

# 1KOMMA5°

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## 3.1 MODULE



### N-Type Topcon module

- \* Fullblack
- \* Double glass
- \* Bifacial



### High Power up to 470 Wp



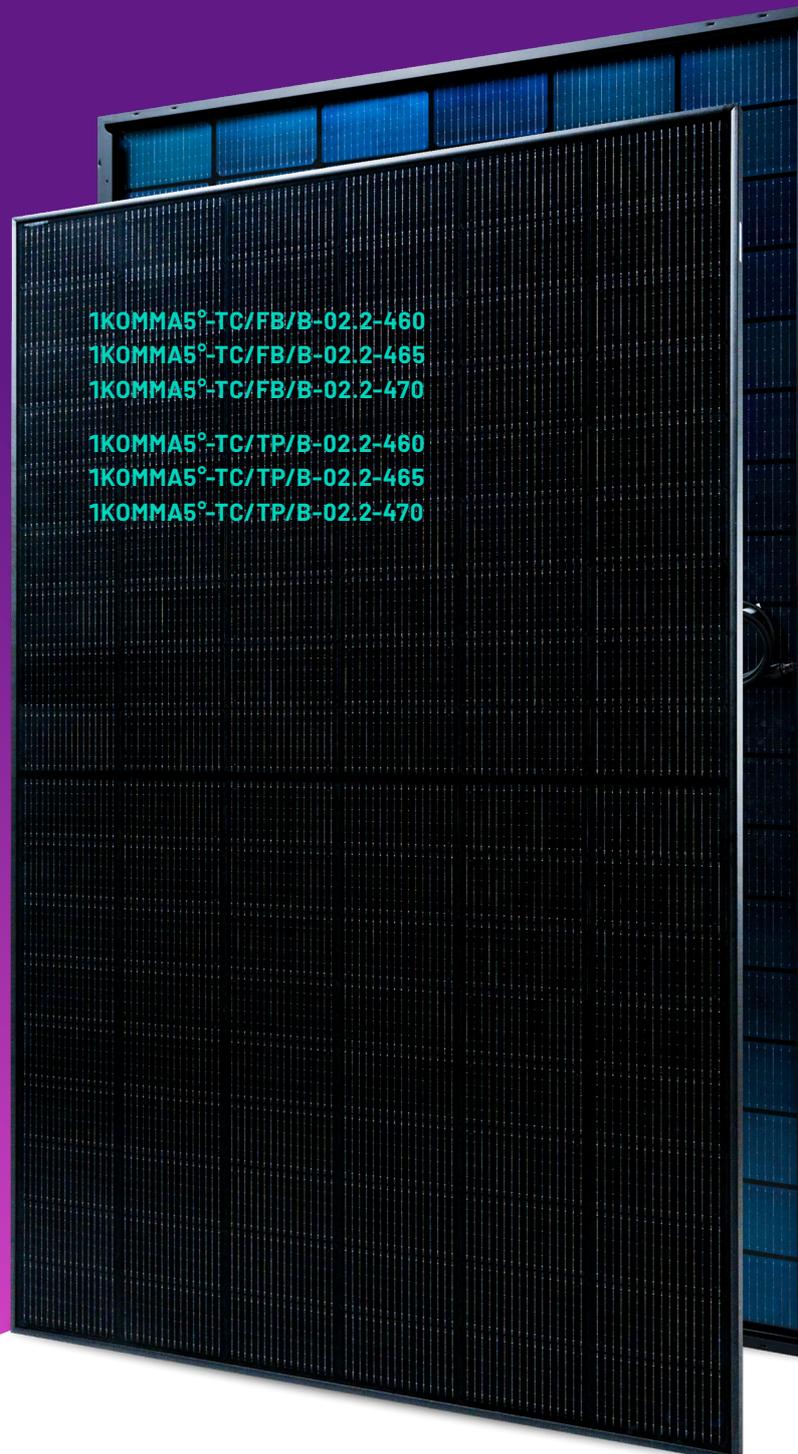
### 1KOMMA5° Warranty

- \* 30 years product
- \* 30 years linear performance warranty\*



### Highest Quality

- and standards
- \* PFAS free
  - \* Zero carbon factory



1KOMMA5°-TC/FB/B-02.2-460

1KOMMA5°-TC/FB/B-02.2-465

1KOMMA5°-TC/FB/B-02.2-470

1KOMMA5°-TC/TP/B-02.2-460

1KOMMA5°-TC/TP/B-02.2-465

1KOMMA5°-TC/TP/B-02.2-470



Designed in DE

\* Performance warranty is under STC condition

# 1KOMMA5° 3.1 MODULE

## MODULE SPECIFICATION

Cell type	N type Mono-crystalline, 96 (6 × 16)
Dimensions [L × W × H, mm]	1,762 × 1,134 × 30
Weight [kg]	24.0
Front	2 mm heat strengthened glass, Anti-reflective coating
Rear	2 mm heat strengthened glass
Junction box	3 Diodes, IP68 » IEC 62790
Cable [mm]	4 mm <sup>2</sup> / Portrait: 300 (+)/200 (-) Landscape: 1,100 (+)/1,100 (-) Length can be customized
Plug type (IEC)	MC4-EVO 2A (PV-KST4-EVO2A/xy / PV-KBT4-EVO2A/xy, Stäubli Electrical Connectors AG)

## ELECTRICAL SPECIFICATIONS<sup>1</sup>

1KOMMA5°-TC/FB/B-02.2- 1KOMMA5°-TC/TP/B-02.2-	460	465	470			
Test conditions	<b>STC<sup>2</sup></b>	<b>BNPI<sup>3</sup></b>	<b>STC<sup>2</sup></b>	<b>BNPI<sup>3</sup></b>	<b>STC<sup>2</sup></b>	<b>BNPI<sup>3</sup></b>
Nominal power [Pmpp/Wp]	460	508	465	514	470	519
Nominal voltage [Vmpp/V]	30.95	30.99	31.21	31.25	31.47	31.51
Nominal current [Impp/A]	14.87	16.41	14.91	16.45	14.95	16.50
Open circuit voltage [Voc/V]	36.32	36.32	36.46	36.46	36.60	36.60
Efficiency [%]	23	23.3	23.3	23.5	23.5	23.5
Short-circuit current [Isc/A]	15.83	17.42	15.88	17.47	15.93	17.53
Test conditions	<b>BSI</b>	<b>BSI</b>	<b>BSI</b>			
Short-circuit current [Isc/A]	19.53	19.60	19.66			

## BIFACIAL POWER GAIN

10% Pmax(STC)[Wp]	497	502	508
20% Pmax(STC)[Wp]	534	539	545
30% Pmax(STC)[Wp]	570	577	583

## MODULE CHARACTERISTICS

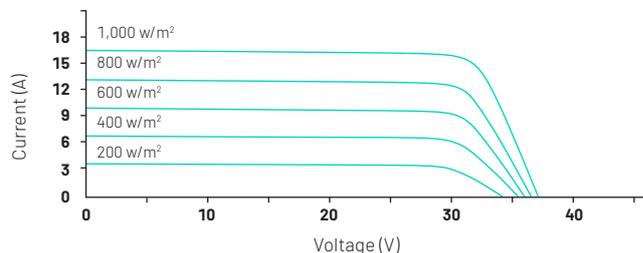
Maximum System Voltage [V]	1,500 DC (IEC)
Overcurrent Protection Rating [A]	30
Power Output Tolerance [%]	0-3
Max. Test Load, Push/Pull [Pa]	Front 5,400 / Back 3,600
Max. Design Load, Push/Pull (Pa)	Front 3,600 / Back 2,400
Annual Degradation (1st year)	≤ 1.0%
Annual Degradation (2nd – 30th year)	Max. 0.4% per year
Protection Class	II
Fire Protection Class	UL Type 29   IEC Class C
Hail Class	HW3 <sub>4</sub>
Module temperature rating (C98)	70°

## TEMPERATURE CHARACTERISTICS

Nominal Module Operating Temperature [NMOT]	42 ± 2°C
Temperature Coefficient [Pmpp]	-0.29 %/°C
Temperature Coefficient [Voc]	-0.25 %/°C
Temperature Coefficient [Isc]	+0.048 %/°C
Operating Temperature [°C]	-40 to +70

## POWER CURVES

### Current-voltage curve (470 W)

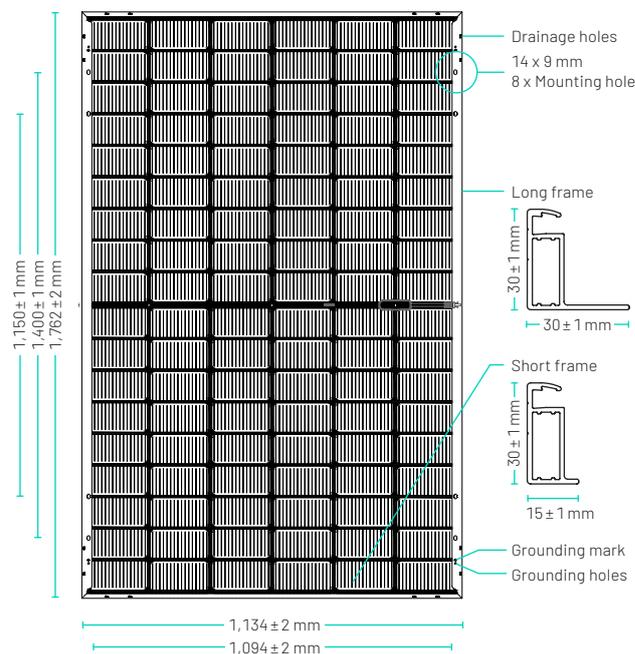


Performance at low irradiance: (200 ± 2) W/m<sup>2</sup>, module at (25 ± 2) °C. Measured according to IEC 60904-1

## PACKAGING INFORMATION

Container	40' HQ
Pallet dimensions [L × W × H, mm]	1,800 × 1,140 × 1,250
Pieces per pallet	36
Pieces per container	936

## TECHNICAL DRAWING



## CERTIFICATIONS

IEC 61215, IEC 61730

Additional Certificates on request

**1** Measurements according to IEC 60904-3, Measurement tolerance: Isc: ±4%, Voc: ±3%, Test uncertainty for Pmax: ±3%, Bifaciality: 80% ± 5%, Pmax: 80 ± 5%, ϕVoc: 100 ± 3%, ϕIsc: 80 ± 5%  
**2 STC** Radiation 1,000 W/m<sup>2</sup>, Module temperature 25°C, AM = 1.5  
**3 BNPI** Front radiation 1,000 W/m<sup>2</sup>, Rear radiation 135 W/m<sup>2</sup>, Module temperature 25°C, AM = 1.5  
**4** Reference diameter of ice balls-VKF 30mm, Ice ball storage temperature -20°C

