solar outdoor lighting systems

SLI Solar Lighting International

X-SERIES LED
## AMERICAN MADE X SERIES LED SOLAR LIGHTING SYSTEM: X-14300-LED-400-T

<table>
<thead>
<tr>
<th><strong>SYSTEM OUTPUT</strong></th>
<th>14,300 LUMENS PER FIXTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SYSTEM VOLTAGE</strong></td>
<td>INPUT 12/24 VDC – OUTPUT 12/24 VDC</td>
</tr>
</tbody>
</table>
| **SYSTEM CERTIFICATION** | - ETL Listed compete system to – UL 1598  
- Certified to CAN/CSA C22.2 No. 250.0  
- Dark Sky Compliant |
| **OPERATIONAL TEMPERATURES** | System is operational from -60° Celsius (with un-frozen batteries) to maximum temperature range of 60° Celsius with 90% humidity |
| **SOLAR MODULES** | - High efficiency UL, CUL, and CE listed 2x200 watt panels  
- 20 year warranty |
| **BATTERY ENCLOSURE** | - Lockable aluminum battery enclosure  
- Pre-wired and tested  
- Designed for a harsh or marine environment  
- Optional raised ridge rubber battery mat for thermal protection |
| **ELECTRONICS** | - Pre-wired and mounted in battery enclosure box  
- Dual circuit breaker protected (no fuse replacement)  
- Maximum Power Point Tracking (MPPT) charge controller is reverse polarity protected and cannot be damaged by wiring incorrectly  
- Instant light test switch – no need to wait for sunset to confirm correct installation |
| **LED LIGHT FIXTURE** | - Dark Sky Compliant  
- Glass cut off optics  

Phillips Illumiled LED Chips  

Color Temperature Options:  
4300k (standard option)  
5300k |
| **TOP OF POLE SOLAR MOUNT** | Aluminum solar array mounting system to provide multiple degrees of adjustments for more precise alignment with the sun |
| **GEL PACK BATTERY** | - American Made  
- Zero maintenance gel pack battery  
- High capacity deep cycle  
- 3 days back up power  
- Automatic low-voltage shutdown to protect battery  
- Battery operating temperature: -60° Celsius to 60° Celsius |
**Product Benefits**

**PHILIPS LUMILEDS**  LED LUMINOUS SOURCE

The new SLI Series LED street light is utilizing PHILIPS LUXEON® T LED luminous source, providing excellent lumen output, long-lasting stability and splendid sight.

Each PHILIPS LUXEON® T chip owns electrostatic protection component, maximally avoid the damage of electrostatic.

More information about the PHILIPS LUXEON® Rebel ES and solid-state lighting technologies can be found at www.philipslumileds.com.

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**LED DRIVER**

Full range SLI Series LED street light utilizing MeanWell HLG Series high-end driver. Providing great luminaire stability, lifespan and optimal performance status.

More information about the MeanWell HLG Series and LED driver technologies, please visit www.meanwell.com

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**BRAND-NEW LED MODULE DESIGN**

Exquisite design with powerful thermal output, with more reliable waterproof performance.

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Lancaster, SC USA
www.solarlightingitl.com
XTREME LUMINAIRE DESIGN

Equipped with exceptional 3rd-generation LED module, the brand-new SLI Series LED street light will give best luminous output, stability and super long life, and build the most cost-effective LED street light ever.

SLI has its own R&D center, and it reserves all related patents for the SLI Series LED street light.

Easy assemble/disassemble, neat wiring & connection, up to 100-110lm/w luminaire light output, IP67 rated, 90% plus driver efficiency, 5 years warranty for the whole luminaire.

More information about the SLI Series LED street light and LED lighting technologies, please visit www.solarlightingitl.com

FLEXIBLE INSTALLATION

Lancaster, SC USA
www.solarlightingitl.com
SLI-110W
LED Parking Lot/Area Light, 250-300W

Black/dark brown fixtures optional
Microwave sensor & daylight sensor optional 1-10V dimmable

Specifications

Electrical Specifications

Model No.: SLI-110W
Nominal Wattage: 110W
Nominal Voltage: 24V DC, 50/60Hz
Maximum Current: AC 1.25A (max)
Power Factor (PF): >0.95
Driver Efficiency: >93%

Photometric Specifications

Luminous Flux: Lumen tolerance +/− 5%
Color Rendering Index: Ra>70/80
Color Temperatures: 30000-6500K
Optional Beam Angles: 70°130°/75°1SO°/120°

Mechanical Specifications

IP&IK Rating: IP66&1K10
Lifetime (L70 Standard): 50,000 hours
Heat Radiator: Anodized Aluminum
Lens Material: PC AAA
Fixture Dimension: 560*278*75mm
Net Weight: 5.6kg
Carton Dimensions: 700-390*170mm
Gross Weight: 6.7kg

190 - 210W SOLAR PANEL
EXCEPTIONAL EFFICIENCY AND PERFORMANCE / EFICIENCIA Y DESEMPEÑO EXCEPCIONAL

S72MC
72 Cells
S72MC-190, S72MC-195, S72MC-200,
S72MC-205, S72MC-210

**BENEFITS / BENEFICIOS**

**High Efficiency / Alta Eficiencia**
High cell efficiency of up to 17.25%.
Líder en la industria empleando celdas monocristalinas con eficiencias de hasta 17.25%.

**More Power / Mayor Potencia**
Delivers up to 50% more power per unit area than conventional solar panels and 100% more than thin film solar panels.
Ofrece hasta un 50% más de potencia por unidad de área a comparación de los paneles solares convencionales y un 100% más que los paneles solares de película delgada.

**Reduces Installation Cost / Reducción en Costos de Instalación**
More power per panel means fewer modules per installation. This saves both time and money.
Mas potencia por panel representa menos módulos por instalación. Esto ahorra tanto tiempo como dinero.

**Reliable and Robust Design / Diseño Robusto y Confiable**
Certified materials, tempered front glass, and a sturdy anodized frame allows the module to operate reliably in multiple mounting configurations.
Materiales certificados, cristal templado y un robusto marco anodizado el cual permite al módulo operar sin problema alguno y en múltiples configuraciones de montaje.

**Solartec 190 - 210W solar modules provide industry leading efficiency and performance.**
Utilizing 72 next generation solar cells and an optimized module design, Solartec S72MC solar module delivers an unprecedented total conversion efficiency. Solartec 190 - 210W modules reduced voltage - temperature coefficient, and exceptional low - light performance attributes, provide far higher energy delivery at peak power than conventional modules.

**Los módulos solares Solartec de 190 - 210W proveen un liderazgo incomparable en la industria gracias a su eficiencia y desempeño.**
El módulo solar Solartec S72MC utiliza 72 celdas solares de última generación, aunado al óptimo diseño del módulo, permitiéndole ofrecer una eficiencia superior. El reducido valor del coeficiente de voltaje-temperatura, y su desempeño excepcional en condiciones de baja iluminación permiten al los módulos de 190 - 210W entregar mucha mayor energía en condiciones de potencia máxima, en comparación con los módulos convencionales.

**Tested Operating Conditions / Condiciones de Operación**

<table>
<thead>
<tr>
<th>Temperature / Temperatura</th>
<th>-40°C to +90°C (-40°F to + 194°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max load / Carga máxima</td>
<td>50psf (2400 pascals) front and back</td>
</tr>
<tr>
<td>Impact Resistance / Resistencia al Impacto</td>
<td>Hail Ø-25mm (1 in.) at 23 m/s (52mph)</td>
</tr>
<tr>
<td>Compiles with / Normado con</td>
<td>IEC 61215 / IEC 61730</td>
</tr>
</tbody>
</table>
### Specifications / Especificaciones

<table>
<thead>
<tr>
<th></th>
<th>S72MC-190</th>
<th>S72MC-195</th>
<th>S72MC-200</th>
<th>S72MC-205</th>
<th>S72MC-210</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model / Modelo</strong></td>
<td>STC</td>
<td>NOCT</td>
<td>STC</td>
<td>NOCT</td>
<td>STC</td>
</tr>
<tr>
<td><strong>Open circuit voltage (Voc) / Voltaje de circuito abierto</strong></td>
<td>45.07</td>
<td>41.10</td>
<td>45.36</td>
<td>42.00</td>
<td>45.62</td>
</tr>
<tr>
<td><strong>Optimum operating voltage (Vmp) / Voltaje en el punto de máxima potencia</strong></td>
<td>37.73</td>
<td>33.93</td>
<td>38.16</td>
<td>35.20</td>
<td>37.26</td>
</tr>
<tr>
<td><strong>Short circuit current (Isc) / Corriente de cortocircuito</strong></td>
<td>5.40 A</td>
<td>4.34 A</td>
<td>5.40 A</td>
<td>4.35 A</td>
<td>5.66 A</td>
</tr>
<tr>
<td><strong>Optimum operating current (Imp) / Corriente en el punto de máxima potencia</strong></td>
<td>5.03 A</td>
<td>3.99 A</td>
<td>5.10 A</td>
<td>4.03 A</td>
<td>5.37 A</td>
</tr>
<tr>
<td><strong>Maximum power (Pmax) / Potencia máxima</strong></td>
<td>190 W</td>
<td>135.4 W</td>
<td>195 W</td>
<td>141.8 W</td>
<td>200 W</td>
</tr>
<tr>
<td><strong>Module efficiency / Eficiencia del módulo</strong></td>
<td>14.9 %</td>
<td>15.29 %</td>
<td>15.74 %</td>
<td>16.18 %</td>
<td>16.64 %</td>
</tr>
</tbody>
</table>

### Temperature Coefficients / Coeficientes de Temperatura

- \( \frac{\text{of Isc / de Isc (A)}}{\text{de Voc / de Voc (B)}} \): +0.024 % / °C  
- \( \text{of Pmax / de Pmax (Y)} \): -0.356 % / °C  
- \( \text{of Pmax / de Pmax (Y)} \): -0.46 % / °C

### Guarantees / Garantías

- Materials comprising photovoltaic modules and any possible defects due to the manufacturing process for 10 years.  
- At least 90% output power provided by the photovoltaic module over 10 years.  
- At least 80% output power provided by the photovoltaic module over 20 years.  

- Measured under standard test conditions and normal operating cell temperature.  
- The electric characteristics of each photovoltaic module are individually monitored leaving the results available to the customer.  

### Applications / Aplicaciones

- Building Integration  
- Solar Power Kits and Plants  
- Cleaning Systems  
- Energy Bill Savings

### Distributed by / Distribuido por

**Contact / Contacto**  
Solartec S.A. de C.V.  
info@solartec.mx

**Carretera Libramiento Norte Km 4.6**  
**Lote No. 9, Parque Industrial Apolo**  
**Tranquero, Gto. México CP 36826**  
**Phone Number:** +52 (462) 635 9828

**www.solartec.mx**
Patented Maximum Power Point Tracking technology allows SLI, Inc. to increase charge current up to 30% or more compared to conventional charge controllers. Don’t waste your money by throwing PV power away! Get the power you paid for with a Solar Lighting International’s MPPT30 charge controller.

SLI’s advanced fully automatic 3-stage charge control system will properly charge flooded lead-acid, AGM and GEL batteries resulting in improved battery performance with less maintenance. The dual 30/40 amp rating will deliver at up to 30 amps in 24 volt systems, or up to 40 amps in 12 volt systems. An automatic or manual equalize function is also provided to periodically condition flooded lead-acid batteries. To further enhance versatility, a user configurable auxiliary output and network interface are also included.

The user configurable auxiliary output can serve as either a 20 amp load controller, or as a 2 amp auxiliary battery charger. The load control feature can be used to limit excessive battery discharge in unattended remote systems, whereas the auxiliary battery charge feature is ideal for charging a separate battery such as the engine battery in an RV. The auxiliary output can also provide fully adjustable dusk to dawn lighting control.

Solar Lighting International’s IPN Network allows up to 8 IPN capable charge controllers to communicate with each other and operate as a single machine rather than separate charge controllers. The IPN network also allows networked controllers to share an optional battery temperature sensor and remote display. The IPN network does not require a display or other special communication hardware to operate.

Get Improved Performance From Your PV Modules And Batteries

- 40 amp 12V or 30 amp 24V rating supports a wide range of applications
- Auxiliary output serves as 20 amp load controller or 2 amp battery charger
- Load controller provides fully adjustable dusk to dawn lighting control
- IPN network interface coordinates multiple controllers & shares optional battery temperature sensor & display
- Optional IPN display provides complete charge control & battery system monitoring, eliminating the need for a separate battery monitor device
- 3-Stage charge control with filtered PWM output & auto/manual equalization improves battery performance & life
- MPPT power converter can charge 12 volt batteries from 24 volt PV modules
- Durable powder coat finish & conformal coated electronics resist corrosion
- Full 5 year limited warranty
- Battery temperature sensor input

Solar Lighting International, Inc.
Lancaster, SC 29720
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Fax +1 803-233-2096
www.solarlightingintl.com
How Do SLI’s Controllers Increase Charge Current?

SLI’s charge controllers increase charge current by operating the PV module in a manner that allows the module to produce all the power it is capable of. A conventional charge controller simply connects the module to the battery when the battery is discharged. When the 75W module in this example is connected directly to a battery charging at 12 volts its power production is artificially limited to about 53 watts. This wastes a whopping 22 watts or nearly 30% of the available power!

Patented MPPT technology used in SLI’s controllers operates in a very different fashion. The MPPT30 controller continually calculates the module’s maximum power voltage, in this case 17 volts. It then operates the module at its maximum power voltage to extract maximum power. The higher power extracted from the module is then provided to the battery in the form of increased charge current. In conditions where extra PV power is not available, MPPT30 controllers will operate as a conventional controller with very low voltage drop.

The actual charge current increase you will see varies primarily with module temperature and battery voltage. In comfortable temperatures, current increase typically varies between 10 to 25%, with 30% or more easily achieved with a discharged battery and cooler temperatures. What you can be sure of is that MPPT30 charge controllers will deliver the highest charge current possible for a given set of operating conditions.

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>SLI MPPT 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Current Rating</td>
<td>30 Amp @ 24 Volts / 40 Amp @ 12 Volts</td>
</tr>
<tr>
<td>Nominal Battery Voltage</td>
<td>12 / 24VDC</td>
</tr>
<tr>
<td>PV Input Voltage</td>
<td>57VDC maximum (Recommend Maximum Voc at STC ≤ 45.6VDC)*</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>0.35W Typical standby • 1.0W Typical charge on</td>
</tr>
<tr>
<td>Charge Algorithm</td>
<td>3-stage Bulk/Acceptance/Float Plus Equalize</td>
</tr>
<tr>
<td>Acceptance Voltage</td>
<td>14.4VDC (range 14.0 - 14.8VDC², 10.0 - 40.0VDC²)</td>
</tr>
<tr>
<td>Float Voltage</td>
<td>13.2VDC (range 13.2 - 13.8VDC², 10.0 - 40.0VDC²)</td>
</tr>
<tr>
<td>Equalization Voltage</td>
<td>15.2VDC (range 10.0 - 40.0VDC²) • automatic or manual operation</td>
</tr>
<tr>
<td>Auxiliary Output Function</td>
<td>Single output field configurable as either: 20 Amp load controller – or – 2 Amp auxiliary battery charger</td>
</tr>
<tr>
<td>• Aux. Battery charge</td>
<td>2 Amp typical, same charge voltage as primary battery</td>
</tr>
<tr>
<td>• Load Control</td>
<td>20 Amp maximum; ON @ ≥7.6VDC² / OFF @ ≤11.5VDC² (Range 10.0 - 40.0VDC², or net battery amp-hours²)</td>
</tr>
<tr>
<td>• Dusk-to-Dawn Cntrl</td>
<td>Variable Post-Dusk and Pre-Dawn timers² , Range 0.5 - 20.0 Hours</td>
</tr>
<tr>
<td>Temperature Compensation</td>
<td>Optional sensor adjusts charge voltage based on measured battery temperature,</td>
</tr>
<tr>
<td></td>
<td>-5.00 mV/C/cell correction factor (Range -0.00 to -8.00 mV/C/cell) • sensor range -60 to +80°C</td>
</tr>
<tr>
<td>Power Conversion Efficiency</td>
<td>97% Typical @ 28 Volt 24 Amp Output</td>
</tr>
<tr>
<td>Cabinet Dimension</td>
<td>6 7/8&quot;H x 6 5/8&quot; W x 3 3/8&quot; D (17.4cm x 16.8cm x 8.59cm)</td>
</tr>
<tr>
<td>Analog Input Accuracy / Range</td>
<td>Battery &amp; Aux. Battery voltimeters, 40.0VDC ±0.50% FS • PV voltmeter, 60.0VDC ±0.50% FS</td>
</tr>
<tr>
<td></td>
<td>42.0A ±0.50% FS</td>
</tr>
<tr>
<td>Communication</td>
<td>Proprietary IPN Network interface</td>
</tr>
<tr>
<td>Approvals</td>
<td>ETL Listed to UL STD. 1741, Certified to CAN/CSA STD. E335-1/2E, CE labeled, FCC part 15 certified</td>
</tr>
<tr>
<td>Environmental</td>
<td>-40 to +40°C, 10 – 90% RH non-condensing</td>
</tr>
</tbody>
</table>

As a part of our continuous improvement process specifications are subject to change without prior notice.

MPPT30 alone, voltages double for 24V battery
* With IPN, which may be used as a set-up tool only, or permanently installed.
² Current rating and current limit are 40A when charging a 12V battery from nominal 12V PV modules. If PV VOC ever exceeds 30V (>12V nominal PV modules) current rating and current limit become 30A.

Solar Lighting International, Inc.
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DC (Deep Cycle) series is specially designed for frequent cyclic discharge. By using strong grids and specially designed active material, the DC series battery offers 30% more cyclic life than the standby series. It is suitable for solar energy systems, marine and RV etc.

### Specification

<table>
<thead>
<tr>
<th>Cells Per Unit</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Per Unit</td>
<td>12</td>
</tr>
<tr>
<td>Capacity</td>
<td>160Ah@10hr-rate to 1.80V per cell @25°C</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 44.0 Kg (Tolerance ±1.5%)</td>
</tr>
<tr>
<td>Max. Discharge Current</td>
<td>160 A (5 sec)</td>
</tr>
<tr>
<td>Internal Resistance</td>
<td>Approx. 4 mΩ</td>
</tr>
</tbody>
</table>
| Normal Operating Temperature Range | Discharge: -20°C~60°C  
Charge: 0°C~50°C  
Storage: -20°C~60°C |
| Normal Operating Temperature Range | 25°C ±5°C |
| Float charging Voltage | 13.6 to 13.8 VDC/unit Average at 25°C |
| Recommended Maximum Charging Current | 43.5 A |
| Equalization and Cycle Service | 14.6 to 14.8 VDC/unit Average at 25°C |
| Self Discharge | SLI Valve Regulated Lead Acid (VRLA) batteries can be stored for more than 6 months at 25°C. Self-discharge ratio less than 3% per month at 25°C. Please charge batteries before using. |
| Terminal | Terminal F5/F12 |
| Container Material | A.B.S. UL94-HB, UL94-V0 Optional. |

### Dimensions

Unit: mm  
Dimension: 344(L) × 173(W) × 285(H)

### Constant Current Discharge Characteristics: A (25°C)

<table>
<thead>
<tr>
<th>F.V/Time</th>
<th>5MIN</th>
<th>10MIN</th>
<th>15MIN</th>
<th>30MIN</th>
<th>1HR</th>
<th>2HR</th>
<th>3HR</th>
<th>4HR</th>
<th>5HR</th>
<th>8HR</th>
<th>10HR</th>
<th>20HR</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.60V</td>
<td>447.0</td>
<td>333.4</td>
<td>263.1</td>
<td>145.7</td>
<td>90.5</td>
<td>55.88</td>
<td>37.97</td>
<td>30.62</td>
<td>25.42</td>
<td>16.74</td>
<td>15.09</td>
<td>7.99</td>
</tr>
<tr>
<td>10.0V</td>
<td>434.1</td>
<td>317.3</td>
<td>257.7</td>
<td>143.8</td>
<td>89.30</td>
<td>54.75</td>
<td>37.27</td>
<td>30.18</td>
<td>25.19</td>
<td>16.68</td>
<td>14.94</td>
<td>7.84</td>
</tr>
<tr>
<td>10.2V</td>
<td>421.2</td>
<td>306.1</td>
<td>253.6</td>
<td>141.6</td>
<td>88.45</td>
<td>54.17</td>
<td>36.94</td>
<td>29.88</td>
<td>25.03</td>
<td>16.53</td>
<td>14.79</td>
<td>7.69</td>
</tr>
<tr>
<td>10.5V</td>
<td>378.2</td>
<td>282.4</td>
<td>241.5</td>
<td>137.7</td>
<td>87.37</td>
<td>53.46</td>
<td>36.61</td>
<td>29.44</td>
<td>24.82</td>
<td>16.38</td>
<td>14.65</td>
<td>7.54</td>
</tr>
<tr>
<td>10.8V</td>
<td>341.4</td>
<td>257.5</td>
<td>222.6</td>
<td>133.2</td>
<td>86.15</td>
<td>53.03</td>
<td>36.18</td>
<td>28.43</td>
<td>24.70</td>
<td>16.31</td>
<td>14.51</td>
<td>7.46</td>
</tr>
<tr>
<td>11.1V</td>
<td>291.5</td>
<td>230.2</td>
<td>199.6</td>
<td>128.1</td>
<td>84.11</td>
<td>50.89</td>
<td>35.48</td>
<td>28.02</td>
<td>24.52</td>
<td>16.18</td>
<td>14.34</td>
<td>7.16</td>
</tr>
</tbody>
</table>

### Constant Power Discharge Characteristics: W (25°C)

<table>
<thead>
<tr>
<th>F.V/Time</th>
<th>5MIN</th>
<th>10MIN</th>
<th>15MIN</th>
<th>30MIN</th>
<th>1HR</th>
<th>2HR</th>
<th>3HR</th>
<th>4HR</th>
<th>5HR</th>
<th>8HR</th>
<th>10HR</th>
<th>20HR</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.60V</td>
<td>4623</td>
<td>3551</td>
<td>2894</td>
<td>1668</td>
<td>1049</td>
<td>654.8</td>
<td>447.1</td>
<td>366.5</td>
<td>304.5</td>
<td>200.5</td>
<td>180.9</td>
<td>96.22</td>
</tr>
<tr>
<td>10.0V</td>
<td>4532</td>
<td>3442</td>
<td>2847</td>
<td>1650</td>
<td>1039</td>
<td>646.8</td>
<td>440.4</td>
<td>361.3</td>
<td>301.8</td>
<td>199.7</td>
<td>179.5</td>
<td>94.55</td>
</tr>
<tr>
<td>10.2V</td>
<td>4481</td>
<td>3351</td>
<td>2815</td>
<td>1636</td>
<td>1033</td>
<td>642.2</td>
<td>438.5</td>
<td>358.0</td>
<td>299.9</td>
<td>198.2</td>
<td>177.9</td>
<td>92.80</td>
</tr>
<tr>
<td>10.5V</td>
<td>4079</td>
<td>3121</td>
<td>2685</td>
<td>1603</td>
<td>1026</td>
<td>634.1</td>
<td>434.9</td>
<td>353.1</td>
<td>297.5</td>
<td>196.5</td>
<td>176.2</td>
<td>91.05</td>
</tr>
<tr>
<td>10.8V</td>
<td>3715</td>
<td>2877</td>
<td>2482</td>
<td>1565</td>
<td>1013</td>
<td>629.4</td>
<td>430.0</td>
<td>341.2</td>
<td>296.2</td>
<td>195.7</td>
<td>174.4</td>
<td>90.17</td>
</tr>
<tr>
<td>11.1V</td>
<td>3263</td>
<td>2601</td>
<td>2234</td>
<td>1522</td>
<td>998.1</td>
<td>605.8</td>
<td>422.8</td>
<td>336.3</td>
<td>295.1</td>
<td>194.3</td>
<td>172.5</td>
<td>86.95</td>
</tr>
</tbody>
</table>

All mentioned values are average values (Tolerance ±2%).
**DC12-160**

**12V160Ah**

### Life characteristics of cyclic use

![Graph showing life characteristics of cyclic use.](image)

### Charge characteristic Curve for standby use

![Graph showing charge characteristic curve for standby use.](image)

### Discharge characteristic Curve

![Graph showing discharge characteristic curve.](image)

### Capacity Factors With Different Temperature

<table>
<thead>
<tr>
<th>Battery Type</th>
<th>-20°C</th>
<th>-10°C</th>
<th>0°C</th>
<th>5°C</th>
<th>10°C</th>
<th>20°C</th>
<th>25°C</th>
<th>30°C</th>
<th>40°C</th>
<th>45°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEL Battery</td>
<td>6V&amp;12V</td>
<td>50%</td>
<td>70%</td>
<td>83%</td>
<td>85%</td>
<td>90%</td>
<td>98%</td>
<td>100%</td>
<td>102%</td>
<td>104%</td>
</tr>
<tr>
<td>AGM Battery</td>
<td>2V</td>
<td>60%</td>
<td>75%</td>
<td>85%</td>
<td>88%</td>
<td>92%</td>
<td>99%</td>
<td>100%</td>
<td>103%</td>
<td>105%</td>
</tr>
<tr>
<td>GEL Battery</td>
<td>6V&amp;12V</td>
<td>46%</td>
<td>66%</td>
<td>76%</td>
<td>83%</td>
<td>90%</td>
<td>98%</td>
<td>100%</td>
<td>103%</td>
<td>107%</td>
</tr>
<tr>
<td>AGM Battery</td>
<td>2V</td>
<td>55%</td>
<td>70%</td>
<td>80%</td>
<td>85%</td>
<td>92%</td>
<td>99%</td>
<td>100%</td>
<td>104%</td>
<td>108%</td>
</tr>
</tbody>
</table>

### Discharge Current VS. Discharge Voltage

<table>
<thead>
<tr>
<th>Discharge Voltage V/cell</th>
<th>1.75V</th>
<th>1.70V</th>
<th>1.60V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge Current (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&lt;2°C)</td>
<td>&lt;0.2C</td>
<td>0.2C</td>
<td>0.3C</td>
</tr>
<tr>
<td>(&lt;10°C)</td>
<td>&lt;0.3C</td>
<td>0.3C</td>
<td>0.4C</td>
</tr>
<tr>
<td>(&gt;10°C)</td>
<td>&gt;0.4C</td>
<td>0.5C</td>
<td>0.6C</td>
</tr>
</tbody>
</table>

### Maintenance & Cautions

**Cycle service**

- Avoid battery over discharge, especially battery series connection use.
- Charged with recommend voltage, ensure battery can be full recharged.
- In general, recharge capacity should be 1.1-1.15 times discharge capacity.

**Effect of temperature on cycle charge voltage:** -4mV/°C.

**There are a number of factors that will affect the length of cyclic service.**

The most significant are depth of discharge, ambient temperature, discharge rate, and the manner in which the battery is recharged.

Generally speaking, the most important factors are depth of discharge.

**Bolt**

<table>
<thead>
<tr>
<th>Terminals</th>
<th>M5</th>
<th>M6</th>
<th>M8</th>
</tr>
</thead>
<tbody>
<tr>
<td>F5 F6 F7</td>
<td>6-76m</td>
<td>8-100m</td>
<td>10-120m</td>
</tr>
</tbody>
</table>

**Address:** Rm405, Tower C, Huahan Building, Langshan Rd16, Nanshan District, ShenZhen, 518057, China

**Website:** www.ritarpower.com

**Phone:** 803-233-3461

**Solar Lighting International, Inc.**

www.solarlightingitl.com
QY Frame - Miniature Circuit Breakers

Features:

- Hydraulic-magnetic technology ensures reduced nuisance tripping with temperature variance
- Always hold 100% rated current
- Wide range of time delays & operating currents
- Current limiting capabilities
- Ultra compact - 13 mm width module
- Din, Mini-rail or Dual mountable

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poles</td>
<td>1, 2</td>
</tr>
<tr>
<td>Max. Voltage</td>
<td>80 VDC</td>
</tr>
<tr>
<td>Max. Interrupting Capacity</td>
<td>10 kA</td>
</tr>
<tr>
<td>Current Rating</td>
<td>1 A to 100 A</td>
</tr>
</tbody>
</table>
| Agency recognition of Approvals | IEC 60947-2   
|                               | UL 489A                                             |
|                               | SANS VC8036                                         |

Solar Lighting International

Solar Lighting International, Inc. 7073 Henry Harris Road Lancaster, SC 29720 Phone +1 803-233-3461 Fax +1 803-233-2096
www.solarlightingitl.com
SLI, Inc. Maximum Power Point Tracking Charge Controller

Solar Lighting International, Inc.  Lancaster, SC 29720
Phone +1 803-233-3461  Fax +1 803-233-2096  www.solarlightingitl.com
CERTIFICATE

This is to certify that

Custom Manufacturing Services, Inc.
142 Brick Street
Princeton, WV 24740
United States of America

with the organizational units/sites as listed in the annex

has implemented and maintains a Quality Management System.

Scope:
The provision of custom metal fabrication and systems level integration of electro-mechanical assembly.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 9001 : 2008

Certificate registration no. 10000410 QM08
Date of original certification 1995-02-27
Date of certification 2015-07-17
Valid until 2018-07-16

UL DQS Inc.

Ganesh Rao
Managing Director

Certification Body: UL DQS Inc., 1130 West Lake Cook Road, Suite 340, Buffalo Grove, IL 60089 USA
Annex to Certificate
Registration No. 10000410 QM08

Custom Manufacturing Services, Inc.
142 Brick Street
Princeton, WV 24740
United States of America

Extended Location

10002998
Custom Manufacturing Services, Inc.
400 Rogers Street
Princeton, WV 24740
United States of America

Scope

The off-site at 400 Rogers Street, Princeton, WV performs the following primary functions: metal fabrication and assembly.

This annex (edition: 2015-07-17) is only valid in connection with the above-mentioned certificate.
Annex to Certificate
Registration No. 10000410 QM08

Custom Manufacturing Services, Inc.
142 Brick Street
Princeton, WV 24740
United States of America

<table>
<thead>
<tr>
<th>Extended Location</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>10002998 Custom Manufacturing Inc.</td>
<td>The off-site at 400 Rogers Street, Princeton, WV performs the following primary functions: metal fabrication and assembly.</td>
</tr>
<tr>
<td>400 Rogers Street Princeton, WV 24740 United States of America</td>
<td></td>
</tr>
</tbody>
</table>

This annex (edition: 2012-07-17) is only valid in connection with the above-mentioned certificate.