



SOLIBRO SL2 CIGS THIN-FILM MODULE

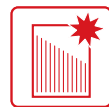
Generation 2.3 | 130-150 Wp

IDEAL FOR
UTILITY PROJECTS



Higher yield

- Positive sorting (+5 W)
- Low temperature coefficient: $-0.32\%/K$



Outstanding aesthetics

- Uniform black surface
- Ideal for visually sophisticated PV solutions



Easy to clean

- Frameless design means these modules are less susceptible to dirt



Quality controlled

- 100% inspected via electroluminescence test
- Longer, stricter tests than required under IEC 61215



Warranty

- 10-year product warranty
- 25-year performance warranty

About Solibro GmbH

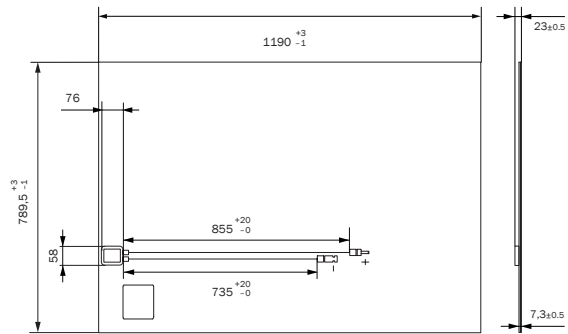
Solibro GmbH is one of the world's leading manufacturers of CIGS thin-film modules, with a production capacity of 145 MW. Solibro has headquarters in Thalheim, Germany and a research site in Uppsala, Sweden, both of which work to develop trailblazing solutions for the company's CIGS products. Solibro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

www.solibro-solar.com

MECHANICAL SPECIFICATIONS

Length	1190 (+3/-1) mm
Width	789.5 (+3/-1) mm
Height	7.3 mm (+ junction box, 15.5 mm)
Weight	16.5 kg
Front cover	4 mm tempered low iron glass with AR coating
Back cover	3 mm float glass
Frame	None
Cell type	ClGS [Cu (In, Ga) Se ₂]
Junction box	Ingress protection: IP67, with 1 bypass diode (8A); 76 mm x 58 mm x 15.5 mm
Cable type	PV1-F Solar cable 2.5 mm ² ; Material: copper, weather-resistant from -40 °C up to +90 °C (+) 855 (+20/-0) mm; (-) 735 (+20/-0) mm
Connector	Renhe 05-6 certified according UL6703

TECHNICAL DRAWING



All values in mm.

ELECTRICAL CHARACTERISTICS

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

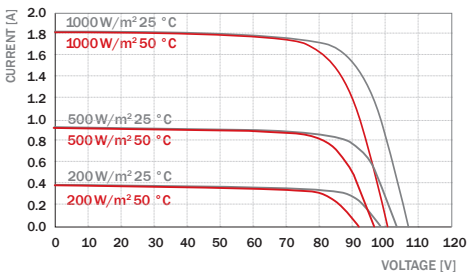
POWER CLASS (+5/-0 W)	[W]	130	135	140	145	150
Minimum Power	P _{MPP}	130.0	135.0	140.0	145.0	150.0
Short Circuit Current	I _{SC}	1.75	1.77	1.79	1.81	1.83
Open Circuit Voltage	V _{OC}	104.5	105.6	106.7	107.8	108.9
Current at P _{MPP}	I _{MPP}	1.54	1.58	1.62	1.66	1.70
Voltage at P _{MPP}	V _{MPP}	84.5	85.5	86.5	87.4	88.3
Module efficiency	[%]	≥ 13.8	≥ 14.4	≥ 14.9	≥ 15.4	≥ 16.0

PERFORMANCE AT NOMINAL MODULE OPERATING TEMPERATURE (800 W/m², NMOT, AM 1.5 G SPECTRUM)¹

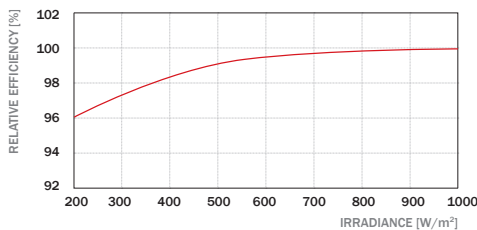
POWER CLASS (+5/-0 W)	[W]	130	135	140	145	150
Minimum Power	P _{MPP}	97.9	101.6	105.4	109.3	113.1
Short Circuit Current	I _{SC}	1.40	1.42	1.44	1.45	1.47
Open Circuit Voltage	V _{OC}	98.9	100.1	101.2	102.3	103.5
Current at P _{MPP}	I _{MPP}	1.23	1.26	1.29	1.32	1.35
Voltage at P _{MPP}	V _{MPP}	79.6	80.6	81.7	82.8	83.8

¹ Measurement accuracy P_{MPP}: ± 5%; tolerance I_{SC}, V_{OC}, I_{MPP}, V_{MPP}: ± 10%. All STC measurements are based on a pre-treatment of modules with 20 kWh/m² of light soaking (20 hours at 1000 W/m² and MPP) followed by a cool down to 25 °C.

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 1000 W/m²

P _{MPP} γ [%/K]	-0.32	I _{SC} α [%/K]	+0.01	V _{OC} β [%/K]	-0.27
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NMOT

Nominal Module Operating Temperature [°C] 42

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V _{sys}	[V]	1000 (IEC) / 600 (UL 1703)	Protection Class	II
Maximum Reverse Current I _r	[A]	3	Fire Rating	C
Positive design load (IEC 61215-2)	[Pa]	Up to 1600*	Permitted operating module temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Negative design load (IEC 61215-2)	[Pa]	Up to 1600*		

*tested with a safety factor γ_m of 1.5

PACKAGING INFORMATION

Measurements including pallet	L 1,313 mm × W 1,131 mm × H 1,016 mm
Approx. gross weight (full box)	770 kg
Maximum no. of stacked boxes for storage	2 on 1 (batch of 3)
Modules per box	44
Max. lorry loading (24 Tons)	30, maximum allowed weight (2 × 8 + 2 × 7)
Max. 40-feet container load (24 Tons)	30, maximum allowed weight (2 × 8 + 2 × 7)

QUALIFICATIONS AND CERTIFICATES

MODULE CERTIFICATES AND TESTS

IEC 61215 (Ed. 1:2016)
IEC 61730 (Ed. 2:2016)
IEC 61701:2011:
Salt Mist Corrosion
IEC 62716:2013:
Ammonia Corrosion
IEC 60068-2-68:1994:
Dust and Sand Resistance
UL 1703 (CSA)
CQC

QUALITY AND EHS CERTIFICATES

ISO 9001:2008
ISO 14001:2009
ISO 50001:2011
BS OHSAS 18001:2007



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