

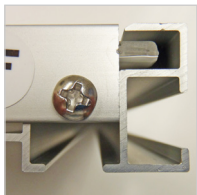
20W Photovoltaic module 20M

This line of modules is the direct result of over three decades of design, manufacturing and use. Attending to every detail in the design and manufacture of our products, our process controls and testing methods have optimized module life and electrical energy production.

Ameresco Solar's off-grid module line offers the following features and benefits:

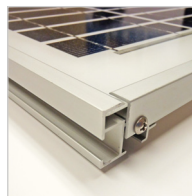
► Built to last

From mountaintops to off-shore platforms, on weather stations in the bitter cold of Antarctica and on telephone signal repeaters in the hot Australian outback, the technology has been proven in the harshest environments.



► Multiple mounting possibilities

Multimount frame allows even greater flexibility in mounting. Positioned parallel to the edge and back of the module, its dual channels accept either M8 or 5/16" hex-head bolts, allowing the module to be mounted from the side or back.



► Easier bolt management

Bolts may be located anywhere along the channels; the channel groove is specially designed to prevent the bolt from rotating when tightening, allowing installation with just one wrench.



► Long cable for easier battery connections

A 4.6 meter PVC-jacketed AWG 18-2 polarized cable is potted into the fully sealed junction box located on the module back. The module's electrical connections are sealed for prevention against corrosion and moisture penetration.

ISO 9001



► Quality and certifications

ISO 9001 factory certification ensures that our manufacturing facilities use proven manufacturing and quality control processes.

Certified to IEC 61215 and 61730

Certified to UL1703 and ULC1703

Certified for use in Class 1, Division 2 Hazardous locations

20W PHOTOVOLTAIC MODULE - 20M

Electrical characteristics

	(1) STC 1000W/m ²	(2) NOCT 800W/m ²
Maximum power (P_{max})	20W	14.4W
Voltage at P_{max} (V_{mpp})	17.9V	15.9V
Current at P_{max} (I_{mpp})	1.12A	0.91A
Short circuit current (I_{sc})	1.16A	0.94A
Open circuit voltage (V_{oc})	22.1V	20.1V
Module efficiency	9.5%	
Tolerance (P_{max})	±10%	
Nominal voltage	12V	
Efficiency reduction at 200W/m ²	<5% reduction (efficiency 9.0%)	
Limiting reverse current	1.29A	
Temperature coefficient of I_{sc}	0.105%/°C	
Temperature coefficient of V_{oc}	-0.360%/°C	
Temperature coefficient of (P_{max})	-0.45%/°C	
(3) NOCT	47±2°C	
Maximum series fuse rating	3A	
Maximum system voltage	50V	

Application class (according to IEC 61730:2007) **Class C**

1: Values at Standard Test Conditions (STC): 1000W/m² irradiance, AM1.5 solar spectrum and 25°C module temperature

2: Values at 800W/m² irradiance, Nominal Operation Cell Temperature (NOCT) and AM1.5 solar spectrum

3: Nominal Operation Cell Temperature: Module operation temperature at 800W/m² irradiance, 20°C air temperature, 1m/s wind speed

Mechanical characteristics

Solar cells	36 crystalline silicon cut cells connected in series
Front cover	High transmission 3.2mm (1/8th in) glass
Encapsulant	EVA
Back cover	White polyester
Frame	Silver anodized aluminum
Junction box	Lo-Pro junction box
Output cables	AWG#18 (0.75mm ²) 2 core, ITC / PLTC Lengths 4572mm / 15 ft. ("+" red; "-" black)
Dimensions	421 x 501 x 23mm / 16.6 x 19.7 x 0.9in
Weight	2.5kg / 5.5lbs

All dimensional tolerances within ±1% unless otherwise stated.

Warranty*

- Free from defects in materials and workmanship for 2 years
- 90% min. power output over 12 years
- Optional 25 years available

* Refer to warranty document for terms and conditions.

Certification

Certified according to the extended version of the IEC 61215 (ed.2), EN 61215:2005-08 (Crystalline silicon terrestrial photovoltaic modules - Design qualification and type approval).

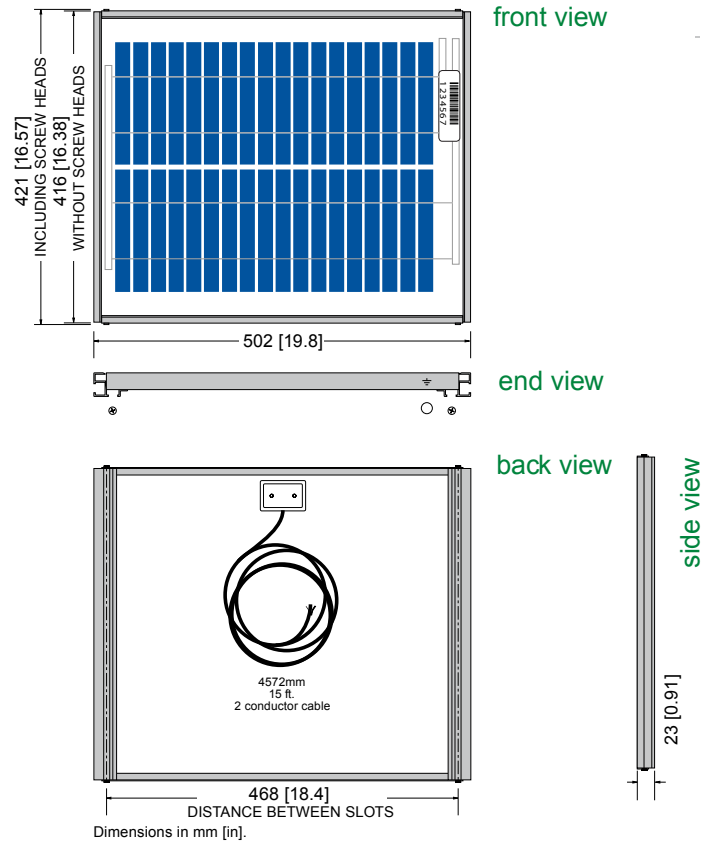
Certified according to IEC 61730-1 and IEC 61730-2 (ed.1), EN 61730-1:2007-05 and EN 61730-2:2007-05. (Photovoltaic module safety qualification, requirements for construction and testing).

Listed to UL 1703 & ULC ORD-C1703 Standard for Safety by Intertek ETL. Class C Fire Rating.

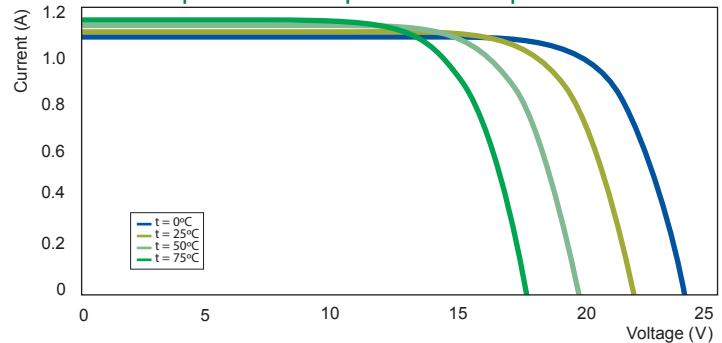
Approved by Intertek ETL according to FM 3611, Dec 2004, and according to CAN/CSA C22.2 No. 213-M1987, 1st Edition, Reaffirmed 2004, for use in a Class I, Division 2, Group A, B, C, D Hazardous (Classified) Location.

AMERESCO SOLAR

Green • Clean • Sustainable



Temperature - dependence of performance



Irradiance - dependence of performance

