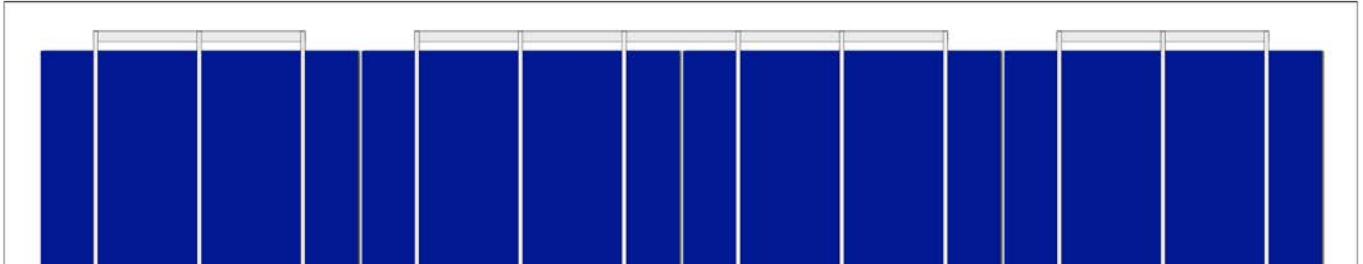




PHOTOVOLTAIC SOLAR ENERGY

POLYCRYSTALLINE MODULES - SI-ESF-M-BIPV-SM-P156-36



ABOUT SOLAR INNOVA

Solar Innova uses the latest materials to manufacture photovoltaic modules. This ensures that we can control our quality strictly in raw materials and production processes, offering our customers a durable and sustainable performance products backed by our 25 year limited power warranty.

PERFORMANCE

These PV modules use high-efficiency polycrystalline silicon cells (the cells are made of several crystals of high purity silicon) to transform the energy of sunlight into electric energy. Each cell is electrically rated to optimize the behavior of the module.

ARCHITECTURAL INTEGRATION

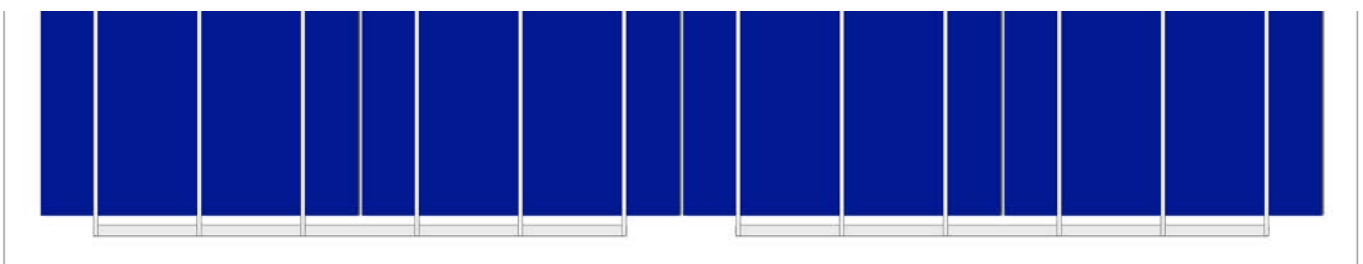
Photovoltaic modules architectural integration, also named "Solar Architecture" or "BIPV" (Building Integrated Photovoltaics), is defined as the installation of those photovoltaic modules that keep a double function; energetic and architectonic (cotaing, enclosure or shading) and replace conventional constructive elements too or can be constituents elements of the architectonic composition. Solar Innova BIPV photovoltaic modules line has been developed considering engineers and architects to provide them of modules that can be integrated functionally and aesthetically into facades and roofs where simultaneously serve as an architectonic material and energy generator.

CERTIFICATES

Our manufacturing plants have been prepared in accordance with:

- ✓ ISO 9001:2008, in terms of Quality Systems and Business.
- ✓ ISO 14001:2004, in terms of Environmental Management Systems.
- ✓ OHSAS 18001:2007, in terms of Management Systems Health and Safety.

Our PV modules are certified by internationally recognized laboratories and are proof of our strict adherence to international safety standards, long term performance and overall quality of products.

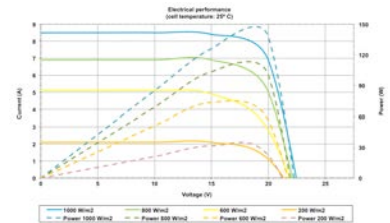




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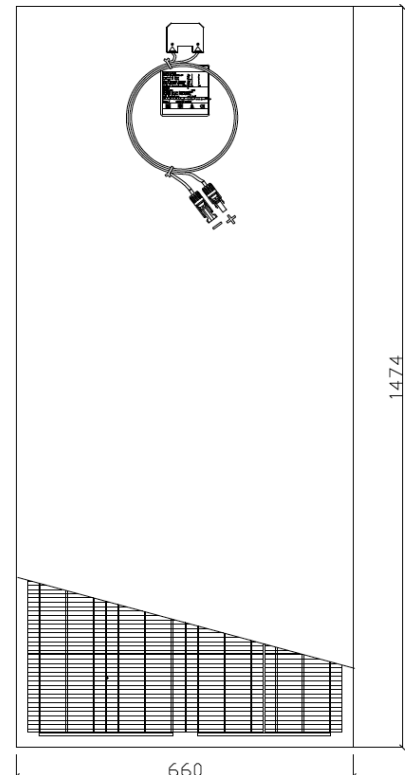
ELECTRICAL CHARACTERISTICS (STC)

Maximum power (Pmpp)	[Wp]	140	145	150	155
Tolerance	[Wp]	0 ~ + 5			
Voltage at maximum power (Vmpp)	[V]	17.85	17.90	18.14	18.31
Current at maximum power (Impp)	[A]	7.84	8.10	8.27	8.46
Open circuit voltage (Voc)	[V]	22.03	22.10	22.39	22.61
Short circuit current (Isc)	[A]	8.43	8.56	8.77	8.90
Maximum system voltage (Vsyst)	[V]	600 (UL) / 1,000 (IEC)			
Maximum series fuse	[A]	15			
Form Factor	[%]	≥ 73			



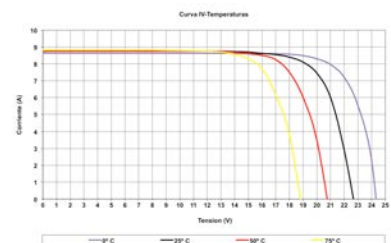
MECHANICAL CHARACTERISTICS

Height	mm	1,474
Width	mm	660
Thickness	mm	30
Weight	kg	12
Front	Material	High transmissivity toughened glass
Front-Thickness	mm	4 ± 0.2
Cells	Type	Polycrystalline
Cells	Quantity	4 x 9
Cells-Size	mm	156 x 156
Cells-Serial connection	Quantity	36
Cells-Parallel connection	Quantity	1
Encapsulation	Materials	Glass/EVA/Cells/EVA/TPT
Junction box	Type	IP67
Junction box	Isolation	Versus humidity and inclement weather
Cables	Type	Polarized and symmetric in length
Cables-Length	mm	900
Cables-Section of copper	mm ²	4
Cables	Features	Low contact resistance Minimal losses for voltage drop
Connectors	Type	MC4



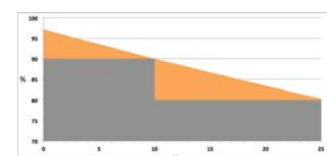
THERMAL CHARACTERISTICS

Temperature coefficient of short circuit current α (Isc)	%/°C	+ 0.0825
Temperature coefficient of open circuit voltage β (Voc)	%/°C	- 0.4049
Temperature coefficient of maximum power γ (Pmpp)	%/°C	- 0.4336
Temperature coefficient of current at maximum power (Impp)	%/°C	+ 0.10
Temperature coefficient of voltage at maximum power (Vmpp)	%/°C	- 0.38
NOCT (Nominal Operating Cell Temperature)	°C	+ 47 ± 2



WARRANTIES

Manufacturing defects	Years	12
Performance	Minimal Rated Power	90 % at 10 years, 80 % at 25 years.
	%/Years	





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