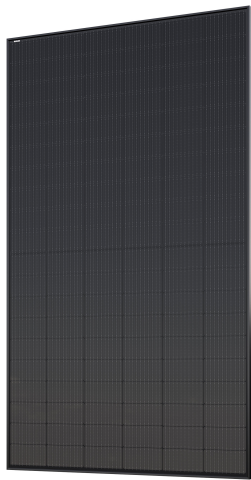


# PRODUCT DATASHEET

## M 450 P 60 LM -BB-F3

PV PANELS P-TYPE MONOFACIAL FULL BLACK | PERC monofacial photovoltaic panels in full black version



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### Areas of application

- Commercial and industrial installations
- Residential installations

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### Product benefits

- 12-years of product guarantee, 25-years of linear power output guarantee
- Limited PID-effect (potential induced degradation) thanks to strict quality control in production process
- Very low yearly degradation of the cells thanks to the better resistance to high temperatures
- Durable design and highest production standards guarantees operational reliability and quality

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### Product features

- Original Stäubli MC4 EVO 2 connectors
- Available in a long cable version
- Frame made of anodized aluminum alloy
- Multi-bus bar (MBB) technology
- Maximum static load up to 5400 Pa

TECHNICAL DATA

ELECTRICAL DATA STC

Maximum Power Pmax (STC)	450 W
Maximum Power Current Imp (STC)	12.80 A
Short Circuit Current Isc (STC)	13.55 A
Maximum Power Voltage Vmp (STC)	35.16 V
Open Circuit Voltage Voc (STC)	41.96 V
Module efficiency factor (STC)	20.78 %

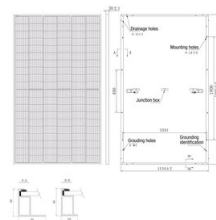
ELECTRICAL DATA NMOT

Maximum Power Pmax (NMOT)	341 W
Maximum Power Current Imp (NMOT)	10.38 A
Short Circuit Current Isc (NMOT)	11.00 A
Maximum Power Voltage Vmp (NMOT)	32.85 V
Open Circuit Voltage Voc (NMOT)	39.20 V

ELECTRICAL DATA STC and NMOT

Power tolerance	3 %
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MECHANICAL DATA



Type of Faciality	Monofacial
Cell material	Mono crystalline
Number of cells	120
Number of bypass diodes	3
With frame	Yes
Type of connection	Staubli MC4 EVO2
Width	1134 mm
Length	1909 mm
Height	30 mm
Product weight	22300.000 g

Cable length	1.2 m
Glass with anti-reflection coating	Yes
Colour backsheet	Black
Colour cells	Dark blue
Colour frame	Black
Front Glass	Yes

### TEMPERATURE RATINGS

Nominal operating cell temperature	44 °C
Temperature coefficient I <sub>sc</sub>	0.050 %/K
Temperature coefficient P <sub>mpp</sub>	-0.350 %/K
Temperature coefficient U <sub>oc</sub>	-0.275 %/K




### OPERATING CONDITIONS

Maximum series fuse rating	25 A
Temperature range in operation	-40...+85 °C
Front Side Maximum Static Loading	5400 Pa
Rear Side Maximum Static Loading	2400 Pa
Reverse current load	25 A

### EQUIPMENT / ACCESSORIES

- Product is delivered as a whole, no assembly required from customer
- MC4 EVO 2 connectors are fitted to the panel
- 3 bypass diodes are already installed in the panel

### DOWNLOAD DATA

Documents and certificates		Document name
	User instruction / safety instructions	PV MODULE
	Declarations of conformity	CE Certificate PV Panels
	Product family datasheet	M440-460P60LM-BB-F3_EN

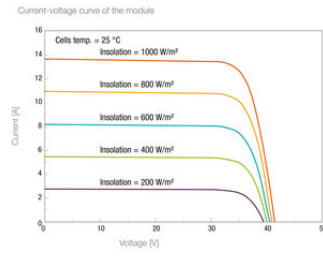
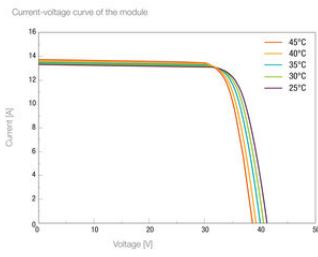
### LOGISTICAL DATA

Product code	Packaging unit (Pieces/Unit)	Dimensions (length x width x height)	Gross weight	Volume
4099854178962	Shipping box 36	1,940 mm x 1,135 mm x 1,140 mm	813085.00 g	2510.17 dm <sup>3</sup>

The mentioned product code describes the smallest quantity unit which can be ordered. One shipping unit can contain one or more single products.

When placing an order, for the quantity please enter single or multiples of a shipping unit.

### ADDITIONAL CATALOG INFORMATION



### DISCLAIMER

Subject to change without notice. Errors and omission excepted. Always make sure to use the most recent release.