SIEMENS

Solar module SM110/SM100

When it comes to reliable and environmentally-friendly generation of electrical power from light, solar modules from Siemens Solar provide the perfect solution. Manufactured in compliance with the most stringent quality standards, they are designed to withstand the toughest environmental conditions and are characterized by their long service life. Siemens Solar power solar modules are covered by a 25-year limited warranty on power output – your guarantee of trouble-free solar power generation.

PowerMax® technology
Siemens Solar proprietary PowerMax® technology optimizes the cells and modules for energy production in all types of environmental conditions. This includes the growing of single crystalline silicon ingots, wafer processing under clean room conditions and the multistage proprietary TOPS™ (Texture Optimized Pyramidal Surface) process. The most striking features of the TOPS™ process are the special textural etching system which creates a pyramid-shaped surface, combined with surface passivation and an anti-reflective oxide coating.

This means that light absorption is especially high, even at low light levels. Siemens Solar PowerMax® solar cells deliver maximum energy throughout the day.

Certifications
The following certificates and approvals confirm the high quality of the Siemens Solar SM110/SM100:

- IEC61215
- TÜV safety class II
- CE mark

Solar module SM110/SM100

- Power rating SM110: **110 W ± 5 %**
  SM100: **100 W ± 5 %**
- Available in 12 V or 24 V versions and as framed module or laminate
- Single crystalline PowerMax® solar cells for maximum *operational* efficiency
- Used in grid-connected systems and for grid-independent rural/stand-alone power supply systems
- 25-year power output warranty

Description

The SM110/SM100 single crystalline solar module is available in a framed and a laminate version. Both modules feature a rugged laminate design and PowerMax® solar cells to provide maximum energy production throughout the day. The module has a rated output of 110 W_p/100 W_p and is available in a 12 volt and a 24 volt version. The efficient design of the SM110/SM100 module, with its large surface area, is ideally suited for medium and high output applications.

The module is designed for easy interconnection to achieve voltage and current configurations for grid-connected systems as well as stand-alone systems.

The high output of the SM110/SM100 reduces the number of modules required to achieve a desired power output. This means:

- fewer overall attachment points
- fewer terminal boxes
- easier assembly and cabling
- reduced installation costs

Intelligent module structure
72 PowerMax® solar cells form the heart of the module. These cells make optimum use of the module surface thanks to their rectangular shape. They are highly efficient and still provide maximum possible power even under low light level conditions. The specially hardened front glass has excellent light-transmitting characteristics and protects the module against even the most adverse environmental conditions, such as hail or ice.

The solar cells are laminated in EVA (ethylene-vinyl acetate) between a multilayer rear film and the front glass. This permanently laminated assembly protects the cells against moisture and ensures electrical insulation.

With the standard version, a torsion-resistant module frame made of anodized aluminum guarantees particularly high mechanical strength. As a result, the module can withstand even extreme wind and snow loads.

Bypass diodes integrated into the terminal box protect the cells when there is partial shading.

Easy installation
The solar module SM110/SM100 is very easy to install.

The standard framed version is suitable for mounting to standard support structures.

The frameless L version has to be installed directly on self-supporting structures with special retaining clips. This module type may **only** be fitted horizontally. Using the laminate holders specially developed by Siemens Solar (Types LCS/LCV) the modules can be arranged overlapping or flat alongside one another on the angle of the roof.

Connecting the module is simple. The electrical connection for the 24 volt version is via one single Sp terminal box, for the 12 volt version it is via two Sp terminal boxes, with the polarities clearly marked.

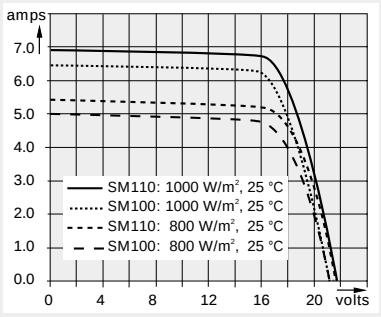
To ensure adequate ventilation behind the panels, the following minimum clearances should be adhered to during installation:

- to rear surfaces >50 mm
- to adjacent modules >5 mm

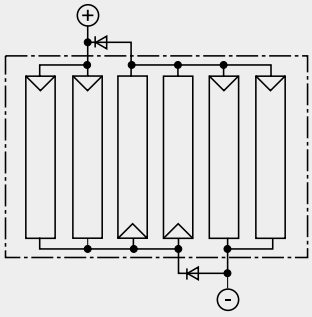
The recommended minimum inclination is 15°.

Technical Data

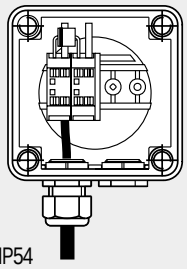
Voltage-current characteristic 12 V



Internal interconnection 12 V

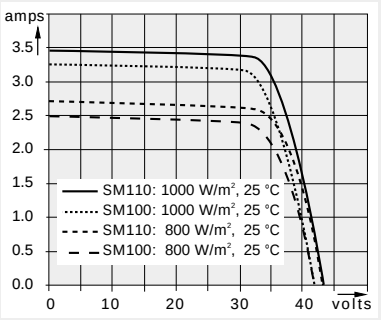


Sp terminal box 12 V (qty. 2)

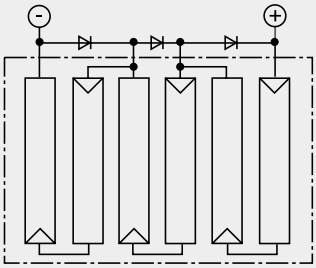


Maximum cable diameter: 4 mm²
Degree of protection: IP54
Cable gland: PG11

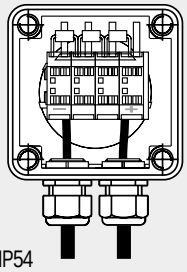
Voltage-current characteristic 24 V



Internal interconnection 24 V

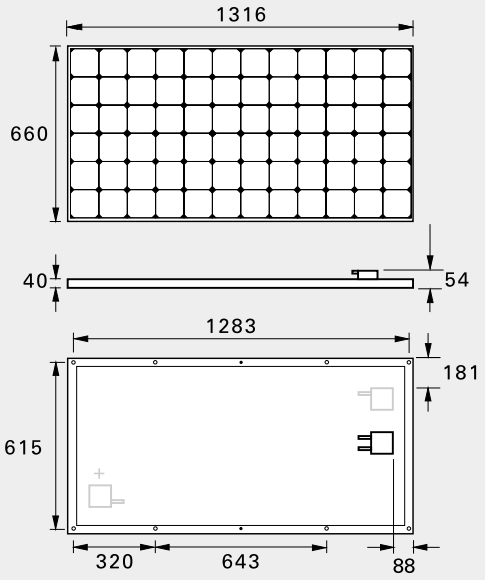


Sp terminal box 24 V



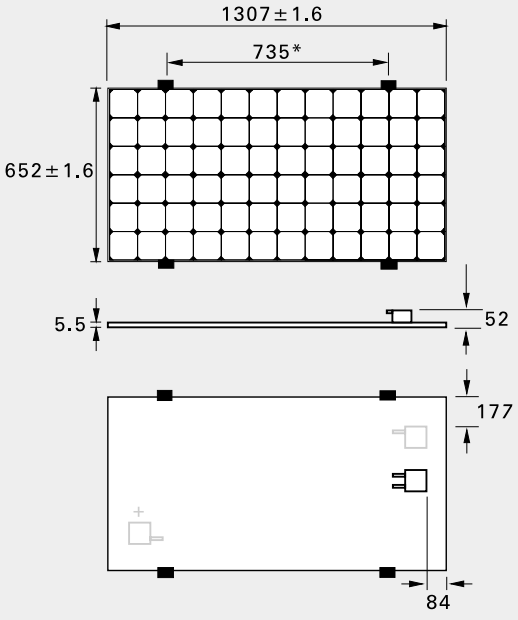
Maximum cable diameter: 4 mm²
Degree of protection: IP54
Cable gland: PG11

Module dimensions SM110/SM100



Hole diameter 7 mm (8 x) or 4 mm (2 x).
Hole dimensioning referred to hole center.
12V terminal boxes drawn in grey.

Module dimensions SM110-L/SM100-L



* Spacing between attachment clips.
Only use Siemens LCS/LCV clamps.
Only transverse mounting allowed.
12V terminal boxes drawn in grey.

Technical Data

Options
Modified versions of the solar module are also available, with MC plug-in contacts for example or a special version for integrated building solutions. You can obtain information about these versions from your Siemens Solar dealer or directly from Siemens Solar.

High Quality
Siemens Solar has established very high quality standards. Thus, our main production plants are certified to ISO 9001. Constant checks and inspections guarantee uniformly high quality. Each module which leaves the production line is subjected to thorough visual inspections as well as mechanical and electrical tests.

Performance warranty
The high quality of the modules results in an expected service life of well over 30 years. The SM110/SM100 is covered by a 25-year Siemens Solar warranty on power output.

You will find further information on modules, solar power generation principles and applications in the Siemens Solar product catalog.

Solar module SM110/SM100

Electrical parameters		SM110	SM110-24	SM100	SM100-24
Rated power P_{max} **(± 5%)**	[W_p][1)]	110	110	100	100
Configuration		12 V	24 V	12 V	24 V
Rated current I_{MPP}	[A]	6.3	3.15	5.9	2.95
Rated voltage U_{MPP}	[V]	17.5	35.0	17.0	34.0
Short circuit current I_{SC}	[A]	6.9	3.45	6.5	3.25
Open circuit voltage U_{0C}	[V]	21.7	43.5	21.0	42.0

Thermal parameters		
NOCT[2)]	[°C]	45 ± 2
Temp. coefficient of the short-circuit current		+ 4 x 10^{-4}/K
Temp. coefficient of the open-circuit voltage		-3.4 x 10^{-3}/K

Limit values / Qualifications		
Max. permitted module temperature	[°C]	-40 to + 85
Max. permitted ambient temperature		
Module under solar irradiation	[°C]	-40 to + 50
Module shaded (storage temperature)	[°C]	-40 to + 85
Maximum permitted system voltage[3)]	[V]	1000
Surface pressure	[N/m^2]	2400
Maximum distortion[4)]	[°]	1.2
Humidity at 85 °C	[%]	85 relative
Hailstorm / hailstones	[mm]	ø 25
	[m/s]	v = 23
Weight (with / without frame)	[kg]	11.5 / 9.5

1) W_p (Watt peak) = Peak power under standard test conditions:
(minimum power 104,5 W_p / 95 W_p)
Air Mass AM = 1.5
Irradiance E = 1000 W/m^2
Cell temperature T_C = 25 °C

2) Normal Operating Cell Temperature at:
Irradiance E = 800 W/m^2
Ambient temperature T_A = 20 °C
Wind speed v_W = 1 m/s

3) Protection class II 820 V

4) Diagonal lifting of the module plane

Your address for photovoltaics from Siemens Solar

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Siemens modules are recyclable.

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