

# Vertex N

N-type i-TOPCon bifacial dual glass  
Monocrystalline module

PRODUCT: TSM-NEG20C.20

POWER RANGE: 620-630W

## 630W

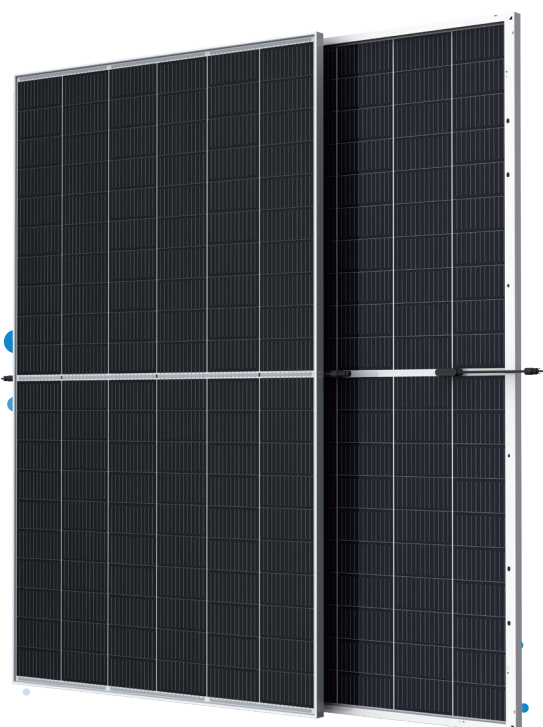
MAXIMUM POWER OUTPUT

## 0~+5W

POSITIVE POWER TOLERANCE

## 22.3%

MAXIMUM EFFICIENCY



### High customer value

- 낮은 LCOE로 인한 BOS 비용 감소로 투자회수 기간 단축
- 낮은 성능감소율과 뛰어난 내구성
- 저전압 설계한 고출력 모듈



### High power up to 630W

- 고밀도 인터커넥트 기술로 최대 22.3%의 모듈 효율
- 뛰어난 빛 가둠효과와 더 낮은 직렬 저항 및 향상된 전류 수집을 위한 멀티버스바 기술 적용



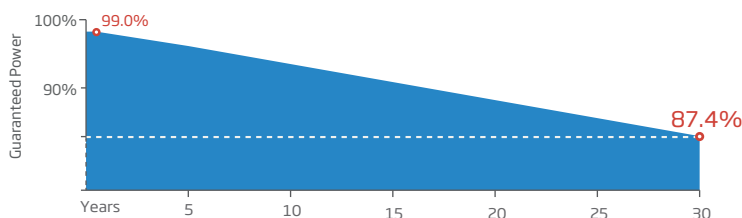
### High reliability

- 최첨단 절단 기술로 마이크로 크랙 최소화
- 셀 프로세스와 엄격한 자재 관리로 인한 높은 PID 저항력
- 염분, 암모니아, 모래, 고온, 습도 등 가혹한 환경에 대한 뛰어난 내성



### High energy yield

- 타 인증기관으로부터 검증받은 뛰어난 Bifaciality 및 낮은 조사 성능
- 연간 음영 조건에서 최적화된 에너지 생산을 제공하는 유니크한 디자인
- 낮은 온도계수와 작업온도
- 후면 추가 발전량



### Comprehensive Products and System Certificates



IEC61215/IEC61730/IEC61701/IEC62716/UL61730

ISO 9001: Quality Management System

ISO 14001: environmental Management System

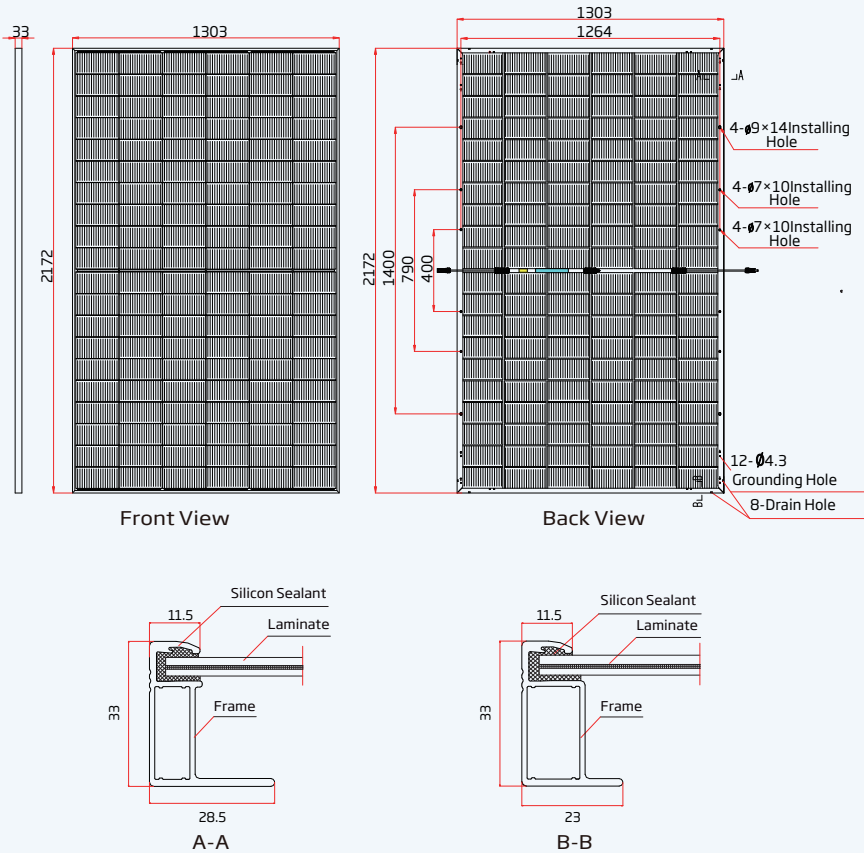
ISO 14064: Greenhouse Gases Emissions Verification

ISO 45001: Occupational Health and Safety Management System

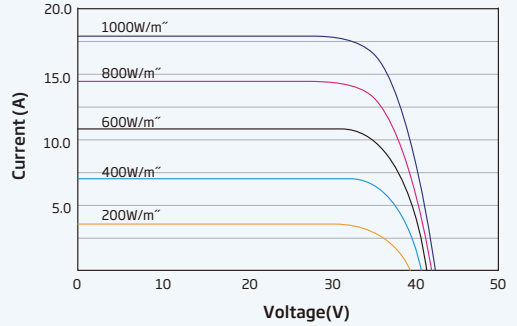


PV CYCLE

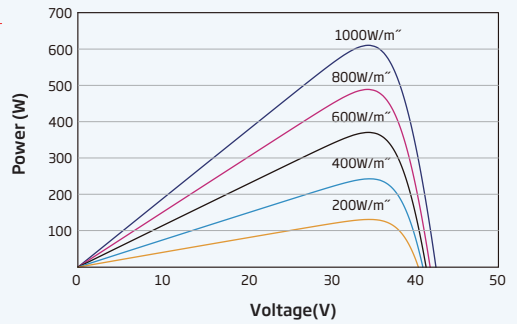
**DIMENSIONS OF PV MODULE(mm)**



**I-V CURVES OF PV MODULE(610W)**



**P-V CURVES OF PV MODULE(610 W)**



**ELECTRICAL DATA (STC)**

최대출력-P <sub>MAX</sub> (Wp)*	620	625	630
출력 공차-P <sub>MAX</sub> (W)		0 ~ +5	
최대출력 동작전압-V <sub>MPP</sub> (V)	36.1	36.4	36.6
최대출력 동작전류-I <sub>MPP</sub> (A)	17.16	17.19	17.22
개방전압-V <sub>OC</sub> (V)	43.2	43.5	43.9
단락전류-I <sub>SC</sub> (A)	18.18	18.21	18.24
모듈 효율 η <sub>m</sub> (%)	21.9	22.1	22.3

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. \*Measuring tolerance: ±3%.

**Electrical characteristics with different power bin (후면 추가발전량 5%)**

최대 출력-P <sub>MAX</sub> (Wp)	651	656	662
최대출력 동작전압-V <sub>MPP</sub> (V)	36.1	36.4	36.6
최대출력 동작전류-I <sub>MPP</sub> (A)	18.02	18.05	18.08
개방전압-V <sub>OC</sub> (V)	43.2	43.5	43.9
단락전류-I <sub>SC</sub> (A)	19.09	19.12	19.15
후면 추가발전량		5%	

Product Bifaciality: 80±5%.

**ELECTRICAL DATA (NOCT)**

최대출력-P <sub>MAX</sub> (Wp)	473	478	482
최대출력 동작전압-V <sub>MPP</sub> (V)	33.9	34.3	34.5
최대출력 동작전류-I <sub>MPP</sub> (A)	13.94	13.95	13.96
개방전압-V <sub>OC</sub> (V)	41.0	41.3	40.6
단락전류-I <sub>SC</sub> (A)	14.65	14.68	14.70

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

**MECHANICAL DATA**

Solar Cells	Monocrystalline
No. of cells	120 cells
Module 치수	2172×1303×33 mm
무게	34.9 kg
Front Glass	2.0 mm, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Back Glass	2.0 mm, Heat Strengthened Glass (White Grid Glass)
Frame	33mm Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> Portrait: 350/280 mm Landscape: 1400/1400 mm
Connector	TS4 Plus / TS4

**TEMPERATURE RATINGS**

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
P <sub>MAX</sub> 온도계수	-0.29%/°C
V <sub>OC</sub> 온도계수	-0.24%/°C
I <sub>SC</sub> 온도계수	0.04%/°C

**MAXIMUM RATINGS**

작업온도	-40~+85°C
최대시스템전압	1500V DC (IEC)
최대퓨즈정격전류	35A

**WARRANTY**

- 12 year Product Workmanship Warranty
- 30 year Power Warranty
- 1% first year degradation
- 0.4% Annual Power Attenuation

(Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

- Modules per box: 26/39 pieces
- Modules per 40' container: 585 pieces