M650~670P66UM-SF-F3

132CELLS HALF-CUT
Monocrystalline PERC PV Module
Silver Frame

LEDVANCE Standard
Common Standard

Guaranteed Power

100%
98%
90%
84.8%
80%

1   5   12   25 Years
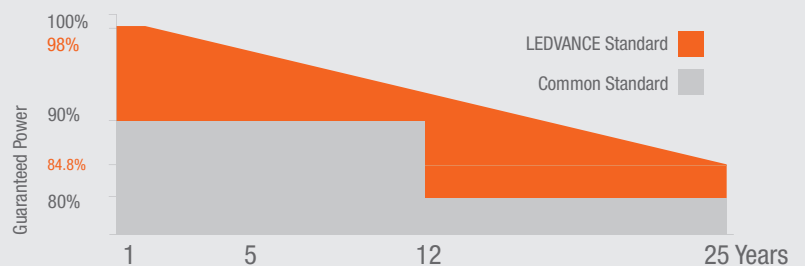
12 YEARS Product guarantee

25 YEARS Output guarantee

650-670Wp **Power** range

21,56% **Maximum** efficiency

0,55% **Yearly** degradation

12BB **Excellent Cell Efficiency** Multi Bus Bar technology increases the efficiency of the modules

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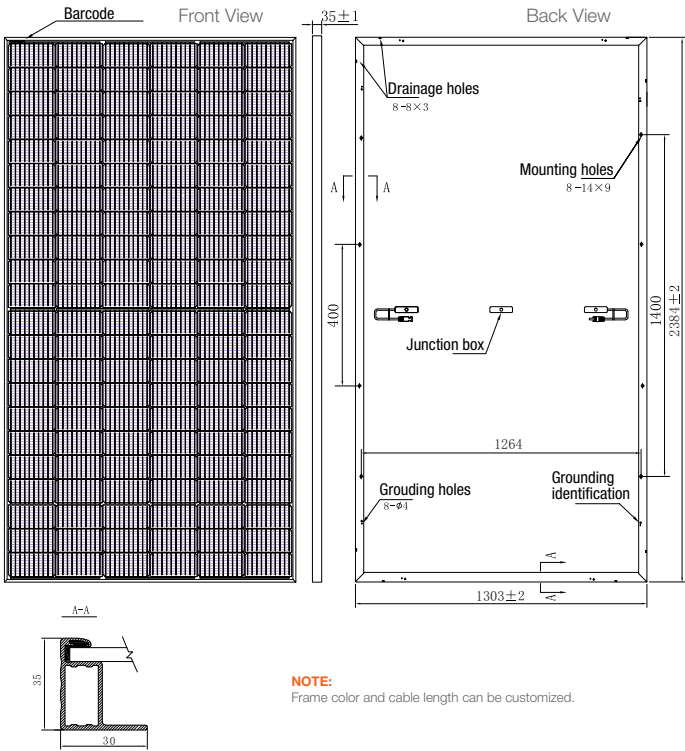
Highest production standards
Guarantees of operational reliability and quality module implementations go far beyond requirements specified in certificates
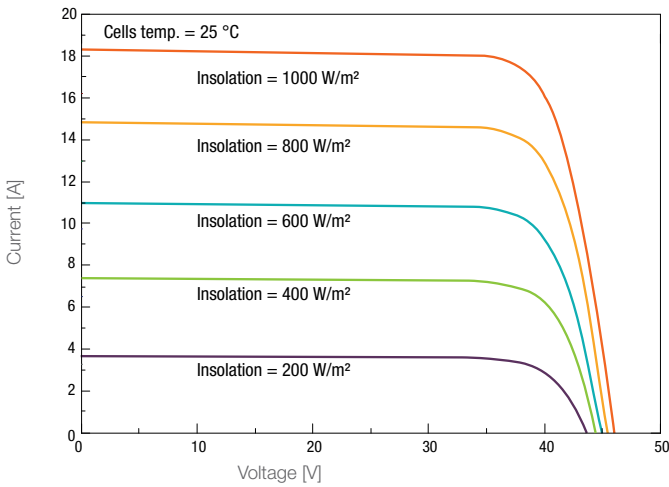
CE TÜVRheinland®

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.
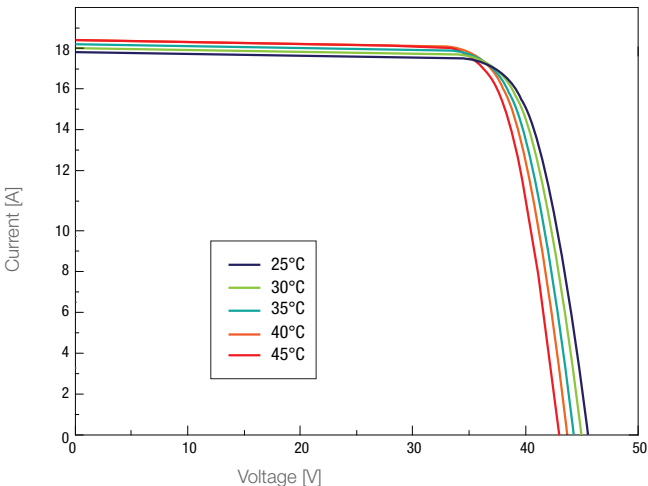
Dimensions of PV module (mm)

Barcode Front View 35±1 Back View

Drainage holes
8−8×3

Mounting holes
8−14×9

Junction box

Grouding holes
8−φ4

Grounding identification

400

1400

2384±2

1264

1303±2

A−A
35
30

NOTE:
Frame color and cable length can be customized.

Current-voltage curve of the module by different insolation

Cells temp. = 25 °C
Insolation = 1000 W/m²
Insolation = 800 W/m²
Insolation = 600 W/m²
Insolation = 400 W/m²
Insolation = 200 W/m²

Current [A] vs Voltage [V]

Current-voltage curve of the PV module by temperature

25°C
30°C
35°C
40°C
45°C

Current [A] vs Voltage [V]

ELECTRICAL CHARACTERISTIC | STC [1]

Power Level	650	655	660	665	670
Nominal power Watt P_{max} (Wp)	650	655	660	665	670
Maximum power voltage V_{mpp} (V)	37.51	37.67	37.83	38.00	38.16
Maximum power current I_{mpp} (A)	17.33	17.39	17.45	17.50	17.56
Open circuit voltage V_{oc} (V)	45.34	45.49	45.64	45.80	45.97
Short circuit current I_{sc} (A)	18.38	18.44	18.50	18.55	18.61
Module efficiency η(%)	20.92	21.08	21.24	21.40	21.56

Measuring tolerance: ±3%

ELECTRICAL CHARACTERISTIC | NMOT [2]

Power Level	650	655	660	665	670
Maximum power P_{max} (Wp)	492	495	499	503	507
Maximum power voltage V_{mpp} (V)	34.70	34.79	34.95	35.13	35.29
Maximum power current I_{mpp} (A)	14.18	14.23	14.28	14.32	14.37
Open circuit voltage V_{oc} (V)	42.17	42.31	42.45	42.60	42.76
Short circuit current I_{sc} (A)	15.04	15.09	15.14	15.18	15.23

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	32.9±1 kg
Glass	3.2 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 EVO2

TEMPERATURE RATINGS

NMOT	44±2 °C
Temperature coefficient of P_{max}	-0.34% / °C
Temperature coefficient of V_{oc}	-0.25% / °C
Temperature coefficient of I_{sc}	0.04% / °C

PACKAGING CONFIGURATION

Piece / Box	31
Size of packing	1350 x 1130 x 2515 mm
Weight of packing	1085 kg
Piece / Container (40'HC)	558

FOOTNOTES:
1) STC (Standard Test Conditions): 1000W/m² solar irradiance, cell temperature 25°C, AM 1.5G
2) 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.

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