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Solar Panel Guide Specification Data Sheet

**ILB Helios Group
NA C-Class 230-250
NA250WM60-156/J**

Also available on the web at
EnergyPal.com/ilb-helios-group-solar-panels/na250wm60-156-j



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 $\pm 2.5W$
- 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	*NA230W- M60-156/J	*NA235W- M60-156/J	*NA240W- M60-156/J	*NA245W- M60-156/J	*NA250W- M60-156/J
Electrical Specification¹² (Standard test conditions emittance 1000W/m ² ; module temperature 25°C; AM=1.5)					
Peak Power (P_{MPP})	230 W	235 W	240 W	245 W	250 W
Open Circuit Voltage (V_{OC})	36.80 V	37.40 V	37.40 V	38.00 V	38.00 V
Short Circuit Current (I_{SC})	8.30 A	8.40 A	8.58 A	8.62 A	8.79 A
Maximum Power Voltage (V_{MPP})	29.70 V	30.20 V	30.20 V	30.70 V	30.70 V
Maximum Power Current (I_{MPP})	7.74 A	7.78 A	7.94 A	7.98 A	8.14 A
Module Efficiency	14.05 %	14.36 %	14.66 %	14.97 %	15.27 %
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				
Mechanical Characteristics					
Dimension (AxBxC)	1650x992x50mm (tolerance ± 2 mm)				
Weight	19.5 kg				
Cable	$\varnothing 4$ mm ² ; length: 900mm (Optional: 1000mm)				
Connector	MC4 compatible				
Container Capacity	Multiple Packing		40 feet (GP) 644 pcs / 28 pallets		
Cell	Mono Crystalline 156 x 156mm				
No. of cells and connections	60 (6x10)				
Temperature/Coefficients					
NOCT	45°C (± 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				

¹ The measurement uncertainty of P_{MPP} may vary by $\pm 3\%$ and all other ratings by $\pm 10\%$

² The electrical data's are typical figures based on our production experience

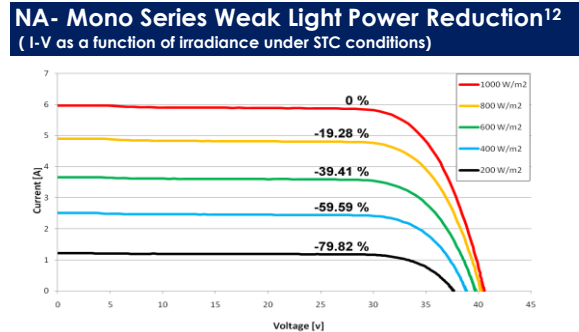
* TÜV test has been successful passed. The certificate will be distributed in May.





Weak Light Specifications

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



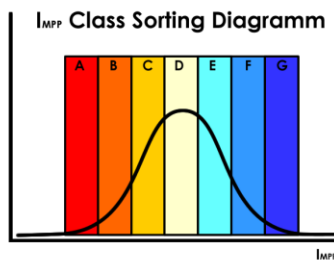
Type	*NA230W-M60-156/J	*NA235W-M60-156/J	*NA240W-M60-156/J	*NA245W-M60-156/J	*NA250W-M60-156/J
Electrical Specification ¹² (Emittance 800W/m ² ; module temperature 25°C; AM=1.5)					
Peak Power (P _{MPP})	185 W	189.69 W	193.73 W	197.76 W	201.8 W
Open Circuit Voltage (V _{OC})	33.25 V	33.79 V	33.79 V	34.34 V	34.34 V
Short Circuit Current (I _{SC})	7.50 A	7.59 A	7.75 A	7.79 A	7.94 A
Maximum Power Voltage (V _{MPP})	26.84 V	27.29 V	27.29 V	27.74 V	27.74 V
Maximum Power Current (I _{MPP})	6.89 A	6.95 A	7.10 A	7.13 A	7.27 A

I_{MPP} Class Category

The ILB Helios I_{MPP} Class sorting is helping to reduce the "Array Mismatch Loss" (≤ 2%).

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

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



I _{MPP} 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	$< I_{MPP} \bar{x} - 0,175 A$



¹ The measurement uncertainty of P_{MPP} may vary by ±3% and all other ratings by ±10%
² 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
Aluminum Frame	Very stable, anodized Alu frame	With finite elements optimized, very stable solution for high resistance and mechanical loads up to 5400 Pa
Backside Cover (TÜV)	Weather resistant and over 1000V approved	Very long life time
Cells	Very stable, high output mono cells	According ILB internal specifications for a high performance output in kW/h and low degradation rate per year
Cable	Special 4mm ² UV and weather resistant solar cable	Low resistance and long lifetime
Connector	MC4 compatible	Easy connection, low oxidation, and with a long lifetime
Diodes	Very resistant diodes	High resistance and long lifetime
EVA Film	Optimal cross linking data and processing performance with long term stability	For the best long term reliability
Front Glass	3,2mm, tempered, low iron solar glass	Very high light transmission
Interconnecting and Buss Ribbon	Low resistance ribbons	For the best long term reliability
Junction Box (TÜV)	IP 65	For the best long term reliability and lifetime
Silicon	Weather and temperature resistant silicon	Optimal sealing and long life time

Recycling Information

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



Renhe Junction Box

Technical Data

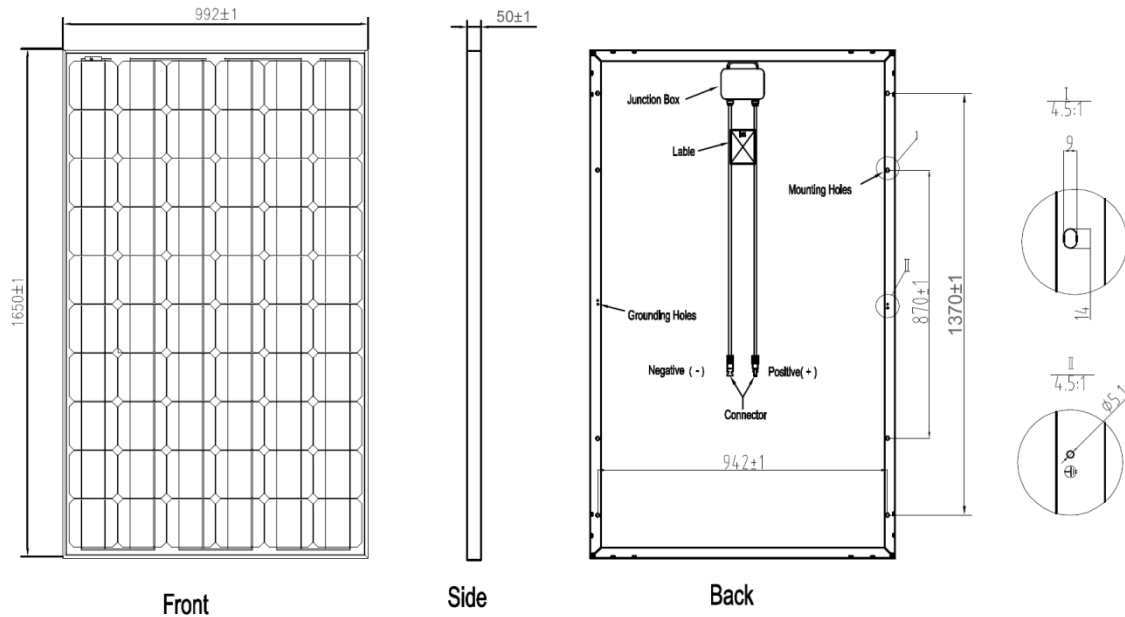
IEC 61215 2nd ed and IEC 61730 1st ed

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 ²
Operating temperature range	-40°C to + 85°C
Schottky Diodes	6



Dimensions

NA230W-M60-156/J to NA250W-M60-156/J



(Unit of measurement is mm)