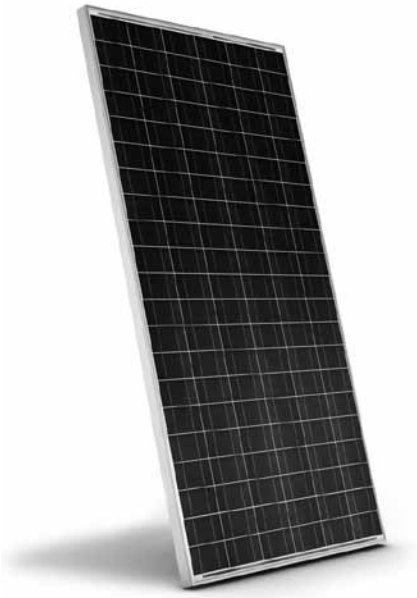
Sovello Pure Power Module
T series / L series

Installation and Operation Manual

T series – High voltage



L series – Low voltage

Sovello Pure Power Module
SV-T-Series / SV-L-Series
Installation and Operation Manual

ENGLISH

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1 Introduction

1.1 About this manual

This manual has been developed in order to ensure that Sovello modules can be installed and used as easily and as safely as possible.

Furthermore, this manual also gives you clear instructions on how to mount the Sovello modules, thereby ensuring that all relevant certification and regulatory requirements, together with the Sovello conditions of warranty, are adhered to.

Before you begin installing, connecting up, operating and maintaining the module, first make sure that you have read and understood all of the installation and safety instructions.

If products in the SV-T and SV-L series are not installed according to the instructions set out in this manual or are used improperly, the warranty is rendered invalid.

We remain committed to pushing forward with innovative work, research activities and the continual improvement of our products. With this in mind, we retain the right to make changes to the information detailed in this manual without prior notification in future versions of the manual.

You might receive this document in several languages. Should any differences arise between various versions, the German version is authoritative in all cases.

During installation, be sure to observe all local, regional, national and international legal provisions, directives, norms and regulations.

The modules may only be installed and maintained by licensed, qualified experts.

1.2 Target group

This manual is aimed at qualified professionals.

1.3 Product identification

All the instructions contained in this manual referto photovoltaic modules of the SV-T and SV-L series by Sovello. They do not apply to other Sovello products or to products from other manufacturers.

1.4 Declaration of conformity

You can access the declaration of conformity of the this product to the corresponding EU directives under the category Products / Certificates on our website www.sovello.com.

1.5 Disclaimer of liability

Sovello accepts no liability for any losses, damages, injuries or costs that arise when installing, operating, using, maintaining or otherwise interacting with the module if the cause was due to the non-adherence to the provisions of this installation and operating manual and the of the conditions and procedures when installing, operating, using and maintaining the module. Sovello does not accept any responsibility for infringements of a patent or any other breah of third-party rights which may arise by the user operating the module in an improper way. Utilisation of the module does not carry any implicit or other form of licence grant pursuant to any patent or patent law. The information contained in this manual is based on Sovello's knowledge and experience and are deemed to be reliable as they are subject to regular checks.

However, Information, product specifications (without limitations) and suggestions constitute neither explicit nor implicit guarantees. Sovello retained the right to make changes to its product, spezifications or to this manual without any prior notification.

1.6 Meaning of the symbols used

Danger!
Danger to life by electric shock in case of non-adherence

Danger!
Danger to life or health risks in case of non-adherence

Warning!
Damage to property in case of non-adherence

Note:
Useful or additional information

1.7 Safety advice

General hazard warnings to avoid electrocution!

Note the following hazard warnings and adhere to them:

- Sovello SV-T and SV-L series photovoltaic modules (PV/solar power modules) generate direct current when exposed to sunlight, even if they have not yet been connected. Touching live parts with a direct current of 30 V or more can result in burns, sparks or death by electrocution.

- If the DC voltage in the system exceeds a total of 120 V, the electrical installation, activation and maintenance of the device must be carried out by a licensed electrician provided that the local regulations covering the handling of electrical systems do not stipulate otherwise.
- Ensure that no children or unqualified people are close to the system or the modules during installation.
- Note the safety measures pertaining to other components used.

General hazard warnings to avoid damaging your heath!

Note the following hazard warnings and adhere to them:

- Do not carry out installation work in rain, snow, ice or strong winds.

General advice to to avoid damage to property!

Note the following hazard warnings and adhere to them:

- Avoid bundling light rays and directing them to the module.
- Ensure that modules are only subjected to ambient temperatures in the range of -40 °C to +80 .
- Modules are not intended for indoor use or application on moving vehicles of any kind. Excluded applications also include installations where modules come into contact with salt water or where they are likely to become partially or wholly submerged in fresh or salt water, such as boats, harbours and buoys.
- Ensure that modules are not subjected to wind or snow loads in excess of the maximum permissible loads and are not subjected to excessive forces due to thermal expansion of the support structure.
- Do not use the modules near equipment or in locations where explosive gases can be generated or can accumulate.
- Do not disassemble, modify or adapt the module or remove any part or labelling attached by Sovello. Doing so will void the warranty.
- For roof-mounted systems, provide adequate rear ventilation under the module to permit cooling (minimum 100 mm gap).
- For roof application, the module should be mounted over a fire-resistant coating (or surface) approved for the application.
- It may be necessary to use components such as ground-fault current circuit breakers, fuses and charging switches.
- The modules must be securely fastened using supporting frames or mounting kits for PV applications.
- Use only equipment, connectors, wiring and and support frames that are suitable for use in a photovoltaic system.

1.8 General information

Note:
The following information makes installation easier for you and may result in a higher output for the system.

Every module is marked with a serial number which includes the date and location of manufacture.

Example: XXxx-YYYYMMDDzzzzzzz
- **XX** = country code (49 for Germany)
- **xx** = Manufacuring location code, can be 01 or higher
- **YYYY** = year, **MM** = month, **DD** = day
- **zzzzzzz** = serial number

- The modules should be mounted to maximize direct exposure to sunlight (south-facing) and eliminate or minimise shadowing (e.g. from buildings, trees, etc). even partial shadowing can greatly reduce module and system output.
- The optimum tilt angle of the modules is about 30° in Central Europe (somewhat steeper in northern Europe, somewhat flatter in southern Europe). Any deviation reduces the energy output of the system.
- The modules may be mounted at any angle from vertical to horizontal orientation. Avoid tilt angles of less than 10° because otherwise dirt will accumulate on the glass surface and be held back by the frame. Dirt accumulated on the module surface can cause active solar cells to be shaded, thereby reducing the electrical output. Contact Sovello for more information on the recommended tilt angles.

2 Mechanical installation

Danger!
Observe the current safety regulations for working with direct current. The modules are always live when exposed to light. Any contact with live module parts, such as terminals may result in burns, sparking and fatal electrical shocks. This also applies even if the module is not connected.

Danger!
Work only under dry conditions and use protective gloves.

Danger!
A module with broken glass or cracked back-skin cannot be repaired and must not be used because contact with the mdoule surface or the frame support can produce an electric shock.

Danger!
Broken or damaged modules must be handled carefully and disposed of properly. Broken glass may have sharp edges and cause injury if not handled with appropriate protective equipment.

Warning!

- The modules must be handled carefully. Do not set the module down hard on any surface. Be particularly careful when placing it on a corner.
- When stored outdoors for a short period of time, make sure the glass ides are laid face down and the modules are covered. This prevents the accumulation of water on the module and damage being down to the exposed connector.
- Do not use the junction box to hold or transport the module.
- Do not stand or step onto the module.
- Do not drop the module or allow objects to fall on it.
- Do not damage or scratch the rear surface.
- The modules are to be handled like glass products. The are not suitable for walking on.

Warning!
A clearance of min. 7 mm must be provided between the modules to allow for thermal expansion of the frames.

The modules may be mounted horizontally or vertically, provided that one of the mounting methods detailed here is used.

If you want to use any installation techniques that are not described here, please consult Sovello to obtain permission. Failure to do so will void the warranty and module certification.

Warning!
Always follow the mounting equipment manufacturer's installation guide in addition to the instructions given in this document.

In cases were the manufacturer's instructions are more stringent than those in the installation manual, the manufacturer's instructions shall apply. In cases where the maximum permissible loading determined by the mounting equipment manufacturer is less than the maximum permissible load stated here, the maximum load indicated by the manufacturer shall be binding.

The maximum load applies to uniformly distributed wind or snow loads. Care should be taken to avoid installing modules in areas prone to drifting snow, icicles and/or ice dam formaction.

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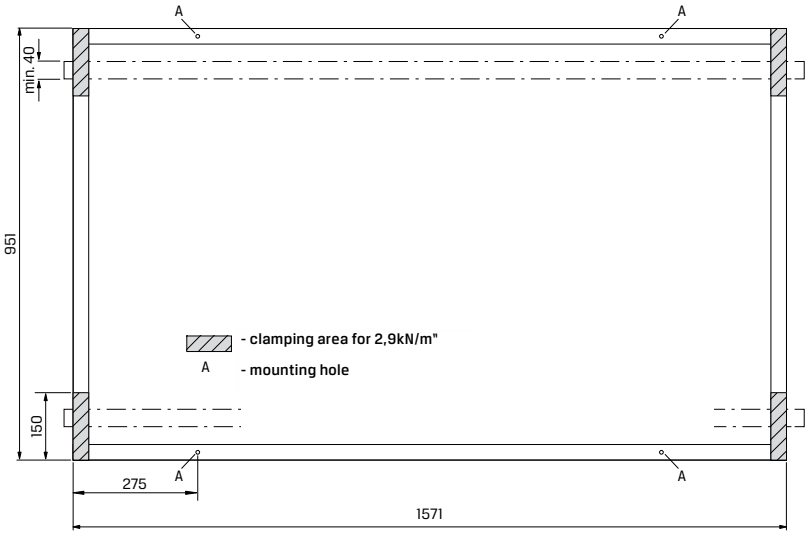
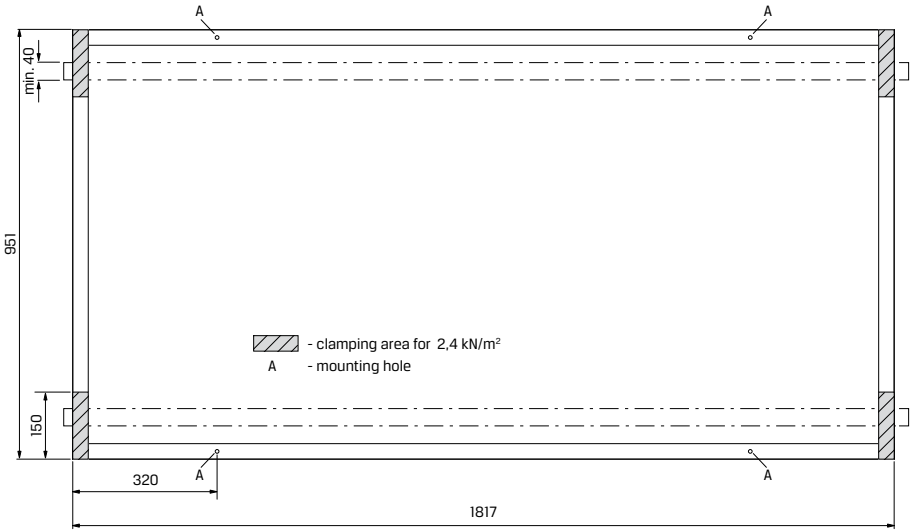
Subconstruction: 2 profiles parallel to the long side Mounting is only permitted in the shaded area or using the mounting holes.

SV-T series



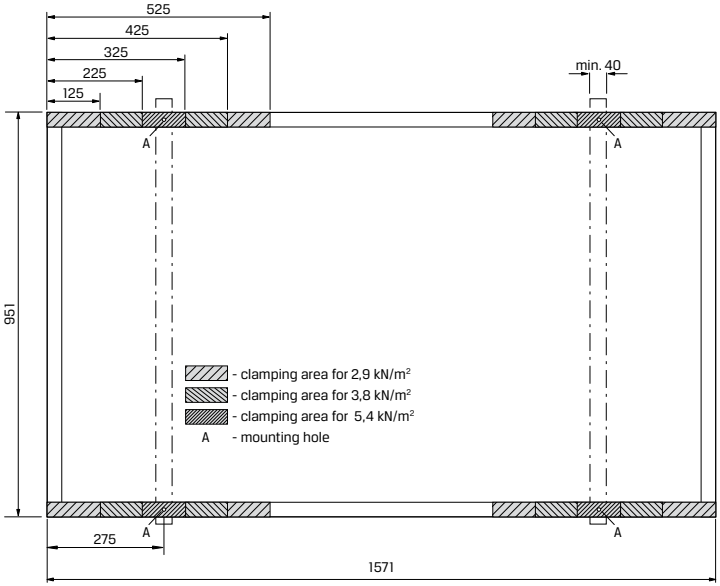
SV-L series



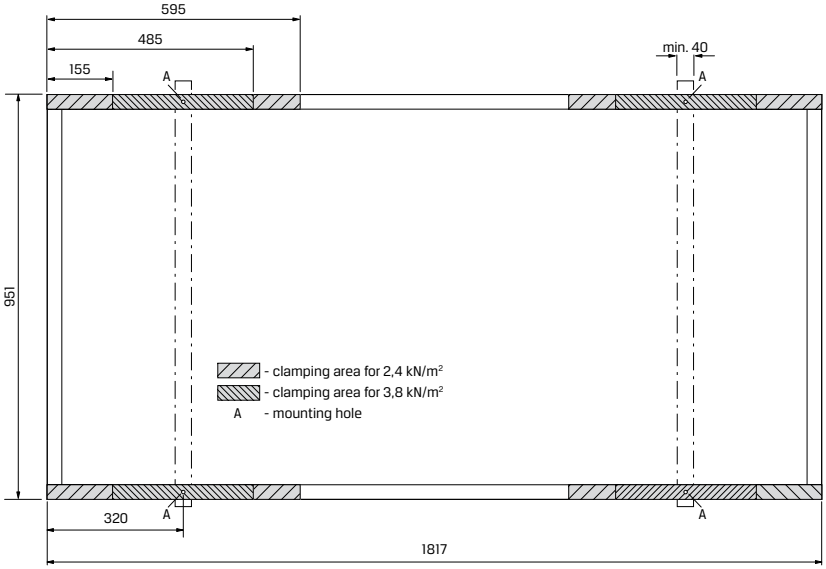
Subconstruction: 2 profiles parallel to the shorter side

Mounting is only permitted in the shaded area or using the mounting holes. Various areas can be used for the profiles. The maximum permissible snow load is given by the profile in the area for the lower load.

SV-T series



SV-L series



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2.1 Mounting using the clamp system (see images on the previous pages)

The modules are mounted using clamps at four points on the mounting system profiles. The profiles can be mounted parallel to the long or short module sides. The important thing is the module may only be fastened in the clamp areas highlighted in the drawing. The maximum permissible snow load depends on the clamping area used and may be derived from the figure. The clamps used must be at least 40 mm wide and overlap the frames by at least 5 mm on the front side. You may not touch the front glass or deform the frames. The maximum permissible wind load is 2.4 kN/m² for all clamping areas.

2.2 Mounting using the mounting holes (see images on the previous pages)

Alternatively, the modules can also be screwed onto the mounting profiles using the mounting holes in the module frame. The profiles can be mounted parallel to the long or short module sides. All four mounting holes must be used to mount the module. The positions of the mounting holes **"A"** are to be taken from the figures. Their diameter is 6.6 mm for use by 6 mm bolts / screws.

Do not use the grounding holes (4 mm) or the drainage holes to fasten the modules. Do not use any other mounting holes in the frames; only use the factory-installed mounting holes.

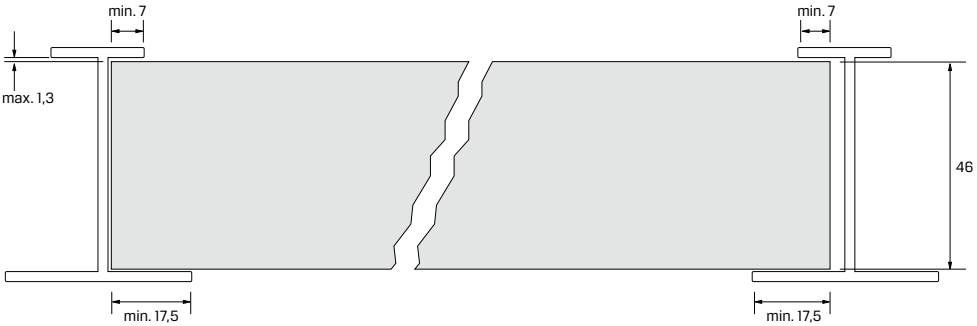
Wind load	2.4 kN/m² (for T and L)
Snow load	5.4 kN/m² for SV-T 3.8 kN/m² for SV-L

2.3 Mounting in case of insertion systems (see image below)

The modules can also be used in click-in systems. The minimum overlaps detailed in the drawing are to be adhered to.

The maximum permissible snow load is

when mounted on the short sides:	5.4 kN/m²
when mounted on the long sides:	2.9 kN/m² for SV-T 2.4 kN/m² for SV-L
Maximum permissible wind load:	2.4 kN/m²



3 Electrical installation

3.1 Planing and design

Do not use modules of different electrical or physical configurations in the same system.

Use system wiring with suitable cross-sectional areas and connectors that are approved for use at the maximum short-circuit current of the module.

When reverse currents can exceed the value of the maximum protective fuse marked on the back of the module, a properly rated and certified over-current device (fuse or circuit breaker) must be connected in series with each module or string of modules. The rating of the over-current device shall not exceed the value of the maximum protective fuse marked on the back of the module.

The module contains factory-installed bypass diodes located inside the junction box. The junction box may not be changed during installation and should not be opened under any circumstances. If done so, the warranty of the module will become null and void.

Specifications required pursuant to IEC-61730

- Sovello modules of the SV-T series / L are qualified for Application Class A.
- Modules certified for Application Class A can also be used in systems operated with a DC of more than 120 V in generally accessible environments. The indicated maximum system voltage of 1,000 V has to be observed, however.
- Modules of Application Class A that fulfil norm IEC-61730 also meet the requirements of Safety Class II.
- Under normal operating conditions, it is likely under certain conditions that the current and/or voltage generated by the PV module /exceeds the values determined under standard test conditions. Therefore, the values of the short-circuit current (Isc) and open-circuit voltage (Uoc) should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor capacities, fuse sizes and size of controls connected to the PV output.
- Conductor recommendations: single conductor cable, type USE-2 (non-conduit).
- Maximum number of series and parallel module configurations: Without an over-current fuse connected in a series for each string, a maximum of three paralell strings can be operated. When a correctly designed and certified over-current fuse is connected in series in each string, four or more strings can be operated in parallel.

Underwriters Laboratories and Canadian Standard ULC/ORD – C1701-01 Information:

- Under normal conditions, a photovoltaic panel is likely to experience conditions that produce more current and/or voltage than reported under standard test conditions. Accordingly, the Isc and Voc values marked on the module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor capacities, fuse sizes, and size on controls connected to the PV output.
- Refer to section 690-8 of the National Electric Code (NEC) for additional multiplying factors of 125 % (80 % de-rating) which may be applicable.
- Conductor recommendation: single conductor cable, type USE-2 (non-conduit), 10AWG (min. 6 mm^2).
- For compliance with the provisions set out in Canadian Standard ULC/ORD-C1703-1, the installation shall be in accordance with CSA-C22.a, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1.
- The cables and sockets are UV-resistant. Be aware that, once the module has been turned on, the cables and sockets are to be stored behind the module in such a way that they are not subject to the damaging effects of direct sunlight.

3.2 Installation

Danger!

- The modules may only be installed and maintained by licensed, qualified experts. Observe the current safety regulations for working with direct current.
- The modules are always live when exposed to light. Any contact with live module parts, such as terminals may result in burns, sparking and fatal electrical shocks.
- Photovoltaic modules have no on / off switch. They can only be rendered inoperative by removing them from light.
- Do not touch the electrical terminals or ends of any wire while installing the module or while the module is exposed to light.
- Never disconnect electrical connections or unplug connectors while the module is in a closed circuit because it may produce an electric arc that is not self-extinguishing.
- Only use insulated tools and rubber gloves approved for working in electrical installations.

Warning!

- Match the polarity of cables and terminals when making connections. Failure to do so may damage the module.
- Modules with a suspected electrical problem should be returned to Sovello for inspection and repair respectively in accordance with the warranty conditions.
- All Sovello modules are equipped with factory-installed wires and connectors. They have been designed to be easily connected in series. Sovello modules of the SV-T series are equipped with Multi-Contact® type 4 click-connectors or compatible.
- Note that indicated protective system of the connector is only applicable when in a connected state. Therefore avoid any penetration of water.

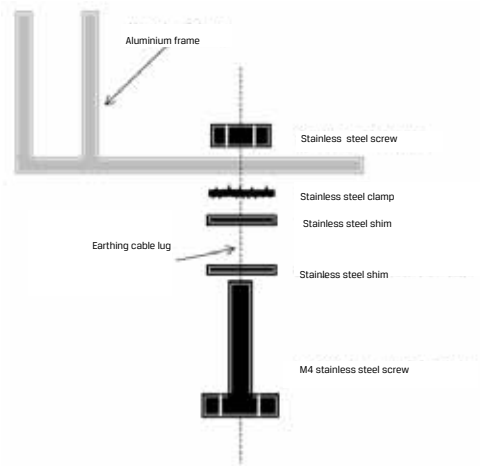
3.3 Grounding the module frame

Sovello does not require the grounding of module frames for functional, electrical reasons. Local or national regulations may, however, require the frame grounding. Frame grounding may also be required for lighting / over-voltage protection.

Module frames should be connected to a grounding for safety reasons in order to protect them from lightening. The module frames are fitted with grounding holes that accommodate self-tapping screws. We recommend using A#10-32 stainless steel thread cutting screws.

The modules can be grounded through the 4.0 mm diameter holes integrated in the frame. The grounding cable can be fixed to the module using a screw (size M4) and stainless steel washers (see figure below). The size of the grounding cable and the grounding technique must be in compliance with the local regulations.

It is possible to gound Sovello modules with grounding plates or clamps from other manufacturers; however, this is on the condition that these are officially suited to grounding metal frames of PV modules and that they have been installed in line with the installation instructions of the manufacturer.



Note:
No electrical grounding is required for Sovello modules. Electrical grounding may however be installed and must always exist in the event that this is required by specific local or national regulations.

4 Operation and Maintenance

Danger!
For safety reasons, checking and maintenance should be performed by qualified personnel only.

Danger!
Always wear rubber gloves for electrical insulations whilst maintaining, washing or cleaning modules to protect yourself from electrical shocks.

Warning!
Never use aggressive or abrasive cleansers or chemicals to clean the coated glass.

No routine maintenance is required. A periodic inspection of the modules for any damage to the glass, back-skin, frame, junction box or external electrical connections is however recommended.

Check the electrical connections for loose connections and corrosion.

Except in cases of heavy and large-area contamination (e. g. wet leaves, bird droppings) PV modules can operate efficiently without ever being washed, although the removal of dirt from the glass surface can increase output.

Water can be used for regular washing or rinsing of the coated front glass to remove dust, dirt or other deposits. To removed ingrained dirt, the coated glass can be washed with a micro-fibre cloth and ethanol or a commercially available glass cleaner.

5 Limited Warranty

Material or Workmanship

Sovello AG (hereinafter: We) warrants the modules (hereinafter: the product) starting with serial number 49XX20111001XXXXXXX (production since Oct. 2011) or with a delivery date of 1.10.2011 onward to the initial customer are free from defects in material or workmanship under normal application, installation, use and service conditions. If the product fails to conform to this warranty, then for a period ending ten (10) years from date of sale to the original purchaser, we will, at our own choice, either repair or replace the product or refund the purchase price. The repair, replacement or refund remedy shall be the sole and exclusive solution provided under this warranty.

»Original consumer purchaser« means the person who first purchased the product covered by this warranty other than for the purpose of resale.

Power output

One year from the date of sale to the original consumer purchaser, the power rating of the Sovello modules will remain at least at 99% of our Minimum Specified Power Rating. We furthermore warrant that from the second year after the date of sale to the original consumer purchaser and for a period of 24 years, the maximum annual degradation will be 0.58 % of our Minimum Specified Power Rating i.e. the power rating will remain at least at 80% of our Minimum Specified Power Rating after 25 years.

In the event of product degradation below the guaranteed minimum output, we will, at our own choice, repair, or replace the product, refund the purchase price, or provide the purchaser with additional modules to make up lost power, provided that such degradation is determined to be due to defects in materials or workmanship under normal installation, application, and use. The relevant Minimum Specified Power Rating is defined in our product data sheet at the time of shipment. Standard Test Conditions are irradiance of 1,000 W/m², 25 °C cell temperature, and AM 1.5 light spectrum.

Limitations and Conditions

The remedy set forth in these limited warranties shall be the sole and exclusive remedy provided under the extended term warranty, unless otherwise agreed by us in writing. In Germany, these limited warranties are neither a guarantee of the quality of the module pursuant to § 443 BGB (German Civil Code) nor are they an acceptance of a guarantee pursuant to § 276 BGB. The limited warranties set forth herein do not apply to any module which in our sole judgment has been subjected to misuse, neglect, or accident; has been damaged through abuse, alteration, improper installation or application, or negligence in use, storage, transportation, or handling; or has in any way been tampered with or repaired by anyone other than us or our agent.

The limited warranties do not cover costs associated with module installation, removal, testing, packaging, transportation, or reinstallation; other costs associated with obtaining warranty service; or costs, lost revenues, or lost profits associated with the performance or nonperformance of defective modules covered by this warranty. Any modules repaired, replaced or provided by us under a warranty claim shall only be covered by the same warranties and original term as the first product purchased

under the said claim. Any replaced parts or products become the property of us. These limited warranties apply only to the first end-user purchaser of the modules or to any subsequent owners of the original building or site where the modules were first installed.

The limited warranties set forth herein are expressly in lieu of and exclude all other express or implied warranties, including but not limited to warranties of merchantability and of fitness for particular purpose, use, or application and all other obligations or liabilities on our part, unless such other warranties, obligations or liabilities are expressly agreed to in writing signed and approved by us.

As far as legally permissible, we shall have no responsibility or liability whatsoever for damage or injury to persons or property, or for other loss or injury resulting from any cause whatsoever arising out of or related to the product, including, without limitation, any defects in the module, or from use or installation. Even in the event of liability decreed by law, we shall be liable for incidental, consequential, or special damages not typically expected.

Our aggregate liability, if any, in damages or otherwise, shall not exceed the payment, if any, received by seller for product furnished, which is the subject of claim or dispute.

Applicable Law

Any claim or dispute regarding these warranties shall be governed by and construed in accordance with German law without respect to conflict of law principles.

Contract retention

If one or more or the terms of this limited warranty is held invalid, void, or unenforceable, the validity of the remaining terms shall remain unchanged and unaffected. The term concerned shall be amended or replaced to an effect which represents the original commercial and legal spirit of the term. In the even that this limited warranty has loopholes are that situations arise during its application that were not but need to addressed, the parties shall agree on a fair and legally permissible term to remove the loophole or to resolve the situation, which is a true and fair reflection of the original intentions of this limited warranty, if the loophole had already been identified or the situation to be rectified had been predicted

Neither party shall be in any way responsible or liable to the other party, or to any third party, if the limited warranty cannot be carried out or it is delayed because of:

a. force majeure, war, terror, civil disorder, strikes,
b. unavailability of suitable and sufficient labout or
c. any other unforeseen event beyond its control.

This also applies to any technological or physical event or condition which is not reasonably known or understood at the time of sale.

Assertion of claims

If you feel you have a claim covered by warranty, you must promptly notify the dealer who sold you the module of the claim. The dealer will give advice handling the claim. If further assistance or information is required, please address your request to us directly in writing.

Implementation

You may only make a claim from this warranty in writing. In doing so, please inform us where, when and from whom you purchased the product, together with the product serial number and the defect you believe the product has. We will require you to return the defective product to us at your expense. If product is determined to be defective and is replaced but is not returned to us, then the customer must submit adequate evidence that such product has been destroyed or recycled.

Electrical Nominal Values

Standard Test Conditions (STC)[1]

		SV-T-190	SV-T-195	SV-T-200	SV-T-205
		High Voltage Configuration			
Nominal Power[2]	W	190	195	200	205
Output Tolerance	W	0/+5	0/+5	0/+5	0/+5
P_{mpp}, max.	W	194.9	199.9	204.9	209.9
P_{mpp}, min.	W	190.0	195.0	200.0	205.0
Module Efficiency	%	12.7	13.1	13.4	13.7
U_{mpp}	V	26.7	27.1	27.5	27.9
I_{mpp}	A	7.12	7.2	7.28	7.36
U_{oc}	V	32.8	32.9	33.2	33.1
I_{sc}	A	8.05	8.15	8.25	8.35

Nominal Operating Cells Temperature Conditions (NOCT)[3]

T NOCT	°C	45.2	45.2	45.2	45.2
P_{max}	W	138.8	142.5	146.1	149.8
U_{mpp}	V	24.4	24.8	25.1	25.5
I_{mpp}	A	5.68	5.74	5.80	5.87
U_{oc}	V	30.3	30.4	30.6	30.6
I_{sc}	A	6.52	6.60	6.68	6.76

[1] STC: 1,000 W/m² irradiance on module level, module temperature 25 °C and spectral distribution of irradiance acc. to Air Mass 1.5
[2] Power rating at standard test conditions (STC)
[3] NOCT: Equilibrium temperature at 800 W/m² irradiance on module level, air temperature 20 °C, wind velocity 1 m/s

Temperature Coefficients

γ P_{mpp}	(%/°C)	-0.45
β U_{mpp}	(%/°C)	-0.42
α I_{mpp}	(%/°C)	-0.03
β U_{oc}	(%/°C)	-0.33
α I_{sc}	(%/°C)	0.06

System Design

Maximum countercurrent flow	18 A
Maximum system voltage	1,000 V

Poor lighting conditions

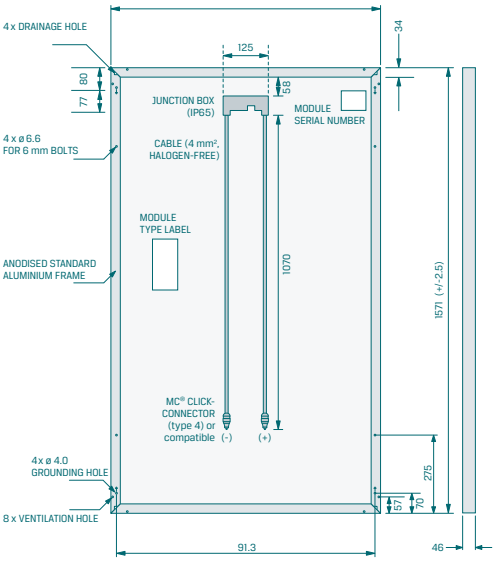
In case of an irradiance of 200 W/m² and a module temperature of 25 °C, the reduction of the relative level of efficiency will be less than 4 % with regard to STC conditions.

Mechanical Stability

High level of guaranteed durability in wind and snow up to 5.4 kN/m².

ELECTRICAL EQUIPMENT
CHECK WITH YOUR INSTALLER

Mechanical Specifications



All dimensions in mm; module weight 17.4 kg.

This product was manufactured using the following materials: 108 polycrystalline silicon solar cells, anti-reflective tempered solar glass, EVA encapsulant, polymer back-skin, and a double-walled, anodized aluminum frame. The product packaging has been tested in accordance with standard ASTM D4169 Assurance Level 2. All specifications in this product data sheet conform to EN 50380. For more information on the approved installation and use of this product, please see the Sovello safety, installation, and operating manual.

Due to continuous innovation, research, and product improvement, the specifications in this product information sheet are subject to change without prior notice. No legal claims may be made based on this product data sheet. Sovello assumes no liability with regard to the use of the information found here or the consequences thereof.

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SV-T-Series / SV-L-Series
Installation and Operation Manual

Standard Test Conditions (STC)[1]

		SV-L-225	SV-L-230	SV-L-235	SV-L-240
		Low Voltage Configuration			
Nominal Power[2]	W	225	230	235	240
Output Tolerance	W	0/+5	0/+5	0/+5	0/+5
P_{mpp}, max.	W	229.9	234.9	239.9	244.9
P_{mpp}, min.	W	225.0	230.0	235.0	240.0
Module Efficziency	%	13.2	13.5	13.7	14.0
U_{mpp}	V	20.3	20.4	20.5	20.5
I_{mpp}	A	11.18	11.39	11.60	11.81
U_{oc}	V	25.4	25.5	25.7	25.8
I_{sc}	A	11.90	12.05	12.19	12.33

Nominal Operating Cells Temperature Conditions (NOCT)[3]
[3]

T NOCT	°C	45.2	45.2	45.2	45.2
P_{max}	W	166.2	169.9	173.5	177.2
U_{mpp}	V	18.6	18.7	18.7	18.8
I_{mpp}	A	8.92	9.08	9.25	9.42
U_{oc}	V	23.5	23.6	23.7	23.8
I_{sc}	A	9.65	9.76	9.88	10.00

[1] STC: 1,000 W/m² irradiance on module level, module temperature 25 °C and spectral distribution of irradiance acc. to Air Mass 1.5
[2] Power rating at standard test conditions (STC)
[3] NOCT: Equilibrium temperature at 800 W/m² irradiance on module level, air temperature 20 °C, wind velocity 1 m/s

Temperature Coefficients

γ P_{mpp}	(%/°C)	-0.45
β U_{mpp}	(%/°C)	-0.42
α I_{mpp}	(%/°C)	-0.03
β U_{oc}	(%/°C)	-0.33
α I_{sc}	(%/°C)	0.06

System Design

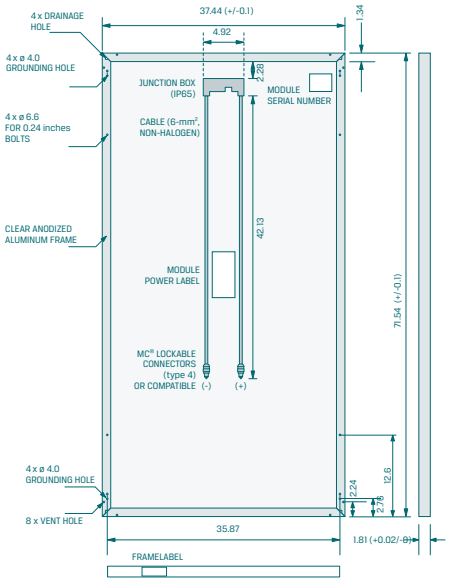
Maximum countercurrent flow	30 A
Maximum system voltage	1.000 V

Poor lighting conditions

In case of an irradiance of 200 W/m² and a module temperature of 25 °C, the reduction of the relative level of efficiency will be less than 4 % with regard to STC conditions.

ELECTRICAL EQUIPMENT
CHECK WITH YOUR INSTALLER

Mechanical Specifications



All dimensions in inches; module weight 44.31 lbs.

This product was manufactured using the following materials: 126 polycrystalline silicon solar cells, anti-reflective tempered solar glass, EVA encapsulant, polymer back-skin, and a double-walled, anodized aluminum frame. The product packaging has been tested in accordance with standard ASTM D4169 Assurance Level 2. All specifications in this product data sheet conform to EN 50380. For more information on the approved installation and use of this product, please see the Sovello safety, installation, and operating manual.

Due to continuous innovation, research, and product improvement, the specifications in this product information sheet are subject to change without prior notice. No legal claims may be made based on this product data sheet. Sovello assumes no liability with regard to the use of the information found here or the consequences thereof.

Sovello Pure Power Module
SV-T-Series / SV-L-Series
Installation and Operation Manual

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