



## Quality criteria and certificates

- IEC 61215, IEC 61730, CE-Certification, ISO 9001 and ILB-ISO 14001
- Tolerance of nominal power ( $P_{MPP}$ )  $\pm 3\%$ ; classification range is  $\pm 5W$
- 5 years product-warranty
- 5 years 95%; 12 years 90%; 18 years 85% and 25 years 80% performance warranty
- TÜV certified for weight load up to 5400Pa

Type	*NA270W- M72-156/J	*NA280W- M72-156/J	*NA290W- M72-156/J	*NA300W- M72-156/J
<b>Electrical Specification<sup>12</sup></b> (Standard test conditions emittance 1000W/m <sup>2</sup> ; module temperature 25°C; AM=1,5)				
Peak Power ( $P_{MPP}$ )	270 W	280 W	290 W	300 W
Open Circuit Voltage ( $V_{OC}$ )	43.50 V	43.50 V	44.20 V	44.20 V
Short Circuit Current ( $I_{SC}$ )	8.28 A	8.40 A	8.52 A	8.68 A
Maximum Power Voltage ( $V_{MPP}$ )	34.40 V	35.26 V	36.16 V	36.81 V
Maximum Power Current ( $I_{MPP}$ )	7.85 A	7.94 A	8.02 A	8.15 A
Module Efficiency	13.92 %	14.43 %	14.95 %	15.46 %
No. of Diodes	6			
Maximum System Voltage	1000 VDC			
Maximum System Current	15 A			
Limiting Reverse Current ( $I_R$ )	20.25 A			
Application Class	A			
Fire Rating	C			
Array mismatch loss	$\leq 2\%$			
Working Temperature	-40°C to +85°C			
Storage Temperature	-40°C to +85°C			
<b>Mechanical Characteristics</b>				
Dimension (AxBxC)	1956x992x50mm (tolerance $\pm 2$ mm)			
Weight	22 kg			
Cable	$\varnothing$ 4mm <sup>2</sup> ; length: 900mm (Optional: 1000mm)			
Connector	MC4 compatible			
Container Capacity	<b>Multiple Packing</b>		40 feet (GP) 552 pcs / 28 pallets	
Cell	Mono Crystalline 156 x 156mm			
No. of cells and connections	72 (6x12)			
<b>Temperature/Coefficients</b>				
NOCT	45°C ( $\pm 2$ °C)			
Temperature Coefficient $V_{OC}$ ( $\beta_2$ )	-0.34 %/K			
Temperature Coefficient $I_{SC}$ ( $\alpha_2$ )	0.06 %/K			
Temperature Coefficient $P_{MPP}$ ( $\gamma_2$ )	-0.42 %/K			



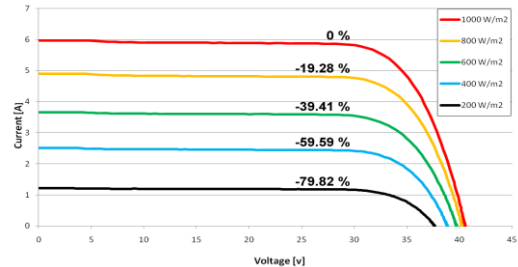
<sup>1</sup> The measurement uncertainty of  $P_{MPP}$  may vary by  $\pm 3\%$  and all other ratings by  $\pm 10\%$   
<sup>2</sup> The electrical data's are typical figures based on our production experience  
 \* TÜV test has been successful passed. The certificate will be distributed in May.



## Weak Light Specifications

NA- Mono Series Weak Light Power Reduction <sup>12</sup>	
Electrical Specification at STC-Condition and AM 1.5	%
1000W/m <sup>2</sup>	-0 %
800W/m <sup>2</sup>	-19.28 %
600W/m <sup>2</sup>	-39.41 %
400W/m <sup>2</sup>	-59.59 %
200W/m <sup>2</sup>	-79.82 %

NA- Mono Series Weak Light Power Reduction<sup>12</sup>  
(I-V as a function of irradiance under STC conditions)



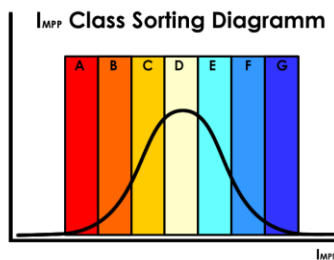
Type	*NA270W- M72-156/J	*NA280W- M72-156/J	*NA290W- M72-156/J	*NA300W- M72-156/J
Electrical Specification <sup>12</sup> (Emittance 800W/m <sup>2</sup> ; module temperature 25°C; AM=1,5)				
Peak Power (P <sub>MPP</sub> )	217.94 W	226.02 W	234.01 W	242.16 W
Open Circuit Voltage (V <sub>OC</sub> )	39.31 V	39.31 V	39.94 V	39.94 V
Short Circuit Current (I <sub>SC</sub> )	7.48 A	7.59 A	7.70 A	7.83 A
Maximum Power Voltage (V <sub>MPP</sub> )	31.08 V	31.86 V	32.67 V	33.26 V
Maximum Power Current (I <sub>MPP</sub> )	7.01 A	7.09 A	7.16 A	7.28 A

## I<sub>MPP</sub> Class Category

The ILB Helios I<sub>MPP</sub> Class sorting is helping to reduce the "Array Mismatch Loss" (≤ 2%).

Every module is marked with a I<sub>MPP</sub> class label according to the ILB Helios sorting method, which is a seven I<sub>MPP</sub> class sorting system by using the I<sub>MPP</sub> average ( $\bar{x}$ ) and a static  $\Delta$  I<sub>MPP</sub> to generate the I<sub>MPP</sub> max and I<sub>MPP</sub> min for each I<sub>MPP</sub> class.

To ensure an easy handling on the installation site, the boxes are marked with an IMPP Class tag.



I <sub>MPP</sub> classes	Range
A	$\geq I_{MPP} \bar{x} + 0,175A$
B	$< I_{MPP} \bar{x} + 0,175 A \leftrightarrow \geq I_{MPP} \bar{x} + 0,105A$
C	$< I_{MPP} \bar{x} + 0,105 A \leftrightarrow \geq I_{MPP} \bar{x} + 0,035A$
D	$< I_{MPP} \bar{x} + 0,035 A \leftrightarrow \geq I_{MPP} \bar{x} - 0,035A$
E	$< I_{MPP} \bar{x} - 0,035 A \leftrightarrow \geq I_{MPP} \bar{x} - 0,105A$
F	$< I_{MPP} \bar{x} - 0,105 A \leftrightarrow \geq I_{MPP} \bar{x} - 0,175A$
G	$< I_{MPP} \bar{x} - 0,175 A$



<sup>1</sup> The measurement uncertainty of P<sub>MPP</sub> may vary by ±3% and all other ratings by ±10%  
<sup>2</sup>The electrical data's are typical figures based on our production experience  
\* TÜV test has been successful passed. The certificate will be distributed in May.



## Materials

Our ILB Helios-Modules are manufactured only with top material on the highest technology standards.

ILB Helios uses only the best supplier, qualified, and approved materials to make sure that we can guarantee the highest performance and the longest life time.

Components	Product	Remarks
<b>Aluminum Frame</b>	Very stable, anodized Alu frame	With finite elements optimized, very stable solution for high resistance and mechanical loads up to 5400 Pa
<b>Backside Cover (TÜV)</b>	Weather resistant and over 1000V approved	Very long life time
<b>Cells</b>	Very stable, high output mono cells	According ILB internal specifications for a high performance output in kW/h and low degradation rate per year
<b>Cable</b>	Special 4mm <sup>2</sup> UV and weather resistant solar cable	Low resistance and long lifetime
<b>Connector</b>	MC4 compatible	Easy connection, low oxidation, and with a long lifetime
<b>Diodes</b>	Very resistant diodes	High resistance and long lifetime
<b>EVA Film</b>	Optimal cross linking data and processing performance with long term stability	For the best long term reliability
<b>Front Glass</b>	3,2mm, tempered, low iron solar glass	Very high light transmission
<b>Interconnecting and Buss Ribbon</b>	Low resistance ribbons	For the best long term reliability
<b>Junction Box (TÜV)</b>	IP 65	For the best long term reliability and lifetime
<b>Silicon</b>	Weather and temperature resistant silicon	Optimal sealing and long life time

## Recycling Information

Component	Short-cut	Name
<b>Glass</b>	SiO <sub>2</sub>	Silicon Dioxide
<b>Cells</b>	c-Si / mc-Si	Monocrystalline-/ Multicrystalline Silicon
	Ag	Silver
	Pd	Palladium
	Ti	Titanium
	Si	Silicon
	AL	Aluminum
<b>Bus bar- / Interconnection-Tab</b>	Cu	Copper
	Sn / Pb / Ag	Tin / Lead / Silver
<b>EVA Film</b>	EVA	Ethylene-Vinyl Acetate
<b>Back Sheet Cover</b>	PET	Polyethylene Terephthalate
	PVF	Polyvinyl Fluoride
<b>Frame</b>	AL	Aluminum
<b>Silicon</b>	TMS	Trimethylsilyl
	Propyl	Propyl (Propyl Ethanoate)
	en	Ethylenediamine
<b>Junction Box; Connectors; Cable</b>	PPO	Polyphenylenoxid
	TPE/PA	Thermoplastic elastomers
	Cu (Sn / Pb)	Copper (Tin / Lead)
<b>Potting Material</b>	PDMS	Polydimethylsiloxane





NA C-Class MONOCRYSTALLINE PV MODULES



PHOTOVOLTAICS

## Renhe Junction Box

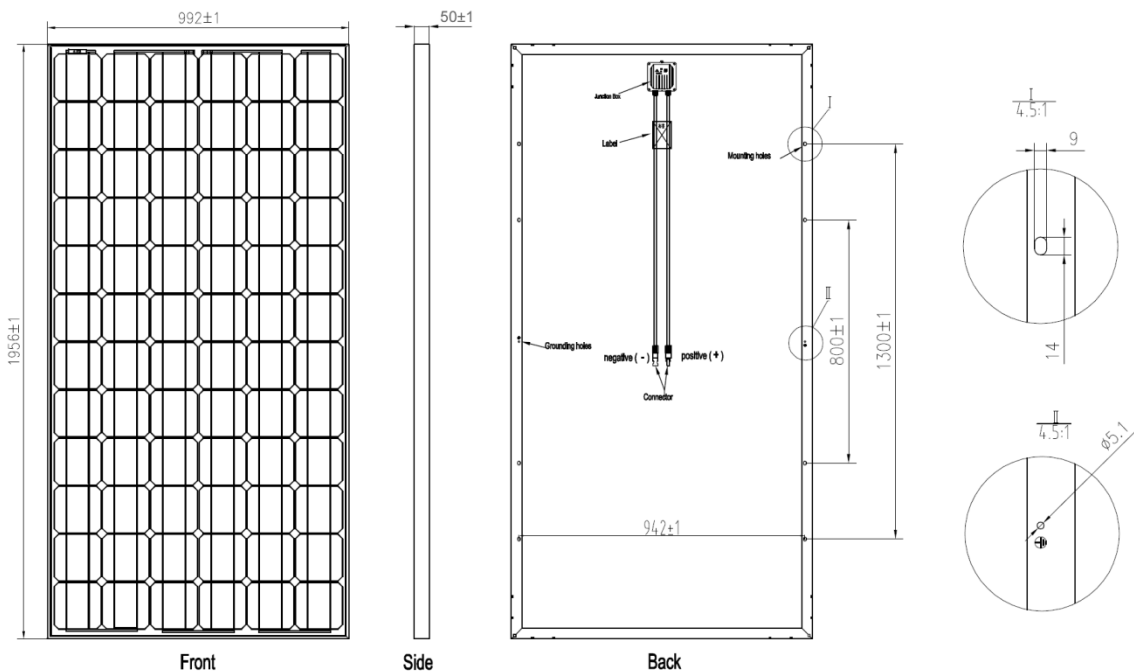
### Technical Data

IEC 61215 2nd ed and IEC 61730 1st ed	
Dimension	151x143.5x25 mm
Cable Length	900mm
Connector	MC4 compatible
Rated Current	15 A
Rated voltage	1000 V DC
Protection type	IP 65
Application Class	Class A
Safety class	Class II
Cable	4 mm <sup>2</sup>
Operating temperature range	-40°C to + 85°C
Schottky Diodes	6



### Dimensions

NA270W-M72-156/J to NA300W-M72-156/J



(Unit of measurement is mm)

