



23.795 kWp Solar PV Installation

30-32 Blyth Road, Hayes, UB3 1BY

Technical Submission Document

January 2020

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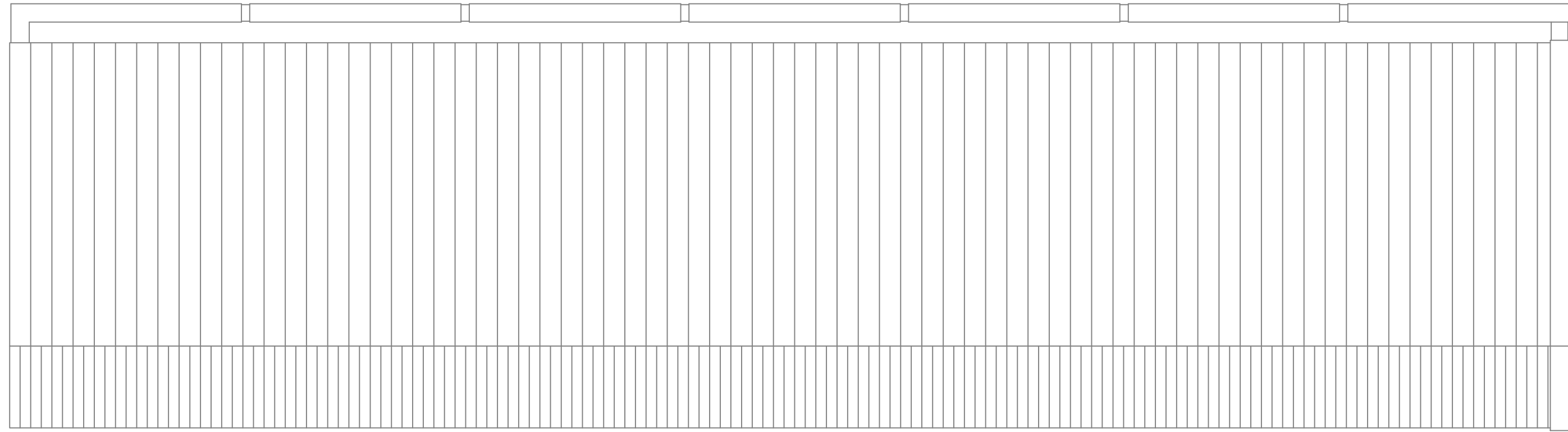
Section 7

System Inverter Data Sheet

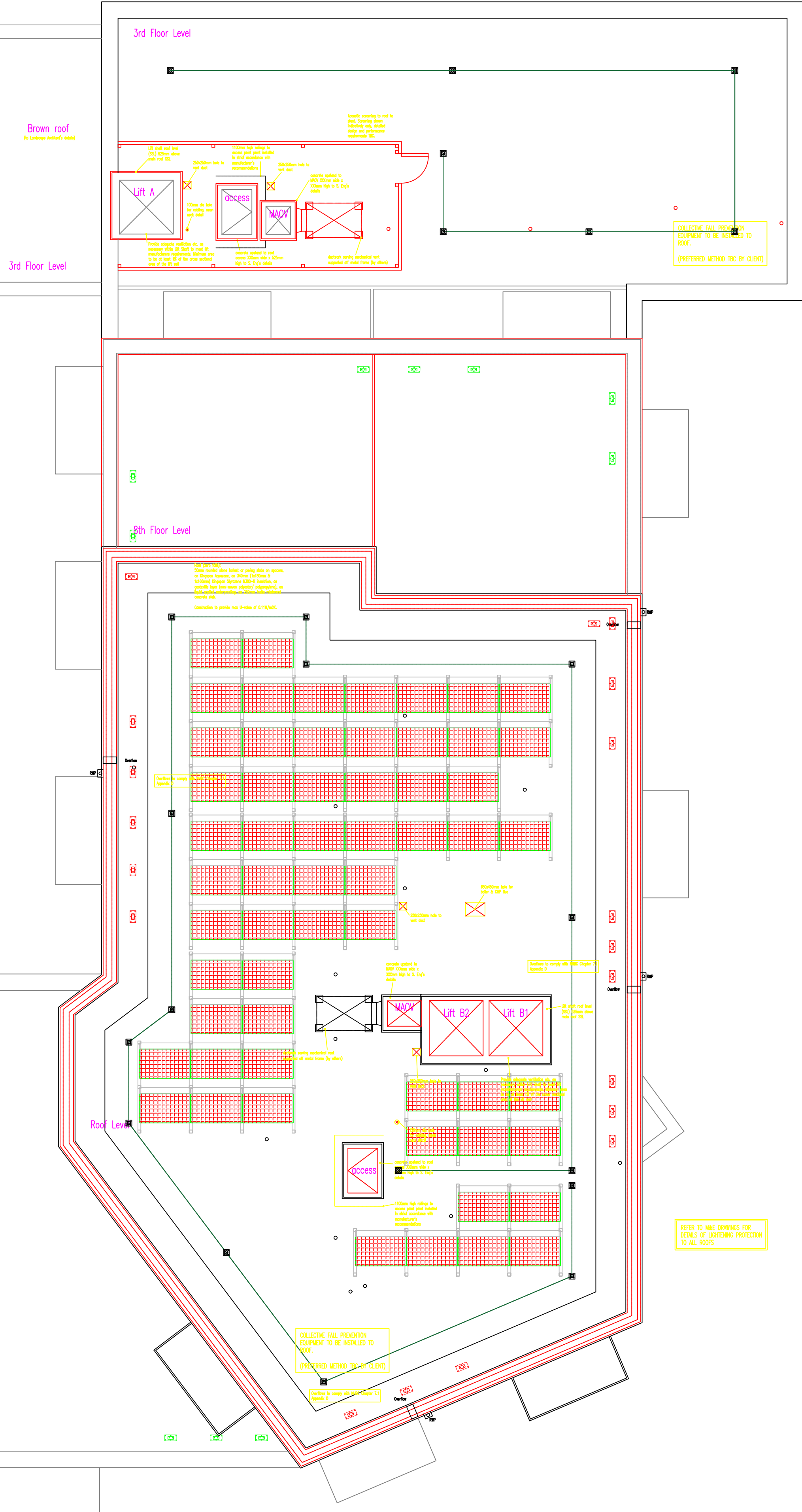
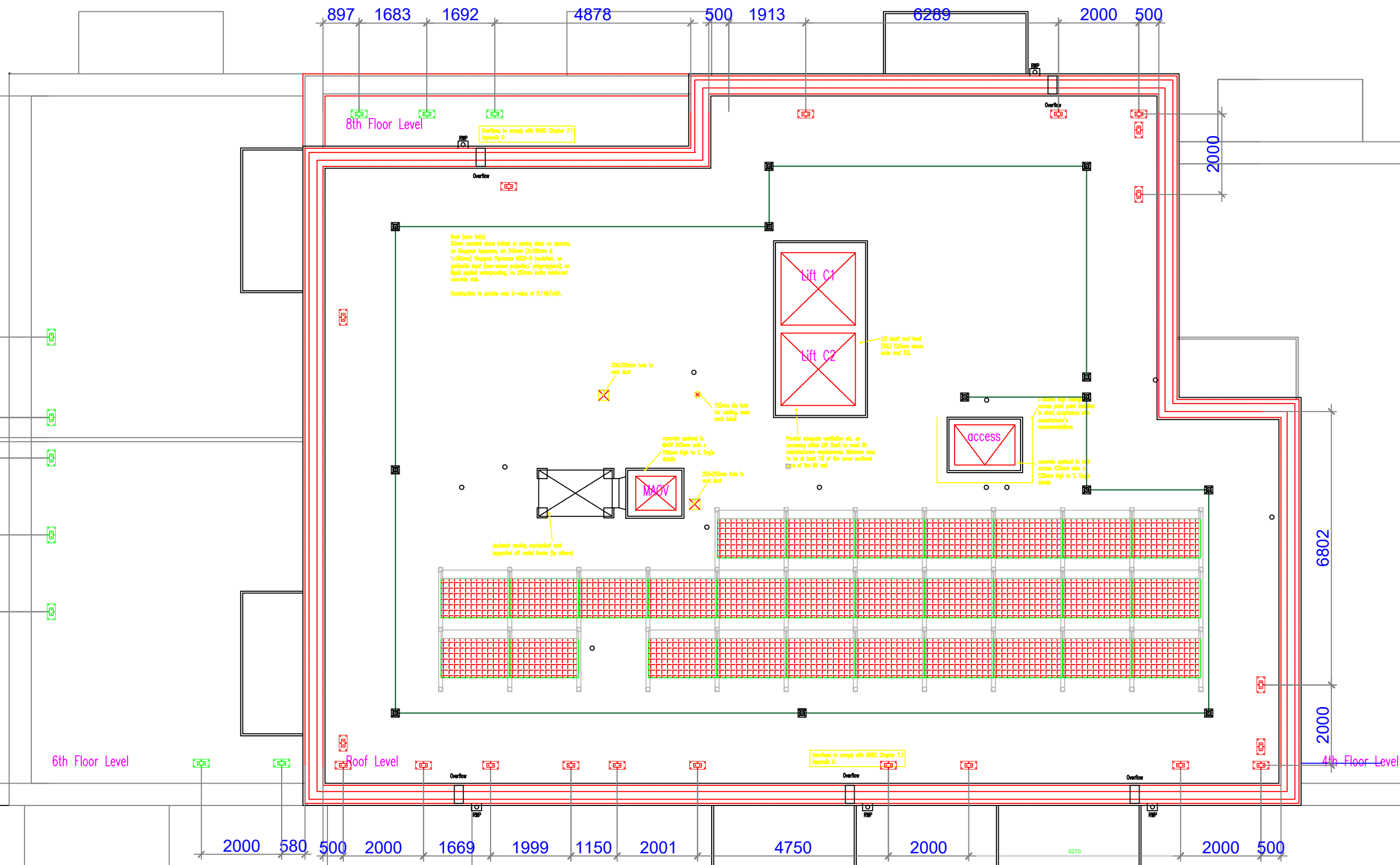
System Inverter Warranty Document

Section 1

System Layout Drawing



87 x 275W PV PANELS
23.925kWp



KEY	
	275W SOLAR PANEL
	50mm MEDIUM GAUGE GALVANISED ALUMINUM PERFORATED TRAY

NOTE
ALL OTHER CABLES NOT SHOWN IN CONTAINMENT RUNS WILL BE DRESSED IN TO PV FRAMING SYSTEM. ALL CABLES OUTSIDE OF PV ARRAY TO BE ATTACHED TO 50mm MEDIUM GAUGE GALVANISED ALUMINUM PERFORATED TRAY

P2	12/02/20	LAYOUT AMENDED TO SUIT	JS
P1	02/01/20	PV OUTPUT AMENDED	JS
P	20/02/19	PRELIMINARY ISSUE	JS
Rev	Date	Description	Drawn

Issue status

PRELIMINARY

Project

BLYTHE ROAD

Title

SOLAR PV
ROOF LAYOUT

Scale

1:100@A1

Designed By

JS

Checked by

DW

Date

FEB'19

envirolec
smart energy solutions

Envirolec SES Ltd
Unit 2,
Hope Lane,
Egham,
London, SE9 3TP
E: jenny.dorring@envirolec-ses.co.uk
T: (0208) 090 0270

BLYR | PV | 001 | P2

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Section 2

System Design

Project Overview

PV System

Grid-connected PV System

Climate Data	LONDON/HEATHROW, GBR (2000 - 2009)
PV Generator Output	23.93 kWp
PV Generator Surface	170.5 m ²
Number of PV Modules	87
Number of Inverters	1

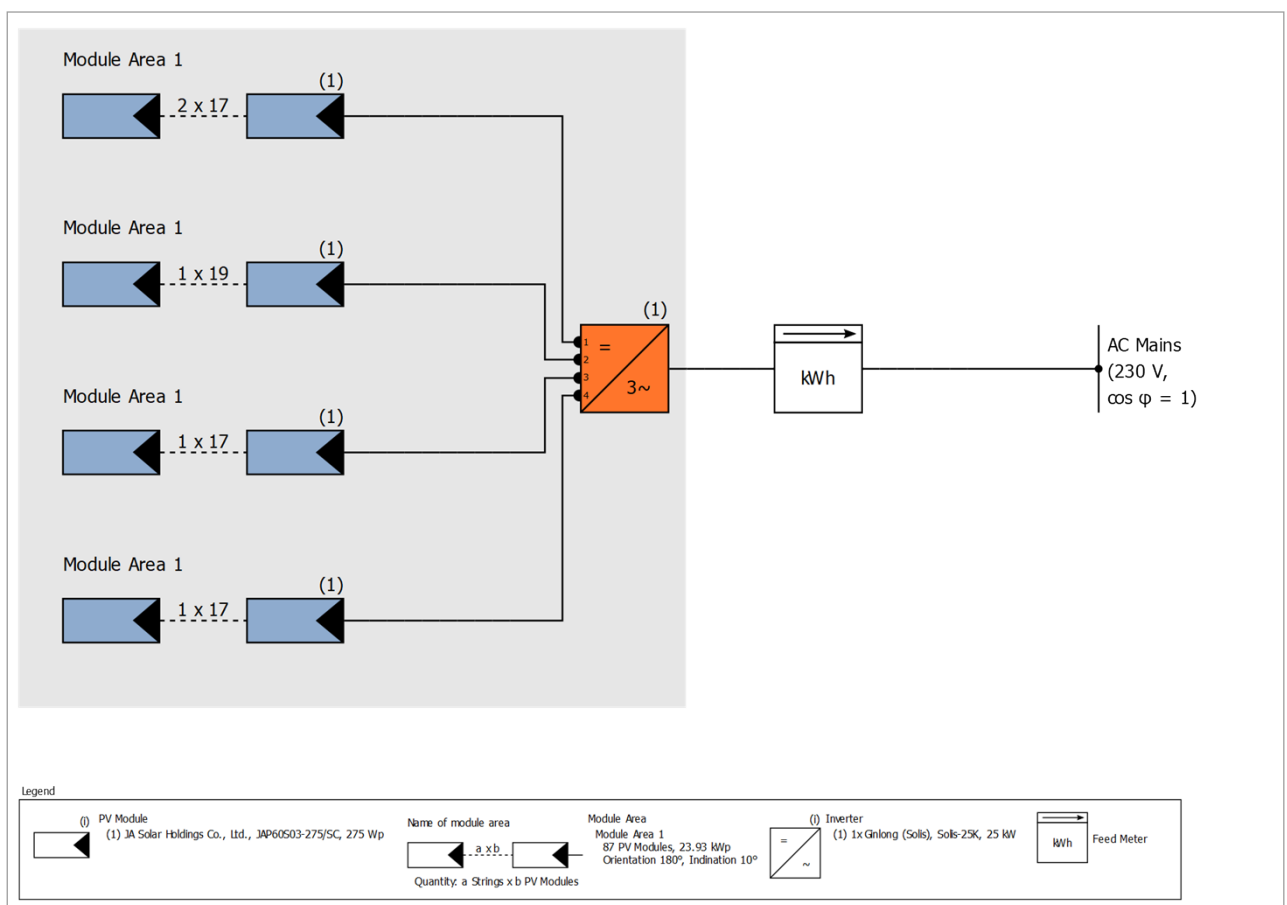


Figure: Schematic diagram

The yield

The yield

PV Generator Energy (AC grid)	22,112 kWh
Grid Feed-in	22,112 kWh
Down-regulation at Feed-in Point	0 kWh
Own Power Consumption	0.0 %
Solar Fraction	0.0 %
Spec. Annual Yield	924.20 kWh/kWp
Performance Ratio (PR)	88.0 %
CO ₂ Emissions avoided	13,267 kg / year

Set-up of the System

Overview

System Data

Type of System	Grid-connected PV System
Start of Operation	12/03/2019

Climate Data

Location	LONDON/HEATHROW, GBR (2000 - 2009)
Resolution of the data	1 h
Simulation model used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Module Areas

1. Module Area - Module Area 1

PV Generator, 1. Module Area - Module Area 1

Name	Module Area 1
PV Modules	87 x JAP60S03-275/SC
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	10 °
Orientation	South 180 °
Installation Type	Mounted - Roof
PV Generator Surface	170.5 m ²

Inverter configuration

Configuration 1

Module Area	Module Area 1
Inverter 1	
Manufacturer	Ginlong (Solis)
Model	Solis-25K
Quantity	1
Sizing Factor	95.7 %
Configuration	MPP 1: 2 x 17
	MPP 2: 1 x 19
	MPP 3: 1 x 17
	MPP 4: 1 x 17

AC Mains

AC Mains

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

Simulation Results

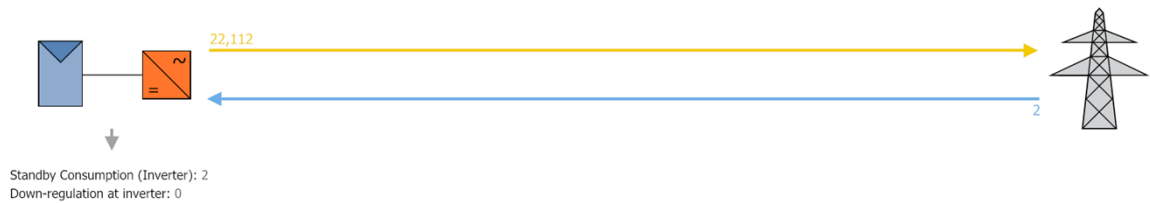
Results Total System

PV System

PV Generator Output	23.9 kWp
Spec. Annual Yield	924.20 kWh/kWp
Performance Ratio (PR)	88.0 %
Grid Feed-in	22,112 kWh/year
Grid Feed-in in the first year (incl. module degradation)	22,112 kWh/year
Standby Consumption (Inverter)	2 kWh/year
CO ₂ Emissions avoided	13,267 kg / year

Energy Flow Graph

Project: Blyth Road

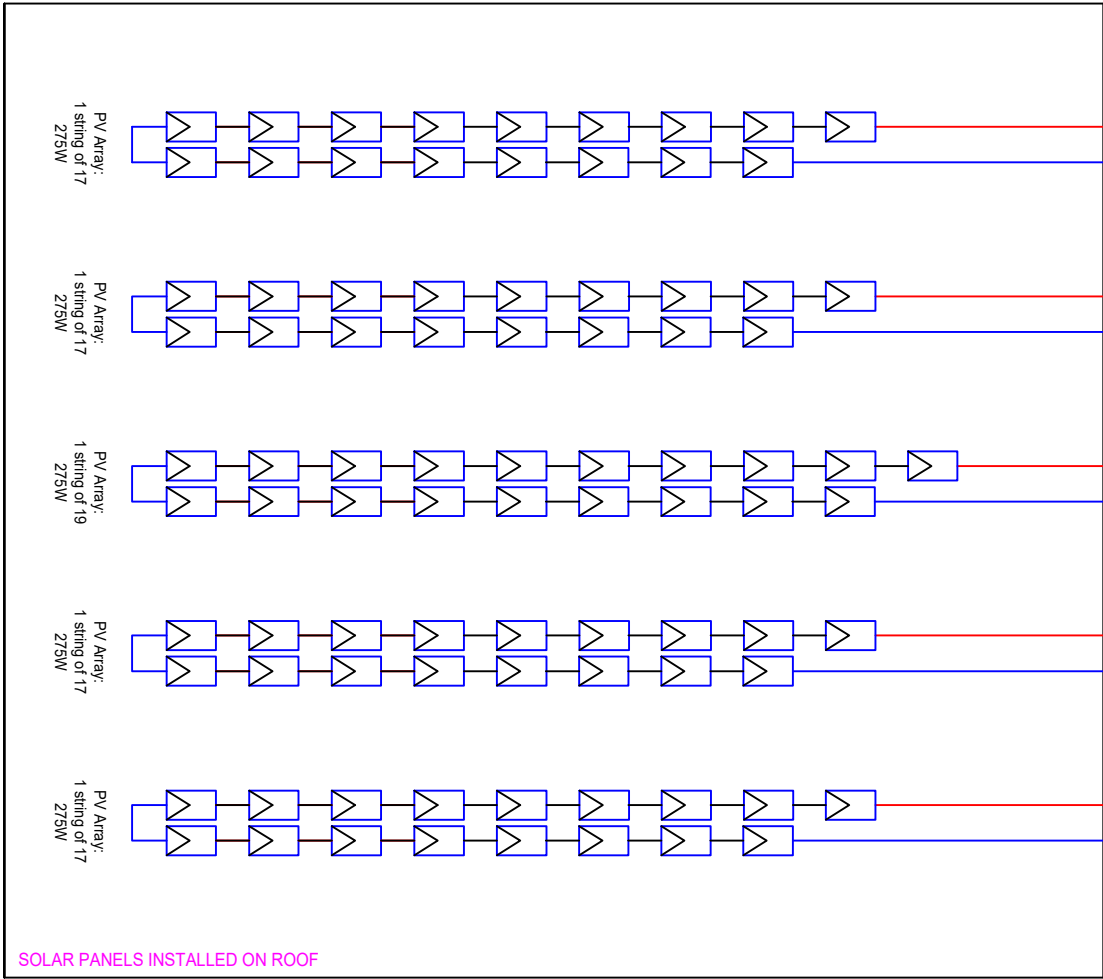


All values in kWh
Small deviations in the totals can occur due to rounding
created with PV*SOL

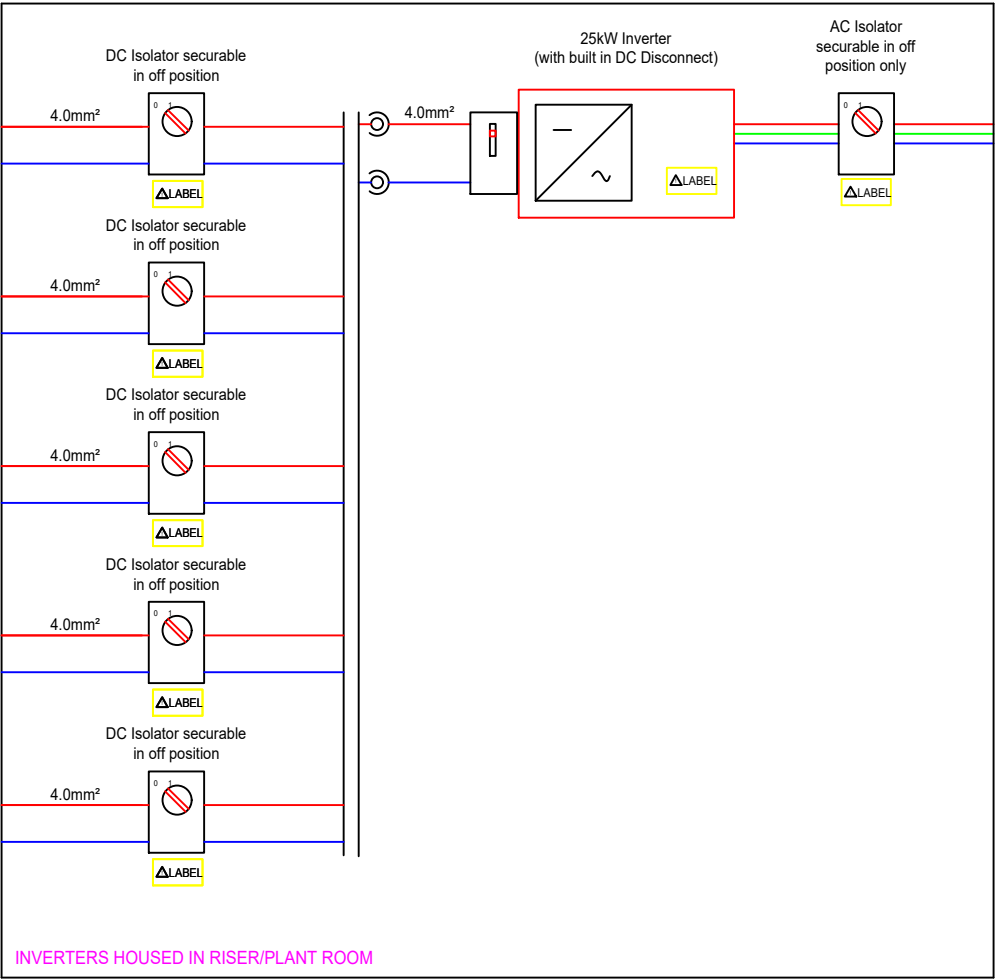
Figure: Energy Flow Graph

Section 3

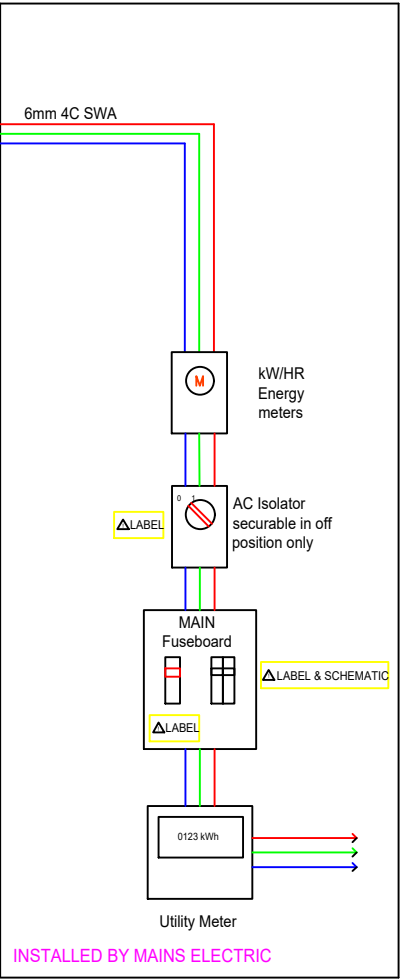
System PV Wiring Schematic Diagram



SOLAR PANELS INSTALLED ON ROOF



INVERTERS HOUSED IN RISER/PLANT ROOM



INSTALLED BY MAINS ELECTRIC

Disconnection and Shutdown

1. Turn off and padlock disconnect AC.
2. Turn off and padlock disconnect DC.
3. Turn off MCB in the consumer unit.
4. Wait 5 minutes for residue power to dissipate before proceeding with any work.

Start Up

1. Turn on MCB in consumer unit.
2. Remove padlocks to disconnectors AC and DC.
3. Turn on disconnecter DC first then turn on AC.
4. Refure to the inverter user guide to check the inverter is displaying that it is generating and working correctly.

Fault Finiding

1. Is there daylight , if no wait until there is.
2. Have the PV Panels been covered, if yes a competent person should remove them.
3. Follow shut down and start up procedures, if Inverter is still not generating contact an engineer.

C1	02/01/20	CONSTRUCTION ISSUE	JS
C	17/04/19	CONSTRUCTION ISSUE	GS
Rev	Date	Description	Drawn

Issue status

CONSTRUCTION

Project

30-32 BLYTH ROAD

Title

SOLAR PV WIRING SCHEMATIC DIAGRAM

Scale

NTS A3

Designed By

GS

Checked by

JS

Date

APR'19

Envirolec SES Ltd
Unit 2, Hope Lane,
Green Lane
Ebbw Vale
SE9 3TP
E: gurpreet.singh@envirolec-ses.co.uk
T: 0208 090 0270

BLYR PV 501 C1

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Section 4

System Weight & Wind Load Calculations

Technical project overview

Blyth Road, UB3 1BY

Building project	Blyth Road, UB3 1BY
Date	13.02.2020
In-house project no.	PA_200213_330837
Editor	Renusol Europe GmbH
Link to configurator	Open link

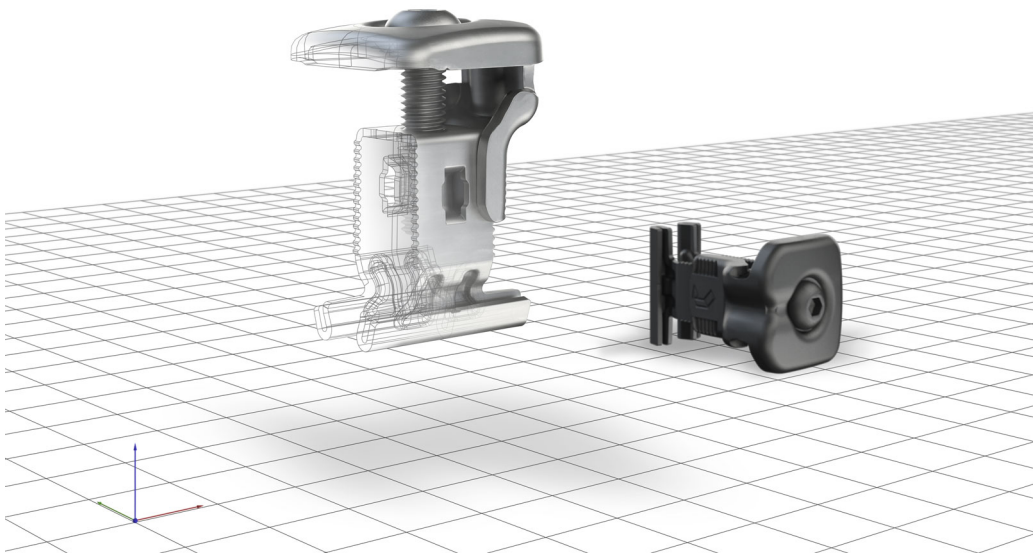


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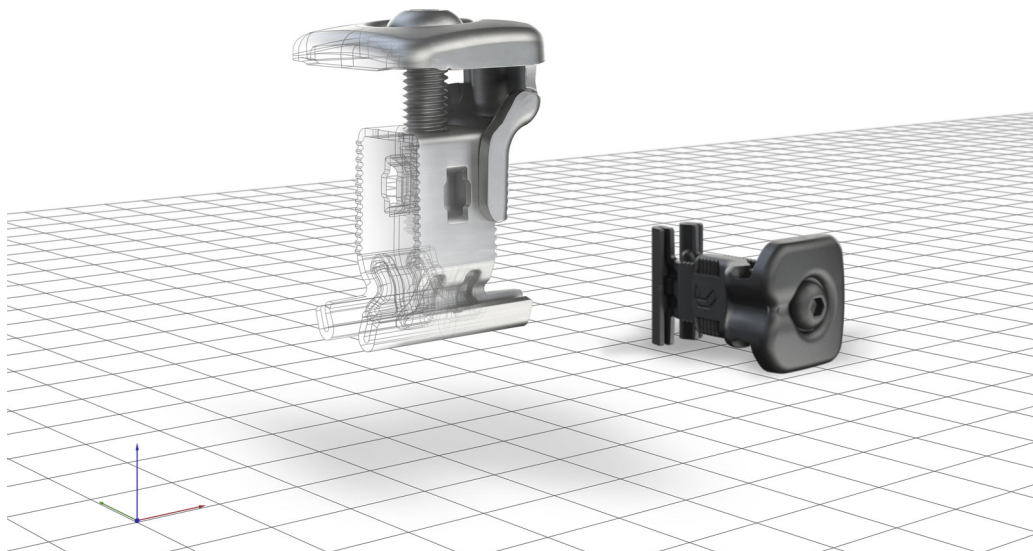
Planned construction Roof 1	4
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Total bill of material	37

Technical project overview

Blyth Road, UB3 1BY

Building project	Blyth Road, UB3 1BY
Address	Blyth Road , UB3 1BY
Country	United Kingdom
Module Type	Canadian Solar - Canadian Solar 275w
Number of modules	28
Rated output	7.7 kWp
Mounting system	FS10S
Editor	Renusol Europe GmbH



LOCATION

Street	Blyth Road
City	UB3 1BY
Country	United Kingdom

SURROUNDINGS

Code	Eurocode NA GB
Terrain height above sealevel	32,00 m
Snow load zone	Zone 3
Base wind speed ($V_{b,0}$)	21,68 m/s
Terrain category	City
Distance to coast	62,18 km
Distance to edge of city	1,19 km
Surroundings	normal
Service life of PV system	25 years
Failure consequence class	2
Partial safety factor dead load (ballast)	1

LOAD CALCULATION RESULT

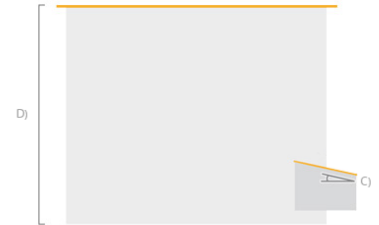
gustSpeedPressure	0,83 kN/m ²
snowLoad	0,50 kN/m ²
Snow load on roof	0,40 kN/m ²
Base wind speed ($V_{b,0}$)	21,68 m/s

TOPOGRAPHY

Topography	Not exposed
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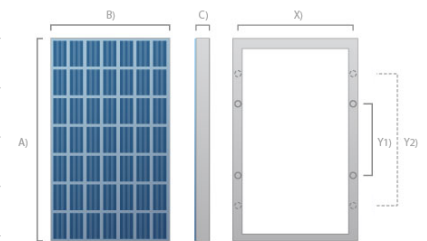
ROOF PROPERTIES

Roof type	Free-form Flat roof
Coverage type	Foil
C) Roof pitch	0,00 °
D) Building height	25,00 m
Parapet height	150,00 mm
Parapet width	200,00 mm



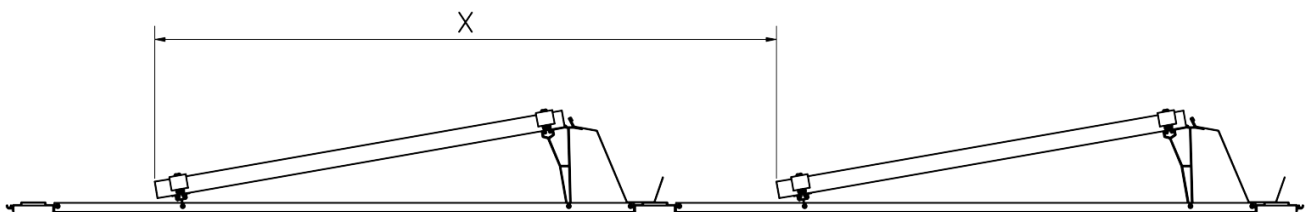
MODULE PARAMETERS

Manufacturer	Canadian Solar
Name	Canadian Solar 275w
Length	1650 mm
Width	992 mm
Height	40 mm
Weight	18 kg
Rated output	275 W _{peak}
black	



SYSTEM

System	FS10S
Friction coefficient	0,50
Ballast block mass (optional)	10,00 kg
X) Row distance	1490mm
Streamliner	Optimized (recommended)



CLAMPS

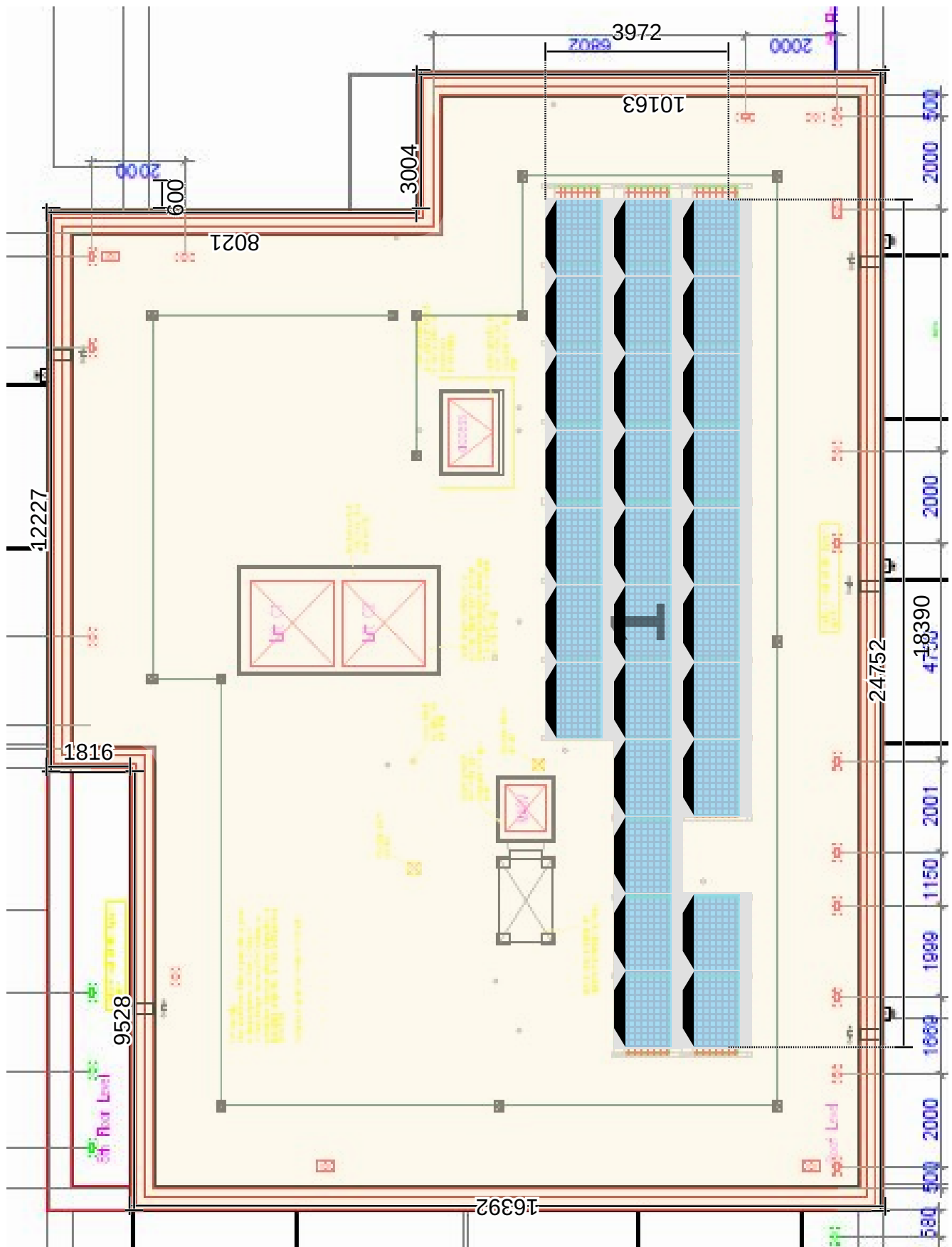
Clamp type	Mid clamps+ / End clamps+
Clamp colour	silver

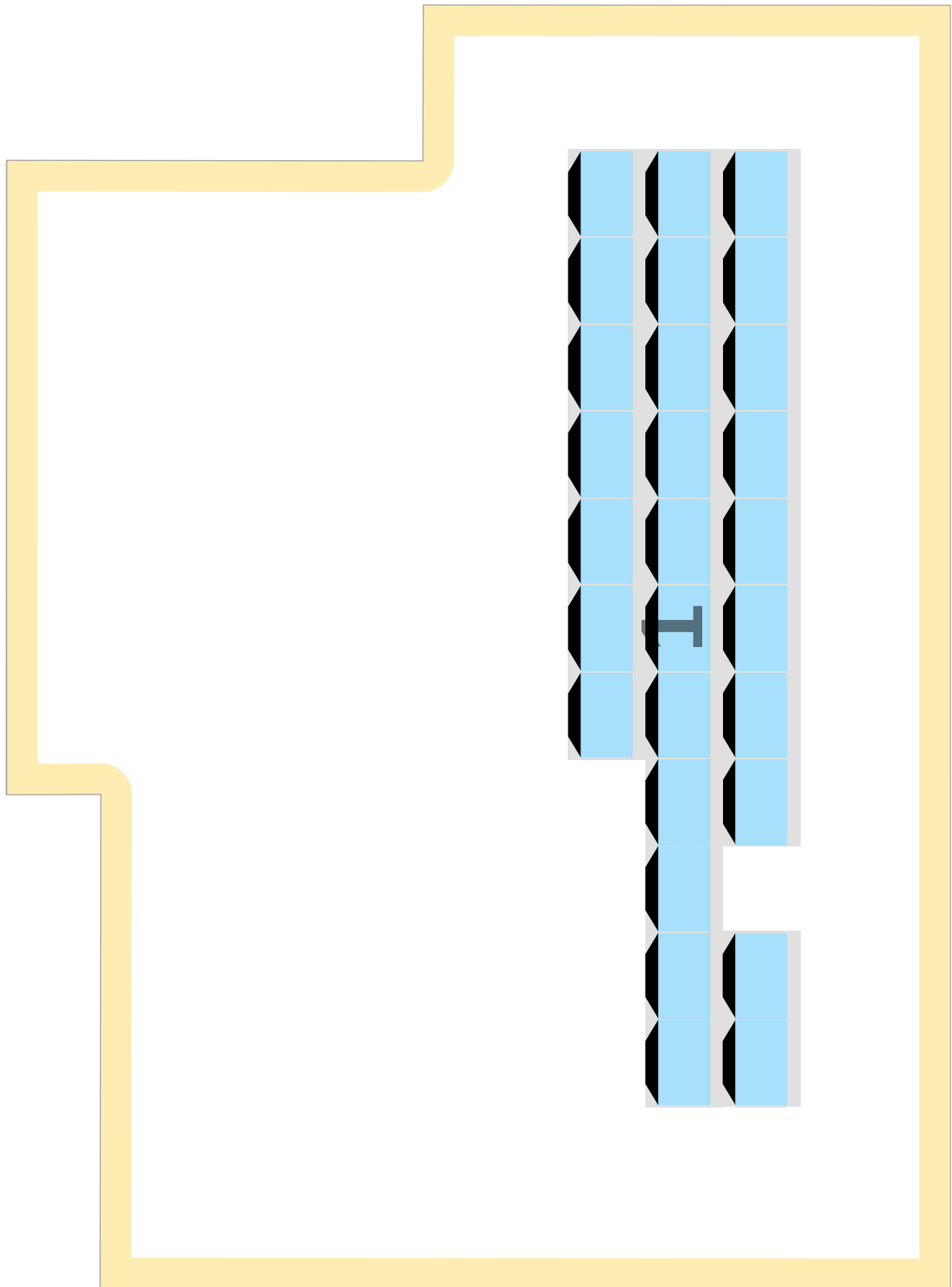
STATIC VALIDATION

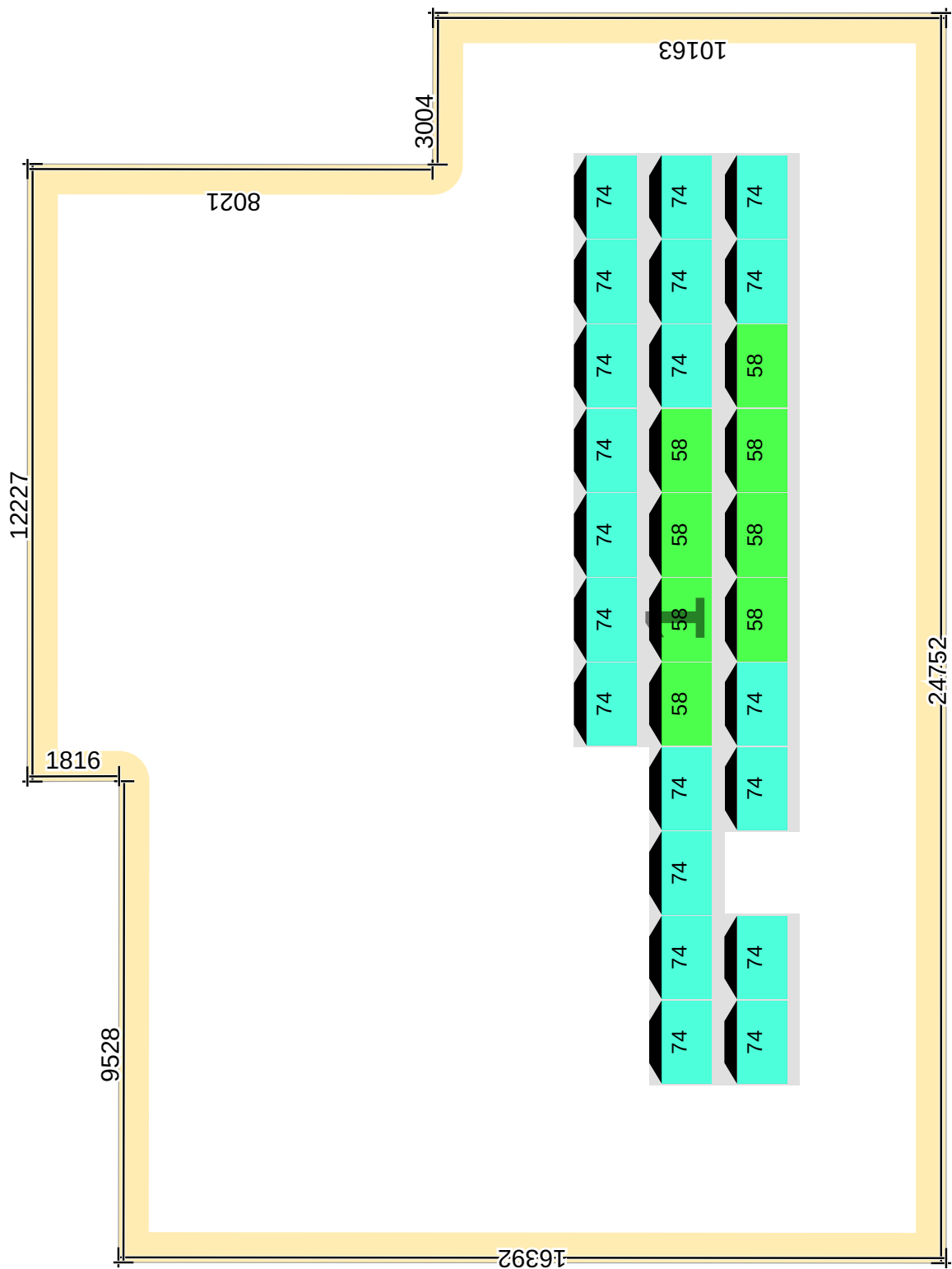
Your project was validated by our statics check successfully.

Maximum ballast value: 74 kg

Ballast: 1935.6 kg
Modules: 504 kg
Partlist: 139.822 kg

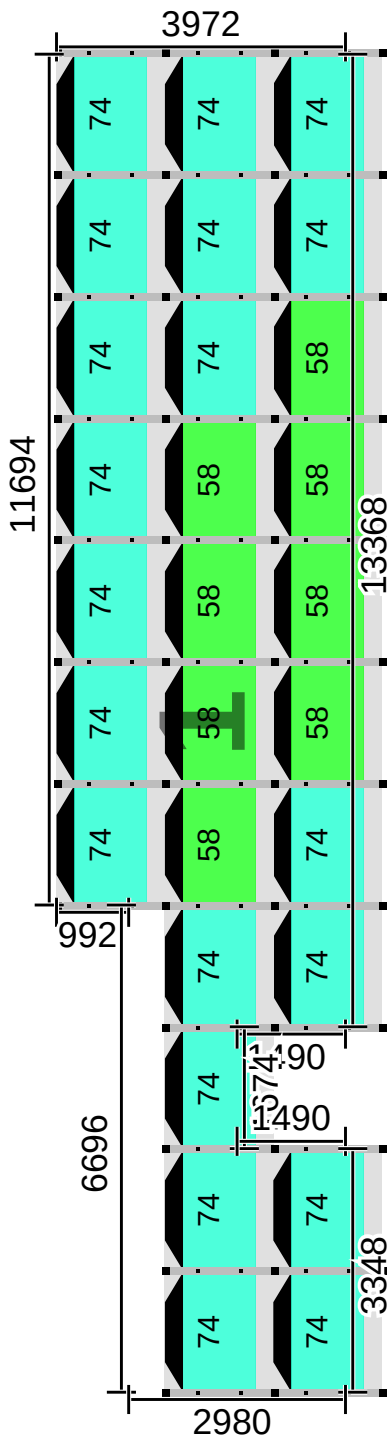


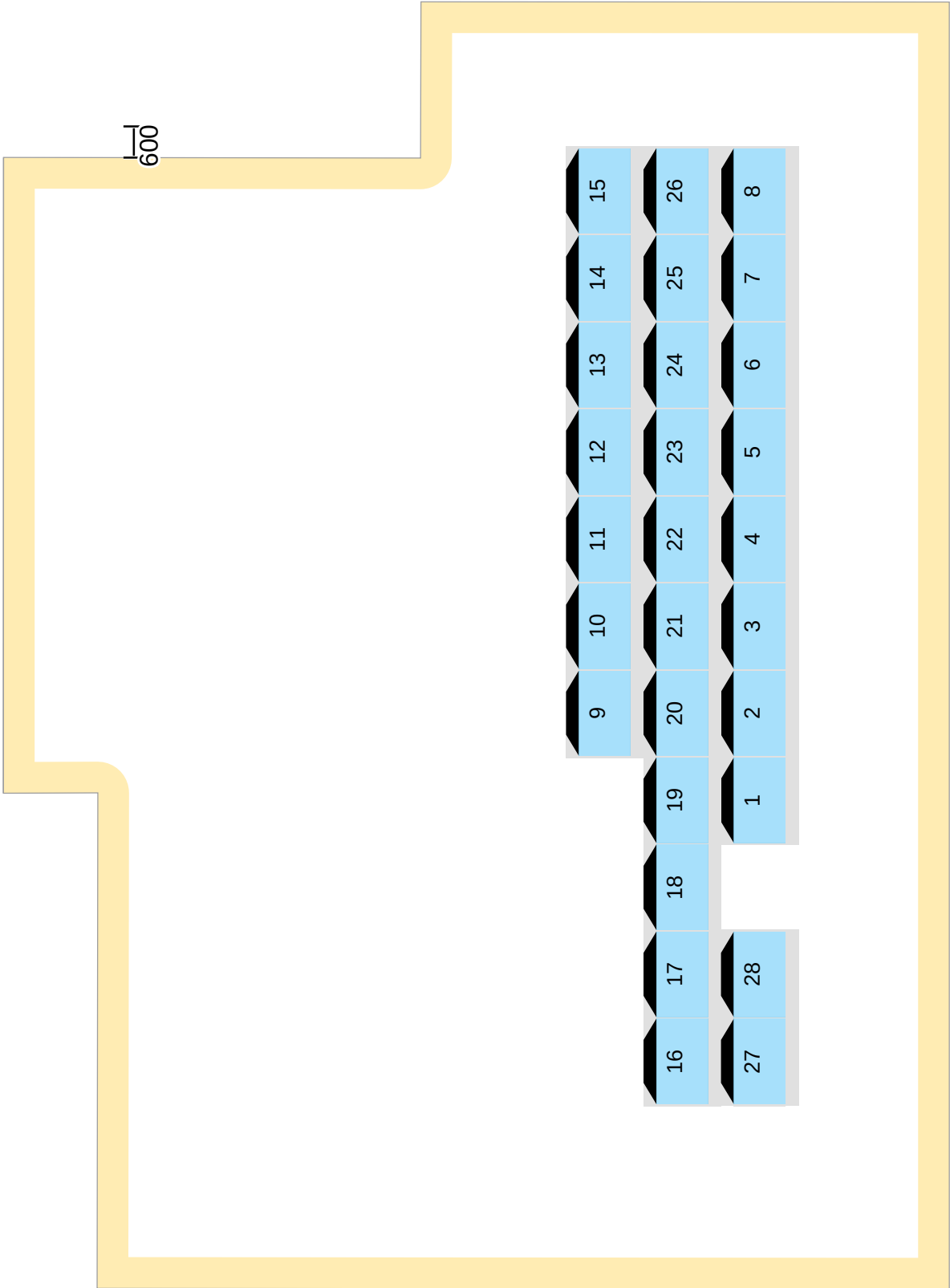




Ballast value[kg] (Blocks with 10 kg)

58	74
(6)	(8)





BILL OF MATERIAL

Article No.	Article	Quantity	Ordering Unit	Weight/Piece	Weight
R420081	End clamp+	16	1	0,06 kg	1,02 kg
R420082	Middle clamp+	48	1	0,06 kg	3,02 kg
R500400	Base rail FS10-S 1389 mm	32	1	1,02 kg	32,64 kg
R500404	Base rail connector	44	1	0,08 kg	3,48 kg
R500411	Roof protection pad 110x95x20mm alu coated	72	1	0,13 kg	9,58 kg
R500420	Eave support	32	1	0,05 kg	1,54 kg
R500421	Ridge support 10°	32	1	0,34 kg	10,94 kg
R500430	Streamliner FS10-S	28	1	2,73 kg	76,44 kg
R900229	Self Drilling Screw 4,8x19 A2	2	100	0,01 kg	1,00 kg
R900314	Socket bolt 6 x 110 mm	128	1	0,01 kg	1,15 kg
				Total Weight: 140,81 kg	

ROOF STATICS

ROOF STATICS

Total weight	2579 kg
Module weight	504 kg
Ballast	1936 kg
Max ballast	74 kg
Roof size	408,93 m ²
Weight per total roof area	6,31 kg/m ²
Mounting system weight	139,82 kg
Max rail pressure	11 kN/m ²

MODULE FIELD STATICS

FIELD1

Total weight	2579 kg
Module weight	504 kg
Ballast	1936 kg
Max ballast	74 kg
Field area	63,91 m ²
Weight per field area	40,36 kg/m ²
Mounting system weight	139,82 kg
Max rail pressure	11 kN/m ²

MODULE STATICS

MODULE STATICS

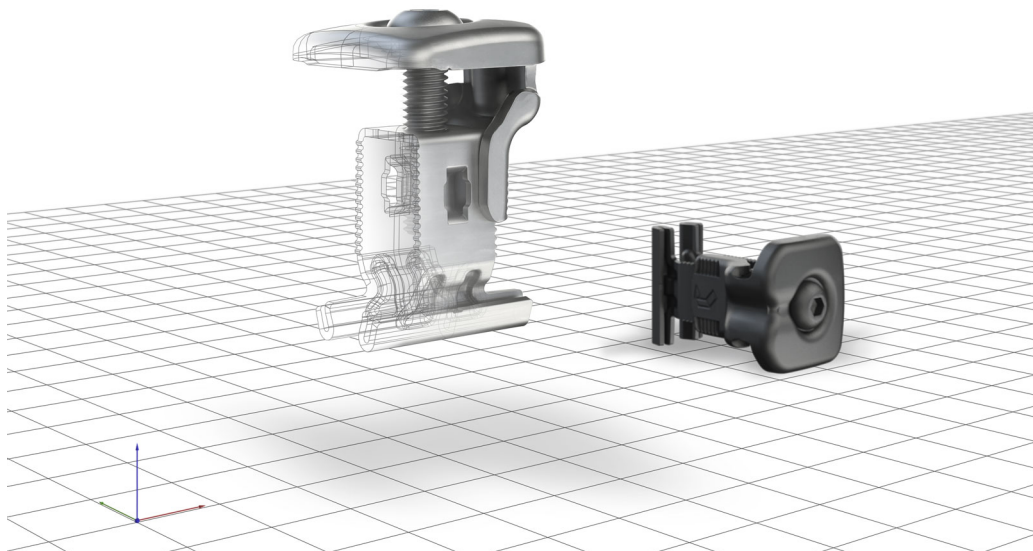
Sliding B_W	$B_W = [q_p * A * \gamma_Q * (C_W - \mu * C_A)] / [\gamma_G * (\mu \cos \alpha - \sin \alpha)] - G$
Uplift B_A	$B_A = [-q_p * A * \gamma_Q * C_A] / [\gamma_G * \cos \alpha] - G$
C_A	Cp value for uplift
C_W	Cp value for sliding
γ_G	Partial safety factor self-weight
γ_Q	Partial safety factor wind
$G = 0,23 \text{ kN}$	Self weight
Loads F_z	$F_z = q_p * A * \gamma_Q * C_A$
Loads F_x	$F_x = q_p * A * \gamma_Q * C_W$
$A = 1,64 \text{ m}^2$	Module area
$\mu = 0,50$	Friction coefficient
$q_p = 0,83$	Peak velocity pressure
$\alpha = 0,00^\circ$	Roof pitch

Modul	B _W [kN]	B _A [kN]	C _W	C _A	Y _G	Y _Q
1	1,49	1,18	0,084	-0,767	1,00	1,35
2	1,49	1,18	0,084	-0,767	1,00	1,35
3	1,32	1,01	0,084	-0,674	1,00	1,35
4	1,32	1,01	0,084	-0,674	1,00	1,35
5	1,32	1,01	0,084	-0,674	1,00	1,35
6	1,32	1,01	0,084	-0,674	1,00	1,35
7	1,49	1,18	0,084	-0,767	1,00	1,35
8	1,49	1,18	0,084	-0,767	1,00	1,35
9	1,49	1,18	0,084	-0,767	1,00	1,35
10	1,49	1,18	0,084	-0,767	1,00	1,35
11	1,49	1,18	0,084	-0,767	1,00	1,35
12	1,49	1,18	0,084	-0,767	1,00	1,35
13	1,49	1,18	0,084	-0,767	1,00	1,35
14	1,49	1,18	0,084	-0,767	1,00	1,35
15	1,49	1,18	0,084	-0,767	1,00	1,35
16	1,49	1,18	0,084	-0,767	1,00	1,35
17	1,49	1,18	0,084	-0,767	1,00	1,35
18	1,49	1,18	0,084	-0,767	1,00	1,35
19	1,49	1,18	0,084	-0,767	1,00	1,35
20	1,32	1,01	0,084	-0,674	1,00	1,35
21	1,32	1,01	0,084	-0,674	1,00	1,35
22	1,32	1,01	0,084	-0,674	1,00	1,35
23	1,32	1,01	0,084	-0,674	1,00	1,35
24	1,49	1,18	0,084	-0,767	1,00	1,35
25	1,49	1,18	0,084	-0,767	1,00	1,35
26	1,49	1,18	0,084	-0,767	1,00	1,35
27	1,49	1,18	0,084	-0,767	1,00	1,35
28	1,49	1,18	0,084	-0,767	1,00	1,35

Technical project overview

Blyth Road, UB3 1BY

Building project	Blyth Road, UB3 1BY
Address	Blyth Road , UB3 1BY
Country	United Kingdom
Module Type	Canadian Solar - Canadian Solar 275w
Number of modules	59
Rated output	16.225 kWp
Mounting system	FS10S
Editor	Renusol Europe GmbH



LOCATION

Street	Blyth Road
City	UB3 1BY
Country	United Kingdom

SURROUNDINGS

Code	Eurocode NA GB
Terrain height above sealevel	32,00 m
Snow load zone	Zone 3
Base wind speed ($V_{b,0}$)	21,68 m/s
Terrain category	City
Distance to coast	62,18 km
Distance to edge of city	1,19 km
Surroundings	normal
Service life of PV system	25 years
Failure consequence class	2
Partial safety factor dead load (ballast)	1

LOAD CALCULATION RESULT

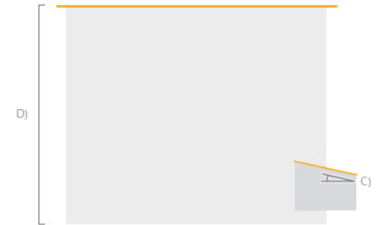
gustSpeedPressure	0,83 kN/m ²
snowLoad	0,50 kN/m ²
Snow load on roof	0,40 kN/m ²
Base wind speed ($V_{b,0}$)	21,68 m/s

TOPOGRAPHY

Topography	Not exposed
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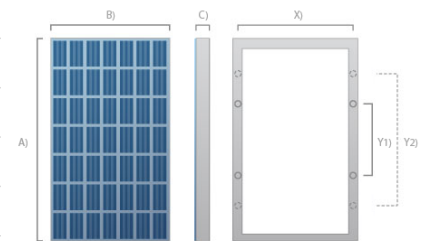
ROOF PROPERTIES

Roof type	Free-form Flat roof
Coverage type	Foil
C) Roof pitch	0,00 °
D) Building height	25,00 m
Parapet height	150,00 mm
Parapet width	200,00 mm



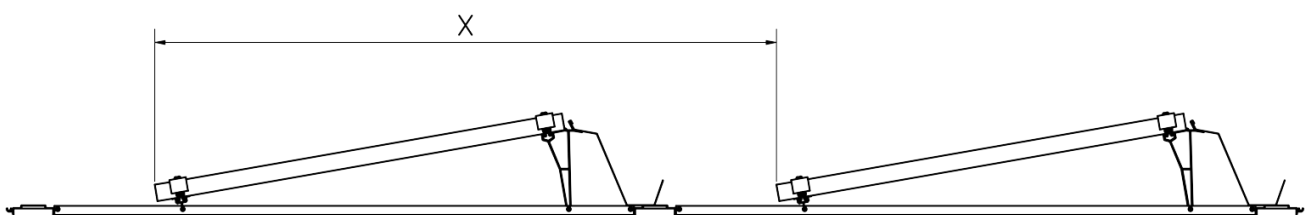
MODULE PARAMETERS

Manufacturer	Canadian Solar
Name	Canadian Solar 275w
Length	1650 mm
Width	992 mm
Height	40 mm
Weight	18 kg
Rated output	275 W _{peak}
black	



SYSTEM

System	FS10S
Friction coefficient	0,50
Ballast block mass (optional)	10,00 kg
X) Row distance	1490mm
Streamliner	Optimized (recommended)



CLAMPS

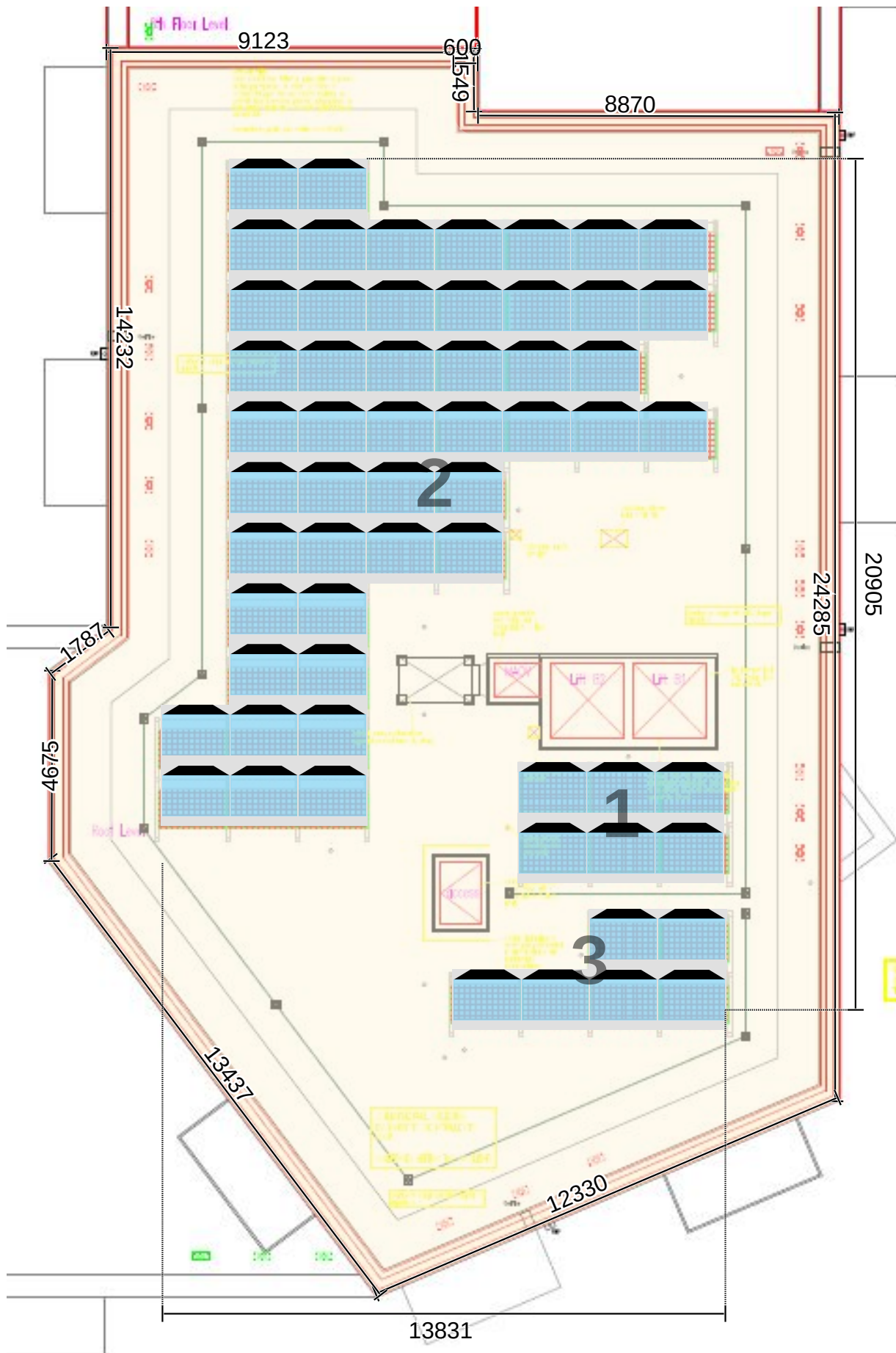
Clamp type	Mid clamps+ / End clamps+
Clamp colour	silver

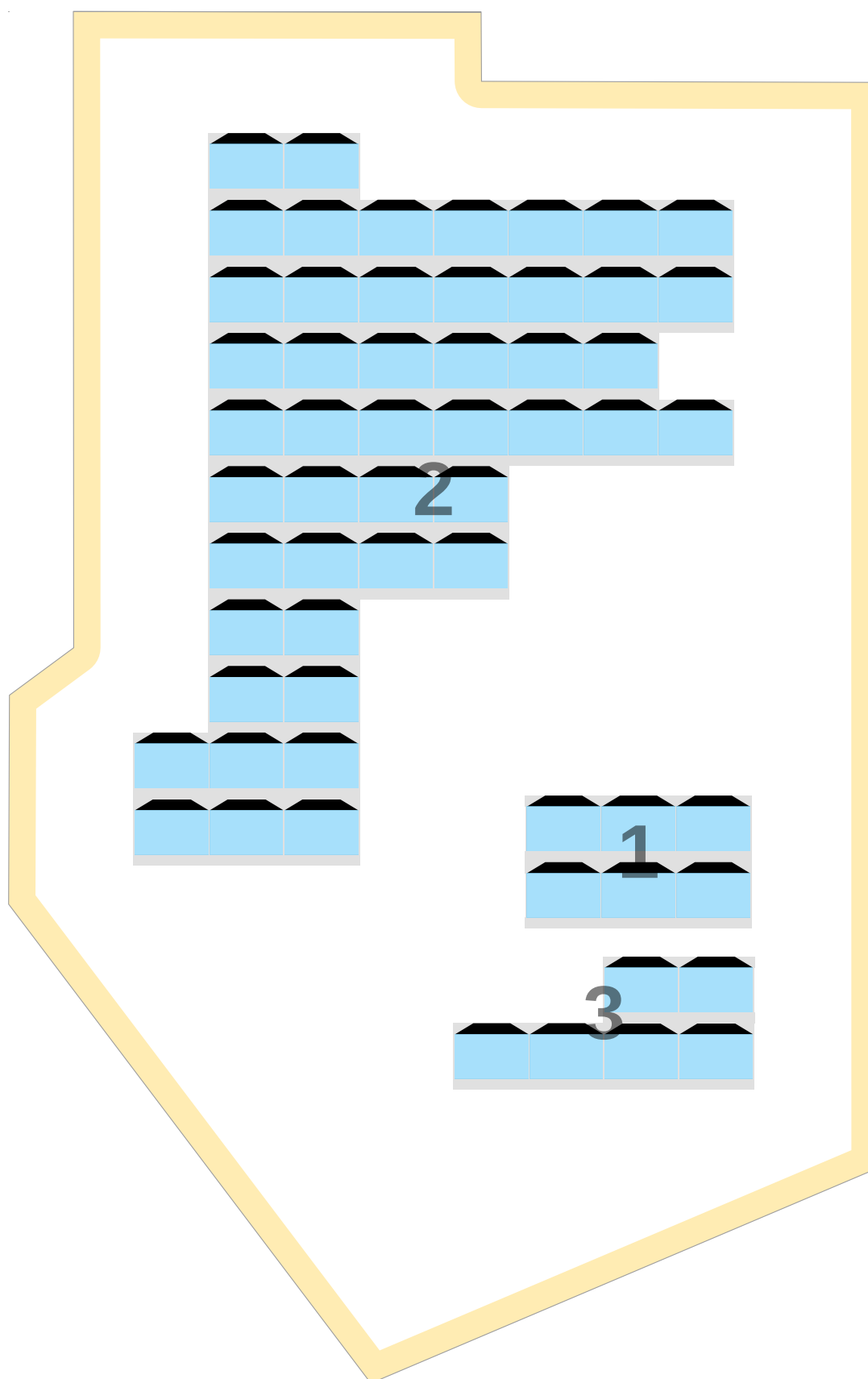
STATIC VALIDATION

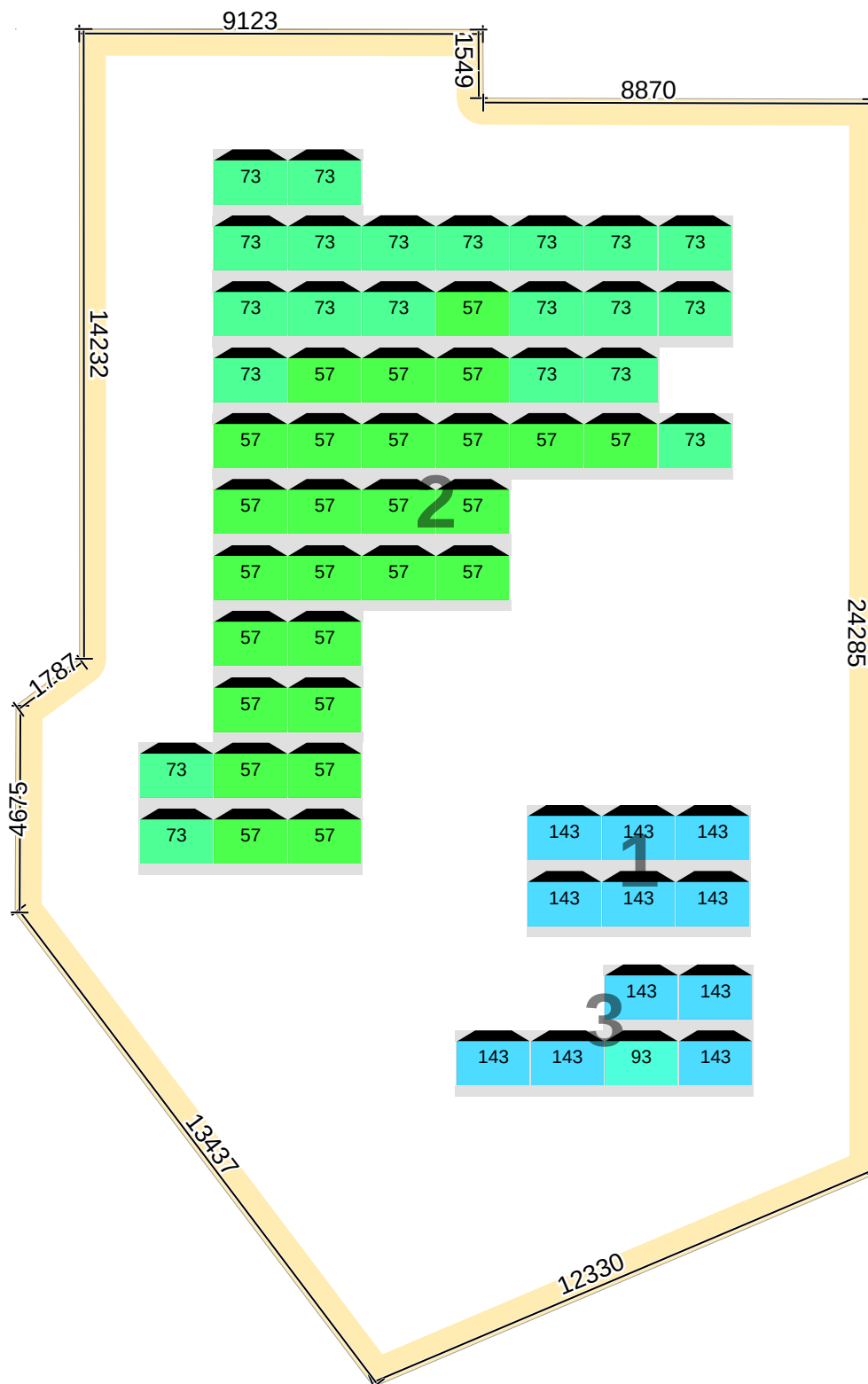
Your project was validated by our statics check successfully.

Maximum ballast value: 143 kg

Ballast: 4685.1 kg
Modules: 1062 kg
Partlist: 330.666 kg

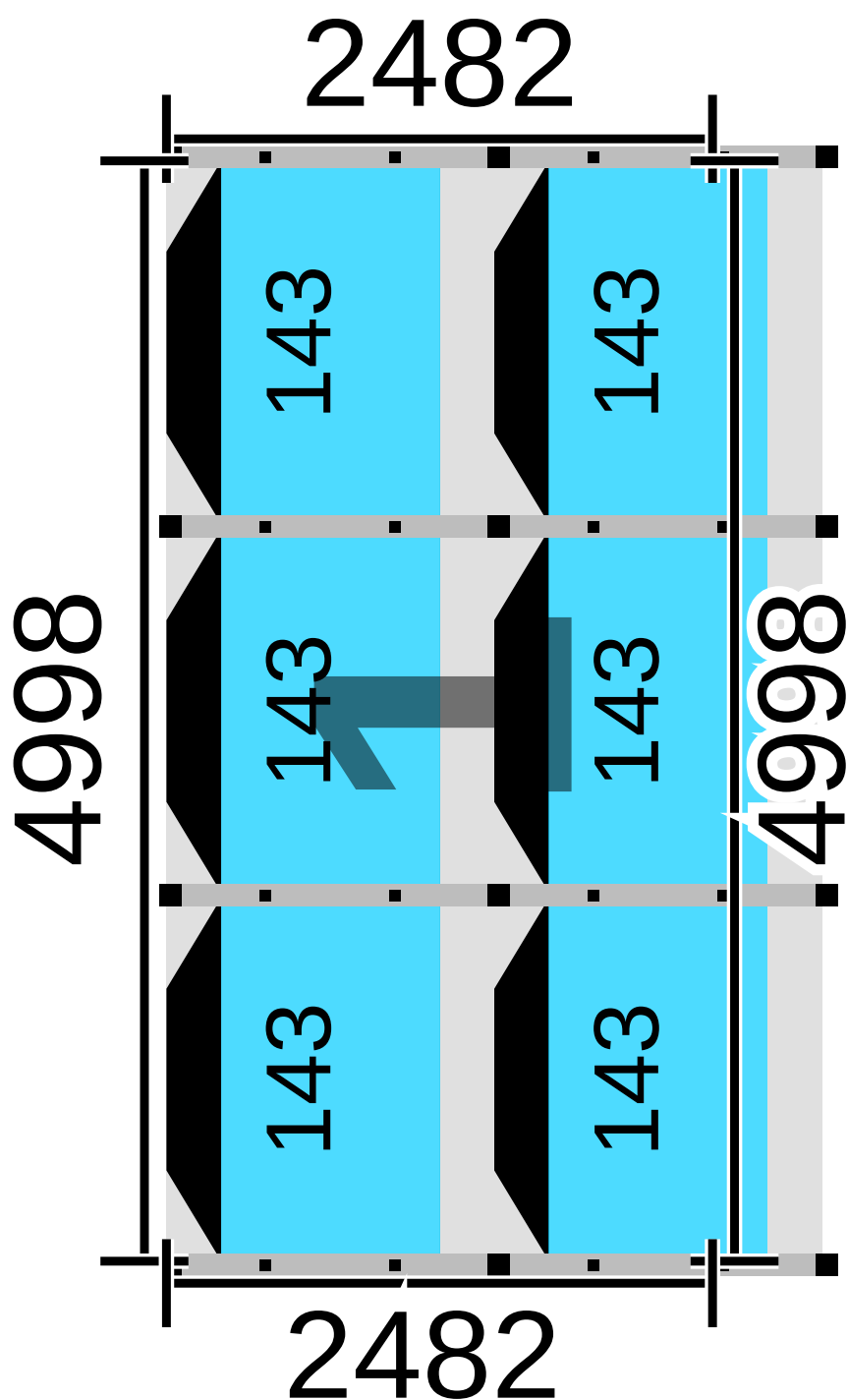


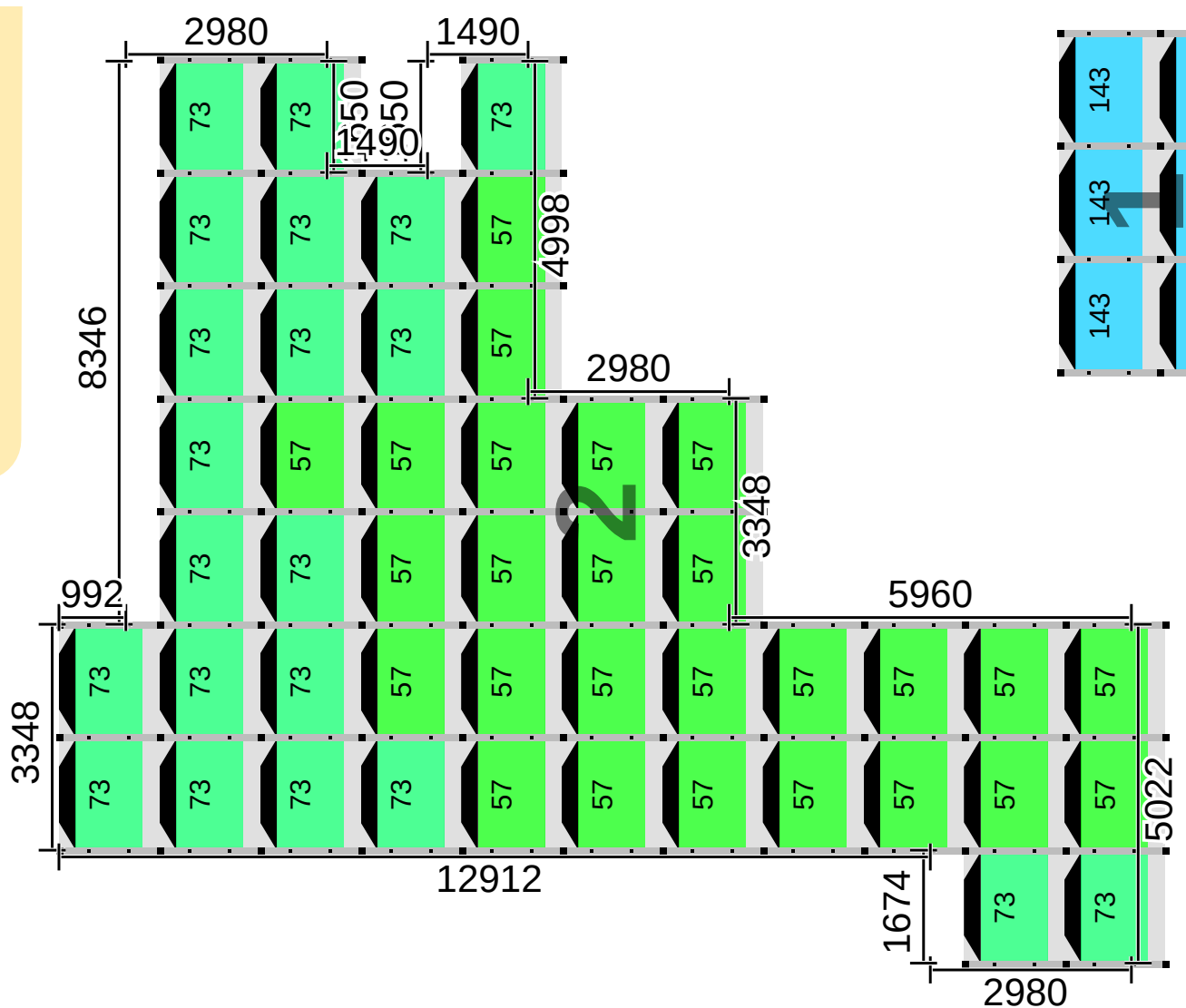


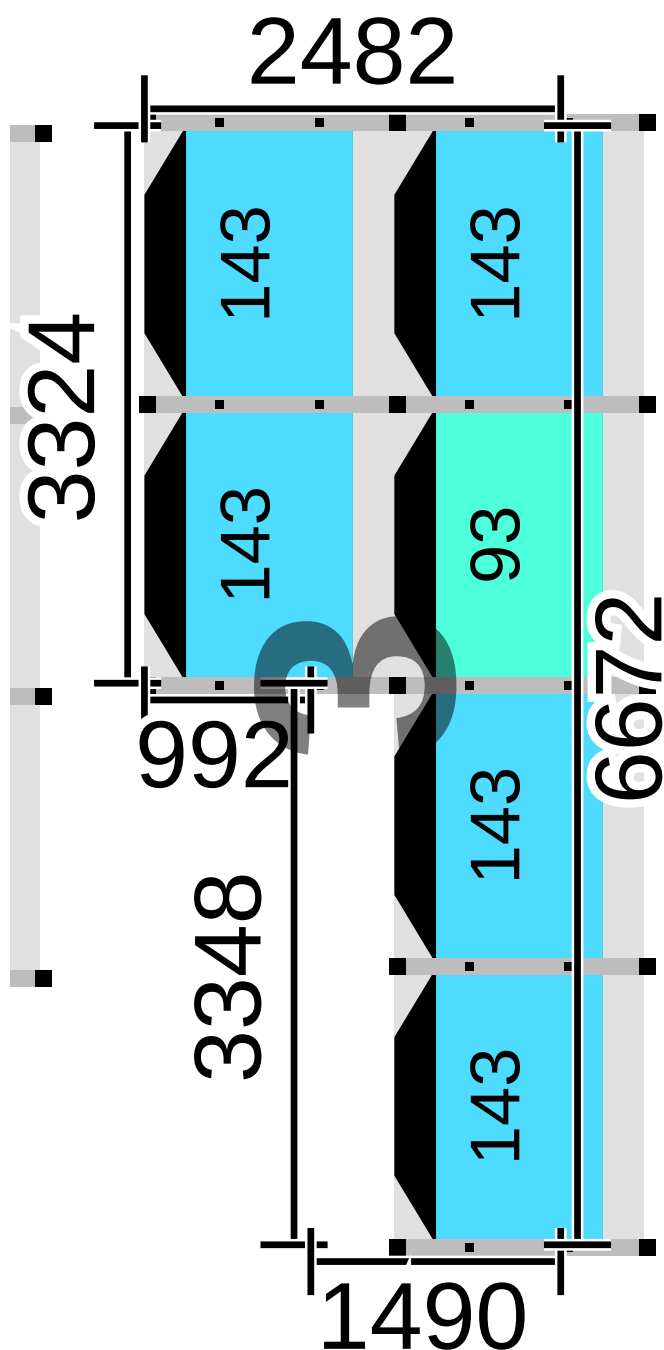


Ballast value[kg] (Blocks with 10 kg)

57	73	93	143
(6)	(8)	(10)	(15)









BILL OF MATERIAL

Article No.	Article	Quantity	Ordering Unit	Weight/Piece	Weight
R420081	End clamp+	60	1	0,06 kg	3,84 kg
R420082	Middle clamp+	88	1	0,06 kg	5,54 kg
R500400	Base rail FS10-S 1389 mm	74	1	1,02 kg	75,48 kg
R500404	Base rail connector	93	1	0,08 kg	7,35 kg
R500411	Roof protection pad 110x95x20mm alu coated	152	1	0,13 kg	20,22 kg
R500420	Eave support	74	1	0,05 kg	3,55 kg
R500421	Ridge support 10°	74	1	0,34 kg	25,31 kg
R500430	Streamliner FS10-S	59	1	2,73 kg	161,07 kg
R520501	ECO Ballast set FS	11	1	2,33 kg	25,63 kg
R900229	Self Drilling Screw 4,8x19 A2	3	100	0,01 kg	1,50 kg
R900314	Socket bolt 6 x 110 mm	296	1	0,01 kg	2,66 kg
Total Weight:					332,15 kg

ROOF STATICS

ROOF STATICS

Total weight	6078 kg
Module weight	1062 kg
Ballast	4685 kg
Max ballast	143 kg
Roof size	490,66 m ²
Weight per total roof area	12,39 kg/m ²
Mounting system weight	330,67 kg
Max rail pressure	15 kN/m ²

MODULE FIELD STATICS

FIELD1

Total weight	998 kg
Module weight	108 kg
Ballast	856 kg
Max ballast	143 kg
Field area	12,41 m ²
Weight per field area	80,44 kg/m ²
Mounting system weight	33,63 kg
Max rail pressure	15 kN/m ²

FIELD2

Total weight	4131 kg
Module weight	846 kg
Ballast	3022 kg
Max ballast	73 kg
Field area	115,46 m ²
Weight per field area	35,78 kg/m ²
Mounting system weight	263,41 kg
Max rail pressure	11 kN/m ²

FIELD3

Total weight	949 kg
Module weight	108 kg
Ballast	807 kg
Max ballast	143 kg
Field area	13,24 m ²
Weight per field area	71,65 kg/m ²
Mounting system weight	33,63 kg
Max rail pressure	15 kN/m ²

MODULE STATICS

MODULE STATICS

Sliding B_W	$B_W = [q_p * A * \gamma_Q * (C_W - \mu * C_A)] / [\gamma_G * (\mu \cos \alpha - \sin \alpha)] - G$
Uplift B_A	$B_A = [-q_p * A * \gamma_Q * C_A] / [\gamma_G * \cos \alpha] - G$
C_A	Cp value for uplift
C_W	Cp value for sliding
γ_G	Partial safety factor self-weight
γ_Q	Partial safety factor wind
$G = 0,24 \text{ kN}$	Self weight
Loads F_z	$F_z = q_p * A * \gamma_Q * C_A$
Loads F_x	$F_x = q_p * A * \gamma_Q * C_W$
$A = 1,64 \text{ m}^2$	Module area
$\mu = 0,50$	Friction coefficient
$q_p = 0,83$	Peak velocity pressure
$\alpha = 0,00^\circ$	Roof pitch

Modul	B _W [kN]	B _A [kN]	C _W	C _A	Y _G	Y _Q
1	1,64	1,17	0,126	-0,767	1,00	1,35
2	1,64	1,17	0,126	-0,767	1,00	1,35
3	1,42	1,00	0,114	-0,674	1,00	1,35
4	1,64	1,17	0,126	-0,767	1,00	1,35
5	1,64	1,17	0,126	-0,767	1,00	1,35
6	1,64	1,17	0,126	-0,767	1,00	1,35
7	1,64	1,17	0,126	-0,767	1,00	1,35
8	1,64	1,17	0,126	-0,767	1,00	1,35
9	1,64	1,17	0,126	-0,767	1,00	1,35
10	1,48	1,17	0,084	-0,767	1,00	1,35
11	1,31	1,00	0,084	-0,674	1,00	1,35
12	1,31	1,00	0,084	-0,674	1,00	1,35
13	1,31	1,00	0,084	-0,674	1,00	1,35
14	1,48	1,17	0,084	-0,767	1,00	1,35
15	1,48	1,17	0,084	-0,767	1,00	1,35
16	1,48	1,17	0,084	-0,767	1,00	1,35
17	1,48	1,17	0,084	-0,767	1,00	1,35
18	1,48	1,17	0,084	-0,767	1,00	1,35
19	1,31	1,00	0,084	-0,674	1,00	1,35
20	1,48	1,17	0,084	-0,767	1,00	1,35
21	1,48	1,17	0,084	-0,767	1,00	1,35
22	1,48	1,17	0,084	-0,767	1,00	1,35
23	1,31	1,00	0,084	-0,674	1,00	1,35
24	1,31	1,00	0,084	-0,674	1,00	1,35
25	1,31	1,00	0,084	-0,674	1,00	1,35
26	1,31	1,00	0,084	-0,674	1,00	1,35
27	1,31	1,00	0,084	-0,674	1,00	1,35
28	1,31	1,00	0,084	-0,674	1,00	1,35
29	1,48	1,17	0,084	-0,767	1,00	1,35
30	1,31	1,00	0,084	-0,674	1,00	1,35
31	1,31	1,00	0,084	-0,674	1,00	1,35
32	1,31	1,00	0,084	-0,674	1,00	1,35
33	1,31	1,00	0,084	-0,674	1,00	1,35
34	1,48	1,17	0,084	-0,767	1,00	1,35
35	1,48	1,17	0,084	-0,767	1,00	1,35

36	1,48	1,17	0,084	-0,767	1,00	1,35
37	1,48	1,17	0,084	-0,767	1,00	1,35
38	1,48	1,17	0,084	-0,767	1,00	1,35
39	1,48	1,17	0,084	-0,767	1,00	1,35
40	1,48	1,17	0,084	-0,767	1,00	1,35
41	1,31	1,00	0,084	-0,674	1,00	1,35
42	1,31	1,00	0,084	-0,674	1,00	1,35
43	1,48	1,17	0,084	-0,767	1,00	1,35
44	1,48	1,17	0,084	-0,767	1,00	1,35
45	1,48	1,17	0,084	-0,767	1,00	1,35
46	1,31	1,00	0,084	-0,674	1,00	1,35
47	1,31	1,00	0,084	-0,674	1,00	1,35
48	1,48	1,17	0,084	-0,767	1,00	1,35
49	1,31	1,00	0,084	-0,674	1,00	1,35
50	1,31	1,00	0,084	-0,674	1,00	1,35
51	1,31	1,00	0,084	-0,674	1,00	1,35
52	1,31	1,00	0,084	-0,674	1,00	1,35
53	1,31	1,00	0,084	-0,674	1,00	1,35
54	1,31	1,00	0,084	-0,674	1,00	1,35
55	1,31	1,00	0,084	-0,674	1,00	1,35
56	1,31	1,00	0,084	-0,674	1,00	1,35
57	1,64	1,17	0,126	-0,767	1,00	1,35
58	1,64	1,17	0,126	-0,767	1,00	1,35
59	1,64	1,17	0,126	-0,767	1,00	1,35

IMPORTANT NOTES

The Project Report is a result of information provided by the Customer ("Customer" means customer of Renusol ordering this Project Report from the technical service of Renusol or user of the PV Configurator creating this Project Report himself). Renusol has neither verified the accurateness nor the completeness of the information and data provided by the Customer, which form the basis of this Project Report. It is the responsibility of the Customer to check and verify all input variables (including but not limited to those input variables which had been pre-set with proposed values) and assumptions used in the Project for their accuracy and correctness.

These verifications shall include but not be limited to the following aspects: (a) Wind and snow loads are proposed by the PV Configurator using respective wind and snow load maps. It should be verified that the local conditions do not deviate from the values used in the Configuration (e.g. location on mountain with higher snow load). (b) The Customer shall check and verify the Failure Consequence Class ("CC"). Typical residential and commercial buildings require CC 2. The Customer shall use higher CC in sensitive local environment (e.g. public building, high frequency of visitors, vicinity with potential for severe damages). (c) The service lifetime of the PV installation shall be verified by the Customer depending on the expectation of the ultimate user of the PV installation as well as the lifetime of the other components used in the installation. If the lifetime is expected beyond the service lifetime used for this Project Report, all relevant structural properties as well as input variables and assumptions shall be re-checked using the then expected service lifetime. (d) For flat roof systems: The Customer shall in any case measure and document the friction coefficient of the PV system on the location-specific roof cover it is placed on. The measurement shall be performed in various, at least three roof areas. (e) For flat roof systems: The PV Configurator proposes a ballast calculation. The ballast forms, together with the weight of the PV mounting system itself and the weight of the module, the total weight of the system. The actual ballast applied may in no case be lower than the values proposed by the PV Configurator. The ballast applied shall furthermore be documented. If the ballast applied cannot be precisely determined, a safety factor increasing the ballast is to be applied.

To the extent values of input variables measured or observed by the Customer differ from values used in this Project Report, the configuration of the PV installation shall be re-iterated using the respective correct values.

To the extent this Project Report includes a data concerning structural properties, it is the responsibility of the Customer to professionally verify (have verified) the structural data with regards to its compliance with the applicable local laws and properties of the location for which the Project Report has been prepared.

Furthermore the Terms of Use of the Renusol PV Configurator (<https://www.pv-configurator.com/pages/terms>) and the General Terms and Conditions (https://www.renusol.com/fileadmin/downloads/allgemeine_geschaeftsbedingungen/Renusol_AGB_EN_110406.pdf) apply. The General Installation Guidelines of Renusol as well as the Installation Manuals and Data Sheets of the respective Renusol products, have likewise to be complied to.



Renusol Europe GmbH
Piccoloministraße 2, 51063 Köln, Germany
T +49 221 788707-0
F +49 221 788707-99
info@renusol.com
www.renusol.com

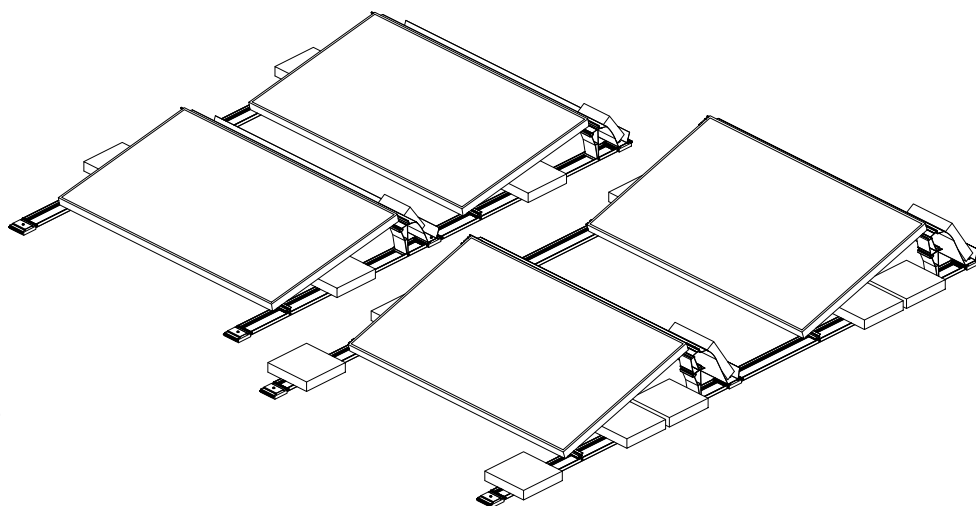
TOTAL BILL OF MATERIAL

Article No.	Article	Quantity	Ordering Unit	Weight/Piece	Weight
R420081	End clamp+	76	1	0,06 kg	4,86 kg
R420082	Middle clamp+	136	1	0,06 kg	8,57 kg
R500400	Base rail FS10-S 1389 mm	106	1	1,02 kg	108,12 kg
R500404	Base rail connector	137	1	0,08 kg	10,82 kg
R500411	Roof protection pad 110x95x20mm alu coated	224	1	0,13 kg	29,79 kg
R500420	Eave support	106	1	0,05 kg	5,09 kg
R500421	Ridge support 10°	106	1	0,34 kg	36,25 kg
R500430	Streamliner FS10-S	87	1	2,73 kg	237,51 kg
R520501	ECO Ballast set FS	11	1	2,33 kg	25,63 kg
R900229	Self Drilling Screw 4,8x19 A2	4	100	0,01 kg	2,00 kg
R900314	Socket bolt 6 x 110 mm	424	1	0,01 kg	3,82 kg
Total Weight:					472,46 kg

Section 5

System Mounting Solution Data Sheet

System Mounting Solution Warranty Document



System datasheet FS10-S / FS18-S

General

System	Ballasted PV-mounting system
Components	Ground rails, rail connector, building protection mat, low post, high post, wind deflector, clamps
System warranty	10 years
Application area	Flat roof on industrial, agricultural and residential buildings
Roof covering	Bitumen, concrete, foil, gravel
Roof slope	max. 3° without additional measures

System properties

System orientation	South
Module tilt	10° / 18°
System weight approx.	2.2 kg/m² (FS10-S) / 2.3 kg/m² (FS18-S) plus ballast (project specific)
Weight PV-module included approx.:	9.3 kg/m² (FS10-S) / 8.1 kg/m² (FS18-S) plus ballast (project specific)
Friction coefficient	$\mu = 0,5$ is to be determined and ensured upon installation surface.
Material	Aluminum, stainless steel, strip-galvanized steel metal sheet, rubber granulate
Minimum edge distance	0,6 m
Shading angle	12° to 17.5°

PV-Modules

Type	Suitable for standard 60 cell panels. Approval for panel corner clamping is to be obtained.
Module width	10°: 950-1,050 mm / 18°: 975-1,010 mm
Orientation	Horizontal/Landscape

Certifications

Wind loads	Determined in wind tunnel tests by Ruscheweyh Consult GmbH
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Services

Layout and ballast plan	Provided by Renusol
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System	Ground rail #	Inter-row spacing approx. [mm]	Shading angle
FS10-S	500400	1,490	17,5°
FS10-S	500401	1,740	12,0°
FS18-S	500402	1,840	17,5°
FS18-S	500403	2,090	14,5°

Warranty Conditions of Renusol Europe GmbH

(As at 3 March 2017)

Renusol Europe GmbH, Piccoloministraße 2, 51063 Cologne, Germany ("**Renusol**") sells the products ("**Goods**") listed in **Annex A**. *Renusol* provides a warranty ("**Warranty**") to the Purchaser ("**Customer**") in accordance with the provisions of these warranty conditions.

1. Scope of Application of the Warranty

- 1.1 The *Warranty* applies only to *Goods* that the *Customer* has purchased directly from *Renusol*. If the *Customer* has purchased the *Goods* from a third party, any claims shall be asserted only against such third party.
- 1.2 The *Warranty* only applies if *Renusol* has declared vis-à-vis the *Customer* that this *Warranty* is to apply (esp. by letter, email or fax). A verbal undertaking does not suffice.
- 1.3 The *Customer's* claims for defects in accordance with clauses 7 and 8 of *Renusol's* General Terms and Conditions of Business ("**T&Cs**") in the version applicable to the *Customer* and the respective purchase shall apply in addition to the rights of the *Customer* under this *Warranty* and shall not be affected by the rights granted to the *Customer* under this *Warranty*.

2. Warranty Period

- 2.1 The *Warranty* shall commence at the time at which the risk passes to the *Customer* pursuant to clause 6 of the *T&Cs*.
- 2.2 The warranty period in relation to the *Goods* is set out in **Annex A**.
- 2.3 If *Renusol* provides goods or services to the *Customer* under this *Warranty* (repair or replacement of the *Goods* pursuant to clause 4.3), this shall not affect the length of the warranty period.

3. Making Claims under the Warranty

- 3.1 If the *Goods* are defective, the *Customer* shall immediately notify *Renusol*, in text form (esp. by letter, fax, email) and enclosing a copy of the warranty certificate, no later than within two weeks from detection of the defect; the notice of defect is deemed to have been submitted in time if it was sent within the prescribed time limit. If the *Customer* fails to notify *Renusol* of any defect within the prescribed time limit, any claims against *Renusol* under this *Warranty* are excluded.
- 3.2 The damage report must be submitted in text form (esp. by letter, fax, email) and include a description of all the circumstances of which the *Customer* is aware and which are relevant in order to determine the cause of defect; this description needs to be worded so as to be understood by a *Renusol* technician. This includes, in particular, the nature and location of the installation of the *Goods*, any modifications, repairs or other alterations or work carried out by the *Customer* or *third parties* in relation to the *Goods* as well as a description of the cause of the defect and any consequences. If the above details are not included, claims against *Renusol* under this *Warranty* are excluded. This does not apply if the *Customer* cannot be reasonably expected or is unable to provide these details as part of the damage report. In this case the *Customer* must provide the details without delay as soon as he is able to or as soon it can reasonably be expected of him.
- 3.3 At the request of *Renusol* the *Customer* shall send the *Goods*, at the *Customer's* cost and risk, to an address in Germany specified by *Renusol*, provided this can reasonably be expected of the *Customer*. *Renusol* will reimburse the *Customer* for the costs incurred in this regard if the defect is covered by the *Warranty* or if the *Customer*, through no fault of his own, has failed to realise that the defect is not covered by the *Warranty*. The costs for returning *Goods* that have been repaired or replaced under the *Warranty* are borne by *Renusol* "*ex works*".
- 3.4 In derogation from clause 3.4, the assertion of claims for defects within the statutory warranty period does not entail any costs for the *Customer*; any costs incurred by the *Customer* are borne by *Renusol* (section 439(2) German Civil Code ["*Bürgerliches Gesetzbuch*", "*BGB*"]). As a consequence, within the warranty period the *Customer* has to bear return and/or shipment costs under the *Warranty* only if, following a check of the notice of defect, it transpires that *Renusol* is not responsible for the defect asserted by the *Customer* and the

Customer is responsible for the unjustified notice of defect, and in particular if the *Customer* could have realised that *Renusol* was not responsible for the defect claimed.

- 3.5 *Renusol* shall acquire ownership in the *Goods* returned by the *Customer* provided they are not repaired and returned to the *Customer*.
- 3.6 For any items that are additionally sent to *Renusol* by the *Customer* and that do not form part of the *Goods*, *Renusol* shall be liable in accordance with clauses 7 and 8 of the *T&Cs* and the statutory provisions.
- 3.7 If the *Customer* had already firmly connected the *Goods* to a facility and in particular to a building so that, pursuant to sections 93, 94 BGB, the *Goods* have become an integral component of the facility, the *Customer* may request that the *Goods* be checked by way of an on-site assessment; clauses 3.3 and 3.4 shall apply mutatis mutandis with regard to any costs incurred in this regard.

4. Scope of the Warranty

- 4.1 A defect for purposes of this *Warranty* shall only include defects in the *Goods'* material, which limit their suitability for normal or intended use in accordance with the contract concluded with the *Customer*.
- 4.2 If the defect reported by the *Customer* is covered by this *Warranty*, *Renusol* will repair the *Goods* affected by the defect or replace them by supplying new *Goods*. *Renusol* will bear the costs thereof except for the costs for installing or removing the *Goods* at the *Customer's* premises; the *Customer* shall bear these costs himself. *Renusol* shall make the decision whether to repair or replace the *Goods* at its reasonable discretion (section 315 BGB). *Renusol* shall be free to exchange the *Goods*, where required, also for completely overhauled *Goods*.
- 4.3 *Renusol* is entitled to commission third parties to fulfil any rights under the *Warranty*. The *Customer* does not have any claim for *Renusol* to fulfil any rights under the *Warranty*.
- 4.4 Should it transpire that the defect reported by the *Customer* is not covered by this *Warranty*, *Renusol* reserves the right to charge the *Customer* for the cost of checking and, where relevant, transporting the *Goods*. This does not apply if the *Customer* has failed to recognise, through no fault of his own, that the defect is not covered by the *Warranty*. *Renusol* is entitled, in relation to any deliverables under the *Warranty* that are not owed, to charge a flat rate of 20 % of the sale price of the *Goods* reported by the *Customer* to be defective. The *Customer* shall be entitled to prove that *Renusol* has, in fact, not incurred any costs or significantly lower costs.
- 4.5 No claims other than those under clause 4.2 – in particular claims for a reduction of the purchase price, claims for withdrawal or damages claims – shall arise on the basis of this *Warranty*.

5. Exclusion of the Warranty

- 5.1 The following defects are excluded from this *Warranty*:
- all defects that are not based on a defect in the *Goods'* material (clause 4.1),
 - all defects of *Goods* in relation to which a manufacturing or serial number attached by *Renusol* has been removed or rendered illegible,
 - all defects that have arisen from non-intended use of the *Goods* by the *Customer* or a third party, i.e. where the *Customer* or third party has failed to use the *Goods* for the purpose that was contractually intended or typical,
 - all defects that have arisen in disregard of or as a result of a breach of installation, operating, repair or other instruction manuals pertaining to the *Goods* that may have been provided by *Renusol*,
 - all defects that have arisen from the installation or maintenance of the *Goods* if the installation or maintenance was not carried out by a suitable and professional specialist firm,
 - all defects that have arisen due to external influences on the *Goods* after they have been delivered to the *Customer*, in particular due to changes, modifications, extensions, repairs, maintenance work, use of the *Goods* with non-original parts belonging to the *Customer* or third parties, improper transport or packaging of the *Goods*, vandalism, damage caused by animals, riots, civil unrest (civil war, demonstrations), war, earthquakes, floods, overvoltage, fire, explosion or lightning strike, and
 - all defects caused to *Goods* of *Renusol* that are not included in any of the product groups listed in **Annex A**.

- 5.2 In addition to clause 5.1., defects of the respective *Goods* that have arisen due to a failure to use the *Goods* in accordance with the standard terms and conditions of use as set out in **Annex B** are excluded from the Warranty.

6. Final Provisions

- 6.1 This *Warranty* and all claims related hereto shall be subject to substantive German law only, to the exclusion of the UN Convention on Contracts for the International Sale of Goods and any conflict of law provisions; this shall not affect article 3(3) and (4) Rome I.
- 6.2 Insofar as translations of these warranty conditions into languages other than German are produced, only the German version shall be legally binding.
- 6.3 If the *Customer* is a merchant, a legal person under public law or a special fund under public law, the exclusive place of jurisdiction for all disputes arising directly or indirectly under this contractual relationship anywhere in the world shall be Cologne, Germany. The same applies even if the *Customer* does not have any general place of jurisdiction in Germany or if his place of residence or habitual abode is not known at the time these legal proceedings are brought. *Renusol* is entitled to assert claims against the *Customer* at its general place of jurisdiction.
- 6.4 Any amendments or supplements to the Warranty as well as all declarations and notifications related to the Warranty must be made in text form (esp. by letter, fax, email). This shall also apply to the repeal of this requirement for text form.
- 6.5 If any provision of this Warranty is or becomes invalid or unenforceable, in whole or in part, this shall not affect the remainder of the provisions. Statutory provisions shall apply in place of the invalid provision. This shall apply accordingly in relation to any omissions in these provisions that the parties had not foreseen.

Annex A

These warranty conditions shall apply to the following *Goods* with the respective warranty period as set out in clause 2.2:

- FS 10 – warranty period: ten years
- FS 10-S – warranty period: ten years
- FS 18-S – warranty period: ten years
- FS 10-EW – warranty period: ten years
- ConSole/CS+ – warranty period: ten years
- InterSole – warranty period: ten years
- VarioSole/VS+ – warranty period: ten years
- MetaSole/MS+/MS+P – warranty period: ten years
- IntraSole – warranty period: ten years
- TS+ – warranty period: ten years

Annex B

In accordance with clause 5.2, *Goods* in the ConSole and CS+ product group shall be subject to the following standard terms and conditions of use:

- the *Goods* shall only be used subject to a sufficient structural basis, in particular installation on a load bearing device that is sufficiently strong to carry the weight of the *Goods* as well as any additional weather-related loads such as water, wind, leaves or snow,
- surface friction coefficient no less than 0.6,
- wind speeds of no more than 130 km/h, and
- ambient temperatures of no less than -30 °C and no more than 50 °C.

In accordance with clause 5.2, *Goods* in the InterSole, VarioSole, MetaSole and IntraSole product groups shall be subject to the following standard terms and conditions of use:

- the *Goods* shall only be used subject to a sufficient structural basis, in particular installation on a load bearing device that is sufficiently strong to carry the weight of the *Goods* as well as any additional weather-related loads such as water, wind, leaves or snow,
- wind speeds of no more than 115 km/h, and
- ambient temperatures of no less than -30 °C and no more than 50 °C.

In accordance with clause 5.2, *Goods* in the FS10, FS10-S, FS18-S and FS10-EW product groups shall be subject to the following standard terms and conditions of use:

- the *Goods* shall only be used subject to a sufficient structural basis, in particular installation on a load bearing device that is sufficiently strong to carry the weight of the *Goods* as well as any additional weather-related loads such as water, wind, leaves or snow,
- surface friction coefficient no less than 0.5,
- dynamic wind pressure of no more than $q_k=1.0 \text{ kN/m}^2$, and
- ambient temperatures of no less than -30 °C and no more than 50 °C.

Section 6

System Solar Panel Data Sheet

System Solar Panel Warranty Document



280W Module

JAP60S01 260-280/SC Series

Introduction

This time-tested legacy module series has been proven to be one of the powerful and most reliable products offered by JA Solar and the most popular choice by PV system installers and customers around world.



5 busbar solar cell design



Low cost



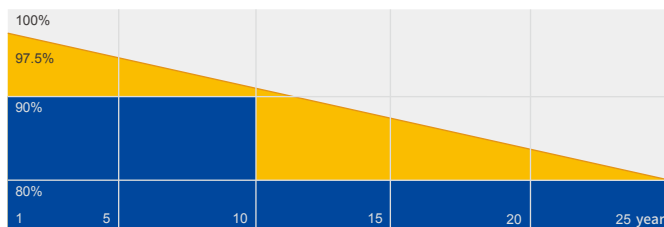
Anti-PID



Highly reliable due to strict quality control

Superior Warranty

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



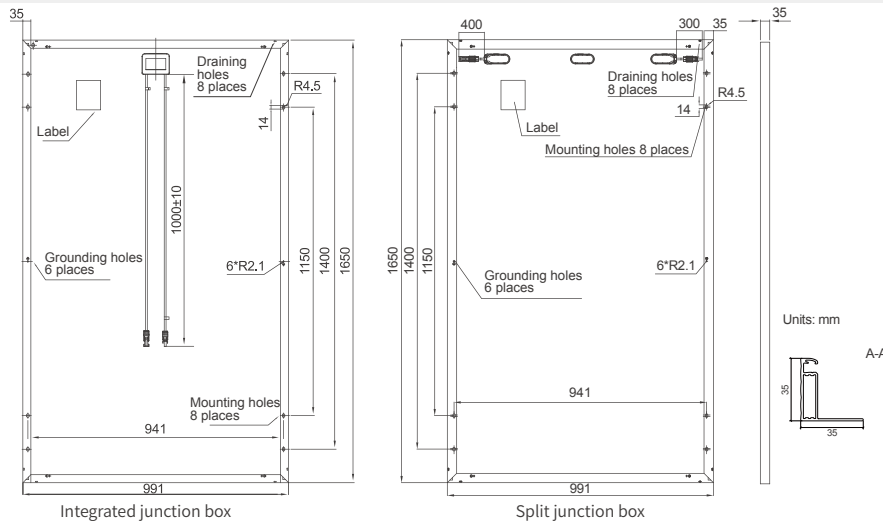
■ JA Linear Power Warranty ■ Industry Warranty

Comprehensive Certificates

- IEC 61215, IEC 61730, UL 1703, IEC TS 62804, IEC 61701, IEC 62716, IEC 60068-2-68
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- OHSAS 18001: 2007 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval



MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Poly
Weight	18.2kg±3%
Dimensions	1650mm×991mm×35mm
Cable Cross Section Size	4mm ²
No. of cells	60(6x10)
Junction Box	IP67, 3 diodes
Connector	MC4 Compatible(1000V) QC 4.10-35(1500V)
Packaging Configuration	30 Per Pallet

ELECTRICAL PARAMETERS AT STC

TYPE	JAP60S01 -260/SC	JAP60S01 -265/SC	JAP60S01 -270/SC	JAP60S01 -275/SC	JAP60S01 -280/SC
Rated Maximum Power(P _{max}) [W]	260	265	270	275	280
Open Circuit Voltage(V _{oc}) [V]	37.74	37.95	38.17	38.38	38.65
Maximum Power Voltage(V _{mp}) [V]	30.71	30.92	31.13	31.34	31.61
Short Circuit Current(I _{sc}) [A]	9.04	9.11	9.18	9.29	9.37
Maximum Power Current(I _{mp}) [A]	8.47	8.57	8.67	8.77	8.86
Module Efficiency [%]	15.9	16.2	16.5	16.8	17.1
Power Tolerance	0~+5W				
Temperature Coefficient of I _{sc} (α _{Isc})	+0.058%/℃				
Temperature Coefficient of V _{oc} (β _{Voc})	-0.330%/℃				
Temperature Coefficient of P _{max} (γ _{Pmp})	-0.400%/℃				
STC	Irradiance 1000W/m ² , cell temperature 25℃, AM1.5G				

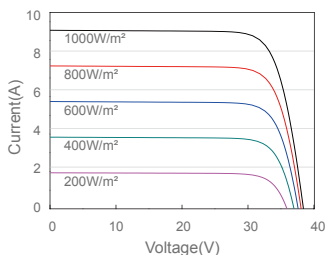
Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

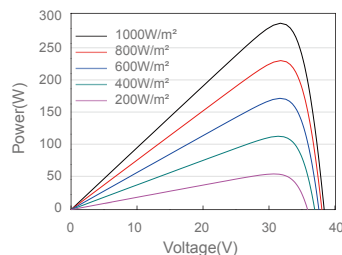
TYPE	JAP60S01 -260/SC	JAP60S01 -265/SC	JAP60S01 -270/SC	JAP60S01 -275/SC	JAP60S01 -280/SC	OPERATING CONDITIONS	
Rated Max Power(P _{max}) [W]	192	196	200	204	207	Maximum System Voltage	1000V/1500V DC(IEC)
Open Circuit Voltage(V _{oc}) [V]	35.70	35.94	36.25	36.56	36.85	Operating Temperature	-40℃~+85℃
Max Power Voltage(V _{mp}) [V]	28.87	29.09	29.29	29.48	29.69	Maximum Series Fuse	20A
Short Circuit Current(I _{sc}) [A]	7.20	7.23	7.27	7.33	7.40	Maximum Static Load, Front	5400Pa
Max Power Current(I _{mp}) [A]	6.66	6.74	6.82	6.90	6.98	Maximum Static Load, Back	2400Pa
NOCT	Irradiance 800W/m ² , ambient temperature 20℃, wind speed 1m/s, AM1.5G					NOCT	45±2℃
						Application Class	Class A

CHARACTERISTICS

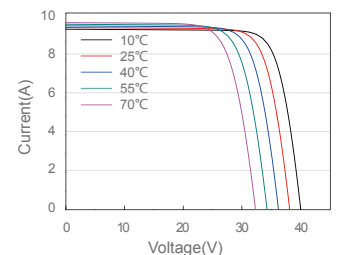
Current-Voltage Curve JAP60S01-270/SC



Power-Voltage Curve JAP60S01-270/SC



Current-Voltage Curve JAP60S01-270/SC



Limited Warranty

for PV Modules

JA SOLAR

www.jasolar.com

JA SOLAR HOLDINGS CO., LTD.

Add: No.36,Jiang Chang San Road, Zhabei, Shanghai 200436, China

Tel: +86-21-6095 5888/6095 5999

Email: service@jasolar.com

Website: www.jasolar.com

JA SOLAR

JA Solar Holdings Co., Ltd., and on behalf of ALL its DIRECTLY AND indirectly owned and controlled subsidiary, INCLUDING BUT NOT LIMITED TO Shanghai JA Solar Technology Co., Ltd.-(hereinafter jointly referred to as “JA Solar”) warrants its Photovoltaic Solar modules’ (MODULES) performance starting from the date of sale to the first customer installing (for their own use) the modules (“Customer”) or starting at the latest 6 months after modules dispatch from the JA Solar factory, whichever occurs earlier (the “Warranty Commencement Date”).

1. Limited Product Warranty – Twelve Year Repair or Replacement

JA Solar warrants that the MODULES together with the factory-assembled DC connectors and cables are free from any defects in materials and workmanship under normal application, usage, installation and service conditions for a period of one hundred and forty-four (144) months from the Warranty Commencement Date. If MODULES become malfunctioning or non-operative due to defects in material or workmanship during the one hundred and forty-four (144)-month period from the Warranty Commencement Date, as verified by an independent testing agency that will be selected and confirmed mutually by JA Solar and Customer in advance, JA Solar will, at its sole option, either repair or replace the malfunctioning or inoperative MODULES. MODULES' repair or replacement remedy shall be the sole and exclusive remedy provided under this Limited Product Warranty and shall not extend beyond the period set forth herein. This Limited Product Warranty does not warranty a specific power output at or during any time frame, which shall be exclusively covered under Section 2 of this Warranty hereinafter ("Limited Peak Power Warranty")

2. Limited Peak Power Warranty– Limited Remedy

JA Solar warrants that for a period of twenty-five years starting from the Warranty Commencement Date, loss of power output against the minimum “Peak Power at STC” as specified on the label of the modules (hereinafter “Nominal Power”) when measured at Standard Test Conditions (STC) for the Product(s) shall not exceed:

- (1) For Mono Products: 3 % for the first year from the Warranty Commencement Date, and 0.65% per year thereafter from the 2nd to the 25th year of the warranty period: with a power output standing at 81.4% of the Nominal Power at the end of the 25-year warranty period;
- (2) For Poly Products: 2.5 % for the first year from the Warranty Commencement Date, and, 0.7% per year thereafter from the 2nd to the 25th year of the warranty period: with a power output standing at 80.7% of the Nominal Power at the end of the 25-year warranty period.

Within the period of twenty-five (25)-year warranty period from the Warranty Commencement Date, should any qualified Module sold by JA Solar exhibit a loss of power output exceed the aforementioned warranted values, provided that any such declared loss in power has been verified by JA Solar, at its sole discretion is due to MODULES' defects in materials or workmanship attributable to JA Solar's own causes and further confirmed by an independent testing agency (if so requested by a customer) (which is to be selected and confirmed mutually by JA Solar and Customer in advance), JA Solar will, at its sole option and discretion, either (1) make up such loss in power by providing to customer(s) additional MODULES; or (2) repair or replace the defective MODULES including free shipping to the location as set out in the original sales contract entered between JA Solar and the customer.

The remedies set forth herein are the sole and exclusive remedies JA Solar is bound to provide under the Limited Peak Power Warranty.

CAVEAT:

The shipping charges for any allegedly defected MODULES shall be borne by the customers making such claims in advance. Should the independent testing agency confirm that such filed defected are to be covered under this Warranty by JA Solar, the shipping charges advanced by the customers may be reimbursed by JA Solar against the original proof of expenditure.

3. Exclusions and Limitations

(a) Warranty claims from any customers, in any event, shall be filed in writing to JA Solar or its authorized distributors within the applicable warranty period and not beyond the last day of the applicable period of time as stated above.

(b) The Limited Product Warranty and Limited Peak Power Warranty shall not apply to MODULES which have been subject to:

- Misuse, abuse, neglect, vandalism or accident;
- Repair or modifications that do not strictly follow the manufacturer's instructions;
- Non-observance of JA Solar's maintenance instructions;
- Power failure, electrical spikes or surges, lightening, flood, fire, accidental breakage or other events outside JA Solar's control.
- Alteration, improper installation or application which is not compliant with JA Solar standard installation manual.

(c) The Limited Product Warranty and Limited Peak Power Warranty do not cover any costs associated with installation, removal or re-installation of the MODULES and (except as explicitly set forth in the last paragraph of the Section 5) customs clearance or any other costs for return of the MODULES.

(d) Warranty claims will not be honored if the type or serial number of JA Solar MODULES have been altered, removed or made illegible without written authorization from JA Solar.

4. Limitation of Warranty Scope

This Warranty as set forth herein is expressly in lieu of and excludes all other express or implied warranties, including but not limited to warranties of merchantability and of fitness for particular purpose, use, or application, and all other obligations or liabilities on the part of JA Solar, unless such other obligations or liabilities are expressly agreed to in writing signed and approved by JA Solar. JA Solar shall have no responsibility or liability whatsoever for damage or injury to persons or property, or for other loss or injury resulting from any cause whatsoever arising out of or related to the MODULES, including, without limitation, any defects in the MODULES or from use or installation.

Under no circumstances shall JA Solar be liable for incidental, consequential or special damages, howsoever caused. Loss of use, loss of profits, loss of production, and loss of revenues. The aforementioned alleged losses by customers are specifically and without limitation excluded from responsibilities of JA Solar. JA Solar's aggregate liability, if any, in damages or otherwise, shall not exceed the invoice value as paid by the Customer, for the single unit of MODULES.

5. Obtaining Warranty Performance

If the Customer has a justified claim covered by this Warranty, an immediate written notification shall be directly made to JA Solar by means of registered letter to the address of JA Solar listed hereunder, or, sending a notification via e-mail to the e-mail account of JA Solar listed hereunder. Together with the notification, the Customer should enclose the evidence of the claim with the corresponding serial number of the MODULES and the date on which the MODULES have been purchased. An invoice with clear indication of the purchase date, purchase price, module type, stamp or signature of JA Solar or its distributors should also be submitted as part of the preliminary evidence.

If the MODULES will be returned to JA Solar for inspection, repair or replacement by JA Solar, JA Solar shall provide the Customer with a Return Merchandise Authorization (RMA). However, JA Solar will not accept a return of any MODULES without such RMA. In connection with both the Limited Product Warranty and Limited Peak Power Warranty, JA Solar may reimburse customer for reasonable, customary and documented transportation charges by sea freight for both the return of the MODULES and reshipment of any repair or replacement MODULES, only if such cost reimbursement is authorized by JA Solar's Customer Service Department in advance.

6. Transferability

This warranty is extended to the original end-user purchaser, and is also transferable to any subsequent owner of the location or holder of the product when MODULES remain at their original installed location upon satisfactory proof of succession or assignment.

7. Severability

If a section, provision or clause of this Warranty, or the application thereof to any person or circumstance, is held invalid, void or unenforceable, such shall not affect and thus shall leave all other sections, provisions, clauses or applications under this Warranty severable, and therefore validly binding.

8. Dispute Resolution

In case of any dispute in terms of warranty-claims, a first-class international testing institute, such as PI Berlin, TÜV SUD or Intertek , UL, shall be entrusted by both parties upon mutual consents in order to provide third party verification and comments. All fees and expenses shall be borne by the party that demanded such verification procedure, unless otherwise agreed. Further dispute over the claim shall be submitted to dispute resolution as stipulated in the main sales contract to which this Warranty is a part of and subject to the applicable jurisdiction agreed by the parties in the sales contract.

9. Various

The repair or replacement of the MODULES or the supply of additional MODULES does not lead to a new commencement of warranty terms, nor shall the original terms of this Warranty be extended. Any replaced MODULES shall become the property of JA Solar.

JA Solar shall at its own options to deliver another type of MODULES (different in size, color, shape, or power), either a new brand or the original one, in case that JA Solar has discontinued producing the module in question at the time of the claim.

10. Force Majeure

JA Solar shall not be responsible or liable to the Customer whatsoever or any third-party arising out of any non-performance or delay in performance of any terms and conditions of the sales, including this Warranty, due to causes of natural disasters such as fire, flood, blizzard, hurricane, thunder, acts of God, changes of public policies, terrorism, war, riots, strikes, unavailability of suitable and sufficient labor or materials and other events which are out of control of JA Solar.

REMARK:

“Peak Power” is the power in watt peak that MODULES generates in its maximum power point under STC condition. ‘STC’ are as follows:

- (a) Light spectrum of AM 1.5
 - (b) Irradiance at 1,000W/m2
 - (c) Cell temperature of 25 degree Centigrade at right angle irradiation
- The measurements are carried out in accordance with IEC61215 as tested at the junction box terminals per the calibration and testing standards of JA Solar valid at the date of manufacture of the MODULES. JA Solar's calibration standards shall be in compliance with the standards applied by international institutions accredited for this purpose.

Section 7

System Inverter Data Sheet

System Inverter Warranty Document

Three

20kW
-
40kW

Solis Three PV Inverter

- ▶ Three phase output
- ▶ Over 98.8% Max. efficiency
- ▶ 200V-1000V input voltage range
- ▶ 7.0" LCD color screen display
- ▶ Four MPPT design with precise MPPT algorithm
- ▶ Compact and light design, easy installation
- ▶ IP65 rated for outdoor installation
- ▶ RS485, WiFi/GPRS (optional) interface
- ▶ Anti-resonance, single transformer can connect 6M+ in parallel
- ▶ Multiple protection functions
- ▶ WiFi and monitoring app available
- ▶ 5 years standard warranty, 20 years optional upgrade



Model:

Solis-20K

Solis-25K

Solis-30K

Solis-33K

Solis-36K-HV

Solis-40K-HV

Features:

Fanless
Cooling
Concept

Four
MPPT

7"
LCD

WiFi/GPRS
Real time
monitoring

Available on the iPhone
App Store
Available on the Android
App Store

IP65

Datasheet

Model	Solis-20K	Solis-25K	Solis-30K	Solis-33K	Solis-36K-HV	Solis-40K-HV
Energy Source	PV					
Input Side(DC)						
Max. DC input power(kW)	23	28	34	36	41	48
Max. DC input voltage(V)	1000				1100	
Start-up voltage(V)	350					
MPPT voltage range(V)	200-800				200-1000	
Max. input current(A)	18A+18A+18A+18A					
MPPT number/Max input strings number	4/8					
Output Side (AC)						
Rated output power(kW)	20	25	30	33	36	40
Max. apparent output power(kVA)	22	27.5	33	33	40	44
Max. output power(kW)	22	27.5	33	33	40	44
Rated grid voltage(V)	400				480	
Grid voltage range(V)	304-460				384-576	
Rated grid frequency(Hz)	50/60					
Operation phase	Three					
Rated grid output current(A)	28.7	36.1	43.3	47.8	43.3	48.1
Max. output current(A)	33.3	41.7	50	50	47.8	53
Power Factor (at rated output power)	0.8...1...0.8					
THDi (at rated output power)	<3%					
DC injection current(mA)	<50					
Grid frequency range(Hz)	47-52 or 57-62					
Efficiency						
Max. efficiency	98.6%	98.6%	98.6%	98.7%	98.8%	98.8%
EU efficiency	98.3%/98.3%	98.3%/98.3%	98.3%/98.3%	98.3%/98.3%	98.4%/98.4%	98.4%/98.4%
MPPTefficiency	99.9%					
Protection						
DC reverse-polarity protection	Yes					
Short circuit protection	Yes					
Output over current protection	Yes					
Output over voltage protection	Yes					
Insulation resistance monitoring	Yes					
Residual current detection	Yes					
Surge protection	Yes					
Islanding protection	Yes					
temperature protection	Yes					
Integrated DC switch	Optional					
General Data						
Dimensins(mm)	530W*700H*356.5D (mm)					
Weight(kg)	57.2	58.2				
Topology	Transformerless					
Self consumption (night)	<1W(Night)					
Operating ambient temperature range	-25-60℃					
Ingress protection	IP65					
Noise emission{typical}	<30 dBA					
Cooling concept	Natural convection					
Max.operation altitude	4000m					
Designed lifetime	>20years					
Grid connection standard	EN50438, G59/3, AS4777, VDE0126-1-1, IEC61727					
Relative humidity	0~100%					
Safty/EMC standard	IEC62109-1/-2, AS3100, EN61000-6-1, EN61000-6-3					
Features						
DC connection	MC-4mateable					
AC connection	Terminal connectors					
Display	7.0"LCD color screen display					
Communication connections	4 pins RS485 connector , 2 RJ45 connector					
Warranty	5 years standard (extend to 20 years)					



SOLIS INVERTER WARRANTY – 3 Phase 5 Year

Ginlong(Ningbo) Technologies Co., Ltd.

No. 57 Jintong Road, Binhai Industrial Park, Xiangshan, Ningbo, Zhejiang 315712, China
Tel: (+86) 574 6578 1806 Email: sales@ginlong.com

Solis Inverter are manufactured by Ginlong (Ningbo) Technologies Co., Ltd. (The Company) (referred to as Ginlong) provides the following Warranty to the purchaser (The Customer) of the Solis 3 Phase Inverter (The Goods). (The Customer is deemed to be the owner of the installed Goods at first sale.

1. Warranty Terms

The Company warrants all Goods to be free from defects in material or workmanship under normal use and service for a period of 5 years from the date of sale to the Customer.

The Warranty covers the cost of unit repairs or replacement parts. The Goods must be returned to the Company for inspection.

The company may repair or replace faulty components at its discretion.

This warranty extends the Customer's statutory rights and cannot be construed so as to diminish such statutory rights.

2. Warranty Extension

The purchaser may apply for a warranty extension within 12 months of purchase by providing the serial number of the unit along with proof of purchase.

3. Warranty Limitations

The Warranty is valid only for Goods purchased either directly from the Company or from an authorized reseller of the company.

The Warranty is not transferable and applies to brand new Goods only.

Defective parts replaced under Warranty become the property of the Company.

The Warranty does not cover:

- (a) Access, labour or transport costs;
- (b) Consequential damages including but not limited to loss of revenue;
- (c) Claims by third parties other than the Customer;
- (d) Defects of installation. (Except where the installation is performed by the Company);
- (e) Goods damaged as a consequence of incorrect installation. (Except where the installation is performed by the Company);
- (f) Items ancillary to installation not supplied by the Company;
- (g) Duties, import/export fees or costs and other general administrative costs;
- (h) Damage to Goods caused by misuse, improper handling or unauthorized modification;
- (i) Loss or damage occurring whilst in transit;
- (j) Accidental or willful damage;
- (k) Any Goods described in a quotation or delivery note as 'ex-display' or 'reconditioned'. (A separate Warranty extension may have been issued to cover such Goods.)

Labour, travel and delivery (to and from customer) will be charged if goods returned found to be not faulty following a warranty claim.

Covers all Three Phase inverters purchased after July 1st 2016 where warranty term changed to 5 year standard.

4. Warranty Claims Procedure

To make a warranty claim the following information needs to be provided:

- Completed RTM Inspection Form
- Product Model (ie. Solis 15kW) and Product Serial Number (ie. A1110011)
- Copy of the invoice for the inverter
- Copy of the installation report and MCS installation certificate

The authorised reseller will liaise with the Company regarding repair or replacement. The cost of unit repair or replacement will be borne by the Company provided the Warranty has been validated and the Warranty period has not expired.

Where repairs must be effected at the Company's headquarters, the Company will endeavor to minimize the down time for the Goods.