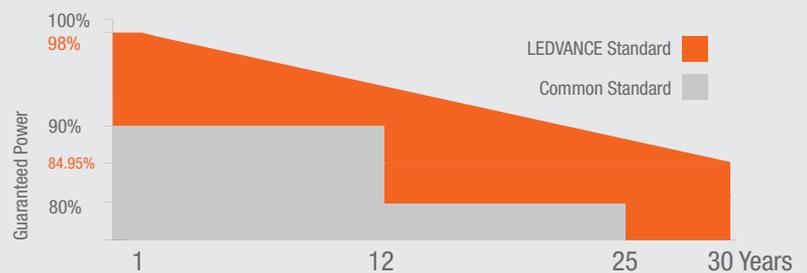


# M650~670P66UB-SF-F3

132CELLS HALF-CUT  
Mono PERC Bifacial PV Module  
Silver Frame



**15 YEARS** Product guarantee

**30 YEARS** Output guarantee

**650-670Wp** Power range

**21,56%** Maximum efficiency

**0,45%** Yearly degradation

**MBB** Excellent Cell Efficiency  
Multi Bus Bar technology increases the efficiency of the modules

**PID** Resistance to power degradation  
Resistance to power degradation caused by Potential-Induced Degradation PID effect, thanks to strict quality control in the module production process and other subassemblies

**Better Weak Illumination Response**  
More power output in weak light conditions, such as haze, clouds and early morning

**Adapted to harsh outdoor environments**  
Resistant to harsh environments such as salt, ammonia, sand, high temperatures and high humidity environments

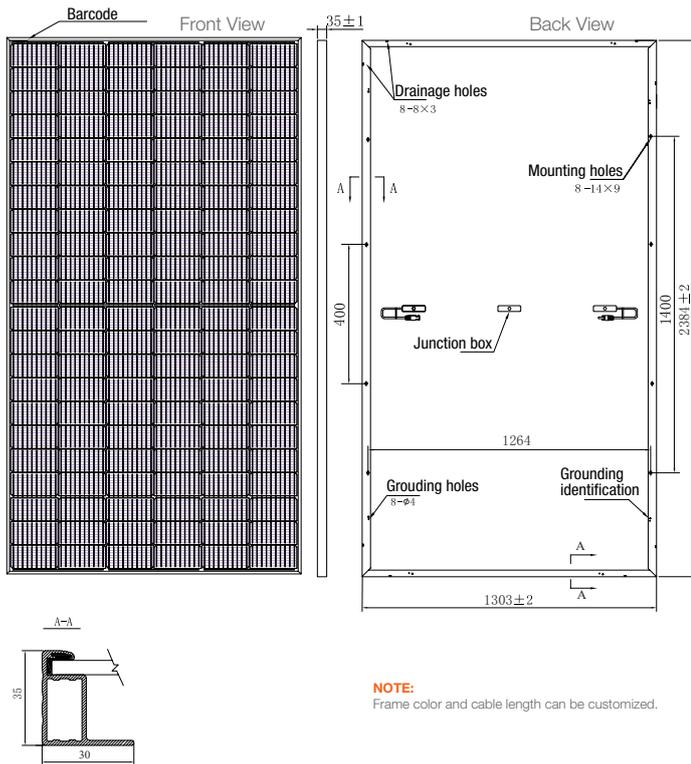
**Highest production standards**  
Guarantees of operational reliability and quality module implementations go far beyond requirements specified in certificates



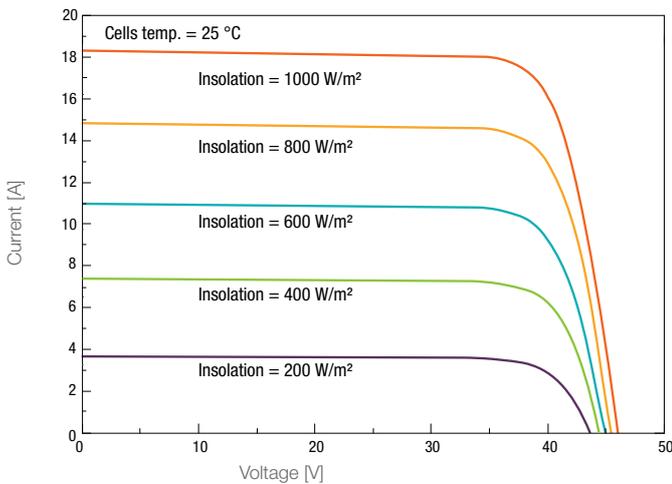
IEC 61215: Design suitability and type approval  
IEC 61730: Safety qualification  
IEC 61701: Salt mist corrosion testing  
IEC 62716: Ammonia corrosion testing  
IEC 60068: Environmental testing: Dust and sand

With subsidiaries in more than 50 countries and business activities in over 150 countries, LEDVANCE is committed to supplying reliable and durable PV products to customers to create together a greener planet.

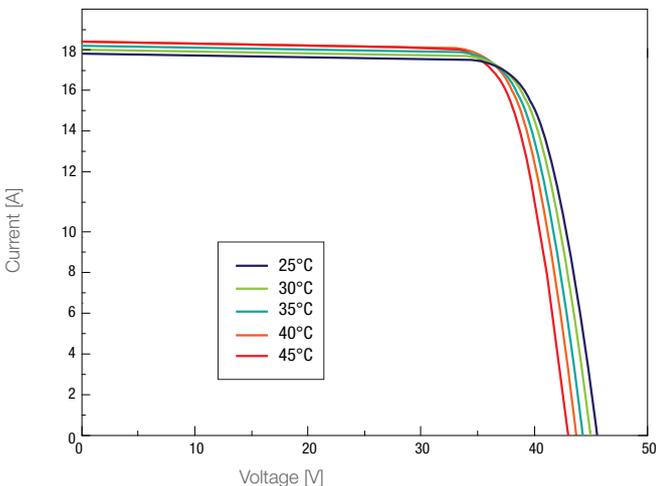
## Dimensions of PV module (mm)



## Current-voltage curve of the module by different insolation



## Current-voltage curve of the PV module by temperature



## ELECTRICAL CHARACTERISTIC | STC <sup>1)</sup>

Power Level	650	655	660	665	670
Nominal power Watt P <sub>max</sub> (Wp)	650	655	660	665	670
Maximum power voltage V <sub>mpp</sub> (V)	37.73	37.89	38.04	38.22	38.38
Maximum power current I <sub>mp</sub> (A)	17.23	17.29	17.35	17.40	17.46
Open circuit voltage V <sub>oc</sub> (V)	45.56	45.71	45.85	46.02	46.20
Short circuit current I <sub>sc</sub> (A)	18.28	18.34	18.40	18.45	18.51
Module efficiency η (%)	20.92	21.08	21.24	21.40	21.56

Measuring tolerance: ±3%

## Bifacial Output-Backside Power Gain

	715	720	726	731	737
10% Maximum power P <sub>max</sub> (Wp)	715	720	726	731	737
10% Module efficiency η (%)	23.02	23.18	23.37	23.53	23.73
20% Maximum power P <sub>max</sub> (Wp)	780	786	792	798	804
20% Module efficiency η (%)	25.11	25.30	25.50	25.69	25.88

## ELECTRICAL CHARACTERISTIC | NMOT <sup>2)</sup>

Power Level	650	655	660	665	670
Maximum power P <sub>max</sub> (Wp)	492	495	499	503	507
Maximum power voltage V <sub>mpp</sub> (V)	34.90	34.99	35.15	35.33	35.48
Maximum power current I <sub>mp</sub> (A)	14.10	14.15	14.20	14.24	14.29
Open circuit voltage V <sub>oc</sub> (V)	42.37	42.51	42.64	42.80	42.97
Short circuit current I <sub>sc</sub> (A)	14.96	15.01	15.06	15.10	15.15

Measuring tolerance: ±3%

## WORKING CONDITIONS

Maximum system voltage	1500 V DC
Operating temperature	-40°C ~ +85°C
Operating humidity	5~85%
Maximum series fuse	30 A
Front/Rear side load	5400 pa / 2400 pa

## MECHANICAL DATA

Solar cells	Mono PERC
Number of cells	132 (6x22) pcs
Size of cells	210 x 105 mm
Module dimension	2384 x 1303 x 35 mm
Frame color	SF – silver
Weight	38.3 ± 1 kg
Glass	2.0 mm tempered glass, anti-reflective coating
Type of frame	Anodized aluminum alloy
Junction box	IP68, 3 diodes
Cables	4 mm², 300 mm or 1400 mm
Connectors	Stäubli MC4 EVO 2

## TEMPERATURE RATINGS

NMOT	44 ± 2 °C
Temperature coefficient of P <sub>max</sub>	-0.34% / °C
Temperature coefficient of V <sub>oc</sub>	-0.25% / °C
Temperature coefficient of I <sub>sc</sub>	0.04% / °C

## PACKAGING CONFIGURATION

Piece / Box	31
Size of packing	1350 x 1130 x 2515 mm
Weight of packing	1252 kg
Piece / Container (40'HC)	558

## FOOTNOTES:

- STC (Standard Test Conditions): 1000W/m² solar irradiance, cell temperature 25°C, AM 1.5G
- NMOT (nominal cell operating temperature): insolation 800W/m², ambient temperature 20°C, AM 1.5G, wind speed 1m/s

## CAUTION:

- Do not connect two or more strings of modules to one fuse.
- The electrical data in this product sheet does not refer to a single module and is not part of the offer, it is used to compare different types of modules only.
- Due to continuous technical innovation, development and product improvement, technical data contained in this product sheet is subject to change at any time without notice and may not be the basis for any damage claims.