

Switched on to smarter energy



Infinity
ENERGY SERVICES



Proposal for Solar Panels

Mr. Ian Brown

5 November 2021

System size: 5.46 kWp

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Rationale for Solar Electricity Systems

Normally, your home will have *just one* electricity supply. This supply connects you to the National Grid. When you turn lights on or power up computers, etc., you are effectively 'calling for' electricity and it flows automatically into your home from the National Grid, via your electricity meter, to meet your needs.

If you have a solar photovoltaic (PV) panel system installed, you will then have a *second* electricity supply. When the sun is out and you are generating your own solar electricity, this electricity will be used *instead of* electricity from the grid. In other words, your lights / computers / washing machines etc. will be powered by free solar electricity rather than costly electricity from the grid.

There are many benefits to having a solar panel system and they include:

1. Generate your own electricity from a free fuel source: the sun.
2. Lower your annual electricity bills.
3. Hedge against rising electricity costs in the future.
4. Reduce your carbon footprint.
5. Store surplus solar electricity in a battery, or hot water, to reduce energy costs further.
6. Charge an electric car.

Solar PV systems typically require no maintenance or servicing, and have a life-span of at least 25 years, usually significantly longer.



Design Overview

Further to my survey of your home, we have produced this report for a suitable solar PV and battery system.

We recreated your roof in our solar CAD software, PV*SOL. In addition to the 3D functionality, PV*SOL also: a) Pulls in weather data from a local weather station, in order to improve the accuracy of its prediction of how much electricity your solar panel system will produce; b) Knows your exact location on the map, in particular the latitude, which dictates how much sun you are exposed to throughout the year; and c) Incorporates other relevant inputs such as your energy demand profile, how much you pay per unit for your electricity, any shading objects, and so on. You will find the full PV*SOL report, together with visualisations, in the Appendix.

We have placed 14 'all black' solar panels on your garage roofs (see graphic below). These are 390W panels made by Trina Solar and further panel details can be found on the next page and in the data-sheet in the Appendix. This creates a 5.46kWp solar panel system.

The panels are 'embedded' with P401 SolarEdge Power Optimisers which make each panel independent of all the others, helping to maximise power output per panel, mitigating against the effects of any shading, and providing very detailed performance data for each panel. This is very much a state-of-the-art, future-proof system.

We then connect the panels to a 5kW inverter made by SolarEdge. Full details about the choice and importance of the inverter can be found on page 4, and a data-sheet is in the Appendix.



Solar Panels & Mounting System

Solar photovoltaic (PV) panels convert sunlight into electricity. The type of electricity produced is known as Direct Current or 'DC'.

Often with technological solutions, 'ROI' and 'quality' are mutually exclusive – you can have one or the other, but not both. This maxim used to be true in the world of solar as well. Nowadays, due to mass production of solar panels in brand new, gleaming factories in Asia, and with the financial muscle of huge conglomerates behind R&D and after-care, you can secure very high quality equipment, at a keen price, in the knowledge that were the worst to happen, the warranty will be backed up in full, far into the future.

We have access to all the solar panels currently available in the UK market and continually assess the key factors such as price, build quality, efficiency, warranty, manufacturer size, UK support, and so on. At the moment, for your project, we recommend the following panel:

Manufacturer: Trina Solar
Panel Rating: 390W
Type of Silicon: mono-crystalline
Product Warranty: 15 years
Model Number: TSM-390DE15H(II)



Number of Panels: 14
Solar PV System Size: 5.46 kWp

Trina Solar Co., Ltd is a world leading manufacturer of high-performance solar power products. The company was founded in 1997 and publicly listed in June 2020 on the Shanghai stock exchange.

Trina Solar is one of the world's top solar cell producers and has several production facilities worldwide. It is a very large, successful solar company that will be around for many years to come.

We work with all the major **mounting system** manufacturers. For your installation, we recommend:

Manufacturer: Renusol
Type: On-roof mounting system
System: Variosole
Country of Manufacture: Germany
Product Warranty: 10 years



Inverter

The solar panels are then connected to an **inverter**. The inverter converts the DC electricity from the panels into Alternating Current or 'AC' electricity which can then be used to power devices, lighting, etc.

An AC electricity cable then runs from the inverter to your fuse-box (consumer unit).

At various points between the panels and the fuse-box, we place **isolators** which allow either parts of the system, or the entire system, to be shut down safely.

We also install a **generation meter** which records how much solar electricity has been generated. Once a quarter, you send the reading to your feed-in tariff provider.

For the solar PV system size mentioned on the previous page, we recommend the following inverter:

Manufacturer:	SolarEdge
Inverter Rating:	5kW
Model:	SE-5H-APP
Warranty:	20 years
Number of Inverters:	1
Total Inverter Capacity:	5kW

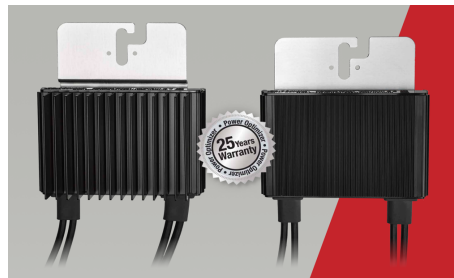


You can find a data-sheet of the inverter in the Appendix.

The total inverter capacity in kW is usually less than the total 'peak' solar panel capacity in kWp. This is because solar panels only reach their peak, or full, output capacity when the sun shines at exactly 90 degrees to the panel surface and in ideal temperature conditions. For most of the year, and at most times of the day, solar panels do not output at their full rated capacity. For this reason, inverters are often 'under-sized' in relation to the solar panels – basically it helps the whole electricity generation system run more efficiently.

As discussed on page 2, each panel will have a SolarEdge power optimiser on the back. These optimisers come with a 25-year warranty.

SolarEdge technology also provides you with market-leading online monitoring of all your solar panels.



Optional Extras

Certain devices can complement a solar PV array (see below). Please let us know if you are interested in any of these.

Heat your water with solar electricity

If you have an immersion heater in your water tank, you can heat your water for free with excess solar electricity.

There are various devices on the market, and the one we recommend is the Solar iBoost. It's relatively inexpensive and easy to install.

The iBoost is fitted in your airing cupboard next to the immersion. We then install a clamp / transmitter where the main electricity cable comes into your home. When the clamp senses you have surplus solar electricity, it turns your immersion on and, hey presto, you get free hot water.



Manufacturer
Marlec

Model
Solar iBoost

Charge Rate
3 kW

Warranty
2 years

Store excess solar energy in a home battery

Another way of capturing excess solar electricity from your panels is to charge a home battery. The stored solar electricity can then be used when the sun isn't shining, e.g. in the evenings or at night.

The most advanced batteries, such as the Tesla Powerwall, also (i) provide emergency power in a power-cut and (ii) can be charged with cheap, off-peak electricity to supplement solar energy in the winter.



Manufacturer
Tesla

Model
Powerwall 2 AC

Storage Capacity
13.5 kWh

Warranty
10 years

Charge your electric car with sunshine

Solar electricity is also the most environmentally friendly way of charging an electric car.

If you already have an electric car – or are thinking you might get one in the future – we recommend a 'smart' home chargepoint like the Zappi.

The Zappi has a setting that guarantees you can charge your car with free solar electricity only, if you wish to. It also allows you to make use of cheap, overnight tariffs, such as Octopus Go.



Manufacturer
MyEnergi

Model
Zappi, Type 2

Charge Rate
7 kW

Warranty
3 years

System Components, Project Costs & Benefits

We will supply, install, and commission all of the following components:

- 14 x Trina Solar 390W mono-crystalline solar panels
- Renusol Variosole on-roof mounting system (10-year warranty)
- 1 x SolarEdge 5kW solar inverter
- 12 x SolarEdge P401 Power Optimisers
- 1 x Solar iBoost
- MID-approved generation meter
- if on-roof system 1 x Bird Protection
- All DC and AC isolators, cabling, trunking, etc.

Our system price also includes:

- Roofing labour
- Electrical labour
- Scaffolding and access equipment
- MCS Certificate
- 10-year insured workmanship warranty
- Grid connection notification

Total fee for Solar Panel System:	£7,726.16
Total fee for Solar iBoost:	£483.00

Our total fee, including all of the above, is: £8,209.16 inc. VAT

Here are the key data concerning system electricity output in kWh, predicted incomes and savings, assumptions, etc.:

Electricity bill saving by using solar electricity directly in the home:	£610 per year
Bill saving from diverting solar electricity to heat your water:	£94 per year
Electricity bill saving from storing solar electricity in a battery:	£0 per year
Electricity bill saving from charging your EV with solar electricity :	£0 per year
Income from the Smart Export Guarantee (see page 7):	£65 per year
Total Annual Gain:	£768 per year

In compiling these figures, we have assumed:

Overall solar array system size:	5.46 kWp	
The price you currently pay for your electricity:	20,000 p	
The amount of electricity you need per year:	12,000 kWh	
The total amount of solar electricity that will be generated per year:	4,694 kWh	100 %
Solar electricity used directly in the home:	3,048 kWh	64.9 %
Excess solar electricity diverted to heat your water:	469 kWh	10 %
Excess solar electricity stored in a battery for later use:	0 kWh	0 %
Solar electricity used to charge your electric car:	0 kWh	0 %
Solar electricity exported to the grid:	1,177 kWh	25.1 %
Solar Fraction – how much of your total energy bill will met by solar:	25 %	
Smart Export Guarantee Rate (assumed – see page 7):	5.5 p	

Grid Application & Smart Export Guarantee

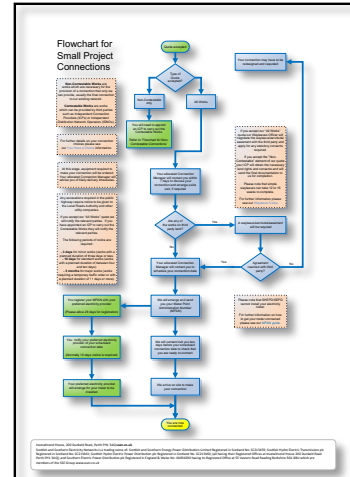
Grid Application

In order to connect solar inverters greater than 3.68 kW on a single phase to the national grid, you need prior permission from the local electricity company, known as the 'DNO'.

Your DNO is:
Scottish and Southern Electricity Networks

Your total inverter capacity is:
5kW

As your inverter size is greater than 3.68 kW, an application to the DNO is required. This process will take 6-8 weeks and we will undertake all the paperwork.



Smart Export Guarantee

The Smart Export Guarantee scheme started on 1 January 2020.


You are paid for every kWh (unit) of solar electricity you export to the grid.

You will need to sign up with a participating energy supplier and have a suitable smart meter installed (free of charge).

The rate you are paid per kWh varies from supplier to supplier.

At the moment, we recommend Octopus Energy which pays 5.5p per kWh on its Outgoing Fixed tariff.

If you install a solar system accompanied with a Tesla Powerwall, you are eligible for the Tesla Energy Plan with Octopus Energy. This includes an unvarying import tariff of 11p per kWh and an export tariff of 11p per kWh.



Which supplier will offer you the best price for your surplus solar power? Our league table will help you understand your choices and who has the best offer for consumers.

*Note that the best price may not always represent the best deal for you, such as in cases where you are required to also be a customer of the supplier.

More information about the Smart Export Guarantee is available [here](#).

Supplier	Tariff Name	Tariff Rate
Octopus Energy	Outgoing Fixed	5.5p

Supplier	Tariff Name	Tariff Type (Fixed, variable export or variable rate)	Tariff Length	Tariff Rate	Payment Cycle	Includes Battery Storage	Requirement for an in-home supplier smart meter
1. Social Energy	Smarter Export	Variable	No Fixed End Date	5.4p	Monthly	Yes	Yes
2. Octopus Energy	Outgoing Fixed	Fixed	12-months Fixed End Date	5.5p	Monthly	Yes	Yes
3. E.ON Energy	Fix & Export Exclusive	Fixed	12-months Fixed term	5.5p	Monthly	Unknown	Unknown
4. Bulb Energy	Export Payments	Fixed	No Fixed End Date	5.38p	3 months	Yes	No
5. CH2O Energy	CH2O S&G Export	Fixed	12-months Fixed term	6.0p	3 months	Can be used with	No
6. ScottishPower	Smart Export Variable	Variable	No Fixed End Date	6.0p	6 months	Unknown	No

Roof Structural Assessment & Planning Permission

Roof Structural Assessment

A typical solar panel weighs 18-19 kg and has a surface area of 1.6m². Each panel, together with the associated mounting equipment, will impose a load on your roof. It is highly likely your roof can easily tolerate this additional loading.

Nonetheless, we will carry out a structural analysis of your roof to guarantee the extra load is within tolerances.

Planning Permission

Most domestic solar panel installations do not require planning permission, as long as they are designed appropriately. The UK law in this area is as follows (taken from the government statutory instrument '2015 No. 596' which relates to the Town and Country Planning Act):

"A.1 Development is not permitted by Class A if—

(a) the solar PV or solar thermal equipment would protrude more than 0.2 metres beyond the plane of the wall or the roof slope when measured from the perpendicular with the external surface of the wall or roof slope;

(b) it would result in the highest part of the solar PV or solar thermal equipment being higher than the highest part of the roof (excluding any chimney);

(c) in the case of land within a conservation area or which is a World Heritage Site, the solar PV or solar thermal equipment would be installed on a wall which fronts a highway;

(d) the solar PV or solar thermal equipment would be installed on a site designated as a scheduled monument; or

(e) the solar PV or solar thermal equipment would be installed on a building within the curtilage of the dwellinghouse or block of flats if the dwellinghouse or block of flats is a listed building."

We have designed the system such that clauses (a), (b) and (c) are met in full. In addition, your house is not sited on a scheduled monument, therefore clause (d) does not apply.

It is our opinion, therefore, that planning permission is not required as long as your house is not listed or within the boundary of another listed building (clause (e)).

Ultimately, planning issues are the responsibility of the building owner and/or tenant, and independent advice should be sought in case of any doubt.

Accreditations, Warranties & References

Accreditations

We hold all the necessary accreditations to be able to install solar panel systems in the UK. These accreditations mean you are entitled to receive any subsidies that might be available, and also protect you as a consumer. Here are our certificate and membership numbers:

MCS Certificate Number: NAP 14896
RECC / MCS Membership Number: 00048808



The Microgeneration Certification Scheme, **MCS**, certifies microgeneration products, such as solar panels, used to produce electricity and heat from renewable sources. MCS also certifies installation companies to ensure the microgeneration products have been installed and commissioned to the highest standard for the consumer.

As members of the Renewable Energy Consumer Code, **RECC**, we agree to abide by the Consumer Code. It covers all the factors that contribute to a high standard of consumer service, before, during and after a contract is agreed.

Warranties & Guarantees

The main components of the installation come with solid **product warranties** of at least 10 years. The exact product warranty lengths for the equipment we recommend are as follows:

Solar panels: 15 years
Inverter(s): 20 years

In addition, Infinity Energy Services provides a free 10-year **insurance-backed guarantee** on our workmanship. In the first instance, if you are not 100% satisfied with our workmanship, you should contact us on 0800 909 8882 and we will come out and rectify it, free of charge. If our company is no longer trading, you would contact the insurance company, IWA, who will send a qualified company out to fix the problem, again free of charge.

The insurance policy also guarantees your deposit, such that if anything happens to us before installation, you can recover your deposit in full.

References

Infinity Energy Services has been installing solar PV systems since 2011. We are technically-led and put great emphasis on excellent electrical design, creating solar panels systems that produce the maximum amount of electricity possible in any given location.

We also pride ourselves on outstanding customer service; before, during, and after installation. We are happy to put you in touch with previous customers so you can hear their feedback direct. In the meantime, please refer to our Checktrade web:

www.checktrade.com/InfinityEnergyServicesLtd/Reviews.aspx

The Next Steps

We trust our careful, detailed approach to your project is what you are looking for and that our overall fee is competitive.

If you have any questions at all, about any aspect of the design or equipment choice, please do not hesitate to ask.

If you did wish to progress with us, the next steps would be:

1. Finalise the design for the solar PV system.
2. Agree an installation date.
3. We send you an order confirmation form which you sign and then pay us a 25% deposit.
4. We place orders for all the equipment.
5. We install and commission the solar panel system on the agreed date.
6. You pay us the balance.
7. We notify the DNO that the system has been energised.

Best regards

Lachlan Marsh, Infinity Energy Services Ltd

Mobile: 01489 533500

Email: lachlan.marsh@infinity-energy.co.uk

The Appendix

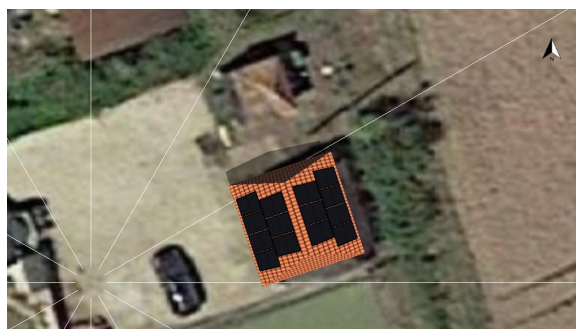
Mr Ian Brown
RG27 0BQ
Mill Ln
Hartley Wespall
Hook

05/11/2021

Your PV system

Address of Installation

RG27 0BQ
Mill Ln
Hartley Wespall
Hook



Project Overview



Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Hartley Wespall, GBR (1991 - 2010)
PV Generator Output	5.46 kWp
PV Generator Surface	26.9 m ²
Number of PV Modules	14
Number of Inverters	1

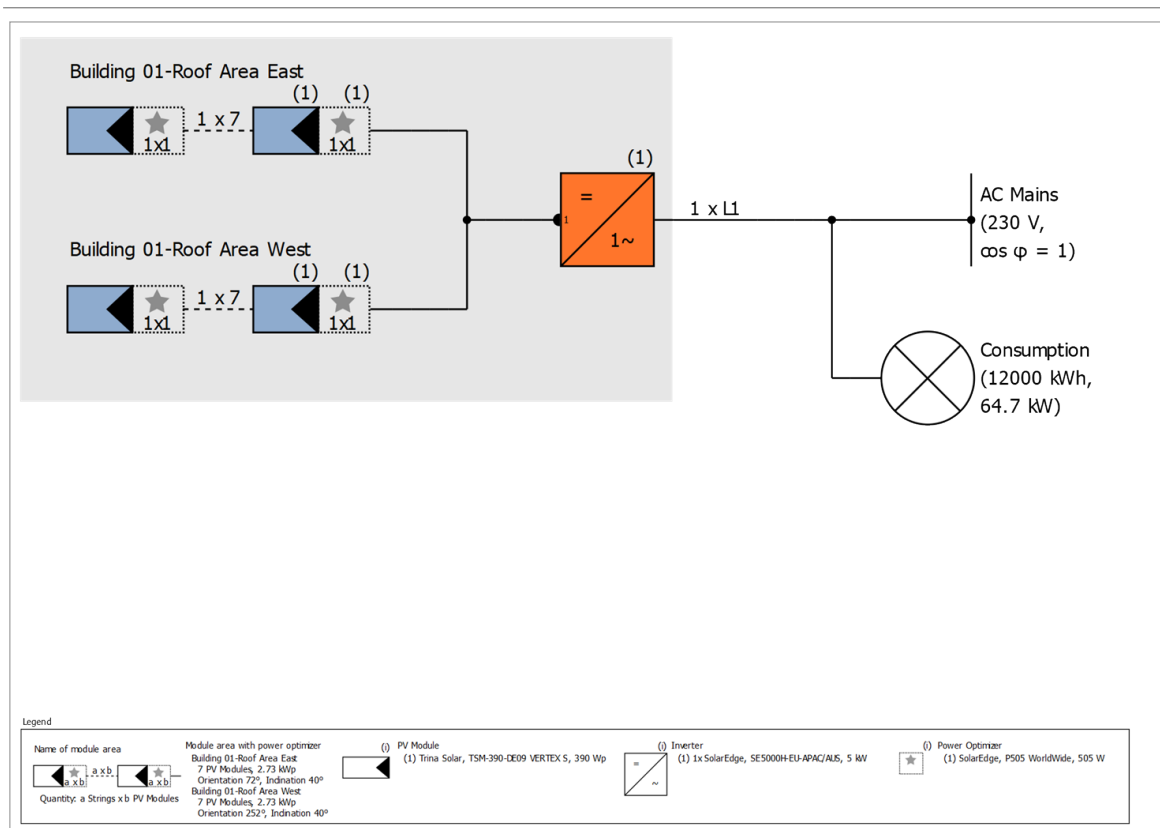


Figure: Schematic diagram

The yield

The yield

PV Generator Energy (AC grid)	4,694 kWh
Direct Own Use	3,048 kWh
Grid Feed-in	1,646 kWh
Down-regulation at Feed-in Point	0 kWh
Own Power Consumption	64.8 %
Solar Fraction	25.4 %
Spec. Annual Yield	857.69 kWh/kWp
Performance Ratio (PR)	95.0 %
Yield Reduction due to Shading	0.0 %/Year
CO ₂ Emissions avoided	2,201 kg / year

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	3D, Grid-connected PV System with Electrical Appliances
Start of Operation	03/11/2021

Climate Data

Location	Hartley Wespall, GBR (1991 - 2010)
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	12000 kWh
Household, seasonal course comparable with standard profile	12000 kWh
Load Peak	64.7 kW

Module Areas

1. Module Area - Building 01-Roof Area East

PV Generator, 1. Module Area - Building 01-Roof Area East

Name	Building 01-Roof Area East
PV Modules	7 x TSM-390-DE09 VERTEX S (v1)
Manufacturer	Trina Solar
Inclination	40 °
Orientation	East 72 °
Installation Type	Roof parallel
PV Generator Surface	13.5 m ²

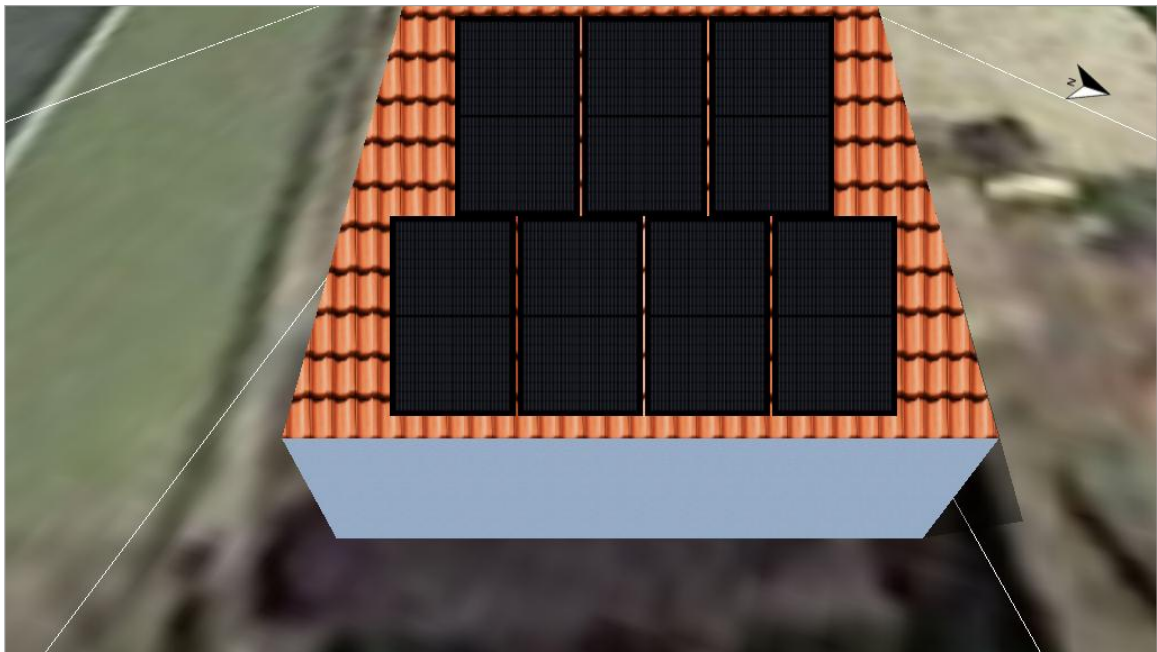


Figure: 1. Module Area - Building 01-Roof Area East

2. Module Area - Building 01-Roof Area West

PV Generator, 2. Module Area - Building 01-Roof Area West

Name	Building 01-Roof Area West
PV Modules	7 x TSM-390-DE09 VERTEX S (v1)
Manufacturer	Trina Solar
Inclination	40 °
Orientation	West 252 °
Installation Type	Roof parallel
PV Generator Surface	13.5 m ²

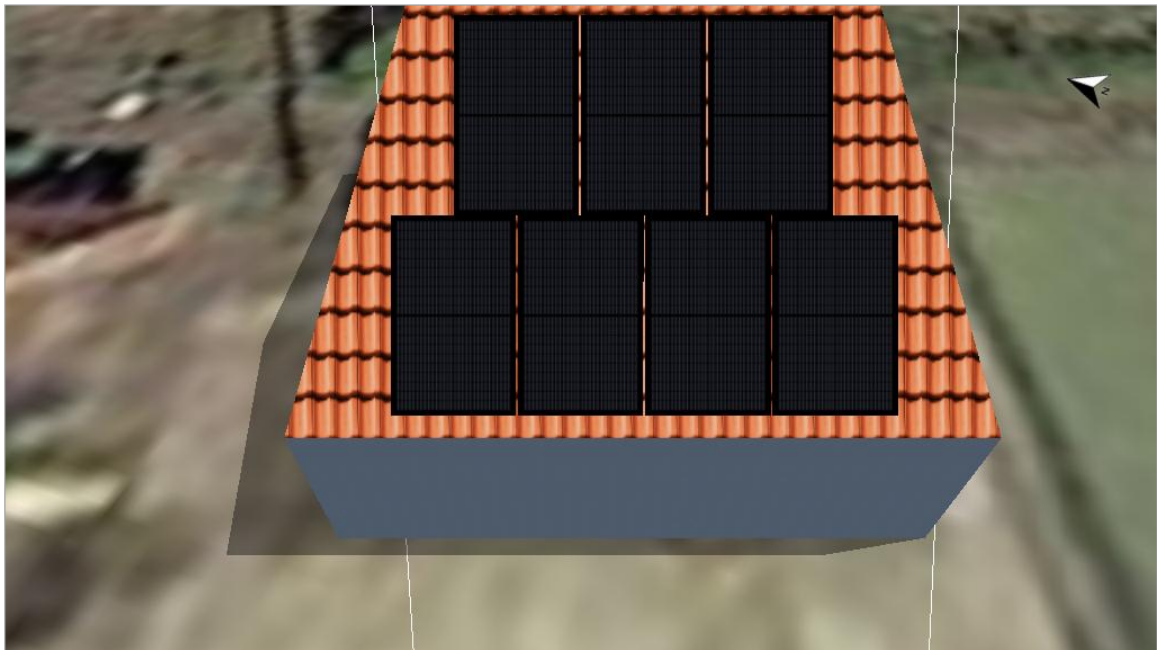


Figure: 2. Module Area - Building 01-Roof Area West

Horizon Line, 3D Design

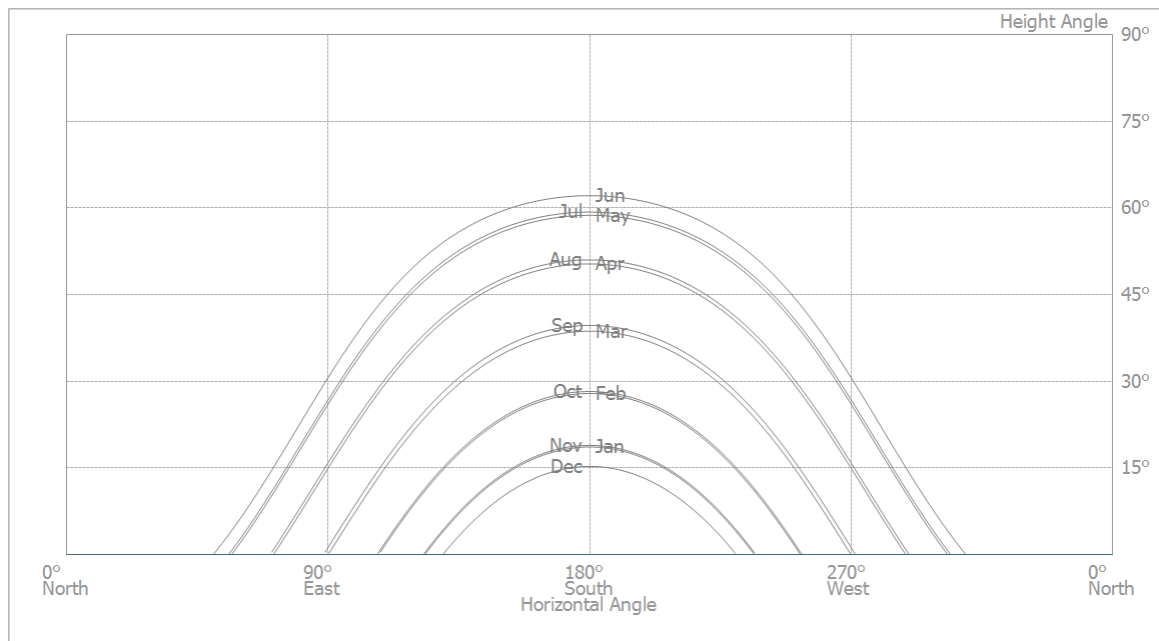


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Areas	Building 01-Roof Area East + Building 01-Roof Area West
Inverter 1	
Model	SE5000H-EU-APAC/AUS (v1)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	109.2 %
Configuration	MPP 1: 1 x 7☆ [1 x 1] 1 x 7☆ [1 x 1]
Power Optimizer 1	
Model	P505 WorldWide (v1)
Manufacturer	SolarEdge
Quantity	14

AC Mains

AC Mains

Number of Phases	3
Mains Voltage (1-phase)	230 V
Displacement Power Factor (cos phi)	+/- 1

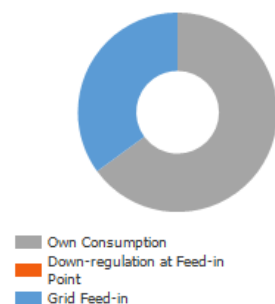
Simulation Results

Results Total System

PV System

PV Generator Output	5.5 kWp
Spec. Annual Yield	857.69 kWh/kWp
Performance Ratio (PR)	95.0 %
Yield Reduction due to Shading	0.0 %/Year
PV Generator Energy (AC grid)	4,694 kWh/Year
Own Consumption	3,048 kWh/Year
Down-regulation at Feed-in Point	0 kWh/Year
Grid Feed-in	1,646 kWh/Year
Own Power Consumption	64.8 %
CO ₂ Emissions avoided	2,201 kg / year

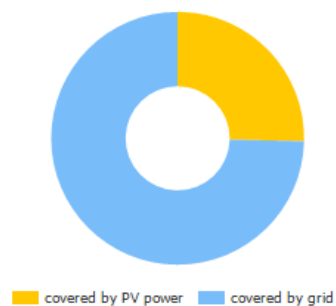
PV Generator Energy (AC grid)



Appliances

Appliances	12,000 kWh/Year
Standby Consumption (Inverter)	11 kWh/Year
Total Consumption	12,011 kWh/Year
covered by PV power	3,048 kWh/Year
covered by grid	8,963 kWh/Year
Solar Fraction	25.4 %

Total Consumption

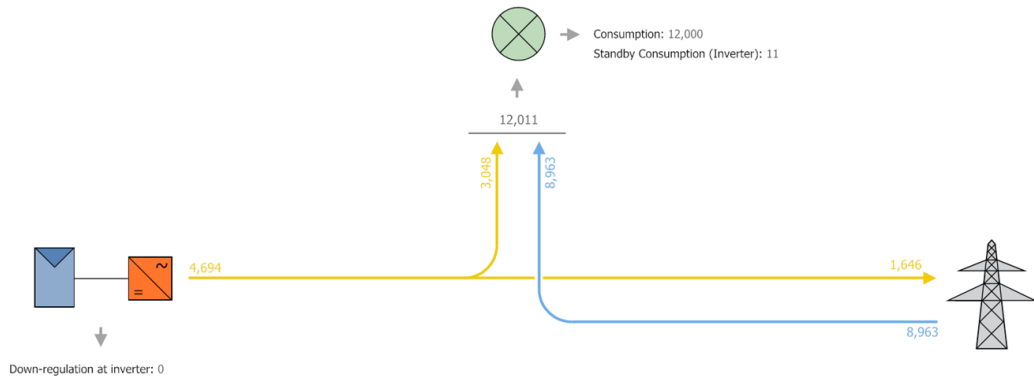


Level of Self-sufficiency

Total Consumption	12,011 kWh/Year
covered by grid	8,963 kWh/Year
Level of Self-sufficiency	25.4 %

Energy Flow Graph

Project: Mr Ian Brown, 4



All values in kWh
Small deviations in the totals can occur due to rounding
created with PV*SOL.

Figure: Energy Flow Graph

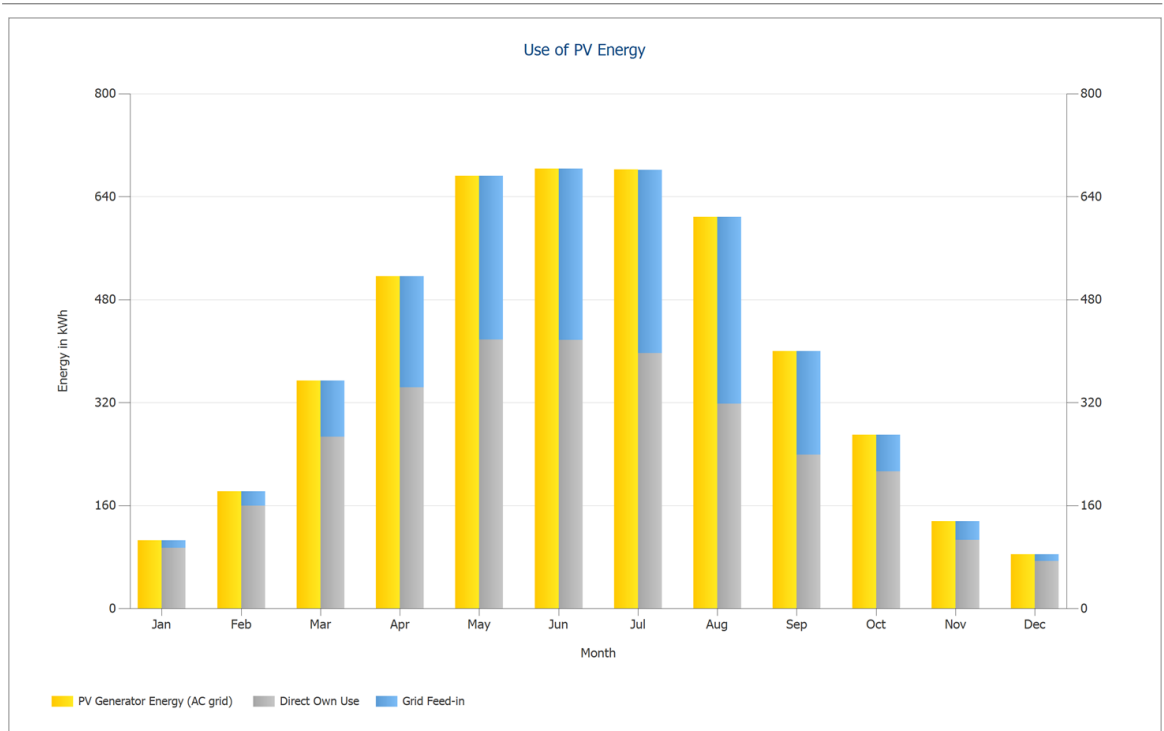


Figure: Use of PV Energy

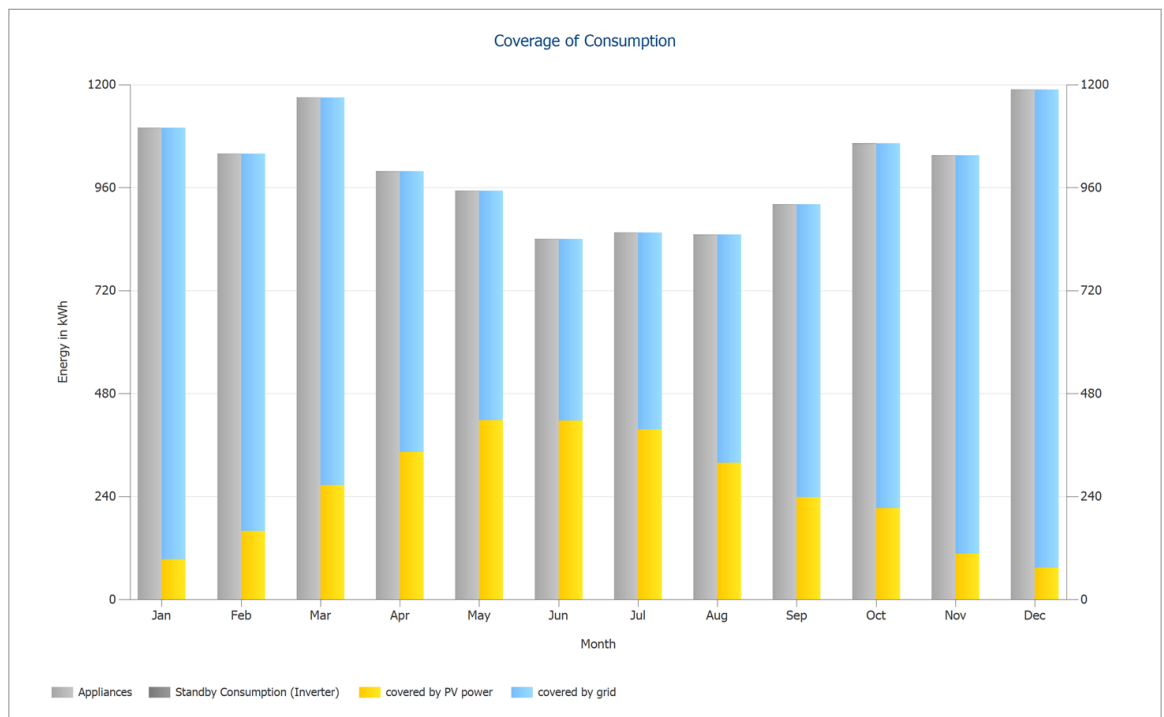


Figure: Coverage of Consumption

Plans and parts list

Circuit Diagram

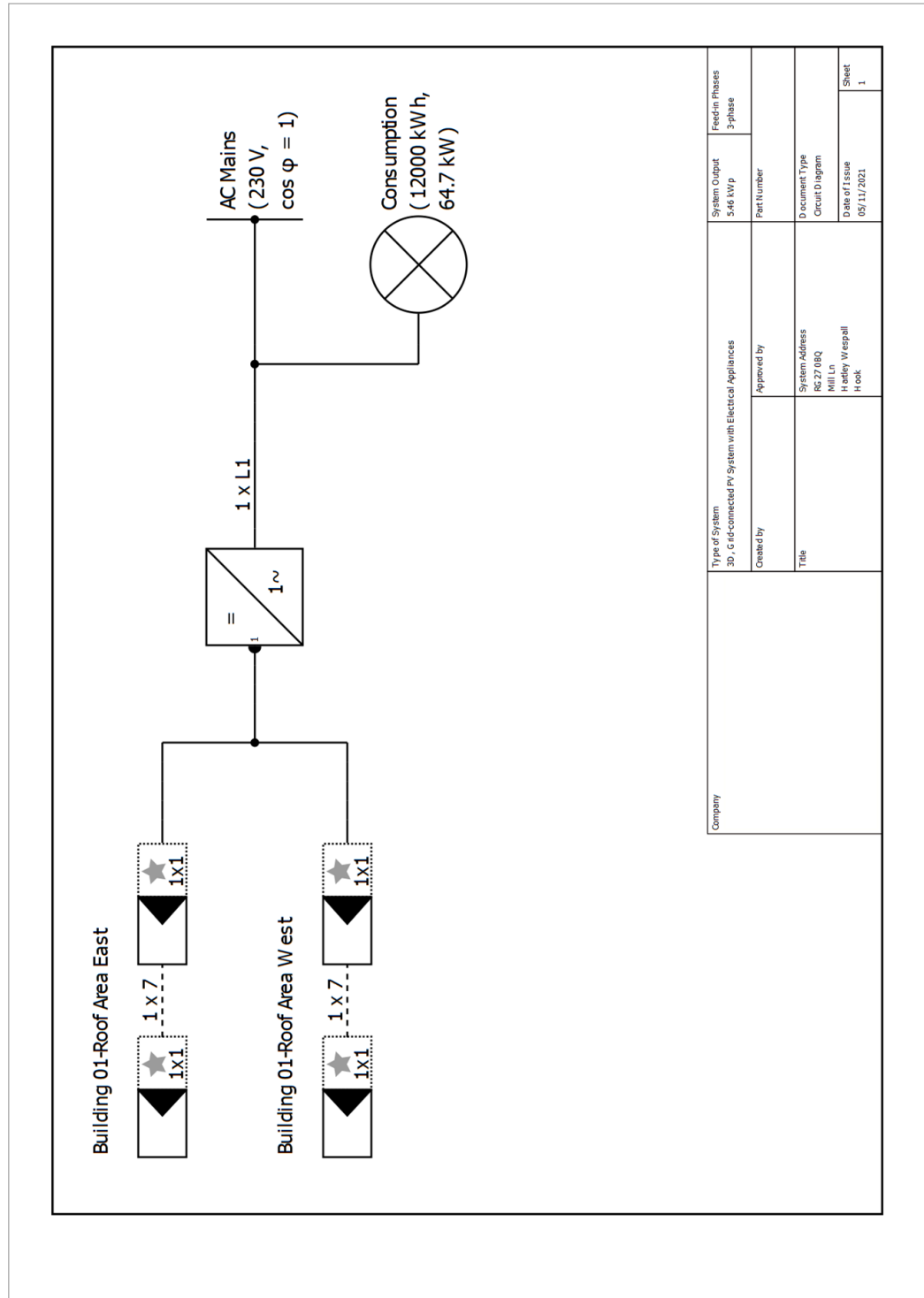


Figure: Circuit Diagram

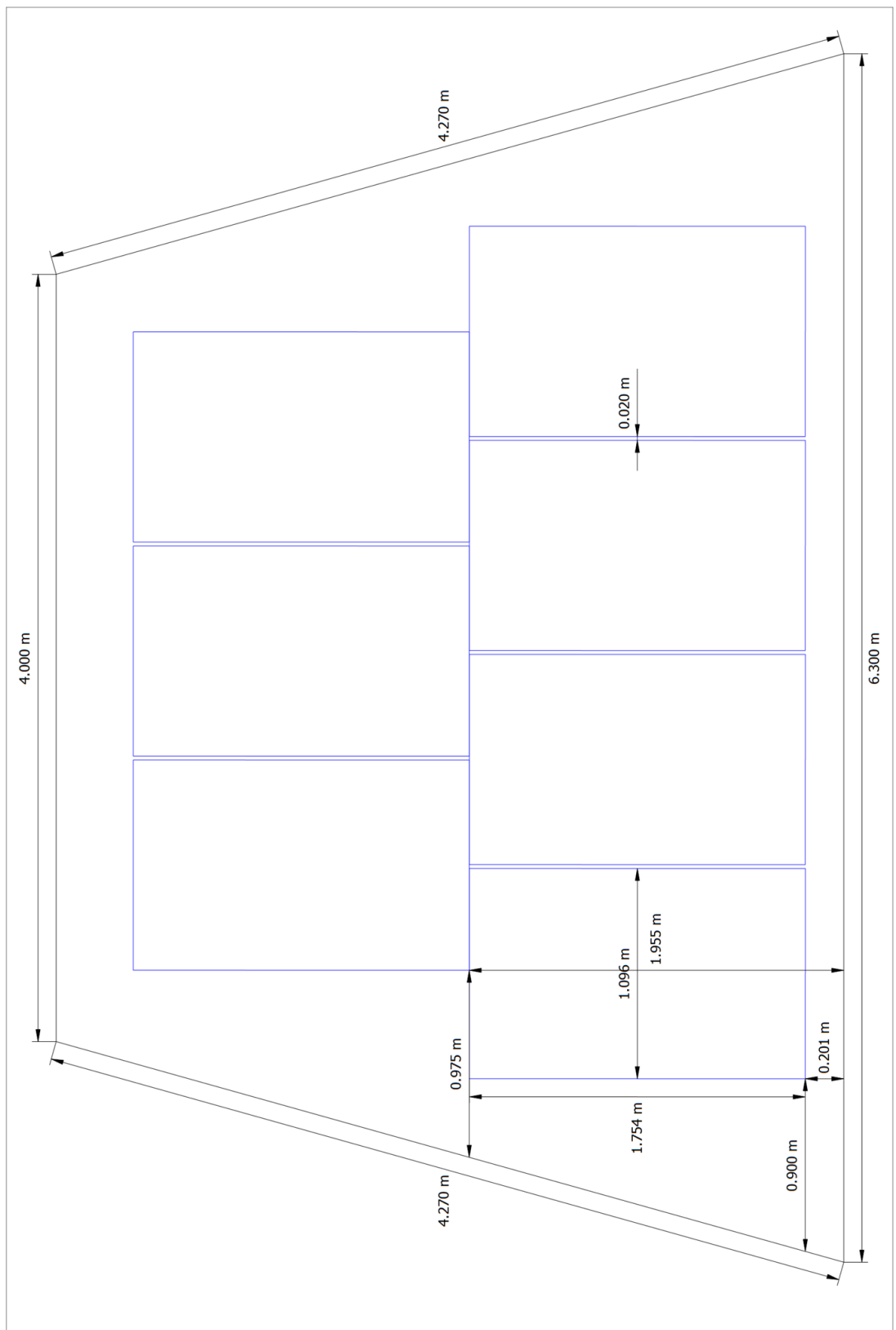


Figure: Building 01-Roof Area East

String Plan

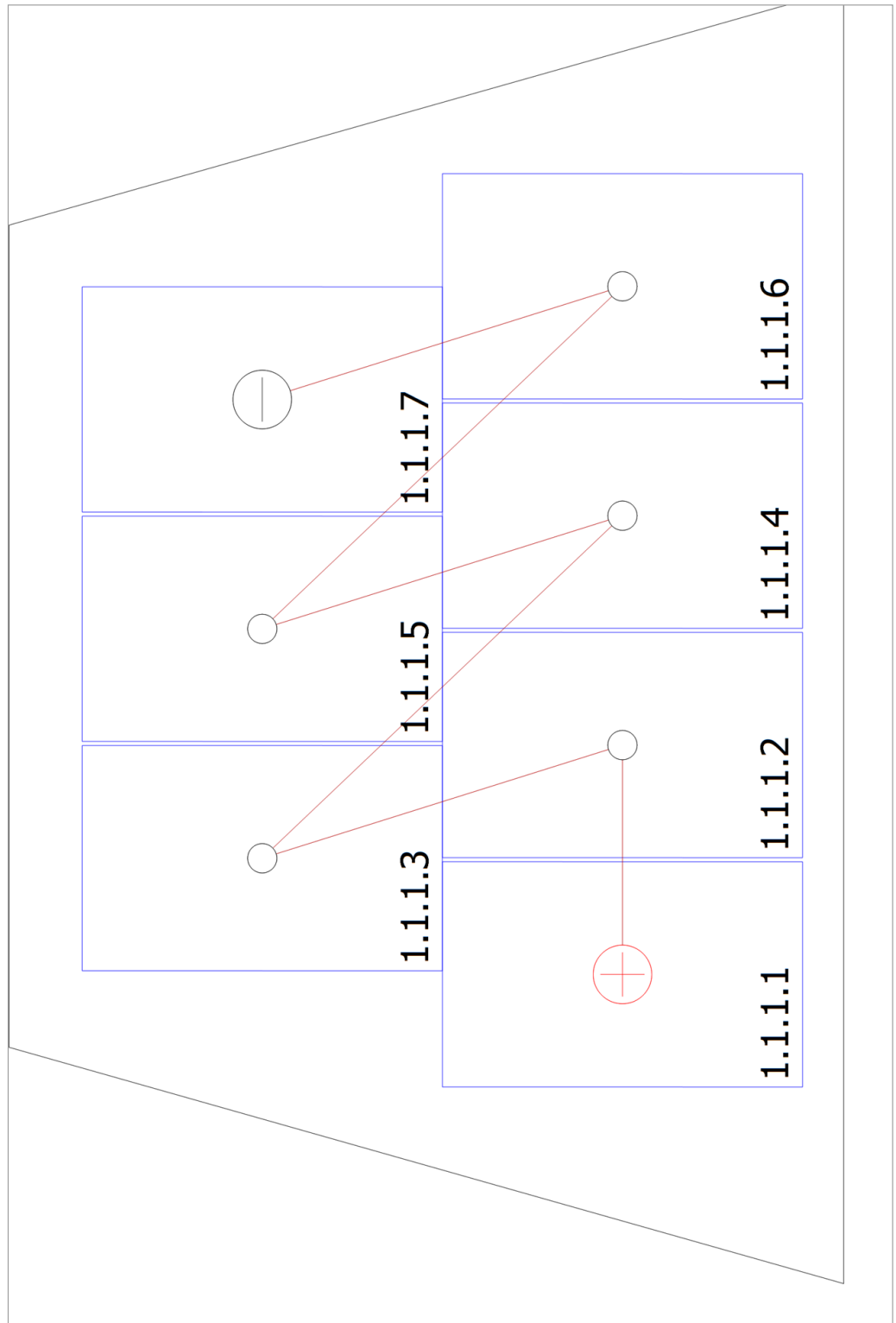


Figure: Building 01-Roof Area East

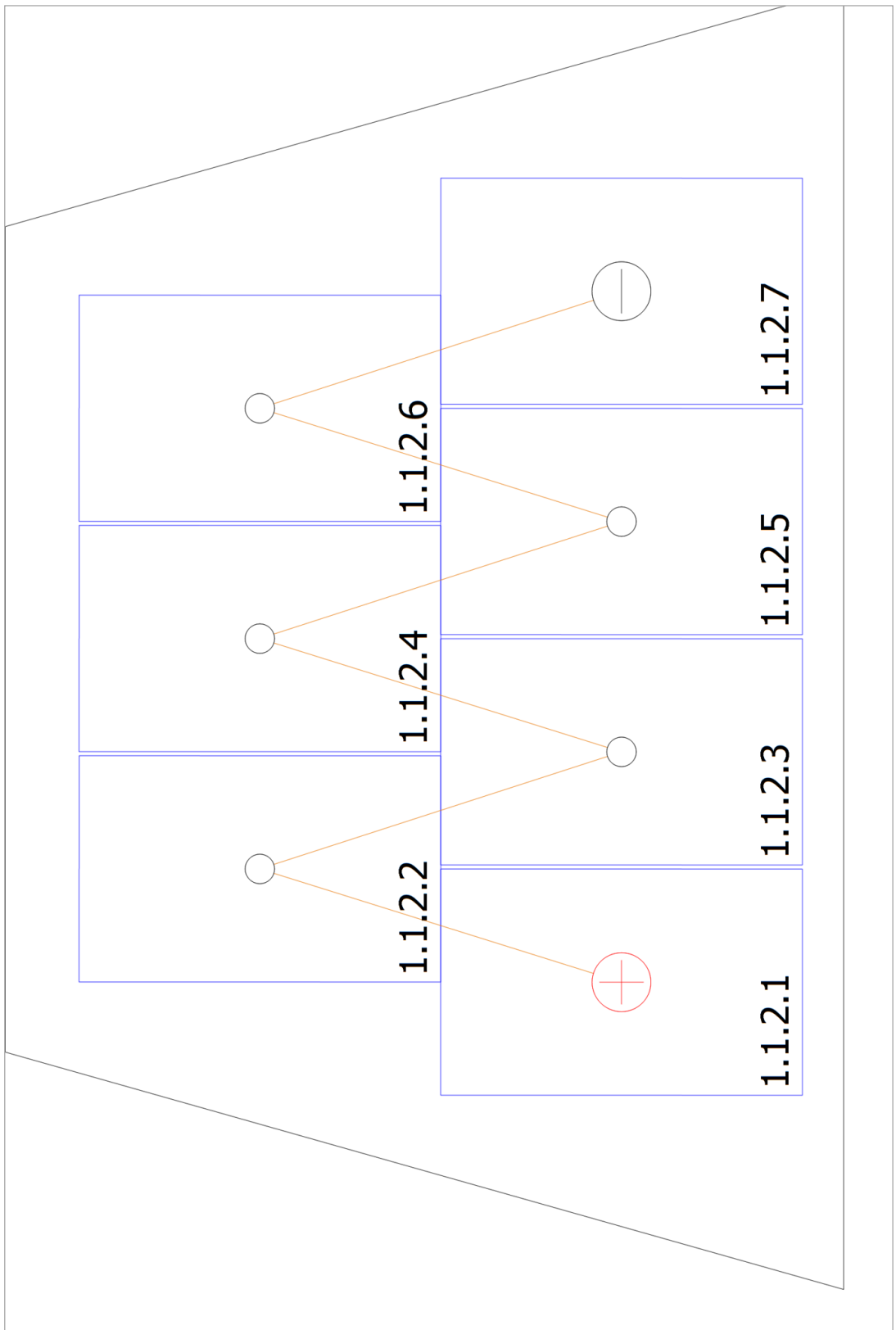


Figure: Building 01-Roof Area West

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Trina Solar	TSM-390-DE09 VERTEX S	14	Piece
2	Inverter		SolarEdge	SE5000H-EU- APAC/AUS	1	Piece
3	Power Optimizer		SolarEdge	P505 WorldWide	14	Piece

Screenshots, 3D Design

Environment



Figure: Overhead View



Figure: South View

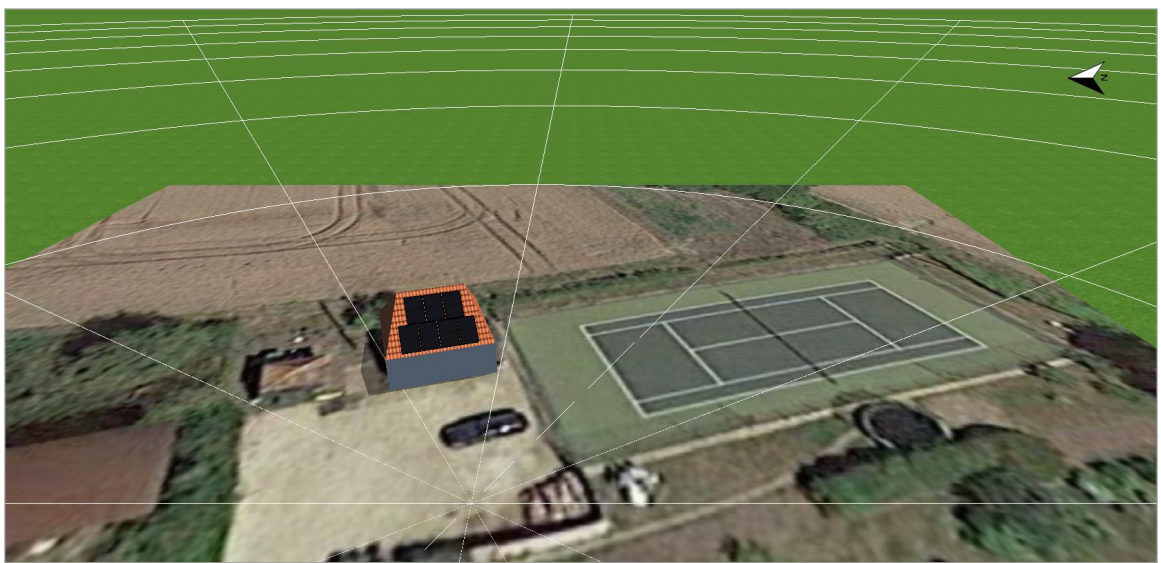


Figure: West View



Figure: East View

Module Areas

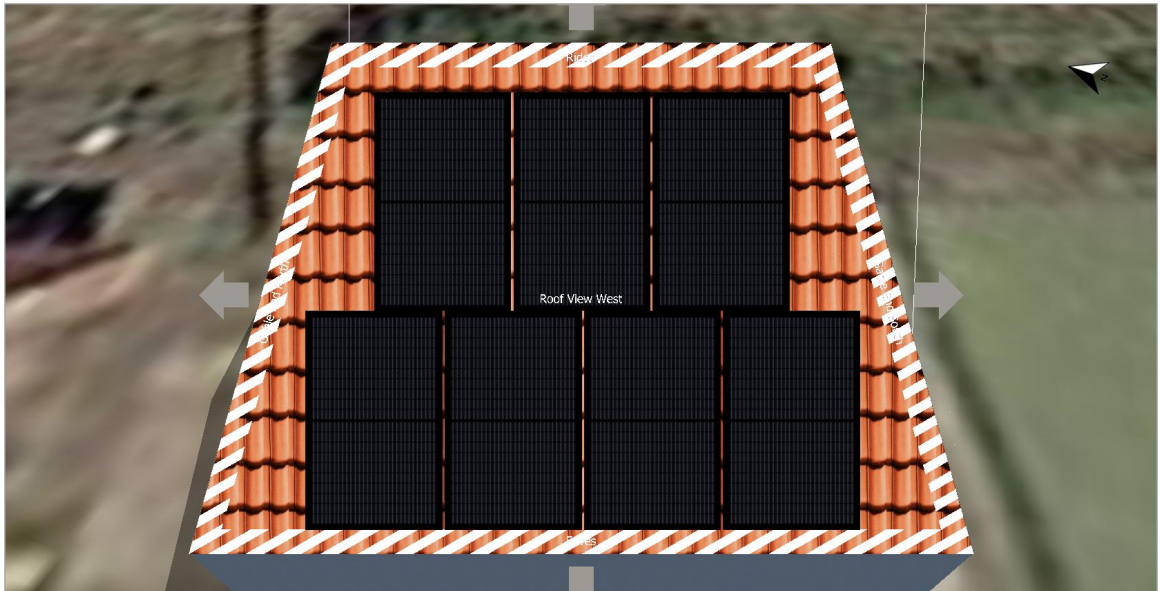


Figure: Module Layout

Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09.05
 PRODUCT RANGE: 380-395W

395W+

MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

20.5%

MAXIMUM EFFICIENCY



Outstanding Visual Appearance

- Designed with aesthetics in mind
- Excellent cell color control by dedicated cell blackening treatment and machine selection.
- Thinner wires that appear all black at a distance



Small in size, big on power

- Small form factor. Generate a huge amount of energy even in limited space.
- Up to 395W, 20.5% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection
- Reduce installation cost with higher power per module and efficiency
- Boost performance in warm weather lower temperature coefficient (-0.34%) and operating temperature



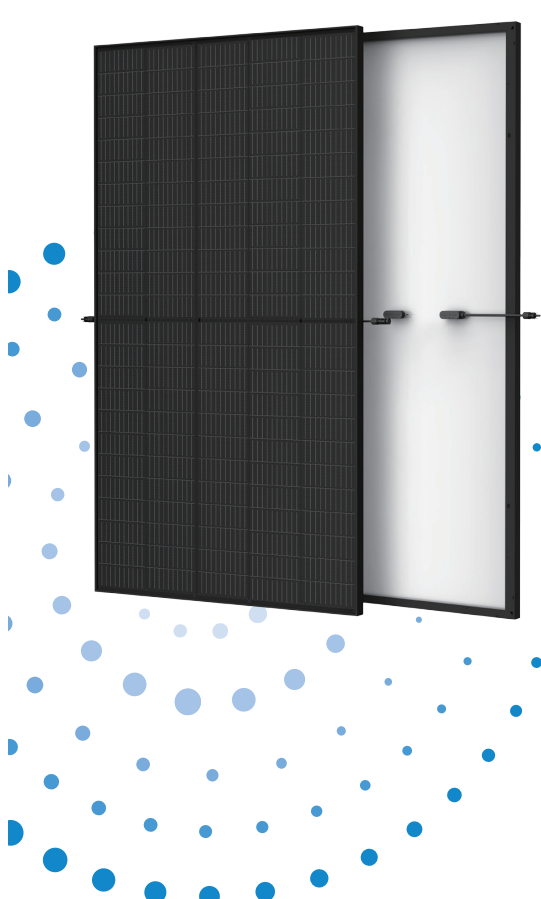
Universal solution for residential and C&I rooftops

- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems
- Perfect size and low weight. Easy for handling. Economy for transporting
- Diverse installation solutions. Flexible for system deployment

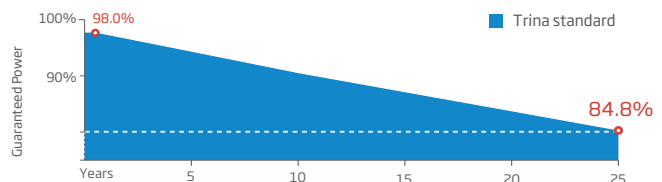


High Reliability

- 15 year product warranty
- 25 year performance warranty with lowest degradation;
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Mechanical performance up to 6000 Pa positive load and 4000 Pa negative load



Trina Solar's Backsheet Performance Warranty



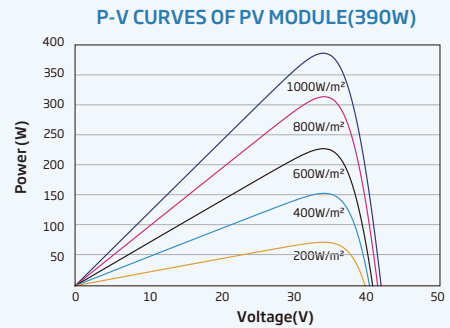
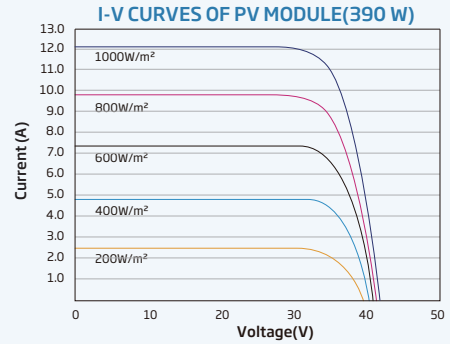
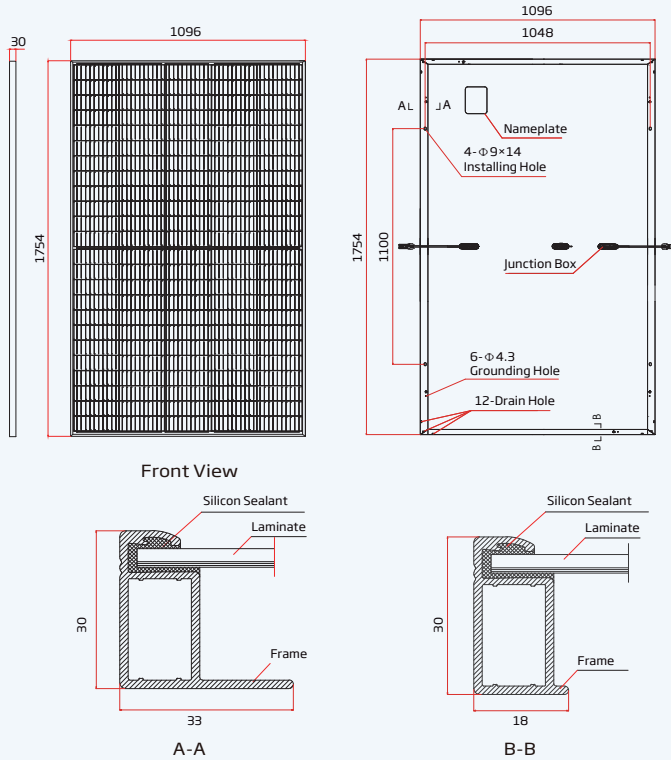
Comprehensive Products and System Certificates



IEC61215/IEC61730/IEC61701/IEC62716
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System



DIMENSIONS OF PV MODULE(mm)



ELECTRICAL DATA (STC)

Peak Power Watts- P_{MAX} (Wp)*	380	385	390	395
Power Tolerance- P_{MAX} (W)	0 ~ +5			
Maximum Power Voltage- V_{MPP} (V)	33.4	33.6	33.8	34.0
Maximum Power Current- I_{MPP} (A)	11.38	11.46	11.54	11.62
Open Circuit Voltage- V_{oc} (V)	40.4	40.6	40.8	41.0
Short Circuit Current- I_{sc} (A)	12.00	12.07	12.14	12.21
Module Efficiency η_m (%)	19.8	20.0	20.3	20.5

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

ELECTRICAL DATA (NOCT)

Maximum Power- P_{MAX} (Wp)	286	290	294	298
Maximum Power Voltage- V_{MPP} (V)	31.4	31.6	31.8	31.9
Maximum Power Current- I_{MPP} (A)	9.12	9.18	9.24	9.32
Open Circuit Voltage- V_{oc} (V)	38.0	38.2	38.4	38.6
Short Circuit Current- I_{sc} (A)	9.67	9.73	9.78	9.84

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	120 cells
Module Dimensions	1754×1096×30 mm (69.06×43.15×1.18 inches)
Weight	21.0 kg (46.3 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Backsheet	Black-White
Frame	30mm(1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), Portrait: 280/280 mm(11.02/11.02 inches) Landscape: 1100/1100 mm(43.31/43.31 inches)
Connector	MC4 EV02 / TS4*

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P_{MAX}	-0.34%/°C
Temperature Coefficient of V_{oc}	-0.25%/°C
Temperature Coefficient of I_{sc}	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40 ~ +85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

WARRANTY

15 year Product Workmanship Warranty
25 year Power Warranty
2% first year degradation
0.55% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 36 pieces
Modules per 40' container: 936 pieces

Single Phase Inverter with HD-Wave Technology

SE2200H, SE3000H, SE3500H, SE3680H,
SE4000H, SE5000H, SE6000H



INVERTERS

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Record-breaking efficiency
- Extremely small, lightweight and easy to install
- High reliability
- Built-in module-level monitoring
- Outdoor and indoor installation
- Fixed voltage inverter for longer strings
- Advanced safety feature - integrated arc fault protection

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/ Single Phase Inverter with HD-Wave Technology

SE2200H, SE3000H, SE3500H, SE3680H, SE4000H, SE5000H, SE6000H

	SE2200H	SE3000H	SE3500H	SE3680H	SE4000H	SE5000H	SE6000H		
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4								
OUTPUT									
Rated AC Power Output	2200	3000	3500	3680	4000	5000 ⁽¹⁾	6000	VA	
Maximum AC Power Output	2200	3000	3500	3680	4000	5000 ⁽¹⁾	6000	VA	
AC Output Voltage (Nominal)	220/230							Vac	
AC Output Voltage Range	184 - 264.5							Vac	
AC Frequency (Nominal)	50/60 ± 5							Hz	
Maximum Continuous Output Current	10	14	16	16	18.5	23	27.5	A	
Total Harmonic Distortion (THD)	<3							%	
Power Factor	1, adjustable -0.9 to 0.9								
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes								
INPUT									
Maximum DC Power	3400	4650	5425	5700	6200	7750 ⁽²⁾	9300	W	
Transformer-less, Ungrounded	Yes								
Maximum Input Voltage	480							Vdc	
Nominal DC Input Voltage	380							Vdc	
Maximum Input Current	6.5	9	10	10.5	11.5	13.5	16.5	Adc	
Reverse-Polarity Protection	Yes								
Ground-Fault Isolation Detection	600kΩ Sensitivity per Unit								
Maximum Inverter Efficiency	99.2							%	
European Weighted Efficiency	98.3	98.8				99		%	
Nighttime Power Consumption	< 2.5							W	
ADDITIONAL FEATURES									
Supported Communication Interfaces	RS485, Ethernet, Wi-Fi (optional), Cellular (optional), ZigBee (optional)								
Smart Energy Management	Export Limitation								
Inverter Commissioning	With the SetApp mobile application using built in Wi-Fi station for local connection								
Arc Fault Protection	Integrated, User Configurable (According to UL1699B)								
STANDARD COMPLIANCE									
Safety	IEC-62109-1/2								
Grid Connection Standards	IEC61727, IEC62116, EN 50438, VDE-AR-N-4105, VDE 0126-1-1, UTE_C_15-712, G83/2, G59/3, CEI-021, ONORM, TF3.2.1, C10-11, NRS 097-2-1								
Emissions	IEC61000-6-2, IEC61000-6-3, IEC61000-3-11, IEC61000-3-12, FCC Part 15 Class B								
INSTALLATION SPECIFICATIONS									
AC Output - Supported Cable Diameter	9-16							mm	
AC - Supported Wire Cross Section	1-13							mm ²	
DC Input	1 x MC4				2 x MC4 pair				
Dimensions (H x W x D)	280 x 370 x 142							mm	
Noise	< 25							dBA	
Weight	7.8			9		10.6		kg	
Cooling	Natural Convection								
Operating Temperature Range	-40 to +60 ⁽³⁾							°C	
Protection Rating	IP65 — Outdoor and Indoor								

⁽¹⁾ 4600VA in Germany

⁽²⁾ 7130VA in Germany

⁽³⁾ Full power up to at least 50°C / 122°F. For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note.pdf>

The UK's favourite PV accessory!

Solar iBoost+ is our latest automatic water heating device for pv system owners. Its increased efficiency and extra functions deliver even more savings and when coupled with iBoost Buddy you can conveniently monitor and control **Solar iBoost+** within the home.

With over 45,000 **Solar iBoost** products successfully working in UK homes installers recommend it!

Solar iBoost+ is brought to you by Marlec, manufacturers in wind and solar renewables since 1979.

Visit www.solariboost.co.uk for latest customer feedback and detailed specifications

Contact your local electrical installer for fitting at:



Marlec Eng Co Ltd

Rutland House, Trevithick Road, Corby, NN17 5XY

Tel: +44 (0)1536 201588 sales@marlec.co.uk

www.solariboost.co.uk

SOLAR iBOOST+

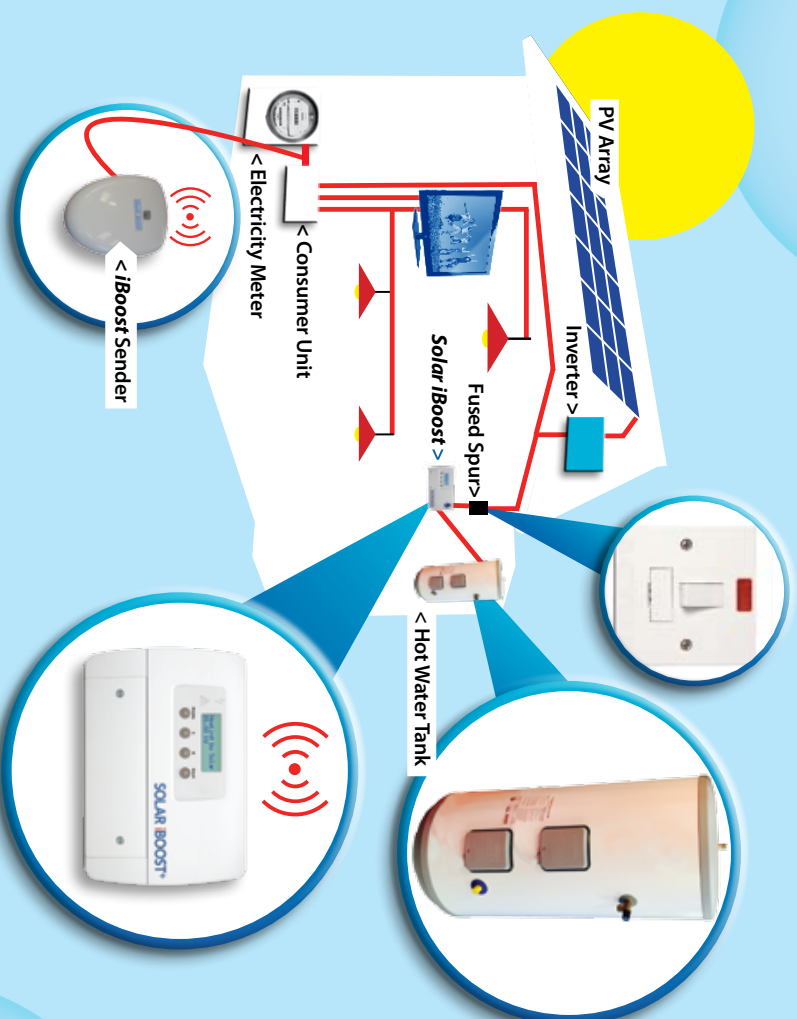
Gives you free hot water from your PV array!



Automatically consume the surplus PV generated energy at your home

Install a **Solar iBoost+** and watch your heating bills fall!

The **Solar iBoost+** concept is to divert the surplus solar photovoltaic energy generated at your home to heat the water in the household tank and save you money.



With **Solar iBoost+** fitted you will

- Cut the cost of water heating in your home.
- Reduce the use of your boiler.
- Maximise the use of the free solar energy generated at your property.

Solar iBoost+ uses only the energy that would otherwise be exported

How does it affect my Feed in Tariff Payments?

This depends on the type of scheme operated in your country but many tariffs are reducing as energy costs are rising, favouring "self consumption" of PV and wind powered home generation.

Generation based FITs are not normally affected as the **Solar iBoost** only measures what is exported. In the UK, the additional export tariff is typically unmetered and therefore self consumption is most advantageous.

Benefits on net metering systems depend on the tariff paid but it may be more cost effective to consume the electricity.

How it Works

1 Using just a single clamp installed at the household meter the Sender transmits vital export energy information to the **Solar iBoost+** wirelessly.

2 **Solar iBoost+** is activated when excess energy is available. It intelligently controls and adjusts the flow of energy to the immersion in proportion with the fluctuating export levels.

3 Water is heated during the day using excess energy only up to the immersion thermostat's setting. You can top up if required from usual heating methods or using the **Solar iBoost's** grid power functions.

Typical example of Solar iBoost+ captured energy:

Generation	2700 W
Energy Consumed	1400 W
Potential Export	1300 W
Energy Diverted	1200 W
Energy Exported	100 W

A Simple Design with Innovative and Clever Features

- **Solar iBoost+** fits quickly and neatly next to your water cylinder wired simply between a fused spur and the immersion. No need to change your standard immersion heater up to 3kW.*
- It responds rapidly to the varying home consumption and changing weather ensuring that only excess power is used.
- **Solar iBoost+** features connections for 2 immersions, switching between them automatically to maximise electric water heating systems.
- Wireless Sender eliminates unsightly and costly wiring.
- **Solar iBoost+** displays real time information "Heating by Solar 1.6kW" and historical energy saving figures are seen at the push of a button. View this and more data using the optional **iBoost+ Buddy** home display.
- LED's also give an instant visual indication of the system in operation.
- Simple programmable timer enables **Solar iBoost+** to work in harmony with your existing water heating system on a 5/2 day basis. Even separate winter and summer settings can be programmed and switched between at the push of a button.
- Selectable languages; French, German, Italian, Portuguese & Spanish.
- Built-in Boost override switch keeps you in control so you can top up your hot water in 15 minute increments up to 2 hours.
- **Solar iBoost+** is ready to connect wirelessly to the **Buddy** if added at installation or a later date.
- CE compliance to all product and safety standards conducted by independent test laboratories.
- 2 year warranty. Dimensions: 288x255x100mm 1.95kg

Consult your PV installer or qualified electrician for installation in your home. The wireless communication, no essential programming and connection into existing circuits means that installation is straightforward for a professional.

Add **iBoost+ Buddy** to conveniently monitor home energy and Heating by Solar savings.

iBOOST+ Buddy



Monitor home energy usage with **iBoost Buddy**. The eco-gauge lets you know when unused energy is available so you can switch on appliances.

View the **Solar iBoost+** display and remotely activate the Boost function.

Keep the **Buddy** handy so you can check the intuitive "traffic light" energy indicator.

Dims: 133x113x56mm 150g

The **iBoost+ Buddy** comes with a mains adaptor and connects wirelessly to the **Solar iBoost+**. Your installer can pair it into the system at the same time or you can add it at a later date.

Call us on

0800 909 8882

Visit us online

www.infinity-energy.co.uk

