

# Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09R.08  
POWER RANGE: 415-435 W

## 435 W+

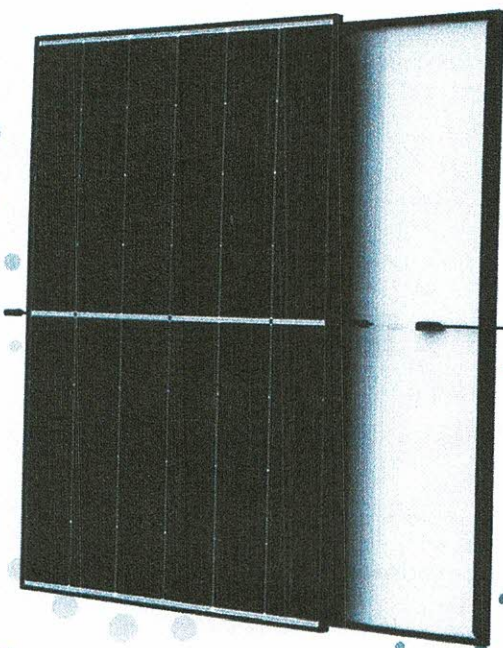
MAXIMUM POWER OUTPUT

## 0/+5 W

POSITIVE POWER TOLERANCE

## 21.8 %

MAXIMUM EFFICIENCY



### Small in size, big on power

- Generates up to 435 W, 21.8 % module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping, lower series resistance, improved current collection and enhanced reliability
- Excellent low light performance (IAM) with cell process and module material optimization



### Universal solution for residential and C&I rooftops

- Designed for compatibility with existing mainstream inverters, optimizers and mounting systems
- Perfect size and low weight for easy handling. Optimized transportation cost
- Reduces installation cost with higher power bin and efficiency
- Flexible installation solutions for system deployment



### High Reliability

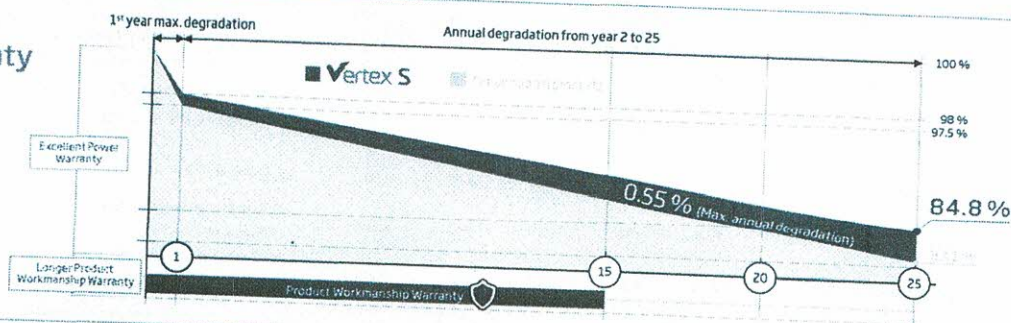
- Positive load up to 6,000 Pa (snow)
- Negative load up to 4,000 Pa (wind)

### Extended Vertex S Warranty

2 %  
1<sup>st</sup> year max. degradation

0.55 %  
Max. annual degradation from year 2 to 25

15 Years  
Product Workmanship Warranty



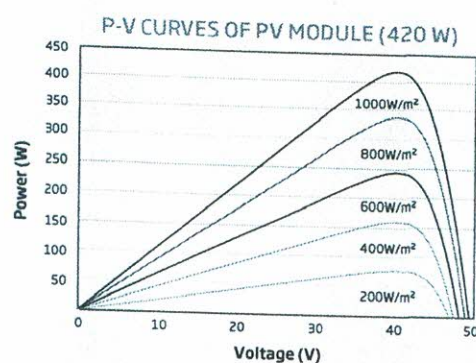
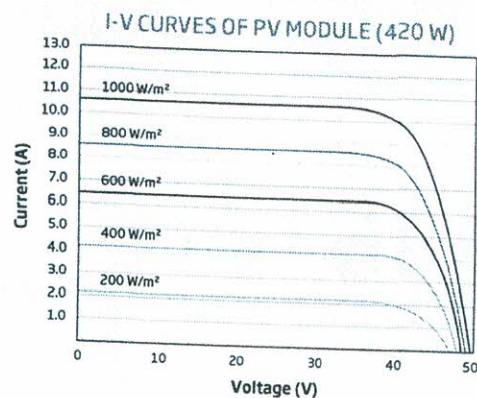
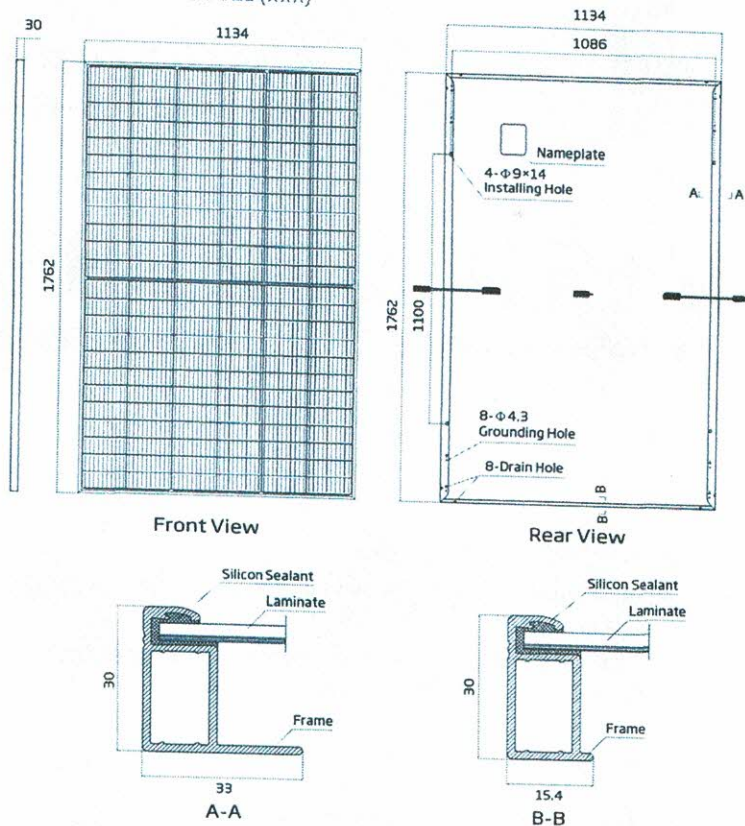
### Comprehensive Product and System Certificates



IEC61215/IEC61730/IEC61701/IEC62716  
ISO 9001: Quality Management System  
ISO 14001: Environmental Management System  
ISO14064: Greenhouse Gases Emissions Verification  
ISO45001: Occupational Health and Safety Management System

**Trinasolar**

## DIMENSIONS OF PV MODULE (mm)



### ELECTRICAL DATA (STC)

|                                      | TSM-415<br>DE09R.08 | TSM-420<br>DE09R.08 | TSM-425<br>DE09R.08 | TSM-430<br>DE09R.08 | TSM-435<br>DE09R.08 |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Peak Power Watts- $P_{MAX}$ (Wp)*    | 415                 | 420                 | 425                 | 430                 | 435                 |
| Power Tolerance- $P_{MAX}$ (W)       | 0/+5                | 0/+5                | 0/+5                | 0/+5                | 0/+5                |
| Maximum Power Voltage- $V_{MPP}$ (V) | 41.0                | 41.3                | 41.5                | 41.8                | 42.0                |
| Maximum Power Current- $I_{MPP}$ (A) | 10.11               | 10.17               | 10.24               | 10.30               | 10.36               |
| Open Circuit Voltage- $V_{OC}$ (V)   | 49.4                | 49.7                | 49.9                | 50.3                | 50.6                |
| Short Circuit Current- $I_{SC}$ (A)  | 10.64               | 10.69               | 10.74               | 10.81               | 10.86               |
| Module Efficiency $\eta$ (%)         | 20.8                | 21.0                | 21.3                | 21.5                | 21.8                |

STC: Irradiance 1000 W/m², Cell Temperature 25 °C, Air Mass AM1.5 \*Measuring tolerance: ±3%

### ELECTRICAL DATA (NOCT)

|                                      | TSM-415<br>DE09R.08 | TSM-420<br>DE09R.08 | TSM-425<br>DE09R.08 | TSM-430<br>DE09R.08 | TSM-435<br>DE09R.08 |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Maximum Power- $P_{MAX}$ (Wp)        | 313                 | 317                 | 321                 | 325                 | 329                 |
| Maximum Power Voltage- $V_{MPP}$ (V) | 38.5                | 38.8                | 39.1                | 39.4                | 39.6                |
| Maximum Power Current- $I_{MPP}$ (A) | 8.13                | 8.17                | 8.21                | 8.26                | 8.30                |
| Open Circuit Voltage- $V_{OC}$ (V)   | 46.5                | 46.7                | 46.9                | 47.3                | 47.6                |
| Short Circuit Current- $I_{SC}$ (A)  | 8.58                | 8.62                | 8.66                | 8.71                | 8.75                |

NOCT: Irradiance at 800 W/m², Ambient Temperature 20 °C, Wind Speed 1m/s.

### MECHANICAL DATA

|                      |                                                                                           |
|----------------------|-------------------------------------------------------------------------------------------|
| Solar Cells          | Monocrystalline                                                                           |
| No. of cells         | 144 cells                                                                                 |
| Module Dimensions    | 1762×1134×30 mm                                                                           |
| Weight               | 21.8 kg                                                                                   |
| Glass                | 3.2 mm, High Transmission, AR Coated Heat Strengthened Glass                              |
| Encapsulant material | EVA/POE                                                                                   |
| Backsheet            | White                                                                                     |
| Frame                | 30 mm Anodized Aluminium Alloy                                                            |
| J-Box                | IP 68 rated                                                                               |
| Cables               | Photovoltaic Technology Cable 4.0 mm²<br>Landscape: 1100/1100 mm<br>Portrait: 280/350 mm* |
| Connector            | TS4/MC4 EVO2*                                                                             |

\*Special order only

### TEMPERATURE RATINGS

|                                          |              |
|------------------------------------------|--------------|
| NOCT(Nominal Operating Cell Temperature) | 43 °C (±2 K) |
| Temperature Coefficient of $P_{MAX}$     | -0.34 %/K    |
| Temperature Coefficient of $V_{OC}$      | -0.25 %/K    |
| Temperature Coefficient of $I_{SC}$      | 0.04 %/K     |

### WARRANTY

|                                      |
|--------------------------------------|
| 15 Year product workmanship warranty |
| 25 Year power warranty               |
| 2% First year degradation            |
| 0.55% Annual power degradation       |

(Please refer to the applicable limited warranty for details)

### MAXIMUM RATINGS

|                         |                 |
|-------------------------|-----------------|
| Operational Temperature | -40 to +85 °C   |
| Maximum System Voltage  | 1500 V DC (IEC) |
| Max Series Fuse Rating  | 20 A            |

### PACKAGING CONFIGURATION

|                           |            |
|---------------------------|------------|
| Modules per box           | 36 pieces  |
| Modules per 40' container | 936 pieces |

# aroTHERM plus air source heat pumps



Whether in a new house or in an older property - a heat pump is almost always the right choice. These days, new systems such as the aroTHERM plus can be combined with both underfloor heating and radiators.

|                             | aroTHERM plus                          |
|-----------------------------|----------------------------------------|
| Heat source                 | Air                                    |
| Output range (kW)           | 3.5, 5, 7, 10, 12                      |
| Usage                       | New buildings, renovation, replacement |
| Heat emitters               | Underfloor heating and radiators       |
| House size                  | Up to 300m <sup>2</sup> in new build   |
| Voltage                     | 230V                                   |
| Decibel level (sound power) | As low as 54dB                         |
| Energy efficiency           | Heating:<br>A+++ / A++ (A+++ - D)      |
| SCoP rating                 | up to 4.88                             |

## The benefits of the aroTHERM plus

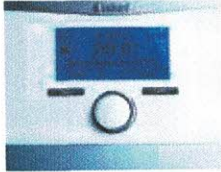


- Outstanding comfort with 75°C flow temperature
- Suitability of aroTHERM plus for modernisation projects
- Exceptionally efficient: highest energy efficiency rating
- Extremely low noise emissions - 3.5, 5, 7 and 12 kW outputs accredited with the Quiet Mark

## Compatible with smart heating controls



sensoCOMFORT



VRC 700



Smartphone app

# aroSTOR domestic hot water air source heat pump cylinder



The aroSTOR range of domestic hot water heat pump cylinders include 200 and 270 litre models. It is perfect for additional hot water requirements in in larger homes or small businesses where there is a high hot water demand.

This heat pump cylinder is incredibly efficient and sustainable, using thermal energy to heat hot water. This thermal energy can be collected via an external air duct, or it can recycle hot air from within the room where it's installed, provided there is sufficient ventilation. The only other energy needed is the electricity to run the appliance.

|                            | aroSTOR domestic hot water heat pump              |
|----------------------------|---------------------------------------------------|
| Heat source                | Air                                               |
| Usage                      | New buildings, renovation, replacement            |
| Size                       | 200 and 270ltr                                    |
| Amount of usable hot water | 367 and 495ltrs<br>*based on stored water at 65°C |
| Energy efficiency          | A+                                                |

## The benefits of aroSTOR

- Highly efficient heat pump cylinder has the best possible ErP label of A+
- The stainless steel tank comes with a five year guarantee (two years for other components)
- A small footprint and range of 360°air duct accessories offers flexible options for siting of the appliance
- Extremely quiet operation, advance insulation and use of rubber on the compressor for quiet operation
- Self managing hot water comfort with electrical back up heater for hot water boost (and Legionella protection)
- aroSTOR heat pumps cylinders come with their own control fixed to the unit. This is a simple turn dial and push button control that has been specifically designed for the aroSTOR.