Design & Access Statement

Swiss Cottage Library
PV Installation

Camden London Borough Council

May 2016

ATKINS

Plan Design Enable

Notice

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Document History

Job number: 5125476		**Document ref:** P:\GBEMF\PDG\PC\Documents\Bse01\5146958 - Swiss Cottage PV Feasibility\04 Statutory\Planning				
Revision	**Purpose description**	**Originated**	**Checked**	**Reviewed**	**Authorised**	**Date**
0	Planning Submission	JM	DSJ	EM	EM	17/05/16

Table of contents

1. Introduction

The Purpose of This Statement

1.1 This Statement accompanies the Planning Application for the proposed mounting of solar PV's on the roof of Swiss Cottage Library.

1.2 This Statement should be read alongside submission documents and drawings associated with the application.

Description of the Proposal

1.3 The proposed scheme is to provide Swiss Cottage Library with a renewable source of energy.

1.4 The proposed solar PV system is to utilise the 520m^2 free roof space to provide an approximate 48kWp rated capacity scheme.

Reason for the Development

1.5 The key objective for the design is to:

1.6 Provide the Library with a solar PV system of approximately 48 kWp without exceeding a system size of 50kWp as the feed in tariff available reduces significantly over this size.

1.7 Export approximately 1,000 kwh of electricity back to the grid when the library is no longer open on Sundays.

1.8 A guarantee a payback period of around 10 years.

The Outcome of the Development

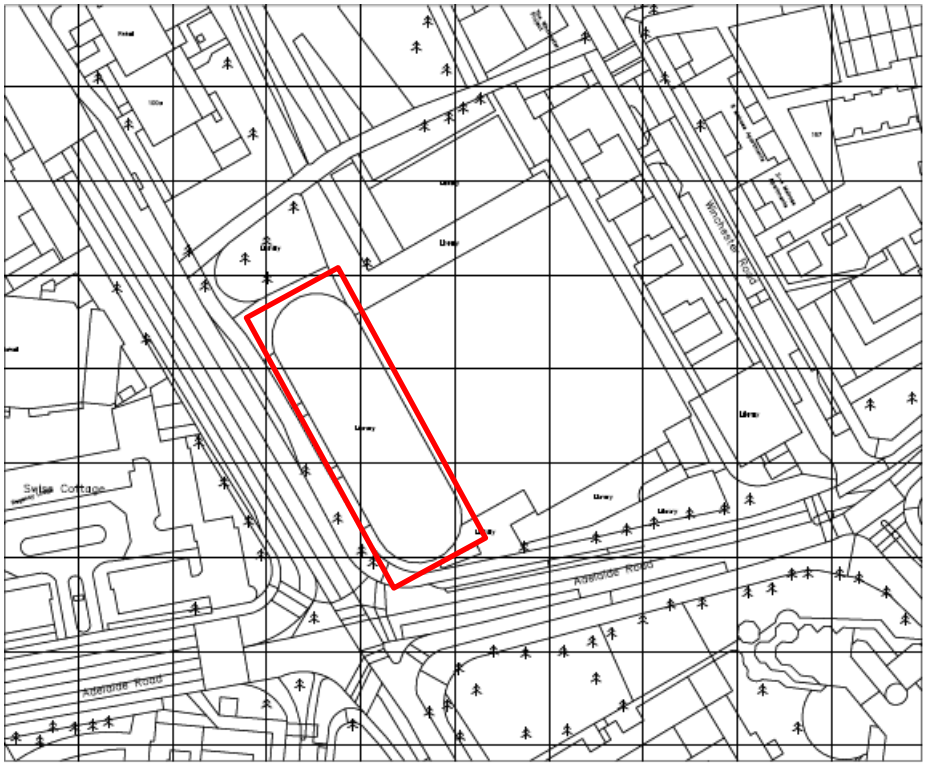


Figure 1 – Existing Site Plan

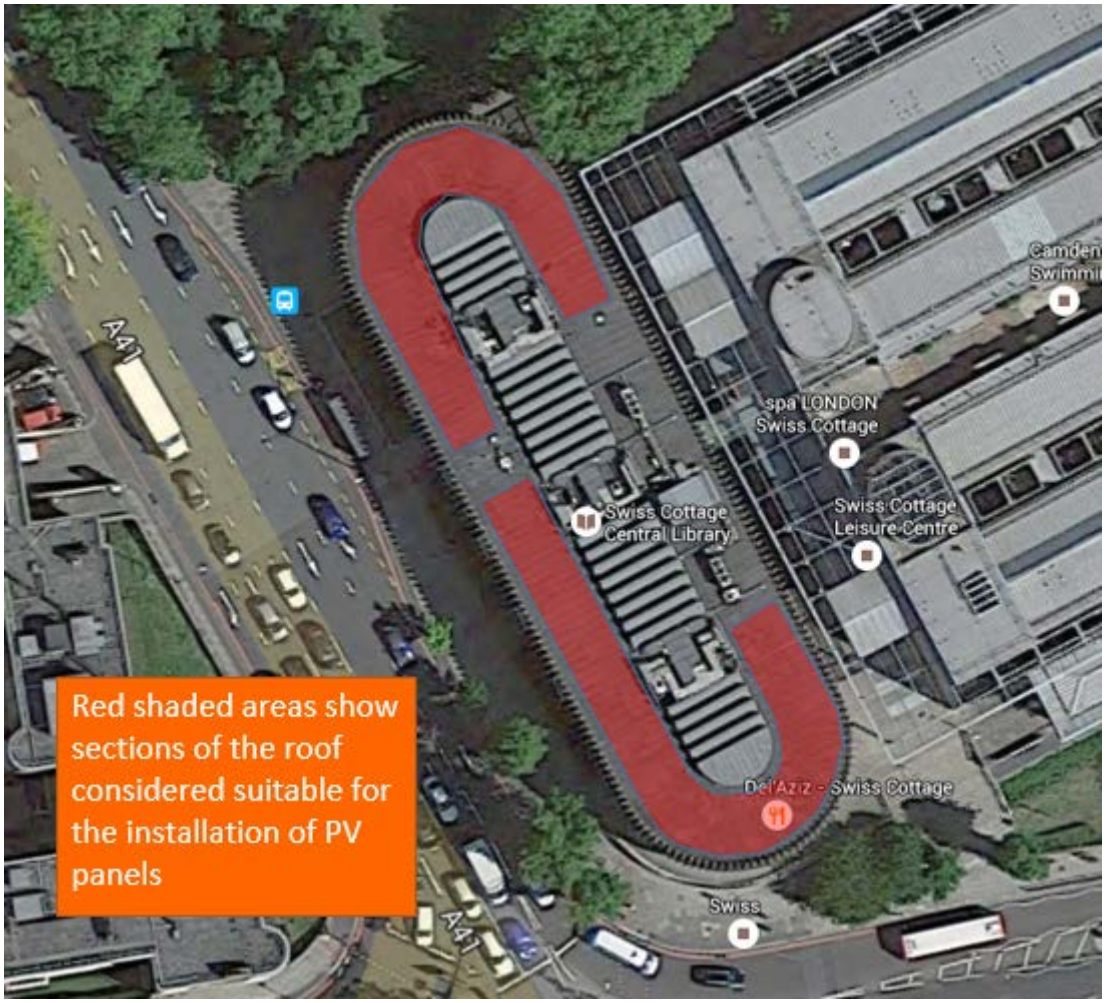


Figure 1 - Proposed Site Roof where PV panels can be installed

2. Design Issues

Site Description

2.1 The site is located on 88 Avenue Road, London NW3 3HA

2.2 The library is a three storey grade II listed building located adjacent to Swiss Cottage Underground Station in London. The building is a concrete framed structure initially constructed in the early 1960s and there have been some minor remodelling over the years. The shape of the building is an obround approximately 73 m long and 21 m wide.

2.3 The roof currently accommodates a chiller and associated air handling plant on its east side. There is a small extract ventilation unit on the west side, and the central area is given over to north-light type windows. There are no plans to modify the existing plant layout so the PV system will be installed within the existing free areas on the roof.

Areas & Layout

2.4 The areas of works are proposed for the roof as well as the riser 3 cupboard which will be utilised to feed cables back to the main electrical intake located within the basement.

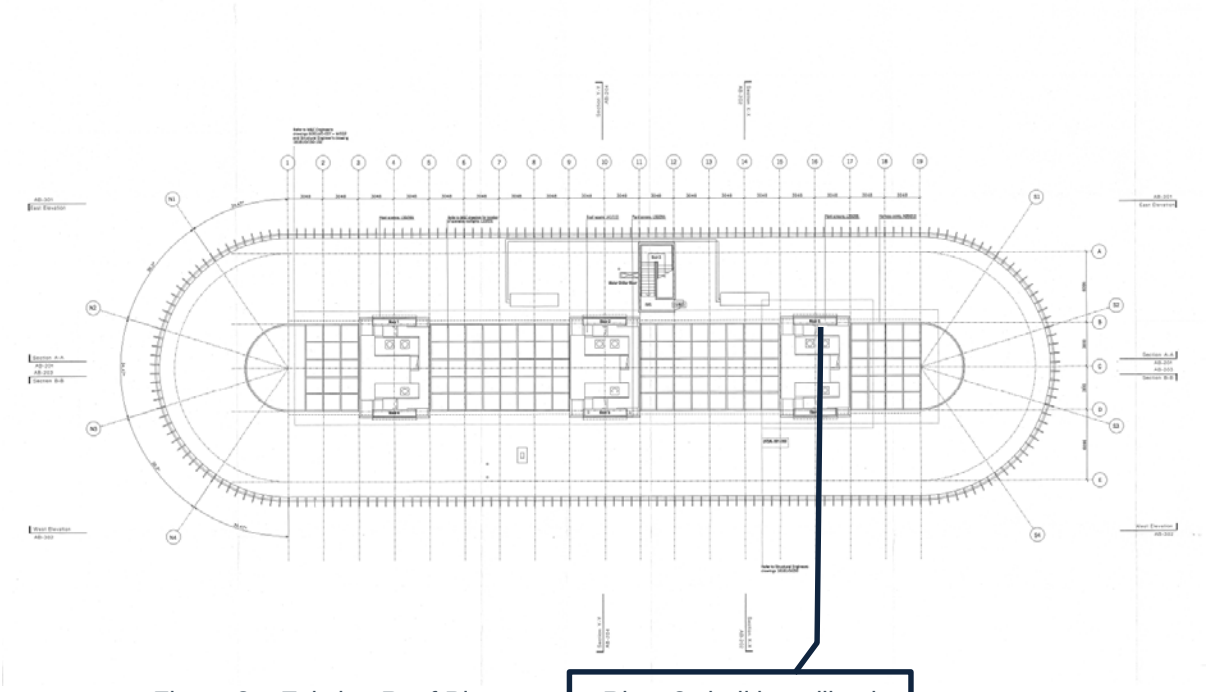


Figure 2 – Existing Roof Plan

Existing Design Appearance

2.5 Swiss Cottage Library was designed by Sir Basil Spence. The building is a concrete framed structure initially constructed in the early 1960s and there have been some minor

remodelling over the years, careful consideration has been taken to preserve the feature if the interior and exterior original building.

2.6 There will not be any changes made to building façade however minor improvements shall be made to the defected parts of the roof to allow for the installation of the PV panels.

2.7 The roof construction is a flat roof with what is believed to be asphalt finish roofing. It is known that the existing roof around 15 years of age.

Proposed Design Appearance

2.8 The design proposals for the new PV panels shall be housed behind the existing roof parapet, the new PV's will therefore not be visible from street level.

2.9 PV modules shall be 1.7m wide by 1m high positioned on aluminium triangles, with rubber pads at around 10mm, so the front of the panels would be approximately 30mm off the roof and position at a 15 degree angle.

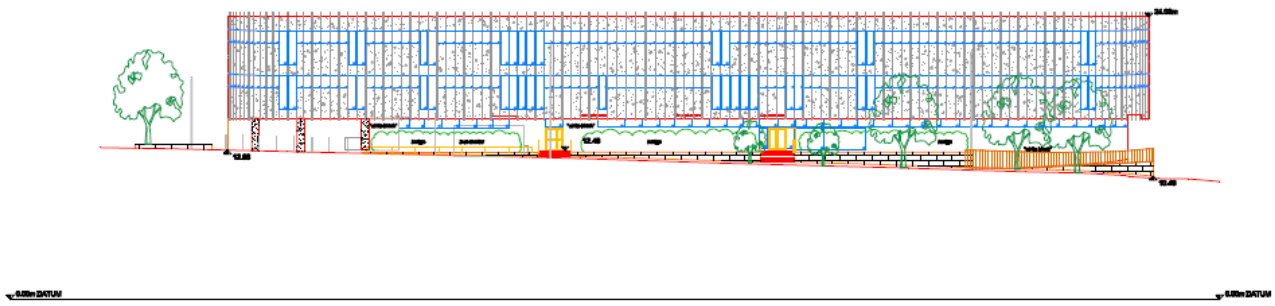
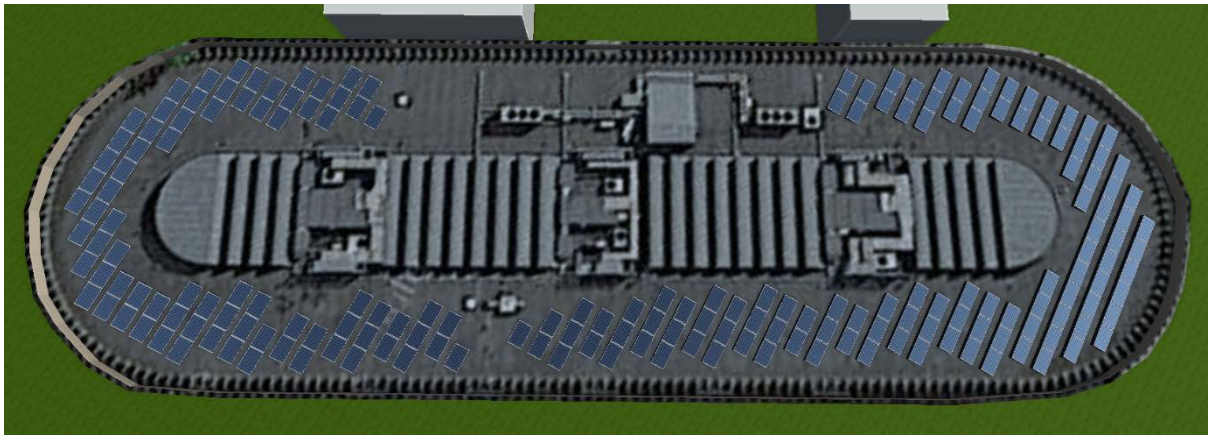


Figure 3 – Existing Western elevation



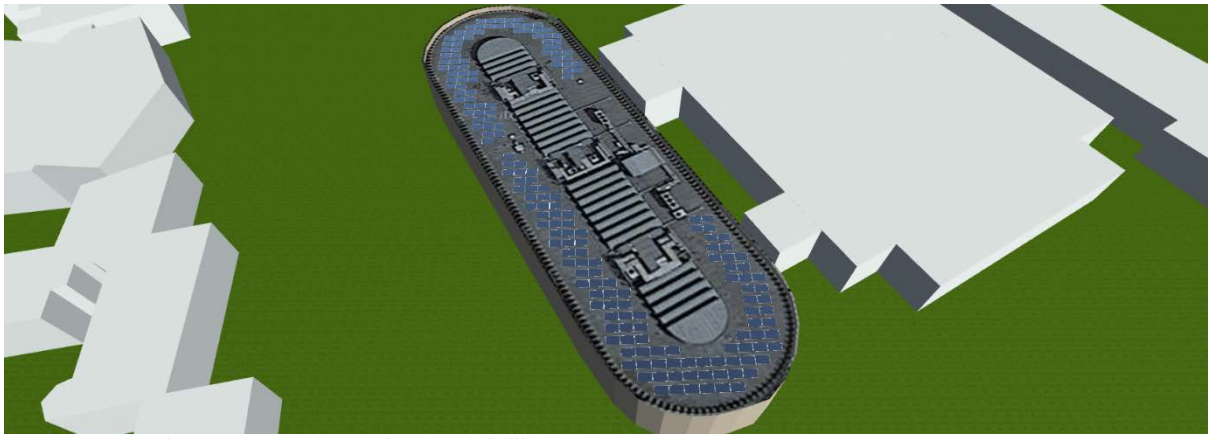


Figure 3 – Proposed PV Modelling

3. Access Issues

Existing Access Situation

3.1 The existing stair core leading up to the roof shall be used as to access the roof as well as maintaining the new PV's

3.2 There are no vehicular access points to Swiss Cottage Library or the leisure centre.

3.3 There is a footway provided around the perimeter of the library.

3.4 Primary pedestrian access is provided in the northern side of the site adjacent to a bus stop on the A41. Further entrances are located within the middle of the building at each side on the Ground floor.

3.5 As part of the proposed works, the existing pedestrian access points around the perimeter of the building will remain unchanged during the construction phase of the PV panels.

4. Materials

Proposed PVs

4.1 The photovoltaic cells shall be mono/polycrystalline panels. The exact manufacture and model shall be determined once the Contractor is appointed to install the works. However a list of approved manufactures can be found within Appendix A of this document

Appendix A

Approved Photovoltaic Panels Manufactures

Sunmodule Plus
SW 260 poly

SOLARWORLD
REAL VALUE

PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)*

		SW 260
Maximum power	P_{max}	260 Wp
Open circuit voltage	U_{oc}	38.4 V
Maximum power point voltage	U_{mpp}	31.4 V
Short circuit current	I_{sc}	8.94 A
Maximum power point current	I_{mpp}	8.37 A
Module efficiency	η_m	15.51 %

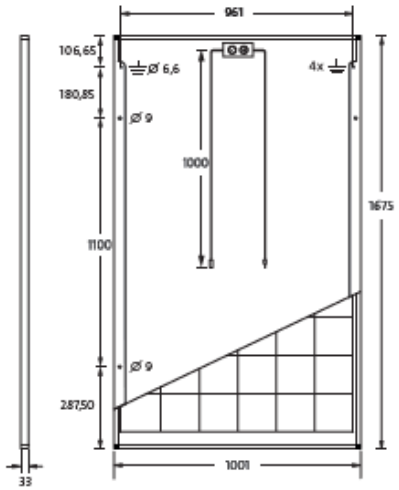
Measuring tolerance (P_{max}) traceable to TUV Rheinland: +/- 2% (TUV Power controlled)

*STC: 1000W/m², 25°C, AM 1.5

PERFORMANCE AT 800 W/m², NOCT, AM 1.5

		SW 260
Maximum power	P_{max}	192.4 Wp
Open circuit voltage	U_{oc}	34.8 V
Maximum power point voltage	U_{mpp}	28.5 V
Short circuit current	I_{sc}	7.35 A
Maximum power point current	I_{mpp}	6.76 A

Minor reduction in efficiency under partial load conditions at 25°C: at 200 W/m², 97% (+/-3%) of the STC efficiency (1000 W/m²) is achieved.



COMPONENT MATERIALS

Cells per module	60
Cell type	Poly crystalline
Cell dimensions	156 mm x 156 mm
Front	Tempered safety glass (EN 12150)
Back	film, white
Frame	Clear anodized aluminum
J-Box	IP65
Connector	H4

DIMENSIONS / WEIGHT

Length	1675 mm
Width	1001 mm
Height	33 mm
Weight	18.0 kg

THERMAL CHARACTERISTICS

NOCT	46 °C
TK I_{sc}	0.051 %/K
TK U_{oc}	-0.31 %/K
TK P_{mpp}	-0.41 %/K

PARAMETERS FOR OPTIMAL SYSTEM INTEGRATION

Power sorting	-0 Wp / +5 Wp
Maximum system voltage SC II	1000 V
Maximum reverse current	25 A
Load / dynamic load	5.4 / 2.4 kN/m²
Number of bypass diodes	3
Operating range	-40°C bis +85°C

ORDERING INFORMATION

Order number	*Description*
82000008	Sunmodule Plus SW 260 poly

SolarWorld AG reserves the right to make specification changes without notice. This data sheet complies with the requirements of EN 50380.

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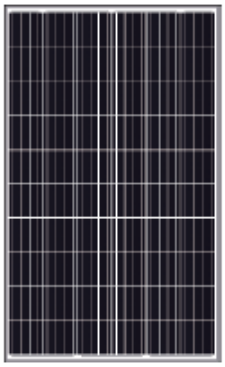
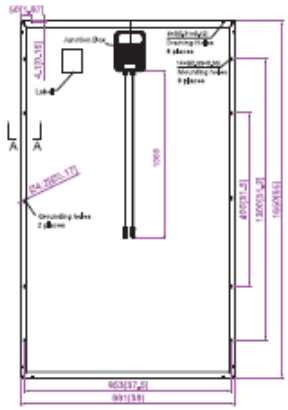
JAP6(SE) 60/260-280/4BB/RE

JA SOLAR

Engineering Drawings





■ customized cable length available upon request

MECHANICAL PARAMETERS

Cell (mm)	Poly 156x156
Weight (kg)	19.5 (approx)
Dimensions (L×W×H) (mm)	1650×991×40
Cable Cross Section Size (mm^2)	4
No. of Cells and Connections	60 (6×10)
Junction Box	IP67, 3 diodes
Connector	MC4
Packaging Configuration	26 Per Pallet

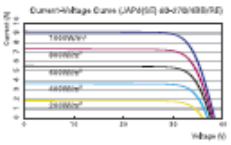
WORKING CONDITIONS

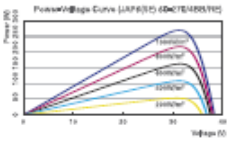
Maximum System Voltage	DC 1000V (IEC)
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	15A
Maximum Static Load, Front Maximum Static Load, Back	5400Pa (112 lb/ft²) 2400Pa (50 lb/ft²)
NOCT	45±2°C
Application Class	Class A

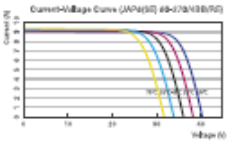
ELECTRICAL PARAMETERS

TYPE	JAP6(SE)60-260/4BB/RE	JAP6(SE)60-265/4BB/RE	JAP6(SE)60-270/4BB/RE	JAP6(SE)60-275/4BB/RE	JAP6(SE)60-280/4BB/RE
Rated Maximum Power at STC (W)	260	265	270	275	280
Open Circuit Voltage (Voc/V)	37.98	38.14	38.30	38.46	38.85
Maximum Power Voltage (Vmp/V)	30.55	30.89	31.21	31.54	31.88
Short Circuit Current (Isc/A)	9.04	9.10	9.16	9.22	9.33
Maximum Power Current (Imp/A)	8.51	8.58	8.65	8.72	8.78
Module Efficiency [%]	15.90	16.21	16.51	16.82	17.12
Power Tolerance (W)			-0~+5W		
Temperature Coefficient of Isc (αIsc)			+0.058%/°C		
Temperature Coefficient of Voc (βVoc)			-0.330%/°C		
Temperature Coefficient of Pmax (γPmp)			-0.400%/°C		
STC	Irradiance 1000W/m², Cell Temperature 25°C, Air Mass 1.5				

I-V CURVE







NOCT

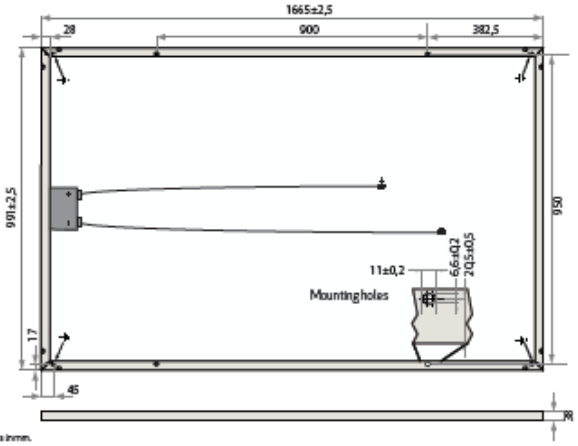
TYPE	JAP6(SE)60-260/4BB/RE	JAP6(SE)60-265/4BB/RE	JAP6(SE)60-270/4BB/RE	JAP6(SE)60-275/4BB/RE	JAP6(SE)60-280/4BB/RE
Max Power (Pmax) [W]	189.28	192.92	196.56	200.20	204.13
Open Circuit Voltage (Voc) [V]	34.88	35.03	35.19	35.37	35.68
Max Power Voltage (Vmp) [V]	27.91	28.07	28.23	28.41	28.66
Short Circuit Current (Isc) [A]	7.25	7.28	7.31	7.34	7.38
Max Power Current (Imp) [A]	6.78	6.87	6.96	7.05	7.12
Condition	Under Normal Operating Cell Temperature, Irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s				

Optimized by solar edge

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.

JA Solar 01.2015

REC PEAK ENERGY SERIES



16.1% EFFICIENCY

10 YEAR PRODUCT WARRANTY

25 YEAR LINEAR POWER OUTPUT WARRANTY

TEMPERATURE RATINGS	
Nominal operating cell temperature (NOCT)	45.7 °C (±2 °C)
Temperature coefficient of P_{MPP}	-0.40 %/°C
Temperature coefficient of V_{OC}	-0.27 %/°C
Temperature coefficient of I_{SC}	0.024 %/°C

ELECTRICAL DATA @ STC	REC240PE	REC245PE	REC250PE	REC255PE	REC260PE	REC265PE
Nominal Power - P_{MPP} (Wp)	240	245	250	255	260	265
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V_{MPP} (V)	29.7	30.1	30.2	30.5	30.7	30.9
Nominal Power Current - I_{MPP} (A)	8.17	8.23	8.30	8.42	8.50	8.58
Open Circuit Voltage - V_{OC} (V)	36.8	37.1	37.4	37.6	37.8	38.1
Short Circuit Current - I_{SC} (A)	8.75	8.80	8.86	8.95	9.01	9.08
Module Efficiency (%)	14.5	14.8	15.1	15.5	15.8	16.1

Analysed data demonstrates that 99.7% of modules produced have a current and voltage tolerance of ±3% from nominal values.
Values at standard test conditions STC (airmass AM 1.5, irradiance 1000 W/m², cell temperature 25°C).
At low irradiance of 200 W/m² (AM 1.5 and cell temperature 25°C) at least 97% of the STC module efficiency will be achieved.

GENERAL DATA	
Cell type:	60 REC PE multi-crystalline 3 strings of 20 cells with by pass diodes
Glass:	3.2 mm solar glass with anti-reflection surface treatment
Back sheet:	Double layer highly resistant polyester
Frame:	Anodized aluminium (silver)
Junction box:	IP67 rated 4 mm² solar cable, 0.9 m + 1.2 m
Connectors:	Multi-Contact MC4 (4 mm²)
Origin	Made in Singapore

ELECTRICAL DATA @ NOCT	REC240PE	REC245PE	REC250PE	REC255PE	REC260PE	REC265PE
Nominal Power - P_{MPP} (Wp)	183	187	189	193	197	202
Nominal Power Voltage - V_{MPP} (V)	27.7	28.1	28.3	28.5	29.0	29.4
Nominal Power Current - I_{MPP} (A)	6.58	6.64	6.68	6.77	6.81	6.90
Open Circuit Voltage - V_{OC} (V)	34.4	34.7	35.0	35.3	35.7	36.0
Short Circuit Current - I_{SC} (A)	7.03	7.08	7.12	7.21	7.24	7.30

Nominal operating cell temperature NOCT (800 W/m², AM 1.5, windspeed 1 m/s, ambient temperature 20°C).

MAXIMUM RATINGS	
Operational temperature:	-40 ... +85°C
Maximum system voltage:	1000 V
Maximum snow load:	550 kg/m² (5400 Pa)
Maximum wind load:	244 kg/m² (2400 Pa)
Max series fuse rating:	25 A
Max reverse current:	25 A

CERTIFICATIONS

IEC 61215 & IEC 61730, IEC 62716 (ammonia resistance) & IEC 61701 (salt mist - sevarity level 6).

WARRANTY

10 year product warranty
25 year linear power output warranty
(max. degression in performance of 0.7% p.a.)
See warranty conditions for further details.

MECHANICAL DATA	
Dimensions:	1665 x 991 x 38 mm
Area:	1.65 m²
Weight:	18 kg

Note! Specifications subject to change without notice.

This datasheet is EN 50380 compliant
Ref: NE-05-05-01 R2 12.13

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