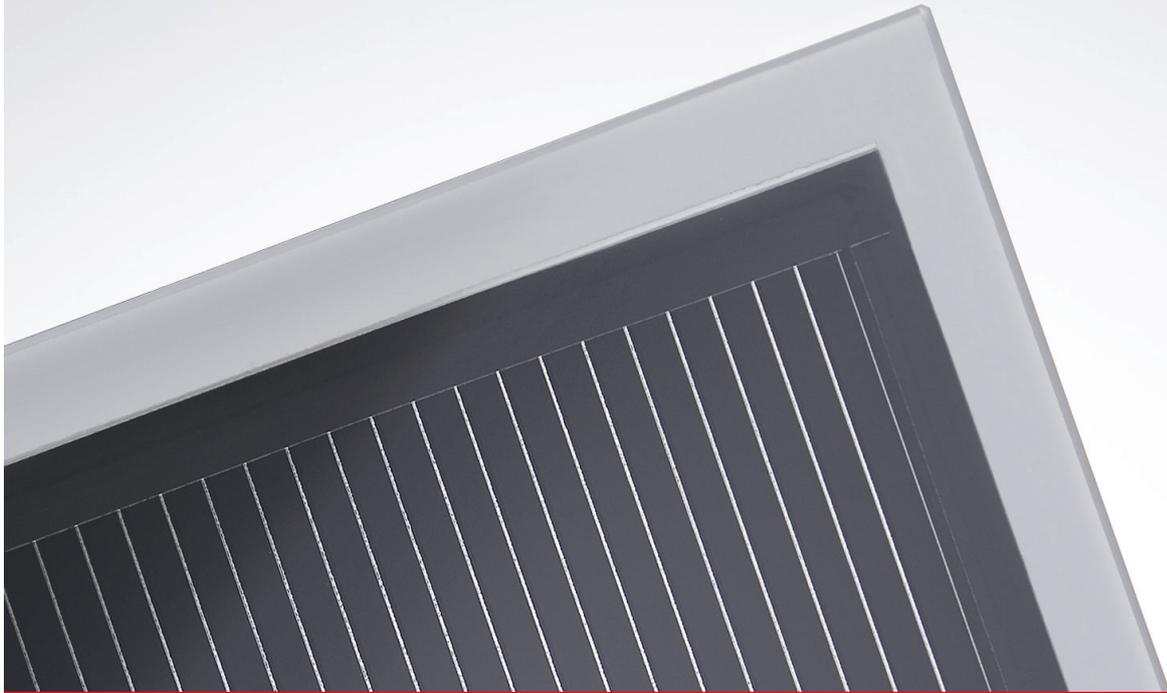


# SOLIBRO SL2 CIGS THIN-FILM MODULE

Generation 1.5 - Efficiency and aesthetics have a new name



Solibro's SL2 thin-film modules offer efficiencies up to 13.3 % in serial production. The modules are especially suited for roof-parallel installations on flat rooftops. This allows minimal shadowing with maximal energy yield. Due to their frameless design, SL2 modules possess excellent self-cleaning properties and require minimal maintenance. All SL2 modules are "Made in Germany" and are tested according to very high standards in order to insure a long lifetime and stable module performance.



## YOUR ADVANTAGES

**More Yield:** Solibro thin-film modules generate a significantly higher energy-yield than competitor modules of same nominal power. You profit from our strict positive-sorting policy and the CIGS light-soaking effect, which further increases the module performance after an initial period of exposure to sunlight.

**Our modules deliver top performance even at very high temperatures:** With a temperature coefficient of  $-0.38\% / K$ , the Solibro CIGS modules are a long way ahead of their crystalline competitors, producing high yields even under critical climatic conditions.

**Excellent usage of sunlight:** Our modules allow PV installations regardless of whether the roof faces to the south, east or west. SL2 modules generate high energy yields even when installed parallel to the roof.

**Aesthetic appearance:** The uniformly black SL2 solar modules are ideal for architecturally demanding photovoltaic installations.

**Controlled quality:** Solibro's SL2 modules are certified according to IEC 61646, IEC 61730 and UL 1703. A multitude of additional quality checks ensure that each single module fulfills the same high standards guaranteeing your long-term energy yields.

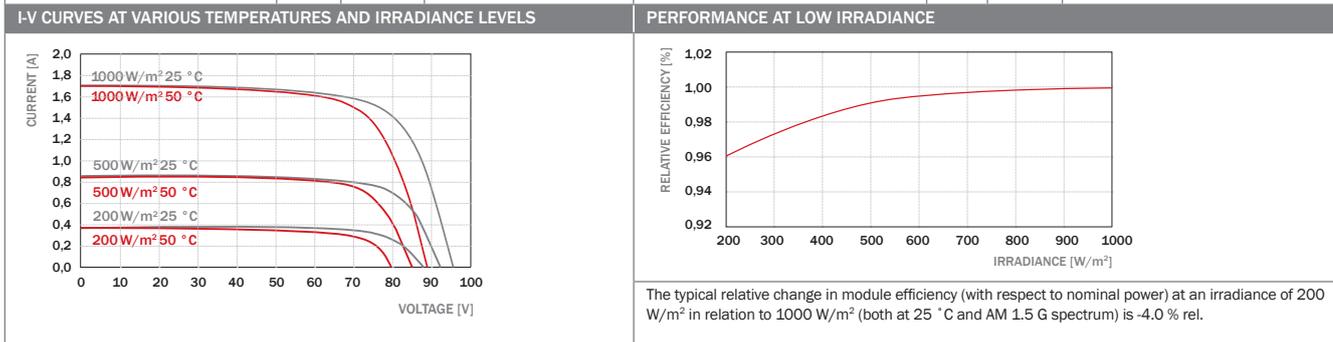
MECHANICAL SPECIFICATION		TECHNICAL DRAWING
Length	1190 (+3/-1) mm	
Width	789.5 (+3/-1) mm	
Height	7.3 mm (+ Junction box, 15 mm)	
Weight	16.5 kg	
Front cover	4 mm tempered low iron glass (ESG)	
Back cover	3 mm float glass	
Frame	None	
Cell type	CIGS [Cu(In, Ga) Se <sub>2</sub> ]	
Junction box	Protection class IP 65, with 1 bypass diode (3A) 66 x 54 x 15 mm <sup>3</sup>	
Cable type	Solar cable 2.5 mm <sup>2</sup> ; (+) 855 (+30/-0) mm; (-) 735 (+30/-0) mm	
Connector	MC4	

## ELECTRICAL CHARACTERISTICS

PERFORMANCE AT STANDARD TEST CONDITIONS (STC: 1000 W/m <sup>2</sup> , 25 °C, AM 1.5 G SPECTRUM) <sup>1</sup>							
POWER CLASS (+5/-0 W)		[W]	100	105	110	115	120
Minimum Power	P <sub>MPP</sub>	[W]	100.0	105.0	110.0	115.0	120.0
Short Circuit Current	I <sub>SC</sub>	[A]	1.68	1.68	1.69	1.69	1.69
Open Circuit Voltage	V <sub>OC</sub>	[V]	90.1	91.6	93.3	95.1	97.6
Current at P <sub>MPP</sub>	I <sub>MPP</sub>	[A]	1.46	1.49	1.52	1.54	1.56
Voltage at P <sub>MPP</sub>	V <sub>MPP</sub>	[V]	68.5	70.5	72.4	74.7	76.9
Nominal efficiency	η	[%]	≥ 10.6	≥ 11.2	≥ 11.7	≥ 12.2	≥ 12.8
PERFORMANCE AT NORMAL OPERATING CELL TEMPERATURE (NOCT: 800 W/m <sup>2</sup> , 51 ± 2 °C, AM 1.5 G SPECTRUM) <sup>1</sup>							
POWER CLASS (+5/-0 W)		[W]	100	105	110	115	120
Minimum Power	P <sub>MPP</sub>	[W]	72.3	75.9	79.5	83.1	86.7
Short Circuit Current	I <sub>SC</sub>	[A]	1.34	1.34	1.35	1.35	1.35
Open Circuit Voltage	U <sub>OC</sub>	[V]	82.0	83.4	84.9	86.5	88.8
Current at P <sub>MPP</sub>	I <sub>MPP</sub>	[A]	1.16	1.18	1.21	1.22	1.24
Voltage at P <sub>MPP</sub>	U <sub>MPP</sub>	[V]	62.1	64.0	65.7	67.8	69.8

<sup>1</sup> Measurement accuracy P<sub>MPP</sub>: ± 5 %; measurement accuracy I<sub>SC</sub>, V<sub>OC</sub>, I<sub>MPP</sub>, V<sub>MPP</sub>: ± 10 %. All STC measurements are based on a pre-treatment of modules with 43 kWh/m<sup>2</sup> of light soaking (43 hours at 1000 W/m<sup>2</sup> and M<sub>PP</sub>) 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<sub>OC</sub> and V<sub>MPP</sub> into account when designing the system.

TEMPERATURE COEFFICIENTS (AT 1000 W/M2, AM 1.5 G SPECTRUM)							
Temperature Coefficient of I <sub>SC</sub>	α	[%/K]	+ 0.00 ± 0.04	Temperature Coefficient of V <sub>OC</sub>	β	[%/K]	-0.29 ± 0.04
Temperature Coefficient of P <sub>MPP</sub>	γ	[%/K]	- 0.38 ± 0.04				



PROPERTIES FOR SYSTEM DESIGN		QUALIFICATIONS AND CERTIFICATES
Maximum System Voltage V <sub>sys</sub>	[V] 1000 (IEC) / 600 (UL 1703)	IEC 61646 (Ed. 2), IEC 61730 (Ed.1) application class A, UL 1703 The production site is certified according to ISO 9001 for Quality Management.   The content of this data sheet is according to DIN EN 50380.
Maximum Reverse Current I <sub>r</sub>	[A] 5	
Wind / Snow Load	[Pa] 2400	
Safety Class	II	
Fire Rating	C	
Permitted module temperature on continuous duty	-40 °C bis +85 °C	

Note: See the installation and operating manual or contact the technical service for further information on approved installation and use of this product.