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How to choose Solar Panels

Powerpoint Presentation

Learning Centre

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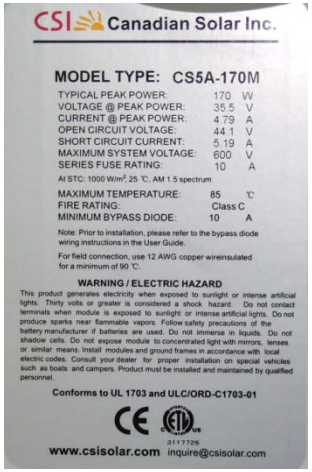
Solar Panels

- Converts Sunlight into DC electricity
- Available DC electricity not suitable to charge batteries directly
- Panels rated in Watts
- Specified Watt rating is Maximum Power available from Panel under standard test conditions (temperature, Irradiance) – Actual Power
  may vary

Important parameters (specified at back of panel):



- **Open Circuit Voltage** : Maximum voltage across the panel under the given external conditions when nothing is connected across the 2 PV panel leads. 12 V nominal panels will have a standard open circuit voltage of approx. 22 Volts. 24 V panels will have a nominal open circuit voltage of 44 Volts
- **Short Circuit Current** : Maximum Current possible under the given external conditions from the PV panel when the two leads are shorted or connected together

The approximate short circuit current can be estimated using the following equation:

Approximate Short Circuit current = PV Panel Power / Vmp, Where Vmp = 17 V (for a 12 V nominal panel) or 34 V (for a 24 V nominal panel)

The short circuit current is an important parameter used to size charge controllers

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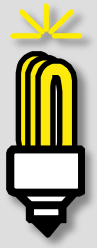
Solar Panel

- Solar Panels are rated by **Open Circuit Voltage** and **Short Circuit Current**. These are specified at Standard test conditions at 25° Celsius and can change with temperature changes
- Open circuit voltage increases with reduction in cell temperature, however cell temperature does not affect short circuit current drastically
- Output Power from PV panel increases as cell temperature decreases
- Short circuit current decreases with decreased solar irradiance, however irradiance (UV measurement) has little effect on the open circuit voltage
- Output Power from PV Panel decreases with decrease in PV panel voltage



For a given Solar Irradiance Level, PV Panels produce higher power at colder temperatures.

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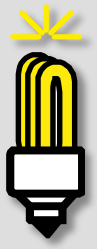
Applications & Sizing

The Size (Power rating) of the required PV array is based on the following factors:

- The total power rating of the connected AC and DC loads
- The daily duration of operation of each of the loads
- The daily peak sun hours available at the given location



Values of peak sun hours maybe obtained from Insolation maps available online or in common literature that show peak sun hours at your location

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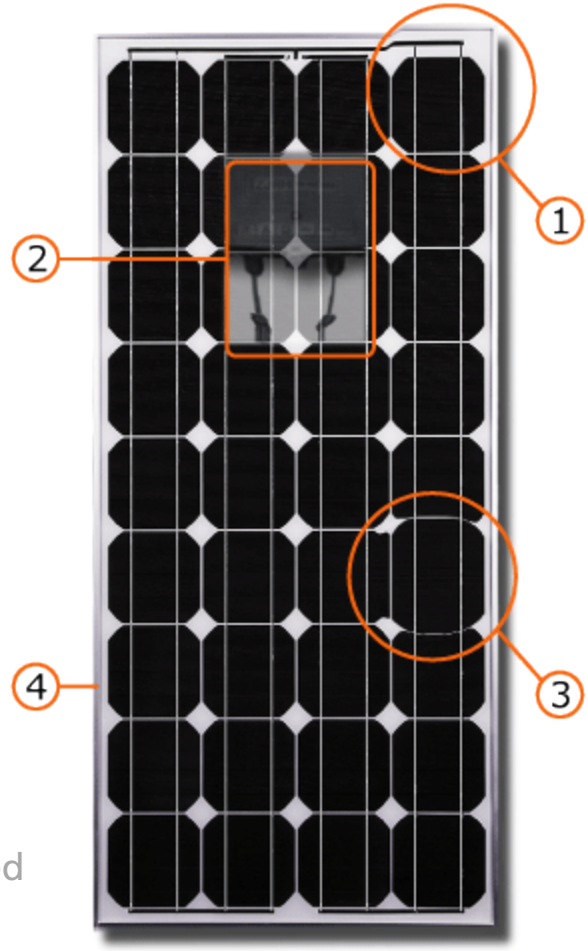
Features

- **Specialty Treated Aluminum Frame**
  - Mechanical Loading to 5400 Pa
  - Increased Module Endurance against high wind & snow.
- **Robust, Weather Resistant Junction Box**
  - Protection Degree: IP 65
  - Protection Class II
  - Temperature Range -40 to +90C
  - Extension Terminals with double fast connects
  - UL/CSA 1703
- **Optimized Module Surface Area**
  - High Efficiency 1st grade Solar Cells
  - Reinforced Solar Glass
  - Advanced Cell Encapsulation
  - Distance between frame edge & cell circuitry is optimized for maximum performance



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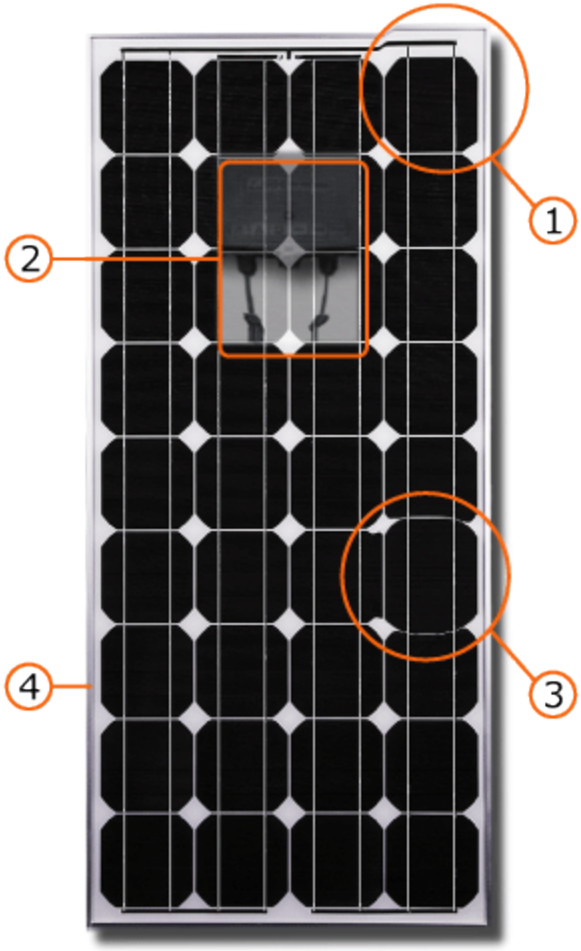
Features

- **Quality that surpasses Industry Standards**
  - UL 1703, TUV, IEC, ISO 9001:2000
  - 5 Year warranty mftr defects
  - 25 Year Power Output Warranty
  - Low return rate < .01% - .1%
  - Power Tolerance +/- 2.5%
- **Available in**
  - Polycrystalline
  - Monocrystalline



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Recommendations

- **CS6D-50P 50 Watt Solar module**
  CS6D is designed for powering remote telecommunication equipment, information monitoring systems and other industrial equipment in off-grid areas or when stand-alone power system is more cost effective.

- **CS5C-85M 85 Watt Solar module**
  CS5C is specially designed for powering remote telecommunication equipment, information monitoring systems and other industrial equipments in off-grid areas or when stand alone power system is more cost effective.

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Recommendations

- **CS6C-130P 130 Watt Solar module**
  CS6C is a robust all-purpose solar module that can be used for on and off-grid solar power plants as well as for roof-top solar systems on residential, commercial, and industrial buildings.

- **CS5A-170M 170 Watt Solar module**
  CS5A is a robust all-purpose solar module that can be used for on and off-grid solar power station as well as for roof-top solar systems on residential, commercial, and industrial buildings.