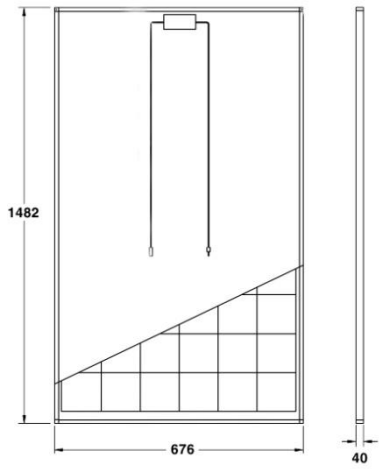
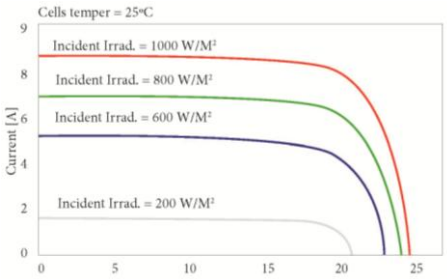
TURBO ENERGY 155

ELECTRICAL SPECIFICATION	
Nominal Maximum Power (Pm)	155 W
Voltage at Maximum Power (Vmpp)	18,35 V
Current at Maximum Power (Impp)	8,45 A
Open Circuit Voltage (Voc)	22,94 V
Short Circuit Current (Isc)	8,75 A
Module Efficiency (%)	18 %
Tolerance	0 to + 7,75 W
Pmpp	-0,4677 %/ºC
Voc	-0,3374 %/ºC
Isc	+ 0,0492 %/ºC
NOCT	45 ± 2 ºC
* Under Standard Test Condition (STC): 1000 W/m2 Irrandiance AM 1.5 spectrum and 25ºC cell temperature	

MECHANICAL DATA	
Maximum System Voltage	1000 V/DC (IEC)
Working Temperature	-40 ºC to + 85ºC Max. Reverse
Maximum Reverse Current (Ir)	10 A
Mechanical load	≥ 5400 Pa
Protection Class	II
Fire protection	C
Resistance	≥ 100 M

WORKING DATA	
Solar Cell	Monocrystalline
Cell Size	156 x 156 mm
Cell configuration	9 x 4 (60)
Weight	12 kg
Module size	1482 x 676 x 40 mm2
Cable Length	1000 mm
Cable section	4 mm2
Number of bypas diodes	3 / 6
Frame	Anodized Aluminum
Juntion Box type	IP65





FEATURES

- Positive Tolerance 0+5W Series.
- Excellente low irradiation performance.
- Fully automated soldering process.
- High module conversion efficiency up to 17,26 %.
- International certificates to ensure the best quality and performance.
- Manufacturing process certified under the ISO 9001 standars.

IEC 61215
IEC 61730
LISTED

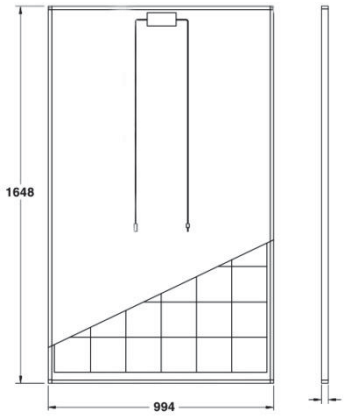
*IEC, MCS, UL y TÜV Rheinland válidos únicamente para LX-80M y LX-140M

TURBO ENERGY 250

ELECTRICAL SPECIFICATION	
Nominal Maximum Power (Pm)	250 W
Voltage at Maximum Power (Vmpp)	30 V
Current at Maximum Power (Impp)	8,33 A
Open Circuit Voltage (Voc)	36 V
Short Circuit Current (Isc)	9,26 A
Module Efficiency (%)	17,26 %
Tolerance	0 to + 5 W
Pmpp	-0,384 %/ºC
Voc	-0,294 %/ºC
Isc	+ 0,068 %/ºC
NOCT	45 ± 2 ºC
* Under Standard Test Condition (STC): 1000 W/m2 Irrandiance AM 1.5 spectrum and 25ºC cell temperature	

MECHANICAL DATA	
Maximum System Voltage	1000 V/DC (IEC)
Working Temperature	-40 ºC to + 85ºC Max. Reverse
Maximum Reverse Current (Ir)	15 A
Mechanical load	7400 Pa
Protection Class	II
Fire protection	C
Resistance	≥ 100 M

WORKING DATA	
Solar Cell	Polycrystalline
Cell Size	156 x 156 mm
Cell configuration	6 x 10 (60)
Weight	19 kg
Module size	1648 x 994 x 40 mm2
Cable Length	90 mm
Cable section	4 mm2
Number of bypas diodes	6
Frame	Anodized Aluminum
Juntion Box type	Weather Proof Nylon IP65



*IEC, MCS, UL y TÜV Rheinland válidos únicamente para LX-80M y LX-140M

FEATURES

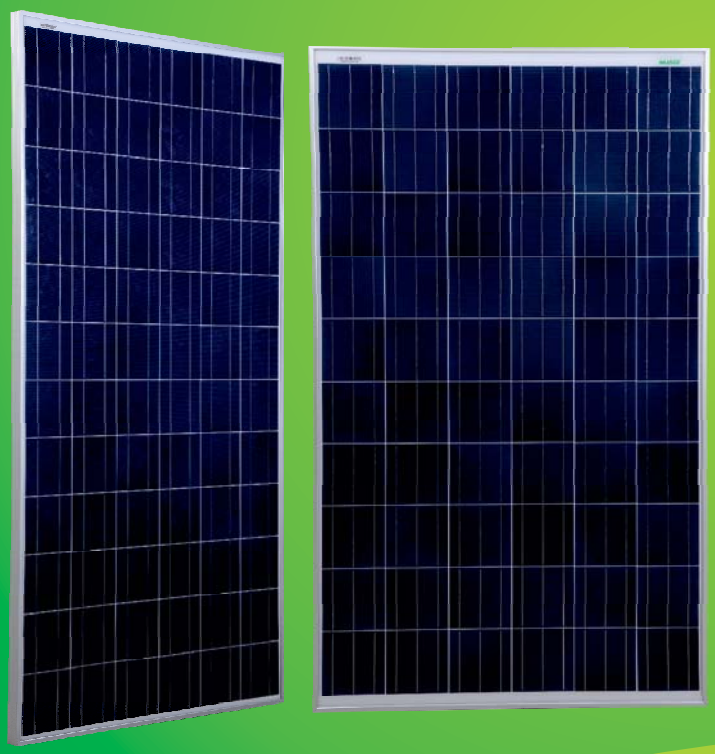
- Positive Tolerance 0+5W Series.
- Excellente low irradiation performance.
- Fully automated soldering process.
- High module conversion efficiency up to 17,26 %.
- International certificates to ensure the best quality and performance.
- Manufacturing process certified under the ISO 9001 standars.

CELEBRATING 25 YEARS OF BUSINESS EXCELLENCE

WAAREE®

ADITYA SERIES MULTI

WS-280 to WS- 315 (72 Cells - 6")



FEATURES

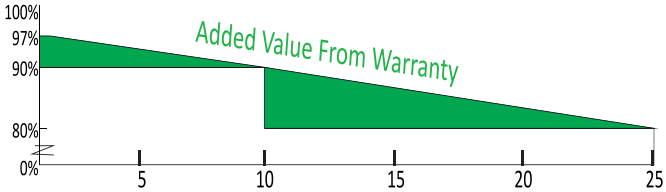
- Superior Module Efficiency as per International Benchmarks
- Positive Power Tolerance 0 /+ 5W
- PID Free Modules with long term reliability
- Glass with Anti Reflective Coating
  Improves light transmission
- Salt mist, Ammonia, Blowing Sand and Hail Resistant
- Sustain Heavy Wind & Snow loads
  (2400 Pa & 7500 Pa)
- IP 67 rated MC4 compatible connectors
- Excellent Performance in low light

250MW
Module
Manufacturing Capacity

Over 20 in house tests
(DH: Damp heat test
TC: Thermal cycling test
HF: Humidity freeze test)

25 Years Output Warranty

10 years Limited Product Warranty
25 years Limited Power Output Warranty:
-Minimum 90% at the end of 10 years
-Minimum 80% at the end of 25 years



INTERNATIONAL & NATIONAL CERTIFICATIONS

ISO 9001:2008 | ISO 14001:2004 | OHSAS 18001:2007
IEC 61215 | IEC 61730-1&2 | UL 1703 | MCS | IEC 61701 | IEC 62716

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CELEBRATING 25 YEARS OF BUSINESS EXCELLENCE

ADITYA SERIES MULTI

WS-280 to WS-315 (72 Cells-6")

WAAREE®

Electrical Characteristics*

Model	WS-280	WS-285	WS-290	WS-295	WS-300	WS-305	WS-310	WS-315
Nominal Maximum Power, P_m (W)*	280	285	290	295	300	305	310	315
Power tolerance	0 / +5 W							
Open Circuit Voltage, V_{oc} (V)*	44.6	44.7	44.8	44.9	45	45.1	45.2	45.3
Short Circuit Current, I_{sc} (A)*	8.37	8.5	8.63	8.76	8.89	9.02	9.14	9.27
Voltage at Maximum Power, V_{mp} (V)*	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8
Current at Maximum Power, I_{mp} (A)*	7.76	7.88	7.99	8.11	8.22	8.34	8.45	8.56
Maximum System Voltage (V)	1000 (IEC)							
Module Efficiency (%)*	14.43	14.69	14.95	15.2	15.46	15.72	15.98	16.23
Maximum Series Fuse Rating (A)	15							
Limiting Reverse Current (A)	15							

*Under Standard Test Conditions (STC) of 1000 W/m² irradiance, AM 1.5 spectrum and 25°C cell temperature.

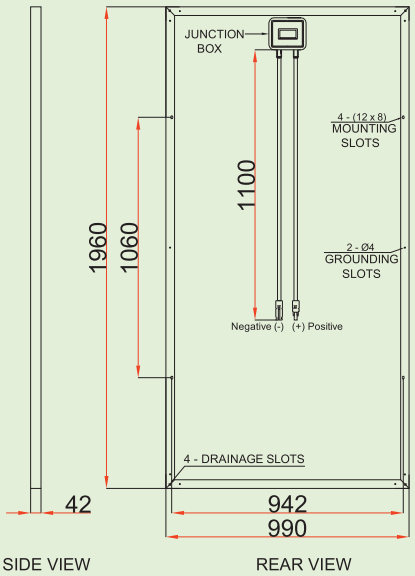
Mechanical Characteristics

Length x Width x Thickness (L x W x T) - mm	1960 x 990 x 42
Mounting Holes Pitch (Y) – mm	1060
Mounting Holes Pitch (X) – mm	942
Weight (kg)	22.5
Solar Cells per Module (Units) / Arrangement	72 / 12 x 6
Solar Cell Type / Length x Width – mm (inch)	Multi crystalline Silicon / 156 x 156 (6" x 6")
Front Cover (Material / Thickness)	Tempered & Low Iron Glass, 3.2 mm
Encapsulate	Ethylene Vinyl Acetate
Frame Material	Anodized Aluminum Alloy
Junction Box (Protection degree / Material)	IP65 rated / Weatherproof PPO enclosure with bypass diodes
No. of bypass diodes	3 / 6
Connector (Type / Protection degree)	MC4 compatible / IP67 rated
Cable (Length / Cross sectional area)	1100 mm / 4 mm²
Packaging	24 + 24 + 5 (2 pallets + 1 box)
Mechanical load	7500 Pa
Fire safety class	C
Safety application class	A
Safety class	II

Thermal Characteristics

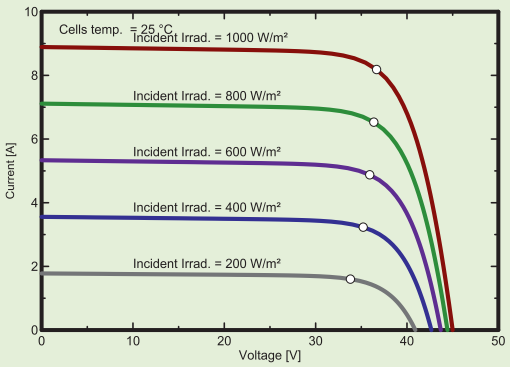
Temperature coefficient of Current (I_{sc}), α (%/°C)	0.0681
Temperature coefficient of Voltage (V_{oc}), ß (%/°C)	-0.2941
Temperature coefficient of Power (P_m), γ (%/°C)	-0.3845
NOCT (°C)	46 ± 2
Operating temperature range (°C)	-40 to 85

Design Specifications

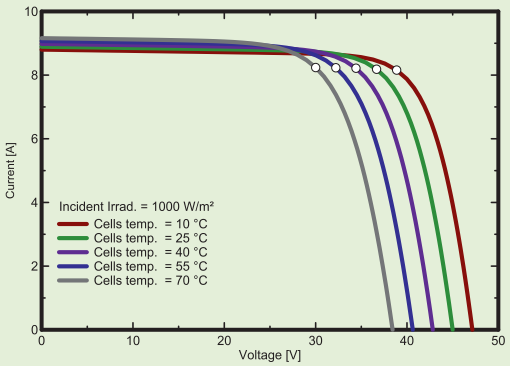


All Dimensions are in mm

I-V Curve Variation with Irradiance



I-V Curve Variation with Temperature



WAAREE is one of india's leading multi-technology companies, headquartered at Mumbai Founded in 1989, WAAREE successfully developed cutting edge technologies to become one of the most preferred brands in the field of instrumentation, petroleum/gas and energies. The company has transformed itself from a single business into a multi-technology organisation, diversifying into exciting areas of Solar Energy, Industrials Valves, Petroleum Equipments and Process control instrumentation.WAAREE has a presence in over 68 countries with primary location in Milan, Dubai, Tokyo, San Francisco, Sydney and soon starting at Jakarta.It has more than 105 global channel partners. In india it has 26 sales offices. WAAREE has a huge list of satisfied customers over the years. Waaree is committed to supply best quality products & technology to its customers. WAAREE's products are manufactured at its state-of-the-art manufacturing facilities and is committed to excel in providing the society with world class quality products.

Contact: WAAREE ENERGIES LTD.
602, Western Edge 1, Opp Western Express Highway, Borivali (east), Mumbai- 400 066, Maharashtra, India
Tel: +91 22 66 44 44 44 Fax: +91 22 66 44 44 00 Email: waaree@waaree.com

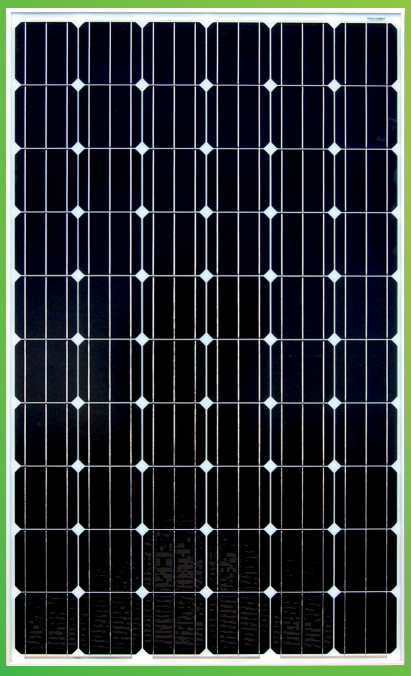
- The specifications are for reference purpose only. Waaree reserves the right to change the specifications without prior notice.

CELEBRATING 25 YEARS OF BUSINESS EXCELLENCE

WAAREE®

SERIE ARUNA MONO

WSM-190 a WSM- 210 (72 Células - 5")



CARACTERÍSTICAS

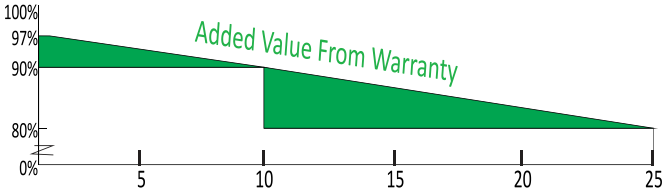
- Módulo de Eficiencia Superior conforme a comparativas internacionales
- Tolerancia Positiva 0 /+ 5W
- Módulo *PID Free* con fiabilidad a largo plazo
- Vidrio con revestimiento anti-reflectante
  Maximiza la transmisión de la luz
- Resistente a niebla salina, amoniaco, arena y granizo
- Soporta vientos fuerte y cargas de nieve
  (2400 Pa & 7500 Pa)
- Conectores tipo MC4 con IP67
- Excelentes rendimientos con baja radiación

250MW
Capacidad de fabricación de módulo

Más de 20 test de calidad en fábrica
(DH: test de calor húmedo
TC: test de ciclos térmicos
HF: test de frío húmedo)

25 Garantía de Potencia

10 años de Garantía de Producto
25 años de Garantía de Potencia:
-Mínimo del 90% a los 10 años
-Mínimo del 80% a los 25 años



CERTIFICACIONES NACIONALES E INTERNACIONALES

ISO 9001:2008 | ISO 14001:2004 | OHSAS 18001:2007
IEC 61215 | IEC 61730-1&2 | UL 1703 | MCS | IEC 61701 | IEC 62716

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CELEBRATING 25 YEARS OF BUSINESS EXCELLENCE

SERIE ARUNA MONO

WSM-190 a WSM-210 (72 Células-5")

WAAREE®

Características Eléctricas*

Modelo	WSM-190 / 24V	WSM-195 / 24V	WSM-200 / 24V	WSM-205 / 24V	WSM-210 / 24V
Potencia Nominal, Pm (W)*	190	195	200	205	210
Tolerancia			0 / + 5 W		
Tensión en Circuito Abierto, Voc (V)*	45.00	45.30	45.60	45.90	46.20
Corriente de Cortocircuito, Isc (A)*	5.63	5.74	5.85	5.96	6.06
Tensión a Máxima Potencia, Vmp (V)*	37.8	37.9	38	38.1	38.20
Corriente en Máxima Potencia, Imp (A)*	5.03	5.15	5.27	5.39	5.5
Tensión Máxima del Sistema (V)			1000		
Eficiencia del Módulo (%)*	14.88	15.27	15.67	16.06	16.45
Valor Máximo del Fusible (A)	15	15	15	15	15
Limitación de Corriente Inversa (A)	15	15	15	15	15

*Bajo Condiciones STC: 1000 W/m^2 de irradiancia, AM spectrum 1.5 y 25°C de temperatura de célula.

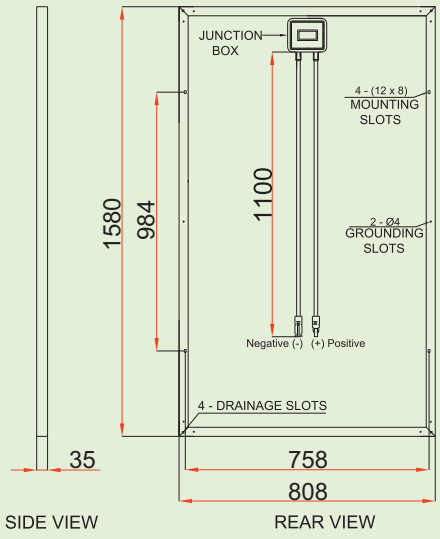
Características Mecánicas

Largo x Ancho x Grueso (L x W x T) - mm	1580 x 808 x 35
Separación de Orificios de montaje (Y) - mm	984
Separación de Orificios de montaje (X) - mm	758
Peso - kg	17
Células por módulo (unidades) / Disposición	72 / (12 x 6)
Tipo de célula solar	Silicio Monocristalino
Largo x Ancho - mm (pulgadas)	125 x 125 (5" x 5")
Cobertura frontal (Material/Grosor)	Vidrio Templado y Bajo en Hierro 3.2 mm
Encapsulado	Etilvinilacetato
Material del Marco	Aleación de Aluminio Anodizado
Caja de Conexiones (protección / material)	Ip65 / A prueba de Interperie PPO Diodos Bypass
Número de diodos bypass	3 / 6
Conector (Grado de protección / Tipo)	Ip67 / Compatible MC4
Cable (Longitud / Sección)	1100 mm / 4 mm^2
Embalaje	29 pcs. / pallet
Resistencia a las Cargas Mecánicas	7500 Pa
Resitencia al fuego (Clase)	C
Seguridad (Clase)	A
Seguridad (Tipo)	II

Características Mecánicas

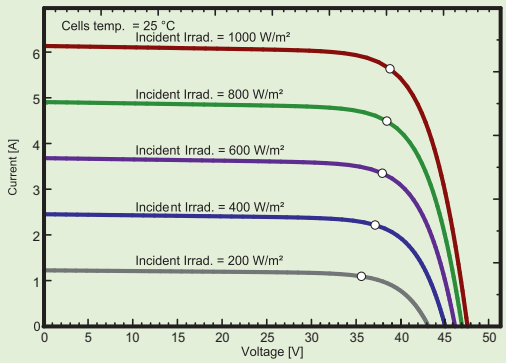
Coeficiente de Temperatura (I_{sc}), α (%/°C)	0.0681
Coeficiente de Temperatura (V_{oc}), ß (%/°C)	-0.2941
Coeficiente de Temperatura (P_m), γ (%/°C)	-0.3845
NOCT (°C)	46 ± 2
Rango de Temperatura de Operación	-40 to 85

Especificaciones de Diseño

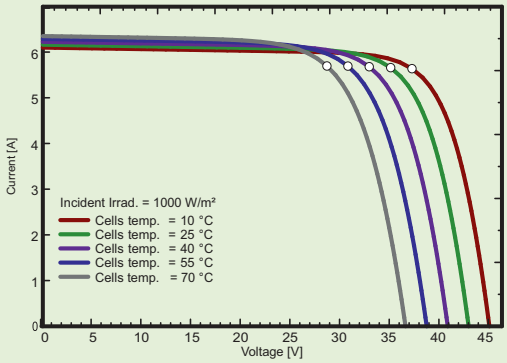


All Dimensions are in mm

Variación de la Curva I-V por Irradiancia



Var. de la Curva I-V por Temperatura



Waaree es una de las compañías multi-tecnología líder de la India, con sede en Bombai, fundada en 1989, Waaree desarrolló con éxito tecnologías de vanguardia para convertirse en una de las marcas más preferidas en el campo de instrumentación, de petróleo / gas y energías. La compañía ha pasado de ser una sola empresa a una organización multi-tecnología, la diversificación en las zonas interesantes de la Energía Solar, Válvulas Industriales, Equipos de Petróleo y instrumentation para control de procesos. WAAREE tiene presencia en más de 68 países con ubicación principal en Milán, Dubai, Tokio, San Francisco, Sydney y próximamente en Jakarta . Cuenta con más de 105 socios de canal globales. En India tiene 26 oficinas de ventas. Waaree tiene una enorme lista de clientes satisfechos en los últimos años y su compromiso es suministrar los mejores productos de calidad y tecnología a sus clientes. Los productos de Waaree se fabrican en sus propias instalaciones en una vigilancia constante del estado de la técnica y está comprometida con la excelencia suministrando a la sociedad producto de alta calidad.

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Tel: +91 22 66 44 44 44 Fax: +91 22 66 44 44 00 Email: waaree@waaree.com
WAAREE EUROPA
Piazza IV Novembre, 7, First Floor, Office 101. 20125 Milano - Italia. Tel.: +39 340 772 1116 - sales@waaree.eu

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