

ARUN SERIES

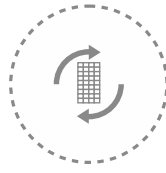
WS-100 to WS-235

WAAREE®

One with the Sun



Superior module efficiency as per international benchmarks



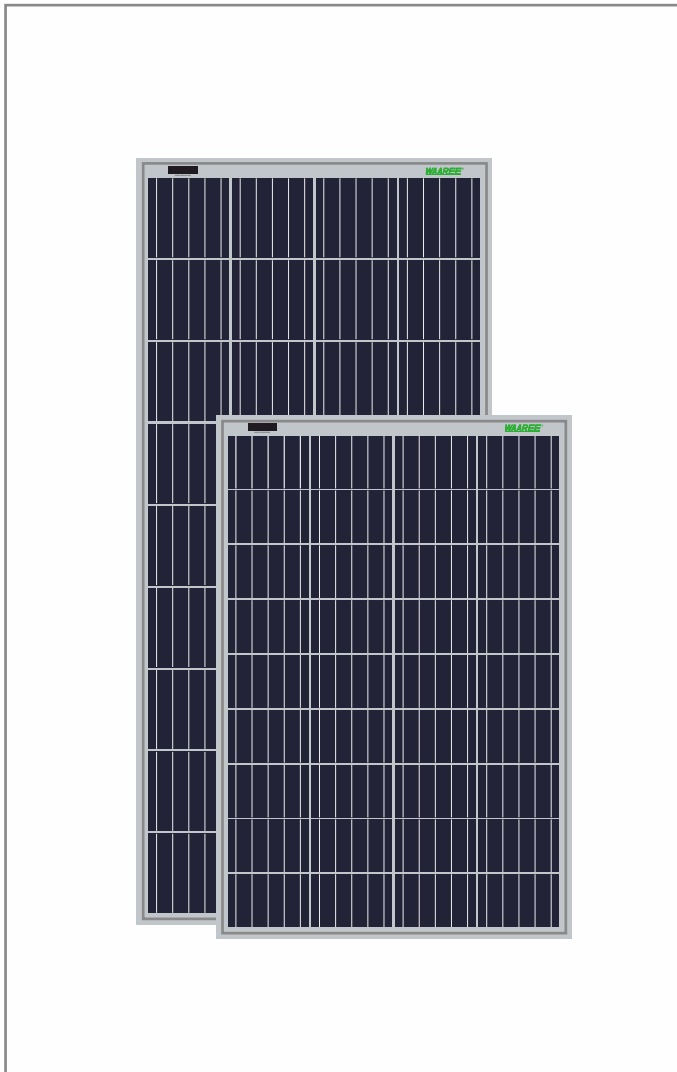
High durability



salt mist resistant



Excellent performance in low light



APPLICATIONS

- Ideal for On/Off-Grid applications
- Rural Electrification
- Off-grid solar system
- Mobile solar system
- Solar street light & lantern applications

THERMAL CHARACTERISTICS

| | |
|---|-----------|
| Temperature coefficient of Current (Isc), α (%/°C) | 0.051 |
| Temperature coefficient of Voltage (Voc), β (%/°C) | -0.2775 |
| Temperature coefficient of Power (Pm), γ (%/°C) | -0.3859 |
| NOCT (°C) | 46 ± 2 |
| Operating temperature range (°C) | -40 to 85 |

WARRANTY

- 5 Years Product Warranty*
- 10 Years Power Output Warranty**

INTERNATIONAL & NATIONAL CERTIFICATIONS

IS 14286 | IS/IEC 61730-1&2 | IEC 61701 | IEC 62804 | UL1703

ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018



R-72002020

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| ELECTRICAL CHARACTERISTICS | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|-------------|-------------|-------|
| Model | WS-100 /12V | WS-100 /24V | WS-105 /12V | WS-110 /12V | WS-110 /24V | WS-115 /12V | WS-115 /24V | WS-120 /12V | WS-120 /24V | WS-125 /12V | WS-125 /24V | WS-130 /12V | WS-130 /24V | WS-135 /12V | WS-140 /12V | WS-140 /24V | WS-145 /12V | WS-150 /12V | WS-150 /24V | WS-160 /12V | WS-160 /24V | WS-155 /24V | WS-160 /24V | |
| Nominal Maximum Power: Pm (W)* | 100 | 100 | 105 | 110 | 110 | 115 | 120 | 120 | 120 | 125 | 125 | 130 | 130 | 135 | 140 | 140 | 145 | 150 | 150 | 160 | 160 | 155 | 160 | |
| Open Circuit Voltage: Voc (V)* | 21.97 | 44 | 22.02 | 22.07 | 44.05 | 22.12 | 22.17 | 22.22 | 44.10 | 22.22 | 44.10 | 22.27 | 44.15 | 22.32 | 22.37 | 44.2 | 23.42 | 23.47 | 44.3 | 44.41 | 44.35 | 44.41 | 44.41 | |
| Short Circuit Current: Isc (A)* | 6.07 | 3.03 | 6.36 | 6.65 | 3.33 | 6.93 | 7.22 | 7.50 | 3.78 | 7.78 | 3.93 | 3.93 | 3.93 | 8.06 | 8.34 | 4.22 | 8.62 | 8.90 | 4.51 | 4.66 | 4.66 | 4.8 | 9.25 | |
| Voltage at Maximum Power: Vmp (V)* | 17.47 | 35.60 | 17.49 | 17.51 | 35.70 | 17.54 | 17.56 | 17.59 | 35.73 | 17.59 | 35.73 | 17.61 | 35.75 | 17.64 | 18.26 | 36 | 18.32 | 18.39 | 36.10 | 36.20 | 36.15 | 36.20 | 36.20 | |
| Current at Maximum Power: Imp (A)* | 5.73 | 2.81 | 6.01 | 6.29 | 3.09 | 6.56 | 6.84 | 7.11 | 3.50 | 7.39 | 3.64 | 3.64 | 3.64 | 7.66 | 7.93 | 3.90 | 8.20 | 8.47 | 4.16 | 4.29 | 4.29 | 4.42 | 8.80 | |
| Maximum System Voltage (V) | 600/1000 | | | | | | | | | | | | | | | | | | | | | | | |
| Module Efficiency (%) | 14.31 | 14.31 | 15.03 | 15.75 | 15.75 | 13.52 | 14.11 | 14.70 | 12.43 | 12.43 | 12.93 | 15.29 | 12.93 | 15.87 | 13.92 | 13.92 | 14.42 | 14.91 | 14.91 | 15.41 | 15.41 | 15.91 | 15.91 | 15.91 |
| Maximum Series Fuse Rating (A) | 12 | | | | | | | | | | | | | | | | | | | | | | | |
| Rated Voltage (V dc) | 17.47 | 35.60 | 17.49 | 17.51 | 35.70 | 17.54 | 17.56 | 17.59 | 35.73 | 17.59 | 35.73 | 17.61 | 35.75 | 17.64 | 18.26 | 35.8 | 18.32 | 18.39 | 36.10 | 36.20 | 36.15 | 36.20 | 36.20 | 36.20 |
| Rated Current (A dc) | 5.73 | 2.81 | 6.01 | 6.29 | 3.09 | 6.56 | 6.84 | 7.11 | 3.50 | 7.39 | 3.64 | 3.64 | 3.64 | 7.66 | 7.93 | 3.90 | 8.20 | 8.47 | 4.16 | 4.29 | 4.29 | 4.42 | 4.42 | 8.80 |
| MECHANICAL CHARACTERISTICS | | | | | | | | | | | | | | | | | | | | | | | | |
| Model | WS-100 /12V | WS-100 /24V | WS-105 /12V | WS-110 /12V | WS-110 /24V | WS-115 /12V | WS-120 /12V | WS-125 /12V | WS-125 /24V | WS-130 /12V | WS-130 /24V | WS-135 /12V | WS-140 /12V | WS-140 /24V | WS-145 /12V | WS-150 /12V | WS-150 /24V | WS-155 /24V | WS-160 /24V | WS-165 /24V | | | | |
| LengthxWidthxThickness (LxWxT)-mm | 1035x 1035x 675x35 | 1035x 1035x 675x35 | 1035x 1035x 675x35 | 1035x 1035x 675x35 | 1035x 1035x 675x35 | 1260x 1260x 675x35 | 1260x 1260x 675x35 | 1260x 1260x 675x35 | 1490x 1490x 675x35 | 1260x 1260x 675x35 | 1260x 1260x 675x35 | 1260x 1260x 675x35 | 1490x 1490x 675x35 | 1490x 1490x 675x35 | 1490x 1490x 675x35 | 1490x 1490x 675x35 | 1490x 1490x 675x35 | 1490x 1490x 675x35 | 1490x 1490x 675x35 | 1490x 1490x 675x35 | | | | |
| Mounting holes pitch (Y)-mm | 545 | 545 | 545 | 545 | 545 | 645 | 645 | 645 | 915 | 645 | 915 | 645 | 915 | 915 | 915 | 915 | 915 | 915 | 915 | 915 | | | | |
| Mounting holes pitch (X)-mm | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | 633 | | | | |
| Weight: (kg) | 9 | 9 | 9 | 9 | 9 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | | | | |
| Cells per module (Units)/Arrangement | 36/ (9x4) | 72/ (18x4) | 36/ (9x4) | 36/ (9x4) | 72/ (18x4) | 36/ (9x4) | 36/ (9x4) | 36/ (9x4) | 72/ (18x4) | 36/ (9x4) | 36/ (9x4) | 36/ (9x4) | 72/ (18x4) | 72/ (18x4) | 36/ (9x4) | 36/ (9x4) | 36/ (9x4) | 72/ (18x4) | 72/ (18x4) | 36/ (9x4) | 36/ (9x4) | 72/ (18x4) | 72/ (18x4) | |
| Cell Type | Polycrystalline | | | | | | | | | | | | | | | | | | | | | | | |
| Front Cover (Material/Thickness) | Tempered & Low Iron Glass: 3.2 / 4.0 mm | | | | | | | | | | | | | | | | | | | | | | | |
| Encapsulate | Ethylene Vinyl Acetate | | | | | | | | | | | | | | | | | | | | | | | |
| Frame | Anodized Aluminium Alloy | | | | | | | | | | | | | | | | | | | | | | | |
| Junction Box (Protection degree/ Material) | IP65 rated/ Weatherproof PPO enclosure with bypass diodes | | | | | | | | | | | | | | | | | | | | | | | |
| Connector | Optional | | | | | | | | | | | | | | | | | | | | | | | |
| Cable | Optional | | | | | | | | | | | | | | | | | | | | | | | |
| Fire Safety Class | C | | | | | | | | | | | | | | | | | | | | | | | |
| Application Class | A | | | | | | | | | | | | | | | | | | | | | | | |
| Safety Class | II | | | | | | | | | | | | | | | | | | | | | | | |

*Standard Test Conditions (STC) - 1000 W/m2 irradiance, Air Mass 1.5 and 25°C cell temperature. Nominal Operating Cell Temperature (NOCT) - 800 W/m2 irradiance, Air Mass 1.5, Ambient temperature 20°C and Wind speed 1 m/s. Average power reduction of 4.5% at 200 W/m2 as per IEC 60904-1. Measuring Uncertainty ± 3%.

*If you need specific product certificates, and if module installations are to deviate from our guidance specified in our installation manual, please contact your local Waaree sales and technical representatives.

- The electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.
- Refer installation Manual instructions & Waaree warranty statement for terms & conditions.
- Waaree Reserves the right to change the specifications without prior notice.

| ELECTRICAL CHARACTERISTICS | | | | | | | | | | | | | | | | | | |
|--|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------|
| Model | WS-170 /24V | WS-175 /24V | WS-180 /24V | WS-185 /24V | WS-190 /24V | WS-195 /24V | WS-200 /12V | WS-200 /24V | WS-205 /12V | WS-210 /12V | WS-210 /24V | WS-215 | WS-220 /12V | WS-220 /24V | WS-225 | WS-230 | WS-235 | |
| Nominal Maximum Power, Pm (W)* | 170.00 | 175.00 | 180.00 | 185.00 | 190.00 | 195.00 | 200.00 | 200.00 | 205.00 | 210.00 | 210.00 | 215.00 | 220.00 | 220.00 | 225.00 | 230.00 | 235.00 | |
| Open Circuit Voltage, Voc (V)* | 44.50 | 44.55 | 45.05 | 45.10 | 45.25 | 45.30 | 33.00 | 22.97 | 33.10 | 23.07 | 43.60 | 33.30 | 33.40 | 43.70 | 33.50 | 33.60 | 33.70 | |
| Short Circuit Current, Isc (A)* | 5.09 | 5.25 | 5.30 | 5.42 | 5.55 | 5.70 | 8.08 | 11.61 | 8.25 | 12.14 | 6.42 | 8.61 | 8.78 | 12.66 | 8.99 | 9.13 | 9.30 | |
| Voltage at Maximum Power, Vmp (V)* | 36.30 | 36.35 | 37.10 | 37.30 | 37.50 | 37.70 | 27.00 | 17.97 | 27.10 | 18.02 | 35.15 | 27.30 | 27.40 | 18.07 | 35.25 | 27.50 | 27.70 | |
| Current at Maximum Power, Imp (A)* | 4.68 | 4.82 | 4.86 | 4.97 | 5.08 | 5.19 | 7.41 | 11.13 | 7.57 | 11.66 | 5.98 | 7.88 | 8.03 | 12.18 | 8.19 | 8.34 | 8.49 | |
| Maximum System Voltage (V) | 600/1000 | | | | | | | | | | | | | | | | | |
| Module Efficiency (%) | 14.61 | 15.04 | 15.47 | 15.90 | 16.33 | 16.76 | 13.56 | 14.85 | 13.90 | 15.60 | 15.60 | 14.58 | 14.91 | 16.34 | 15.25 | 15.59 | 15.93 | |
| Maximum Series Fuse Rating (A) | 15 | | | | | | | | | | | | | | | | | |
| Rated Voltage (V dc) | 36.30 | 36.35 | 37.10 | 37.30 | 37.50 | 37.70 | 27.00 | 17.97 | 27.10 | 18.02 | 35.15 | 27.30 | 27.40 | 18.07 | 35.25 | 27.50 | 27.60 | 27.70 |
| Rated Current (A dc) | 4.68 | 4.82 | 4.86 | 4.97 | 5.08 | 5.19 | 7.41 | 11.13 | 7.57 | 11.66 | 5.98 | 7.88 | 8.03 | 12.18 | 8.19 | 8.34 | 8.49 | |
| MECHANICAL CHARACTERISTICS | | | | | | | | | | | | | | | | | | |
| Model | WS-170 /12V | WS-175 /24V | WS-180 /24V | WS-185 /24V | WS-190 /24V | WS-195 /24V | WS-200 /12V | WS-200 /24V | WS-205 /12V | WS-210 /12V | WS-210 /24V | WS-215 | WS-220 /12V | WS-220 /24V | WS-225 | WS-230 | WS-235 | |
| LengthxWidthxThickness (LxWxT)-mm | 1175x 990x35 | 1175x 990x35 | 1175x 990x35 | 1175x 990x35 | 1175x 990x35 | 1175x 990x35 | 1360x 990x35 | 1360x 990x35 | 1490x 990x35 | 1360x 990x35 | 1360x 990x35 | 1490x 990x35 | 1360x 990x35 | 1360x 990x35 | 1490x 990x35 | 1490x 990x35 | 1490x 990x35 | |
| Mounting holes pitch (Y)-mm | 595 | 595 | 595 | 595 | 595 | 900 | 900 | 900 | 900 | 900 | 900 | 915 | 900 | 900 | 900 | 900 | 900 | |
| Mounting holes pitch (X)-mm | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | |
| Weight (kg) | 13 | 13 | 13 | 13 | 13 | 13 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | |
| Cells per module (Units)/Arrangement | 72/ (12x6) | 72/ (12x6) | 72/ (12x6) | 72/ (12x6) | 72/ (12x6) | 72/ (12x6) | 54/ (9x6) | 54/ (9x6) | 54/ (9x6) | 72/ (12x6) | 72/ (12x6) | 54/ (9x6) | 72/ (12x6) | 72/ (12x6) | 54/ (9x6) | 54/ (9x6) | 54/ (9x6) | |
| Cell Type | Polycrystalline | | | | | | | | | | | | | | | | | |
| Front Cover (Material/Thickness) | Tempered & Low Iron Glass, 3.2 / 4.0 mm | | | | | | | | | | | | | | | | | |
| Encapsulate | Ethylene Vinyl Acetate | | | | | | | | | | | | | | | | | |
| Frame | Anodized Aluminium Alloy | | | | | | | | | | | | | | | | | |
| Junction Box (Protection degree/ Material) | IP65 rated/ Weatherproof PPO enclosure with bypass diodes | | | | | | | | | | | | | | | | | |
| Connector | Optional | | | | | | | | | | | | | | | | | |
| Cable | Optional | | | | | | | | | | | | | | | | | |
| Fire Safety Class | C | | | | | | | | | | | | | | | | | |
| Application Class | A | | | | | | | | | | | | | | | | | |
| Safety Class | II | | | | | | | | | | | | | | | | | |

*Standard Test Conditions (STC) - 1000 W/m2 irradiance, Air Mass 1.5 and 25°C cell temperature. Nominal Operating Cell Temperature (NOCT) - 800 W/m2 irradiance, Air Mass 1.5, Ambient temperature 20°C and Wind speed 1 m/s. Average power reduction of 4.5% at 200 W/m2 as per IEC 60904-1. Measuring Uncertainty ± 3%.

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