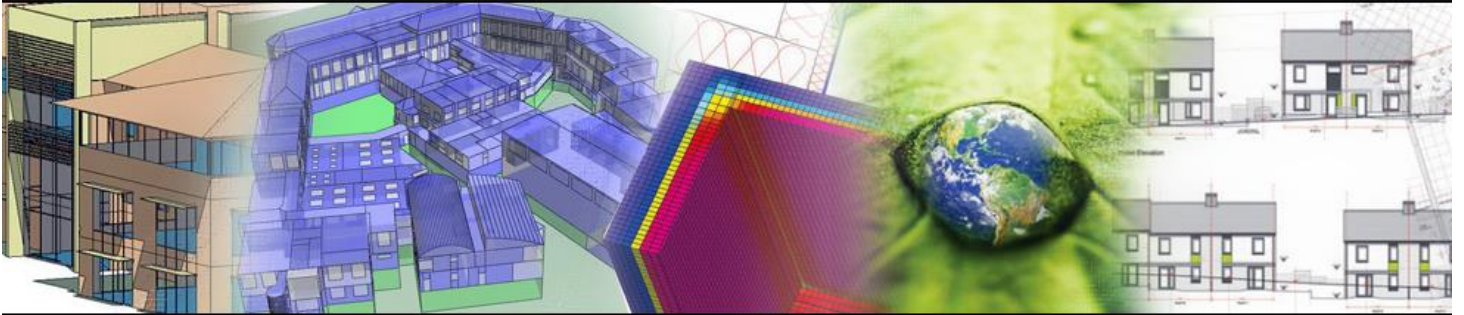




Discharge of planning conditions 15 & 17

Acol Crescent, Ruislip

Stroma Reference: 12-18-71744 S3
Date: 08/05/2019
Prepared for: Bugler Group Ltd

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1. Summary

Discharge of planning conditions 15 & 17

Prepared by

Ben Talbutt BSc (hons)
Senior Sustainability Consultant
Date: 08/05/2019
File reference: 12-18-71744 S3

Version	Status	Date	Change Summary
S1	As Designed	21/02/2019	First Issue
S2	As Designed	12/04/2019	Included offset payment details
S3	As Designed	08/05/2019	Update to PV details and CO2 calculation



Registered office as above. Company reg. no. 4507219

2. Introduction

This report has been prepared for Bugler Group Ltd, by Stroma Built Environment, a construction consultancy specialising in sustainability, energy conservation and the application of renewable energy technologies. It has been prepared to discharge condition 15 & 17 of the planning approval which states:

Condition 15

Prior to the commencement of development, a scheme demonstrating a reduction of 25tCO2 for 30 years shall be submitted and approved in writing by the Local Planning Authority. The scheme should identify a project or projects offsite that aim to achieve a saving of 25tCO2 through energy efficiency improvements and/or low or zero carbon technology. No occupation of this development shall occur until identification of the offsite project has been finalised and agreed in writing with the Local Planning Authority. The offsite project must commence within 1 year of the first occupation of this development unless otherwise agreed in writing by the Local Planning Authority.

REASON

To ensure the development contributes to the reduction in CO2 in accordance with Policy 5.2 of the London Plan (2016)

Condition 17

Prior to the commencement of development full details of the low and zero carbon technology required to achieve the onsite savings from the 'Be Green' measures as set out in the Energy Assessment (Energist, December 2017) shall be submitted and approved in writing by the Local Planning Authority. The details shall include the specifications of the PV panels and include updated roof plans and elevations showing the inclusion of the specified panels. The development must proceed in accordance with the agreed details.

REASON

To ensure the development contributes to the reduction in CO2 in accordance with Policy 5.2 of the London Plan (2016)

3. Condition 15

Condition 15

Prior to the commencement of development, a scheme demonstrating a reduction of 25tCO₂ for 30 years shall be submitted and approved in writing by the Local Planning Authority. The scheme should identify a project or projects offsite that aim to achieve a saving of 25tCO₂ through energy efficiency improvements and/or low or zero carbon technology. No occupation of this development shall occur until identification of the offsite project has been finalised and agreed in writing with the Local Planning Authority. The offsite project must commence within 1 year of the first occupation of this development unless otherwise agreed in writing by the Local Planning Authority.

REASON

To ensure the development contributes to the reduction in CO₂ in accordance with Policy 5.2 of the London Plan (2016)

A number of changes have been made to the specification since the original Energy Strategy by Energist. These are as follows:

- Ground floor U-value goes from 0.13 W/m²k to 0.22 W/m²k
- External wall U-values go from 0.18 W/m²k to 0.20 W/m²k
- Roof U-value go from 0.13 W/m²k to 0.11 W/m²k
- Window U-values go from 1.4 W/m²k to 0.8 W/m²k
- Air permeability goes from 5 m³/hm² to 4 m³/hm²
- Main gas boiler changed to ATAG A325EC
- Natural ventilation changed to MVHR from Nuaire MRXBOXAB-ECO2
- Enhanced thermal bridging details instead of Appendix R values

The majority of these changes are improvements on the original values and areas where the specification has worsened have been offset through improved services and fabric proposals elsewhere. The result of these changes on the carbon dioxide emissions are outlined in Table 1 below.

Table 1: CO₂ emissions after each stage of the Energy Hierarchy for Domestic Buildings

Carbon dioxide emissions for domestic buildings (t.CO₂ per annum)	
	Regulated
Baseline: Part L 2013	42.41
After Energy Demand reduction	31.75
After heat network / CHP	31.75
After Renewable Energy	23.68

The improved specification leaves only 23.68 t.CO₂ per annum to offset. Table 2 includes an updated offset calculation to satisfy Condition 17. It is based on offset payments of £60 per tonne of CO₂ for 30 years and is to be made to the local authority's carbon offset scheme.

Table 2: Site wide regulated CO₂ emissions to offset

	CO₂ savings	
	t.CO₂ per annum	t.CO₂ over 30 years
Carbon emissions to offset	23.68	710.4
	£ per annum	or £ lump sum
Carbon offset payment	£1,420.80	£42,624

4. Condition 17

Condition 17

Prior to the commencement of development full details of the low and zero carbon technology required to achieve the onsite savings from the 'Be Green' measures as set out in the Energy Assessment (Energist, December 2017) shall be submitted and approved in writing by the Local Planning Authority. The details shall include the specifications of the PV panels and include updated roof plans and elevations showing the inclusion of the specified panels. The development must proceed in accordance with the agreed details.

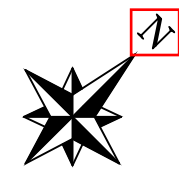
REASON

To ensure the development contributes to the reduction in CO2 in accordance with Policy 5.2 of the London Plan (2016)

The latest version of the energy strategy by Energist (dated 16th January 2018) details a change to the original wall u-value and Photovoltaic (PV) area.0

It is now proposed that a total of 20.44 kWp (Increased from 20.1kWp) of PV will be installed facing South East at a 10° tilt which will be connected to the Landlord's supply. Appendix A. includes the proposed roof plan and PV layout.

Appendix A. Indicative Photovoltaic Layout and Details



KEY

280W SOLAR PANEL

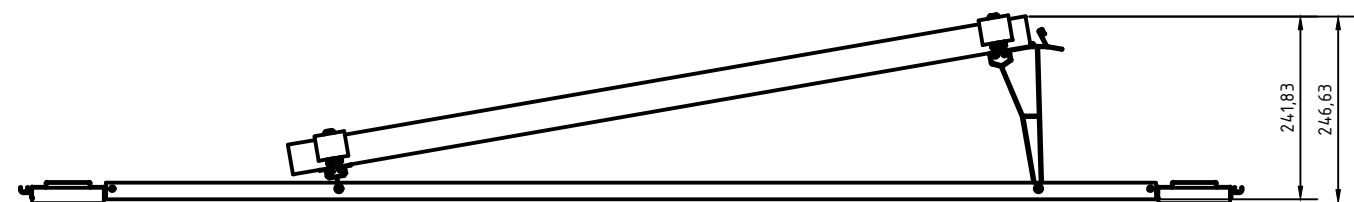
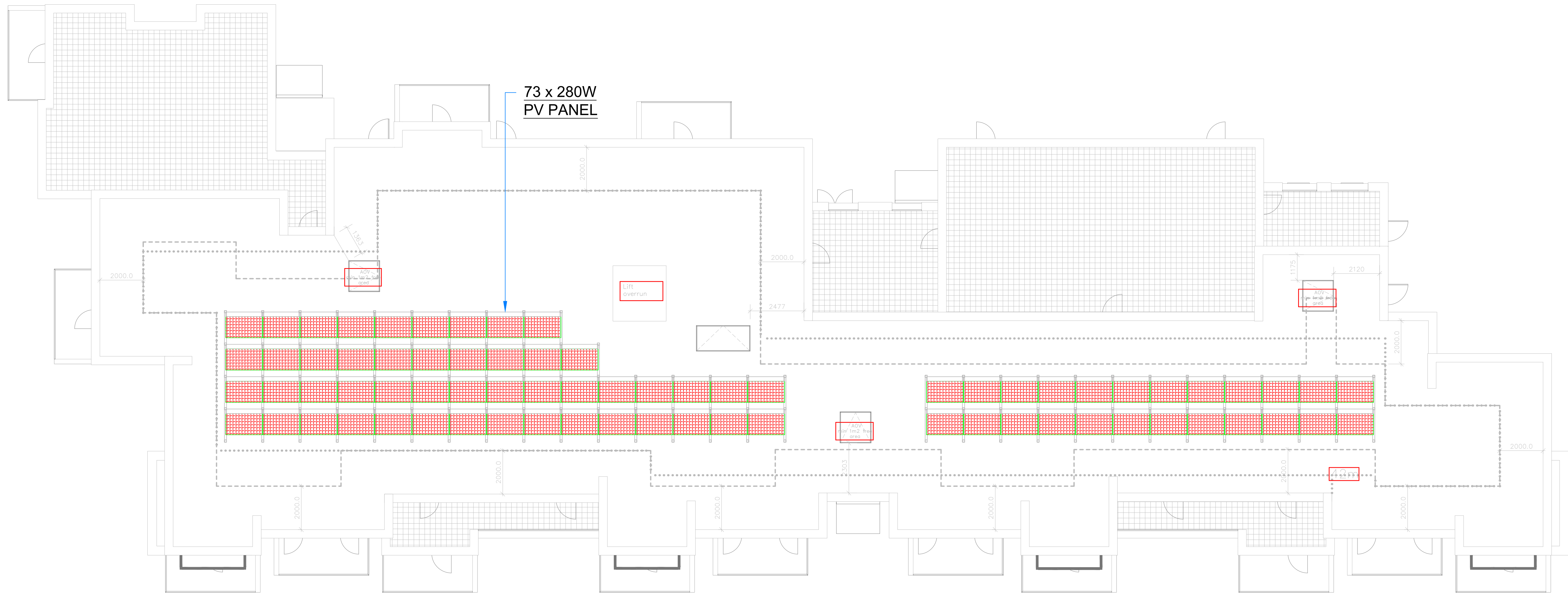
50mm MEDIUM GAUGE GALVANISED ALUMINUM PERFORATED TRAY

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

NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTS AND SPECIFICATIONS.
- INFORMATION AND SETTING OUT ON THIS DRAWING IS BASED LARGELY ON INFORMATION TAKEN FROM CAD DRAWINGS PREPARED BY OTHERS AND GIVEN IN GOOD FAITH. NO RESPONSIBILITY CAN BE ACCEPTED FOR ERRORS RESULTING FROM INACCURACIES IN THESE ORIGINAL DRAWINGS.
- LAYOUT SUBJECT TO CHANGE DEPENDANT ON SITE CONDITIONS.



TYPICAL SECTION OF PV PANEL (1:10)

P	30/04/19	PRELIMINARY ISSUE	JS
Rev	Date	Description	Drawn
Issue status			

PRELIMINARY

Project	ACOL CRESCENT
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Title	SOLAR PV ROOF LAYOUT
-------	----------------------

Scale	Designed By	Checked by	Date
1:100@A1	JS	DW	OCT'17

envirolec
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ACT	PV	001	P
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Project Overview

PV System

Grid-connected PV System

Climate Data	NORTHOLT RAF, GBR (2000 - 2009)
PV Generator Output	20.44 kWp
PV Generator Surface	119.4 m ²
Number of PV Modules	73
Number of Inverters	1

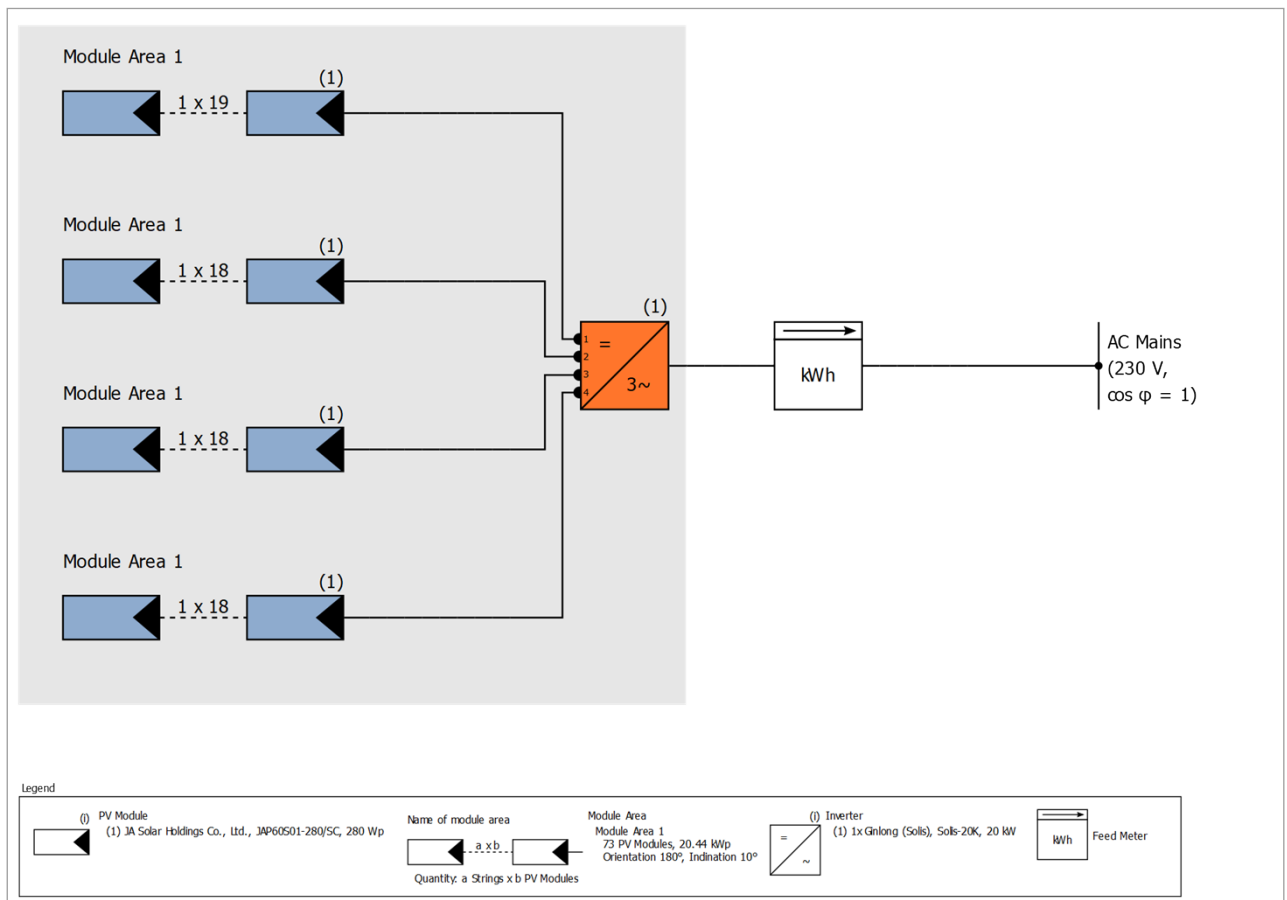


Figure: Schematic diagram

The yield

The yield

PV Generator Energy (AC grid)	18,309 kWh
Grid Feed-in	18,309 kWh
Down-regulation at Feed-in Point	0 kWh
Own Power Consumption	0.0 %
Solar Fraction	0.0 %
Spec. Annual Yield	895.72 kWh/kWp
Performance Ratio (PR)	87.9 %
CO ₂ Emissions avoided	10,985 kg / year



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



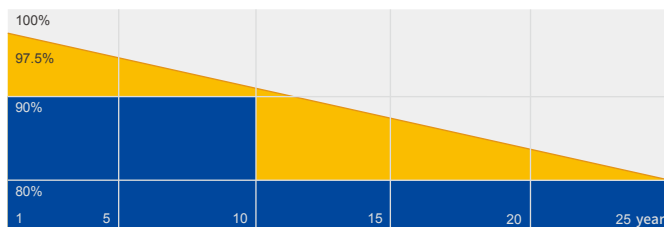
Anti-PID



Highly reliable due to strict quality control

Superior Warranty

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



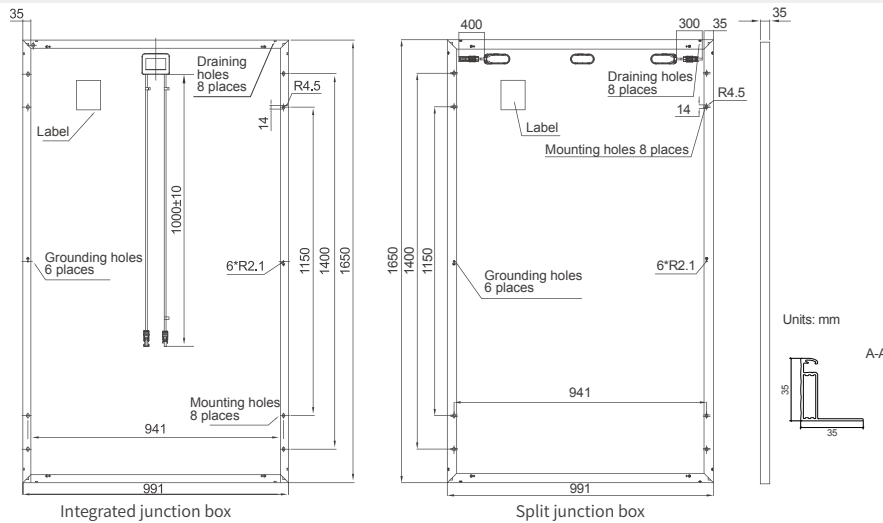
■ JA Linear Power Warranty ■ Industry Warranty

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%/°C				
Temperature Coefficient of V _{oc} (β _{Voc})	-0.330%/°C				
Temperature Coefficient of P _{max} (γ _{Pmp})	-0.400%/°C				
STC	Irradiance 1000W/m ² , cell temperature 25°C, AM1.5G				

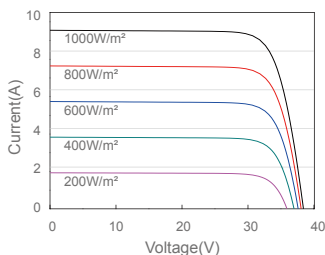
Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

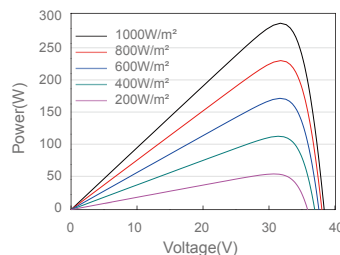
TYPE	JAP60S01 -260/SC	JAP60S01 -265/SC	JAP60S01 -270/SC	JAP60S01 -275/SC	JAP60S01 -280/SC	OPERATING CONDITIONS	
Rated Max Power(P _{max}) [W]	192	196	200	204	207	Maximum System Voltage	1000V/1500V DC(IEC)
Open Circuit Voltage(V _{oc}) [V]	35.70	35.94	36.25	36.56	36.85	Operating Temperature	-40°C~+85°C
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°C, wind speed 1m/s, AM1.5G					NOCT	45±2°C
						Application Class	Class A

CHARACTERISTICS

Current-Voltage Curve JAP60S01-270/SC



Power-Voltage Curve JAP60S01-270/SC



Current-Voltage Curve JAP60S01-270/SC

