bypass diodes)
Output Cables	4.0 mm ² , Portrait: (-)350 mm and (+)160 mm in length Landscape: (-)1400 mm and (+)1400 mm in length or customized length
Connectors	Genuine MC4 EVO2, TL-Cable01S
Fire Class Rating	C in accordance with UL 790

Packing Configuration

Container	20' GP	40' HC
Pieces per pallet	31	31
Pallets per container	5	22
Pieces per container	155	682
Packaging box dimensions	2125×1130×1205 mm	
Packaging box weight	812 kg	

Information on how to install and operate this product is available in the installation instruction. All values indicated in this data sheet are subject to change without prior announcement. The specifications may vary slightly. All specifications are in accordance with standard EN 50380. Color differences of the modules relative to the figures as well as discolorations of/in the modules which do not impair their proper functioning are possible and do not constitute a deviation from the specification.

Current-Voltage & Power-Voltage Curve (450S)



Dealer information

