Solar Panels and String Inverter

Included in your standard package.

JA Solar 440W

The JA Solar 440W Mono MBB PERC LR Half-Cell All Black Panel stands out in the market for its advanced monocrystalline technology and aesthetically pleasing all-black design.

Efficiency	22%
Weight	20kg
Dimensions (W x H x D)	1722 x 1134 x 30 (mm)
Warranty	25 year product warranty 25 year performance warranty

Solis String inverter

Solis 6 is the latest generation of residential inverters from Solis. This range of inverters are leaders in small residential and commerical rooftop installations.

Efficiency	>97%
Weight	18.3 kg
Dimensions (W x H x D)	333 x 505 x 249 mm
Warranty	10 year warranty

Fastensol Pitched Roof Mounting System: Fastensol's roof mounting kit ensures a quick, secure, and hassle-free set-up that optimises panel positioning for optimum solar energy generation and system longevity.

Batteries and Hybrid Inverter

Included in your standard package if selected.

PowerDepot H5B

PowerDepot H5B is a low-voltage product designed for residential application. The reliable lithium iron phosphate (LFP) technology ensures maximum safety and longer cycle life. It can be used flexibly for self-consumption and backup applications with a wide capacity range scalable from 5.12kWh to 25.6kWh to meet various energy storage needs.

Depth of discharge	90%
Weight	55kg
Warranty	10 Year Warranty
Dimensions (W x H x D)	574 x 228 x 600 mm

Solis Energy Storage Hybrid 5G Inverter with DC switch

Solis new 5G Hybrid inverter range that supports power for important loads during load shedding as well as saving power during peak demands.

Efficiency	>97%
Weight	18.3kg
Warranty	10 Year Warranty
Dimensions (W x H x D)	333 x 505 x 249 mm

Additional Products

These are not included in your standard package. You may choose to add them to your package following your survey.

Tigo TS4-A-O Optimisers Boost and monitor your solar efficiency with Tigo Optimisers, engineered to enhance energy output from each individual panel, ensuring your solar system operates at peak performance, regardless of shading.

£ 55.00 per panel

Pigeon protection wiring for solar panels involves installing a mesh around the panels to prevent pigeons from nesting underneath. This helps maintain panel efficiency by preventing debris buildup and damage, using durable, weather-resistant materials.

£ 35.00 per panel

Solar iBoost Hot Water Device Maximise your solar usage with the Solar iBoost, a smart device that diverts excess solar energy to heat your water, reducing your energy bills and contributing to a greener, more sustainable lifestyle.

£ 550.00

EPS or Emergency Power supply refers to a Solar PV System's ability to automatically or manually change over to powering your essential circuits from your battery storage system, in the case of a power cut.

£ 550.00

Solar Panel Pricing

The standard package includes solar panels, inverter and mounting system with full installation, 10 year warranties and online monitoring. Standard installation includes 1 side of scaffolding up to 2 storeys, additional scaffolding may be charged seperately. Prices include 0% VAT; commercial customers pay 20% VAT.

Panel System Size	Price
4 panels	£ 2,675.00
5 panels	£ 2,846.00
6 panels	£ 2,883.00
7 panels	£ 3,001.00
8 panels	£ 3,135.00
9 panels	£ 3,352.00
10 panels	£ 3,497.00
11 panels	£ 3,689.00
12 panels	£ 3,880.00
13 panels	£ 4,147.00
14 panels	£ 4,313.00

Panel System Size	Price
15 panels	£ 4,567.00
16 panels	£ 4,676.00
17 panels	£ 4,838.00
18 panels	£ 4,999.00
19 panels	£ 5,365.00
20 panels	£ 5,489.00
21 panels	£ 5,620.00
22 panels	£ 5,751.00
23 panels	£ 5,883.00
24 panels	£ 6,014.00
25 panels	£ 6,119.00

If you want more than 25 panels, please speak to your installer.

Battery Size Options

System size	Usable Capacity	Price
Small	4.6 kWh	£ 2,119.00
Medium	9.2 kWh	£ 3,148.00
Large	13.8 kWh	£ 4,662.00

JA SOLAR | DEEP BLUE 3.0 Pro

Version No. : **Global-EN-20230921A**

440W MBB LR Series

- Higher output power
- Lower LCOE
- Better mechanical loading tolerance
- Less shading and lower resistive loss

- 15-year product warranty
- 25-year linear power output warranty

Half-cell Module
JAM54S31 LR
415-440

Comprehensive Certificates

- IEC 61215, IEC 61730,UL 61215, UL 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems
- IEC 62941: 2019 Terrestrial photovoltaic (PV) modules - Quality system for PV module manufacturing

JA SOLAR | DEEP BLUE 3.0 Pro

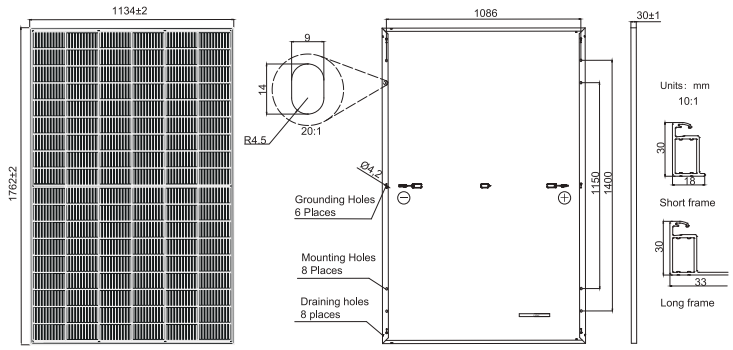
www.jasolar.com
Specifications subject to technical changes and tests.
JA Solar reserves the right of final interpretation.

440W

415-440

JAM54S31

LR Series



Remark: customized frame color and cable length available upon request

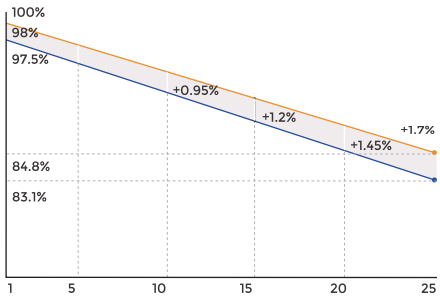
Cell	Mono
Weight	20kg
Dimensions	1762±2mm×1134±2mm×30±1mm
Cable Cross Section Size	4mm² (IEC), 12 AWG(UL)
No. of cells	108(6x18)
Junction Box	IP68, 3 diodes
Connector	QC 4.10-351/ MC4-EVO2A
Cable Length (Including Connector)	Portrait: 300mm(+)/400mm(-); Landscape: 1200mm(+)/1200mm(-)
Front Glass	2.8mm
Packaging Configuration	36pcs/Pallet, 936pcs/40ft Container

ELECTRICAL PARAMETERS AT STC

TYPE	JAM54S31 -415/LR	JAM54S31 -420/LR	JAM54S31 -425/LR	JAM54S31 -430/LR	JAM54S31 -435/LR	JAM54S31 -440/LR
Rated Maximum Power(Pmax) [W]	415	420	425	430	435	440
Open Circuit Voltage(Voc) [V]	37.55	37.73	37.91	38.09	38.27	38.45
Maximum Power Voltage(Vmp) [V]	30.92	31.11	31.30	31.49	31.68	31.86
Short Circuit Current(Isc) [A]	14.17	14.25	14.33	14.42	14.50	14.58
Maximum Power Current(Imp) [A]	13.42	13.50	13.58	13.65	13.73	13.81
Module Efficiency [%]	20.8	21.0	21.3	21.5	21.8	22.0
Power Tolerance	0~+5W					
Temperature Coefficient of Isc(α_Isc)	+0.045% ℃					
Temperature Coefficient of Voc(β_Voc)	-0.275%/ ℃					
Temperature Coefficient of Pmax(γ_Pmp)	-0.350%/ ℃					
STC	Irradiance 1000W/m², cell temperature 25 ℃, AM1.5G					

Superior Warranty

0.55% Annual Degradation Over 25 years



- New linear power warranty
- Standard module linear power warranty

*Subject to the terms and conditions contained in the Limited Warranty Statement.
Also this 15-year limited product warranty is available only for products installed and operating on residential rooftops in certain regions.

ELECTWRICAL PARAMETERS AT NOCT

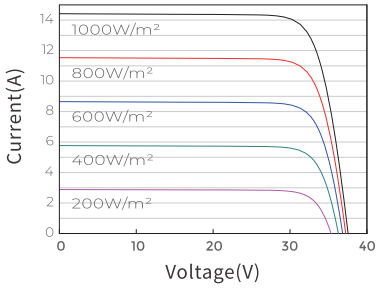
TYPE	JAM54S31 -415/LR	JAM54S31 -420/LR	JAM54S31 -425/LR	JAM54S31 -430/LR	JAM54S31 -435/LR	JAM54S31 -440/LR
Rated Max Power(Pmax) [W]	314	318	322	326	329	333
Open Circuit Voltage(Voc) [V]	35.53	35.70	35.87	36.04	36.21	36.38
Max Power Voltage(Vmp) [V]	29.26	29.44	29.62	29.80	29.98	30.15
Short Circuit Current(Isc) [A]	11.33	11.40	11.47	11.53	11.60	11.67
Max Power Current(Imp) [A]	10.74	10.80	10.86	10.92	10.99	11.05
NOCT	Irradiance 800W/m², ambient temperature 20 ℃, wind speed 1m/s, AM1.5G					

OPERATING CONDITIONS

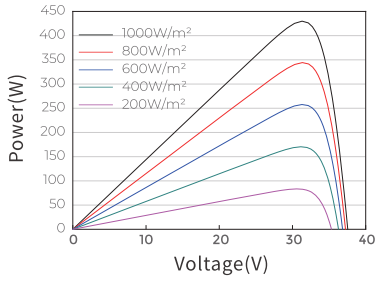
Maximum System Voltage	1000V/1500V DC
Operating Temperature	-40 ℃~+85 ℃
Maximum Series Fuse Rating	25A
Maximum Static Load,Front*	5400Pa(112lb/ft²)
Maximum Static Load,Back*	2400Pa(50lb/ft²)
NOCT	45±2 ℃
Safety Class	Class Ⅱ
Fire Performance	UL Type 1

CHARACTERISTICS

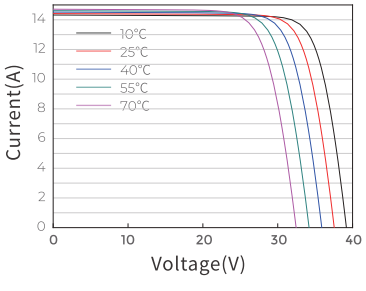
Current-Voltage Curve **JAM54S31-430/LR**



Power-Voltage Curve **JAM54S31-430/LR**



Current-Voltage Curve **JAM54S31-430/LR**



PowerDepot H5B

PowerDepot H5B is a low-voltage product designed for residential application. The reliable lithium iron phosphate (LFP) technology ensures maximum safety and longer cycle life. It can be used flexibly for self-consumption and backup applications with a wide capacity range scalable from 5.12kWh to 25.6 kWh, to meet various energy storage needs.

APP Monitoring (optional)
Real-time monitoring
& Remote upgrade available

High Protection Level
Indoor & outdoor options

Various Mounting Methods
Wall-mounted
or floor-standing installations

High Safety
LFP & smart BMS

Wide Compatibility
Matching with leading inverters

Technical Specifications

Model	PowerDepot H5B
Battery Type	LiFePO4
Nominal Battery Energy	5.12 kWh
Operating voltage	44.8 ~ 57.6V
Nominal Voltage	51.2V
Nominal Capacity	100Ah
Max. output power	3.84kW
Recomended Charge & Discharge C Rate	0.5C
Recommended Charge/Discharge Current	50A
Recommended Depth of Discharge (DOD)	90%
Net Weight	55 kg
Dimension[W*D*H]	574*228*600 mm
Charging Temp. Range	0~55°C
Discharging Temp. Range	-20~55°C
Communication	CAN/RS485/RS232
Cycle Life[1]	≥6000 Cycles
Protection Level	IP65
Expansion	Up to 5 units in parallel
Color	White
Alarms	Overcharge/Over-discharge/Overcurrent/Overtemperature/Short Circuit
Monitoring & Protection	Each system has smart BMS, breaker embedded in system
Pros	Can be used in both off-grid and hybrid setups, compact design, floor or wall-mounted
Certification & Safety Standard	UN38.3/CE-EMC/IEC62619/IEC62040/IEC60730 /GOST-R/UKCA/CEC Accredited
Compatible Inverters	SMA/Victron/Ingeteam/Delios/Goodwe/Solis /Deye/SAJ/Voltronic/Sungrow etc.

[1] Test conditions: 0.2C Charging& Discharging. @25* ℃, 80% DOD

S5-EH1P(3-6)K-L

Solis Energy Storage Inverters

>> Models:

S5-EH1P3K-L

S5-EH1P3.6K-L

S5-EH1P4.6K-L

S5-EH1P5K-L

S5-EH1P6K-L

360° View

Features:

- Max. string input current **15A**
- Uninterrupted power supply, 20ms reaction
- 5kW backup power to support more important loads
- With shifting and peak shaving capabilities friendly to grid
- Multiple working modes to make maximize self-consumption, increase benefit
- Higher charge-discharge efficiency, improving the economic benefits
- AFCI protection, proactively reduces fire risk
- Compatible with lithium & lead-acid batteries, increased more choice in different markets
- Fanless design, long lifespan
- Intelligent EMS function, improving battery's reliability
- With high-frequency isolation technology, making system safer and long lifespan
- 24-hour fully intelligent energy management, Real-time grasp of PV plant status
- Remotely control & upgrade function, making digital power plant maintenance at your fingertips

DATASHEET

S5-EH1P(3-6)K-L

Models	3K	3.6K	4.6K	5K	6K
Input DC (PV side)					
Recommended max. PV power	4.8 kW	5.7 kW	8 kW	8 kW	8 kW
Max. input voltage	600 V				
Rated voltage	330 V				
Start-up voltage	120 V				
MPPT voltage range	90-520 V				
Max. input current	15 A / 15 A				
Max. short circuit current	22.5 A / 22.5 A				
MPPT number/Max. input strings number	2/2				
Battery					
Battery type	Li-ion / Lead-acid				
Battery voltage range	42 - 58 V				
Battery capacity	50 - 2000 Ah				
Max. charge / discharge power	3 kW		5 kW		
Max. charge / discharge current	62.5 A		100 A		
Communication	CAN				
Output AC (Back-up)					
Rated output power	3 kW		5 kW		
Max. apparent output power	4.5 kVA, 10SEC		7 kVA, 10SEC		
Back-up switch time	<20 ms				
Rated output voltage	1/N/PE, 220 V / 230 V				
Rated frequency	50 Hz / 60 Hz				
Rated output current	14 A / 13.5 A		23 A / 22 A		
THDv (@linear load)	<2%				
Input AC (Grid side)					
Input voltage range	187-265 V				
Max. input current	20.5 A / 20 A	25 A / 23.5 A	31.5 A / 30 A	34.5 A / 33 A	34.5 A / 33 A
Frequency range	45-55 Hz / 55-65 Hz				
Output AC (Grid side)					
Rated output power	3 kW	3.6 kW	4.6 kW	5 kW	6 kW
Max. apparent output power	3.3 kVA	4 kVA	4.6 kVA	5.5 kVA	6.6 kVA
Operation phase	1/N/PE				
Rated grid voltage	220 V / 230 V				
Rated grid frequency	50 Hz / 60 Hz				
Rated grid output current	13.7 A / 13.1 A	16.4 A / 15.7 A	20.9 A / 20 A	22.8 A / 21.7 A	27.3 A / 26.1 A
Max. output current	15 A	18.5 A	21 A	25 A	30 A
Power factor	>0.99 (0.8 leading - 0.8 lagging)				
THDi	<2%				
Efficiency					
Max. efficiency	>97.1%				
EU efficiency	>96.5%				
Protection					
DC reverse-polarity protection	Yes				
Short circuit protection	Yes				
Output over current protection	Yes				
Surge protection	DC Type II / AC Type II				
Ground fault monitoring	Yes				
Integrated AFCI (DC arc-fault circuit protection)	Yes (1)				
Protection class/Over voltage category	I/II				
General Data					
Dimensions (W*H*D)	333*505*249 mm				
Weight	18.3 kg				
Topology	High frequency isolation (for battery)				
Operating ambient temperature range	-25 ~ +60°C				
Ingress protection	IP65				
Cooling concept	Natural convection				
Max. operation altitude	3000 m				
Grid connection standard	G98 or G99, VDE-AR-N 4105/VDE V 0124, EN 50549-1, VDE 0126/UTE C 15/VFR:2019, RD 1699/RD 244/UNE 206006/ UNE 206007-1, CEI 0-21, C10/11, NRS 097-2-1, EIFS 2018.2, IEC 62116, IEC 61727, IEC 60068, IEC 61683, EN 50530, MEA, PEA				
Safety/EMC standard	IEC/EN 62109-1/-2, EN 61000-6-2/-3				
Features					
DC connection	MC4 connector				
AC connection	Quick connection plug				
Display	7.0"LCD color screen display				
Communication	RS485, Optional: Wi-Fi, GPRS				

(1) Activation required.

S6-GR1P(2.5-6)K

Solis Single Phase Inverters

>> Models:

S6-GR1P2.5K
S6-GR1P3K
S6-GR1P3.6K
S6-GR1P4K
S6-GR1P4.6K
S6-GR1P5K
S6-GR1P6K

360° View

Features:

- Max. efficiency 97.7%
- String current up to **14A**
- Super high frequency switching technology
- Wide voltage range and low startup voltage
- 2 MPPT design with precise MPPT algorithm
- Intergrated Export Power Manager (EPM)
- AFCI protection, proactively reduces fire risk
- Compact and lightweight
- Friendly and adaptable connection to the grid

DATASHEET

S6-GR1P(2.5-6)K

Models	2.5K	3K	3.6K	4K	4.6K	5K	6K
Input DC							
Recommended max. PV power	3.75 kW	4.5 kW	5.4 kW	6 kW	6.9 kW	7.5 kW	9 kW
Max. input voltage	550 V	600 V					
Rated voltage	250 V	330 V					
Start-up voltage	60 V	120 V					
MPPT voltage range	50-450 V	90-520 V					
Max. input current	14 A / 14 A						
Max. short circuit current	22 A / 22 A						
MPPT number/Max. input strings number	2/2						
Output AC							
Rated output power	2.5 kW	3 kW	3.6 kW	4 kW	4.6 kW	5 kW	6 kW
Max. apparent output power	2.8 kVA	3.3 kVA	4 kVA	4.4 kVA	5 kVA	5 kVA	6 kVA
Max. output power	2.8 kW	3.3 kW	4 kW	4.4 kW	5 kW	5 kW	6 kW
Rated grid voltage	1/N/PE, 220 V / 230 V						
Rated grid frequency	50 Hz / 60 Hz						
Rated grid output current	11.4 A / 10.9 A	13.6 A / 13.0 A	16.0 A / 15.7 A	18.2 A / 17.4 A	20.9 A / 20.0 A	22.7 A / 21.7 A	27.3 A
Max. output current	13.3 A	15.7 A	16.0 A	21.0 A	23.8 A	25.0 A	27.3 A
Power factor	>0.99 (0.8 leading - 0.8 lagging)						
THDi	<3%						
Efficiency							
Max. efficiency	97.3%	97.3%		97.6%		97.7%	
EU efficiency	96.5%	96.6%		97.1%		97.1%	
Protection							
DC reverse-polarity protection	Yes						
Short circuit protection	Yes						
Output over current protection	Yes						
Surge protection	Yes						
Grid monitoring	Yes						
Anti-islanding protection	Yes						
Temperature protection	Yes						
Integrated AFCI (DC arc-fault circuit protection)	Yes [1]						
Integrated DC switch	Optional						
General Data							
Dimensions (W*H*D)	310*543*160 mm						
Weight	11 kg	11.2 kg		12 kg			
Topology	Transformerless						
Self-consumption (night)	<1 W						
Operating ambient temperature range	-25 ~ +60°C						
Relative humidity	0-100%						
Ingress protection	IP66						
Cooling concept	Natural convection						
Max. operation altitude	4000 m						
Grid connection standard	G98[2] or G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1, VDE 0126 / UTE C 15 / VFR:2019, RD 1699 / RD 244 / UNE 206006 / UNE 206007-1, CEI 0-21, C10/11, NRS 097-2-1, EIFS 2018.2, IEC 62116, IEC 61727, IEC 60068, IEC 61683, EN 50530, MEA, PEA						
Safety/EMC standard	IEC/EN 62109-1/-2, IEC/EN 61000-6-2/-3						
Features							
DC connection	MC4 connector						
AC connection	Quick connection plug						
Display	LCD						
Communication	RS485, Optional: Wi-Fi, GPRS						

(1) Activation required. (2) G 98 for 2.5K-3.6K.

SOLAR iBOOST+

Installation Instructions

(Installation by Qualified Electricians Only)

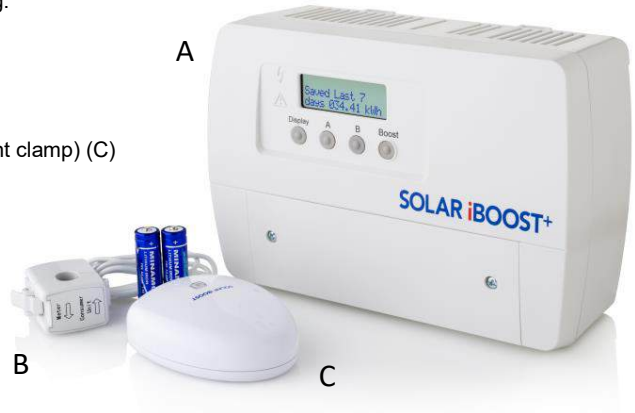
CE

Doc. No: SM-504 Iss B 01.07.19

1 Checks Before Commencing Installation

Check you have received the following:

- Solar iBoost+ main unit (A)
- Measurement Clamp (B)
- Sender (connects to measurement clamp) (C)
- 2 × AA batteries (for Sender)
- Wall fixings
- Solar iBoost+ user manual
- Wall fixing template



Please note and ensure the following before commencing any installation...

1. The electrical installation of this device must only be undertaken by a **suitably trained and qualified electrician;** all local safety standards must be observed.

   To comply with safety regulations it is necessary to have a means of full disconnection of the iBoost+ from the supply after installation, it is recommended the installation incorporates a double pole isolation switch in the incoming supply.

   All work must satisfy Building/IEE Wiring regulations in force at the time.

2. Solar iBoost+ is designed for heating water tanks in a domestic setting with up to two immersion heaters rated up to 3kW each which **MUST include a working mechanical thermostat**.

3. There should be NO electronic controls or switches between the Solar iBoost+ and the immersion heater, only direct connection to the immersion and mechanical thermostat are suitable for Solar iBoost+. It is therefore recommended that the Solar iBoost+ be located at the water tank (assuming this not within a safety zone of a bathroom which may prohibit the fitting of electrical devices). Cable lengths between the Solar iBoost+ and the immersion heater should not exceed 3 metres.

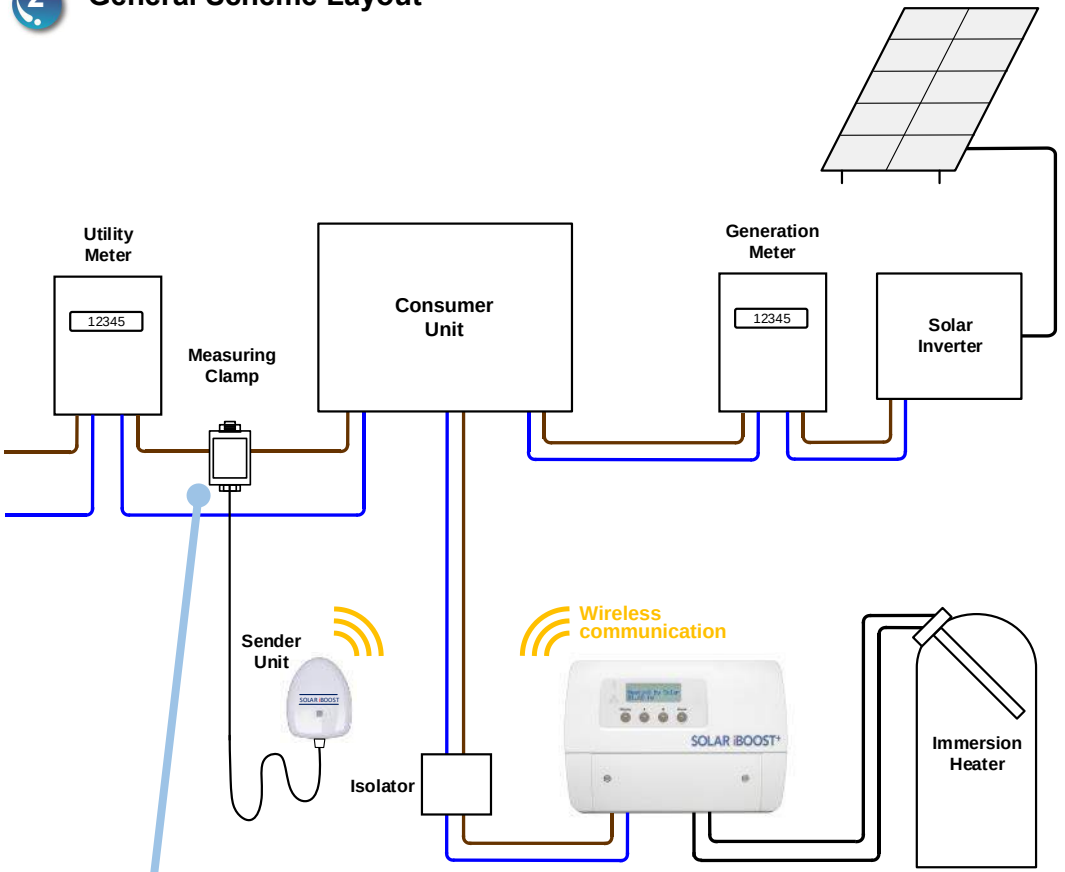
4. If the installation can not be effected at the water tank and cable lengths between the Solar iBoost+ and the immersion **exceed 3 metres**, it is recommended that shielded cables be installed.

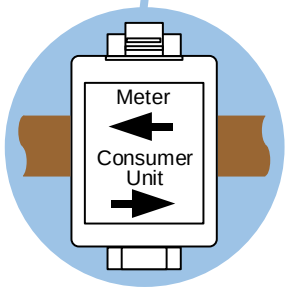
5. If the existing cable to the immersion heater appears to be aged or damaged in any way, replace the cable.

6. The Output of the Solar iBoost+ is a specially modulated DC output which must never be connected to the normal AC circuit. The Solar iBoost+ output must be the only supply to the immersion heaters and connected through a good quality, working mechanical thermostat.

Failure to comply will damage the unit and invalidate the warranty.

2 General Scheme Layout





IMPORTANT!

Ensure the clamp is orientated on the Live cable correctly as shown on the label. This is critical for correct operation.

- **Never connect AC Live or Neutral to the HTR1 or HTR 2 terminals**
- **Solar iBoost+ must be the only supply to the immersion heaters**
- **DO NOT CONNECT ANY WIRES TO A LIVE Solar iBoost+**

3 Installation

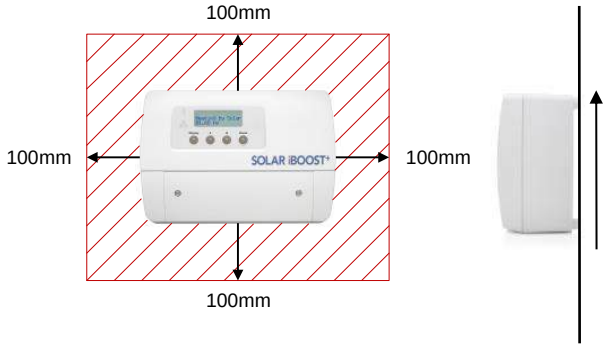
Positioning - Use the installation template provided

Locate the Solar iBoost+ close to the hot water tank and connect electrically between a fused outlet or MCB and the immersion heater(s). Keep cable distances to a minimum whilst ensuring they are secured to prevent connection movement in service.

Install the unit with a minimum 100mm clearance on each side.

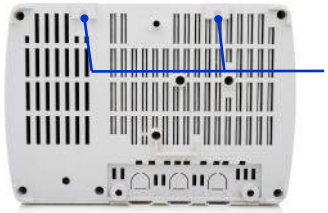
Do not allow airflow to be obstructed. Ensure nothing is fitted within the red zone shown around the unit.

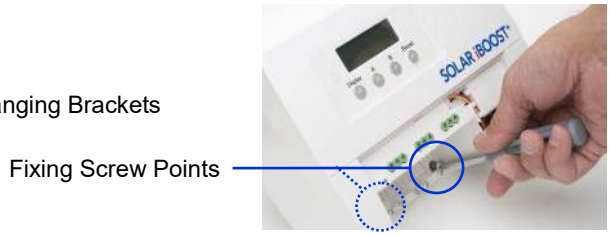
The unit must be fitted vertical on the wall.



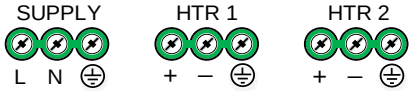
Fixing the Solar iBoost+

Using the screws and wall plugs provided or suitable screws for the mounting surface, fix the Solar iBoost+ using the 4 fixing points...





4 Connecting the Solar iBoost+



SUPPLY

L 220-240V ac Input - must be protected by 16A MCB or 13A fused outlet.

N Neutral

⏚ Earth (all earth terminals common)

HTR 1 / HTR 2 (IMMERSION HEATER CONNECTIONS)

+ Connect to the Live terminal of the immersion heater thermostat, max 13A.

– Connect to the Neutral terminal of the immersion heater

⏚ Earth

- Wire the Solar iBoost+ in accordance with the Wiring Diagram.
- HTR2 Terminals allow the connection of a second immersion, if fitted.
- Terminals allow the connection of up to 4mm² solid copper conductor or multi-strand cable.
- Solar iBoost+ has overvoltage protection and will temporarily stop diverting if the supply voltage is above 260V ac.
- Ensure terminals are fully tightened and cable is clamped using the cable clamps provided. Where necessary, invert the plastic cable clamp to provide the correct grip.
- After wiring replace the terminal cover. Only use the screws provided with the cover. DO NOT switch on at this stage.
- **Ensure the cover is tightened down as this prevents vibration of the fan unit and unwanted fan noise.**

Wiring Diagram

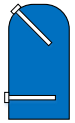
For all installations -

- **Test the immersion heaters and thermostats before installation and replace defective parts where necessary. Do not install the Solar iBoost+ where a functioning thermostat is not present. A good 3kW immersion will give a resistance reading of 20 ohms. Replace any aged or damaged cables.**
- **There must be no control of the immersion heater(s) by any equipment other than the Solar iBoost+. In addition, there should not be any additional source of power connected to the immersion heater. The Solar iBoost+ will replace any Boost controls or Hot Water Timers.**

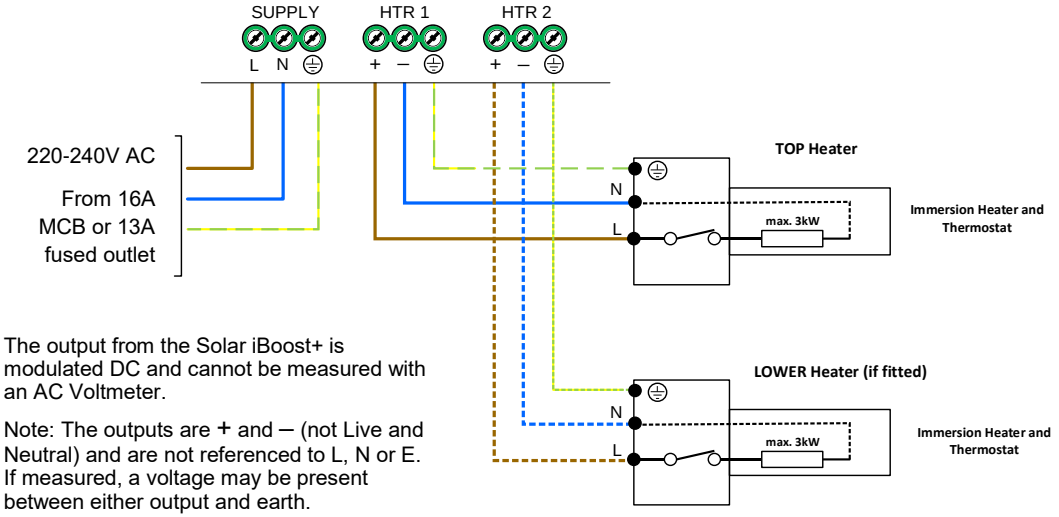
Failure to comply will result in damage to the Solar iBoost+ and invalidate your warranty.

Single or Dual Immersion Heater connection

Where a single immersion heater is fitted (most common installation) it should be connected to the terminals marked HTR 1.



Where two immersion heaters are present, connect the upper most heater in the tank to the HTR1 terminals and the lower heater to the HTR2 terminals. Correct connection is important so that the upper most heating element receives heating priority.



The output from the Solar iBoost+ is modulated DC and cannot be measured with an AC Voltmeter.

Note: The outputs are + and – (not Live and Neutral) and are not referenced to L, N or E. If measured, a voltage may be present between either output and earth.

Dual Immersion Heater Operation

The Solar iBoost+ automatically detects when two immersion heaters are connected.

As hot water is drawn from the upper part of the tank, it is important the heaters are connected as described so that the Solar iBoost+ can automatically give heating priority to the top heater. Excess generation is diverted to the top heater until temperature is reached and the heater thermostat opens. Solar iBoost+ then automatically switches to the lower heater to continue to divert excess generation until the lower heater is also satisfied and 'Water Tank HOT' is displayed.

When diverting to the lower heater the Solar iBoost+ will periodically (every 15 minutes) switch to the top heater and the cycle of heating begins again. This maintains the temperature in the upper part of the tank.

An indication of the current heater being supplied is shown on the 'Heating by Solar' display.

This operating mode is the same whether diverting excess generation or in boost function.

5 Assembling the Sender and Measurement Clamp

The Sender unit has a Measurement Clamp that detects export current when fitted around the incoming Live supply cable from the utility meter. The unit sends measurements wirelessly to the Solar iBoost+ unit.

Note: The Sender and Solar iBoost+ units are factory paired. Do not press the button on the sender or pairing may be lost.

1. Fit the plug from the Measurement Clamp cable into the Sender.

2. Fit batteries (included).

When fitting the batteries the sender should be at least 1-2m away from the Solar iBoost+

3. Switch on the power to the Solar iBoost+. A set up procedure runs and the two devices connect automatically, usually within 30 seconds.

6 Fitting the Measurement Clamp

At the utility meter (**Caution!** not the Generation meter) identify the **Live cable feed to the property's consumer unit.**

Open the Measurement Clamp and remove any plastic packaging. Position the clamp around the cable observing the correct orientation as shown below. Close the Clamp and ensure that the latch is engaged.

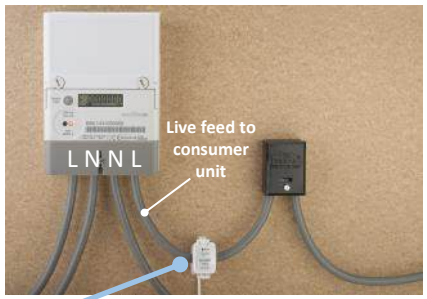
For best results, install the sender upright as shown below, using the rear hanging hook.

Note: Mechanical meters (with rotating disks) can cause distortions to measurements. Position the clamp along the meter cable, away from the base of the meter.

Installation Examples

A. Utility meter live input to consumer unit **without** Henley /Connector blocks.

B. Utility meter live input to consumer unit **with** Henley / Connector blocks.



Where a Henley or other connector block is fitted, the Measurement Clamp is fitted between the utility meter and the connection block.

IMPORTANT: the orientation markings on the clamp must be observed to ensure only excess current is detected and used for water heating.

7 Commission and Test the System

These tests are designed to verify that only excess generation is used by the Solar iBoost+. Installers must check that increased home energy consumption results in reduced diversion to the immersion heater. The availability of high energy appliances (e.g. kettle, electric showers etc.) are useful during these tests.

- Before testing, if 'Tank Hot' is shown on the Solar iBoost+, run off some hot water.
- 'Heating by Solar' is displayed only when excess energy exceeds 100W. Switch off appliances to enable energy to be exported for these tests.
- Perform tests 1, 2 and 4 when excess generation is available. When there is no PV generation, perform tests 3 and 4 .

Test 1

Check that the Solar iBoost+ stops diverting energy when the PV system is shutdown.

- Shutdown the PV array and the Solar iBoost+ display changes to "Water Heating OFF."

  Reinstate the PV array.

Test 2

Check that switching appliances on and off in the home results in varying levels of 'Heating by Solar'.

- Switch off all the MCB's / Fuses except for the PV and immersion.
- Check the level of PV generation on the inverter.
- The "Heating by Solar" level should be approximately 100W less than generation.
- Reinstate MCB's / Fuses.
- Switch on one or two low energy appliances to see the level of 'Heating by Solar' proportionally fall. As further appliances are switched on 'Water Heating OFF' may be seen.

Test 3

Perform this test if no PV generation is available when commissioning. Export energy can be simulated by temporarily reversing the orientation of the Measurement Clamp.

- Shut down the PV array
- Reverse the orientation of the measurement clamp (consumption in the home is then measured as export energy)
- Switch on a kettle or high energy device
- Whilst the kettle is on 'Heating by Solar' is displayed and Solar iBoost+ function is proved.

IMPORTANT! Return the clamp to its correct operating position and reinstate the PV array.

Test 4

Test the Boost function is operational.

- Press the Boost button 2 times, "Manual Boost ON" displays
- Check that water is heating
- Scroll the Boost button until it reads "Manual Boost OFF"

Operation

Consult the User Manual provided for the following:

Hot Water Boost - Solar iBoost+ incorporates manual Boost and timed Boost features to enable the user to heat water via the immersion during times of low PV generation.

Battery Storage - Where the Solar iBoost+ is installed in conjunction with battery storage, an offset may be configured to allow the battery storage to take priority over water heating.

Language - The display can be set to operate in other languages via the programming options.

Technical Specifications

Solar iBoost+ Controller:

Operating Voltage:	220-240 Vac	
Control type:	1B (Pulse Width Modulation)	
Maximum Permissible Loads:	Maximum 3kW immersion heaters (13A Resistive)	
Rated Impulse Voltage Withstand	4kV	
Insulation Properties	Pollution Degree 2 in accordance with IEC 664	
Operating Ambient Temperature Range:	0 to 40°C	
Approvals:	EN 60730-2-7	EN 301 489-3
	EN 300 220	EN 55014-1
	EN 55014-2	
	AS/NZS 4268	
Weight/Dimensions:	1.36kg	225 x 158 x 92 mm

Solar iBoost+ Sender:

Battery Type:	2 x AA IEC LR6 1.5V alkaline (supplied)	
Battery Life Cycle:	1 year (user replaceable)	
Operating Radio Frequency	868.3 MHz (United Kingdom/Europe)	
	925 MHz (Australia/New Zealand)	
Radio Range	1 to 30m indoors	
	(dependant on construction and local conditions)	
Operating Ambient Temperature Range:	-5 to 40°C	
Approvals:	EN 60950	EN 301 489-3
	EN 300 220	
	AS/NZS 4268	
Dimensions:	95 x 75 x 35 mm (excluding clamp)	

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Further Support

Technical support for qualified installers and electricians, visit:

www.marlec.co.uk/troubleshootmysolariboost

Tigo® Flex MLPE

TS4-A-O

Module-level PV Optimizer

The TS4-A-O (Optimization) is the advanced add-on optimization solution that brings smart module functionality to standard PV modules for higher reliability. Improve energy efficiency by upgrading underperforming PV systems or adding smart features to new installations.

The TS4-A-O complies with NEC 2017 and 2020 690.12 Rapid Shutdown specifications when installed on each module and accompanied by the Tigo Access Point (TAP) and the Cloud Connect Advanced (CCA). Module-level DC production data, as well as data from other Modbus connected devices, can be analyzed via Tigo's Energy Intelligence Software when connected to the cloud.

The TS4-A-O with UHD-Core technology and expanded specifications supports PV modules up to 700W, and 15A.

Included Features

Module-level **optimization** for increased energy yield and greater design flexibility

Manual or automatic module-level **shutdown.** Complies with NEC 2017 and 2020.

Module-level **monitoring** for energy production tracking and system management

Easy Installation

Snap to standard module frame or remove clips for rack mounting

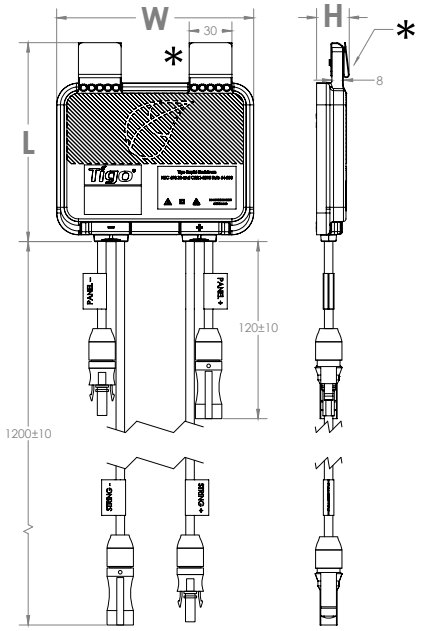
Smart Commissioning

Configure and commission with your Android or iOS mobile device

TS4-A-O SPECIFICATIONS

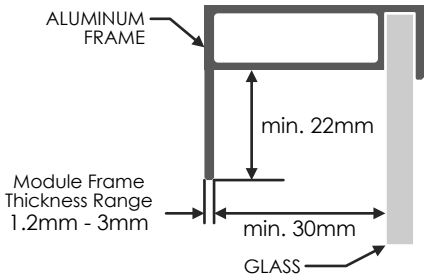
Environmental	
Operating Temperature Range	-40°C to +70°C (-40°F to +158°F)
Outdoor Rating	IP68, NEMA 3R
Maximum Elevation	2000m
Mechanical	
Dimensions	W=138.4mm, L= 139.7mm, H= 22.9mm
Weight	520g
Electrical	
Max Input Voltage (V_{OC} @ Lowest Temperature)	80V
Input Voltage Range	16 - 80V*
Maximum Cont. Current (Imax)	15A
Maximum Short Circuit Current (Isc)	20A
Maximum Power	700W
Cable Length (in/out)	0.12/1.2m (standard), 0.62/1.2m (optional)
Connectors	MC4 (standard), EVO2 (optional)
Communication Type	Wireless
Recommended Fuse Rating	30A
Rapid Shutdown Time Limit	30 secs or less**
Conductor AWG Range	10-12 AWG
PVRSE Controlled Conductors	≤30 Vdc, ≤240VA, ≤8A**

TAP required for module-level shutdown and CCA required for monitoring with TS4-A-O.
*$V_{MOD\ MAX}$ of the connected panel = TS4-A-O $V_{DCU\ MAX}$
**Limits are based on NEC 690.12 rapid shutdown requirements.



*Clips can be removed for rack mounting

Module frame specifications for mounting TS4-A



ORDERING INFORMATION

461-00252-32	TS4-A-O, 15A, 700W, 1500VUL/1000V IEC, 1.2M Cable, MC4
461-00252-62	TS4-A-O, 15A, 700W, 1500VUL/1000V IEC, 0.62/1.2M Cable, MC4
461-00261-62	TS4-A-O, 15A, 700W, 1500VUL/IEC, 0.62/1.2M Cable, EVO2
461-00261-32	TS4-A-O, 15A, 700W, 1500VUL/IEC, 1.2M Cable, EVO2
462-00252-32	TS4-A-O, 15A, 700W, 1000VIEC, 0.12/1.2M Cable, MC4
462-00252-62	TS4-A-O, 15A, 700W, 1000VIEC, 0.62/1.2M Cable, MC4
462-00261-32	TS4-A-O, 15A, 700W, 1500VIEC, 0.12/1.2M Cable, EVO2
462-00261-62	TS4-A-O, 15A, 700W, 1500VIEC, 0.62/1.2m Cable, EVO2

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sales@tigoenergy.com

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For additional info and product selection assistance, use Tigo's online design tool at tigoenergy.com/design

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