DuraGEN™ SOLAR ENGINES: RELIABLE OFF-GRID POWER

• Ideal power source for low-voltage devices
• Fast, easy installation
• Intelligent energy management
• Reliable year-round power, day and night
Solar power – Maintenance Free and No Air Pollutants!

Solar power, makes it easier than ever to install and operate electrical equipment anywhere in the world - from desert regions to remote mountain tops! For a fraction of the cost of maintaining a fuel-operated generator, Carmanah’s DuraGEN solar engines can generate electricity safely and reliably to run critical remote systems with confidence.

DuraGEN™ Solar Engine Features and Benefits

The DuraGEN™ solar engine is a complete stand-alone solar power supply that provides power to crucial equipment in remote locations for industrial, telecom, and security applications.

Each DuraGEN solar engine comes as a complete, ready to install system and includes the following components:

- Solar module
- Array cabling (and junction box if the system includes more than one module)
- Side pole mount hardware
- Enclosure
- Control panel – with solar controller (15 Amp or 30 Amp depending on the system size), backing plate, breakers
- Batteries – default battery types include the EX1050 (105 Ah battery) and EX1500 (150 Ah battery)
- Battery cabling

Proven Performance

Industrial strength build quality - Carmanah’s DuraGEN solar engines are built to tough standards, and designed to function flawlessly in even the most extreme climates and environments. Thousands of Carmanah’s DuraGEN solar engines are deployed and operating reliably in environments ranging from desert heat to the arctic cold. All DuraGEN solar engine models are designed to perform reliably in ambient temperatures from -40° to 60° (-40 to 140 F) for dependable worry-free operation.

Pre-wired and pre-tested for fast and simple installation

A reputation for quality - The DuraGEN solar engine is built on Carmanah’s years of experience designing solar-powered equipment. Carmanah enjoys a well-earned reputation for top quality, reliable products and professional, efficient services.

Constructed of high-quality, industry-standard components, Carmanah’s DuraGEN solar engines come preassembled, pre-wired and ready to install. All connections are clearly labeled and precise installation instructions are included to make installation quick and easy.

Cost Savings

Value - Carmanah DuraGEN solar engines are completely self-sufficient. As an alternative to hard-wired systems, Carmanah’s solar power systems significantly reduce installation costs and eliminate expensive electrical permits, maintenance charges and ongoing electricity bills.

Aluminum Enclosures

Durable - The DuraGEN solar engine’s aluminum enclosures are made from powder coated, lightweight aluminum offering superior corrosion protection for use in H2S and marine environments.

The two and four battery enclosures are UL cUL listed and NEMA rated and available with insulation for use in extreme climates.
Versatile Applications

Install the DuraGEN solar engine wherever you need power. The DuraGEN solar engine’s flexible design means a single DuraGEN solar engine can be used to power all sorts of third-party equipment.

Carmanah’s DuraGEN solar engines can provide a steady flow of clean, high quality, dependable power for a wide range of remote and hazardous location applications, including:

- Video surveillance
- Homeland Security
- Security lighting/ surveillance
- UHF/VHF Radio
- Wi-Fi and broadband
- Irrigation control
- Wireless data
- SCADA
- Valve actuation
- Chemical injection pumping
- Electronic flow measurement
- Cathodic protection
- Well-site security
- Traffic monitoring
The DuraGEN solar engine...
the complete stand-alone solar power supply
System Components

Charge Controller (mounted inside enclosure)

Control Panel (mounted inside enclosure)

Aluminum Enclosure

Battery
System Options
Carmanah’s DuraGEN solar engines are available with a variety of options:

- Security mount
- Flat pole mount hardware
- Pad mount hardware
- Lift-ears – for easy lifting using cranes
- Battery riser – improves battery cooling in hot climates
- Insulation (D2 and D4 only)

Company Support
Carmanah products provide years of reliable service, and require little or no maintenance. To ensure customers get the most out of their products, the company offers a range of customer services, from planning and installation to training and ongoing support.

Enclosures
All enclosures are designed to NEMA 3R standards
D2 and D4 enclosures are UL and CUL certified
Wiring kits for PV array and battery bank

Adaptable, reliable, affordable solutions: at Carmanah, putting solar to work is what we do best.
System Sizing and Selection

Carmanah’s DuraGEN solar engines are complete, ready to ship and ready to install systems with pre-assembled control panels. The DuraGEN solar engine comes in a variety of standard outputs and configurations to accommodate a wide range of remote power needs. Carmanah’s experienced sales staff will help you assess your power requirements, or refer to the specifications chart below.

<table>
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<tr>
<th>SYSTEM</th>
<th>WATTS</th>
<th>ENCLOSURE TYPE1</th>
<th>VOLTAGE (V DC)</th>
<th>AMP HOURS (Ahr)</th>
<th>SOLAR MODULE WATTS</th>
<th>SOLAR MODULE QUANTITY</th>
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</table>

1 S1 supports 1 battery, D2 supports 2 batteries, D4 supports 4 batteries

Use the online configurator to quickly and easily identify the right system for your load requirements. Find this easy to use tool at solarforindustry.com.

Each system consists of three major components:

**Solar Panel(s)**

Solar panel type and wattage varies with each system.

**Batteries**

Default battery types include the EX-1050 (105 Ahr) and EX-1500 (150 Ahr).

**Controller and Control Panel**

(All breaker switches and terminal blocks are CSA and UL approved)

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<th>CONTROLLER</th>
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<th>30</th>
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<tr>
<td>Rated Solar Current</td>
<td>15 A</td>
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<tr>
<td>Rated Load Current</td>
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<tr>
<td>System Voltage</td>
<td>12/24 V</td>
<td>12/24 V</td>
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</table>
Carmanah is the brand of choice for integrated solar power systems around the world.

Anywhere conventional power is unreliable, unavailable, or unaffordable, Carmanah's unique solar power solutions offer a new level of freedom and convenience.

Carmanah's products are among the best performing and most reliable in the industry—built to provide years of trouble-free service, even under the most extreme environmental conditions.

Call your Carmanah representative today for more information and pricing.

For more information or to find the regional office nearest you, please visit carmanah.com.

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### DuraGEN Solar Engine Sizing Calculator

**Customer name and point of contact:**

**Application description:**

**Specify application location (country, state, province, nearest city, lat/long if known):**

**Nominal voltage (circle one):** 12VDC or 24VDC or ______ VAC and ______ frequency

**Autonomous days (circle one; 5 is typical):** 1, 3, 5, 10, 20, or other ______

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<th>Qty</th>
<th>Equipment</th>
<th>Load (Amps)</th>
<th>Voltage</th>
<th>Load (Watts)</th>
<th>Use (Hrs/Day)</th>
<th>Use (Days/Week)</th>
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<tr>
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<td>SCADA controller</td>
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<td>12 VDC</td>
<td>0.39 x 12 = 4.7</td>
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**Total**