

The 2015 colorful diversity of GridParity and Almaden products

World's best Glass-Glass PV-Modules

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load capacity - 450kg per qm



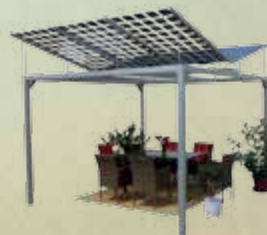
Innovative Carport Systems

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Large PV Parking Lots

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Patio Shading - Aesthetic electric autarchy

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PV Roof Solutions

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Large Roof / Field Installations

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Charging Station

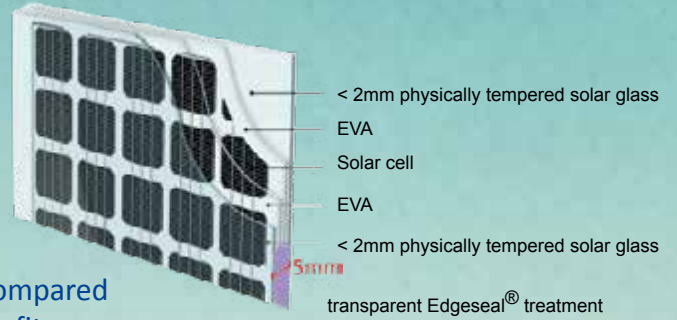
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Outstanding properties make our modules the best in the World

- Light weight (2+2 mm glass), 12 kg m²
- Extreme durability through Hi-tec tempering
- Highest wind/snowload > 5400 Pa.
- High reliability through glass back
- Best performance even in case of very high temperatures
- Extended warranty of 30 years, 50+ year lifetime

-> Almaden modules produce 12 % more lifetime power compared to competitors which generate an extraordinarily high benefit.



Almaden's modules are resistant against every kind of climate.



Cold temperature with snow:
Low temperatures are prevailing in countries of the northern hemisphere but also during the night in desert areas. All materials have to withstand temperatures below 30°Cel. as well as fast changes to high temperatures up to 85°Cel..



Salt water:
Salt and also air-borne chemicals are very aggressive and a threat to the modules materials. Glass is the first choice to withstand these threats.

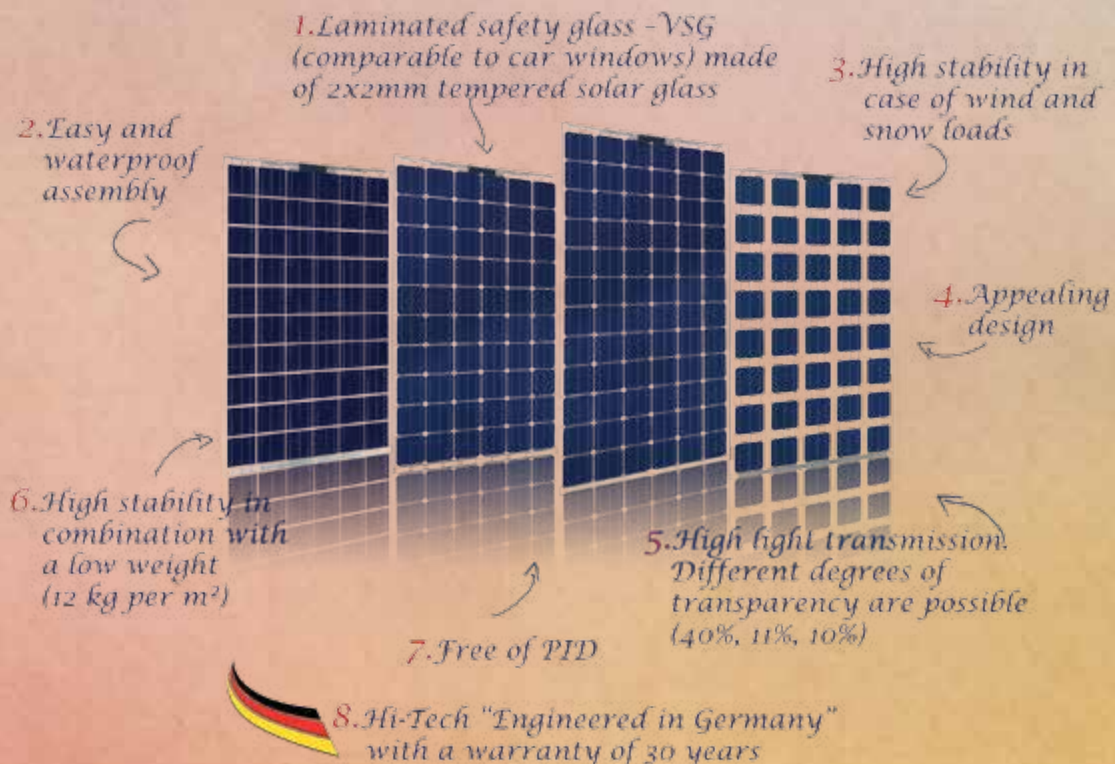


Desert climate:
Desert areas include very high temperatures of up to 85°Cel. in the inside of the module. Temperatures change in fast cycle. In many cases the material doesn't withstand these changes over their lifespan of 30 – 50 years. As a result, Almaden's modules loose very little power compared to other cells.



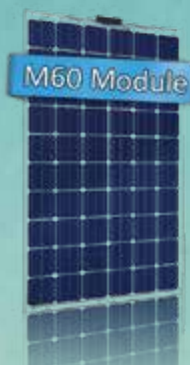
Hot and humid climate:
Is a special threat to modules. A chemical reaction with most foils like EVA takes place and as a result citric acid builds up. Consequently, the temperature rises and the acid boils, which destroys the modules over months and years. Almaden established a unique technique in order to oppose these threats and protect the cells.

8 Highlights (unique position features) of our glass - glass modules (tempered solar glass)





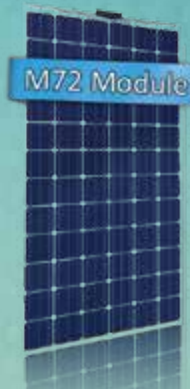
consisting of 60 Polycrystalline solar cells
Size 1: 1652 x 986 x 5 mm



consisting of 60 Monocrystalline solar cells
Size 1: 1652 x 986 x 5 mm



consisting of 40 Monocrystalline solar cells
Size 1: 1652 x 986 x 5 mm



consisting of 50 Monocrystalline solar cells
Size 2: 1968 x 986 x 5 mm



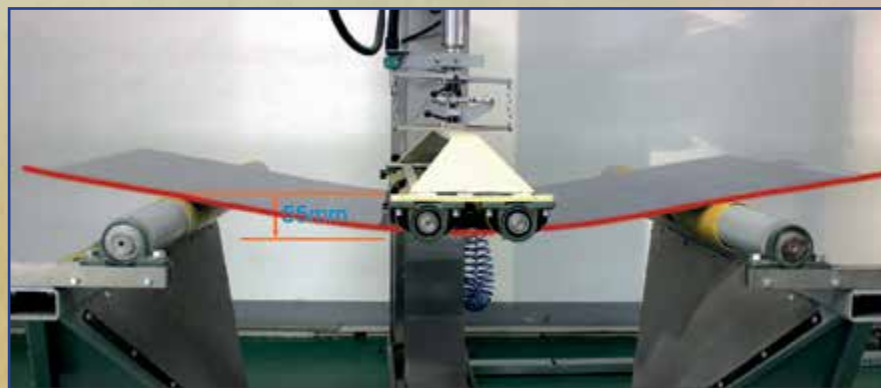
consisting of 72 Monocrystalline solar cells
Size 2: 1968 x 986 x 5 mm

Very high stability and unrivaled flexibility

Almaden modules made of laminated safety glass bear the highest loads: During the test shown in the picture, a VW Passat drove on top of the module. During this experiment the module bent, but held the load. As a result, no cracks were visible on the glass surface.

We almost couldn't believe the result and started further investigation. See the test results below.

450 kg /m²



The result is overwhelming: Even after an extreme deflection of 55 mm with 1000 cycles, the laminate remained totally intact and - even more amazing: there were no microcracks in the solar cells and thus no performance limitations of the modules. This is illustrated in the two electroluminescence photos which show the solar cells before (on the left side) and after 1000 cycles.



Before bending test, no micro cracks observed



After 1000 cycle bending test, no micro cracks observed

Technical Data for all Modules



MECHANICAL SPECIFICATION

Cell Type	Poly-crystalline / Mono-crystalline / bifacial		
Cell Dimension	156mm x 156mm (6" x 6")		
Module Dimension	Size 1	1652mm x 986mm x 5mm	(30mm with J-box)
Module Dimension	Size 2	1968mm x 986mm x 5mm	(30mm with J-box)
Weight	Size 1	20kg	
Weight	Size 2	24kg	
Front Glass	2mm tempered AR glass		
Back Glass	2mm tempered glass		

LIMITS

Operational Temperature	°C	-40~+85
Maximum Static Load	Pa	5400
Maximum Wind Load	Pa	2400
Maximum System Voltage	V(DC)	IEC:1000 UL:600
Maximum Series Fuse Rating	A	15

TEMPERATURE COEFFICIENT

Nominal Operating Cell Temperature	NOCT	°C	45±2
Temperature Coefficient of Isc	α	%/°C	+0.56
Temperature Coefficient of Voc	β	%/°C	-0.353
Temperature Coefficient of Pmpp	γ	%/°C	-0.485

Almaden Modules hold the following certificates:



P60 Module

ELECTRICAL SPECIFICATION (STC)

Model	SEAP60-240	SEAP60-245	SEAP60-250	SEAP60-255
Rated Power (Pmpp)	240W	245W	250W	255W
Rated Current (Impp)	8.09A	8.17A	8.26A	8.34A
Rated Voltage (Vmpp)	29.70V	30.00V	30.30V	30.60V
Short Circuit Current (Isc)	8.50A	8.59A	8.68A	8.76A
Open Circuit Voltage (Voc)	37.60V	38.00V	38.40V	38.80V





registered as SEAP60

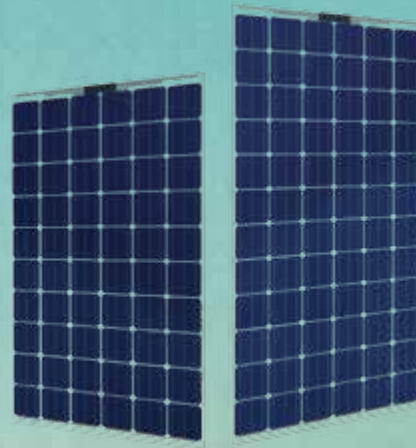


M60 Module

ELECTRICAL SPECIFICATION (STC)

Rated Power (P _{mpp})	260W
Rated Current (I _{mpp})	8.50A
Rated Voltage (V _{mpp})	30.59V
Short Circuit Current (I _{sc})	9.07A
Open Circuit Voltage (V _{oc})	38.24V

   registered as SEAM60



M72 Module

ELECTRICAL SPECIFICATION (STC)

Rated Power (P _{mpp})	300W
Rated Current (I _{mpp})	8.09A
Rated Voltage (V _{mpp})	37.09V
Short Circuit Current (I _{sc})	8.60A
Open Circuit Voltage (V _{oc})	45.85V

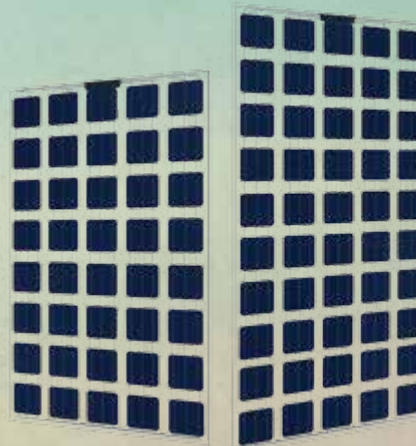
   registered as SEAM72

M40 Module

ELECTRICAL SPECIFICATION (STC)

Rated Power (P _{mpp})	170W
Rated Current (I _{mpp})	8.11A
Rated Voltage (V _{mpp})	21.17V
Short Circuit Current (I _{sc})	8.59A
Open Circuit Voltage (V _{oc})	29.79V




   registered as SEAM40



M50 Module

ELECTRICAL SPECIFICATION (STC)










Rated Power (P _{mpp})	195W
Rated Current (I _{mpp})	7.84A
Rated Voltage (V _{mpp})	25.5V
Short Circuit Current (I _{sc})	8.09A
Open Circuit Voltage (V _{oc})	31.7V

   registered as SEAM50

[For more information please read our module brochure!](#)

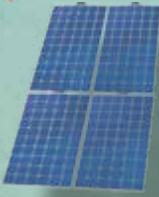


Outstanding Properties of all Almaden Modules

-  **Sleek module design - Ultrathin - Ultralight**
 No frame, no back sheet. 2mm physically tempered glass exclusively used as front and back protection material.
-  **Supreme fire resistancy**
 The glass - glass design helps to save the module from damages caused by arc and hot spots, eliminating potential dangers of fire.
-  **Outstanding performance in case of wind/snow load**
 Certified to withstand high wind loads of 2400pa & snow loads of 5400pa.
-  **Superior weak light performance**
 Outstanding weak light performance guaranteed by Almaden's anti-reflective nano-coating technology.
-  **PID free**
 PID (potential induced degradation). Free guaranteed
-  **Extended warranty**
 -10 years product warranty on workmanship & materials
 -30 years warranty on linear power output.
-  **Micro-Crack free**
 No micro-cracks under harsh transportation, complicated handling and installation conditions as well as during lifetime module operation.
-  **Positive power output tolerance**
 0 / +5 W positive tolerance
-  **Easy cleaning**
 Frameless design, no dust sticks on the edge.

S

4 Modules M60
208 x 335 cm
1000 Wp



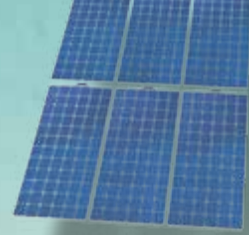
M-K

6 Modules M60
308 x 335 cm
1500 Wp



M-L

6 Modules M72
308 x 403 cm
1800 Wp



L

9 Modules M60
308 x 508 cm
2250 Wp



M-XL

8 Modules M72
410 x 403 cm
2400 Wp



M-XXL

10 Modules M72
514 x 403 cm
3000 Wp



XL

12 Modules M60
410 x 508 cm
3000 Wp



XXL

15 Modules M60
514 x 508 cm
3750 Wp



Our attractive carport solutions are easy to install due to our innovative designs from specially developed aluminum profiles. Through optimal production (see Figure 2 right), these are relatively light but still extremely stable. You only need a hex wrench included as a tool, (figure on the right). The port is configured with only a few screws. An illustrated assembly guide is included in the delivery.



Waterproof assembly with matching aluminum profile

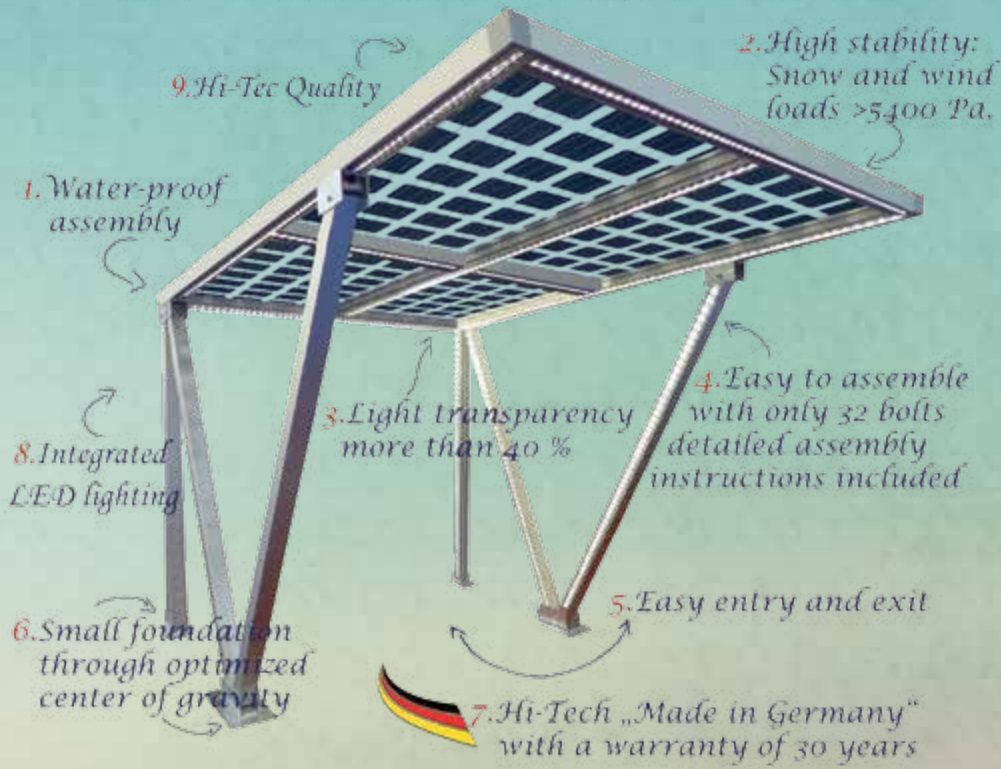
EPDM sealing profile



All our modules are supplied with a UV resistant EPDM rubber profile on the long sides. Therefore it is used as a transport protection as well as directly with our cover profile made of high quality aluminum in order to provide a waterproof installation. The profile is fixed tightly with stainless steel screws on virtually every substrate (aluminum, wood, steel, etc.). The lateral sides are sealed with a UV resistant butyl tape to allow unimpeded drainage of rain water (clean water).



9 Highlights (USPs) of our PV applications (carports, patio areas etc.)



Intelligent designed systems

Our kits are manufactured by an intelligently designed system that allows both an easy assembly and a very high stability and durability. The entire structure is made of anodized corrosion resistant aluminum. The connection parts are made of a special stainless steel with a high nickel content.

The number of necessary connections is optimized. Therefore, for smaller carports only about 25 screws are necessary, for the large carports, only about 50 screws.

For all kits detailed documentation is supplied.

load capacity: 450kg per qm

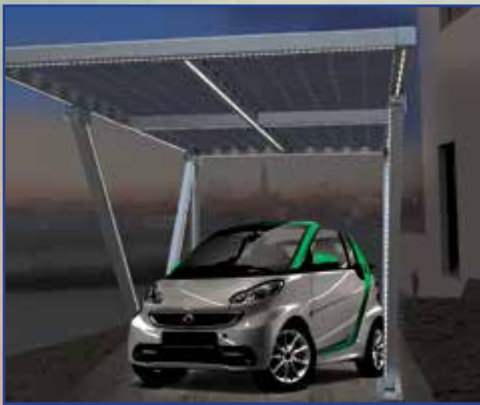


Carport S



Carport S technical details	
PV equipment	4 x P60 per 250 Wp
transparency	ca. 11%
gross performance	1 kW
annual yield	ca. 1100 kWh*
size (length x width)	3,35m x 2,08m (10ft 11in x 6ft 10in)
weight (inclusive modules)	ca. 225 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade

Carport with LED lighting




Optional equipment for all carports:

- inverter for on-grid and off-grid
- battery packs in different sizes
- Recommendations for foundations
- LED lighting strips

Carport M-K

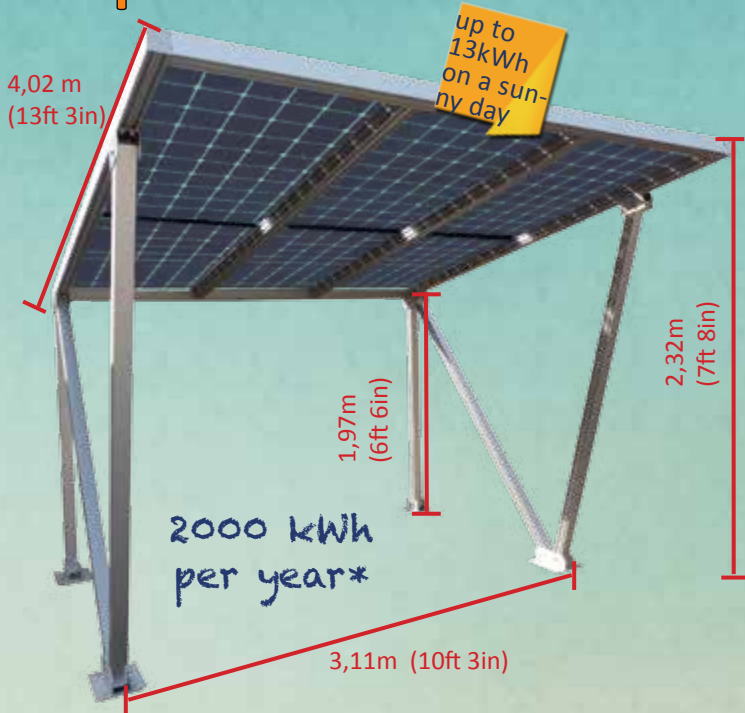
Carport M-K technical details	
PV equipment	6 x P60 per 250 Wp
transparency	ca. 11%
gross performance	1,5 kW
annual yield	ca. 1650 kWh*
size (length x width)	3,35m x 3,08m (10ft 12in x 10ft 2in)
weight (inclusive modules)	ca. 325 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade



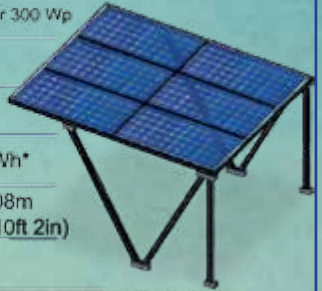

* Value for Munich / Upper Bavaria with east-west alignment without shade.

Carport M-L



Carport M-L technical details	
PV equipment	6 x M72 per 300 Wp
transparency	ca. 11%
gross performance	1,8 kW
annual yield	ca. 2000 kWh*
size (length x width)	4,08m x 3,08m (13ft 5in x 10ft 2in)
weight (inclusive modules)	ca. 360 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade

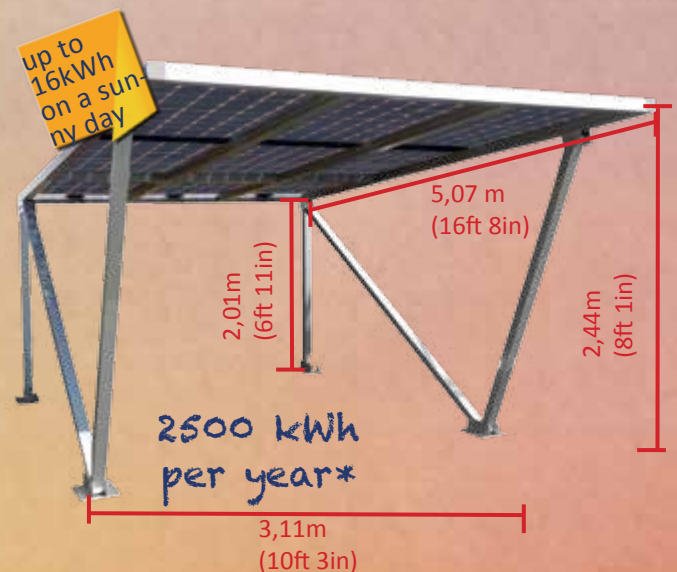
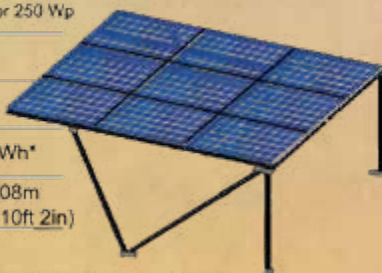


L - Carport with LED lighting strips

Carport L

Carport L technical details	
PV equipment	9 x P60 per 250 Wp
transparency	ca. 11%
gross performance	2,25 kW
annual yield	ca. 2500 kWh*
size (length x width)	5,05m x 3,08m (16ft 7in x 10ft 2in)
weight (inclusive modules)	ca. 450 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade

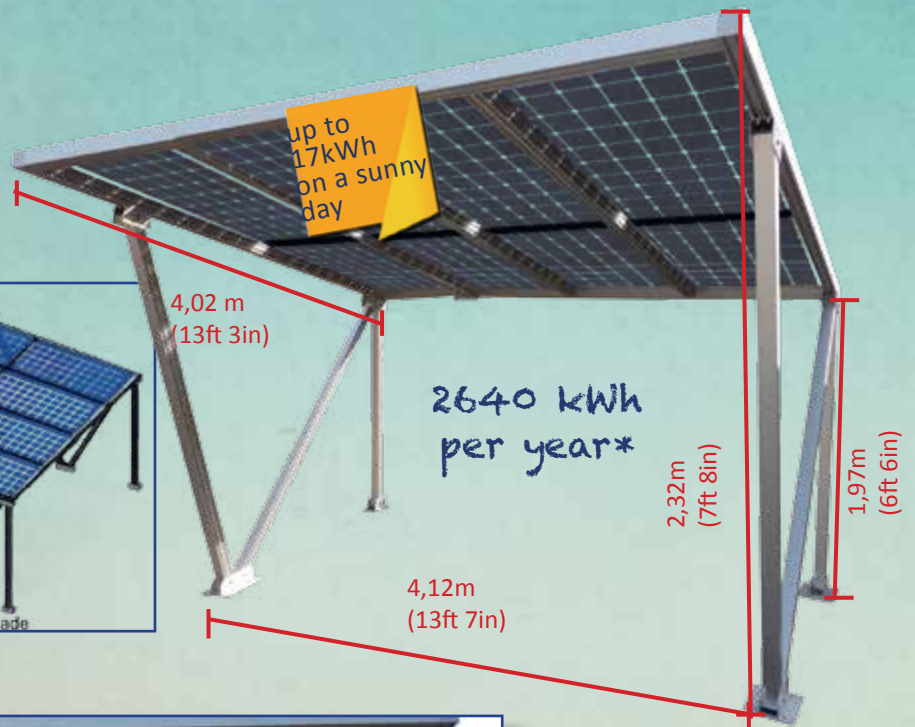
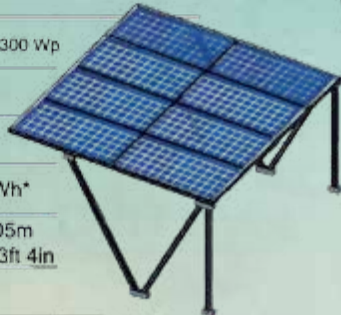


* Value for Munich / Upper Bavaria with east-west alignment without shade.

Carport M-XL

Carport M-XL technical details	
PV equipment	8 x M72 je 300 Wp
transparency	ca. 11%
gross performance	2,4 kW
annual yield	ca. 2640 kWh*
size (length x width)	4,10m x 4,05m 13ft 6in x 13ft 4in
weight (inclusive modules)	ca. 395 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade

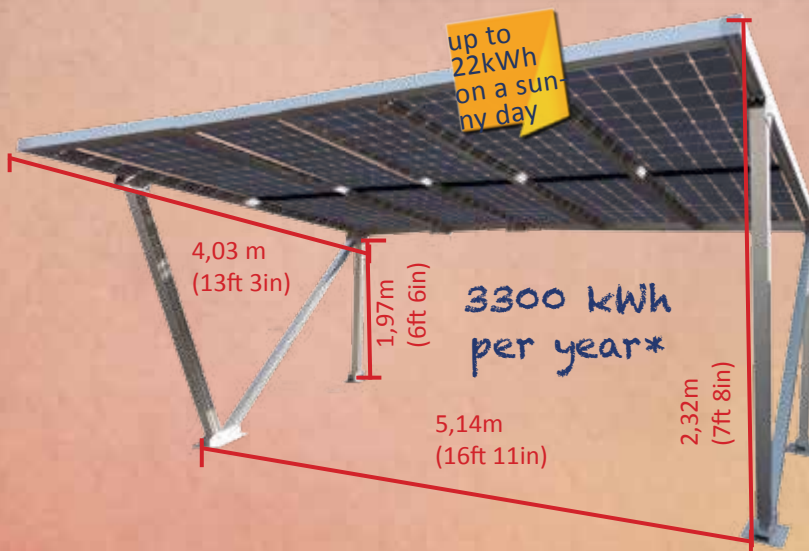
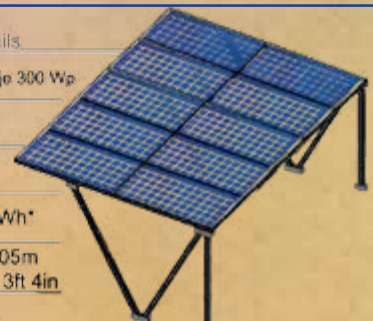


L - Carport

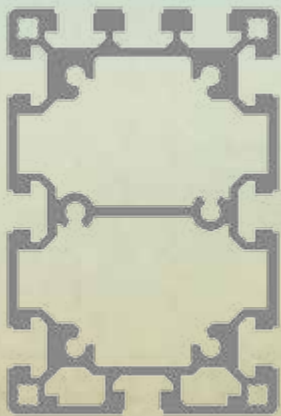
Carport M-XXL

Carport M-XXL technical details	
PV equipment	10 x M72 je 300 Wp
transparency	ca. 11%
gross performance	3 kW
annual yield	ca. 3300 kWh*
size (length x width)	5,05m x 4,05m 16ft 7in x 13ft 4in
weight (inclusive modules)	ca. 549 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade

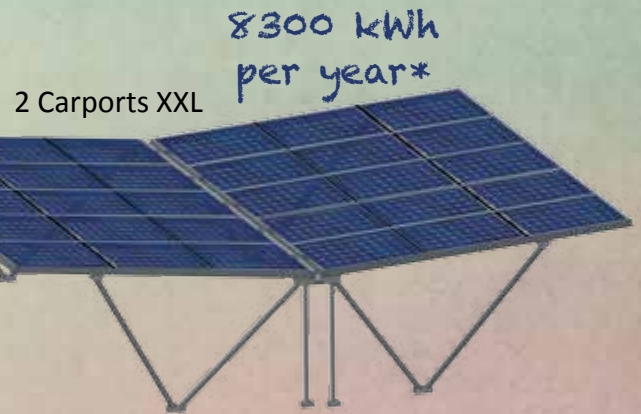


* Value for Munich / Upper Bavaria with east-west alignment without shade.



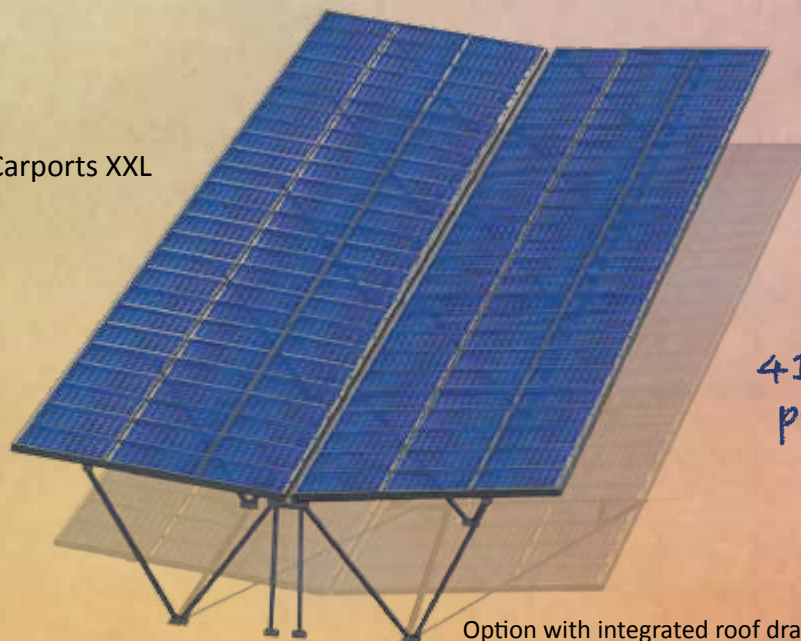
Our kit system offers lightweight but extremely stable components that can be combined with standard screwdrivers without drilling holes. An illustrated detailed installation manual is included in each kit.

Our aluminum profiles are developed from a particularly stable and weather-resistant alloy with an optimized design for extreme loads (such as wind and snow loads). The surface is anodized. Due to the high quality **Made in Germany**, these are offered with a 12 year warranty.



Option with integrated roof drainage

10 Carports XXL



Option with integrated roof drainage

* Value for Munich / Upper Bavaria with east-west alignment without shade.

Carport XL

4,12m (13ft 7in)

up to 22kWh on a sunny day

5,07 m (16ft 8in)

2,44m (8ft 1in)

2,01m (6ft 8in)

3300 kWh per year*

mounted in only 5 hours

Product warranty on our fixing system
12 YEARS

unique waterproof structure

Carport XL technical details	
PV equipment	12 x P60 per 250 Wp
transparency	ca. 11%
gross performance	3 kW
annual yield	ca. 3300 kWh*
size (length x width)	5,05m x 4,10m (16ft 7in x 13ft 6in)
weight (inclusive modules)	ca. 530 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade

Carport XXL

up to 28kWh on a sunny day

5,08 m (16ft 8in)

2,01m (6ft 8in)

2,44m (8ft 1in)

4150 kWh per year*

5,14m (16ft 11in)

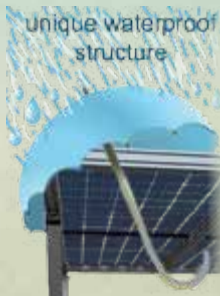
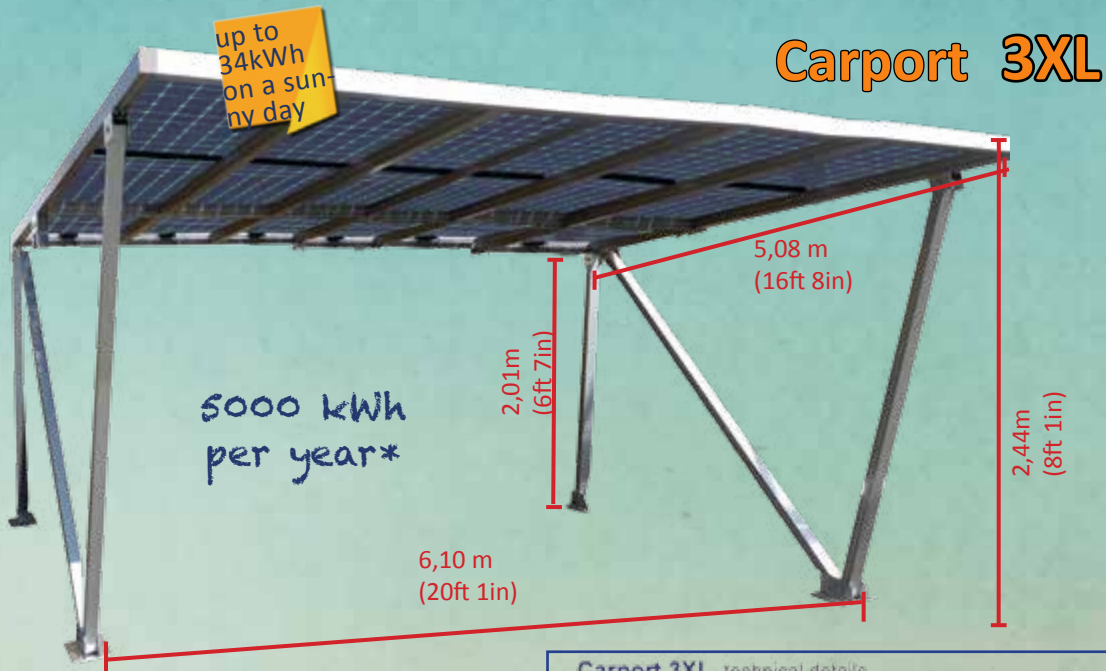
Product warranty on our fixing system
12 YEARS

unique waterproof structure

Carport XXL technical details	
PV equipment	15 x P60 per 250 Wp
transparency	ca. 11%
gross performance	3,75 kW
annual yield	ca. 4150 kWh*
size (length x width)	5,15m x 5,10m (16ft 11in x 16ft 9in)
weight (inclusive modules)	ca. 694 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade

* Value for Munich / Upper Bavaria with east-west alignment without shade.



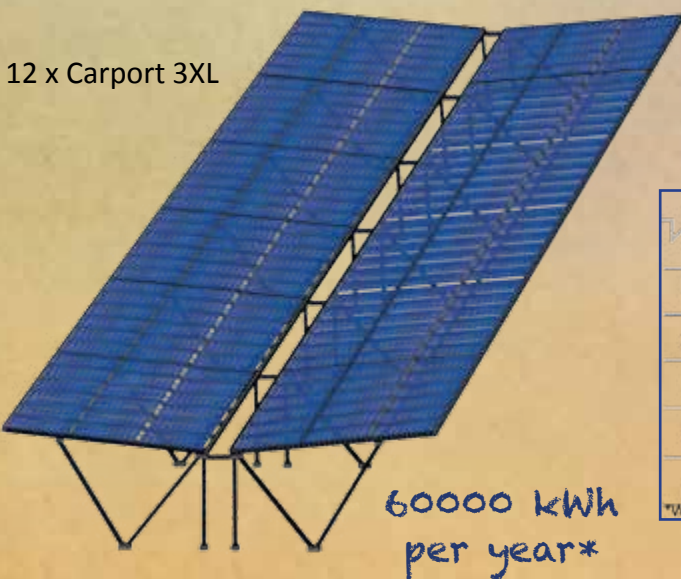
Carport 3XL technical details	
PV equipment	18 x P60 je 250 Wp
transparency	ca. 11%
gross performance	4,5 kW
annual yield	ca. 5000 kWh*
size (length x width)	5,15m x 6,10m (16ft 11in x 20ft 1in)
weight (inclusive modules)	approx. 876 kg

*Value for Munich / Upper Bavaria with east-west alignment without shade

Our detailed construction manual explains the easy construction process step by step.



Example for larger parking lots



Carport 12 x 3XL technical details	
PV equipment	216 x P60 je 250 Wp
transparency	ca. 11%
gross performance	54 kW
annual yield	approx. 60000 kWh*
size (length x width)	10,30m x 36,60m (33ft 10in x 120ft 1in)
weight (inclusive modules)	ca. 10 t

*Werte für München / Oberbayern bei Ost-West Ausrichtung ohne Verschattung

* Value for Munich / Upper Bavaria with east-west alignment without shade.



Tuscany Pavillon	
Length x Width	309 x 337 cm
PV Modules M50, 205 Wp	6
Electrical Power overall approx.	1230 Wp
Annual yield approx.	1400 kWh
Weight in kg approx.	294 kg

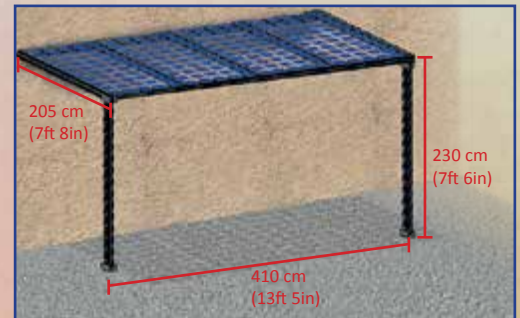
This architectural gem is also available as a kit with all the parts at a reasonable price. All parts can be easily assembled for self-assembly with connectors and fixed with self-tapping stainless steel screws. A detailed assembly instructions with pictures are included. Our Premium PV modules made of laminated safety glass (LSG) to protect from rain, but at the same time offer an aesthetic protection from the sun. Partial shading is available with 40% light transmission. The two hardened, only 2 mm thin sheets of glass are almost indestructible and designed for a lifetime of 30 years.

Terrace Lea

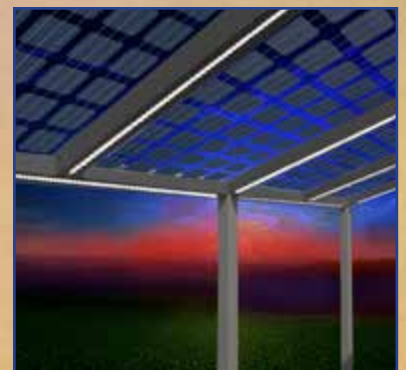
Terrace Lea	Lea 2	Lea 3	Lea 4	Lea 5*
Length 205 cm, width:	205 cm	308 cm	410 cm	514 cm
PV Module M72, 300 Wp	2	3	4	5
Total power	600 Wp	900 Wp	1200 Wp	1500 Wp
annual yield	660 kWh	1.000 kWh	1.350 kWh	1.680 kWh
approx. weight in kg	120	160	215	300

* Heavy loadprofile cross section 80 x 120

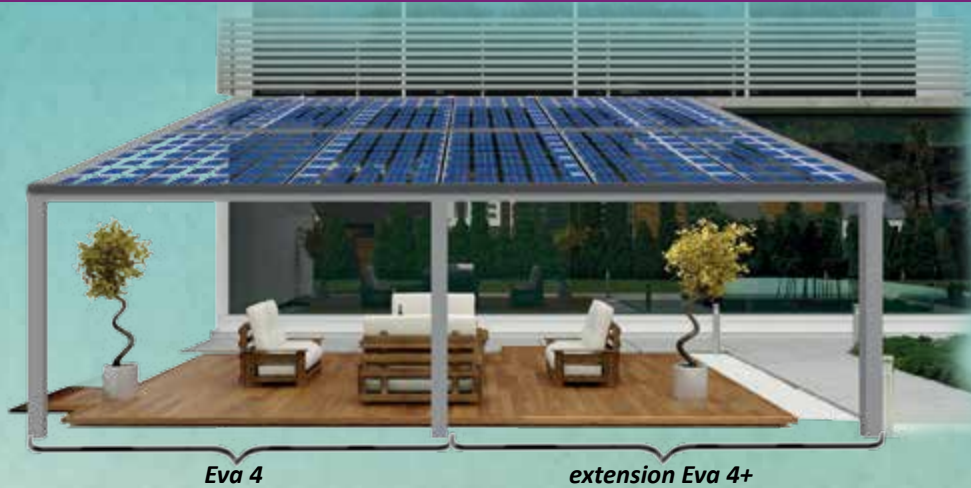
If you use the semi-transparent (40%) modules M50 the yield decreases to 60%



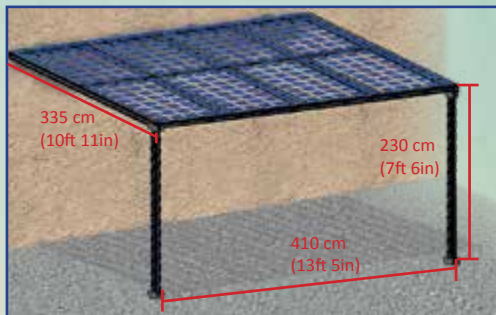
The kit **Lea** is optimal for small patios or little roofs over smoking areas or waiting zones, etc. Versions of 2m, 3m or 4m are available. The inclination of the roof may be defined by the length of the posts.



Terrace Eva



Shade your patio by using the kit **Eva** and extension **Eva+**



Terrace Eva	Eva 2	Eva 3	Eva 4	Eva 5*
Length 205 cm, width:	205 cm	308 cm	410 cm	514 cm
PV Module M60, 300 Wp	4	6	8	10
Total power	1000 Wp	1500 Wp	2000 Wp	2500 Wp
annual yield	1100 kWh	1.650 kWh	2.200 kWh	2.570 kWh
approx. weight in kg	170	235	310	435

* Heavy load profile cross section 80 x 120

If you use the semi-transparent (40%) modules M40 the yield decreases to 60%.

The construction **Eva** has a width of 3,35 m and is available in a length of 2 m, 3 m and 4 m as well.



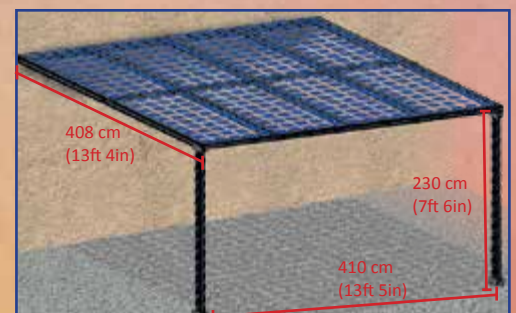
All kits are available with semitransparent Modules (40% transmittance). The picture (left) shows the construction **Eva 4** with 8 M40 modules with a power of 170 Wp each.

Terrace Mila

Terrace Mila	Mila 2	Mila 3	Mila 4	Mila 5*
Length 205 cm, width:	205 cm	308 cm	410 cm	514 cm
PV Module M72, 300 Wp	4	6	8	10
Total power	1200 Wp	1800 Wp	2400 Wp	3000 Wp
annual yield	1320 kWh	2.000 kWh	2.650 kWh	2.650 kWh
approx. weight in kg	220	310	400	500

* Heavy load profile (cross section 80 x 120)

If you use M50 semi-transparent modules (40%) the yield decreases to 60%.



Kits for transparent and waterproof PV Roofs -
1000 and more ideas for your **Building Integrated PV**



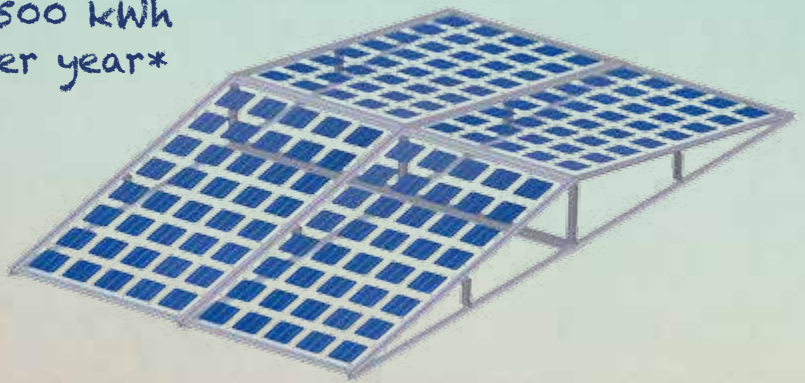
4400 kWh per year*

up to 28kWh on a sunny day



up to 35kWh on a sunny day

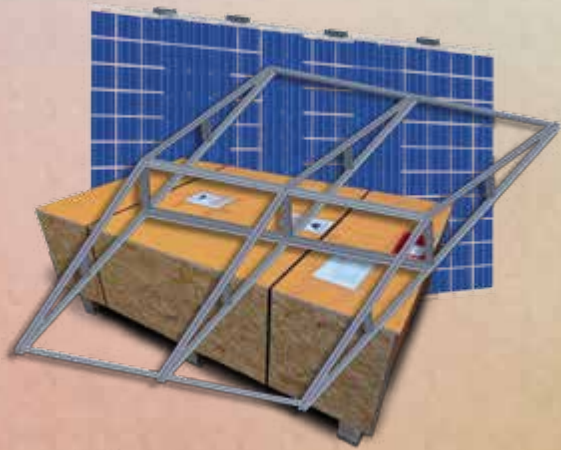
5500 kWh per year*



Produce your own electricity at cost of \$ 0.10 per kWh (or less)

optimized construction less than 2 kg per m²

The kits are designed so that all the pieces fit into a sturdy box together with the modules.
Thus transportation cost will be reduced.



1650 kWh per year*



up to 10kWh on a sunny day



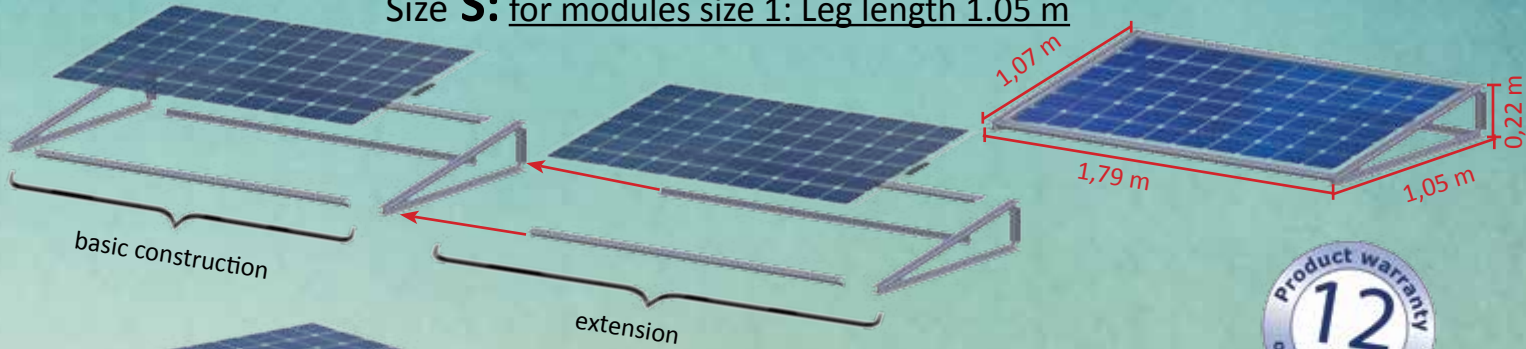
Our detailed construction manual explains the easy construction process step by step.

* Value for Munich / Upper Bavaria with east-west alignment without shade.

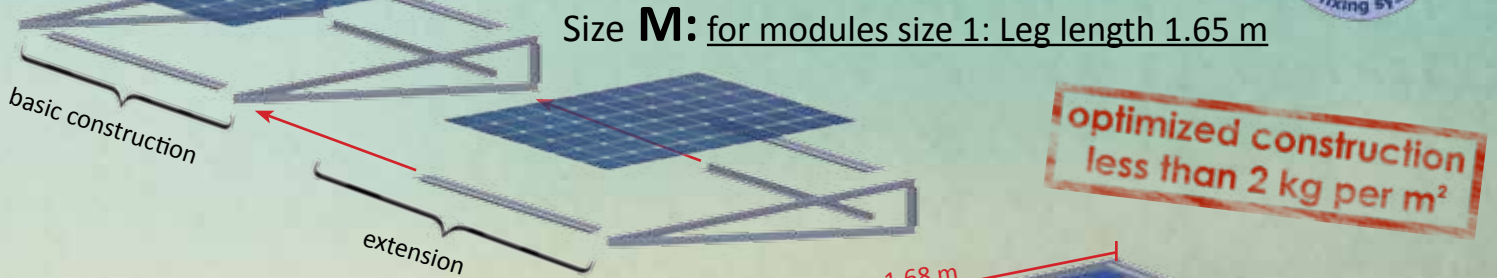
Construction of high-quality anodized aluminum consisting of pre-assembled side panels, cross members, ridge bars and ridge cover profiles. These are bolted together.

1. Canopies

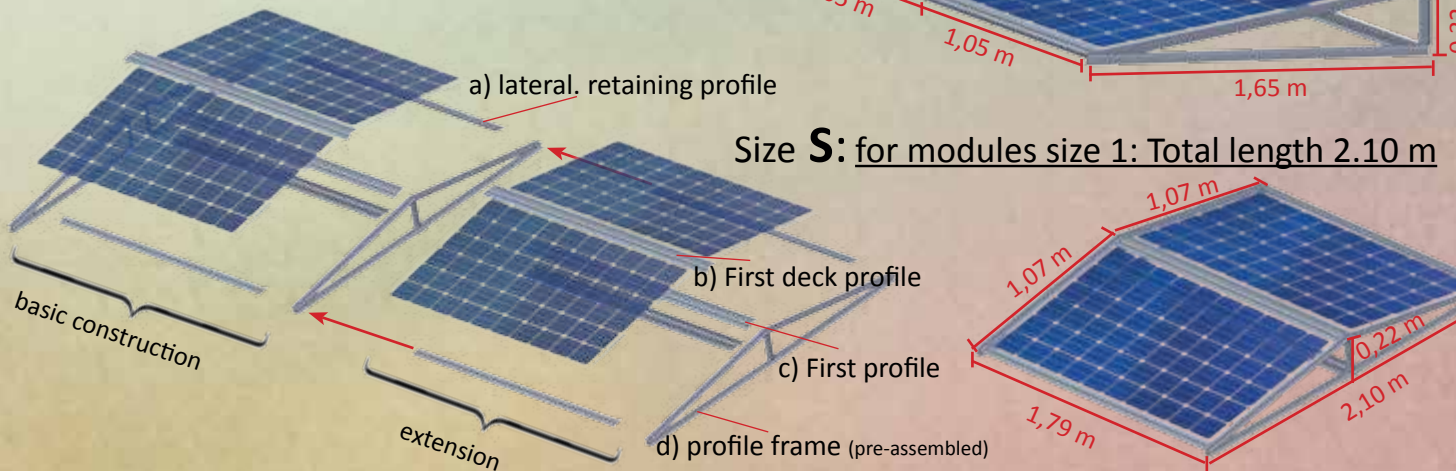
Size **S**: for modules size 1: Leg length 1.05 m



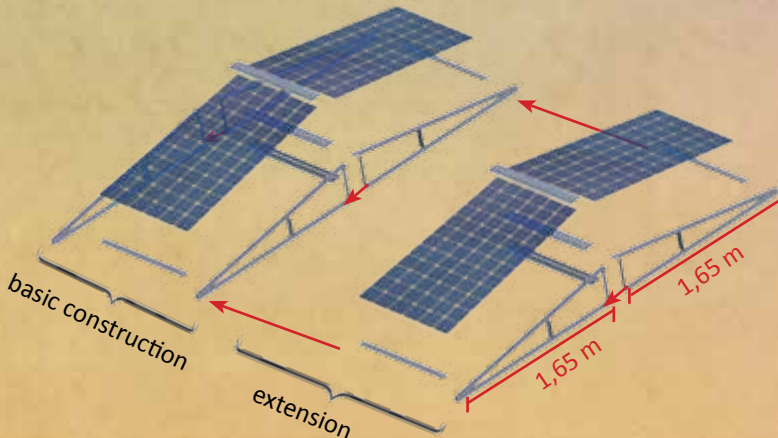
Size **M**: for modules size 1: Leg length 1.65 m



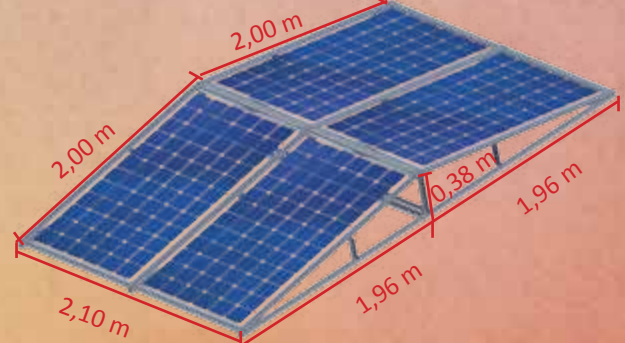
2. Saddle Roofs



Size **M**: for modules size 1: Leg length 1.65 m



Size **L**: for modules size 2: Leg length 1.96 m



The basic design can be customized with enlargement to the desired length of the roof.



up to 7kWh on a sunny day

1 kWp*

Canopy: Kit M + 3 x expansion
approx. annual yield: 1.100 kWh*
 cost per kWh¹⁾²⁾: 0,063 \$



up to 1,5kWh on a sunny day

Canopy: Kit S
approx. annual yield: 187 kWh*
 cost per kWh¹⁾²⁾: 0,094 \$



up to 17kWh on a sunny day

2,5 kWp*

Shopping cart roof: Kit L + 4 x exp.
approx. annual yield: 2.750 kWh*
 cost per kWh¹⁾²⁾: 0,058 \$



up to 10kWh on a sunny day

1,5 kWp*

Garden shed roof: Kit M + 2 x exp.
approx. annual yield: 1.650 kWh*
 cost per kWh¹⁾²⁾: 0,062 \$



up to 3kWh on a sunny day

0,5 kWp*

Canopy: Kit M + 1 x expansion
approx. annual yield: 550 kWh*
 cost per kWh¹⁾²⁾: 0,067 \$



up to 7kWh on a sunny day

1 kWp*

Electrical box enclosure: Kit M
approx. annual yield: 1.100 kWh*
 cost per kWh¹⁾²⁾: 0,067 \$



up to 28kWh on a sunny day

4 kWp*

Greenhouse roof: Kit L + 5 x expansion
approx. annual yield: 4.400 kWh*
 cost per kWh¹⁾²⁾: 0,058 \$



up to 35kWh on a sunny day

5 kWp*

Container roof: Kit M + 9 x expansion
approx. annual yield: 5.500 kWh*
 cost per kWh¹⁾²⁾: 0,058 \$



up to 28kWh on a sunny day

4 kWp*

Bus stop roof: Kit M + 7 x exp.
approx. annual yield: 4.400 kWh*
 cost per kWh¹⁾²⁾: 0,058 \$



up to 10kWh on a sunny day

1,5 kWp*

Boat roofing: Kit M + 2 x expansion
approx. annual yield: 1.650 kWh*
 cost per kWh¹⁾²⁾: 0,067 \$



up to 35kWh on a sunny day

5 kWp*

Bicycle roofing: Kit L + 7 x exp.
approx. annual yield: 5.500 kWh*
 cost per kWh¹⁾²⁾: 0,055 \$

*Value for Munich / Upper Bavaria with east - west alignment without shading.
¹⁾ depreciation 20 year, no interest, expected life time: 30 years.
²⁾ Costs: only material, no installation and inverter.



Mounting East-West

- Fast and easy assembly through pre-assembled components
- Optimized design through wind tunnel tests
- For modules with and without frame (Almaden glass-glass modules)
- Fixing without injury of foil or bitumen roof top layer
- Direct screwing of the module carrier on the roof sheet metal possible
- Maximizing the usable area



Mounting: East-West

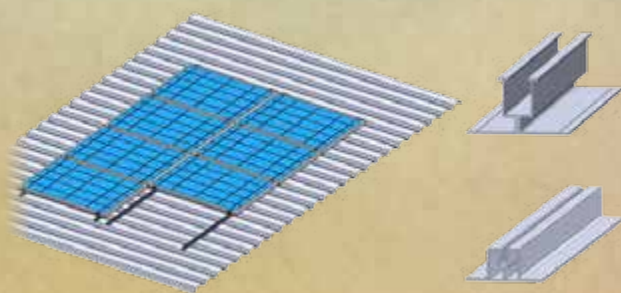
Mounting: North-South

Mounting North-South

- Fast and easy assembly through pre-assembled components
- Optimized design through wind tunnel tests
- For modules with and without frame (Almaden glass-glass modules)
- Fixing without injury of the foil or bitumen roof top layer
- Direct screwing of the module carrier on the roof sheet metal possible
- Possible elevation angles: 10 °, 15 °, 20 °, 25 °
- Top yield



optimized construction less than 2 kg per m²

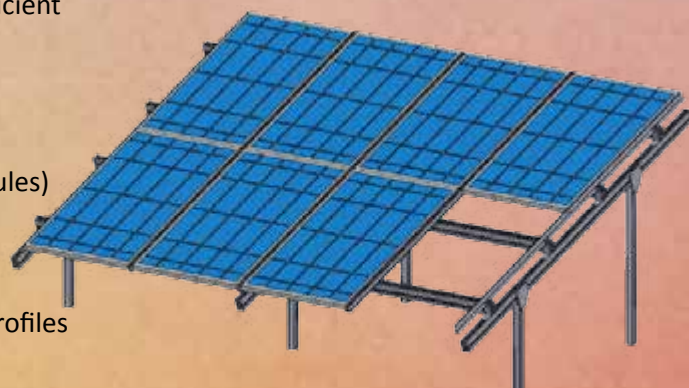


Roof-parallel assignment

- Fast and easy assembly through pre-assembled components
- Optimized design through wind tunnel tests
- For modules with and without frame (Almaden glass-glass modules)
- Fixing without injury of foil or bitumen roof top layer
- Direct screwing of the module carrier on the roof sheet metal possible
- Water-proof sealing through innovative EPDM rubber band
- Very cost-efficient

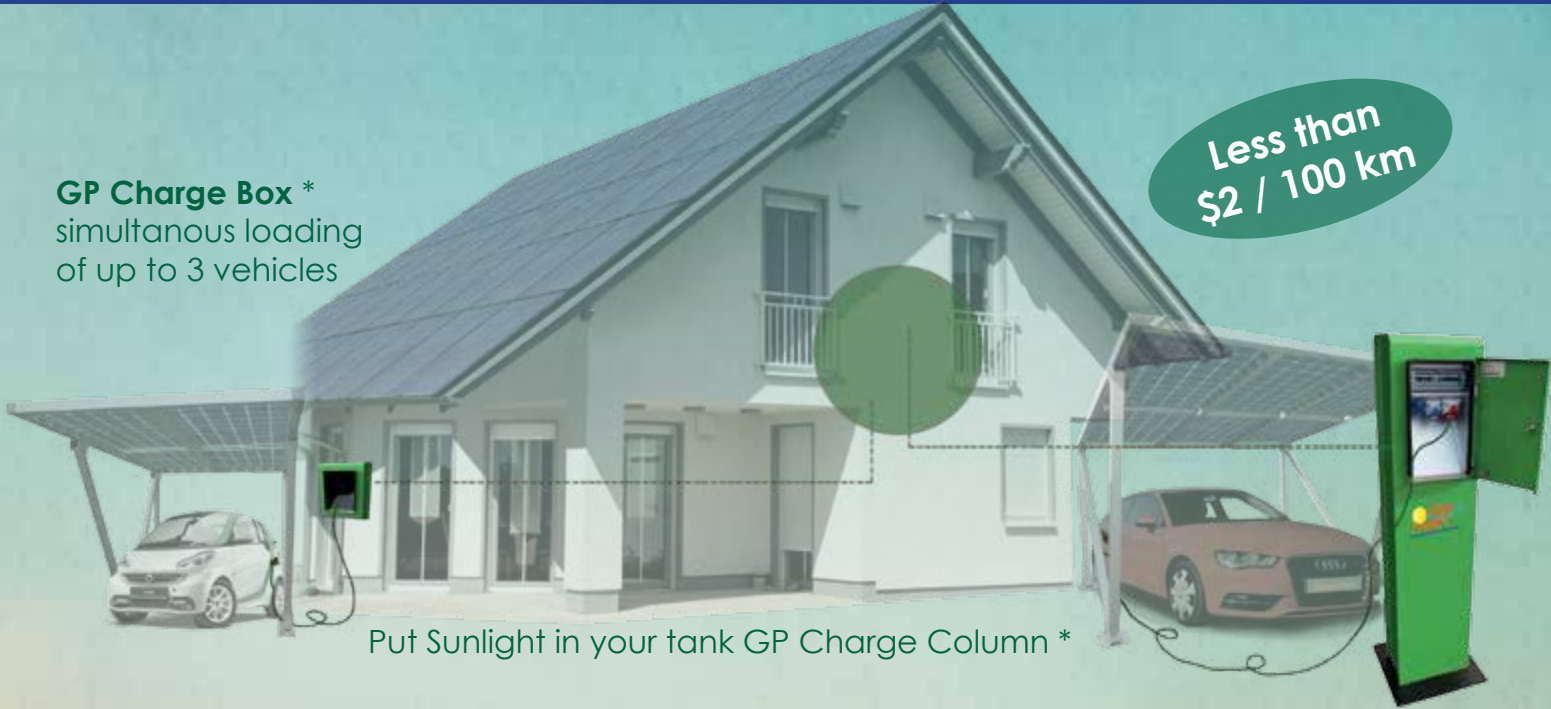
Field installation

- All aluminum system with pre-assembled components
- For modules with and without frame (Almaden glass-glass modules)
- Flexible, project orientated delivery times
- center rail for time-saving insertion of modules
- very high stability due to robust design
- available for ground screw, concrete foundation and ramming profiles

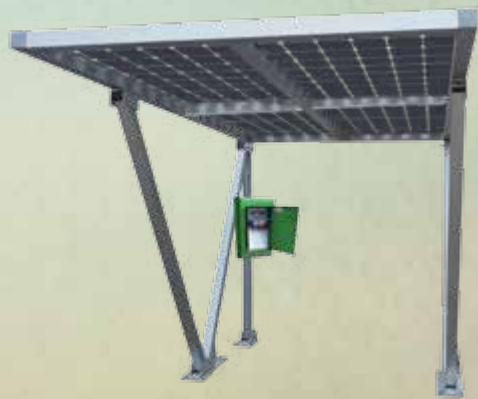


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