

**1KOM  
MA5°**

# 1KOMMA5° Full Black Module

- **Backed by Porsche**  
Porsche Ventures as an investor
- **German Design & Quality**  
Full black modules tested by independent institutes
- **German Warranty**  
25 years product & 30 years performance warranty
- **German Made Polysilicon**  
High CO<sub>2</sub> savings thanks to Poly-Si from Germany

1KOMMA5°-FullBlack-01-415  
1KOMMA5°-FullBlack-01-420  
1KOMMA5°-FullBlack-01-425

Designed in /  
with raw materials from



**415 ~ 425 W**  
POWER RANGE

**0+5 Wp**  
POWER TOLERANCE

**21.8%**  
MAX MODULE  
EFFICIENCY

**≤ 1.0%**  
ANNUAL POWER  
DEGRADATION 1ST YEAR

**≤ 0.4%**  
ANNUAL POWER  
DEGRADATION YEAR 2-30

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## Electrical Specifications

**STC** Irradiance 1,000 W/m<sup>2</sup>, Cell Temperature 25° C, AM = 1.5

	415	420	425
Rated output (P <sub>mpp</sub> / Wp)	415	420	425
Rated voltage (V <sub>mpp</sub> / V)	31.76	31.93	32.10
Rated current (I <sub>mpp</sub> / A)	13.06	13.15	13.24
Open circuit voltage (V <sub>oc</sub> / V)	37.80	38.00	38.20
Short circuit current (I <sub>sc</sub> / A)	13.76	13.87	13.98
Module efficiency	21.3%	21.5%	21.8%

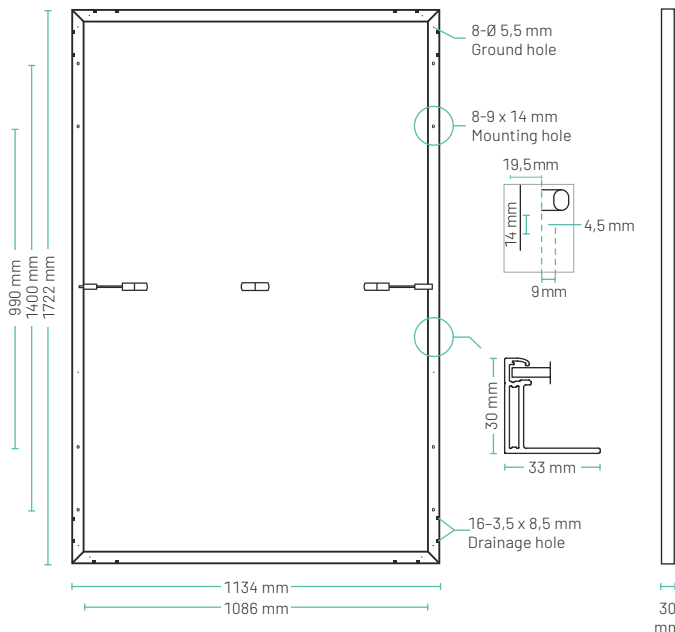
**NMOT** Irradiance 800 W/m<sup>2</sup>, Ambient Temperature 20° C, AM=1.5, Wind Speed 1m/s

	312.1	315.8	319.6
Rated output (P <sub>mpp</sub> / Wp)	312.1	315.8	319.6
Rated voltage (V <sub>mpp</sub> / V)	29.90	30.06	30.21
Rated current (I <sub>mpp</sub> / A)	10.44	10.51	10.58
Open circuit voltage (V <sub>oc</sub> / V)	35.91	36.10	36.29
Short circuit current (I <sub>sc</sub> / A)	11.11	11.20	11.28

## Temperature Ratings (STC) and Operating Parameters

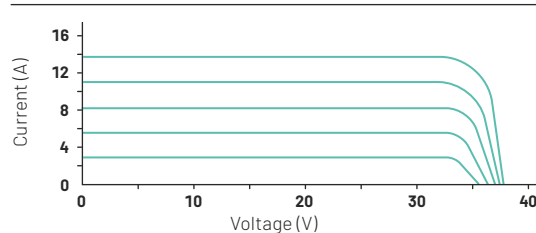
Temperature coefficient (P <sub>mpp</sub> )	-0.29%/°C	No. of diodes	3
Temperature coefficient (I <sub>sc</sub> )	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (V <sub>oc</sub> )	-0.24%/°C	Max. series fuse rating	25 A
Nominal module operating temperature (NMOT)	41±2° C	Max. system voltage (IEC)	1,500V <sub>DC</sub>
Power Tolerance	0+5 Wp	Fire Rating	Class C
Operating temperature (C°)	-40 – +85° C		
Maximum hail value	45mm diameter / 30.7m/s test velocity		

## Mechanical Specifications

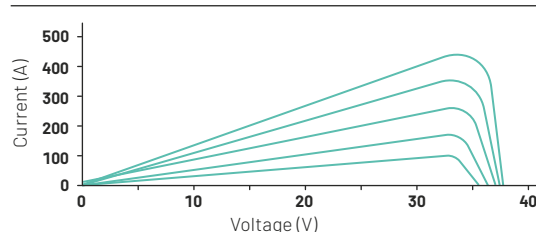


## Curve

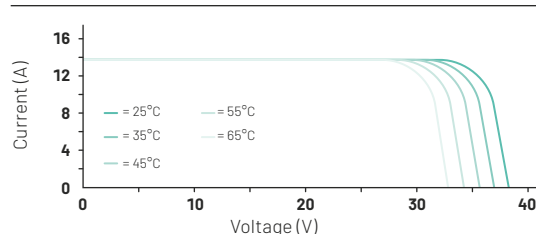
### Current-Voltage (415W)



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Outer dimensions (L x W x H)	1,722 x 1,134 x 30 mm
Cell type	mono-crystalline
No. of cells	108 (6*18)
Frame technology	Aluminum, black anodized
Front glass thickness	3.2 mm
Cable length (Including connector)	1,200 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
Maximum mechanical test load	5,400 Pa (front) / 2,400 Pa (back)
Connector type (IEC)	MC4-EV02A
Module weight	21.3 kg

