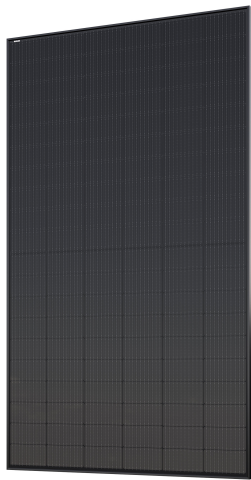


# PRODUCT DATASHEET

## 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 % |

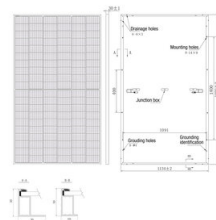
ELECTRICAL DATA NMOT

|                                  |         |
|----------------------------------|---------|
| 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 % |
|-----------------|-----|

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   |

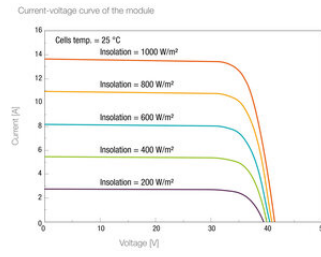
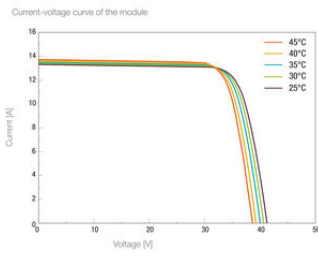
### LOGISTICAL DATA

| Product code  | Packaging unit (Pieces/Unit) | Dimensions (length x width x height) | Gross weight | Volume                  |
|---------------|------------------------------|--------------------------------------|--------------|-------------------------|
| 4099854178962 | Shipping box<br>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.