

Solis-3P(3-20)K-4G

Solis Three Phase Inverters



360 degree

Features:

- ▶ Max. efficiency 98.7%
- ▶ Wide voltage range and low startup voltage
- ▶ 2 MPPT design with precise MPPT algorithm
- ▶ THDi<1.5%, low harmonic distortion against grid
- ▶ Multiple protections levels
- ▶ Intergrated Export Power Manager (EPM)



Model:

Solis-3P3K-4G	Solis-3P4K-4G	Solis-3P5K-4G
Solis-3P6K-4G	Solis-3P8K-4G	Solis-3P9K-4G
Solis-3P10K-4G	Solis-3P12K-4G	Solis-3P15K-4G
Solis-3P17K-4G	Solis-3P20K-4G	

Datasheet

Model Name	Solis-3P3K-4G	Solis-3P4K-4G	Solis-3P5K-4G	Solis-3P6K-4G	Solis-3P8K-4G	Solis-3P9K-4G	Solis-3P10K-4G	Solis-3P12K-4G	Solis-3P15K-4G	Solis-3P17K-4G	Solis-3P20K-4G
------------	---------------	---------------	---------------	---------------	---------------	---------------	----------------	----------------	----------------	----------------	----------------

Input DC

Recommended max. PV power	4.5 kW	6 kW	7.5 kW	9 kW	12 kW	13.5 kW	15 kW	18 kW	22.5 kW	25.5 kW	30 kW
Max. input voltage	1000 V										
Rated voltage	600 V										
Start-up voltage	180 V										
MPPT voltage range	160-850 V										
Max. input current	11 A / 11 A							22 A / 22 A			
Max. short circuit current	17.2 A / 17.2 A							34.3 A / 34.3 A			
MPPT number/Max. input strings number	2/2							2/4			

Output AC

Rated output power	3 kW	4 kW	5 kW	6 kW	8 kW	9 kW	10 kW	12 kW	15 kW	17 kW	20 kW
Max. apparent output power	3.3 kVA	4.4 kVA	5.5 kVA	6.6 kVA	8.8 kVA	9.9 kVA	11 kVA	13.2 kVA	16.5 kVA	18.7 kVA	22 kVA
Max. output power	3.3 kW	4.4 kW	5.5 kW	6.6 kW	8.8 kW	9.9 kW	11 kW	13.2 kW	16.5 kW	18.7 kW	22 kW
Rated grid voltage	3/N/PE, 220 V / 380 V, 230 V / 400V										
Rated grid frequency	50 Hz / 60 Hz										
Rated grid output current	4.6A/4.3A	6.1A/5.8A	7.6A/7.2A	9.1A/8.7A	12.2A/11.5A	13.7A/13.0A	15.2A/14.4A	18.2A/17.3A	22.8A/21.7A	25.8A/24.6A	30.4A/28.9A
Max. output current	4.7 A	6.4 A	7.9 A	9.5 A	12.7 A	14.3 A	15.9 A	19.1 A	23.8 A	27 A	31.8 A
Power Factor	>0.99 (0.8 leading - 0.8 lagging)										
THDi	<1.5%										

Efficiency

Max. efficiency	98.3%					98.7%					
EU efficiency	97.8%					98.1%					

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*										
Integrated DC switch	Optional										

General Data

Dimensions (W*H*D)	310*563*219 mm			
Weight	17.3 kg	18 kg	18.9 kg	19.8 kg
Topology	Transformerless			
Self consumption (night)	<1 W			
Operating ambient temperature range	-25 ~ +60°C			
Relative humidity	0-100%			
Ingress protection	IP65			
Cooling concept	Natural convection		Intelligent redundant fan-cooling	
Max. operation altitude	4000 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, TOR, EIFS 2018.2, IEC 62116, IEC 61727, IEC 60068, IEC 61683, EN 50530			
Safety/EMC standard	IEC/EN 62109-1/-2, IEC/EN 61000-6-1/-2/-3/-4			

Features

DC connection	MC4 connector										
AC connection	Quick connection plug										
Display	LCD										
Communication	RS485, Optional: Wi-Fi, GPRS										

* Activation required.

DEEP BLUE 4.0 Pro

Mono

455W n-type Bifacial Double Glass
High Efficiency Mono Module
JAM54D41 430-455/LB/1500V Series

Introduction

Powered by the latest SMBB n-type solar cell and half-cell configuration, these modules have higher output power, lower LID, better weak illumination response, and better temperature coefficient.



Higher power generation
better LCOE



Better weak illumination response



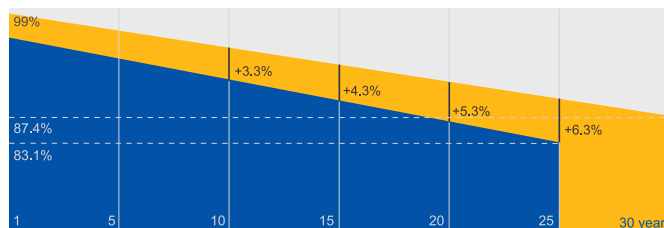
Better Temperature Coefficient

Superior Warranty

- 12-year product warranty
- 30-year linear power output warranty

1% 1st-year Degradation

0.4% Annual Degradation
Over 30 years



■ n-type Bifacial Double Glass Module
Linear Performance Warranty

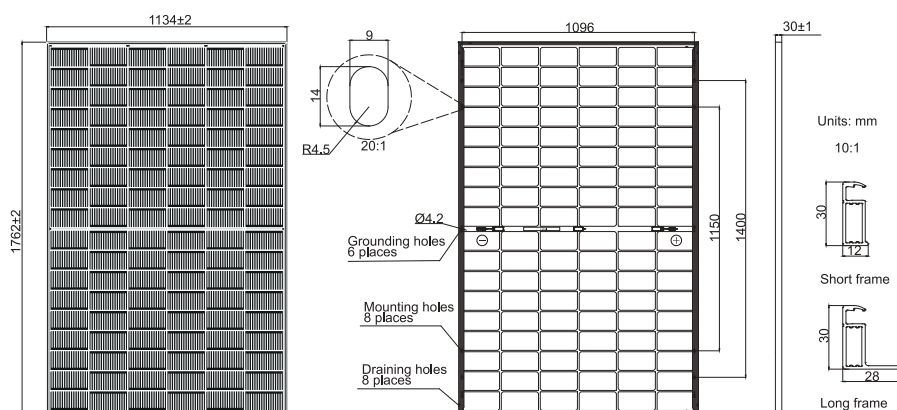
■ Standard Module Linear
Performance Warranty

Comprehensive Certificates

- IEC 61215, IEC 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems



MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono-16BB
Weight	22kg
Dimensions	1762±2mm×1134±2mm×30±1mm
Cable Cross Section Size	4mm ² (IEC), 12 AWG(UL)
No. of cells	108(6×18)
Junction Box	IP68, 3 diodes
Connector	Stäubli MC4-EVO2A/MC4-EVO2 QC Solar QC 4.10-351/QC 4.10-35
Cable Length (Including Connector)	Portrait: 300mm(+)/400mm(-); 800mm(+)/800mm(-)(Leapfrog) Landscape: 1200mm(+)/1200mm(-)
Front Glass/Back Glass	1.6mm/1.6mm
Country of Manufacturer	China/Vietnam

ELECTRICAL PARAMETERS AT STC

TYPE	JAM54D41-430/LB/1500V	JAM54D41-435/LB/1500V	JAM54D41-440/LB/1500V	JAM54D41-445/LB/1500V	JAM54D41-450/LB/1500V	JAM54D41-455/LB/1500V
Rated Maximum Power(P _{max}) [W]	430	435	440	445	450	455
Open Circuit Voltage(V _{oc}) [V]	38.50	38.70	38.90	39.10	39.30	39.50
Maximum Power Voltage(V _{mp}) [V]	32.12	32.29	32.47	32.65	32.82	33.00
Short Circuit Current(I _{sc}) [A]	14.14	14.23	14.31	14.40	14.48	14.56
Maximum Power Current(I _{mp}) [A]	13.39	13.47	13.55	13.63	13.71	13.79
Module Efficiency [%]	21.5	21.8	22.0	22.3	22.5	22.8
Power Tolerance	0~+5W					
Temperature Coefficient of I _{sc} (α _{Isc})	+0.046%/°C					
Temperature Coefficient of V _{oc} (β _{Voc})	-0.260%/°C					
Temperature Coefficient of P _{max} (γ _{Pmp})	-0.300%/°C					
STC	Irradiance 1000W/m ² , cell temperature 25°C, AM1.5G					

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.
Measurement tolerance at STC: P_{max} ±3 %, V_{oc} ±3% and I_{sc} ±4%.

ELECTRICAL CHARACTERISTICS WITH 10% SOLAR IRRADIATION RATIO

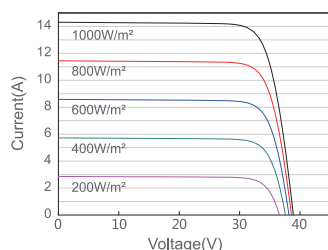
OPERATING CONDITIONS

TYPE	JAM54D41-430/LB/1500V	JAM54D41-435/LB/1500V	JAM54D41-440/LB/1500V	JAM54D41-445/LB/1500V	JAM54D41-450/LB/1500V	JAM54D41-455/LB/1500V	Maximum System Voltage	1500V DC
Rated Max Power(P _{max}) [W]	464	470	475	481	486	491	Operating Temperature	-40°C~+85°C
Open Circuit Voltage(V _{oc}) [V]	38.50	38.70	38.90	39.10	39.30	39.50	Maximum Series Fuse Rating	30A
Max Power Voltage(V _{mp}) [V]	32.11	32.29	32.47	32.65	32.82	32.99	Maximum Static Load, Front Maximum Static Load, Back	2400Pa, 1.5 1600Pa, 1.5
Short Circuit Current(I _{sc}) [A]	15.27	15.36	15.46	15.55	15.64	15.73	NOCT	45±2°C
Max Power Current(I _{mp}) [A]	14.46	14.55	14.63	14.72	14.81	14.89	Bifaciality*	80%±10%
Irradiation Ratio (rear/front)	10%						Fire Safety Class	Class C

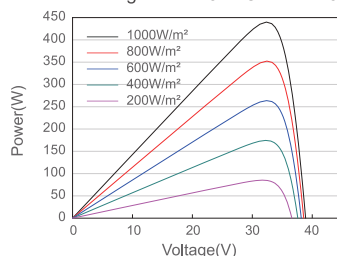
*Bifaciality=P_{max, rear}/Rated P_{max, front}

CHARACTERISTICS

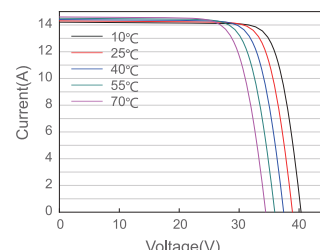
Current-Voltage Curve JAM54D41-440/LB/1500V



Power-Voltage Curve JAM54D41-440/LB/1500V

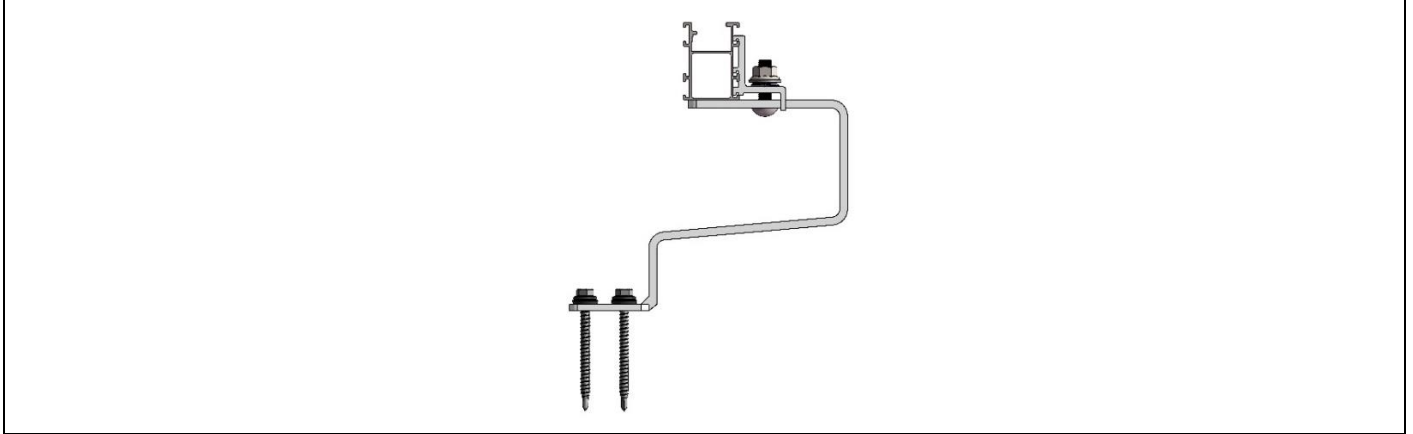


Current-Voltage Curve JAM54D41-440/LB/1500V

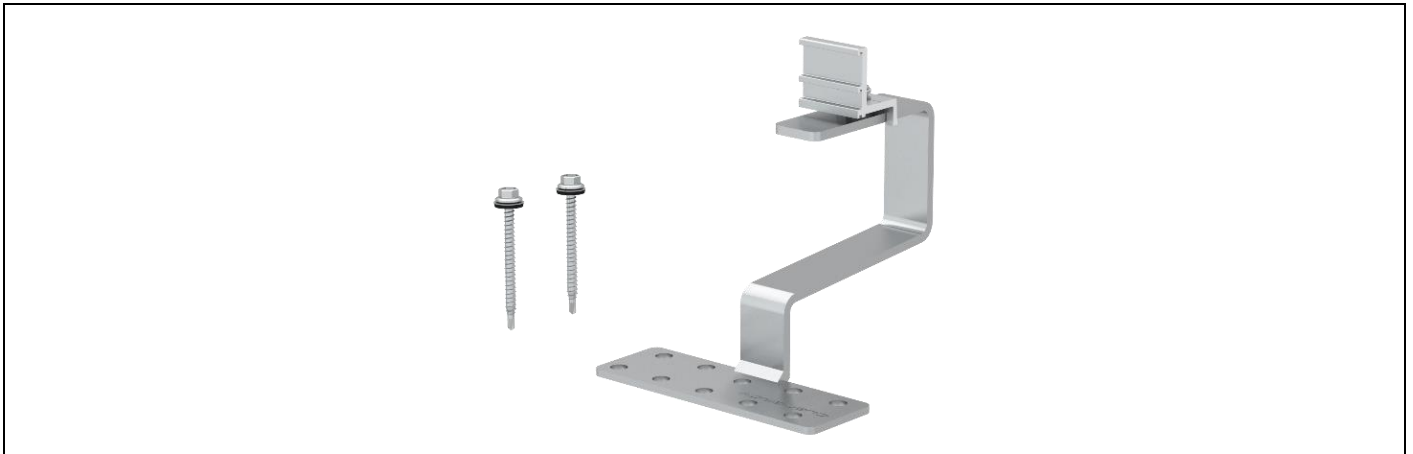


Tile Interface

Assembly

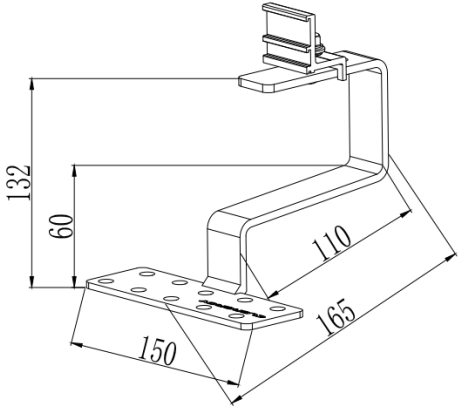


Component



Tile Interface for light to medium with 6.3x70 Buildex Screw
Part No.: ER-I-PRO/01 (bar code: 12-003-00055)

Technical Specification

Application	Tile Roof Timber Rafter	
Screw Specification	2 x C3 Buildex 14-11 x 70 (14 gauge, 6.3 mm, 11 TPI, 70 mm long) screw with 16 mm Aluminum Bonded Washer	
Dimensions	L165*W150*H132mm	
Weight	0.732 kg	
Packaging	12 units per pack, 2 packs (24 units) per carton	
Material	Roof Hook: SUS304 Bolts/Washer/Nuts/Spring: SUS304 ezClip: AL6005-T5	
Standard	BRE489 GB50797 AS NZS1170.2 EN1991 JISC8955 ASCE 7-10	



SolarFlash™

Now we can all do it right

The innovative new weather proof solution to the solar industry problem of fitting solar panels to slate roofs.

 Watch the presentation ▶

 Watch the installation video ▶

Many installation technicians are not experienced roofers and are therefore not able to offer a quality repair or long term guarantee. The SolarFlash™ system enables any competent installer to perform a high quality slate/tile roof repair.

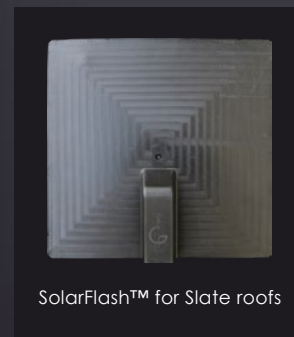
The system is designed to create a waterproof solution to refitting slates/tiles around the bracket. The existing method of dressing a flashing material around the bracket is fundamentally flawed. This is because (without specialist equipment) the flashing material is in contact with the bracket, which is a movable projection from the roof. This bracket must be allowed to move. By dressing lead around the bracket, any movement in the bracket will cause movement in the lead. As the lead is interwoven with the slates/tiles, there is a potential for the lead to damage/crack the slates.

Benefits of using SolarFlash™

- Is simple, practical and permanent
- Is easy to use by all installers
- minimises roof tile cutting areas
- ensures sufficient bracket clearance for a range of different brackets
- allows bracket movement without tile stress
- doesn't compromise a roof's weather protection
- doesn't compromise a roof's aesthetic appearance
- comes with a 25 year guarantee

Specification

SolarFlash™ Size

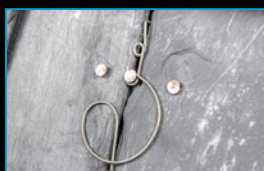


The full SolarFlash™ solution kit includes:

- 1 x SolarFlash™
- 3x Hallhooks &
- 1 x Hookpull
- 2 x Shims (packings)
- 1 x Weather-seal foam insert
- Compensation hooks
- User instructions

MCS 012 Compliant

MCS 012 is a new standard that ensures products which are used to fix solar PV and solar thermal products onto pitched roofs are meeting relevant local and national building regulations in terms of Wind upload, Weathertightness; and Fire Resistance. It requires full testing of the flashing kit in conjunction with the mounting kit. The SolarFlash™ system will pass any weathertightness test if used in conjunction with a bracket that gives at least 30mm clearance from the rafter to the bend down the roof i.e. the elbow should be no less than 30mm deep and then can be made to work with shims (packings).



HallHook™

is a permanent, secret and fail safe device that should be used when replacing a broken slate.

G&H Group

Firlands Mill
Pudsey
Leeds

Contact person:

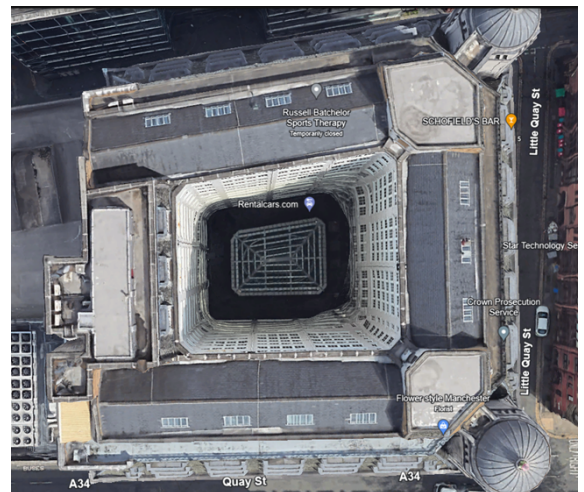
James Hutchinson
Phone: 0113 255 6433
E-Mail: james.hutchinson@ghp.me

16/07/2024

Your PV system from G&H Group

Address of Installation

Sunlight House, Little Quay St, Manchester M3 3HP



Project Description:

Pv on roof

Project Overview



Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Manchester, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
PV Generator Output	22.7 kWp
PV Generator Surface	101.9 m ²
Number of PV Modules	51
Number of Inverters	1

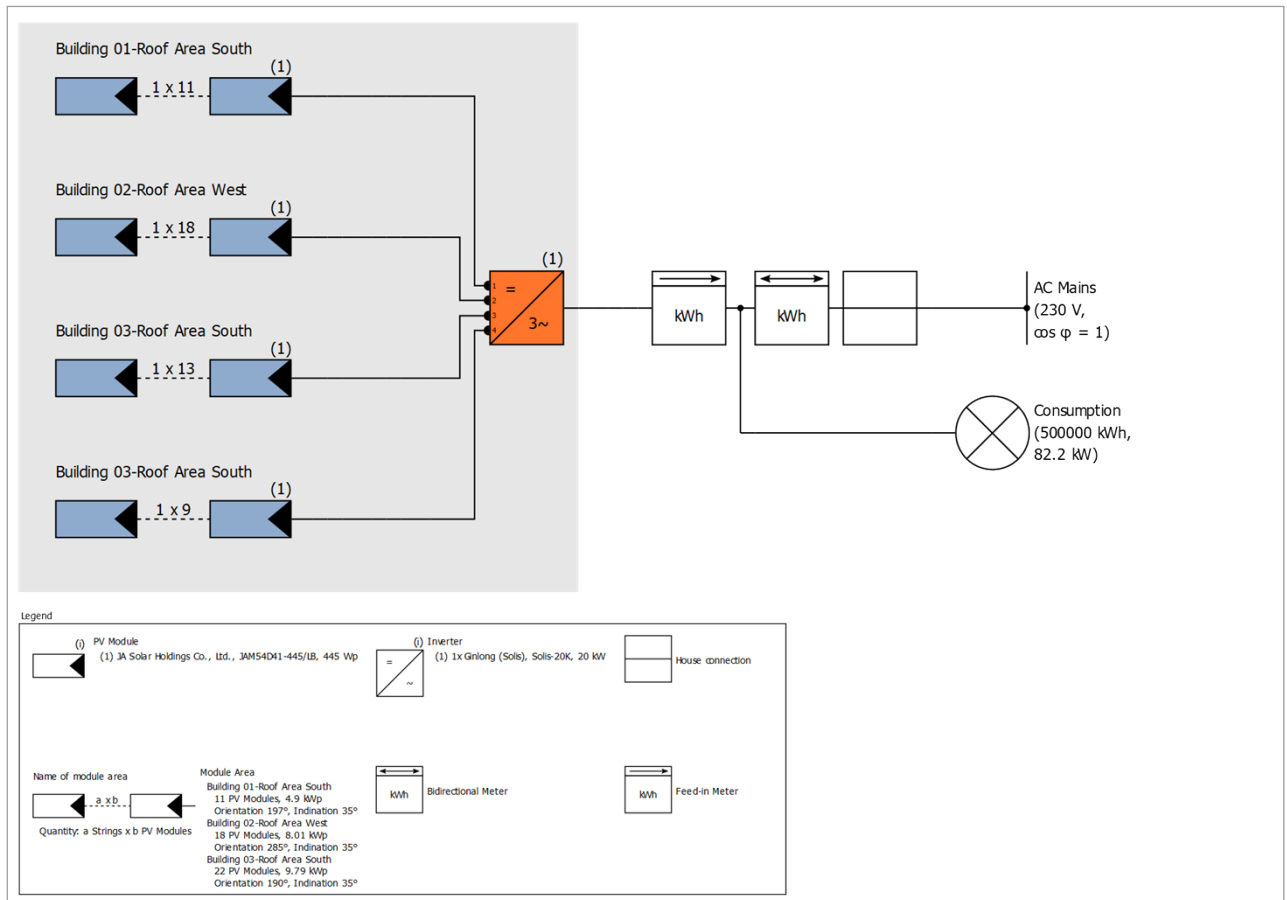


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	22.70 kWp
Spec. Annual Yield	975.49 kWh/kWp
Performance Ratio (PR)	93.40 %
Yield Reduction due to Shading	0.9 %
PV Generator Energy (AC grid)	22,152 kWh/Year
Own Consumption	22,152 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	0 kWh/Year
Own Power Consumption	100.0 %
CO ₂ Emissions avoided	10,405 kg / year
Level of Self-sufficiency	4.4 %

Financial Analysis

Your Gain

Total investment costs	22,695.00 £
Internal Rate of Return (IRR)	38.38 %
Amortization Period	2.7 Years
Electricity Production Costs	0.0568 £/kWh
Energy Balance/Feed-in Concept	Surplus Feed-in

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
Climate Data	
Location	Manchester, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies
Consumption	
Total Consumption	500000 kWh
Office building 16000 m²	500000 kWh
Load Peak	82.2 kW

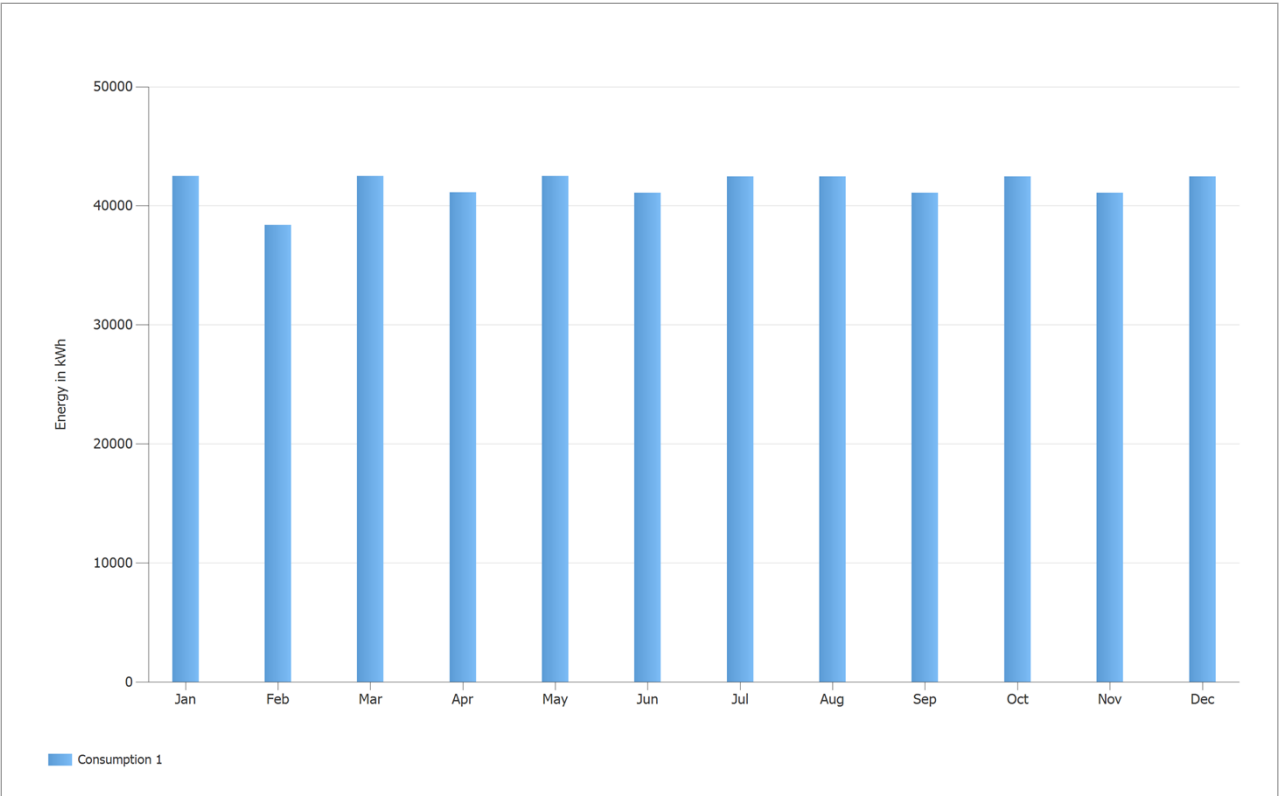


Figure: Consumption

Module Areas

1. Module Area - Building 01-Roof Area South

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

Name	Building 01-Roof Area South
PV Modules	11 x JAM54D41-445/LB (v1)
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	35 °
Orientation	South 197 °
Installation Type	Mounted - Roof
PV Generator Surface	22.0 m ²



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

2. Module Area - Building 02-Roof Area West

PV Generator, 2. Module Area - Building 02-Roof Area West

Name	Building 02-Roof Area West
PV Modules	18 x JAM54D41-445/LB (v1)
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	35 °
Orientation	West 285 °
Installation Type	Mounted - Roof
PV Generator Surface	36.0 m ²

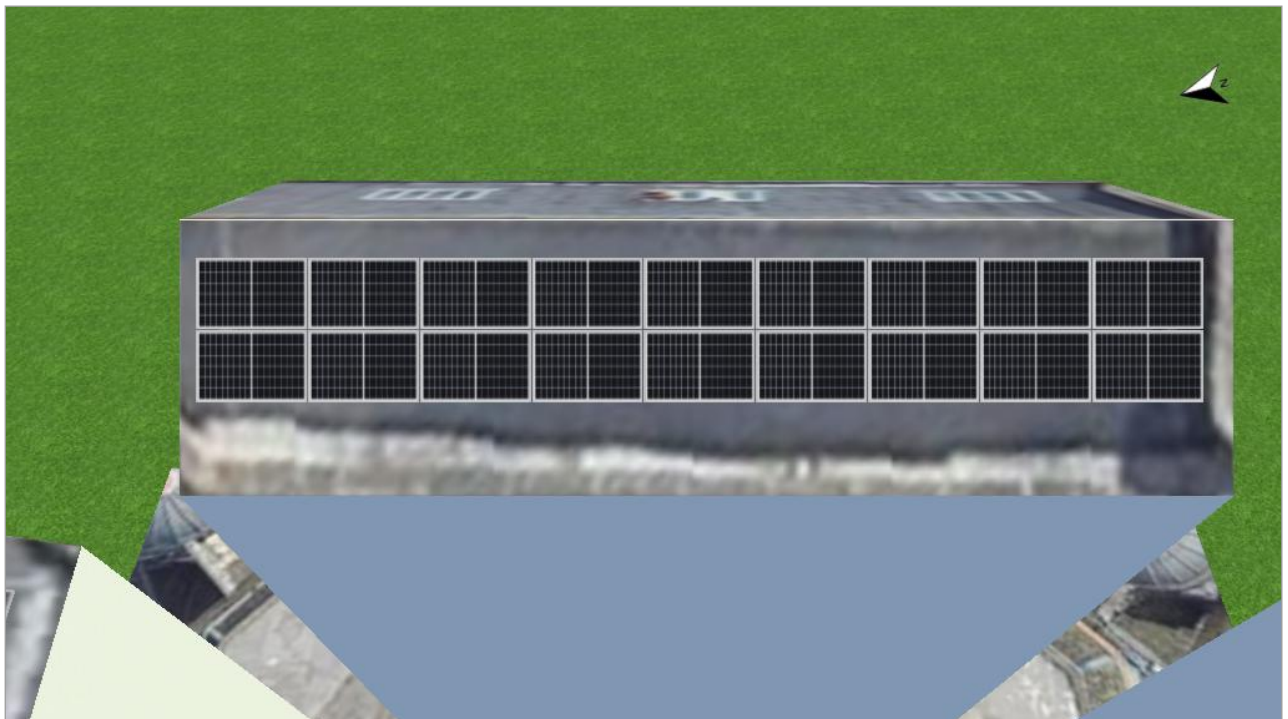


Figure: 2. Module Area - Building 02-Roof Area West

3. Module Area - Building 03-Roof Area South

PV Generator, 3. Module Area - Building 03-Roof Area South

Name	Building 03-Roof Area South
PV Modules	22 x JAM54D41-445/LB (v1)
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	35 °
Orientation	South 190 °
Installation Type	Mounted - Roof
PV Generator Surface	44.0 m ²

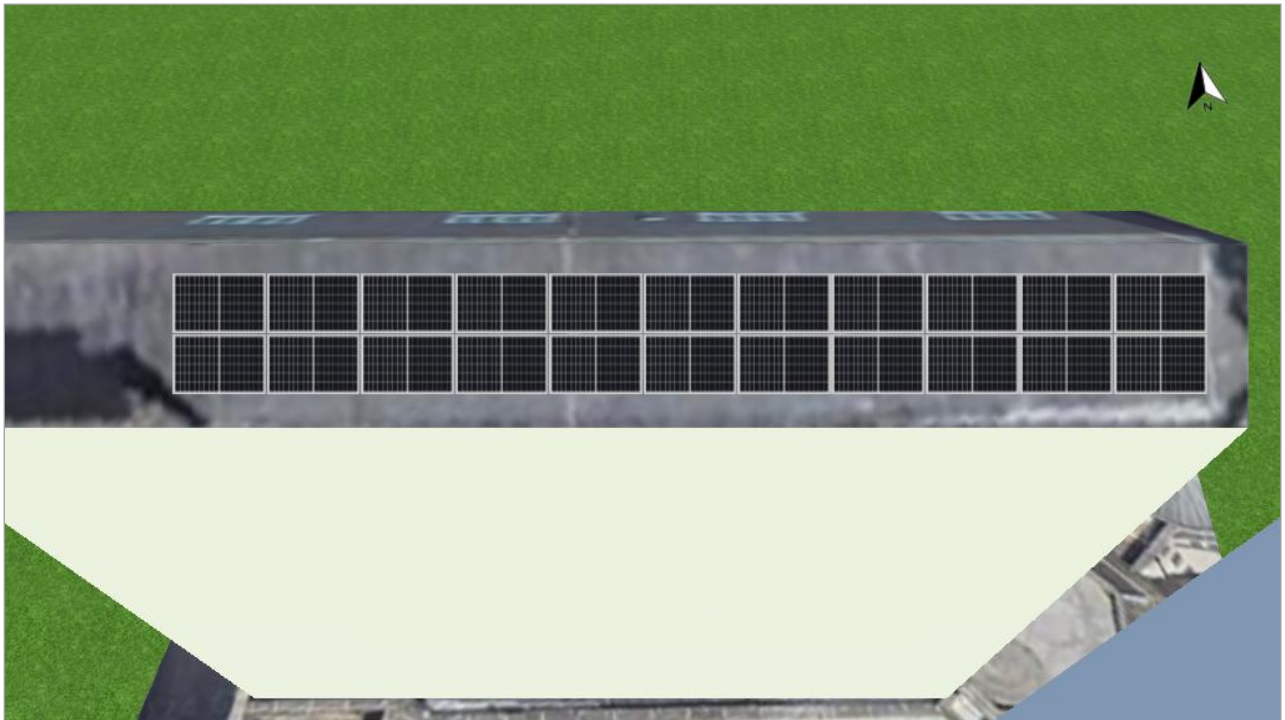


Figure: 3. Module Area - Building 03-Roof Area South

Horizon Line, 3D Design

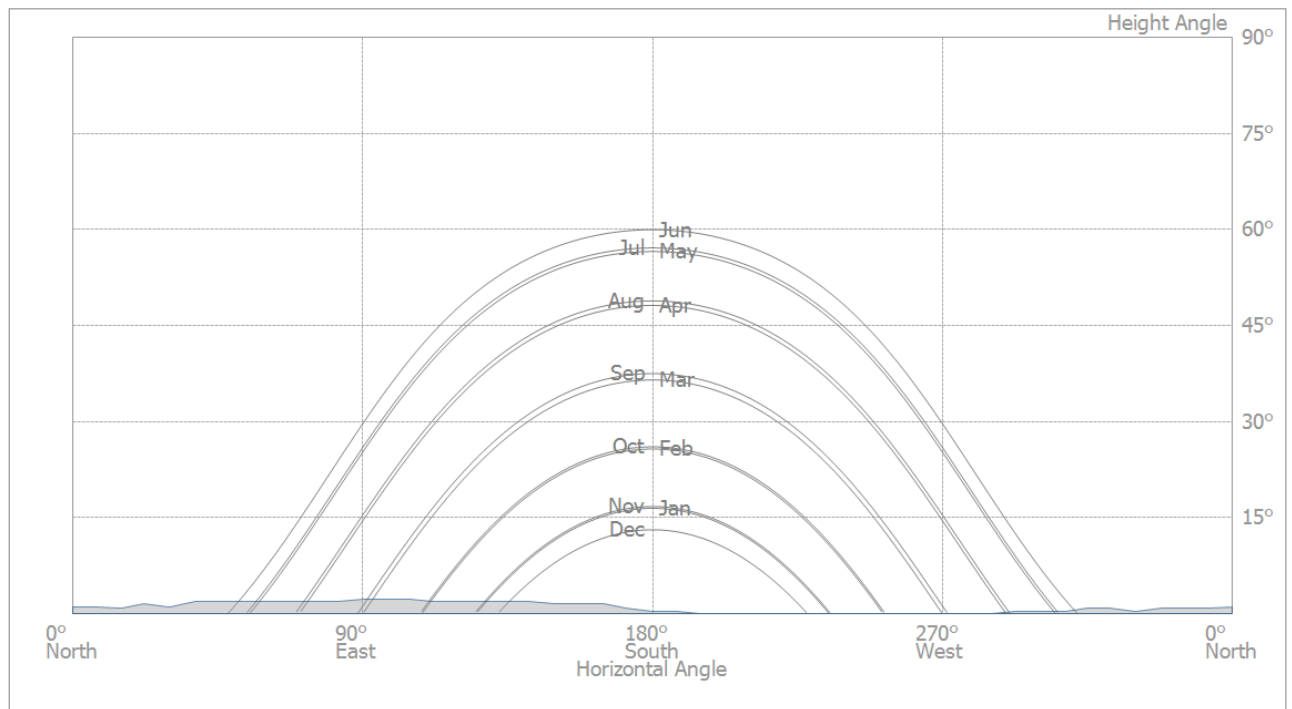


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Areas	Building 01-Roof Area South + Building 02-Roof Area West + Building 03-Roof Area South
Inverter 1	
Model	Solis-20K (v2)
Manufacturer	Ginlong (Solis)
Quantity	1
Sizing Factor	113.5 %
Configuration	MPP 1: 1 x 11 MPP 2: 1 x 18 MPP 3: 1 x 13 MPP 4: 1 x 9

AC Mains

AC Mains

Number of Phases	3
Mains voltage between phase and neutral	230 V
Displacement Power Factor (cos phi)	+/- 1

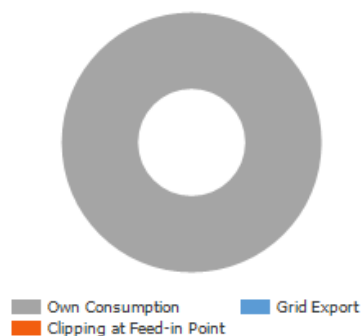
Simulation Results

Results Total System

PV System

PV Generator Output	22.70 kWp
Spec. Annual Yield	975.49 kWh/kWp
Performance Ratio (PR)	93.40 %
Yield Reduction due to Shading	0.9 %
PV Generator Energy (AC grid)	22,152 kWh/Year
Own Consumption	22,152 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	0 kWh/Year
Own Power Consumption	100.0 %
CO ₂ Emissions avoided	10,405 kg / year

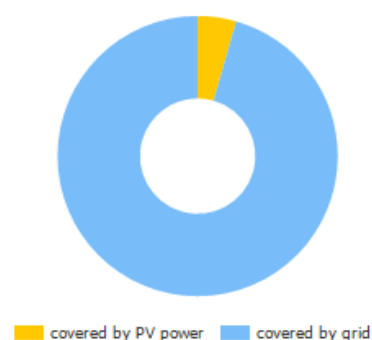
PV Generator Energy (AC grid)



Appliances

Appliances	500,000 kWh/Year
Standby Consumption (Inverter)	13 kWh/Year
Total Consumption	500,013 kWh/Year
covered by PV power	22,152 kWh/Year
covered by grid	477,861 kWh/Year
Solar Fraction	4.4 %

Total Consumption

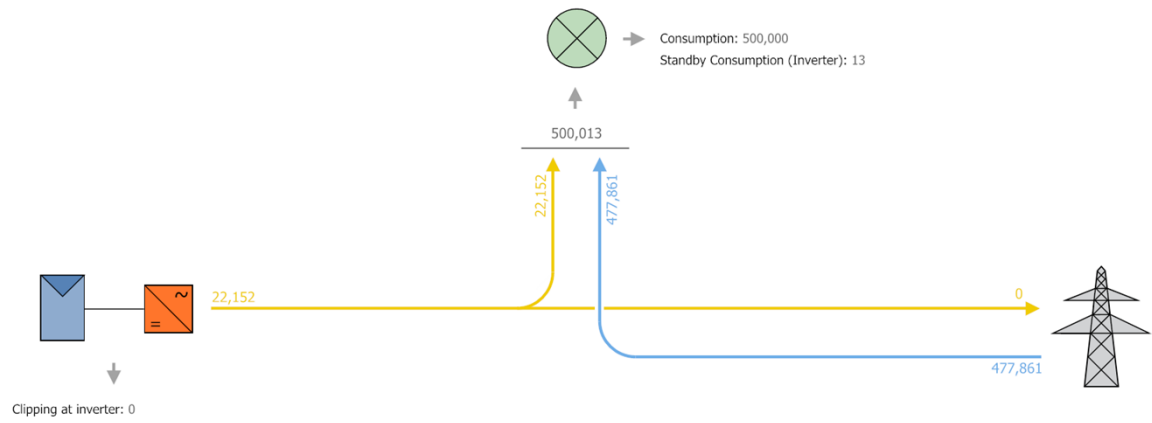


Level of Self-sufficiency

Total Consumption	500,013 kWh/Year
covered by grid	477,861 kWh/Year
Level of Self-sufficiency	4.4 %

Energy Flow Graph

Project: Sunlight House



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

Figure: Energy flow

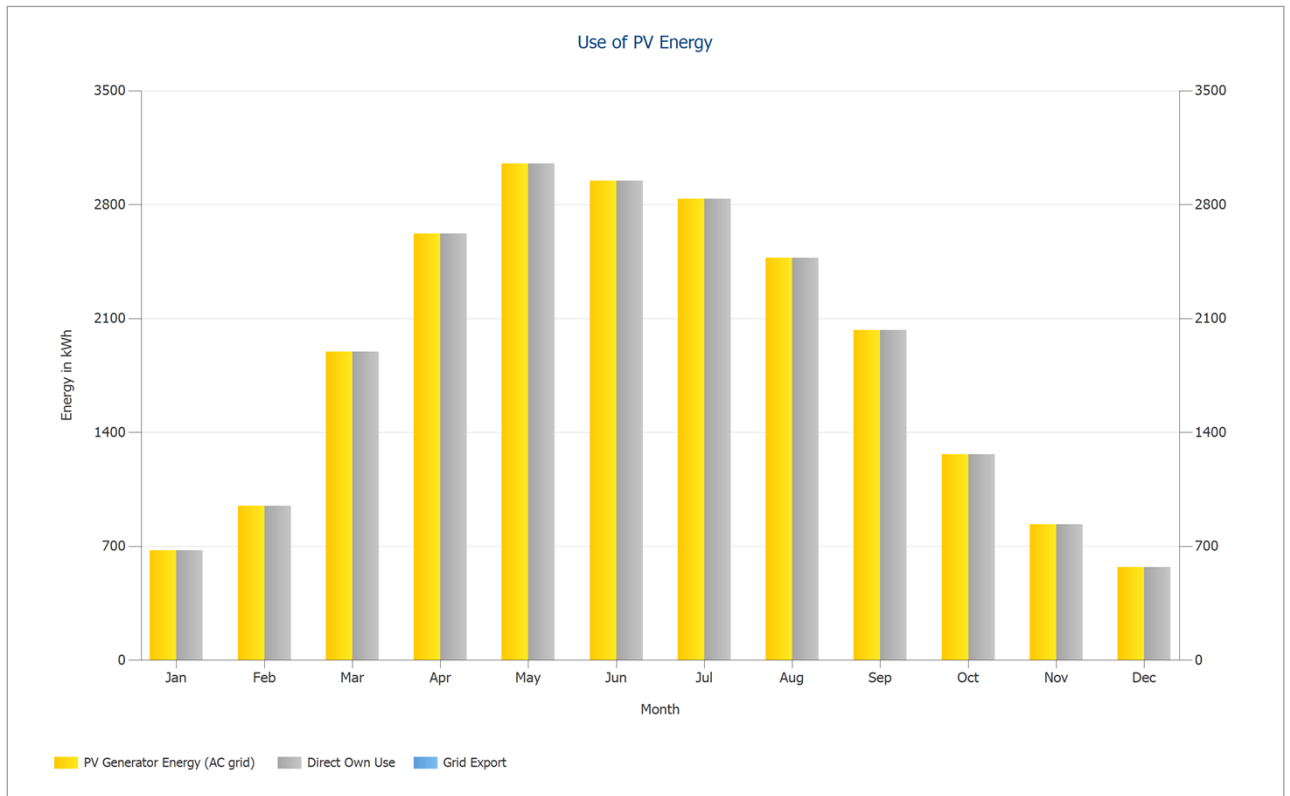


Figure: Use of PV Energy

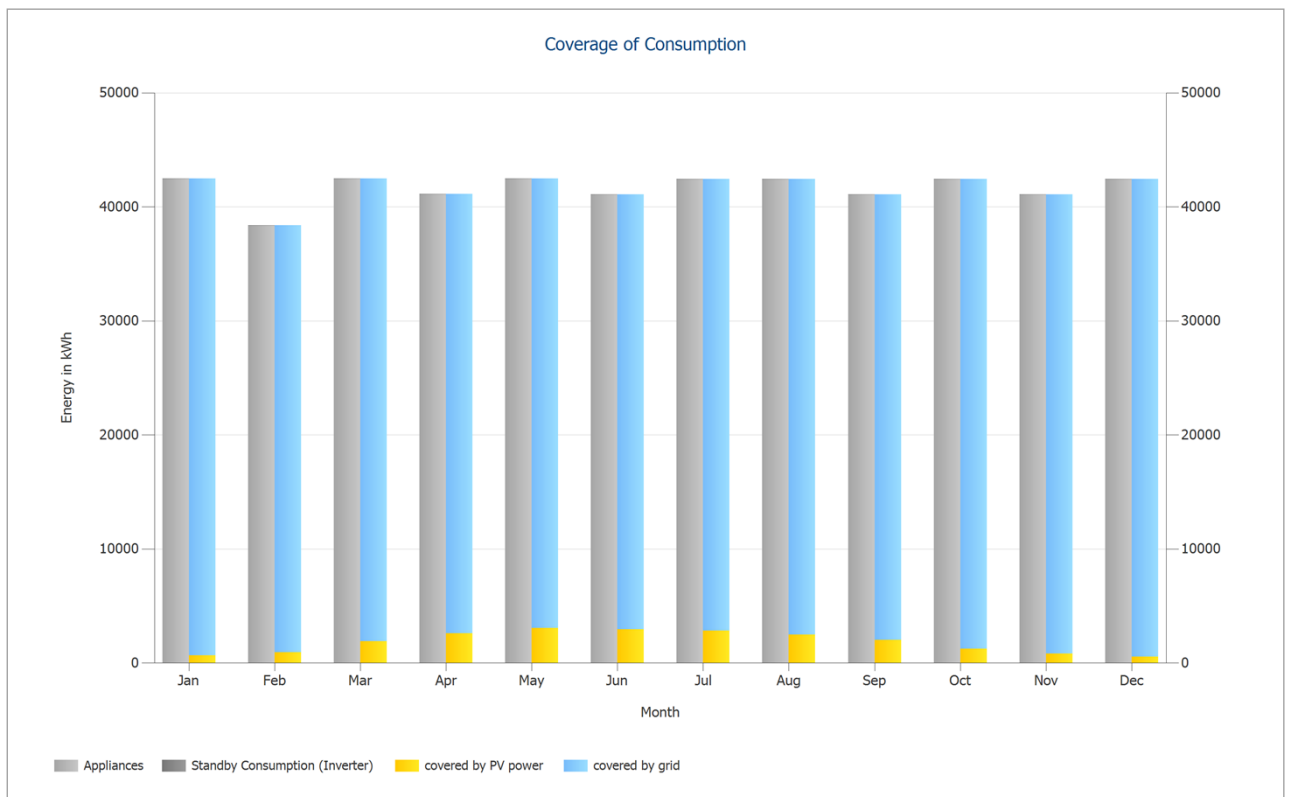


Figure: Coverage of Consumption

Plans and parts list

Circuit Diagram

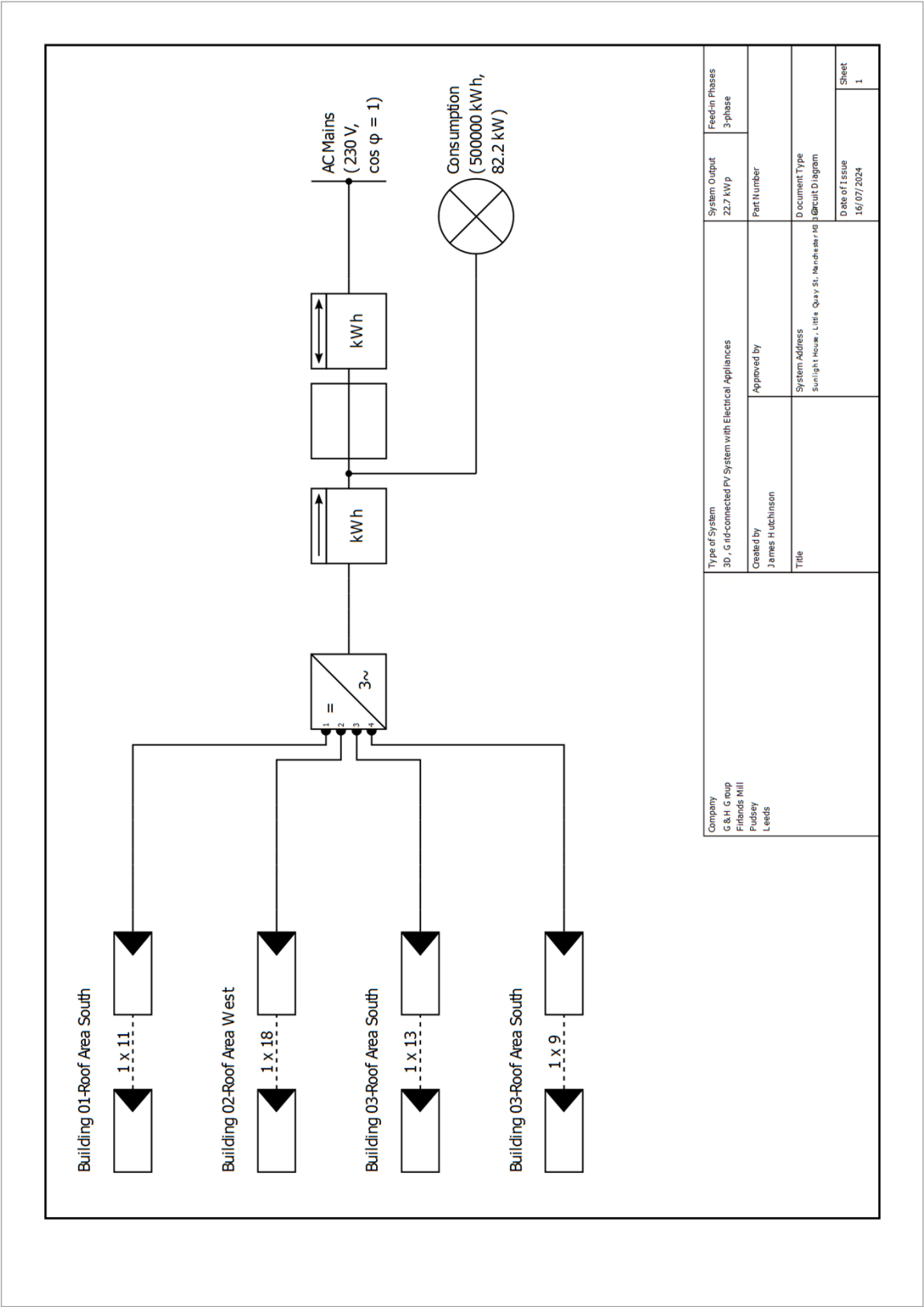


Figure: Circuit Diagram

Overview plan

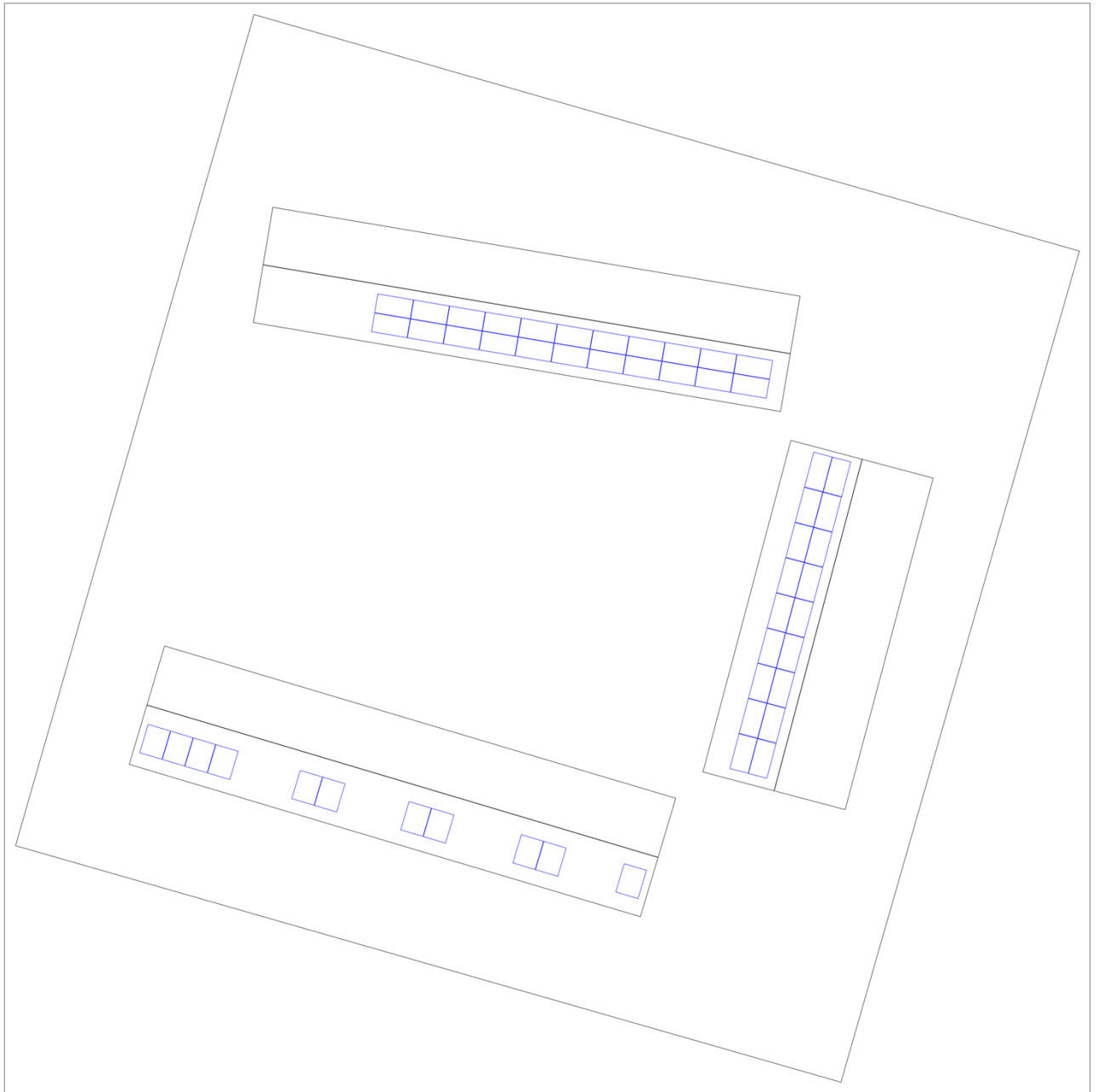


Figure: Overview plan

Dimensioning Plan

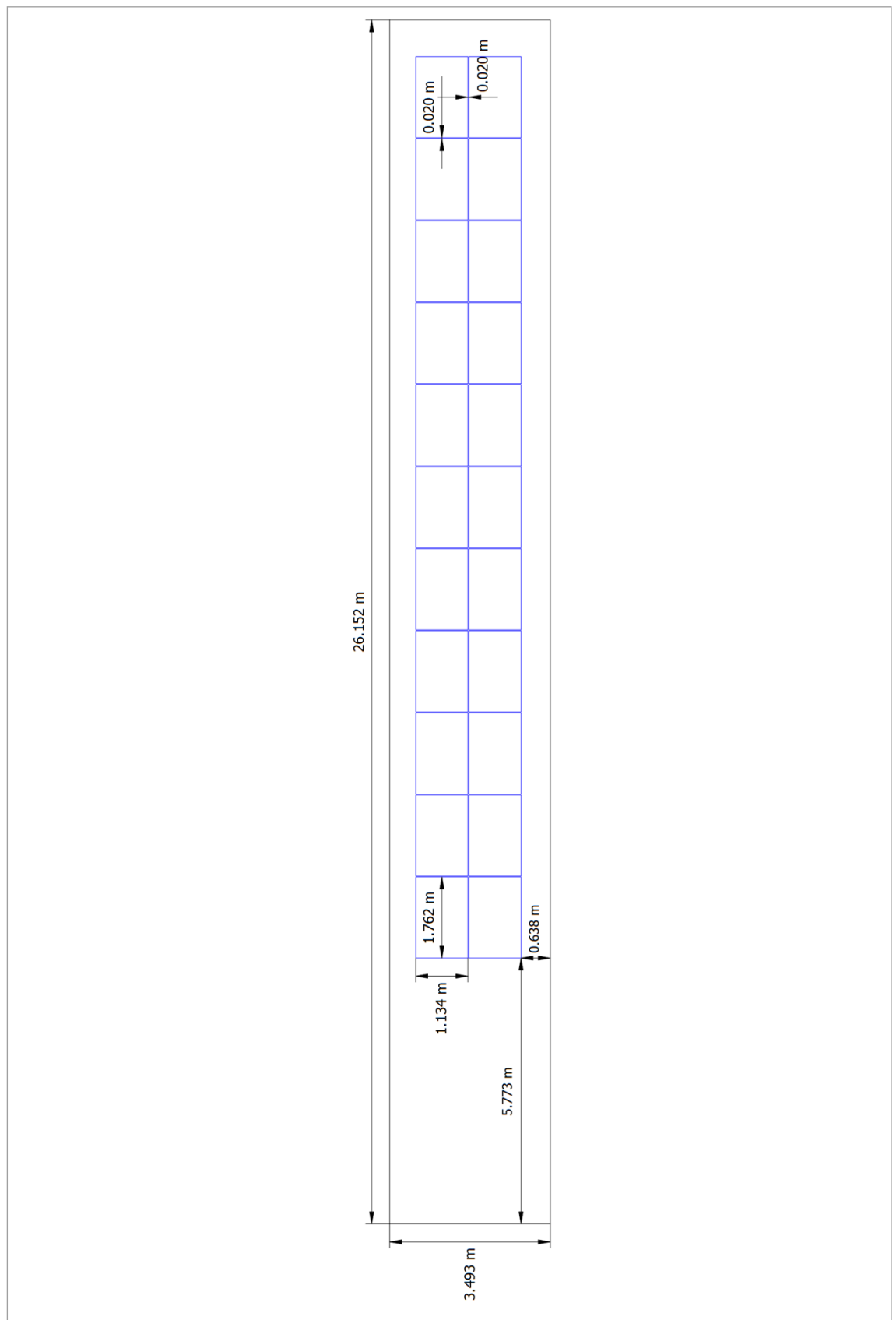


Figure: Building 03 - Roof Area South

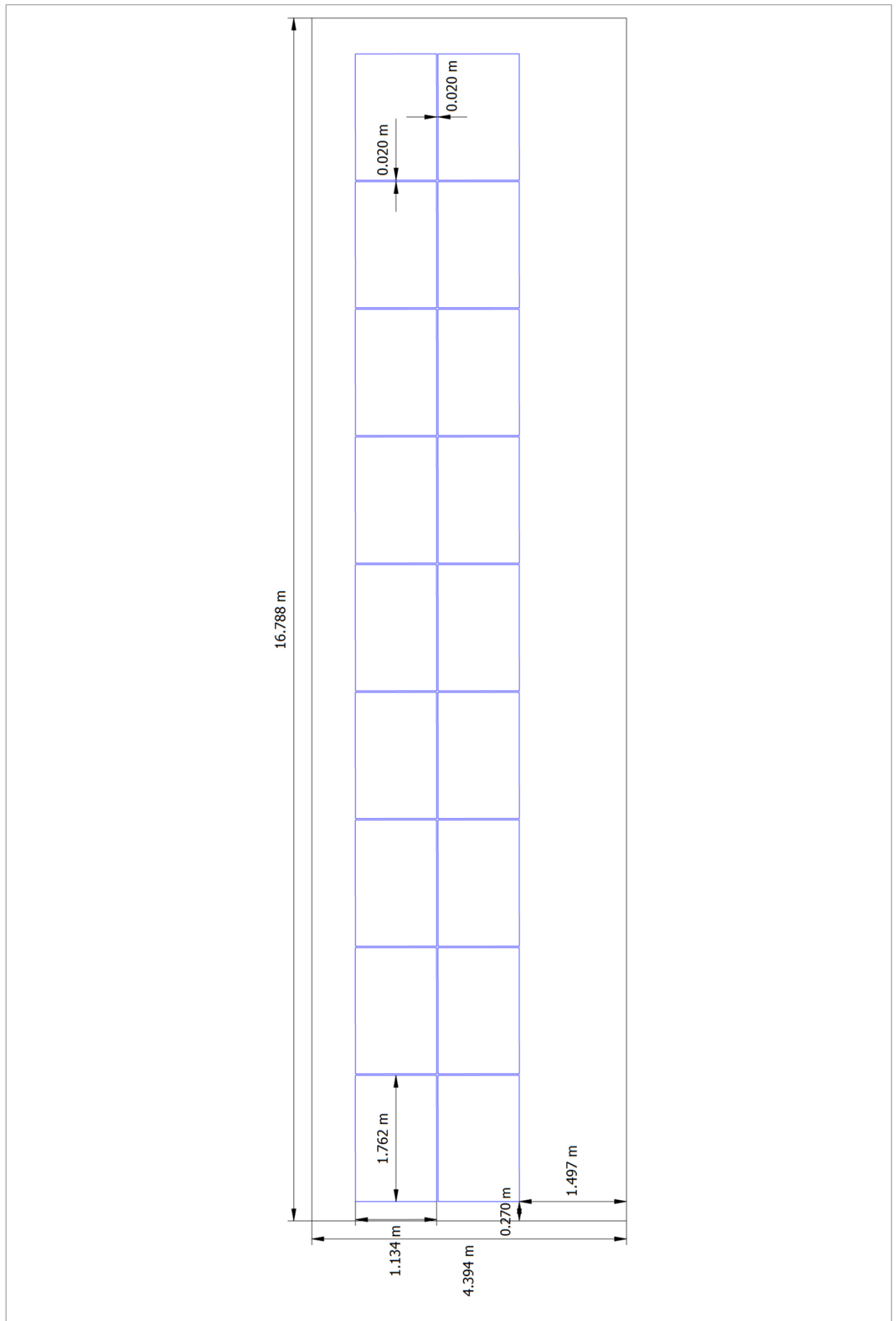


Figure: Building 02 - Roof Area West

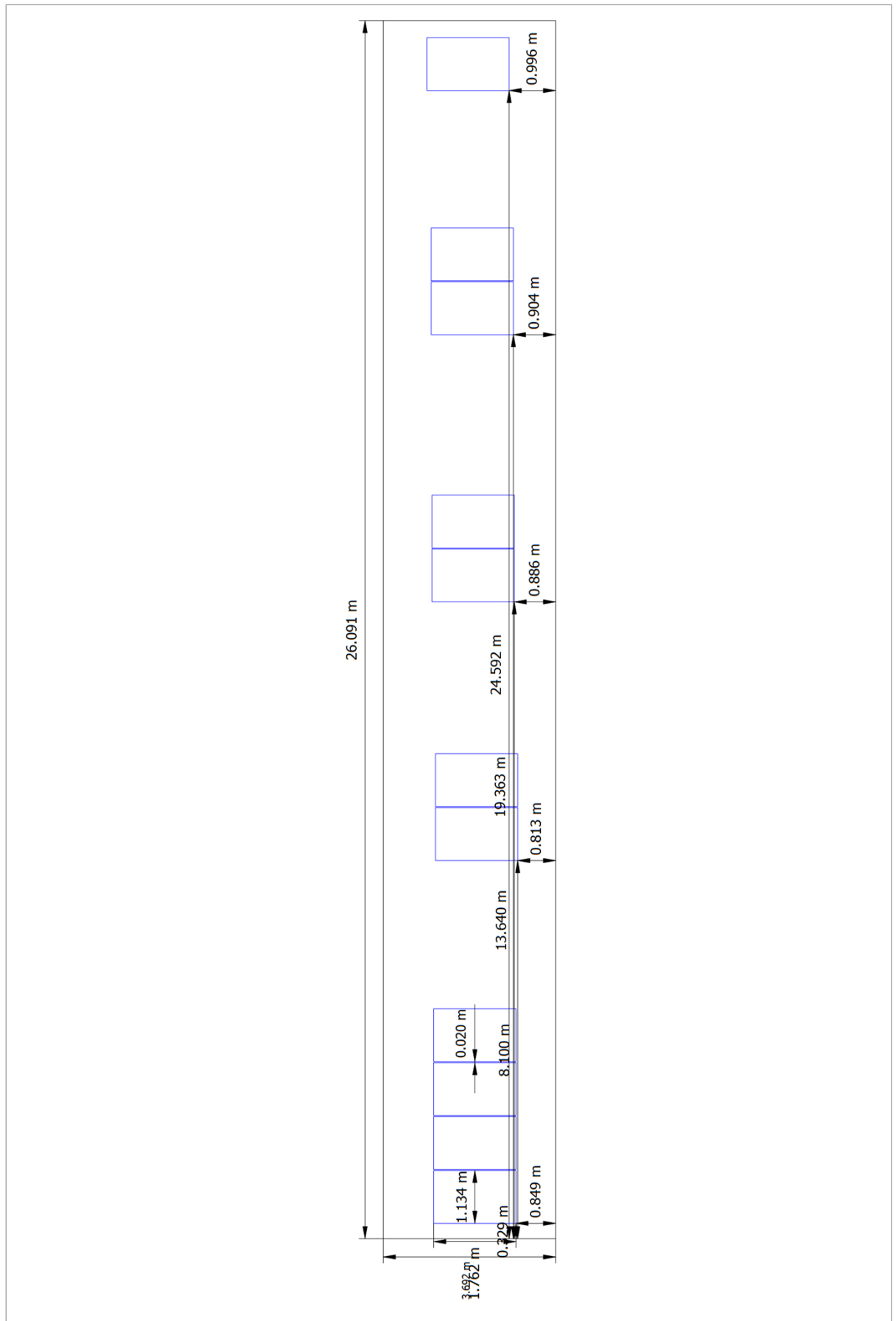


Figure: Building 01 - Roof Area South

String Plan

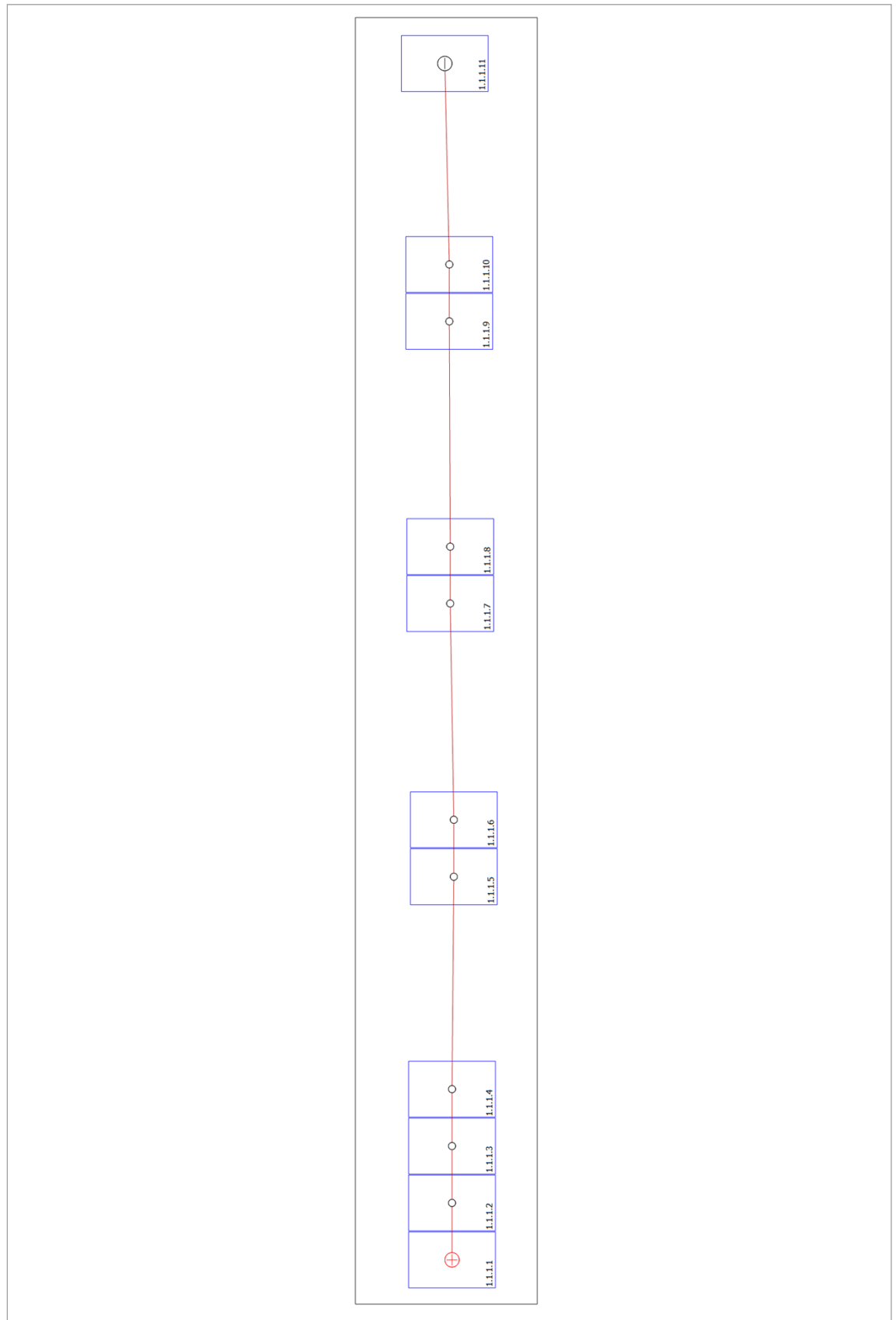


Figure: Building 01 - Roof Area South

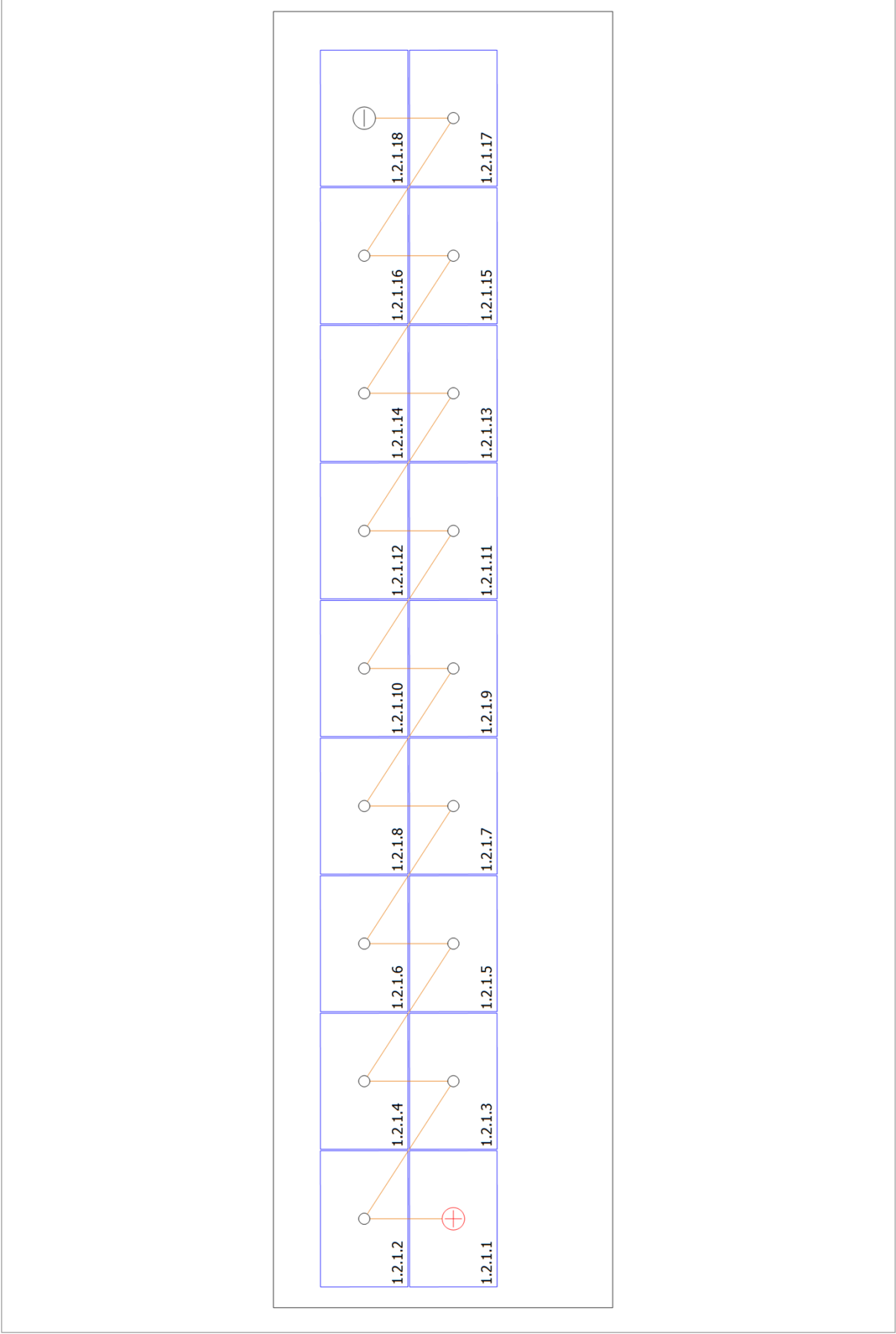


Figure: Building 02 - Roof Area West

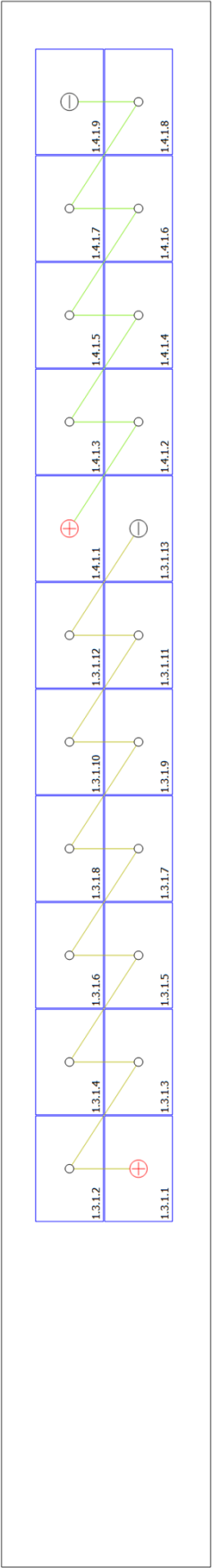


Figure: Building 03 - Roof Area South

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		JA Solar Holdings Co., Ltd.	JAM54D41-445/LB	51	Piece
2	Inverter		Ginlong (Solis)	Solis-20K	1	Piece
3	Components			Feed-in Meter	1	Piece
4	Components			House connection	1	Piece
5	Components			Bidirectional Meter	1	Piece