This document contains UL required installation instructions.

### Electrical Rating

<table>
<thead>
<tr>
<th>Condition</th>
<th>SRK160-S</th>
<th>SRK165-S</th>
<th>SRK170-S</th>
<th>SRK175-S</th>
<th>SRK180-S</th>
<th>SRK185-S</th>
<th>SRK190-S</th>
<th>SRK195-S</th>
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</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>160</td>
<td>165</td>
<td>170</td>
<td>175</td>
<td>180</td>
<td>185</td>
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<td>195</td>
</tr>
<tr>
<td>Power (W)</td>
<td>Tolerance of</td>
<td>+10% / -5%</td>
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<td></td>
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<tr>
<td>Open circuit voltage(V)</td>
<td>Voc</td>
<td>116</td>
<td>117</td>
<td>118</td>
<td>119</td>
<td>120</td>
<td>121</td>
<td>122</td>
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<tr>
<td>Short circuit current(A)</td>
<td>Isc</td>
<td>2.14</td>
<td>2.15</td>
<td>2.16</td>
<td>2.17</td>
<td>2.18</td>
<td>2.19</td>
<td>2.21</td>
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<tr>
<td>Voltage of maximum power point</td>
<td>Vmp</td>
<td>83.1</td>
<td>85.7</td>
<td>87.8</td>
<td>90.2</td>
<td>92.4</td>
<td>95.0</td>
<td>97.1</td>
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<tr>
<td>Current of maximum power point</td>
<td>Imp</td>
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<td>1.99</td>
<td>1.94</td>
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<tr>
<td>Insulation</td>
<td>1250V, 25°C, AM1.5</td>
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<td></td>
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</tbody>
</table>

*The electrical characteristics are within 10% of the measured values at Standard Test Conditions (STC) of 1000 W/m², cell temperature of 25°C, and AM of 1.5 spectrum. The stated maximum power reflects both the initial measured value at the plant and stabilized performance of the product within the stated tolerance of +10% / -5%.

### System Design

- **Maximum system voltage**: Vsys - 1500 V (IEC/UL), 1000 V (c/UL)
- **Limiting reverse current**: Ir - 7A
- **Maximum series fuse rating**: Isf - 4A

### Mechanical Data

- **Dimensions** (L x W x H): 1.257 x 977 x 35 mm
- **Weight**: 18.5 kg (40.8 lbs)
- **Module operating temperature**: -40°C to 85°C
- **Application class on IEC61730**: Class A
- **Fire safety class on IEC61730**: Class C
- **System Fire Class Rating on UL1703**: Class A

### General Safety

- **Be sure to conform to all relevant local and national laws, regulations and codes when installing, wiring, operating and maintainingSolar Frontier PV modules.** (hereafter referred to as PV modules).
- **Installation, wiring, and maintenance of PV modules must only be carried out by licensed and trained persons.**
- **Artificially concentrated sunlight shall not be directed on the PV module.**
- **The front surface of PV modules must always be covered with an opaque material during installation to decrease the potential of electric shock.**
- **Do not disconnect operational PV modules or electrical arcing may occur. This may result in serious bodily harm or death.**
- **The PV module packaging is not waterproof material.** Keep the junction box and the PV module connector away from any liquids when storing and transporting PV modules.
- **Wear appropriate protection and take all necessary precautions to prevent electric shock, especially when DC voltage exceeds 30VDC.**
- **Only interconnect PV modules with similar electrical characteristics in series or in parallel to prevent system imbalance conditions and module damage.**
- **Do not install PV module in areas expose to oil vapor, corrosive and flammable gases or fire.**
- **Avoid accumulation of grit or dust on the PV modules as it may influence the output yield.**
- **Do not disassemble or modify or stress PV modules.**
- **Ensure that all instructions and information related to PV modules and other balance of system components are fully understood prior to handling and installing a PV solar system.**
- **Do not use PV modules for purposes other than terrestrial power generation to prevent electrical shock, fire or other accidents.**
- **Do not use any light sources other than natural sunlight and general illumination for power generation.**
- **Only use equipment, connectors, wiring and support frames suitable for PV modules.**

### Mechanical Installation

- **The PV module is considered to be in compliance with UL 1703 only when the PV module is mounted in the manner specified by the mounting instructions below.**
- **Please refer to further instructions provided by the clamp, bolt, and screw manufacturer.**
- **Keep clear of at least 100mm between the PV modules and the roof to allow cool air to circulate around the back of the PV module. This also allows condensation to dissipate.**

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**Disclaimer**

This installation instruction is the proprietary information of Solar Frontier K.K. (hereafter referred to as Solar Frontier). This installation instruction is provided as required by UL. This document does not validate Solar Frontier’s Limited Warranty Certificate for PV modules. Solar Frontier will not assume any liability for damage arising from improper use, installation, operation or maintenance. Solar Frontier reserves the right to make amendments to the contents of this document without prior notice. For additional queries, please contact your local supplier or Solar Frontier directly.
Mounting with Clamps
a) Mounting with clamps – PV module perpendicular to support rails:
  4 clamps shall be secured within 256mm±5mm distance from the corner of the
  longer module frame.
  b) Mounting with clamps – PV module parallel to support rails:
  4 clamps shall be secured within 256mm±7mm distance from the corner of the
  longer frame. The width of overlap between PV module and rail shall be 10
  mm (0.4 in) minimum.

Specification of clamp and bolt used for (d) and (e) shall be as below.
- Mid Clamp: Aluminum, length of minimum 30mm, height of 33mm, bottom
  width of 19mm, minimum 3mm thick, width of capture area is 8mm
  minimum. The distance from the center of bolt-hole and the edge of the
  clamping side is 9.5mm.
- End Clamp: Aluminum, length of minimum 30mm, height of 35mm (from
  underside of top of clamp to bottom of clamp), bottom width of 20mm,
  minimum 3mm thick, width of capture area is 8mm minimum. The distance
  from the center of bolt-hole and the edge of the clamping side is
  10mm.
- Bolt: Stainless-steel M8 bolts with a minimum length of 20mm.

Recommended tightening torque is 12.5 N-m minimum

- Clamps must not create shadow nor cover the front glass, and shall not deform
  the module frames during installation.

Example: Module Parallel to Support Rails

256mm

745mm

Electrical Installation

- Under normal conditions, a photovoltaic module may experience conditions that
  produce more current and/or voltage than reported at Standard Test Conditions.
  The requirements of the National Electrical Code (NEC) in Article 690 shall be
  followed to address these increase outputs.
- In the installations not under the requirements of the NEC, the values of max
  Voc marked on the PV modules shall be multiplied by a factor of 1.25 when
  determining component voltage ratings, conductor ampacities, overcurrent device
  ratings, and size of conductors connected to the PV module output.
- Avoid installation when PV modules, installation tools, or installation area are
  exposed to water or other liquids. If the connectors are covered with a connector
  cap, remove and discard only when connectors are mated during installation.
- Wiring should be in accordance with the NEC, and that the grounding method of
  the frame of arrays shall comply with the NEC, article 250.
- Installation shall be in accordance with CSA C22.1, Safety Standard for Electrical
- The PV array open-circuit voltage must never exceed the maximum system voltage
  (including in low temperature conditions).
- PV modules installed in parallel will be provided with the specified maximum series
  fuse.
- Minimum cable diameter: 2.5mm².
- The sum of Voc of PV modules in series must not exceed the maximum system
  voltage of the PV module under any condition.
- Do not connect the PV modules directly to loads such as motors. Variation in output
  power may damage the motor.
- Cables should be adequately protected from damage by wildlife.

Grounding
The PV module with exposed conductive parts is considered to be in compliance with
UL703 only when it is electrically grounded in accordance with the instructions
presented below and the requirements of the NEC.

- Verify necessary grounding requirements prior to installation. Your local authorities could help you
  further.
- Grounding holes (4mm²/0.15in) with a grounding mark are provided on each longer module frame
  to accommodate grounding.
- For a reliable grounding connection to the module frame, combination of a stainless steel cupped
  washer and a #6 bolt and nut (recommended tightening torque of 1.0N-m). Use a copper grounding wire
  no less than 2mm (14AWG) with a temperature rating of -40° to 85°C (-40° to 185°F).

- Module frames and other system components shall be connected to an earth ground for
  lightning protection, in accordance with local, and national standards and regulations. Install any
  other appropriate lightning protection tools as needed.

Electrical Wiring

- Do not open the junction box on the back side of the PV module.
- Fasten module cables to the frame or to the mounting system in order to avoid any
  dropping of the cable or other potential stress to the connectors.
- Cables should be secured so they are not exposed to direct sunlight (such as behind the
  PV module).

Operation

- Prior to connecting the PV system to the grid, make sure the entire system has been
  checked, tested and approved in accordance with the applicable regulations.
- Depending on local regulations and utility policies, connection to the grid and start up
  of the PV system may only be performed by authorized personnel.

Maintenance

- Periodic visual check is highly recommended in order to maintain the efficiency of PV
  modules and the security of the mounting.
- Remove any dirt, fallen leaves or bird droppings from the surface of PV modules.
  If necessary, please use soft cloths or sponges. Avoid use of hard or abrasive objects.
  Please consult with Solar Frontier in advance before using detergents or chemicals for cleaning.
- When replacement parts are required, be sure to use parts specified by the
  manufacturer.
- Stop using PV modules when any damage or unusual phenomena are observed. Have
  them immediately replaced or removed by a qualified technician.
- Clean PV modules only when in open circuit or when the inverter is not operational.
  To minimize the risk of electric shock and power production loss, it is recommended that
  cleaning be conducted in low light conditions, such as between dusk and dawn.

Disposal

- PV modules must be disposed of in a responsible manner. Please contact your local
  supplier or disposal company for further information. For health and safety reasons, PV
  modules should not be disposed of with household garbage, and must be dealt with in accordance with
  local codes and regulations.
- Solar Frontier is a member of PV Cycle, marking its commitment to the environment
  and public safety. PV Cycle’s initiatives can be found at: http://www.pvcycle.org/