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Project Name: Plastona

28/1/2022

Your PV system from RENI DS

Address of Installation

Project Description:
net metering

Project Overview

Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System

Climate Data	Athinai, GRC (1991 - 2010)	
Values source	Meteonorm 7.3	
PV Generator Output	992,52	kWp
PV Generator Surface	4.698,0	m²
Number of PV Modules	1838	
Number of Inverters	~~9~~	

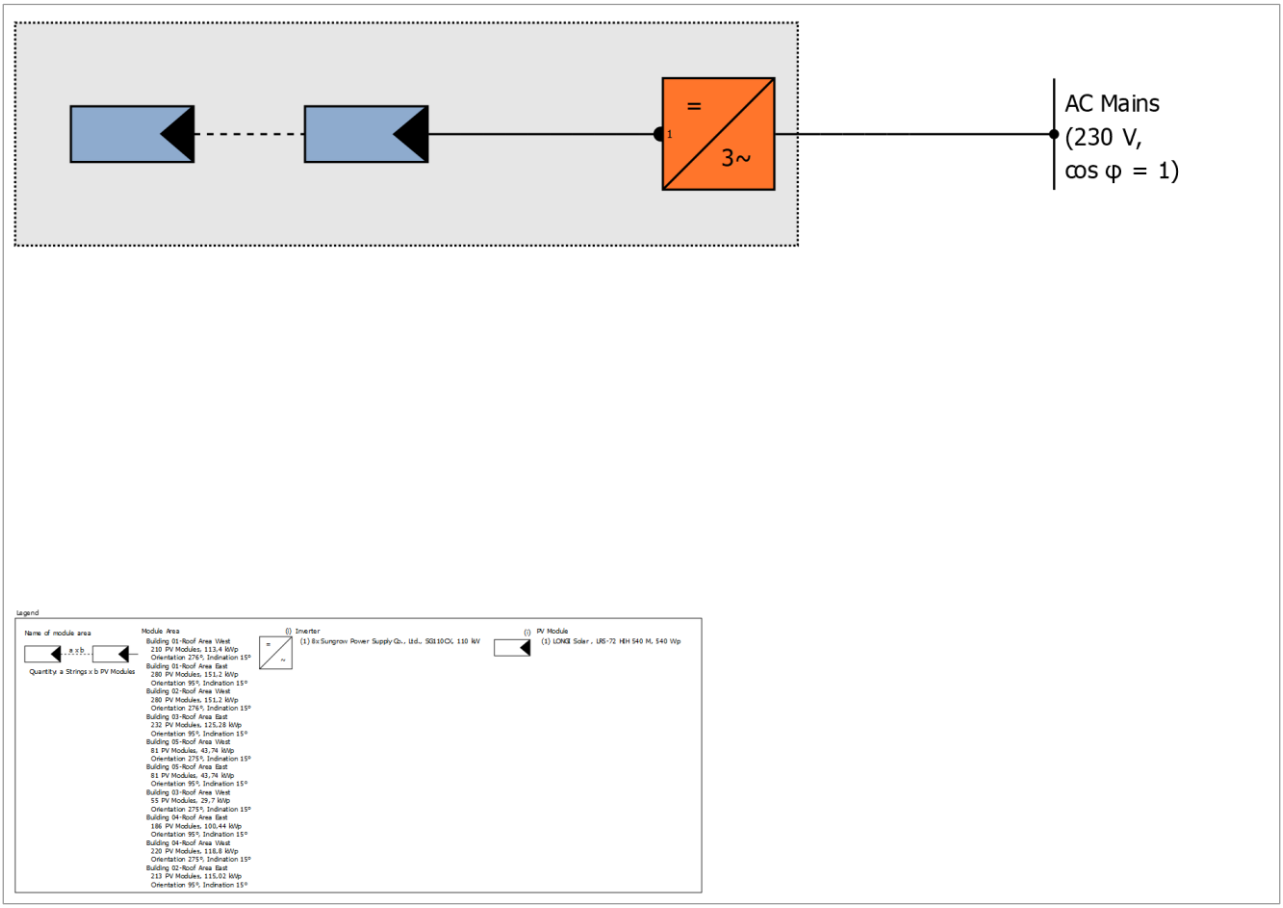

Figure: Schematic diagram

Production Forecast

Production Forecast		
PV Generator Output	992,52	kWp
Spec. Annual Yield	1.450,66	kWh/kWp
Performance Ratio (PR)	88,87	%
Yield Reduction due to Shading	0,9	%/Year
Grid Feed-in	1.439.878	kWh/Year
Grid Feed-in in the first year (incl. module degradation)	1.439.878	kWh/Year
Standby Consumption (Inverter)	66	kWh/Year
CO_2 Emissions avoided	676.712	kg / year

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

Set-up of the System

Overview

System Data

Type of System	3D, Grid-connected PV System

Climate Data

Location	Athinai, GRC (1991 - 2010)
Values source	Meteonorm 7.3
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Module Areas

1. Module Area - Building 01-Roof Area West

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

Name	Building 01-Roof Area West
PV Modules	210 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	West 276 °
Installation Type	Roof parallel
PV Generator Surface	536,8 m²

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

2. Module Area - Building 01-Roof Area East

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

Name	Building 01-Roof Area East
PV Modules	280 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	East 95 °
Installation Type	Roof parallel
PV Generator Surface	715,7 m²

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

3. Module Area - Building 02-Roof Area West

PV Generator, 3. Module Area - Building 02-Roof Area West

Name	Building 02-Roof Area West
PV Modules	280 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	West 276 °
Installation Type	Roof parallel
PV Generator Surface	715,7 m²

Figure: 3. Module Area - Building 02-Roof Area West

4. Module Area - Building 03-Roof Area East

PV Generator, 4. Module Area - Building 03-Roof Area East

Name	Building 03-Roof Area East
PV Modules	232 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	East 95 °
Installation Type	Roof parallel
PV Generator Surface	593,0 m²

Figure: 4. Module Area - Building 03-Roof Area East

5. Module Area - Building 05-Roof Area West

PV Generator, 5. Module Area - Building 05-Roof Area West

Name	Building 05-Roof Area West
PV Modules	81 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	West 275 °
Installation Type	Roof parallel
PV Generator Surface	207,0 m²

Figure: 5. Module Area - Building 05-Roof Area West

6. Module Area - Building 05-Roof Area East

PV Generator, 6. Module Area - Building 05-Roof Area East

Name	Building 05-Roof Area East
PV Modules	81 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	East 95 °
Installation Type	Roof parallel
PV Generator Surface	207,0 m²

Figure: 6. Module Area - Building 05-Roof Area East

7. Module Area - Building 03-Roof Area West

PV Generator, 7. Module Area - Building 03-Roof Area West

Name	Building 03-Roof Area West
PV Modules	55 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	West 275 °
Installation Type	Roof parallel
PV Generator Surface	140,6 m²

Figure: 7. Module Area - Building 03-Roof Area West

8. Module Area - Building 04-Roof Area East

PV Generator, 8. Module Area - Building 04-Roof Area East

Name	Building 04-Roof Area East
PV Modules	186 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	East 95 °
Installation Type	Roof parallel
PV Generator Surface	475,4 m²

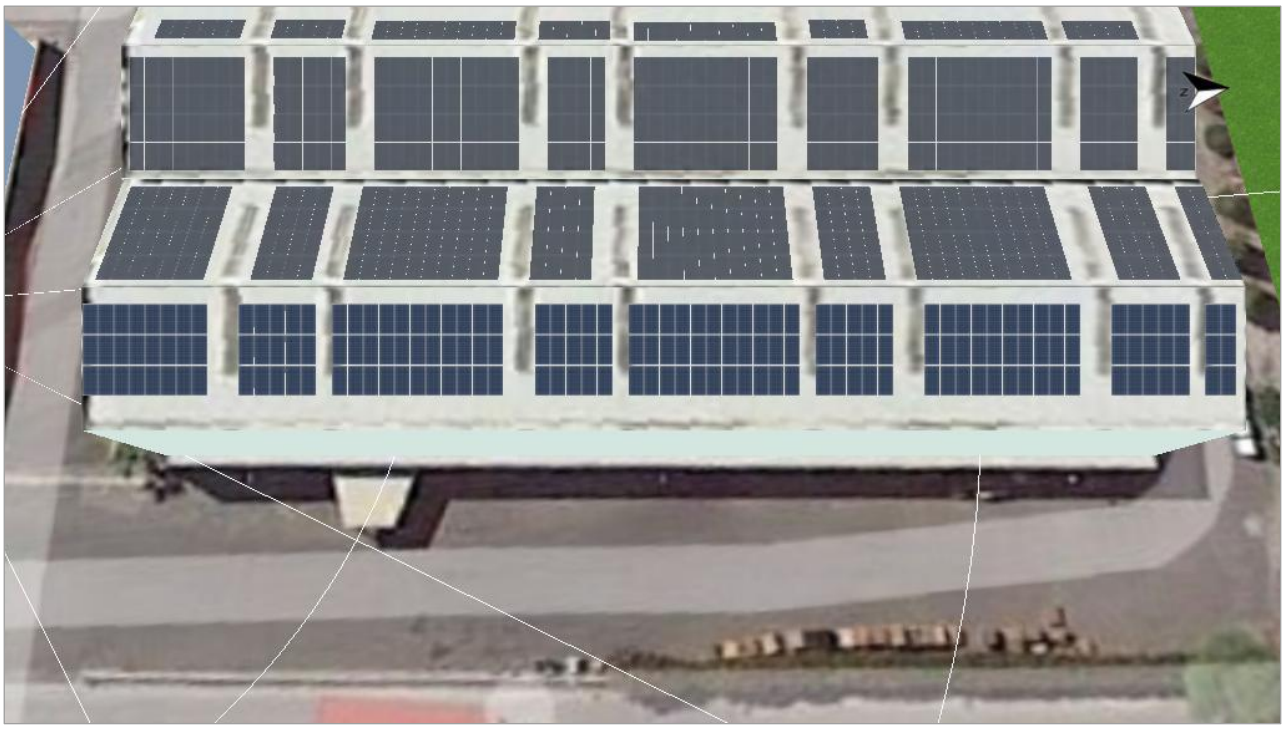

Figure: 8. Module Area - Building 04-Roof Area East

9. Module Area - Building 04-Roof Area West

PV Generator, 9. Module Area - Building 04-Roof Area West

Name	Building 04-Roof Area West
PV Modules	220 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	West 275 °
Installation Type	Roof parallel
PV Generator Surface	562,3 m²

Figure: 9. Module Area - Building 04-Roof Area West

10. Module Area - Building 02-Roof Area East

PV Generator, 10. Module Area - Building 02-Roof Area East

Name	Building 02-Roof Area East
PV Modules	213 x LR5-72 HIH 540 M (v2)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	East 95 °
Installation Type	Roof parallel
PV Generator Surface	544,4 m²

Figure: 10. Module Area - Building 02-Roof Area East

Horizon Line, 3D Design

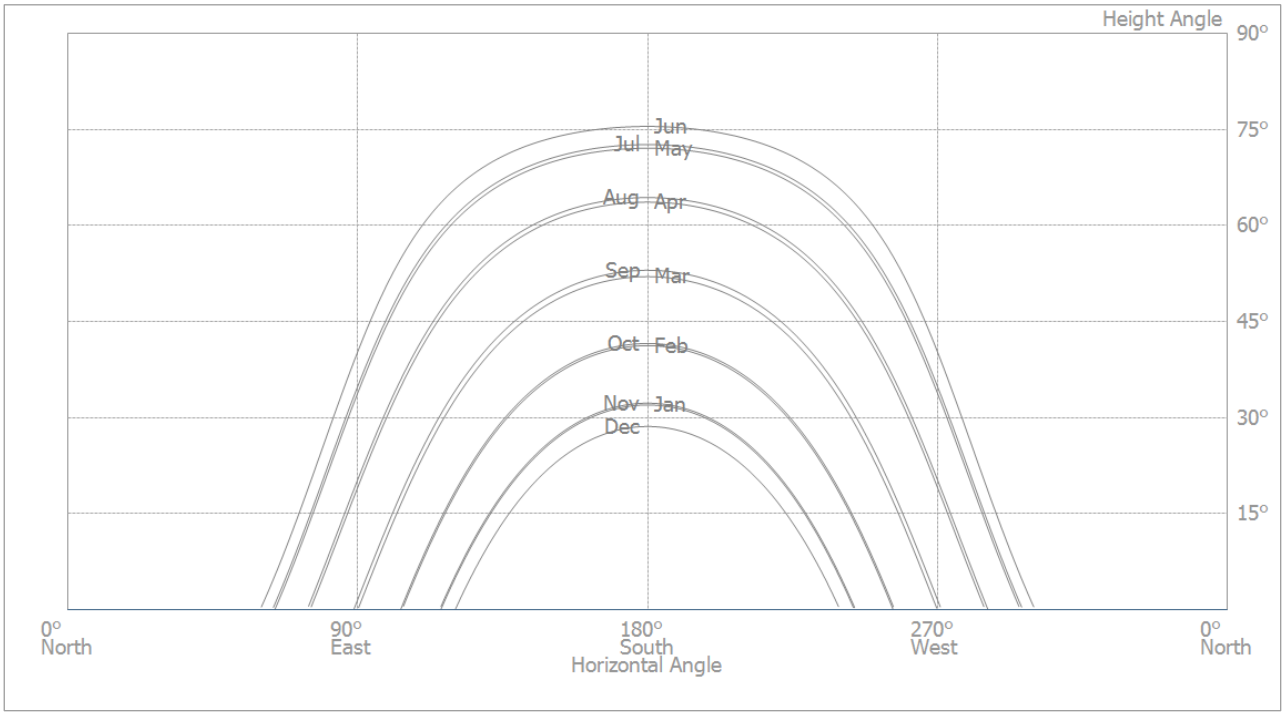

Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Area	Building 01-Roof Area West
Inverter 1	
Model	SG110CX (v2)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	103,1 %
Configuration	MPP 1: 2 x 14
	MPP 2: 2 x 14
	MPP 3: 2 x 14
	MPP 4: 2 x 14
	MPP 5: 2 x 14
	MPP 6: 2 x 11
	MPP 7: 2 x 10
	MPP 8: 1 x 14
	MPP 9: 1 x 14

Configuration 2

Module Area	Building 01-Roof Area East
Inverter 1	
Model	SG110CX (v2)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	137,5 %
Configuration	MPP 1: 2 x 19
	MPP 2: 2 x 16
	MPP 3: 2 x 15
	MPP 4: 2 x 15
	MPP 5: 2 x 15
	MPP 6: 2 x 15
	MPP 7: 2 x 15
	MPP 8: 2 x 15
	MPP 9: 2 x 15

Configuration 3

Module Area	Building 02-Roof Area West
Inverter 1	
Model	SG110CX (v2)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	137,5 %
Configuration	MPP 1: 2 x 19
	MPP 2: 2 x 16
	MPP 3: 2 x 15
	MPP 4: 2 x 15
	MPP 5: 2 x 15
	MPP 6: 2 x 15
	MPP 7: 2 x 15
	MPP 8: 2 x 15
	MPP 9: 2 x 15

Configuration 4

Module Area	Building 03-Roof Area East
Inverter 1	
Model	SG110CX (v2)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	113,9 %
Configuration	MPP 1: 2 x 14
	MPP 2: 2 x 14
	MPP 3: 2 x 14
	MPP 4: 2 x 14
	MPP 5: 2 x 14
	MPP 6: 2 x 14
	MPP 7: 2 x 13
	MPP 8: 2 x 12
	MPP 9: 1 x 14

Configuration 5

Module Areas	Building 05-Roof Area West + Building 05-Roof Area East + Building 03-Roof Area West
Inverter 1	
Model	SG110CX (v2)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	106,5 %
Configuration	MPP 1: 2 x 17
	MPP 2: 2 x 17
	MPP 3: 2 x 14
	MPP 4: 2 x 14
	MPP 5: 2 x 12
	MPP 6: 1 x 19
	MPP 7: 1 x 19
	MPP 8: 1 x 17
	MPP 9: 1 x 14

Configuration 6

Module Area	Building 04-Roof Area East
Inverter 1	
Model	SG110CX (v2)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	91,3 %
Configuration	MPP 1: 2 x 14
	MPP 2: 2 x 14
	MPP 3: 2 x 14
	MPP 4: 2 x 13
	MPP 5: 2 x 10
	MPP 6: 1 x 14
	MPP 7: 1 x 14
	MPP 8: 1 x 14
	MPP 9: 1 x 14

Configuration 7

Module Area	Building 04-Roof Area West
Inverter 1	
Model	SG110CX (v2)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	108 %
Configuration	MPP 1: 2 x 14
	MPP 2: 2 x 14
	MPP 3: 2 x 14
	MPP 4: 2 x 14
	MPP 5: 2 x 14
	MPP 6: 2 x 14
	MPP 7: 2 x 13
	MPP 8: 2 x 13
	MPP 9: not allocated

Configuration 8	
Module Area	Building 02-Roof Area East
Inverter 1	
Model	SG110CX (v2)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	104,6 %
Configuration	MPP 1: 2 x 14
	MPP 2: 2 x 14
	MPP 3: 2 x 14
	MPP 4: 2 x 14
	MPP 5: 2 x 14
	MPP 6: 2 x 14
	MPP 7: 2 x 13
	MPP 8: 1 x 19
	MPP 9: not allocated

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	992,52	kWp
Spec. Annual Yield	1.450,66	kWh/kWp
Performance Ratio (PR)	88,87	%
Yield Reduction due to Shading	0,9	%/Year
Grid Feed-in	1.439.878	kWh/Year
Grid Feed-in in the first year (incl. module degradation)	1.439.878	kWh/Year
Standby Consumption (Inverter)	66	kWh/Year
CO_2 Emissions avoided	676.712	kg / year

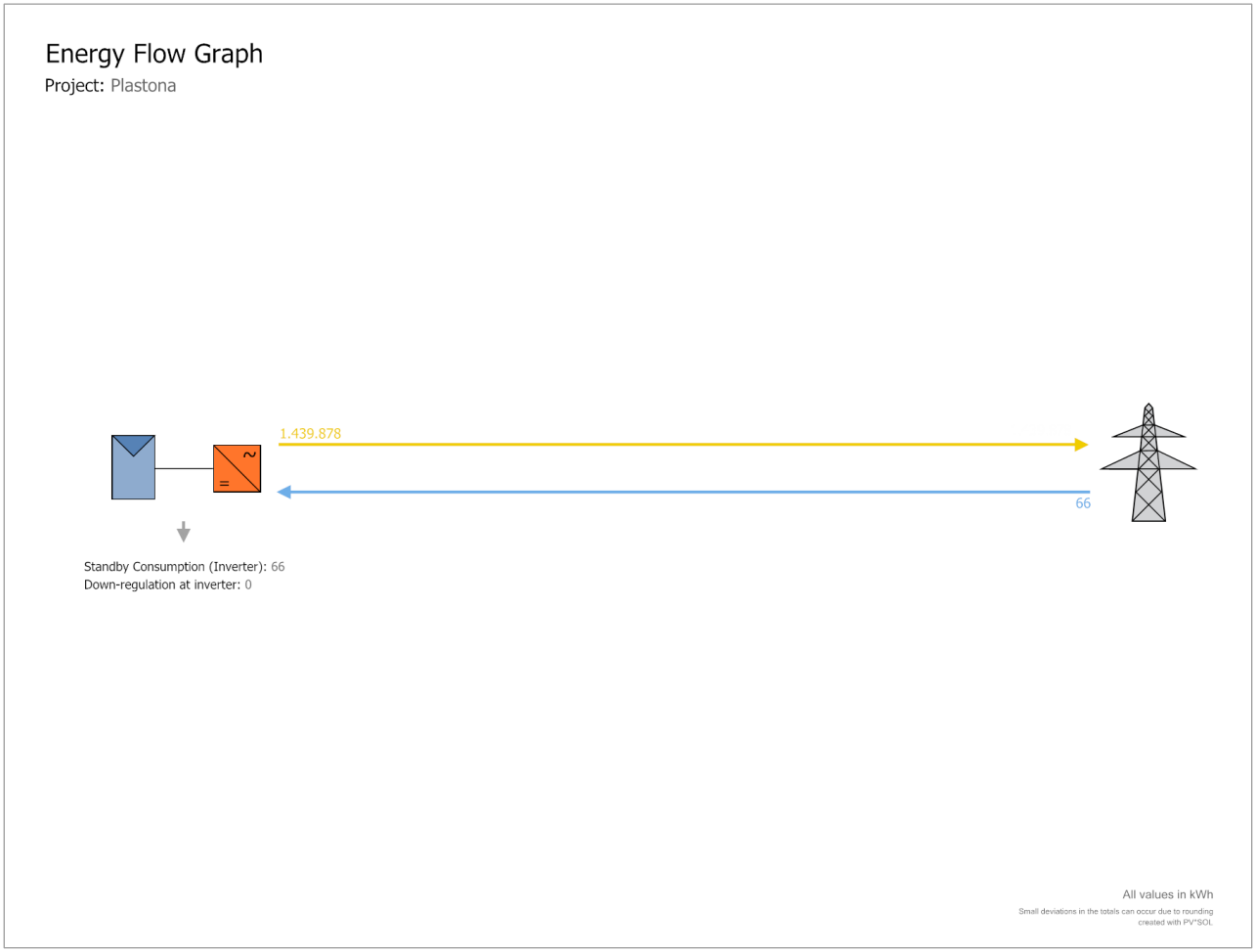

Figure: Energy flow

Data Sheets

PV Module Data Sheet

PV Module: LR5-72 HIH 540 M (v2)

Manufacturer	LONGI Solar	
Available	Yes	
Electrical Data		
Cell Type	Si monocrystalline	
Half-cell module	Yes	
Cell Count	72	
Number of Bypass Diodes	3	
Loss voltage per bypass diode	1	V
Integrated power optimizer	No	
Only Transformer Inverters suitable	No	
I/V Characteristics at STC		
MPP Voltage	41,65	V
MPP Current	12,97	A
Open Circuit Voltage	49,5	V
Short-Circuit Current	13,85	A
Increase open circuit voltage before stabilisation	0	%
Nominal output	540	W
Fill Factor	78,8	%
Efficiency	21,13	%
I/V Part Load Characteristics		
Values source	Manufacturer/user-created	
Irradiance	200	W/m²
Voltage in MPP at Part Load	39,968	V
Current in MPP at Part Load	2,64	A
Open Circuit Voltage (Part Load)	46,391	V
Short Circuit Current at Part Load	2,87	A
Additional Parameters		
Temperature Coefficient of Voc	-131,2	mV/K
Temperature Coefficient of Isc	6,9	mA/K
Temperature Coefficient of Pmpp	-0,34	%/K
Incident Angle Modifier (IAM)	100	%
Maximum System Voltage	1500	V
Mechanical Data		
Width	1133	mm
Height	2256	mm
Depth	35	mm
Frame Width	11	mm
Weight	27,2	kg

Inverter Data Sheet

Inverter: SG110CX (v2)

Manufacturer	Sungrow Power Supply Co., Ltd.	
Available	Yes	
Electrical data - DC		
DC nominal output	110	kW
Max. DC Power	165	kW
Nom. DC Voltage	585	V
Max. Input Voltage	1100	V
Max. Input Current	234	A
Number of DC Inlets	18	
Electrical data - AC		
AC Power Rating	110	kW
Max. AC Power	110	kVA
Number of Phases	3	
With Transformer	No	
Electrical data - other		
Change in Efficiency when Input Voltage deviates from Rated Voltage	0,02	%/100V
Min. Feed-in Power	2	W
Standby Consumption	2	W
Night Consumption	2	W
MPP Tracker		
Output Range < 20% of Power Rating	99,9	%
Output Range > 20% of Power Rating	100	%
Count of MPP Trackers	9	
MPP Tracker 1-9		
Max. Input Current	26	A
Max. Input Power	22,1	kW
Min. MPP Voltage	200	V
Max. MPP Voltage	1000	V