# HT-SOLAR

Delivering Solar Power since 1960



# HT48-210R(ND)-F

## DOUBLE GLASS BIFACIAL TOPCON PV MODULE

*440-475W ALL BLACK*

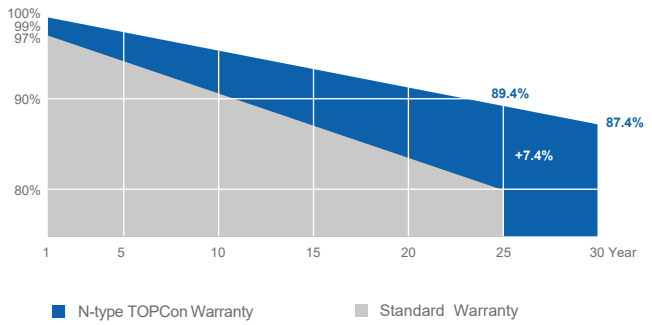
## DESIGNED FOR AUSTRALIA

## COMPOSITE FRAME MANUFACTURED WITH UP TO 30% RECYCLED MATERIALS

## FEATURE

| | |
|---|---|
| | Half-cut cell technology reduces internal power loss, improves power production and provides excellent heat dissipation to avoid hot spots. |
| | **30 Year** product warranty for rooftop installations<br>**15 Year** for ground mounted. |
| 30Yrs | **30 Year** power output warranty. |
| **EL Tested** | High quality control using double EL tests to ensure reliability and avoid microcracks. |
| | Certified to withstand extreme mechanical load 8000 Pa positive and 4000 Pa negative.<br>45mm hailstone at the speed of 23m/s tested by Dekra. |
| **TOPCon** | Optimised Super Multi-Busbar (SMBB) for maximum light absorption, lower resistance, better low-light response and improved current collection for enhanced reliability. |
| **1500V** | Designed for high voltage systems of up to 1500 VDC, increases string length and saves on BoS costs. |
| **2%** | All modules sorted and packaged by amperage reducing mismatch losses by average of 2% to enhance system output. |
| **AntiPID** | 288hrs **enhanced PID test (IEC TS 62804)**, a performance with minimal power degradation and higher energy yield. |
| **IEC Tests** | IEC 61701 Salt Mist Corrosion Resistance<br>IEC 62716 Ammonia Corrosion Resistance<br>IEC 60068 Dust Resistance |
| **Low** Degradation Rate | 0.4% annual degradation rate over 30 year power output. |

## WARRANTY




## COMPREHENSIVE AND FIRST-RATE CERTIFICATION SYSTEM

IEC 61215, IEC 61730 Latest Standard
SA8000, ISO 9001, ISO 14001 and ISO 45001.
Strict quality control of the highest international standards.

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#DS1265

# MULTIWAY+

## BETTER CHOICE FOR HIGHER EFFICIENCY!

# HT48-210R(ND)-F

**440W /445W /450W /455W /460W /465W /470W /475W**

## ELECTRICAL CHARACTERISTICS (STC)

| Module Type | HT48-210R(ND)-F | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Maximum Power (Pmax) | 440W | 445W | 450W | 455W | 460W | 465W | 470W | 475W |
| Open Circuit Voltage(Voc) | 35.33V | 35.52V | 35.71V | 35.90V | 36.09V | 36.28V | 36.47V | 36.66V |
| Short Circuit Current(Isc) | 16.19A | 16.22A | 16.25A | 16.28A | 16.31A | 16.34A | 16.37A | 16.40A |
| Maximum Power Voltage(Vmp) | 28.86V | 29.11V | 29.36V | 29.61V | 29.86V | 30.11V | 30.36V | 30.61V |
| Maximum Power Current(Imp) | 15.25A | 15.29A | 15.33A | 15.37A | 15.41A | 15.45A | 15.49A | 15.53A |
| Module Efficiency | 22.0% | 22.3% | 22.5% | 22.8% | 23.0% | 23.3% | 23.5% | 23.8% |
| Power Measurement Tolerances | ±3% | | | | | | | |
| Power Measurement Tolerances | 0~+3% | | | | | | | |
| Maximum System Voltage | 1500V DC (IEC) | | | | | | | |
| Maximum Series Fuse Rating | 30A | | | | | | | |
| Operating Temperature | -40-70°C, Module[T98] max :70°C | | | | | | | |

STC: AM 1.5, Irradiance 1000W/m², module temperature 25℃

## ELECTRICAL CHARACTERISTICS (NMOT)

| Module Type | HT48-210R(ND)-F | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Maximum Power(Pmax) | 334W | 337W | 341W | 345W | 349W | 353W | 356W | 360W |
| Open Circuit Voltage(Voc) | 33.74V | 33.92V | 34.10V | 34.28V | 34.47V | 34.65V | 34.83V | 35.01V |
| Short Circuit Current(Isc) | 13.06A | 13.08A | 13.11A | 13.13A | 13.16A | 13.18A | 13.20A | 13.23A |
| Maximum Power Voltage(Vmp) | 27.56V | 27.80V | 28.04V | 28.28V | 28.52V | 28.76V | 28.99V | 29.23V |
| Maximum Power Current(Imp) | 12.12A | 12.12A | 12.16A | 12.20A | 12.24A | 12.27A | 12.28A | 12.32A |

NMOT: Irradiance 800W/m², ambient temperature 20℃, wind speed 1m/s

## ELECTRICAL RATINGS AT IRRADIANCE LEVEL AT BNPI

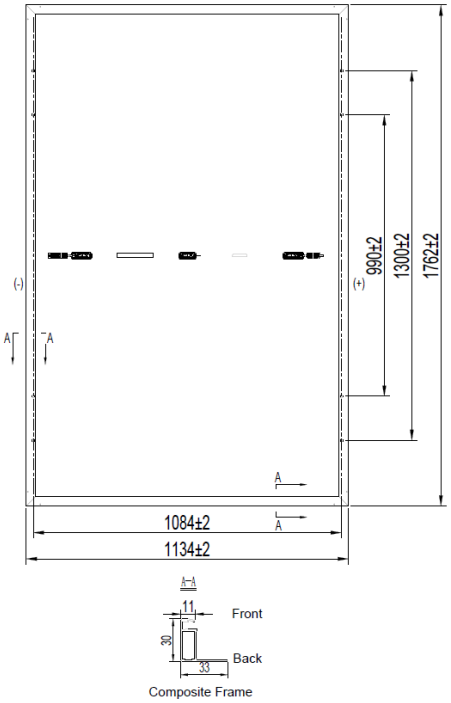
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Rated Voc at BNPI [V] / tolerance ±5% | 35.31 | 35.5 | 35.69 | 35.88 | 36.07 | 36.26 | 36.45 | 36.64 |
| Rated Isc at BNPI [A] / tolerance ±5% | 17.94 | 17.97 | 18.01 | 18.04 | 18.07 | 18.1 | 18.14 | 18.17 |
| Rated Vmp at BNPI [V] | 28.88 | 29.13 | 29.38 | 29.63 | 29.88 | 30.13 | 30.38 | 30.63 |
| Rated Imp at BNPI [A] | 16.9 | 16.94 | 16.99 | 17.03 | 17.07 | 17.12 | 17.16 | 17.21 |
| Rated Pmax at BNPI [W] / tolerance ±3% | 488 | 493.5 | 499 | 504.6 | 510.2 | 515.8 | 521.4 | 527.1 |

## BIFACIALITY COEFFICIENT WITH TOLERANCE (BNPI)

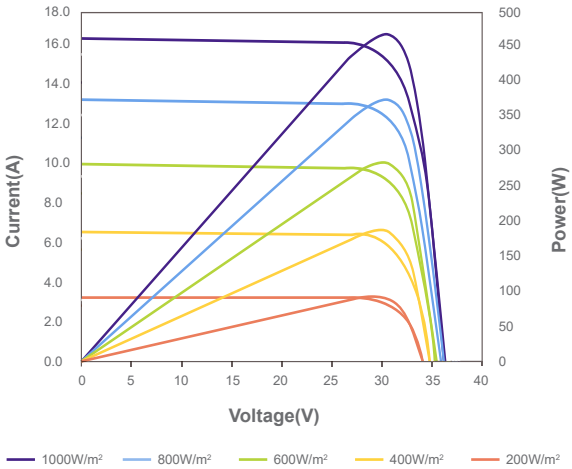
| | |
|---|---|
| φPmax | 80%±5% |
| φVoc | 98%±5% |
| φIsc | 80%±5% |

| | | |
|---|---|---|
| Nominal Module Operating Temperature(NMOT) | | 43 ± 2°C |
| Temperature Coefficient of Pmax | γ(PM) | -0.29%/℃ |
| Temperature Coefficient of Voc | β(Voc) | -0.25%/℃ |
| Temperature Coefficient of Isc | α(Isc) | 0.046%/℃ |
| Solar Cells | Monocrystalline | |
| No.of Cells | 96 (6x16) | |
| Dimensions | 1762mm x 1134mm x 30mm | |
| Weight | 24.0kg | |
| Glass | 2mm Anti-Reflection Coating Heat Strengthened Glass | |
| Frame | Polymer Composite Frame: contains 30% recycled materials | |
| Junction Box/Connectors | IP68 / Stäubli MC4 | |
| Cable | 4mm²(IEC) length: (+) 1200mm, (-) 1200mm or customised | |
| Fire Class Rating | Class C | |
| Packaging Configuration | 37 pcs/box: 962 pcs/ 40' HQ Container | |

## DIMENSIONS OF PV MODULE (MM)




## IV CURVES




**Shanghai Aerospace Automobile Electromechanical Co., Ltd.**
(HT-SAAE)

**Factory**
Lianyungang Shenzhou New Energy Co., Ltd. (HT-Solar)

**Australia office**
Tel: 1300 309 008 Website: www.ht-saae.com.au

**Made in China**

Module recycling should be carried out by professionals.

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Only available in Australia