

## DATASHEET

430 Wp 182/16BB mm cell(1/2 CUT) 108 pcs  
N-type Bi-Facial Glass/Glass Full Black  
AN-430-N-16BB-BI-GG-FB

N-TYPE  
430 Wp  
BI-FACIAL  
GLASS/GLASS  
FULL BLACK  
LONGLIFE 35

Designed and manufactured by



**DARWIN**  
RENEWABLE ENERGY INNOVATOR





**STÄUBLI**

Original European parts (ie. MC + Staubli)



**DARWIN Module Frame**  
High stability and torsion free



**DARWIN Module Wave Shape**  
Grip shaped frame with anti-slip coating



**DARWIN Junction box**  
High quality design for longer life expectancy

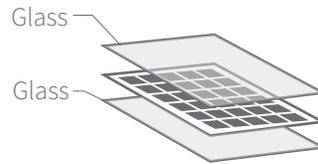


**DARWIN anti-reflection coating**  
Maximize the light absorption for higher output

**90% BIFACIALITY**

**N-TYPE**

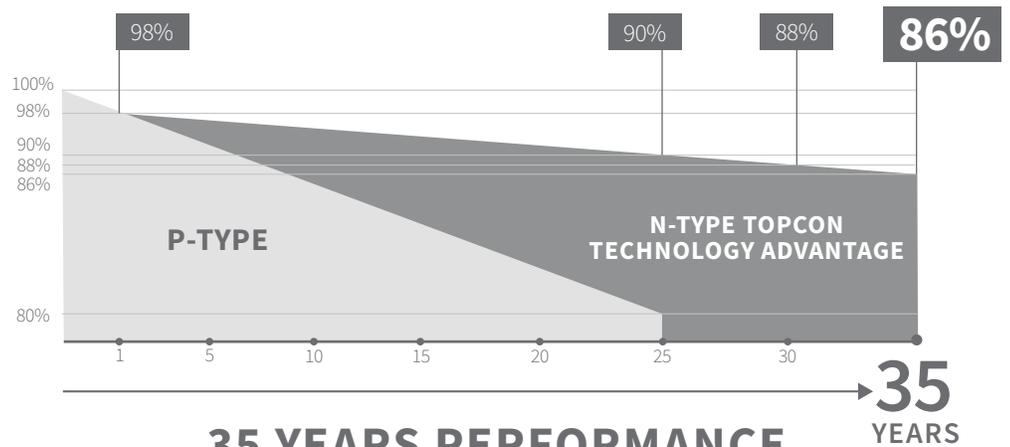
**TOPCON 2023**



High Power Output Standards



35 years linear power output  
Guarantee (86%) 0,40 % annual degradation



**35 YEARS PERFORMANCE**

**WARRANTY 86%**

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Efficiency



0-5 % positive power tolerance by individual measurement.



Low LCOE (Levelized Cost of Energy)

**22,00%**

MODULE EFFICIENCY

Key Features – Durability & Quality



100% visual electro-luminance inspection



Enhanced mechanical load, certified to withstand Wind load (2400 Pascal) and Snow load (5400 Pascal)



Durability against extreme environmental conditions



Better shading tolerance and lower resistive loss



High salt mist and ammonia resistance



Multi Busbar Technology for better light trapping



No hot spot due to optimized electrical design, low current  
**MUCH LOWER THAN P-TYPE**



Very low temp coefficient (P Max) for higher output  
**MUCH LOWER THAN P-TYPE**



**N-TYPE  
NO HOT SPOT  
TOPCON TECHNOLOGY**



**VERY LOW TEMP COEFFICIENT**  
(P Max) for higher output



**ZERO PID+LID**  
(DUE TO N-TYPE)

European



- "ANDO by Darwin" is a European brand with 100% European roots

- The Darwin R&D team collaborates with IMEC for new product developments.

- All products are engineered in Europe according to European norms (EN, IEC, etc.)

- The manufacturing facilities operate with European insurance partners such as MunichRE

- The company Darwin has offices and is represented in LV, BE, NL, DE, FR, ESP, IT and GB. Warehousing as well as technical support and warranty issues are being taken care of locally.

- Our quality control team works, upon request, with "EnergyVille Belgium" and "Solartester Netherlands" for incoming quality controls, such as extra flash, durability, electro-luminescence inspections and tests.



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**Darwin Management & Production**


ISO9001:2015 (Quality Management Systems)  
 ISO14001:2015 + ISO45001:2018 (Environmental Management Systems)



OHSAS18001:2011 (Occupational Health and Safety Management Systems)



Most of Darwin products are manufactured in TIER1 listed production facilities

**Certifications**


Darwin manufacturing facilities strive to work with a maximum possible Cradle2cradle percentage.

**Electrical Parameters**
**Electrical Parameters**

**AN ULTRA HIGH EXTRA EFFICIENCY** can be reached by the reflection of sunlight to the back of the panel.

|                               | Front       | Back Extra Power (Depend on the % of reflected light to the back) |         |        |
|-------------------------------|-------------|---|---------|--------|
|                               |             | 10%   | 20%     | 30%    |
| <b>Light Source (%)</b>       | <b>100%</b> |   |         |        |
| Peak Power (Pmax) (W)         | 430         | ±450  | ±487    | ±520   |
| Open Circuit Voltage-Voc      | 38.72       | 38.0  | 38.1    | 38.2   |
| Short Circuit Current-Isc (A) | 14.25       | 14.80   | 15.80   | 16.80  |
| Max. Power Voltage-Vmp (V)    | 32.34       | 32.1  | 32.2    | 32.3   |
| Max. Power Current-Imp (A)    | 13.30       | 14.00   | 15.10   | 16.20  |
| Module Efficiency – Nm (%)    | 22.00 %     | 24.72 %   | 26.66 % | 28.52% |
| Power Tolerance               |             | 0+5Wp   |         |        |

Final results depend on the actual reflection from the location of installation and are subject to many other unknown factors.

**STC:** Irradiance 1000 W/m<sup>2</sup>, module temperature 25°C, AM=1.5; Tolerances of Pmax, Voc and Isc are all within +/- 5%

**Electrical Parameters at NOCT**

|                               |         |
|-------------------------------|---------|
| Max. Power – Pmax (W)         | 328.7 W |
| Open Circuit Voltage-Voc (V)  | 36.80 V |
| Short Circuit Current-Isc (A) | 11.49 A |
| Max. Power Voltage-Vmp (V)    | 30.20 V |
| Max. Power Current-Imp (A)    | 10.89 A |

\*NOCT (Nominal cell temp.): Irradiance 800W/m<sup>2</sup>, Ambient Temp. 25°C, Wind Speed 1m/s

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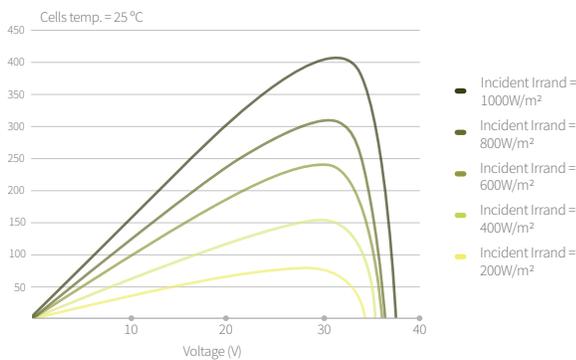
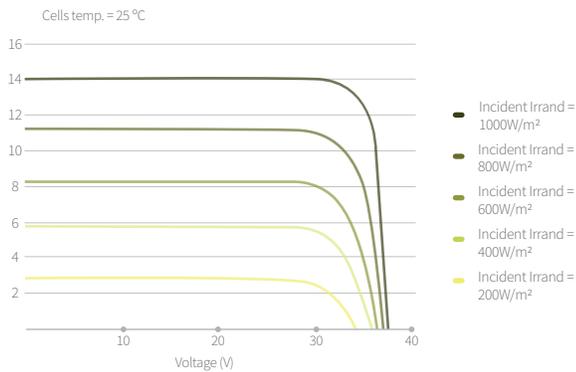
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 RENEWABLE ENERGY INNOVATOR

### Operating Parameters

|                                   |               |
|-----------------------------------|---------------|
| Max. System Voltage (Vdc)         | 1500 VDC      |
| Max. Series Fuse Rating (A)       | 25 A          |
| Nominal Operating Cell temp. (°C) | 45 +/- 2 °C   |
| Operational temp. (°C)            | -45°C -+85 °C |

Class II

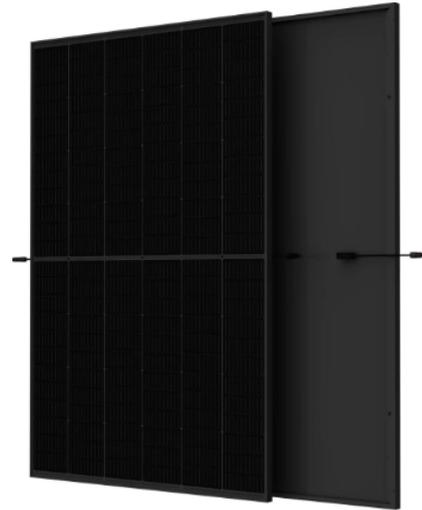
### Current-voltage Curve (Cell Temp.)



### Temperature Coefficient

|                                |             |
|--------------------------------|-------------|
| Temp. Coefficient of Isc (°C)  | +.0.045%/°C |
| Temp. Coefficient of Voc (°C)  | -.0.250%/°C |
| Temp. Coefficient of Pmax (°C) | -.0.290%/°C |

### Power + Performance Warranty



**25 years= 90% 30 years= 88% 35 years= 86%**

### Mechanical Design

|                                    |  |
|------------------------------------|--|
| Frontside glass + Backside glass   | 1.6 mm + 1.6 mm toughened Low-reflection low-irontempered glass for maximum transmission |
| Coating on glass                   | Anti-reflection coating Darwin type  |
| Backside                           | Black composite film   |
| Encapsulant material               | EVA/POE  |
| Frame                              | 30 mm Black anodized Aluminium Alloy 6005-T6<br>Cradle to cradle concept                 |
| Junction Box                       | IP68, 1500 V, Darwin type  |
| Cable Length (mm)                  | (+) 1200 mm, (-) 1200 mm   |
| Cable Thickness (mm <sup>2</sup> ) | 4del mm <sup>2</sup> (IEC)   |
| Connector (plug-in system)         | EU original Stäubli Plug Socket, IP68, MC4-EVO2, 1500 V                                  |
| Fire class                         | C  |
| Internal Diodes                    | 3 Bypass Diodes  |

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### Mechanical Specifications TOPCON

|                           |                             |
|---------------------------|-----------------------------|
| Cell                      | N Type 16BB 182mm (2x54pcs) |
| Cell Size (mm)            | 182x91 mm (1/2 cut)         |
| No. of Cells              | 108 pcs (6 x 18)            |
| Dimensions L x W x H (mm) | 1722 x 1134 x 30 +/- 1.5 mm |
| Weight (kg)               | 20.5 kg                     |

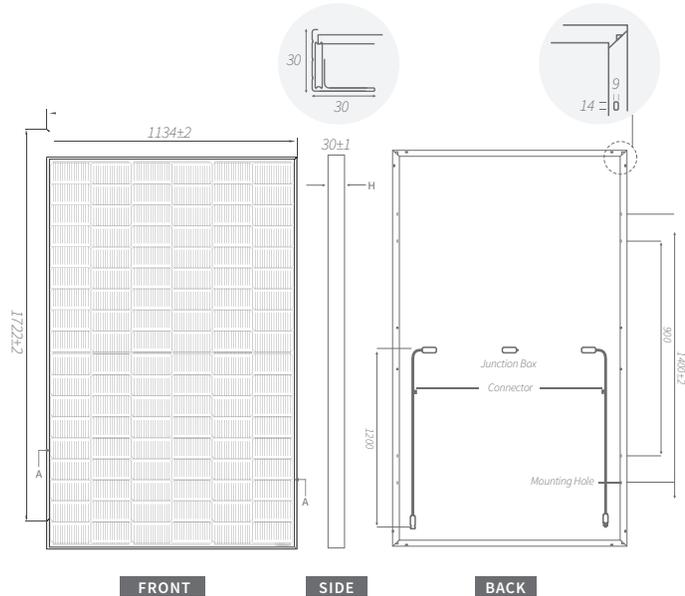
### Mechanical Load

|                                |                               |
|--------------------------------|-------------------------------|
| Design load (pressure/suction) | 3600 Pa / 1600 Pa             |
| Test load (pressure/suction)   | 5400 Pa / 2400 Pa             |
| Hail Test                      | Diam. 25 mm,<br>speed 80 km/h |

### Packaging

|                              |                        |
|------------------------------|------------------------|
| Configuration Pallet         | 36 pcs / pallet        |
| Pallet Size                  | 1722 x 1130 x 1245 mm  |
| Pallet configuration 40ft HQ | 26 pallets / container |
| Qty per 40ft HQ              | 936 pcs / container    |

### Mechanical Diagrams



\*All Dimensions in mm | The above drawing is a graphical representation of the product | For engineering quality drawings please contact DARWIN.

## FULL-OPTION DARWIN WARRANTY

**35 YEARS** PRODUCT WARRANTY

**35 YEARS** PERFORMANCE WARRANTY

**35 YEARS** SERVICE WARRANTY



|                      | Darwin Full-Option | VS | Conventional  |
|----------------------|--------------------|----|---------------|
| Product Warranty     | 35 Years           |    | Max. 10 Years |
| Performance Warranty | 35 Years           |    | Max. 10 Years |
| Start point          | 100%               |    | 97%           |
| Yearly decline       | 0.34/ 0.40%        |    | 0.55 / 0.7%   |
| End point (25years)  | >90%               |    | 80%           |
| End point (35 years) | >86%               |    | NOT AVAILABLE |
| Service Warranty     | 35 Years           |    | NOT AVAILABLE |
| Shipping - new part  | INCLUDED!          |    | NOT AVAILABLE |
| Shipping - old part  | INCLUDED!          |    | NOT AVAILABLE |
| Installation         | INCLUDED!          |    | NOT AVAILABLE |

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