



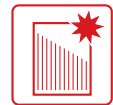
SOLIBRO SL2-F CIGS THIN-FILM MODULE

Generation 2.0 | 115-135 Wp



Higher yield

- Positive sorting (+5 W)
- Light-soaking effect
- Low temperature coefficient: $-0.37\%/K$



Outstanding aesthetics

- Uniform black surface
- Ideal for visually sophisticated PV solutions



Laminate with frame

- Easy to install and specially stable, particularly on smaller rooftop installations



Quality controlled

- 100% inspected via electroluminescence test
- Longer, stricter tests than required under IEC 61646



Tests and certification

- Certification: ISO 9001:2008, ISO 14001:2009, BS OHSAS 18001:2007, IEC 61646/61730, MCS, UL 1703 (CSA), Golden Sun

10-year product warranty

25-year performance warranty

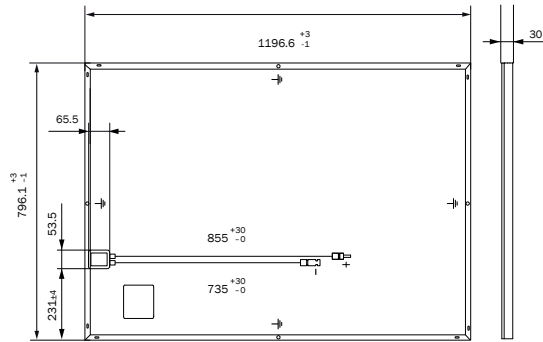
About Solibro GmbH

Solibro GmbH is one of the world's leading manufacturers of CIGS thin-film modules, with a production capacity of 145 MW. Solibro has been part of the Hanergy Group since September 2012. Solibro has headquarters in Thalheim, Germany and a research site in Uppsala, Sweden, both of which work to develop trailblazing solutions for the company's CIGS products. Solibro supplies products that are sustainable and cost-effective, with extraordinary aesthetics and top quality "Made in Germany".

MECHANICAL SPECIFICATIONS

Length	1196.6 (+3/-1) mm
Width	796.1 (+3/-1) mm
Height	30 mm
Weight	18.0 kg
Front cover	4 mm tempered low iron glass with AR coating
Back cover	3 mm float glass
Frame	Aluminum frame, black
Cell type	CIGS [Cu (In, Ga) Se ₂]
Junction box	Protection class IP 65, with 1 bypass diode; 66 mm x 54 mm x 14.5 mm
Cable type	Solar cable 2.5 mm ² ; (+) 855 (+30/-0) mm; (-) 735 (+30/-0) mm
Connector	MC4

TECHNICAL DRAWING



All values in mm.

ELECTRICAL CHARACTERISTICS

PERFORMANCE AT STANDARD TEST CONDITIONS (1000 W/m², 25 °C, AM 1.5 G SPECTRUM)¹

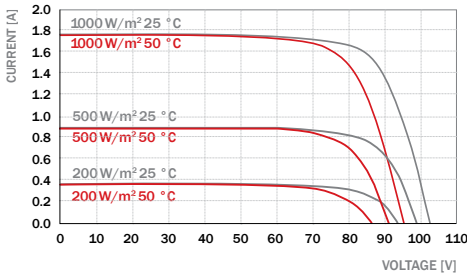
POWER CLASS (+5/-0 W)		[W]	115	120	125	130	135
Minimum Power	P _{MPP}	[W]	115.0	120.0	125.0	130.0	135.0
Short Circuit Current	I _{SC}	[A]	1.73	1.74	1.75	1.76	1.77
Open Circuit Voltage	V _{OC}	[V]	97.3	98.7	100.2	101.6	102.6
Current at P _{MPP}	I _{MPP}	[A]	1.49	1.53	1.56	1.59	1.63
Voltage at P _{MPP}	V _{MPP}	[V]	77.2	78.4	80.1	81.8	82.8
Module efficiency		[%]	≥ 12.1	≥ 12.6	≥ 13.1	≥ 13.6	≥ 14.2

PERFORMANCE AT NORMAL OPERATING CELL TEMPERATURE (800 W/m², NOCT, AM 1.5 G SPECTRUM)¹

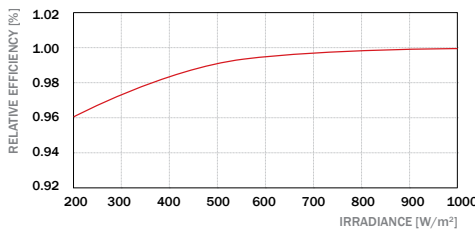
POWER CLASS (+5/-0 W)		[W]	115	120	125	130	135
Minimum Power	P _{MPP}	[W]	82.8	86.3	89.7	93.1	97.5
Short Circuit Current	I _{SC}	[A]	1.39	1.40	1.40	1.41	1.42
Open Circuit Voltage	V _{OC}	[V]	88.8	90.3	91.7	93.0	94.0
Current at P _{MPP}	I _{MPP}	[A]	1.19	1.22	1.24	1.26	1.30
Voltage at P _{MPP}	V _{MPP}	[V]	69.6	70.7	72.3	73.9	75.0

¹ Measurement accuracy P_{MPP}: ± 5%; measurement accuracy I_{SC}, V_{OC}, I_{MPP}, V_{MPP}: ± 10%. All STC measurements are based on a pre-treatment of modules with 43 kWh/m² of light soaking (43 hours at 1000 W/m² and MPP) followed by a cool down to 25 °C. Please consider that the voltage of our CIGS modules can increase slightly after an initial period of exposure to sunlight. Take a safety factor of +2.5% for V_{OC} and V_{MPP} into account when designing the system.

I-V CURVES AT VARIOUS TEMPERATURES AND IRRADIANCE LEVELS



PERFORMANCE AT LOW IRRADIANCE



The typical relative change in module efficiency (with respect to nominal power) at an irradiance of 200 W/m² in relation to 1000 W/m² (both at 25 °C and AM 1.5 G spectrum) is -4.0 % rel.

TEMPERATURE COEFFICIENTS AT STC

P_{MPP} γ [%/K] -0.37 ± 0.04 I_{SC} α [%/K] +0.01 ± 0.02 V_{OC} β [%/K] -0.29 ± 0.04

NOCT

Nominal Operating Cell Temperature [°C] 51 ± 2

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V _{sys}	[V]	1000 (IEC) / 600 (UL 1703)	Safety Class	II
Maximum Reverse Current I _r	[A]	4	Fire Rating	C
Snow Load (Acc. to IEC 61646)	[Pa]	5400	Permitted operating module temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Wind Load (Acc. to IEC 61646)	[Pa]	2400		

PACKAGING INFORMATION

Measurements including pallet	L 1,313 mm × W 1,131 mm × H 996 mm
Approx. gross weight (full box)	585 kg
Maximum no. of stacked boxes for storage	2 on 1 (batch of 3)
Modules per box	30
Max. lorry loading (24 Tons)	40, maximum allowed volume (2 × 10 + 2 × 10)
Max. 40-foot container load (24 Tons)	34, maximum allowed volume (2 × 9 + 2 × 8)

QUALIFICATIONS AND CERTIFICATES

IEC 61646 (Ed. 2),
IEC 61730 (Ed.1) application class A, UL 1703 (CSA)

The production site is certified according to ISO 9001 for Quality Management.



MCS PV 0151
Photovoltaic System

MADE IN GERMANY

The content of this data sheet is according to DIN EN 50380.

NOTE!

See the Installation and Operating Manual or contact the technical service for further information on approved installation and use of this product.

SOLIBRO GMBH

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